FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PHOENIX, ARIZONA

WATERMAN WASH AND TRIBUTARIES FLOODPLAIN DELINEATION STUDY FCD 2002C024

APPENDIX E & F

Book 4 of 5

Prepared by:

Engineering and Environmental Consultants, Inc.
3003 North Central, Suite 600
Phoenix, Arizona 85012-2905
Phone: (602) 248-7702
FAX: (602) 248-7851

March 2006

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY
PHOENIX, ARIZONA

WATERMAN WASH AND TRIBUTARIES FLOODPLAIN DELINEATION STUDY FCD 2002C024

APPENDIX E & F

Book 4 of 5

Prepared by:

Engineering and Environmental Consultants, Inc.
3003 North Central, Suite 600
Phoenix, Arizona 85012-2905
Phone: (602) 248-7702
FAX: (602) 248-7851

March 2006

Registered Professional Engineer (Civil)
CERTIFICATE NO. 37890
LLOYD A. VICK
Date Signed 3/10/06
ARIZONA, U.S.A.

Table of Contents

LIST OF APPENDICES

BOOK 2 OF 5

Appendix A REFERENCES
Appendix A.1 Data Collection Summary
Appendix A.2 Referenced Documents

Appendix B GENERAL DOCUMENTATION AND CORRESPONDENCE
Appendix B.1 Special Problems Report
Appendix B.2 Contact (telephone) Reports
Appendix B.3 Meeting Minutes or Reports
Appendix B.4 General Correspondence
Appendix B.5 Contract Documents
Appendix B.6 FEMA Correspondence

Appendix C SURVEY FIELD NOTES
Appendix C.1 Survey Field Notes for Aerial Mapping Control
Appendix C.2 Survey Field Notes for Hydrologic Modeling
Appendix C.3 Survey Field Notes for Hydraulic Modeling

Appendix D HYDROLOGIC ANALYSIS SUPPORTING DOCUMENTATION
Appendix D.1 Precipitation Data
- Isopoluvials from NOAA2 Atlas.
- Prefre data from DDMSW.
- Flood Flow Frequency Table -log-Pearson Type III analysis.

Appendix D.2 Physical Parameter Calculations
- Special Provisions to soil surveys (refer to section 4.3.1 of the report for further description).
- Maricopa County Slope Adjustment Table.
- Parameter Estimation Table.
- DDMSW Output Tables for Soil Data (See also Combined Basin Data Table).
- DDMSW Output Tables for Land Use (See also Combined Basin Data Table).
- DDMSW Output Tables for Sub-basin Parameters (Combined Basin Data Table).

Appendix D.3 Hydrograph Routing Data
- Examples of Actual Cross Sections versus Idealized 8-Point Cross Section (Flow Master Worksheet included for Idealized Cross Section).
  - Actual Cross Section – Labeled A
  - Idealized 8-Point Cross-Section – Labeled B
- Flow Master Summary Worksheets and Cross Section Data.

Registered Professional Engineer (Civil) CERTIFICATE NO. 37890 LLOYD A. VICK Date Signed 3/18/06 ARIZONA, U.S.A.

BOOK 3 OF 5

Appendix D.3 Hydrograph Routing Data

- Flow Master Summary Worksheets and Cross Section Data for the routes along Waterman Wash for the model without the railroad.
- Flow Master Summary Worksheets and Cross Section Data for routes along Waterman Wash for the model with railroad.
- Flow Master Summary Worksheets and Cross Section Data for the model with railroad levee for Watersheds C-F.

Appendix D.4 Reservoir Routing Data

- Structure Photos
- Detail Drawings.
- HY8 Output.
- Summary Worksheets and Rating Tables for Diverts along the embankment.
- DI and DQ Records.
- SV, SE, SQ Records for Ponds.
- Sketches of Ponds.

Appendix D.5 Flow Splits and Diversion Data

- Summary Worksheets and Rating Tables for Diverts (Flow Master worksheets labeled with an "A" at the end represent the route data).
- DI, DQ Records.

Appendix D.6 Hydrologic Calculations

- The data included in each of the following is the input, the Hec-1 schematic, and the runoff summary.
- D.6.1 - Model with the railroad levee in place.
- D.6.2 - Model without the railroad levee.
- D.6.3 - Model for Watershed J.

BOOK 4 OF 5

Appendix E HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

Appendix E.1 Roughness Coefficient Estimation

Appendix E.2 Cross Section Plots

Appendix E.3 Expansion and Contraction Coefficients

Appendix E.4 Analysis of Structures

Appendix E.5 Hydraulic Calculations

Appendix F EROSION AND SEDIMENT TRANSPORT ANALYSIS SUPPORTING DOCUMENTATION

BOOK 5 OF 5

LIST OF EXHIBITS

Soils Map (Exhibit 1)	Book 5
Land Use Map (Exhibit 2)	Book 5
Vegetative Cover Map (Exhibit 3)	Book 5
ERM Location Map (Exhibit 4)	Book 5
N-Value Identification Map (Exhibit 5)	Book 5
Flood Hazard Delineation Based on Surficial Geologic Mapping (Exhibit 6)	Book 5
Watershed Hydrology Maps (Exhibit H1 - H10)	Book 5
HEC-1 Schematic Maps (Exhibit S1 – S14)	Book 5
Hydraulics Work Study Maps (FP1-FP40)	Map Roll
Hydraulic Work Maps (half-size 11x17)	Section 7 of Book 1
Annotated FEMA Flood Insurance Rate Maps	Book 1

Appendix E

HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

Appendix E.1

ROUGHNESS COEFFICIENT ESTIMATION

Waterman Wash
FCD - 2002C024

n-Value Report

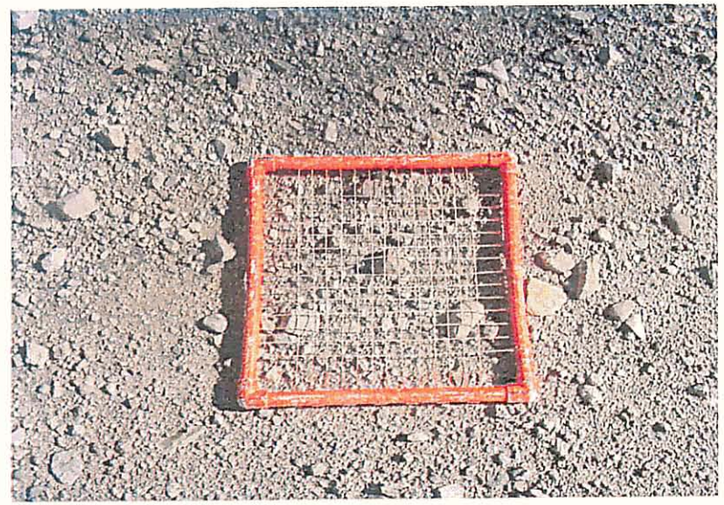
Summary Table of
Individual and Group
Estimated n-Values

WASH NAME	S-T-R NAME	GROUP No.	N VALUE LEFT	N VALUE CHANNEL	N VALUE RIGHT
TYPICAL 1		**1**	**0.044**	**0.049**	**0.044**
A17	2S2WS17A (A17)	1	0.044	0.050	0.044
A18	2S2WS17B (A18)	1	0.045	0.042	0.043
A19	2S2WS20 (A19)	1	0.044	0.046	0.043
A30	2S3WS12 (A30)	1	0.043	0.045	0.043
A35	2S2WS16A (A35)	1	0.043	0.050	0.043
A37	2S2WS15 (A37)	1	0.044	0.051	0.045
A51	2S2WS7B (A51)	1	0.042	0.050	0.041
B33	3S2WS2B (B33)	1	0.046	0.047	0.045
B38	3S2WS2C (B38)	1	0.049	0.045	0.044
B47	3S1WS6 (B47)	1	0.042	0.048	0.044
E49-2	4S1ES9 (E49)	1	0.042	0.048	0.043
TYPICAL 2		**2**	**0.042**	**0.043**	**0.042**
A41	2S2WS26 (A41)	2	0.043	0.044	0.044
B29	2S2WS35B (B29)	2	0.040	0.043	0.040
F34-3	4S1ES15A (F34)	2	0.044	0.043	0.043
H71	3S1WS4A (H71)	2	0.044	0.043	0.044
I66	1S2WS33 (I66)	2	0.044	0.043	0.043
TYPICAL 3		**3**	**0.045**	**0.038**	**0.045**
B45	3S1WS5 (B45)	3	0.040	0.031	0.042
D33	3S1WS26 (D33)	3	0.050	0.035	0.051
D42	3S1WS22 (D42)	3	0.050	0.035	0.051
F34	4S1ES15A (F34)	3	0.045	0.039	0.046
G40	3S1WS15A (G40)	3	0.047	0.035	0.047
J39-3	1S2WS9A (J39)	3	0.044	0.037	0.046
TYPICAL 4		**4**	**0.041**	**0.041**	**0.041**
B12	3S1WS9 (B12)	4	0.040	0.043	0.040
B35	3S2WS2D (B35)	4	0.042	0.039	0.042
D39	3S1WS15 (D39)	4	0.040	0.041	0.040
E49	4S1ES9 (E49)	4	0.042	0.040	0.043
F34-2	4S1ES15A (F34)	4	0.038	0.040	0.037
WW	4S1ES15B (F32)	4	0.039	0.040	0.038
TYPICAL 5		**5**	**0.051**	**0.054**	**0.051**
J37	1S2WS18B (J37)	5	0.049	0.051	0.051
J38	1S2WS17 (J38)	5	0.052	0.053	0.051
J40	1S2WS9B (J40)	5	0.051	0.061	0.054
TYPICAL 6		**6**	**0.050**	**0.043**	**0.050**
A27	2S3WS12 (A27)	6	0.045	0.043	0.049
A60	1S3WS24A (A60)	6	0.053	0.042	0.051
J14	1S2WS14 (J14)	6	0.050	0.041	0.048
J39	1S2WS9A (J39)	6	0.057	0.044	0.055
J39-2	1S2WS9A (J39)	6	0.049	0.043	0.051
J48	1S2WS2 (J48)	6	0.050	0.044	0.049
WW-4	WATERMAN	6	0.050	0.046	0.050
TYPICAL 7		**7**	**0.048**	**0.054**	**0.048**
WW-2	WATERMAN	7	0.048	0.053	0.048
WW-3	WATERMAN	7	0.048	0.055	0.048
TYPICAL 8		**8**	**0.040**	**0.055**	**0.045**
F20	4S1ES23 (F20)	8	0.040	0.055	0.045

Appendix E.1.1

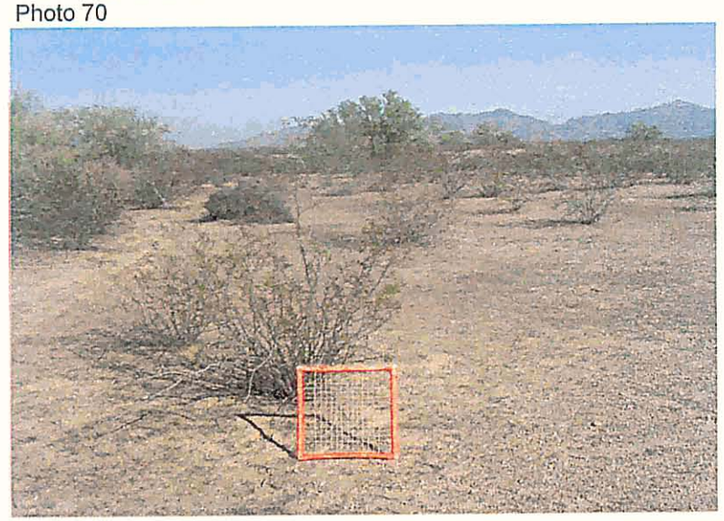
N-VALUE REACH GROUP 1

Main Wash-Looking Downstream
Photo 69



Main Wash-Bed Material
Photo 70

Left Overbank-Looking Downstream
Photo 71

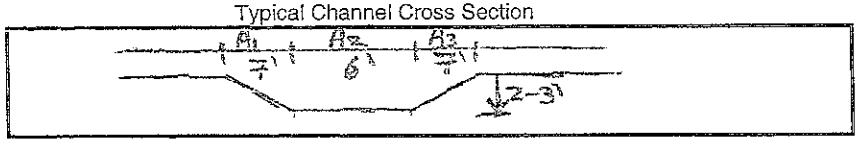


Right Overbank-Looking Downstream
Photo 72

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A17
Photograph No.: # 69-72
Section Description: channel has gravel bed material, overbanks are firm soil
channel has medium to large vegetation
L & ROB are sparsely vegetated with brush and grass

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					9	15	9	
% [decimal]					0.27	0.46	0.27	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028		0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.035		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.014				0.014
	Large		0.025-0.050		0.033		0.03	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.064	0.035	0.061	
x (% of Area)					0.01728	0.0161	0.01647	
Sum (left, right,center)						0.04985		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.050		0.044

Main Wash-Looking Downstream
Photo 73

Main Wash-Bed Material
Photo 74

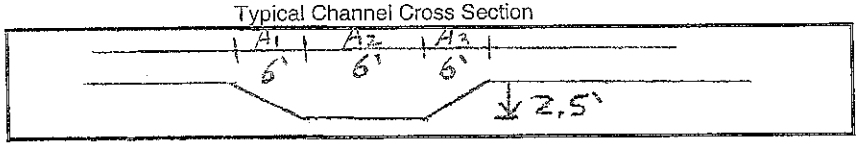
Left Overbank-Looking Downstream
Photo 75

Right Overbank-Looking Downstream
Photo 76

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A18
Photograph No.: # 73-76
Section Description: channel has sandy to small gravel bed, overbanks have firm soil. Channel vegetation is small to medium brush L & ROB are slightly vegetated with small brush and grass

Rough Sketch of
Typical Channel Cross Section

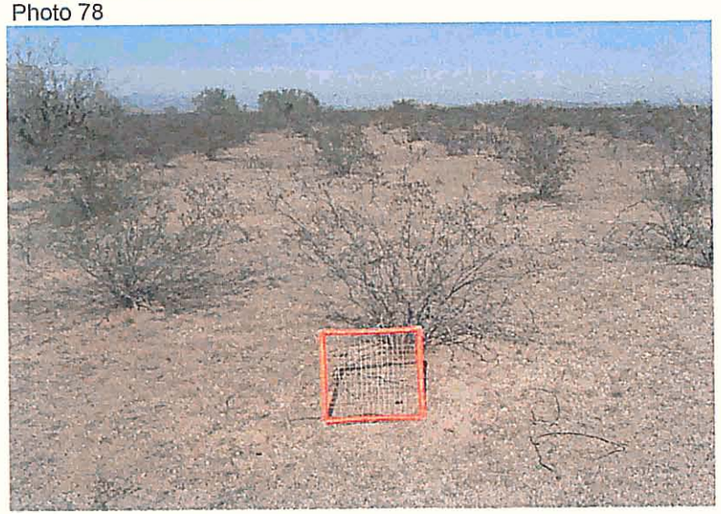


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					8	15	8	
% [decimal]					0.26	0.48	0.26	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028		0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.03		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.015	0.023		0.023	0.013
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.053	0.03	0.053	
x (% of Area)					0.01378	0.0144	0.01378	
Sum (left, right,center)						0.04196		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.045		0.042		0.043

Main Wash-Looking Downstream
Photo 77

Main Wash-Bed Material
Photo 78

Left Overbank-Looking Downstream
Photo 79

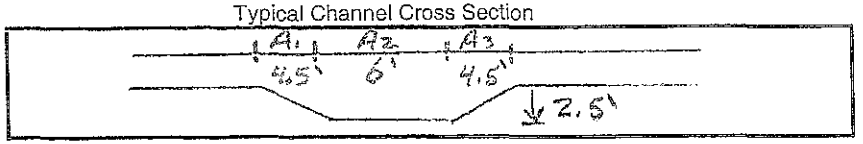


Right Overbank-Looking Downstream
Photo 80

Determination of Manning's Roughness Coefficients by FCDMC Method

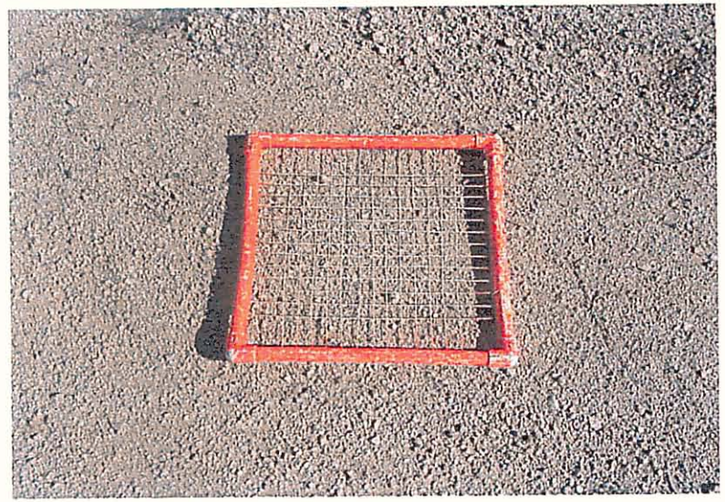
Project: **Waterman Wash**
Stream: A19
Photograph No.: # 77-80
Section Description: channel bed is coarse sand and gravel mix overbanks have firm soil. channel vegetation consists of medium and large brush. L & ROB are sparsely vegetated with mdeium brush

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					6	15	6	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.03		0.03	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.014				0.013
	Large		0.025-0.050		0.031		0.03	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	lternating (occasionally)		0.001-0.005					
	lternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.064	0.032	0.063	
x (% of Area)					0.01408	0.01792	0.01386	
Sum (left, right,center)						0.04586		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.046		0.043

Main Wash-Looking Downstream
Photo 85



Main Wash-Bed Material
Photo 86

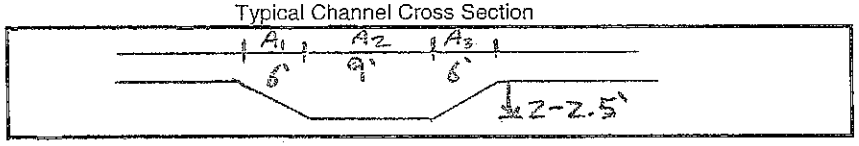
Left Overbank-Looking Downstream
Photo 87

Right Overbank-Looking Downstream
Photo 88

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A30
Photograph No.: # 85-88
Section Description: channel bed is coarse sand and some gravel. Overbanks consist of firm soil. Channel has medium and large vegetation. L & ROB have sparse small to medium vegetation

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					6	18	6	
% [decimal]					0.2	0.6	0.2	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028		0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.015				0.015
	Large		0.025-0.050		0.032		0.034	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.063	0.032	0.064	
x (% of Area)					0.0126	0.0192	0.0128	
Sum (left, right,center)						0.0446		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.043		0.045		0.043

Main Wash-Looking Downstream
Photo 69

Main Wash-Bed Material
Photo 70

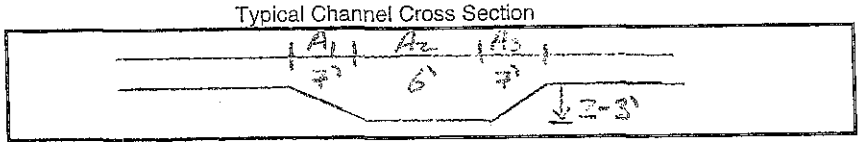
Left Overbank-Looking Downstream
Photo 71

Right Overbank-Looking Downstream
Photo 72

Determination of *Manning's Roughness Coefficients* by FCDMC Method

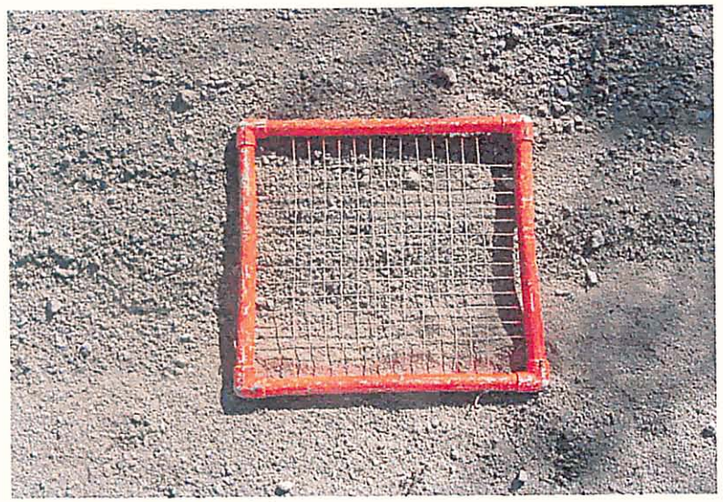
Project: **Waterman Wash**
Stream: A35
Photograph No.: # 69-72
Section Description: channel bed is gravel. Overbanks are firm soil. channel vegetation is medium and large brush and trees L & ROB vegetation is sparse, with small and medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					9	15	9	
% [decimal]					0.27	0.46	0.27	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028		0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.035		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.013				0.013
	Large		0.025-0.050		0.033		0.03	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.064	0.035	0.061	
x (% of Area)					0.01728	0.0161	0.01647	
Sum (left, right,center)						0.04985		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.043		0.050		0.043

Main Wash-Looking Downstream
Photo 65



Main Wash-Bed Material
Photo 66

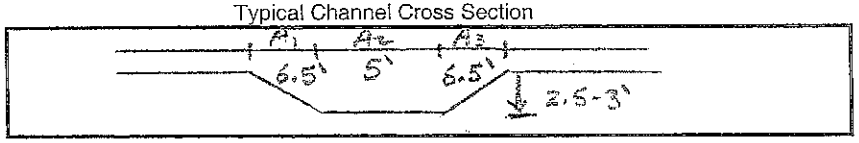
Left Overbank-Looking Downstream
Photo 67

Right Overbank-Looking Downstream
Photo 68

Determination of Manning's Roughness Coefficients by FCDMC Method

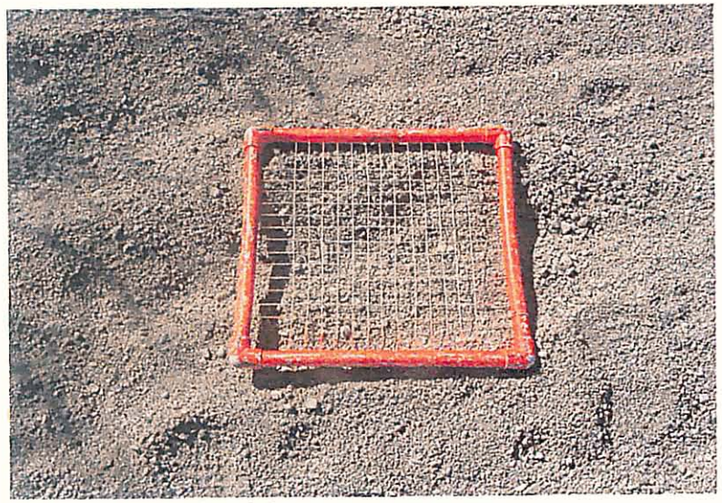
Project: **Waterman Wash**
Stream: A37
Photograph No.: # 65-68
Section Description: channel bed is coarse sand. Overbanks are firm soil. channel vegetation is large brush and trees. L & ROB vegetation is sparse with small and medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section

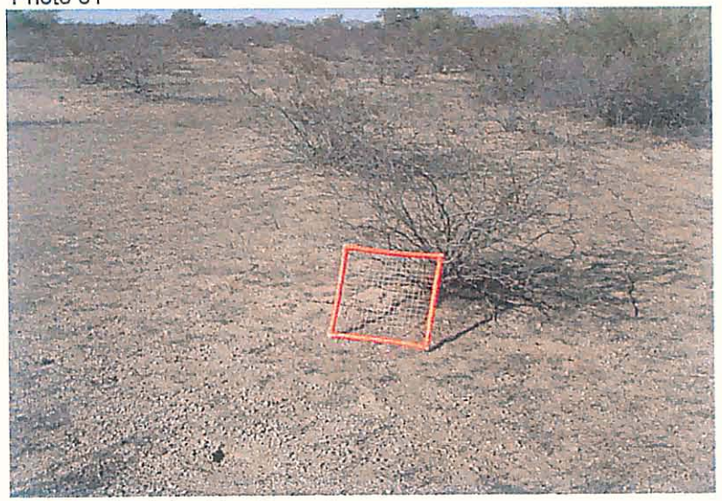


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					9	14	9	
% [decimal]					0.28	0.44	0.28	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.03		0.03	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.032		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.004		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.014				0.015
	Large		0.025-0.050		0.03		0.032	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.064	0.032	0.067	
x (% of Area)					0.01792	0.01408	0.01876	
Sum (left, right,center)						0.05076		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.051		0.045

Main Wash-Looking Downstream
Photo 81



Main Wash-Bed Material
Photo 82



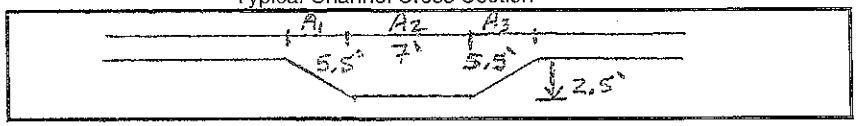
Left Overbank-Looking Downstream
Photo 83

Right Overbank-Looking Downstream
Photo 84

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A51
Photograph No.: # 81-84
Section Description: channel is coarse sand. Overbanks are firm soil. channel vegetation is medium to large brush and trees L & ROB are sparse with small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					7	18	7	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.03		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005					
	Moderate		0.006-0.010		0.006		0.006	
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.002	0	0.002	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.012				0.011
	Large		0.025-0.050		0.04		0.035	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.077	0.03	0.072	
x (% of Area)					0.01694	0.0168	0.01584	
Sum (left, right,center)						0.04958		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.042		0.050		0.041

Main Wash-Looking Downstream
Photo 49

Main Wash-Bed Material
Photo 50

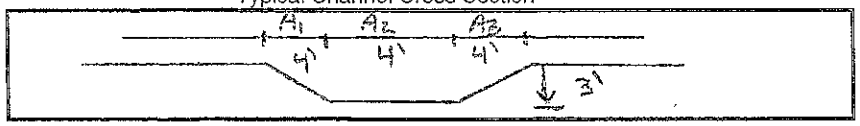
Left Overbank-Looking Downstream
Photo 51

Right Overbank-Looking Downstream
Photo 52

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B33
Photograph No.: # 49-52
Section Description: channel is coarse sand and gravel. Overbanks are firm soil. channel vegetation is medium brush and trees. L & ROB are sparse with small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section

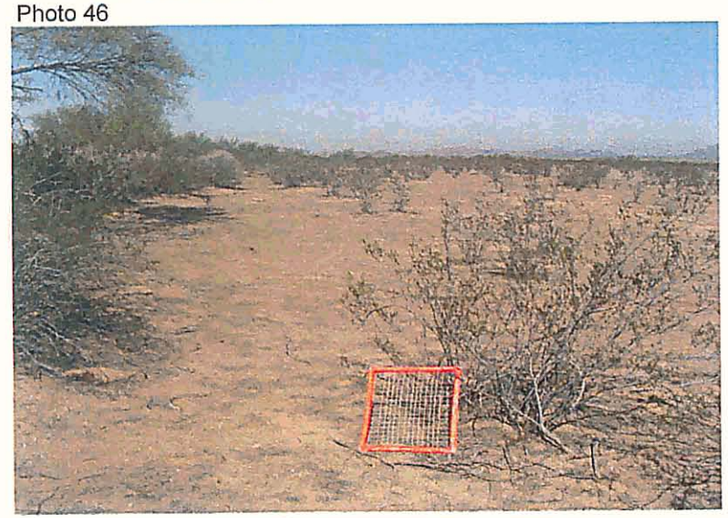


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					12	12	12	
% [decimal]					0.33	0.33	0.33	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.016	0.024		0.023	0.015
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.056	0.031	0.054	
x (% of Area)					0.01848	0.01023	0.01782	
Sum (left, right,center)						0.04653		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.046		0.047		0.045

Main Wash-Looking Downstream
Photo 45

Main Wash-Bed Material
Photo 46

Left Overbank-Looking Downstream
Photo 47

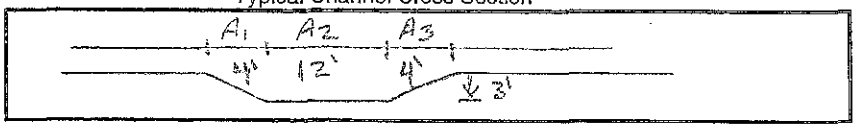


Right Overbank-Looking Downstream
Photo 48

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B38
Photograph No.: # 45-48
Section Description: channel is coarse sand and gravel. Overbanks are firm soil. channel vegetation is large brush and trees. ROB is sparse with small to medium brush. LOB has medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section

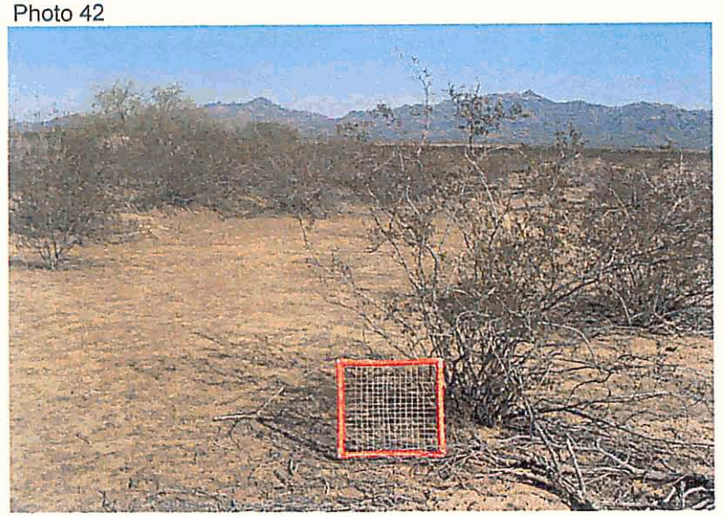


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					6	36	6	
% [decimal]					0.125	0.75	0.125	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.032		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.005		0.004	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0		0		0
	Minor		0.005-0.015		0.006		0.005	
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.019				0.014
	Large		0.025-0.050		0.044		0.045	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.084	0.032	0.083	
x (% of Area)					0.0105	0.024	0.010375	
Sum (left, right,center)						0.044875		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.049		0.045		0.044

Main Wash-Looking Downstream
Photo 41

Main Wash-Bed Material
Photo 42

Left Overbank-Looking Downstream
Photo 43



Right Overbank-Looking Downstream
Photo 44

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B47
Photograph No.: # 41-44
Section Description: channel is coarse sand. Overbanks are firm soil.
channel vegetation is large brush and trees.
ROB is somewhat sparse with small to medium brush.
LOB is sparce with medium brush and grasses.

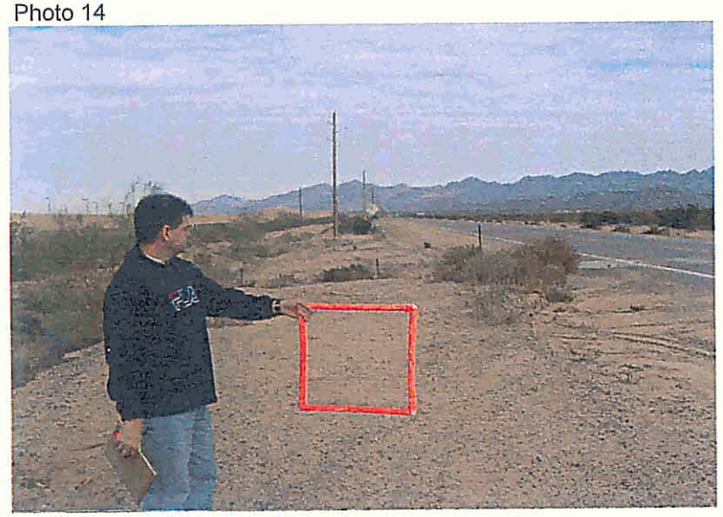
Rough Sketch of
Typical Channel Cross Section

Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					7	16	7	
% [decimal]					0.23	0.54	0.23	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.031	0.03		0.03	0.031
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.03		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.002	0	0.002	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.011				0.013
	Large		0.025-0.050		0.033		0.035	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.067	0.03	0.07	
x (% of Area)					0.01541	0.0162	0.0161	
Sum (left, right,center)						0.04771		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.042		0.048		0.044

Main Wash-Looking Downstream
Photo 13

Main Wash-Bed Material
Photo 14

Left Overbank-Looking Downstream
Photo 15

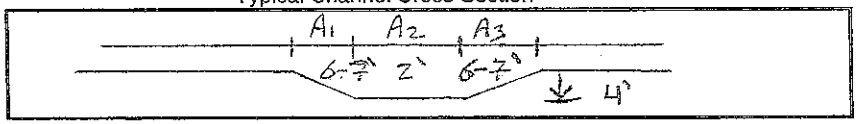


Right Overbank-Looking Downstream
Photo 16

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: E49-2
Photograph No.: #13-16
Section Description: channel and overbanks are firm soil. Channel vegetation is small and medium brush. L & ROB are sparse with small and medium vegetation

Rough Sketch of
Typical Channel Cross Section

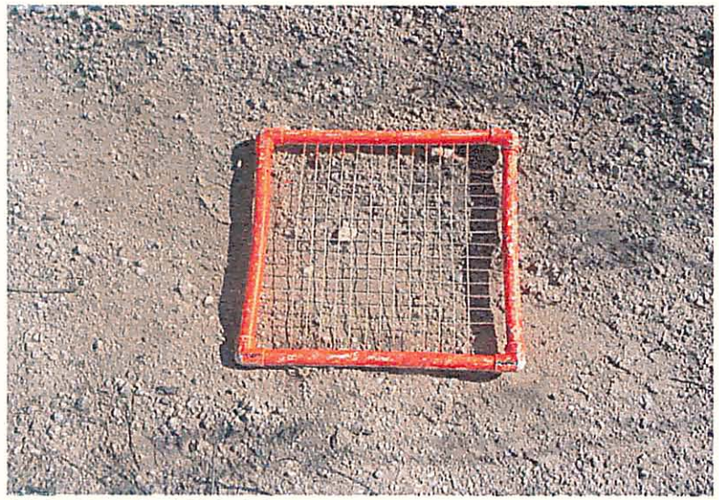


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					13	8	13	
% [decimal]					0.38	0.24	0.38	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028	0.028	0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010					
	Medium		0.01-0.025	0.012	0.02	0.022	0.018	0.013
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.048	0.05	0.046	
x (% of Area)					0.01824	0.012	0.01748	
Sum (left, right,center)						0.04772		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.042		0.048		0.043

Appendix E.1.2

N-VALUE REACH GROUP 2

Main Wash-Looking Downstream
Photo 61



Main Wash-Bed Material
Photo 62

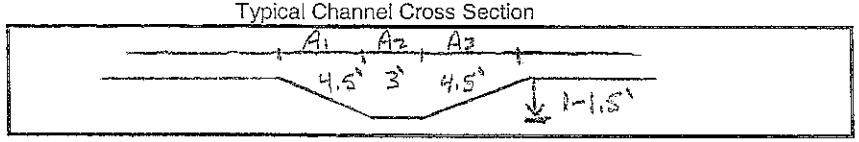
Left Overbank-Looking Downstream
Photo 63

Right Overbank-Looking Downstream
Photo 64

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A41
Photograph No.: # 61-64
Section Description: channel is coarse sand. Overbanks are firm soil. channel vegetation is small to medium brush and trees L & ROB are sparse with small to medium brush.

Rough Sketch of
Typical Channel Cross Section

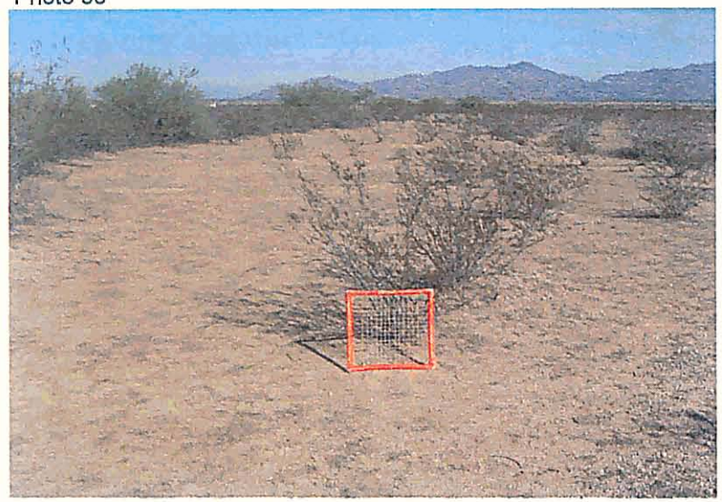


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					3	4	3	
% [decimal]					0.3	0.4	0.3	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028		0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.03		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.001	0	0.002	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.013	0.021		0.023	0.014
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.052	0.03	0.055	
x (% of Area)					0.0156	0.012	0.0165	
Sum (left, right,center)						0.0441		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.043		0.044		0.044

Main Wash-Looking Downstream
Photo 57

Main Wash-Bed Material
Photo 58

Left Overbank-Looking Downstream
Photo 59

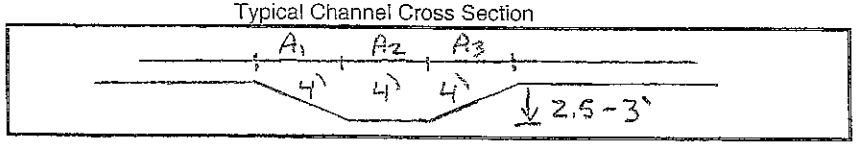


Right Overbank-Looking Downstream
Photo 60

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B29
Photograph No.: # 57-60
Section Description: channel bed is gravel. Overbanks are firm soil.
channel vegetation is small to medium brush.
L & ROB are sparse with small brush.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					6	11	6	
% [decimal]					0.26	0.48	0.26	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028		0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.01		0		0.01
	Medium		0.01-0.025		0.021		0.024	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.051	0.032	0.054	
x (% of Area)					0.01326	0.01536	0.01404	
Sum (left, right,center)						0.04266		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.04		0.043		0.04

Main Wash-Looking Downstream
Photo 147

Main Wash-Bed Material
Photo 148

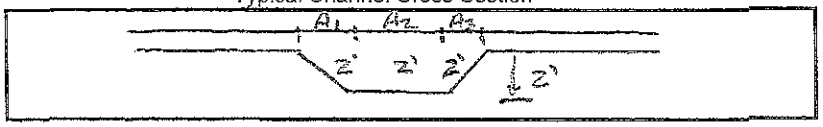
Left Overbank-Looking Downstream
Photo 149

Right Overbank-Looking Downstream
Photo 150

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: F34-3
Photograph No.: #147-150
Section Description:

Rough Sketch of
Typical Channel Cross Section

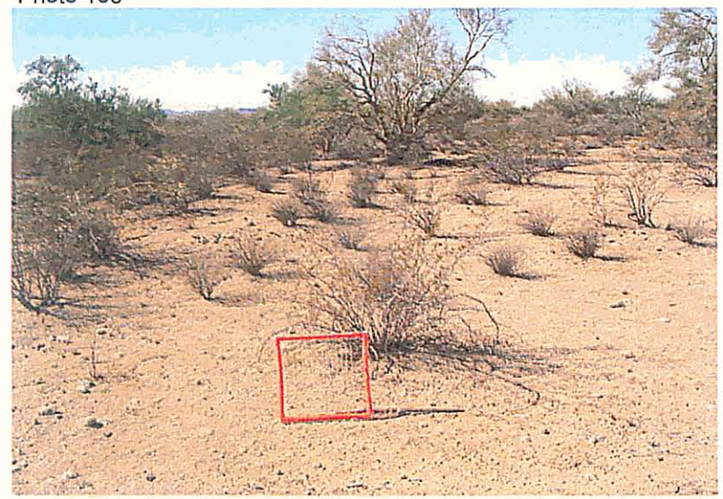


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					4	4	4	
% [decimal]					0.33	0.34	0.33	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.026	0.027		0.027	0.026
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.028		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.018	0.021		0.021	0.017
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.051	0.028	0.051	
x (% of Area)					0.01683	0.00952	0.01683	
Sum (left, right,center)						0.04318		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.043		0.043

Main Wash-Looking Downstream
Photo 167

Main Wash-Bed Material
Photo 168

Left Overbank-Looking Downstream
Photo 169

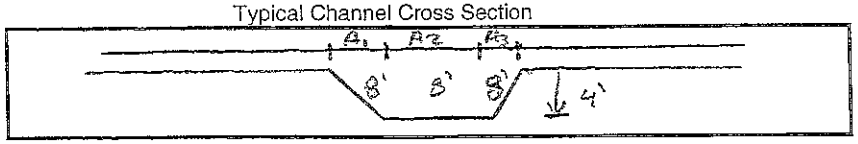


Right Overbank-Looking Downstream
Photo 170

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: H71
Photograph No.: #167-170
Section Description:

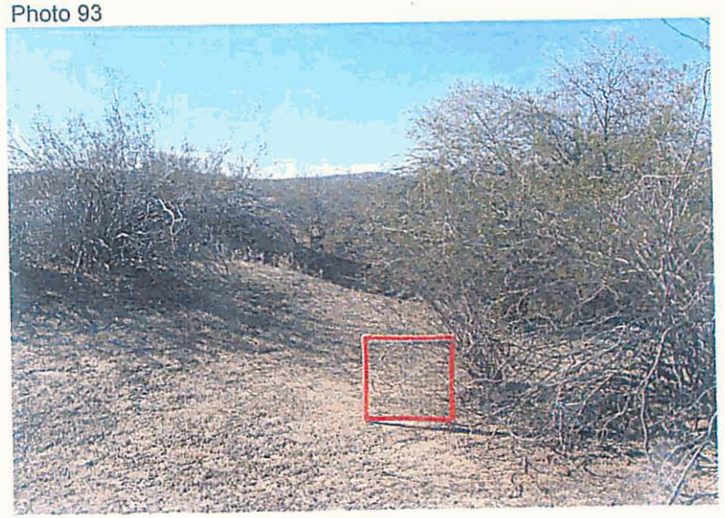
Rough Sketch of
Typical Channel Cross Section



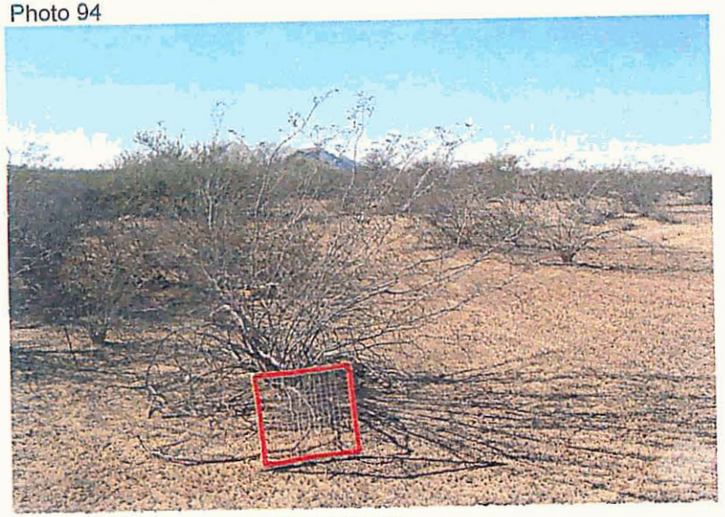
Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					16	32	16	
% [decimal]					0.25	0.5	0.25	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028		0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.03		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.016	0.025		0.025	0.016
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.055	0.03	0.055	
x (% of Area)					0.01375	0.015	0.01375	
Sum (left, right,center)						0.0425		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.043		0.044

Main Wash-Looking Downstream
Photo 93

Main Wash-Bed Material
Photo 94



Left Overbank-Looking Downstream
Photo 95

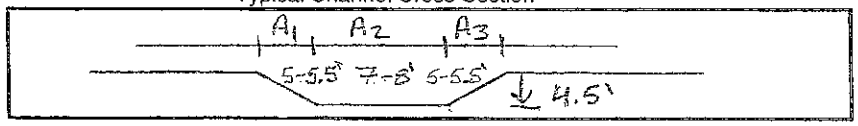


Right Overbank-Looking Downstream
Photo 96

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: I66
Photograph No.: # 93-96
Section Description: channel bed is gravel. Overbanks are firm soil. Channel vegetation is medium brush and trees. L & ROB are sparse medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					11.8	33.8	11.8	
% [decimal]					0.21	0.58	0.21	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.03		0.03	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005				0.003	
	Moderate		0.006-0.010		0.006			
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.003	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.014	0.023		0.022	0.013
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.062	0.032	0.055	
x (% of Area)					0.01302	0.01856	0.01155	
Sum (left, right,center)						0.04313		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.043		0.043

Appendix E.1.3

N-VALUE REACH GROUP 3

Main Wash-Looking Downstream
Photo 29

Main Wash-Bed Material
Photo 30

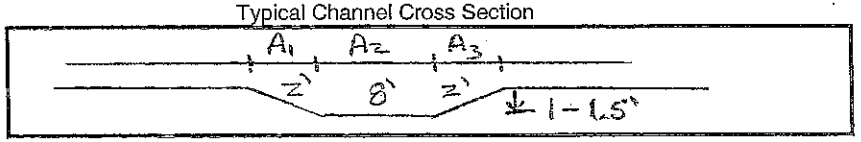
Left Overbank-Looking Downstream
Photo 31

Right Overbank-Looking Downstream
Photo 32

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B45
Photograph No.: # 29-32
Section Description: channel is coarse sand. Overbanks are firm soil. channel vegetation is medium brush and trees. L & ROB are sparse with small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					1.25	10	1.25	
% [decimal]					0.1	0.8	0.1	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026			0.025		
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0.002	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.01	0.024		0.025	0.012
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.056	0.025	0.058	
x (% of Area)					0.0056	0.02	0.0058	
Sum (left, right,center)						0.0314		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.04		0.031		0.042

Main Wash-Looking Downstream
Photo 21

Main Wash-Bed Material
Photo 22

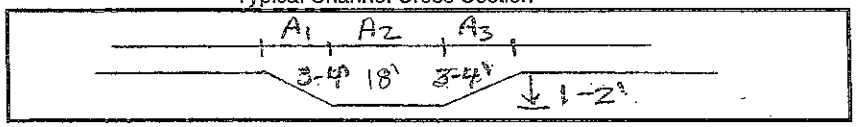
Left Overbank-Looking Downstream
Photo 23

Right Overbank-Looking Downstream
Photo 24

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: D33
Photograph No.: # 21-24
Section Description: channel has fine sand. Overbanks have firm soil. channel vegetation is large brush and trees. L & ROB has medium to large trees and brush.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					2.6	27	2.6	
% [decimal]					0.08	0.84	0.08	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.03		0.03	0.029
	Fine Sand		0.023-.026			0.026		
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.004		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004		0.003	0	0.003	
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.021				0.022
	Large		0.025-0.050		0.045		0.04	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.082	0.026	0.078	
x (% of Area)					0.00656	0.02184	0.00624	
Sum (left, right,center)						0.03464		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.05		0.035		0.051

Main Wash-Looking Downstream
Photo 21

Main Wash-Bed Material
Photo 22

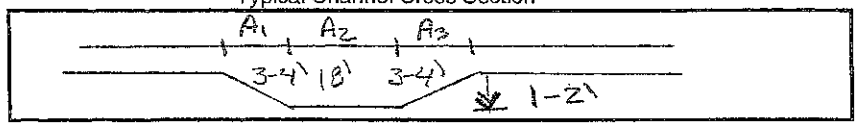
Left Overbank-Looking Downstream
Photo 23

Right Overbank-Looking Downstream
Photo 24

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: D42
Photograph No.: # 21-24
Section Description: channel is fine sand. Overbanks are firm soil.
channel vegetation is medium and large trees and brush
L & ROB are medium and large brush.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					2.6	27	2.6	
% [decimal]					0.08	0.84	0.08	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.03		0.03	0.029
	Fine Sand		0.023-.026			0.026		
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.004		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.003	0	0.003	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.021				0.022
	Large		0.025-0.050		0.045		0.04	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.082	0.026	0.078	
x (% of Area)					0.00656	0.02184	0.00624	
Sum (left, right,center)						0.03464		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.05		0.035		0.051

Main Wash-Looking Downstream
Photo 5

Main Wash-Bed Material
Photo 6

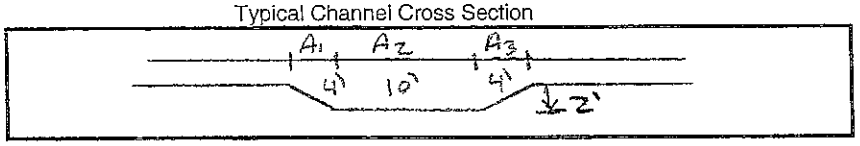
Left Overbank-Looking Downstream
Photo 7

Right Overbank-Looking Downstream
Photo 8

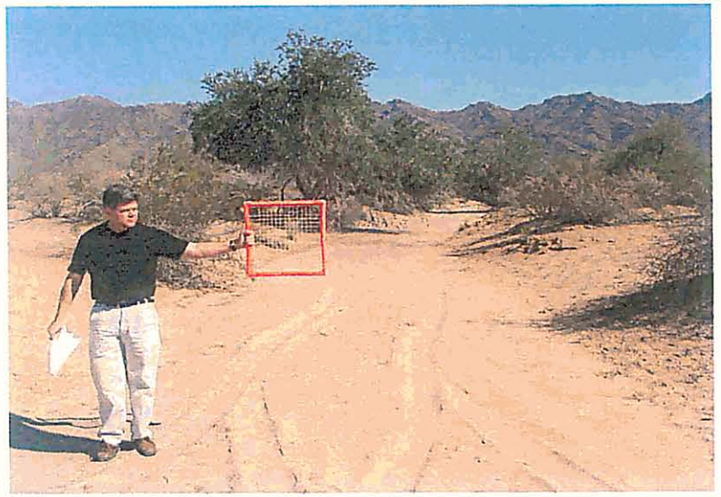
Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: F34
Photograph No.: # 5-8
Section Description: channel and overbanks are firm soil. Channel vegetation is small to medium brush. L & ROB are sparse with small to medium brush.

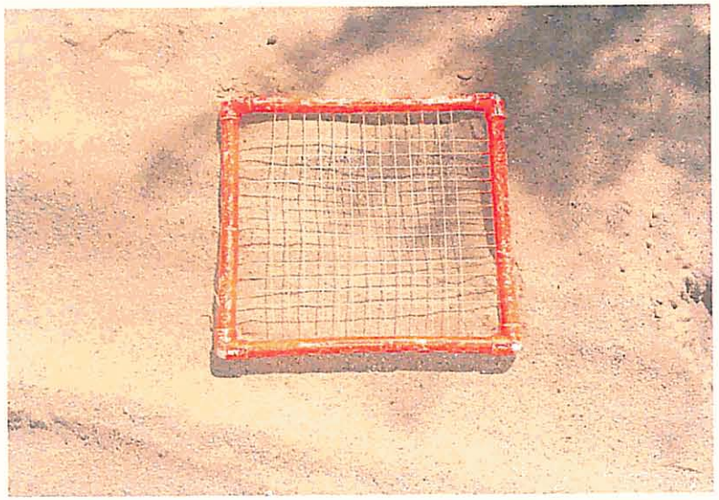
Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					8	20	8	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028	0.028	0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.017	0.023		0.024	0.018
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.053	0.028	0.054	
x (% of Area)					0.01166	0.01568	0.01188	
Sum (left, right,center)						0.03922		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.045		0.039		0.046

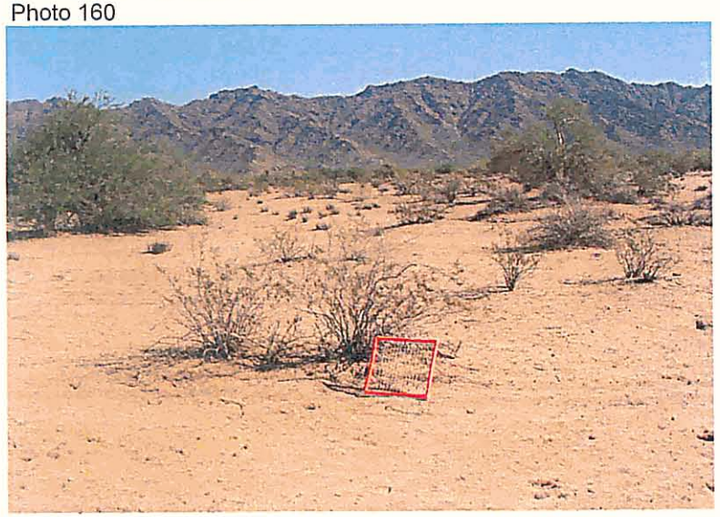


Main Wash-Looking Downstream
Photo 159



Main Wash-Bed Material
Photo 160

Left Overbank-Looking Downstream
Photo 161

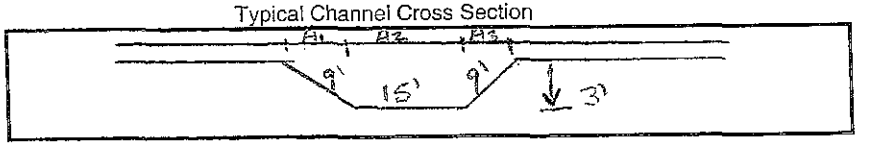


Right Overbank-Looking Downstream
Photo 162

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: G40
Photograph No.: #159-162
Section Description:

Rough Sketch of
Typical Channel Cross Section

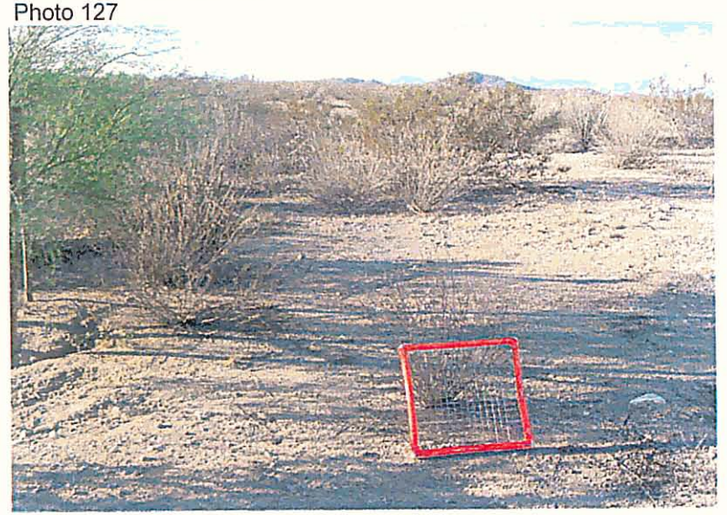


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					13.5	45	13.5	
% [decimal]					0.19	0.62	0.19	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.026		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.017	0.02		0.02	0.017
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0		0		0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.049	0.026	0.049	
x (% of Area)					0.00931	0.01612	0.00931	
Sum (left, right,center)						0.03474		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.047		0.035		0.047

Main Wash-Looking Downstream
Photo 126

Main Wash-Bed Material
Photo 127

Left Overbank-Looking Downstream
Photo 128

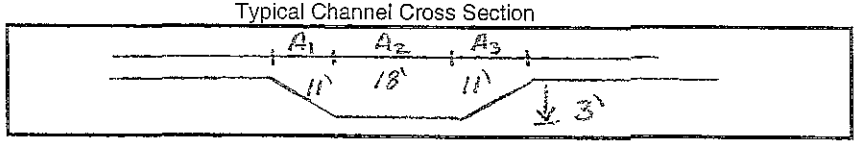


Right Overbank-Looking Downstream
Photo 129

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J39-3
Photograph No.: # 126-129
Section Description: channel is coarse sand. Overbanks are firm soil. channel vegetation is medium brush and grasses. L & ROB are small to medium brush and grasses.

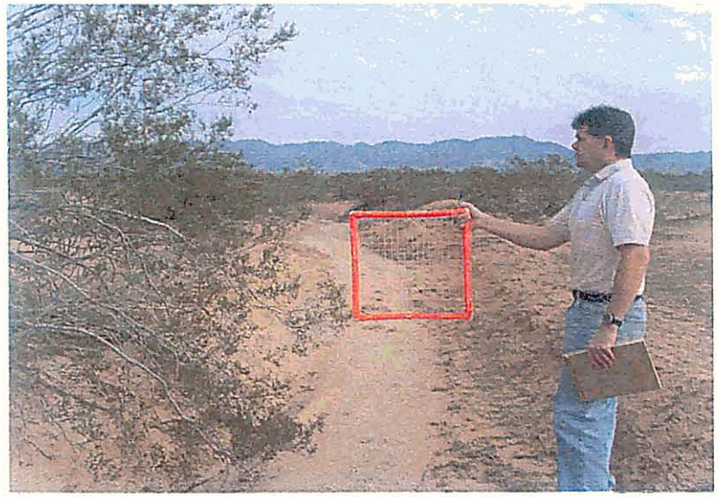
Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					21	54	21	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.014	0.017		0.018	0.016
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0		0		0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.046	0.029	0.047	
x (% of Area)					0.01012	0.01624	0.01034	
Sum (left, right,center)						0.0367		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.044		0.037		0.046

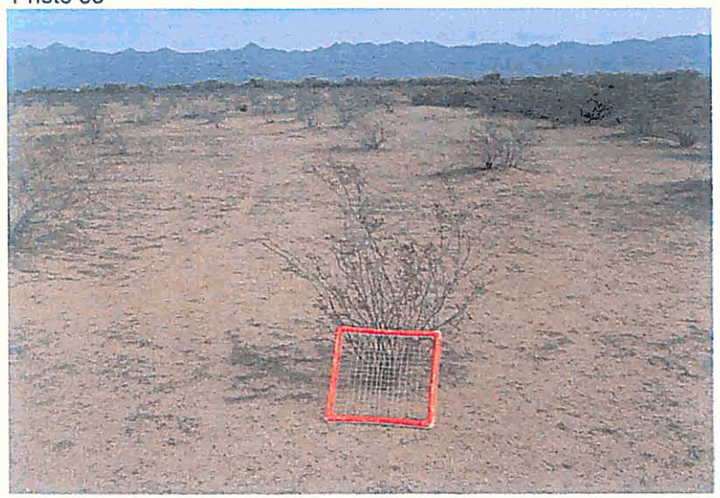
Appendix E.1.4

N-VALUE REACH GROUP 4

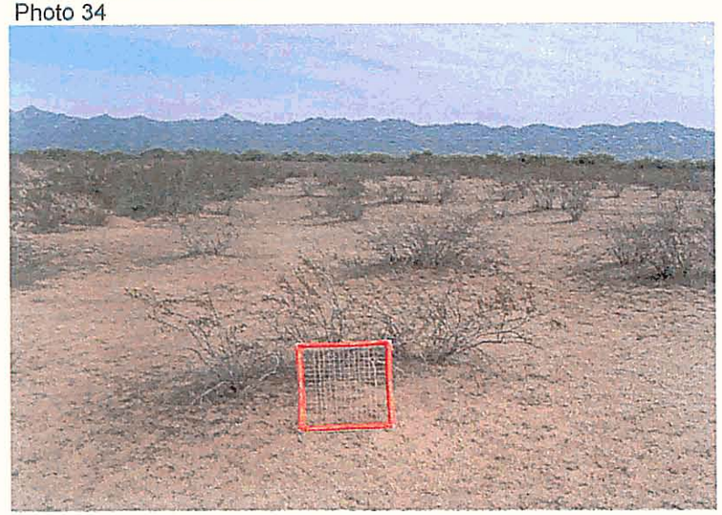


Main Wash-Looking Downstream
Photo 33

Main Wash-Bed Material
Photo 34



Left Overbank-Looking Downstream
Photo 35

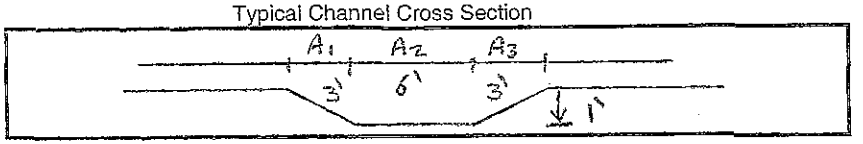


Right Overbank-Looking Downstream
Photo 36

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B12
Photograph No.: # 33-36
Section Description: channel is firm soil with gravel. Overbanks are firm soil. Channel vegetation is medium brush. L & ROB are small brush and grasses.

Rough Sketch of
Typical Channel Cross Section

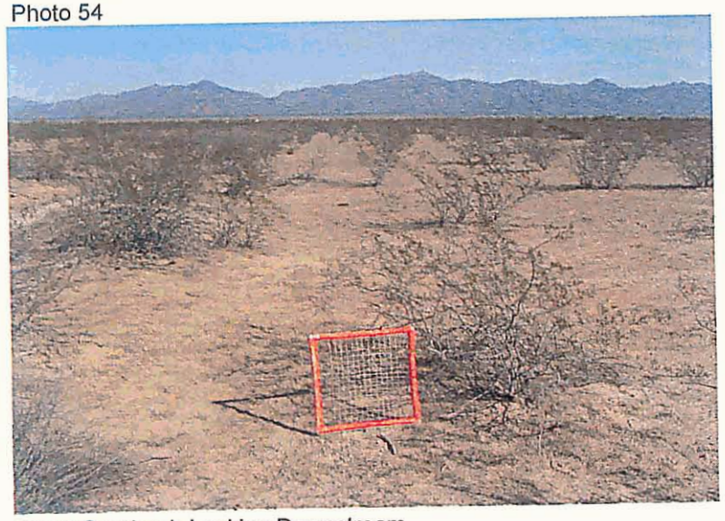


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					2	6	2	
% [decimal]					0.2	0.6	0.2	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.031		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.001		0.02	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010	0.01		0		0.01
	Medium		0.01-0.025		0.021		0.02	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.051	0.031	0.069	
x (% of Area)					0.0102	0.0186	0.0138	
Sum (left, right,center)						0.0426		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.04		0.043		0.04

Main Wash-Looking Downstream
Photo 53

Main Wash-Bed Material
Photo 54

Left Overbank-Looking Downstream
Photo 55

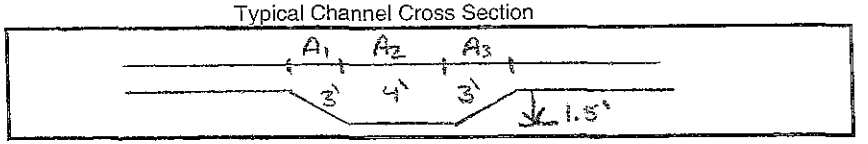


Right Overbank-Looking Downstream
Photo 56

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: B35
Photograph No.: # 53-56
Section Description: channel is coarse sand. Overbanks are firm soil. channel vegetation is small to medium brush. L & ROB are sparse small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section

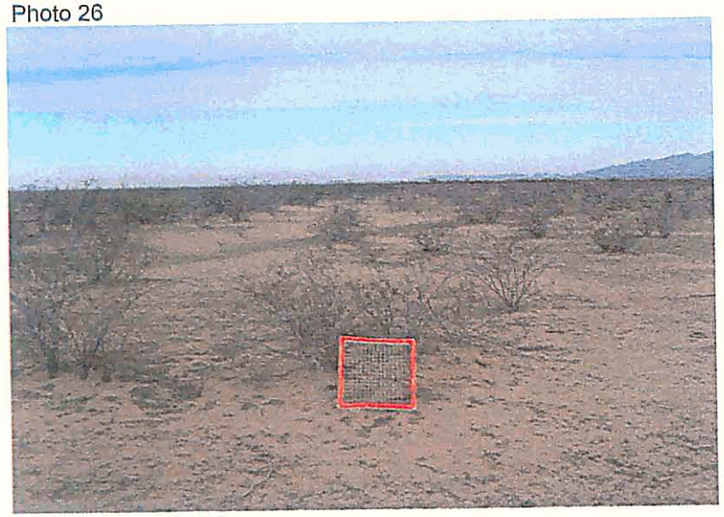


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					4	6	4	
% [decimal]					0.285	0.43	0.285	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.03		0.03	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.001		0.001	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.012	0.015		0.015	0.012
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.046	0.029	0.046	
x (% of Area)					0.01311	0.01247	0.01311	
Sum (left, right,center)						0.03869		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.042		0.039		0.042

Main Wash-Looking Downstream
Photo 25

Main Wash-Bed Material
Photo 26

Left Overbank-Looking Downstream
Photo 27

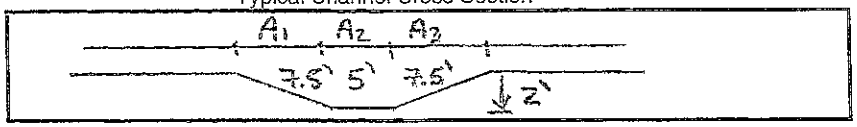


Right Overbank-Looking Downstream
Photo 28

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: D39
Photograph No.: # 25-28
Section Description: channel is firm soil and coarse sand. Overbanks are firm soil. Channel vegetation is medium brush. L & ROB vegetation is sparse small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section

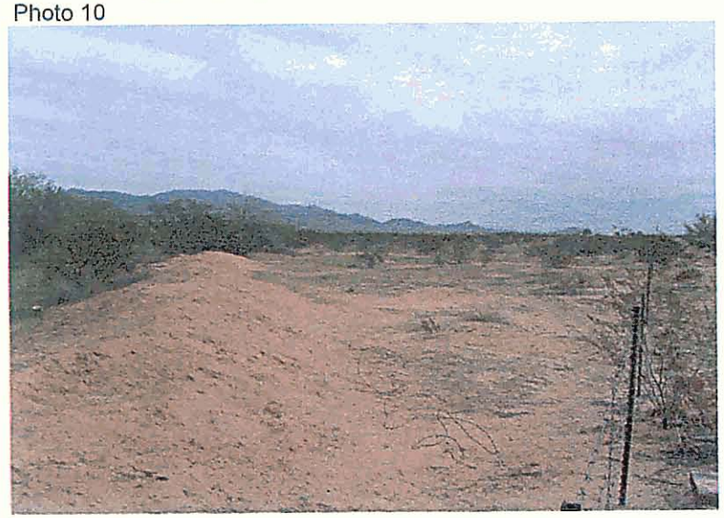


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					8	10	8	
% [decimal]					0.31	0.38	0.31	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.029		0.029	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.028		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.001		0.001	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.012	0.019		0.019	0.012
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.049	0.028	0.049	
x (% of Area)					0.01519	0.01064	0.01519	
Sum (left, right,center)						0.04102		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.04		0.041		0.04

Main Wash-Looking Downstream
Photo 9

Main Wash-Bed Material
Photo 10

Left Overbank-Looking Downstream
Photo 11

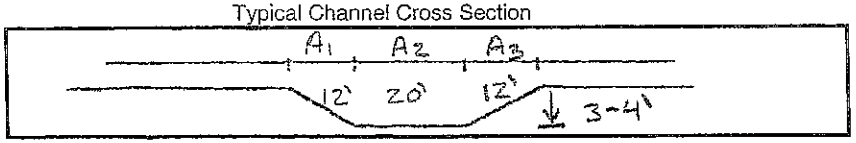


Right Overbank-Looking Downstream
Photo 12

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: E49
Photograph No.: # 9-12
Section Description: channel and overbanks are firm soil. Channel has medium brush and grasses. L & ROB are sparse with small to medium brush and grasses.

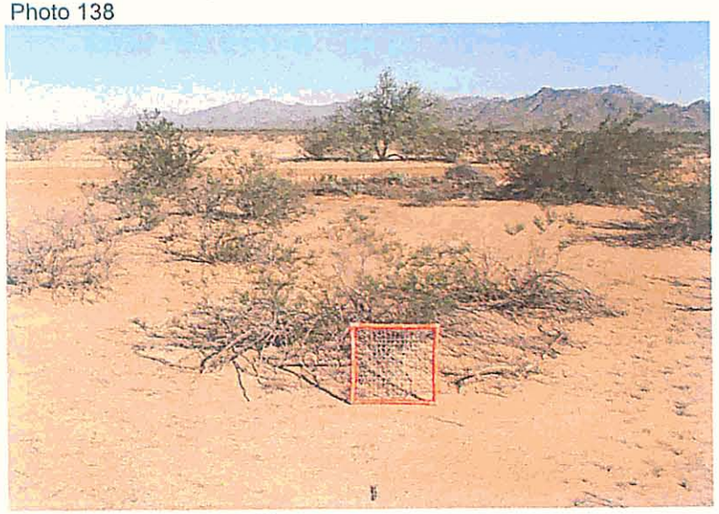
Rough Sketch of
Typical Channel Cross Section



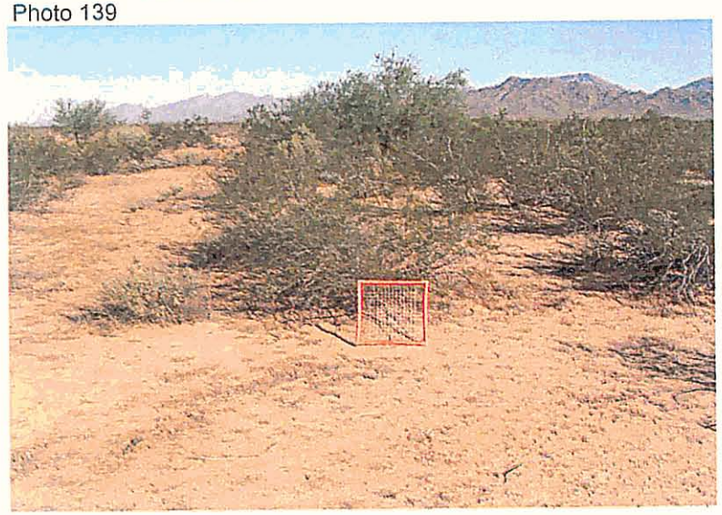
Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					12	42	12	
% [decimal]					0.19	0.62	0.19	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029	0.029	0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.012	0.024		0.028	0.013
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.056	0.029	0.059	
x (% of Area)					0.01064	0.01798	0.01121	
Sum (left, right,center)						0.03983		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.042		0.040		0.043

Main Wash-Looking Upstream
Photo 138

Main Wash-Bed Material
Photo 139



Left Overbank-Looking Upstream
Photo 140

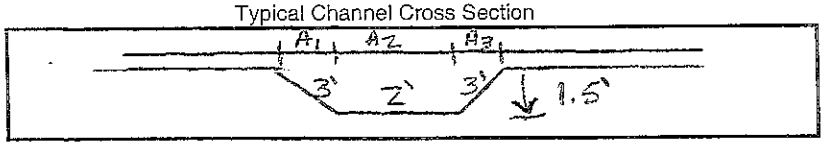


Right Overbank-Looking Upstream
Photo 141

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: F34-2
Photograph No.: # 138-141
Section Description: Overbanks are firm soil. Vegetation is more sparse on the LOB than the ROB.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					2	3	2	
% [decimal]					0.3	0.4	0.3	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028		0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.026		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		0.009
	Medium		0.01-0.025	0.01	0.018		0.02	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.048	0.026	0.05	
x (% of Area)					0.0144	0.0104	0.015	
Sum (left, right,center)						0.0398		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.038		0.040		0.037

WW

Main Wash-Looking Downstream
Photo 1

Main Wash-Bed Material
Photo 2

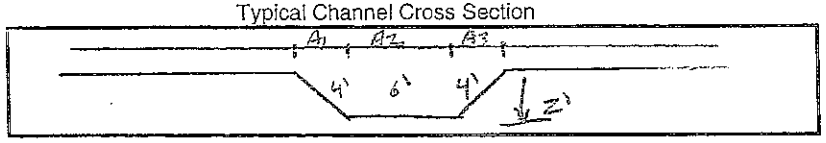
Left Overbank-Looking Downstream
Photo 3

Right Overbank-Looking Downstream
Photo 4

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: WW
Photograph No.: # 1-4
Section Description: channel and overbanks are firm soil. Channel vegetation is medium brush and trees. L & ROB are sparse with small and medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					6	12	6	
% [decimal]					0.25	0.5	0.25	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.028	0.028	0.028	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000		0.002		0.002	
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.002	0	0.003	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		0.009
	Medium		0.01-0.025	0.01	0.018		0.02	
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.05	0.028	0.053	
x (% of Area)					0.0125	0.014	0.01325	
Sum (left, right,center)						0.03975		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.039		0.040		0.038

Appendix E.1.5

N-VALUE REACH GROUP 5

Main Wash-Looking Downstream
Photo 109

Main Wash-Bed Material
Photo 110

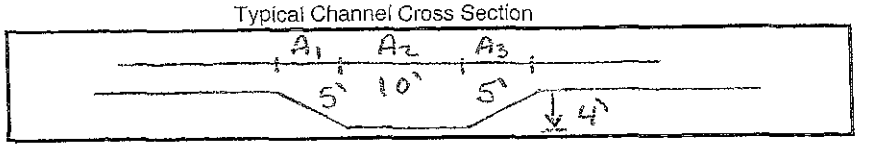
Left Overbank-Looking Downstream
Photo 111

Right Overbank-Looking Downstream
Photo 112

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J37
Photograph No.: # 109-112
Section Description: channel bed is gravel. Overbanks are firm soil. channel vegetation is medium to large trees and brush. *L & ROB are sparse medium brush and grasses.*

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					14	40	14	
% [decimal]					0.21	0.58	0.21	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.031	0.03		0.03	0.031
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.03		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.005		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.002	0	0.002	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.018			0.02	0.02
	Large		0.025-0.050		0.035		0.03	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000					
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.072	0.03	0.087	
x (% of Area)					0.01512	0.0174	0.01827	
Sum (left, right,center)						0.05079		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.049		0.051		0.051

Main Wash-Looking Downstream
Photo 105

Main Wash-Bed Material
Photo 106

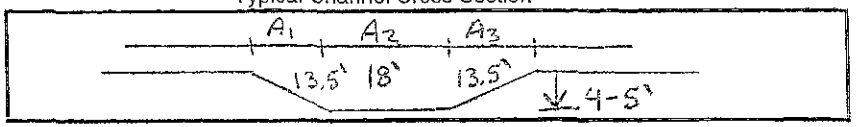
Left Overbank-Looking Downstream
Photo 108

Right Overbank-Looking Downstream
Photo 107

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J38
Photograph No.: # 105-108
Section Description: channel is coarse sand. Overbanks are firm soil.
channel vegetation is large and very large trees and brush.
L & ROB are medium brush and grasses.

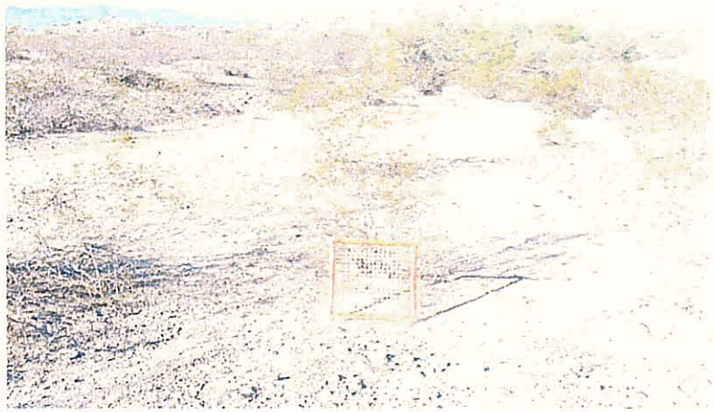
Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					32	81	32	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0	0	0	0	0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010					
	Medium		0.01-0.025	0.022		0		0.021
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.055		0.055	
Variations in the Channel Cross Section	Gradual	n4	0.000					
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.084	0.029	0.084	
x (% of Area)					0.01848	0.01624	0.01848	
Sum (left, right,center)						0.0532		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.052		0.053		0.051

Main Wash-Looking Downstream
Photo 101

Main Wash-Bed Material
Photo 102



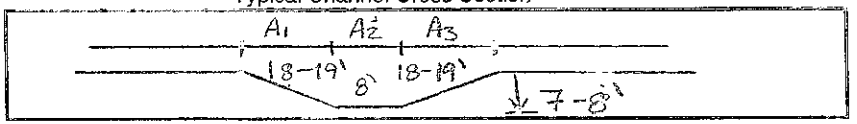
Left Overbank-Looking Downstream
Photo 103

Right Overbank-Looking Downstream
Photo 104

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J40
Photograph No.: # 101-104
Section Description: channel is gravel w/some cobbles. Overbanks are firm soil. Channel vegetation is medium and large brush and trees. L & ROB are sparse with small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					69.4	60	69.4	
% [decimal]					0.35	0.3	0.35	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.027		0.027	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.032		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0.002	0	0.002	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.015				0.018
	Large		0.025-0.050		0.03		0.033	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000					
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.061	0.032	0.064	
x (% of Area)					0.02135	0.0096	0.0224	
Sum (left, right,center)						0.05335		
Degree of Meandering	Minor	m	1					
	Appreciable		1.15	1.15		1.15		1.15
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.051		0.061		0.054

Appendix E.1.6

N-VALUE REACH GROUP 6

Main Wash-Looking Downstream
Photo 89

Main Wash-Bed Material
Photo 90

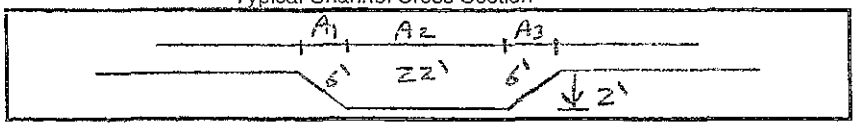
Left Overbank-Looking Downstream
Photo 91

Right Overbank-Looking Downstream
Photo 92

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A27
Photograph No.: # 89-92
Section Description: channel bed is coarse sand. Overbanks are firm soil channel vegetation is medium to large brush and trees. L & ROB are sparse with small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					6	44	6	
% [decimal]					0.11	0.78	0.11	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.031	0.03		0.03	0.031
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.032		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.014				0.018
	Large		0.025-0.050		0.05		0.05	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.082	0.032	0.082	
x (% of Area)					0.00902	0.02496	0.00902	
Sum (left, right,center)						0.043		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.045		0.043		0.049

Main Wash-Looking Upstream
Photo 113

Main Wash-Bed Material
Photo 114

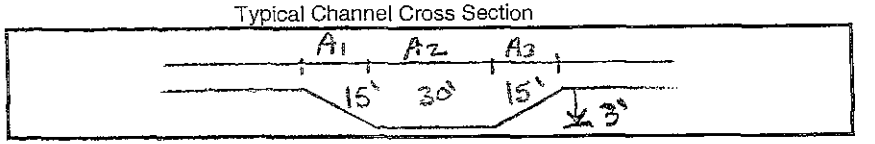
Left Overbank-Looking Upstream
Photo 115

Right Overbank-Looking Upstream
Photo 116

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: A60
Photograph No.: # 113-116
Section Description: channel is fine sand. Overbanks are firm soil. *channel vegetation is large brush and trees.* L & ROB have small and medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section

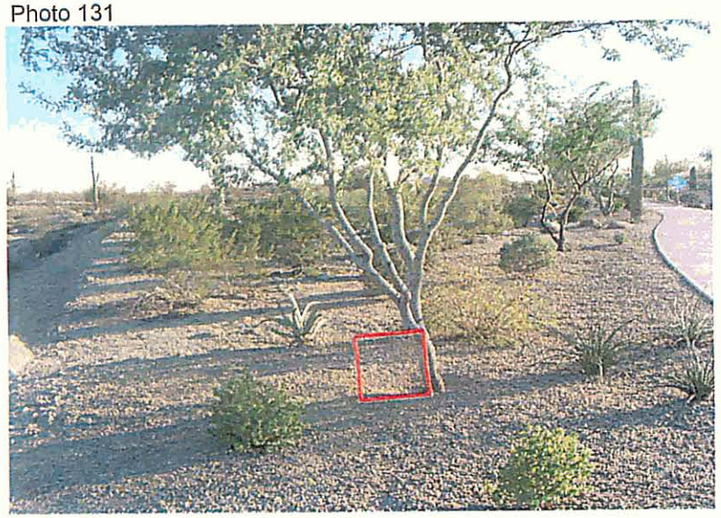


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					23	90	23	
% [decimal]					0.17	0.66	0.17	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.029		0.029	0.029
	Fine Sand		0.023-.026			0.025		
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005	0.002	0.003		0.002	0.002
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0.004	0.002	0	0.002	0
	Minor		0.005-0.015					0.005
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.018				0.015
	Large		0.025-0.050		0.045		0.04	
	Very Large		0.050-0.100					
Variations in the *Channel Cross Section*	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.079	0.025	0.073	
x (% of Area)					0.01343	0.0165	0.01241	
Sum (left, right,center)						0.04234		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.053		0.042		0.051

Main Wash-Looking Downstream
Photo 130

Main Wash-Bed Material
Photo 131

Left Overbank-Looking Downstream
Photo 132

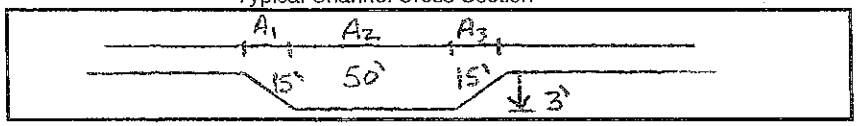


Right Overbank-Looking Downstream
Photo 133

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J14
Photograph No.: # 130-133
Section Description: channel is fine and coarse sand. Overbanks are firm soil. Channel vegetation is large and very large brush and trees. LOB is medium brush. ROB is small and medium brush and trees.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					23	150	23	
% [decimal]					0.12	0.76	0.12	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.03		0.03	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0	0	0	0	0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.02				0.018
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.05		0.05	
Variations in the Channel Cross Section	Gradual	n4	0.000					
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.08	0.029	0.08	
x (% of Area)					0.0096	0.02204	0.0096	
Sum (left, right,center)						0.04124		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.05		0.041		0.048

Main Wash-Looking Downstream
Photo 97

Main Wash-Bed Material
Photo 98

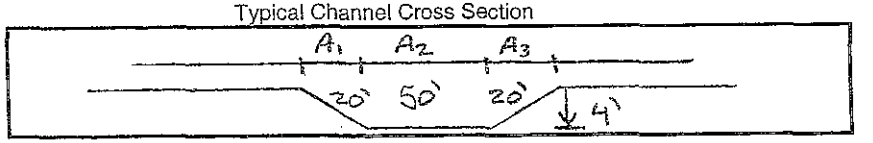
Left Overbank-Looking Downstream
Photo 99

Right Overbank-Looking Downstream
Photo 100

Determination of Manning's Roughness Coefficients by FCDMC Method

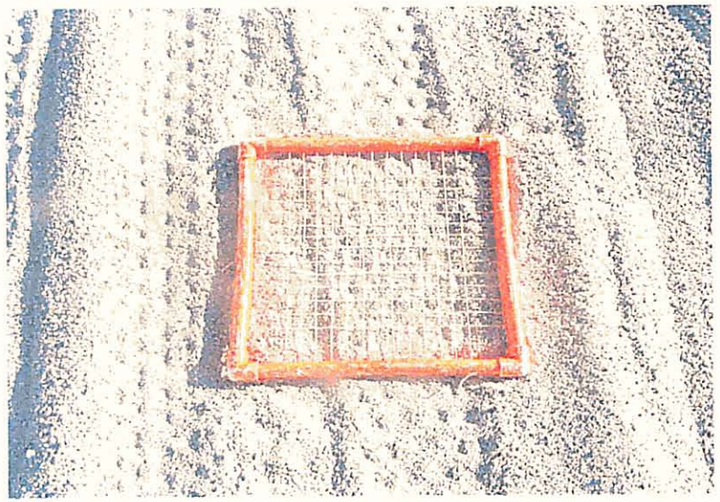
Project: **Waterman Wash**
Stream: J39
Photograph No.: # 97-100
Section Description: channel is coarse sand. Overbanks are firm soil.
channel vegetation is large to very large brush and trees.
L & ROB are medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft²]					40	200	40	
% [decimal]					0.14	0.72	0.14	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.029	0.029		0.029	0.029
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0	0	0	0	0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.028				0.026
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.055		0.055	
Variations in the Channel Cross Section	Gradual	n4	0.000	0		0		0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.084	0.029	0.084	
x (% of Area)					0.01176	0.02088	0.01176	
Sum (left, right,center)						0.0444		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.057		0.044		0.055

Main Wash-Looking Downstream
Photo 117



Main Wash-Bed Material
Photo 118

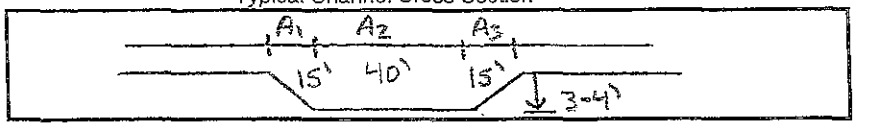
Left Overbank-Looking Downstream
Photo 119

Right Overbank-Looking Downstream
Photo 120

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J39-2
Photograph No.: # 117-120
Section Description: channel bed is coarse sand. Overbanks are firm soil. channel vegetation is large to very large brush and trees. L & ROB are small to medium brush, cacti and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					26	140	26	
% [decimal]					0.14	0.72	0.14	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.029		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0	0	0	0	0
	Minor		0.001-0.005					
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.019				0.021
	Large		0.025-0.050					
	Very Large		0.050-0.100		0.05		0.05	
Variations in the Channel Cross Section	Gradual	n4	0.000	0		0		0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.079	0.029	0.079	
x (% of Area)					0.01106	0.02088	0.01106	
Sum (left, right,center)						0.043		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.049		0.043		0.051

Main Wash-Looking Downstream
Photo 134

Main Wash-Bed Material
Photo 135

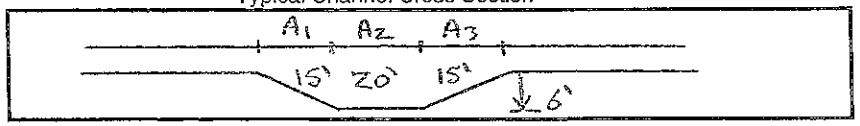
Left Overbank-Looking Downstream
Photo 136

Right Overbank-Looking Downstream
Photo 137

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: J48
Photograph No.: # 134-137
Section Description: channel is gravel. Overbanks are firm soil. Channel vegetation is medium to large brush and trees. L & ROB are medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					45	120	45	
% [decimal]					0.21	0.58	0.21	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035			0.033		
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.005		0.005	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.02	0.024		0.025	0.019
	Large		0.025-0.050					
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000					
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.058	0.033	0.059	
x (% of Area)					0.01218	0.01914	0.01239	
Sum (left, right,center)						0.04371		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.05		0.044		0.049

Main Wash-Looking Downstream
Photo 17

Main Wash-Bed Material
Photo 18

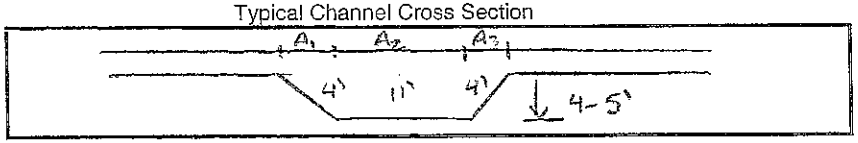
Left Overbank-Looking Downstream
Photo 20

Right Overbank-Looking Downstream
Photo 19

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: WW-4
Photograph No.: # 17-20
Section Description: channel is coarse sand. Overbanks are firm soil.
channel vegetation is medium to large brush and trees.
L & ROB is small to medium brush and grasses.

Rough Sketch of
Typical Channel Cross Section



Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					10	50	10	
% [decimal]					0.14	0.72	0.14	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.028		0.028	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.032		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.003		0.003	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.02				0.02
	Large		0.025-0.050		0.05		0.05	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000					
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.081	0.032	0.081	
x (% of Area)					0.01134	0.02304	0.01134	
Sum (left, right,center)						0.04572		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.05		0.046		0.05

Appendix E.1.7

N-VALUE REACH GROUP 7

Main Wash-Looking Downstream
Photo 151

Main Wash-Bed Material
Photo 152

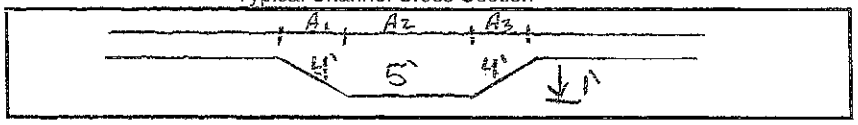
Left Overbank-Looking Downstream
Photo 153

Right Overbank-Looking Downstream
Photo 154

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: WW-2
Photograph No.: #151-154
Section Description:

Rough Sketch of
Typical Channel Cross Section

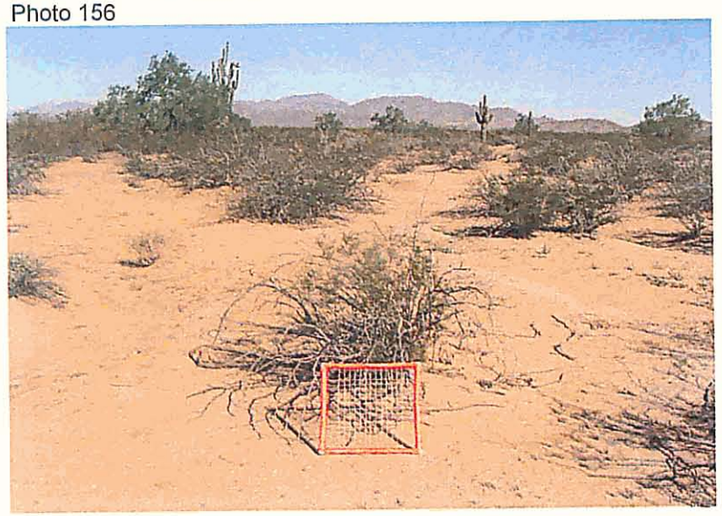


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					2	5	2	
% [decimal]					0.22	0.56	0.22	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.028	0.028		0.028	0.028
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.032		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.02				0.02
	Large		0.025-0.050		0.05		0.05	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.08	0.032	0.08	
x (% of Area)					0.0176	0.01792	0.0176	
Sum (left, right,center)						0.05312		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.048		0.053		0.048

Main Wash-Looking Downstream
Photo 155

Main Wash-Bed Material
Photo 156

Left Overbank-Looking Downstream
Photo 157

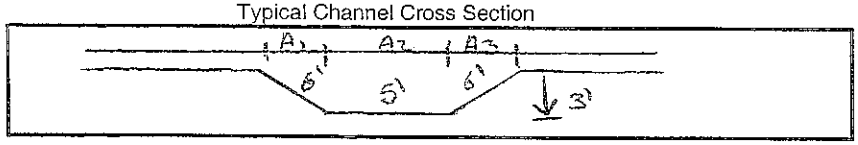


Right Overbank-Looking Downstream
Photo 158

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: WW-3
Photograph No.: #155-158
Section Description:

Rough Sketch of
Typical Channel Cross Section

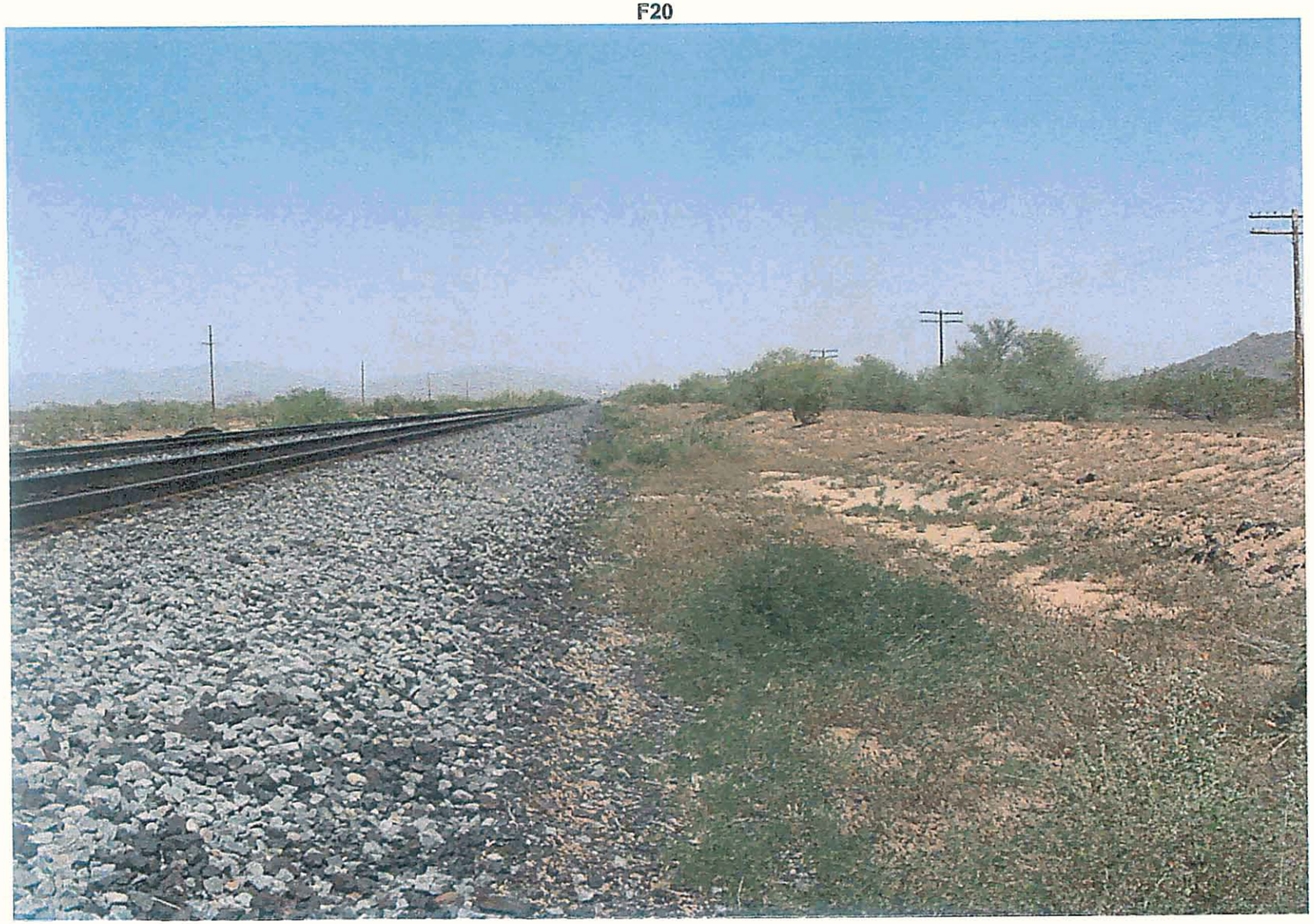


Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					9	15	9	
% [decimal]					0.27	0.46	0.27	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032	0.03	0.029		0.029	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036			0.03		
	Gravel		0.028-0.035					
	Cobble		0.030-0.050					
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.002		0.002	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.018				0.018
	Large		0.025-0.050		0.045		0.045	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.076	0.03	0.076	
x (% of Area)					0.02052	0.0138	0.02052	
Sum (left, right,center)						0.05484		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.048		0.055		0.048

Appendix E.1.8

N-VALUE REACH GROUP 8

F20



Typical Section

Determination of Manning's Roughness Coefficients by FCDMC Method

Project: **Waterman Wash**
Stream: 4S1WS23 (F20)
Photograph No.:
Section Description:

Rough Sketch of
Typical Channel Cross Section

Channel Conditions		Manning's n Adjustment		Left Overbank	Main Channel (left bank -A1)	Main Channel (center -A2)	Main Channel (right bank -A3)	Right Overbank
Area [ft^2]					25	40	80	
% [decimal]					0.17	0.28	0.55	
Channel Bed Material	Concrete	n0	0.012-0.018					
	Rock Cut		0.025					
	Firm Soil		0.025-0.032		0.032	0.032	0.032	0.03
	Fine Sand		0.023-.026					
	Coarse Sand		0.026-0.036					
	Gravel		0.028-0.035					
	Cobble		0.030-0.050	0.03				
	Boulder		0.040-0.070					
Degree of Irregularity	Smooth	n1	0.000	0		0		0
	Minor		0.001-0.005		0.001		0.001	
	Moderate		0.006-0.010					
	Severe		0.011-0.020					
Effects of Obstructions	Negligible	n2	0.000-0.004	0	0	0	0	0
	Minor		0.005-0.015					
	Appreciable		0.020-0.030					
	Severe		0.040-0.060					
Vegetation	Small	n3	0.002-0.010			0		
	Medium		0.01-0.025	0.01	0.01			0.015
	Large		0.025-0.050			0.03	0.022	
	Very Large		0.050-0.100					
Variations in the Channel Cross Section	Gradual	n4	0.000	0	0	0	0	0
	Alternating (occasionally)		0.001-0.005					
	Alternating (frequently)		0.010-0.015					
Sum (n0-n4)					0.043	0.062	0.055	
x (% of Area)					0.00731	0.01736	0.03025	
Sum (left, right,center)						0.05492		
Degree of Meandering	Minor	m	1	1		1		1
	Appreciable		1.15					
	Severe		1.3					
n = (n0 + n1 + n2 + n3 + n4)m				0.04		0.055		0.045

APPENDIX E.2
CROSS SECTION PLOTS

MODEL: 1S2WS14 (J14)
REACHES: 1S2WS14 (J14)
1S2WS23 (J14)
MODEL: 1S2WS17 (J38)
REACH: 1S2WS17 (J38)
MODEL: 1S2WS18B (J37)
REACHES: 1S2WS18B (J37)
1S2WS18A (J27)
MODEL: 1S2WS2A (J46)
REACH: 1S2WS2A (J46)
MODEL: 1S2WS2B (J48)
REACH: 1S2WS2B (J48)
MODEL: 1S2WS2C (J47)
REACH: 1S2WS2C (J47)
MODEL: 1S2WS31 (A56)
REACHES: 1S2WS31 (A56)
2S3WS12A (A30)
2S3WS12B (A27)
2S2WS7C (A32)
2S2WS7A (A52)
2S3WS1 (A54)
2S2WS6 (A55)
2S2WS20 (A19)
2S2WS17B (A63)
2S2WS7B (A51)
MODEL: 1S2WS31B (I70)
REACHES: 1S2WS31B (I70)
1S2WS32A (I67)
1S2WS32B (I68)
1S2WS34 (I65)
1S2WS33 (I66)
1S2WS31A (I71)
MODEL: 1S2WS9A (J39)
REACHES: 1S2WS9A (J39)
1S2WS27 (J16)
1S2WS22 (J20)
MODEL: 1S2WS9B (J40)
REACH: 1S2WS9B (J40)
MODEL: 1S3WS24A (A60)
REACHES: 1S3WS24A (A60)
1S3WS24B (A59)
MODEL: 2S1WS31 (B46)
REACH: 2S1WS31 (B46)
MODEL: 2S2WS15 (A37)
REACH: 2S2WS15 (A37)
MODEL: 2S2WS16A (A35)
REACHES: 2S2WS16A (A35)
2S2WS16B (A15)
2S2WS17A (A17)
MODEL: 2S2WS26 (A41)
REACH: 2S2WS26 (A41)
MODEL: 2S2WS35A (B58)
REACH: 2S2WS35A (B58)
MODEL: 2S2WS35B (B29)
REACH: 2S2WS35B (B29)
MODEL: 3S1WS4A (H71)
REACHES: 3S1WS4A (H71)
3S1WS4B (H73)
3S1WS3 (H29)
MODEL: 3S1WS5 (B45)
REACH: 3S1WS5 (B45)
MODEL: 3S1WS6 (B47)
REACH: 3S1WS6 (B47)
MODEL: 3S1WS9 (B12)
REACH: 3S1WS9 (B12)
MODEL: 3S2WS2A (B33)
REACHES: 3S2WS2A (B33)
3S2WS2E (B33)
3S2WS11 (B37)
3S2WS2D (B35)
MODEL: 3S2WS2B (B65)
REACHES: 3S2WS2B (B65)
3S2WS1 (B54)
3S2WS2C (B38)
MODEL: 4S1ES21 (E45)
REACH: 4S1ES21 (E45)
MODEL: 4S1ES23 (F20)
REACH: 4S1ES23 (F20)
MODEL: WATERMAN WASH
REACHES: WATERMAN WASH
3S1WS15B (D39)
3S1WS15A (G40)
3S1WS26 (D33)
3S1WS25B (D32)
3S1WS25A (D31)
4S1ES15A (F34)
4S1ES9 (E49)
4S1ES20 (E44)
3S1WS22A (D42)
3S1WS22B (G39)

MODEL: 1S2WS14 (J14)

REACH: 1S2WS14 (J14)

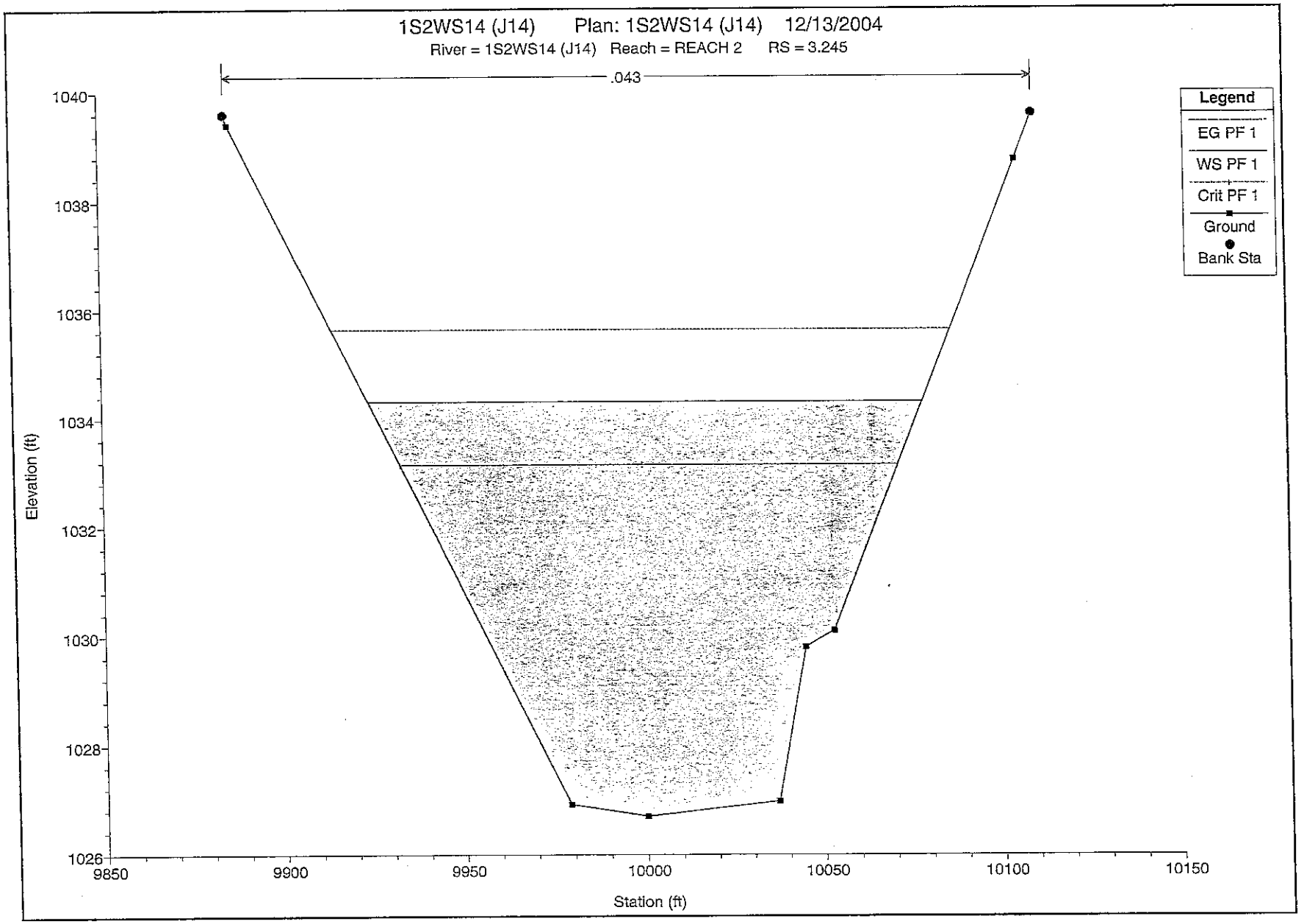
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

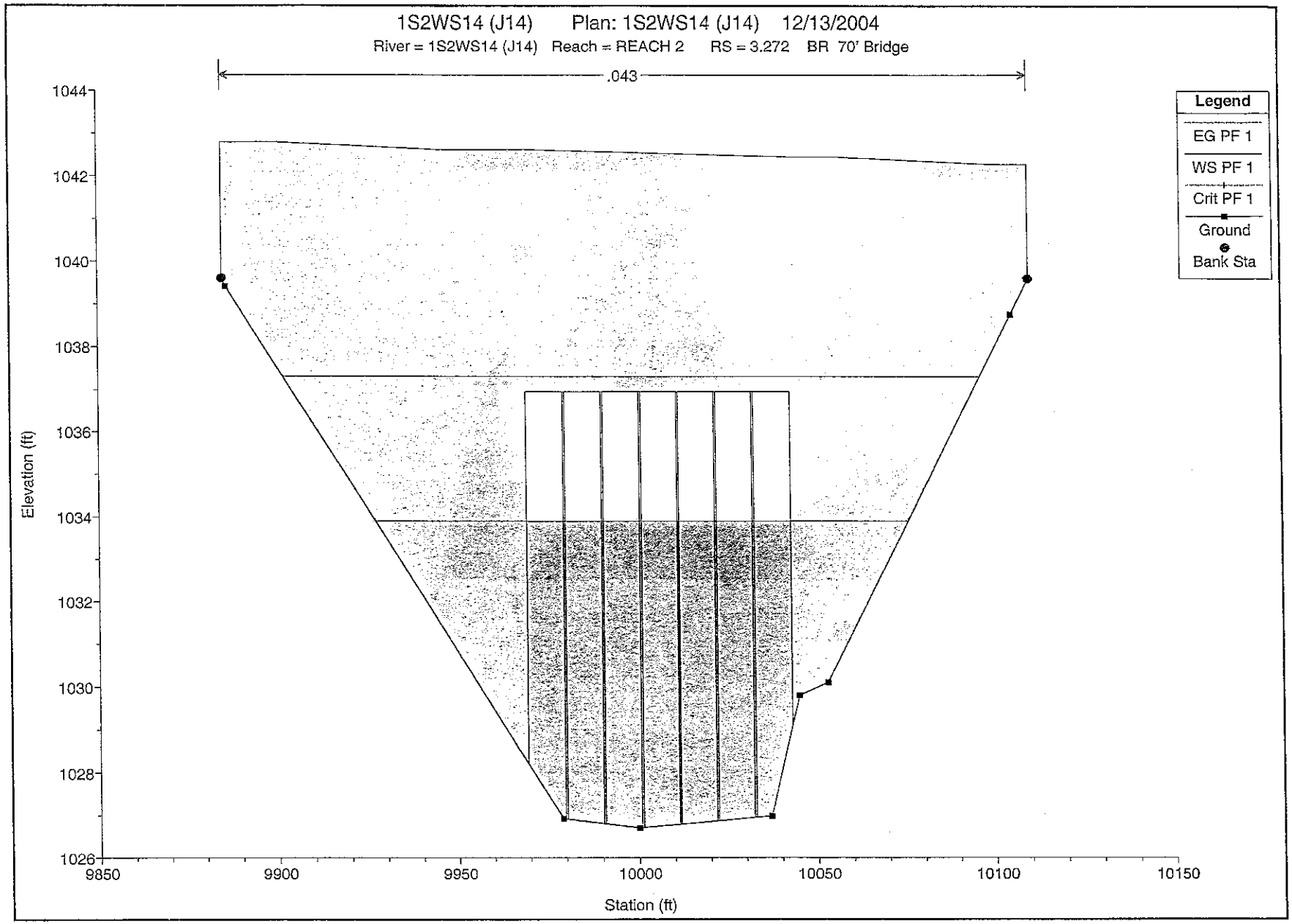
Change in Discharge based on Reach Length

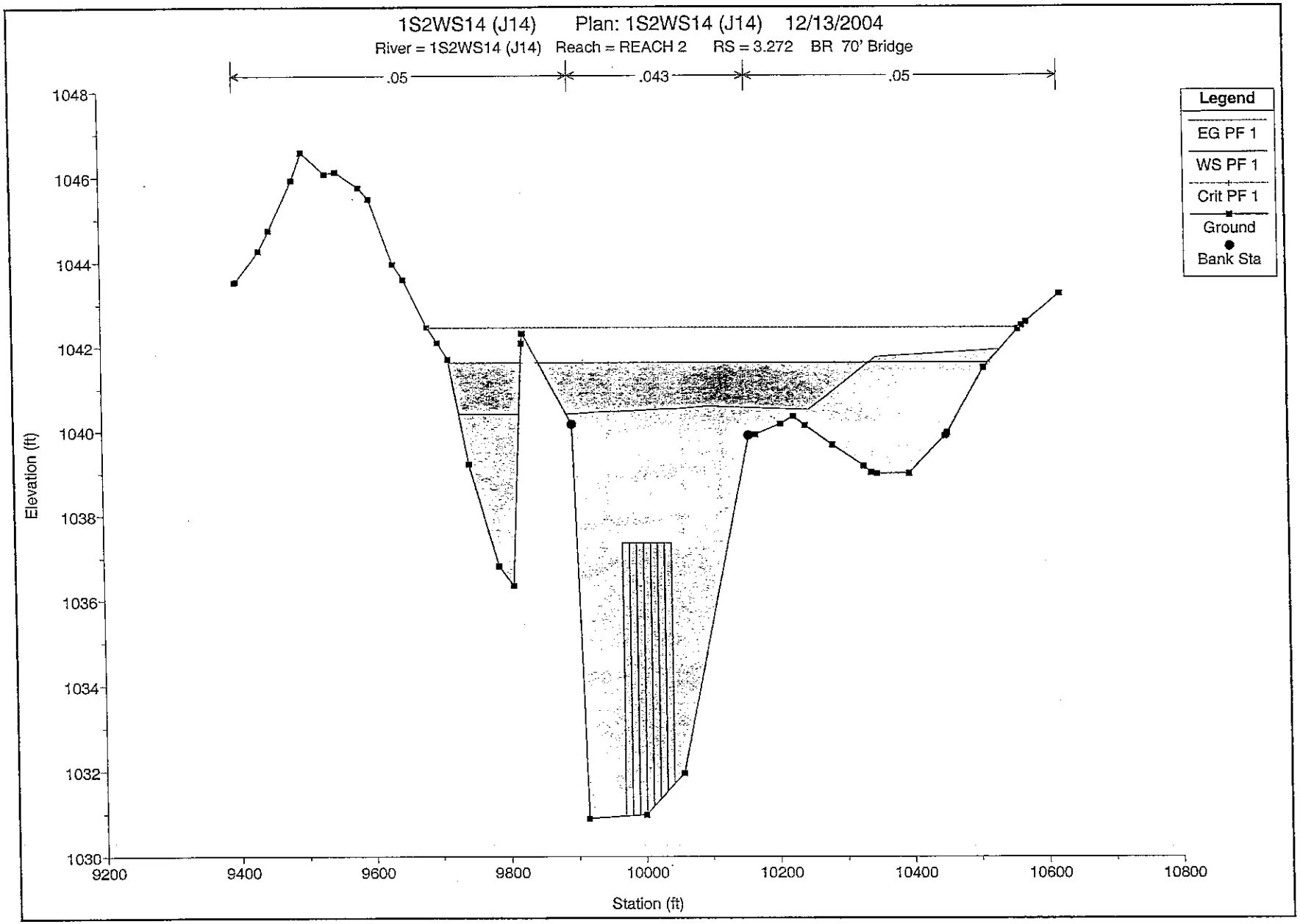
Wash ID: 1S2WS14 (J14)

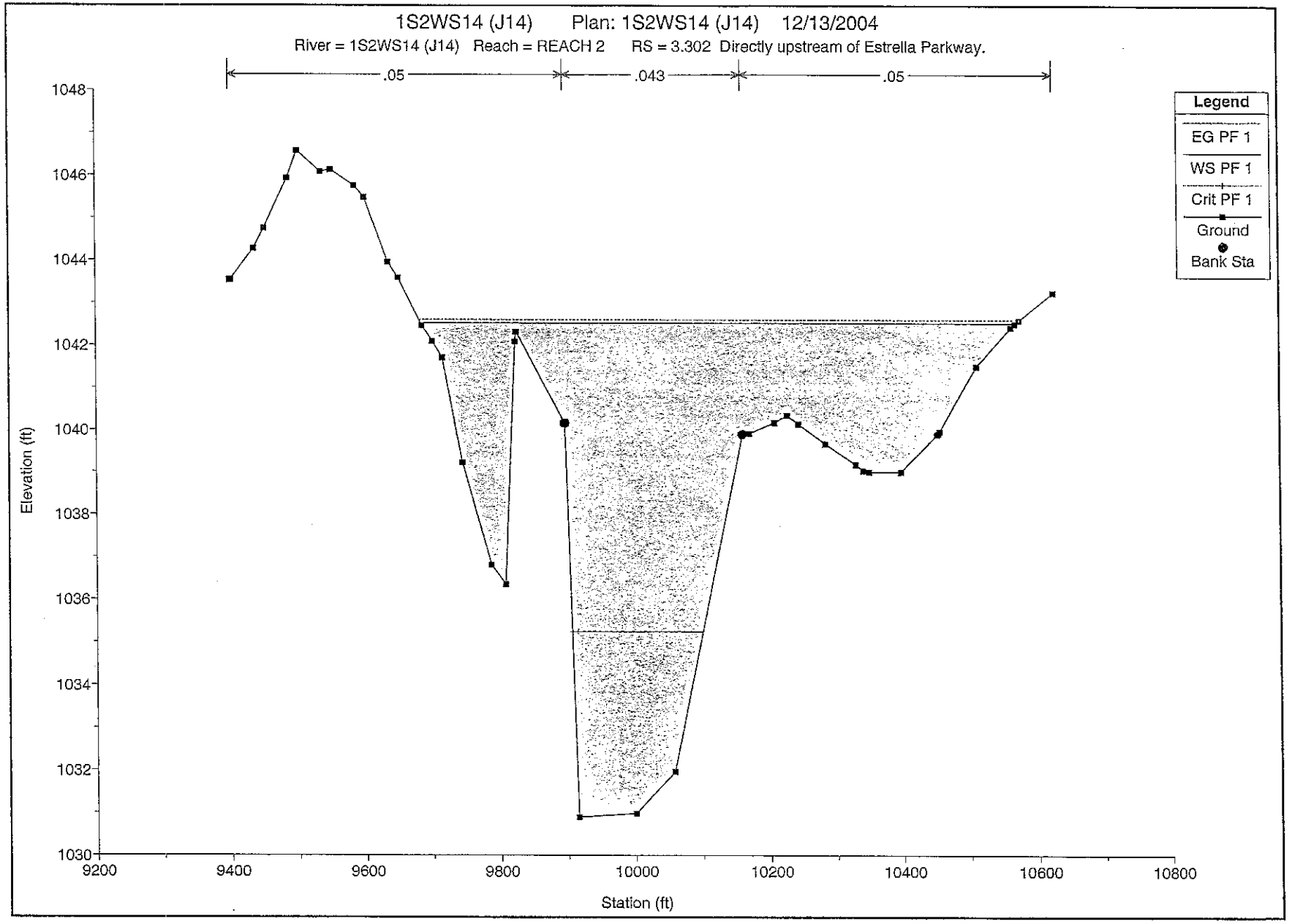
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
J14	4.853	8657	8660	8700
J14	4.589	8325	8320	8300
J14	4.354	8029	8030	8000
J14	4.078	7681	7680	7700
J14	3.846	7389	7390	7400
CPJ14A	3.575	7048	7050	7000
CPJ14	3.302	7165	7170	7200
CPJ14	3.245	7165	7170	7200

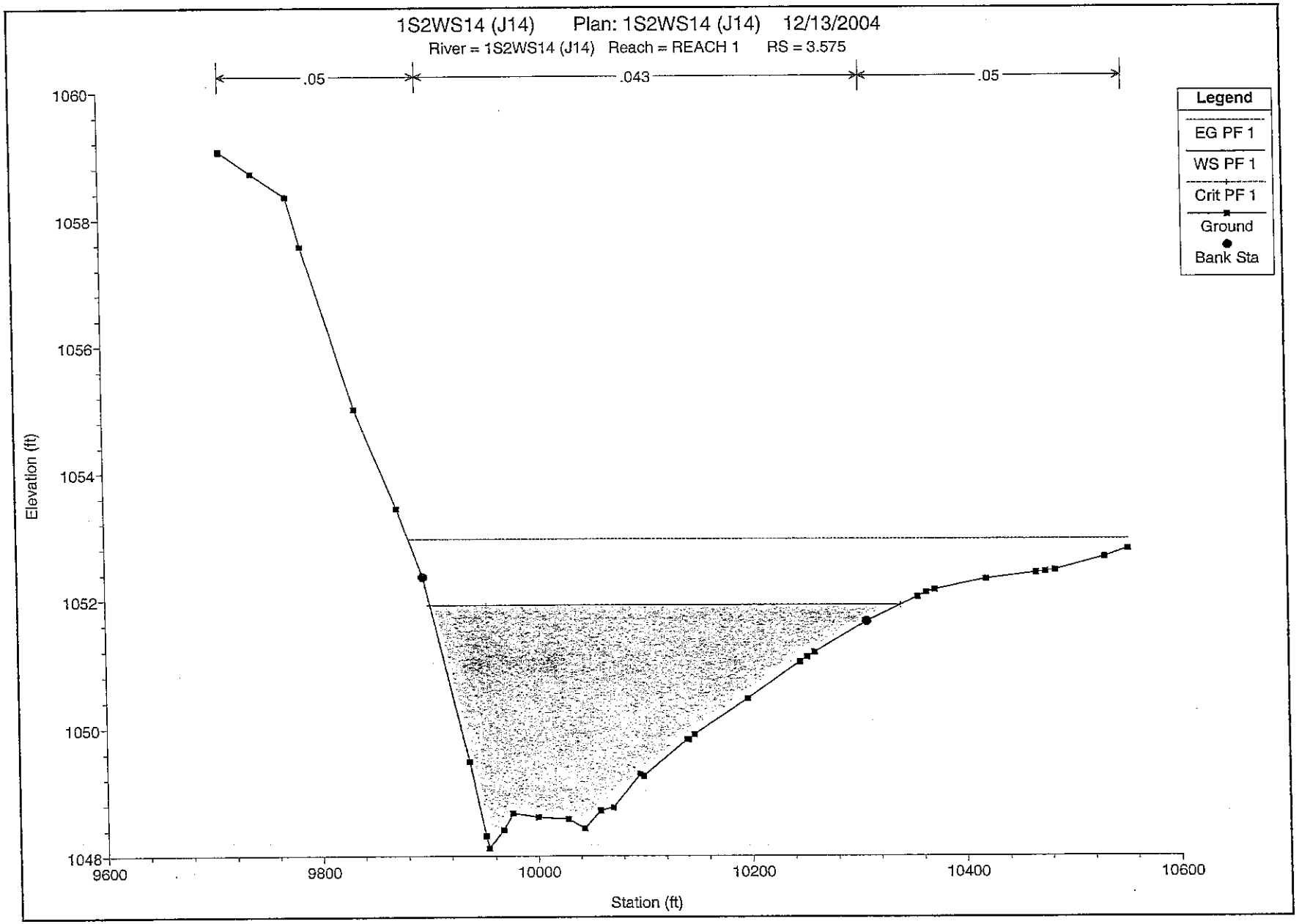
3.245 is directly downstream of CPJ14, so the discharge for CPJ14 was used.

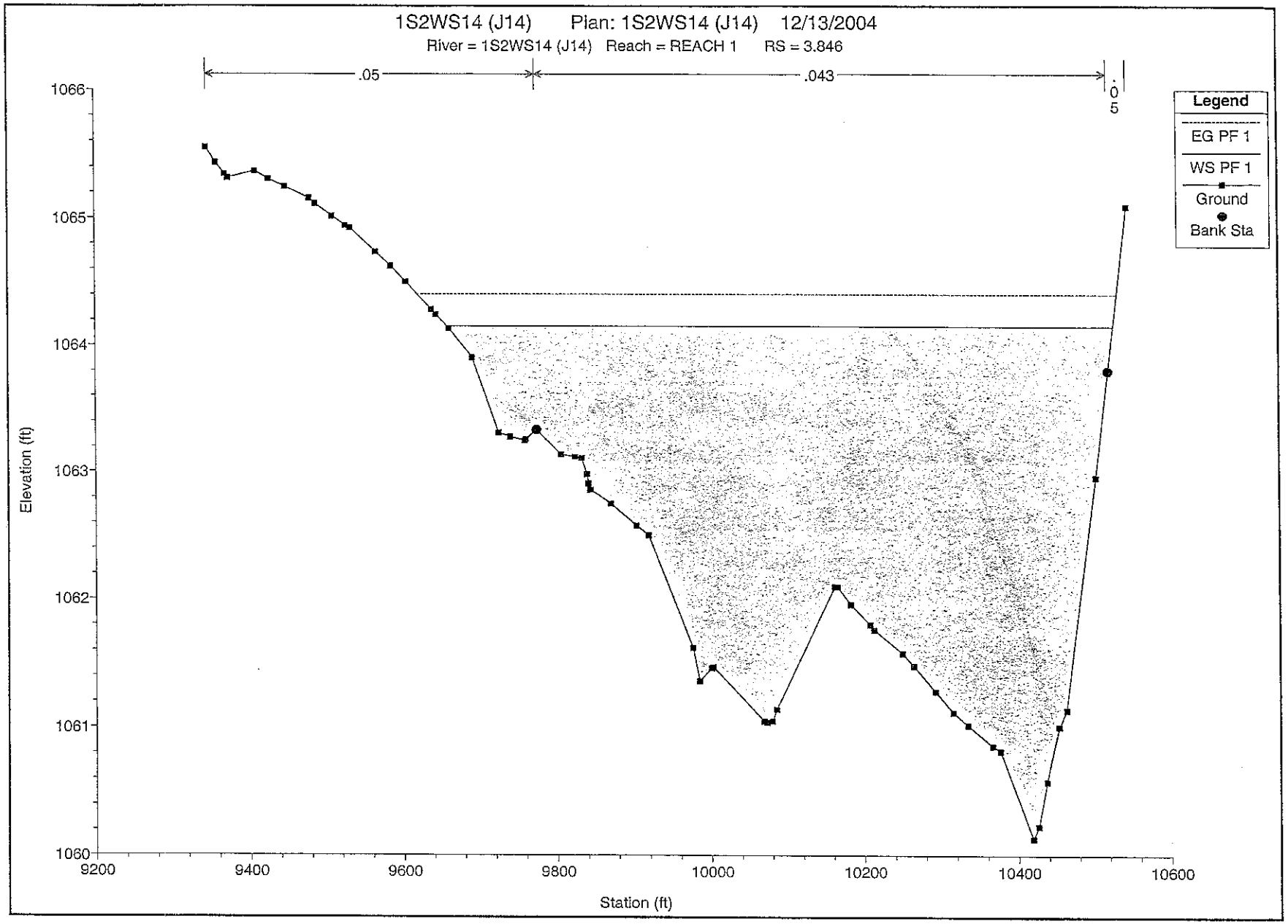

1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 2 RS = 3.245
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1040
1038
1036
1034
1032
1030
1028
1026
9850
9900
9950
10000
10050
10100
10150
Station (ft)

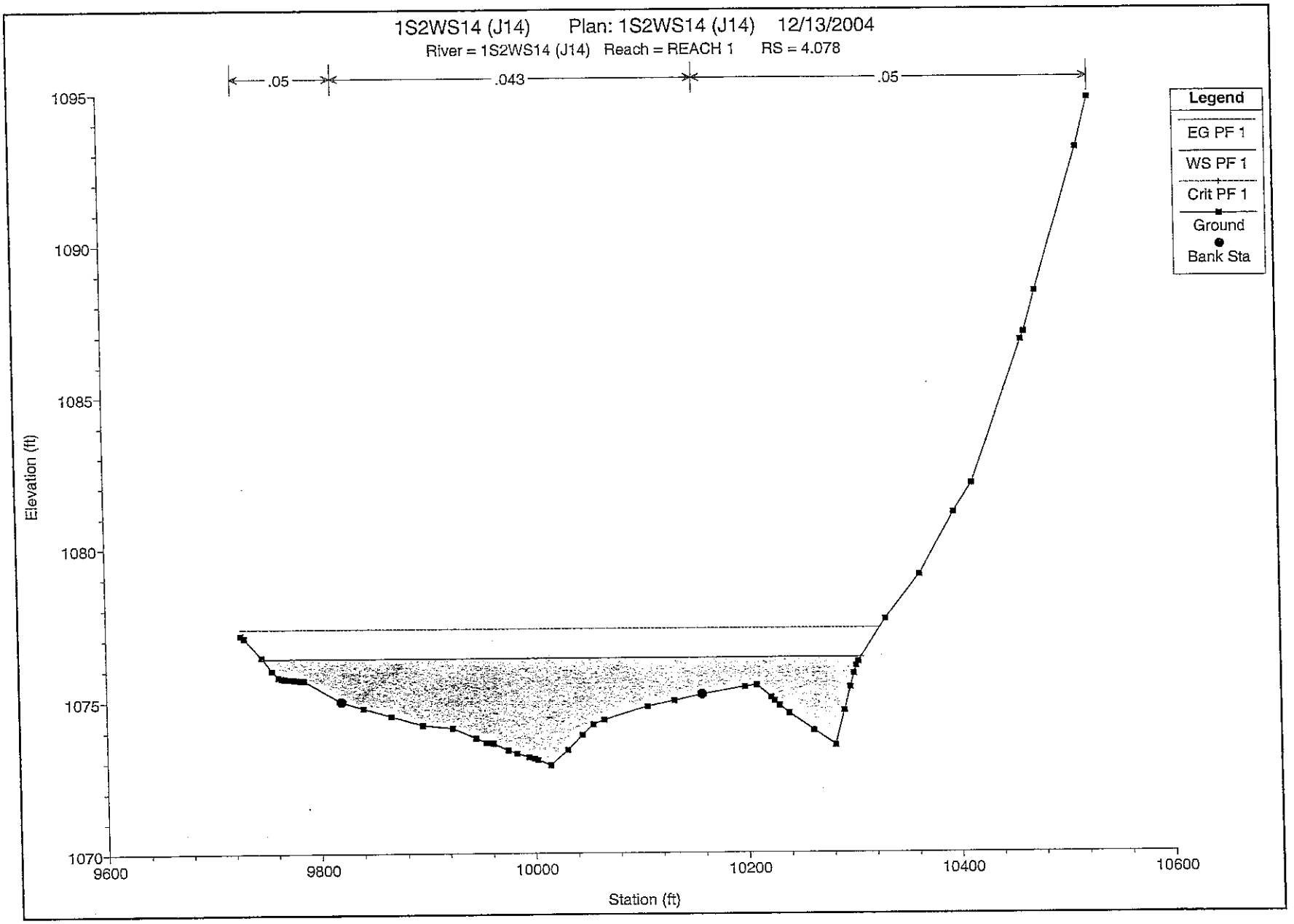

1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 2 RS = 3.272 BR 70' Bridge
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1044
1042
1040
1038
1036
1034
1032
1030
1028
1026
9850
9900
9950
10000
10050
10100
10150
Station (ft)

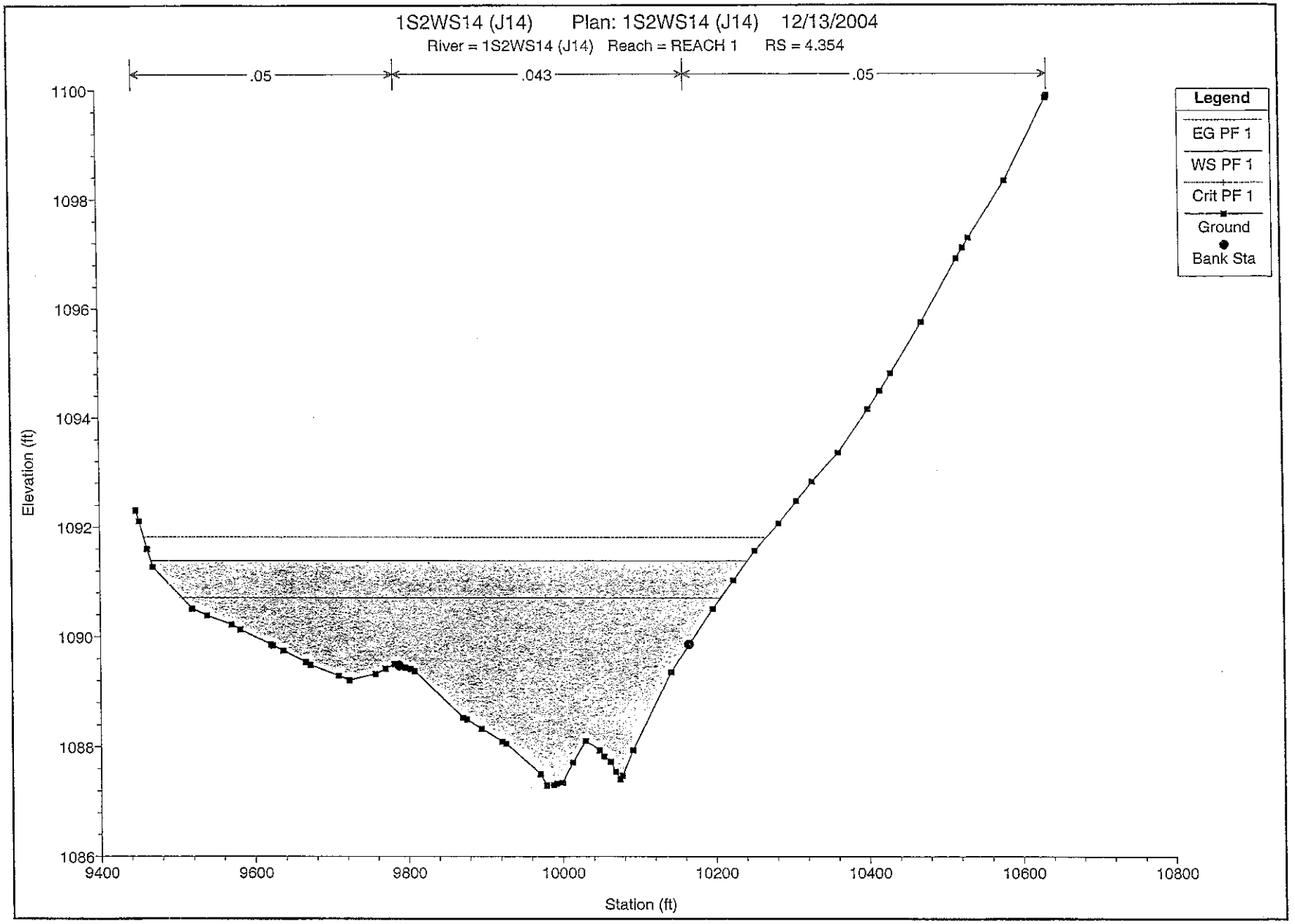

1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 2 RS = 3.272 BR 70' Bridge
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1048
1046
1044
1042
1040
1038
1036
1034
1032
1030
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

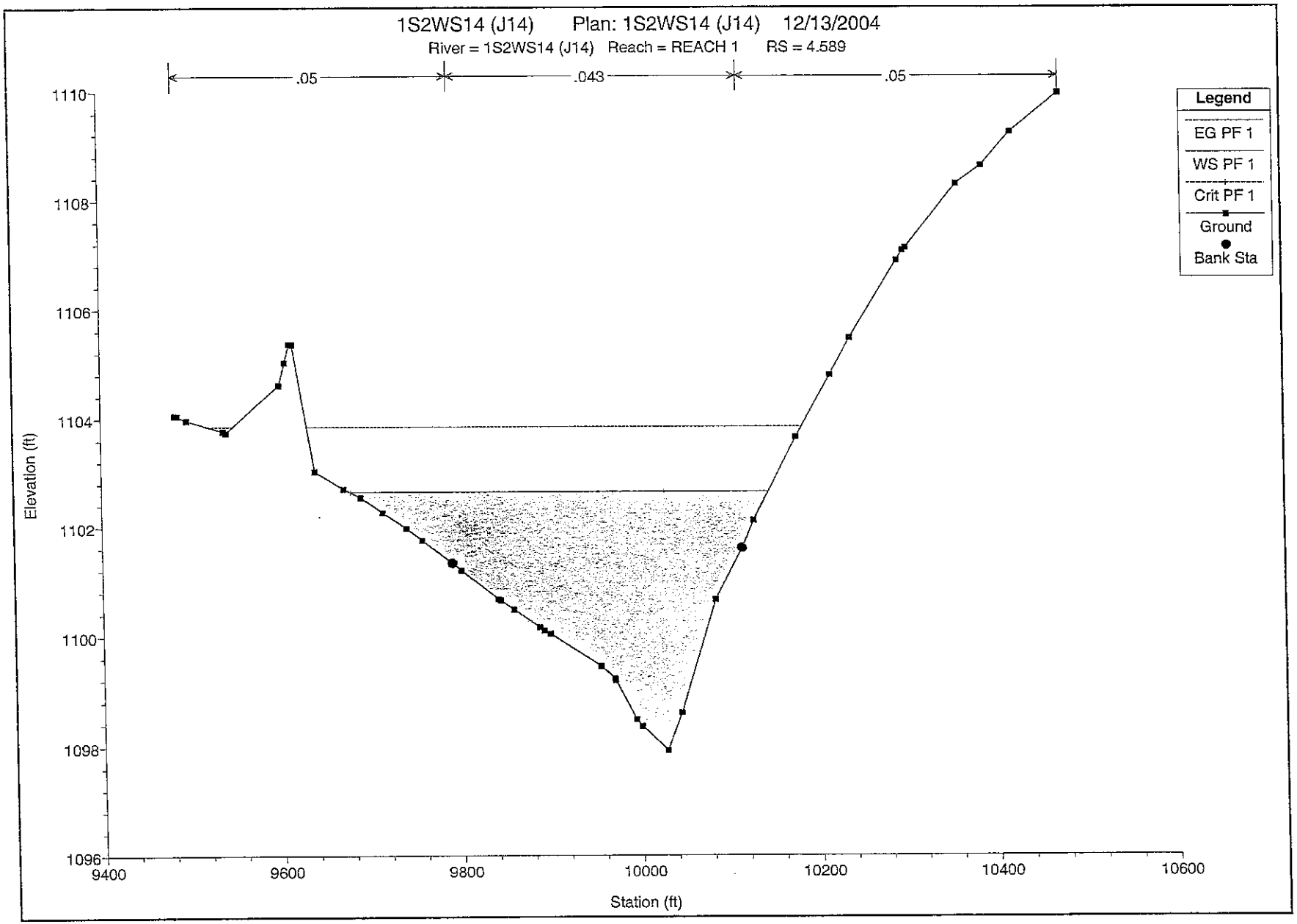

1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 2 RS = 3.302 Directly upstream of Estrella Parkway.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1048
1046
1044
1042
1040
1038
1036
1034
1032
1030
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

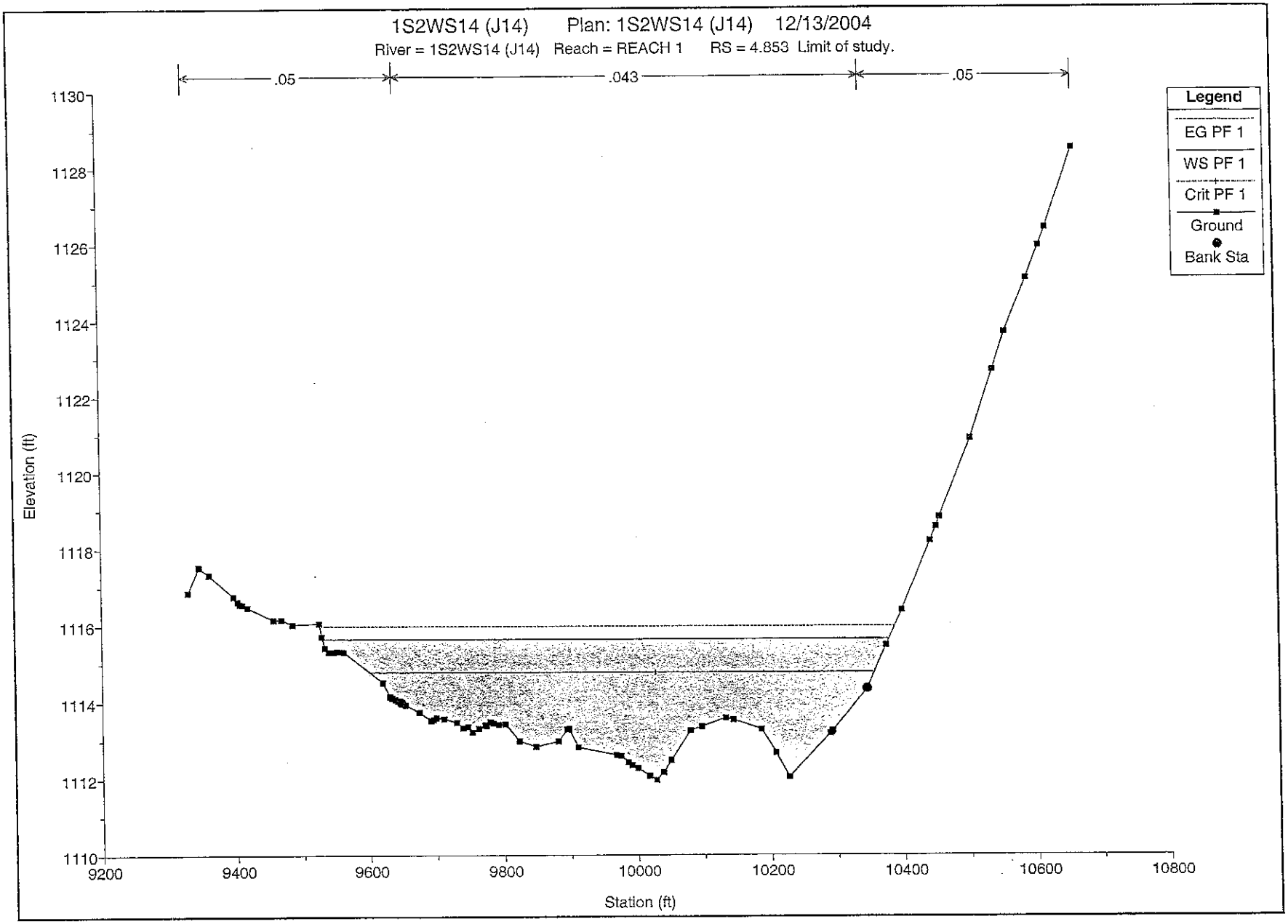

1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 1 RS = 3.575
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1060
1058
1056
1054
1052
1050
1048
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 1 RS = 3.846
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1066
1065
1064
1063
1062
1061
1060
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 1 RS = 4.078
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1095
1090
1085
1080
1075
1070
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 1 RS = 4.354
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1100
1098
1096
1094
1092
1090
1088
1086
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 1 RS = 4.589
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1110
1108
1106
1104
1102
1100
1098
1096
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS14 (J14) Reach = REACH 1 RS = 4.853 Limit of study.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1130
1128
1126
1124
1122
1120
1118
1116
1114
1112
1110
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: 1S2WS14 (J14)

REACH: 1S2WS23 (J14)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

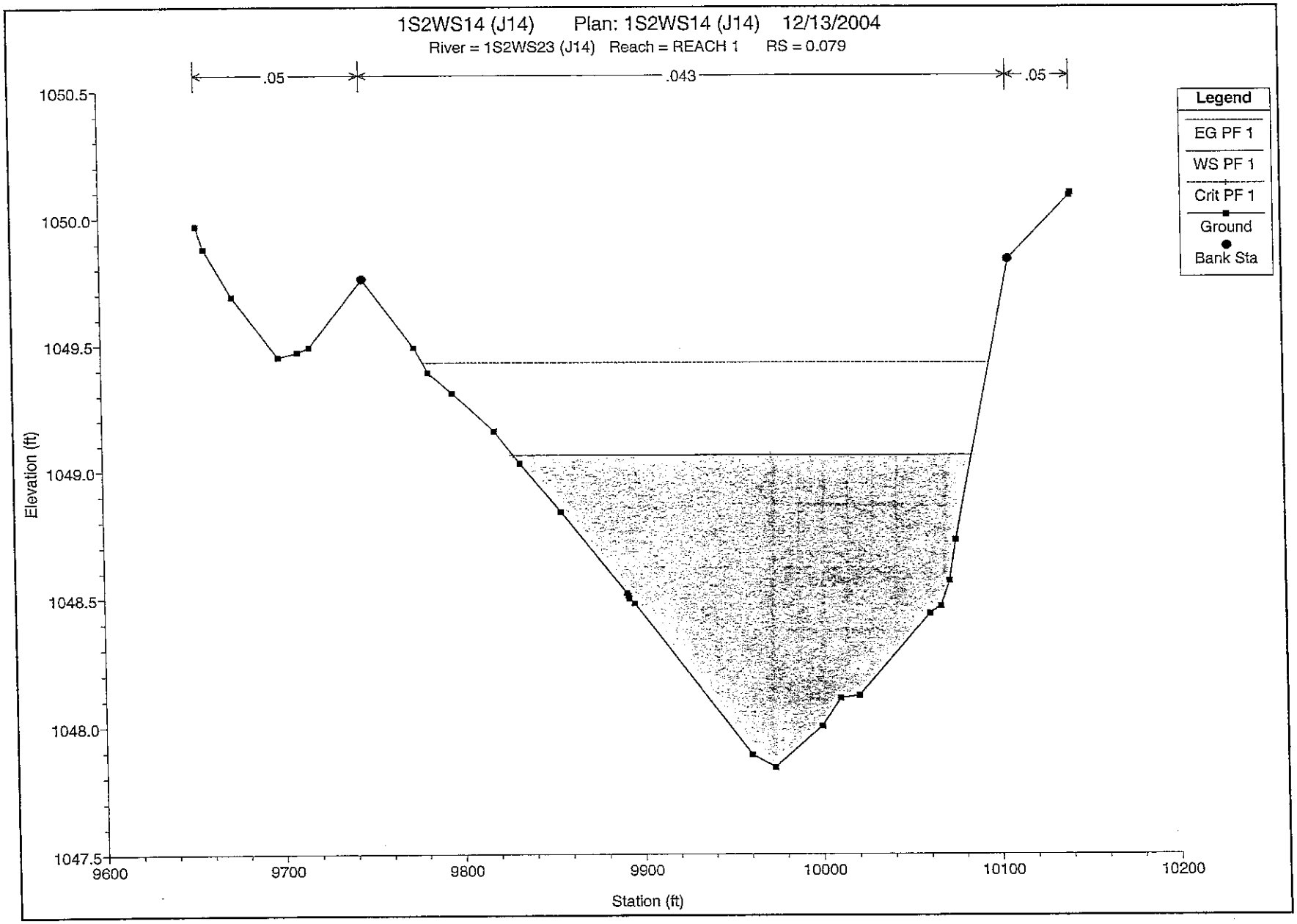
Wash ID: 1S2WS23 (J14)

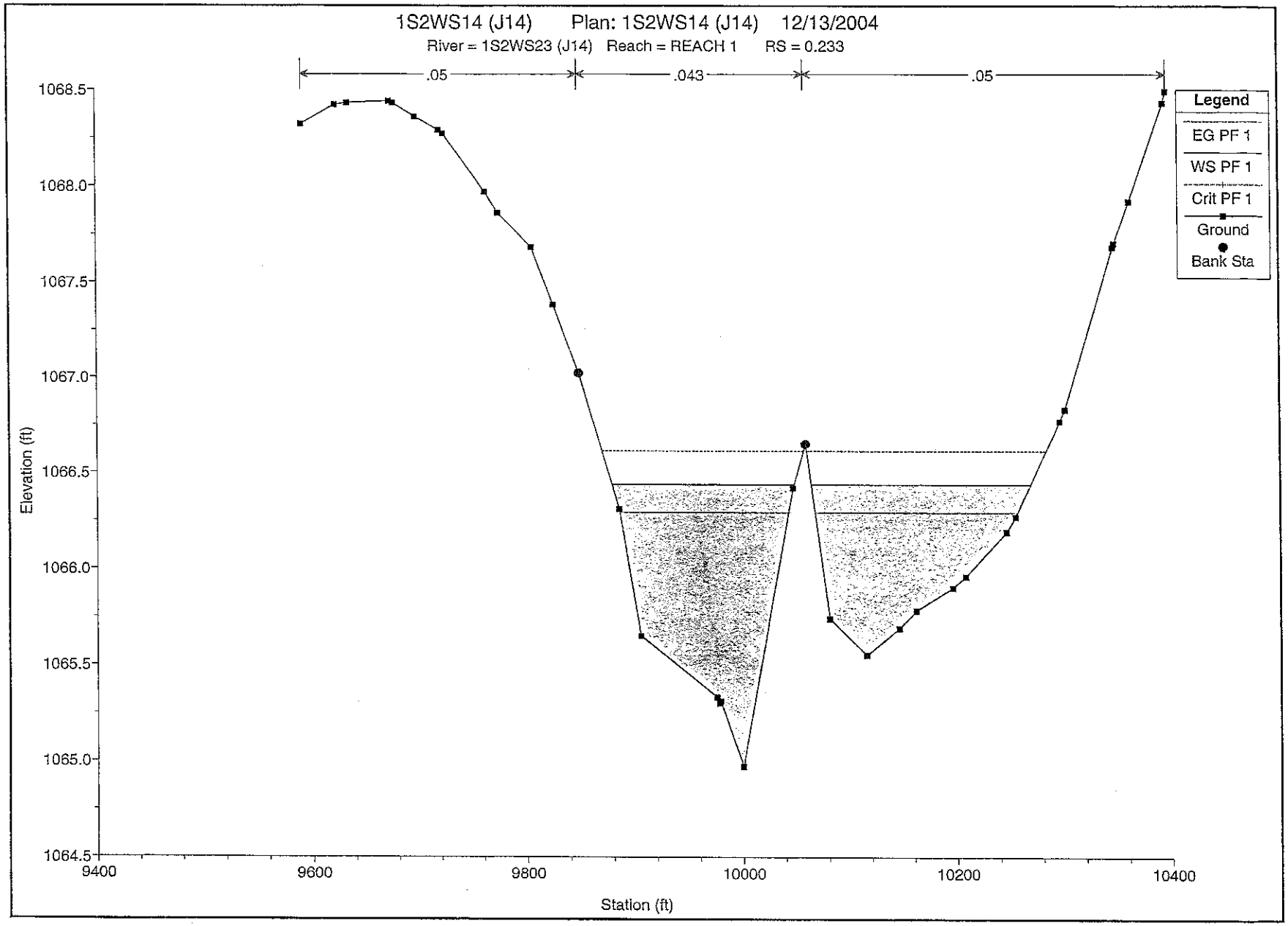
Subbasin: J25

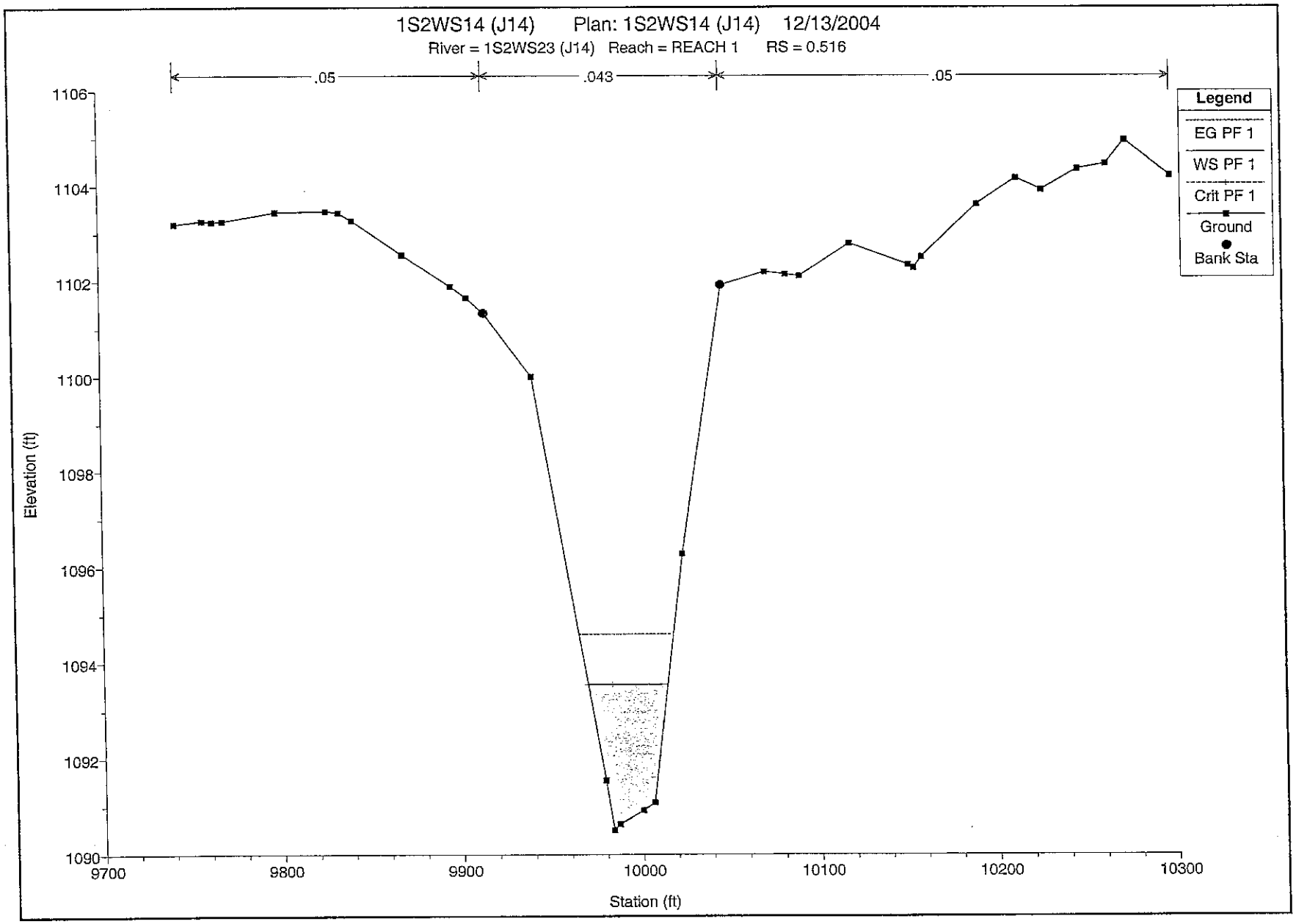
Total Discharge (cfs) = 887

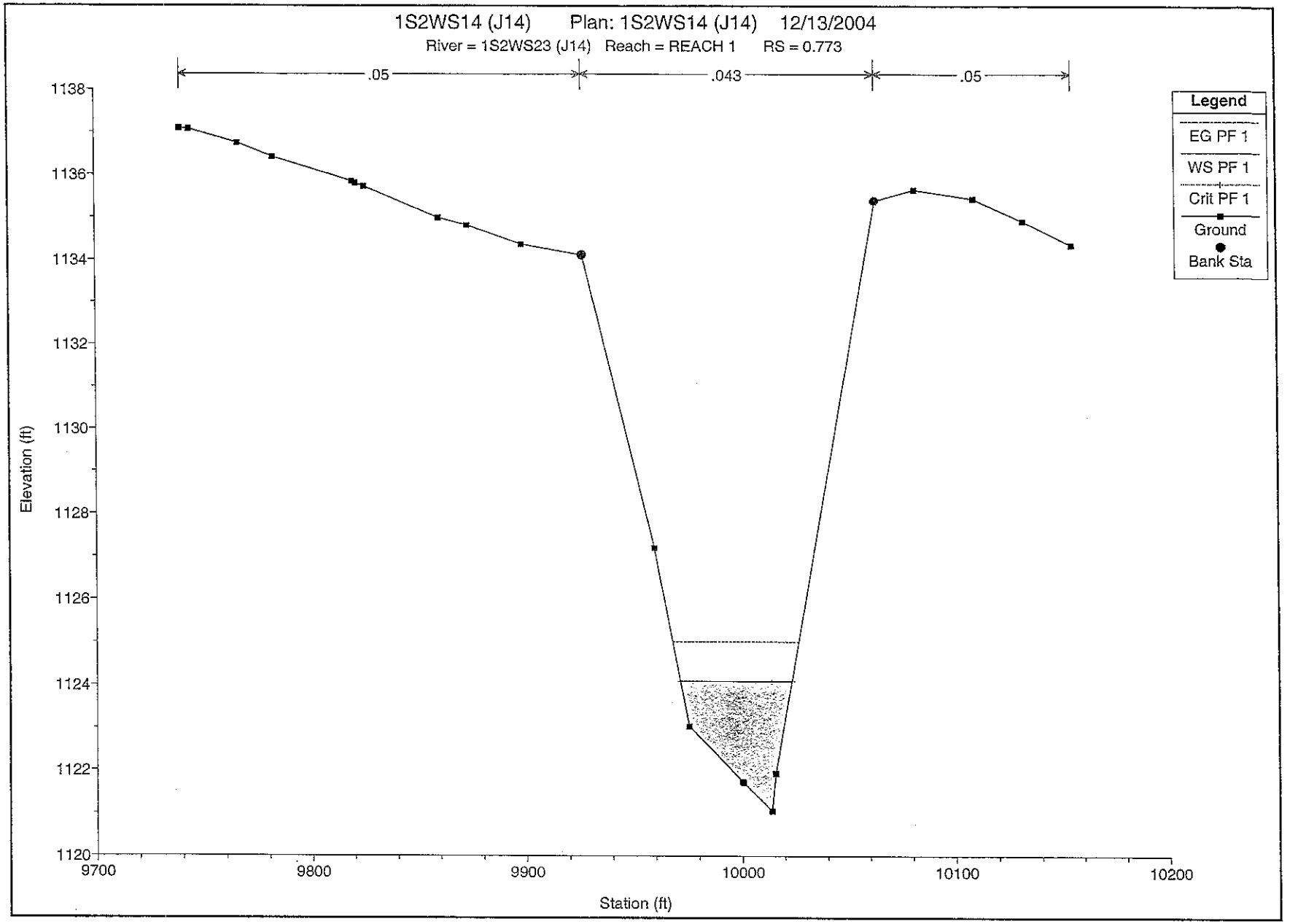
Total Area (acres) = 335

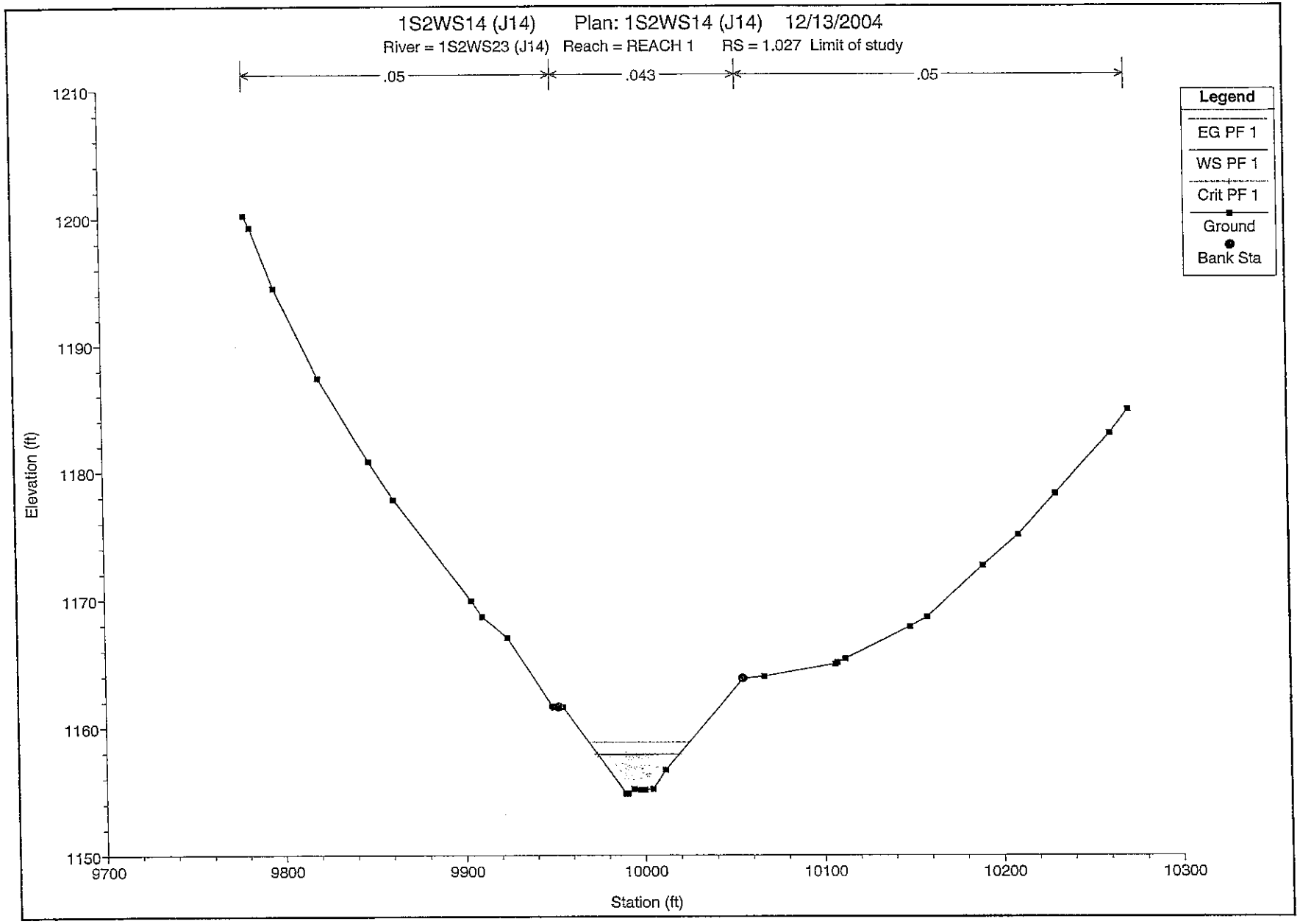
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.027	252	75.2	670
0.773	274	81.9	730
0.516	292	87.1	770
0.233	307	91.6	810
0.079	335	99.9	890


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS23 (J14) Reach = REACH 1 RS = 0.079
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1050.5
1050.0
1049.5
1049.0
1048.5
1048.0
1047.5
9600
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS23 (J14) Reach = REACH 1 RS = 0.233
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1068.5
1068.0
1067.5
1067.0
1066.5
1066.0
1065.5
1065.0
1064.5
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS23 (J14) Reach = REACH 1 RS = 0.516
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1106
1104
1102
1100
1098
1096
1094
1092
1090
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS23 (J14) Reach = REACH 1 RS = 0.773
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1138
1136
1134
1132
1130
1128
1126
1124
1122
1120
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS14 (J14) Plan: 1S2WS14 (J14) 12/13/2004
River = 1S2WS23 (J14) Reach = REACH 1 RS = 1.027 Limit of study
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1210
1200
1190
1180
1170
1160
1150
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS17 (J38)

REACH: 1S2WS17 (J38)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

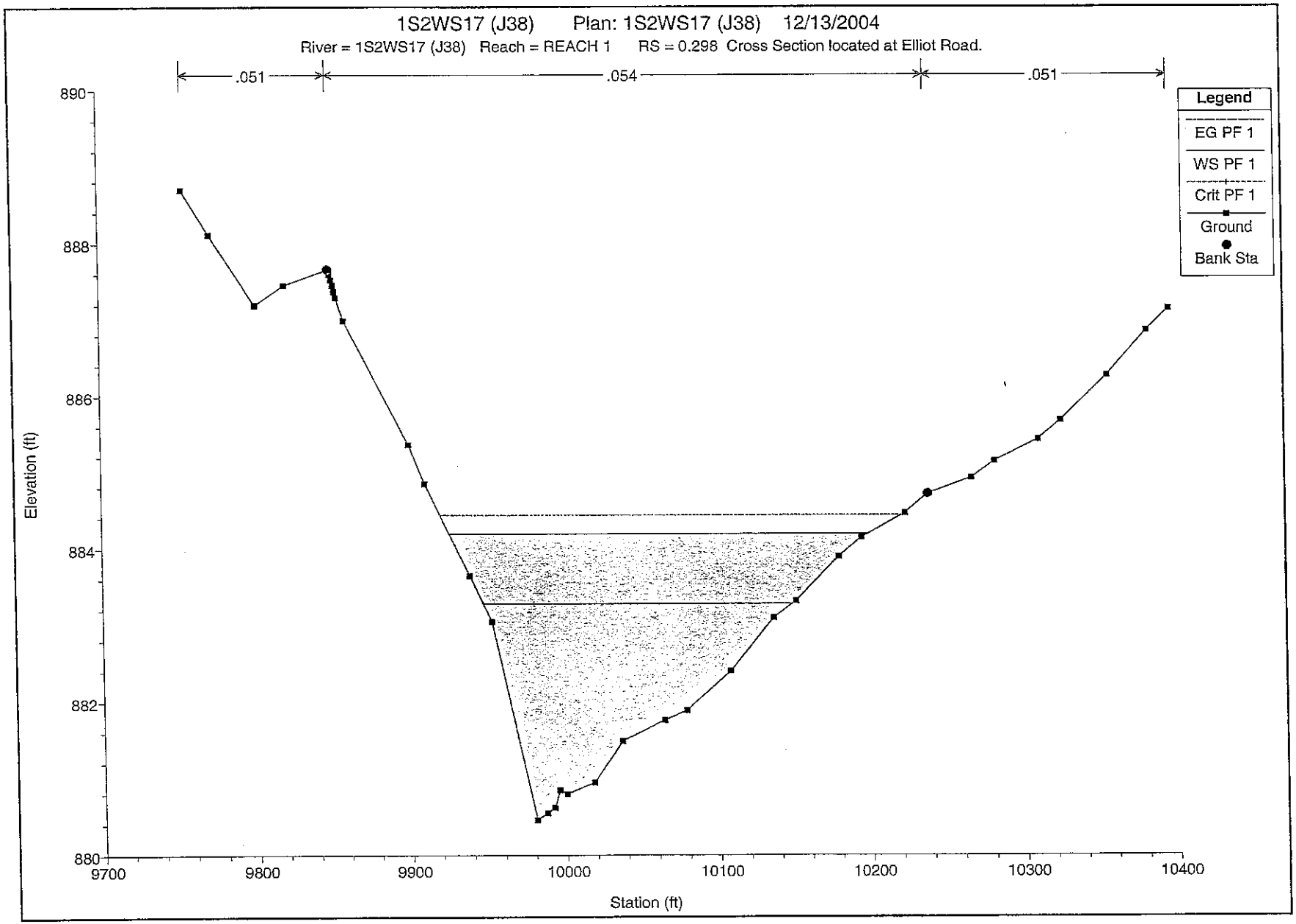
Wash ID: 1S2WS17 (J38)

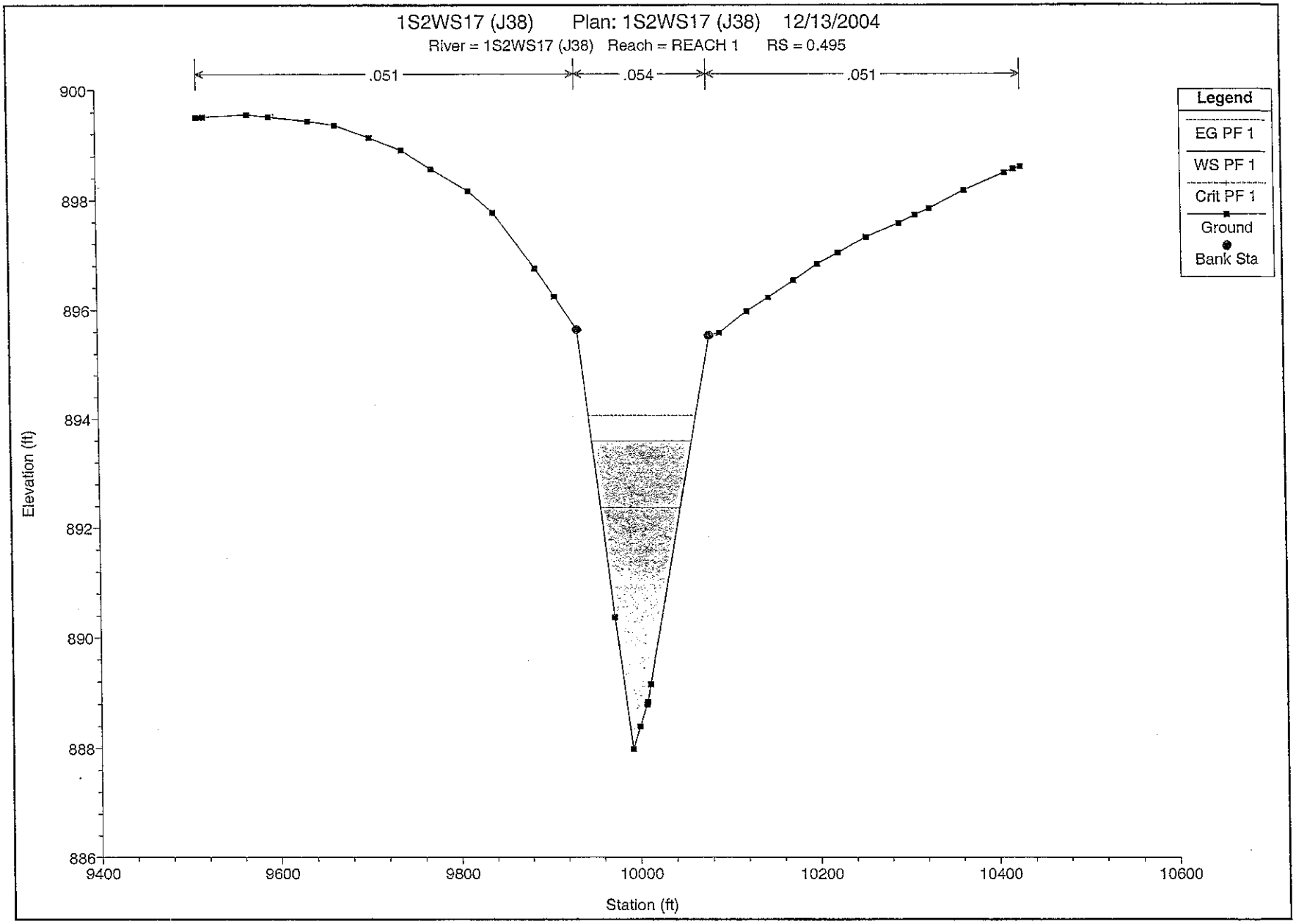
Subbasin: J38

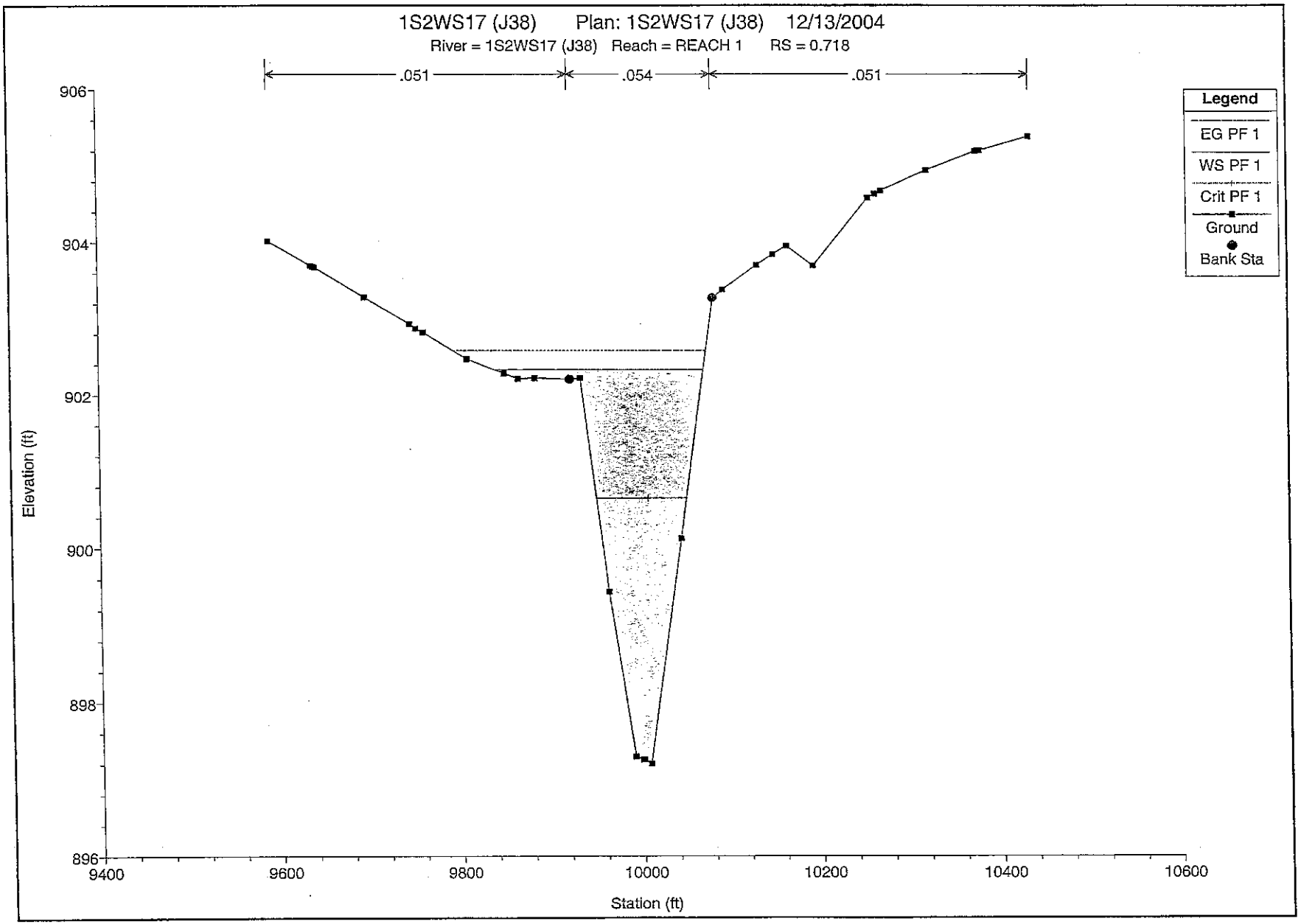
Total Discharge (cfs) = 2303

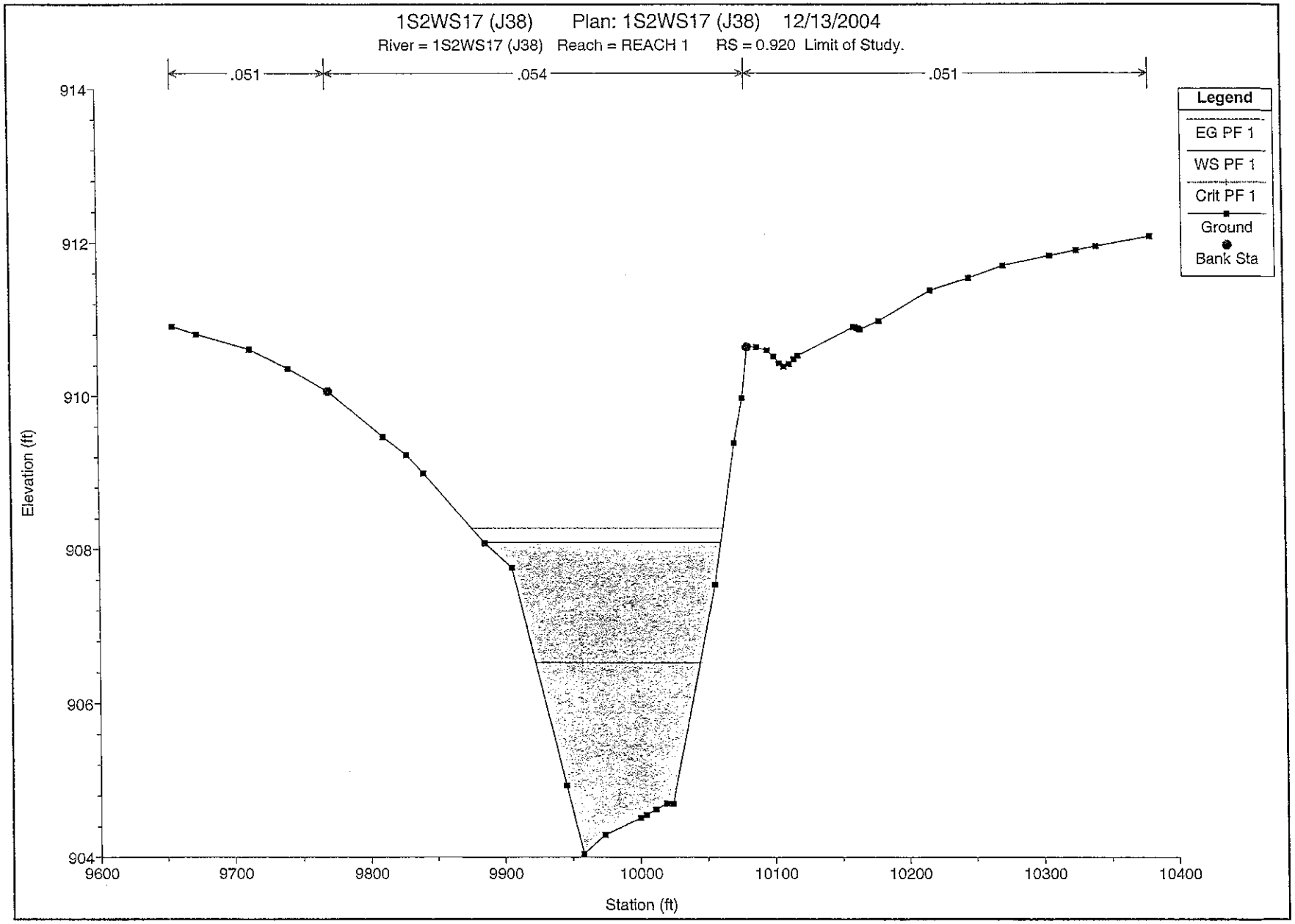
Total Area (acres) = 1319

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.920	845	64.1	1480
0.718	935	70.9	1630
0.495	1035	78.5	1810
0.298	1155	87.6	2020


1S2WS17 (J38) Plan: 1S2WS17 (J38) 12/13/2004
River = 1S2WS17 (J38) Reach = REACH 1 RS = 0.298 Cross Section located at Elliot Road.
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
890
888
886
884
882
880
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS17 (J38) Plan: 1S2WS17 (J38) 12/13/2004
River = 1S2WS17 (J38) Reach = REACH 1 RS = 0.495
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
900
898
896
894
892
890
888
886
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS17 (J38) Plan: 1S2WS17 (J38) 12/13/2004
River = 1S2WS17 (J38) Reach = REACH 1 RS = 0.718
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
906
904
902
900
898
896
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS17 (J38) Plan: 1S2WS17 (J38) 12/13/2004
River = 1S2WS17 (J38) Reach = REACH 1 RS = 0.920 Limit of Study.
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
914
912
910
908
906
904
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

MODEL: 1S2WS18B (J37)

REACH: 1S2WS18B (J37)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 1S2WS18B (J37)

Subbasin: J28

Total Discharge (cfs) = 1114

Total Area (acres) = 631

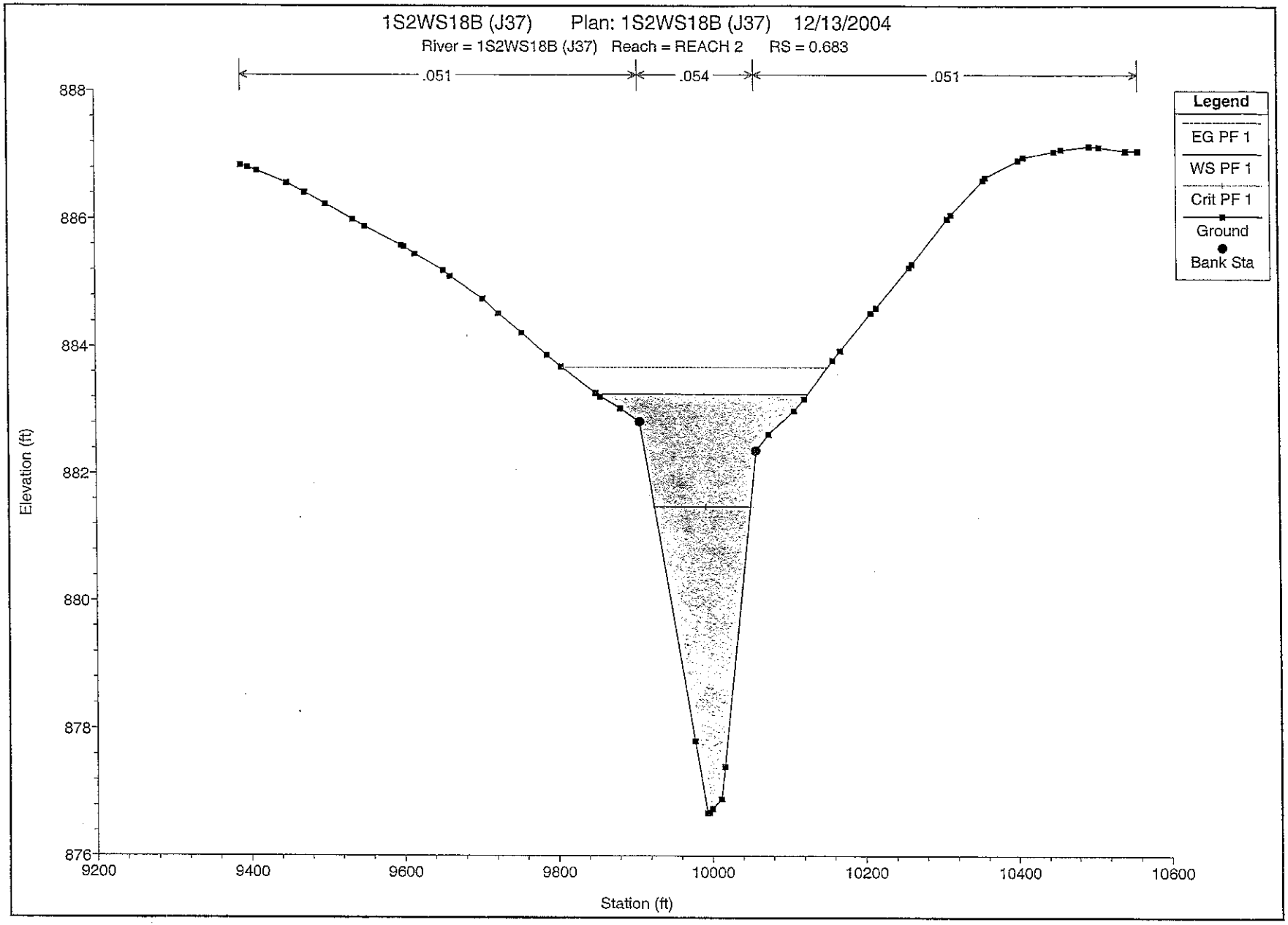
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.618	549	87.0	970
1.338	587	93.0	1040

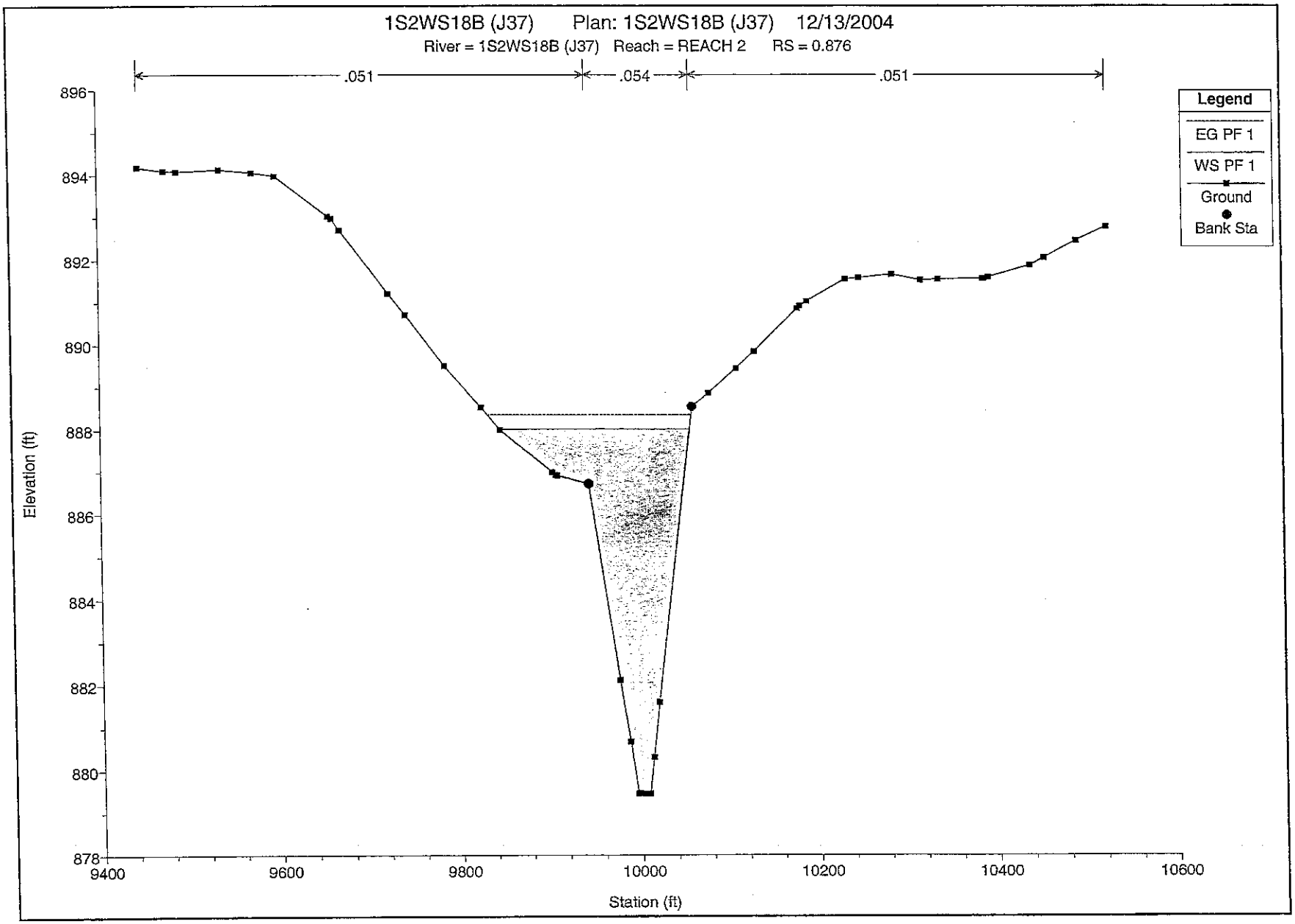
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

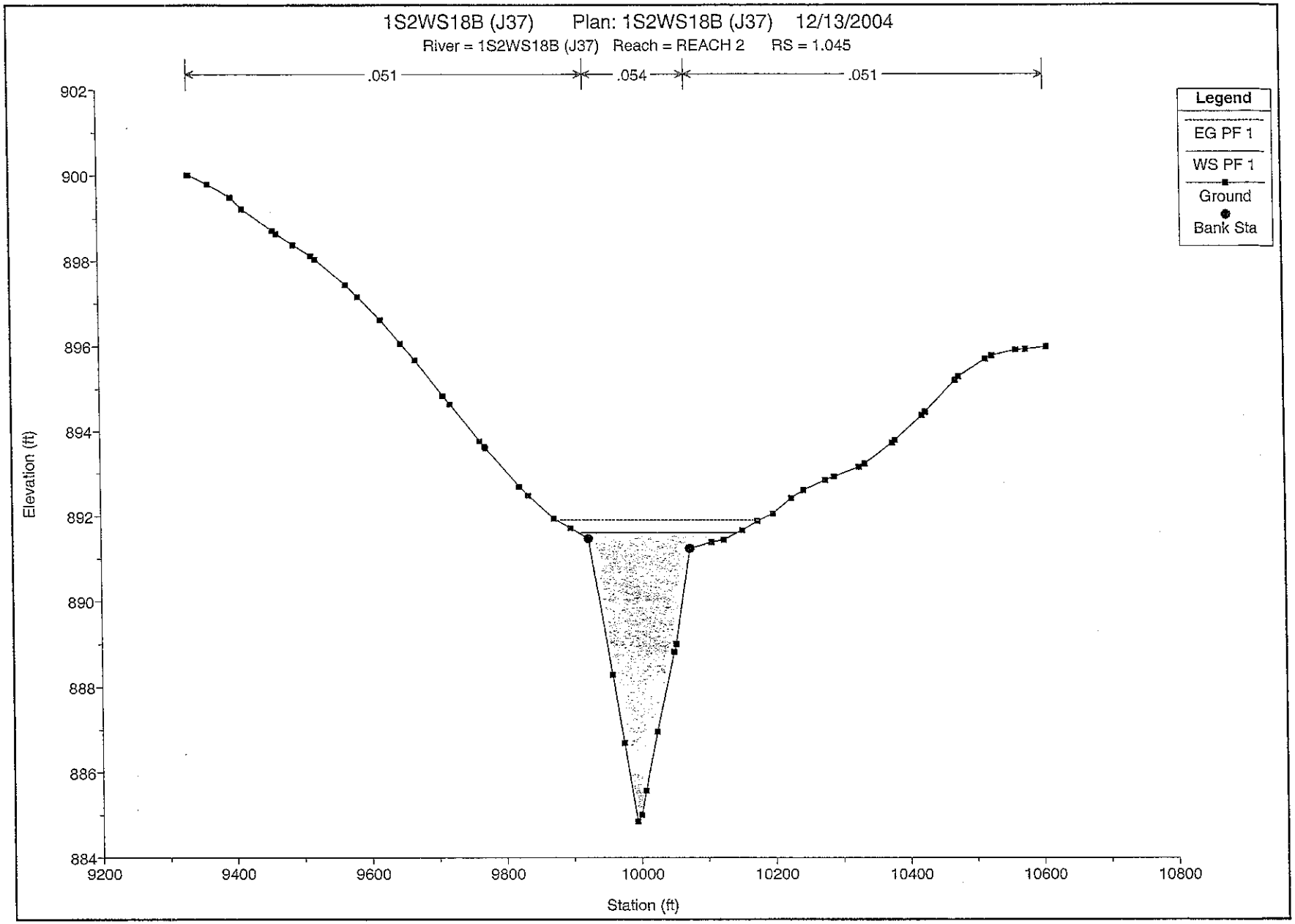
Change in Discharge based on Reach Length

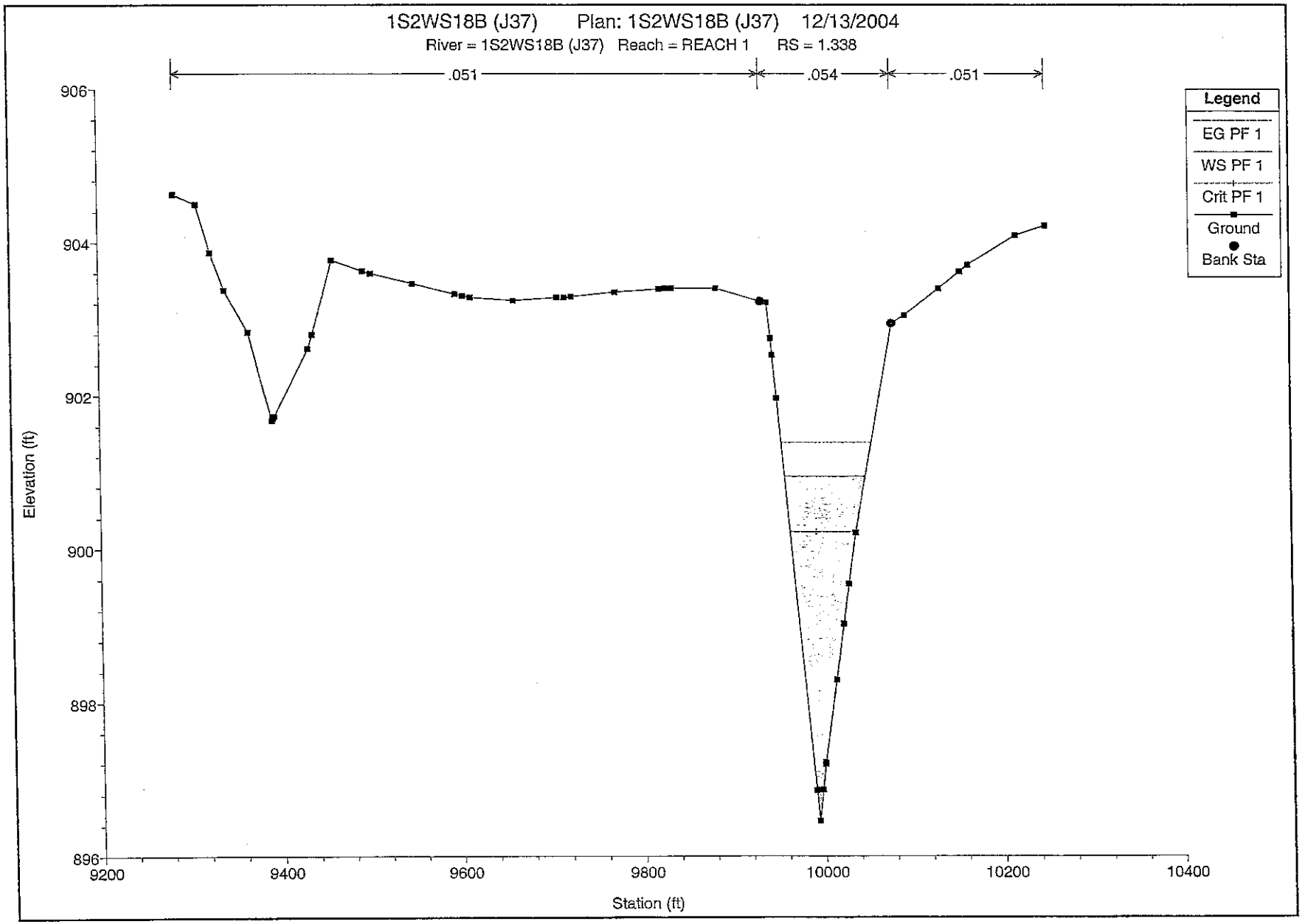
Wash ID: 1S2WS18B (J37)

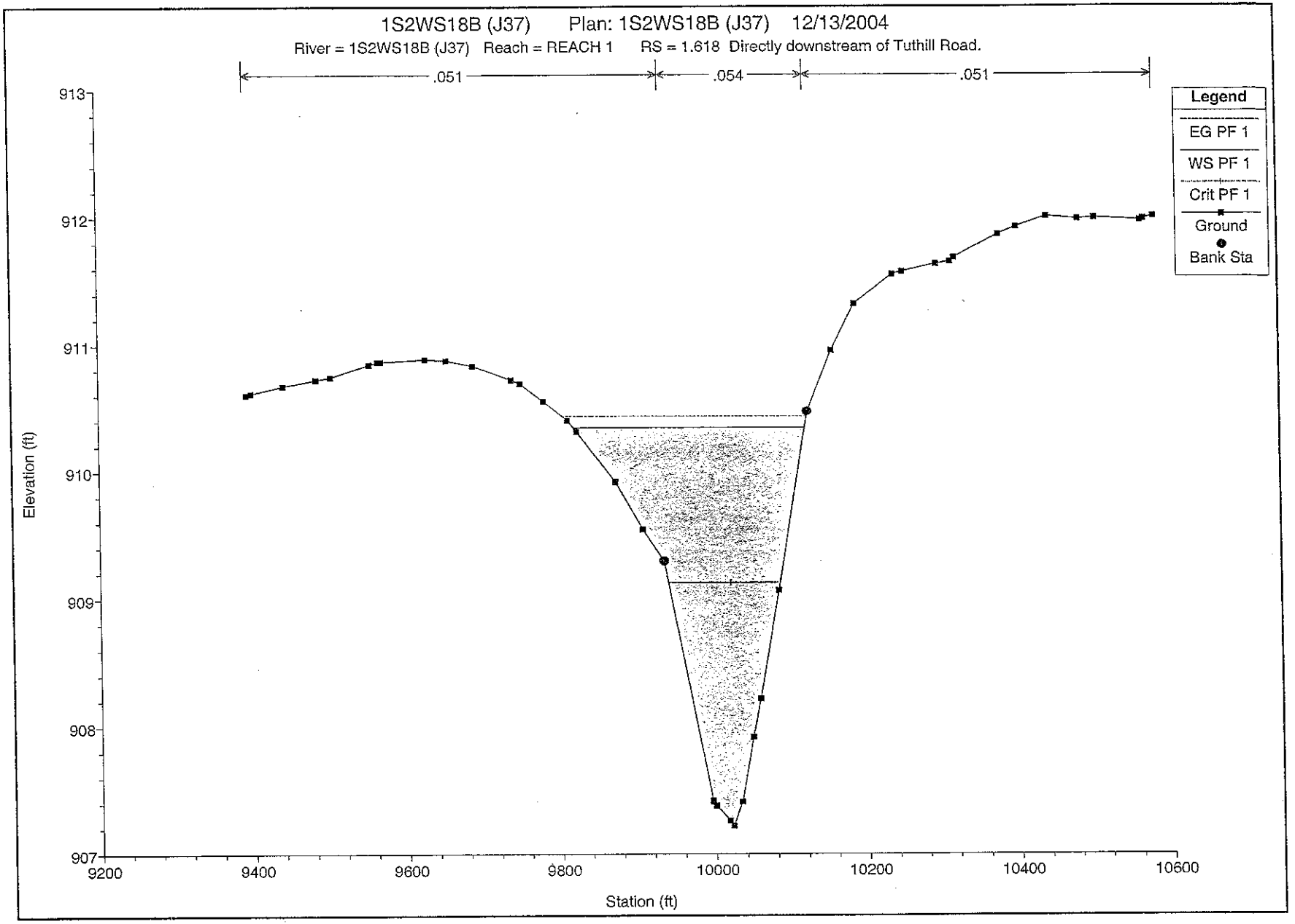
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPJ27	1.045	2475	2480	2500
J37	0.876	2798	2800	2800
CPJ37	0.683	3167	3170	3200


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18B (J37) Reach = REACH 2 RS = 0.683
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
888
886
884
882
880
878
876
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18B (J37) Reach = REACH 2 RS = 0.876
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
896
894
892
890
888
886
884
882
880
878
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18B (J37) Reach = REACH 2 RS = 1.045
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
902
900
898
896
894
892
890
888
886
884
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18B (J37) Reach = REACH 1 RS = 1.338
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
906
904
902
900
898
896
9200
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18B (J37) Reach = REACH 1 RS = 1.618 Directly downstream of Tuthill Road.
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
913
912
911
910
909
908
907
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS18B (J37)

REACH: 1S2WS18A (J27)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

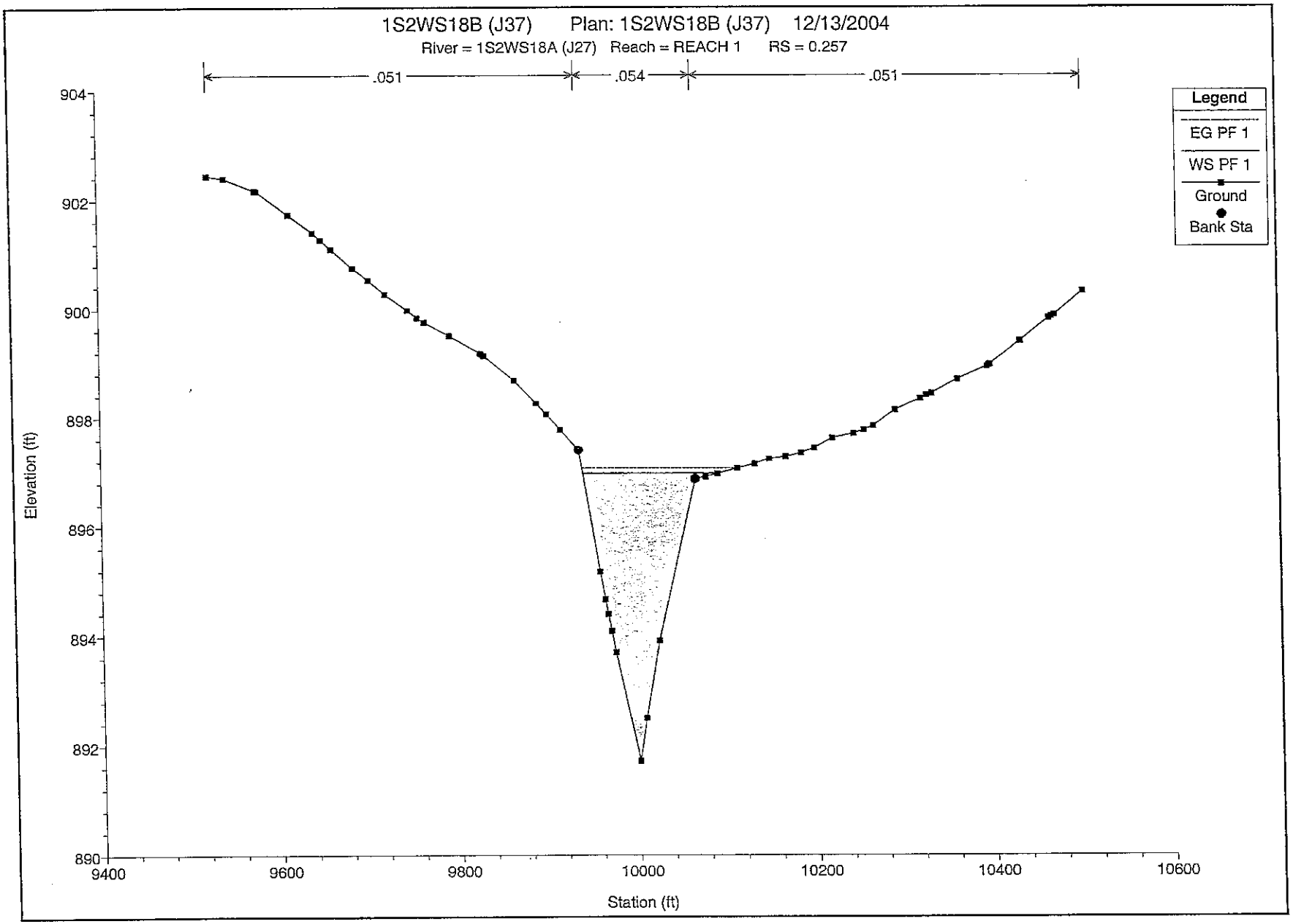
Wash ID: 1S2WS18A (J27)

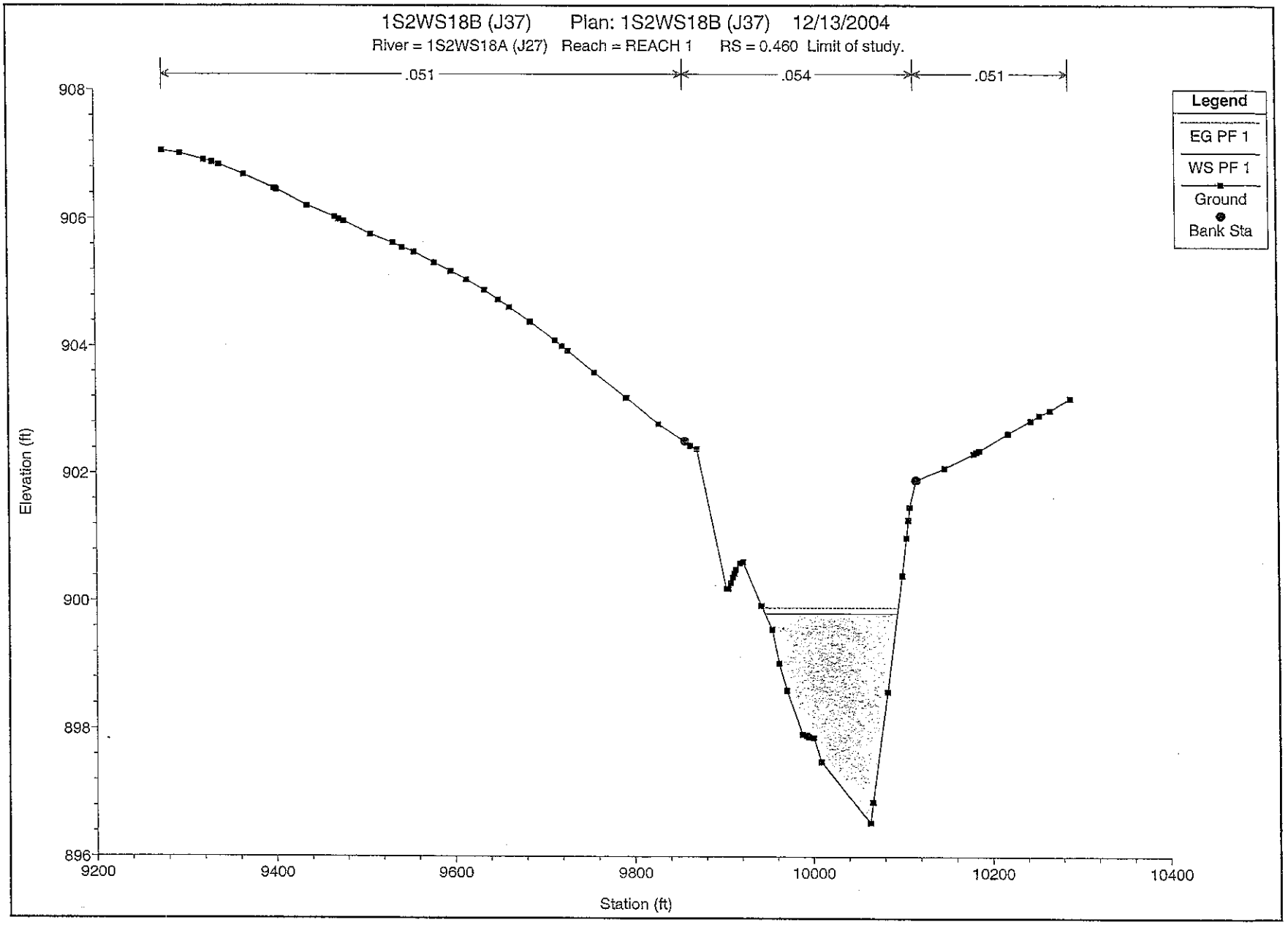
Subbasin: J27

Total Discharge (cfs) = 1431

Total Area (acres) = 961

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.460	471	49.1	700
0.257	551	57.3	820


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18A (J27) Reach = REACH 1 RS = 0.257
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
904
902
900
898
896
894
892
890
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS18B (J37) Plan: 1S2WS18B (J37) 12/13/2004
River = 1S2WS18A (J27) Reach = REACH 1 RS = 0.460 Limit of study.
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
908
906
904
902
900
898
896
9200
9400
9600
9800
10000
10200
10400
Station (ft)

MODEL: 1S2WS2A (J46)

REACH: 1S2WS2A (J46)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 1S2WS2A (J46)

Subbasin: J30

Total Discharge (cfs) = 656

Total Area (acres) = 213

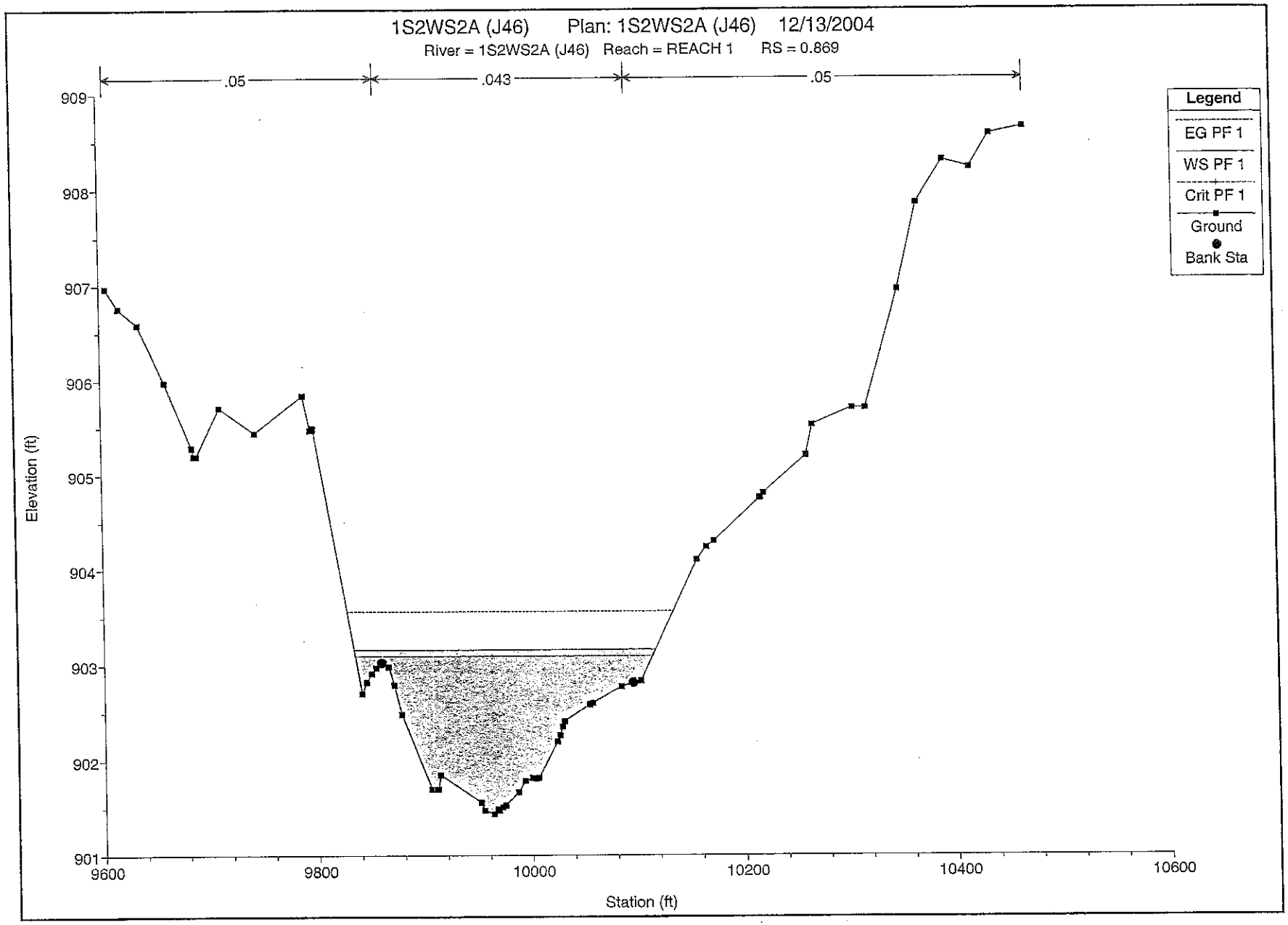
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
3.326	128	60.3	400
3.080	154	72.5	480
2.849	200	94.1	620
2.541	213	100.0	660

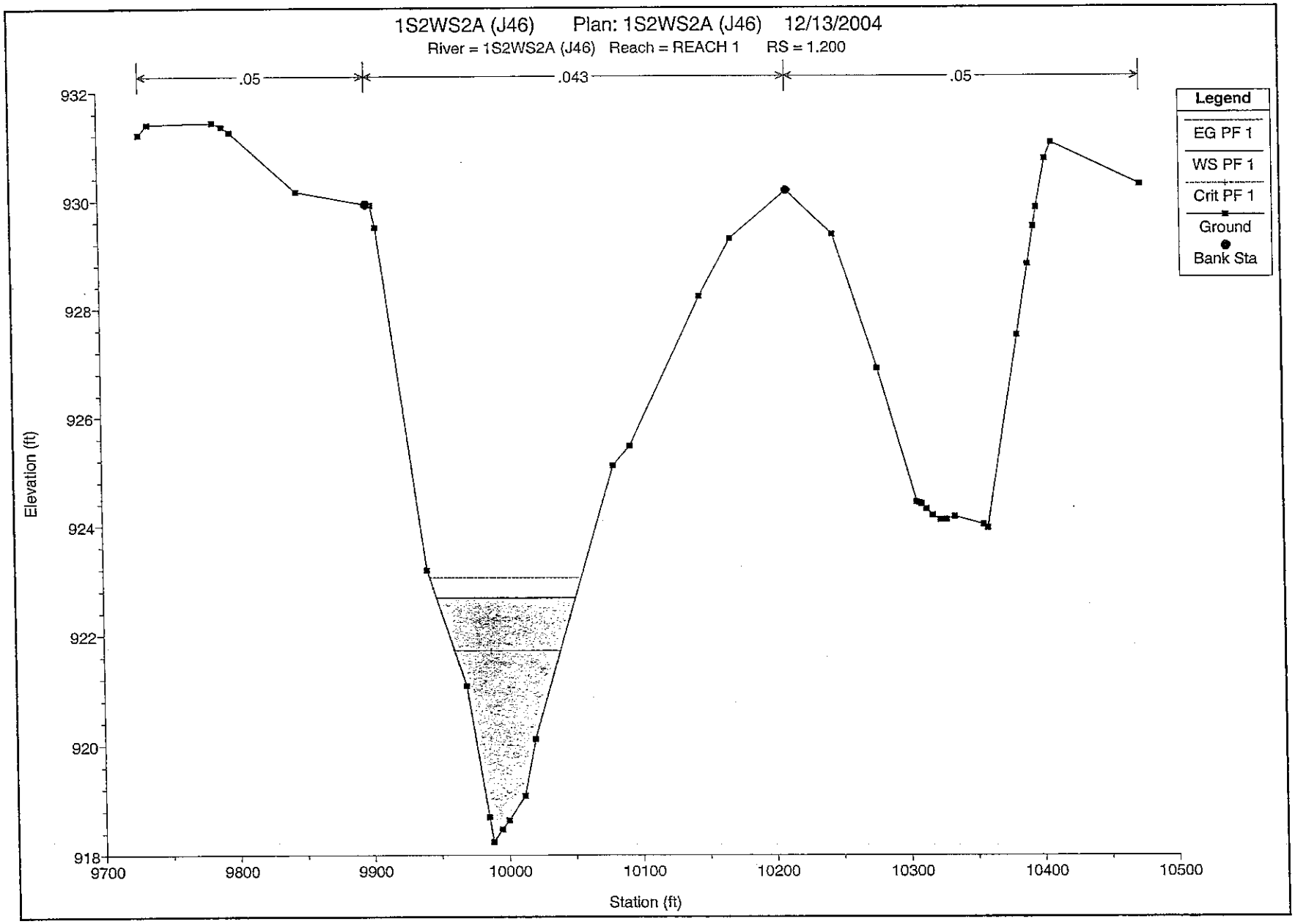
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

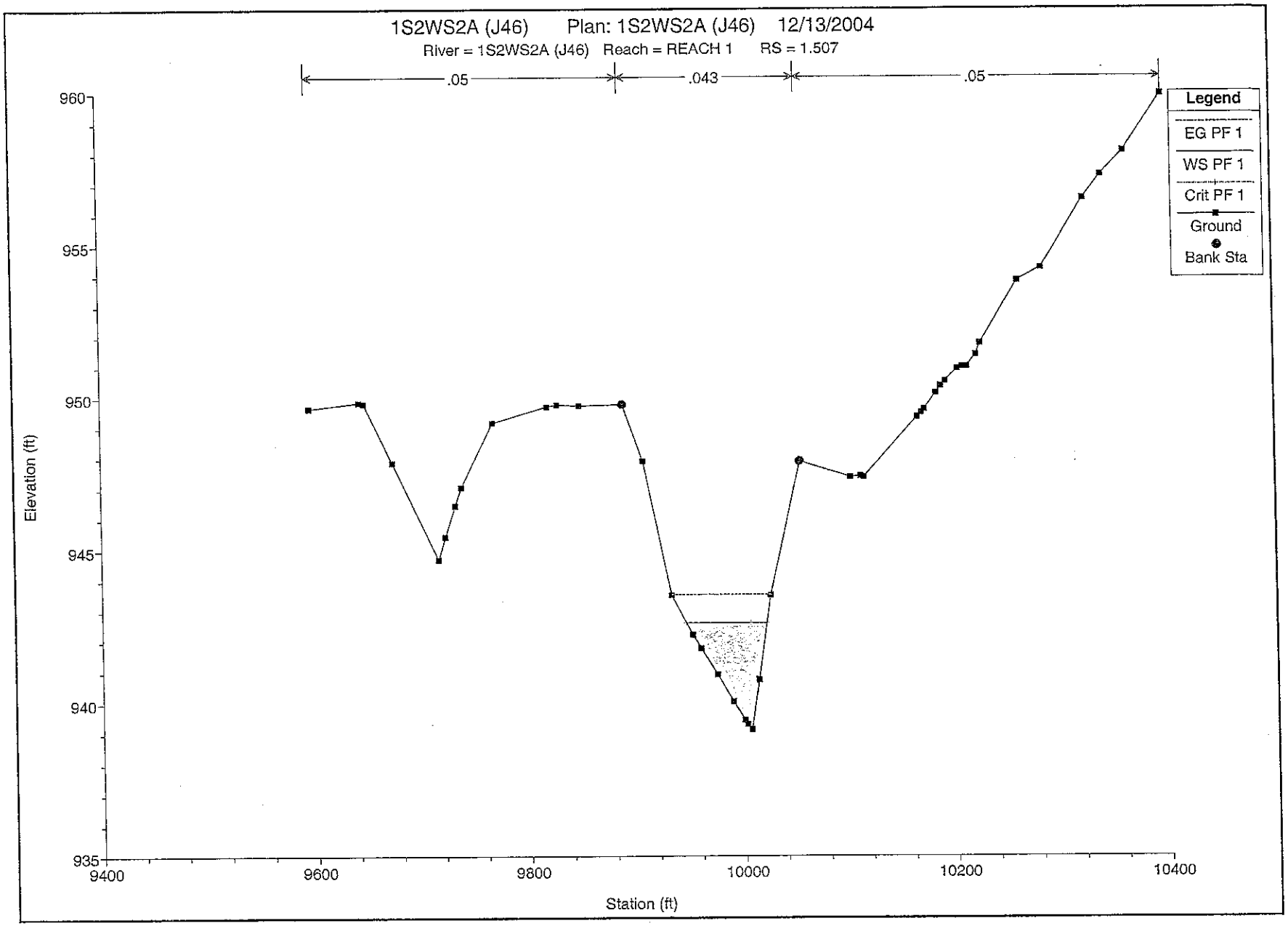
Change in Discharge based on Reach Length

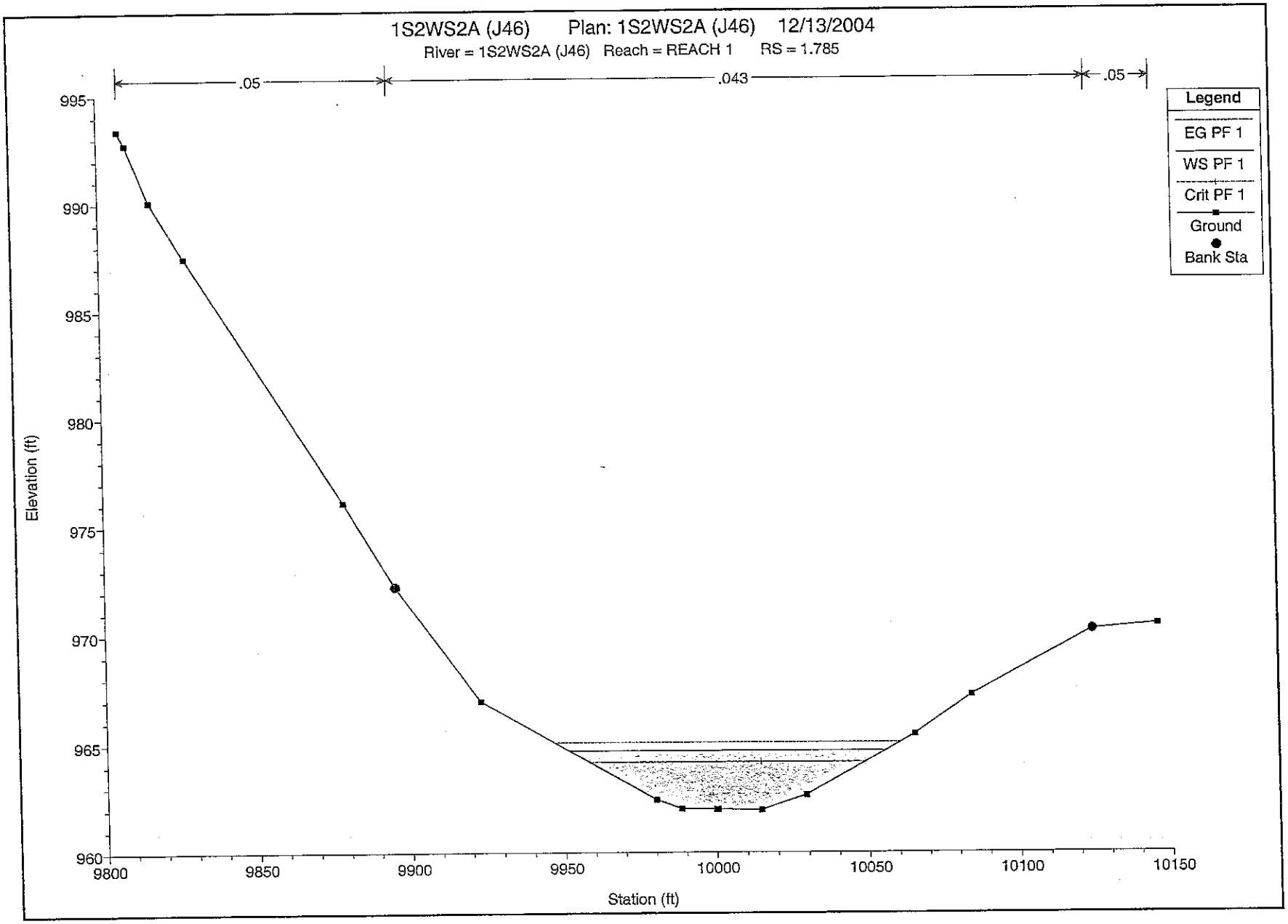
Wash ID: 1S2WS2A (J46)

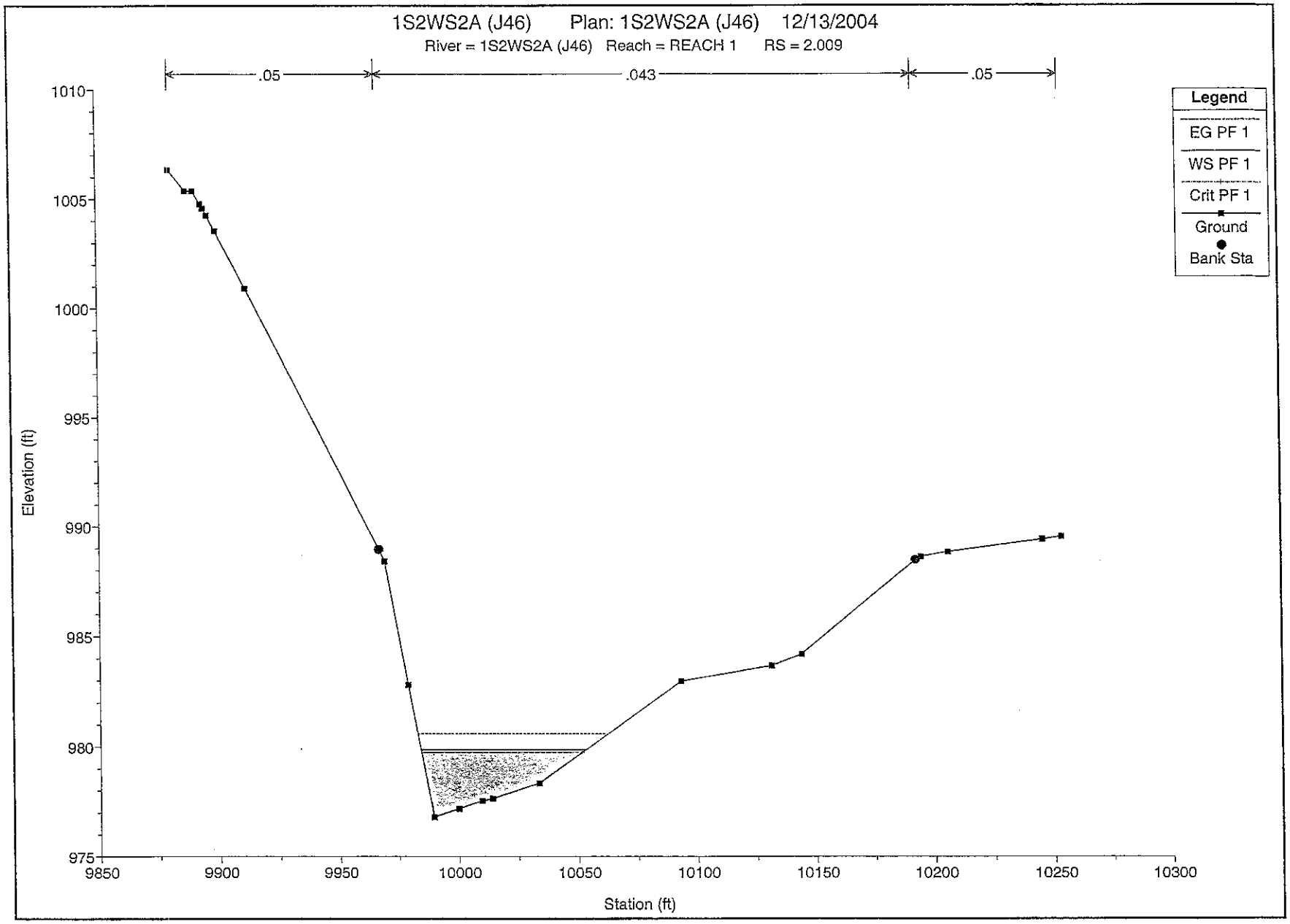
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPJ30	2.541	656	660	700
J46	2.459	686	690	700
J46	2.287	750	750	800
J46	2.009	853	850	900
J46	1.785	936	940	900
J46	1.507	1039	1040	1000
J46	1.200	1153	1150	1200
CPJ46	0.869	1276	1280	1300

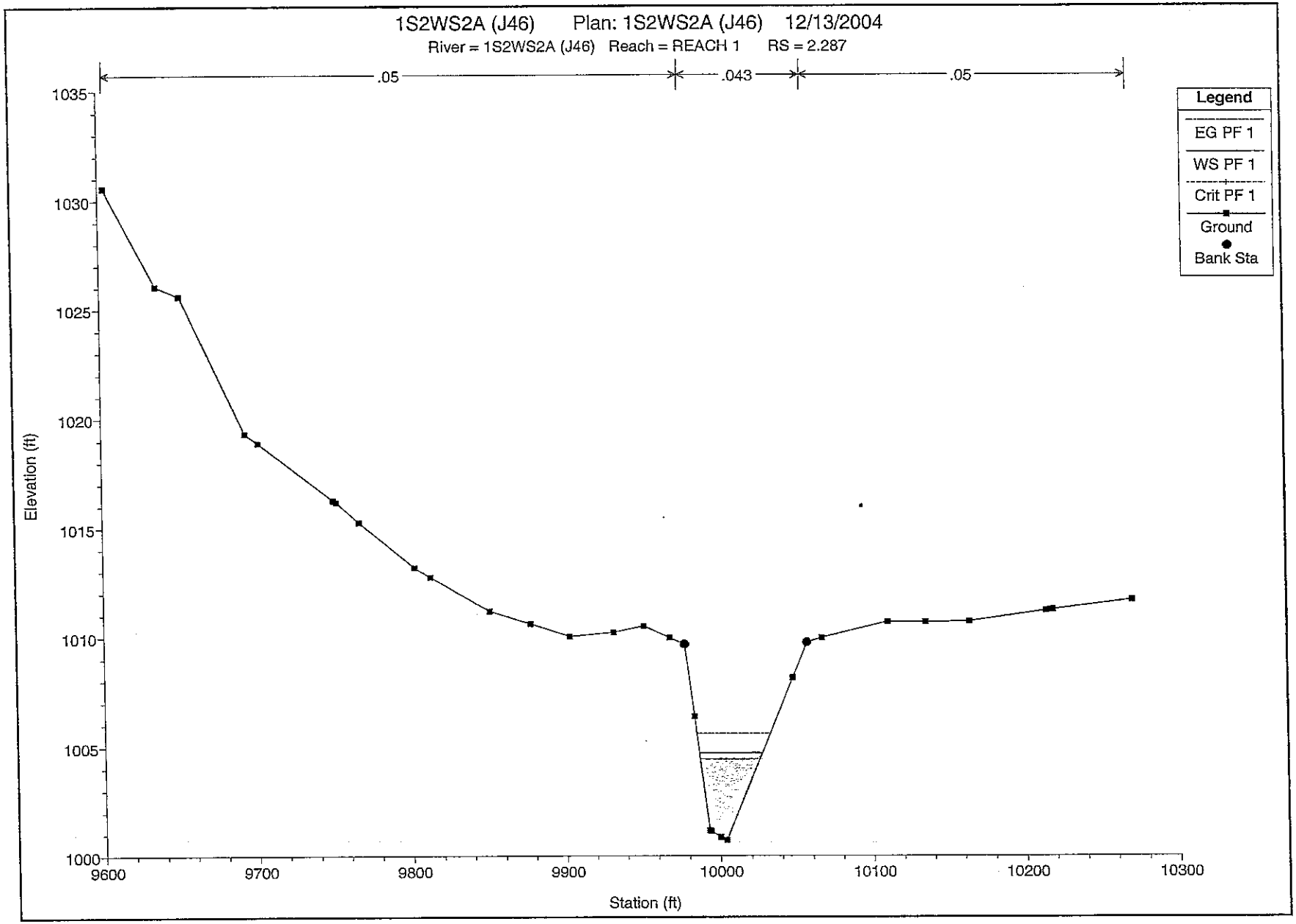

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 0.869
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
909
908
907
906
905
904
903
902
901
9600
9800
10000
10200
10400
10600
Station (ft)

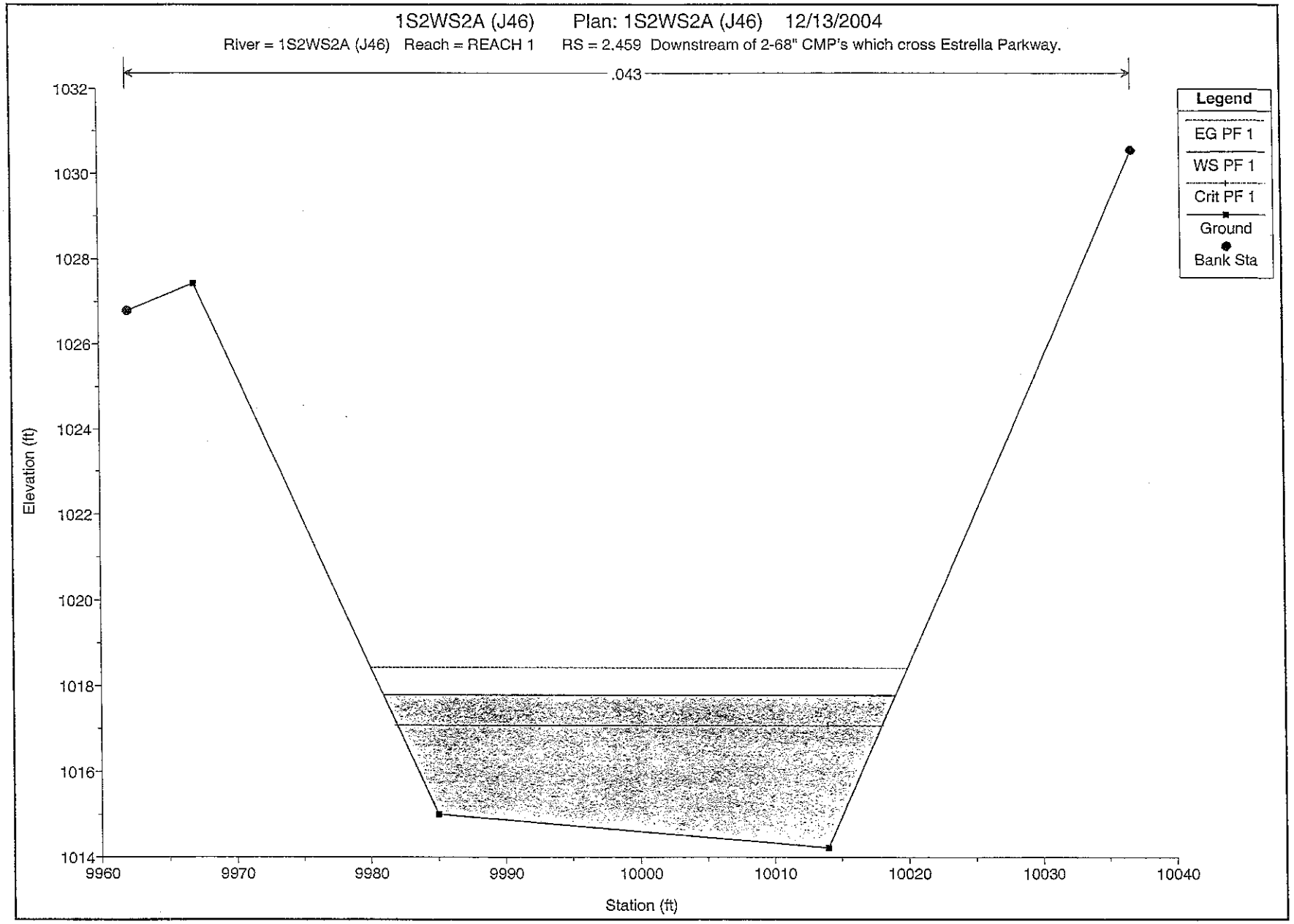

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 1.200
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
932
930
928
926
924
922
920
918
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

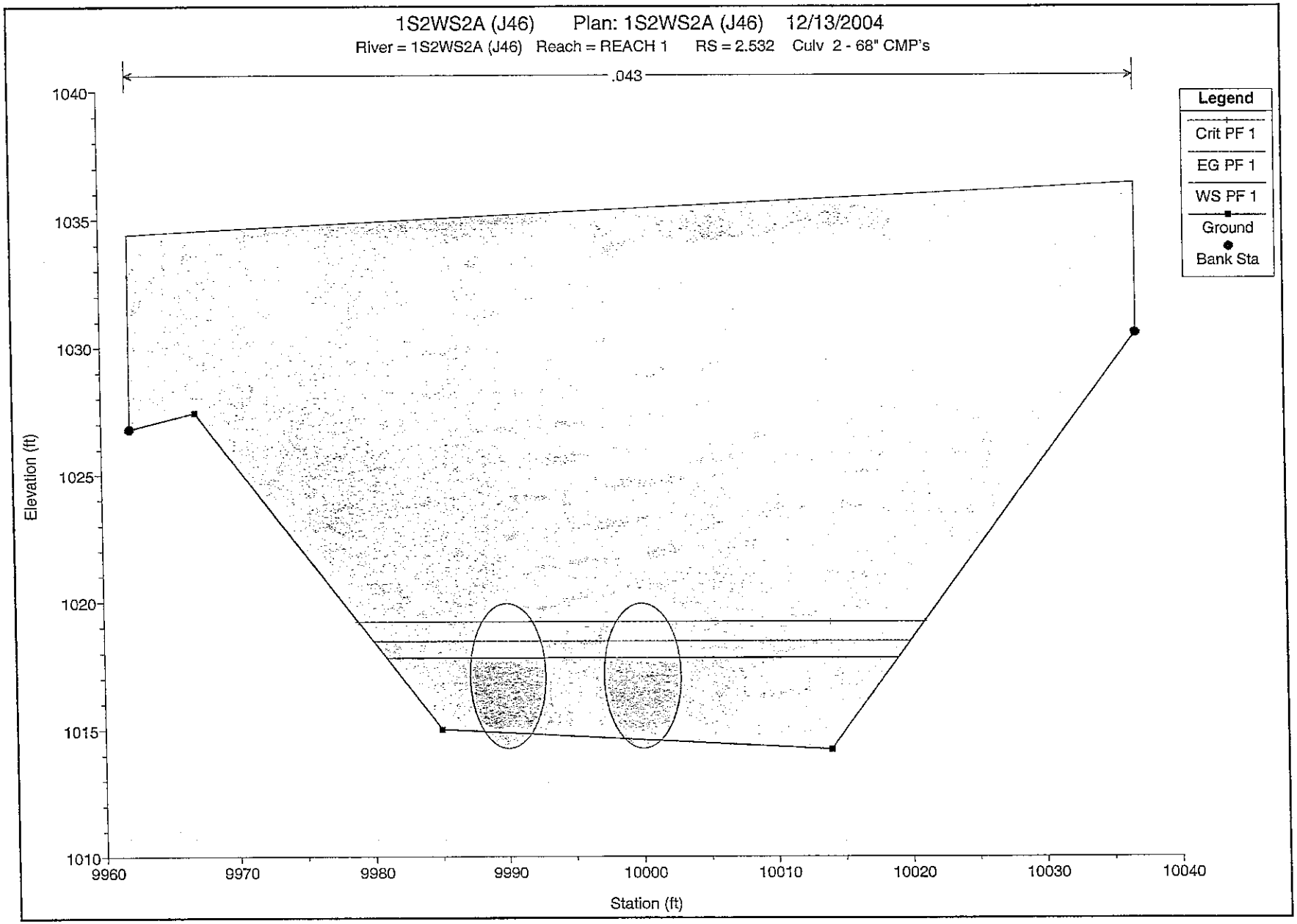

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 1.507
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
960
955
950
945
940
935
9400
9600
9800
10000
10200
10400
Station (ft)

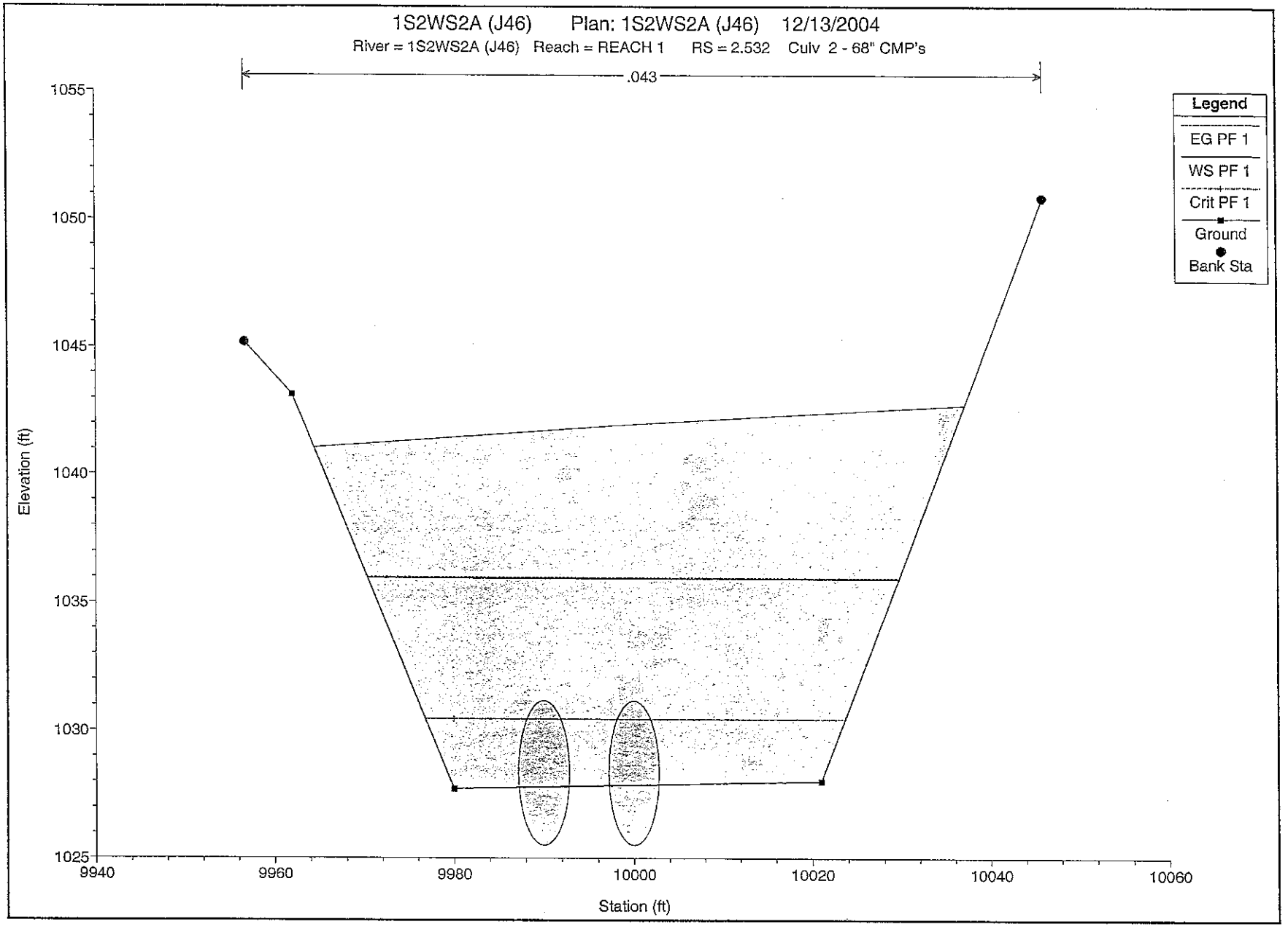

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 1.785
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
995
990
985
980
975
970
965
960
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)

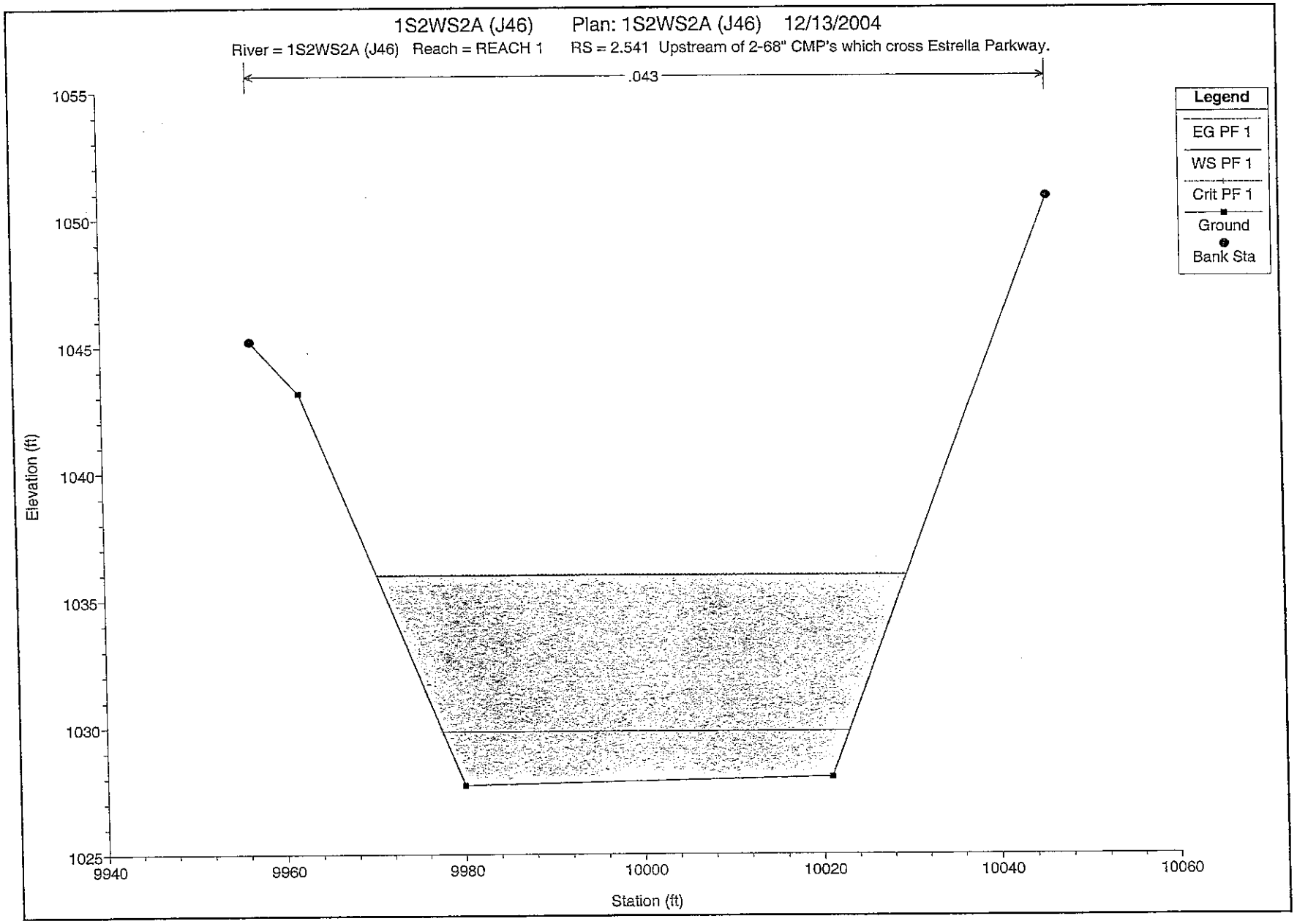

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.009
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1010
1005
1000
995
990
985
980
975
9850
9900
9950
10000
10050
10100
10150
10200
10250
10300
Station (ft)

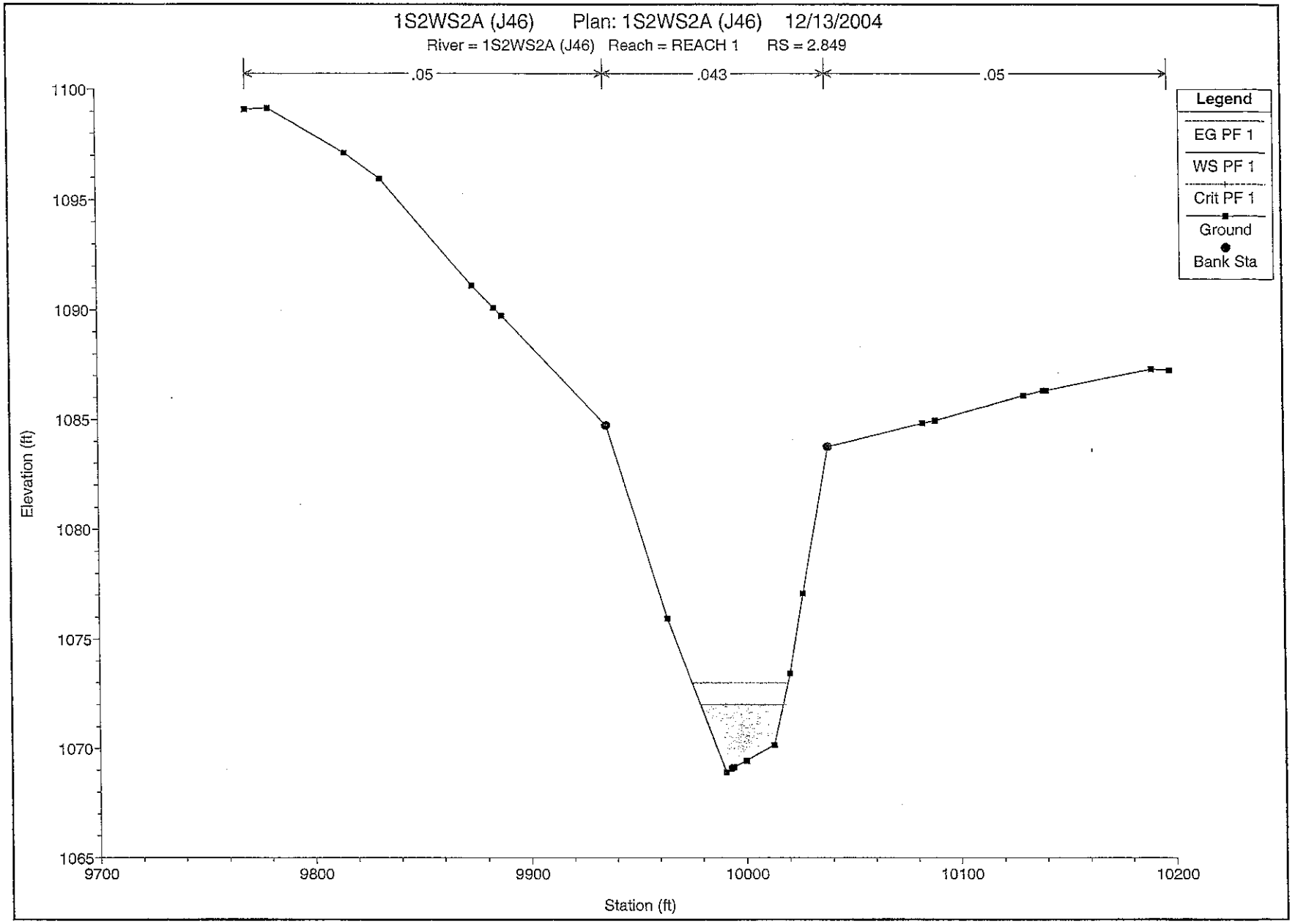

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.287
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1035
1030
1025
1020
1015
1010
1005
1000
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

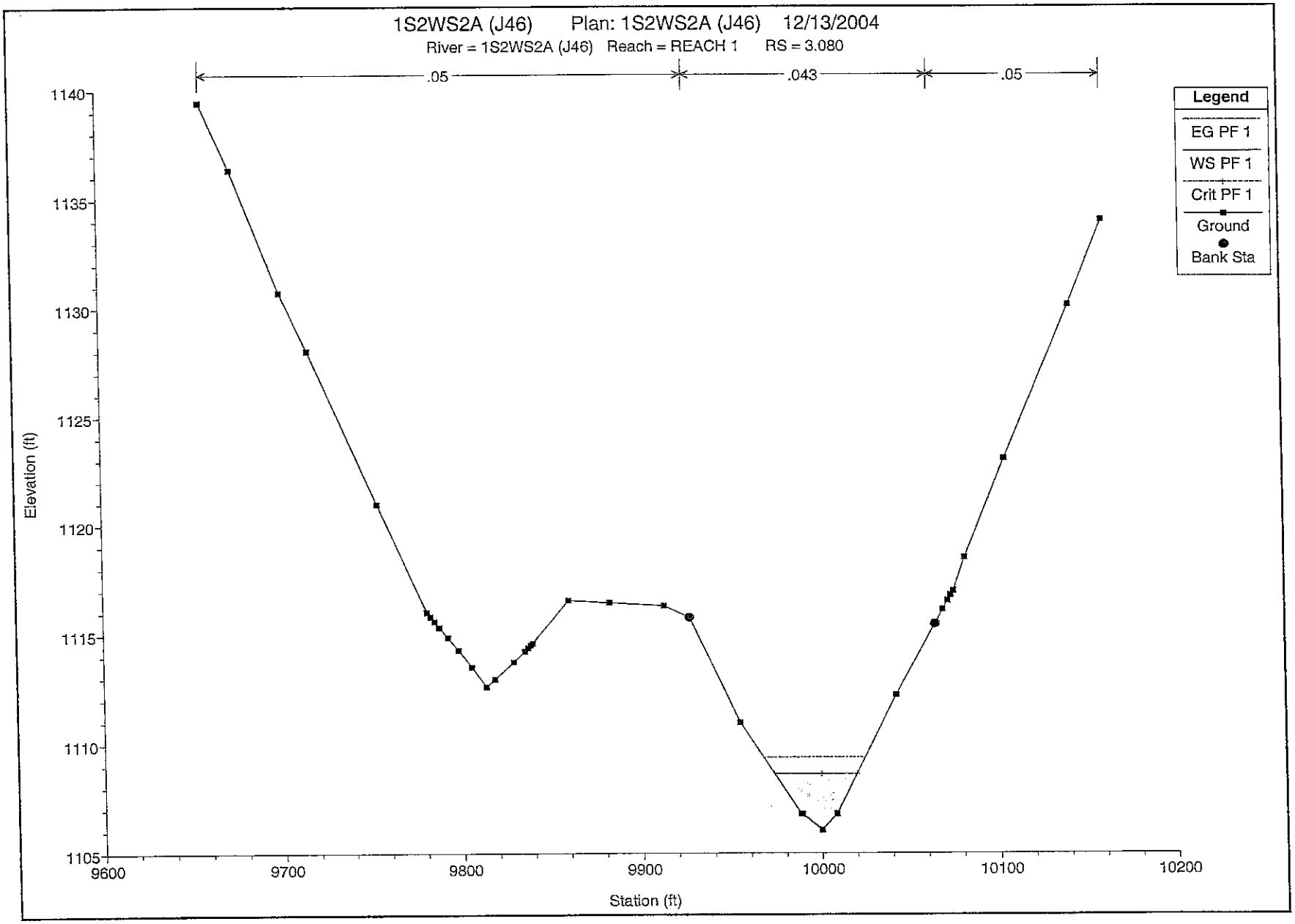

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.459 Downstream of 2-68" CMP's which cross Estrella Parkway.
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1032
1030
1028
1026
1024
1022
1020
1018
1016
1014
9960
9970
9980
9990
10000
10010
10020
10030
10040
Station (ft)

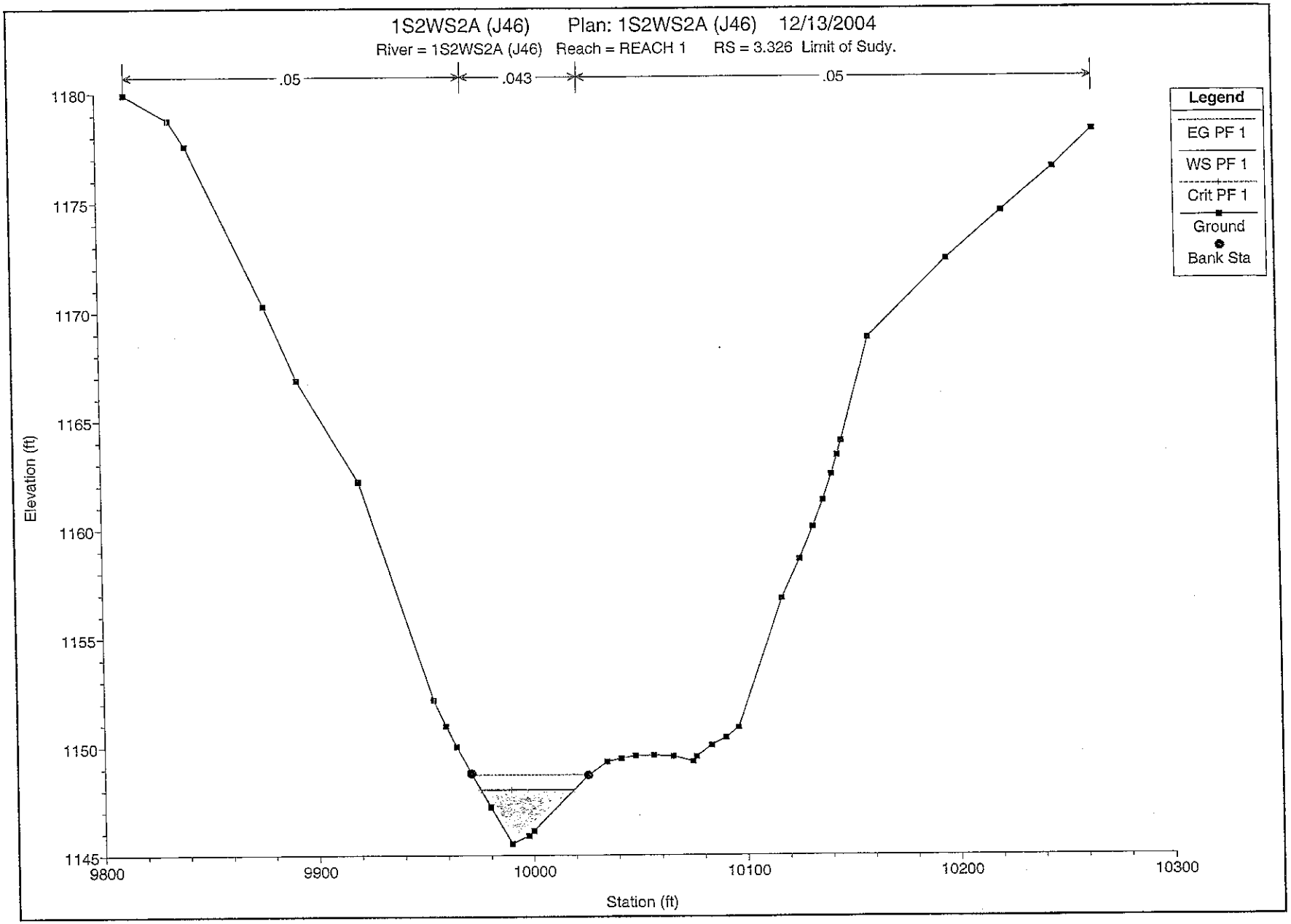

1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.532 Culv 2 - 68" CMP's
.043
Legend
Crit PF 1
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1040
1035
1030
1025
1020
1015
1010
9960
9970
9980
9990
10000
10010
10020
10030
10040
Station (ft)


1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.532 Culv 2 - 68" CMP's
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1055
1050
1045
1040
1035
1030
1025
9940
9960
9980
10000
10020
10040
10060
Station (ft)


1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.541 Upstream of 2-68" CMP's which cross Estrella Parkway.
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1055
1050
1045
1040
1035
1030
1025
9940
9960
9980
10000
10020
10040
10060
Station (ft)


1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 2.849
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1100
1095
1090
1085
1080
1075
1070
1065
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 3.080
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1140
1135
1130
1125
1120
1115
1110
1105
9600
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS2A (J46) Plan: 1S2WS2A (J46) 12/13/2004
River = 1S2WS2A (J46) Reach = REACH 1 RS = 3.326 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1180
1175
1170
1165
1160
1155
1150
1145
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS2B (J48)

REACH: 1S2WS2B (J48)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 1S2WS2 (J48)

Subbasin: J31

Total Discharge (cfs) = 826

Total Area (acres) = 291

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
3.397	193	66.2	550
3.143	228	78.4	650
2.911	256	88.1	730
2.644	268	92.0	760
2.391	291	100.0	830

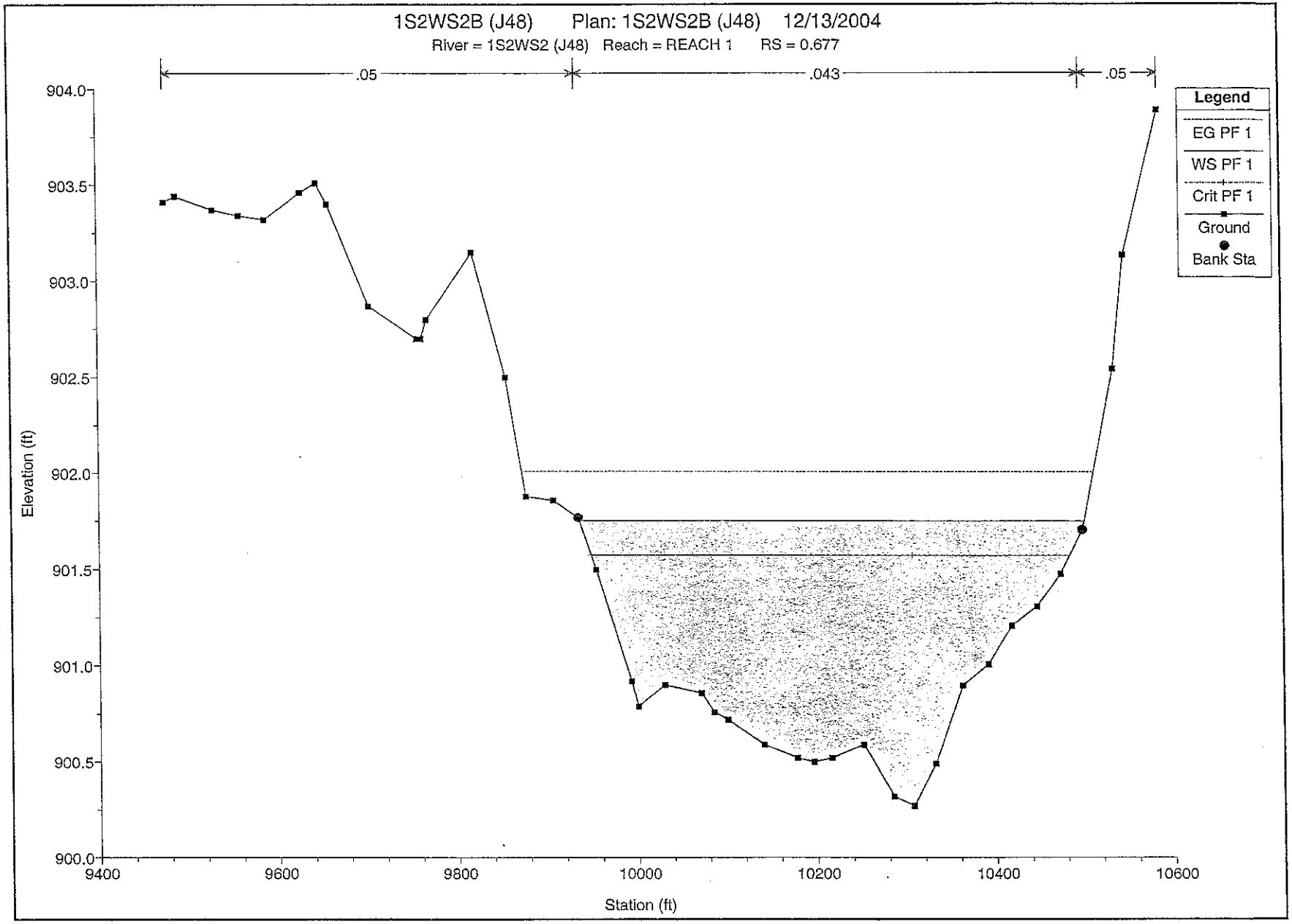
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

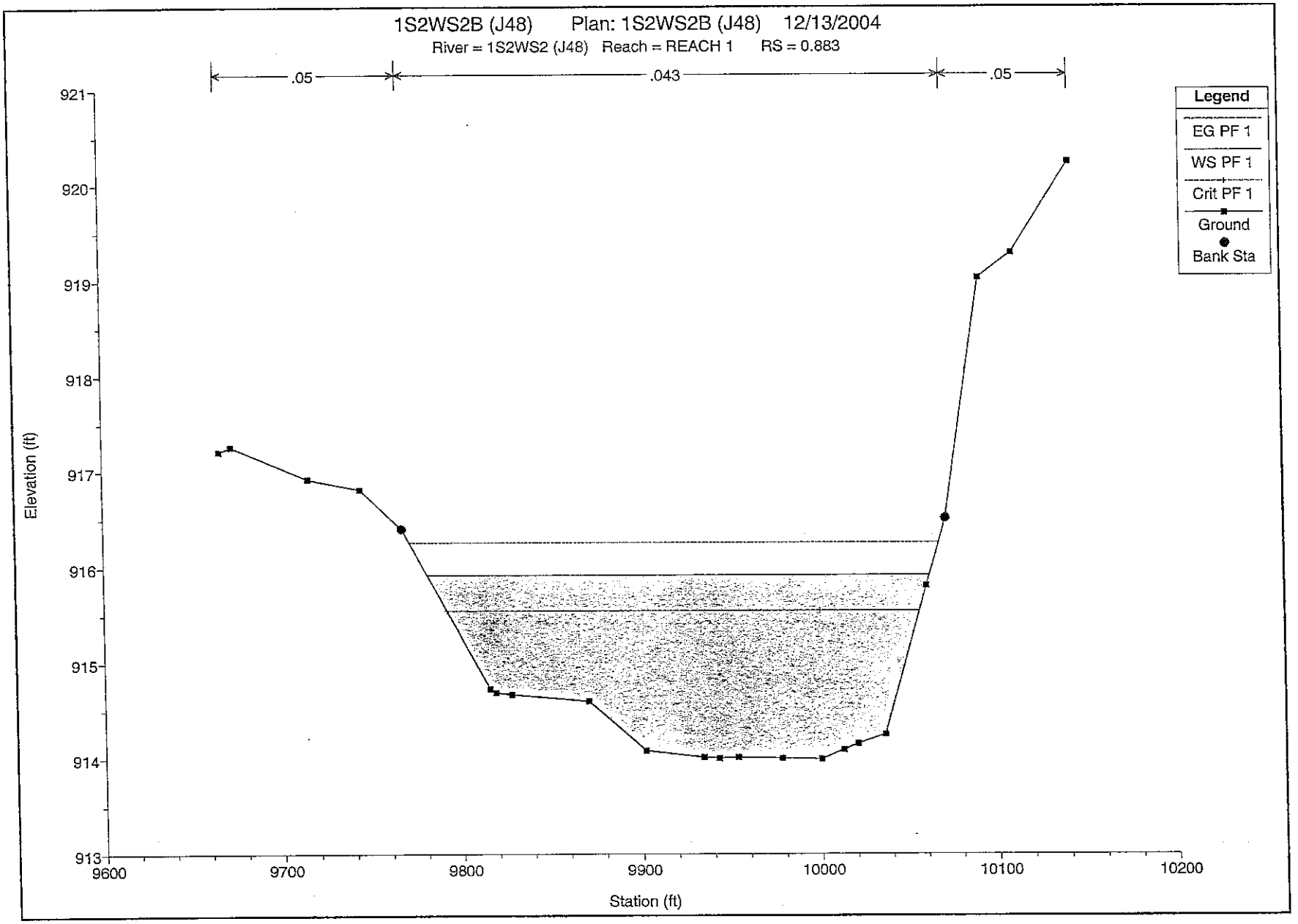
Change in Discharge based on Reach Length

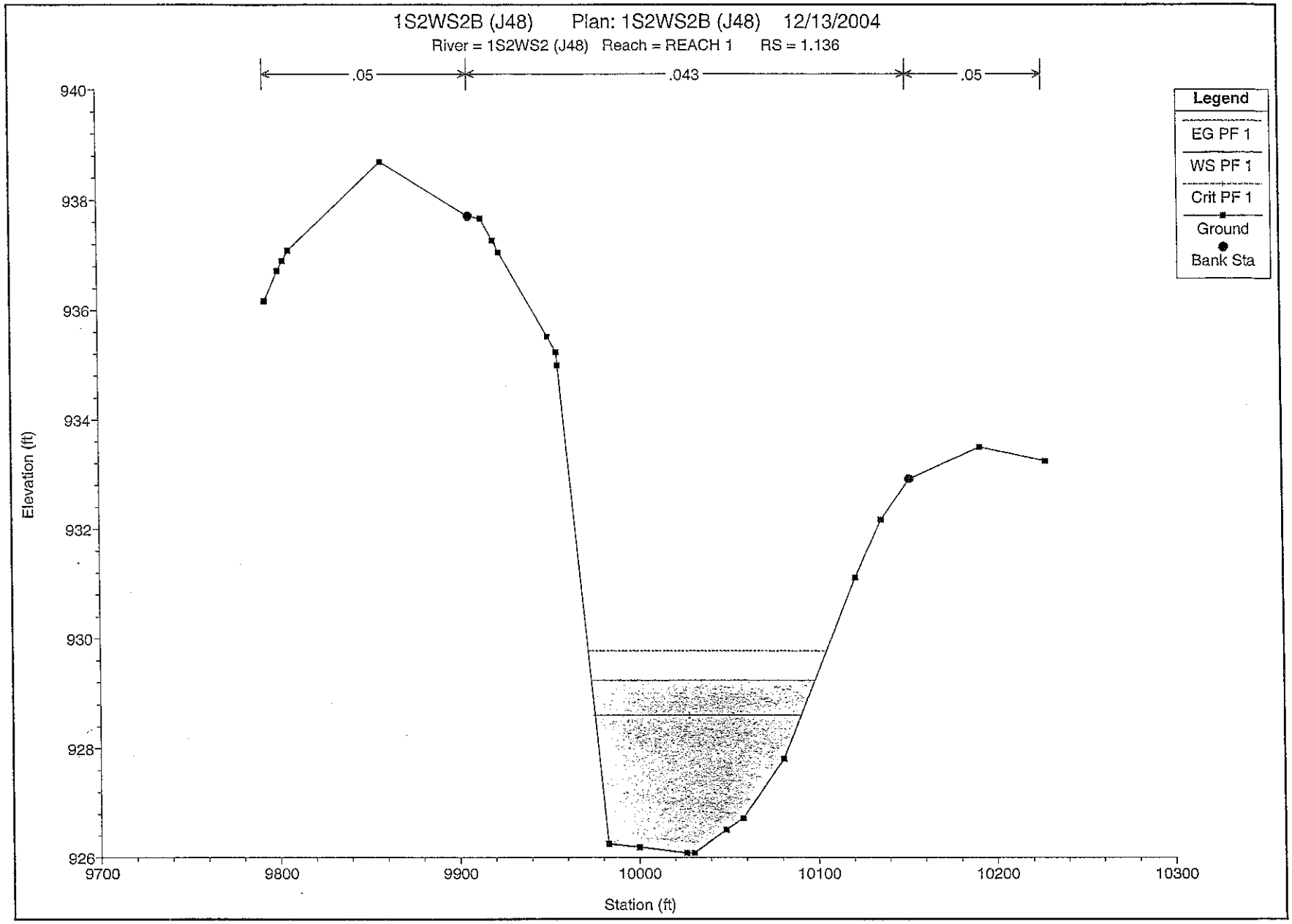
Wash ID: 1S2WS2B (J48)

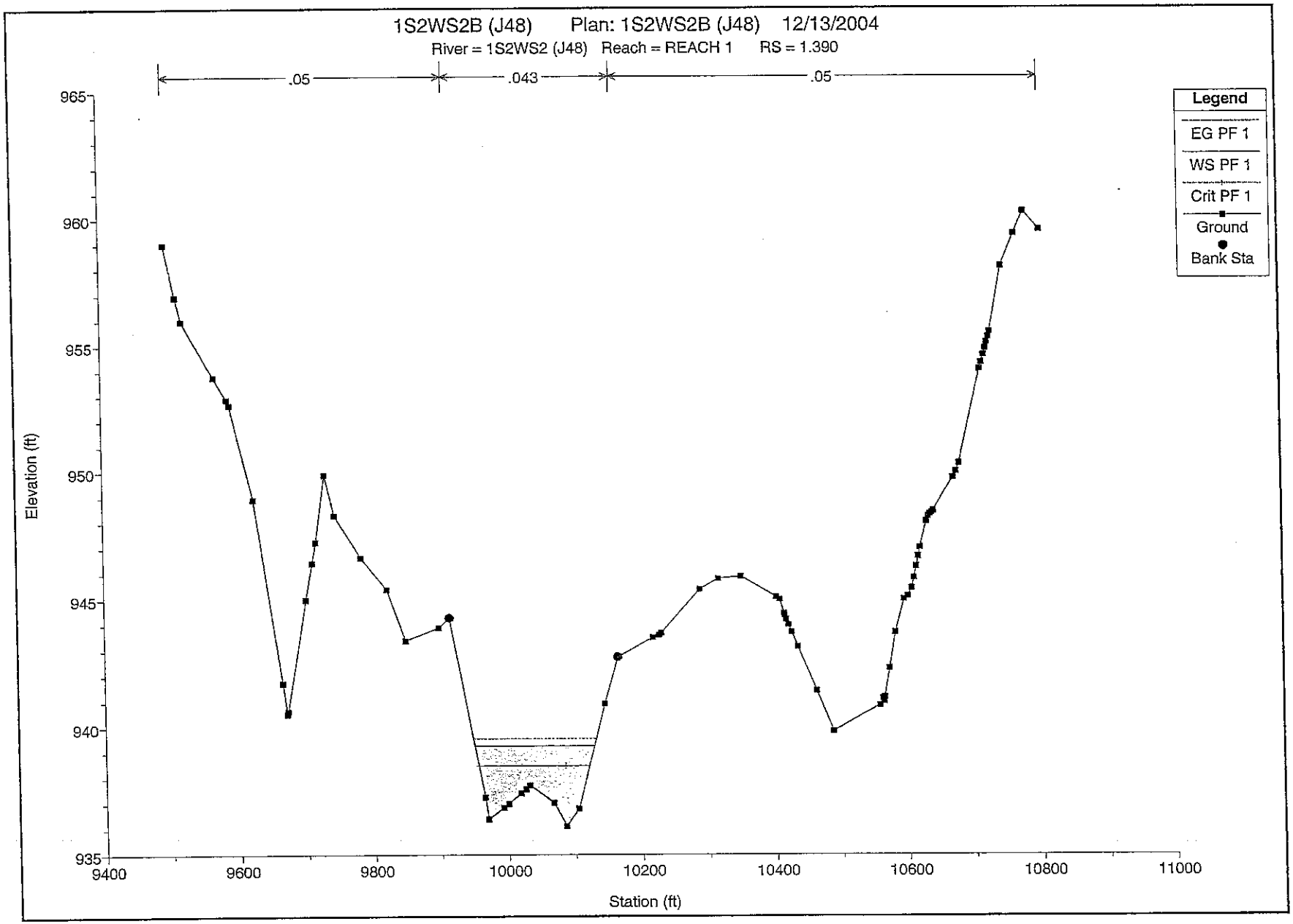
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPJ31	2.391	826	830	800
J48	2.346	859	860	900
J48	1.990	1119	1120	1100
J48	1.726	1313	1310	1300
J48	1.390	1558	1560	1600
J48	1.136	1744	1740	1700
J48	0.883	1929	1930	1900
CPJ48	0.677	2080	2080	2100

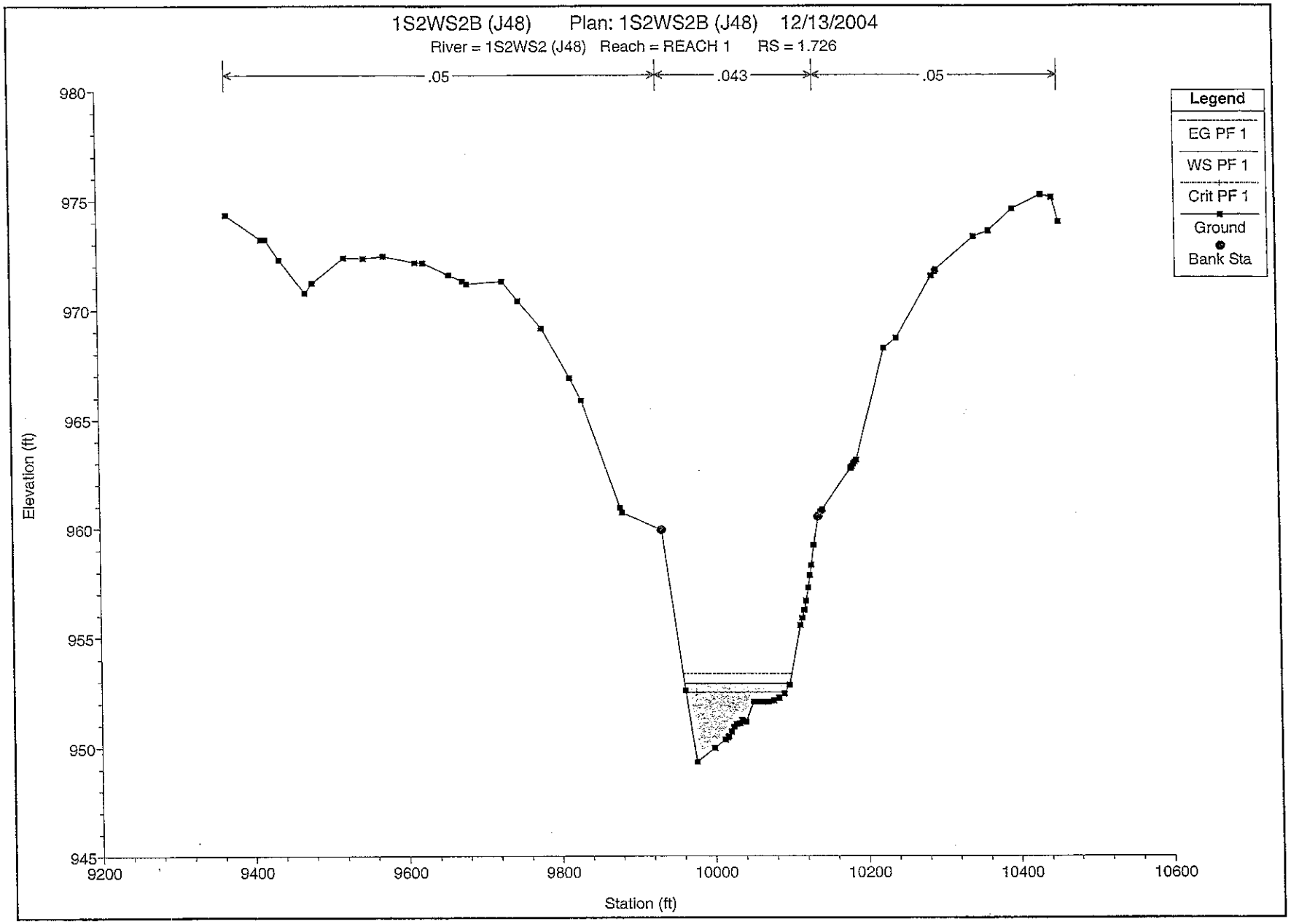
CPJ31 is equivalent to J31

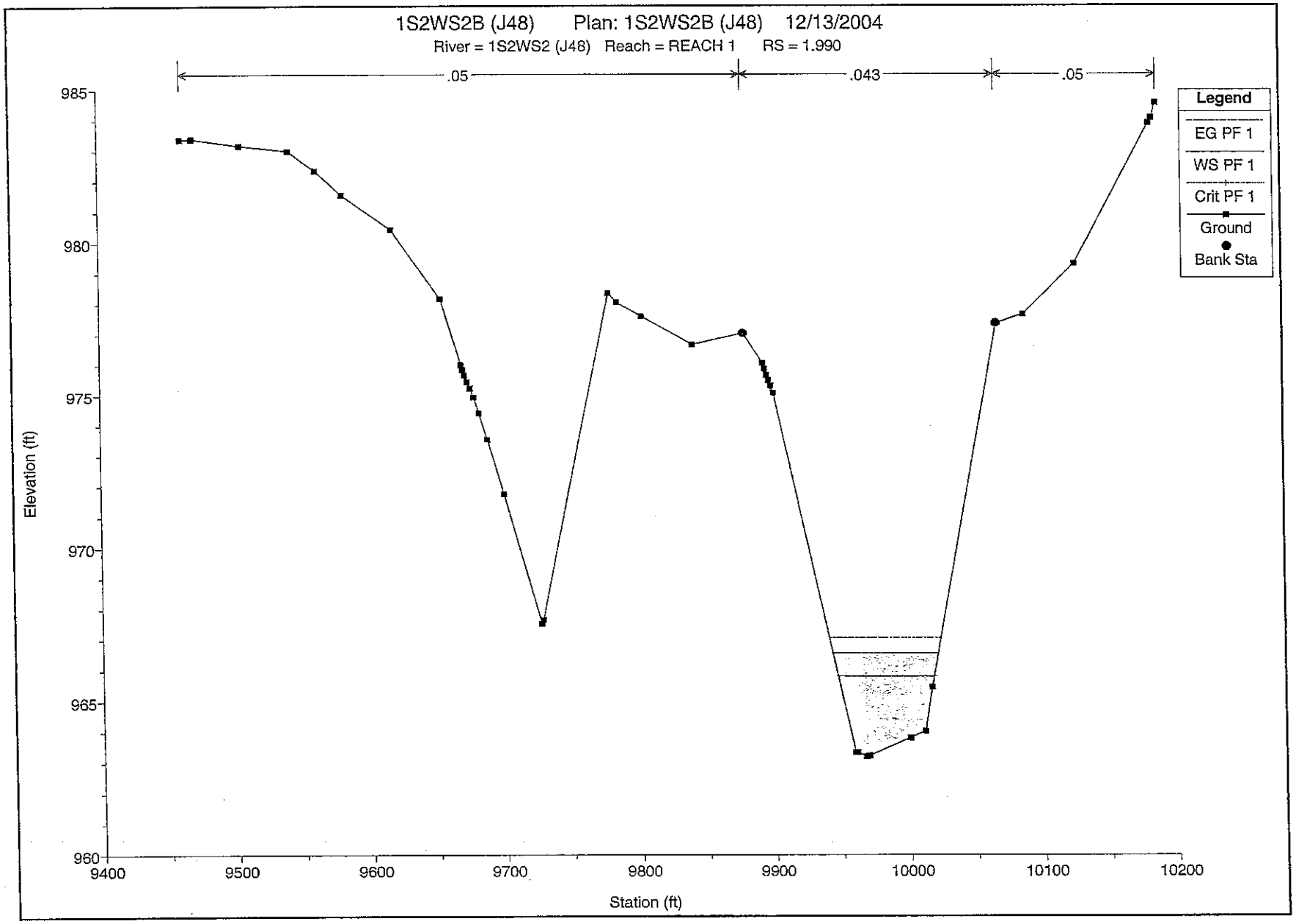

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 0.677
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
904.0
903.5
903.0
902.5
902.0
901.5
901.0
900.5
900.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

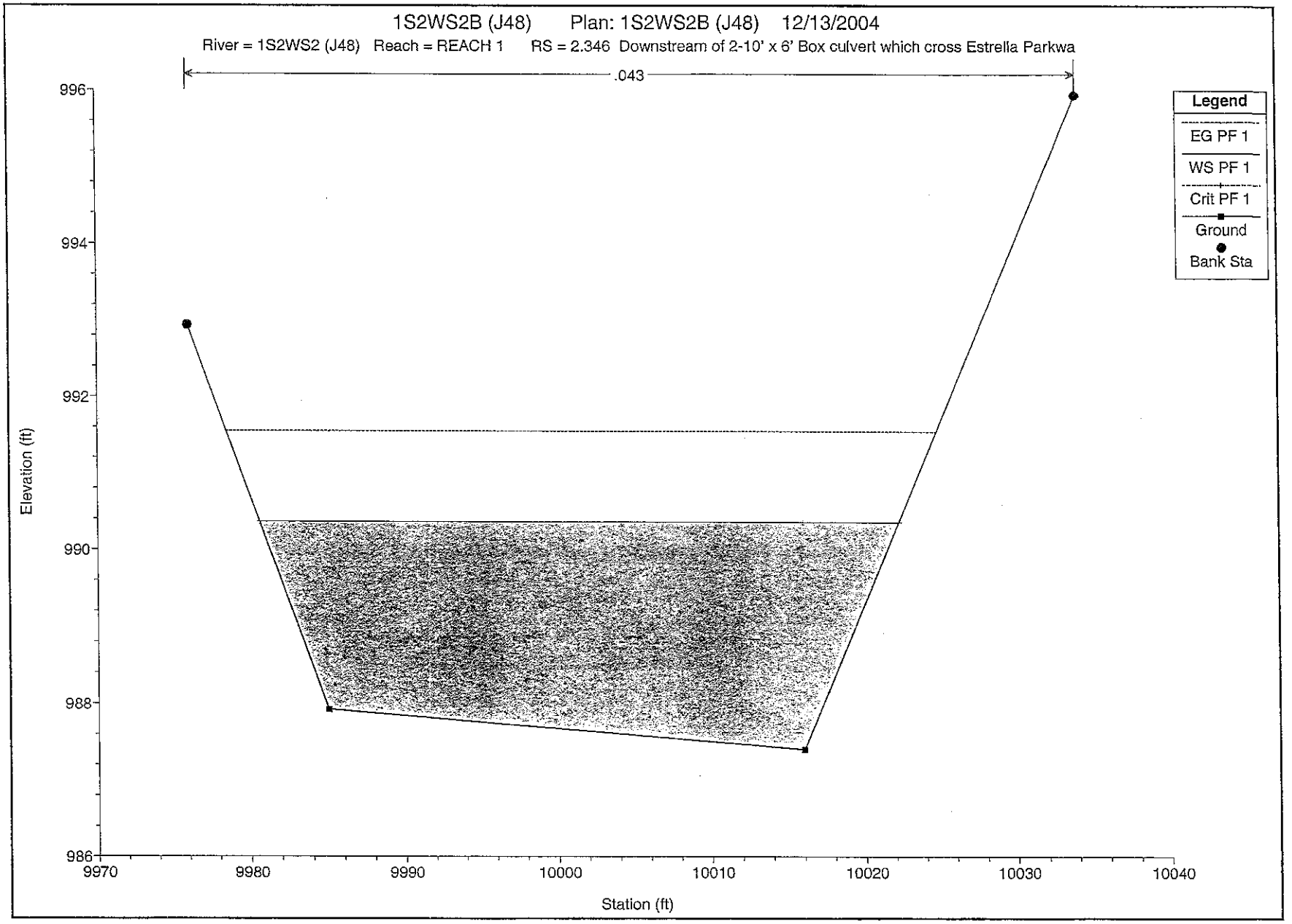

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 0.883
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
921
920
919
918
917
916
915
914
913
9600
9700
9800
9900
10000
10100
10200
Station (ft)

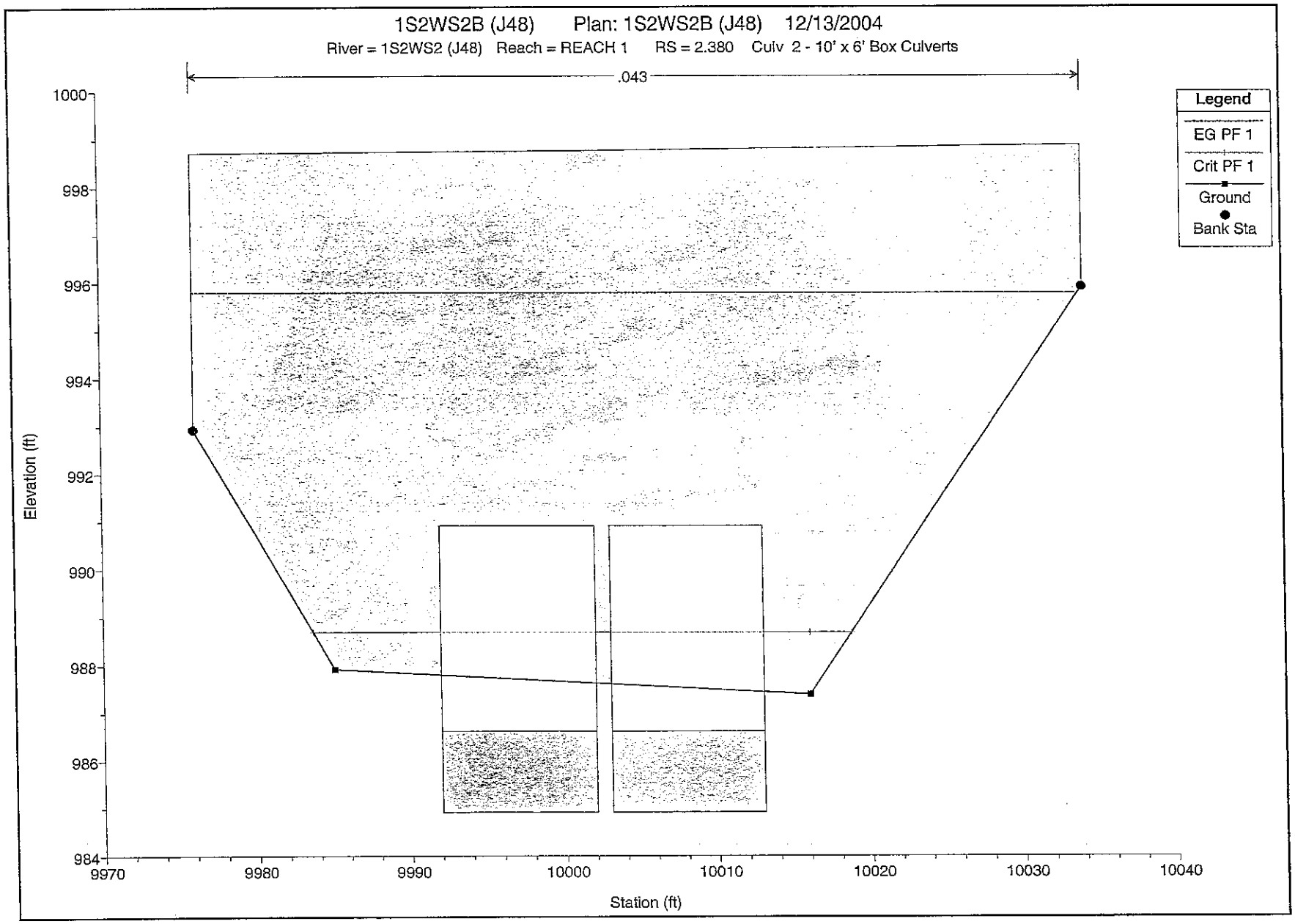

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 1.136
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
940
938
936
934
932
930
928
926
9700
9800
9900
10000
10100
10200
10300
Station (ft)

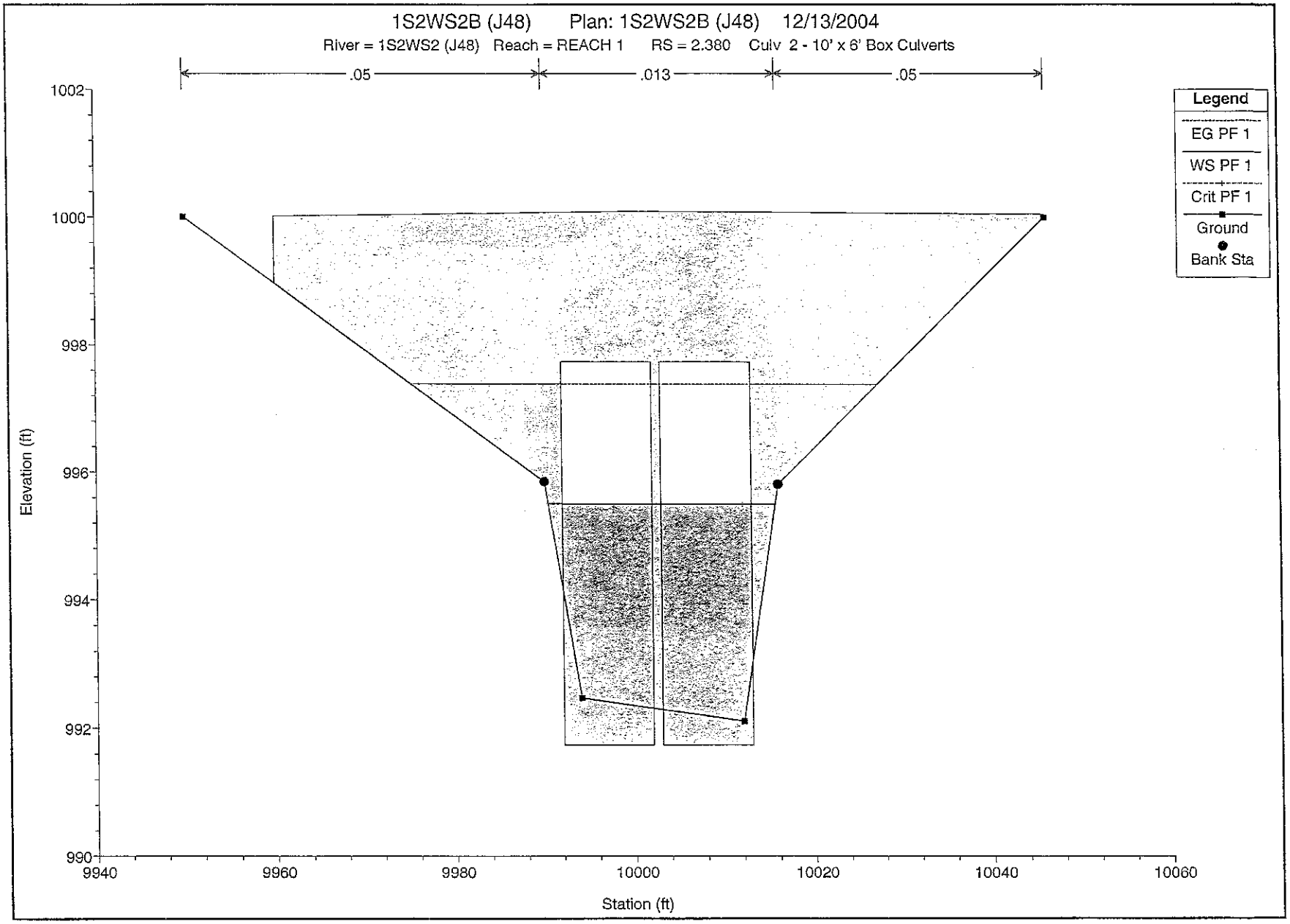

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 1.390
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
965
960
955
950
945
940
935
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

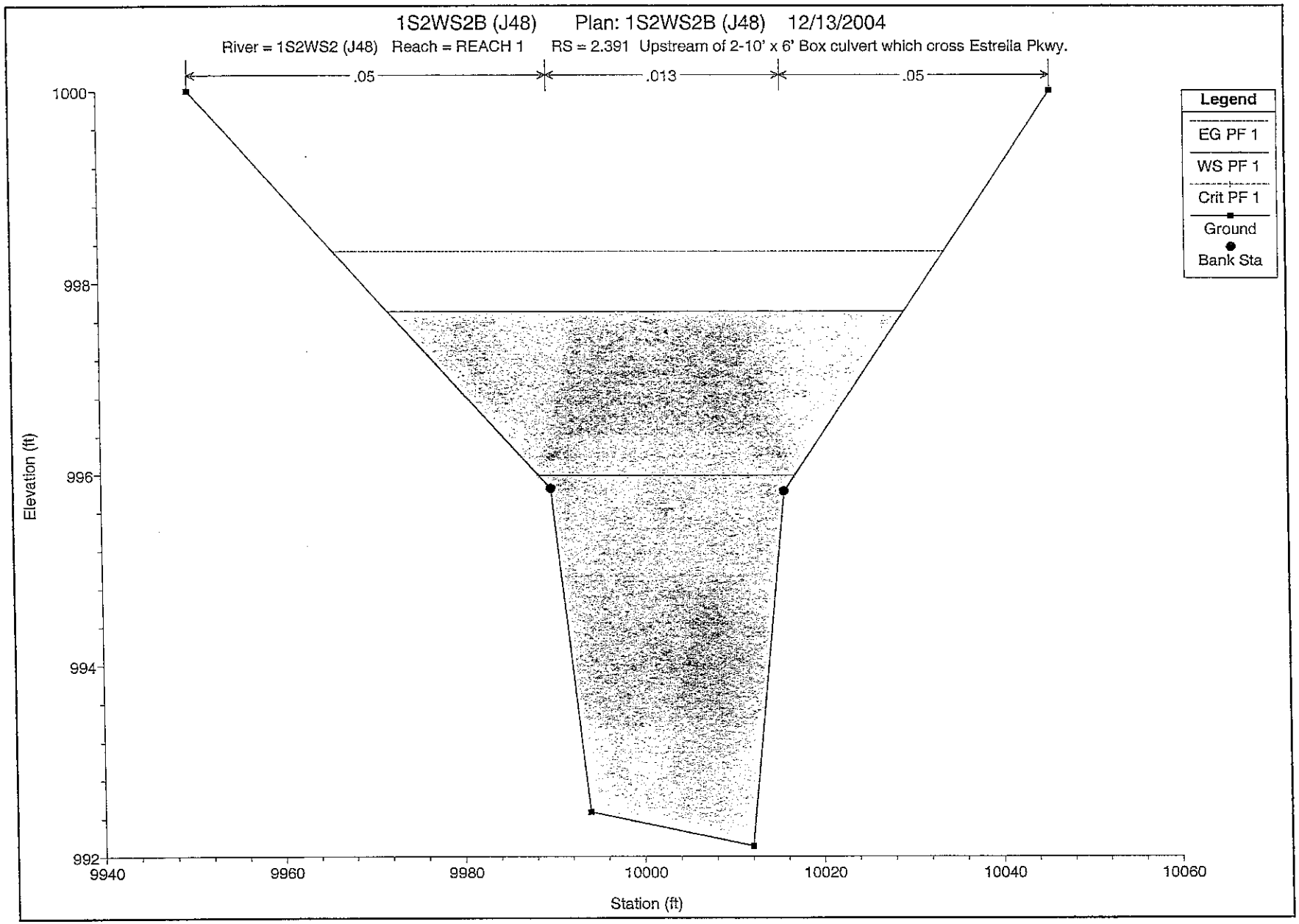

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 1.726
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
980
975
970
965
960
955
950
945
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

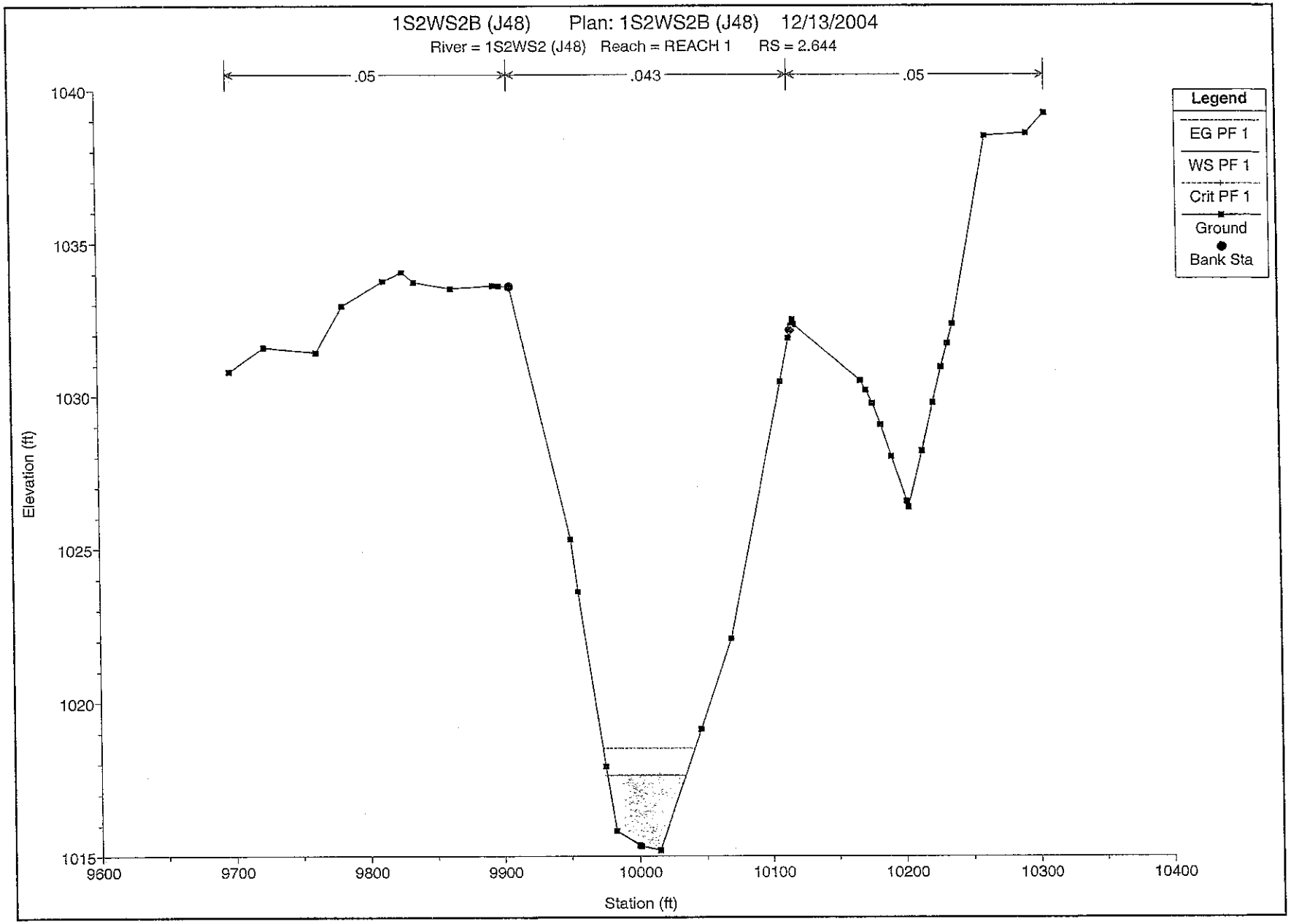

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 1.990
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
985
980
975
970
965
960
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

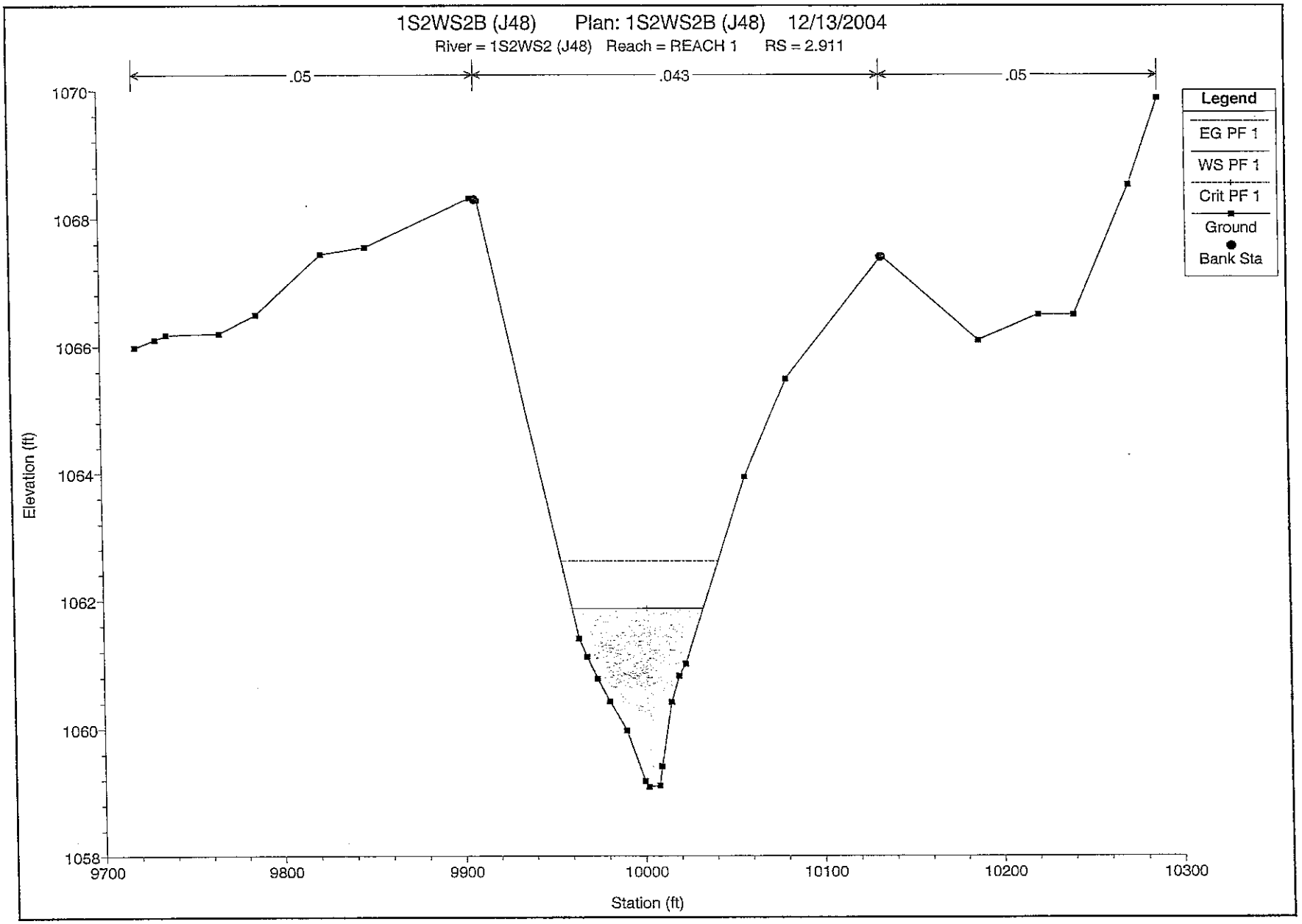

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 2.346 Downstream of 2-10' x 6' Box culvert which cross Estrella Parkwa
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
996
994
992
990
988
986
9970
9980
9990
10000
10010
10020
10030
10040
Station (ft)

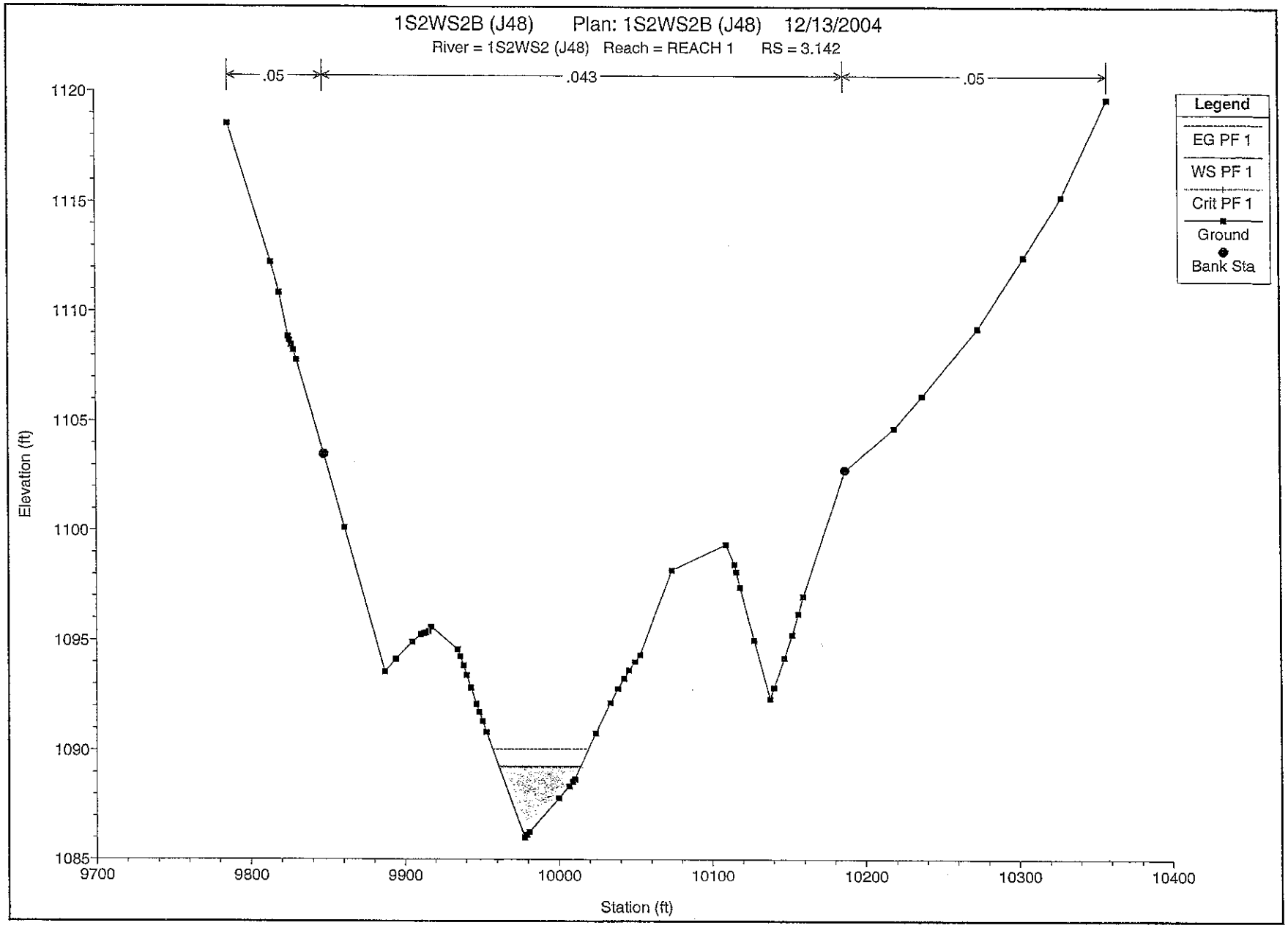

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 2.380 Culv 2 - 10' x 6' Box Culverts
.043
Legend
EG PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1000
998
996
994
992
990
988
986
984
9970
9980
9990
10000
10010
10020
10030
10040
Station (ft)

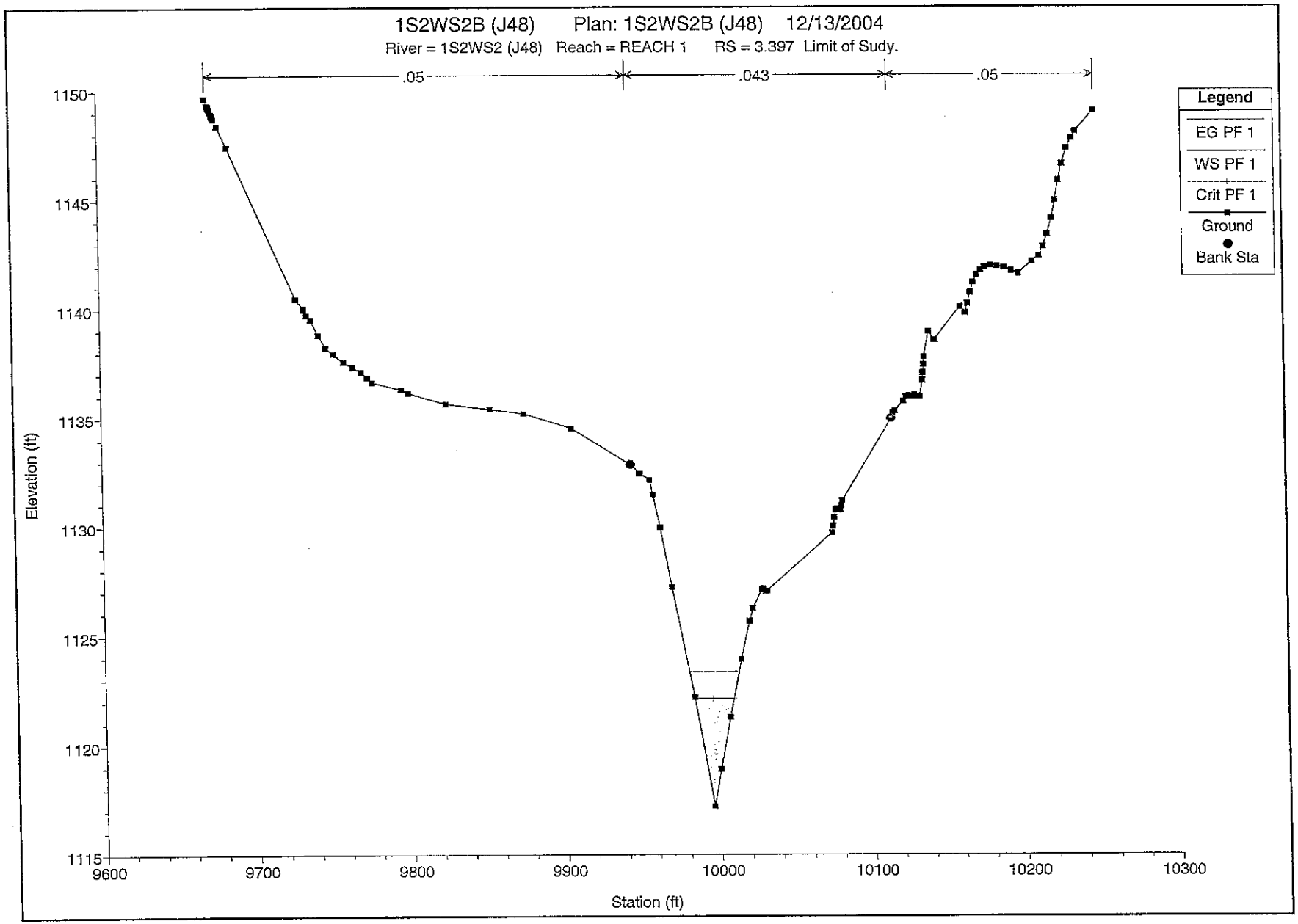

1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 2.380 Culv 2 - 10' x 6' Box Culverts
.05
.013
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1002
1000
998
996
994
992
990
9940
9960
9980
10000
10020
10040
10060
Station (ft)


1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 2.391 Upstream of 2-10' x 6' Box culvert which cross Estrella Pkwy.
.05
.013
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1000
998
996
994
992
9940
9960
9980
10000
10020
10040
10060
Station (ft)


1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 2.644
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1040
1035
1030
1025
1020
1015
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 2.911
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1070
1068
1066
1064
1062
1060
1058
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 3.142
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1120
1115
1110
1105
1100
1095
1090
1085
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS2B (J48) Plan: 1S2WS2B (J48) 12/13/2004
River = 1S2WS2 (J48) Reach = REACH 1 RS = 3.397 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1150
1145
1140
1135
1130
1125
1120
1115
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS2C (J47)

REACH: 1S2WS2C (J47)

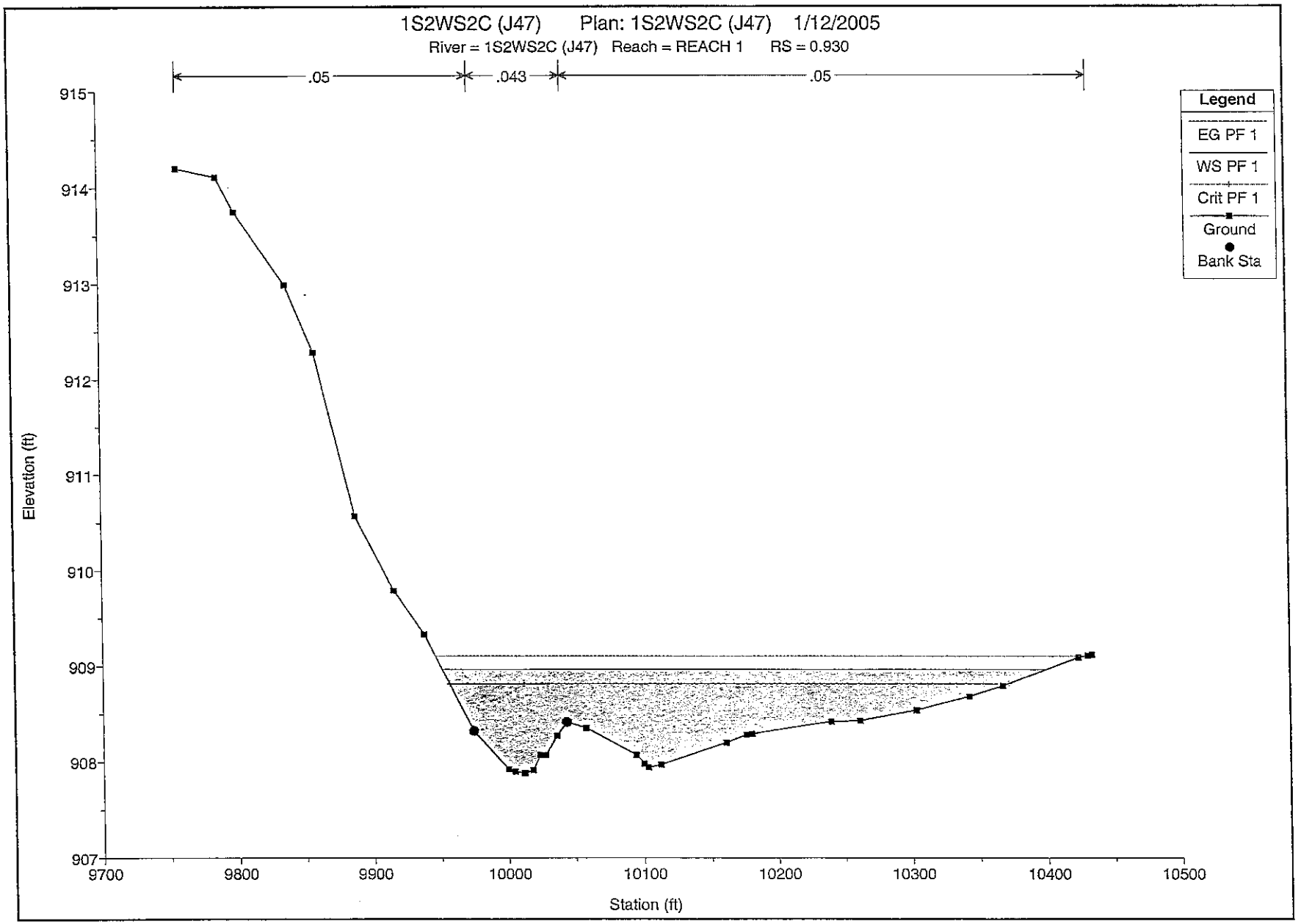
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

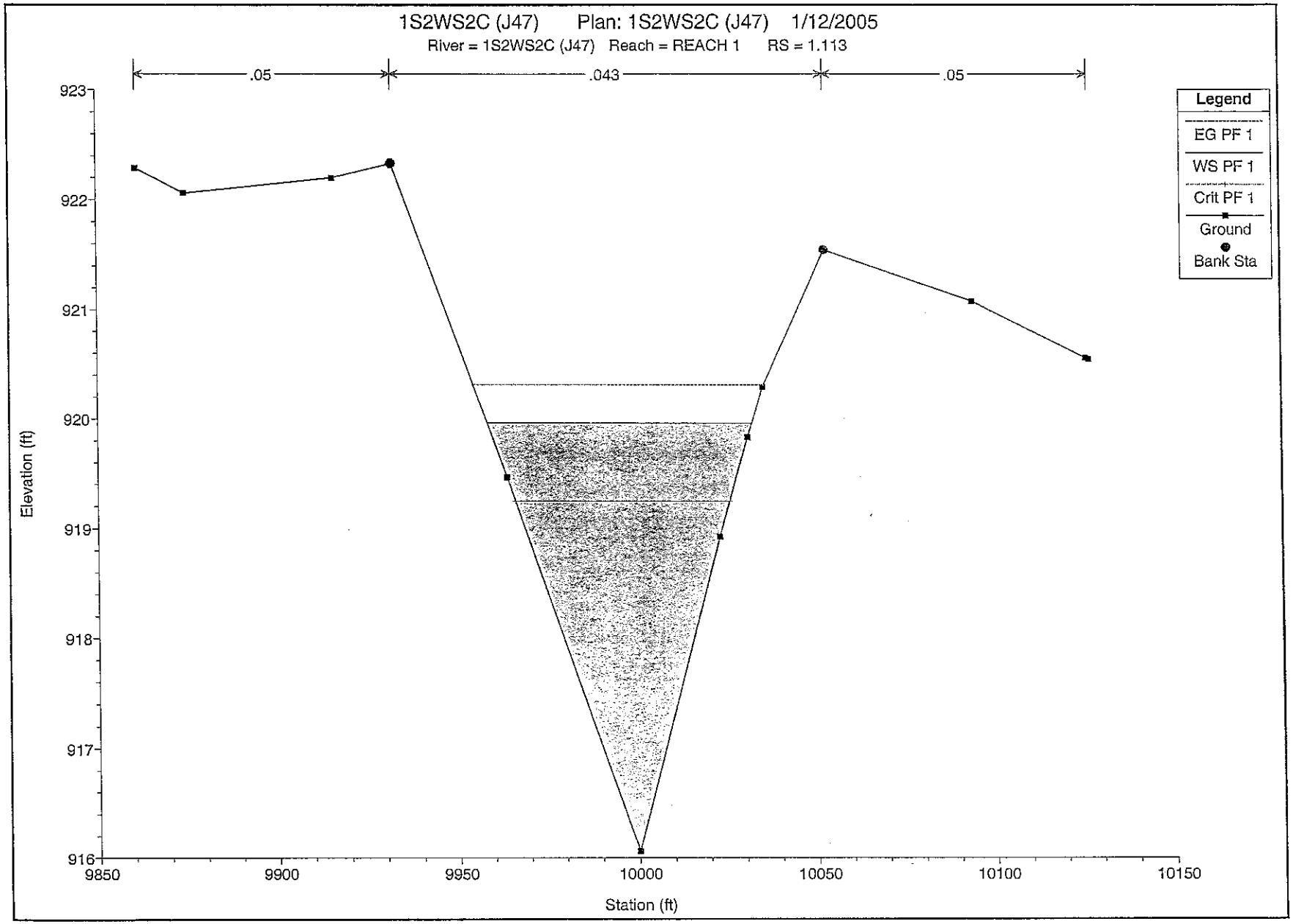
Change in Discharge based on Reach Length

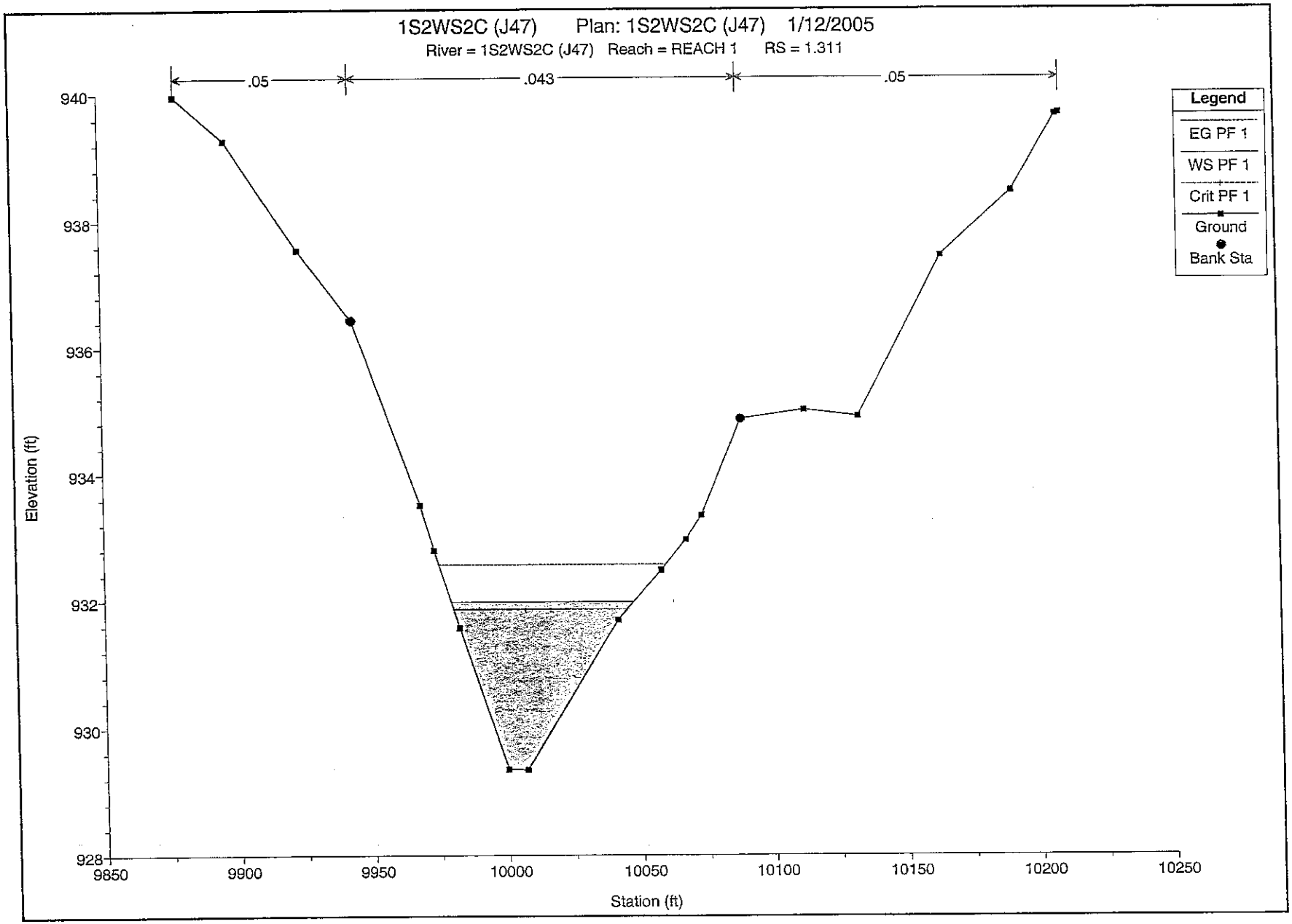
Wash ID: 1S2WS2C (J47)

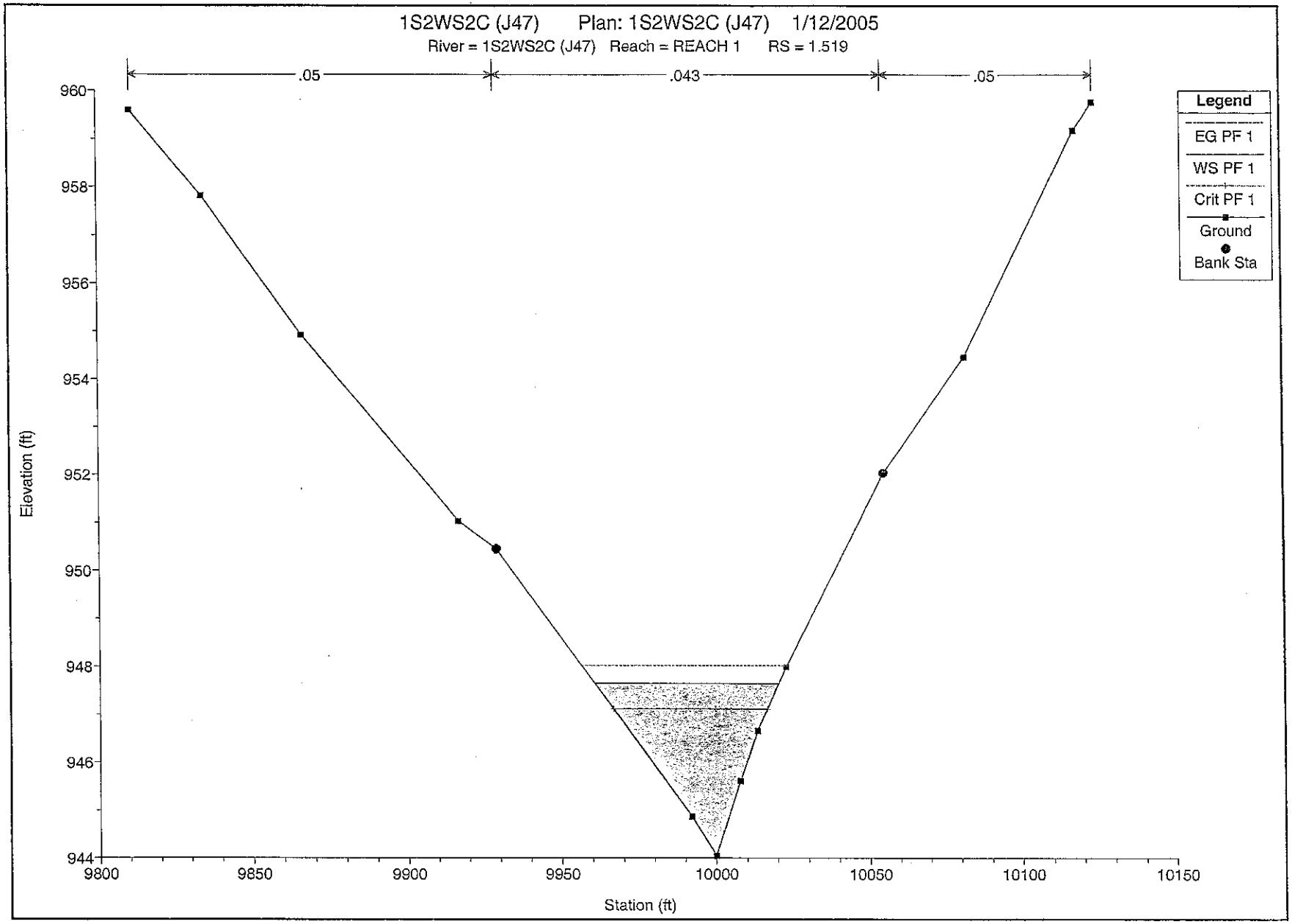
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPJ53	2.460	121	120	100
J47	2.201	228	230	200
J47	1.977	321	320	300
J47	1.705	433	430	400
J47	1.519	510	510	500
J47	1.311	596	600	600
J47	1.113	678	680	700
J47	0.930	754	750	800
CPJ47	0.825	797	800	800

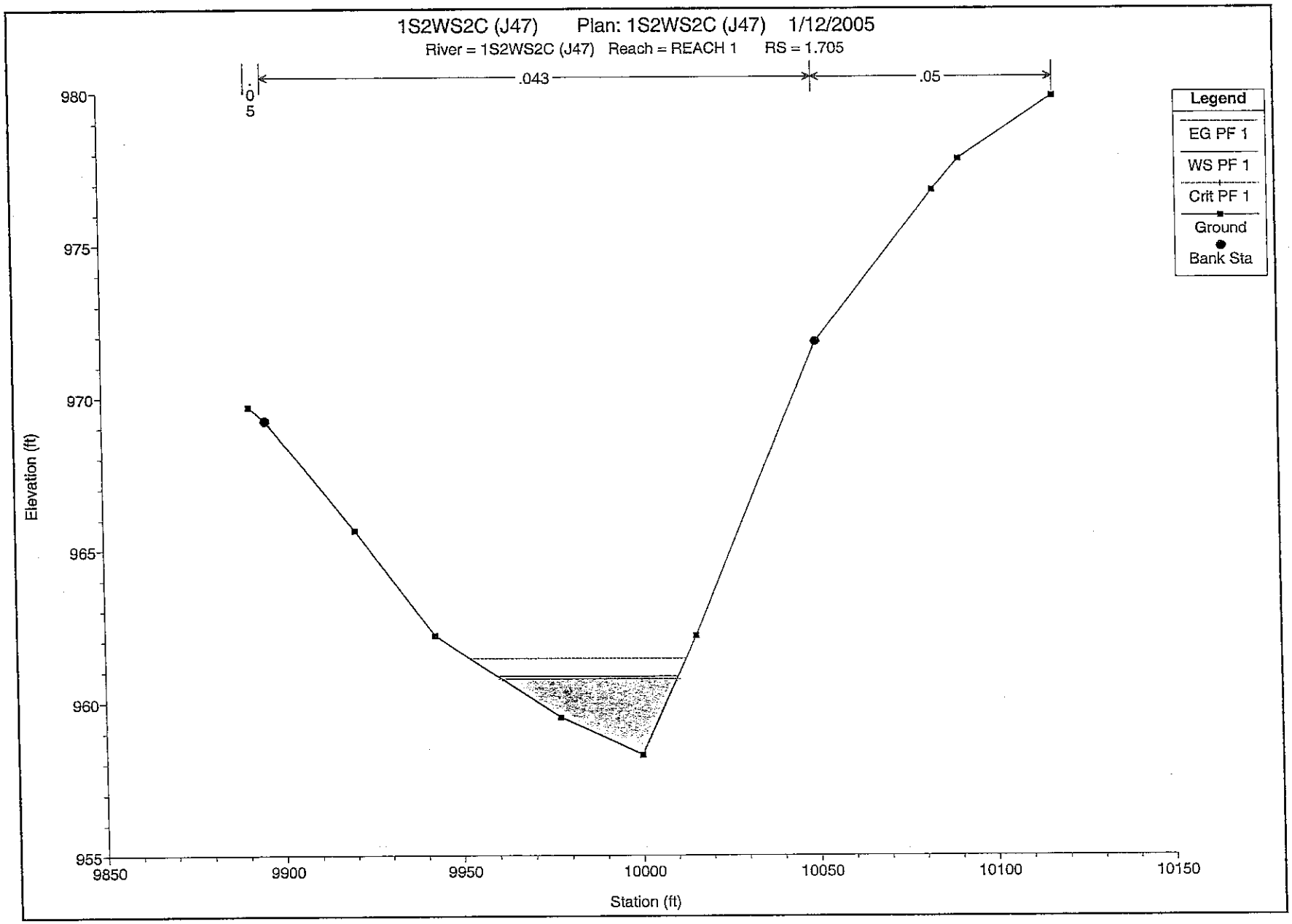
1. 0.825 does not exist in HEC-RAS model. Cross section in excel sheet for calculation purposes.

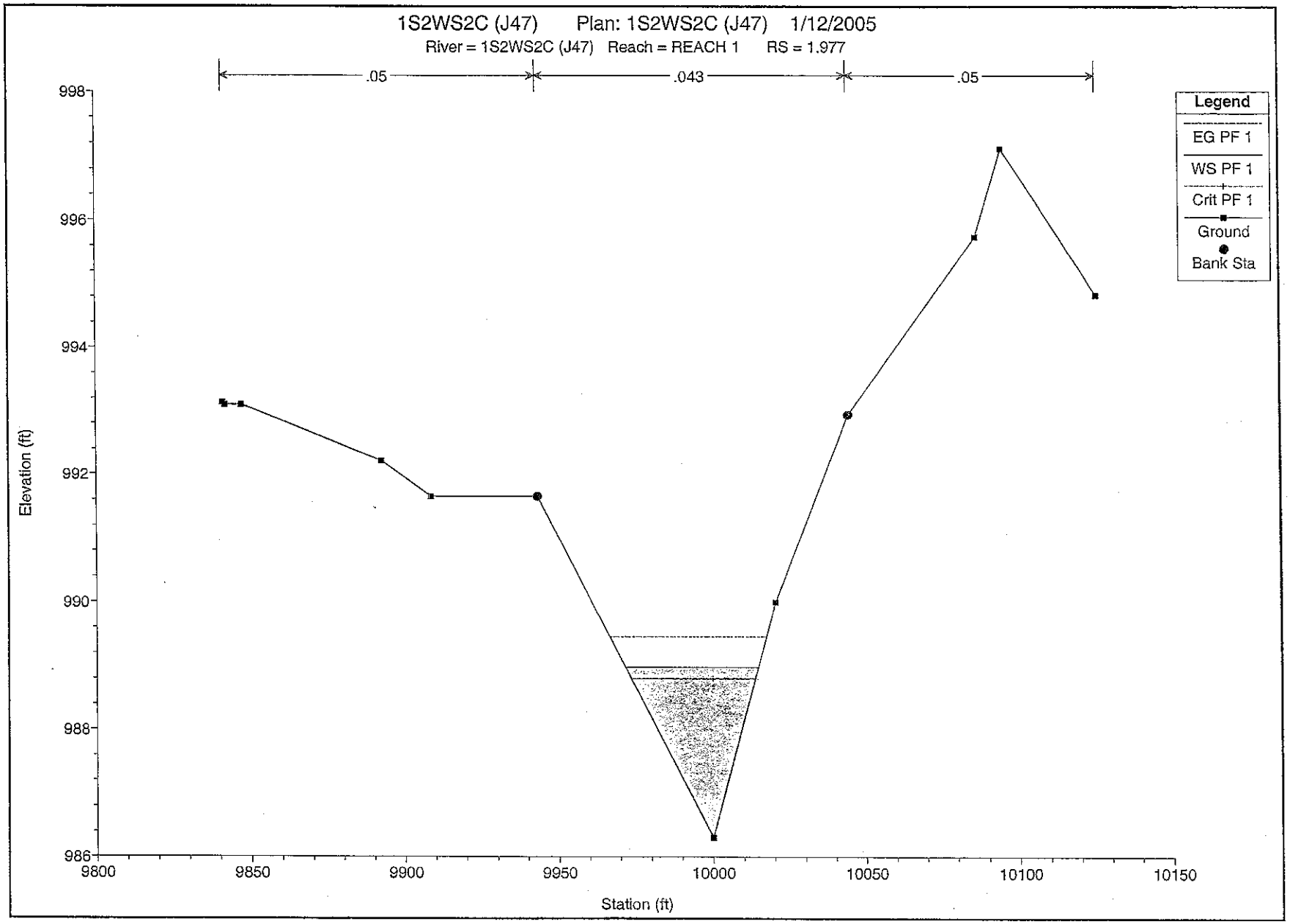

1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 0.930
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
915
914
913
912
911
910
909
908
907
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

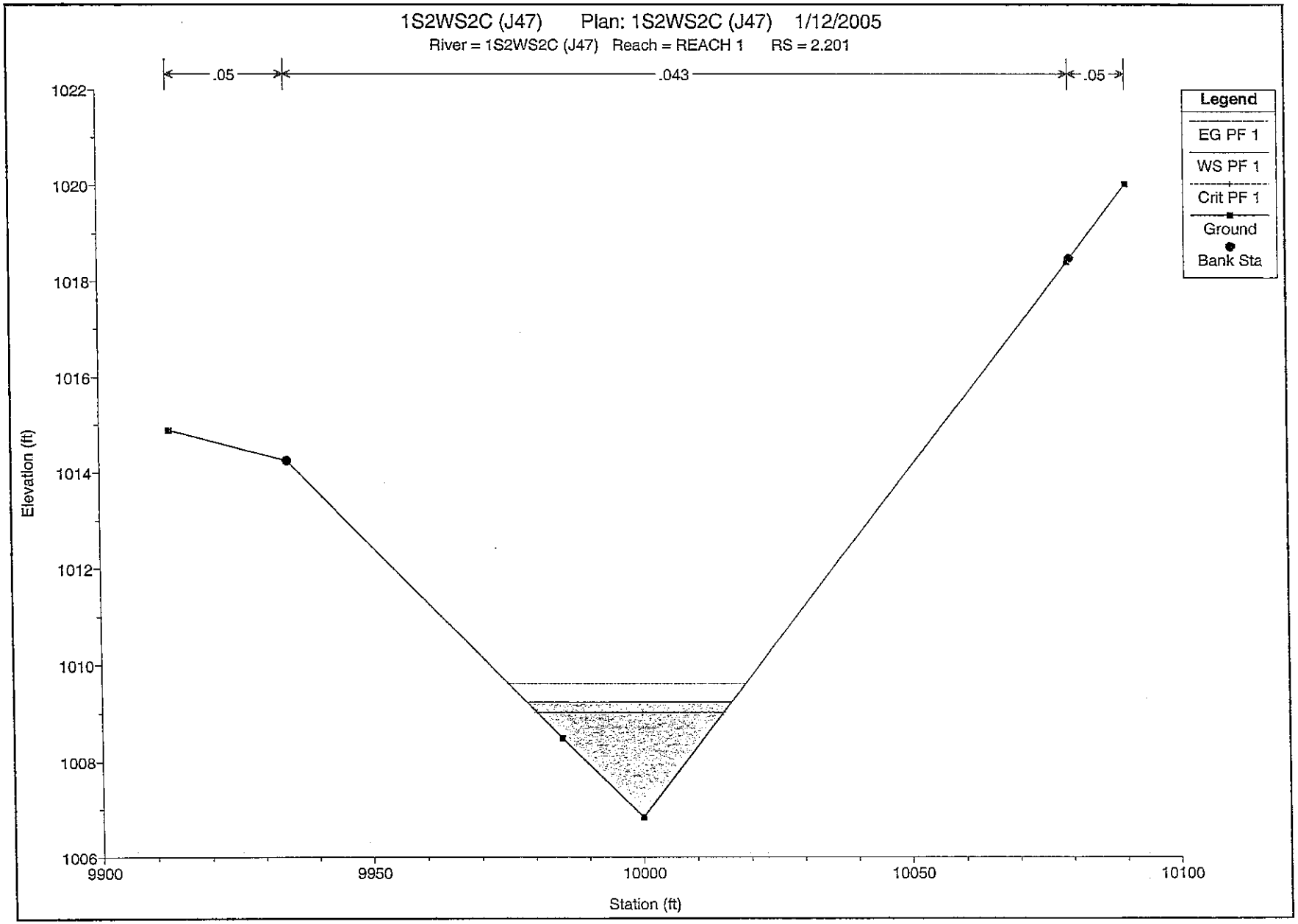

1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 1.113
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
923
922
921
920
919
918
917
916
9850
9900
9950
10000
10050
10100
10150
Station (ft)

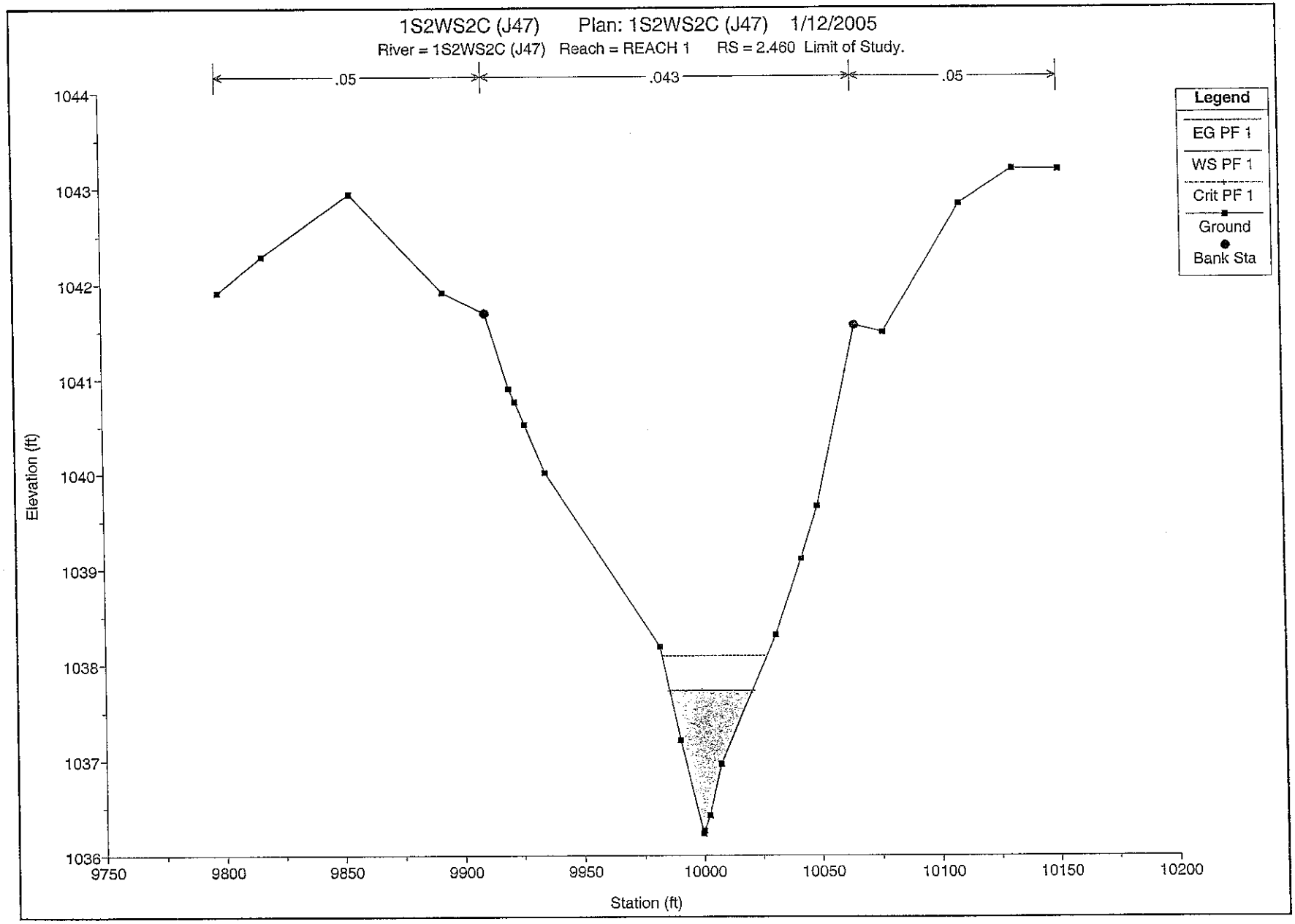

1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 1.311
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
940
938
936
934
932
930
928
9850
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)


1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 1.519
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
960
958
956
954
952
950
948
946
944
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)


1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 1.705
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
980
975
970
965
960
955
9850
9900
9950
10000
10050
10100
10150
Station (ft)


1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 1.977
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
998
996
994
992
990
988
986
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)


1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 2.201
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1022
1020
1018
1016
1014
1012
1010
1008
1006
9900
9950
10000
10050
10100
Station (ft)


1S2WS2C (J47) Plan: 1S2WS2C (J47) 1/12/2005
River = 1S2WS2C (J47) Reach = REACH 1 RS = 2.460 Limit of Study.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1044
1043
1042
1041
1040
1039
1038
1037
1036
9750
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 1S2WS31 (A56)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 1S2WS31 (A56)

Subbasin: A28

Total Discharge (cfs) = 653

Total Area (acres) = 353

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
4.185	124	35.1	229
3.910	353	100.0	653

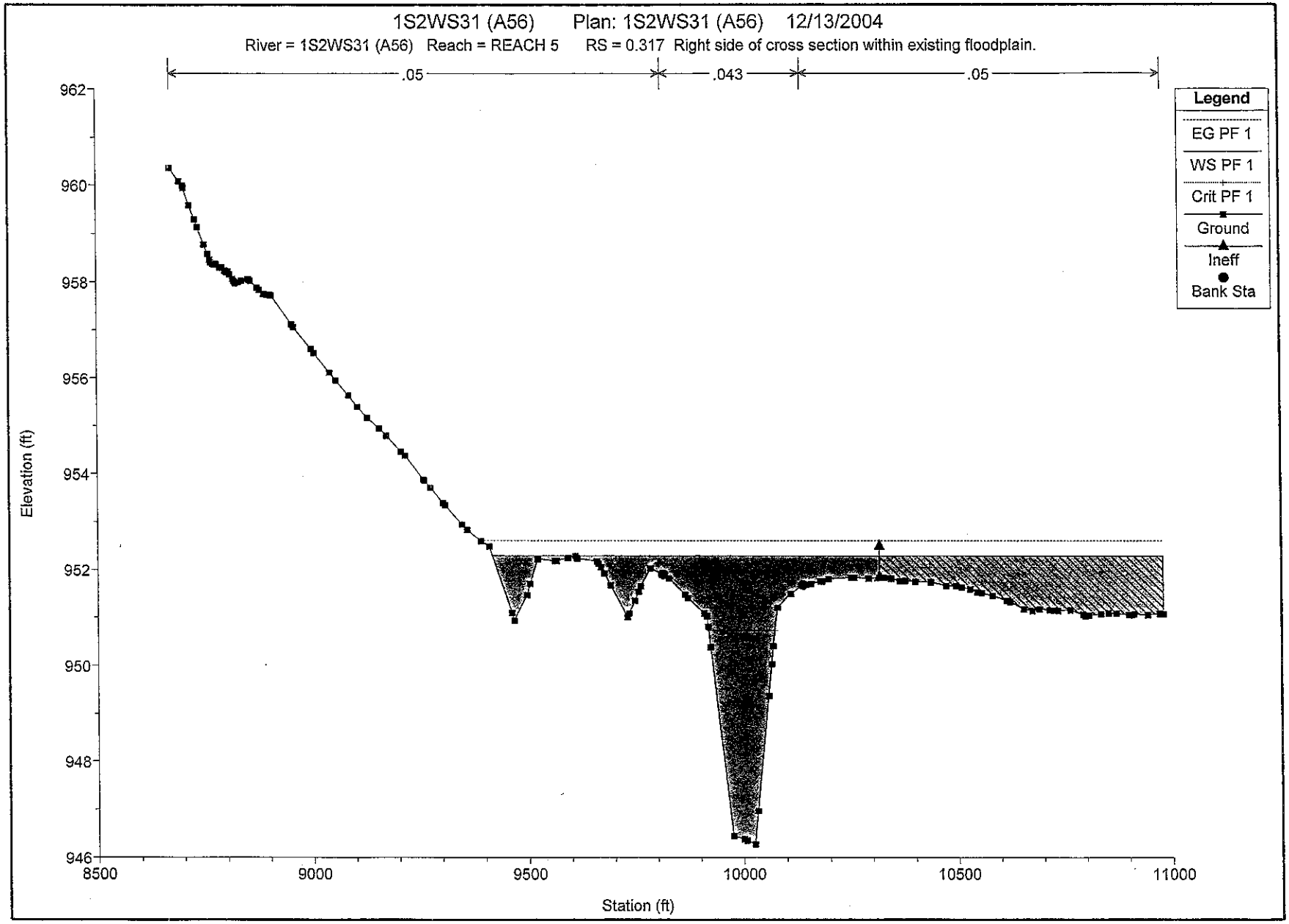
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

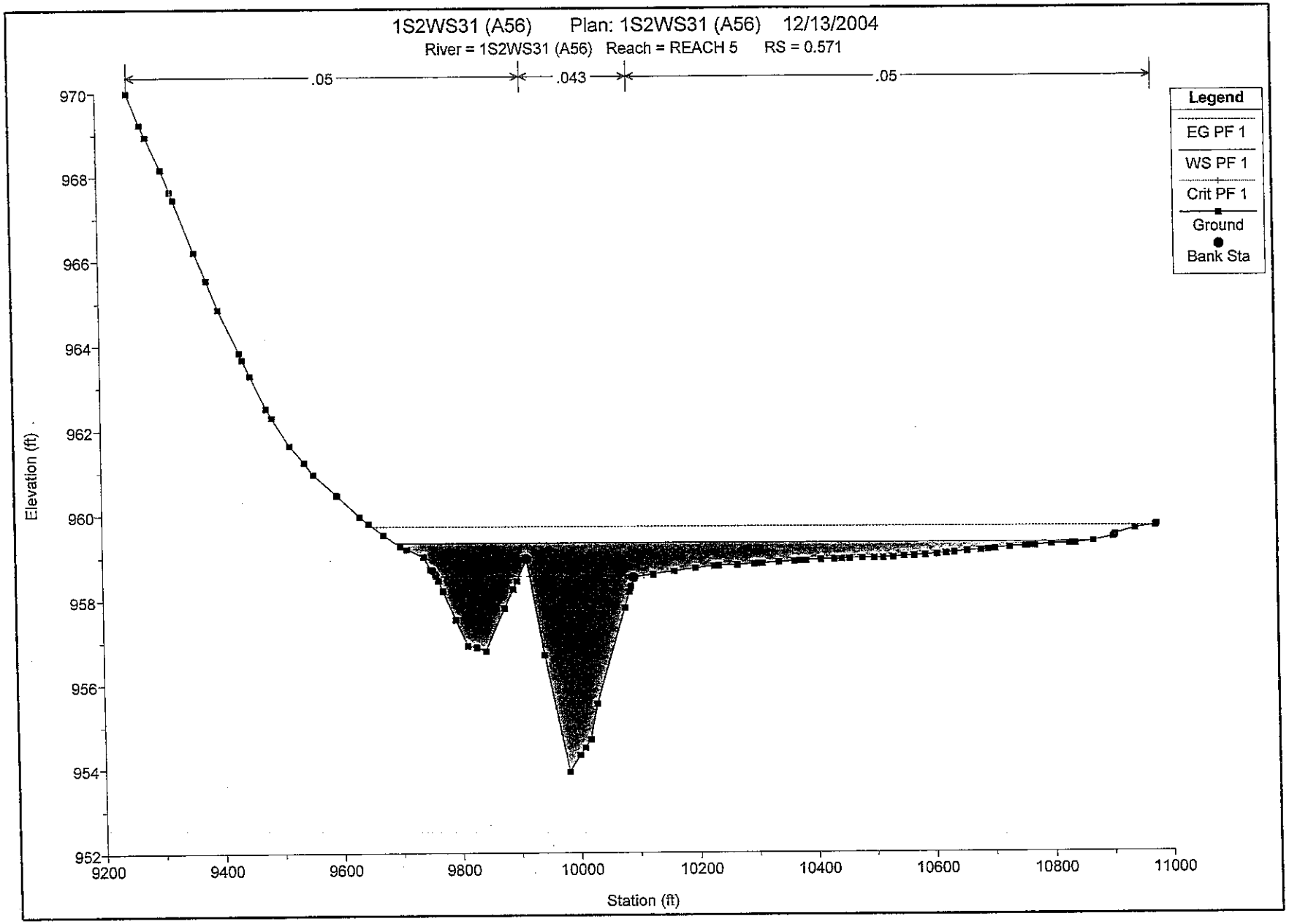
Change in Discharge based on Reach Length

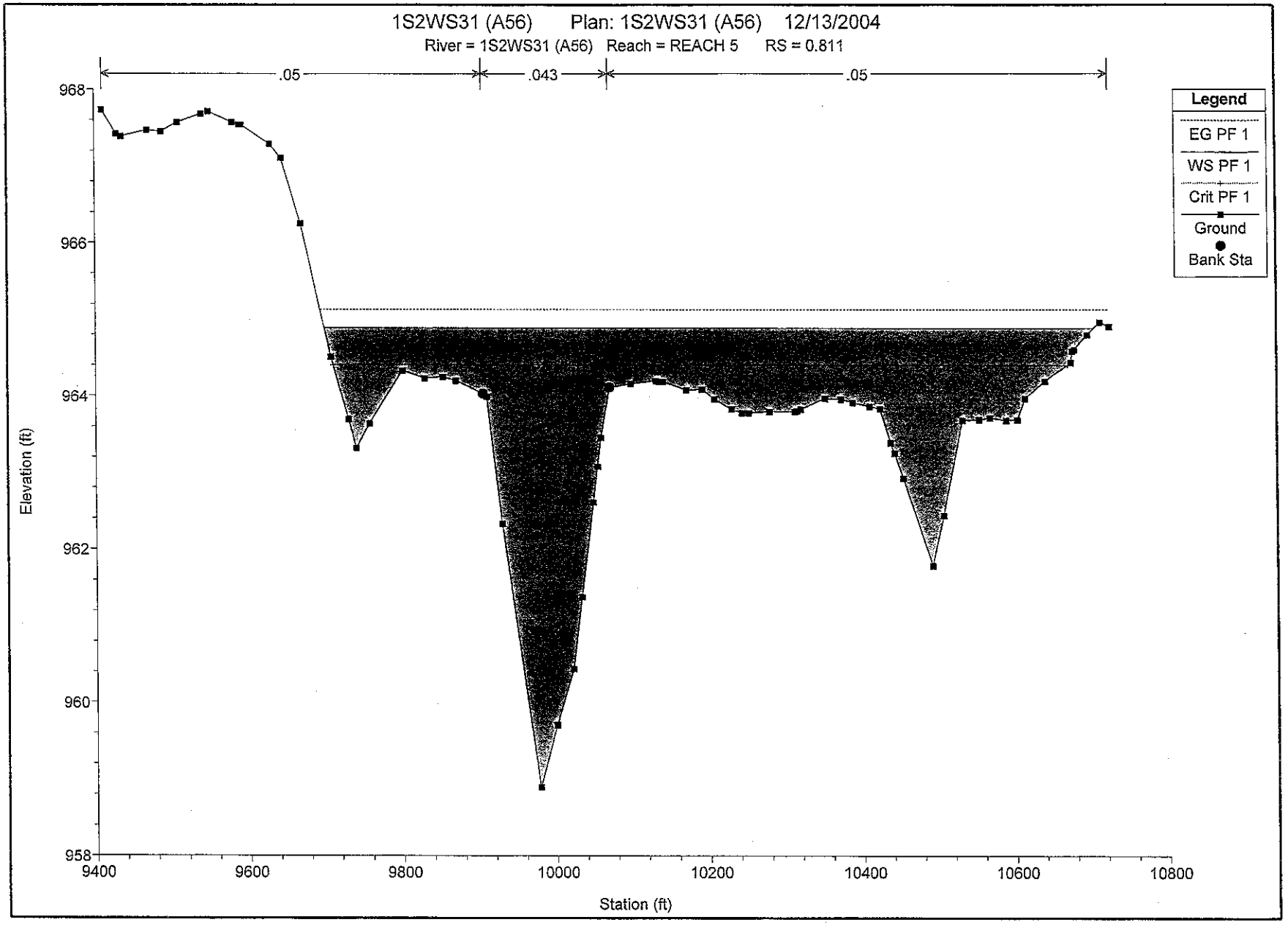
Wash ID: 1S2WS31 (A56)

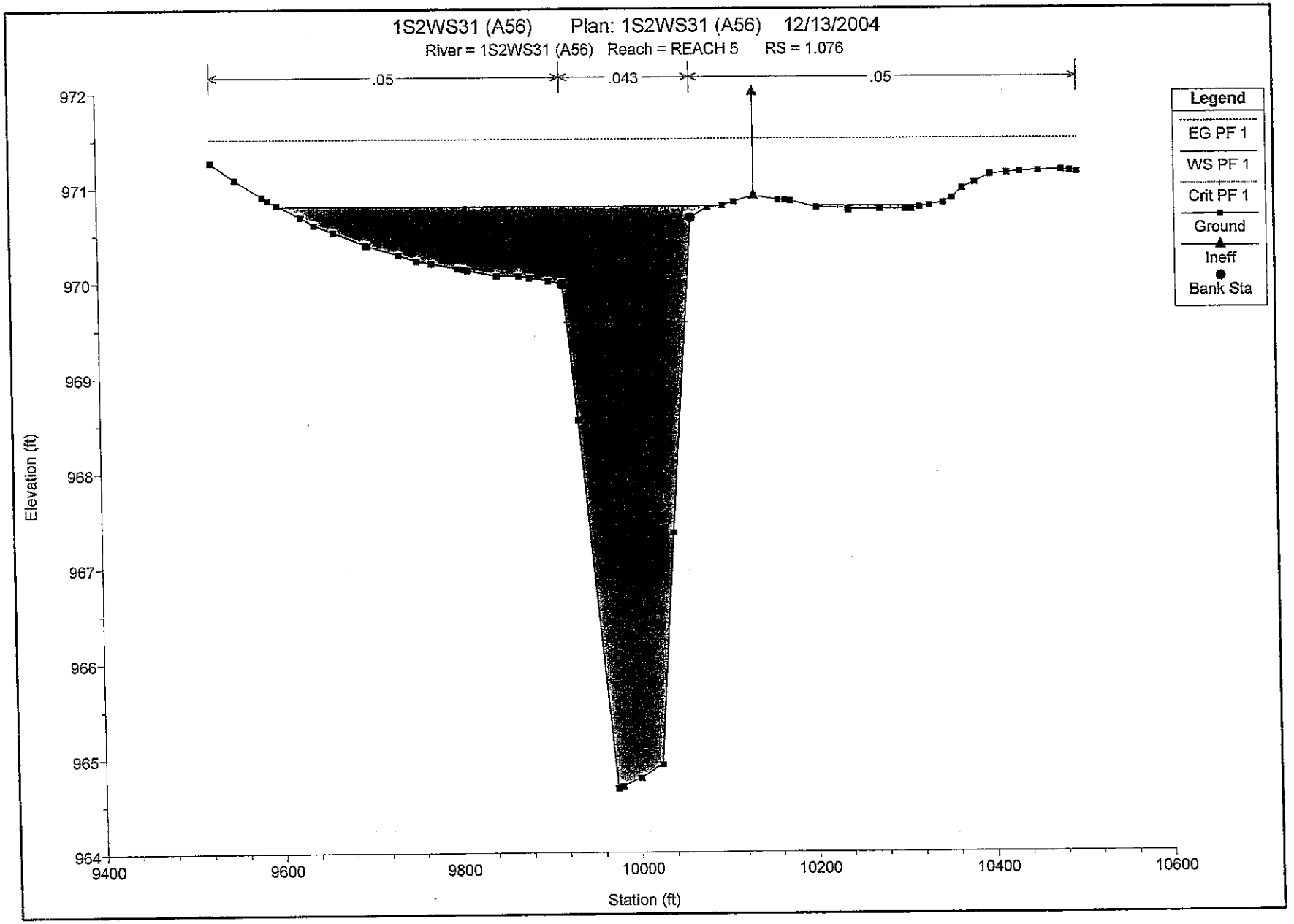
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)	*percent of area*
A28	4.185	229	230	200	
A28	3.910	653	650	700	
A27	3.668	1052	1050	1100	50
CPA27	3.374	1452	1450	1500	
A29	3.011	1734	1730	1700	50
CPA29	2.673	2016	2020	2000	
CPA30	2.673	2901	2900	2900	
A52	2.388	2836	2840	2800	50
CPA52A	2.110	2772	2770	2800	
CPA52	2.110	3898	3900	3900	
A55	1.913	4347	4350	4300	
CPA55A		2061	2060	2100	
CPA55	1.913	4626	4630	4600	
A56	1.595	4554	4550	4600	
A56	1.329	4494	4490	4500	
A56	1.076	4437	4440	4400	
A56	0.811	4378	4380	4400	
A56	0.571	4324	4320	4300	
A56	0.317	4266	4270	4300	
CPA56	0.000	4195	4200	4200	

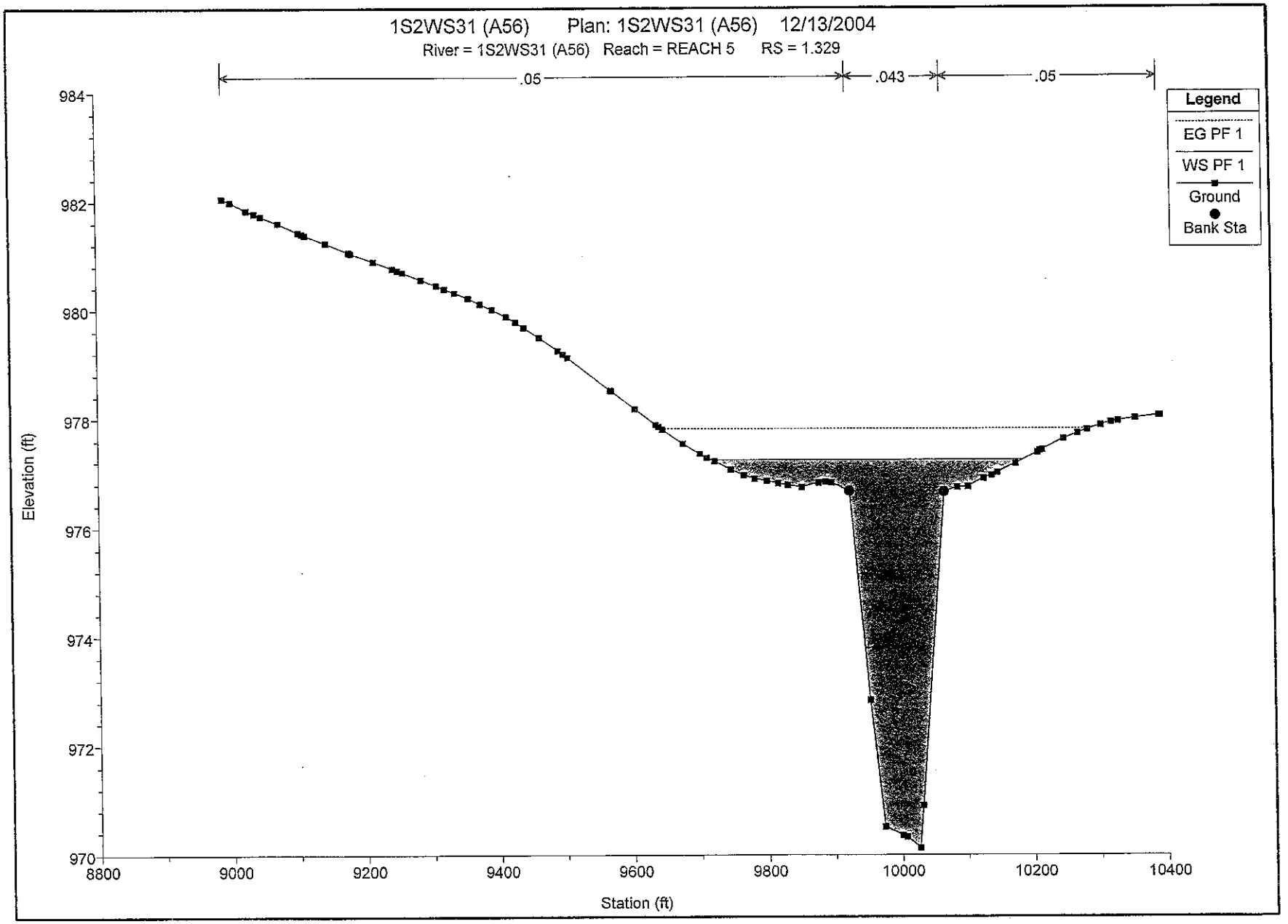
Notes:
1. Q at station 3.910 is 653 cfs for local subbasin A28
2. A percentage of the area for subbasin A55 was used to determine the q at cross section 1.913.
2. 236 out of 392 acres contribute to A55.
2. 450 + 3898 = 4347

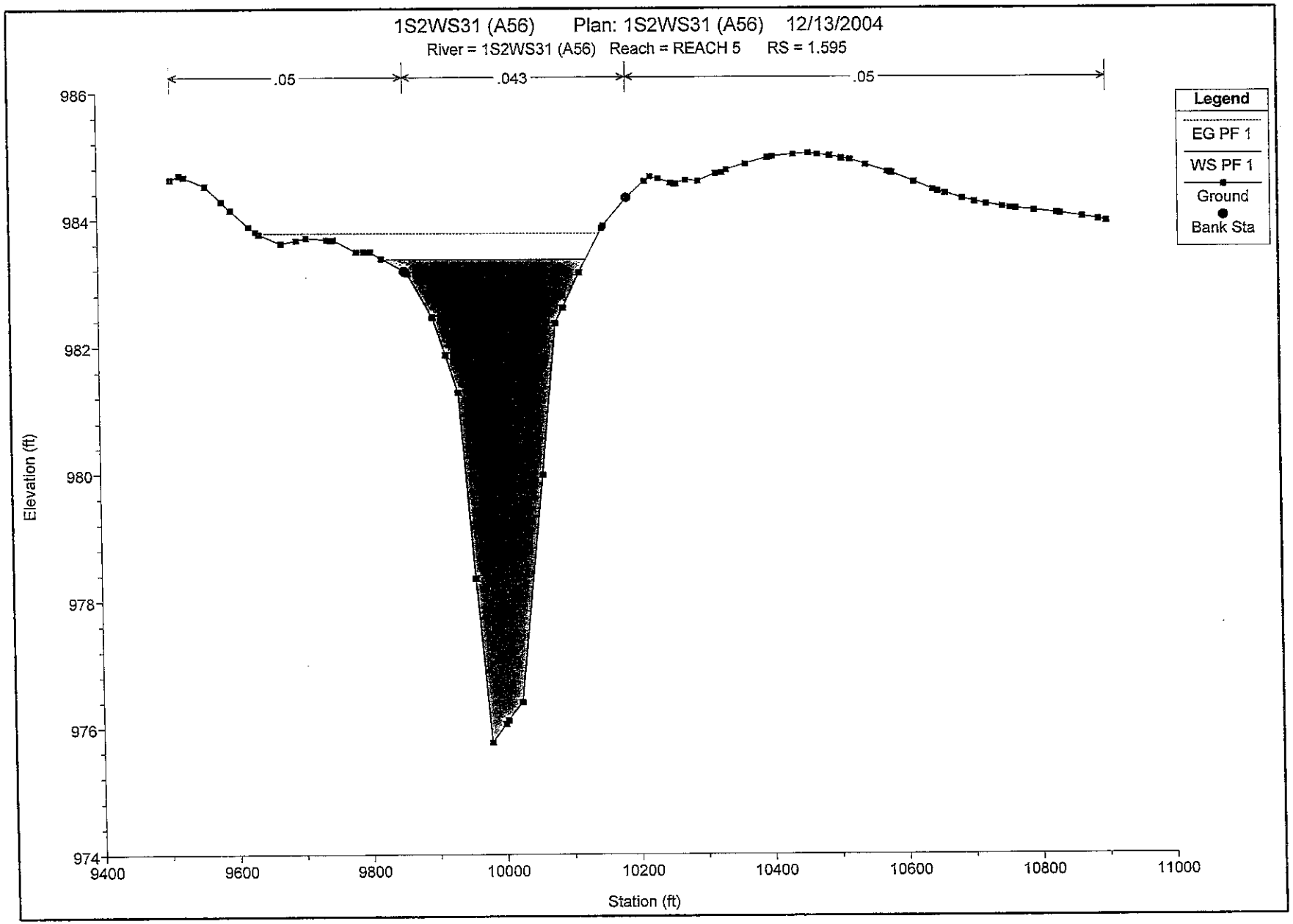

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 5 RS = 0.317 Right side of cross section within existing floodplain.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
962
960
958
956
954
952
950
948
946
8500
9000
9500
10000
10500
11000
Station (ft)

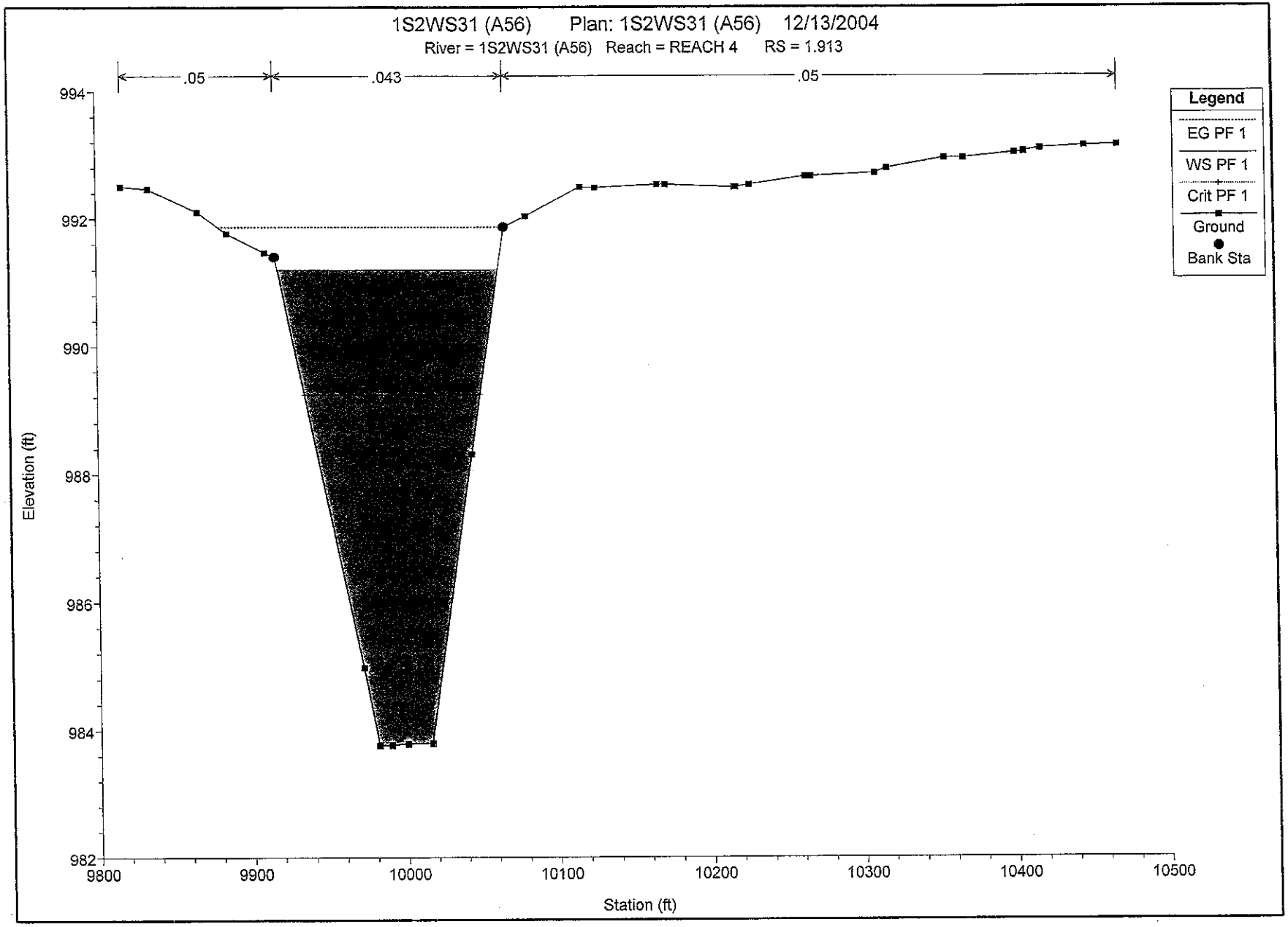

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 5 RS = 0.571
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
970
968
966
964
962
960
958
956
954
952
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

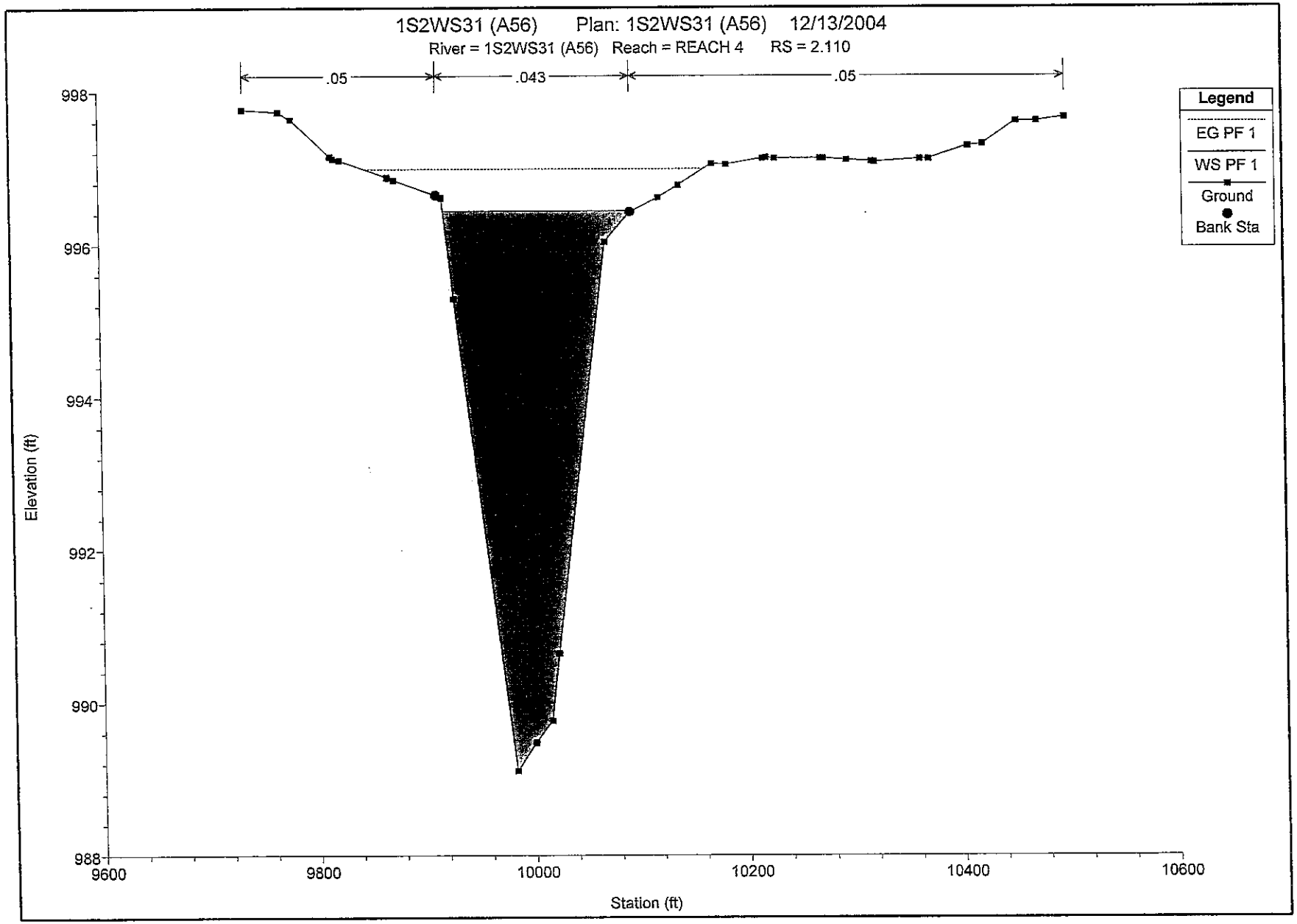

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 5 RS = 0.811
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
968
966
964
962
960
958
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

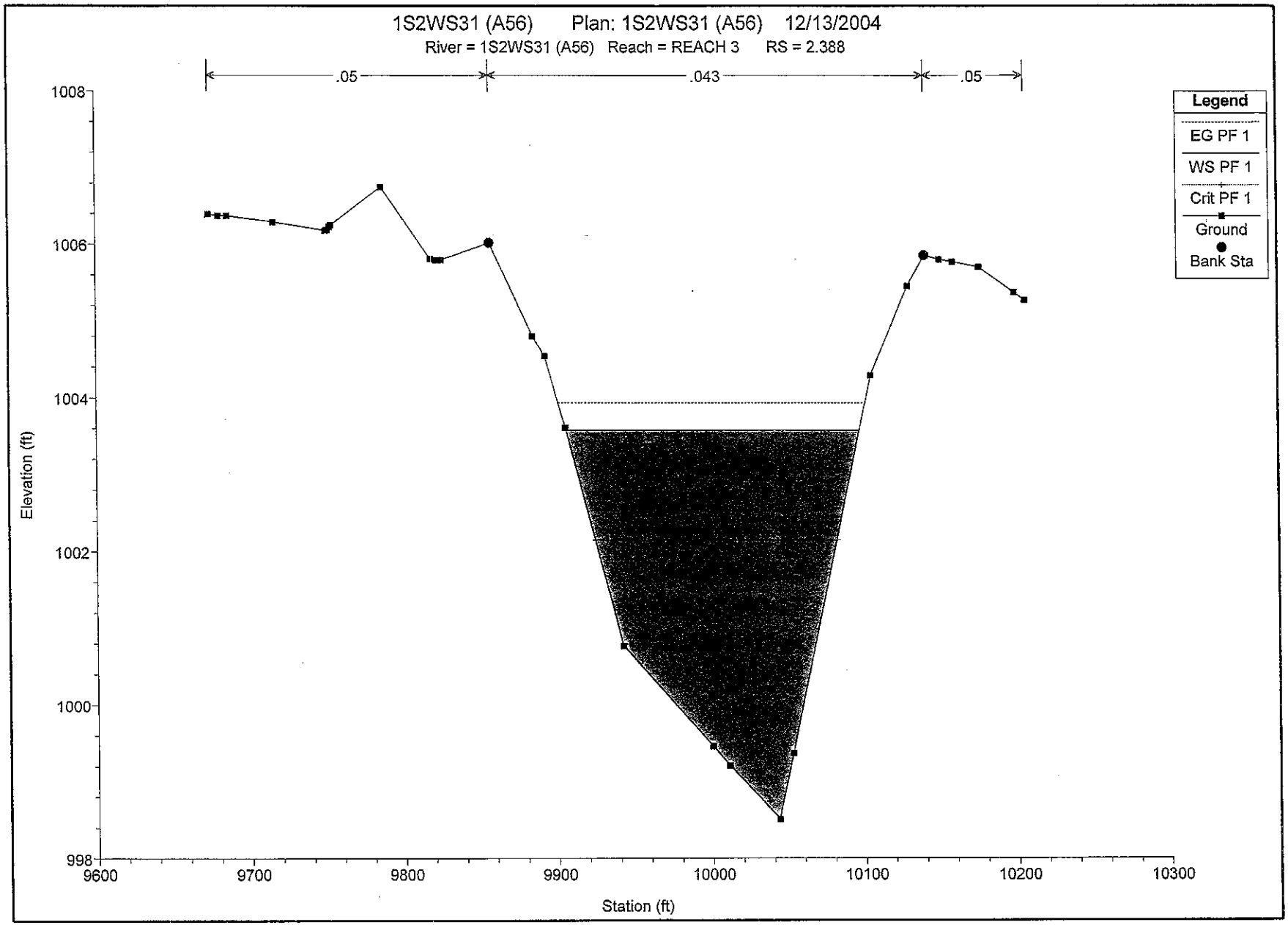

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 5 RS = 1.076
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
972
971
970
969
968
967
966
965
964
9400
9600
9800
10000
10200
10400
10600
Station (ft)

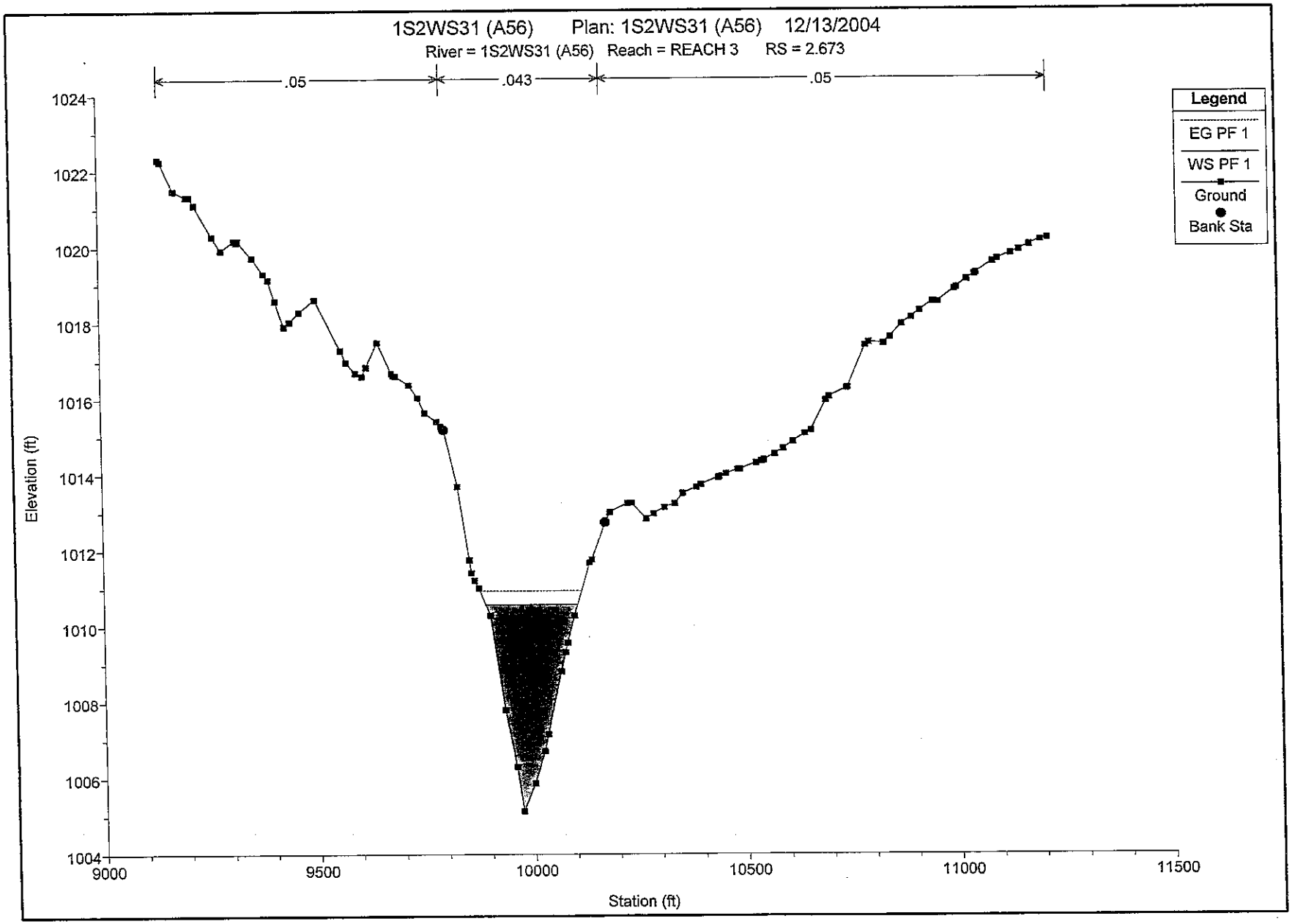

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 5 RS = 1.329
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
984
982
980
978
976
974
972
970
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

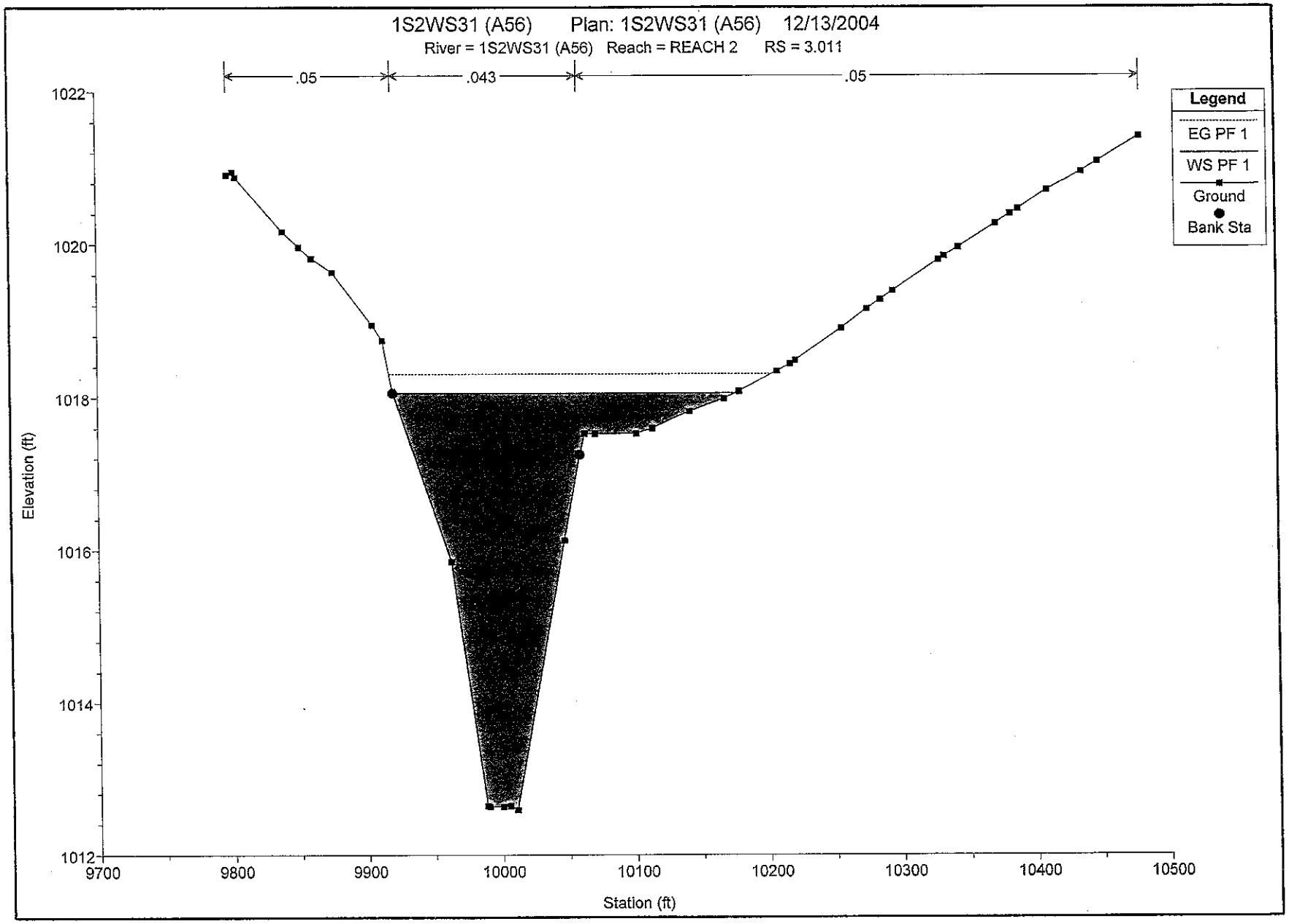

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 5 RS = 1.595
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
986
984
982
980
978
976
974
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

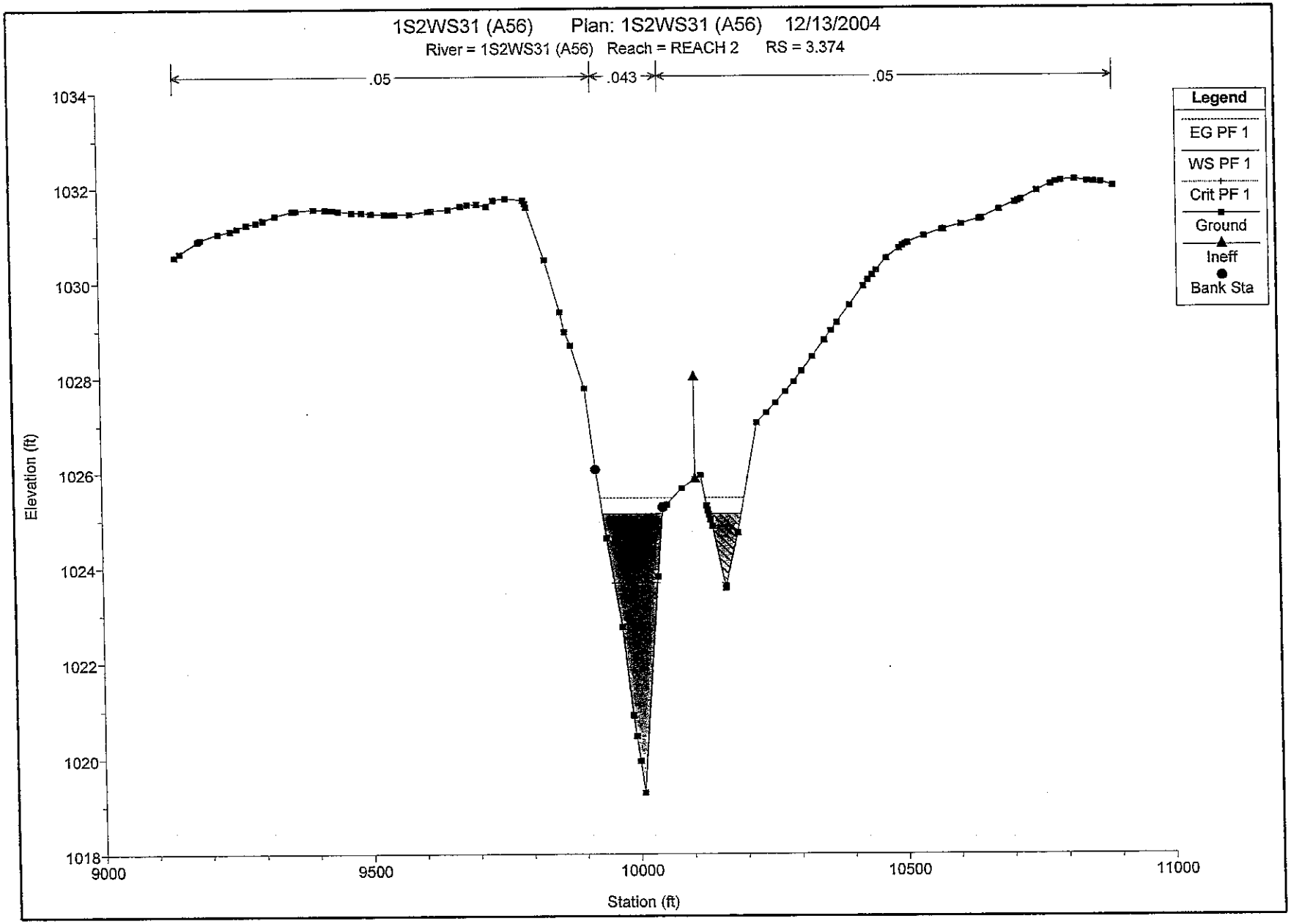

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 4 RS = 1.913
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
994
992
990
988
986
984
982
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

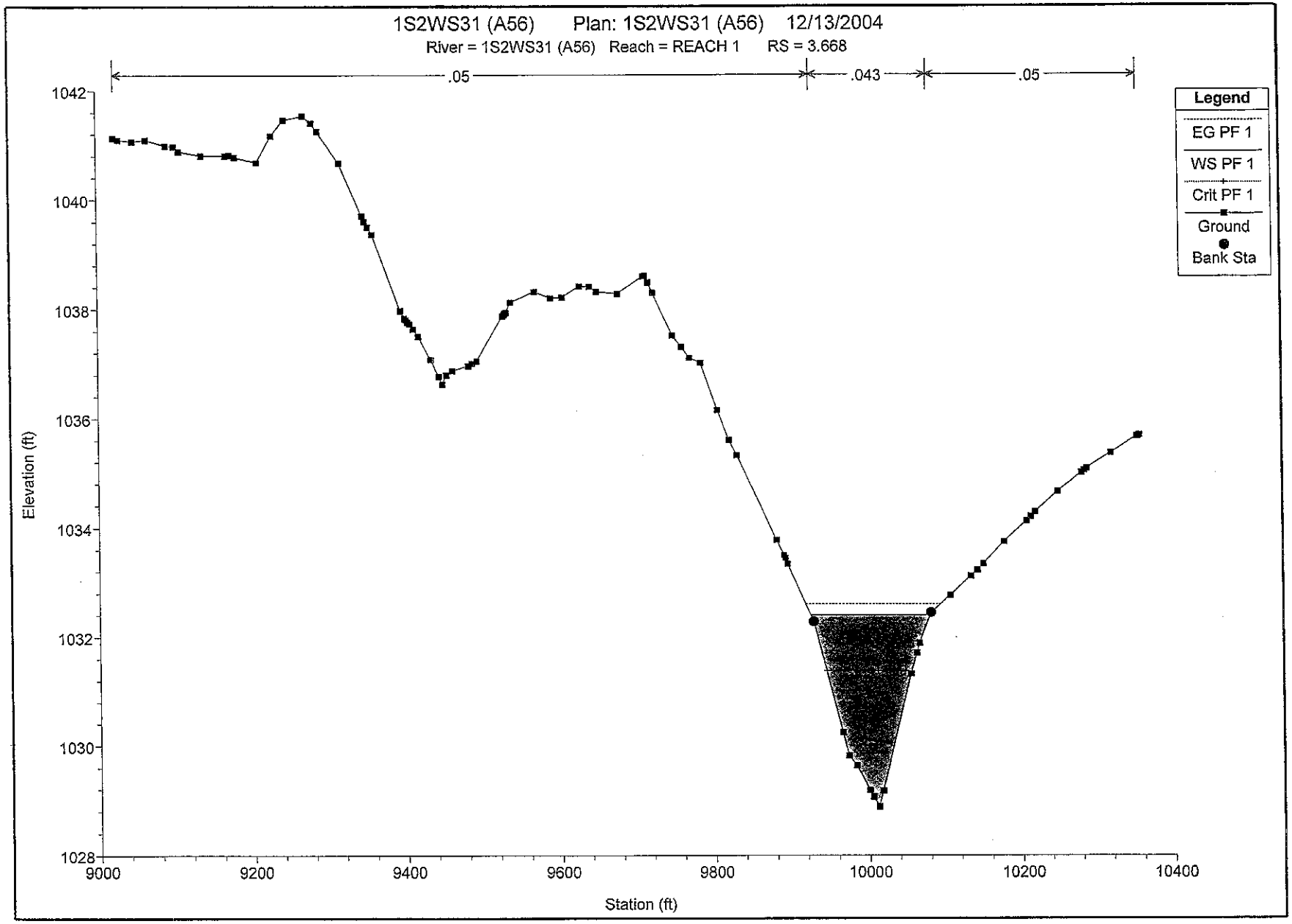

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 4 RS = 2.110
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
998
996
994
992
990
988
9600
9800
10000
10200
10400
10600
Station (ft)

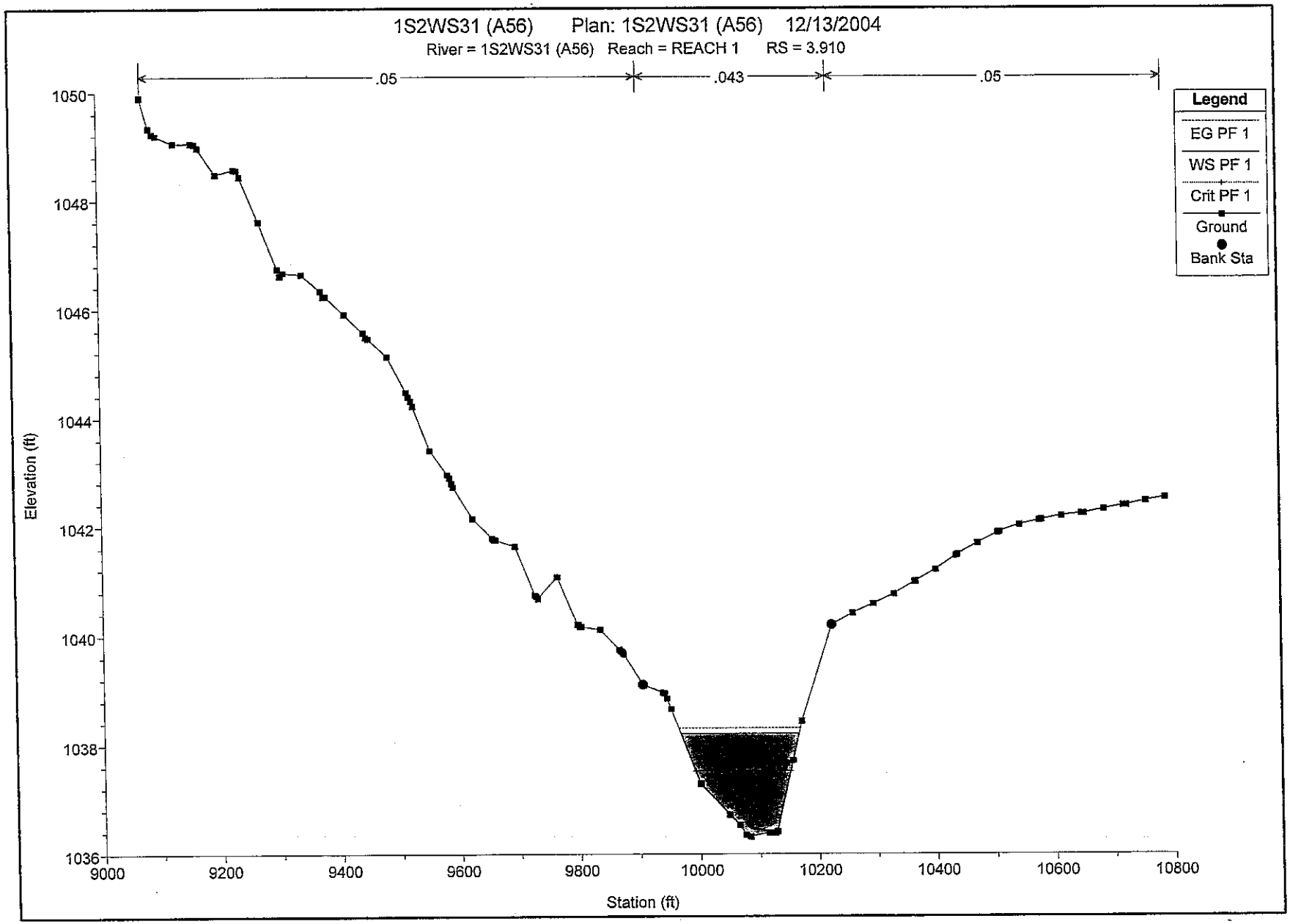

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 3 RS = 2.388
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1008
1006
1004
1002
1000
998
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

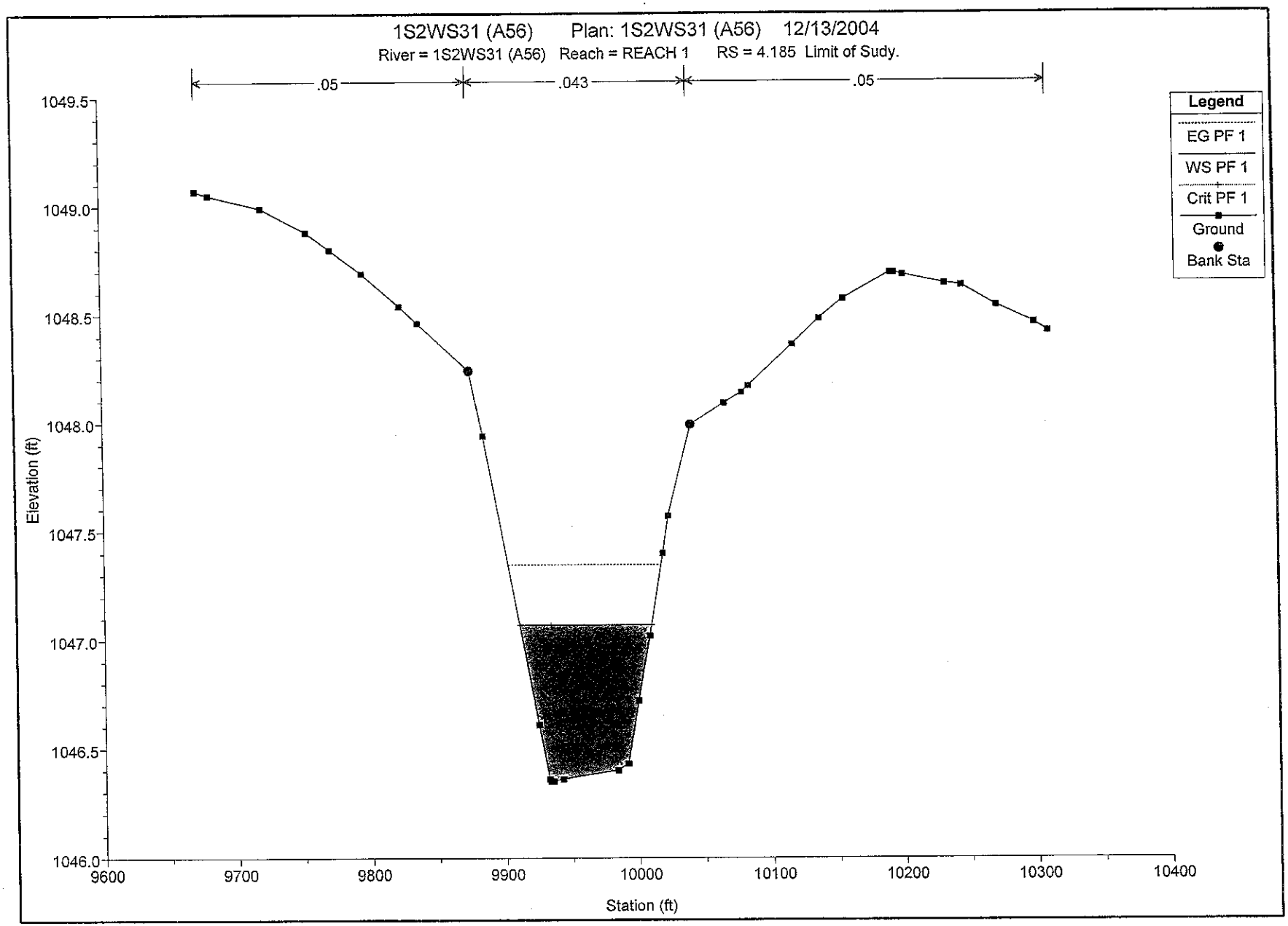

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 3 RS = 2.673
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1024
1022
1020
1018
1016
1014
1012
1010
1008
1006
1004
9000
9500
10000
10500
11000
11500
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 2 RS = 3.011
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1022
1020
1018
1016
1014
1012
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 2 RS = 3.374
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1034
1032
1030
1028
1026
1024
1022
1020
1018
9000
9500
10000
10500
11000
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 1 RS = 3.668
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1042
1040
1038
1036
1034
1032
1030
1028
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 1 RS = 3.910
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1050
1048
1046
1044
1042
1040
1038
1036
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 1S2WS31 (A56) Reach = REACH 1 RS = 4.185 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1049.5
1049.0
1048.5
1048.0
1047.5
1047.0
1046.5
1046.0
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S3WS12A (A30)

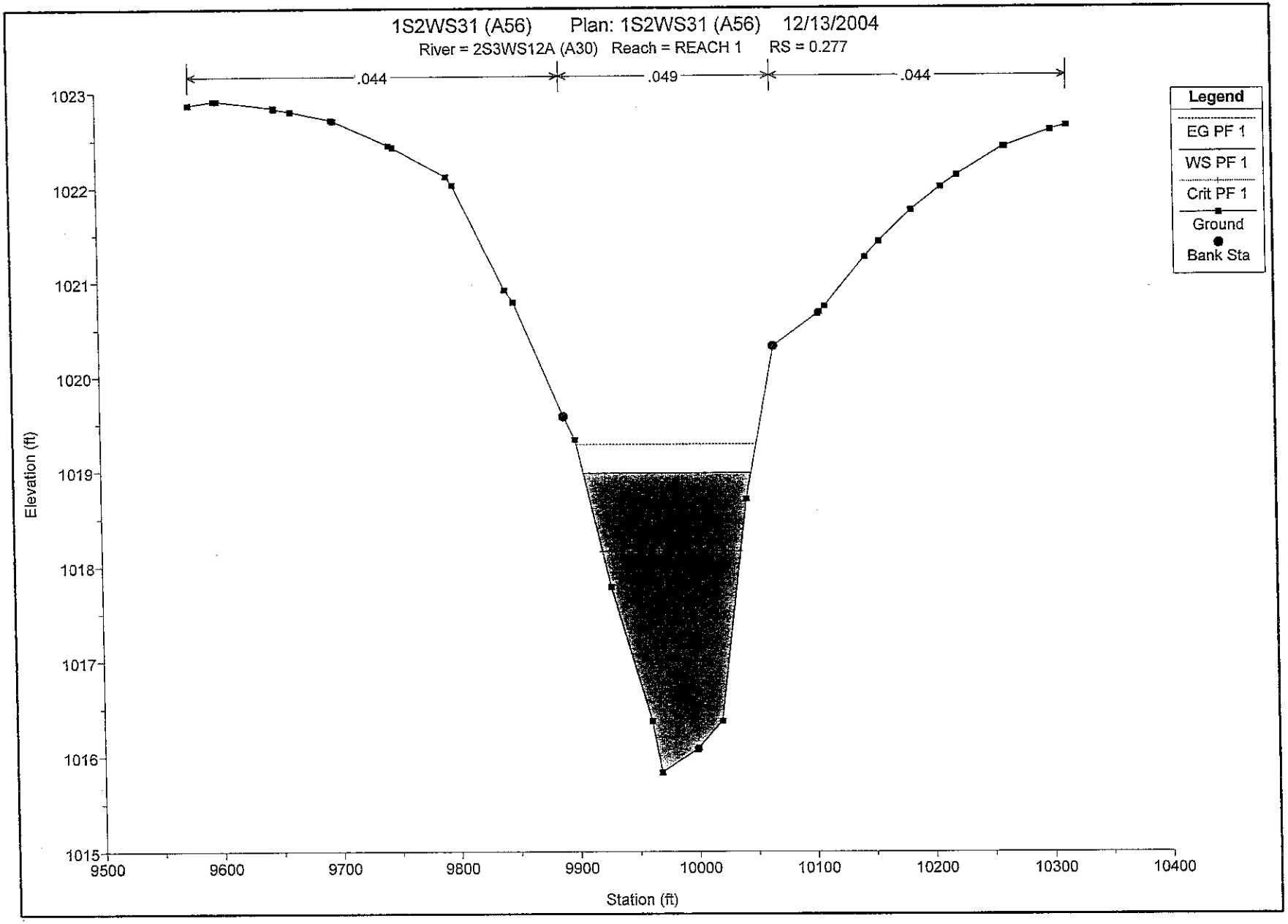
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

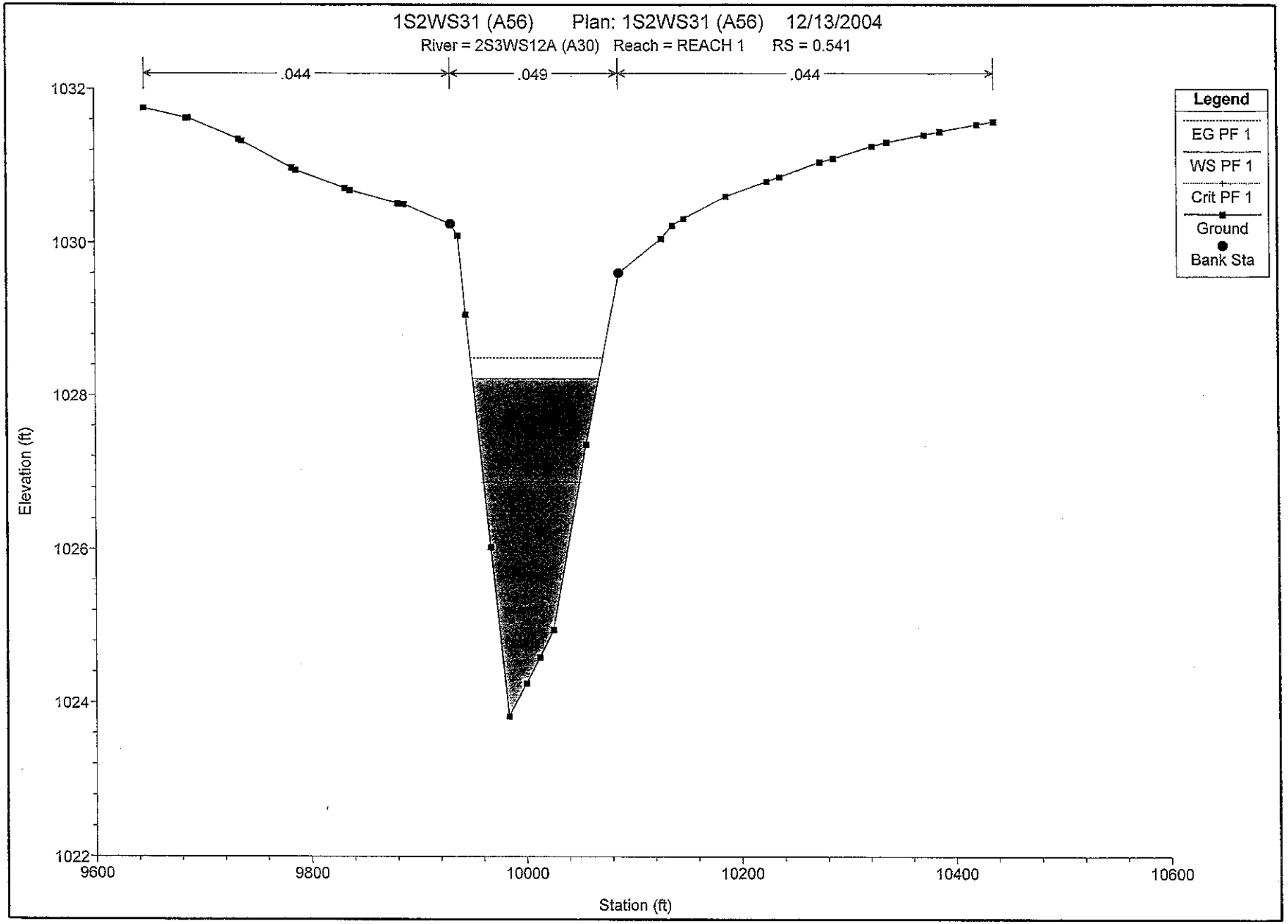
Change in Discharge based on Reach Length

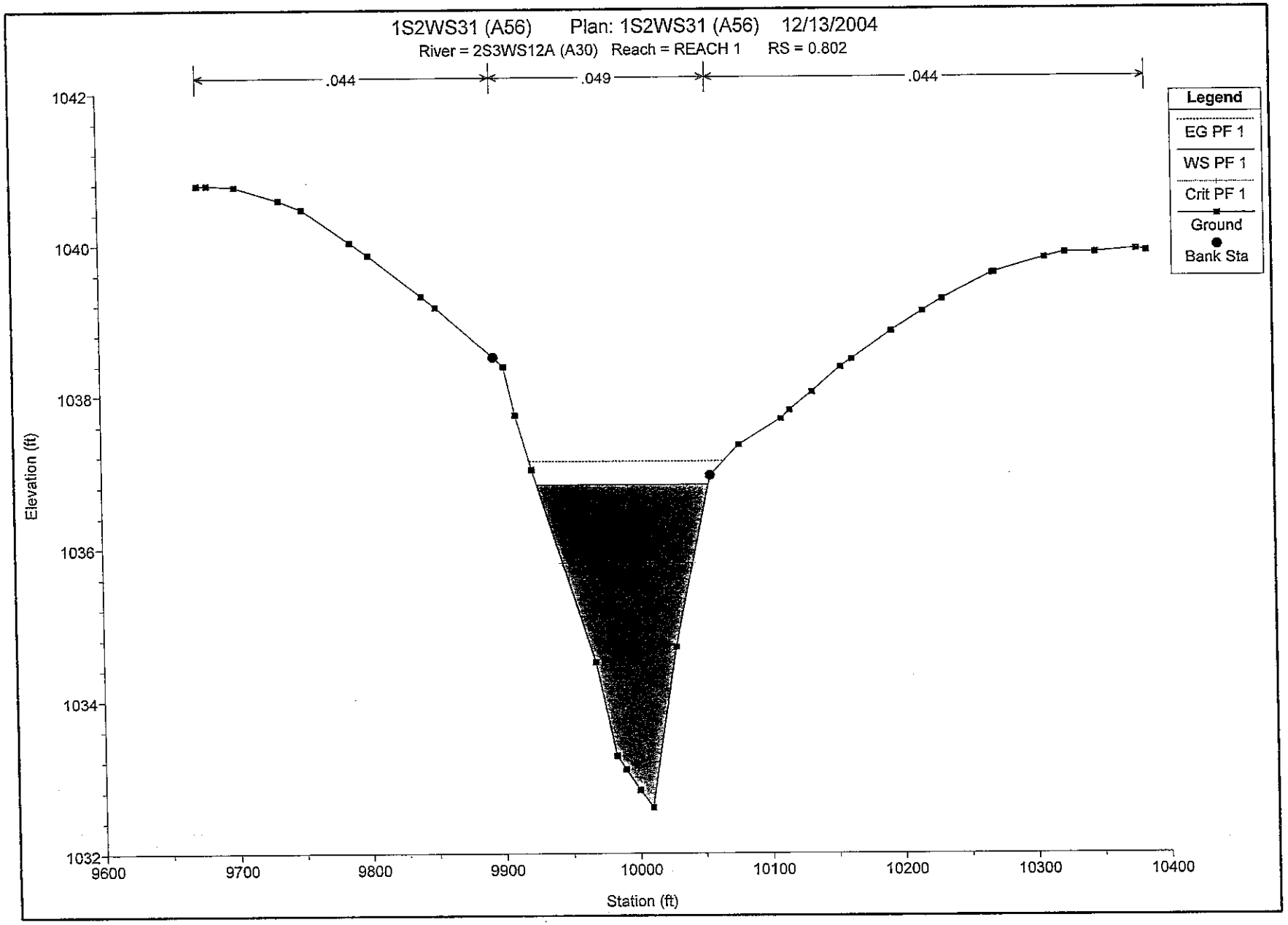
Wash ID: 2S3WS12A (A30)

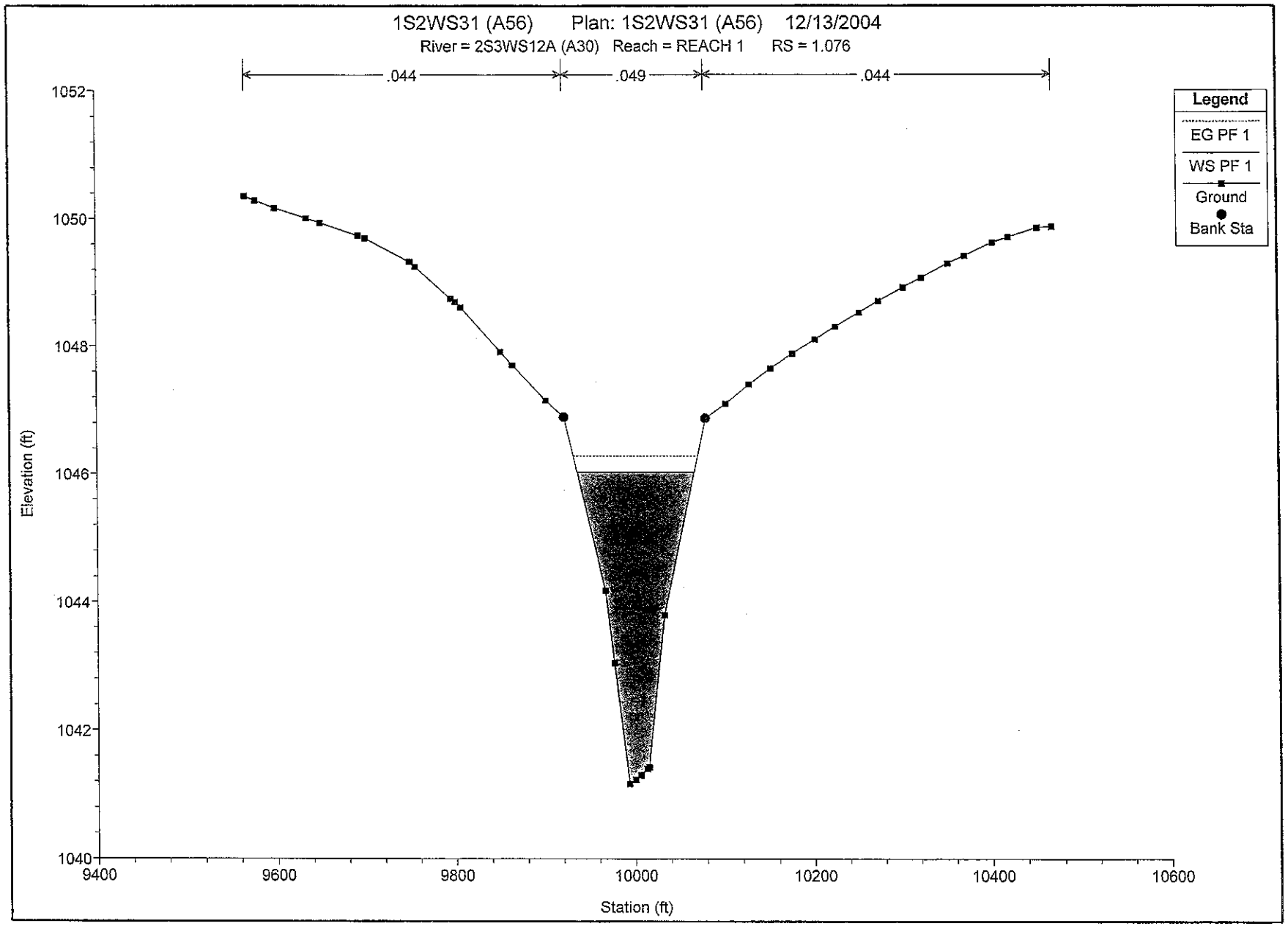
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
A06	4.175	694	694	690
A06	3.908	726	726	730
CPA06	3.613	793	793	790
A24	3.368	859	859	860
A24	3.116	926	926	930
A24	2.811	1008	1008	1010
A24	2.536	1082	1080	1100
A24	2.254	1158	1160	1200
A24	2.011	1223	1220	1200
A24	1.788	1283	1280	1300
CPA24	1.605	1332	1330	1300
A30	1.343	1313	1310	1300
A30	1.076	1294	1290	1300
A30	0.802	1275	1270	1300
A30	0.541	1256	1260	1300
CPA30A	0.277	1237	1240	1200

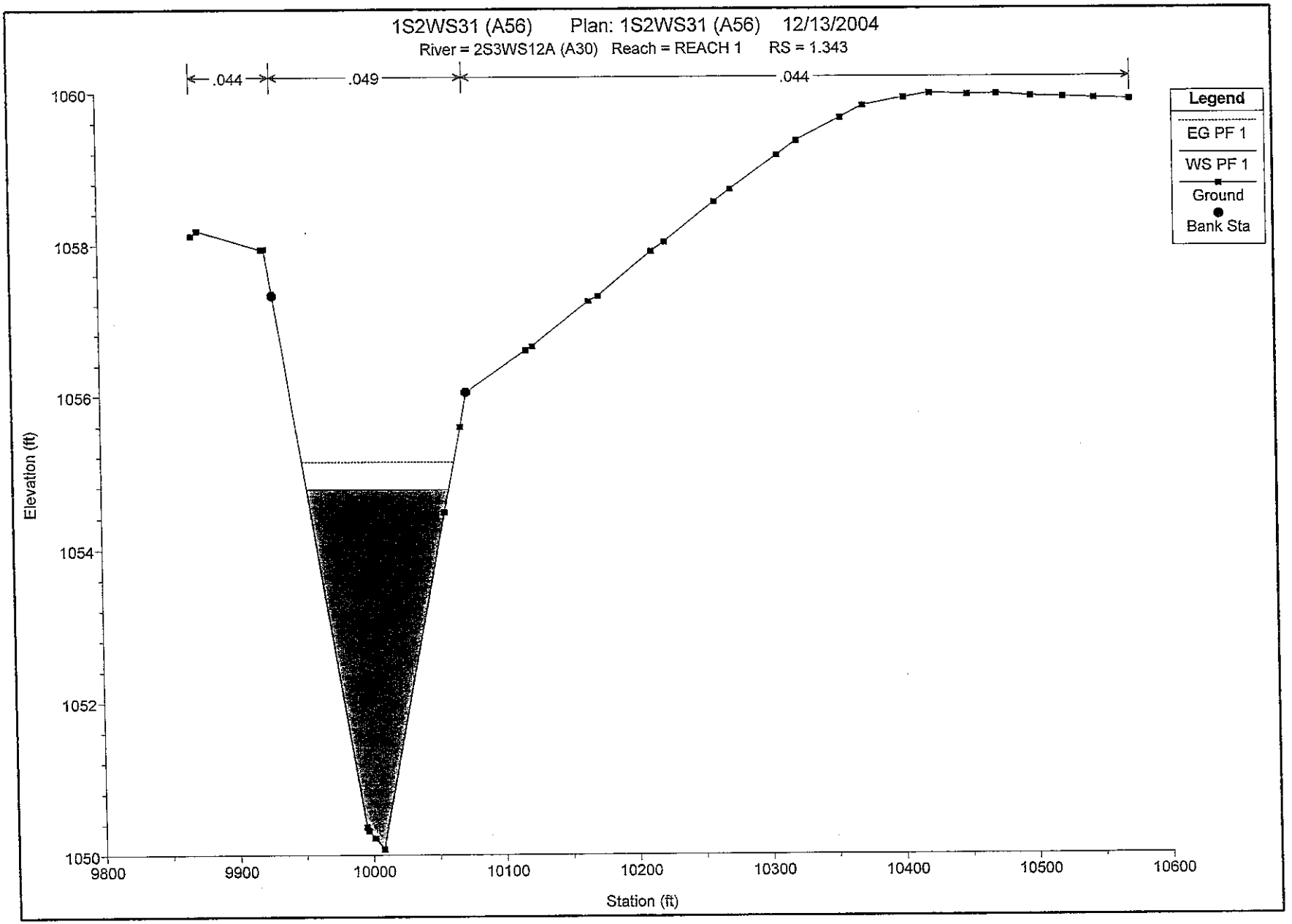
1. 87% of drainage area contributes to 4.175.
2. 91% of drainage area contributes to 3.908
3. Local runoff for A06 is 798 cfs.

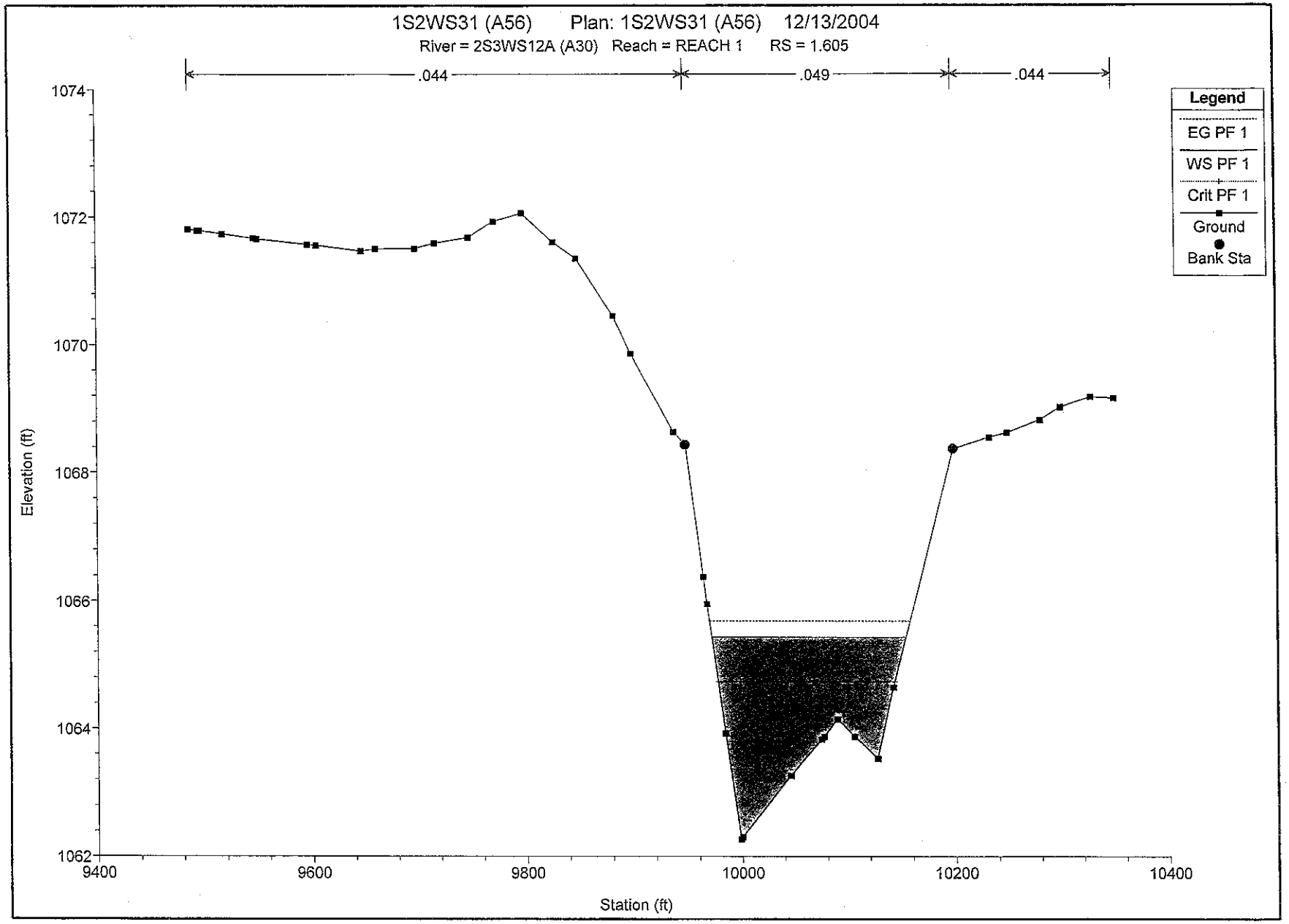

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 0.277
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1023
1022
1021
1020
1019
1018
1017
1016
1015
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

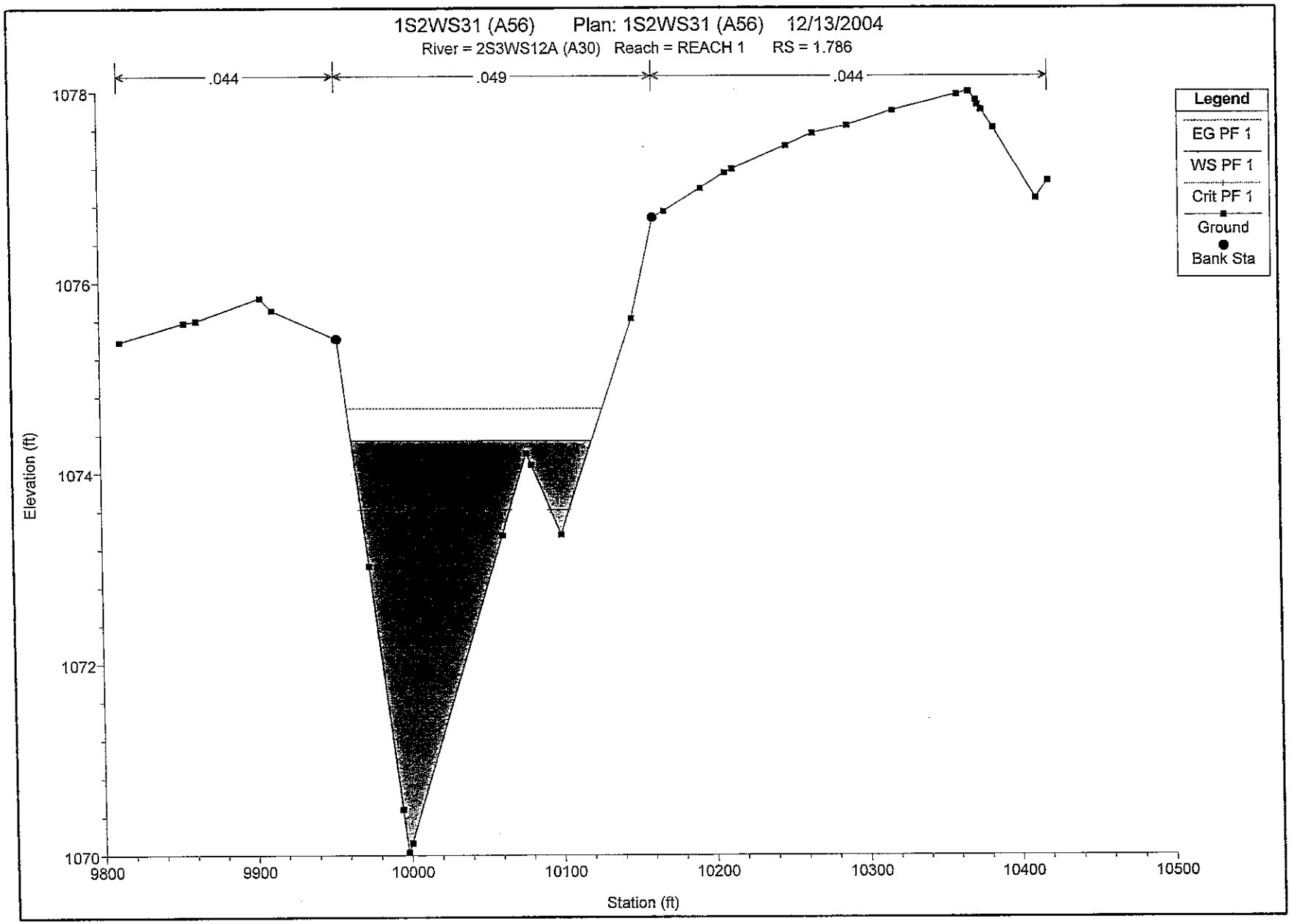

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 0.541
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1032
1030
1028
1026
1024
1022
9600
9800
10000
10200
10400
10600
Station (ft)

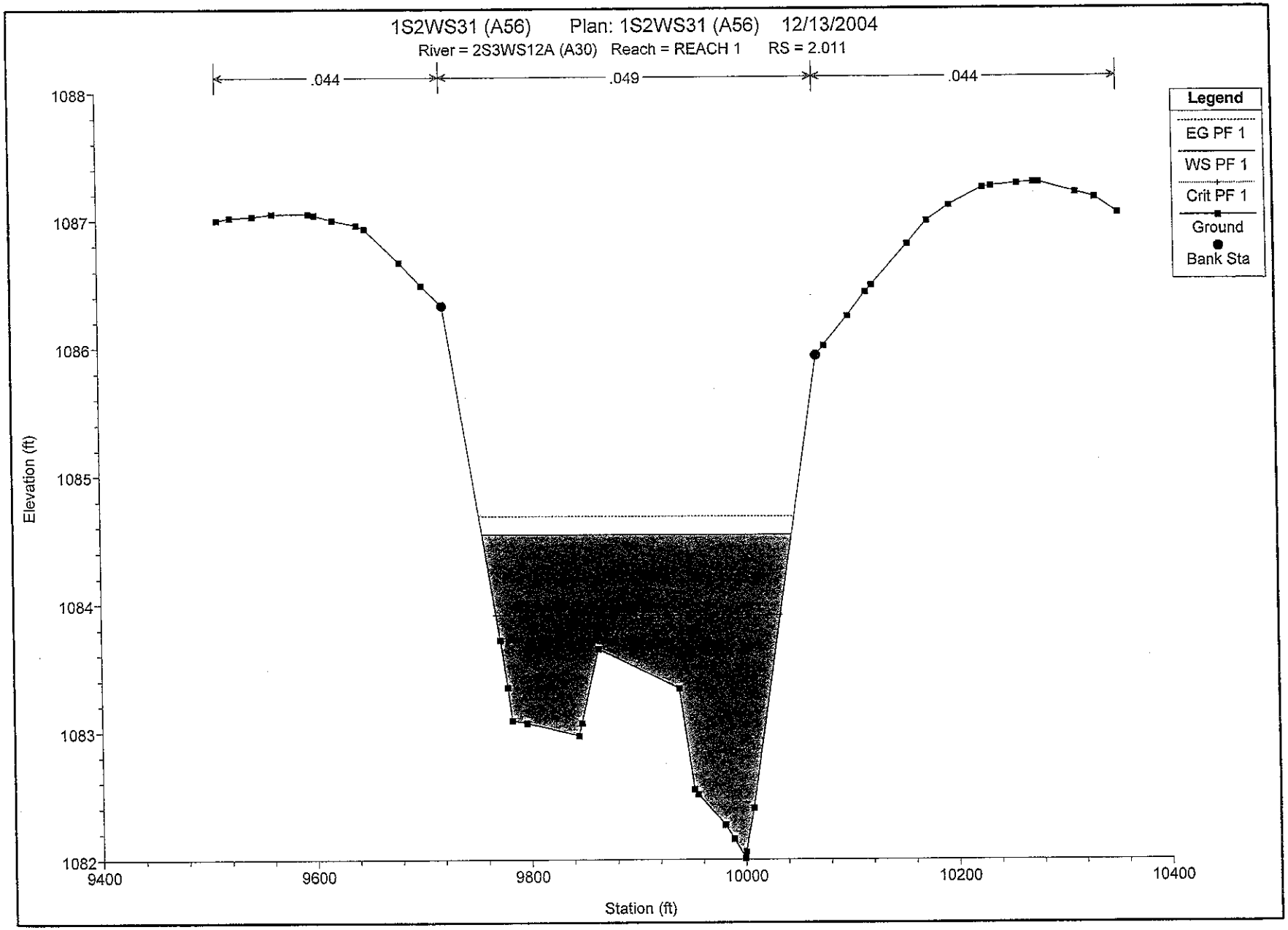

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 0.802
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1042
1040
1038
1036
1034
1032
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

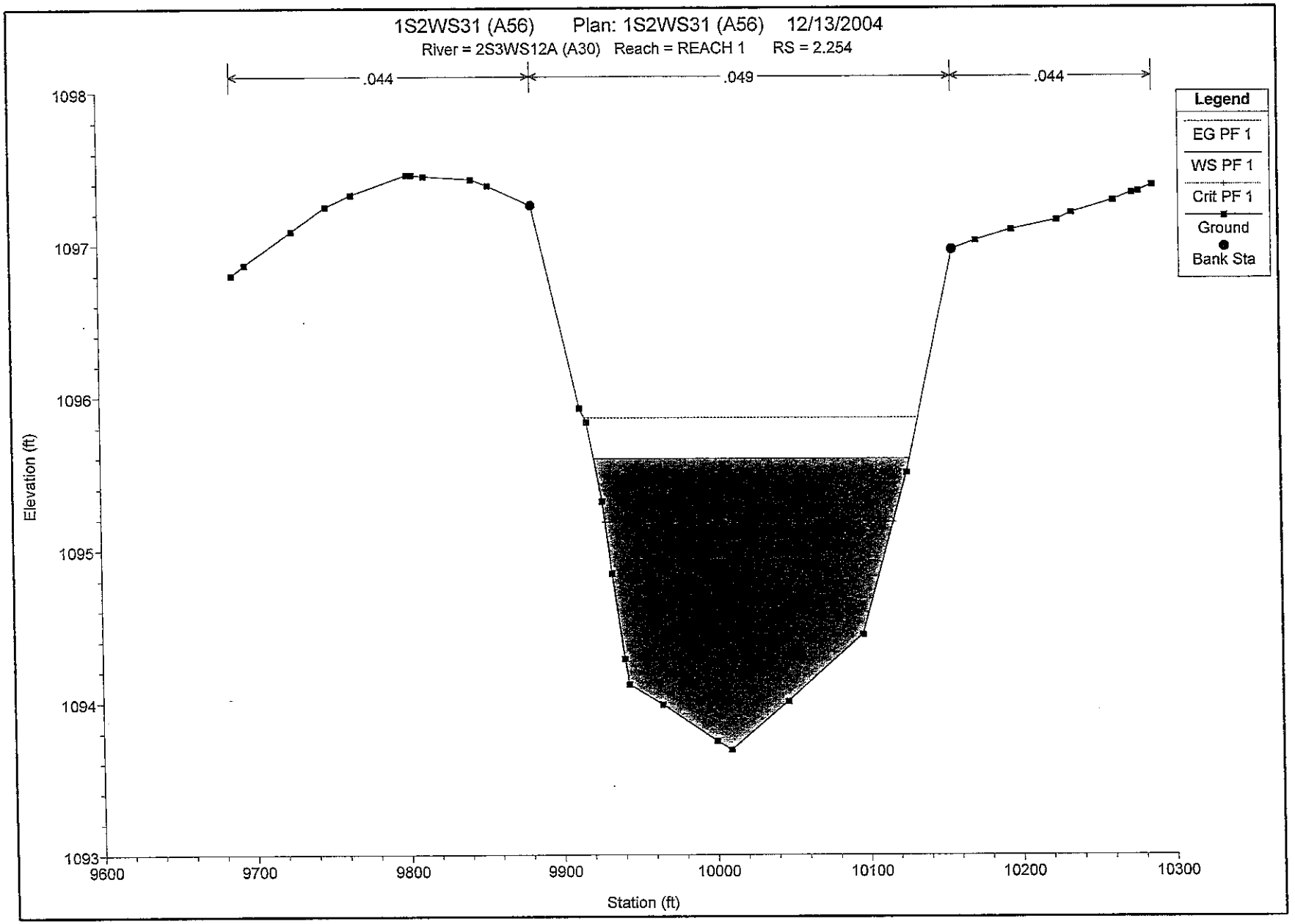

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 1.076
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1052
1050
1048
1046
1044
1042
1040
9400
9600
9800
10000
10200
10400
10600
Station (ft)

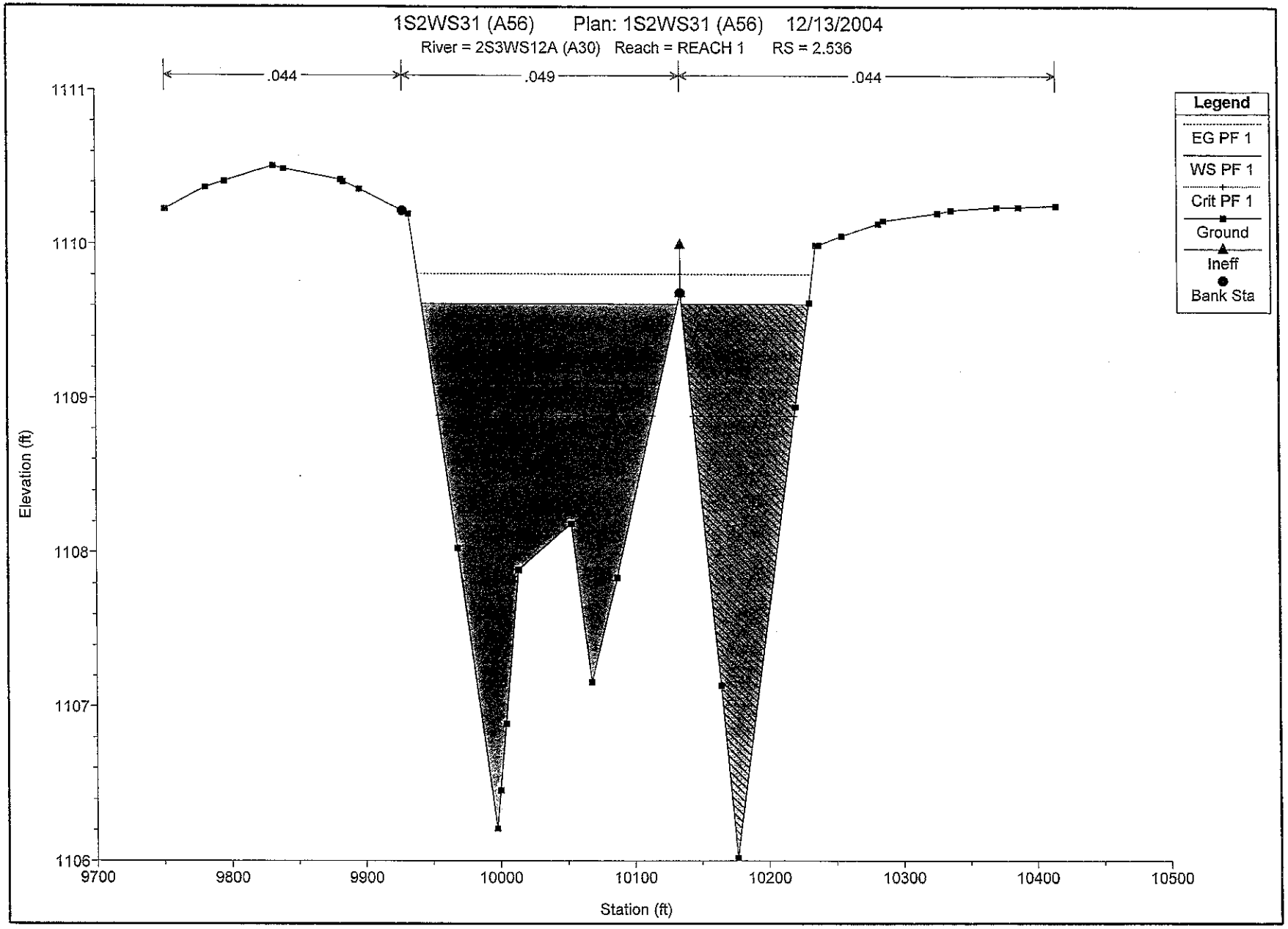

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 1.343
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1060
1058
1056
1054
1052
1050
9800
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)

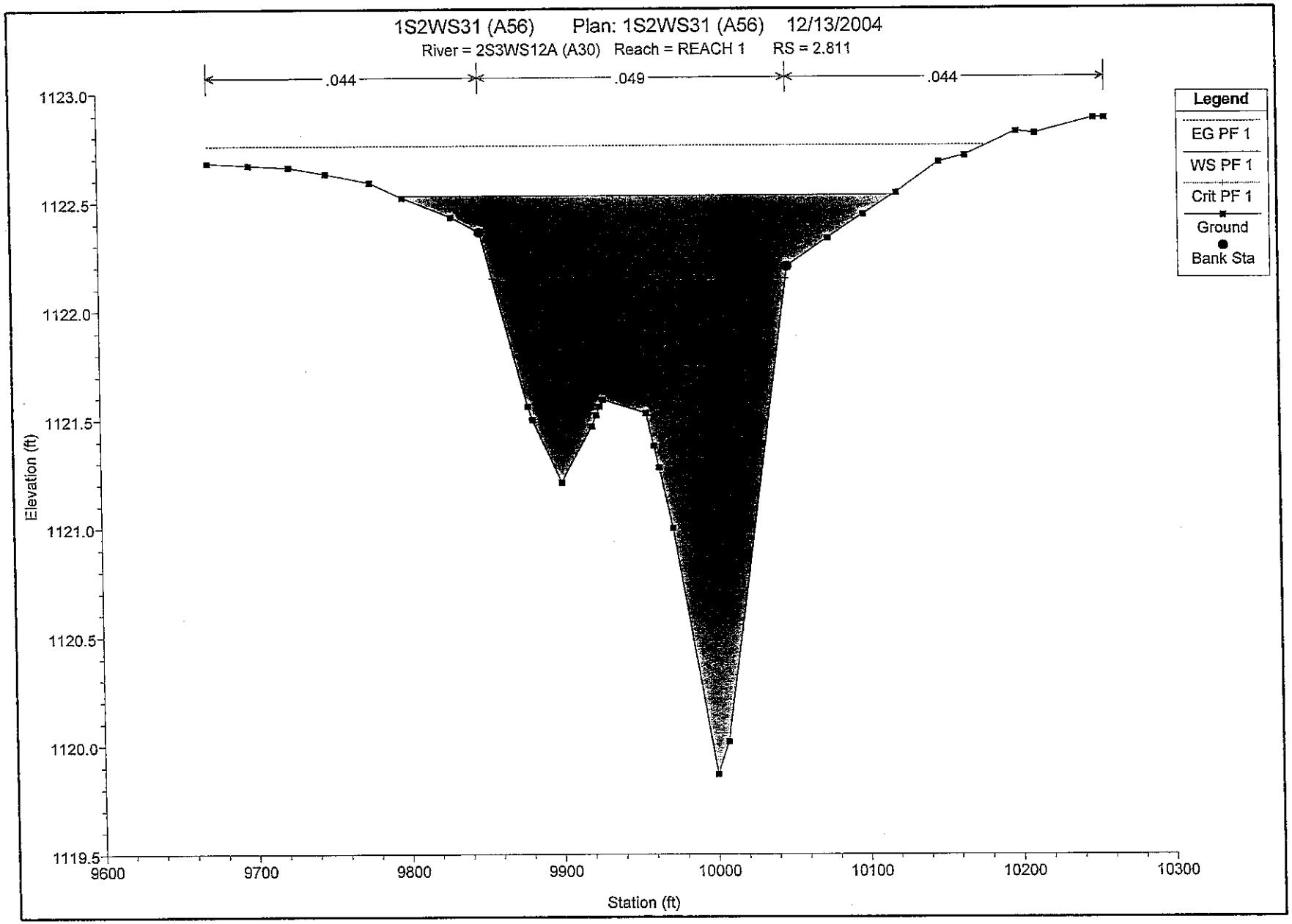

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 1.605
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1074
1072
1070
1068
1066
1064
1062
9400
9600
9800
10000
10200
10400
Station (ft)

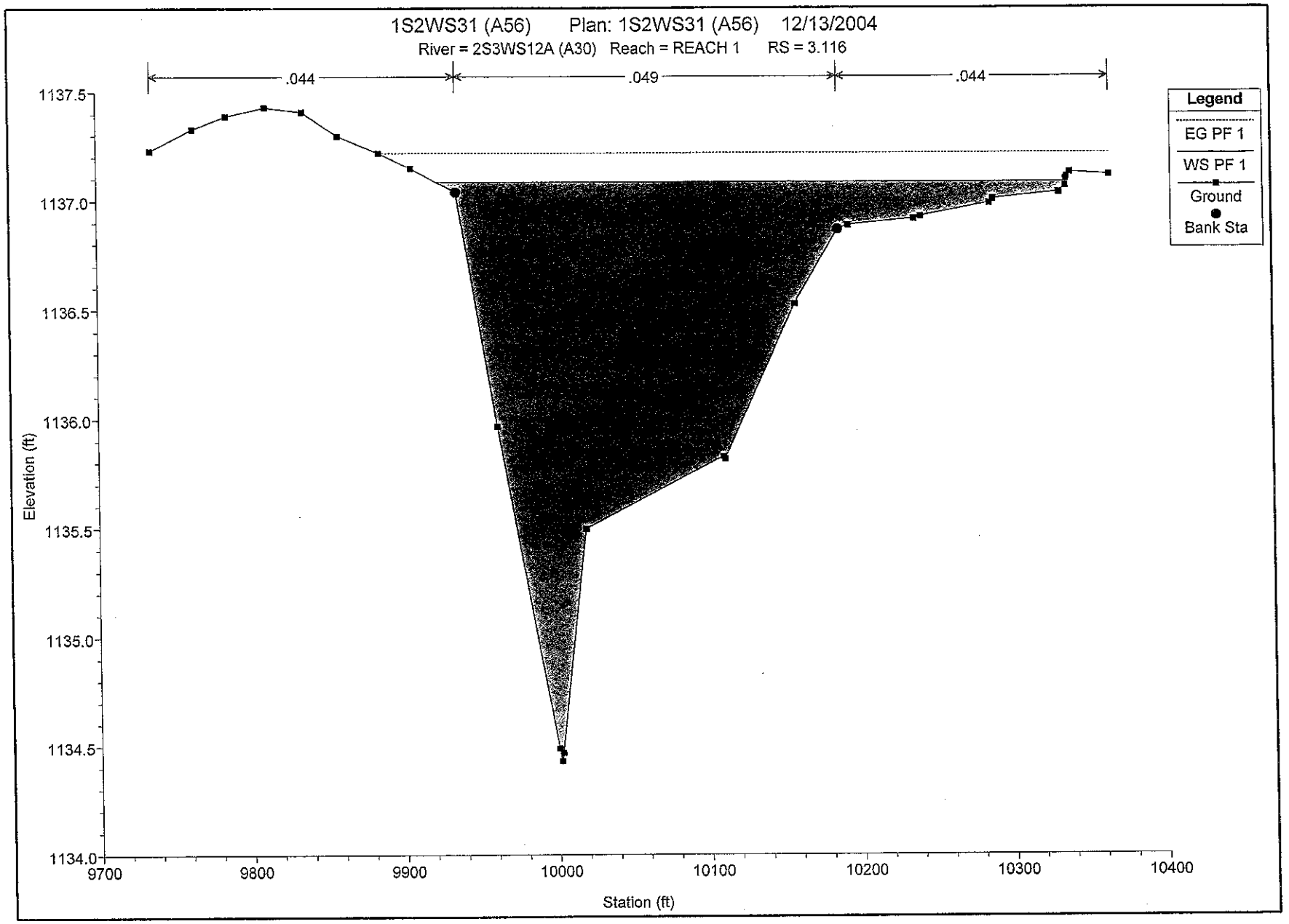

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 1.786
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1078
1076
1074
1072
1070
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

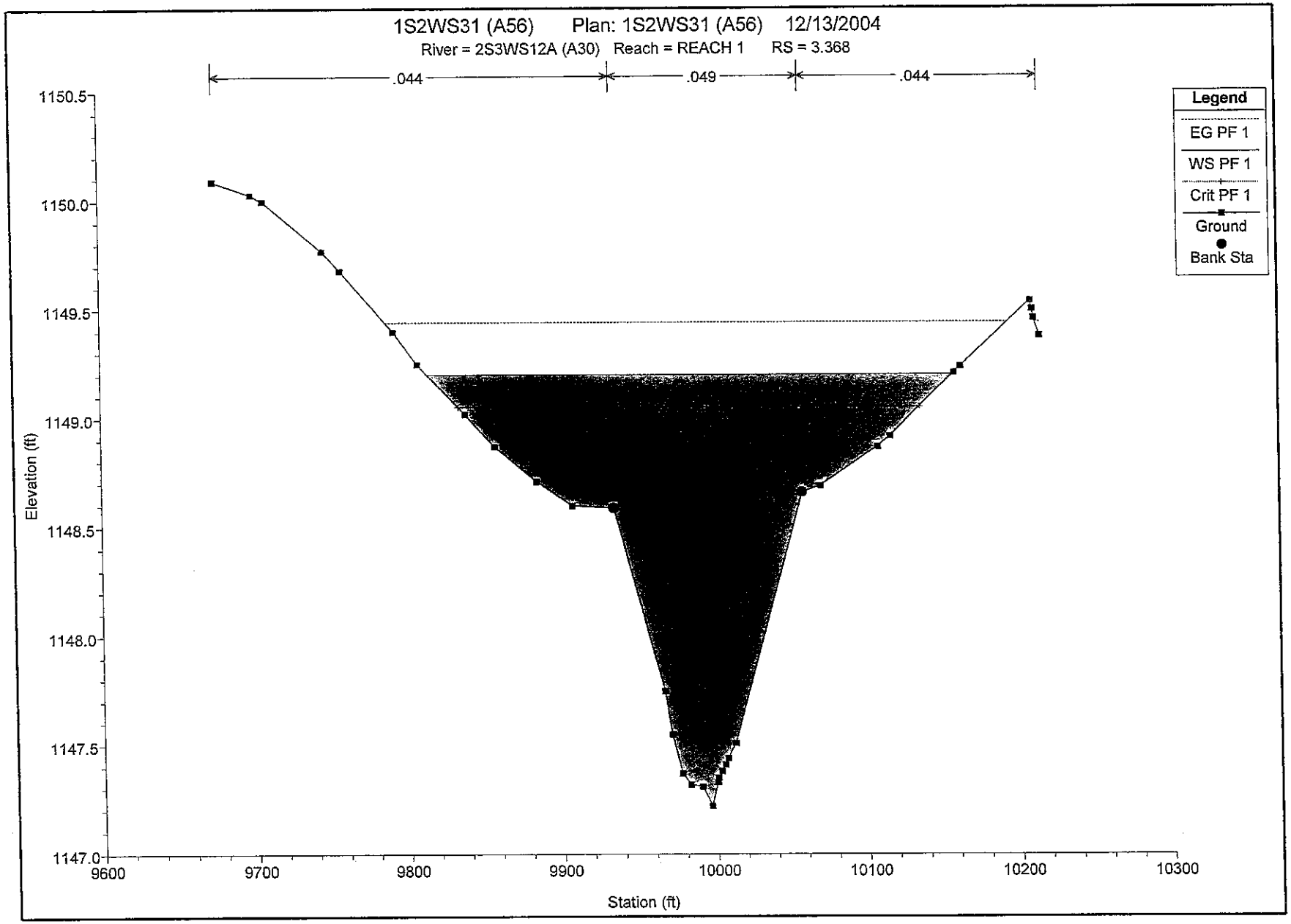

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 2.011
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1088
1087
1086
1085
1084
1083
1082
9400
9600
9800
10000
10200
10400
Station (ft)

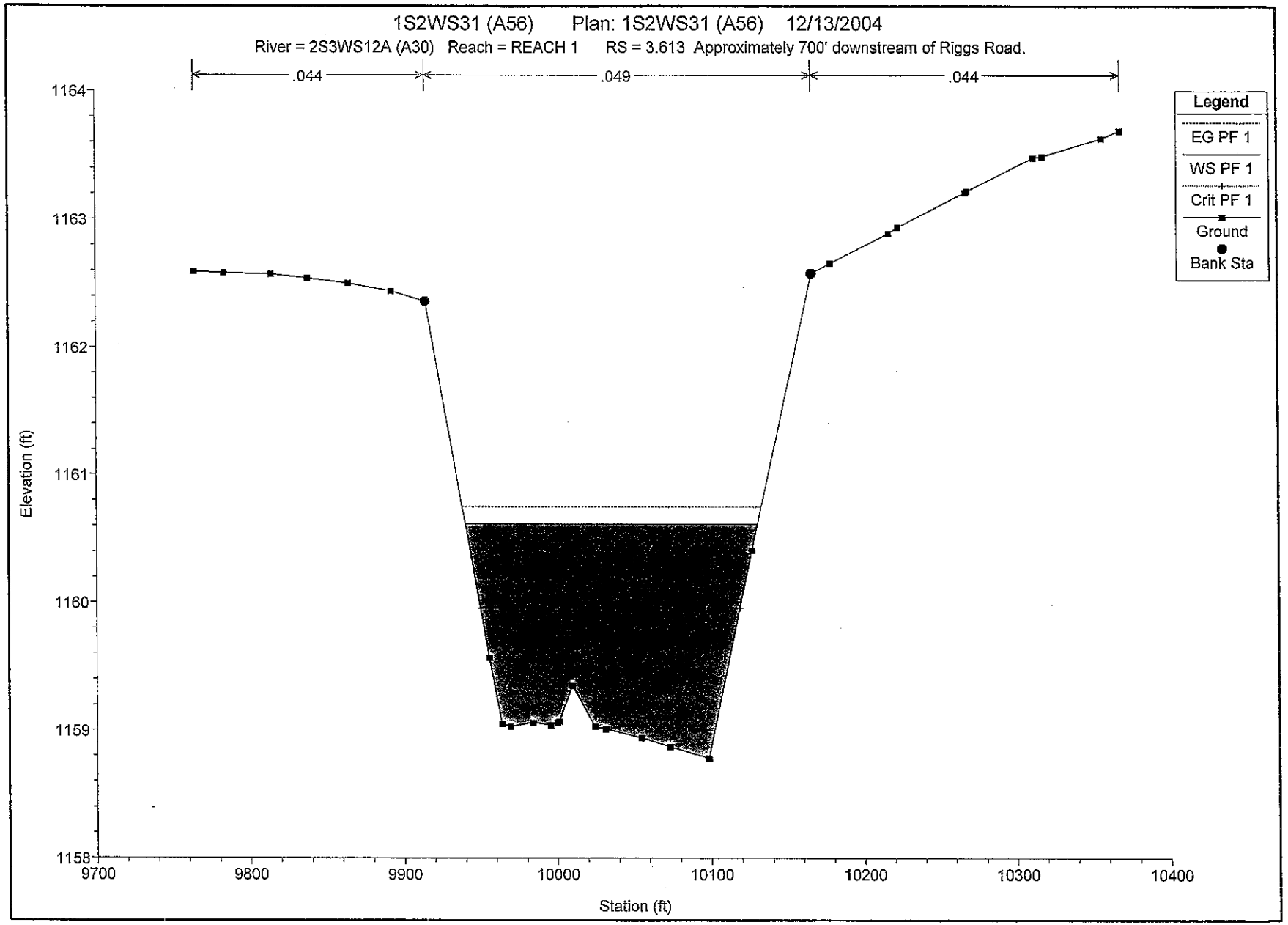

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 2.254
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1098
1097
1096
1095
1094
1093
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

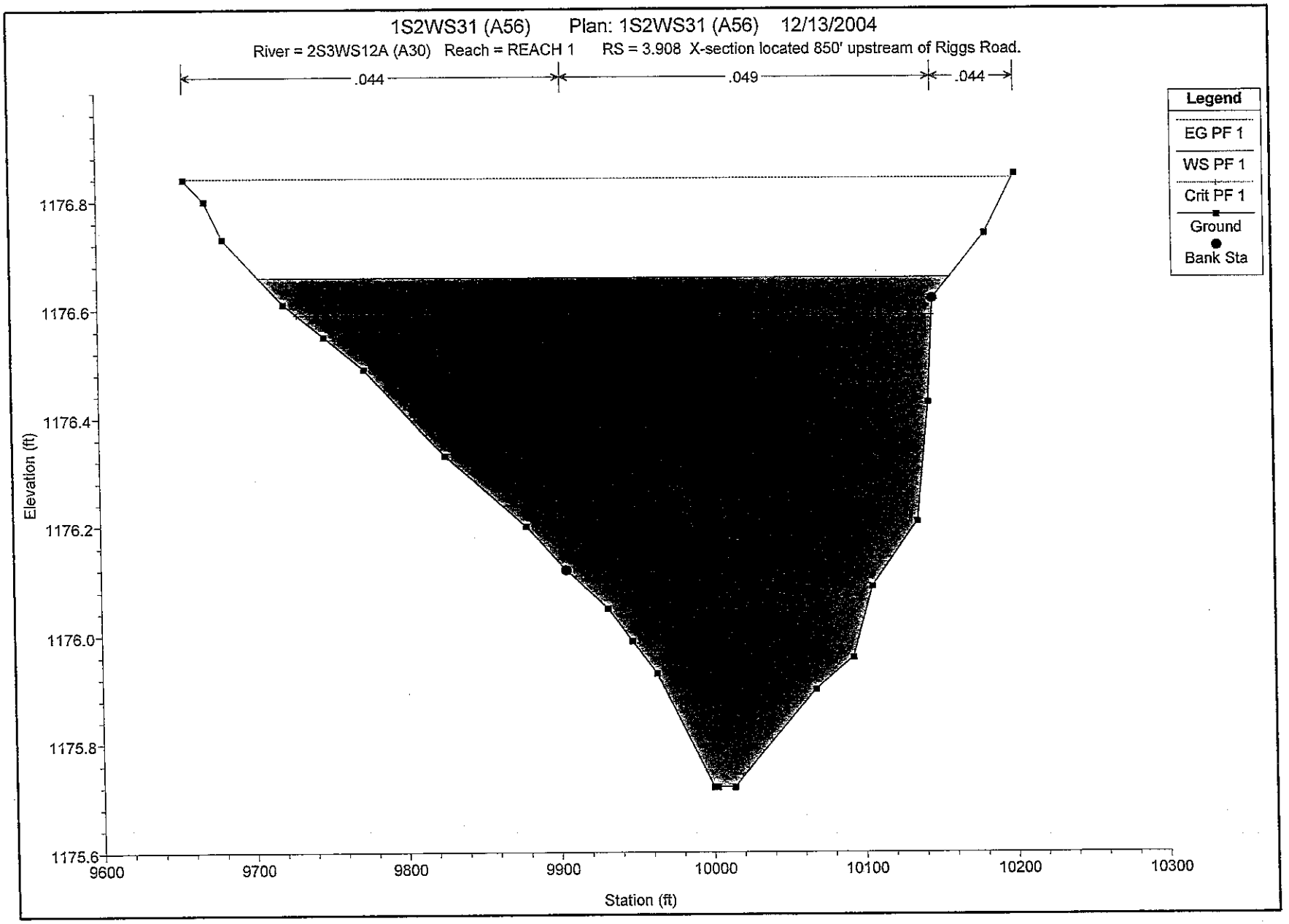

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 2.536
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1111
1110
1109
1108
1107
1106
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

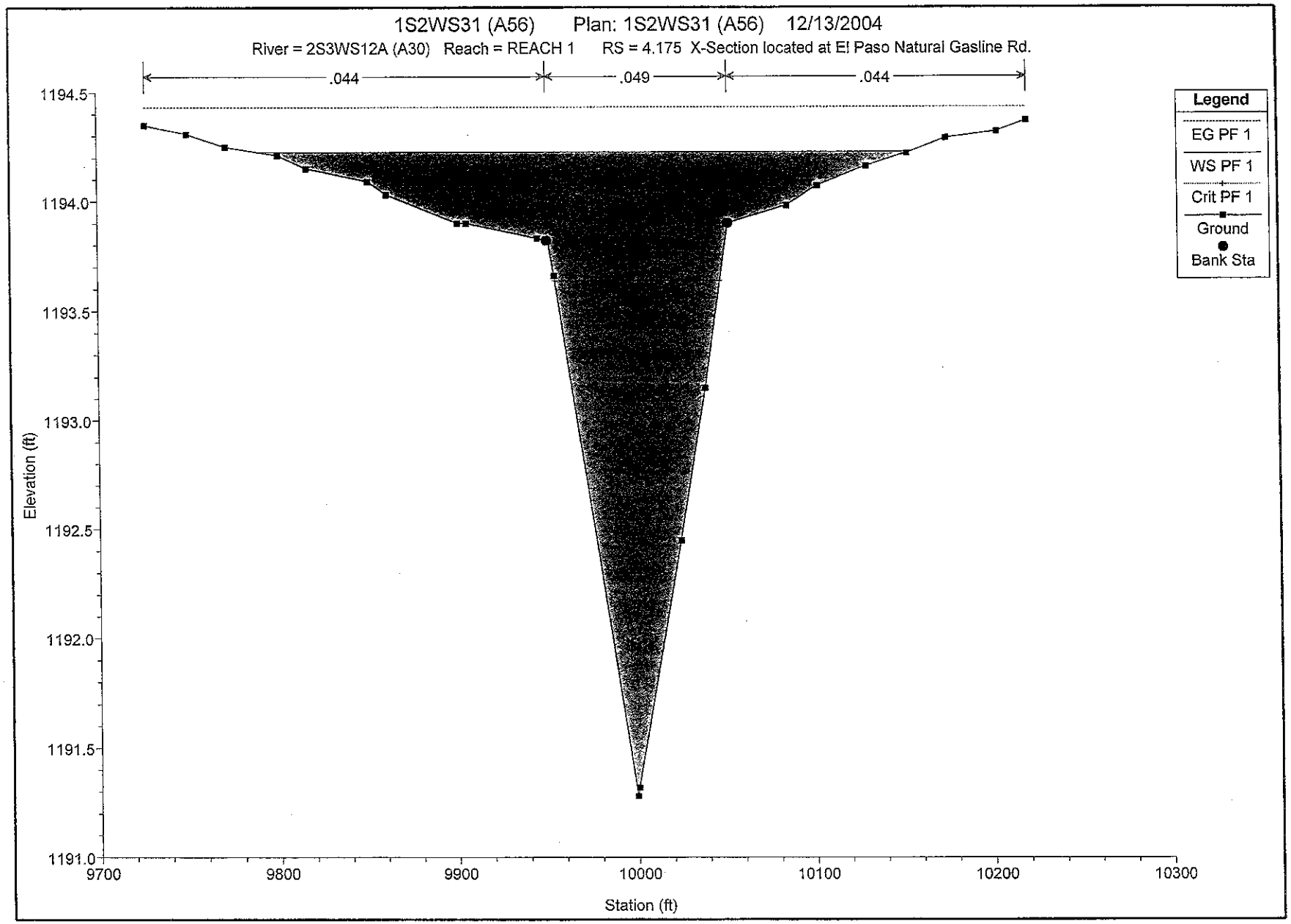

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 2.811
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1123.0
1122.5
1122.0
1121.5
1121.0
1120.5
1120.0
1119.5
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 3.116
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1137.5
1137.0
1136.5
1136.0
1135.5
1135.0
1134.5
1134.0
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 3.368
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1150.5
1150.0
1149.5
1149.0
1148.5
1148.0
1147.5
1147.0
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 3.613 Approximately 700' downstream of Riggs Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1164
1163
1162
1161
1160
1159
1158
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 3.908 X-section located 850' upstream of Riggs Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1176.8
1176.6
1176.4
1176.2
1176.0
1175.8
1175.6
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12A (A30) Reach = REACH 1 RS = 4.175 X-Section located at El Paso Natural Gasline Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1194.5
1194.0
1193.5
1193.0
1192.5
1192.0
1191.5
1191.0
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS31 (A56)

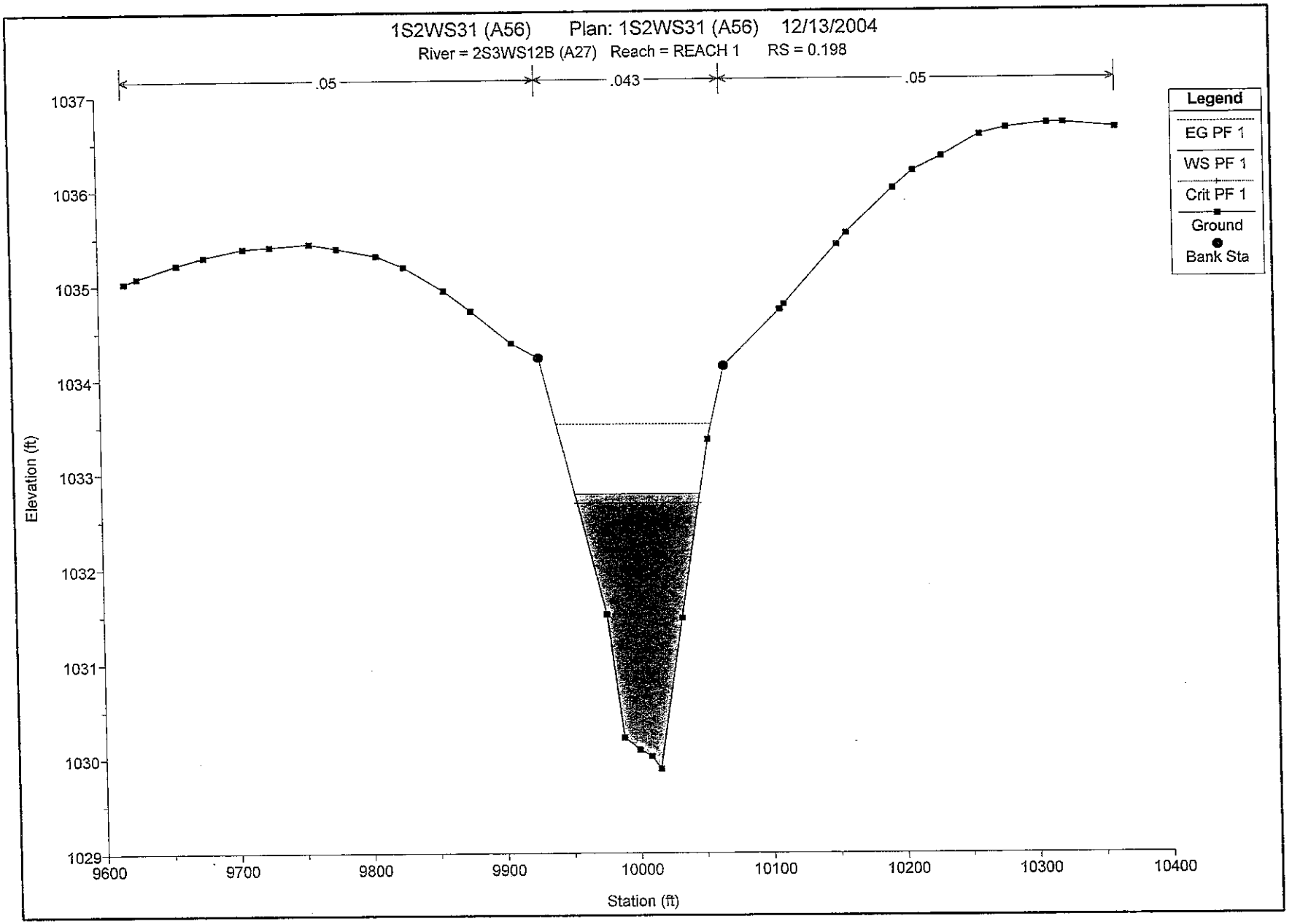
REACH: 2S3WS12B (A27)

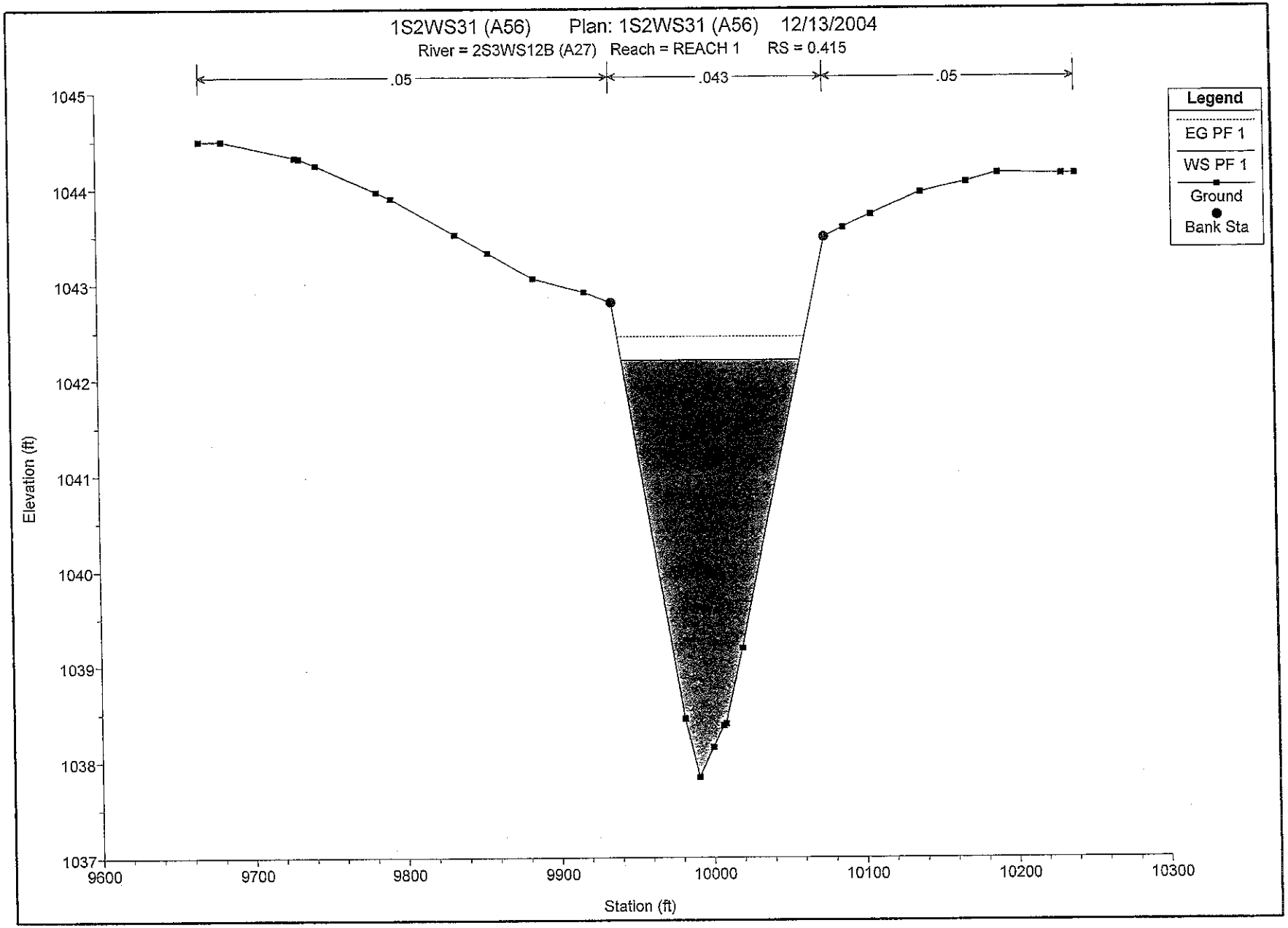
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

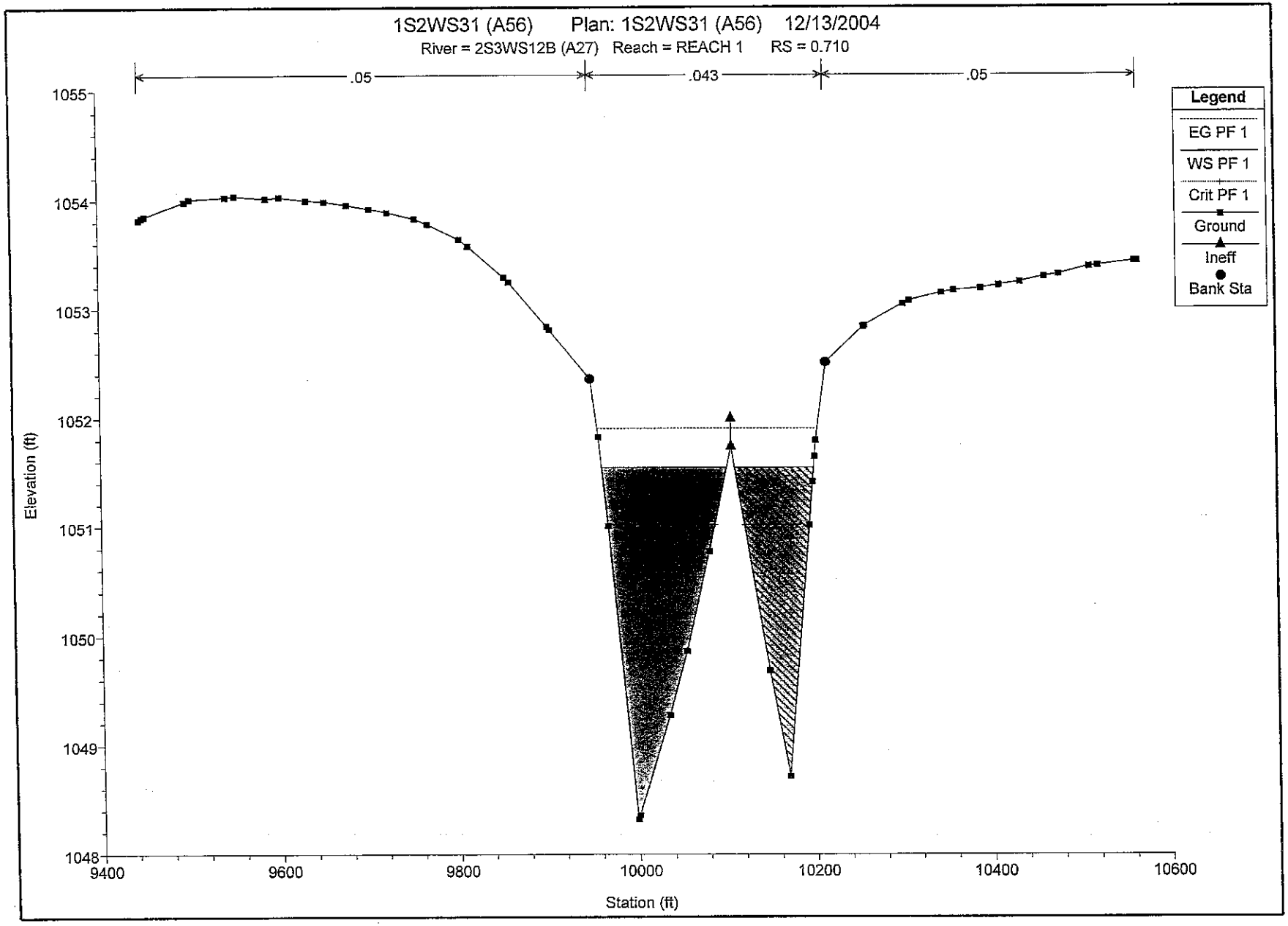
Change in Discharge based on Reach Length

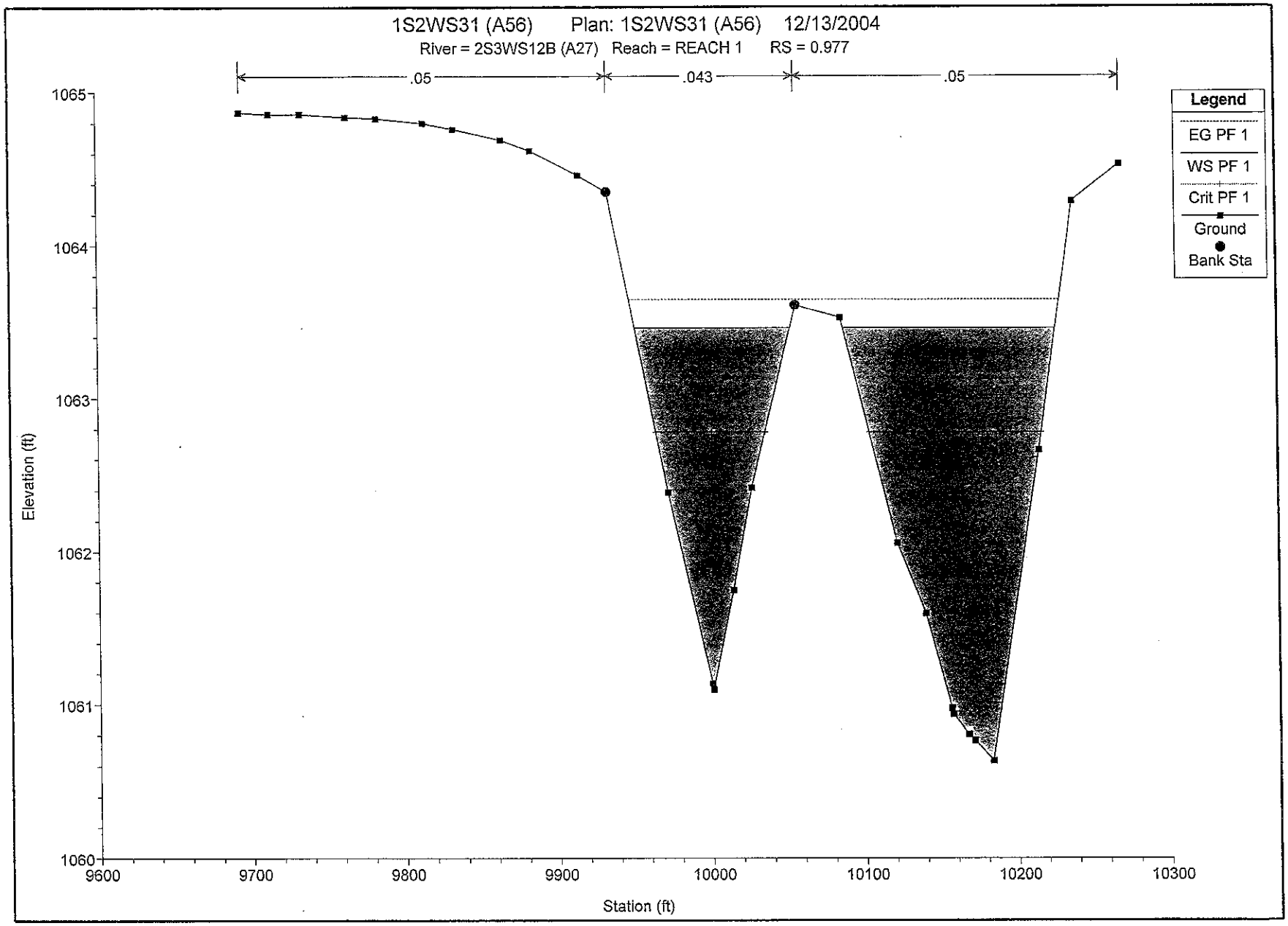
Wash ID: 2S3WS12B (A27)

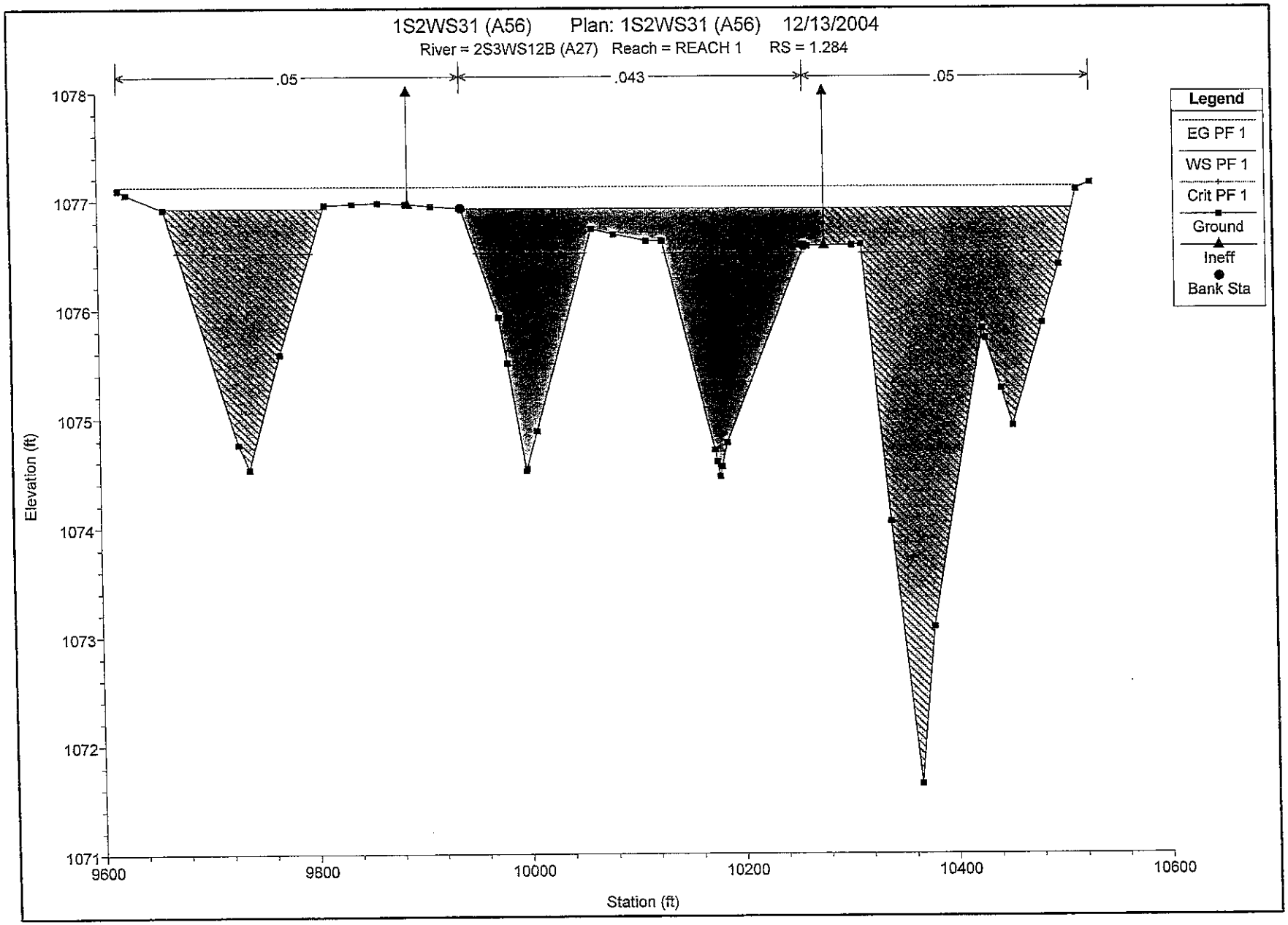
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPA05	3.291	1848	1850	1800
A26	3.045	1765	1760	1800
A26	2.781	1676	1680	1700
A26	2.544	1596	1600	1600
A26	2.288	1510	1510	1500
A26	2.026	1421	1420	1400
A26	1.772	1335	1340	1300
CPA26	1.516	1249	1250	1200
A27	1.261	1218	1220	1200
A27	0.973	1183	1180	1200
A27	0.712	1151	1150	1200
A27	0.415	1115	1120	1100
CPA27A	0.198	1089	1090	1100

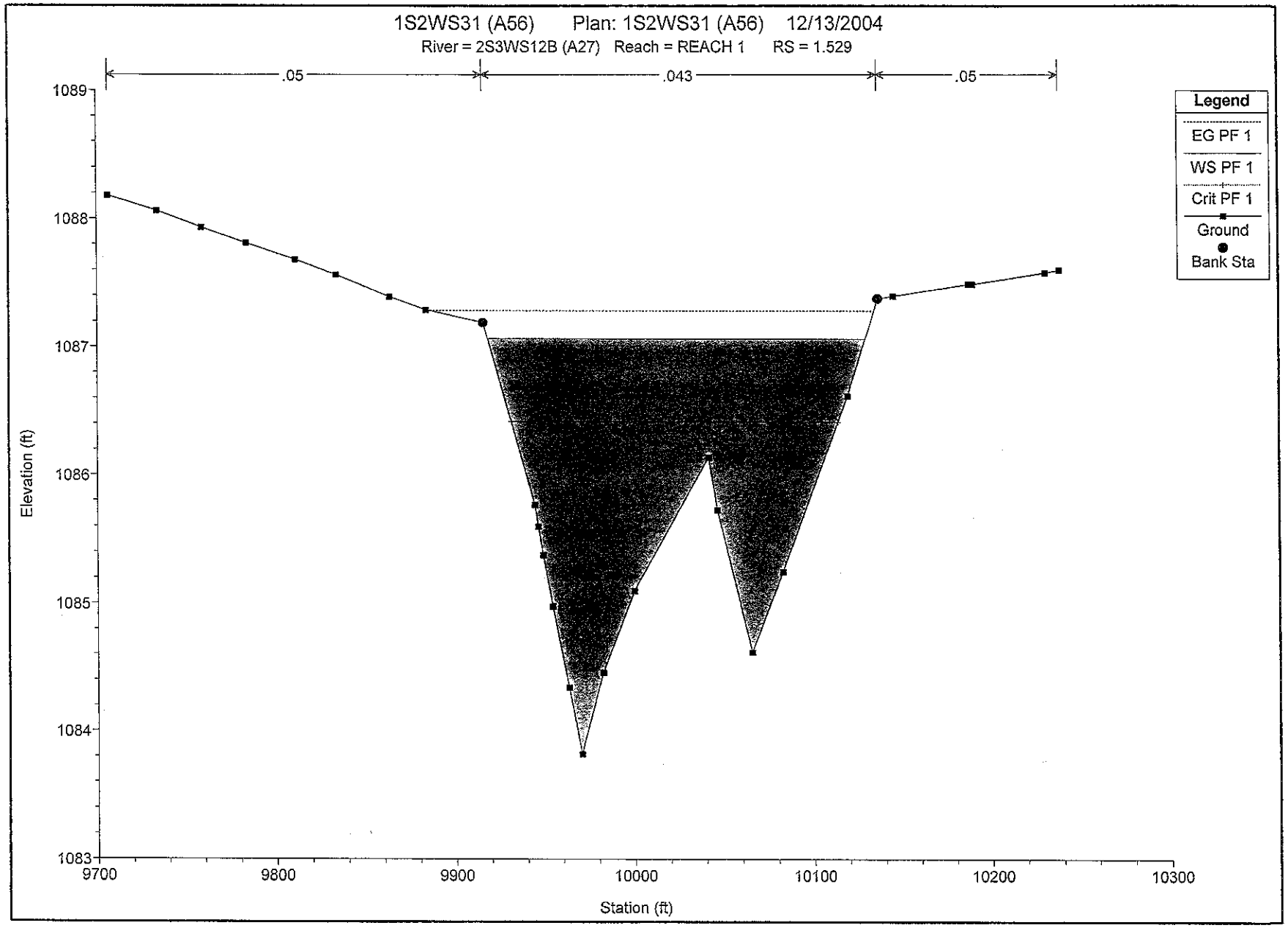

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 0.198
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1037
1036
1035
1034
1033
1032
1031
1030
1029
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

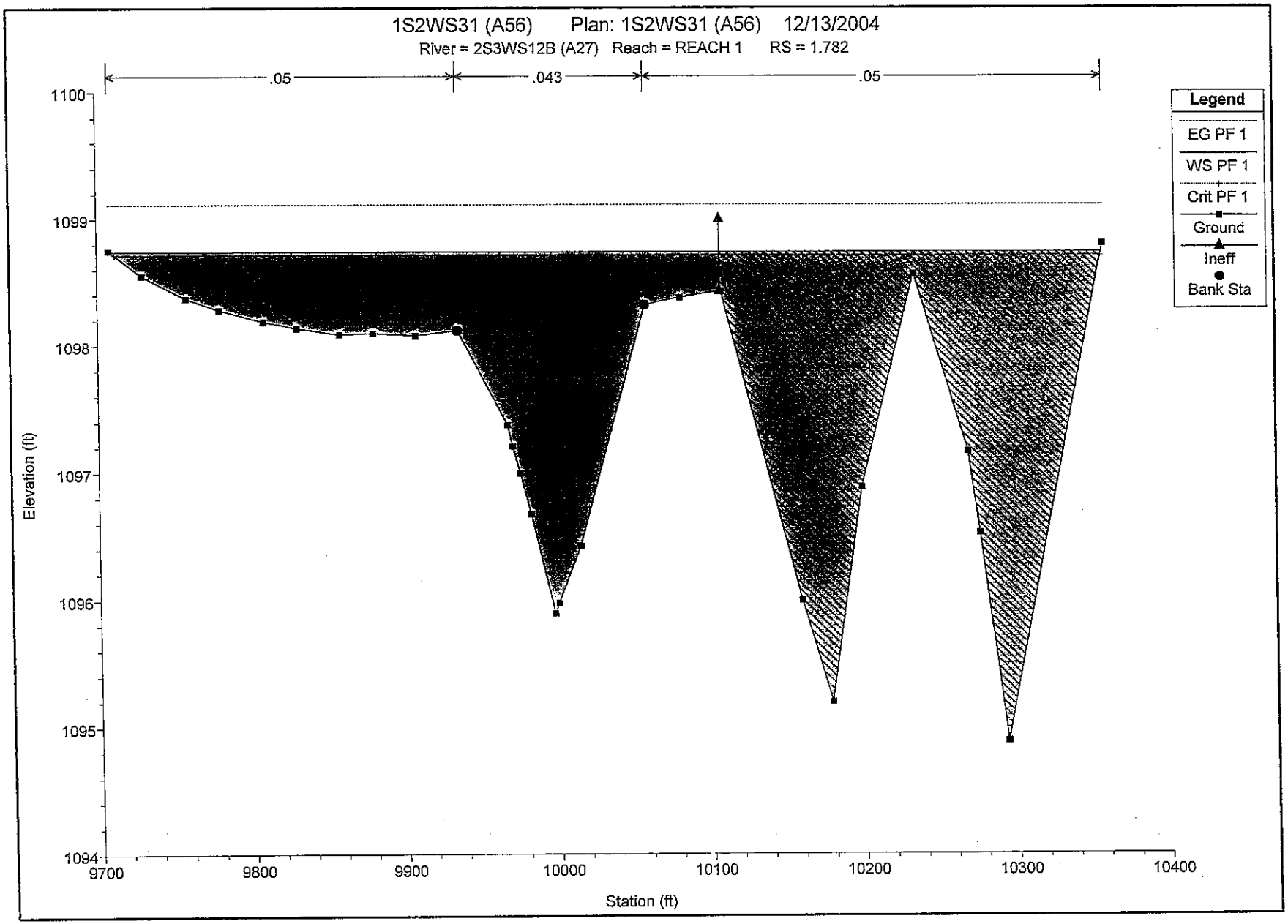

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 0.415
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1045
1044
1043
1042
1041
1040
1039
1038
1037
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

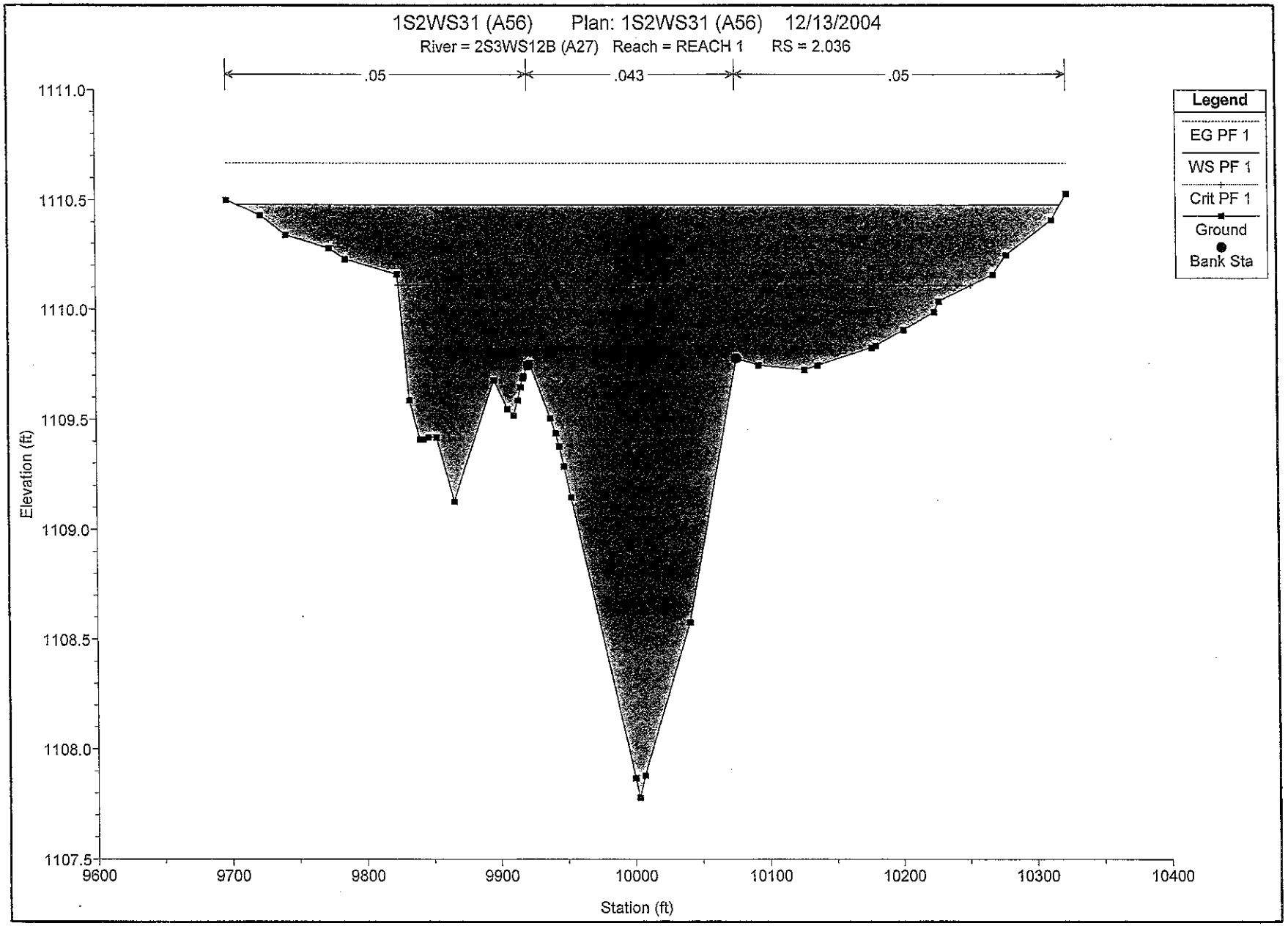

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 0.710
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1055
1054
1053
1052
1051
1050
1049
1048
9400
9600
9800
10000
10200
10400
10600
Station (ft)

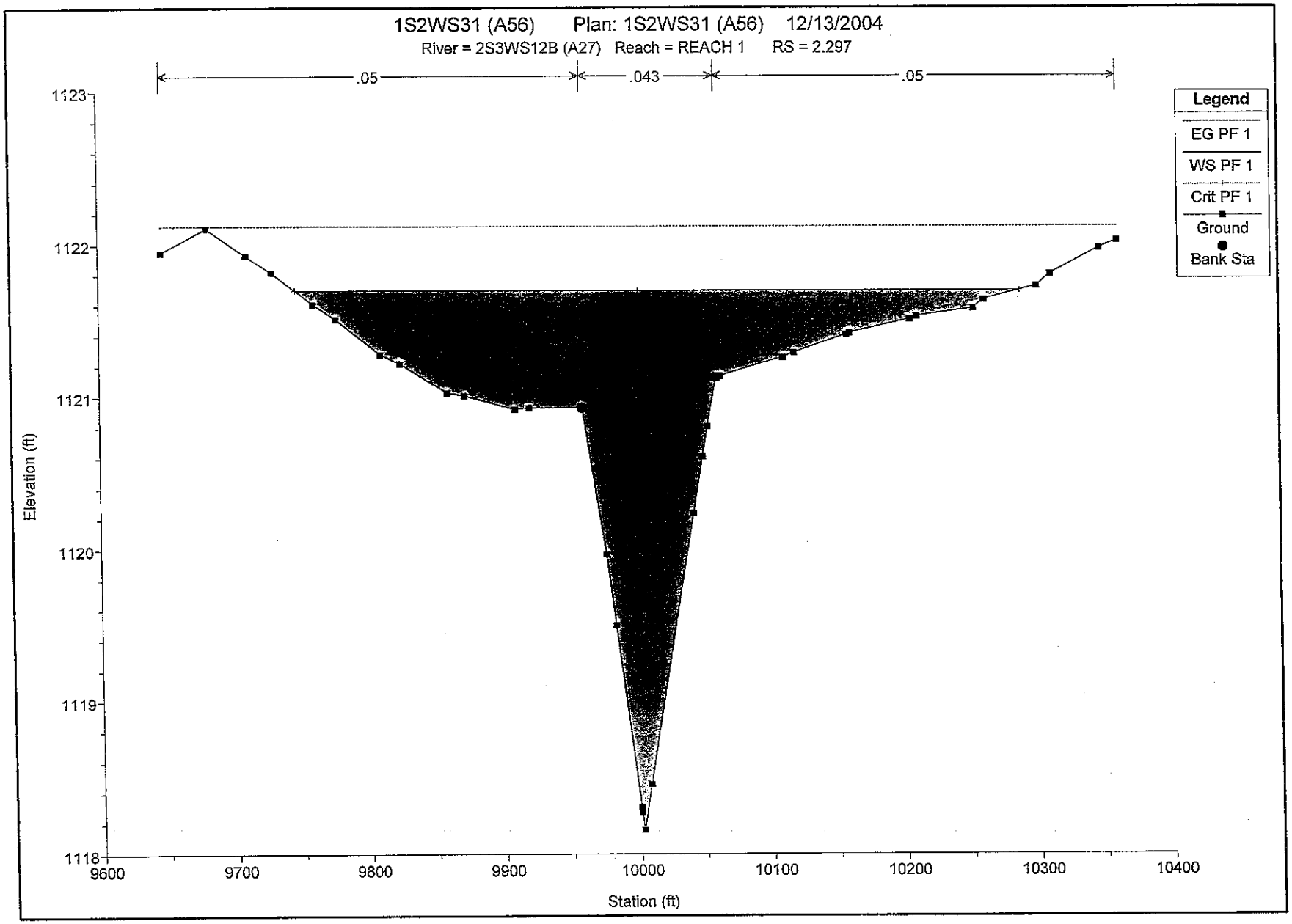

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 0.977
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1065
1064
1063
1062
1061
1060
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

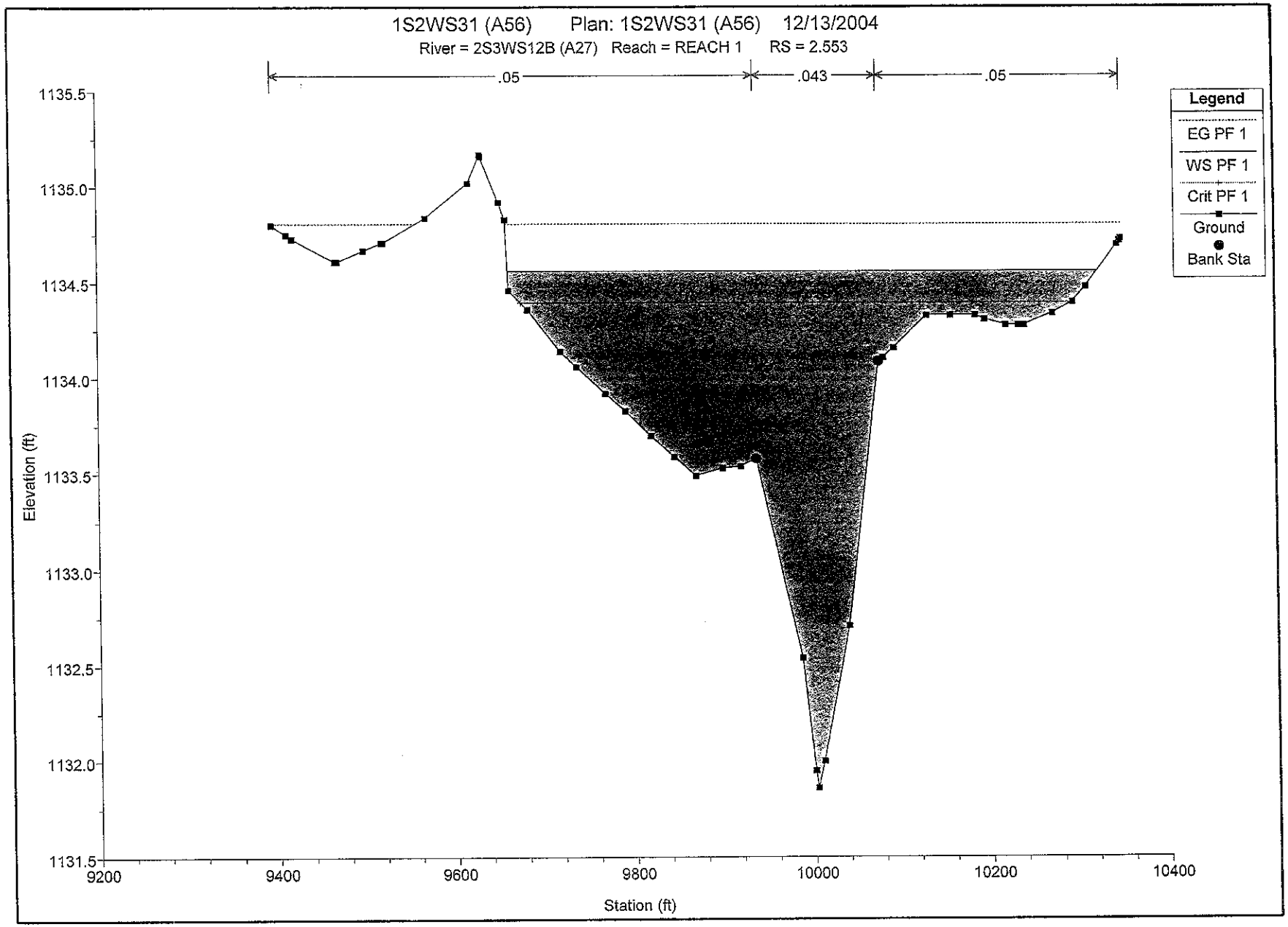

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 1.284
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1078
1077
1076
1075
1074
1073
1072
1071
9600
9800
10000
10200
10400
10600
Station (ft)

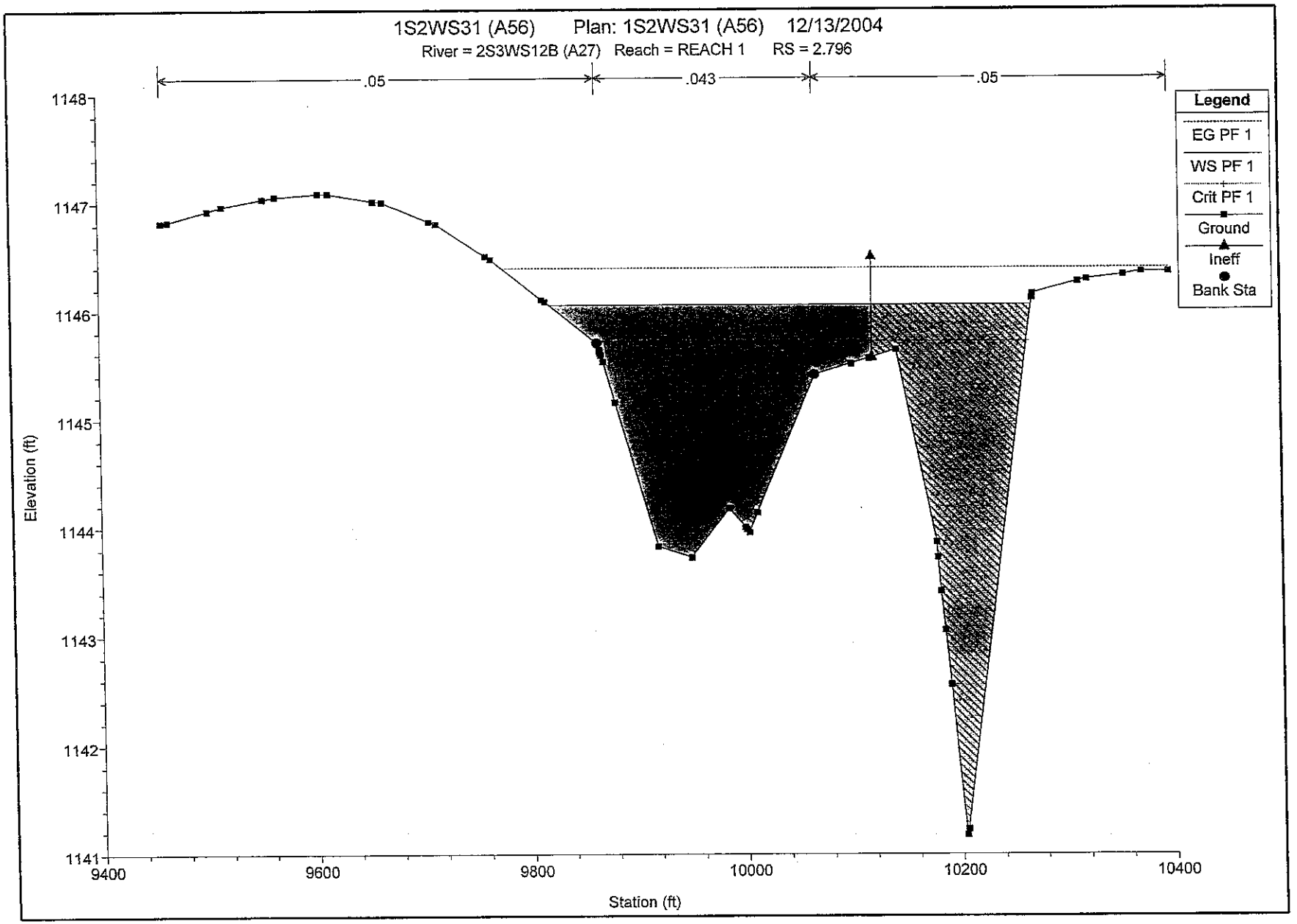

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 1.529
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1089
1088
1087
1086
1085
1084
1083
9700
9800
9900
10000
10100
10200
10300
Station (ft)

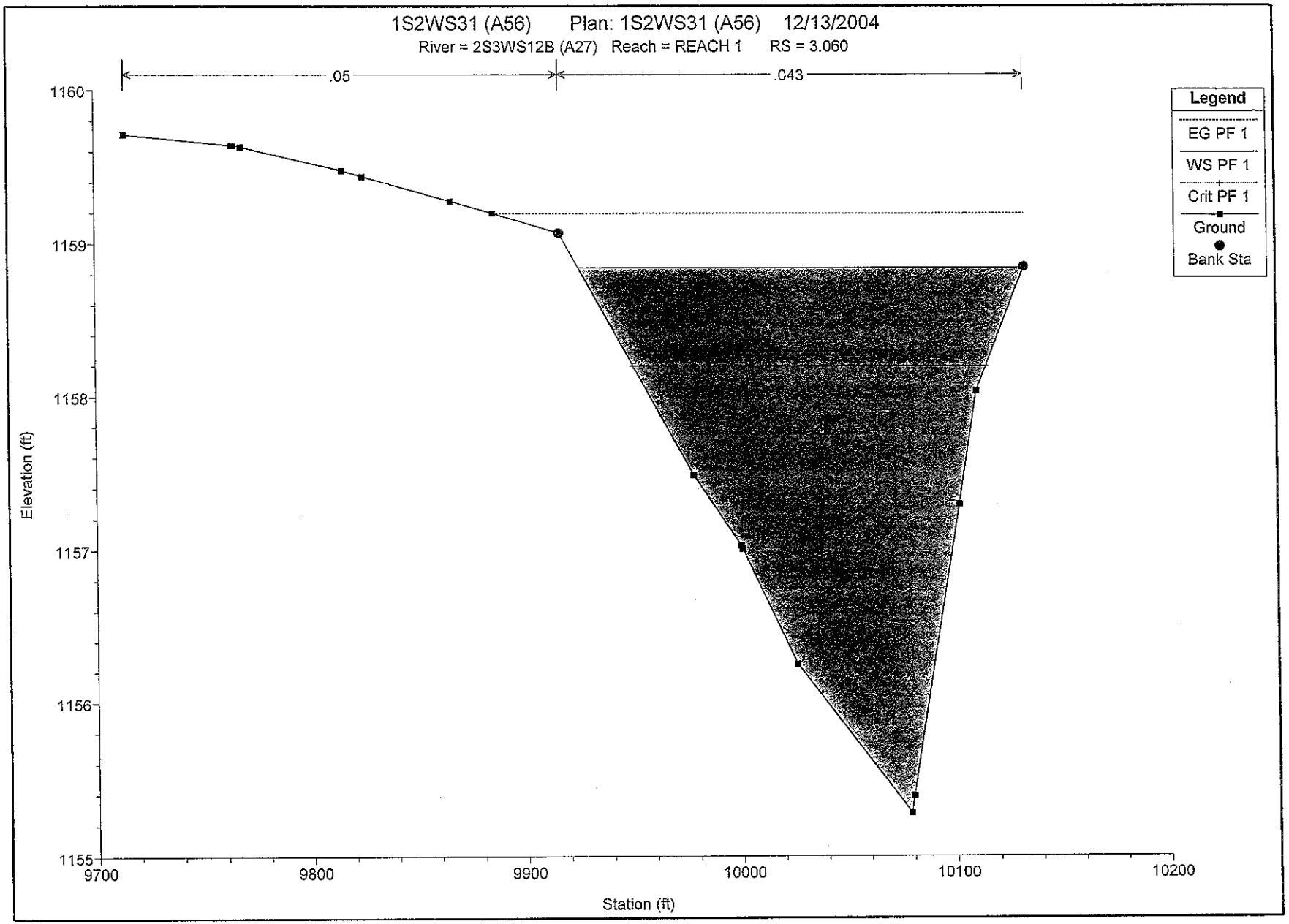

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 1.782
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1100
1099
1098
1097
1096
1095
1094
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

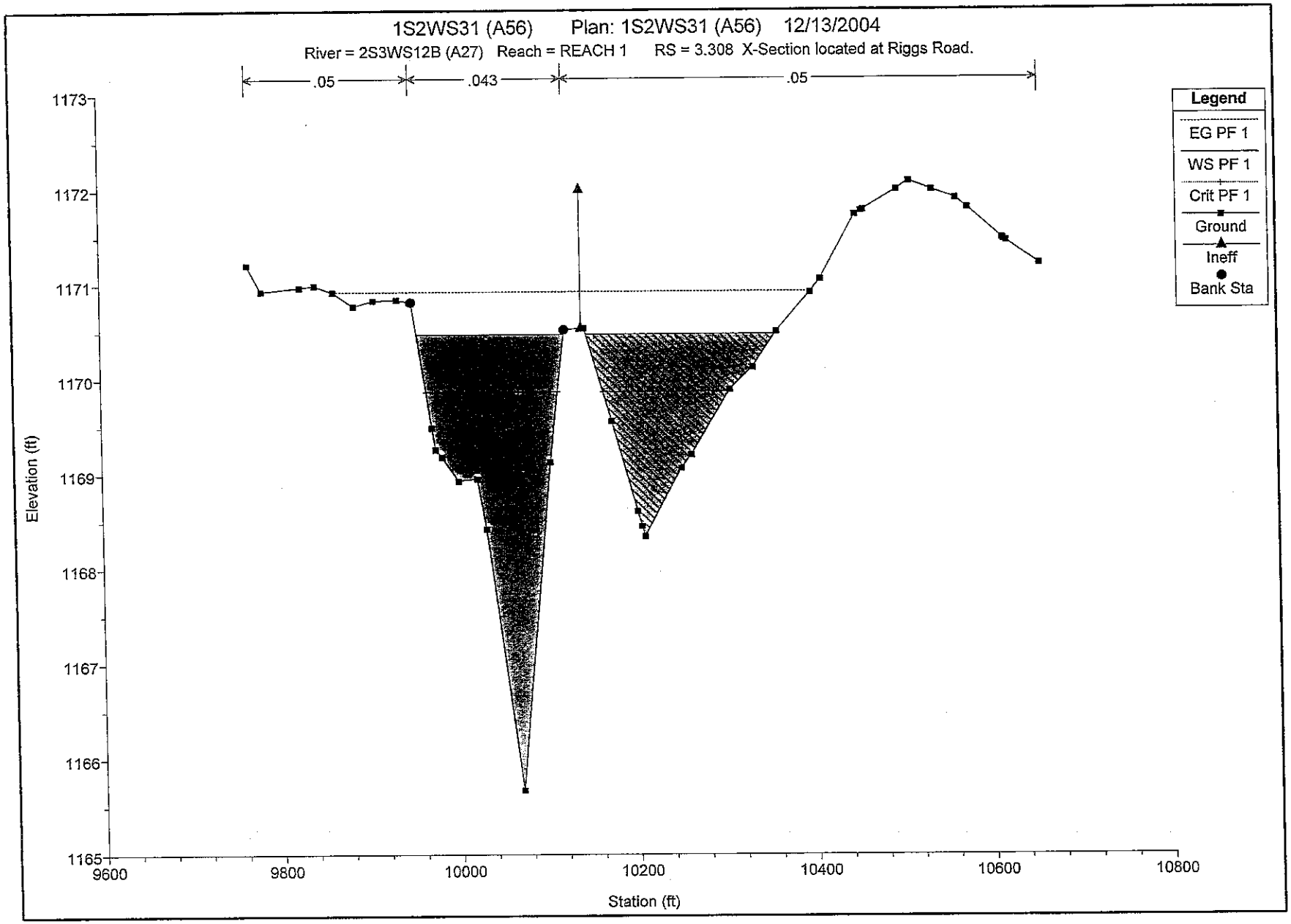

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 2.036
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1111.0
1110.5
1110.0
1109.5
1109.0
1108.5
1108.0
1107.5
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 2.297
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1123
1122
1121
1120
1119
1118
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 2.553
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1135.5
1135.0
1134.5
1134.0
1133.5
1133.0
1132.5
1132.0
1131.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 2.796
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1148
1147
1146
1145
1144
1143
1142
1141
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 3.060
.05
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1160
1159
1158
1157
1156
1155
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS12B (A27) Reach = REACH 1 RS = 3.308 X-Section located at Riggs Road.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1173
1172
1171
1170
1169
1168
1167
1166
1165
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S2WS7C (A32)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

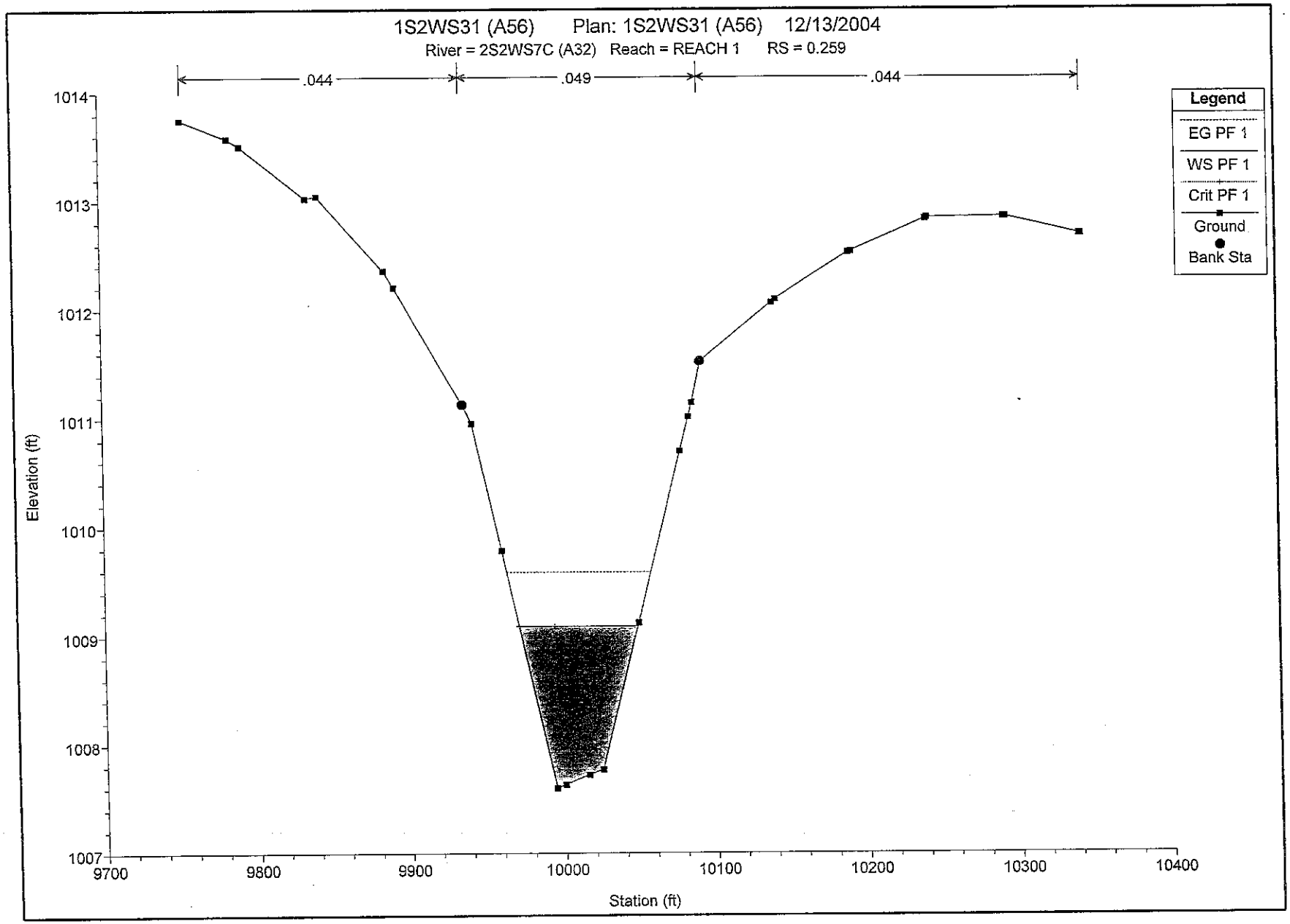
Change in Discharge based on Reach Length

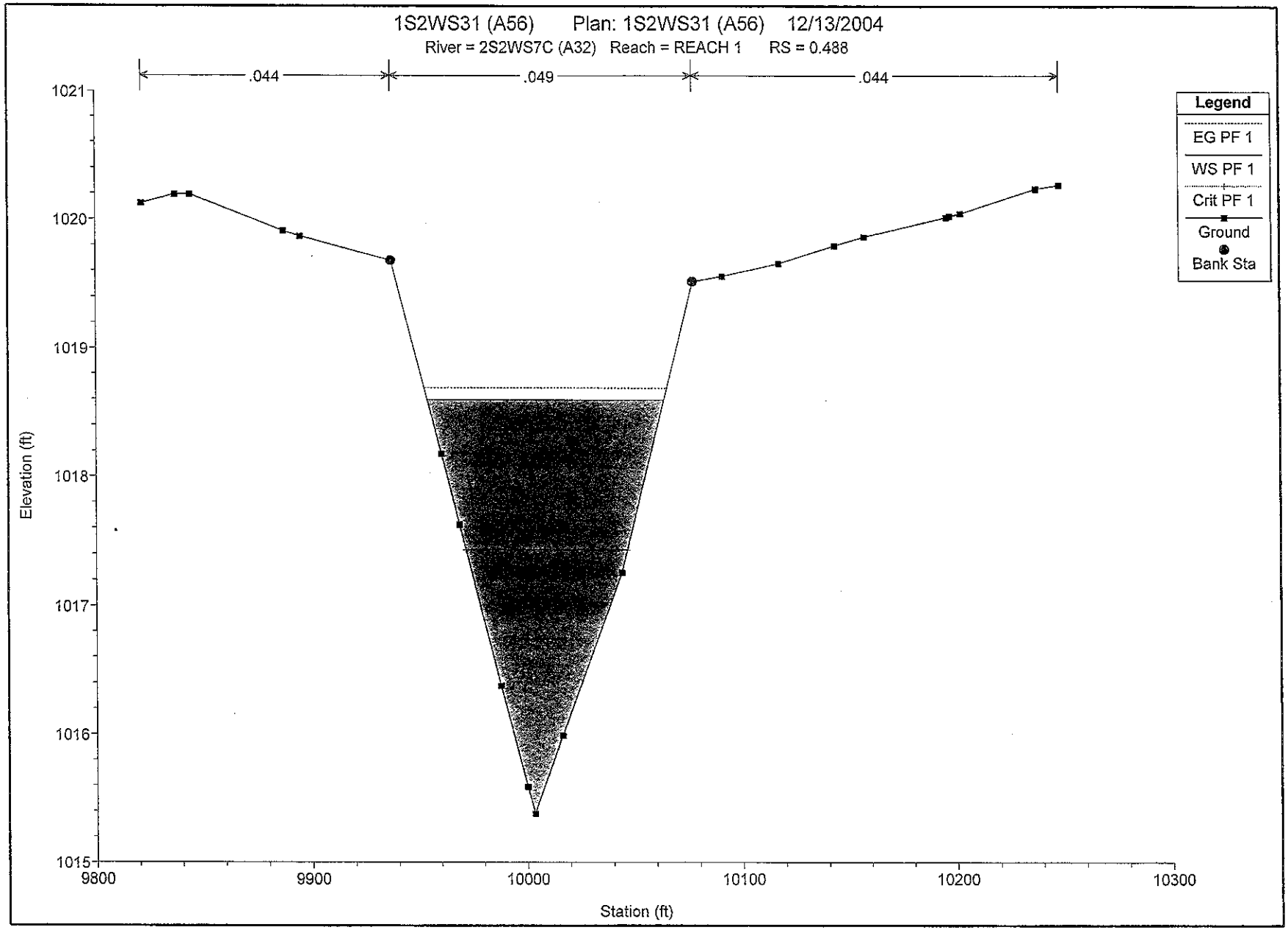
Wash ID: 2S2WS7C (A32)

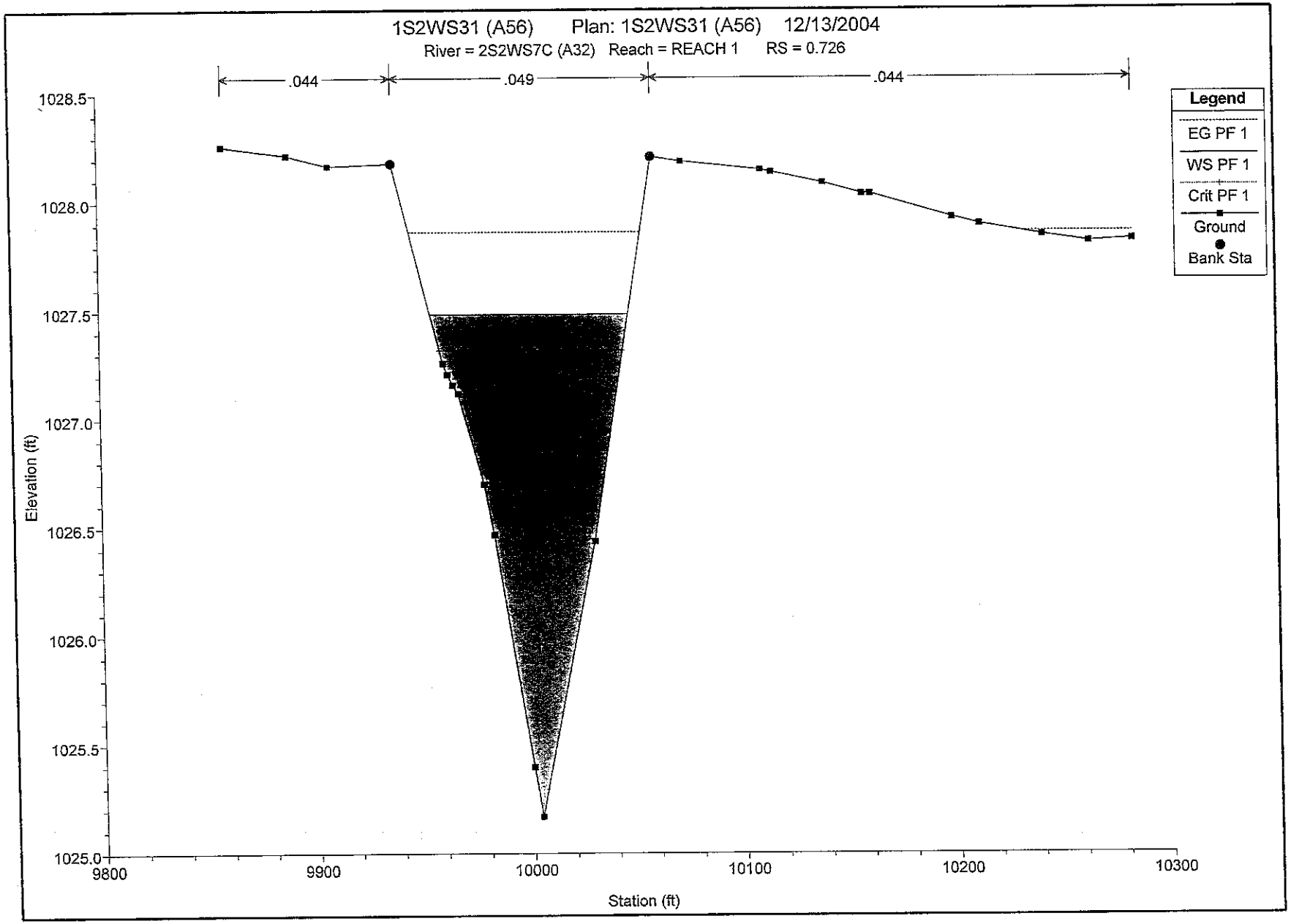
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
A32	1.475	602	600	600
A32	1.226	567	570	600
A32	0.964	529	530	500
A32	0.726	495	500	500
A32	0.488	462	460	500
A32	0.259	429	430	400

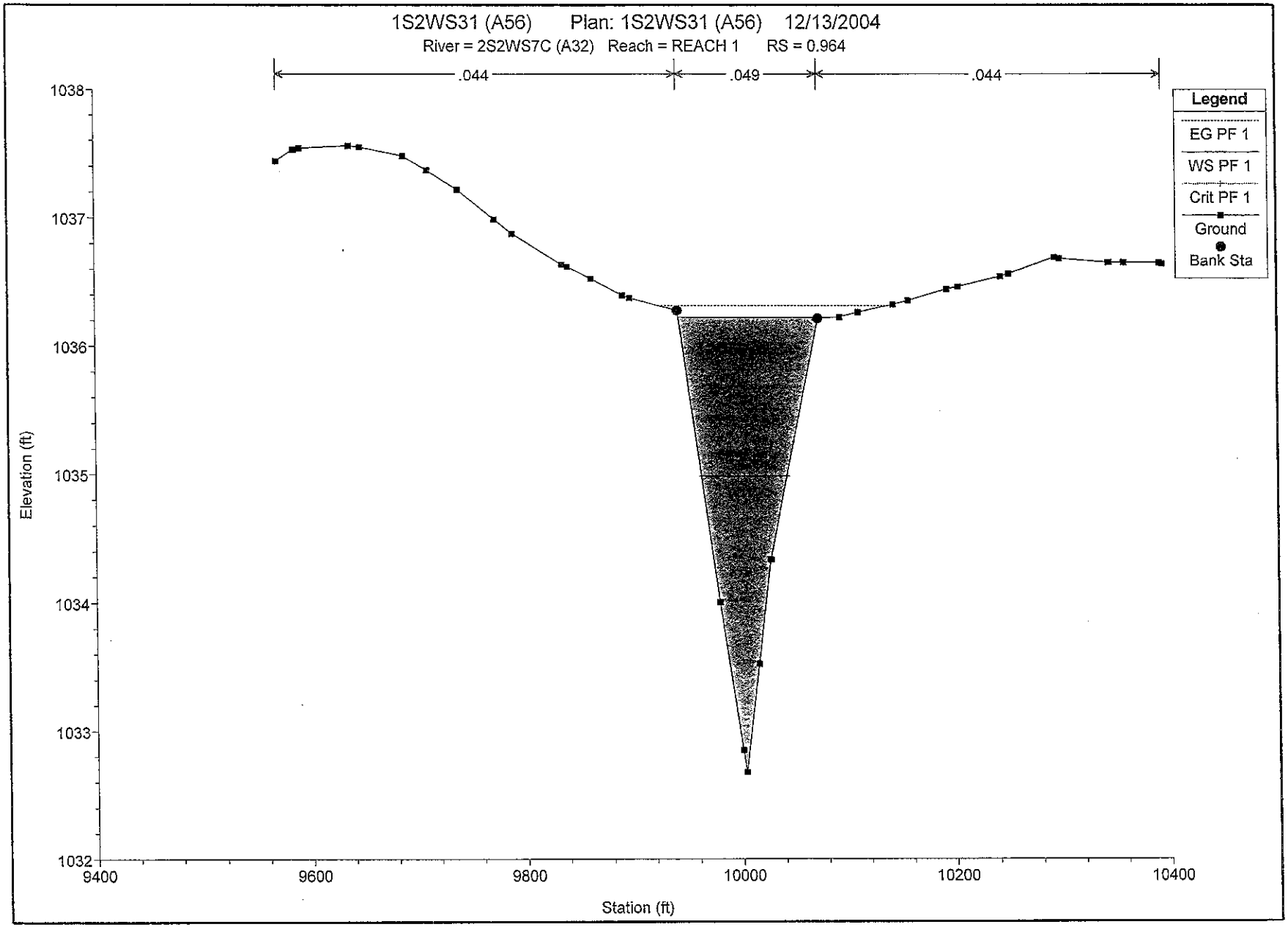
Notes:

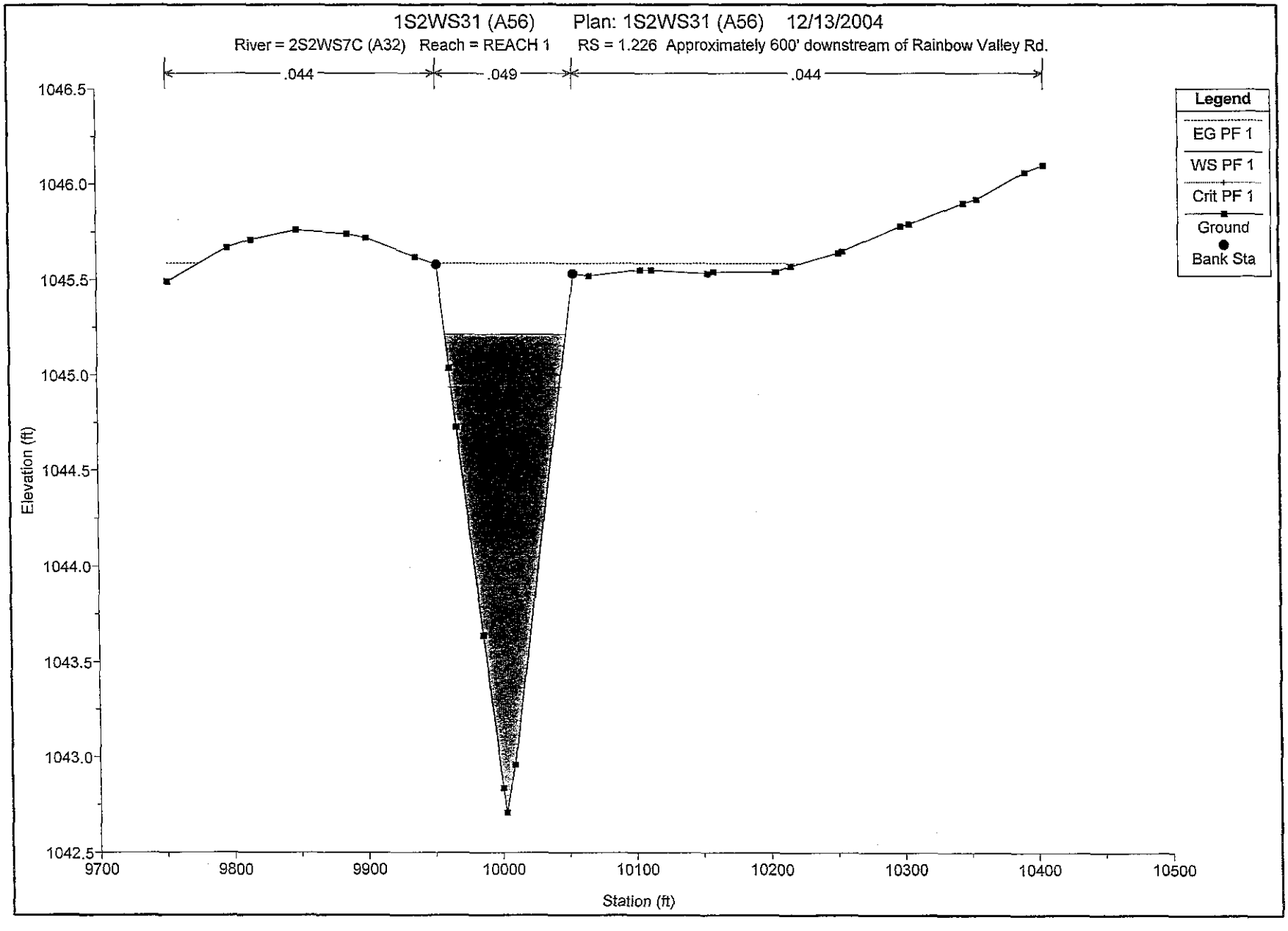
1. Q at X-section 0.259 is the routed flow from CPA31 prior to combining with local inflow and other routed flows at CPA32

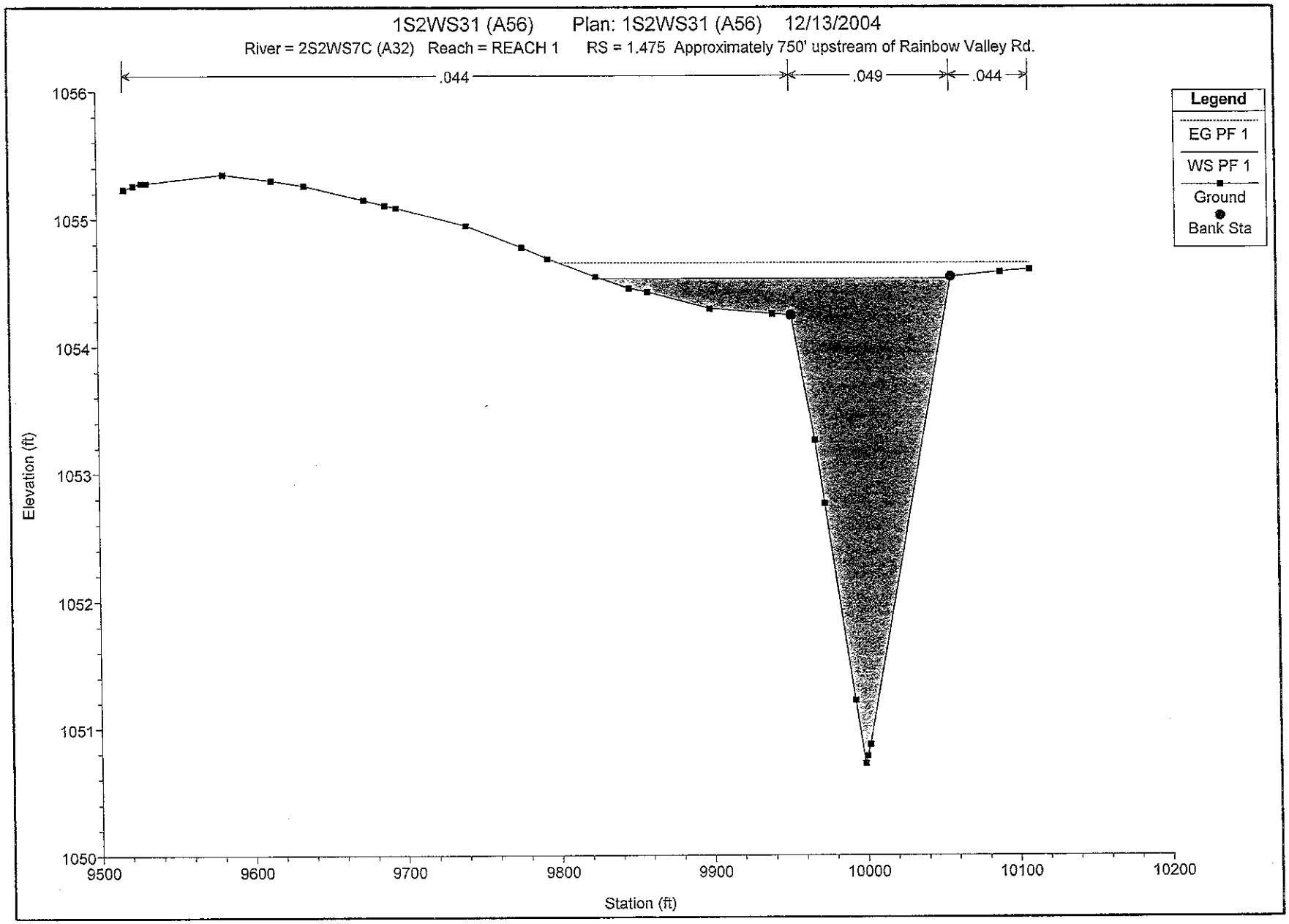

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7C (A32) Reach = REACH 1 RS = 0.259
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1014
1013
1012
1011
1010
1009
1008
1007
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7C (A32) Reach = REACH 1 RS = 0.488
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1021
1020
1019
1018
1017
1016
1015
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7C (A32) Reach = REACH 1 RS = 0.726
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1028.5
1028.0
1027.5
1027.0
1026.5
1026.0
1025.5
1025.0
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7C (A32) Reach = REACH 1 RS = 0.964
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1038
1037
1036
1035
1034
1033
1032
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7C (A32) Reach = REACH 1 RS = 1.226 Approximately 600' downstream of Rainbow Valley Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1046.5
1046.0
1045.5
1045.0
1044.5
1044.0
1043.5
1043.0
1042.5
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7C (A32) Reach = REACH 1 RS = 1.475 Approximately 750' upstream of Rainbow Valley Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1056
1055
1054
1053
1052
1051
1050
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S2WS7A (A52)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 2S2WS7A (A52)

Subbasin: A08

Total Discharge (cfs) = 1272

Total Area (acres) = 1355

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
5.072	69	5.1	60
4.830	95	7.0	90
4.586	131	9.7	120
4.400	1355	100.0	1270

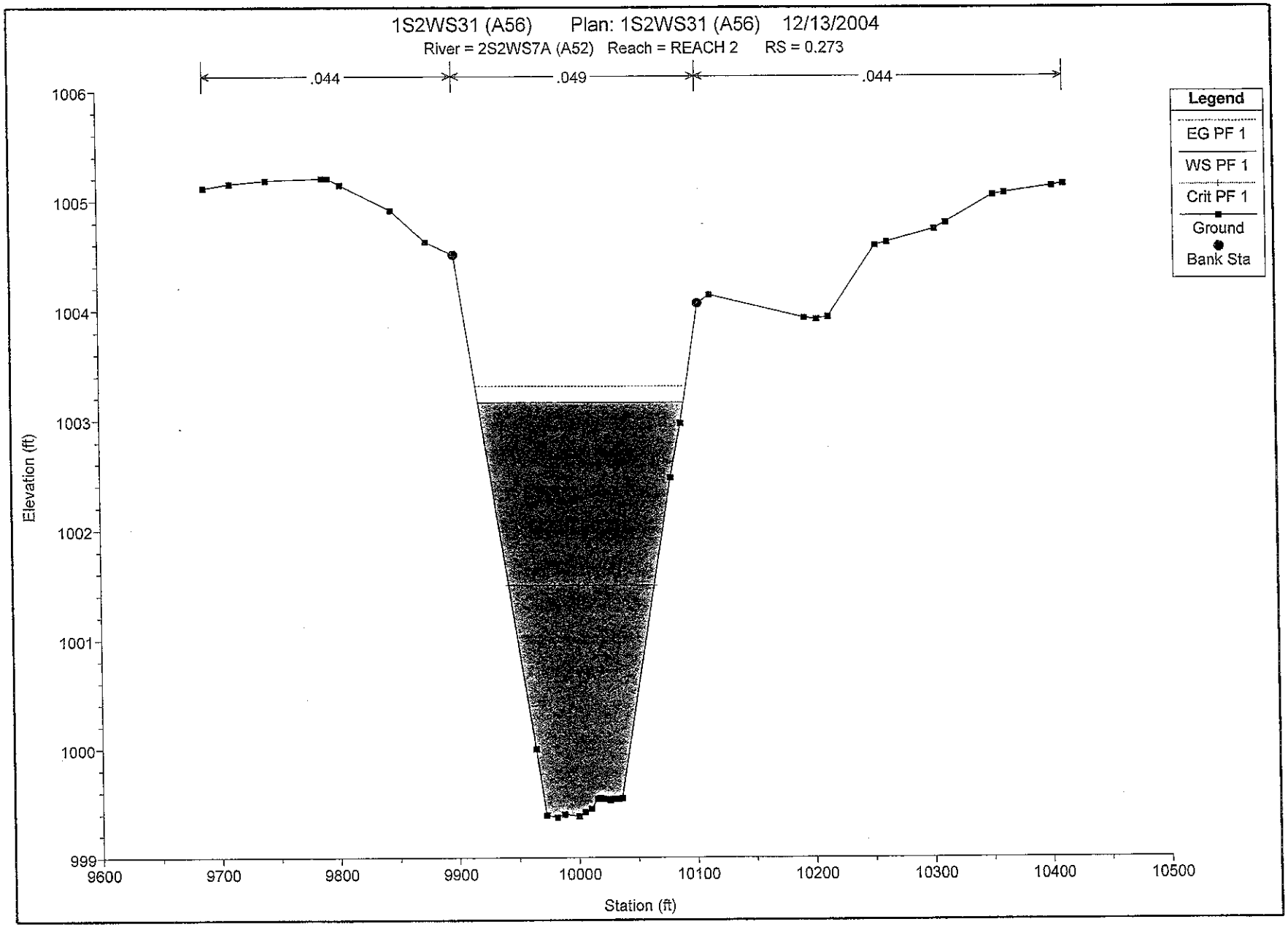
plus diversion from A09

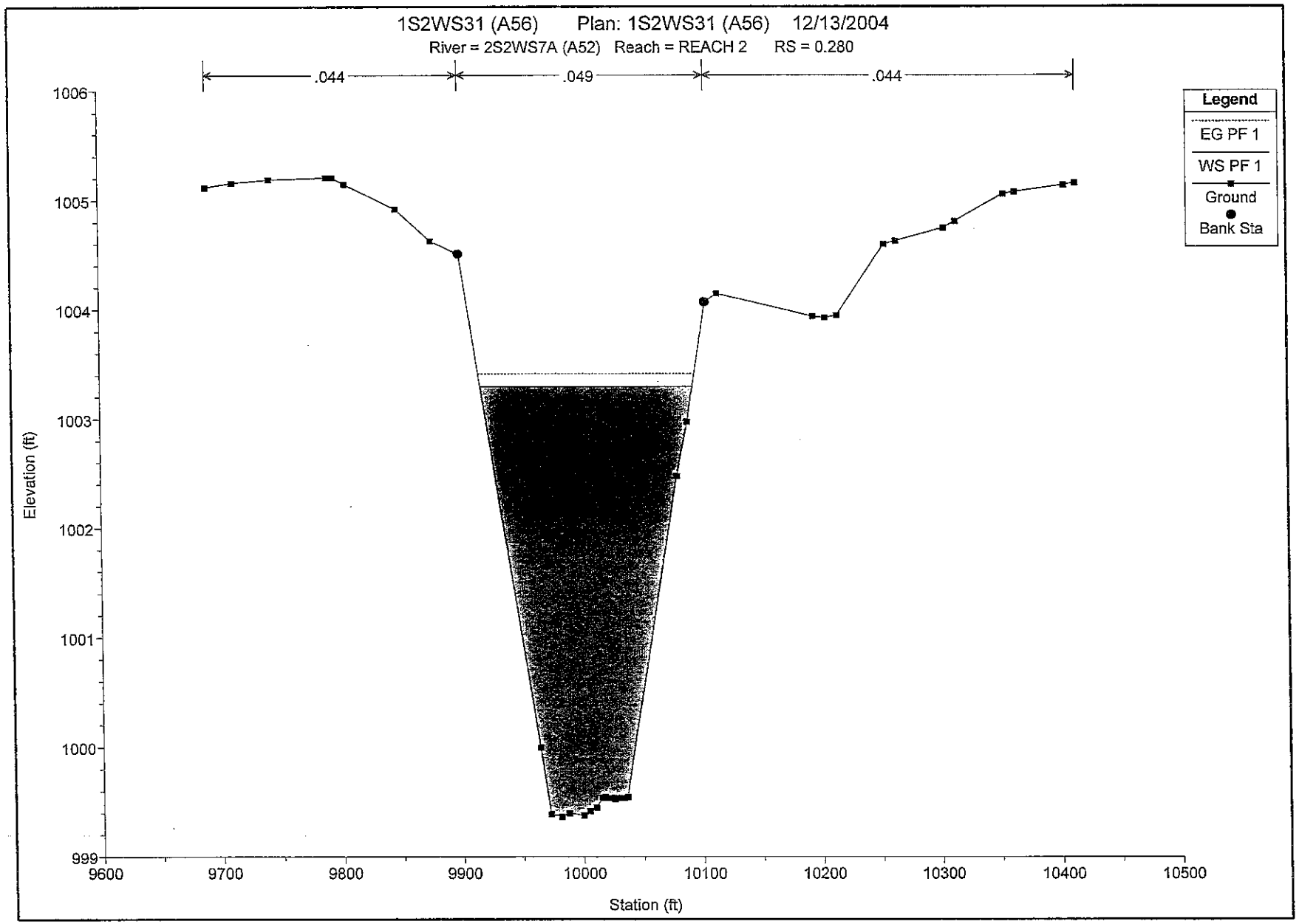
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

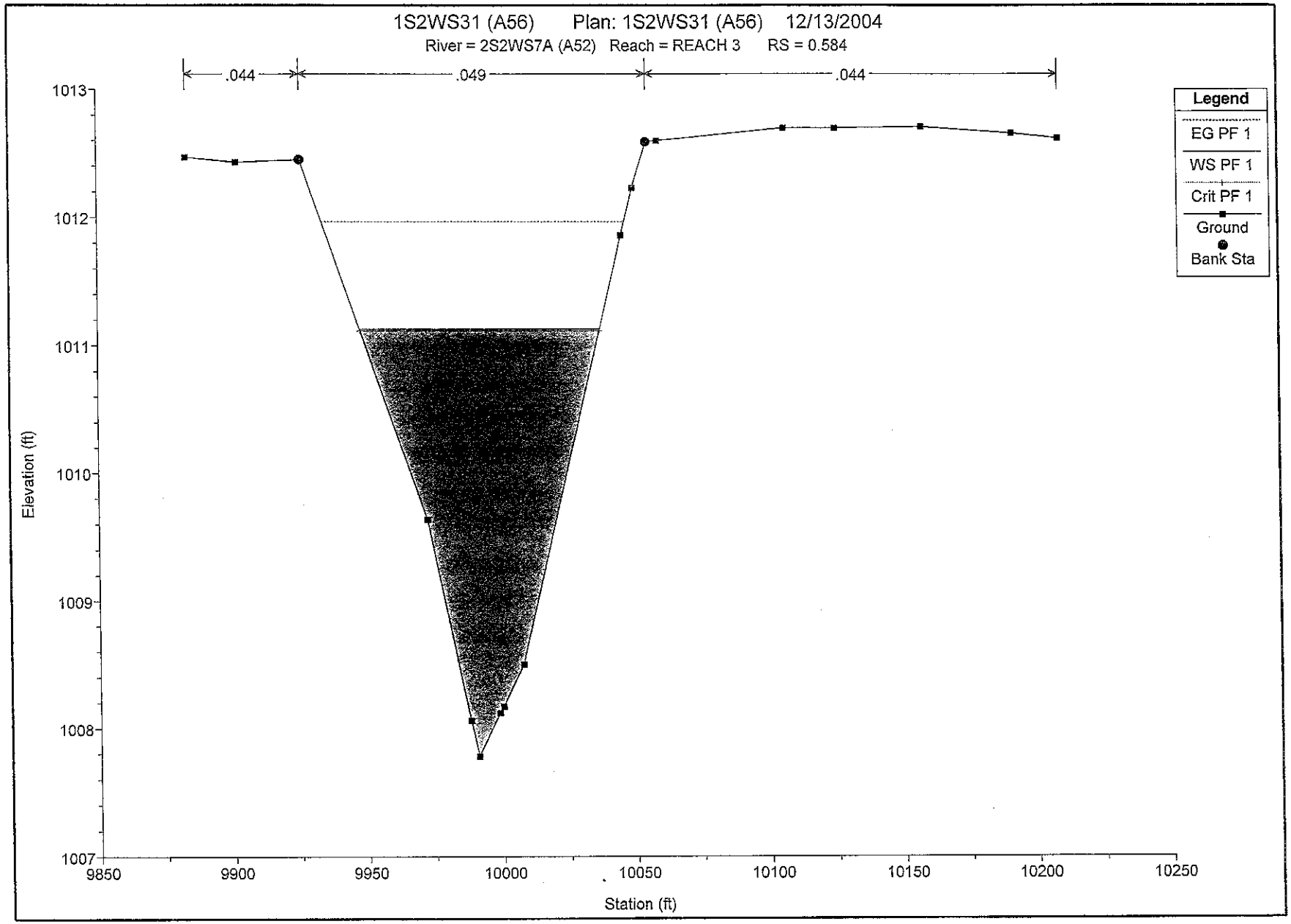
Change in Discharge based on Reach Length

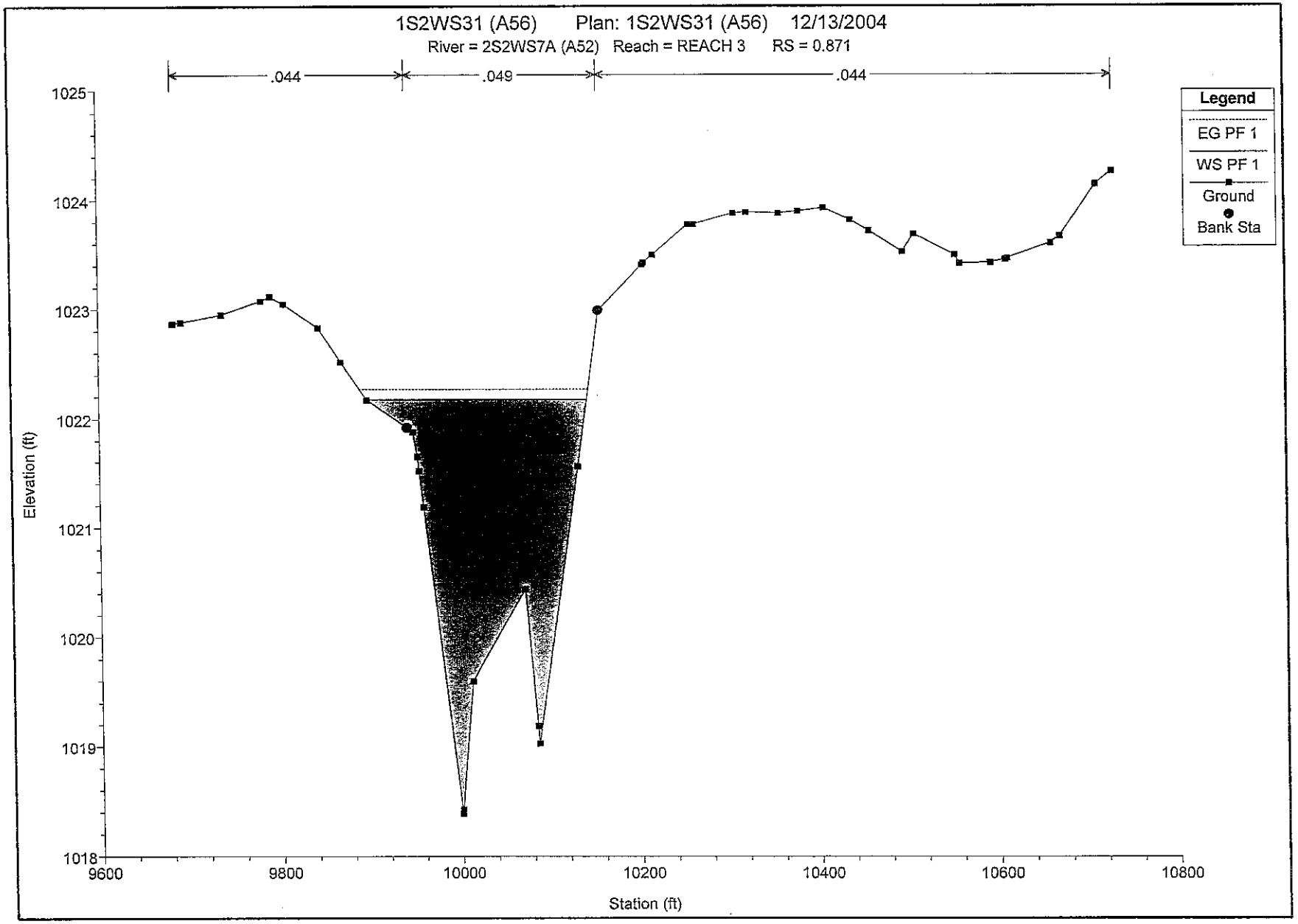
Wash ID: 2S2WS7A (A52)

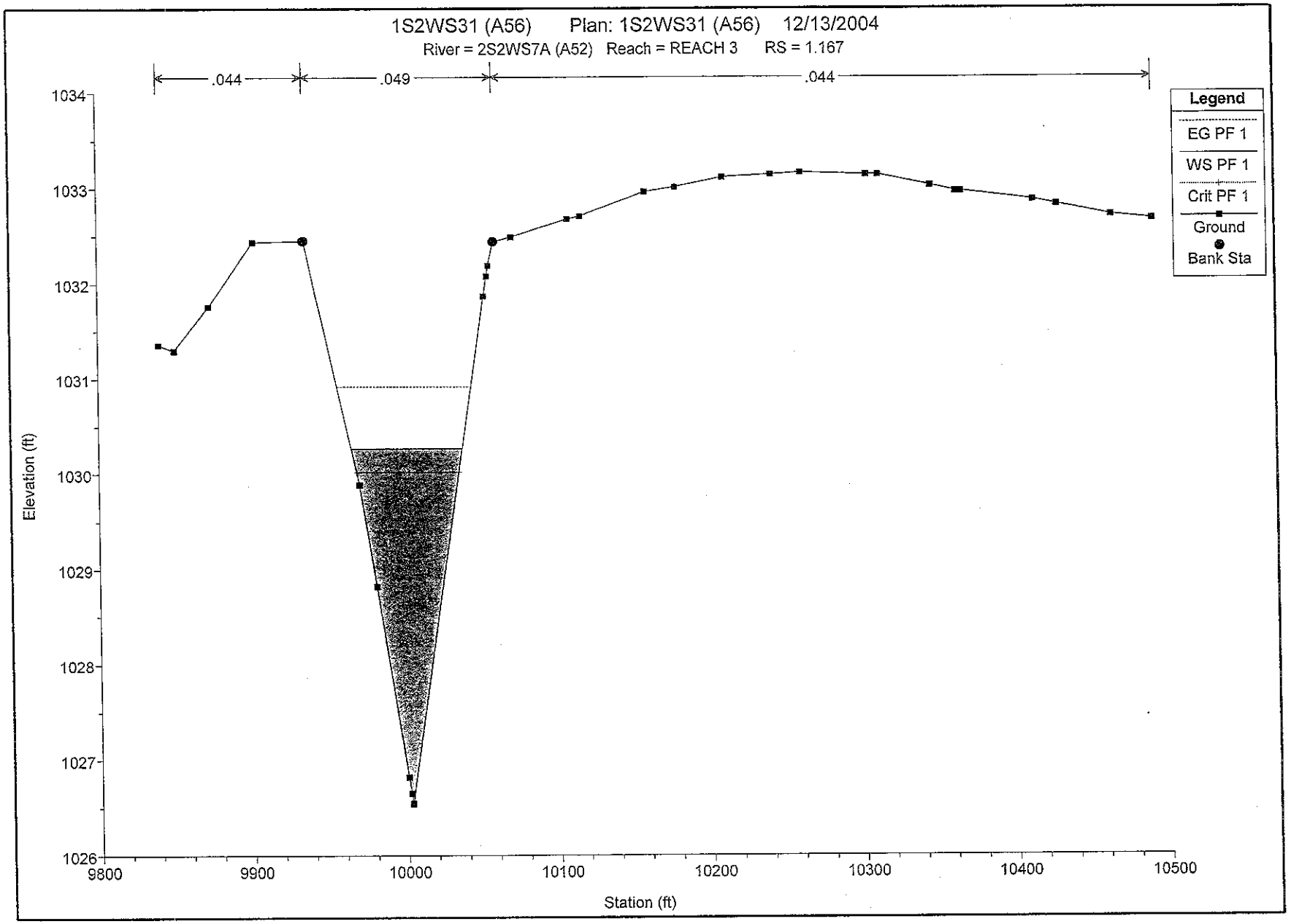
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)	
A08	5.072	600	600	600	
A08	4.830	630	630	600	
A08	4.586	660	660	700	
CPA08	4.400	1636	1640	1600	
A21	4.285	946	950	900	
A21	4.120	1085	1090	1100	
A21	3.884	1284	1280	1300	
CPA21	3.593	1529	1530	1500	
A20	3.326	847	850	800	847 routed to A20
A20	3.047	795	800	800	
A20	2.779	746	750	700	
CPA20	2.494	693	690	700	
DivA20	2.494	285	290	300	
A32	2.238	396	400	400	285 routed to A32
A32	2.009	496	500	500	
A32	1.714	625	620	600	
A32	1.398	762	760	800	
A32	1.167	863	860	900	
A32	0.871	992	990	1000	
A32	0.584	1117	1120	1100	
CPA32A	0.273	1252	1250	1300	
CPA32	0.000	1354	1350	1400	
to CPA52		1354	1350	1400	

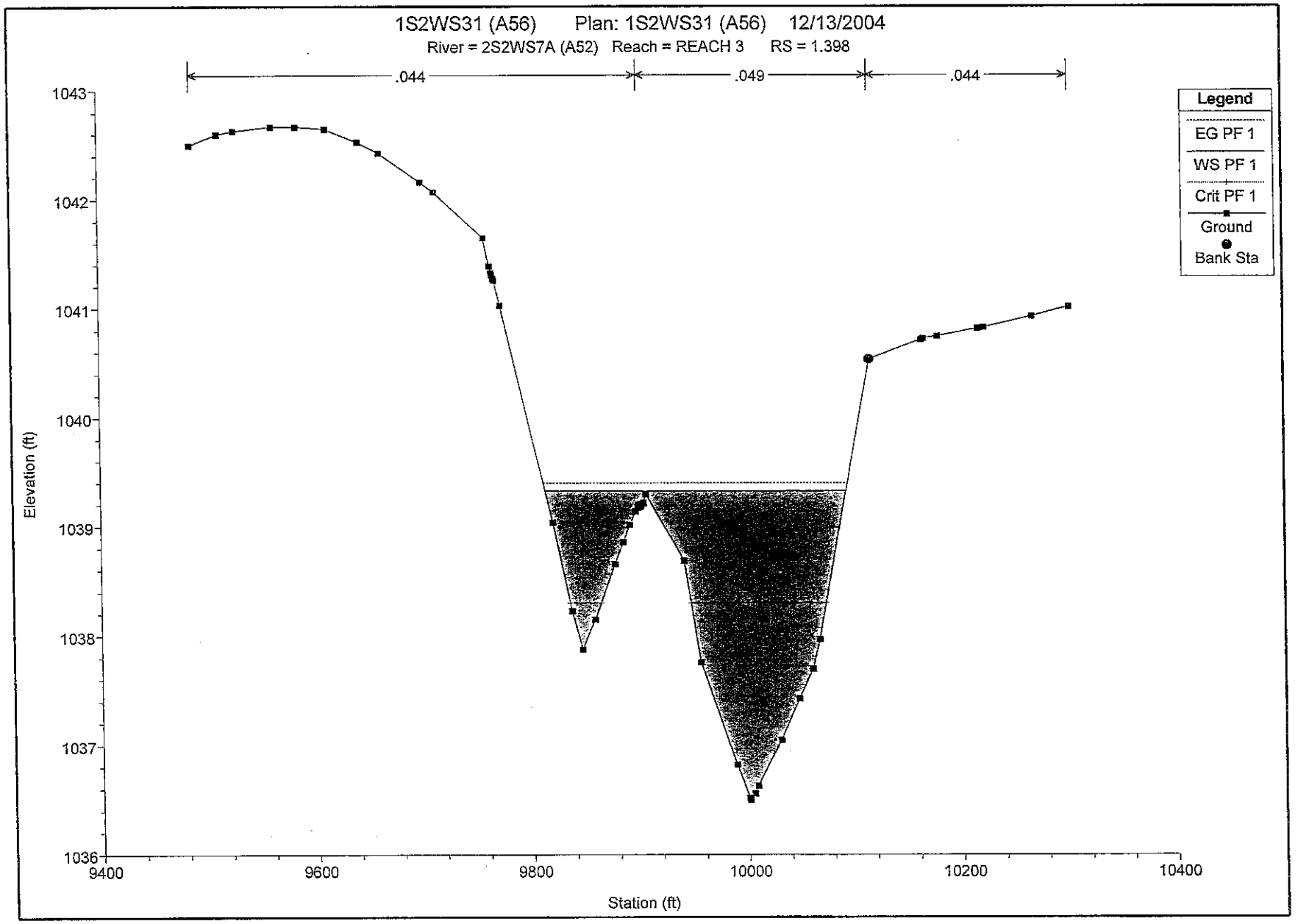

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 2 RS = 0.273
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1006
1005
1004
1003
1002
1001
1000
999
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

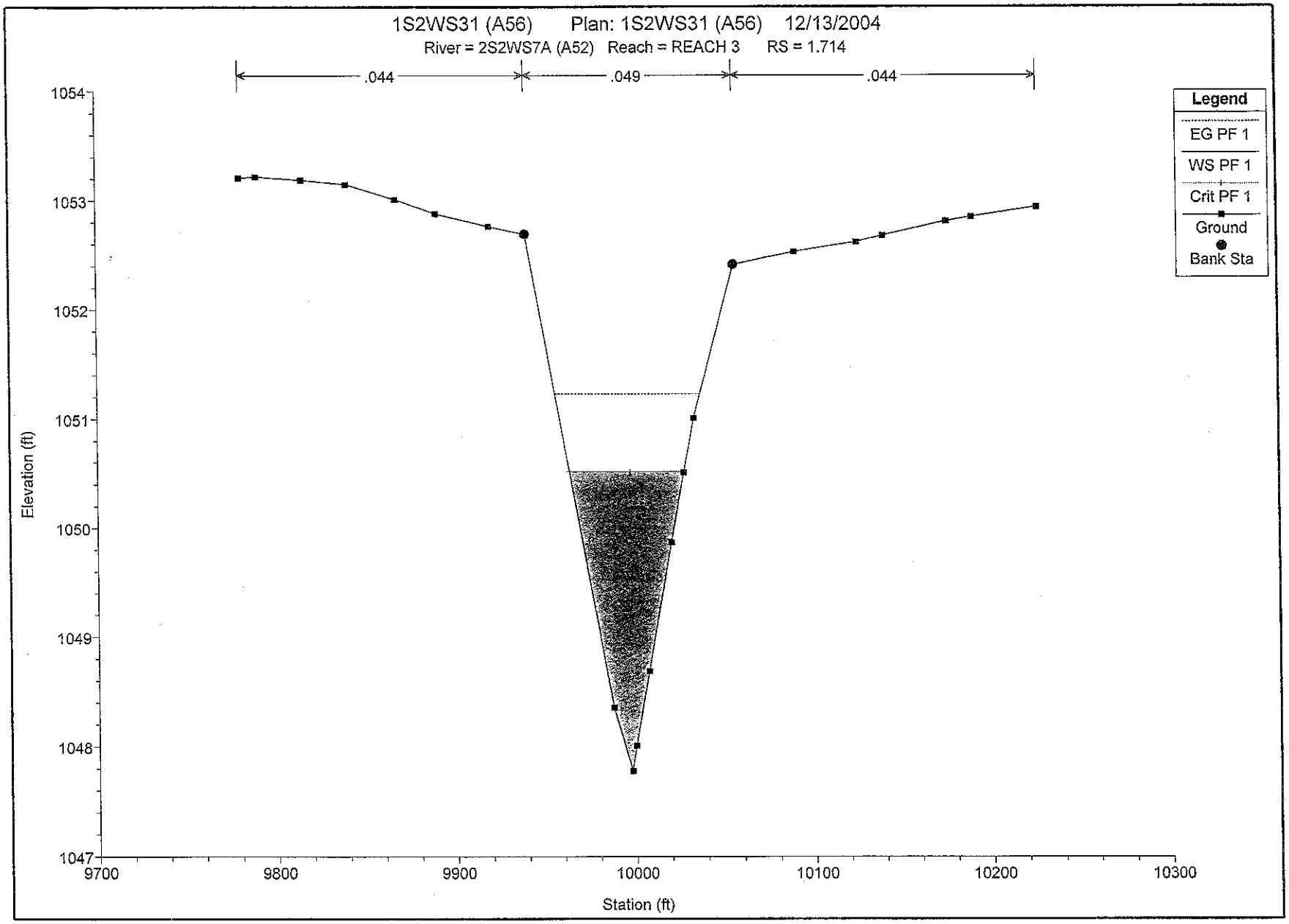

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 2 RS = 0.280
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1006
1005
1004
1003
1002
1001
1000
999
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

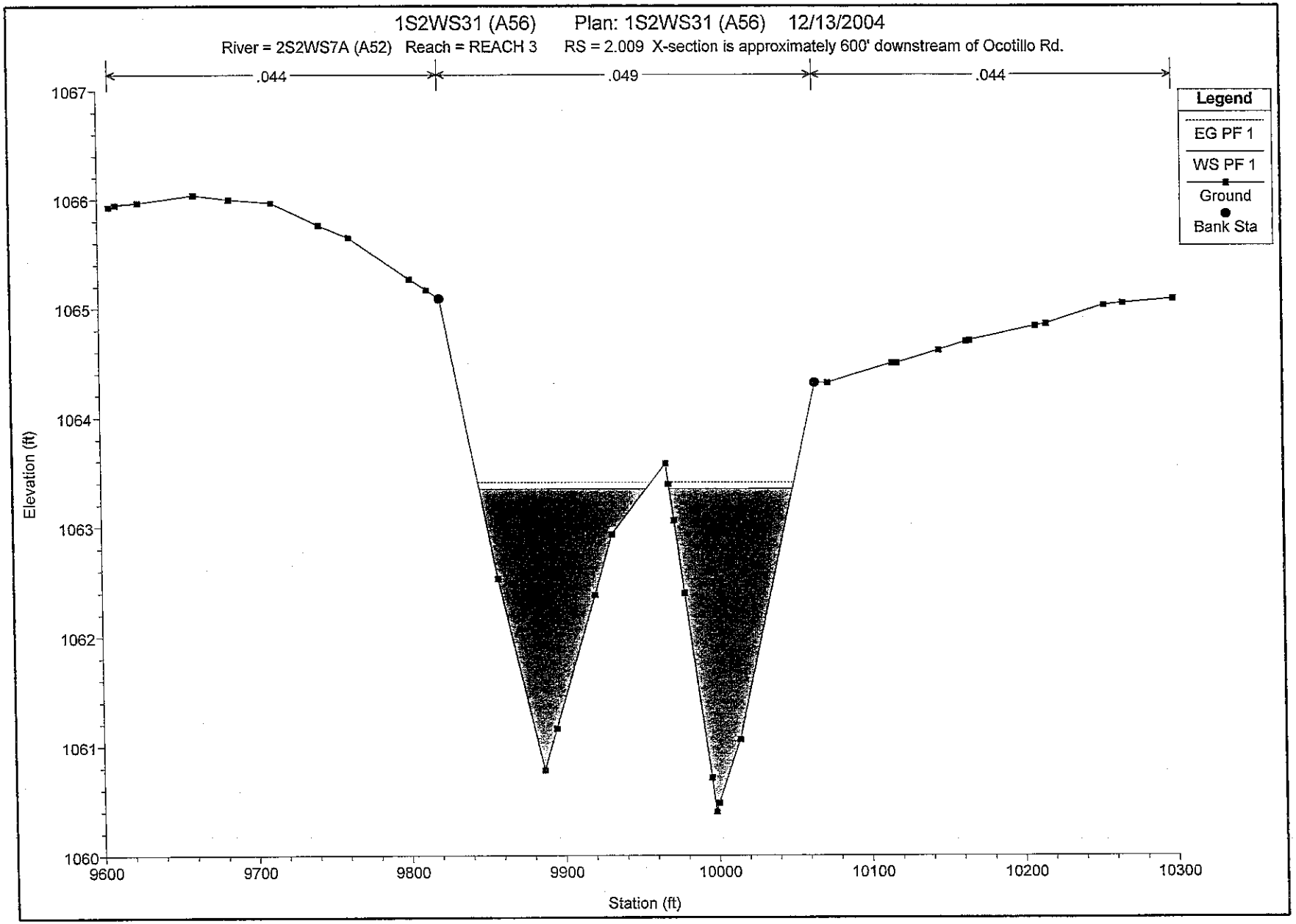

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 0.584
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1013
1012
1011
1010
1009
1008
1007
9850
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

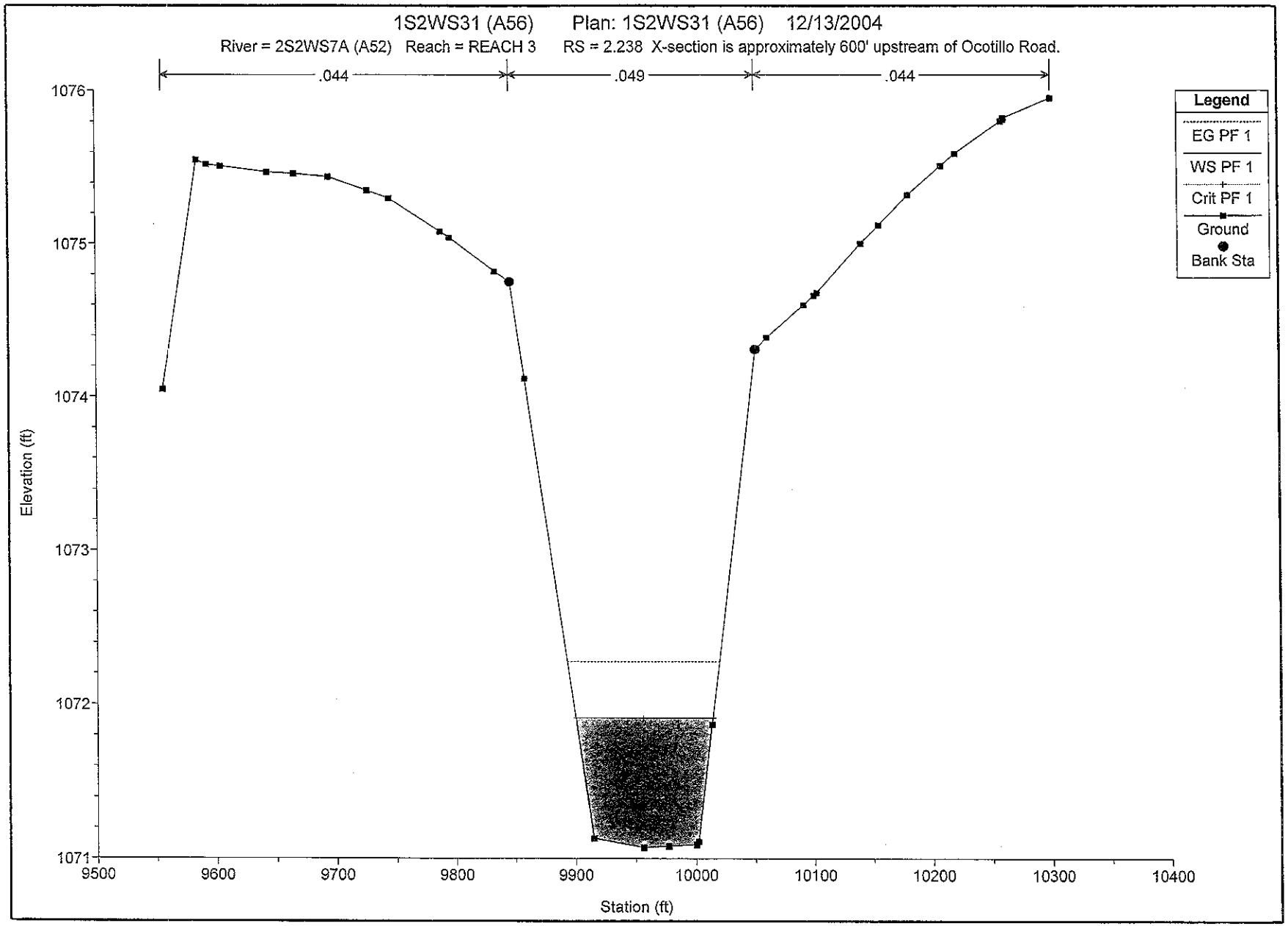

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 0.871
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1025
1024
1023
1022
1021
1020
1019
1018
9600
9800
10000
10200
10400
10600
10800
Station (ft)

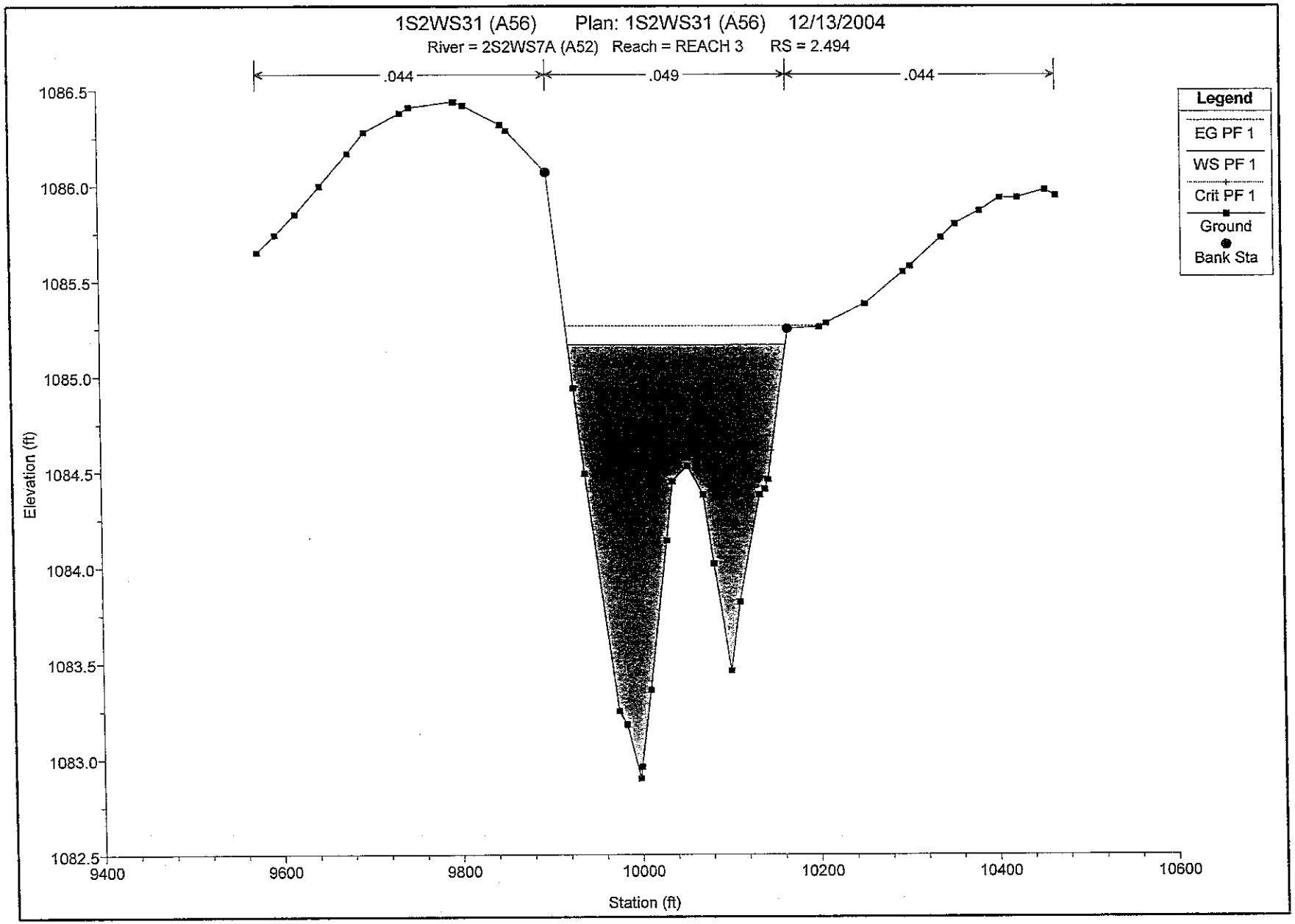

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 1.167
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1034
1033
1032
1031
1030
1029
1028
1027
1026
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

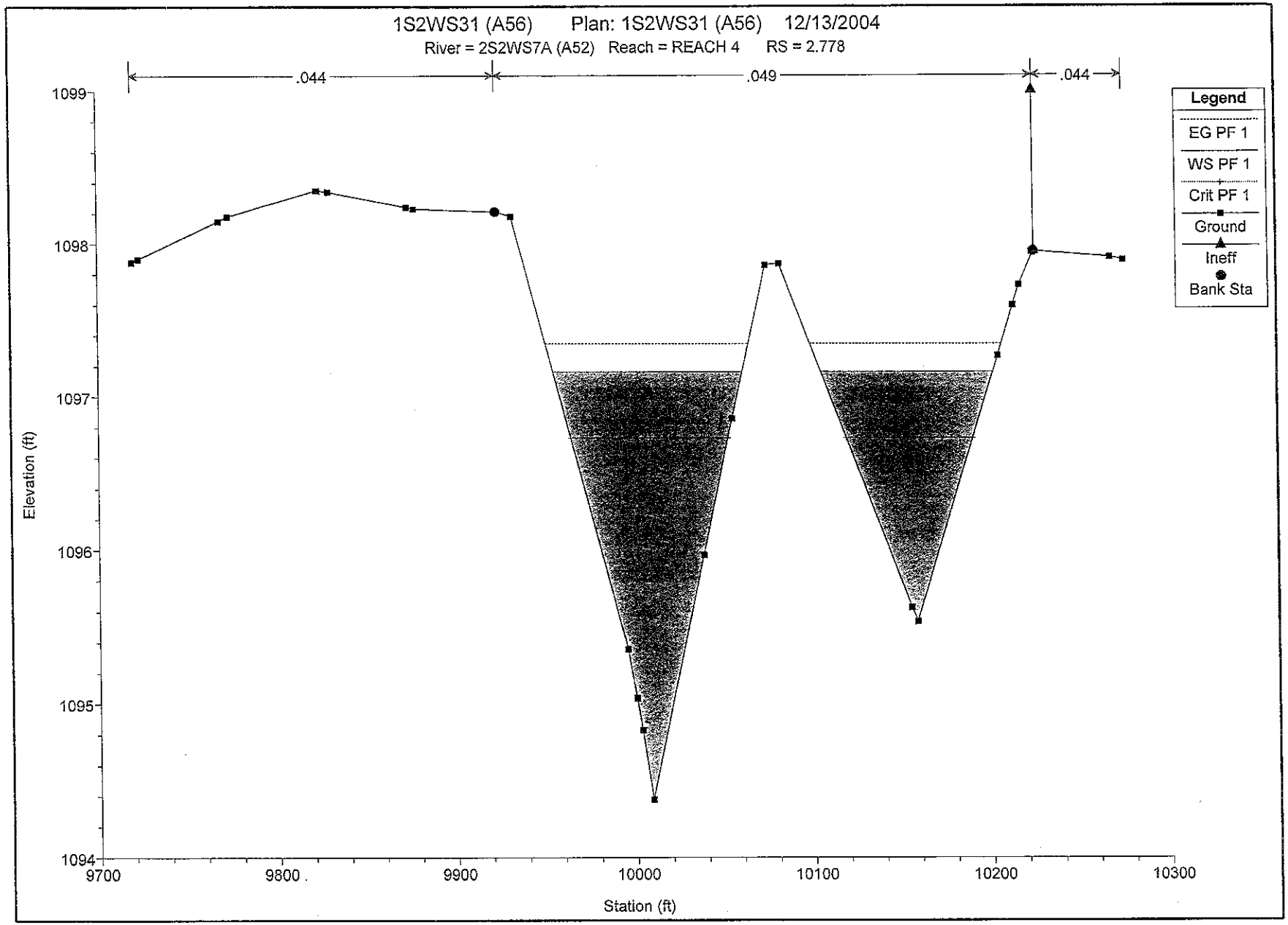

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 1.398
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1043
1042
1041
1040
1039
1038
1037
1036
9400
9600
9800
10000
10200
10400
Station (ft)

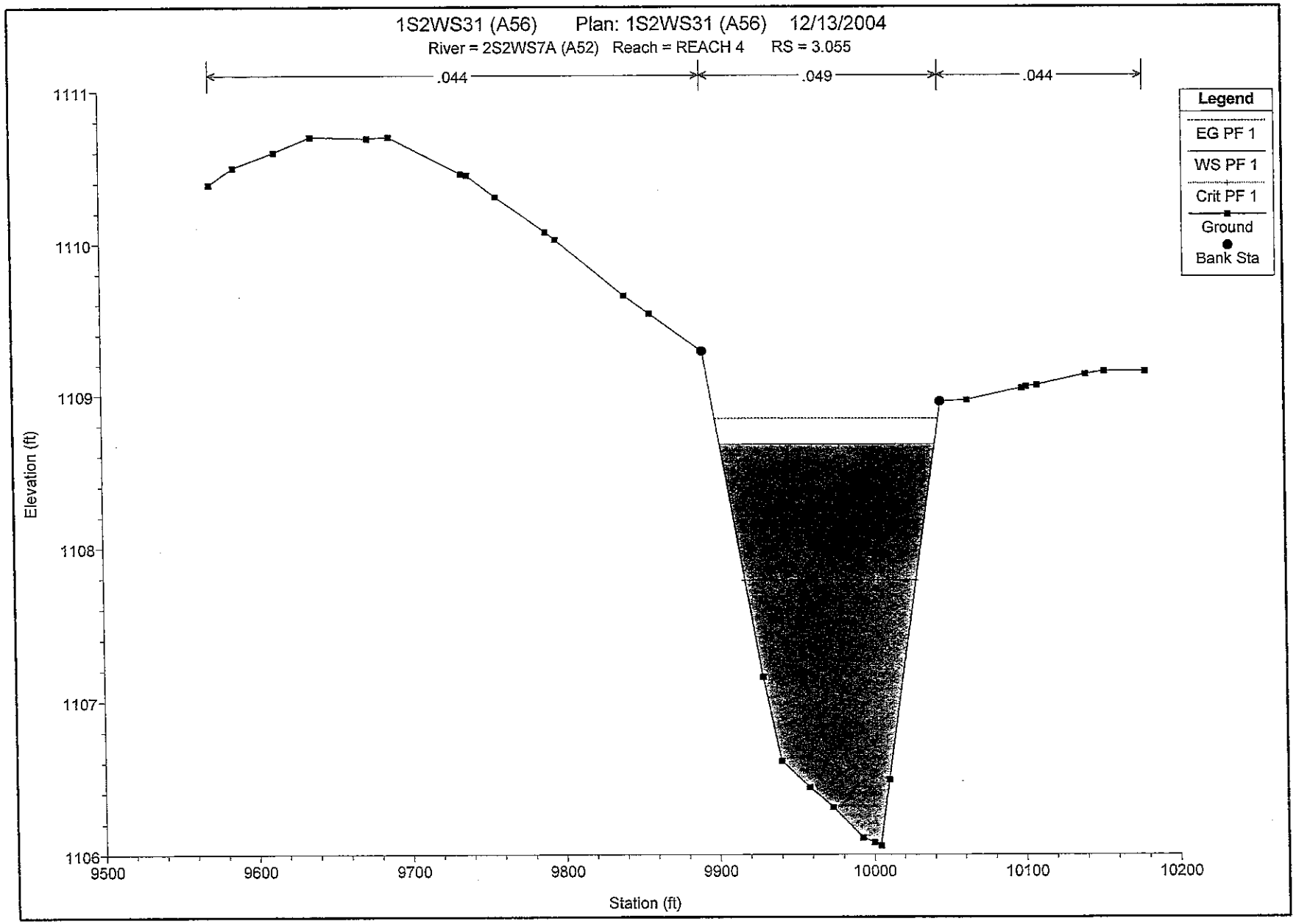

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 1.714
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1054
1053
1052
1051
1050
1049
1048
1047
9700
9800
9900
10000
10100
10200
10300
Station (ft)

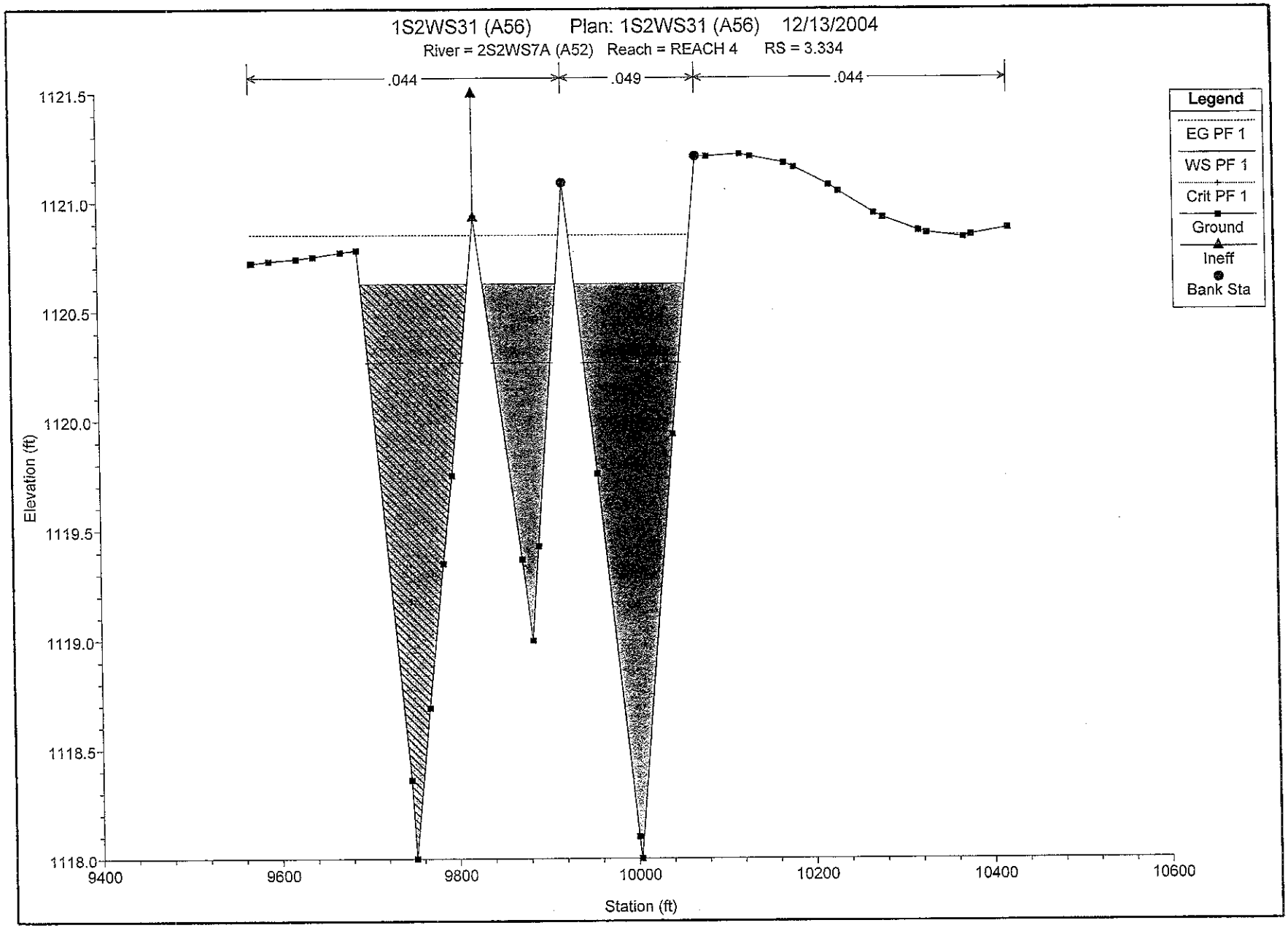

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 2.009 X-section is approximately 600' downstream of Ocotillo Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1067
1066
1065
1064
1063
1062
1061
1060
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

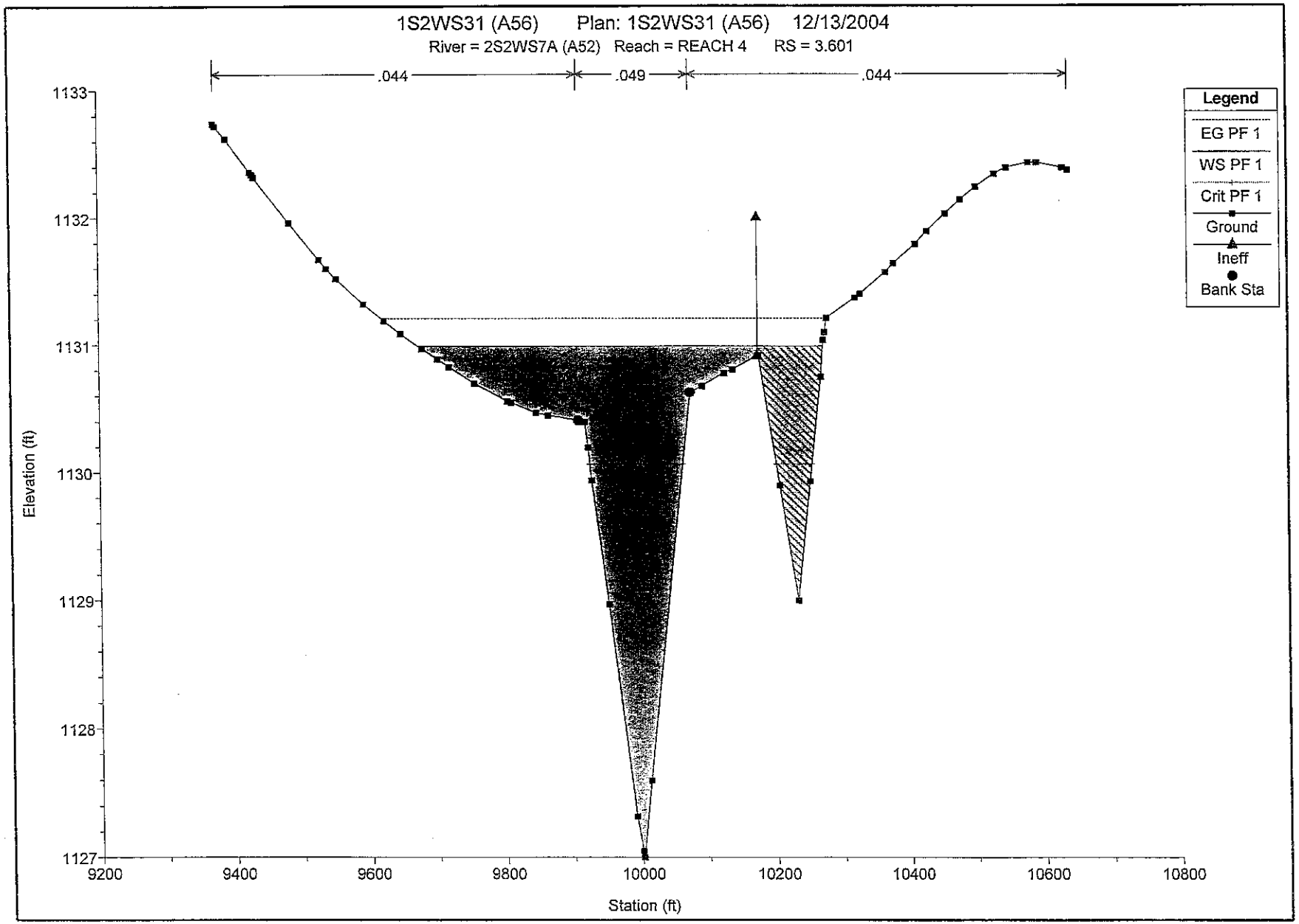

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 2.238 X-section is approximately 600' upstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1076
1075
1074
1073
1072
1071
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

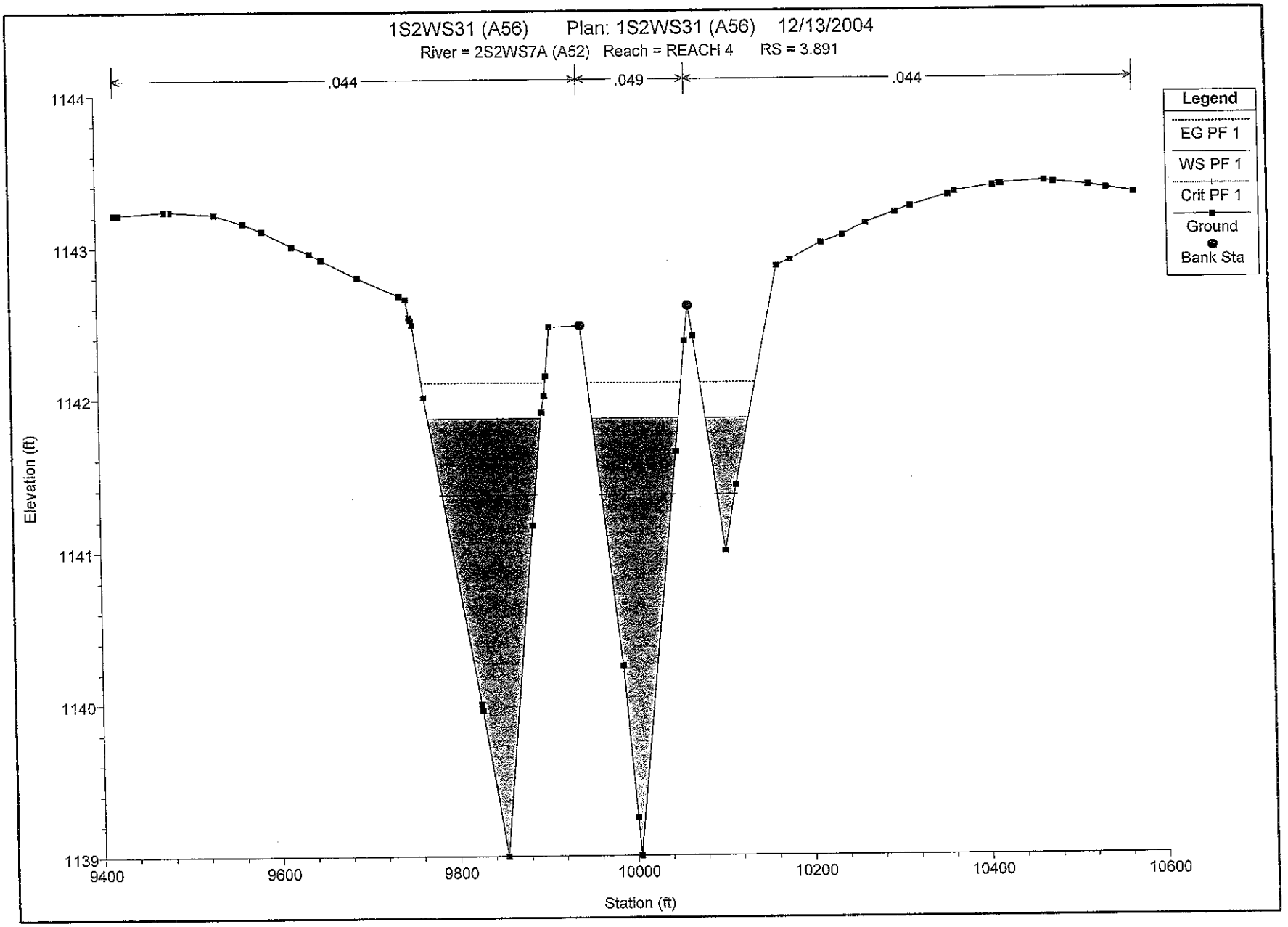

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 3 RS = 2.494
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1086.5
1086.0
1085.5
1085.0
1084.5
1084.0
1083.5
1083.0
1082.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

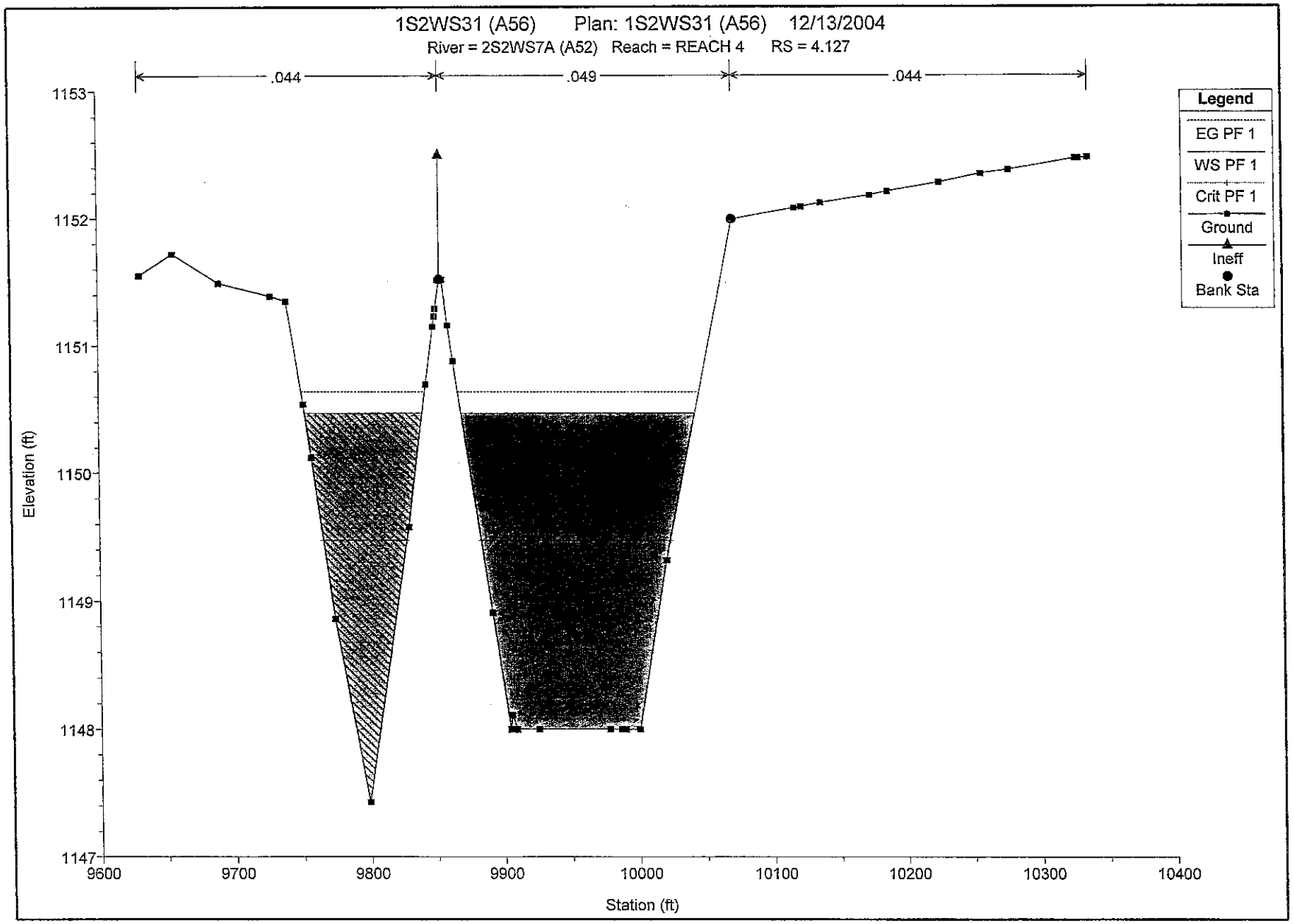

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 2.778
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1099
1098
1097
1096
1095
1094
9700
9800
9900
10000
10100
10200
10300
Station (ft)

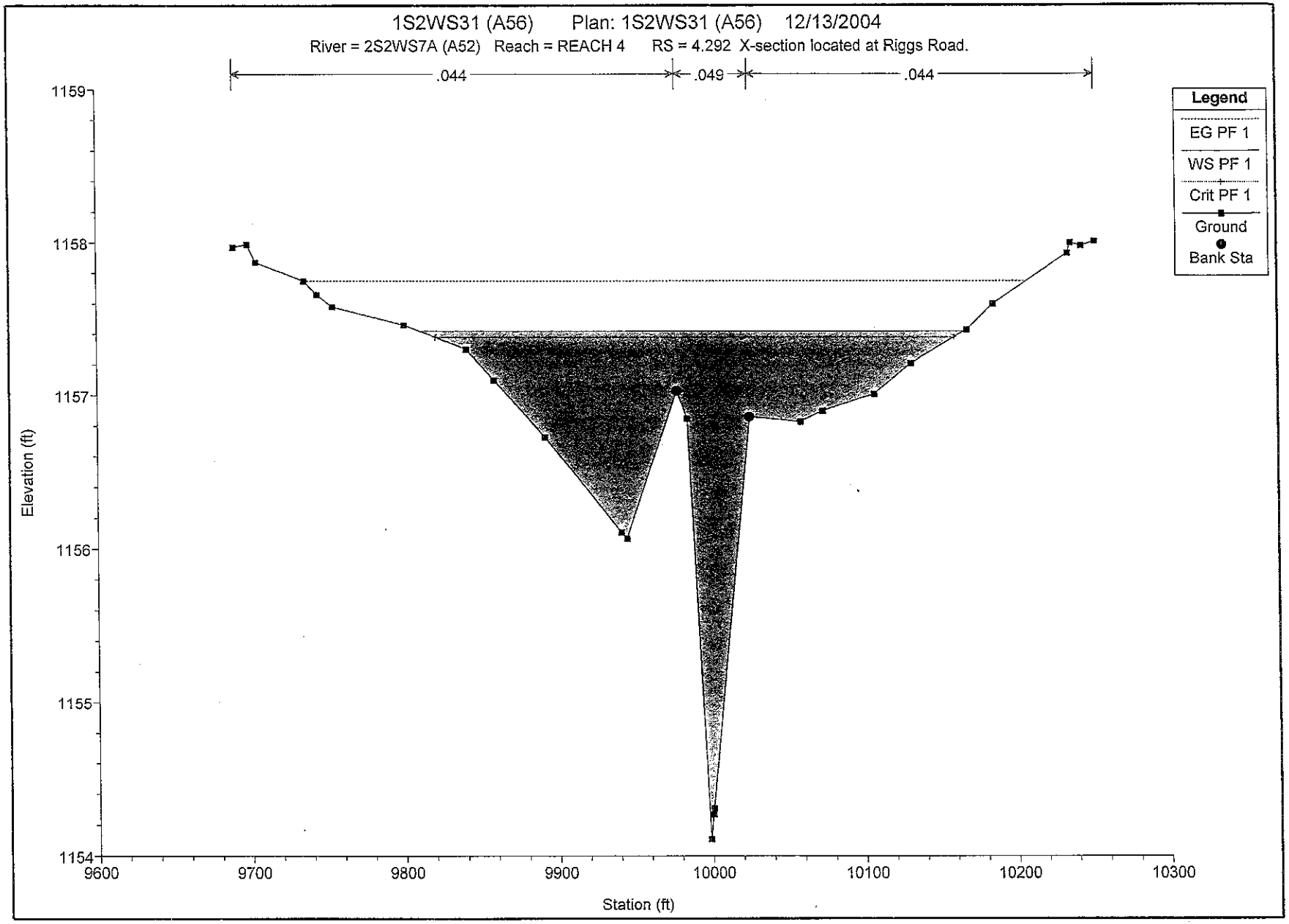

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 3.055
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1111
1110
1109
1108
1107
1106
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

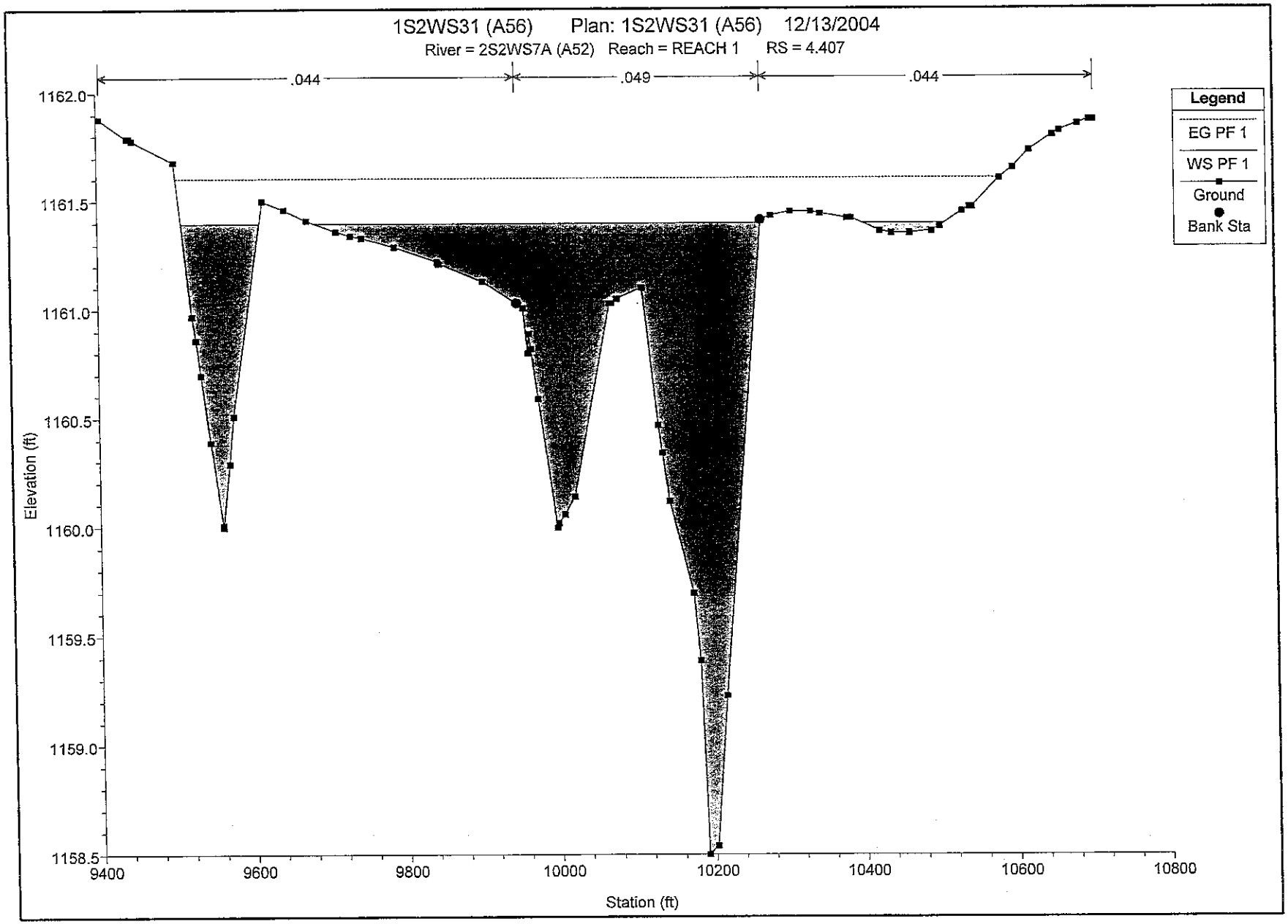

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 3.334
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1121.5
1121.0
1120.5
1120.0
1119.5
1119.0
1118.5
1118.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

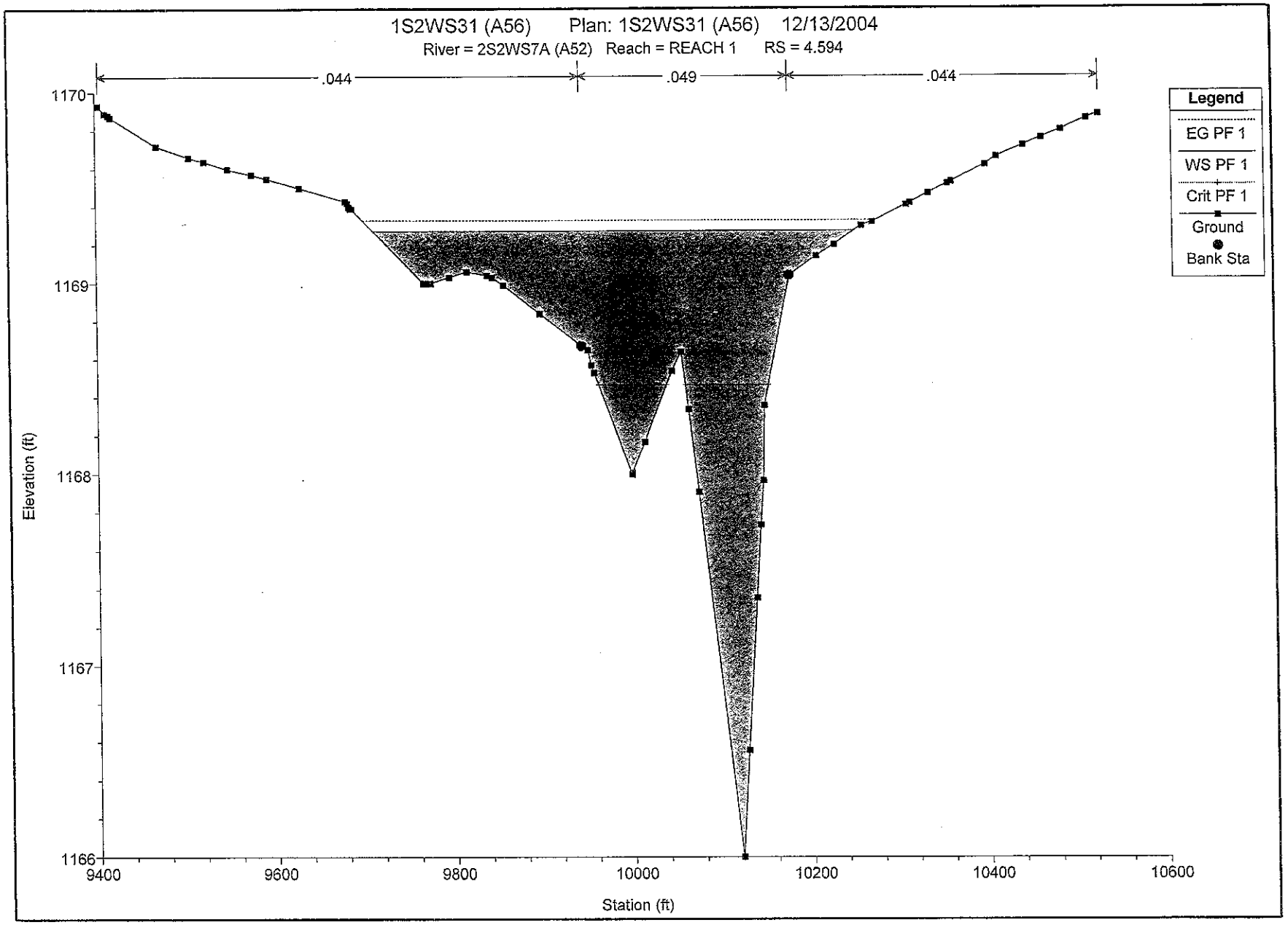

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 3.601
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1133
1132
1131
1130
1129
1128
1127
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

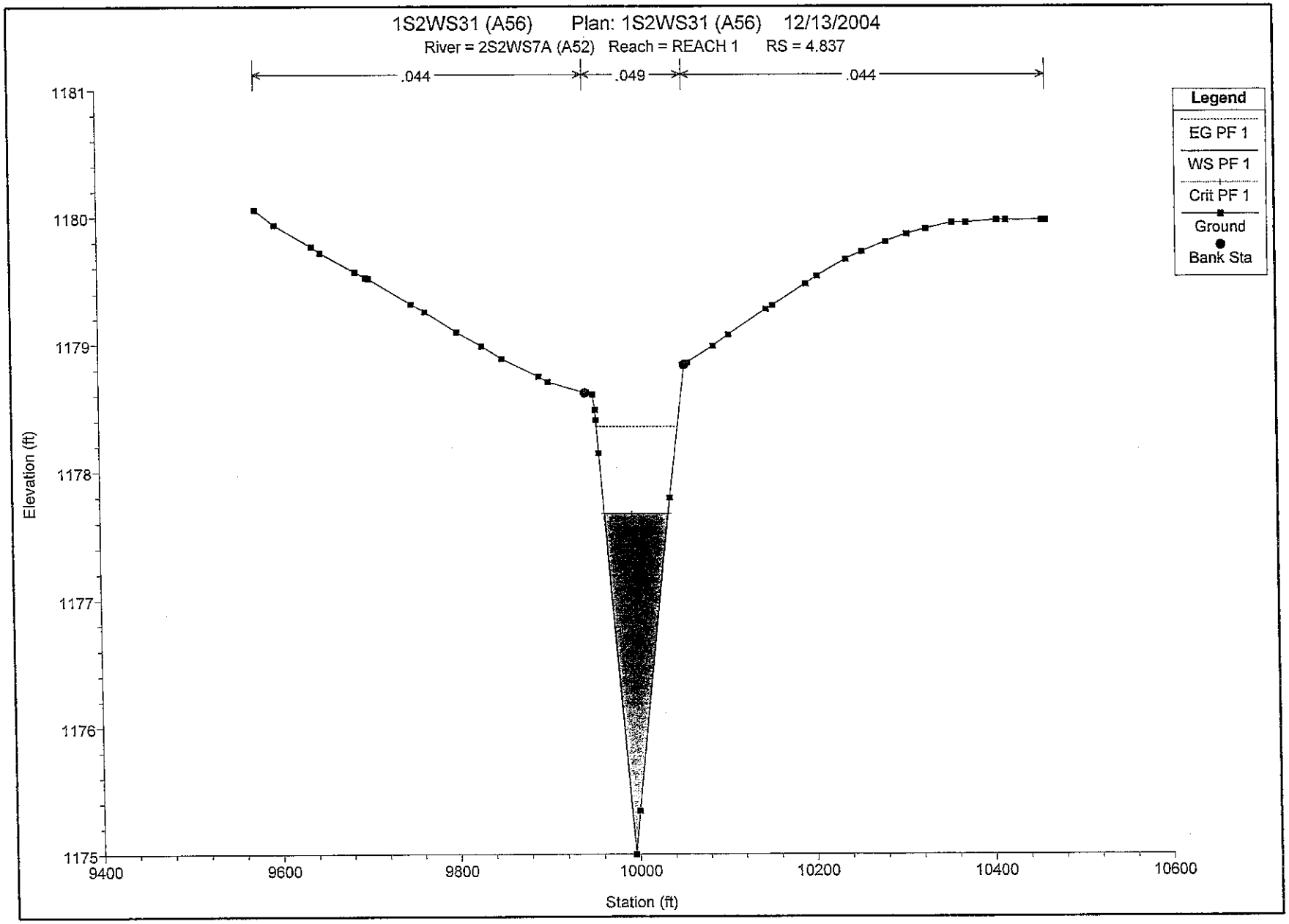

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 3.891
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1144
1143
1142
1141
1140
1139
9400
9600
9800
10000
10200
10400
10600
Station (ft)

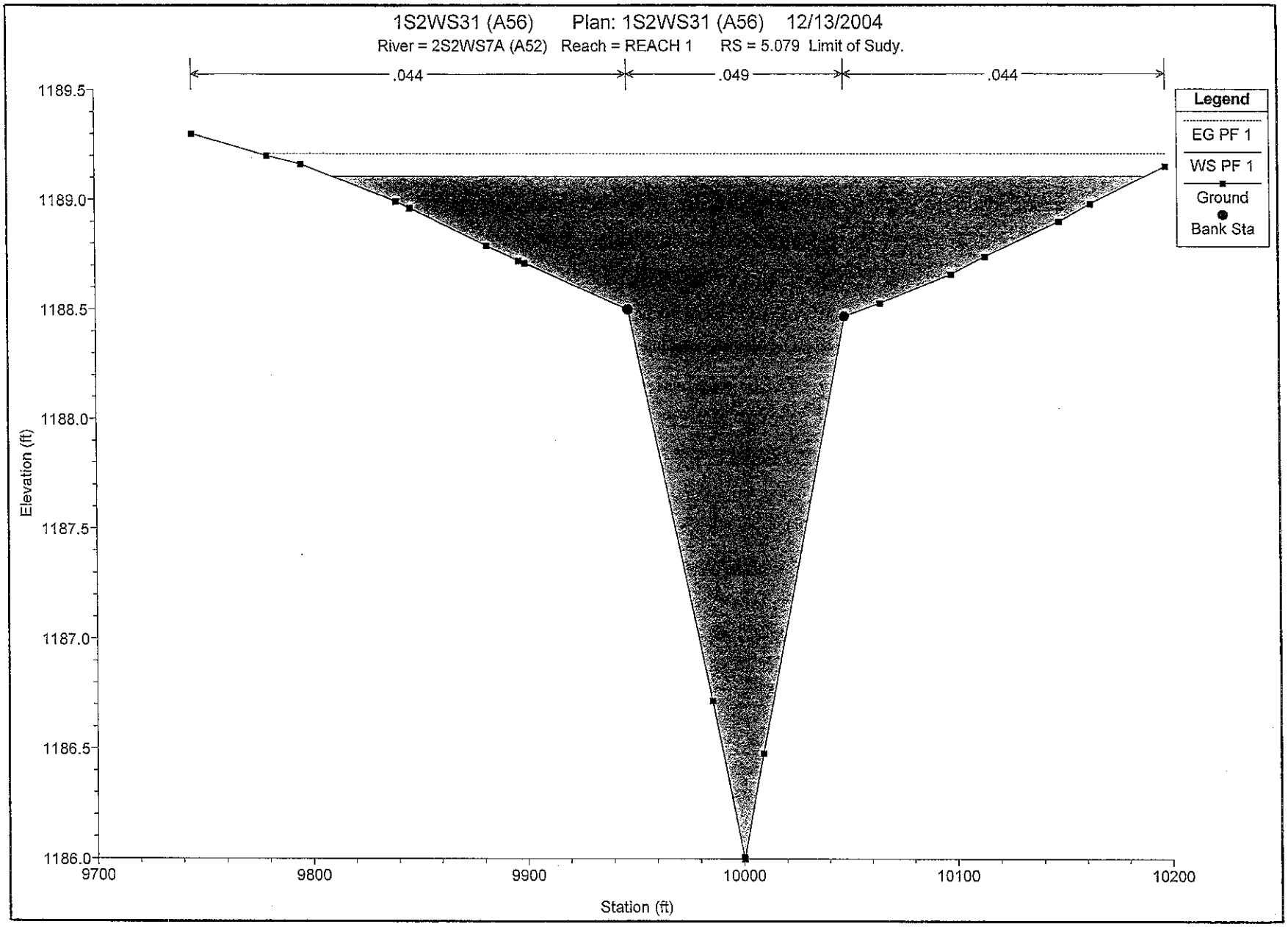

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 4.127
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1153
1152
1151
1150
1149
1148
1147
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 4 RS = 4.292 X-section located at Riggs Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1159
1158
1157
1156
1155
1154
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 1 RS = 4.407
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1162.0
1161.5
1161.0
1160.5
1160.0
1159.5
1159.0
1158.5
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 1 RS = 4.594
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1170
1169
1168
1167
1166
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 1 RS = 4.837
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1181
1180
1179
1178
1177
1176
1175
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7A (A52) Reach = REACH 1 RS = 5.079 Limit of Sudy.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1189.5
1189.0
1188.5
1188.0
1187.5
1187.0
1186.5
1186.0
9700
9800
9900
10000
10100
10200
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S3WS1 (A54)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

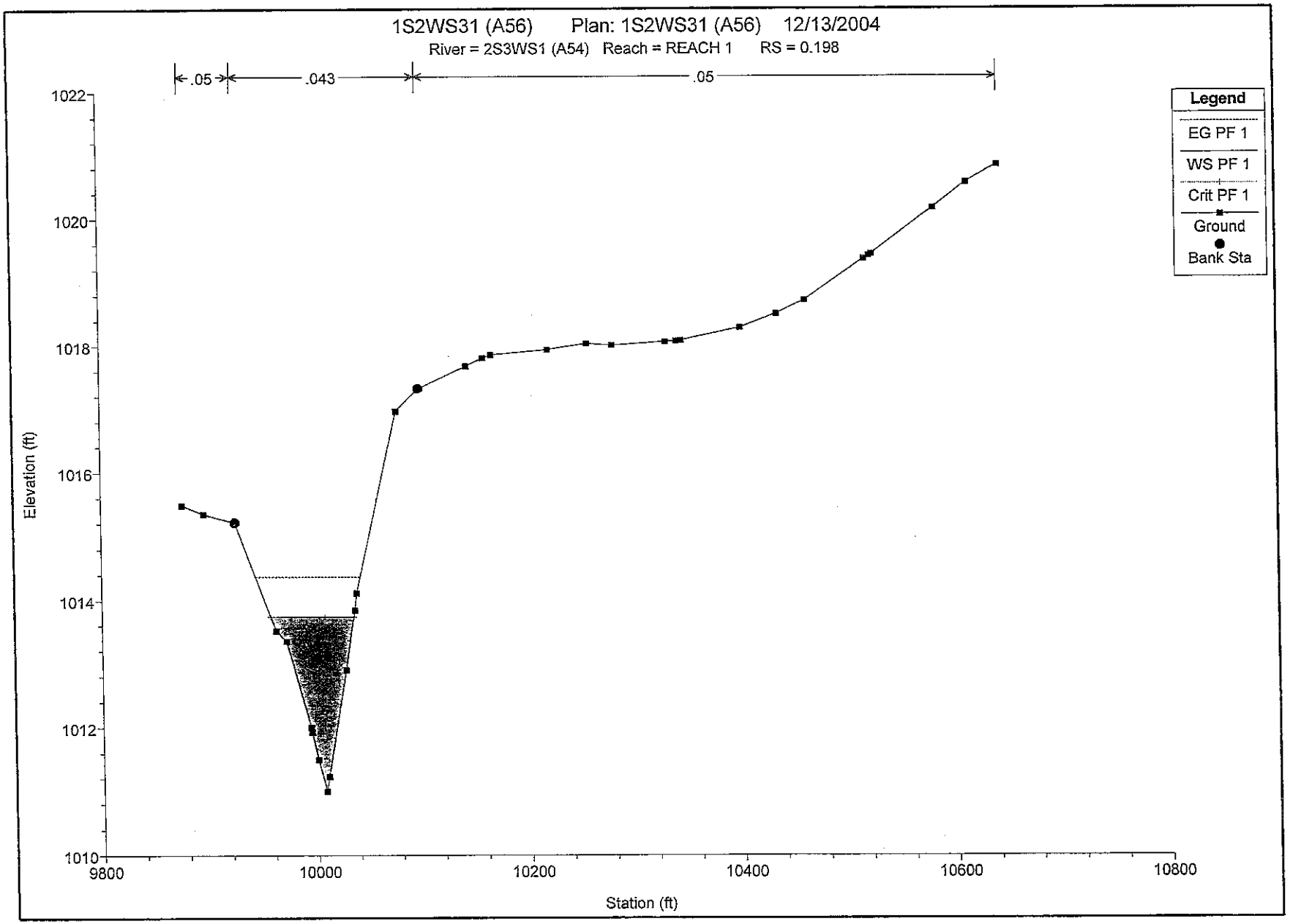
Wash ID: 2S3WS1 (A54)

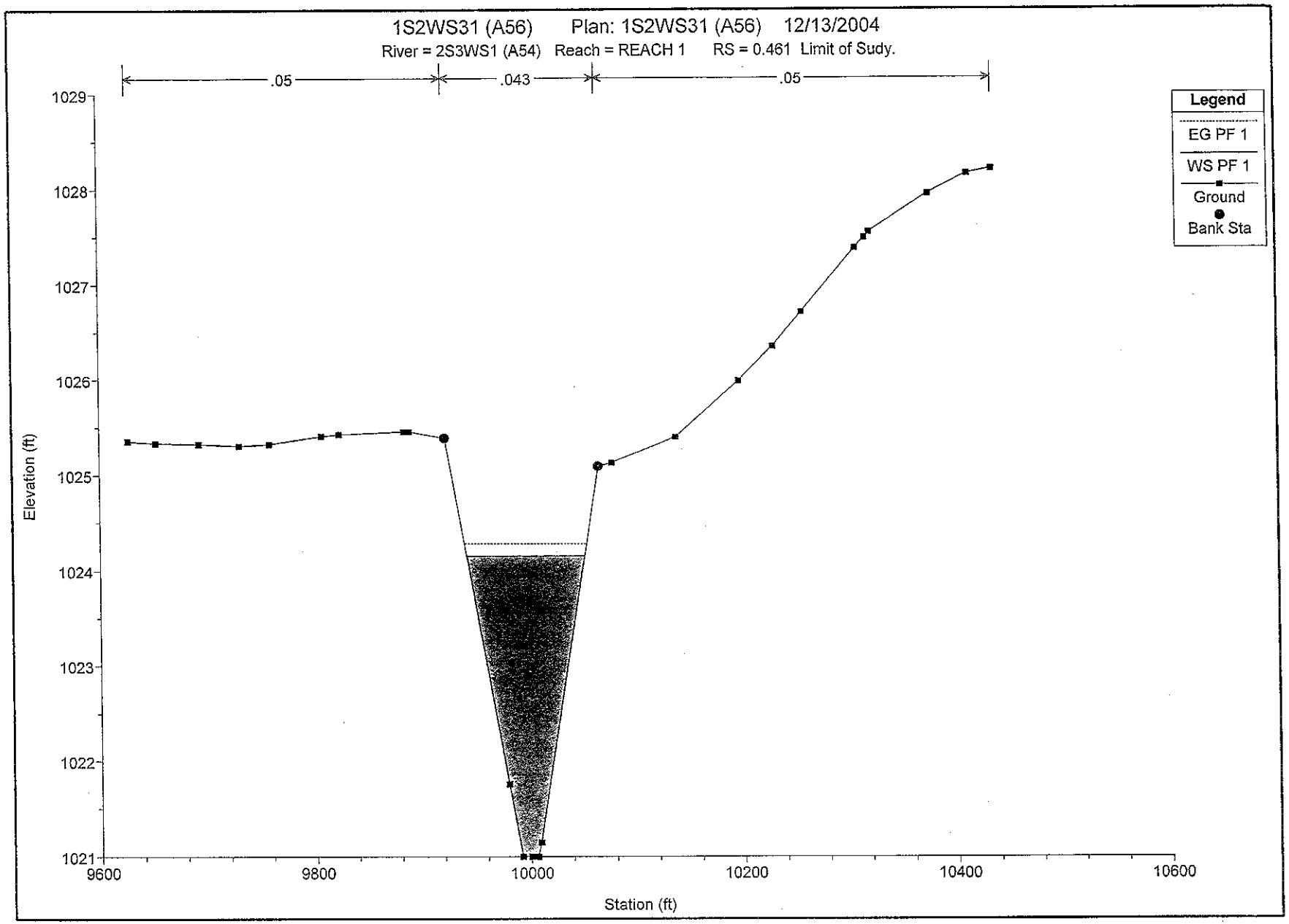
Subbasin: A54

Total Discharge (cfs) = 620

Total Area (acres) = 324

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.461	290	89.6	560
0.198	324	100.0	620


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS1 (A54) Reach = REACH 1 RS = 0.198
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1022
1020
1018
1016
1014
1012
1010
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S3WS1 (A54) Reach = REACH 1 RS = 0.461 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1029
1028
1027
1026
1025
1024
1023
1022
1021
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S2WS6 (A55)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 2S2WS6 (A55)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPA54	0.727	1856	1860	1900
A55	0.505	1919	1920	1900
A55	0.255	1989	1990	2000
CPA55A	0.000	2061		

Notes:
1. Discharge at 0.727 is 1860 cfs.
2. No cross section at station 0.000

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

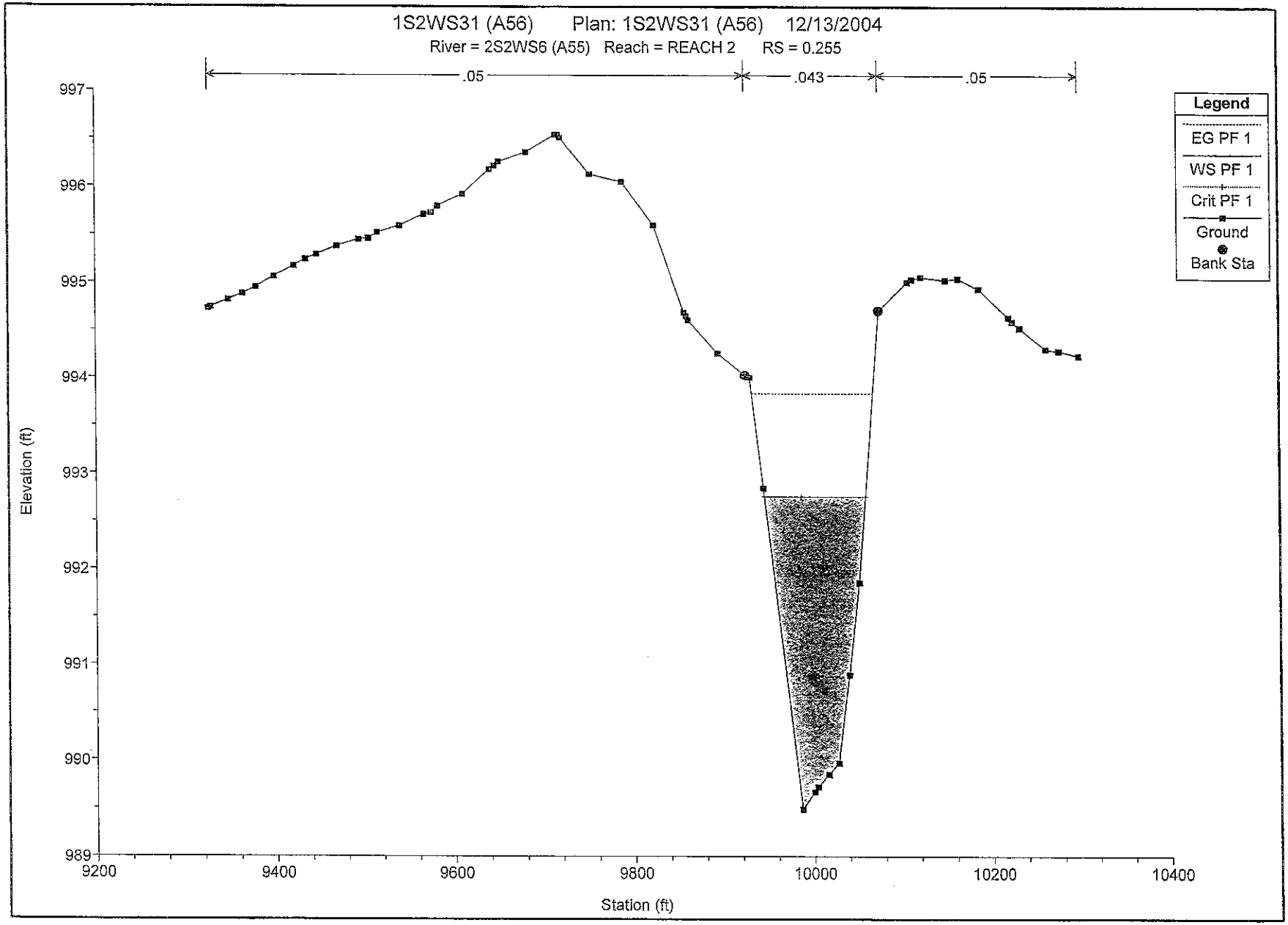
Wash ID: 2S2WS6 (A55)

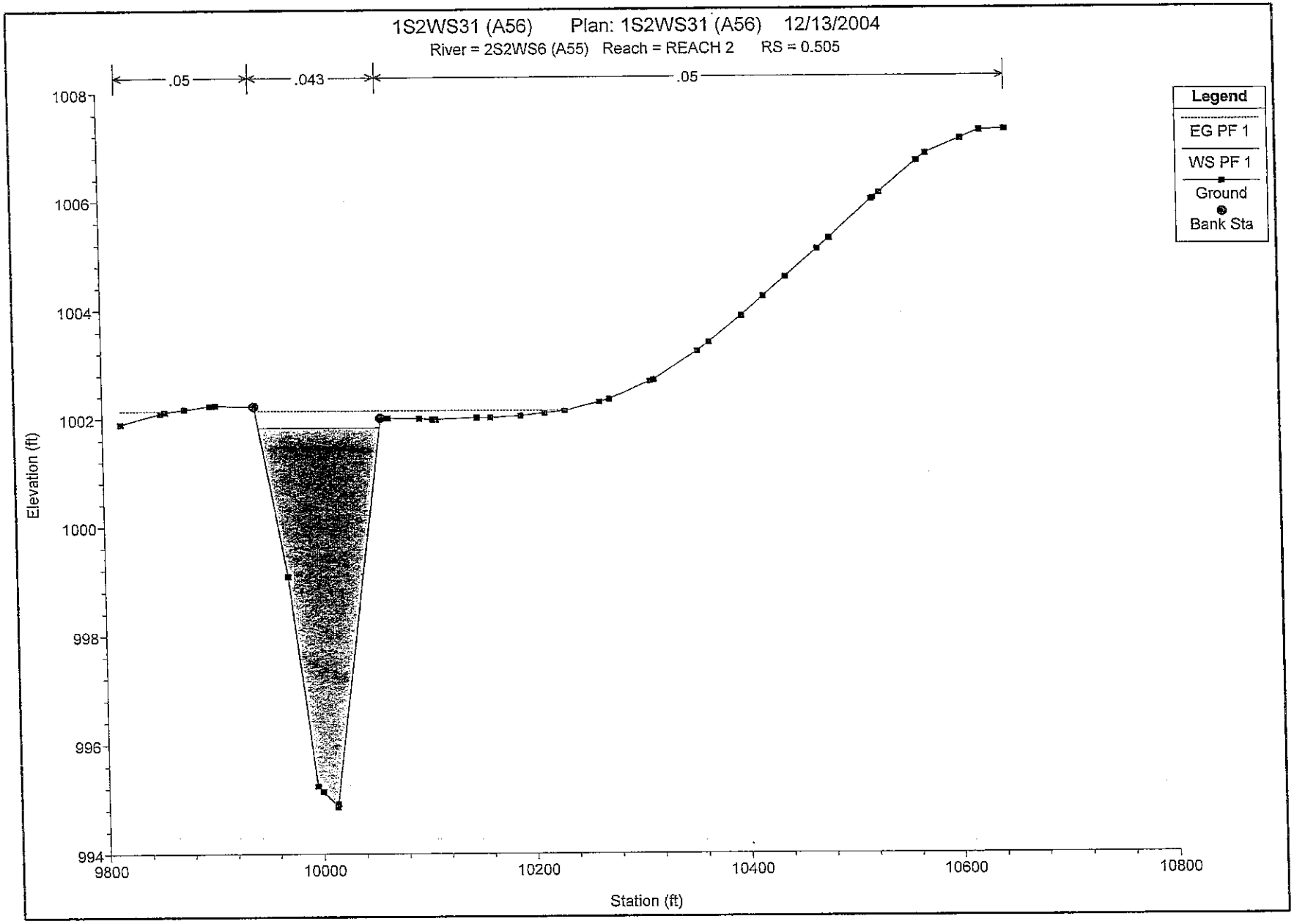
Subbasin: A53

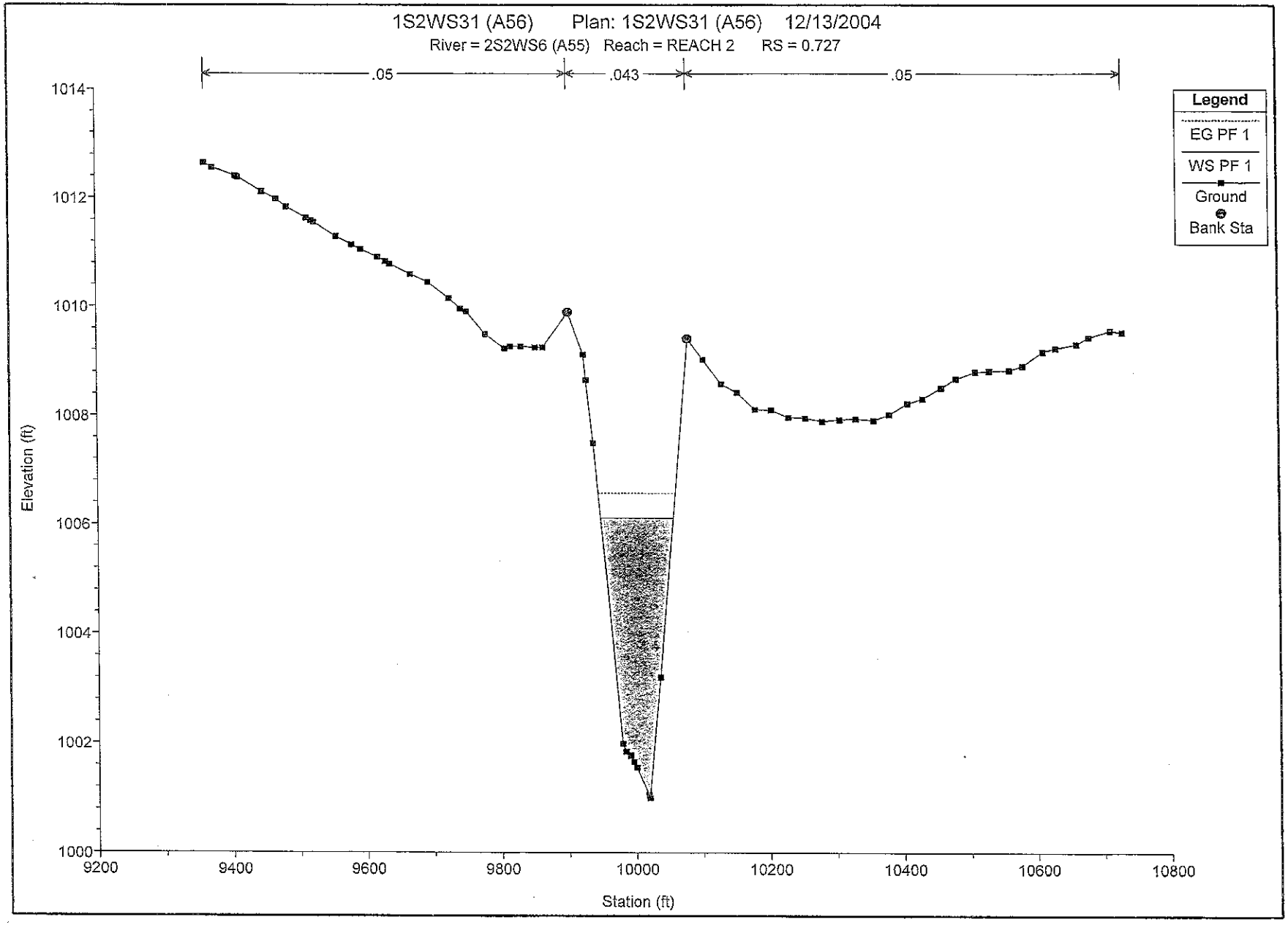
Total Discharge (cfs) = 1259

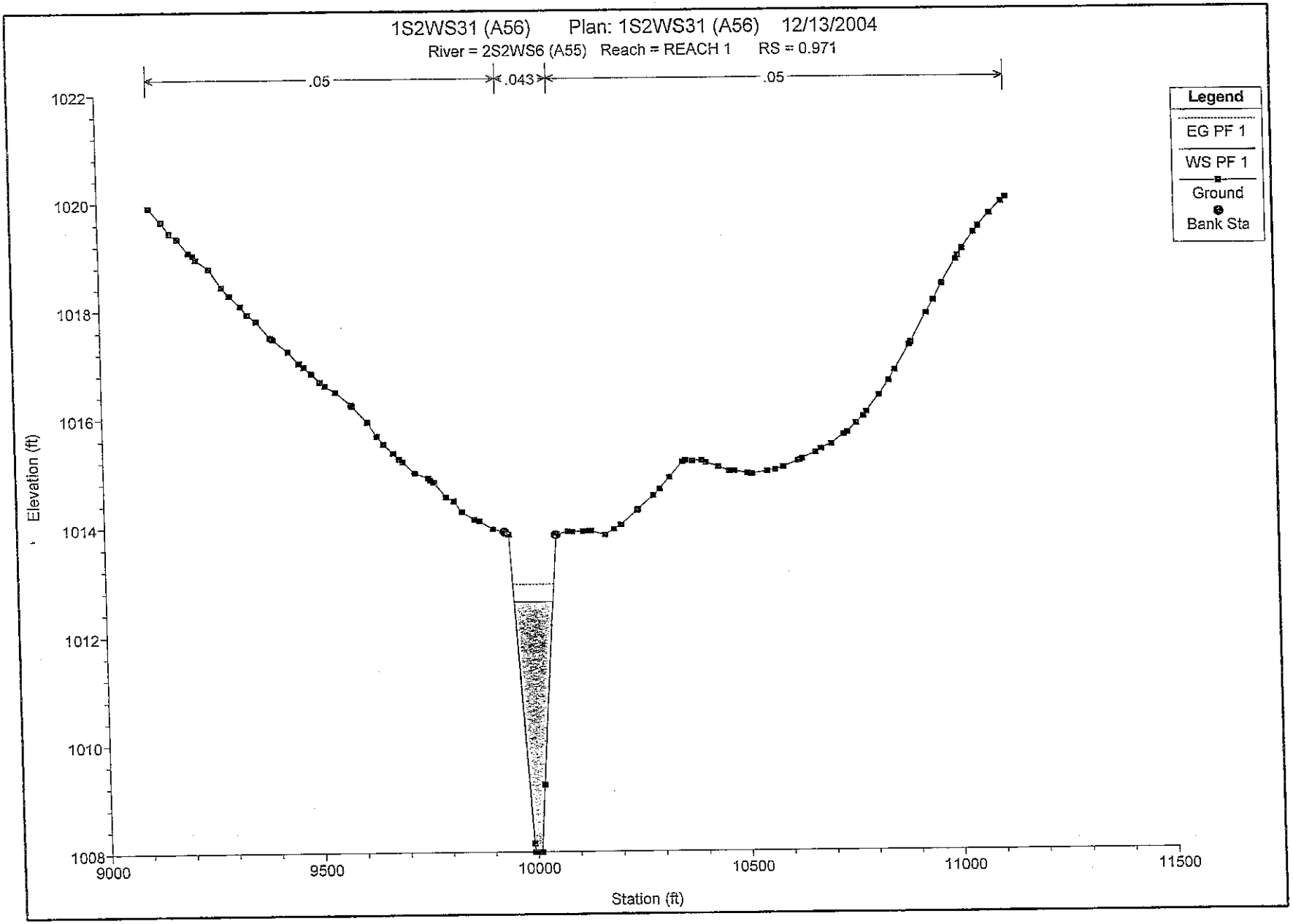
Total Area (acres) = 1118

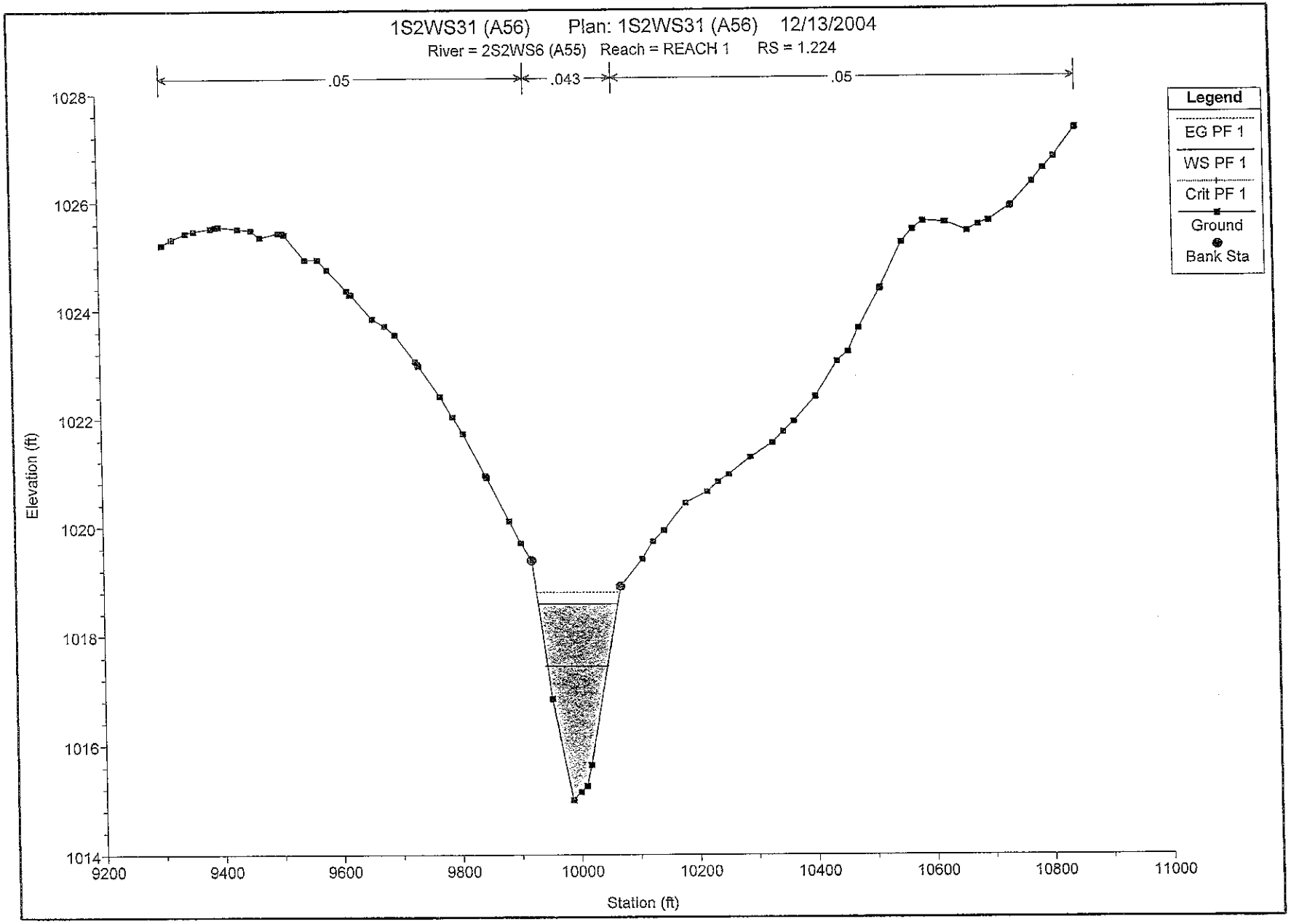
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.720	529	47.3	600
1.465	610	54.6	690
1.224	939	84.0	1060
0.971	996	89.1	1120
0.727	1118	100.0	1260

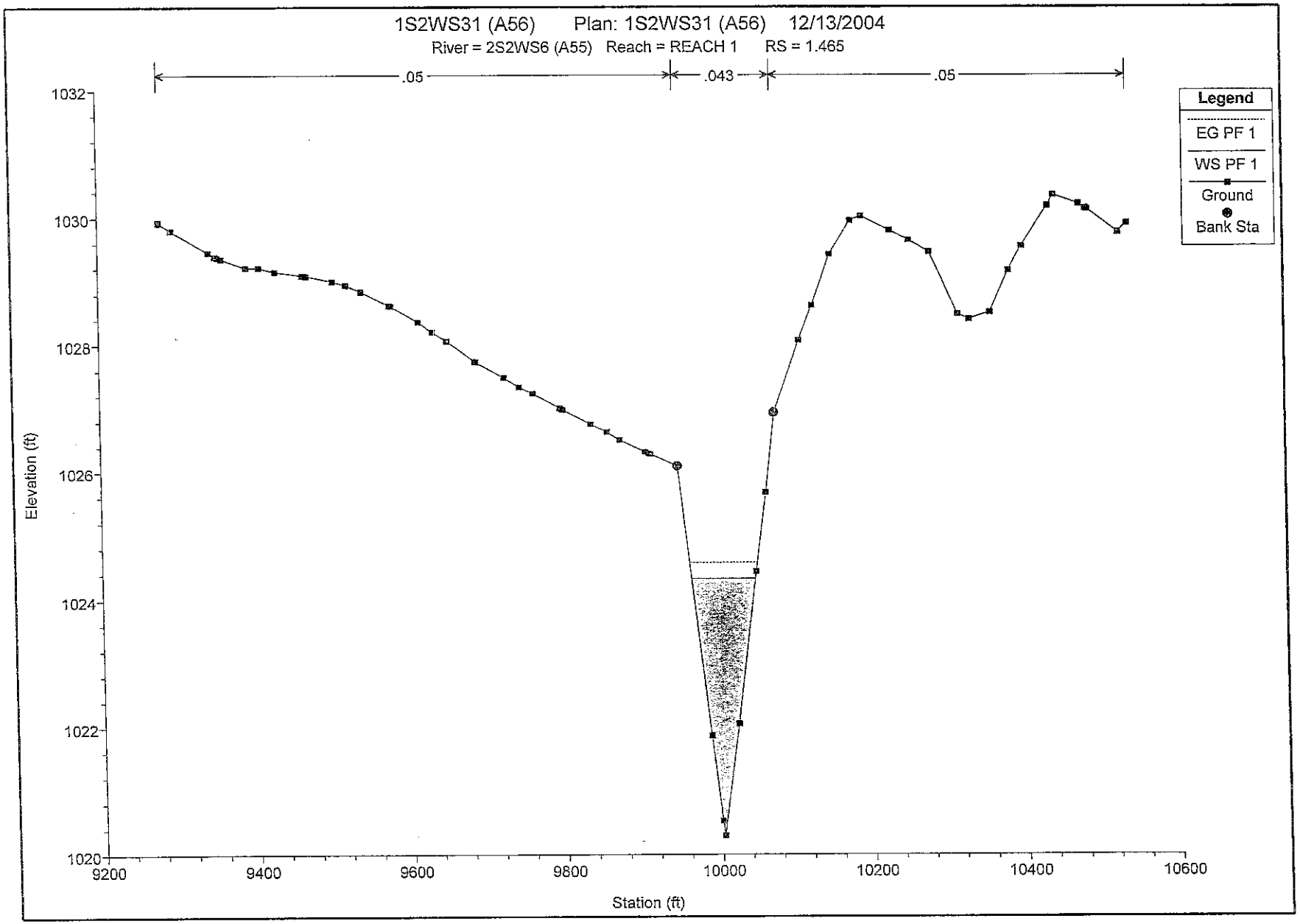

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 2 RS = 0.255
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
997
996
995
994
993
992
991
990
989
9200
9400
9600
9800
10000
10200
10400
Station (ft)

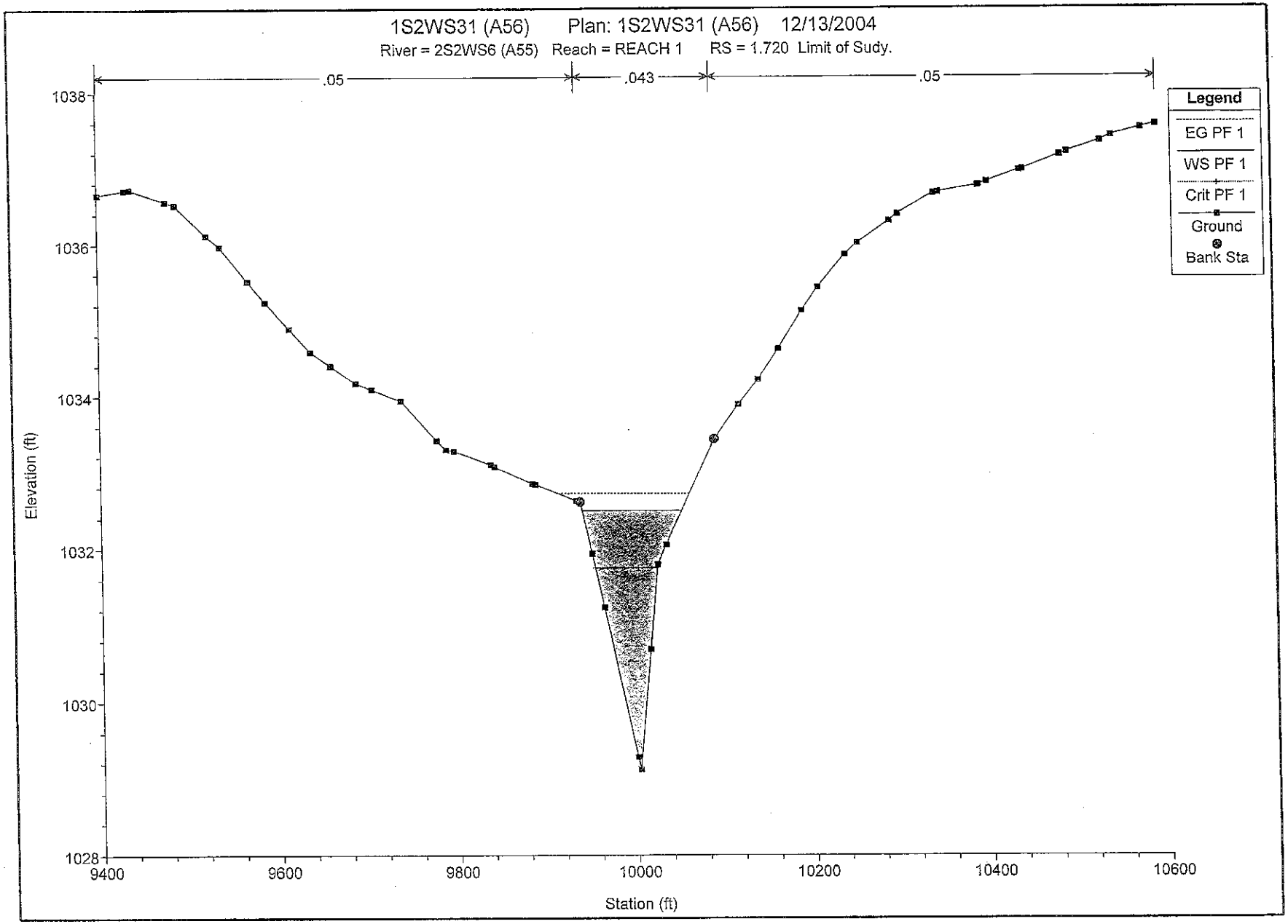

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 2 RS = 0.505
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1008
1006
1004
1002
1000
998
996
994
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 2 RS = 0.727
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1014
1012
1010
1008
1006
1004
1002
1000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 1 RS = 0.971
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1022
1020
1018
1016
1014
1012
1010
1008
9000
9500
10000
10500
11000
11500
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 1 RS = 1.224
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1028
1026
1024
1022
1020
1018
1016
1014
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 1 RS = 1.465
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1032
1030
1028
1026
1024
1022
1020
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS6 (A55) Reach = REACH 1 RS = 1.720 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1038
1036
1034
1032
1030
1028
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S2WS20 (A19)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

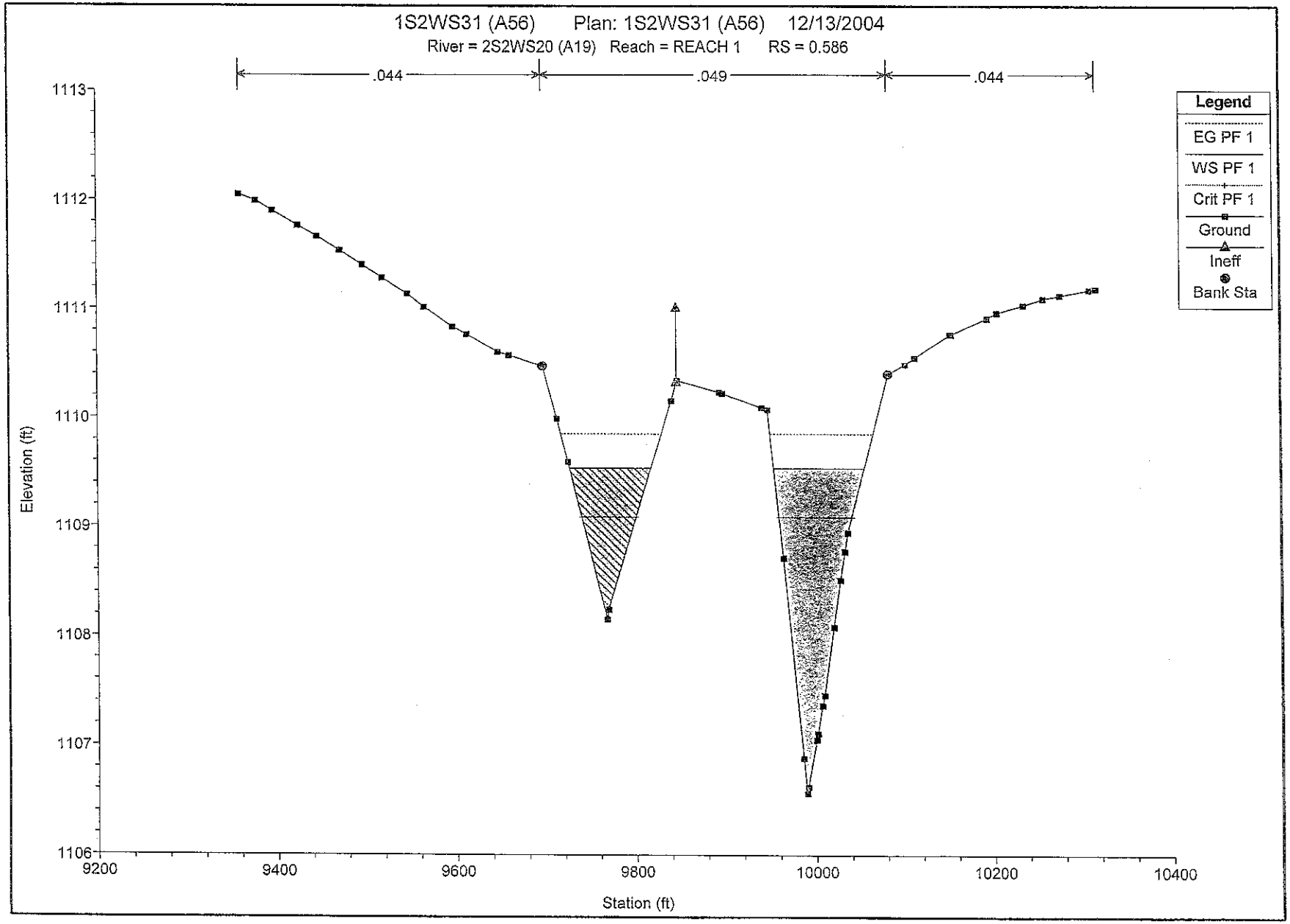
Change in Discharge based on Reach Length

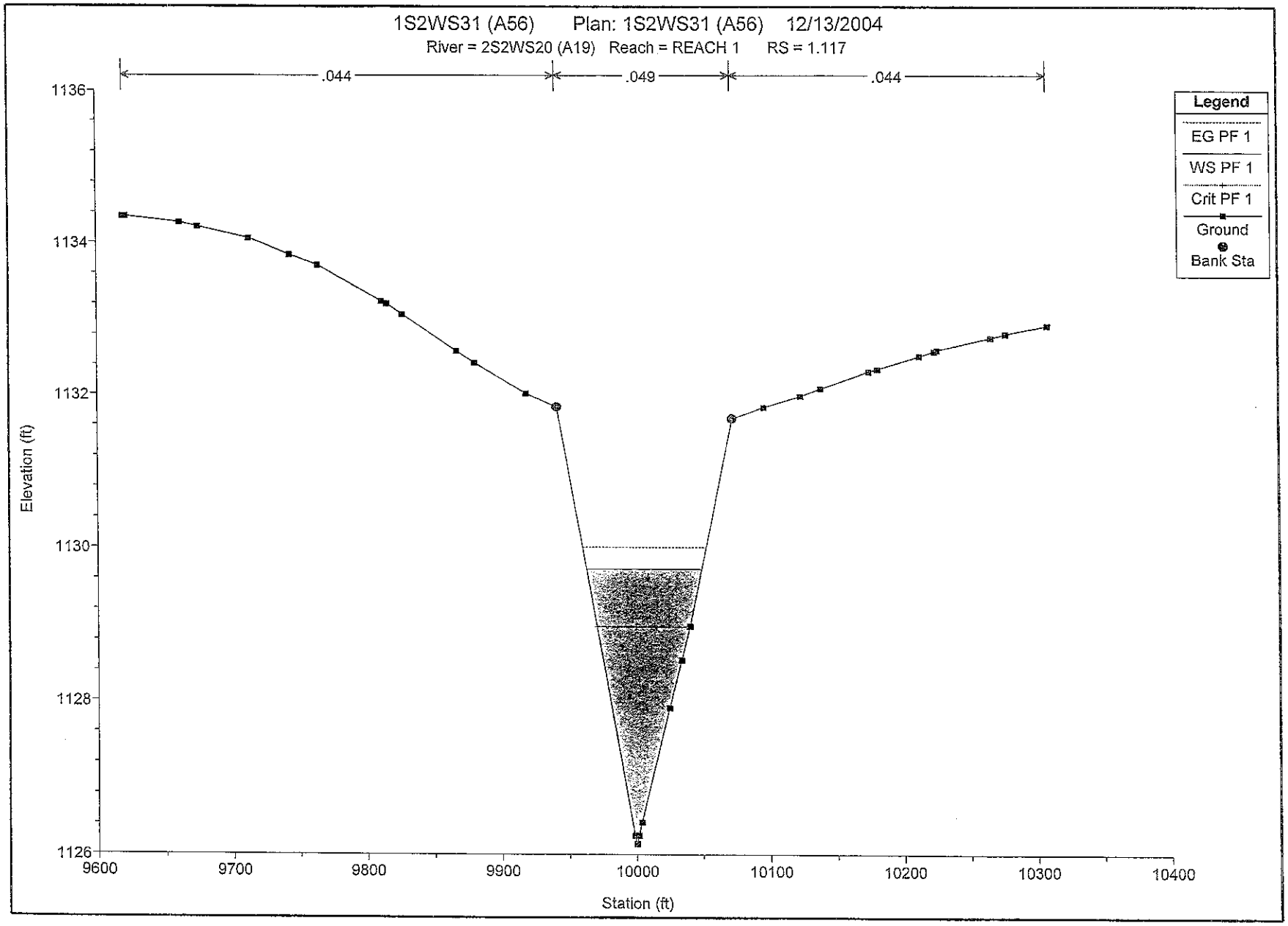
Wash ID: 2S2WS20 (A19)

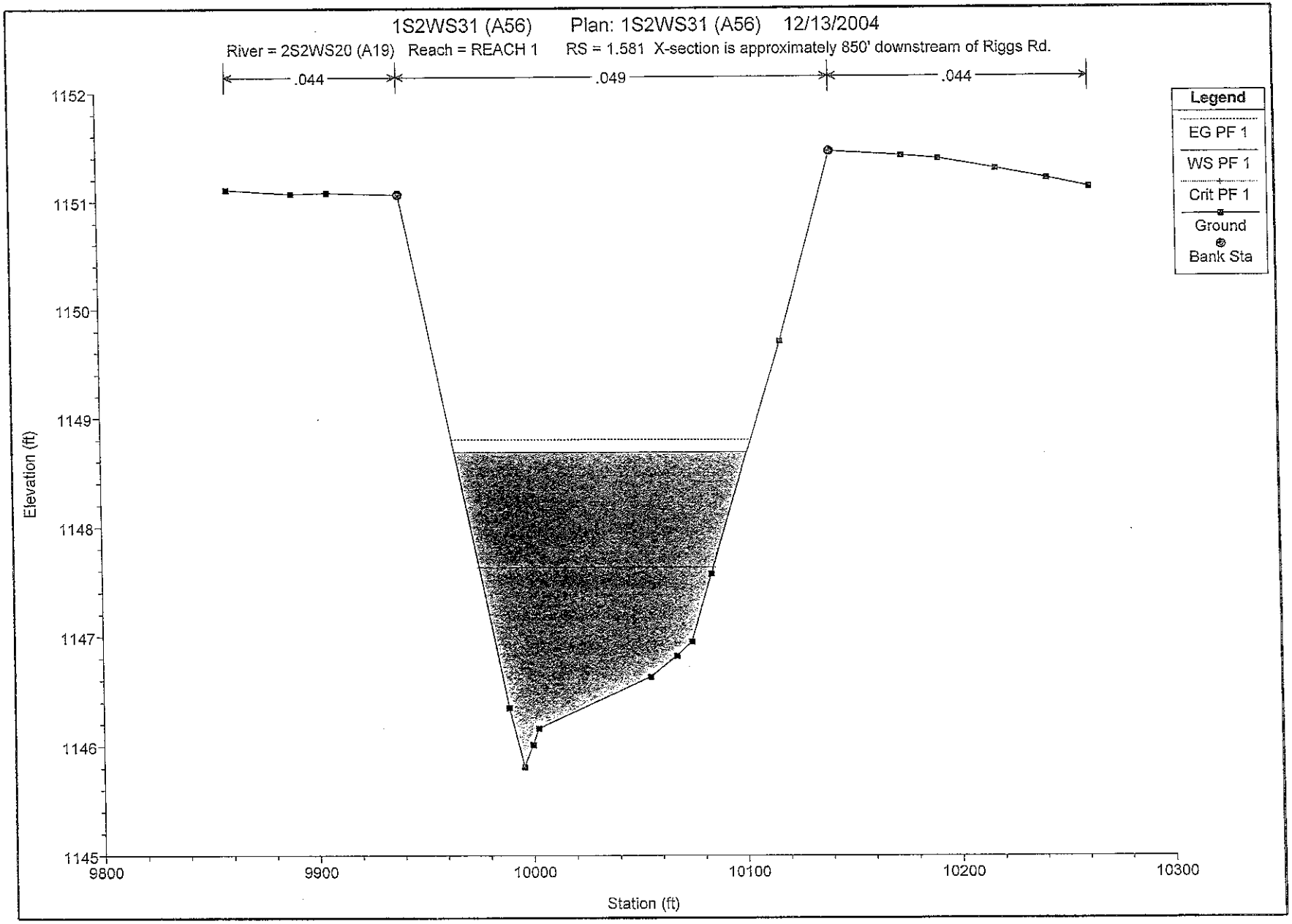
Subbasin	*X-section*	*Discharge*	*Q (3 sig-figs)*	*Q (2 sig-figs)*
CPA08		1636		
DA08	1.848	690		
A19	1.581	682	680	700
A19	1.338	675	680	700
A19	1.117	669	670	700
A19	0.842	661	660	700
A19	0.586	654	650	700
A19	0.362	647	650	600
CPA19A	0.000	637	640	600

Notes:

1. Q of 690 cfs diverted from CPA08 into Subbasin A19
2. CPA19A is sum of routed/diverted flow from CPA08 and local inflow
3. CPA19 is sum of CPA19A and CPA18
4. X-section 1.848 does not exist. Used for deteremination of Q's.
5. X-section 0.000 does not exist. Used for deteremination of Q's.


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS20 (A19) Reach = REACH 1 RS = 0.586
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1113
1112
1111
1110
1109
1108
1107
1106
9200
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS20 (A19) Reach = REACH 1 RS = 1.117
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1136
1134
1132
1130
1128
1126
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS20 (A19) Reach = REACH 1 RS = 1.581 X-section is approximately 850' downstream of Riggs Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1152
1151
1150
1149
1148
1147
1146
1145
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S2WS17B (A63)

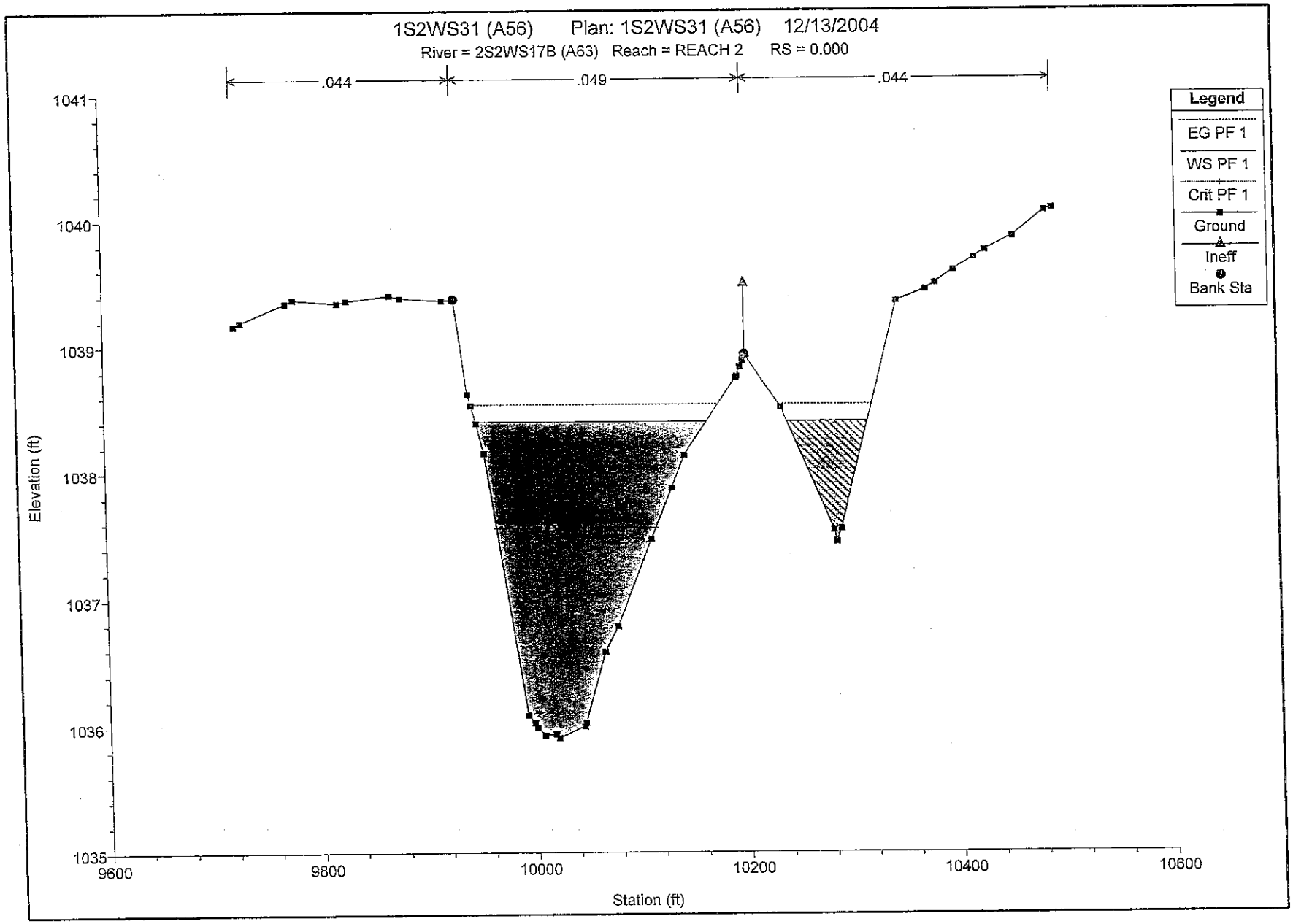
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

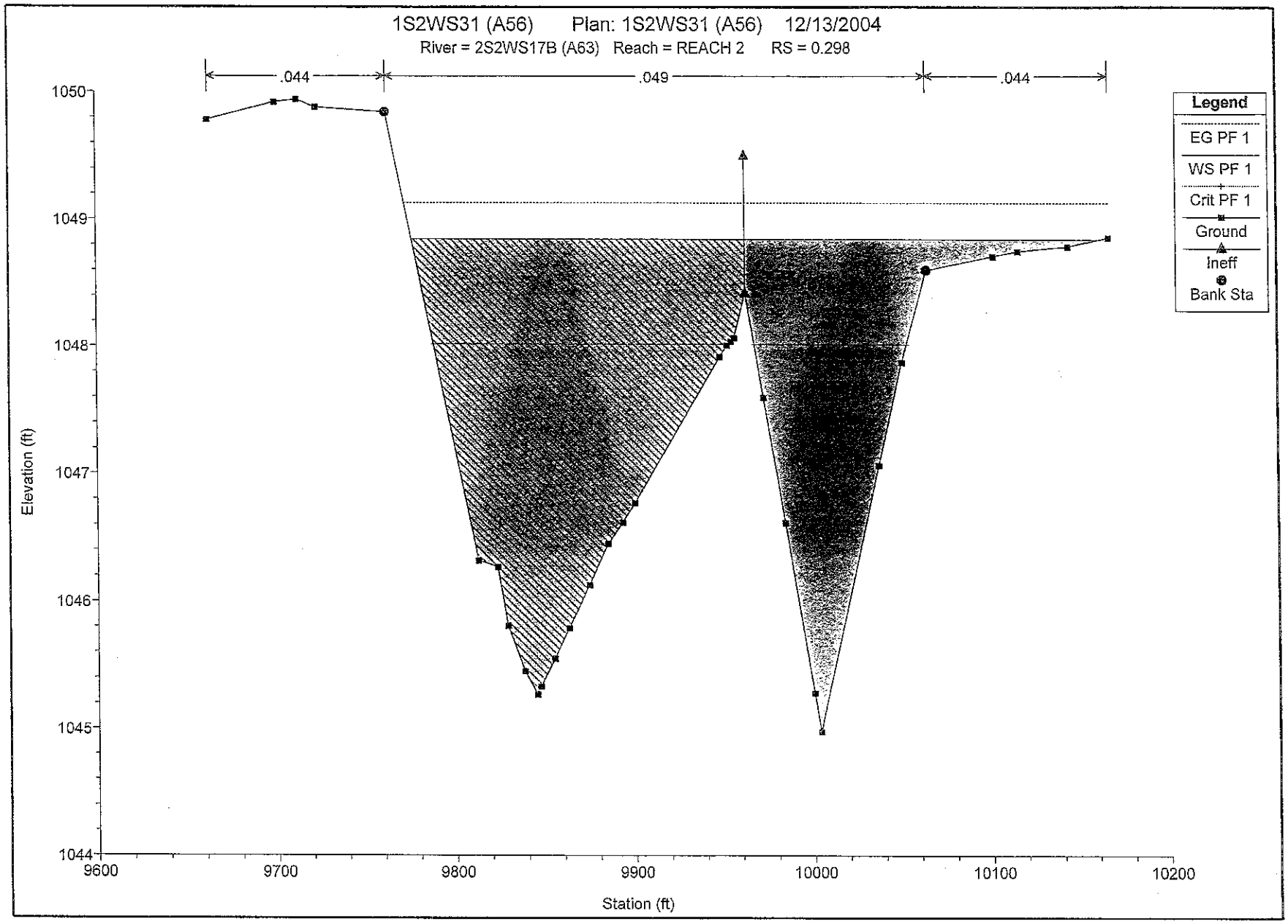
Change in Discharge based on Reach Length

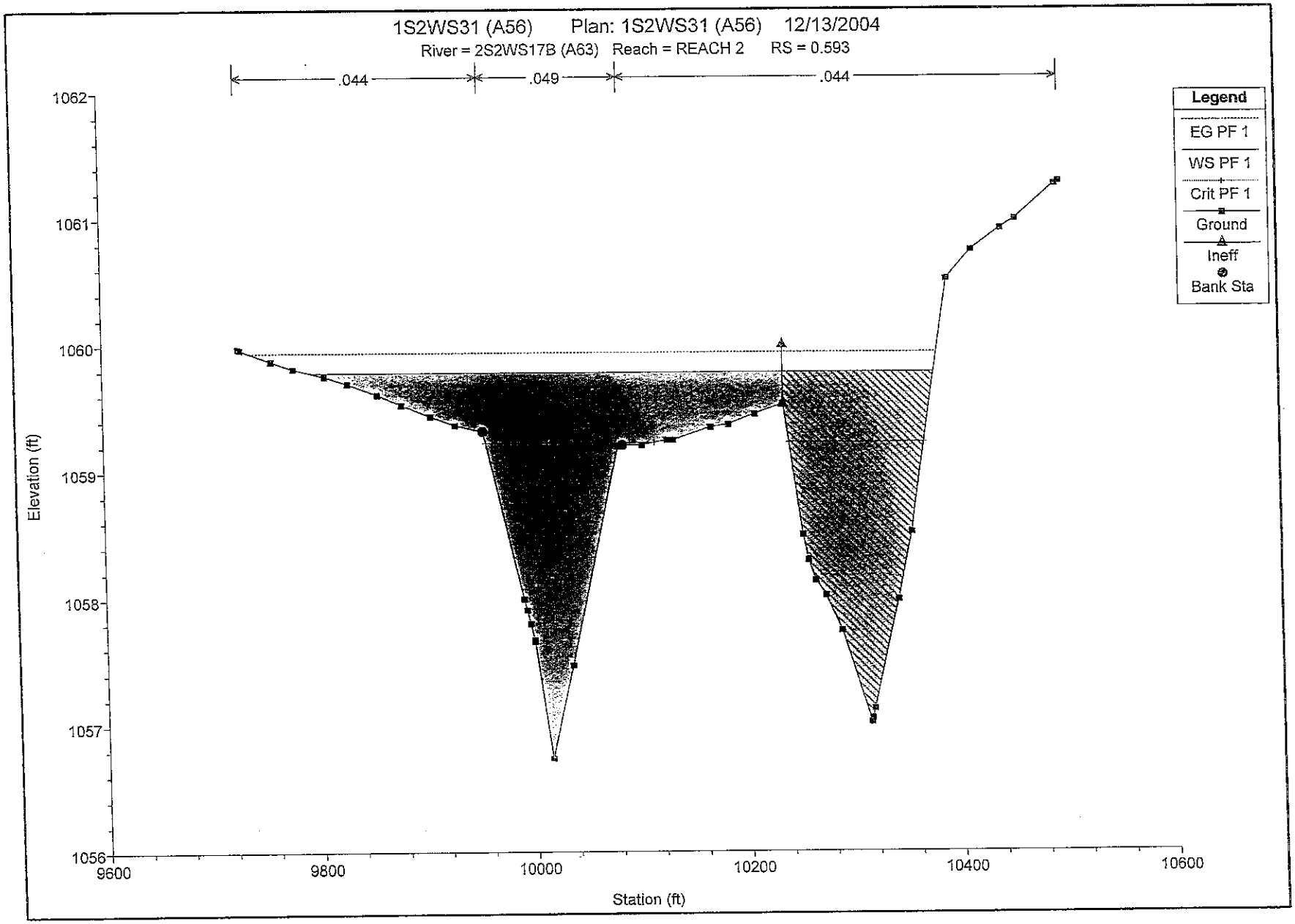
Wash ID: 2S2WS17B (A63)

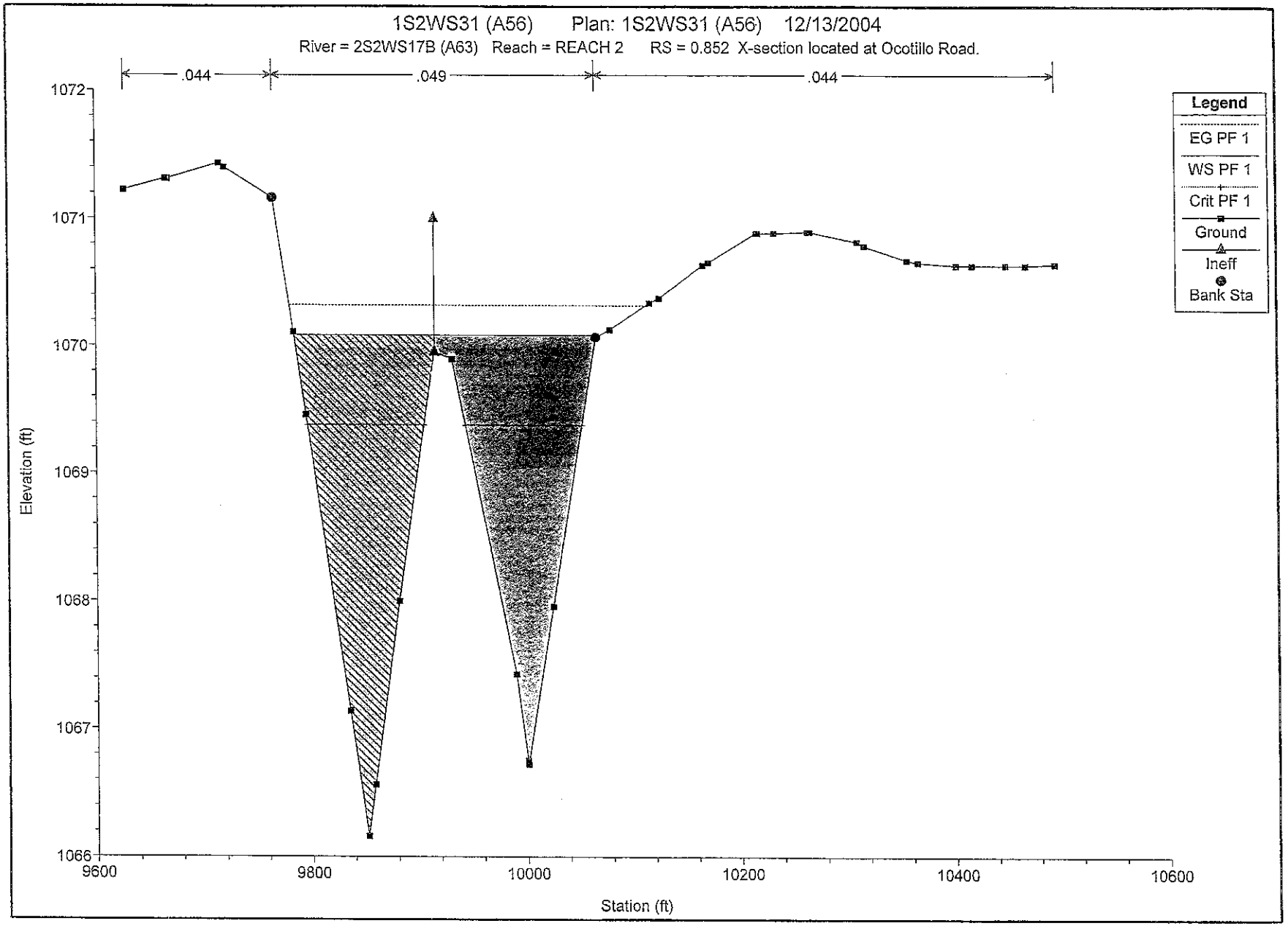
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
u/s CPA03	5.104	1943	1940	1900
A64	4.381	1835	1840	1800
A64	4.098	1793	1790	1800
A64	3.884	1761	1760	1800
A64	3.592	1718	1720	1700
CPA64	3.299	1674	1670	1700
A18	3.038	1538	1540	1500
A18	2.771	1398	1400	1400
A18	2.521	1268	1270	1300
A18	2.168	1083	1080	1100
A18	1.898	942	940	900
CPA18	1.627	801	800	800
split to A19		373	370	400
CPA19	1.294	886	890	900
A63	1.137	889	890	900
A63	0.852	893	890	900
A63	0.593	897	900	900
A63	0.298	902	900	900
A63	0.000	907	910	900
d/s CPA63A	-0.295	912	910	900
d/s CPA63	-0.295	1421	1420	1400

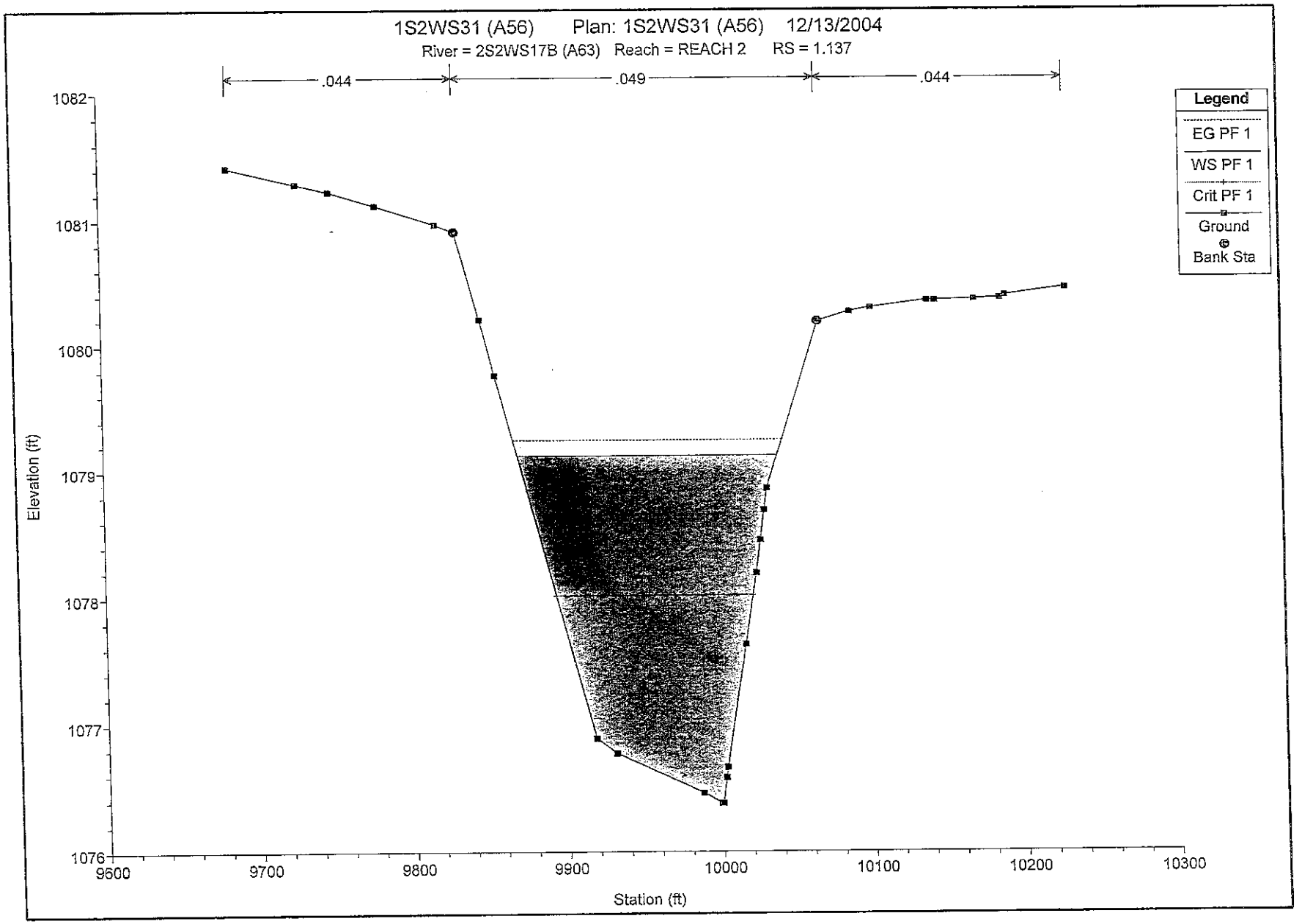
1. X-section 5.104 does not exist. Used for determination of Q's.
2. X-section -0.295 does not exist. Used for determination of Q's.

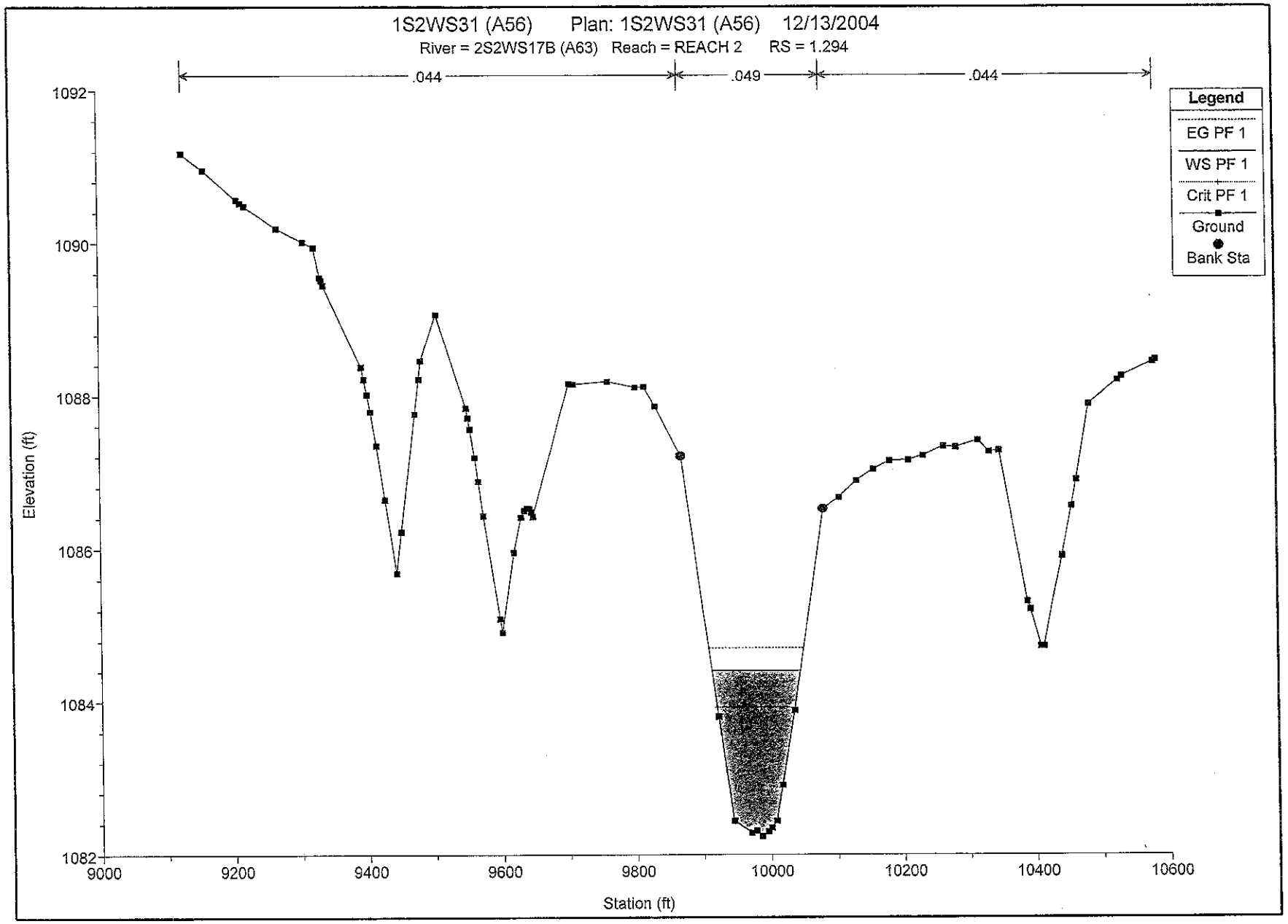

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 2 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1041
1040
1039
1038
1037
1036
1035
9600
9800
10000
10200
10400
10600
Station (ft)

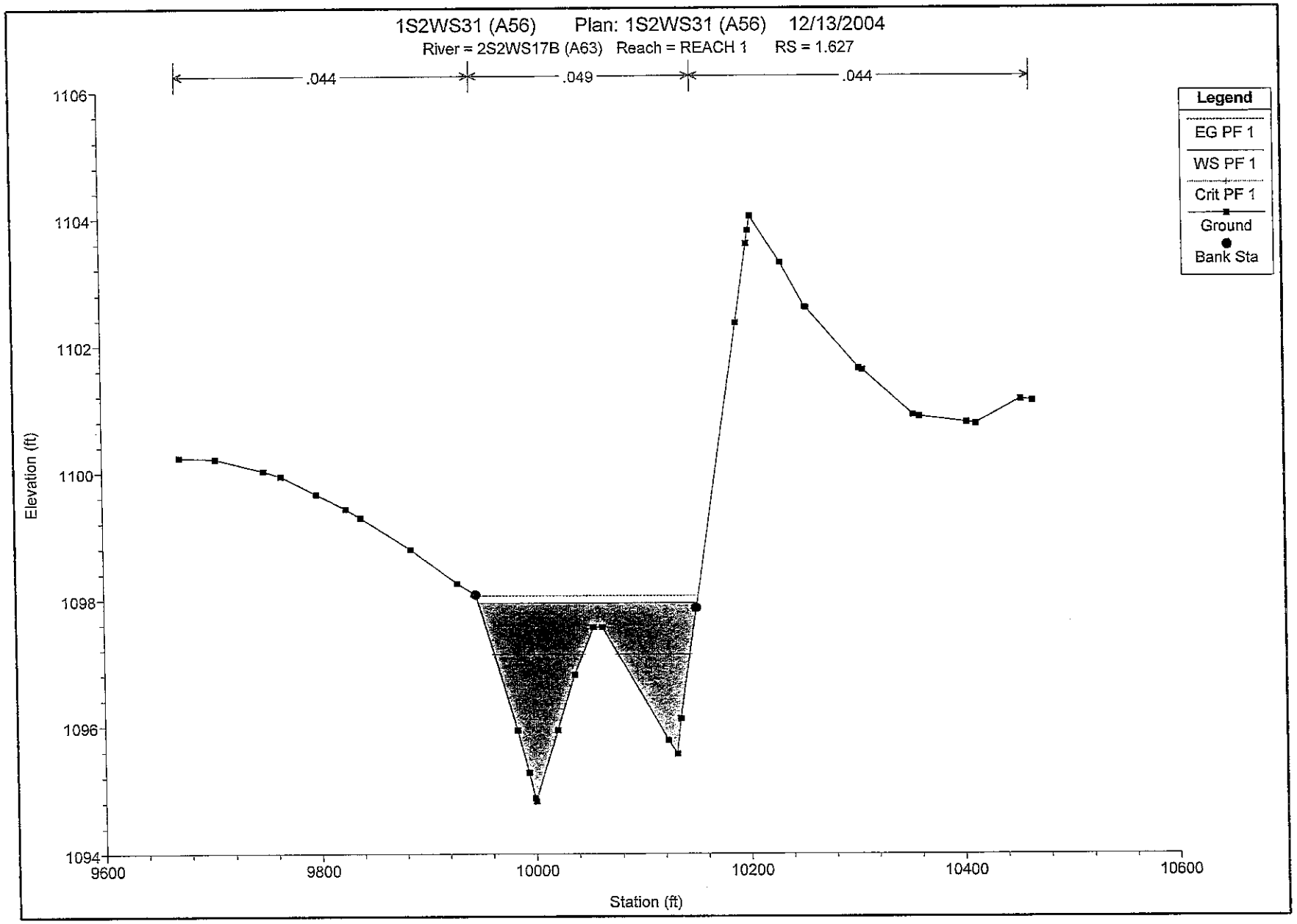

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 2 RS = 0.298
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1050
1049
1048
1047
1046
1045
1044
9600
9700
9800
9900
10000
10100
10200
Station (ft)

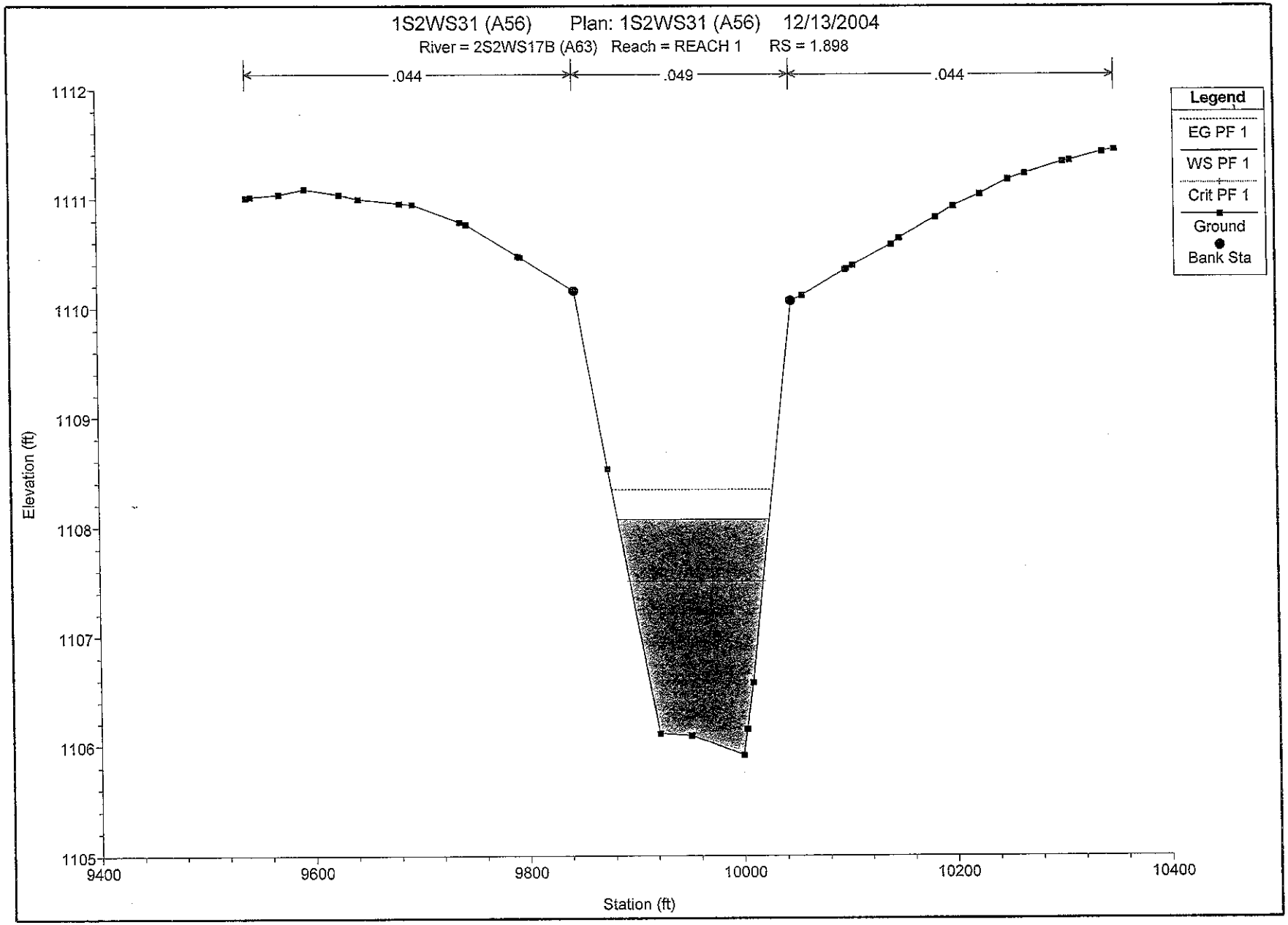

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 2 RS = 0.593
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1062
1061
1060
1059
1058
1057
1056
9600
9800
10000
10200
10400
10600
Station (ft)

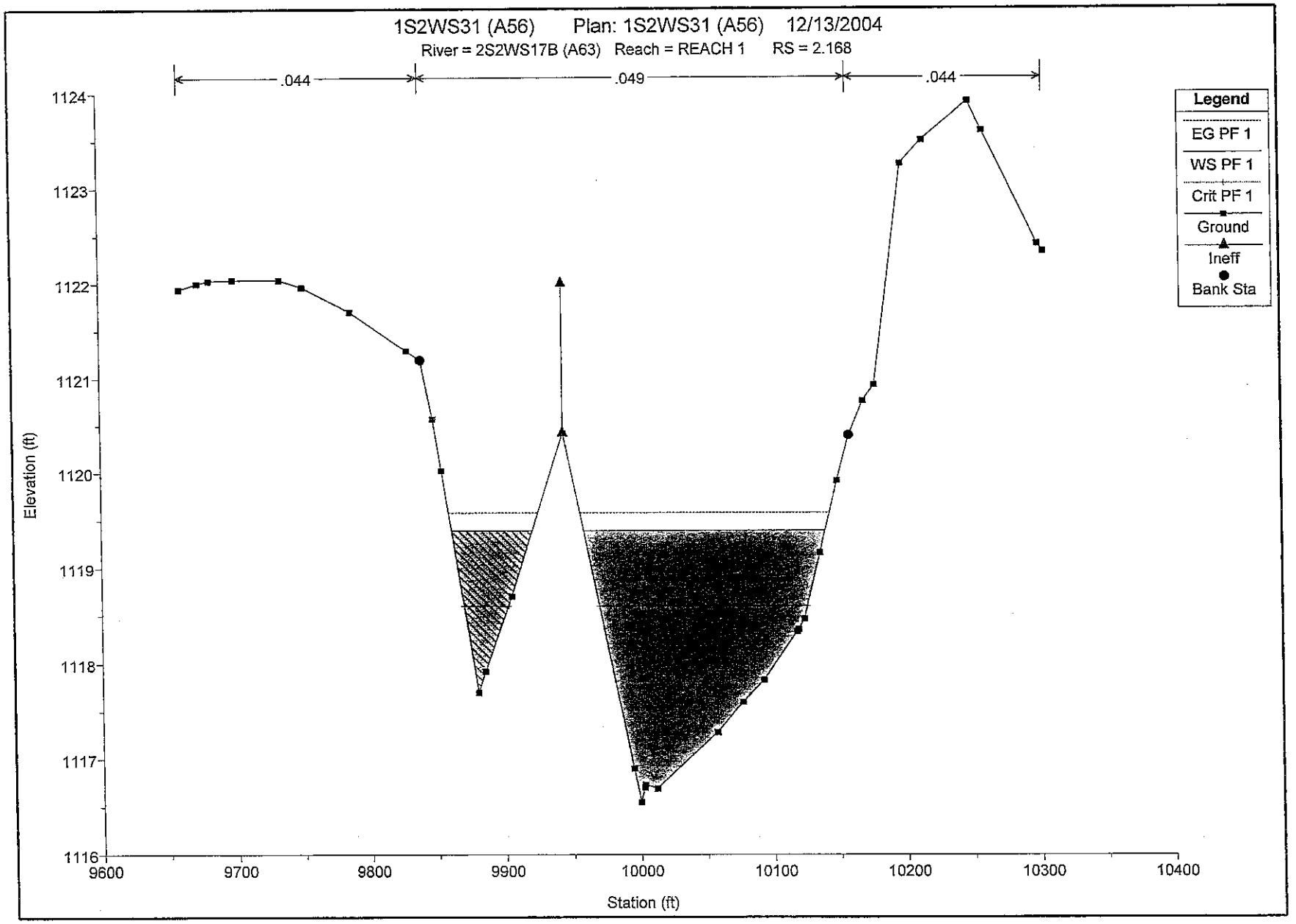

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 2 RS = 0.852 X-section located at Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1072
1071
1070
1069
1068
1067
1066
9600
9800
10000
10200
10400
10600
Station (ft)

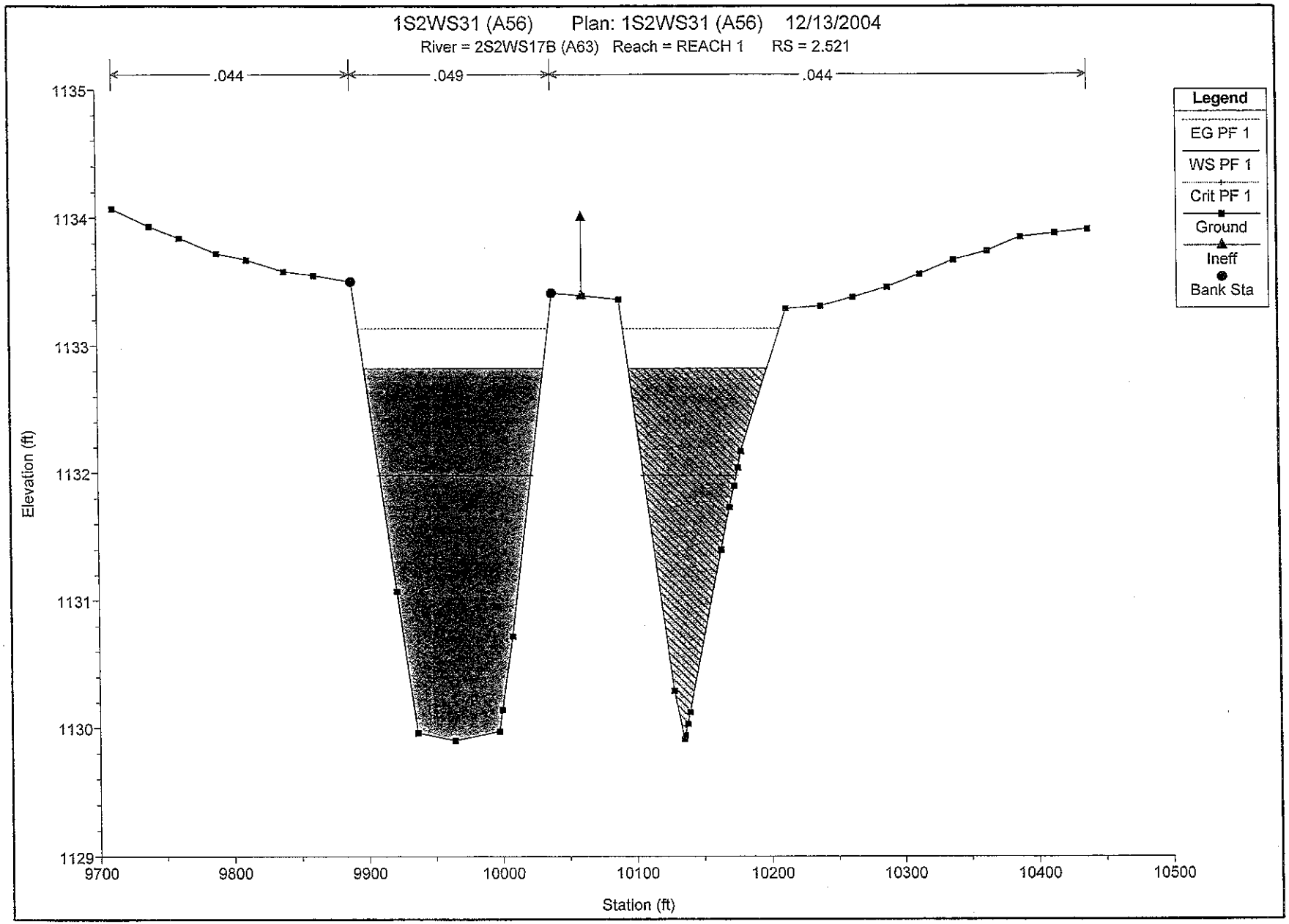

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 2 RS = 1.137
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1082
1081
1080
1079
1078
1077
1076
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

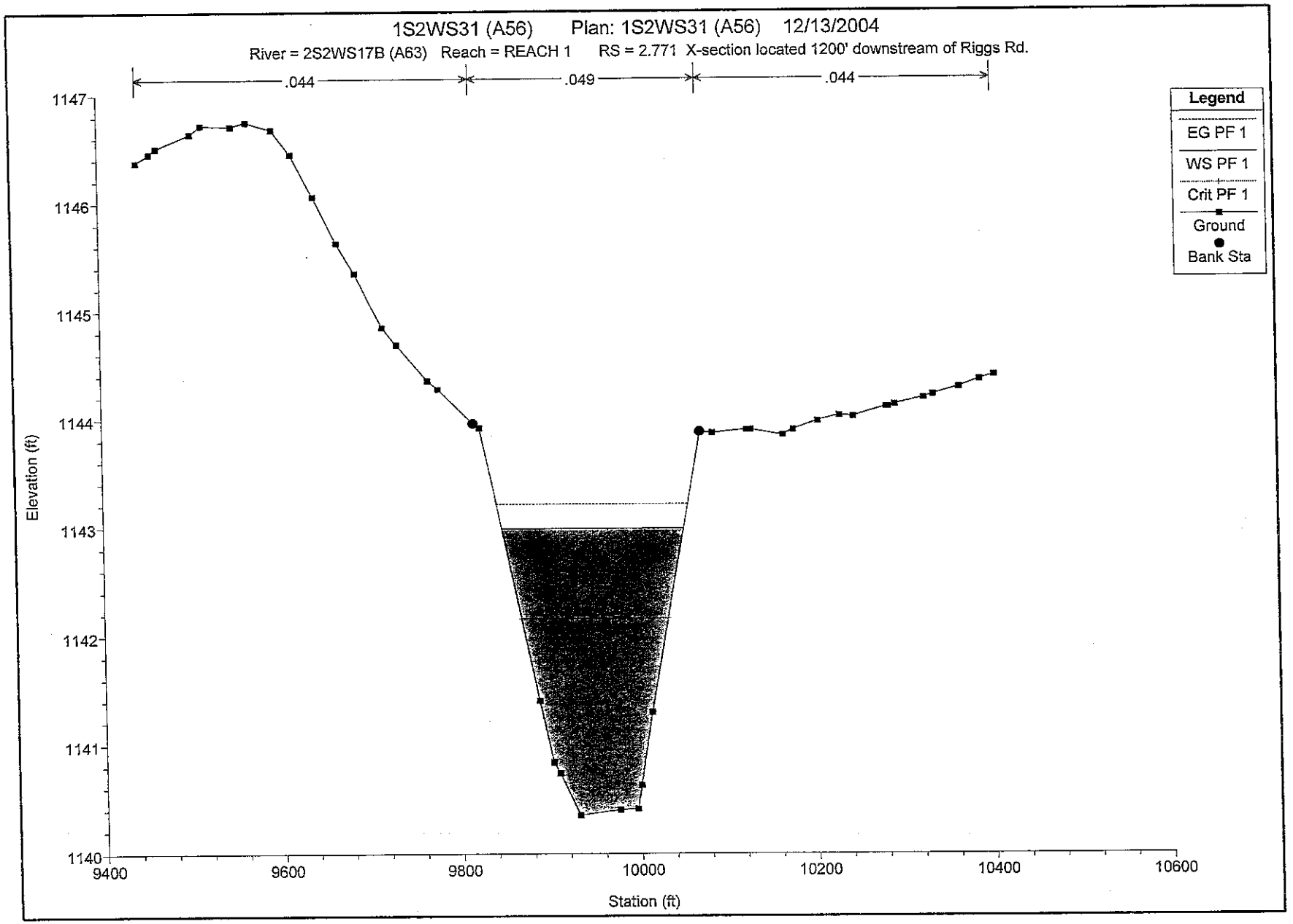

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 2 RS = 1.294
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1092
1090
1088
1086
1084
1082
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

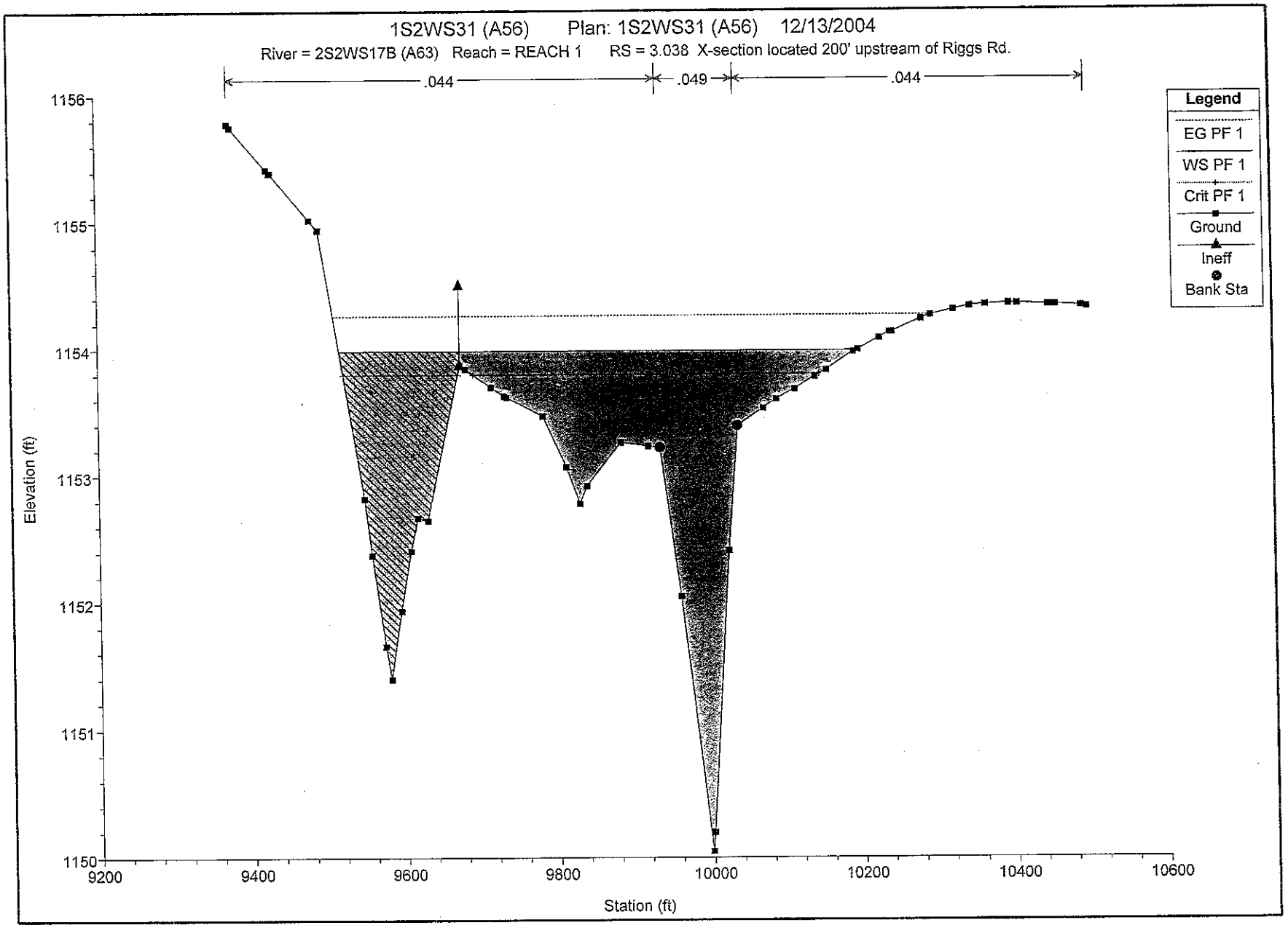

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 1.627
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1106
1104
1102
1100
1098
1096
1094
9600
9800
10000
10200
10400
10600
Station (ft)

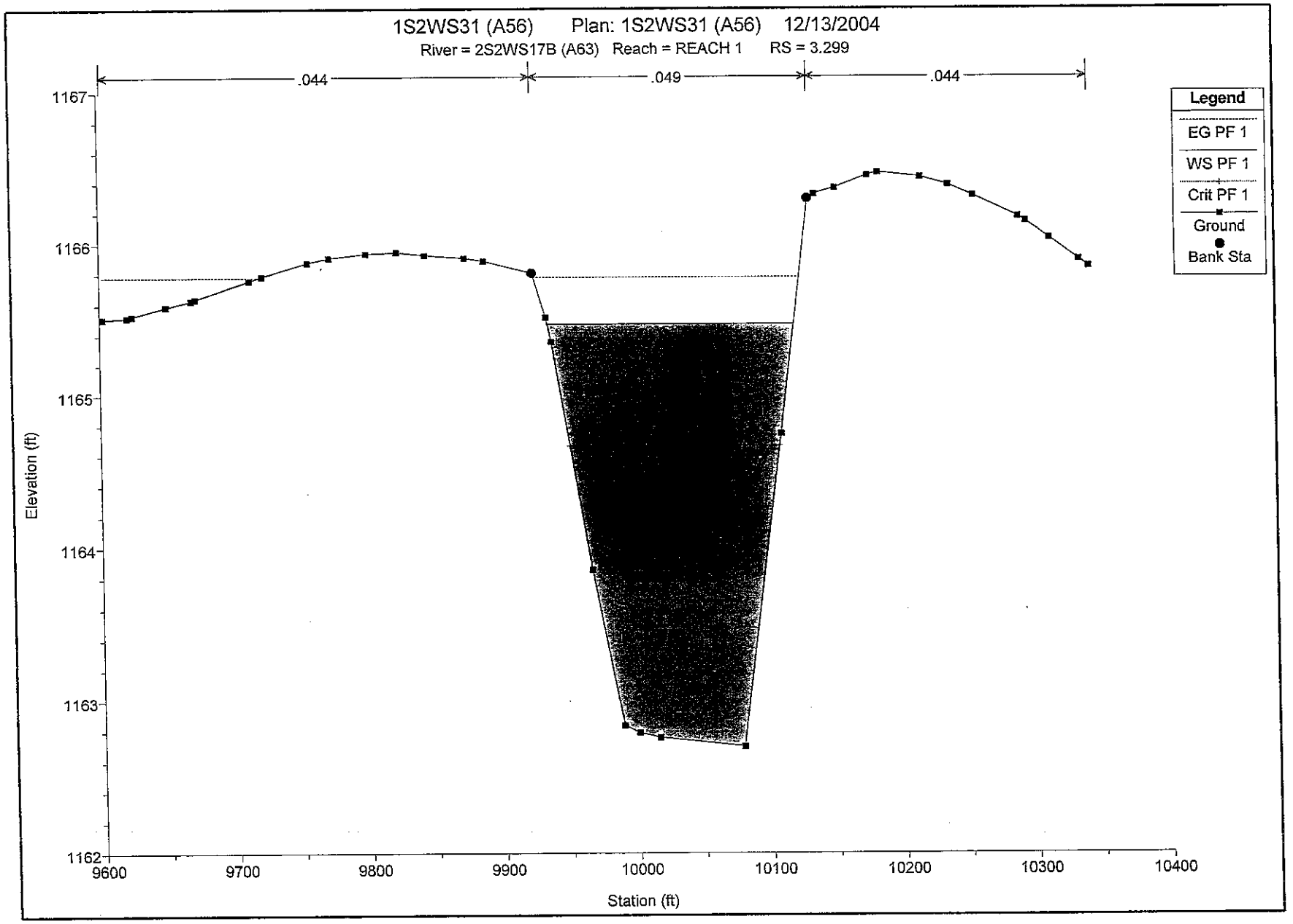

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 1.898
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1112
1111
1110
1109
1108
1107
1106
1105
9400
9600
9800
10000
10200
10400
Station (ft)

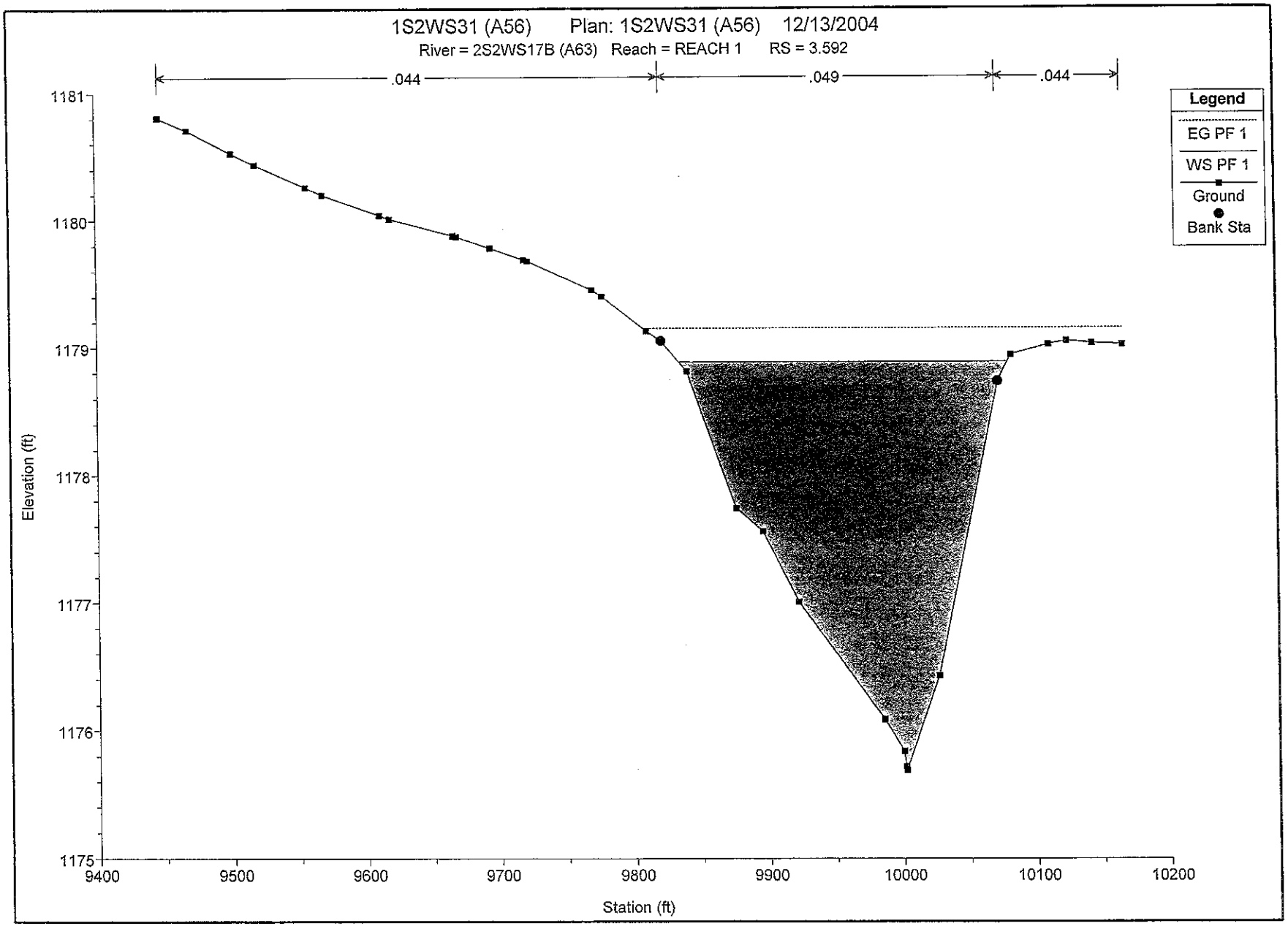

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 2.168
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1124
1123
1122
1121
1120
1119
1118
1117
1116
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

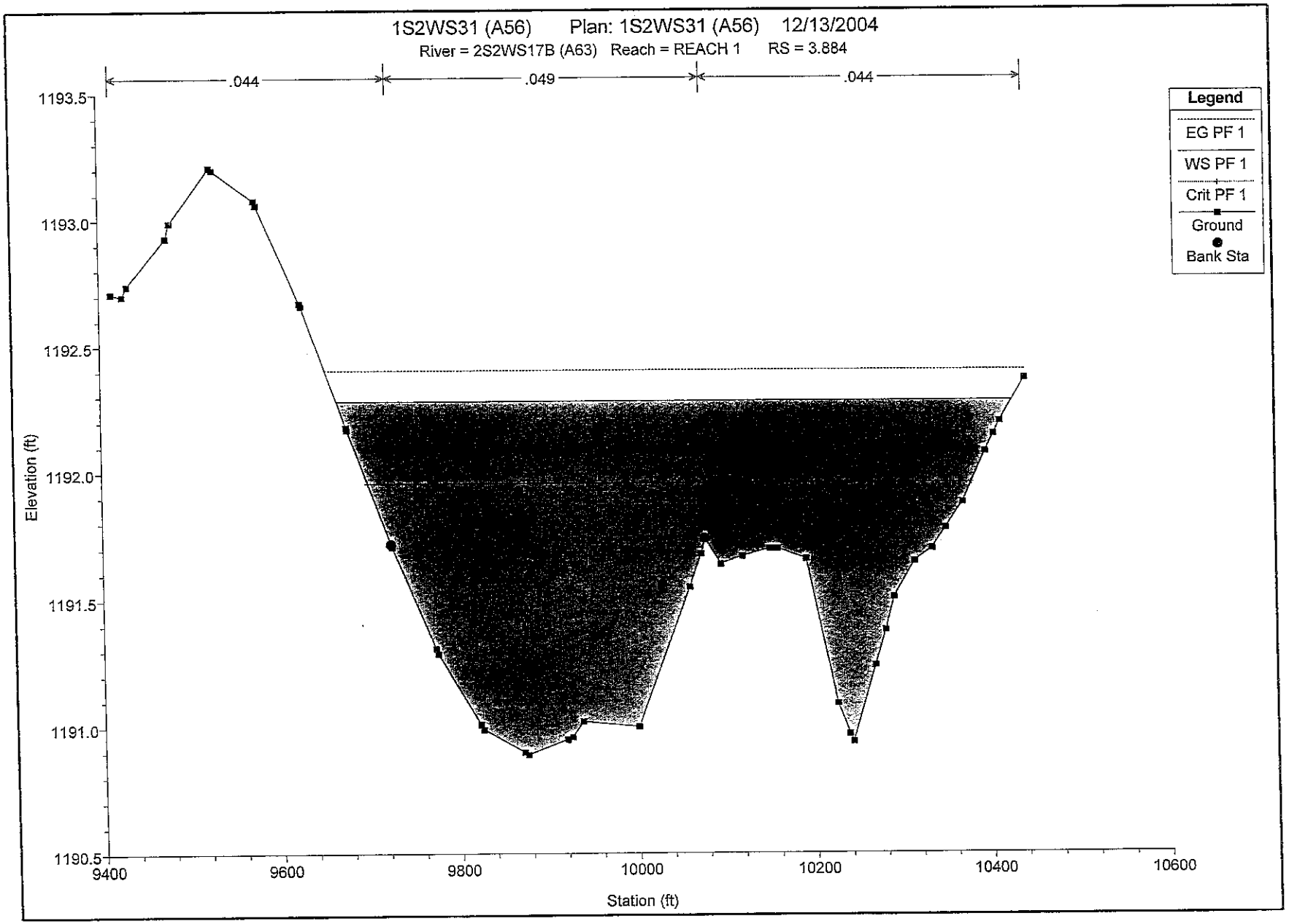

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 2.521
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1135
1134
1133
1132
1131
1130
1129
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

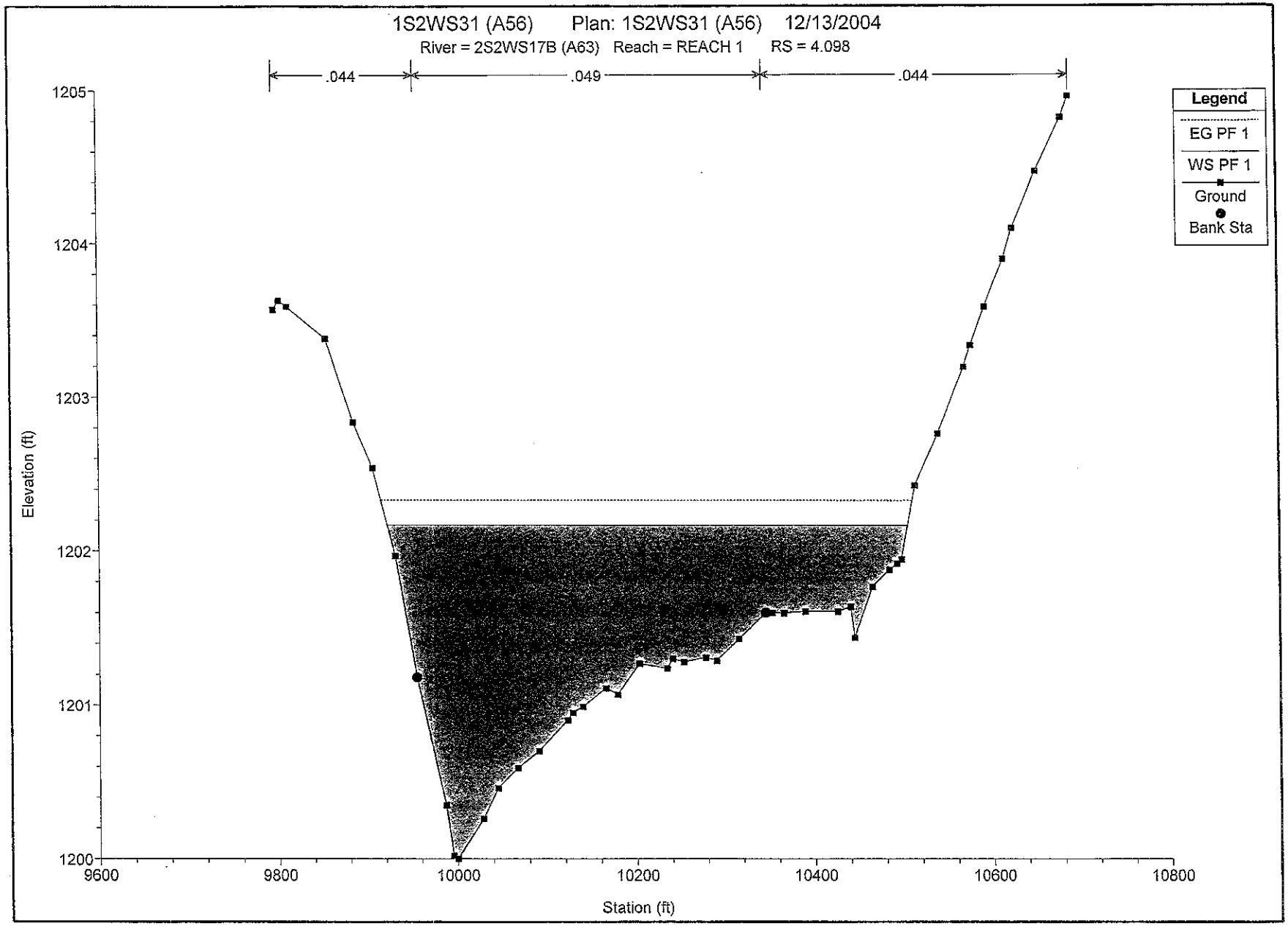

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 2.771 X-section located 1200' downstream of Riggs Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1147
1146
1145
1144
1143
1142
1141
1140
9400
9600
9800
10000
10200
10400
10600
Station (ft)

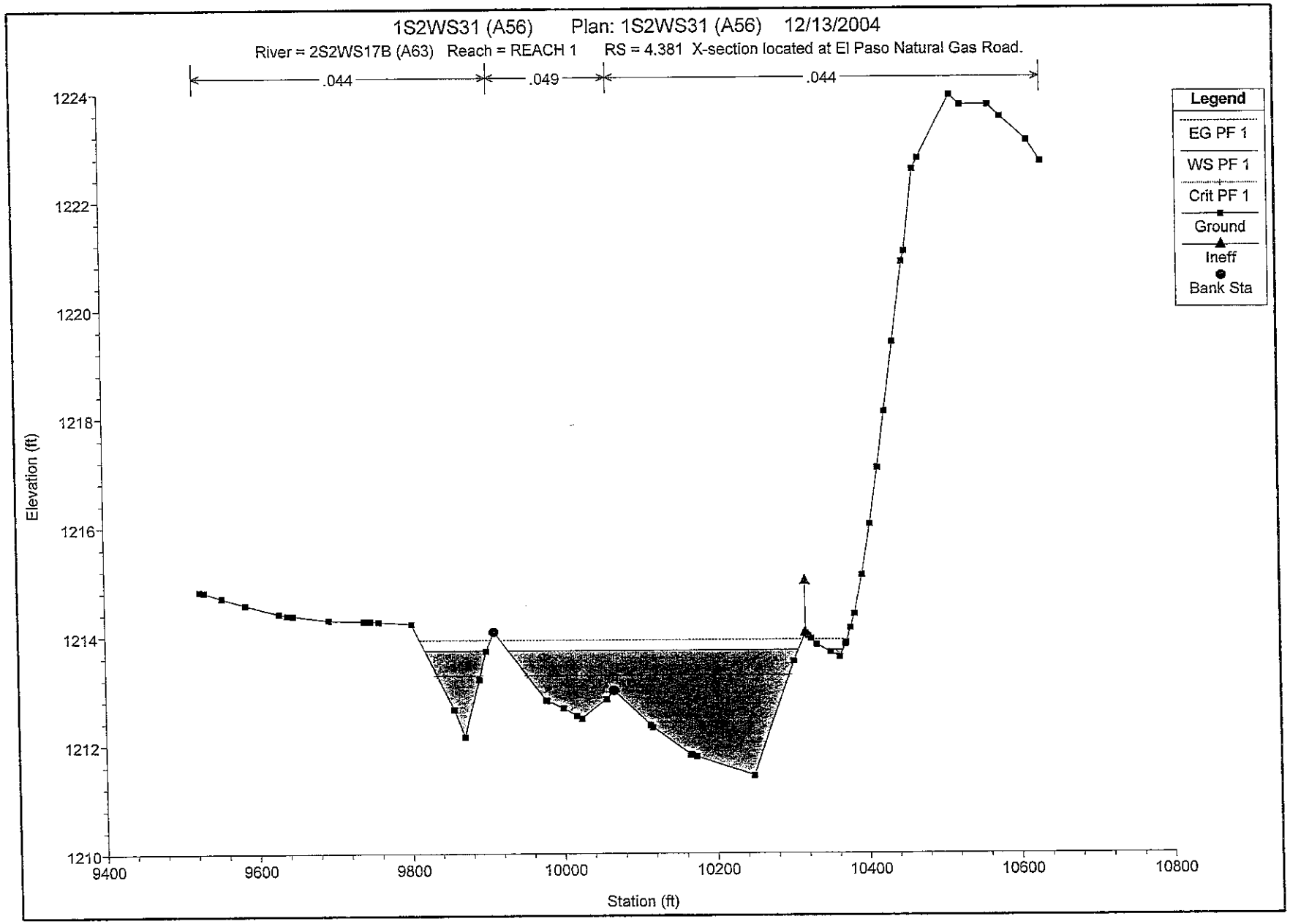

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 3.038 X-section located 200' upstream of Riggs Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1156
1155
1154
1153
1152
1151
1150
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 3.299
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1167
1166
1165
1164
1163
1162
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 3.592
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1181
1180
1179
1178
1177
1176
1175
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 3.884
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1193.5
1193.0
1192.5
1192.0
1191.5
1191.0
1190.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 4.098
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1205
1204
1203
1202
1201
1200
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS17B (A63) Reach = REACH 1 RS = 4.381 X-section located at El Paso Natural Gas Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1224
1222
1220
1218
1216
1214
1212
1210
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: 1S2WS31 (A56)

REACH: 2S2WS7B (A51)

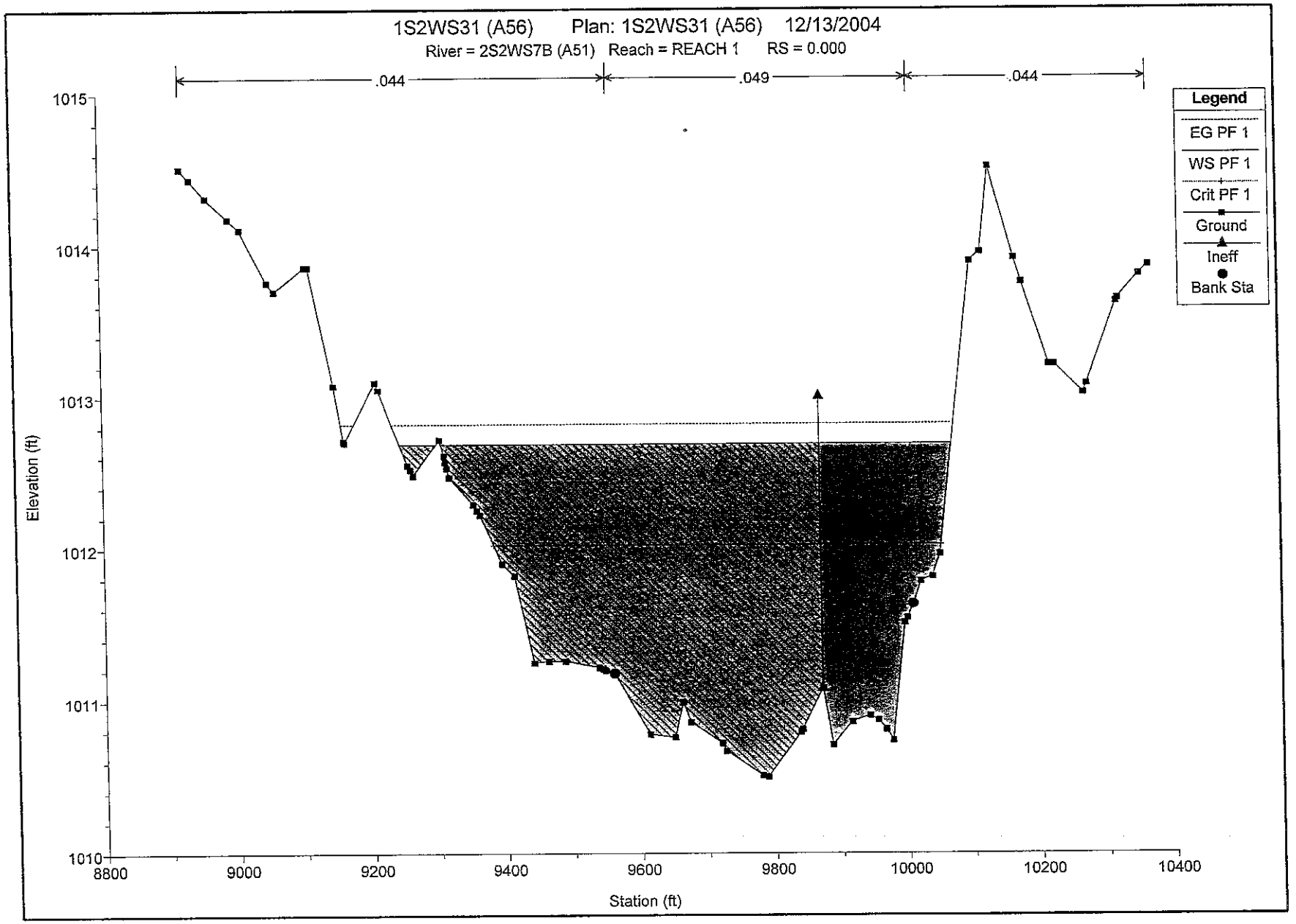
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

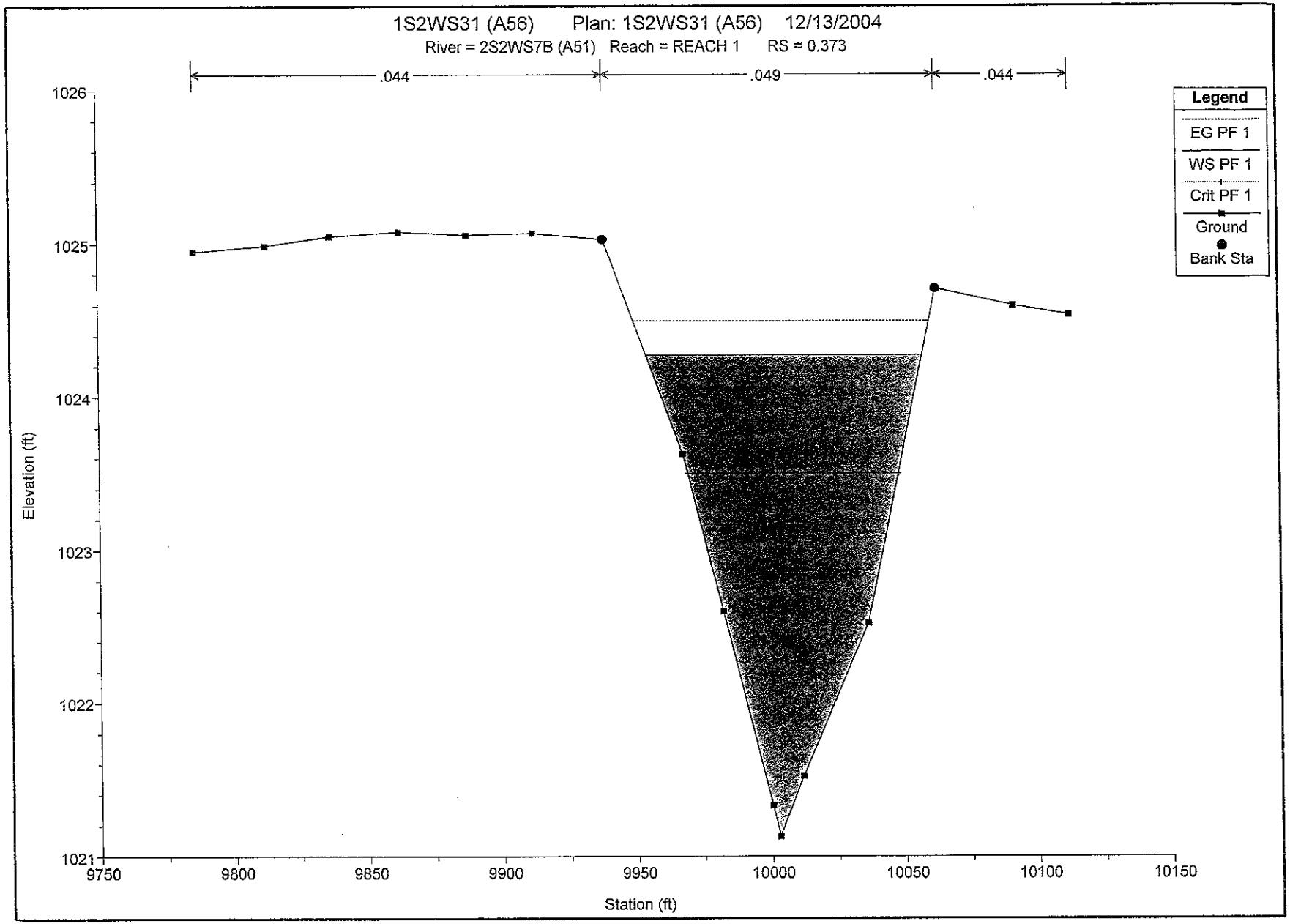
Change in Discharge based on Reach Length

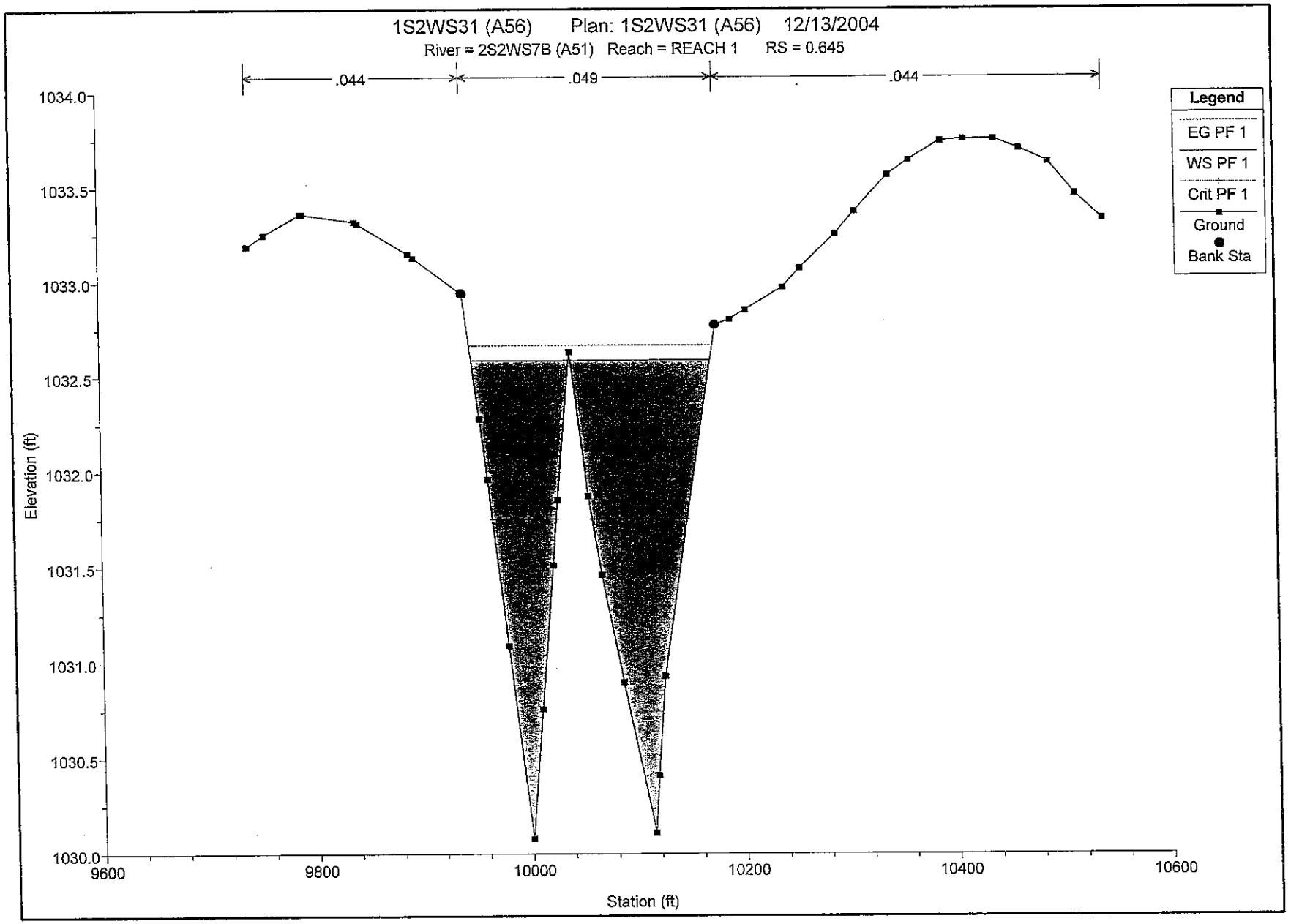
Wash ID: 2S2WS7B (A51)

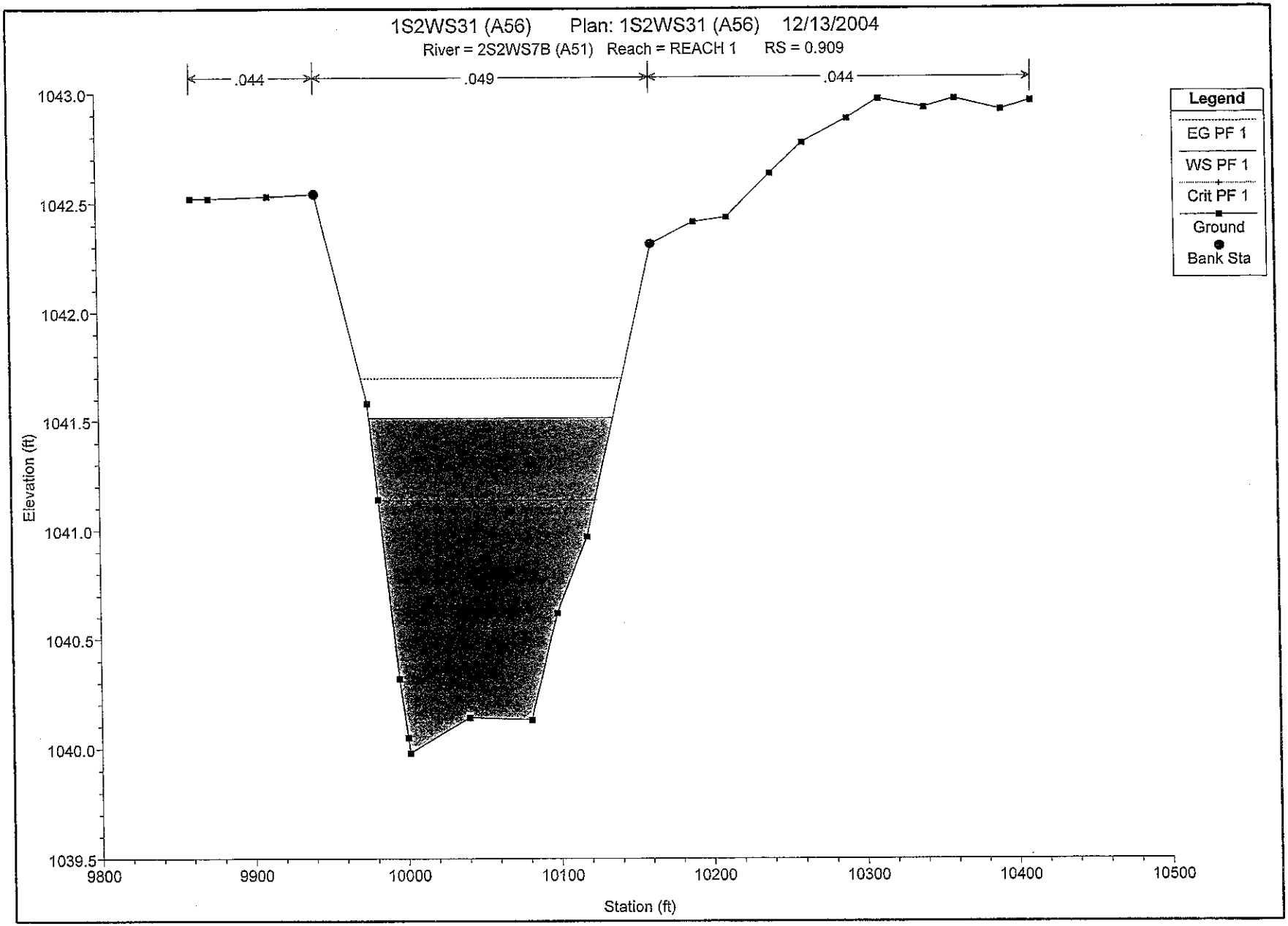
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPA20		693		
DA20	1.978	407	410	400
A51	1.710	456	460	500
A51	1.452	503	500	500
A51	1.187	551	550	600
A51	0.909	601	600	600
A51	0.645	649	650	600
A51	0.373	699	700	700
A51	0.000	767	770	800
CPA51	-2.000	1130	1130	1100

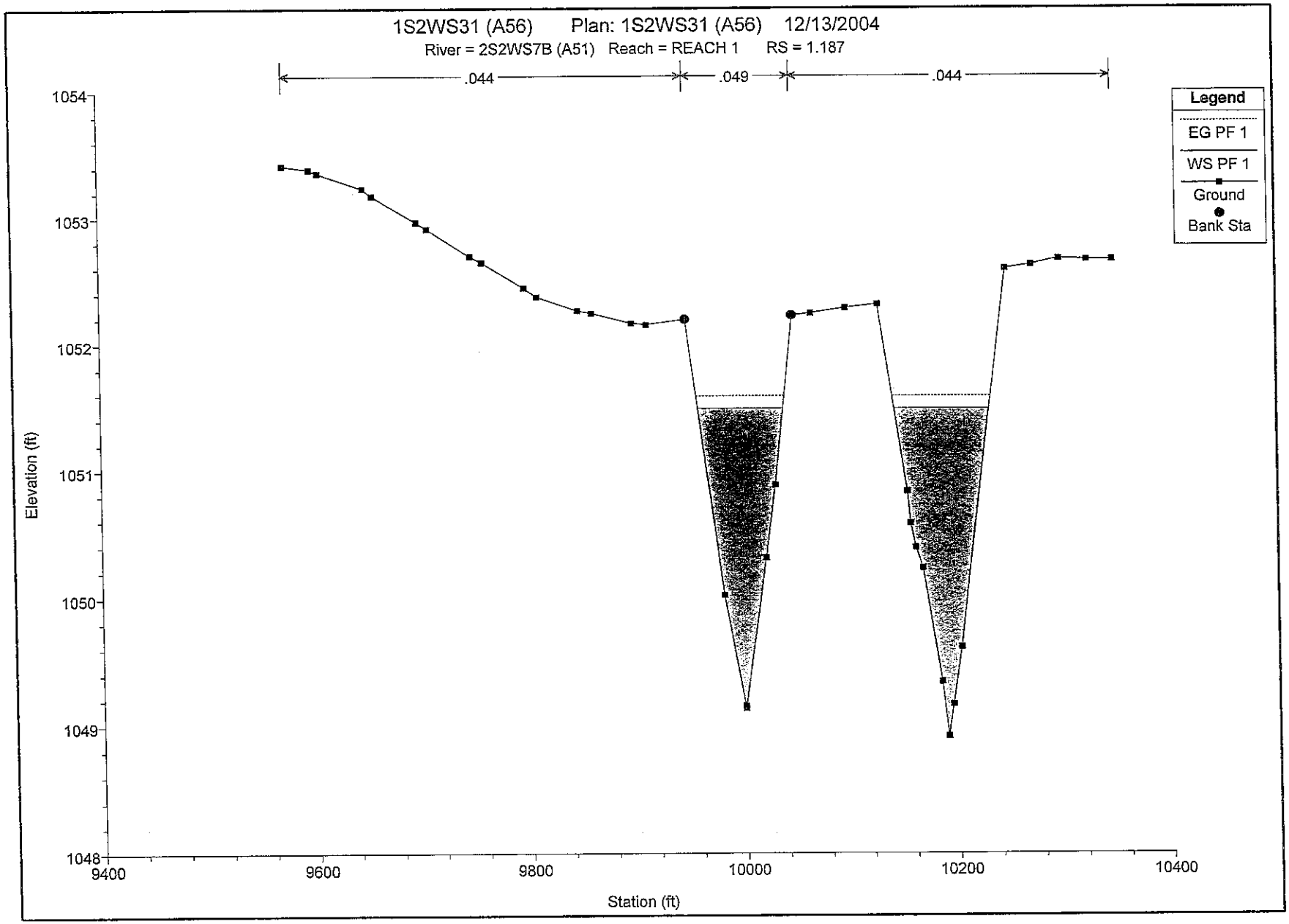
Notes:
1. Q at CPA20 is 693 cfs
2. split into A51 is 407 cfs
3. CPA51 = 1130 cfs

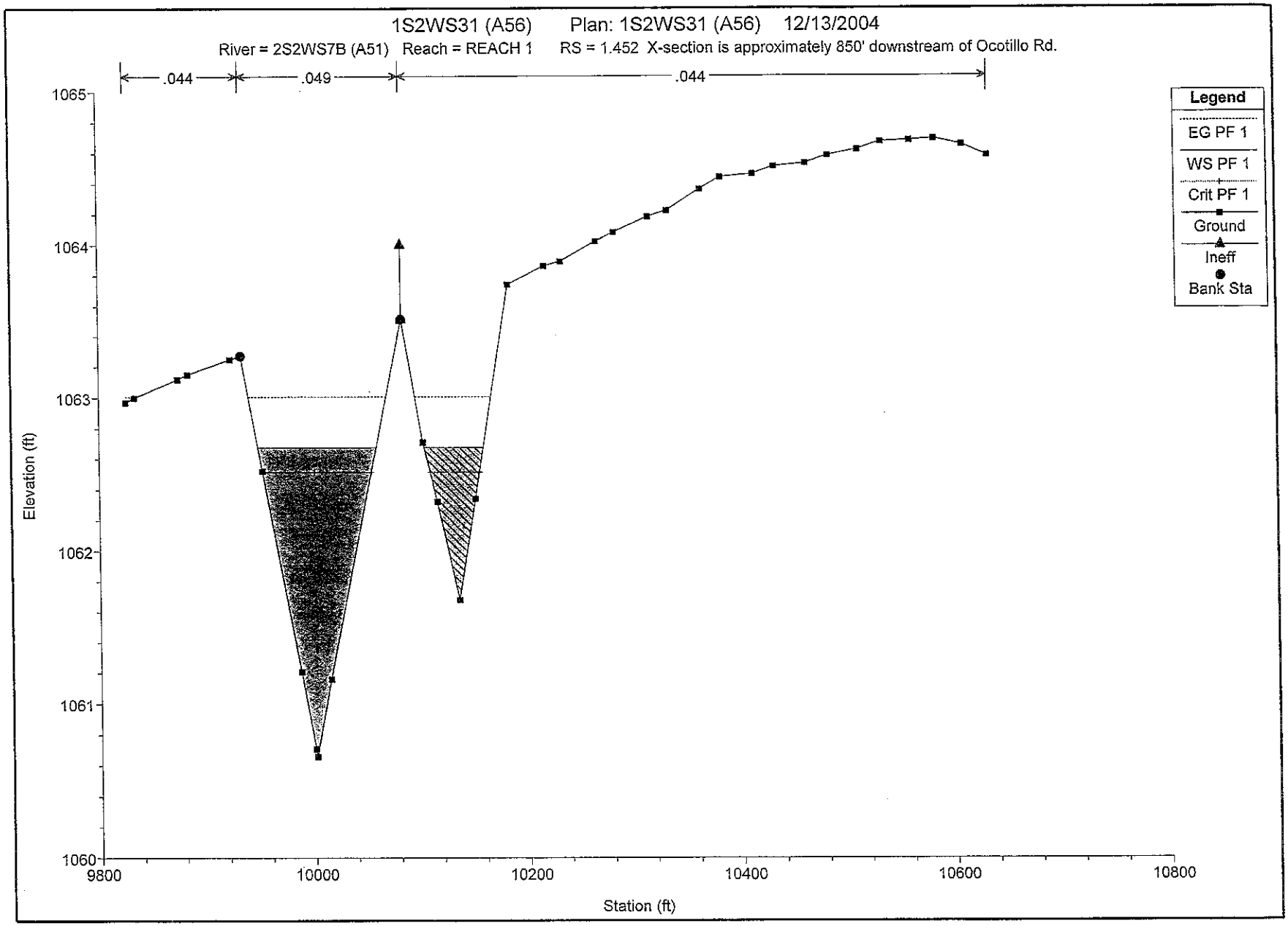

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1015
1014
1013
1012
1011
1010
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

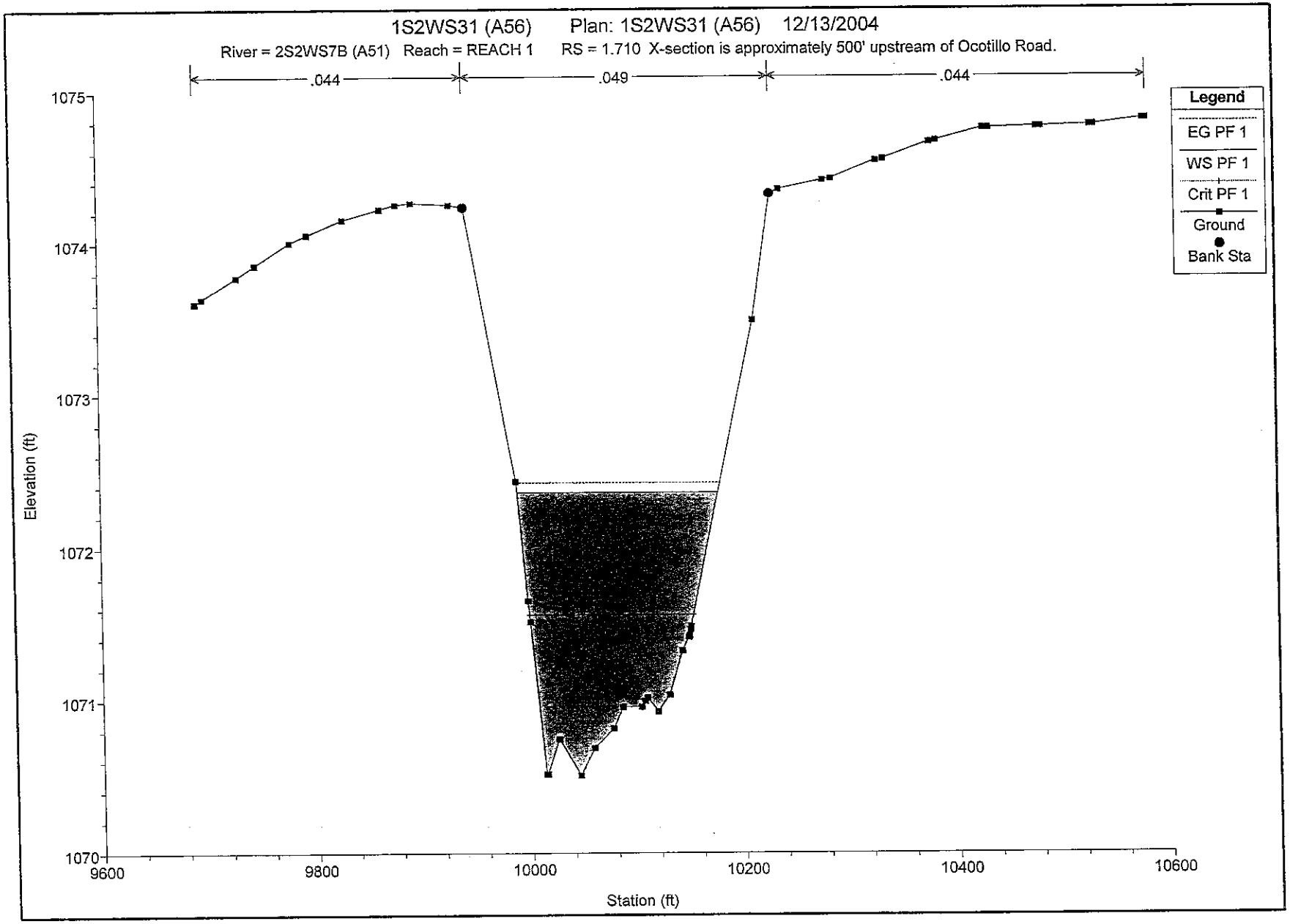

1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 0.373
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1026
1025
1024
1023
1022
1021
9750
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 0.645
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1034.0
1033.5
1033.0
1032.5
1032.0
1031.5
1031.0
1030.5
1030.0
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 0.909
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1043.0
1042.5
1042.0
1041.5
1041.0
1040.5
1040.0
1039.5
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 1.187
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1054
1053
1052
1051
1050
1049
1048
9400
9600
9800
10000
10200
10400
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 1.452 X-section is approximately 850' downstream of Ocotillo Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1065
1064
1063
1062
1061
1060
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31 (A56) Plan: 1S2WS31 (A56) 12/13/2004
River = 2S2WS7B (A51) Reach = REACH 1 RS = 1.710 X-section is approximately 500' upstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1075
1074
1073
1072
1071
1070
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS31B (I70)

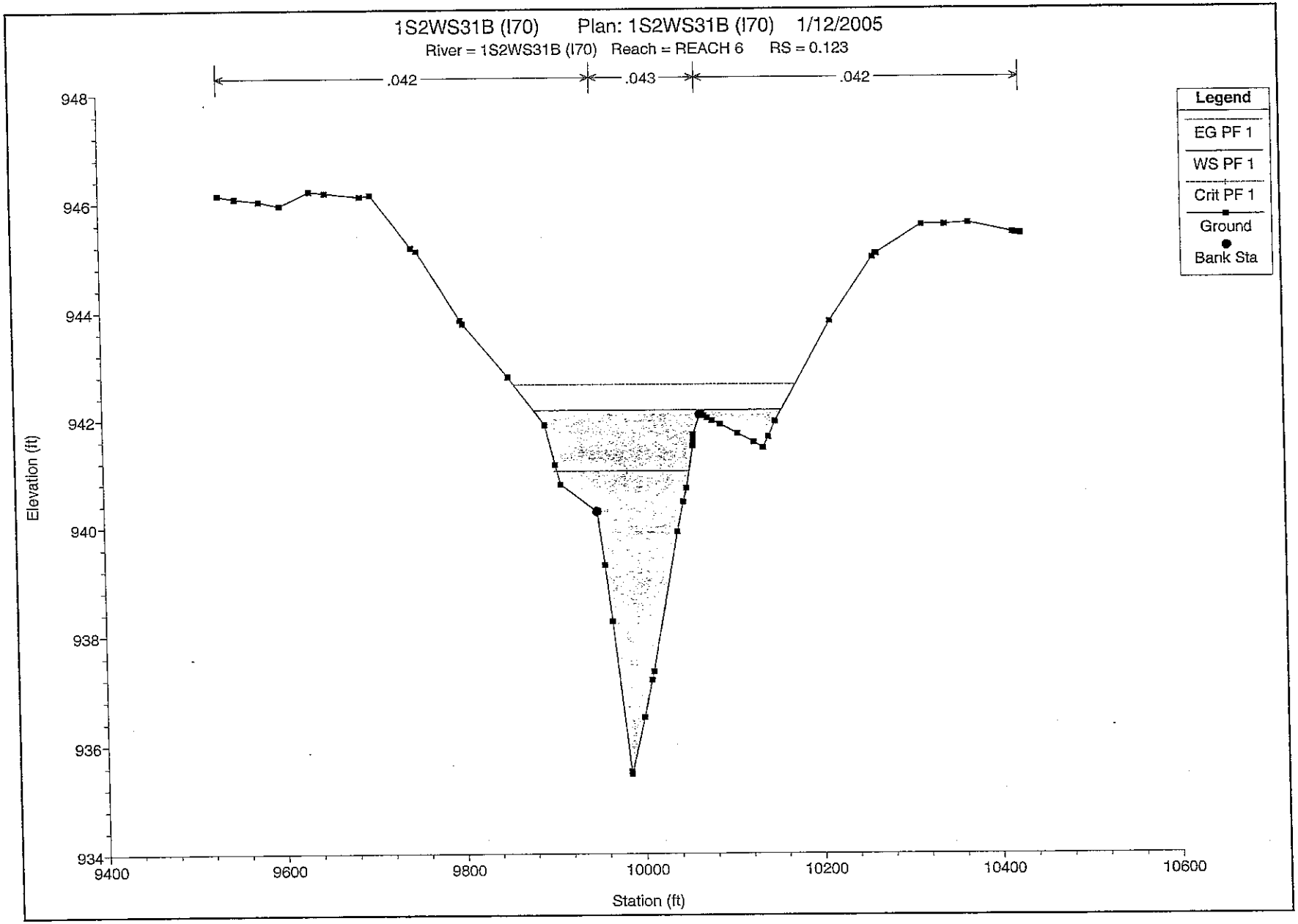
REACH: 1S2WS31B (I70)

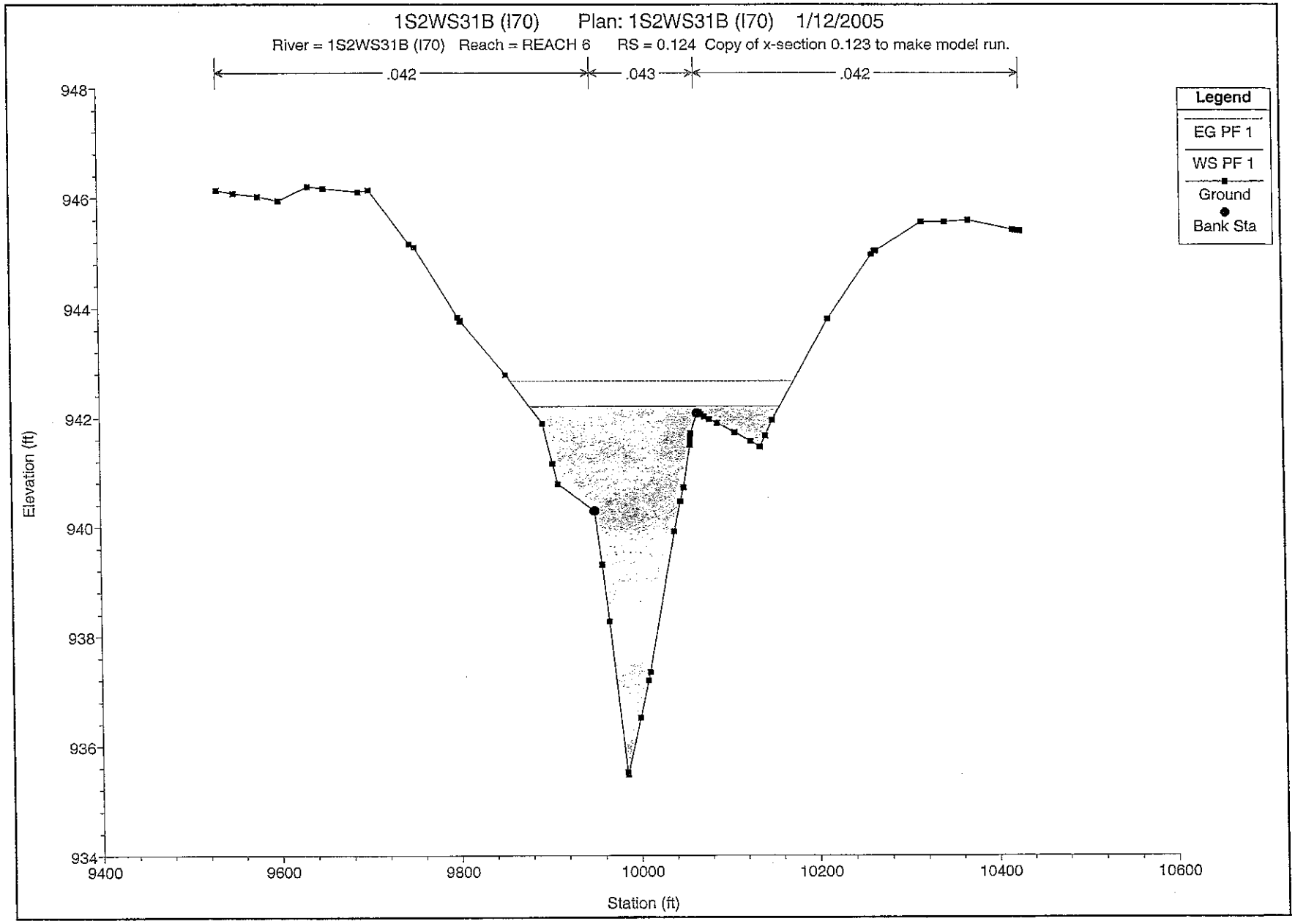
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

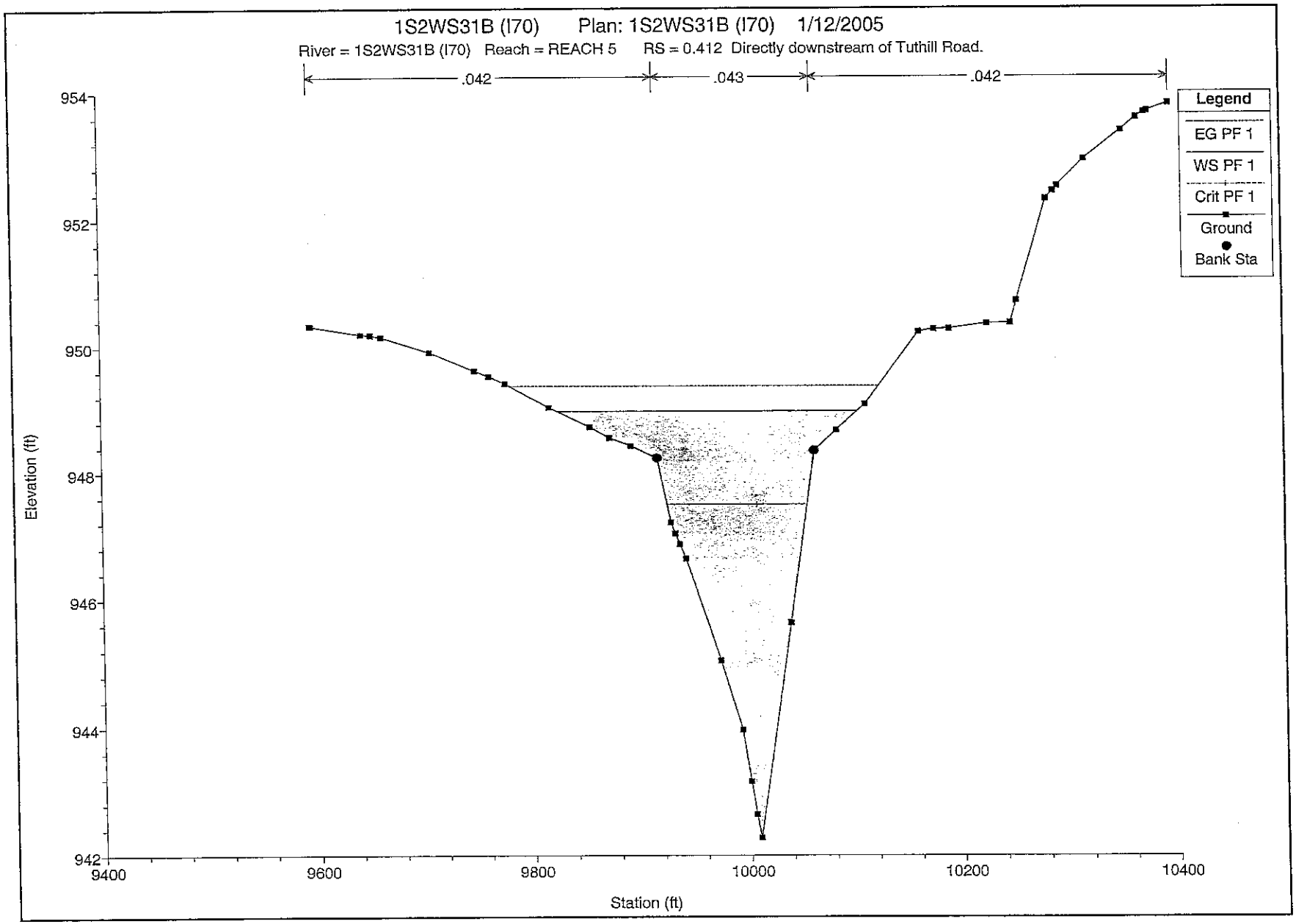
Change in Discharge based on Reach Length

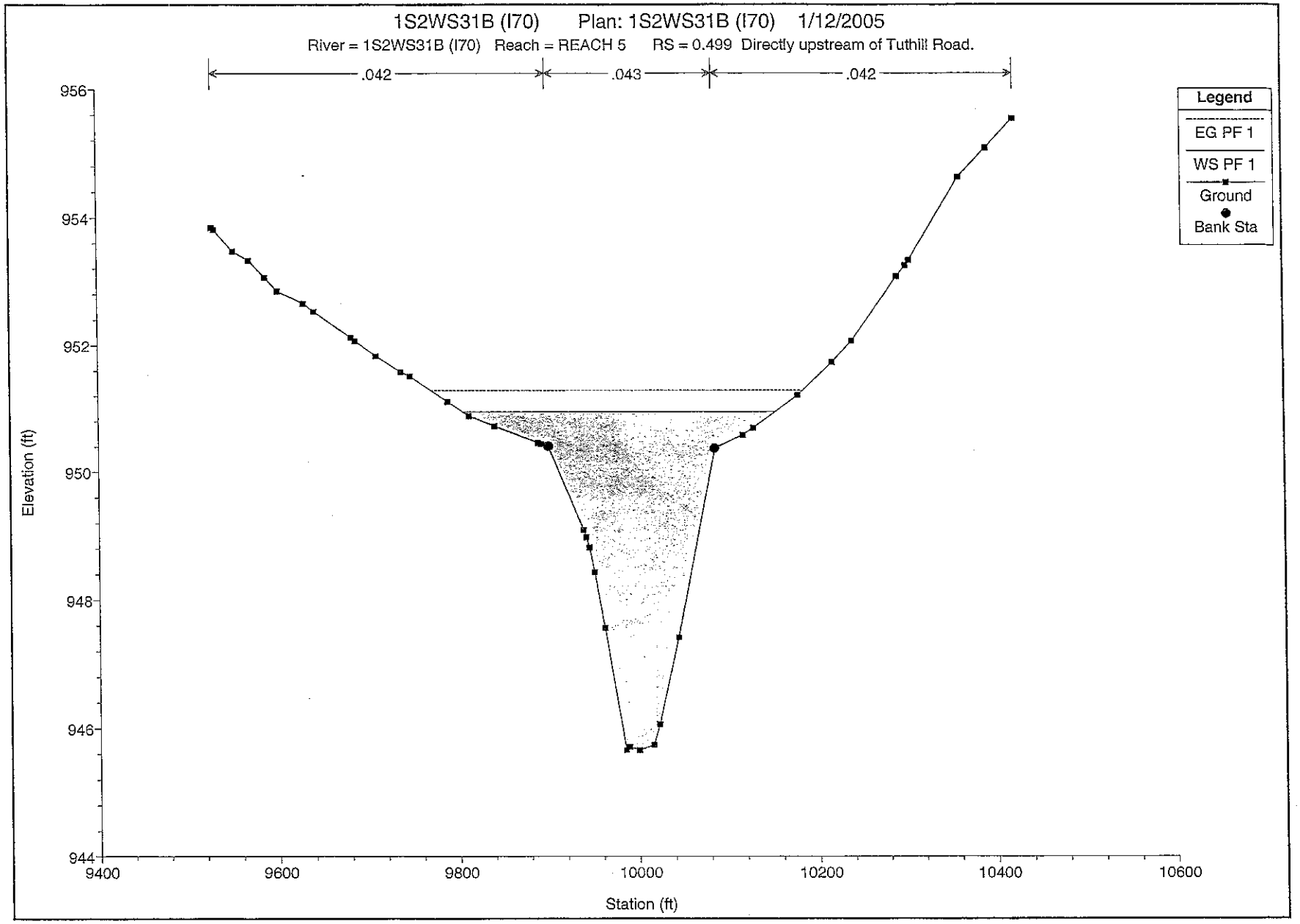
Wash ID: 1S2WS31B (I70)

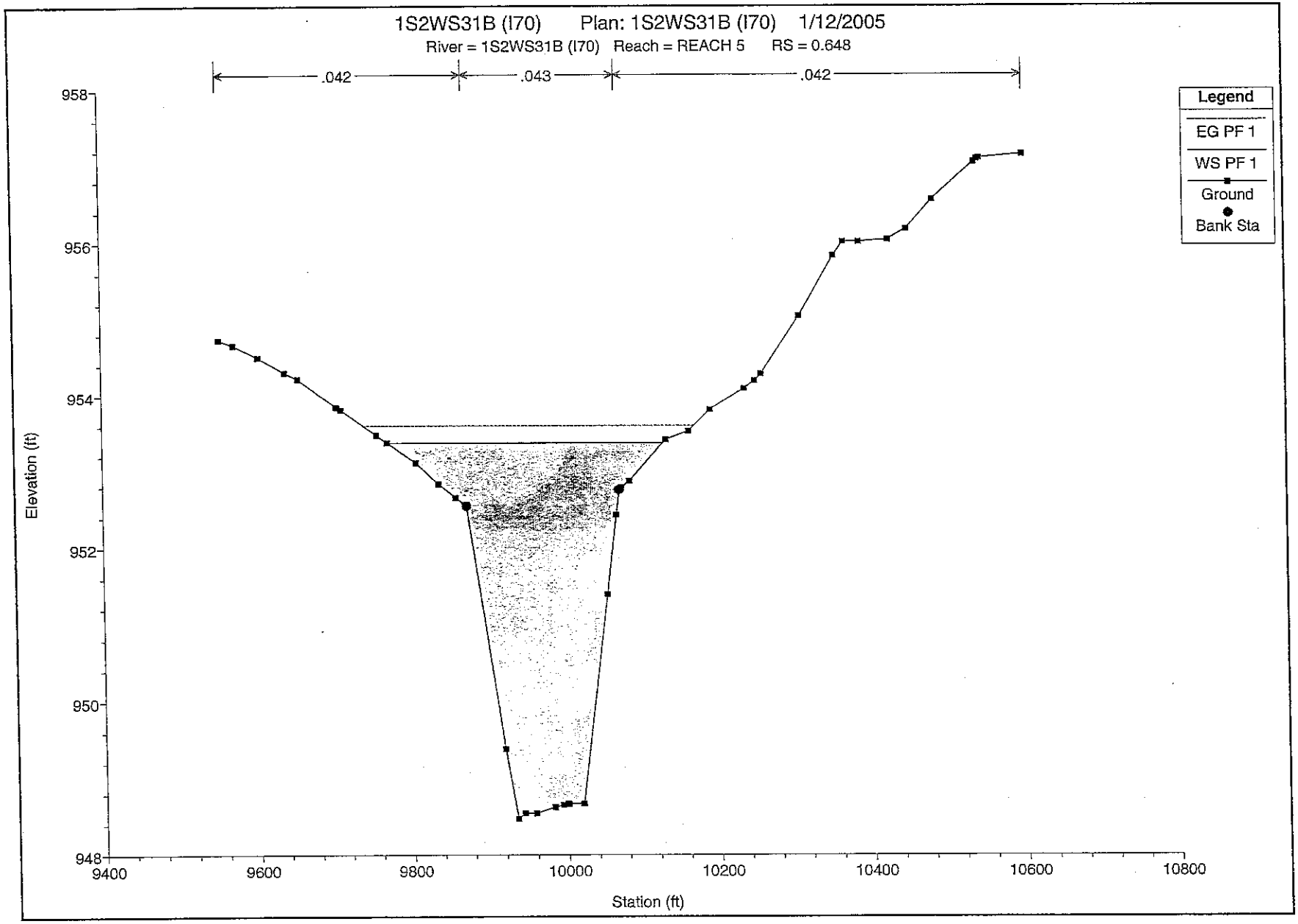
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPI72	4.423	653	650	700
I60	4.171	780	780	800
I60	3.898	917	920	900
I60	3.648	1043	1040	1000
I60	3.378	1179	1180	1200
I60	3.113	1312	1310	1300
I60	2.925	1407	1410	1400
CPI60A	2.792	1474	1470	1500
CPI60	2.706	2678	2680	2700
I66	2.522	2933	2930	2900
CPI66	2.277	3272	3270	3300
I67	2.037	3165	3170	3200
I67	1.772	3047	3050	3000
CPI67	1.482	2918	2920	2900
CPI69	1.162	3071	3070	3100
I70	0.907	2957	2960	3000
I70	0.648	2841	2840	2800
I70	0.499	2774	2770	2800
CPI70	0.412	2735	2740	2700
CPI71	0.124	2749	2750	2700

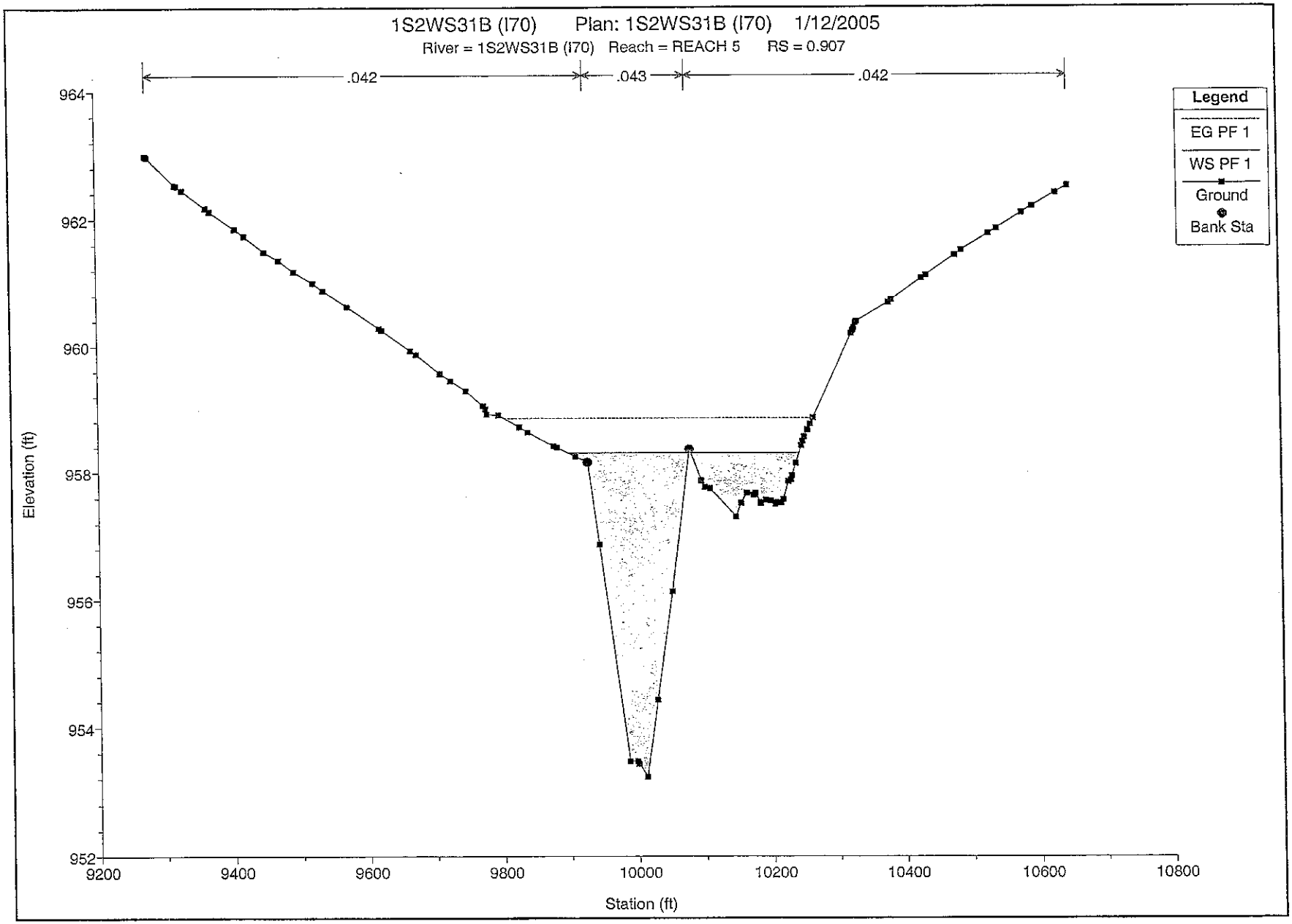

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 6 RS = 0.123
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
948
946
944
942
940
938
936
934
9400
9600
9800
10000
10200
10400
10600
Station (ft)

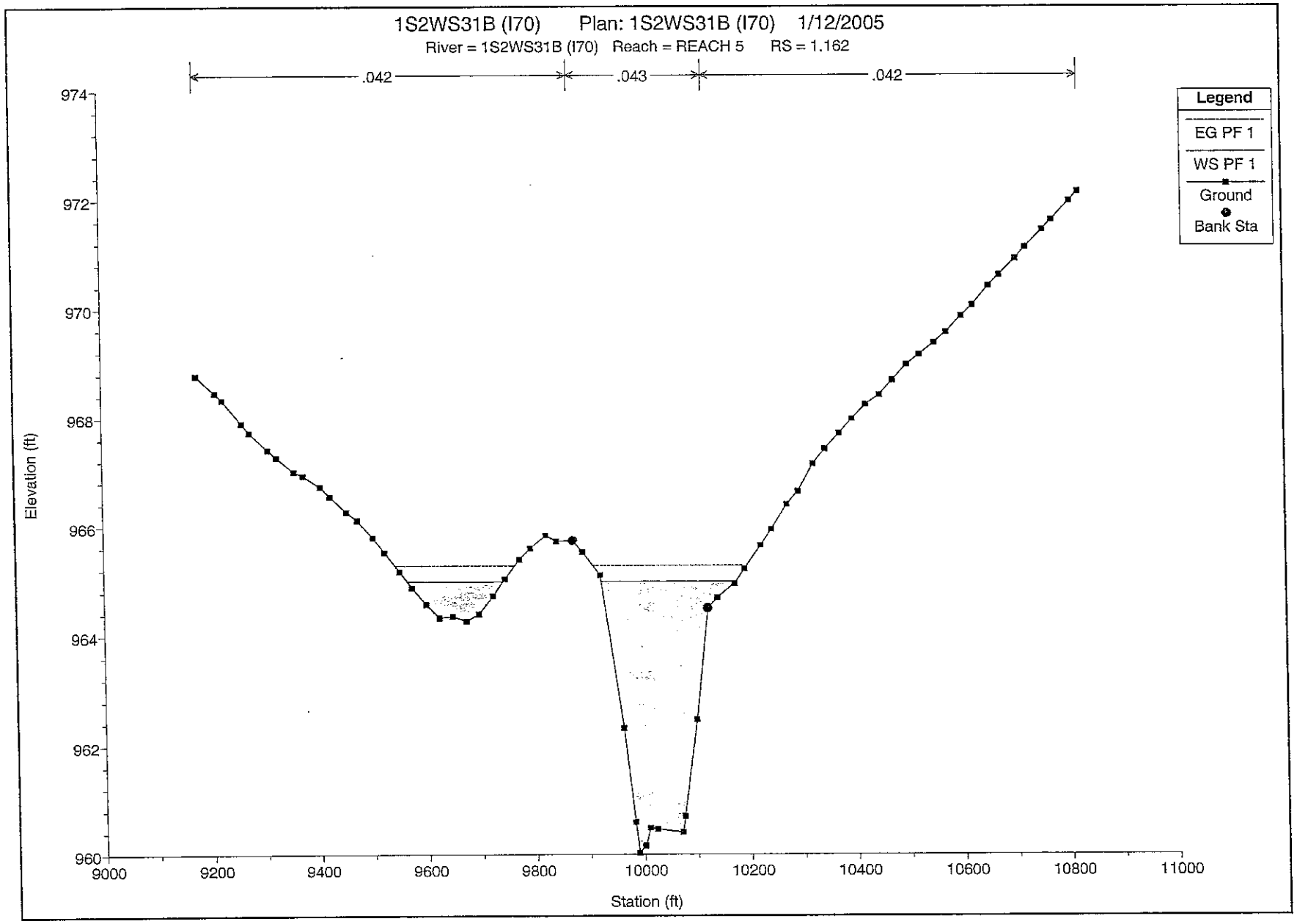

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 6 RS = 0.124 Copy of x-section 0.123 to make model run.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
948
946
944
942
940
938
936
934
9400
9600
9800
10000
10200
10400
10600
Station (ft)

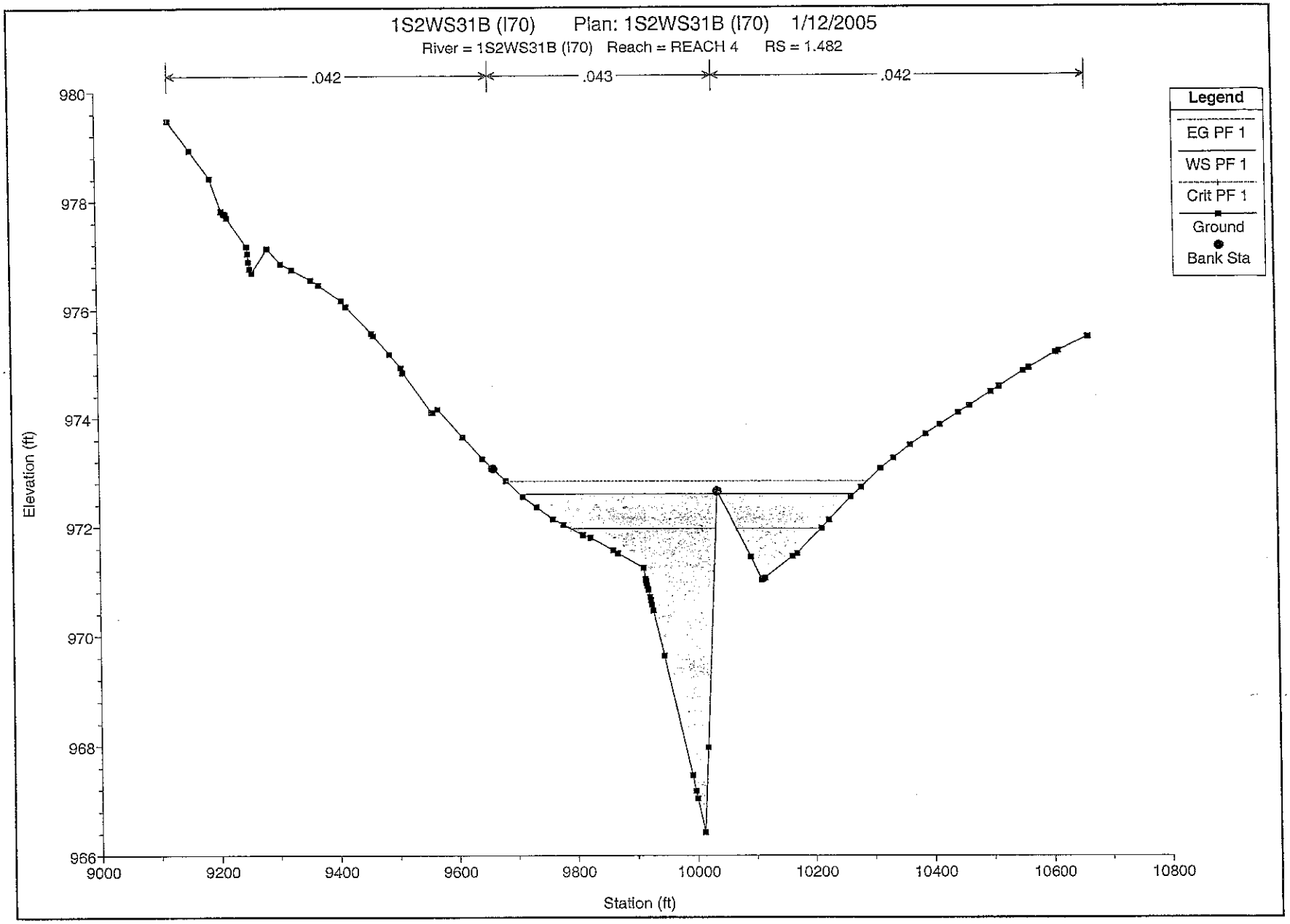

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 5 RS = 0.412 Directly downstream of Tuthill Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
954
952
950
948
946
944
942
9400
9600
9800
10000
10200
10400
Station (ft)

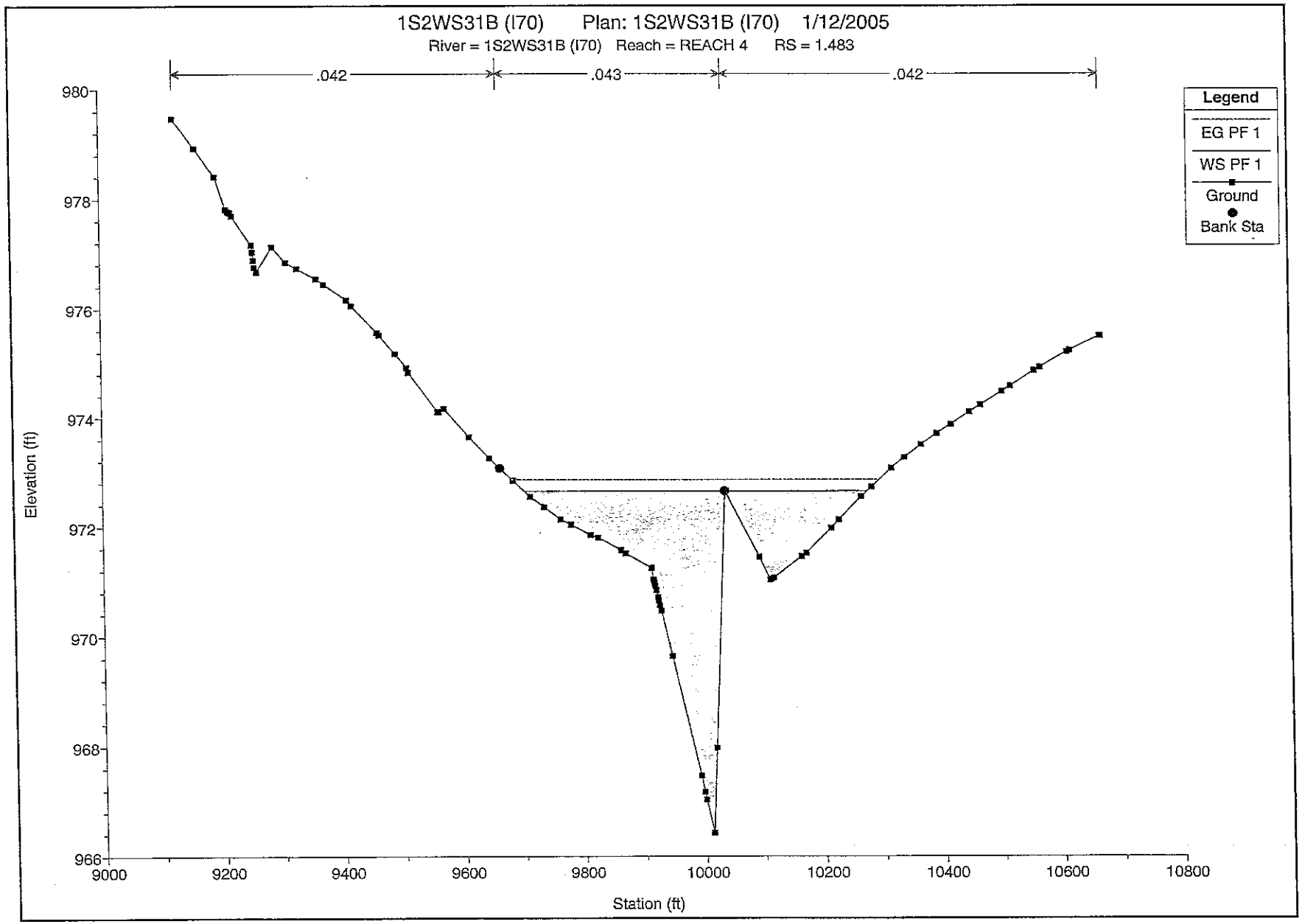

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 5 RS = 0.499 Directly upstream of Tuthill Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
956
954
952
950
948
946
944
9400
9600
9800
10000
10200
10400
10600
Station (ft)

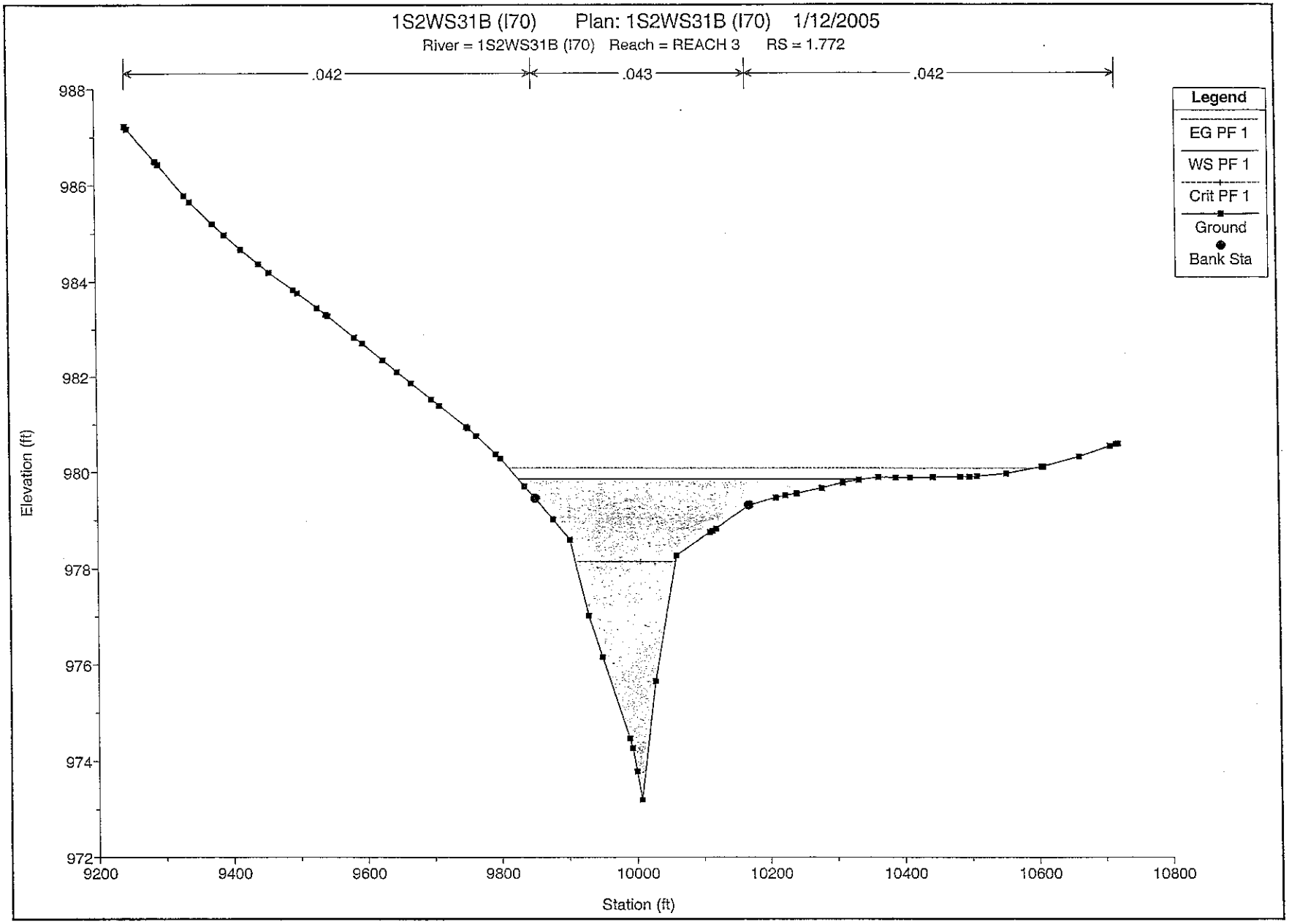

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 5 RS = 0.648
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
958
956
954
952
950
948
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

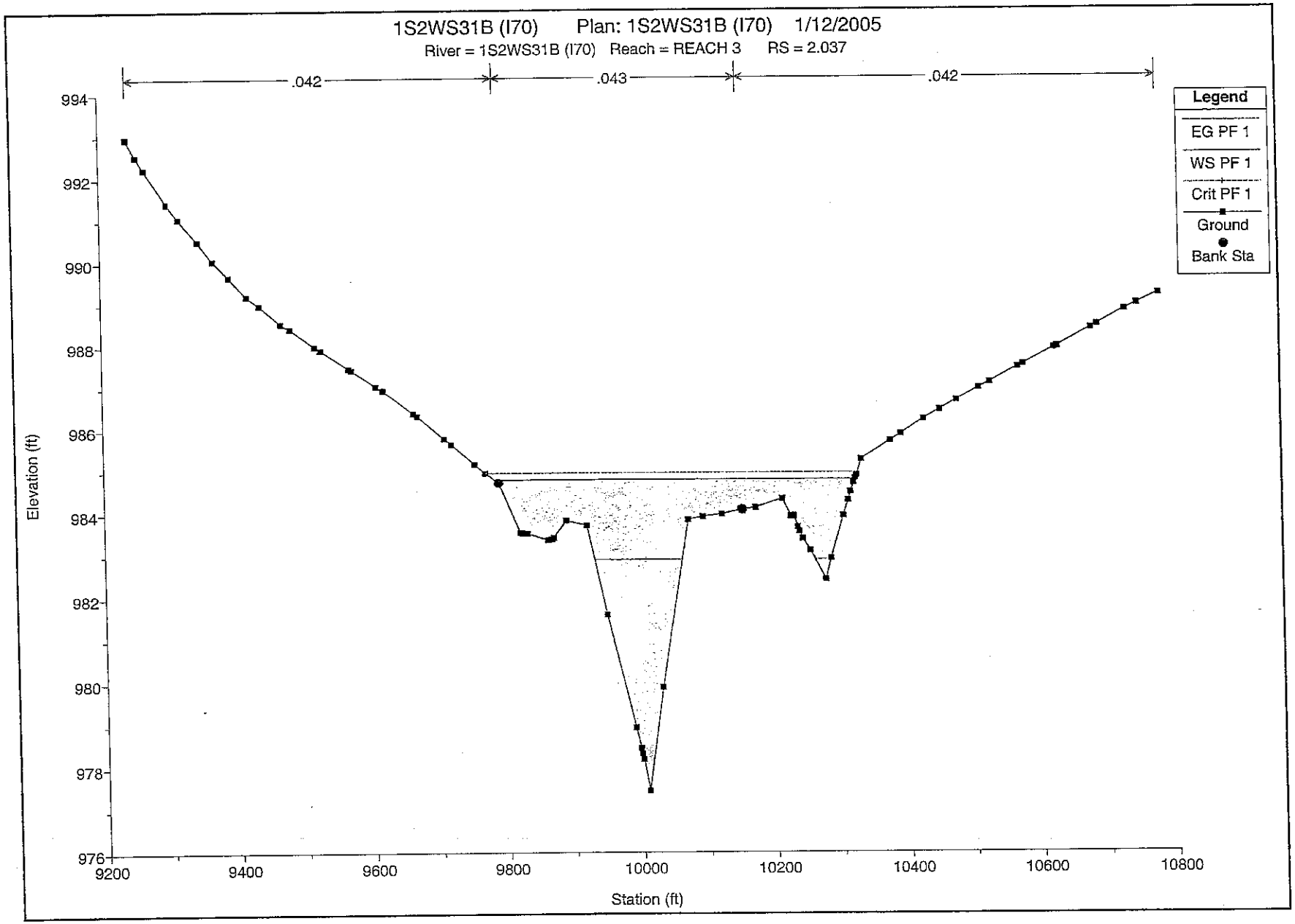

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 5 RS = 0.907
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
964
962
960
958
956
954
952
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

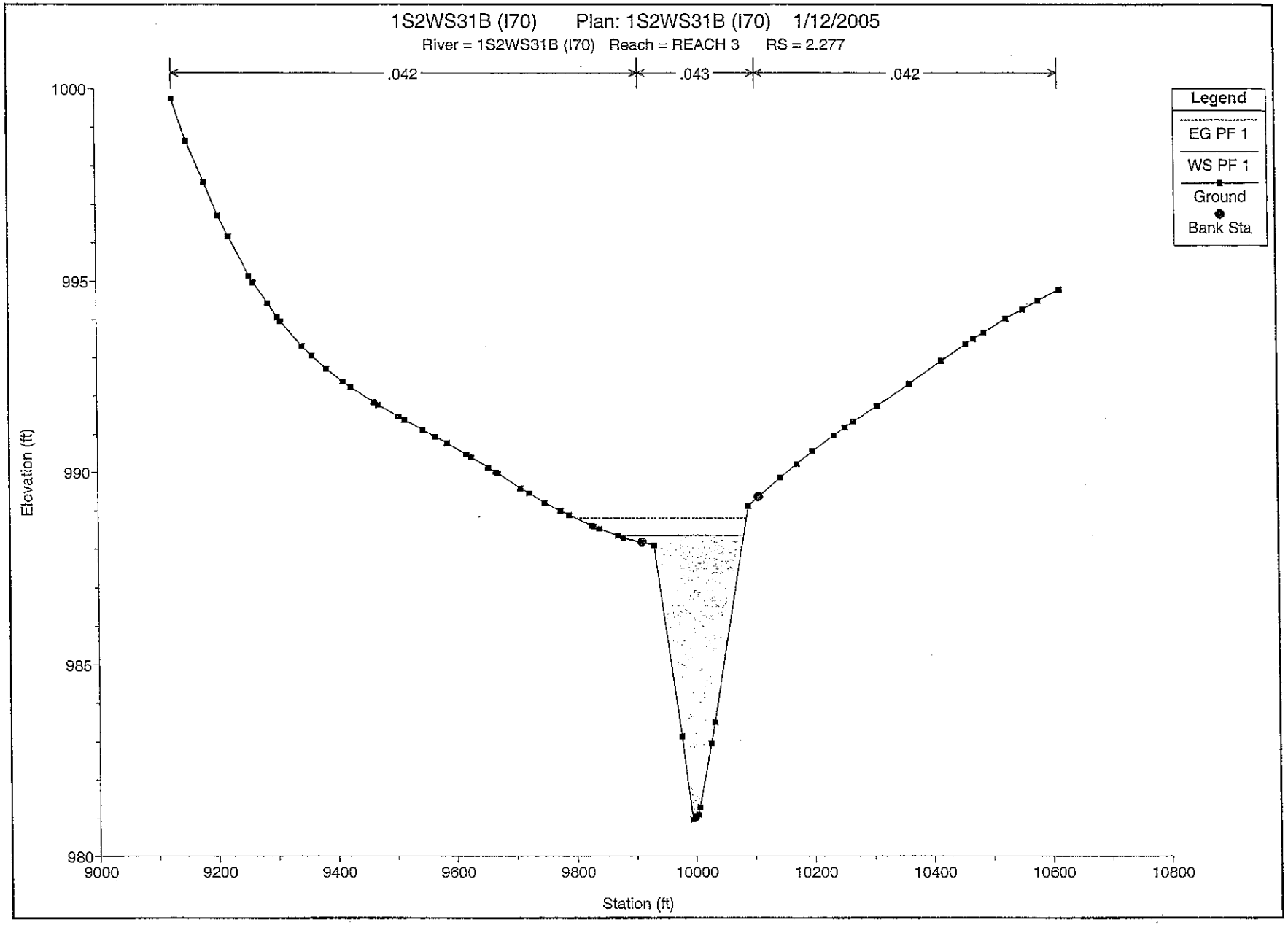

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 5 RS = 1.162
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
974
972
970
968
966
964
962
960
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

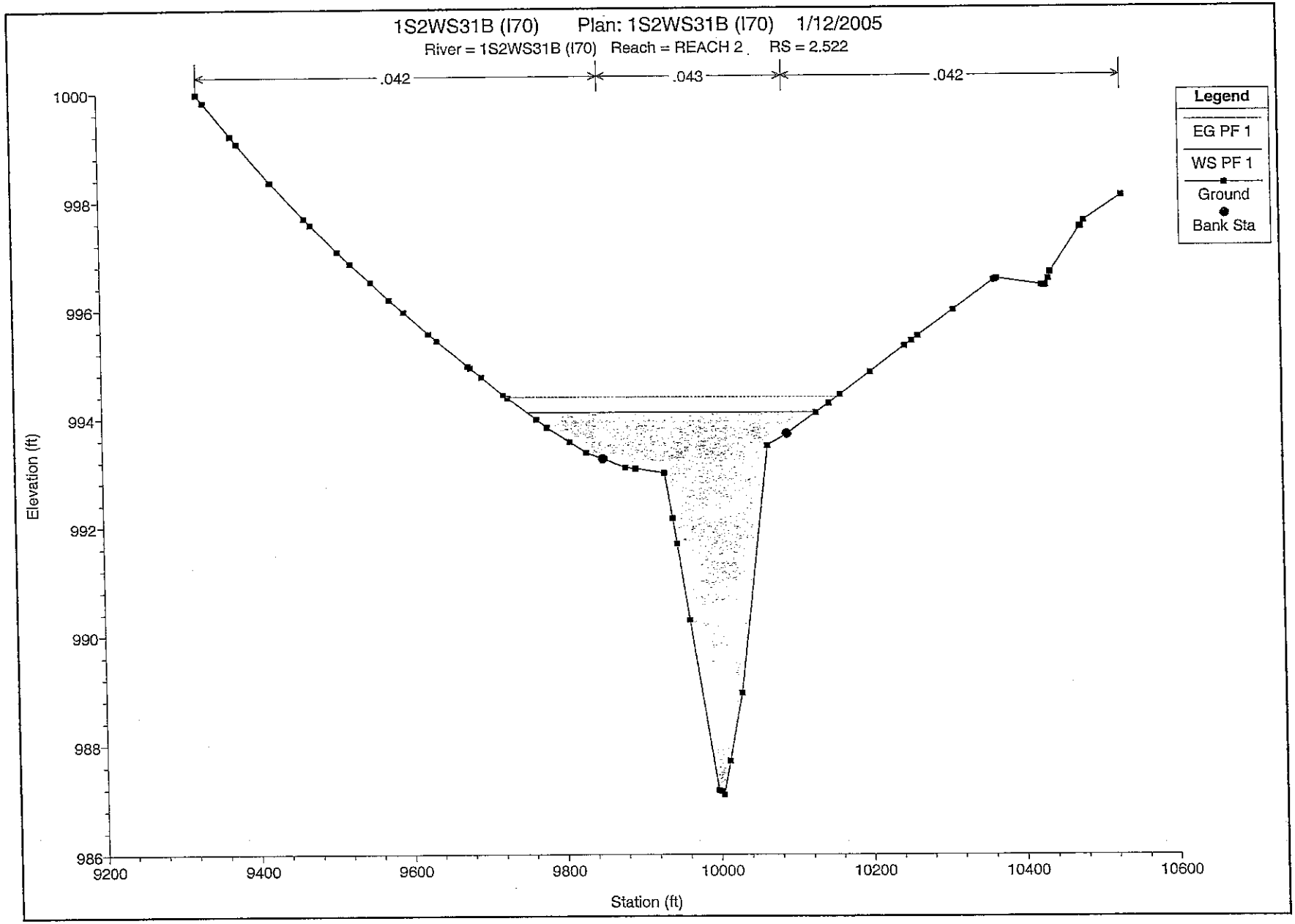

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 4 RS = 1.482
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
980
978
976
974
972
970
968
966
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

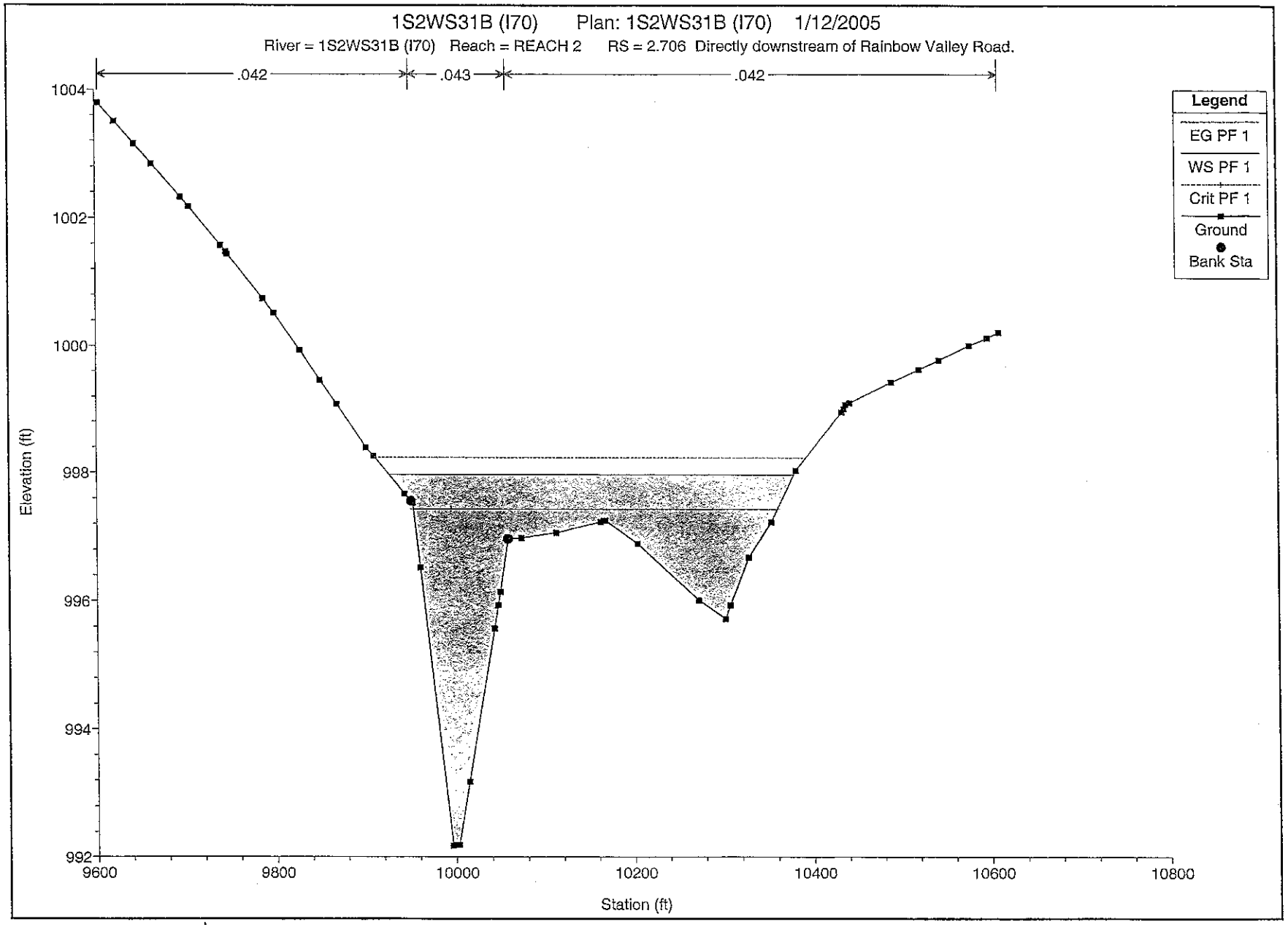

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 4 RS = 1.483
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
980
978
976
974
972
970
968
966
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

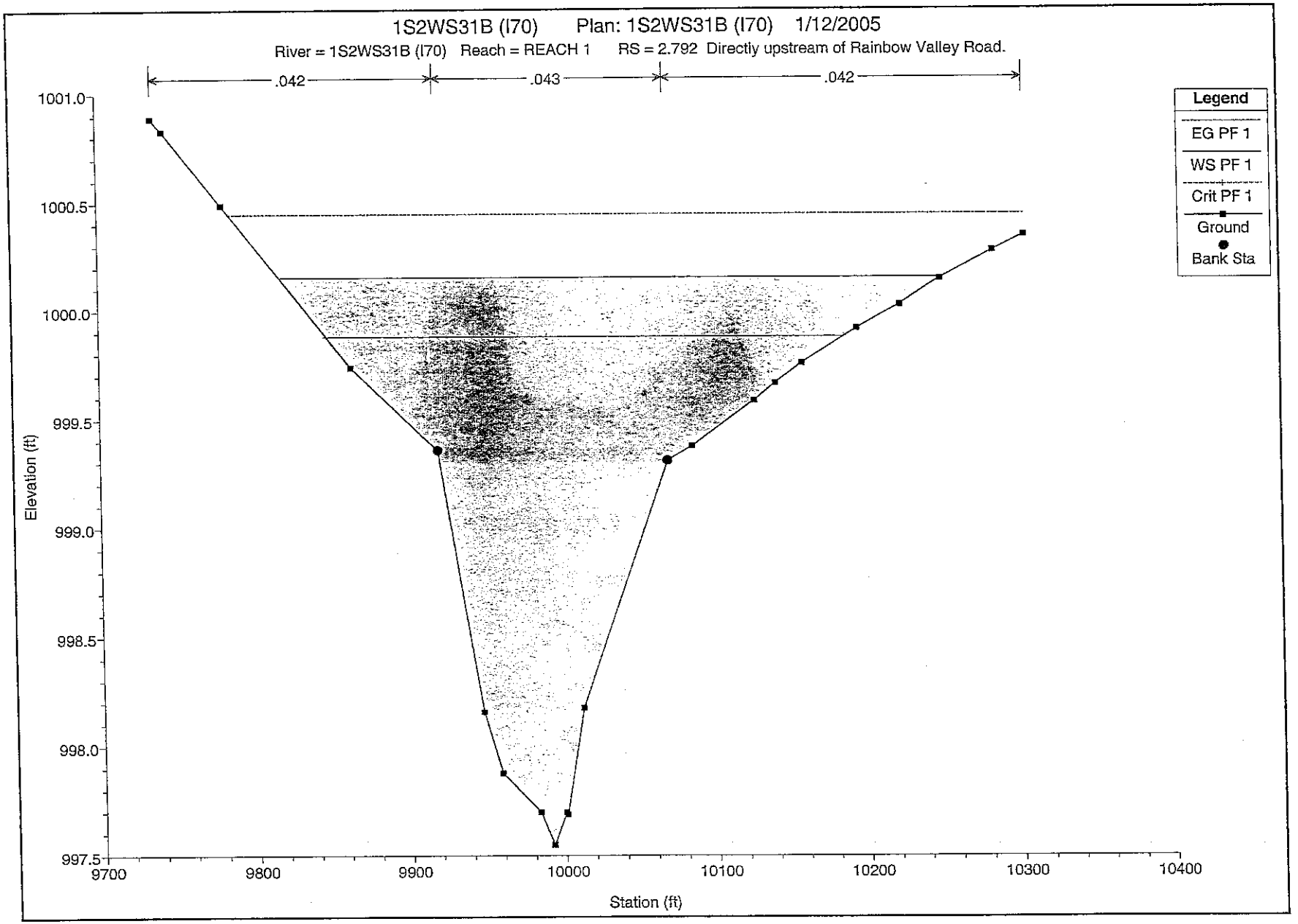

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 3 RS = 1.772
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
988
986
984
982
980
978
976
974
972
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

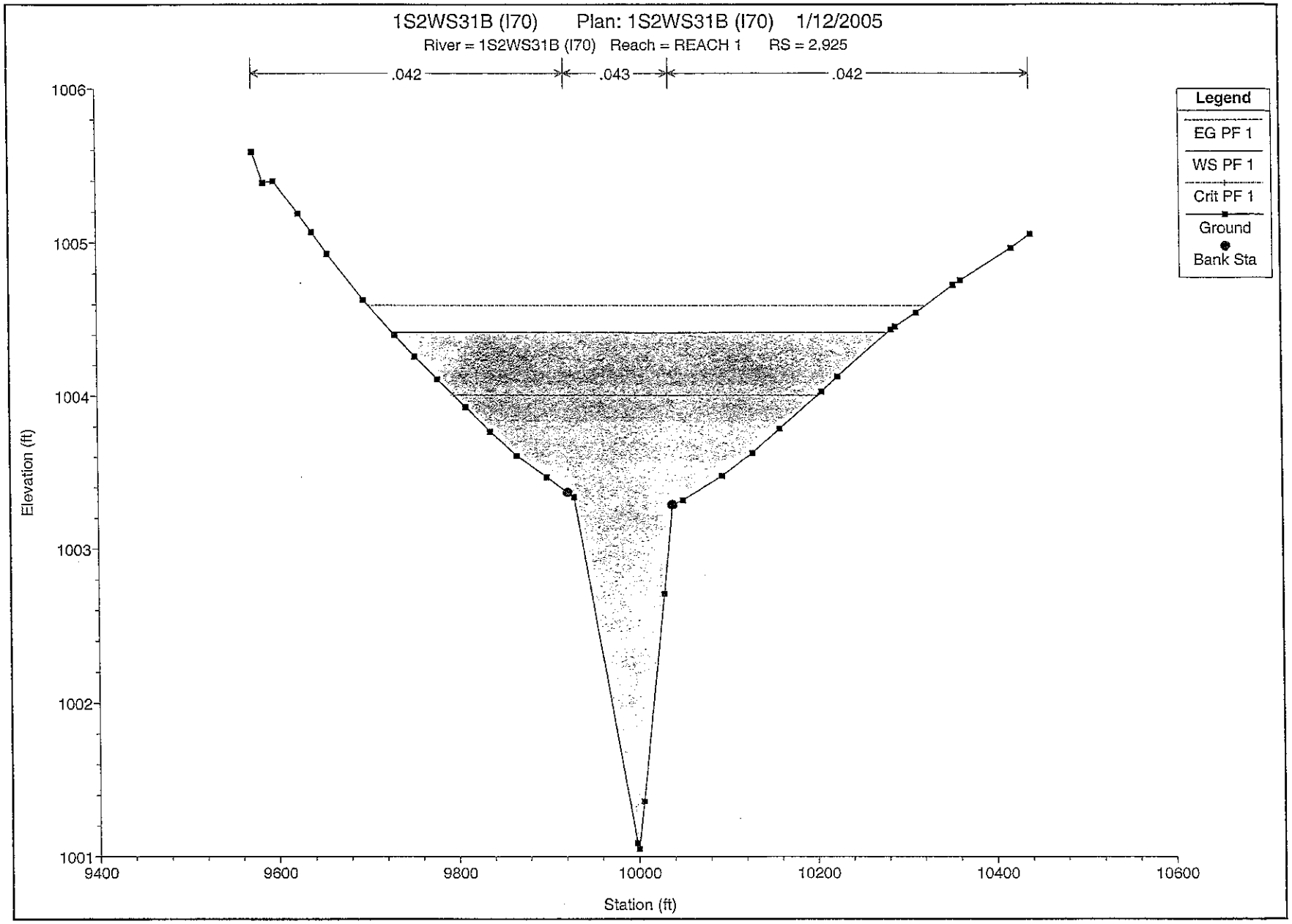

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 3 RS = 2.037
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
994
992
990
988
986
984
982
980
978
976
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

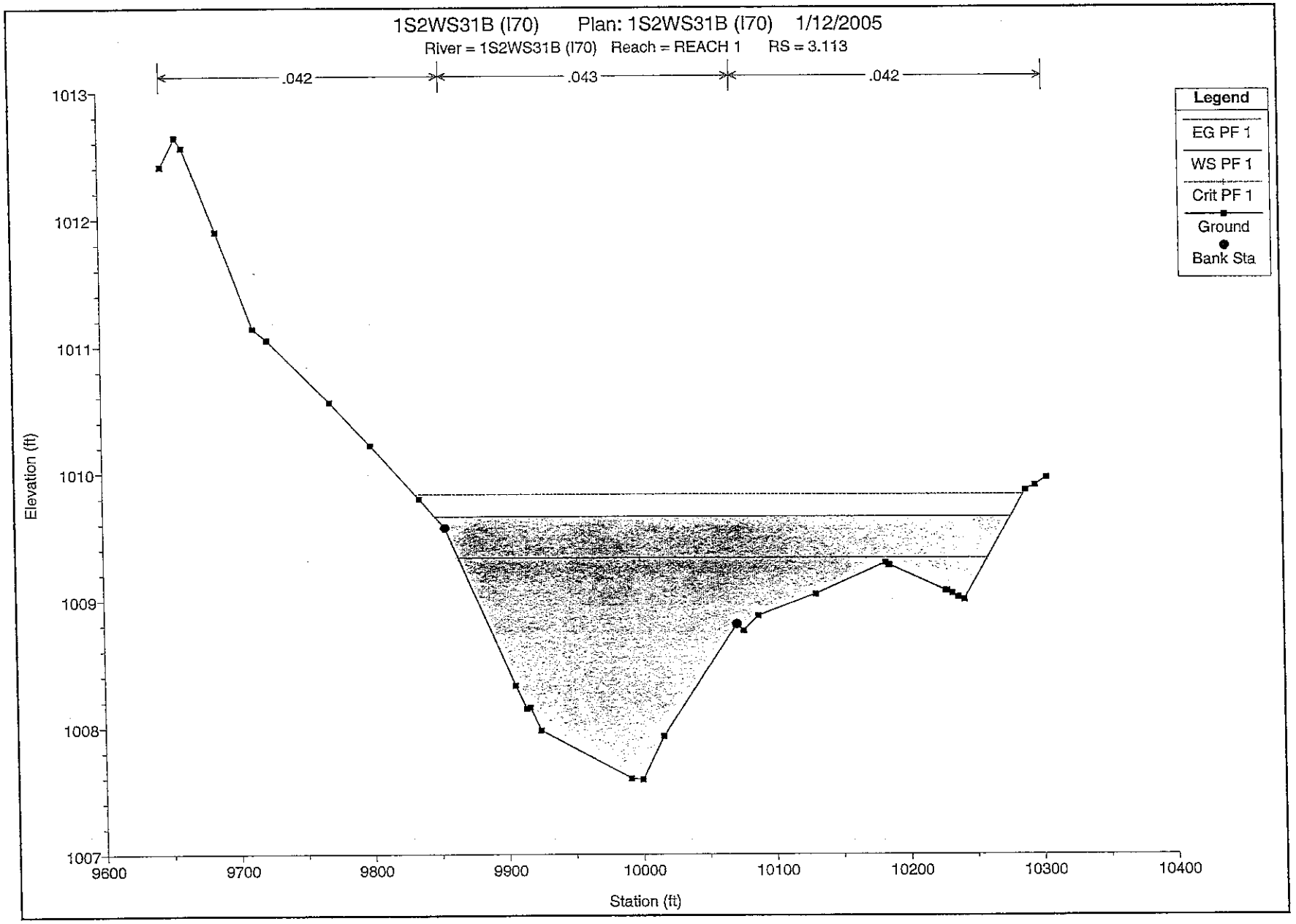

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 3 RS = 2.277
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1000
995
990
985
980
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

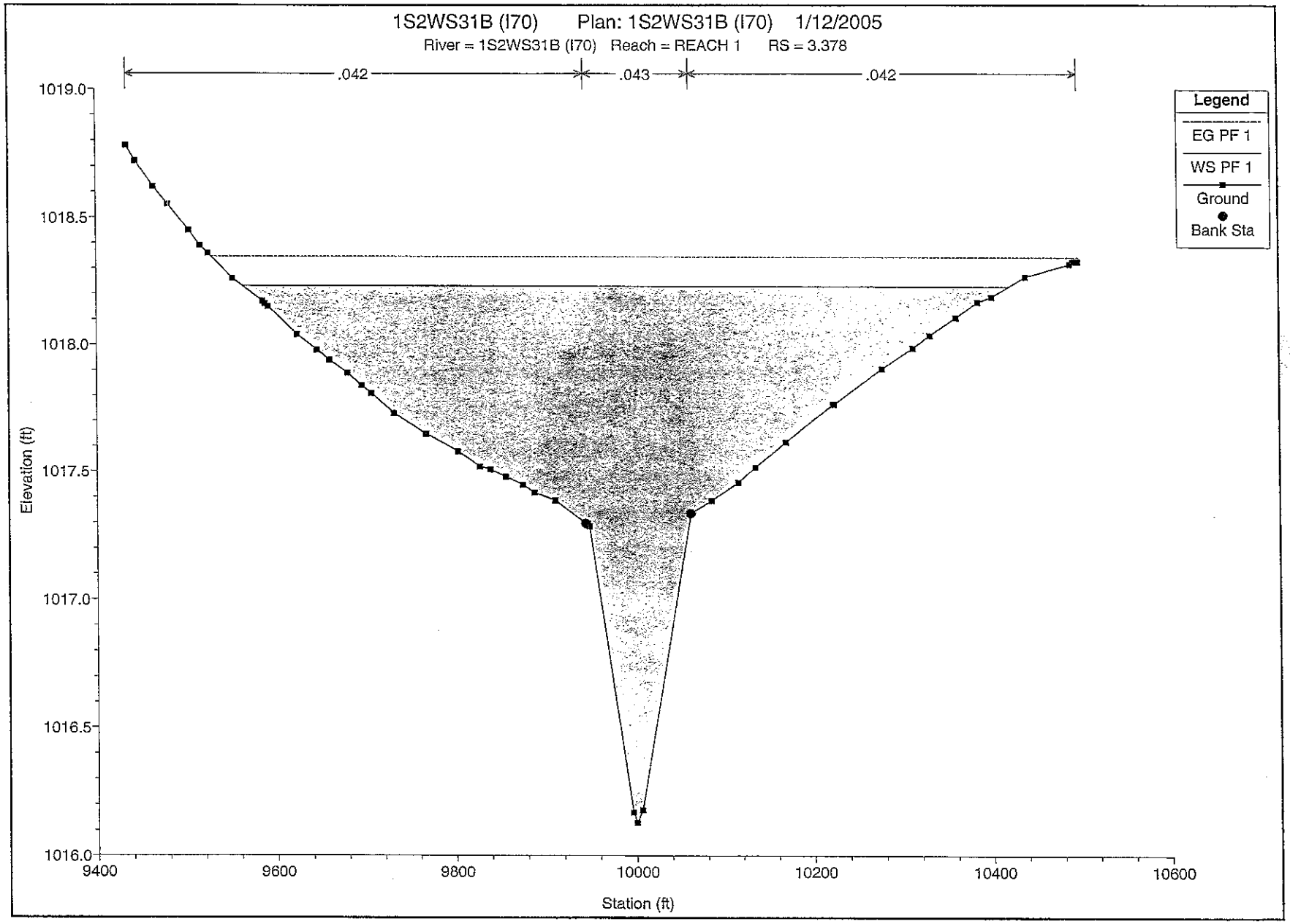

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 2 RS = 2.522
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1000
998
996
994
992
990
988
986
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

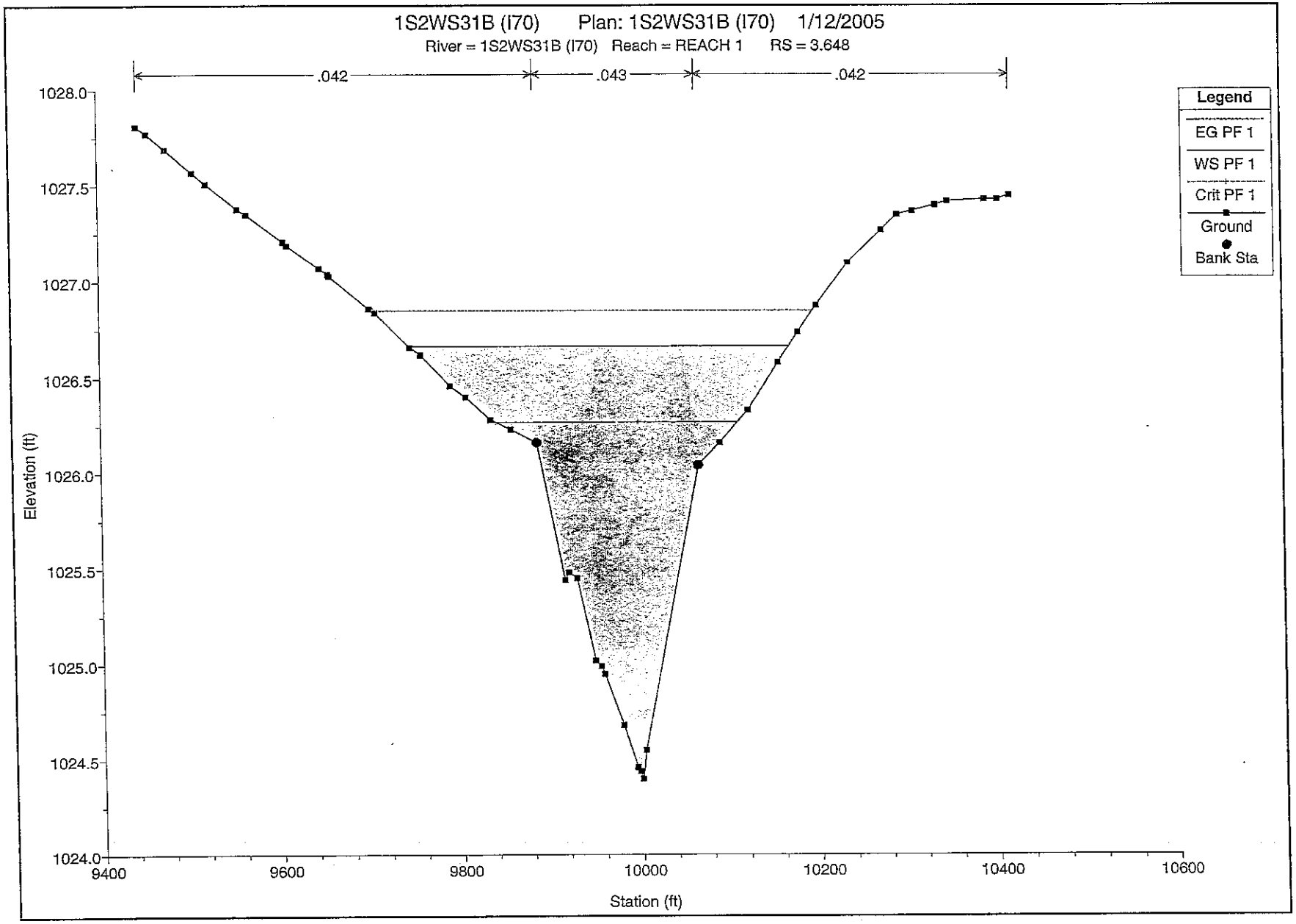

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 2 RS = 2.706 Directly downstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1004
1002
1000
998
996
994
992
9600
9800
10000
10200
10400
10600
10800
Station (ft)

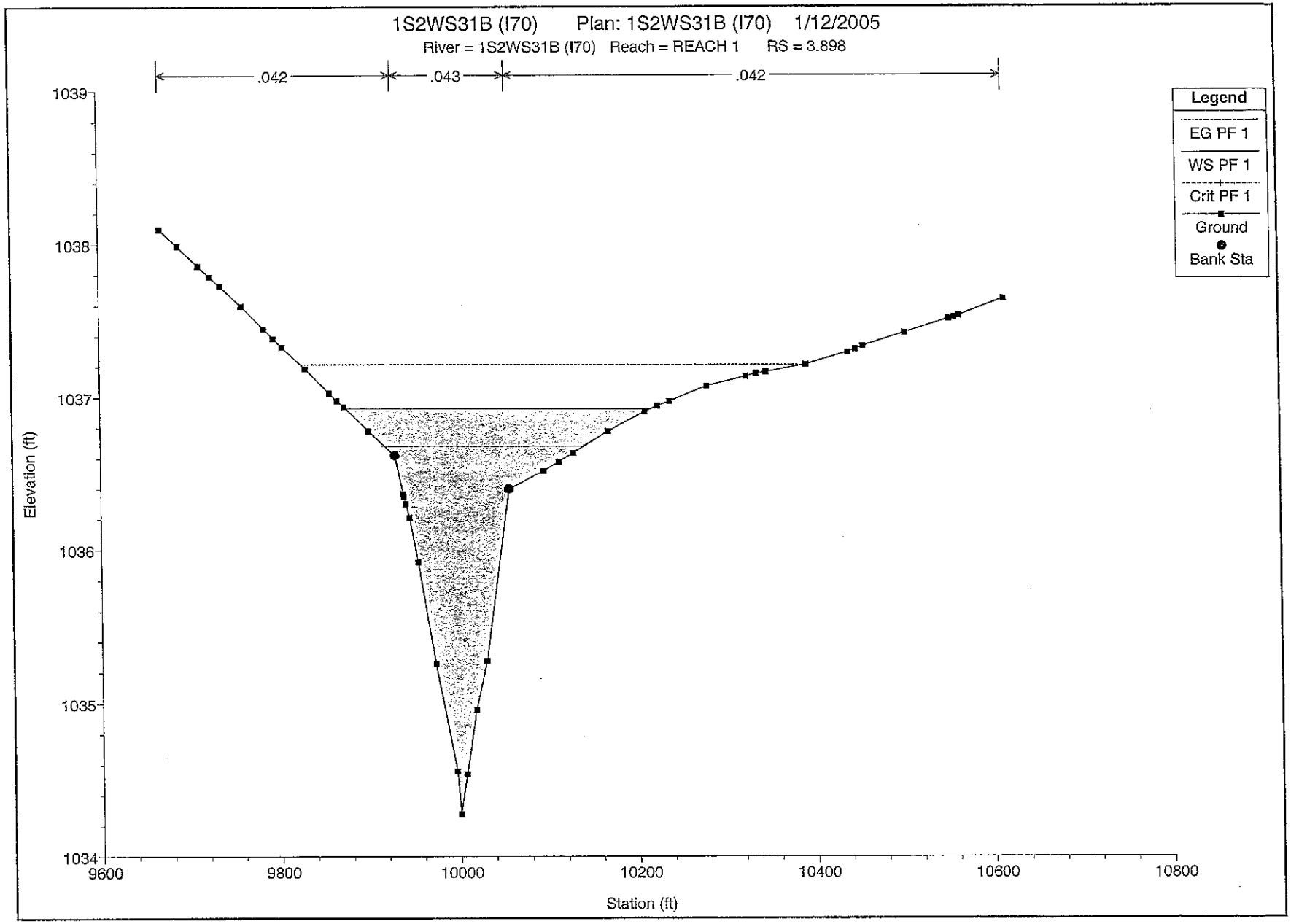

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 2.792 Directly upstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1001.0
1000.5
1000.0
999.5
999.0
998.5
998.0
997.5
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

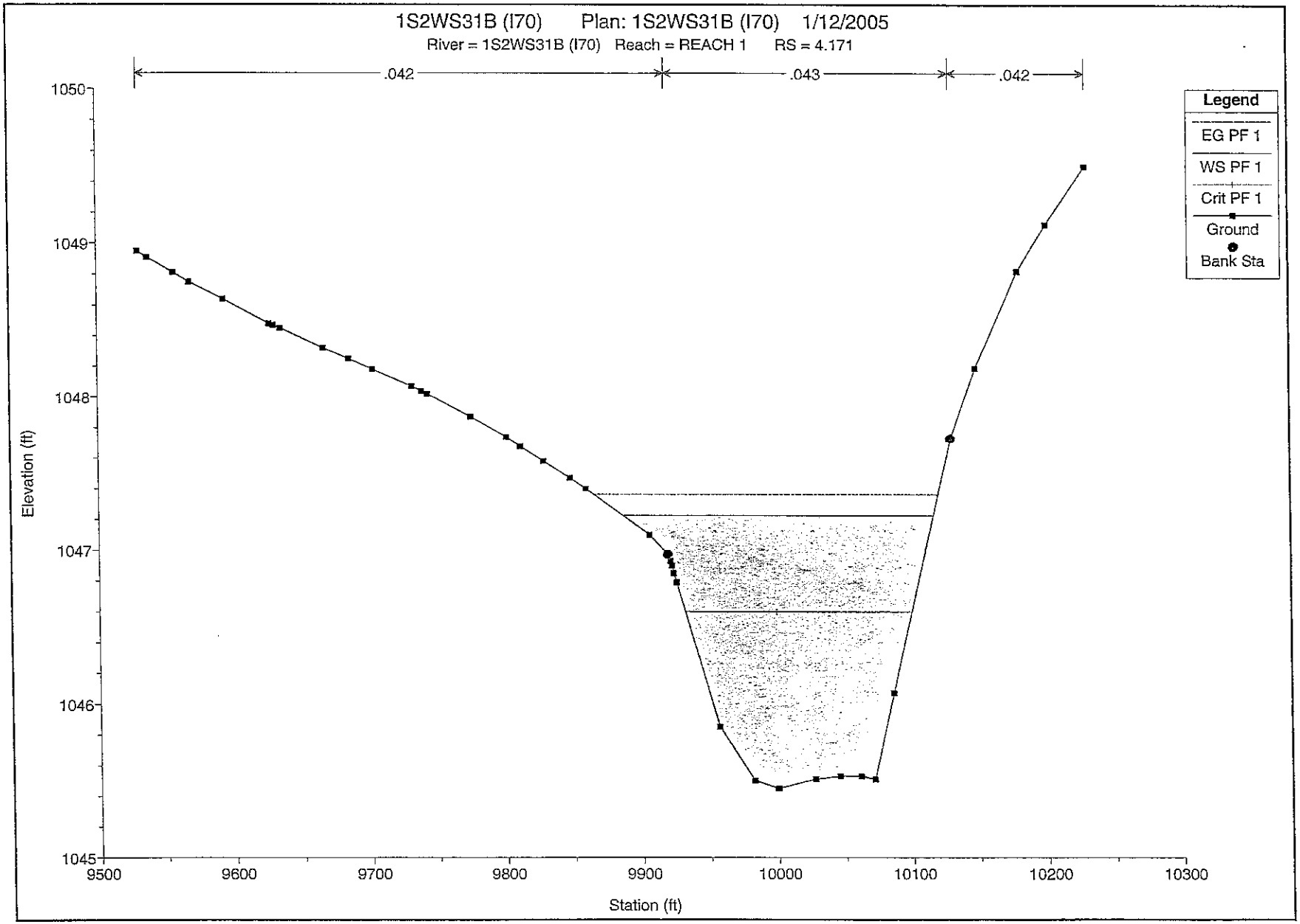

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 2.925
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1006
1005
1004
1003
1002
1001
9400
9600
9800
10000
10200
10400
10600
Station (ft)

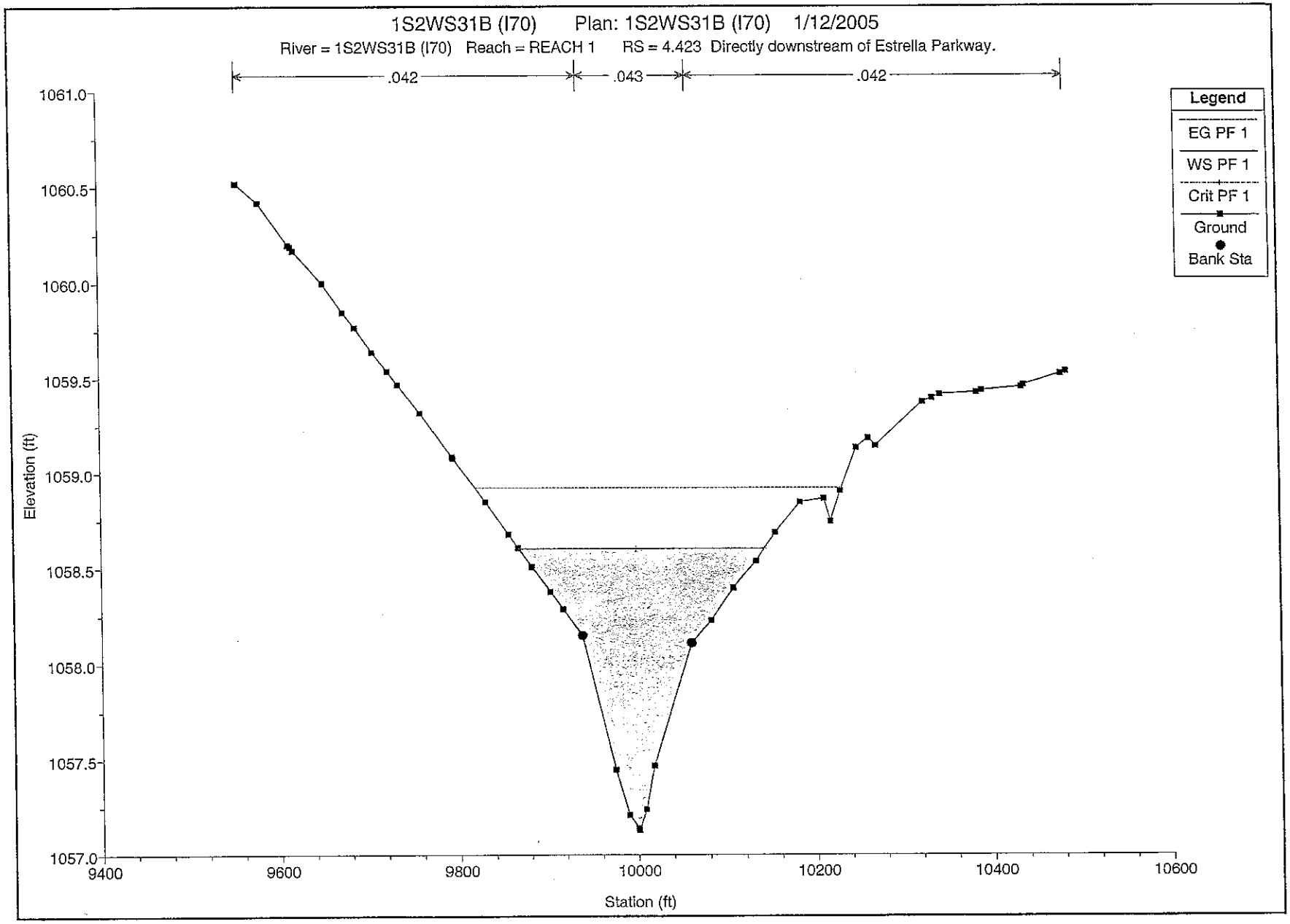

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 3.113
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1013
1012
1011
1010
1009
1008
1007
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 3.378
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1019.0
1018.5
1018.0
1017.5
1017.0
1016.5
1016.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 3.648
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1028.0
1027.5
1027.0
1026.5
1026.0
1025.5
1025.0
1024.5
1024.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 3.898
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1039
1038
1037
1036
1035
1034
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 4.171
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1050
1049
1048
1047
1046
1045
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31B (I70) Reach = REACH 1 RS = 4.423 Directly downstream of Estrella Parkway.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1061.0
1060.5
1060.0
1059.5
1059.0
1058.5
1058.0
1057.5
1057.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS31B (I70)

REACH: 1S2WS32A (I67)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

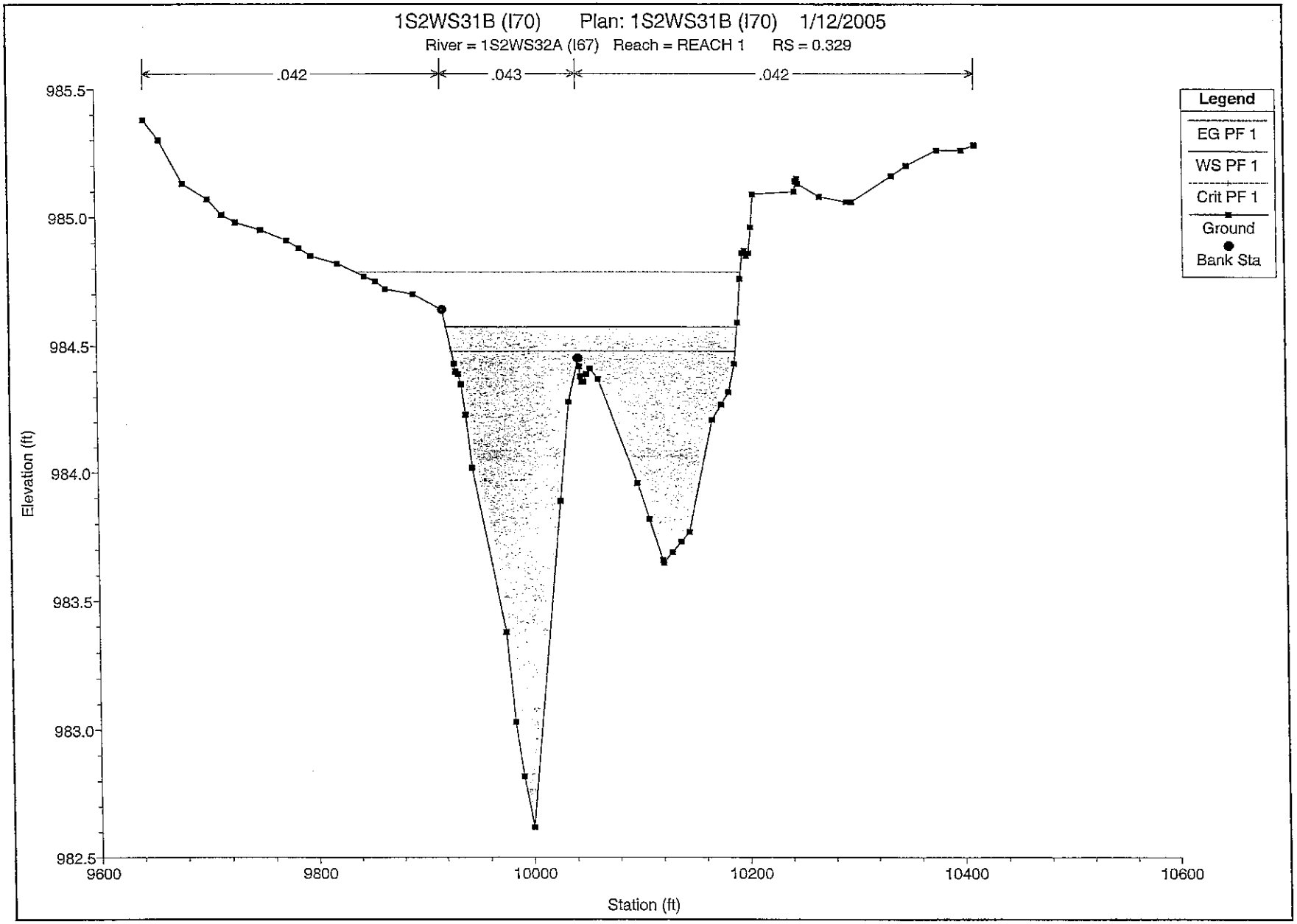
Wash ID: 1S2WS32A (I67)

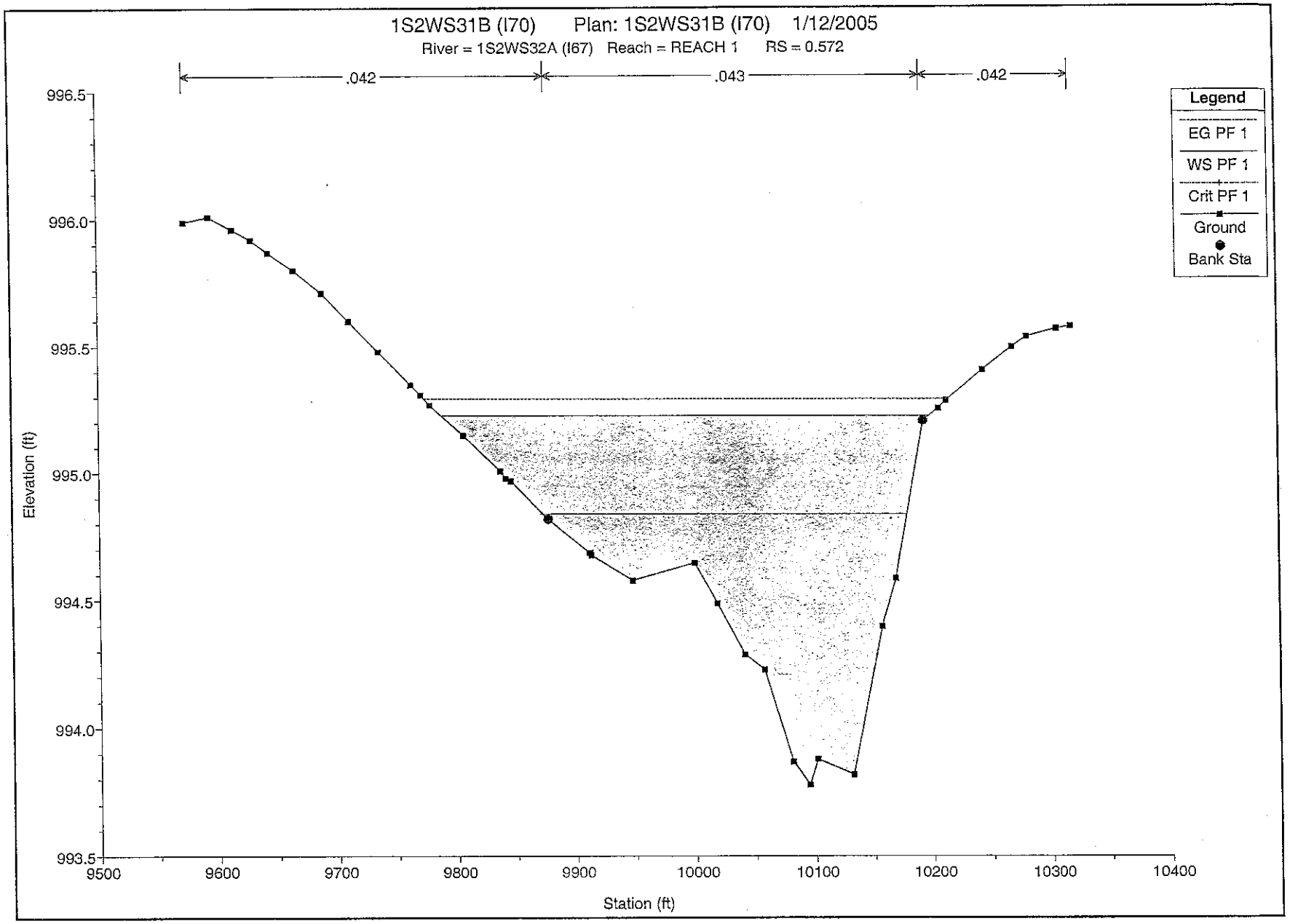
Subbasin: I67

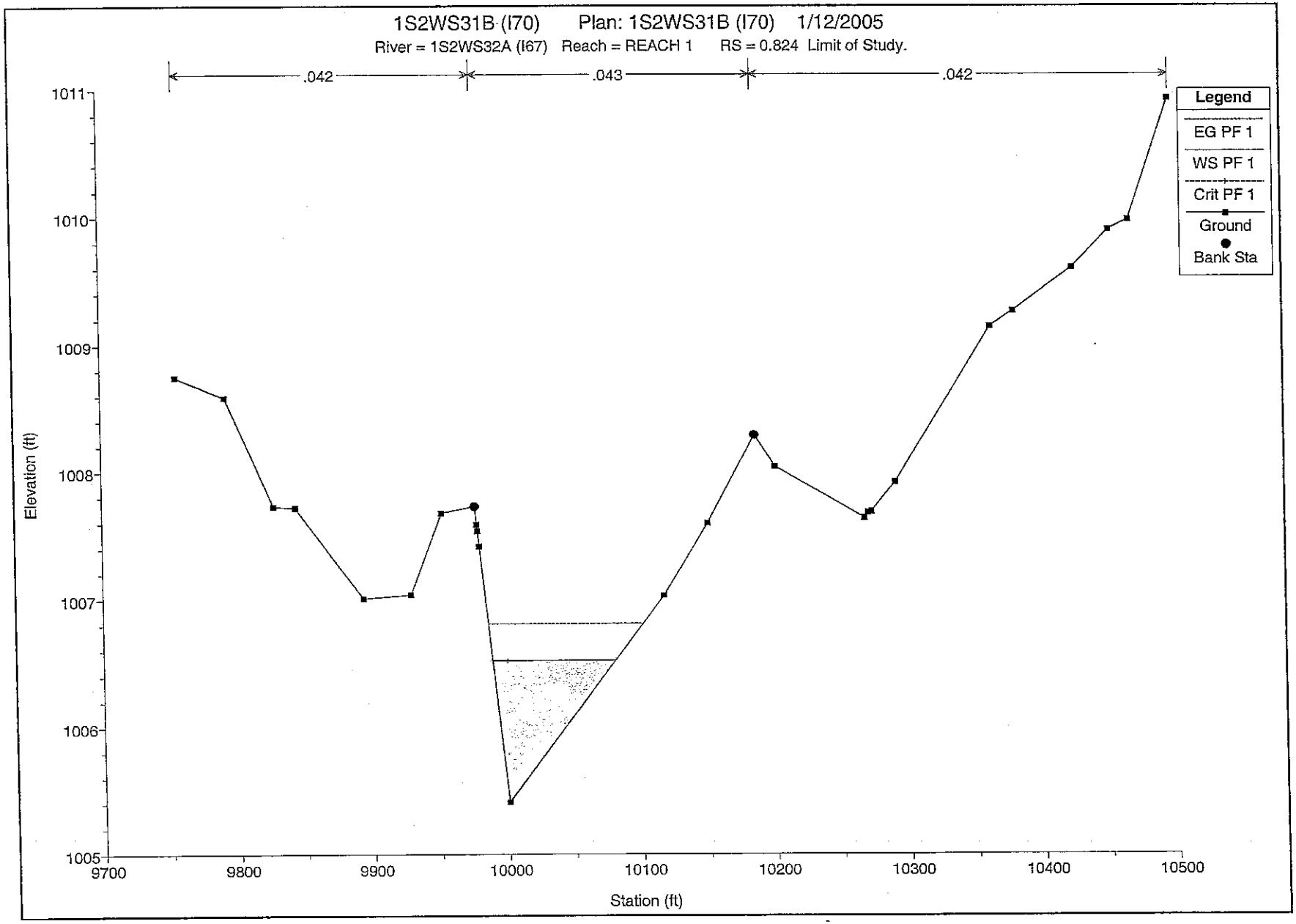
Total Discharge (cfs) = 1674

Total Area (acres) = 621

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.824	83	13.4	220
0.572	206	33.2	560
0.329	250	40.3	670


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32A (I67) Reach = REACH 1 RS = 0.329
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
985.5
985.0
984.5
984.0
983.5
983.0
982.5
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32A (I67) Reach = REACH 1 RS = 0.572
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
996.5
996.0
995.5
995.0
994.5
994.0
993.5
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32A (I67) Reach = REACH 1 RS = 0.824 Limit of Study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1011
1010
1009
1008
1007
1006
1005
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

MODEL: 1S2WS31B (I70)

REACH: 1S2WS32B (I68)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

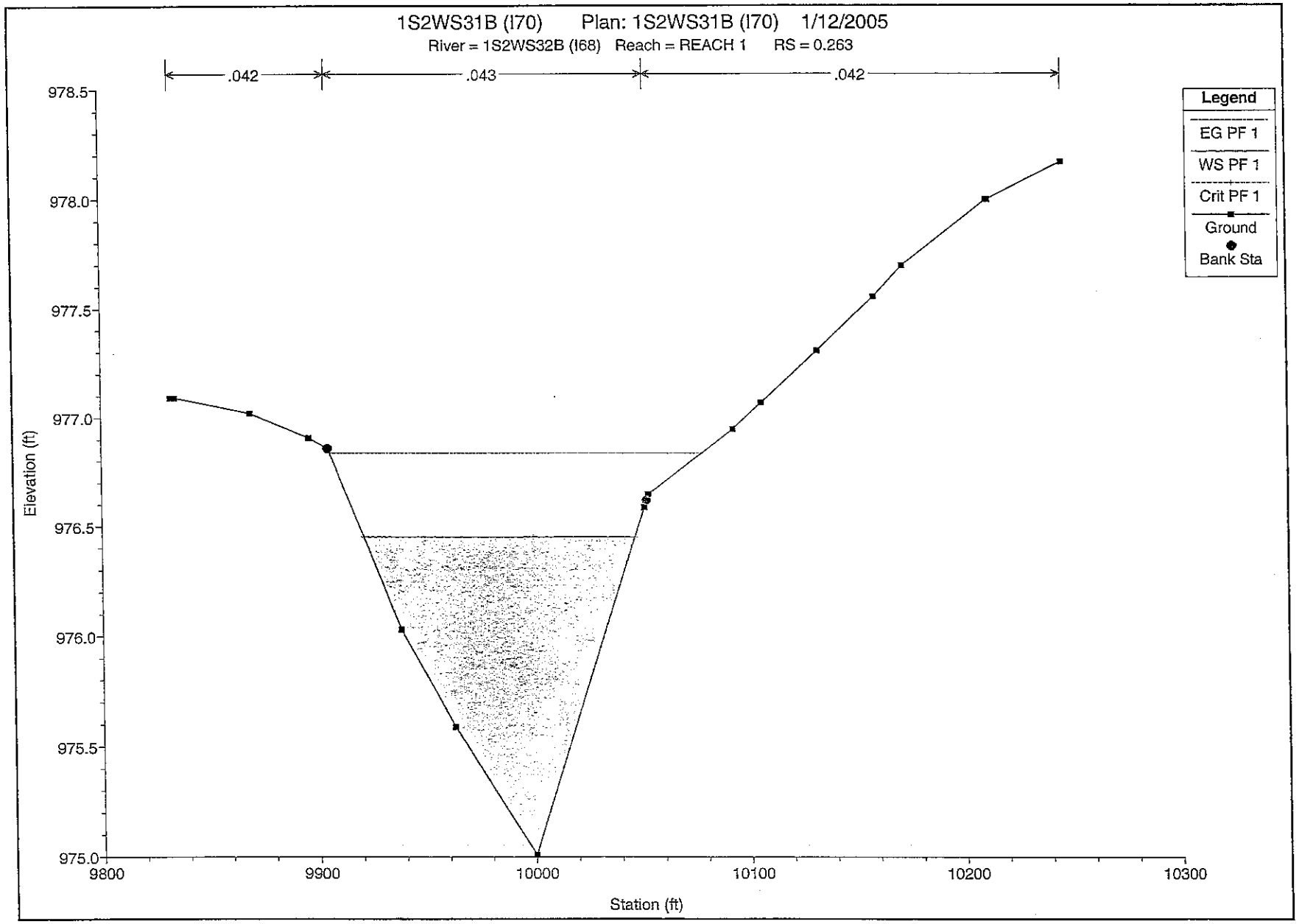
Wash ID: 1S2WS32B (I68)

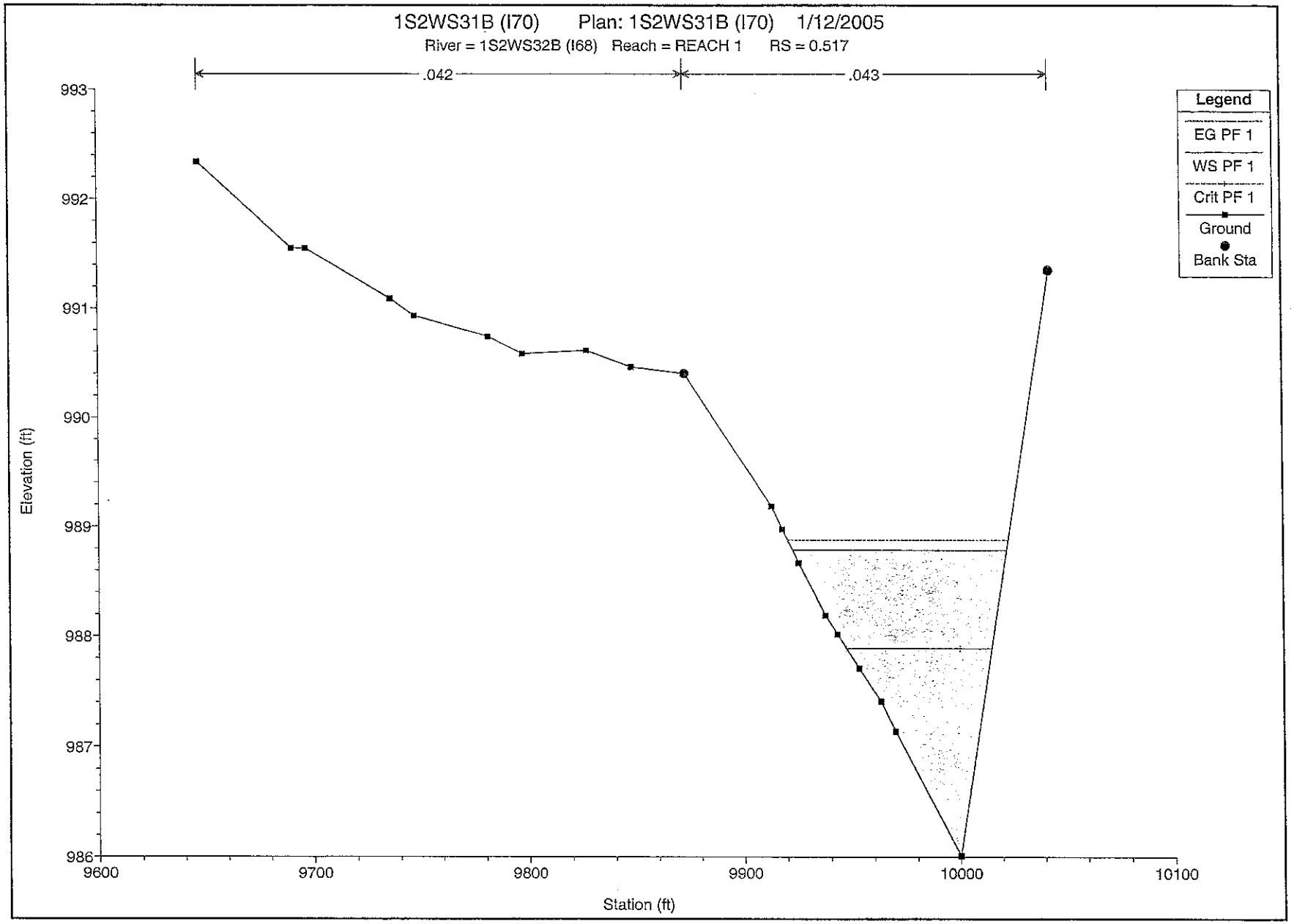
Subbasin: I68

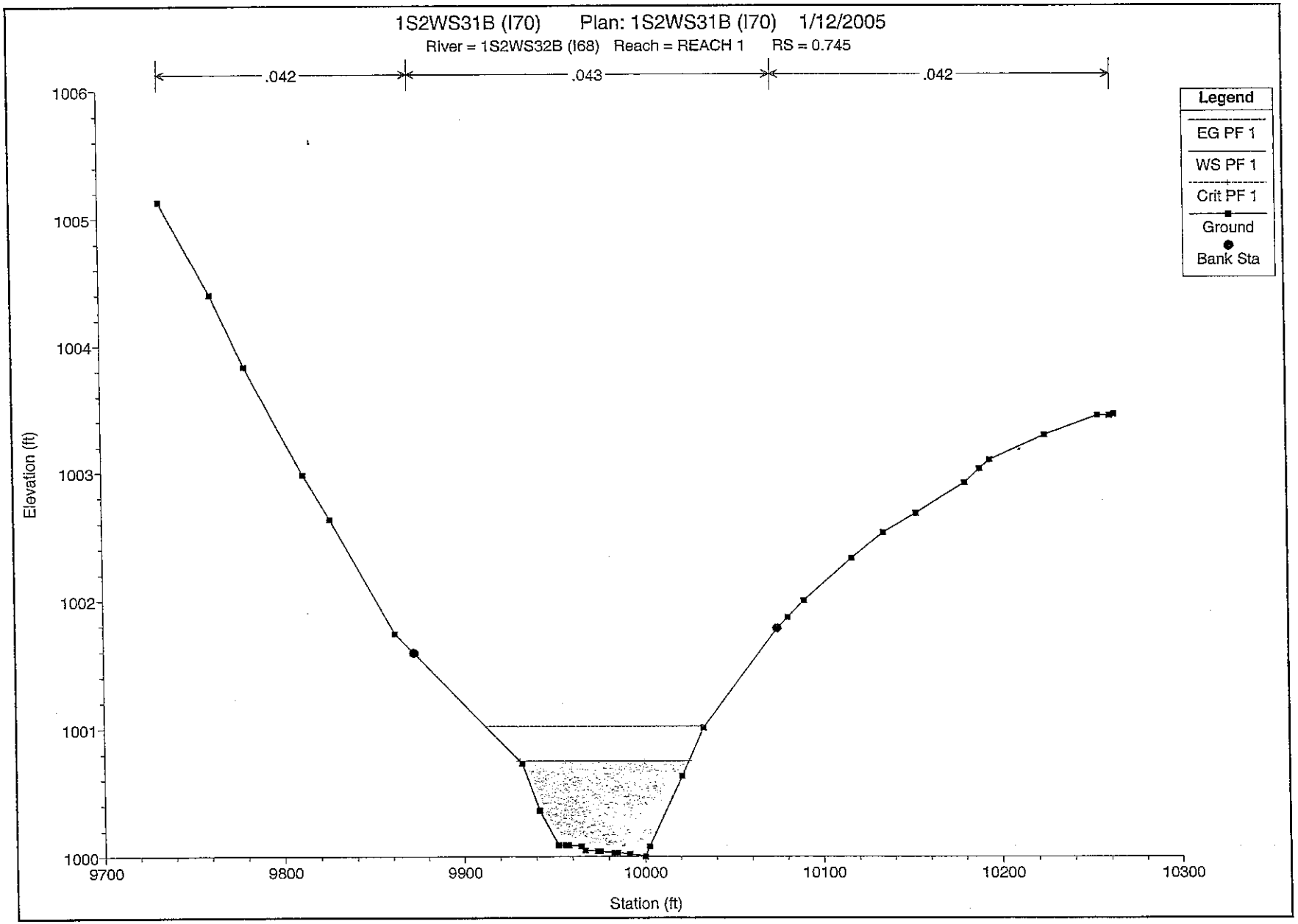
Total Discharge (cfs) = 523

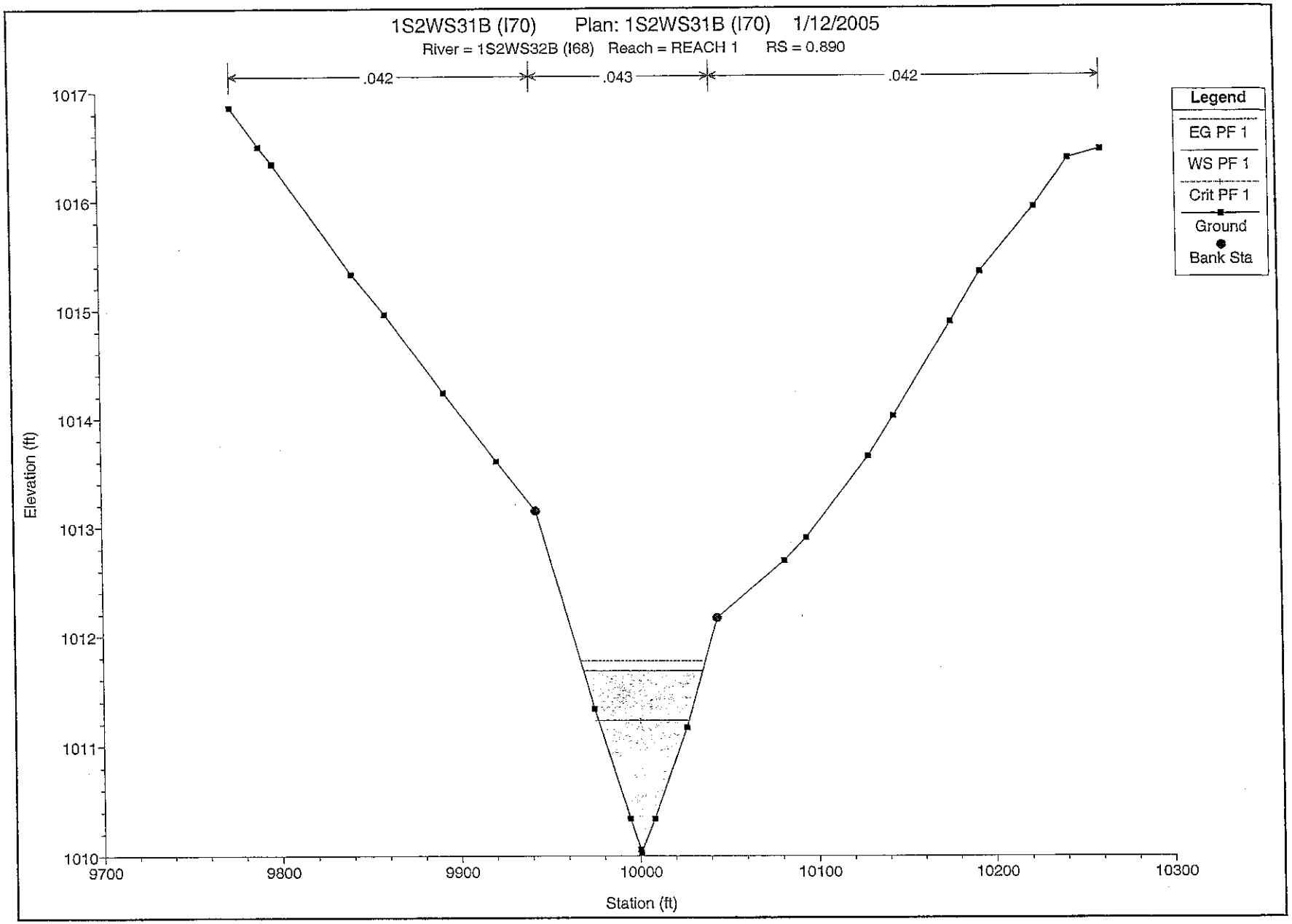
Total Area (acres) = 187

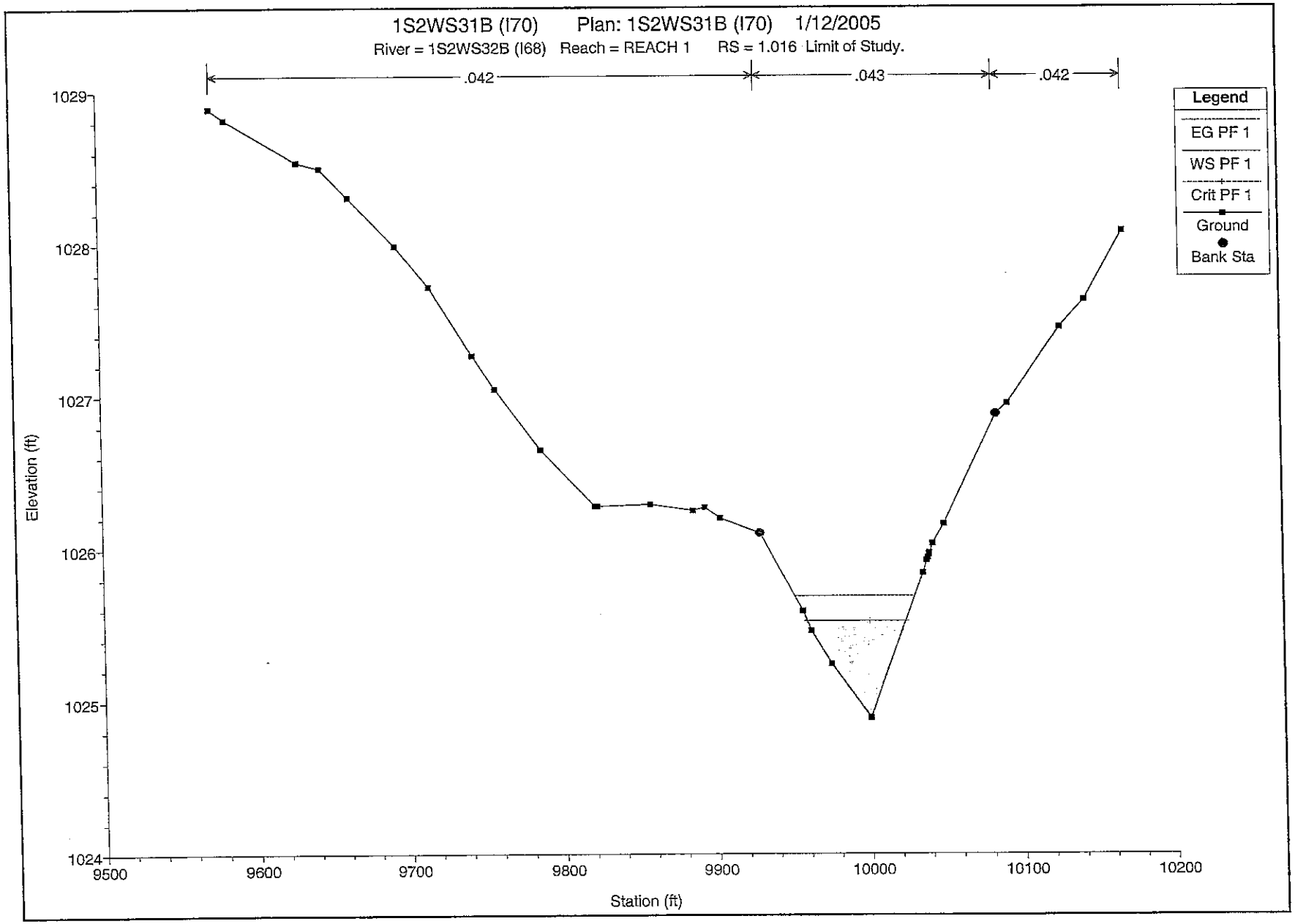
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.016	24	12.9	70
0.890	50	26.8	140
0.745	74	39.6	210
0.517	123	65.9	340
0.263	170	91.1	480


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32B (I68) Reach = REACH 1 RS = 0.263
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
978.5
978.0
977.5
977.0
976.5
976.0
975.5
975.0
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32B (I68) Reach = REACH 1 RS = 0.517
.042
.043
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
993
992
991
990
989
988
987
986
9600
9700
9800
9900
10000
10100
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32B (I68) Reach = REACH 1 RS = 0.745
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1006
1005
1004
1003
1002
1001
1000
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32B (I68) Reach = REACH 1 RS = 0.890
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1017
1016
1015
1014
1013
1012
1011
1010
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS32B (I68) Reach = REACH 1 RS = 1.016 Limit of Study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1029
1028
1027
1026
1025
1024
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

MODEL: 1S2WS31B (I70)

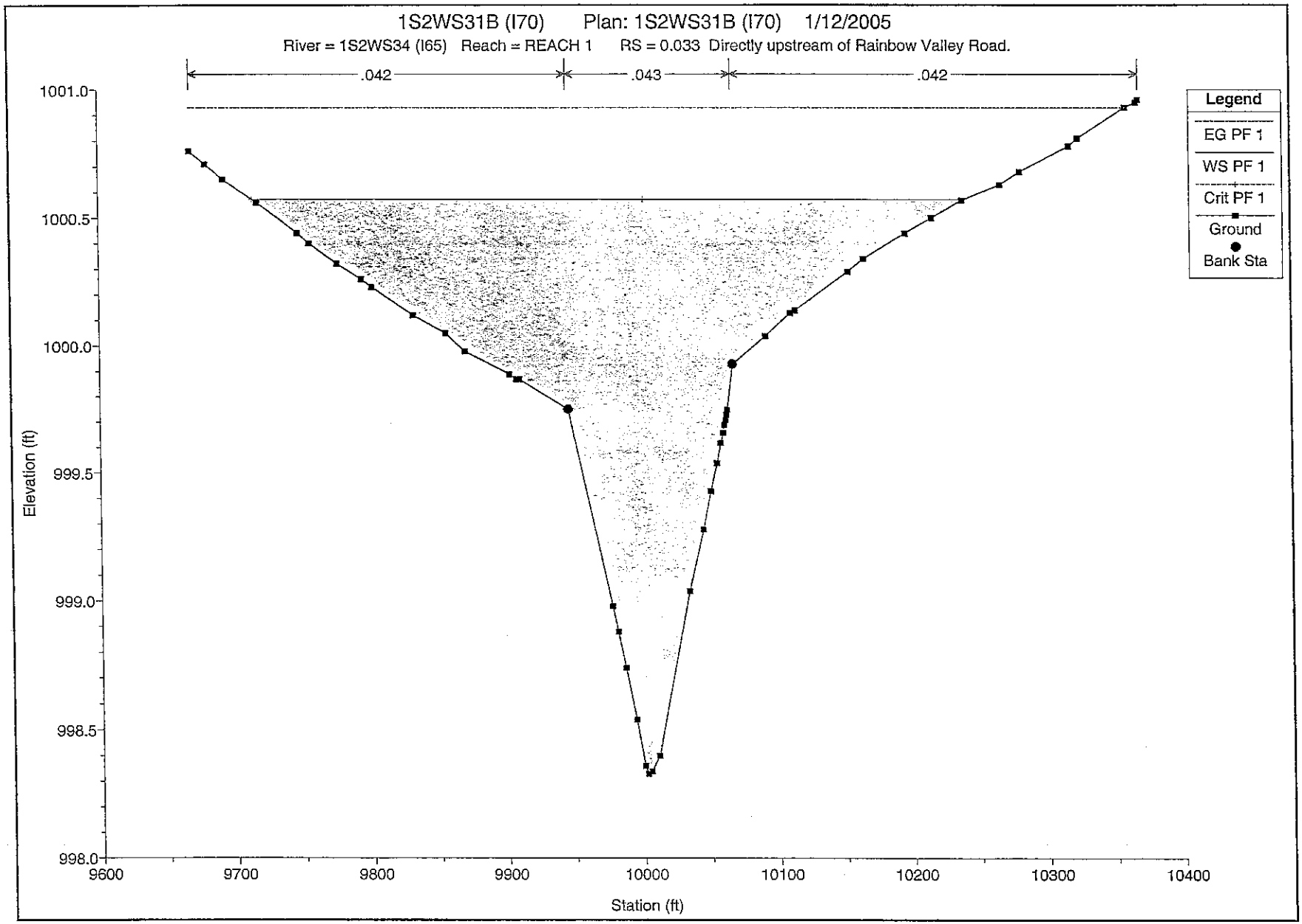
REACH: 1S2WS34 (I65)

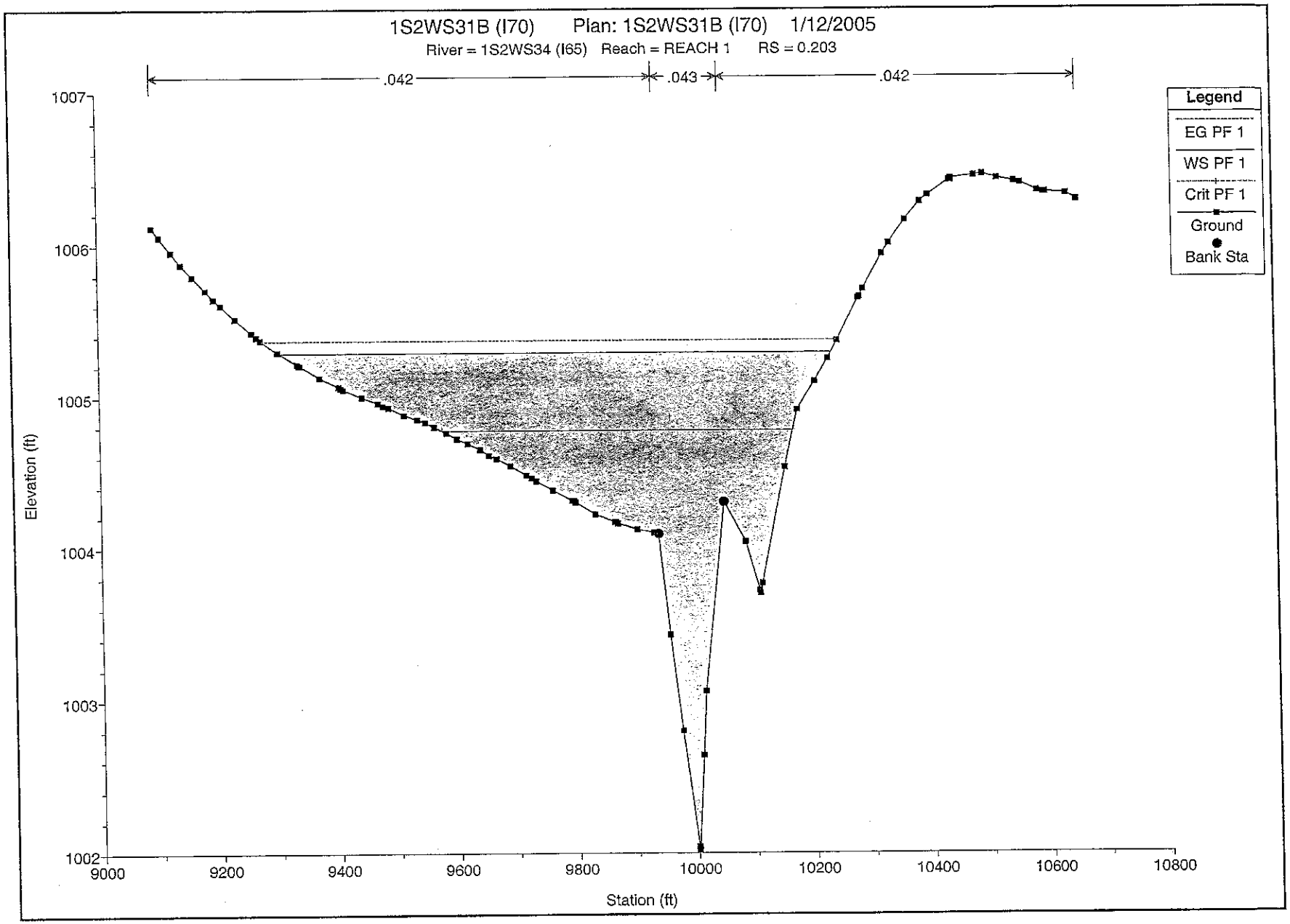
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

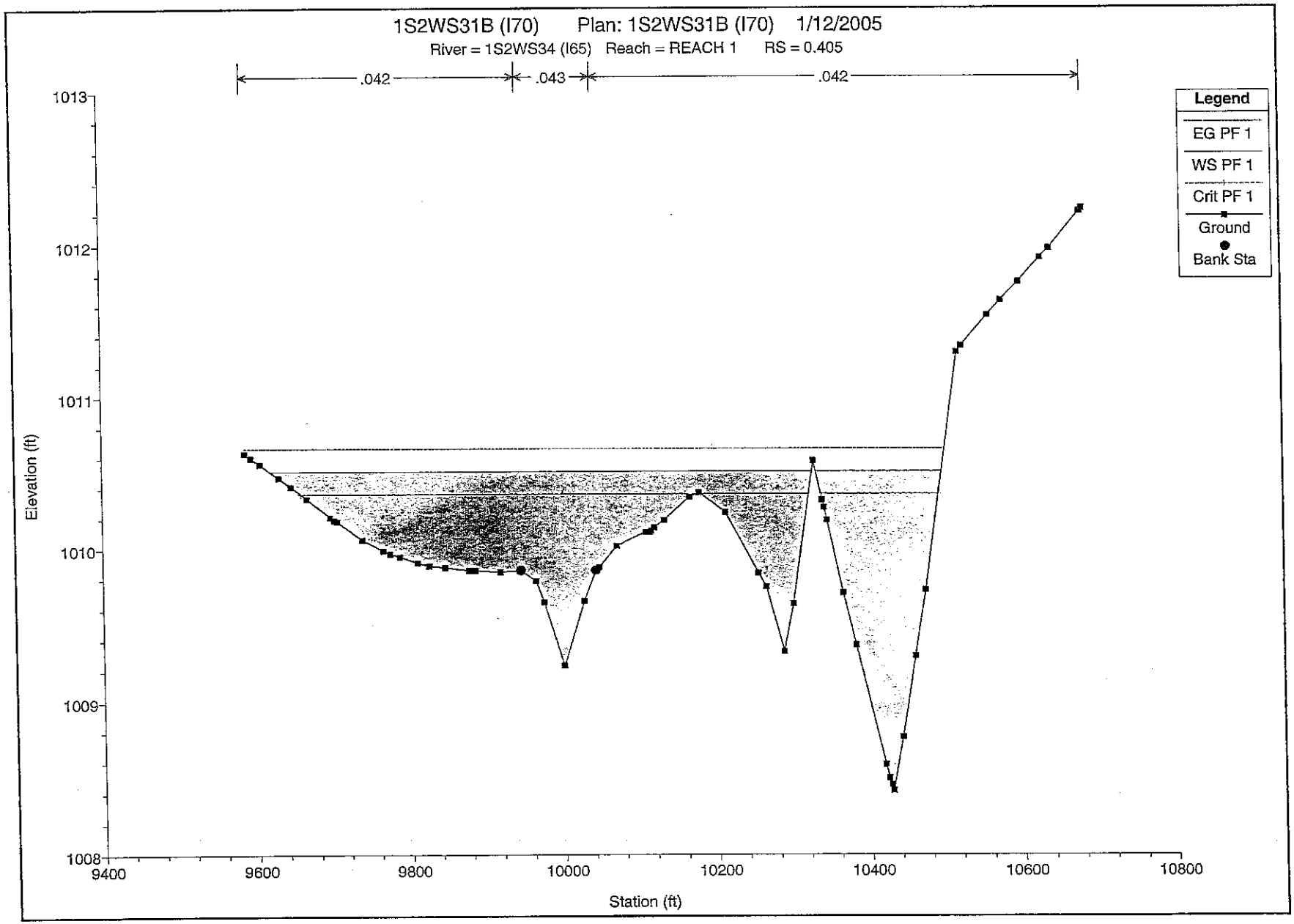
Change in Discharge based on Reach Length

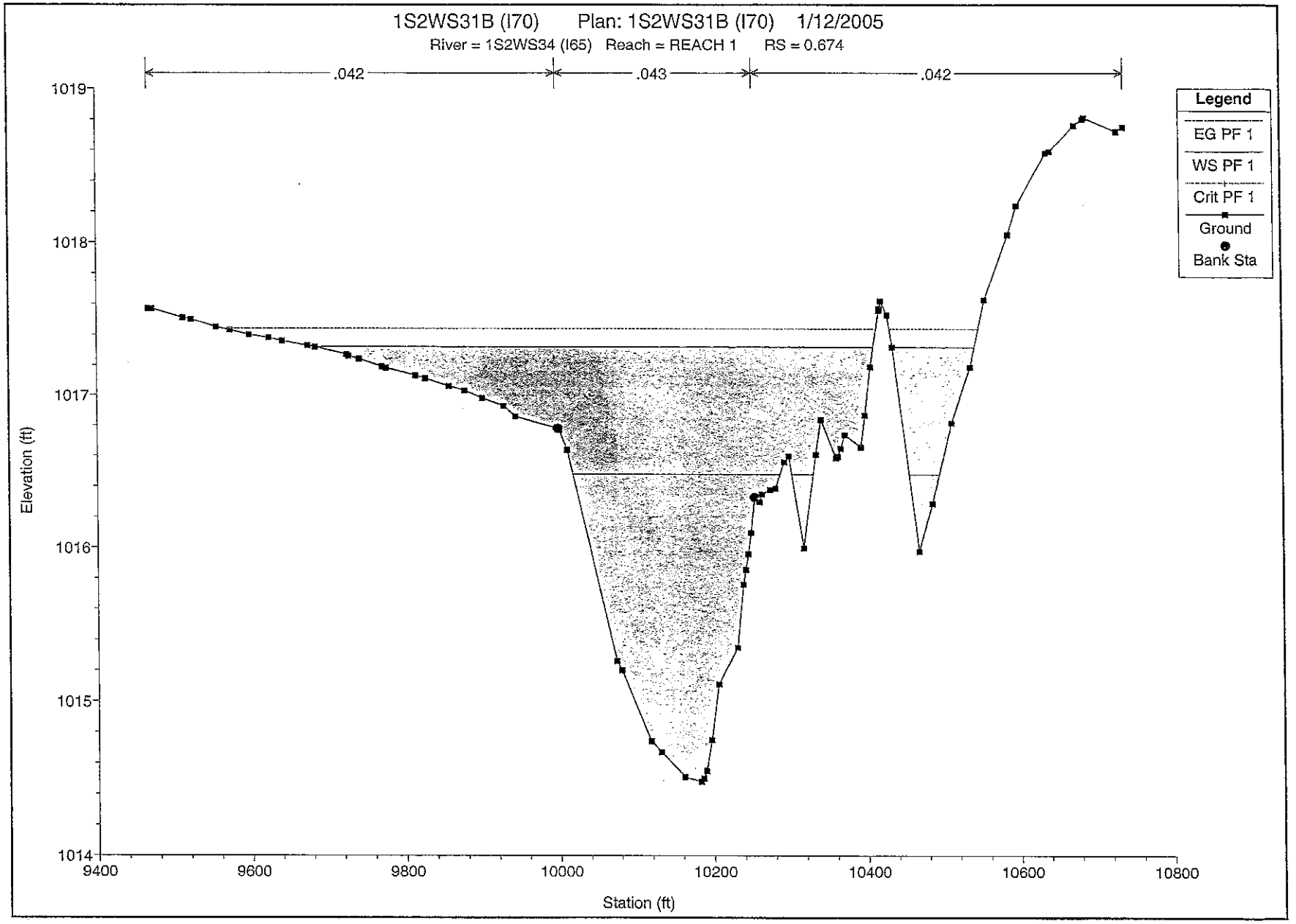
Wash ID: 1S2WS34 (I65)

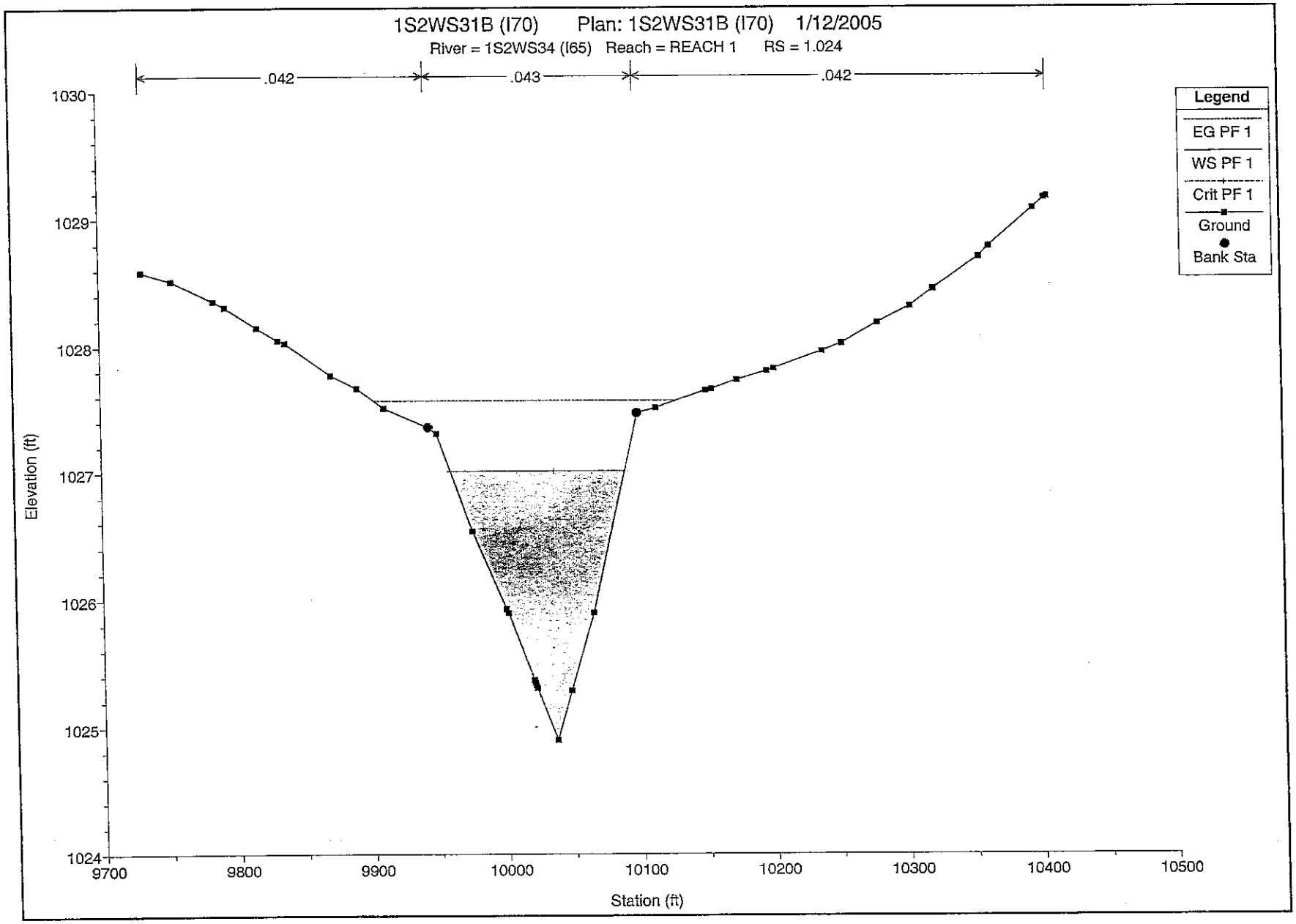
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPI56	3.043	786	790	800
I58	2.766	794	790	800
I58	2.529	801	800	800
I58	2.306	807	810	800
I58	2.066	814	810	800
I58	1.813	821	820	800
I58	1.557	828	830	800
I58	1.278	836	840	800
CPI58	1.024	843	840	800
CPI64	0.674	1913	1910	1900
I65	0.405	1670	1670	1700
I65	0.203	1487	1490	1500
CPI65	0.033	1333	1330	1300

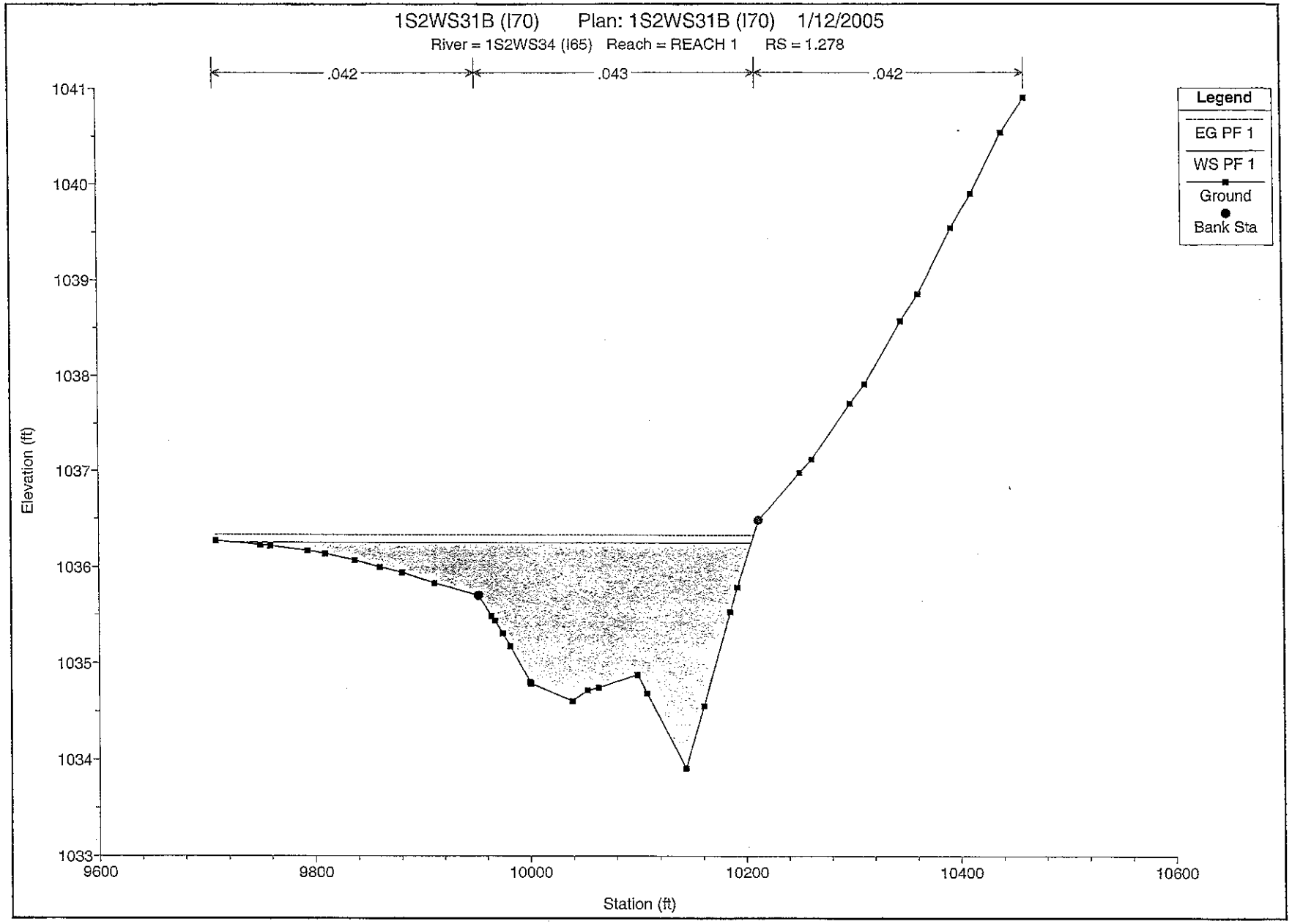

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 0.033 Directly upstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1001.0
1000.5
1000.0
999.5
999.0
998.5
998.0
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

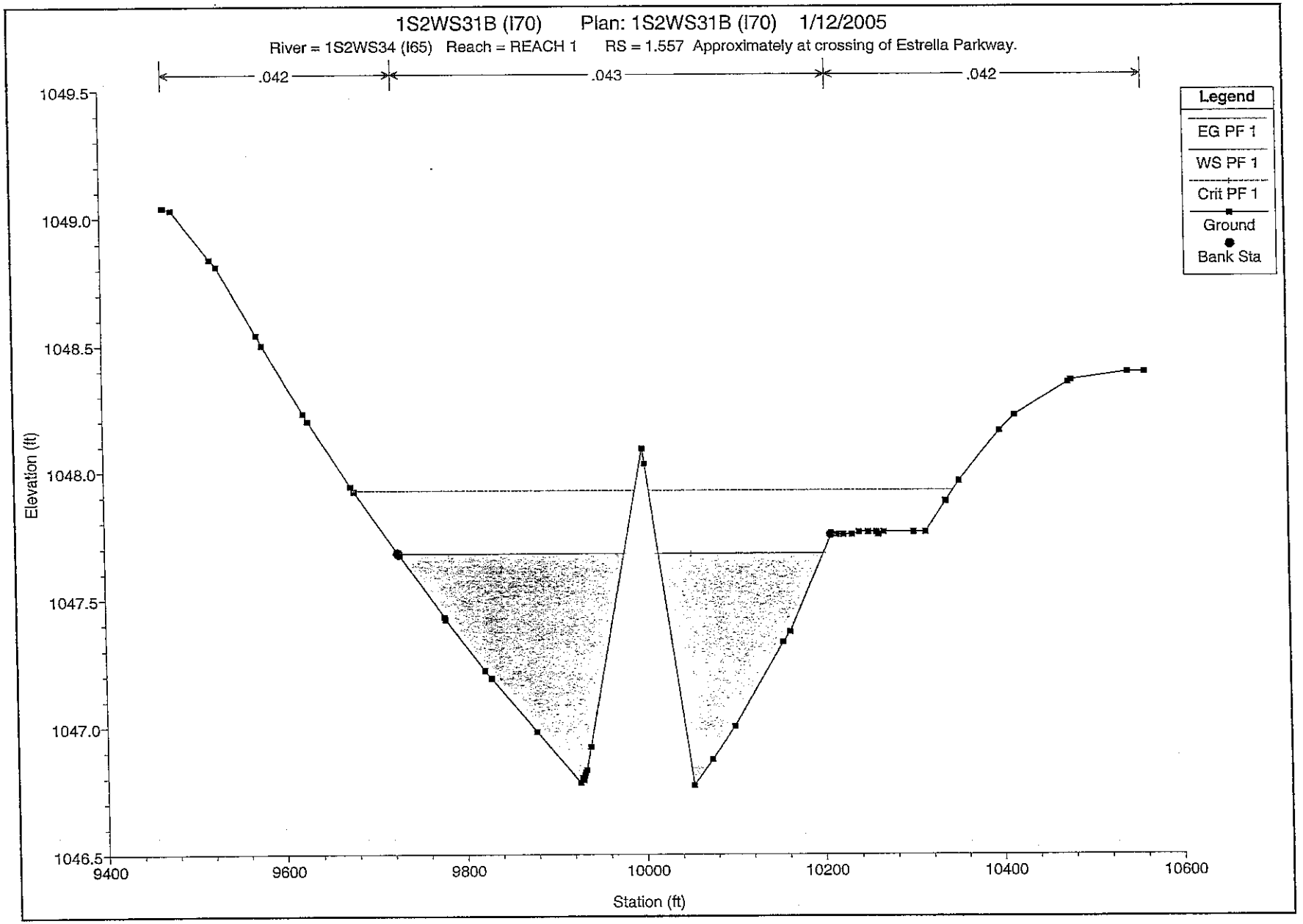

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 0.203
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1007
1006
1005
1004
1003
1002
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

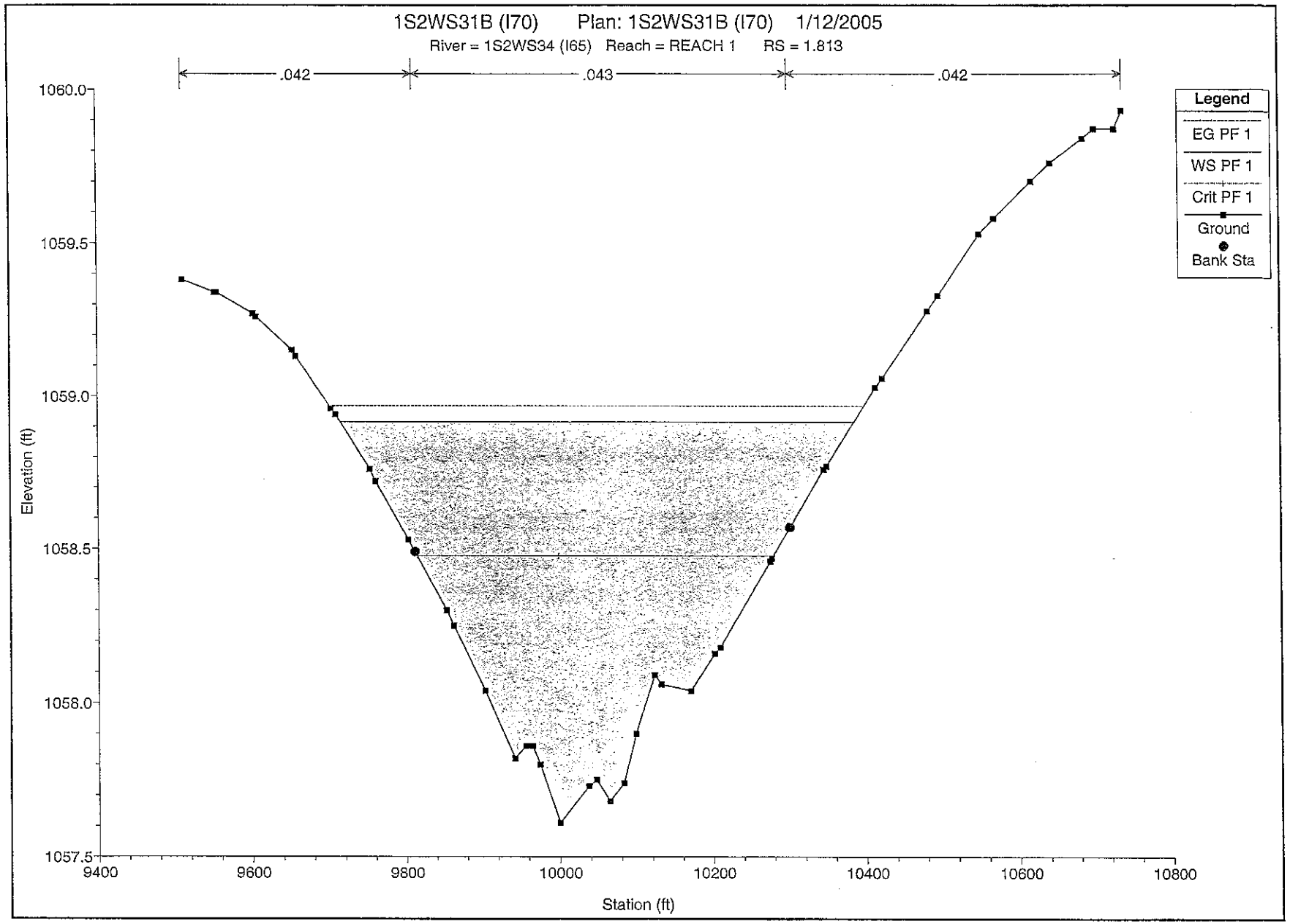

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 0.405
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1013
1012
1011
1010
1009
1008
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

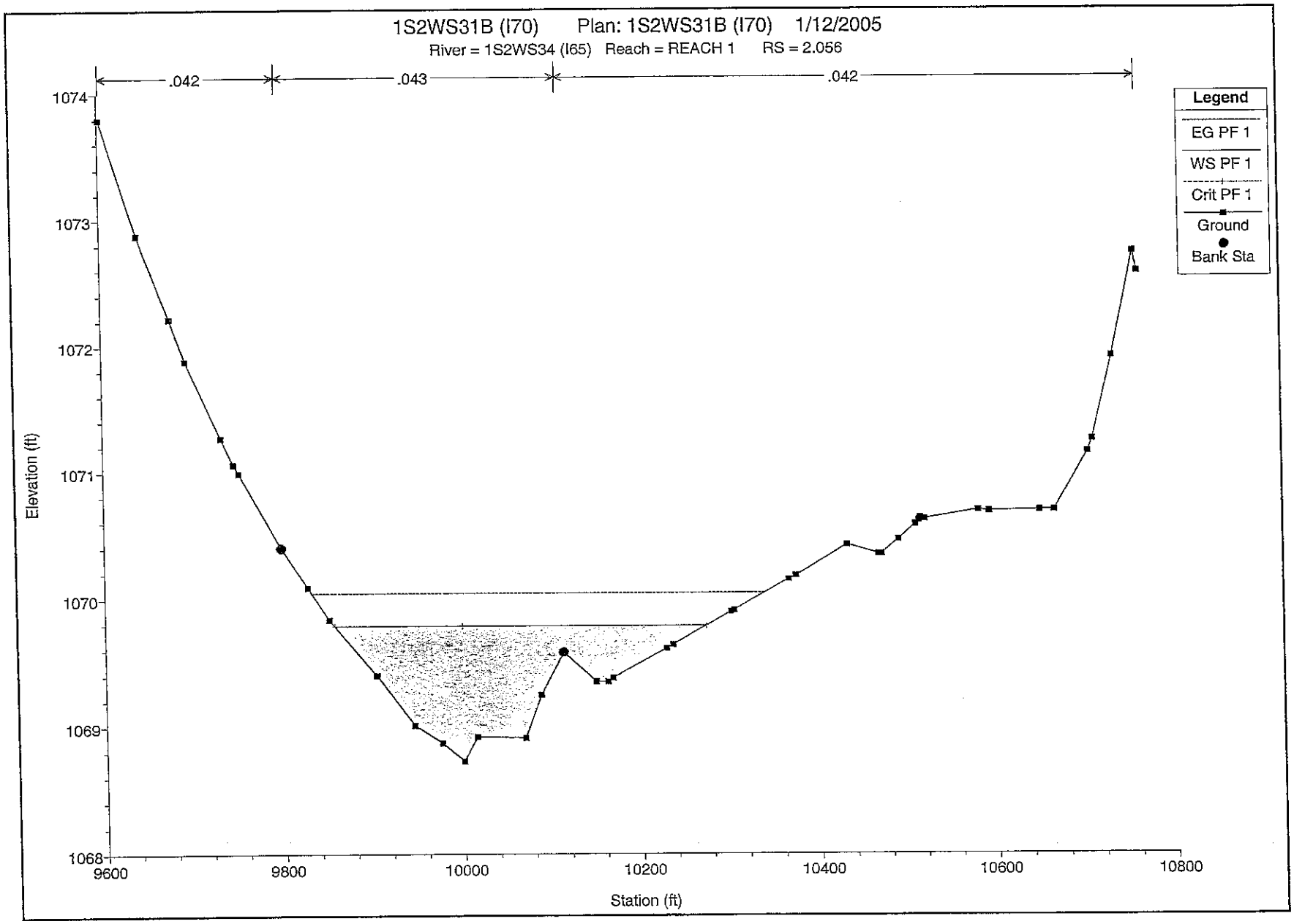

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 0.674
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1019
1018
1017
1016
1015
1014
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

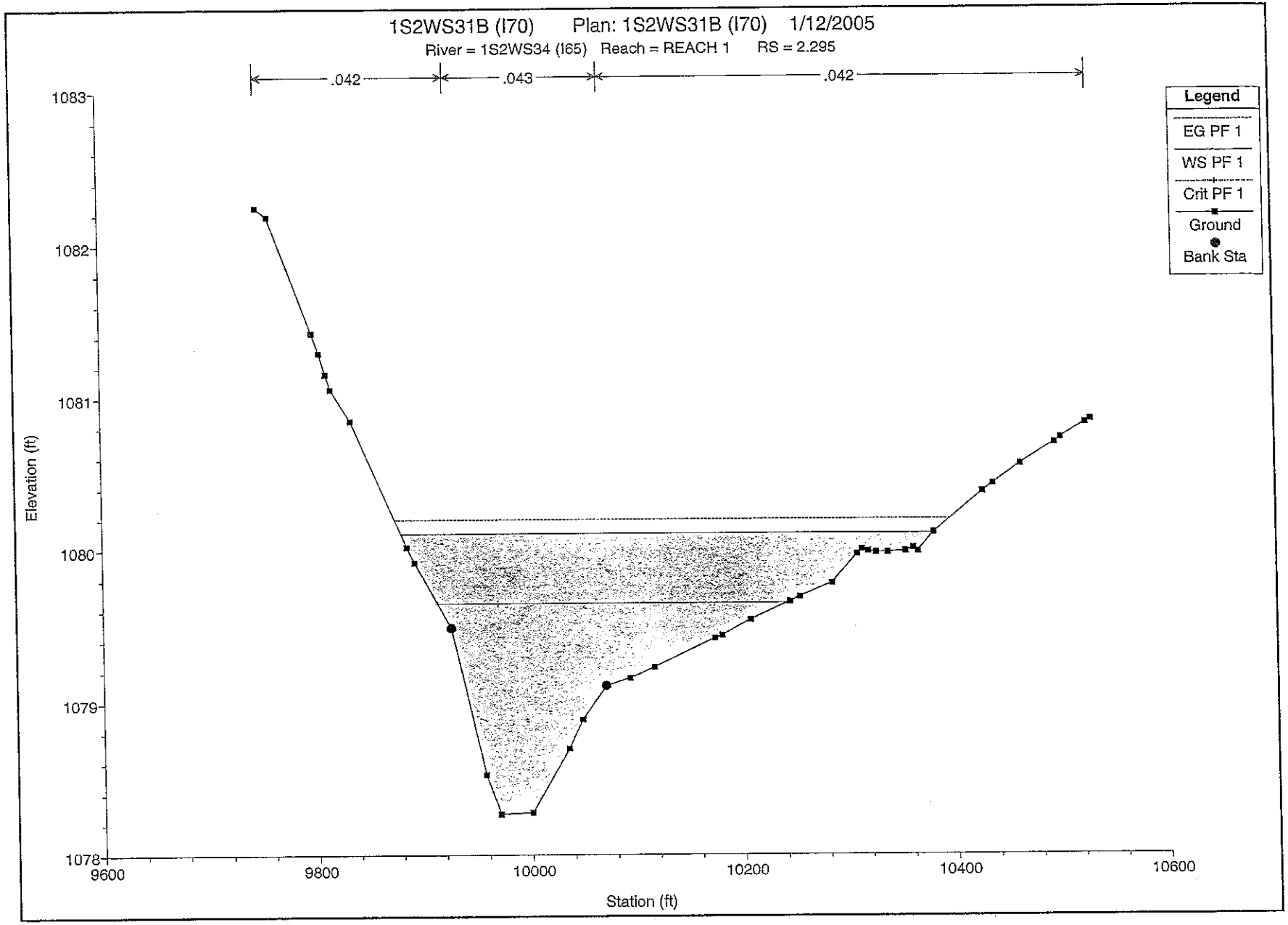

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 1.024
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1030
1029
1028
1027
1026
1025
1024
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

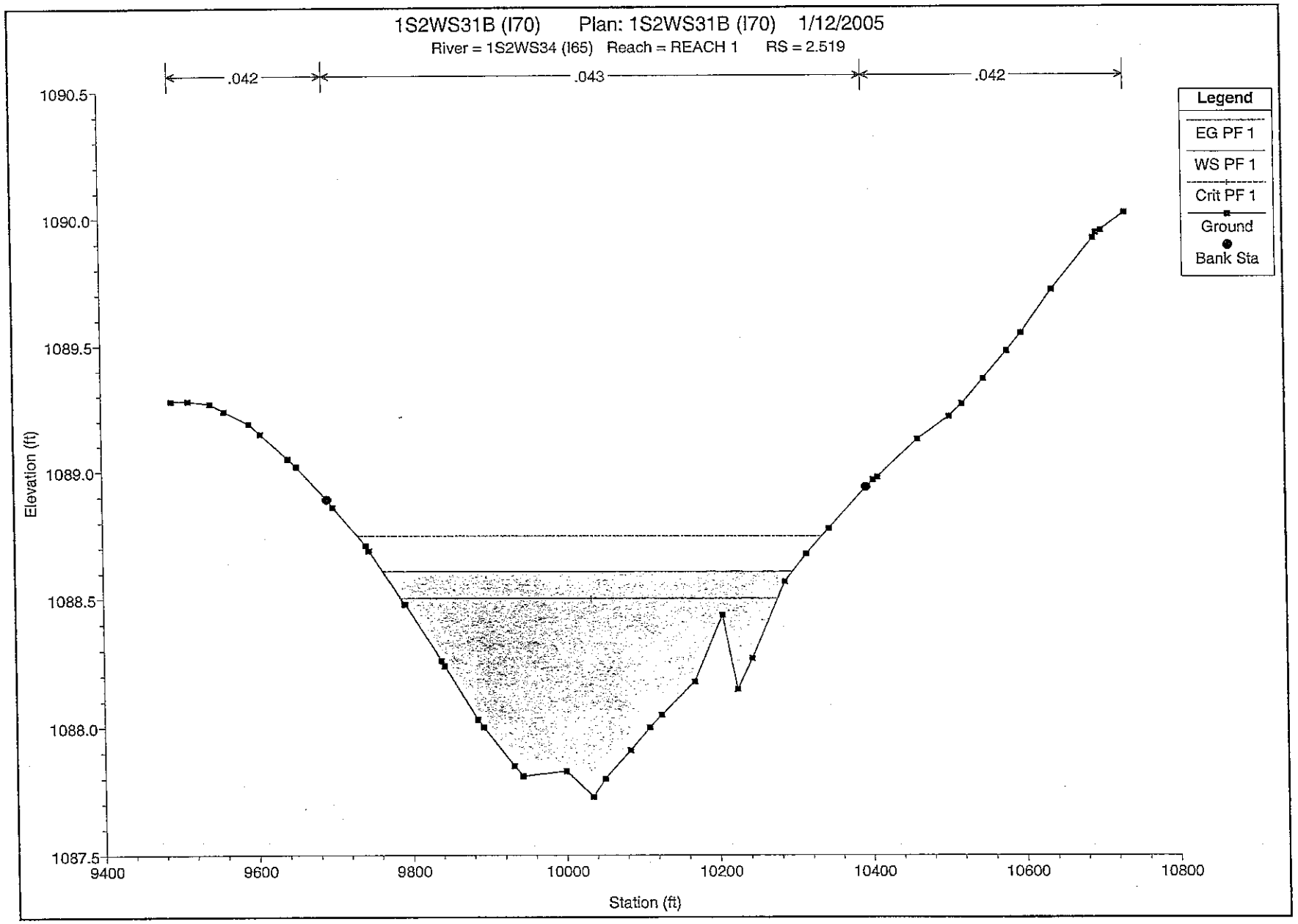

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 1.278
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1041
1040
1039
1038
1037
1036
1035
1034
1033
9600
9800
10000
10200
10400
10600
Station (ft)

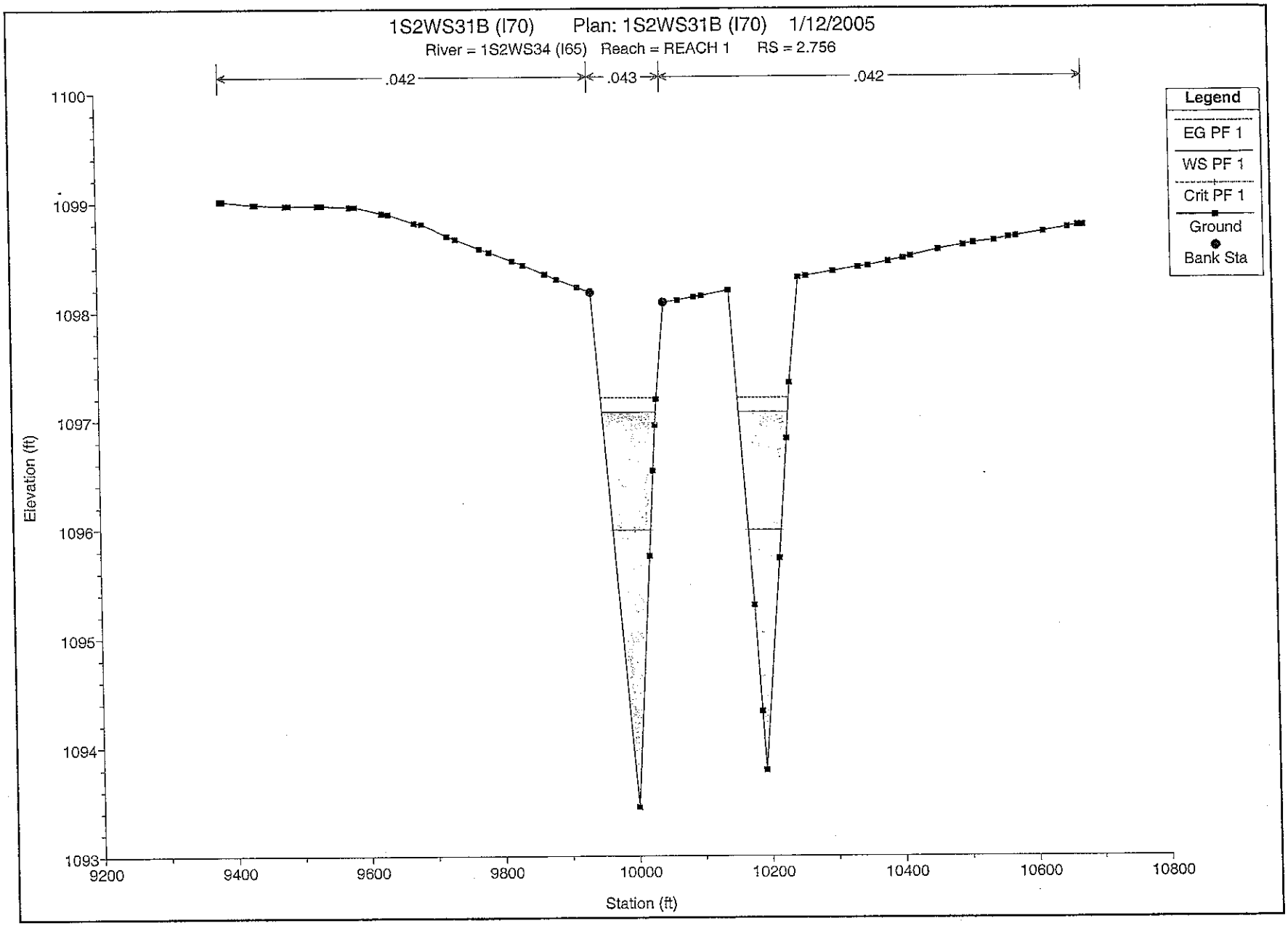

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 1.557 Approximately at crossing of Estrella Parkway.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1049.5
1049.0
1048.5
1048.0
1047.5
1047.0
1046.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

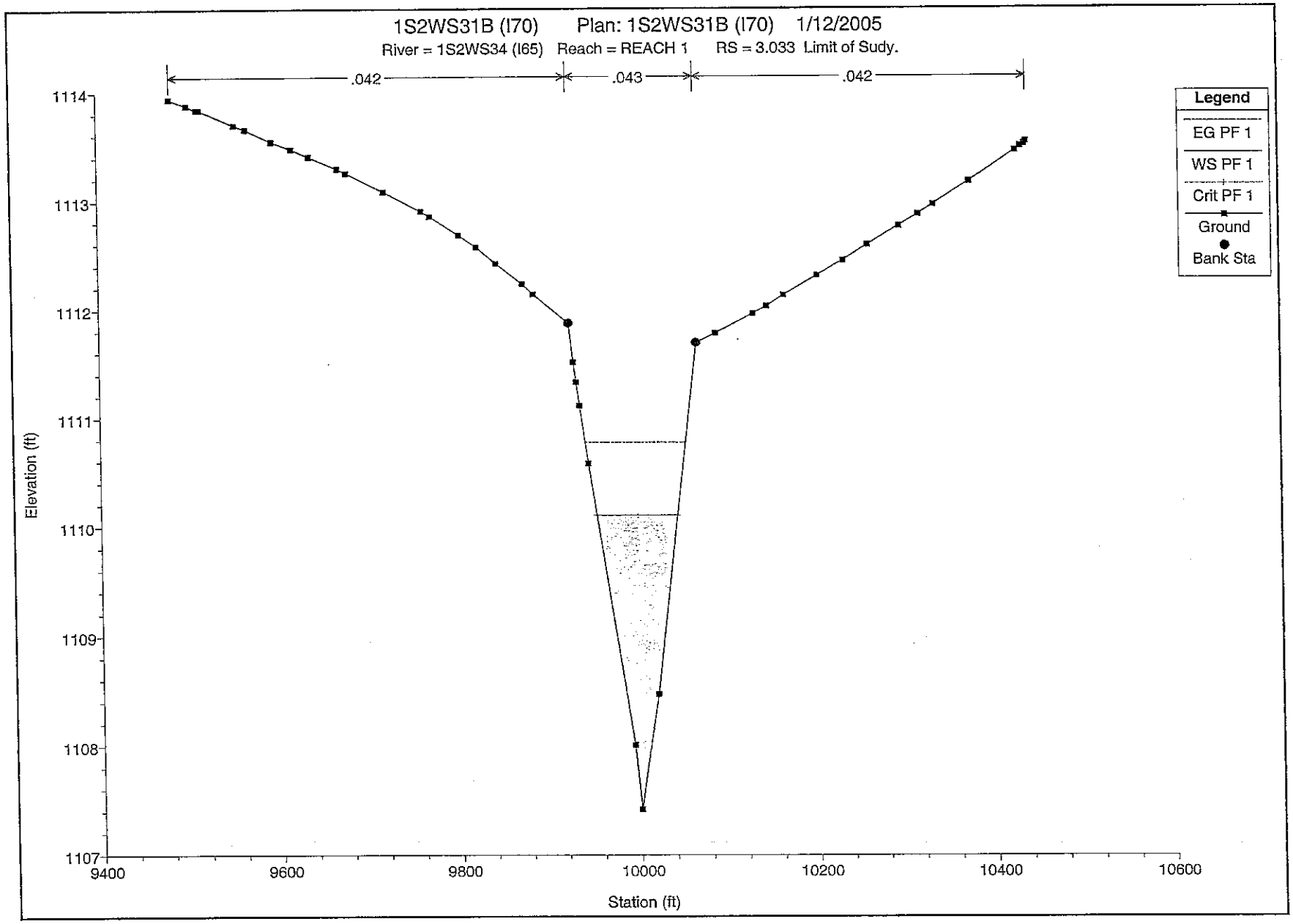

1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 1.813
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1060.0
1059.5
1059.0
1058.5
1058.0
1057.5
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 2.056
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1074
1073
1072
1071
1070
1069
1068
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 2.295
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1083
1082
1081
1080
1079
1078
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 2.519
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1090.5
1090.0
1089.5
1089.0
1088.5
1088.0
1087.5
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 2.756
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1100
1099
1098
1097
1096
1095
1094
1093
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS34 (I65) Reach = REACH 1 RS = 3.033 Limit of Sudy.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1114
1113
1112
1111
1110
1109
1108
1107
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS31B (I70)

REACH: 1S2WS33 (I66)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

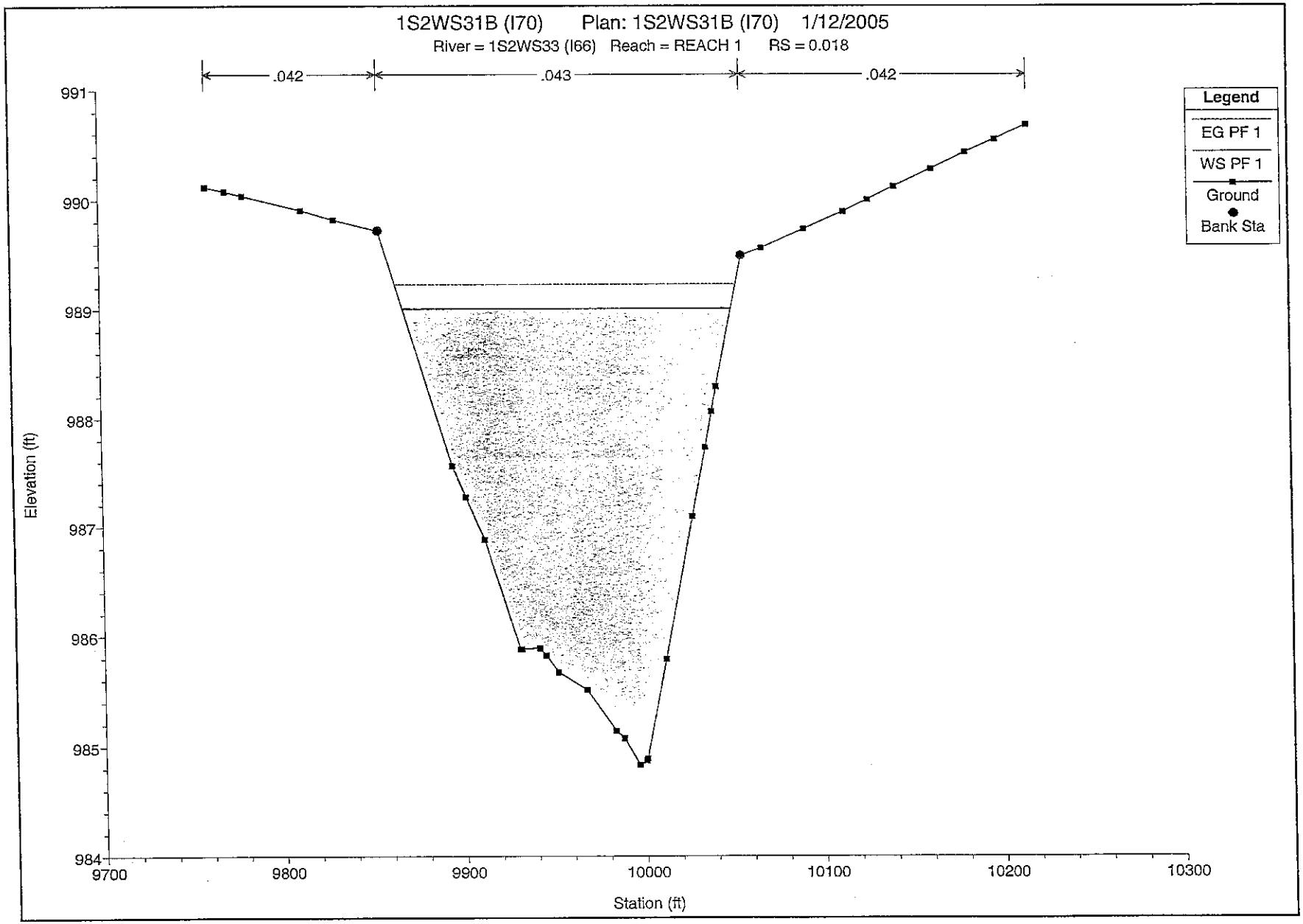
Wash ID: 1S2WS33 (I66)

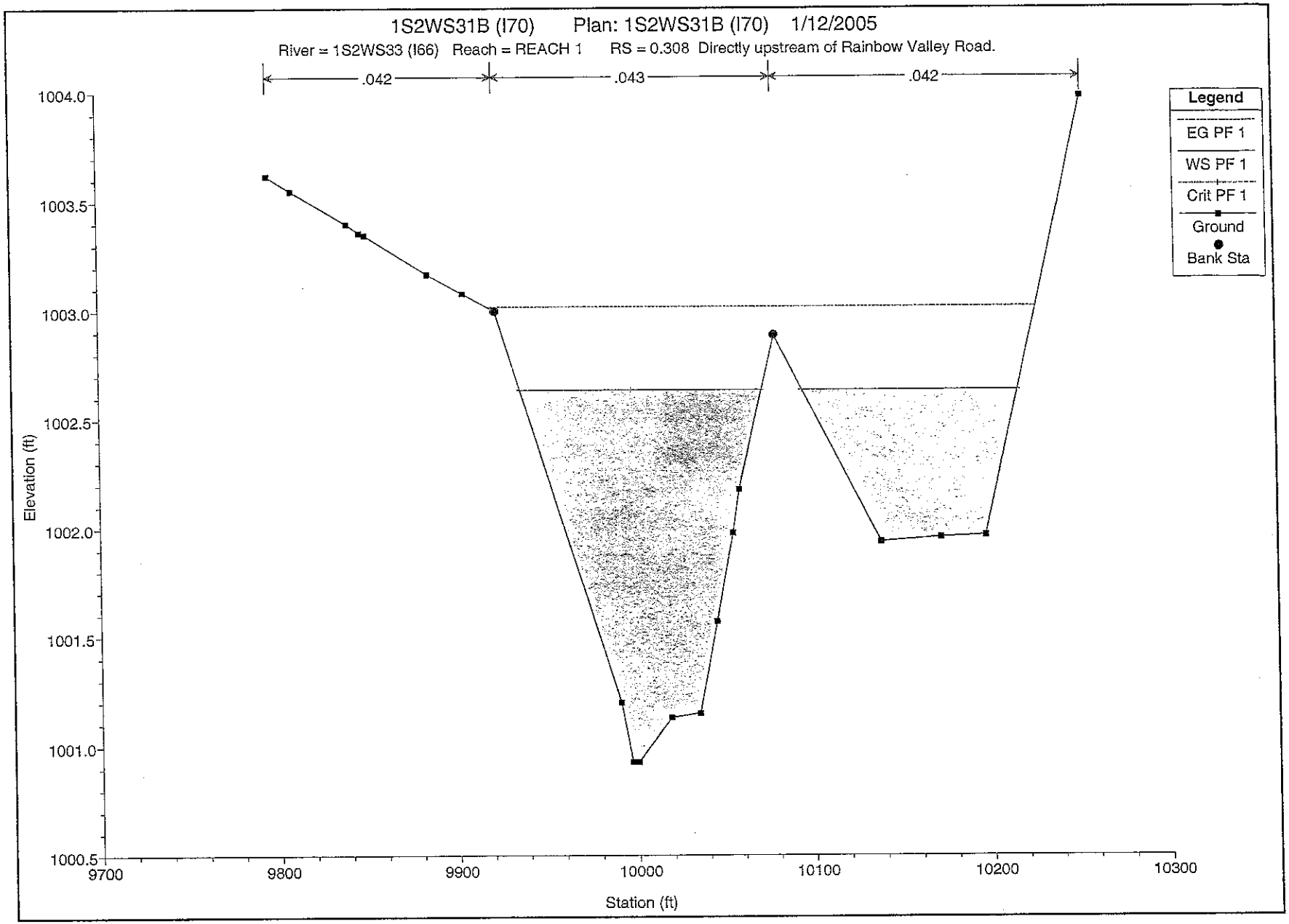
Subbasin: I66

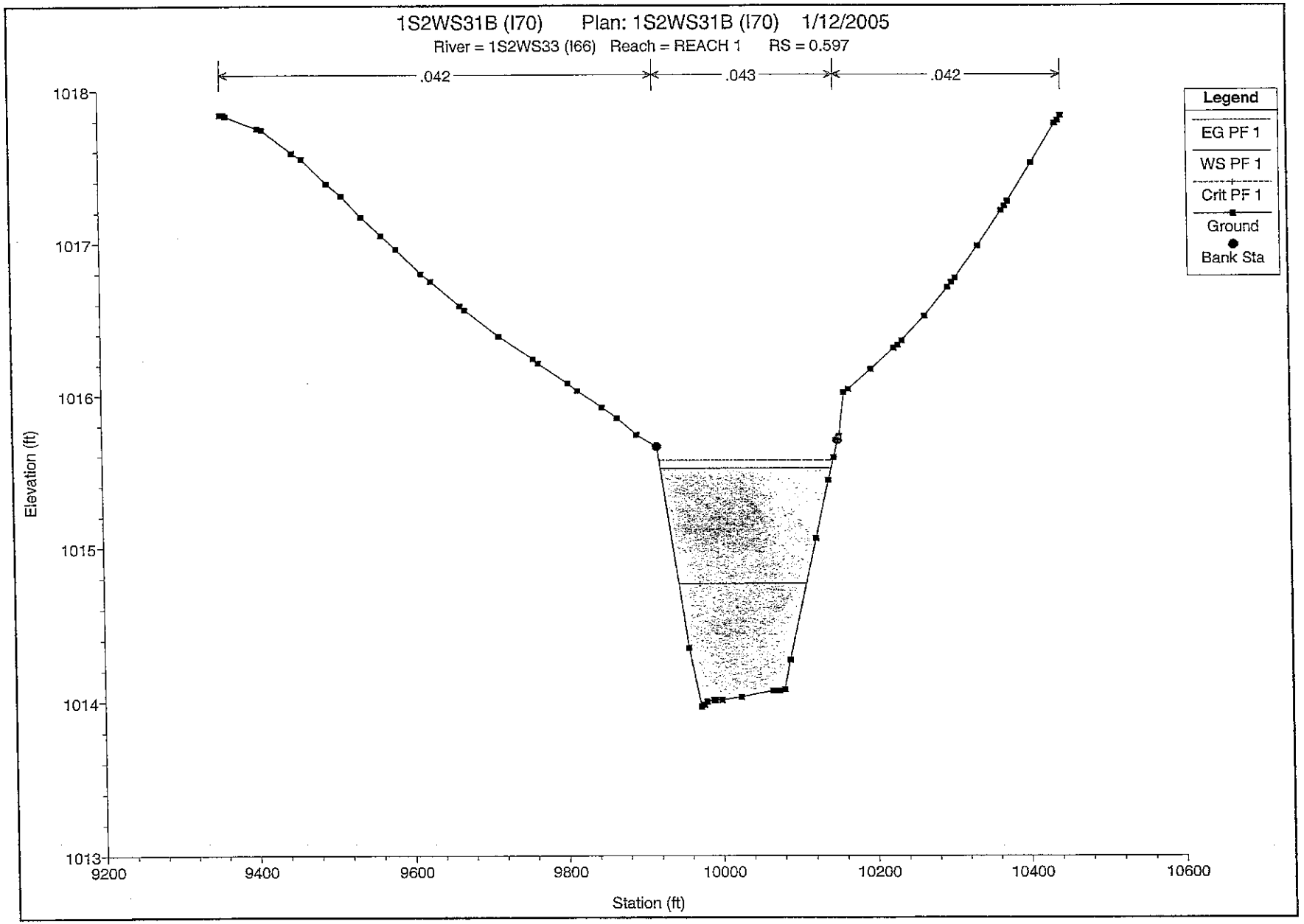
Total Discharge (cfs) = 1713

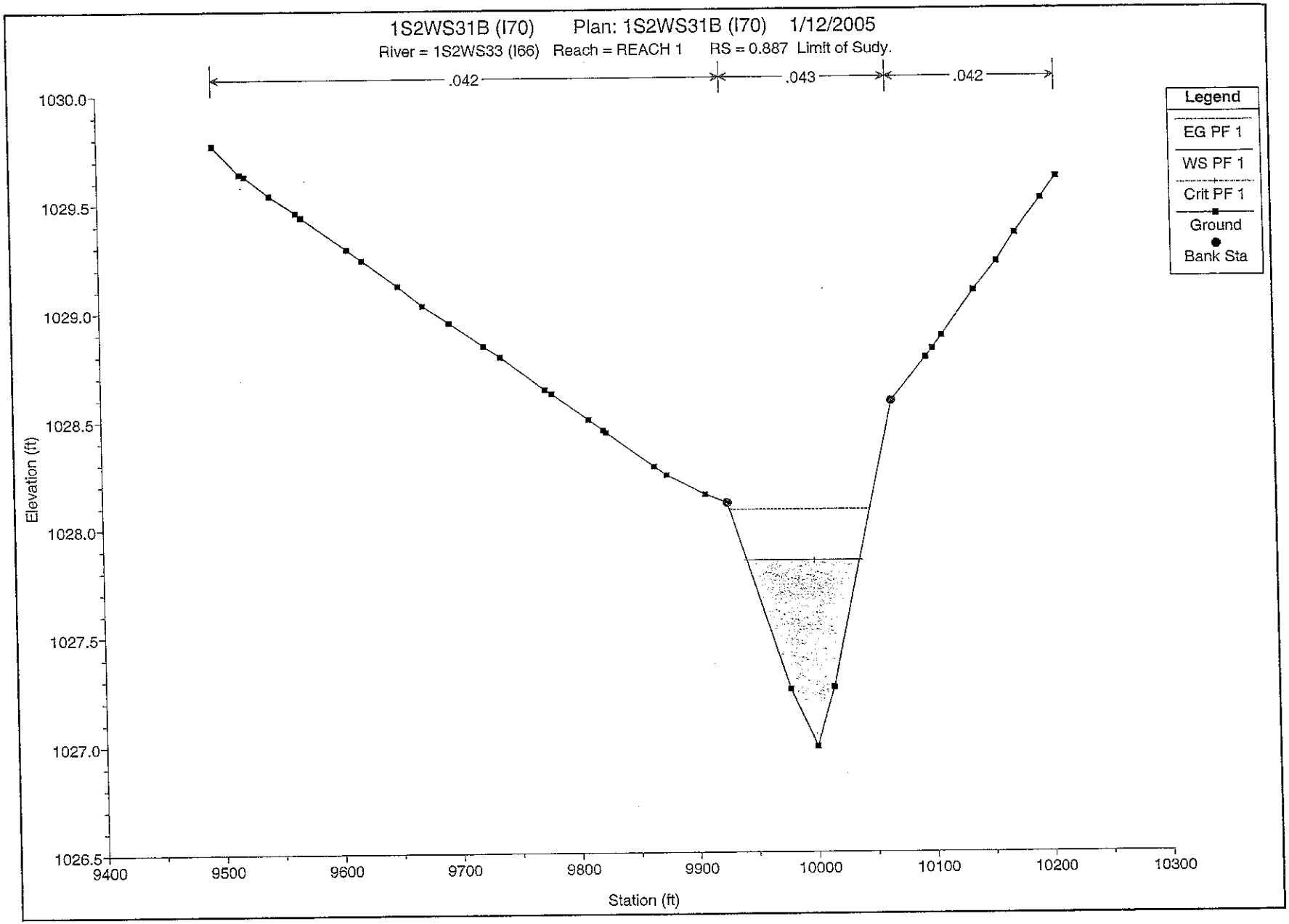
Total Area (acres) = 580

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.887	57	9.8	170
0.597	154	26.6	450
0.308	316	54.4	930
0.018	580	100.0	1710


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS33 (I66) Reach = REACH 1 RS = 0.018
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
991
990
989
988
987
986
985
984
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS33 (I66) Reach = REACH 1 RS = 0.308 Directly upstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1004.0
1003.5
1003.0
1002.5
1002.0
1001.5
1001.0
1000.5
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS33 (I66) Reach = REACH 1 RS = 0.597
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1018
1017
1016
1015
1014
1013
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS33 (I66) Reach = REACH 1 RS = 0.887 Limit of Sudy.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1030.0
1029.5
1029.0
1028.5
1028.0
1027.5
1027.0
1026.5
9400
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS31B (I70)

REACH: 1S2WS31A (I71)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

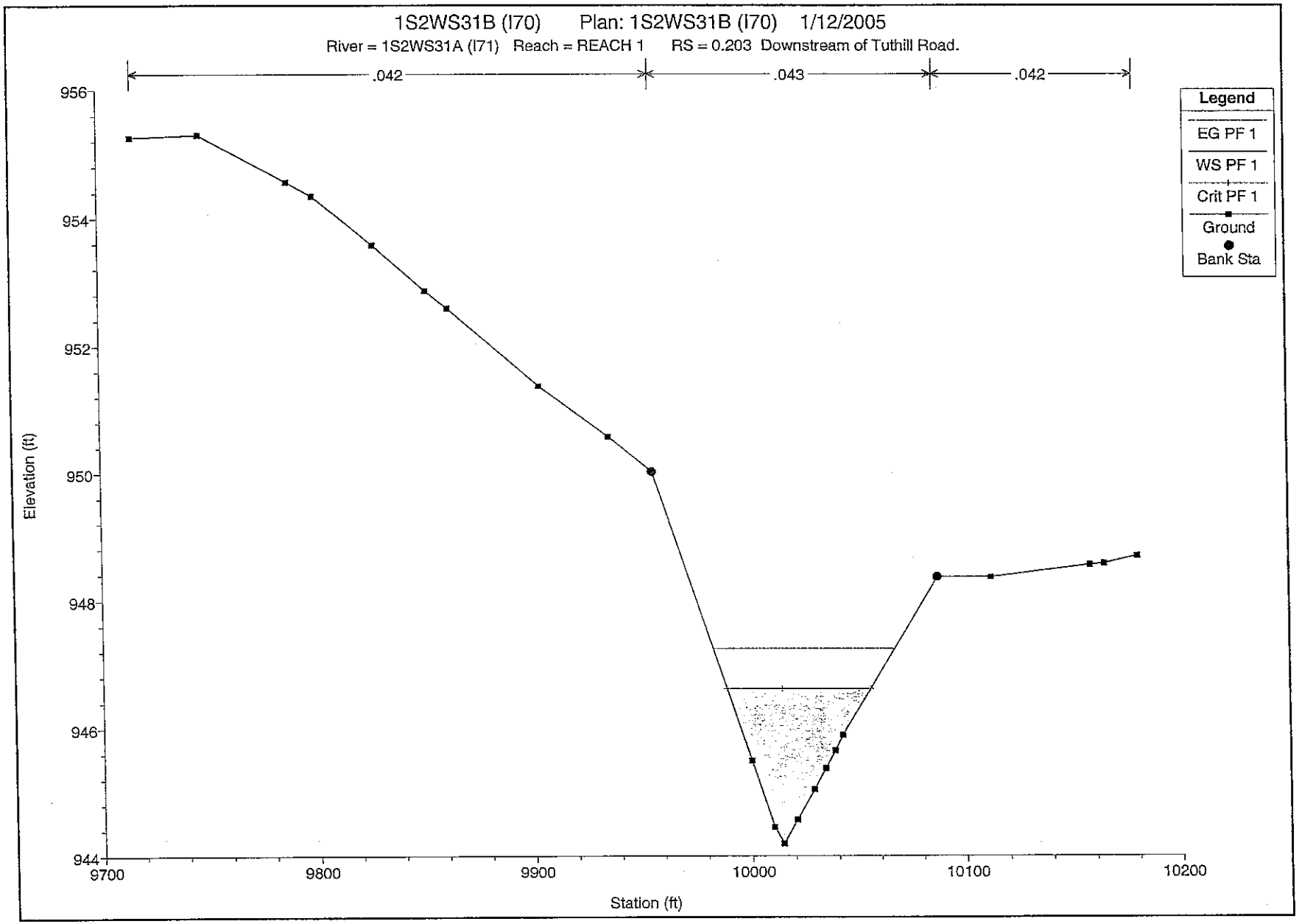
Wash ID: 1S2WS31A (I71)

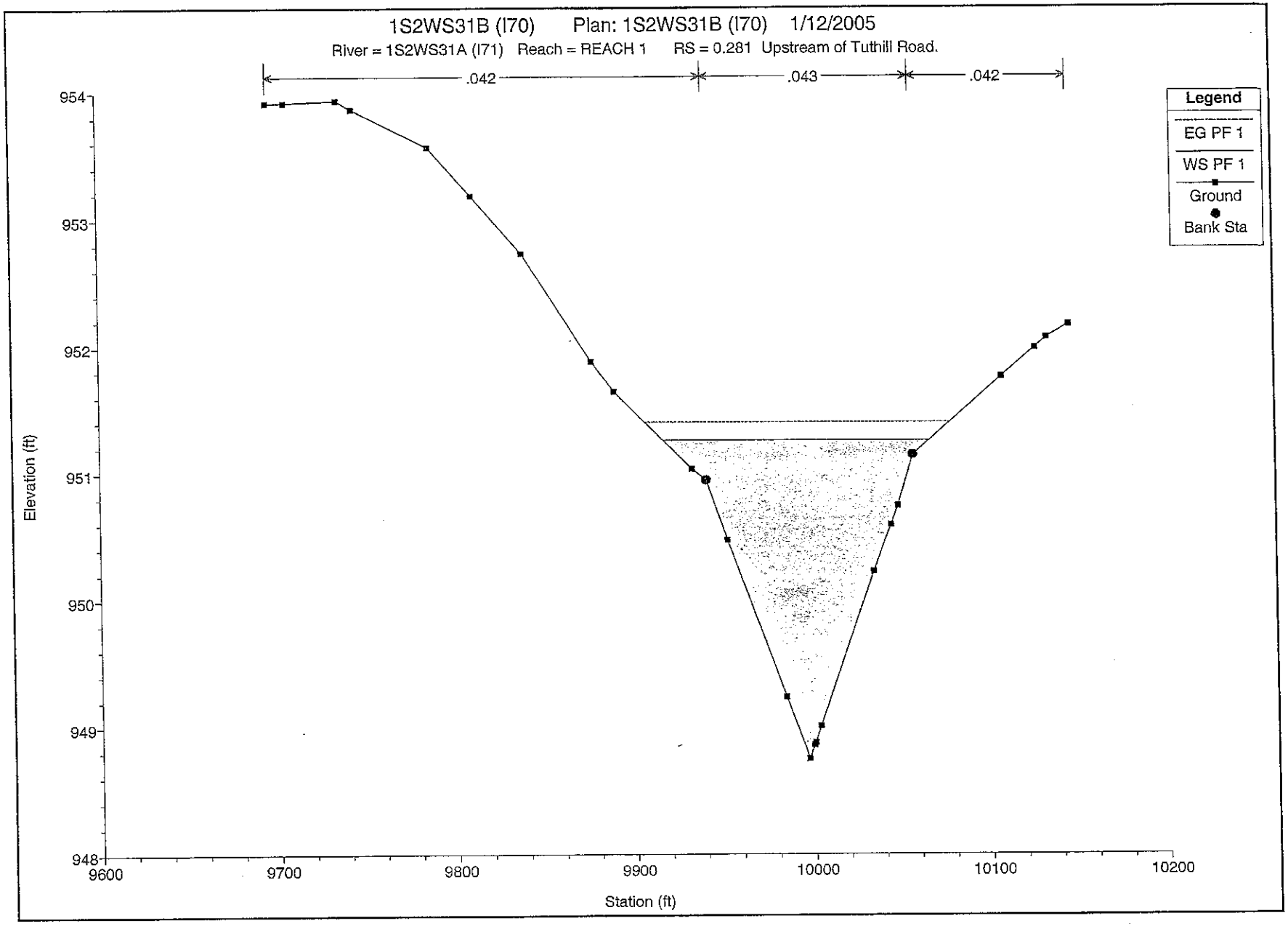
Subbasin: I71

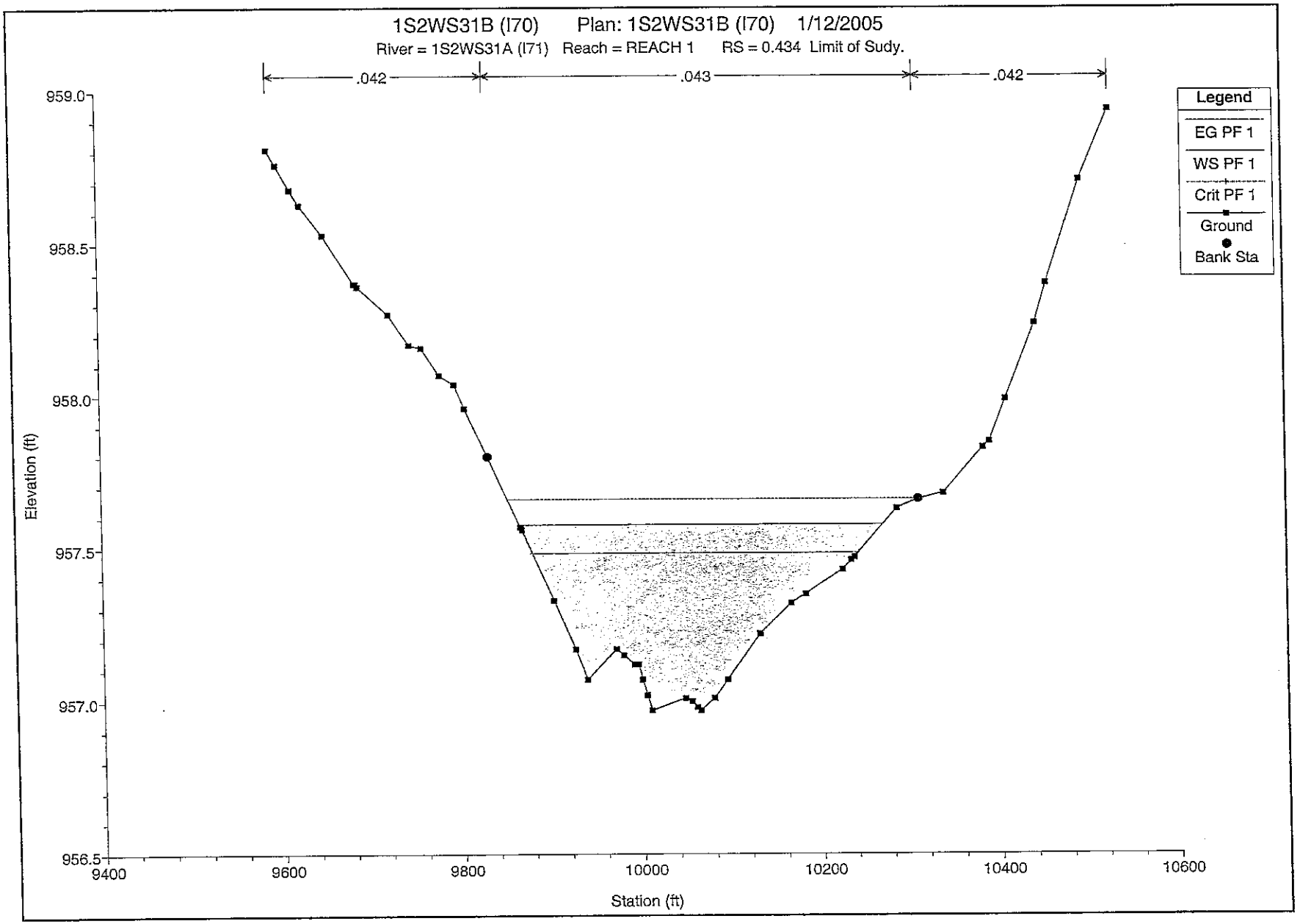
Total Discharge (cfs) = 744

Total Area (acres) = 269

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.434	120	44.7	330
0.281	179	66.5	490
0.203	187	69.5	520


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31A (I71) Reach = REACH 1 RS = 0.203 Downstream of Tuthill Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
956
954
952
950
948
946
944
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31A (I71) Reach = REACH 1 RS = 0.281 Upstream of Tuthill Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
954
953
952
951
950
949
948
9600
9700
9800
9900
10000
10100
10200
Station (ft)


1S2WS31B (I70) Plan: 1S2WS31B (I70) 1/12/2005
River = 1S2WS31A (I71) Reach = REACH 1 RS = 0.434 Limit of Sudy.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
959.0
958.5
958.0
957.5
957.0
956.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS9A (J39)

REACH: 1S2WS9A (J39)

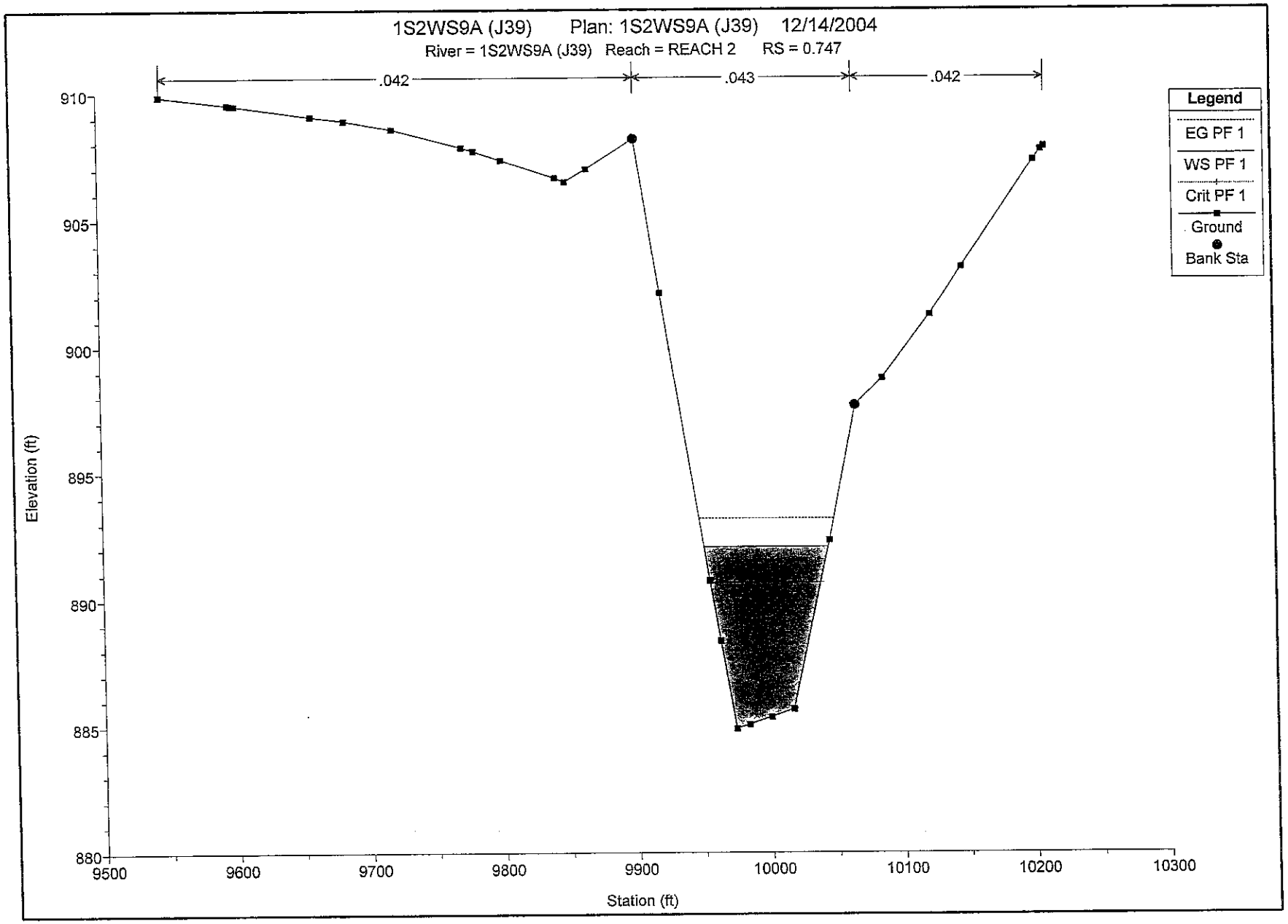
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

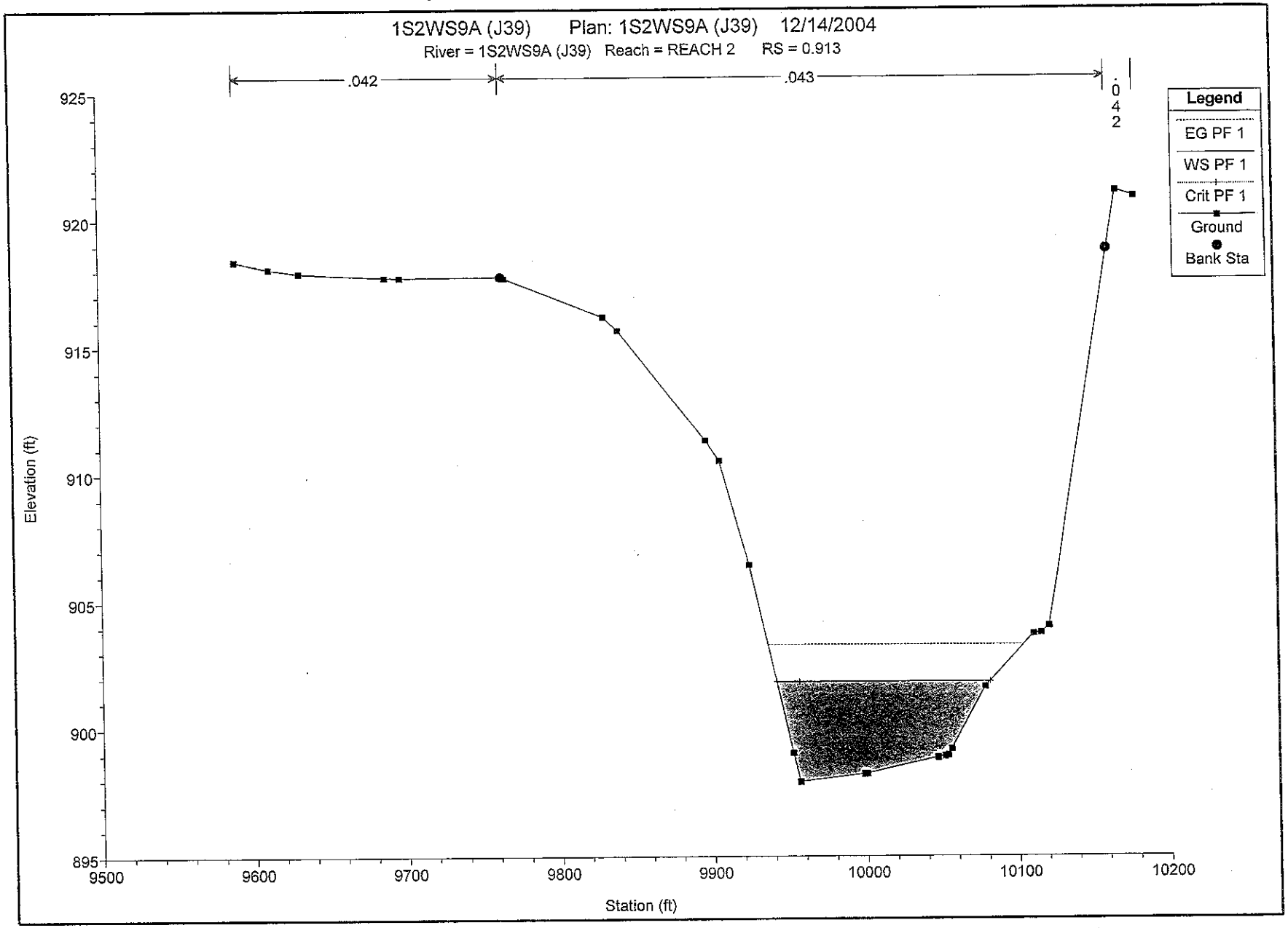
Change in Discharge based on Reach Length

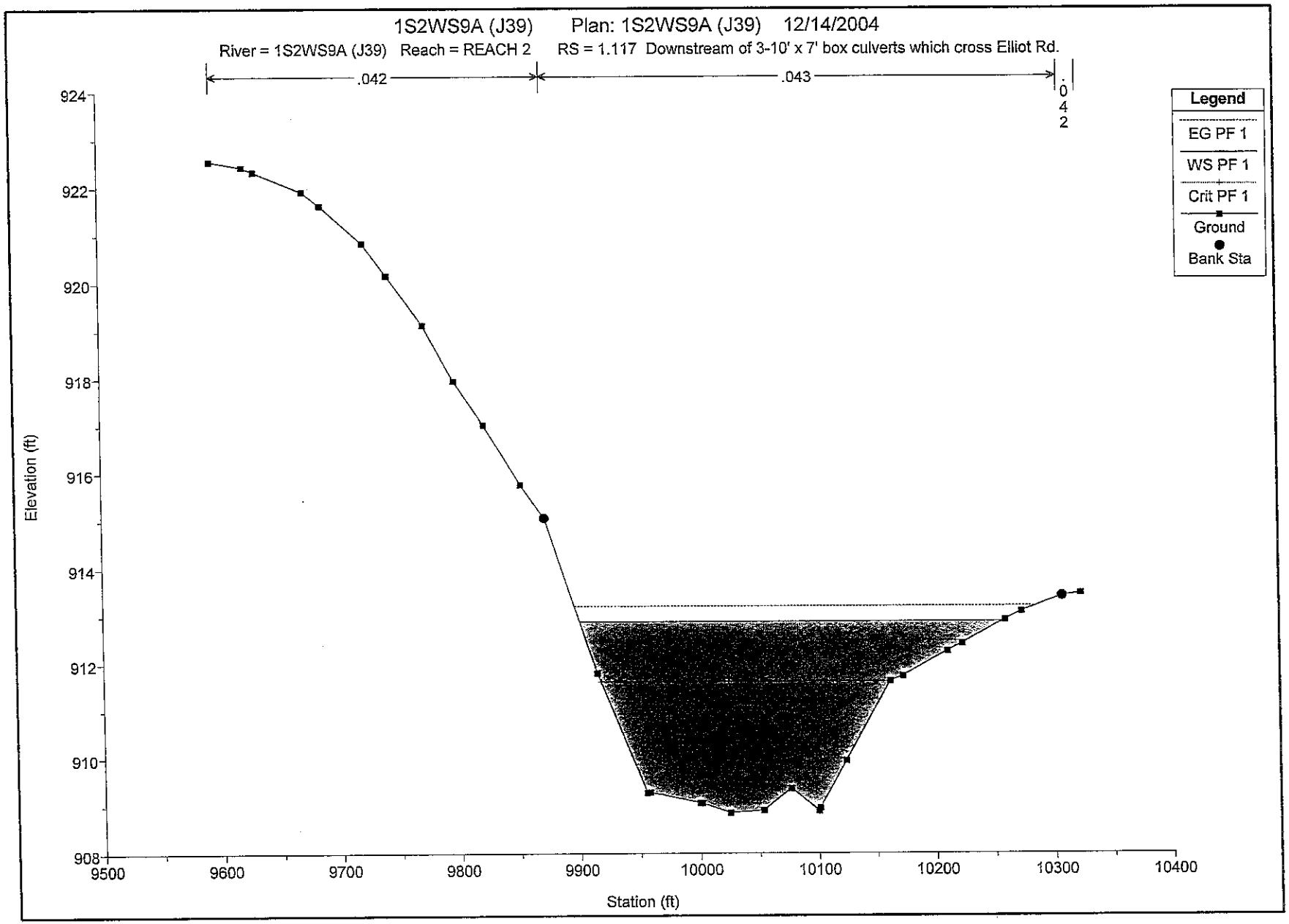
Wash ID: 1S2WS9A (J39)

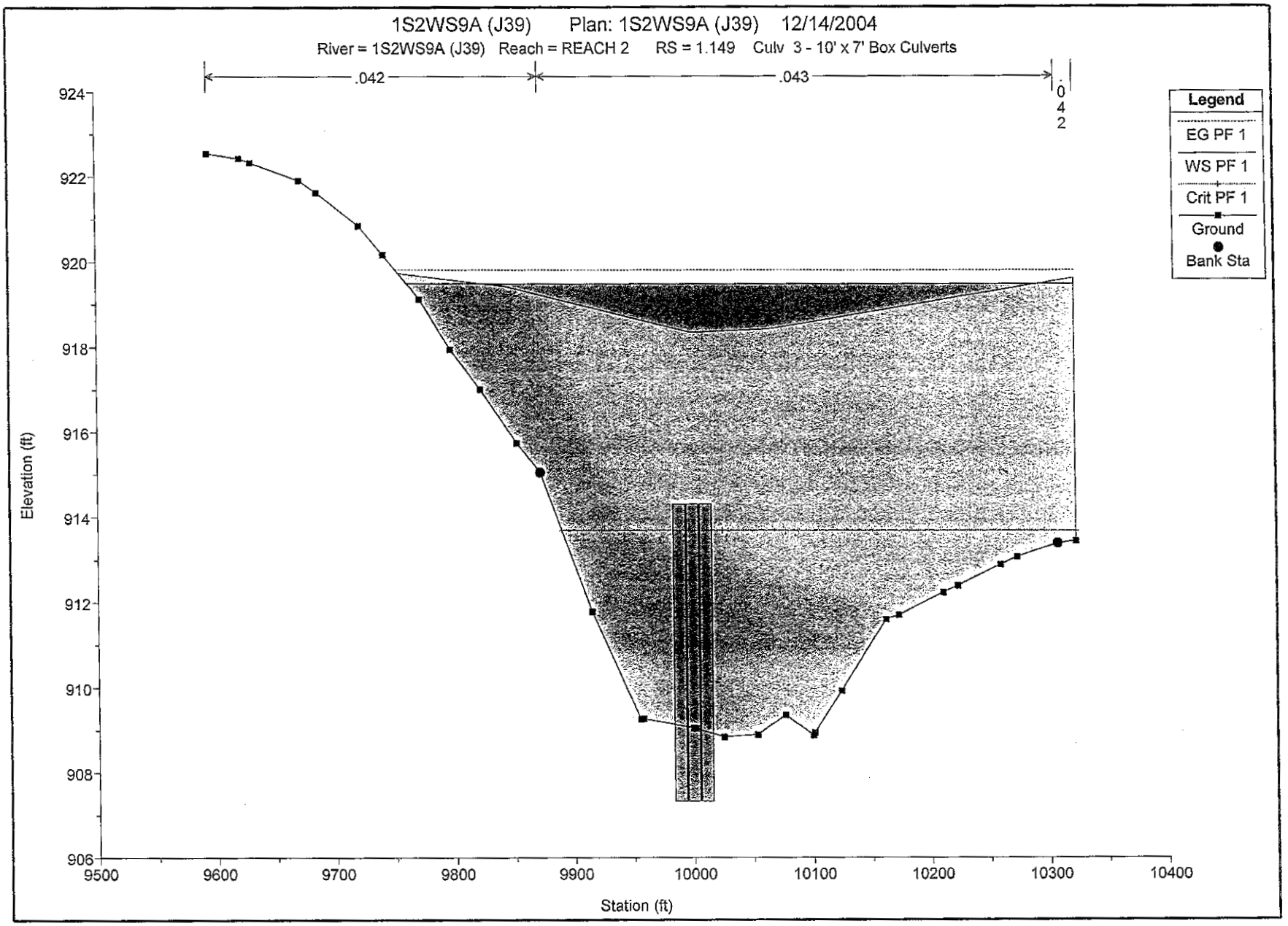
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
J13	6.679	345	350	300
J13	6.374	569	570	600
CPJ13	6.086	781	780	800
J17	5.752	1007	1010	1000
J17	5.455	1208	1210	1200
CPJ17	5.222	1365	1370	1400
J54	4.901	1301	1300	1300
J54	4.636	1249	1250	1200
J54	4.349	1191	1190	1200
CPJ54	4.055	1133	1130	1100
CPJ21	3.881	3496	3500	3500
J21	3.516	3783	3780	3800
J21	3.313	3943	3940	3900
J21	3.065	4138	4140	4100
CPJ22	2.751	4385	4390	4400
CPJ22	2.751	4385	4390	4400
J39	2.508	4332	4330	4300
J39	2.214	4267	4270	4300
J39	1.959	4212	4210	4200
J39	1.725	4160	4160	4200
J39	1.367	4082	4080	4100
J39	1.157	4036	4040	4000
J39	0.913	3982	3980	4000
CPJ39	0.747	3946	3950	3900

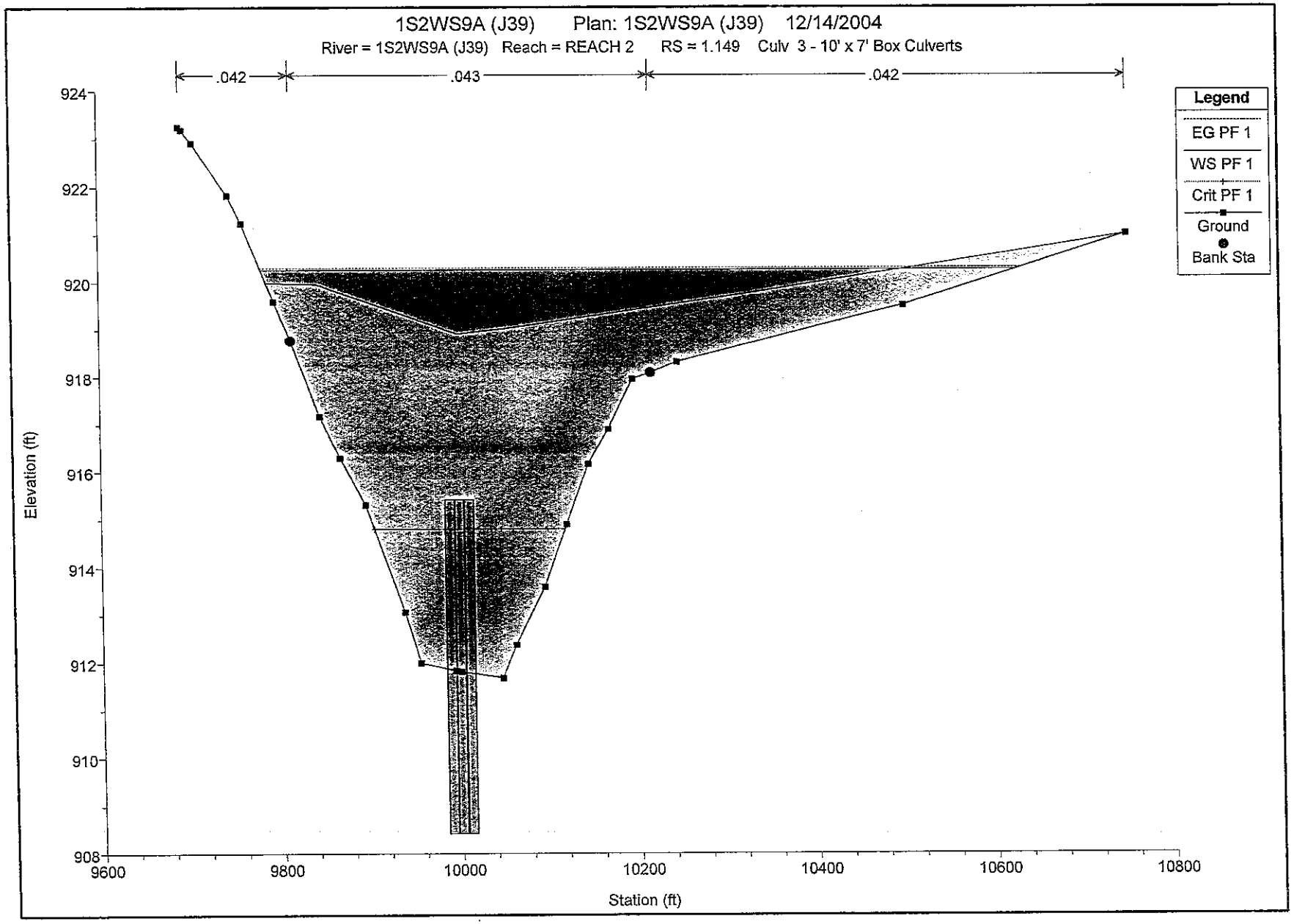
Initial discharge taken from CPJ09.

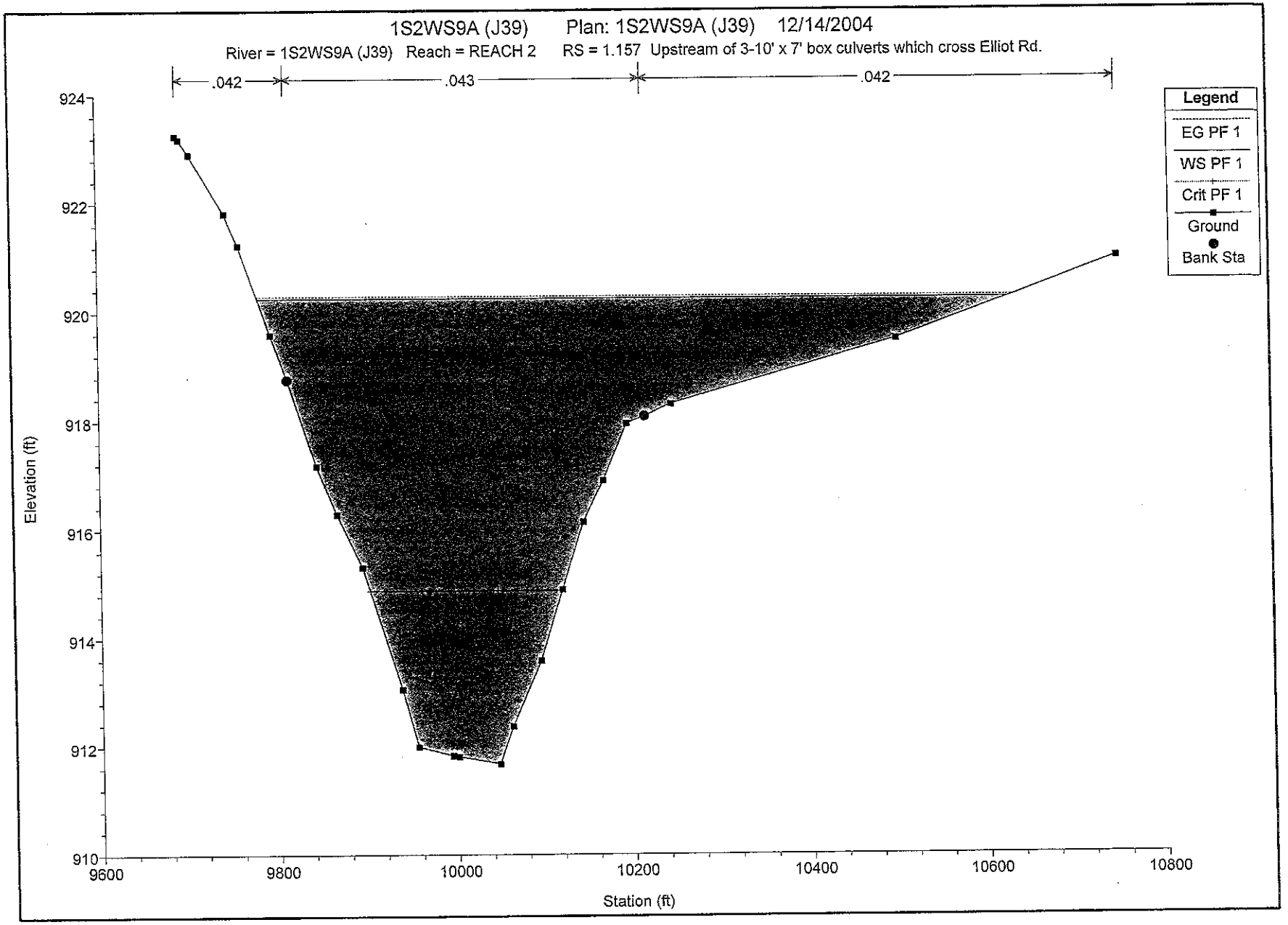

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 0.747
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
910
905
900
895
890
885
880
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

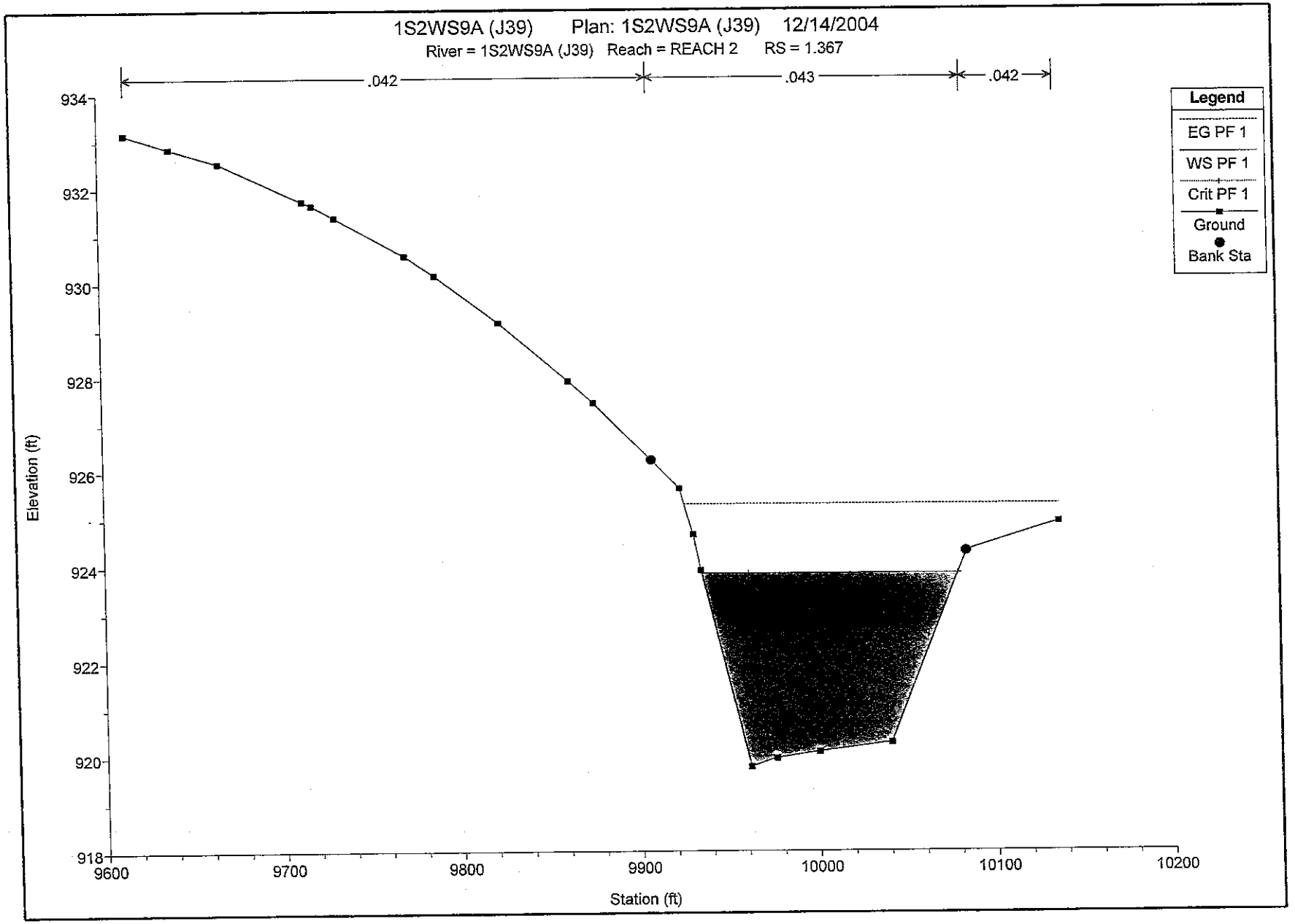

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 0.913
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
925
920
915
910
905
900
895
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

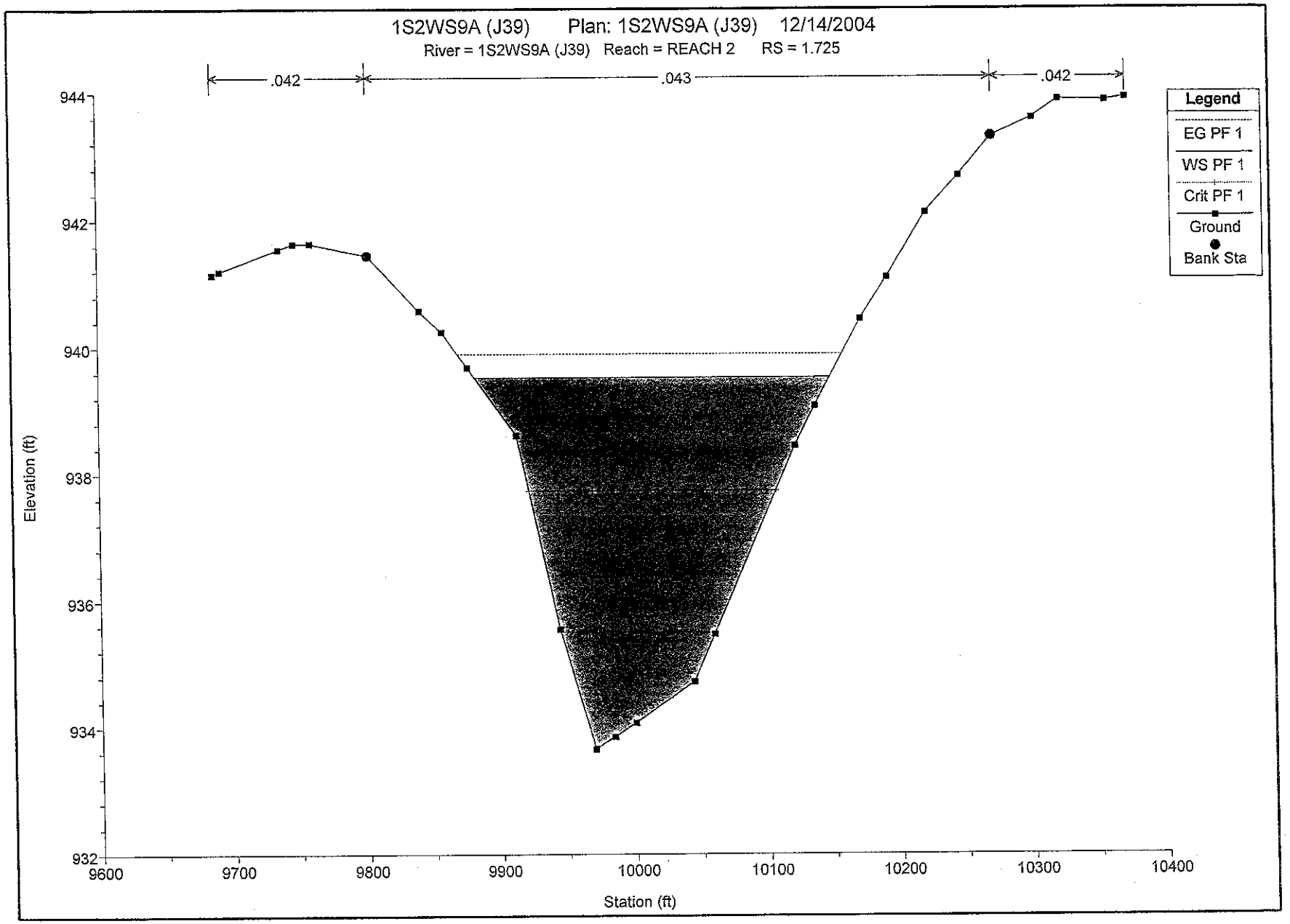

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.117 Downstream of 3-10' x 7' box culverts which cross Elliot Rd.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
924
922
920
918
916
914
912
910
908
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

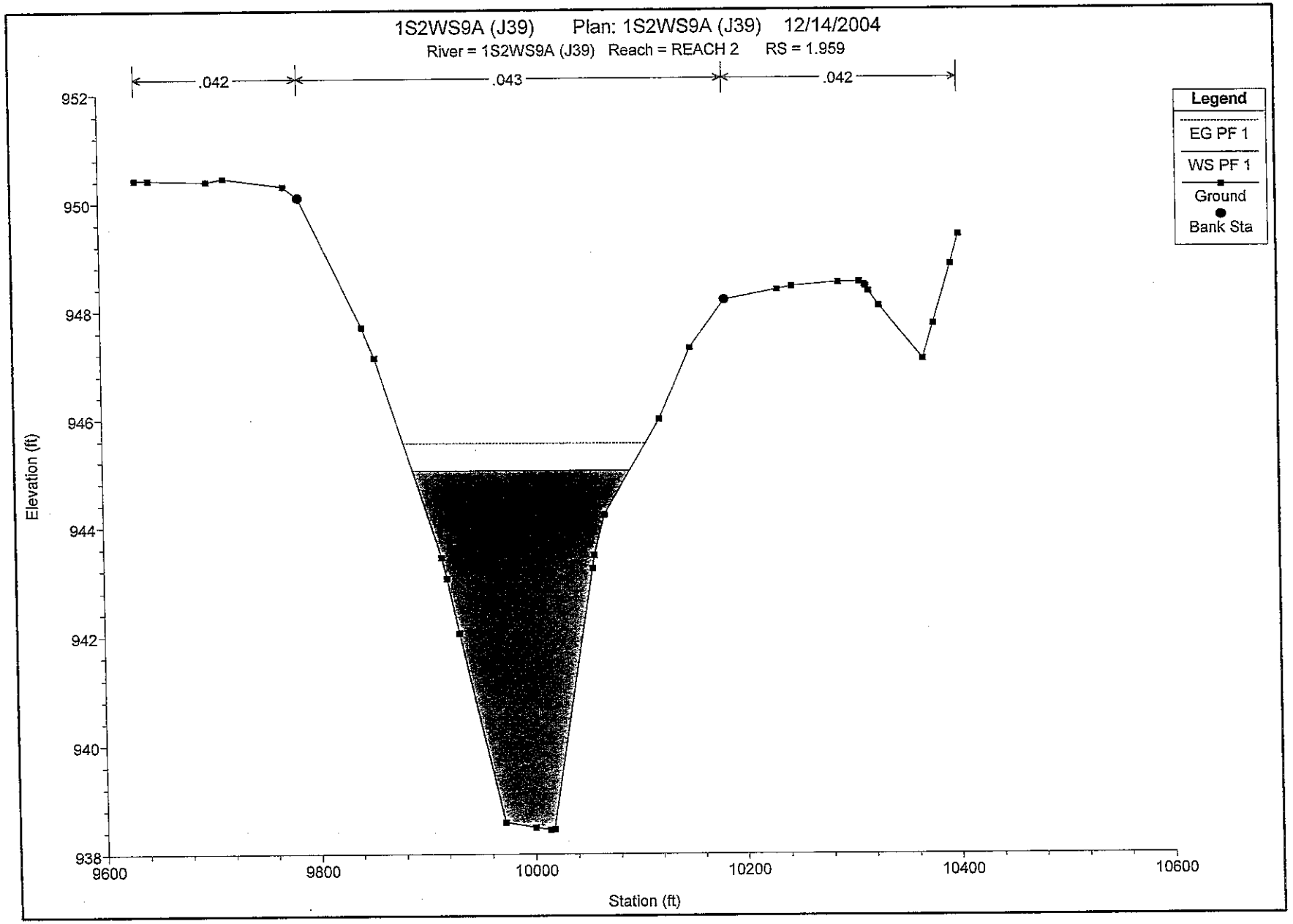

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.149 Culv 3 - 10' x 7' Box Culverts
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
924
922
920
918
916
914
912
910
908
906
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

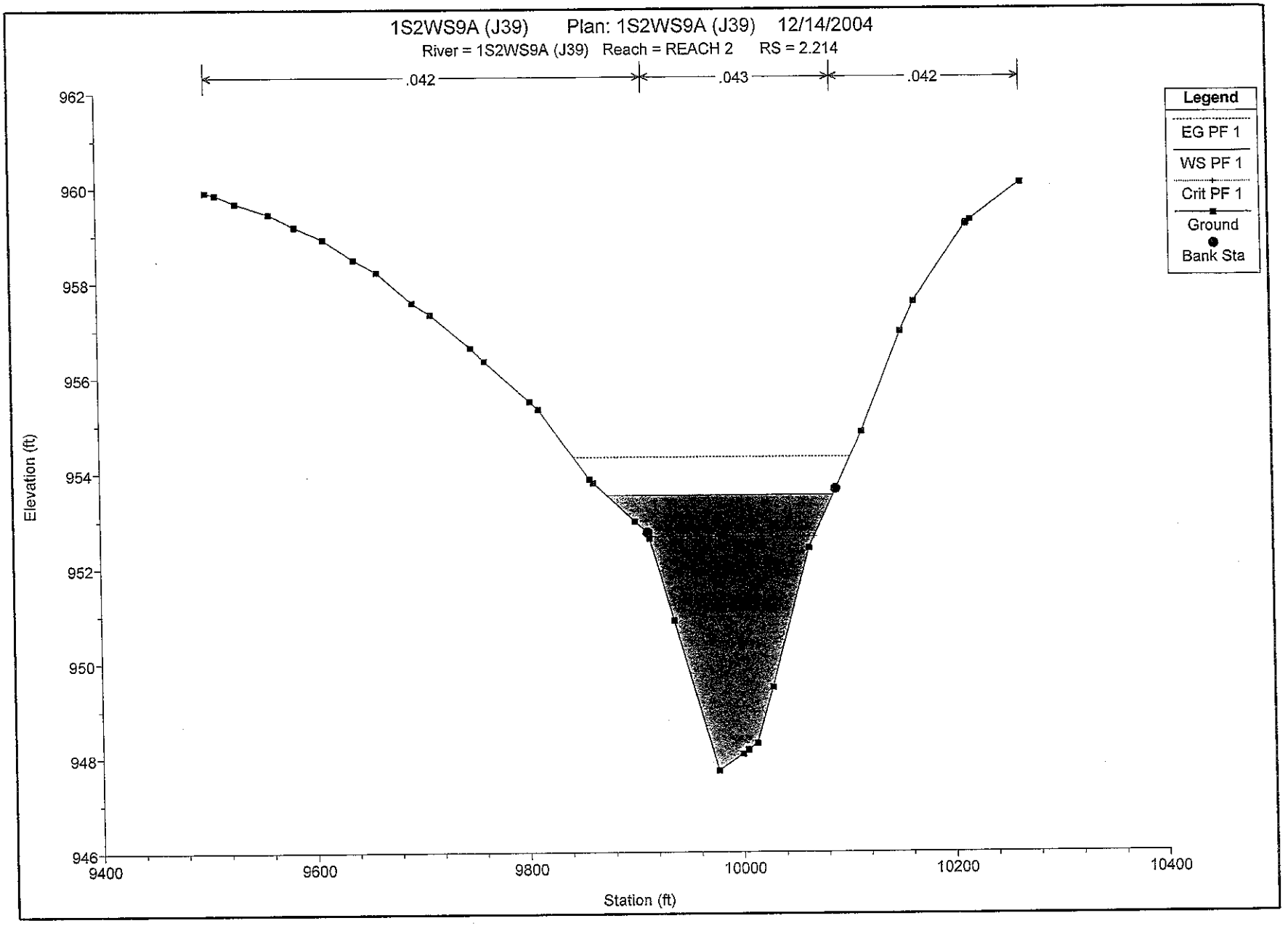

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.149 Culv 3 - 10' x 7' Box Culverts
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
924
922
920
918
916
914
912
910
908
9600
9800
10000
10200
10400
10600
10800
Station (ft)

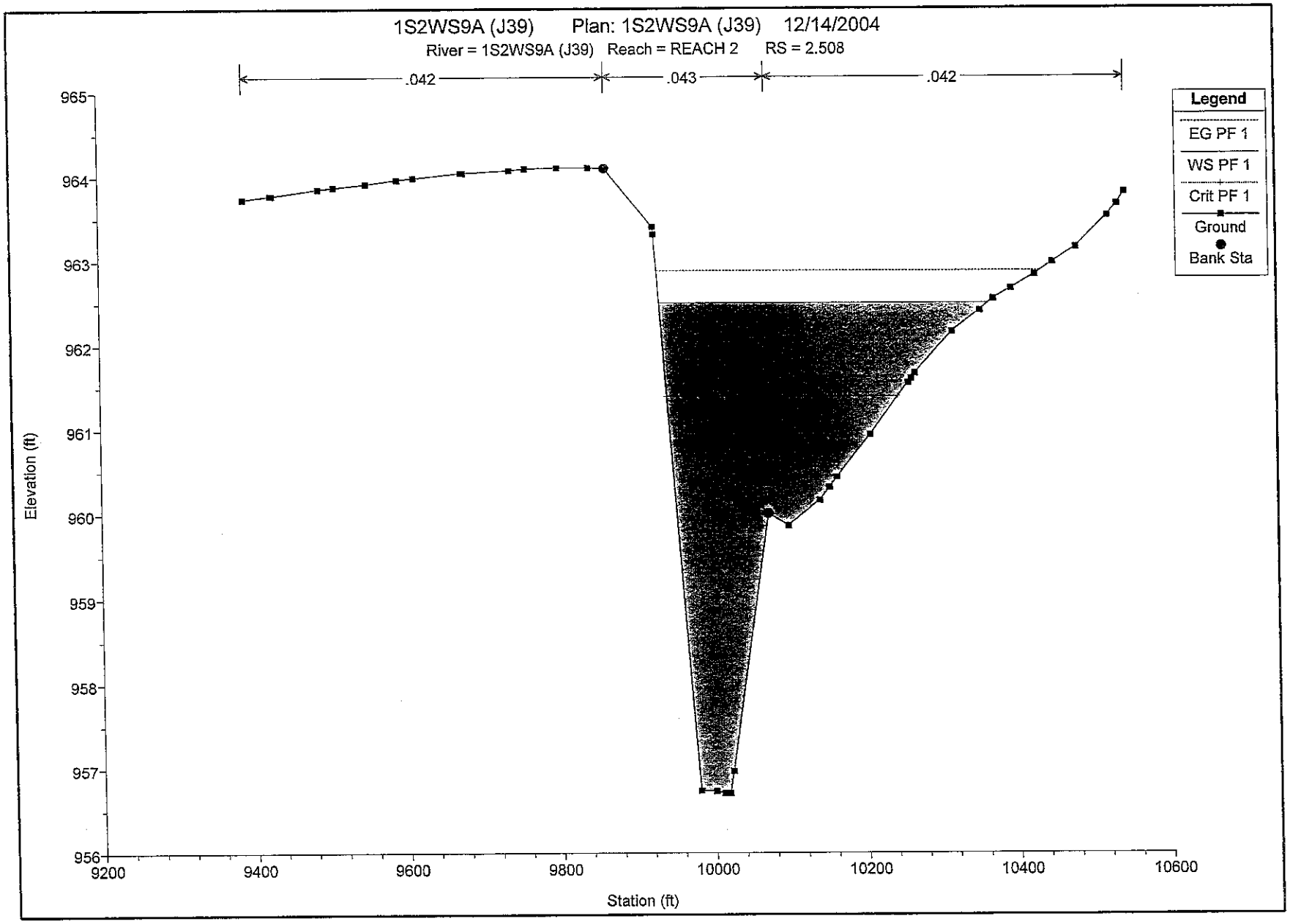

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.157 Upstream of 3-10' x 7' box culverts which cross Elliot Rd.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
924
922
920
918
916
914
912
910
9600
9800
10000
10200
10400
10600
10800
Station (ft)

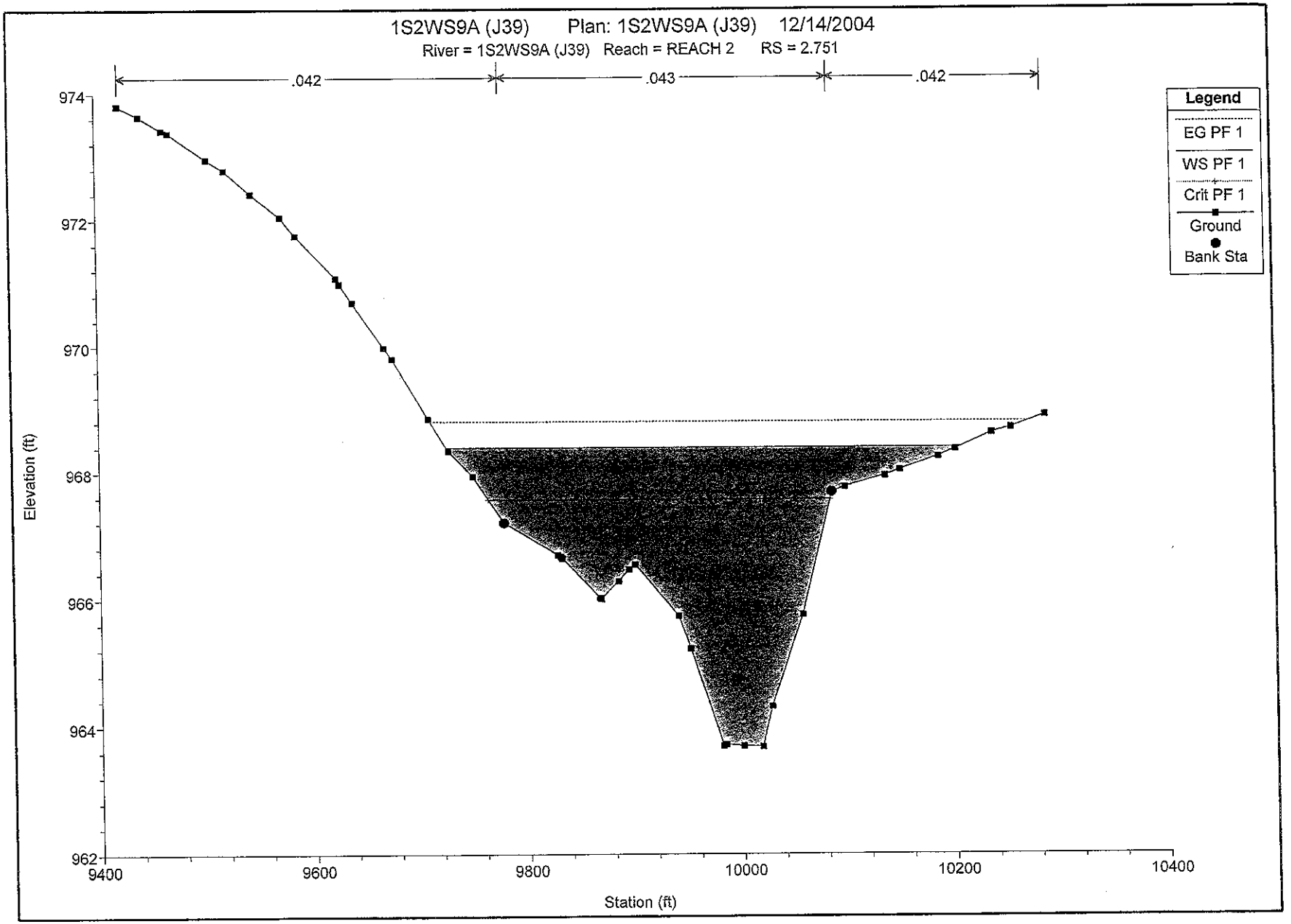

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.367
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
934
932
930
928
926
924
922
920
918
9600
9700
9800
9900
10000
10100
10200
Station (ft)

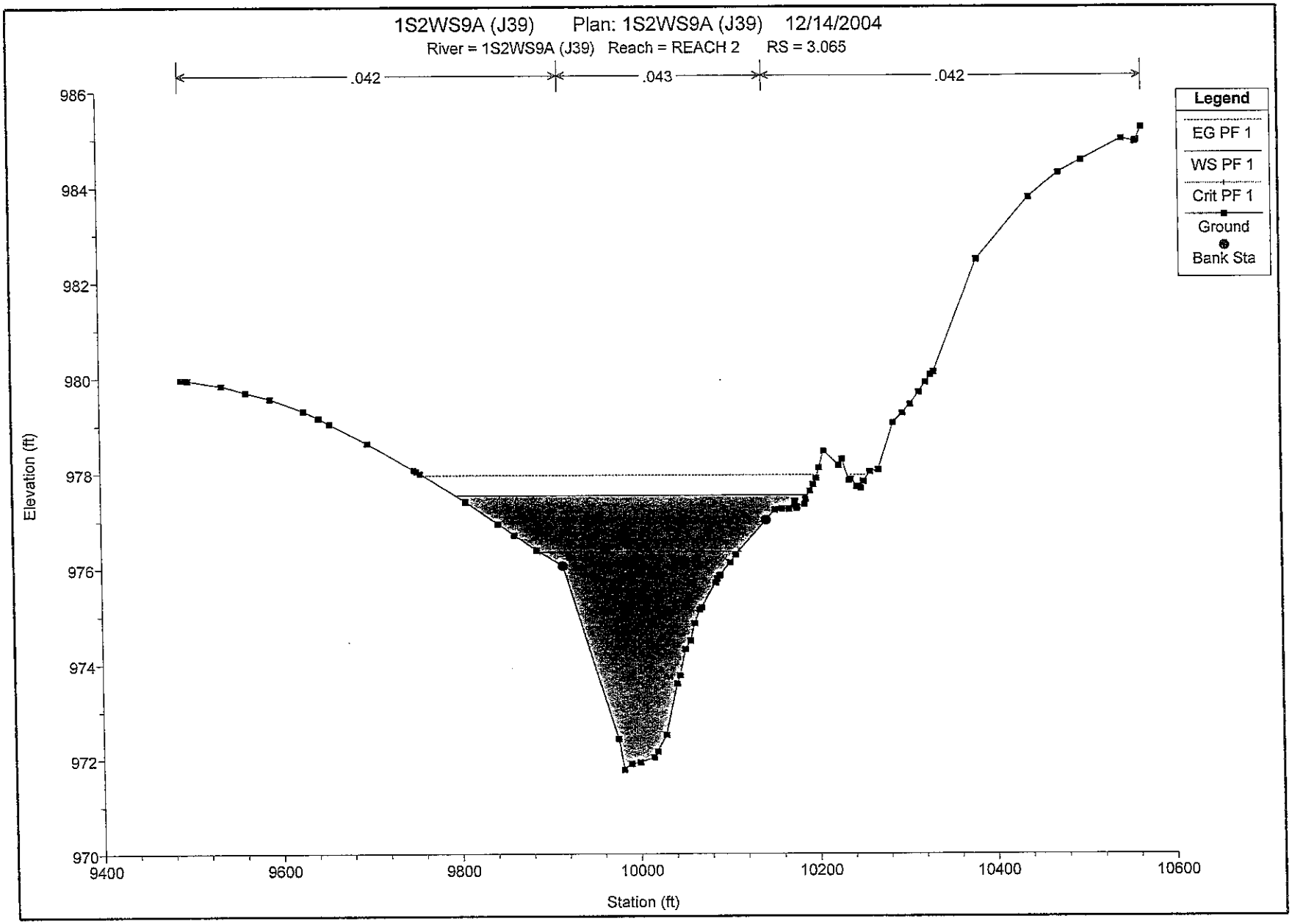

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.725
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
944
942
940
938
936
934
932
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

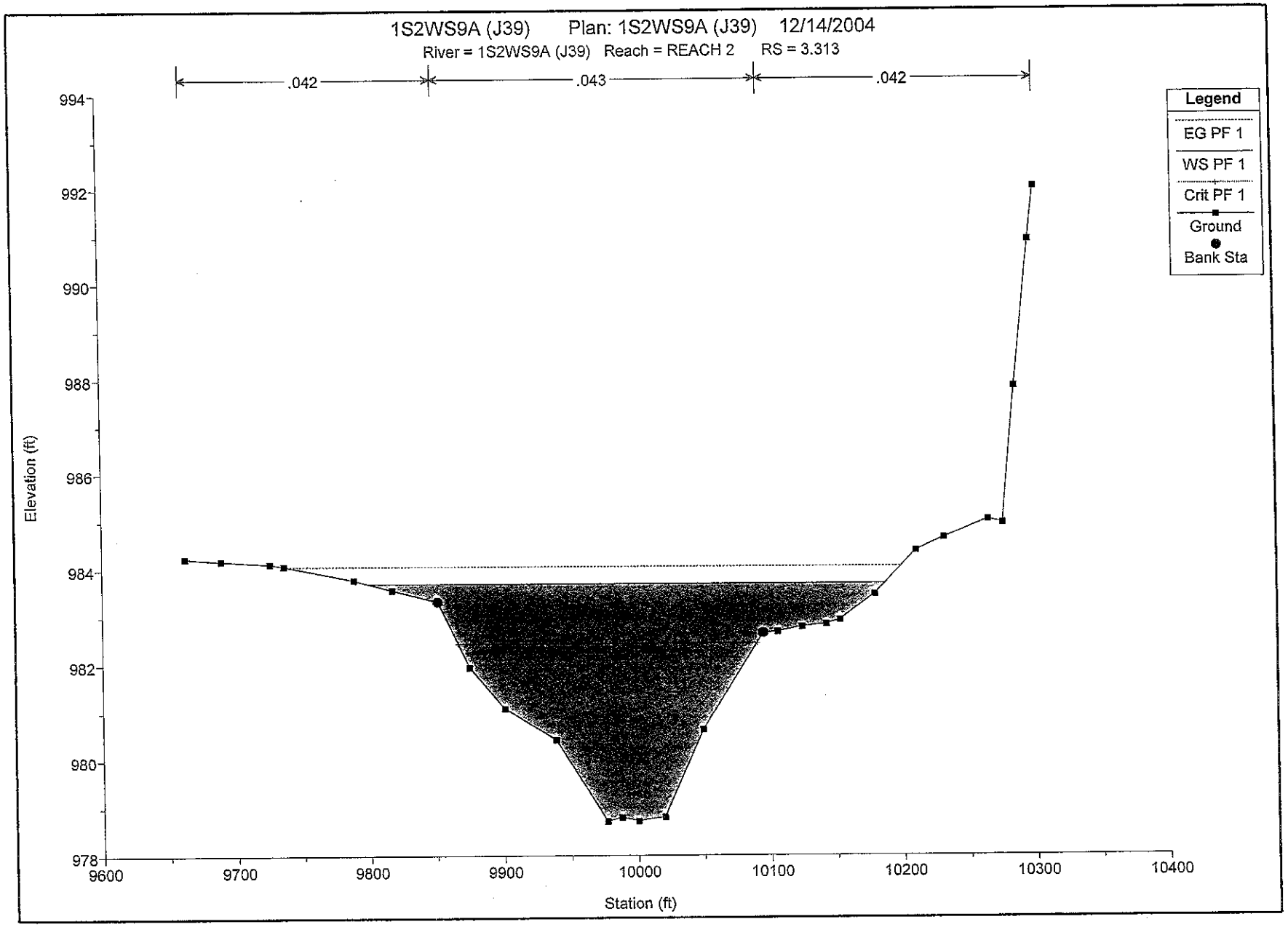

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 1.959
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
952
950
948
946
944
942
940
938
9600
9800
10000
10200
10400
10600
Station (ft)

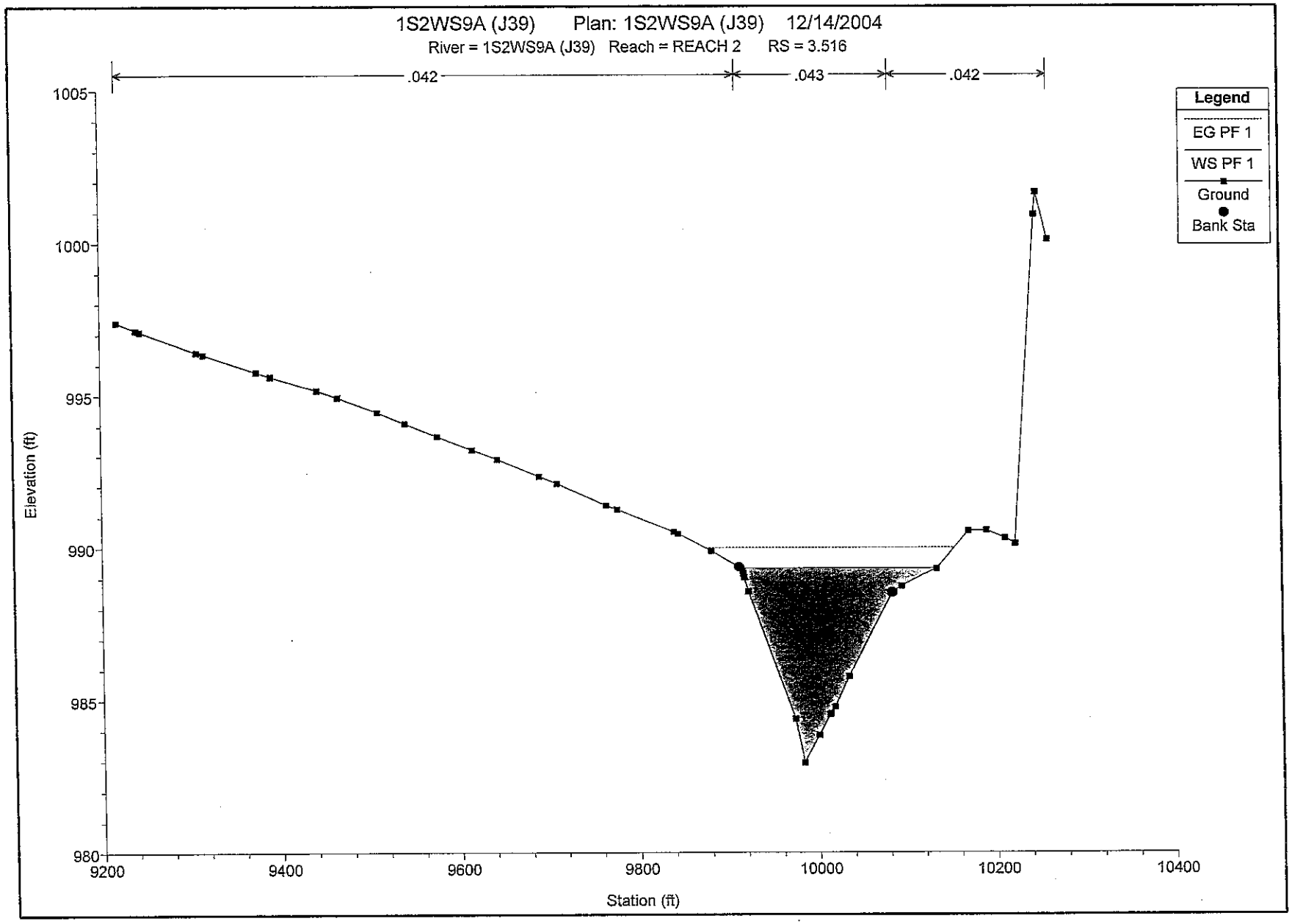

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 2.214
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
962
960
958
956
954
952
950
948
946
9400
9600
9800
10000
10200
10400
Station (ft)

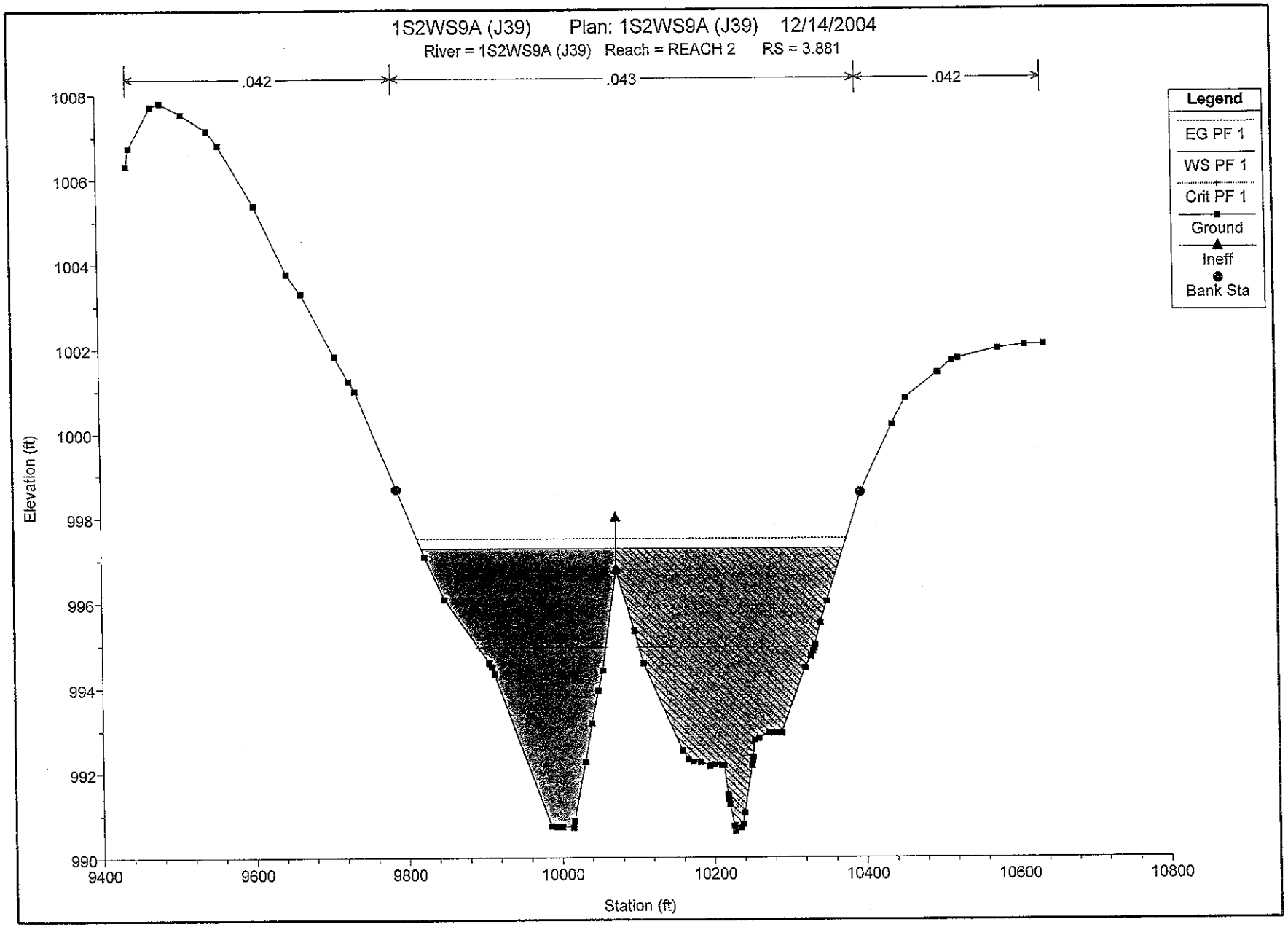

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 2.508
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
965
964
963
962
961
960
959
958
957
956
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

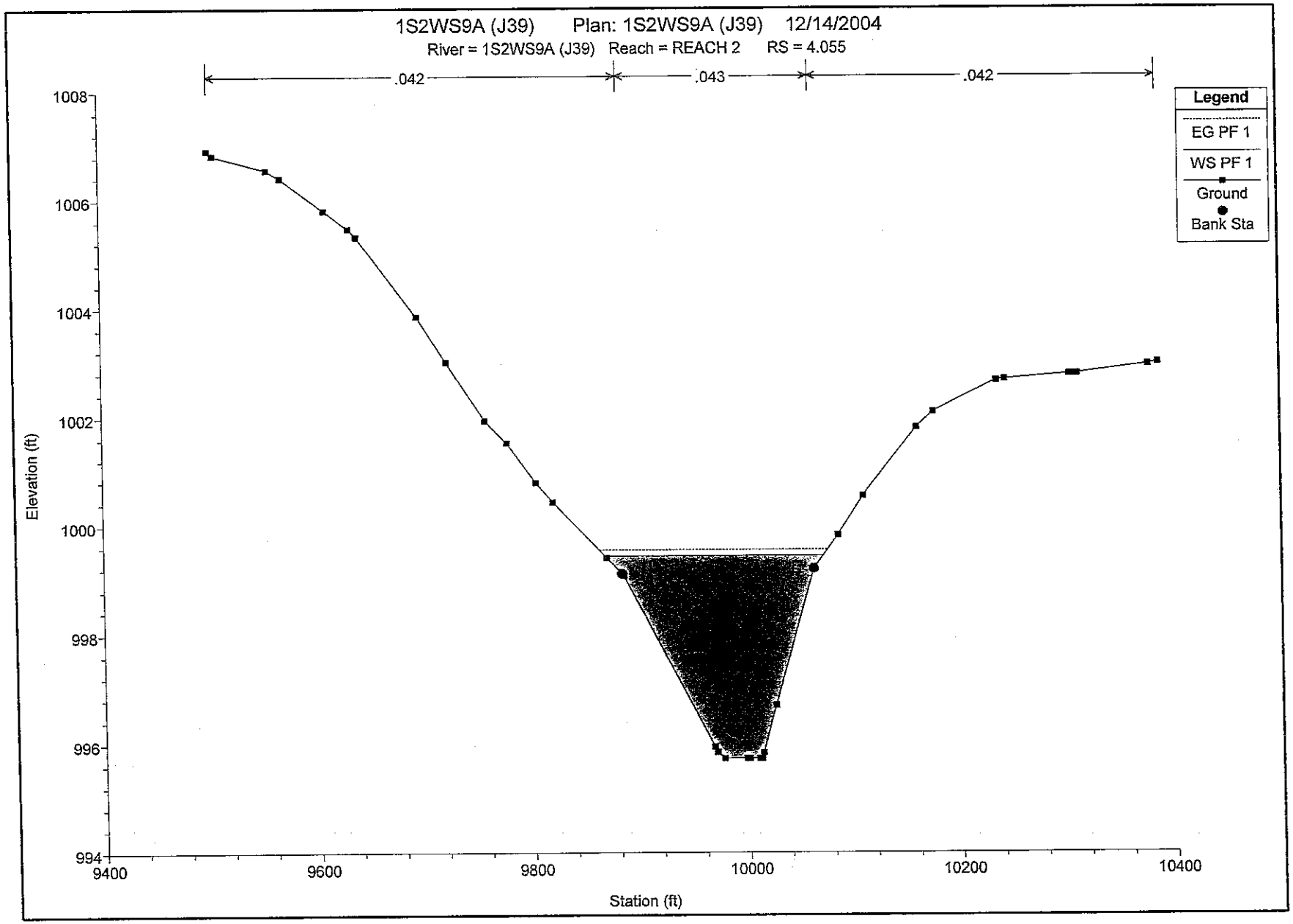

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 2.751
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
974
972
970
968
966
964
962
9400
9600
9800
10000
10200
10400
Station (ft)

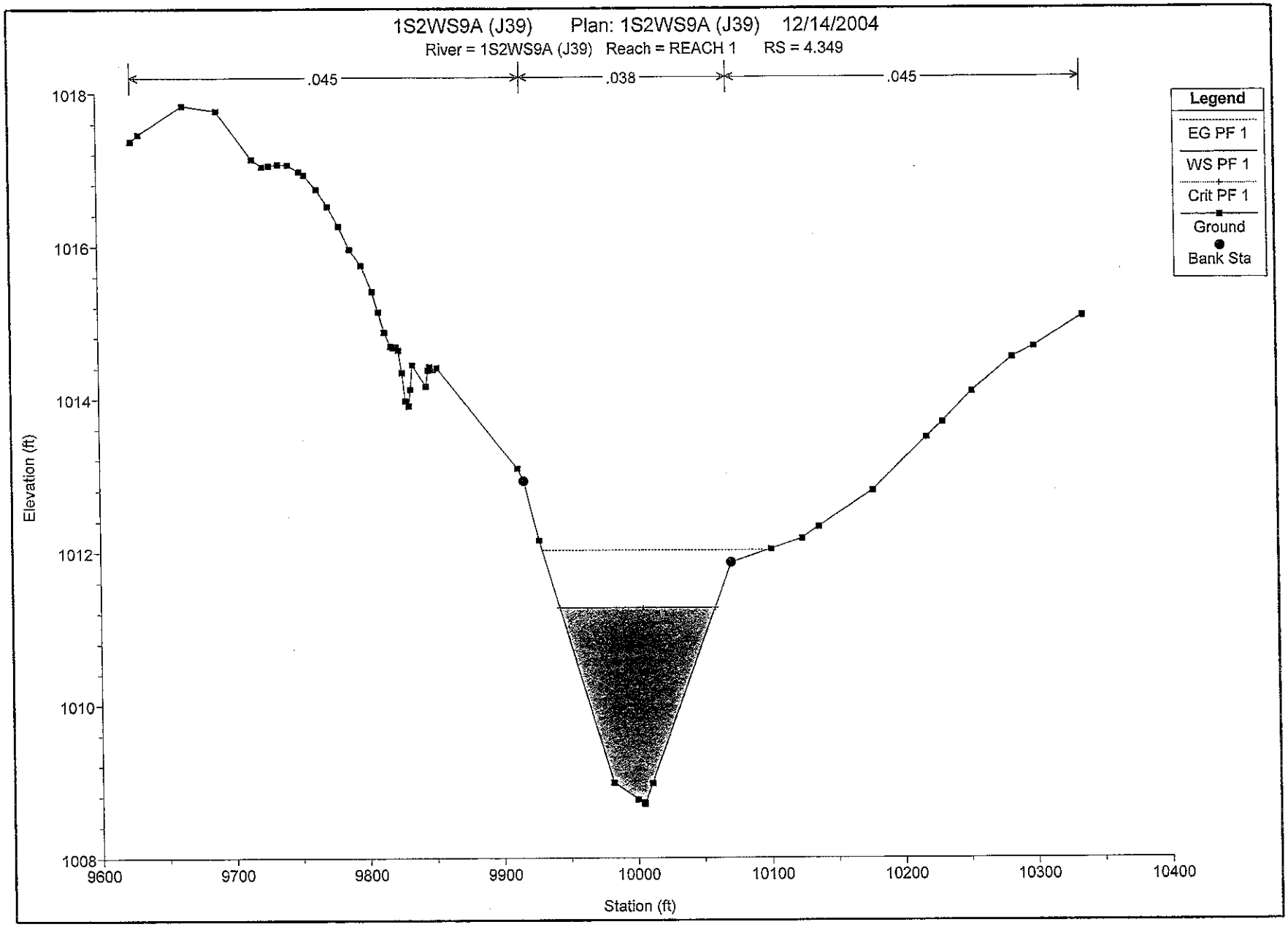

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 3.065
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
986
984
982
980
978
976
974
972
970
9400
9600
9800
10000
10200
10400
10600
Station (ft)

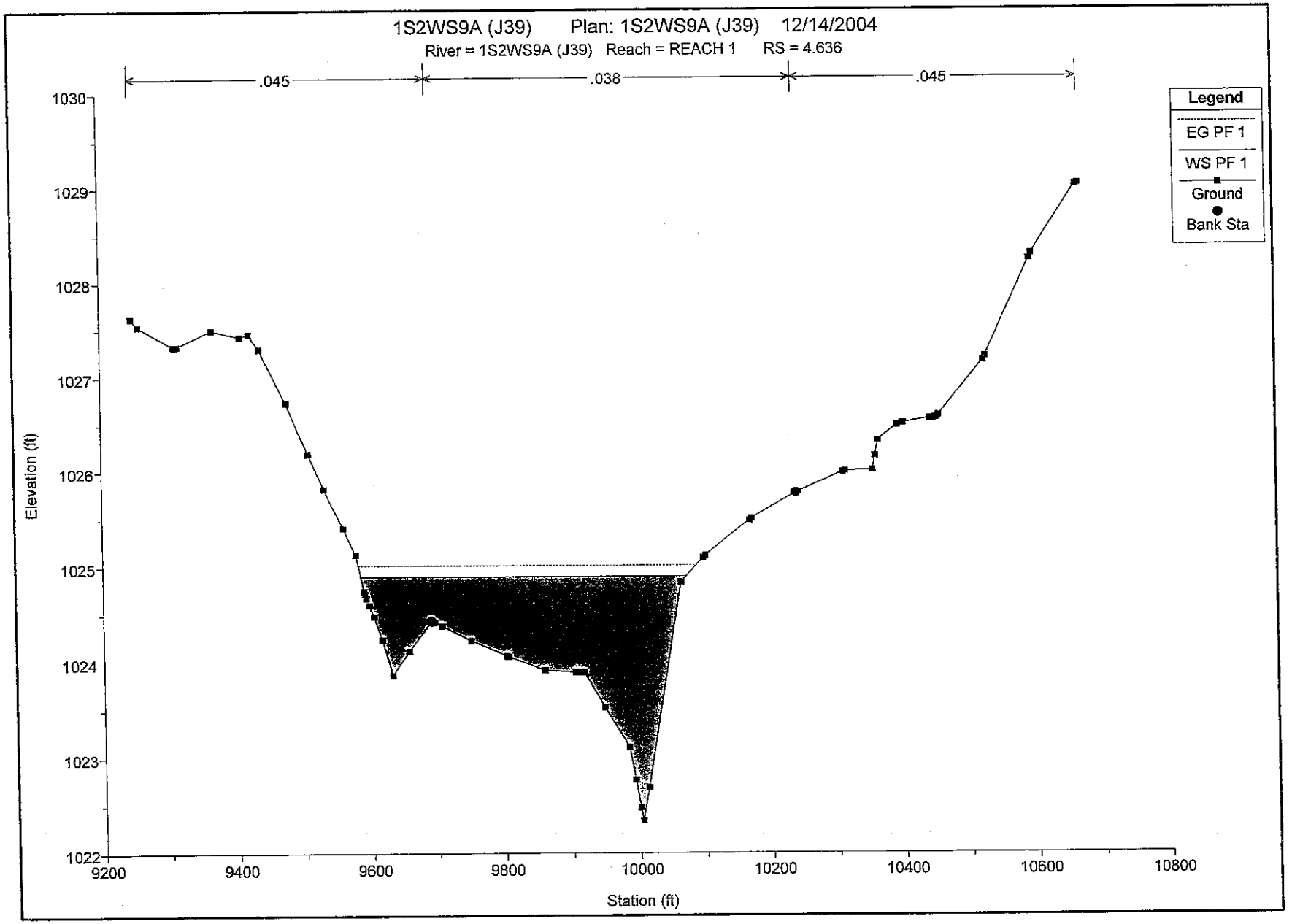

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 3.313
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
994
992
990
988
986
984
982
980
978
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

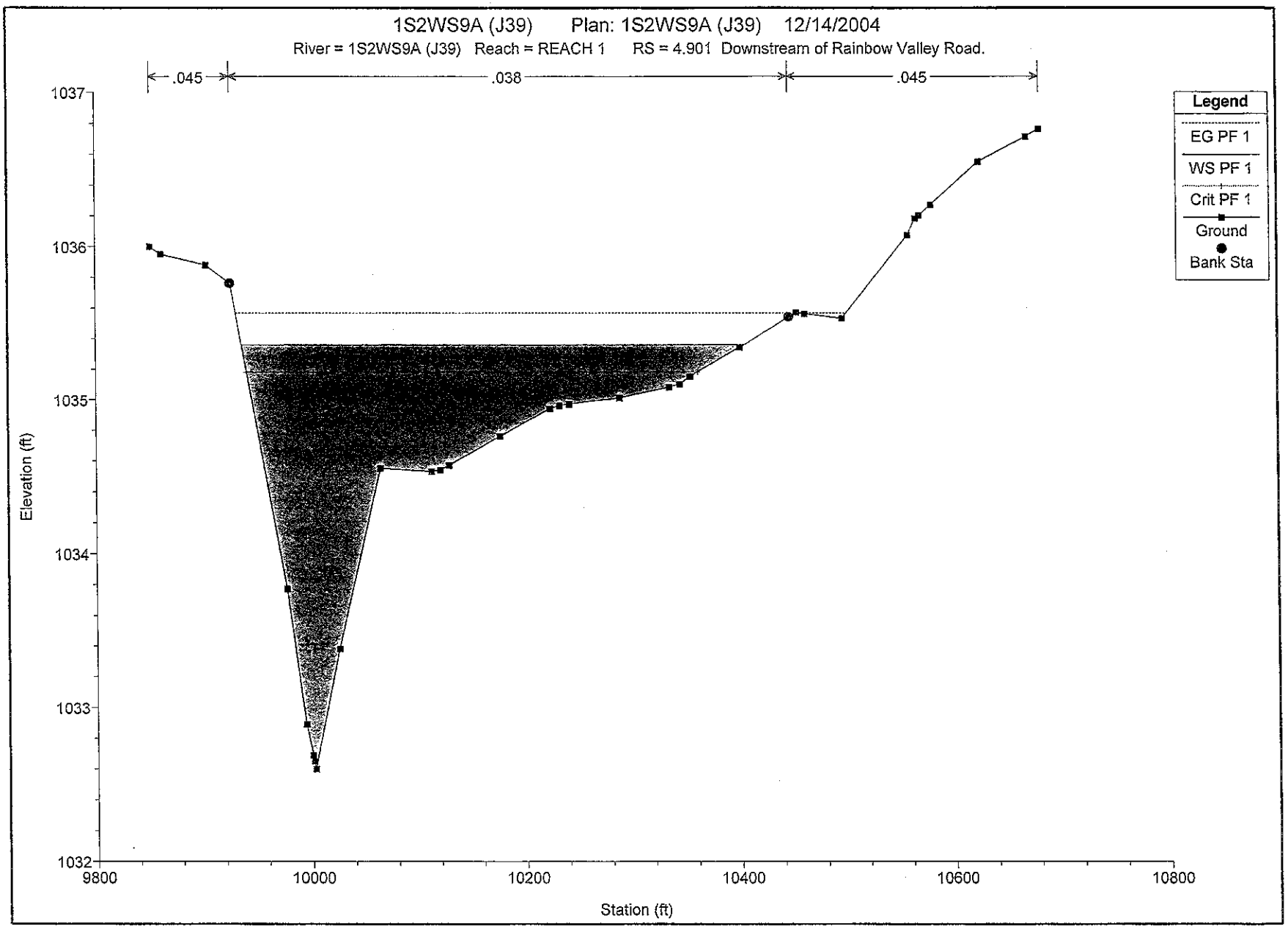

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 3.516
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1005
1000
995
990
985
980
9200
9400
9600
9800
10000
10200
10400
Station (ft)

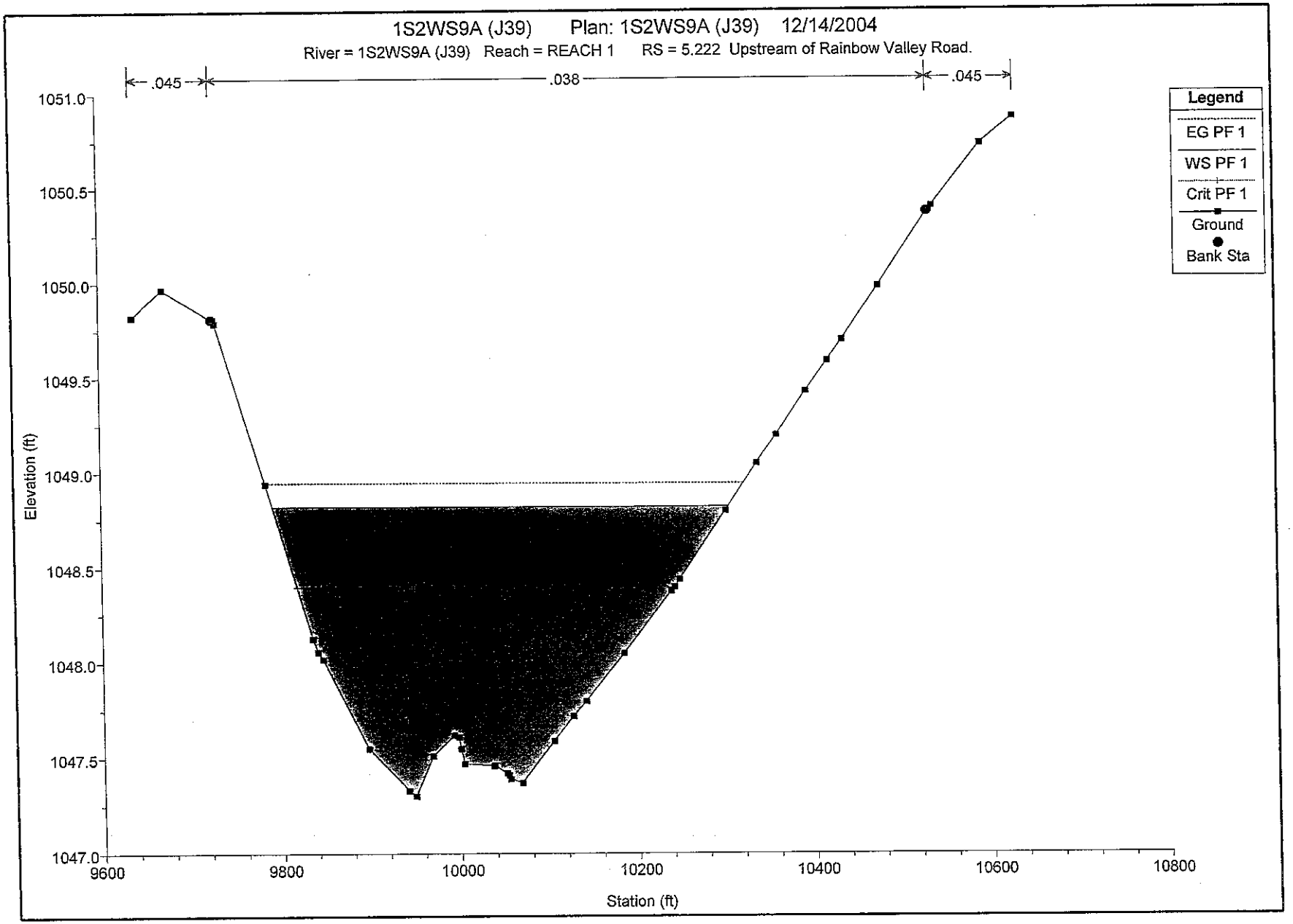

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 3.881
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1008
1006
1004
1002
1000
998
996
994
992
990
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

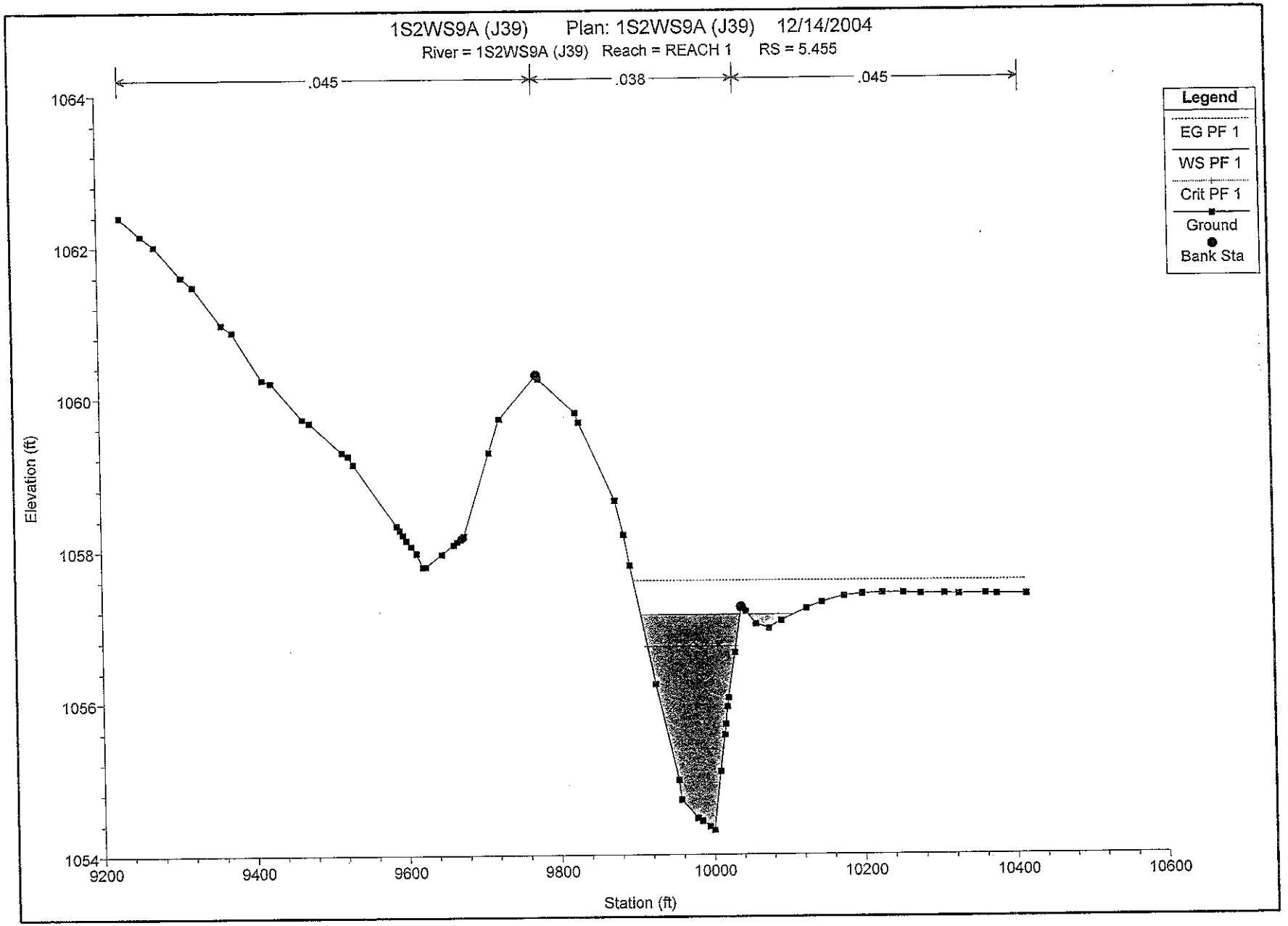

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 2 RS = 4.055
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1008
1006
1004
1002
1000
998
996
994
9400
9600
9800
10000
10200
10400
Station (ft)

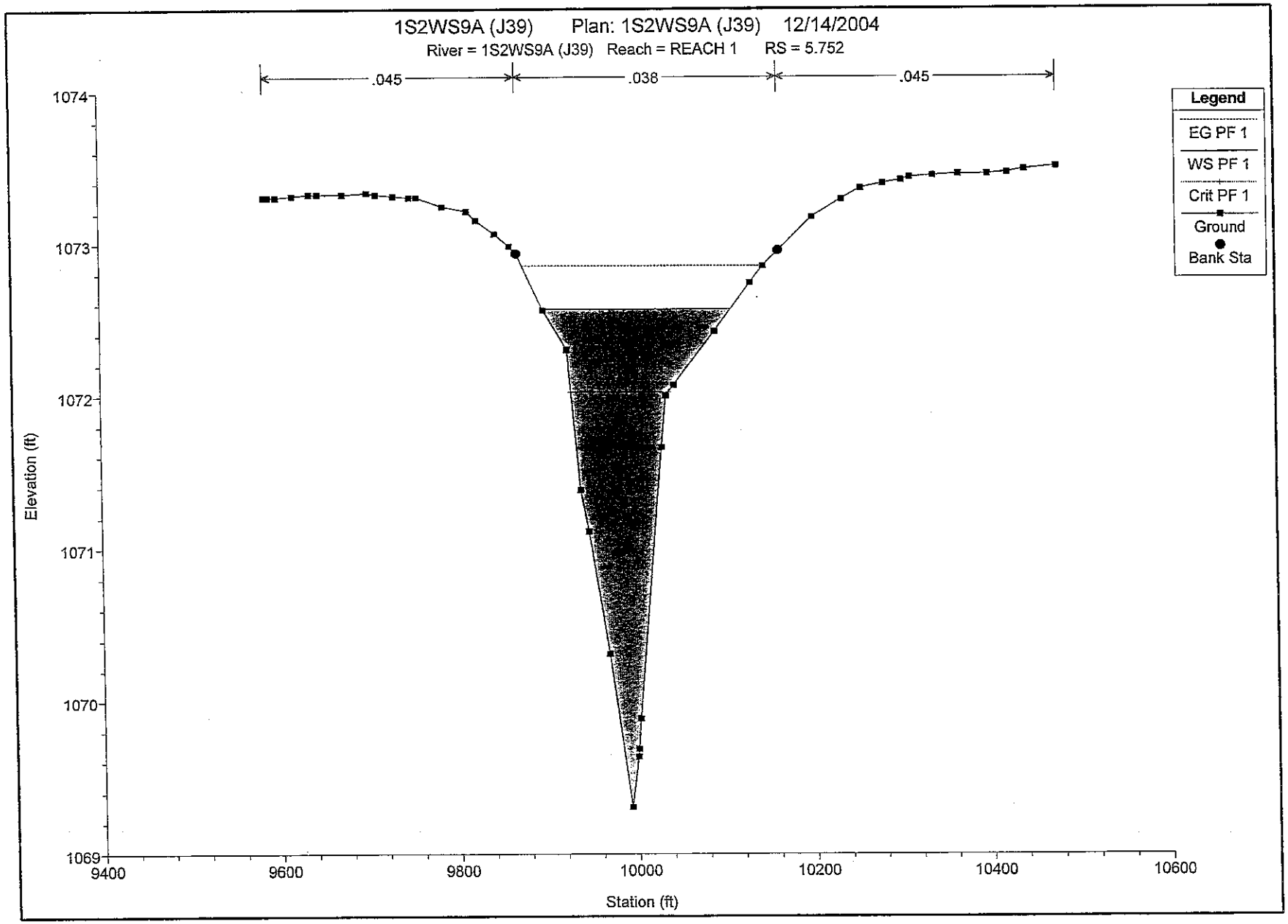

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 4.349
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1018
1016
1014
1012
1010
1008
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

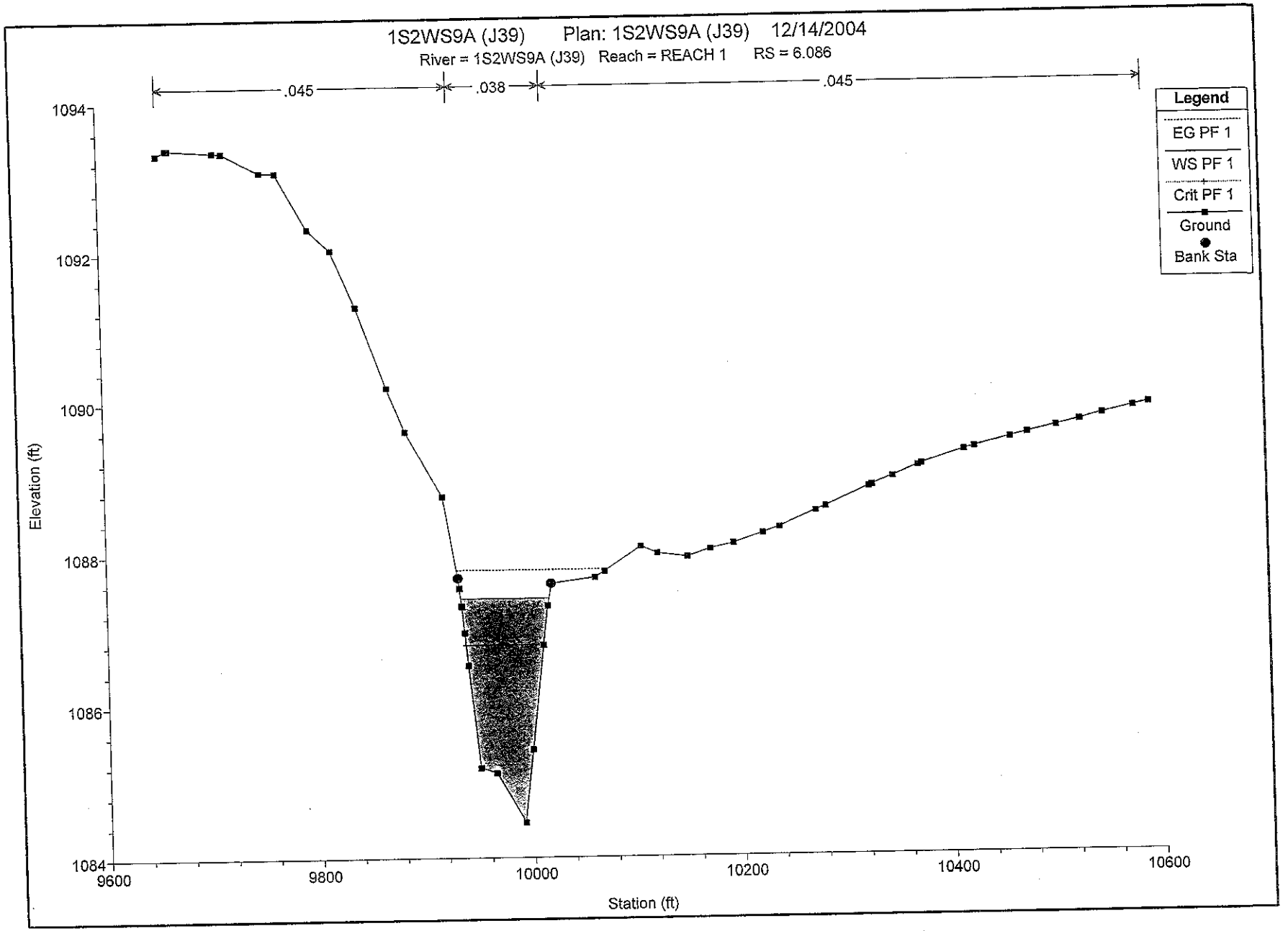

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 4.636
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1030
1029
1028
1027
1026
1025
1024
1023
1022
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

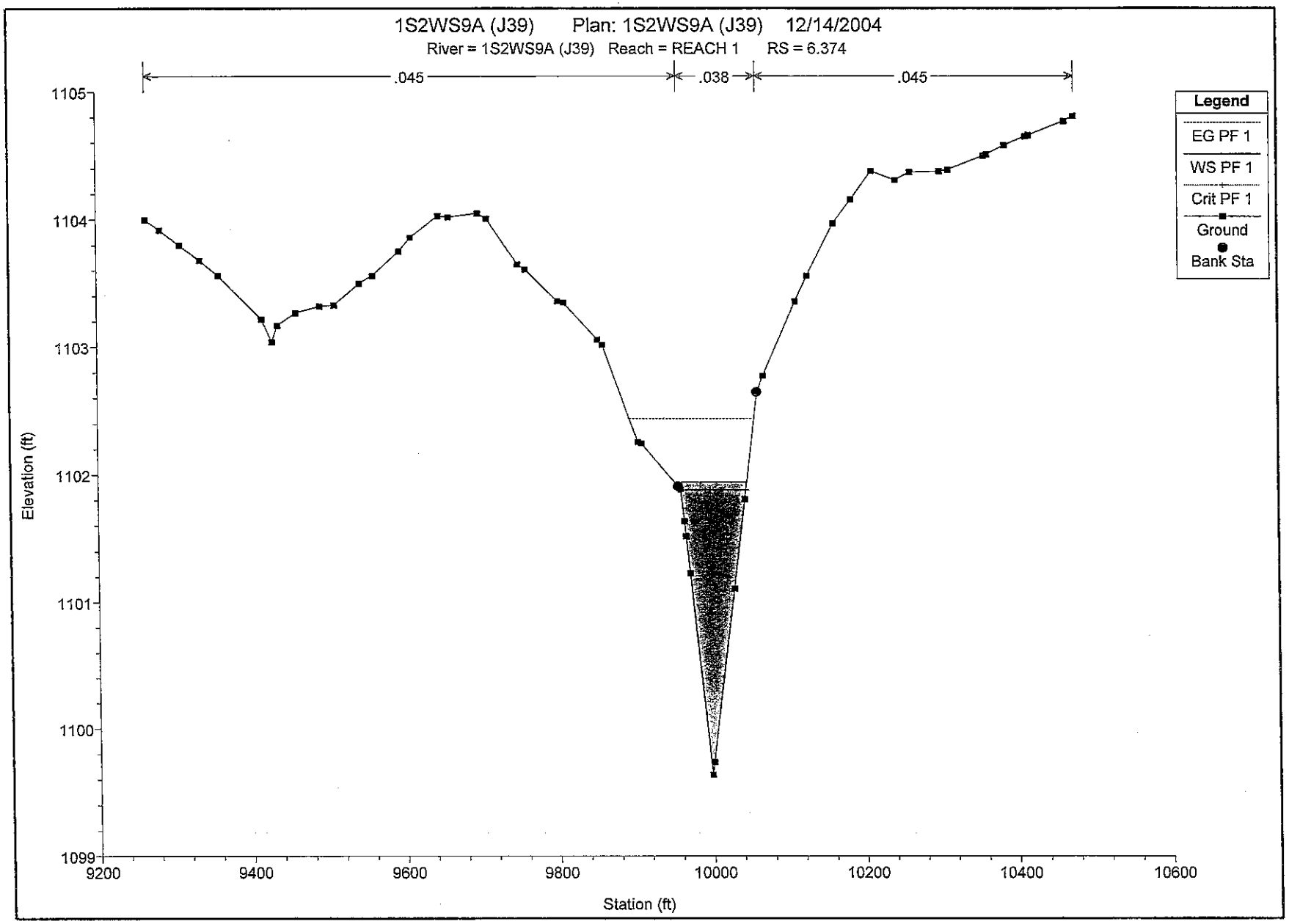

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 4.901 Downstream of Rainbow Valley Road.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1037
1036
1035
1034
1033
1032
9800
10000
10200
10400
10600
10800
Station (ft)

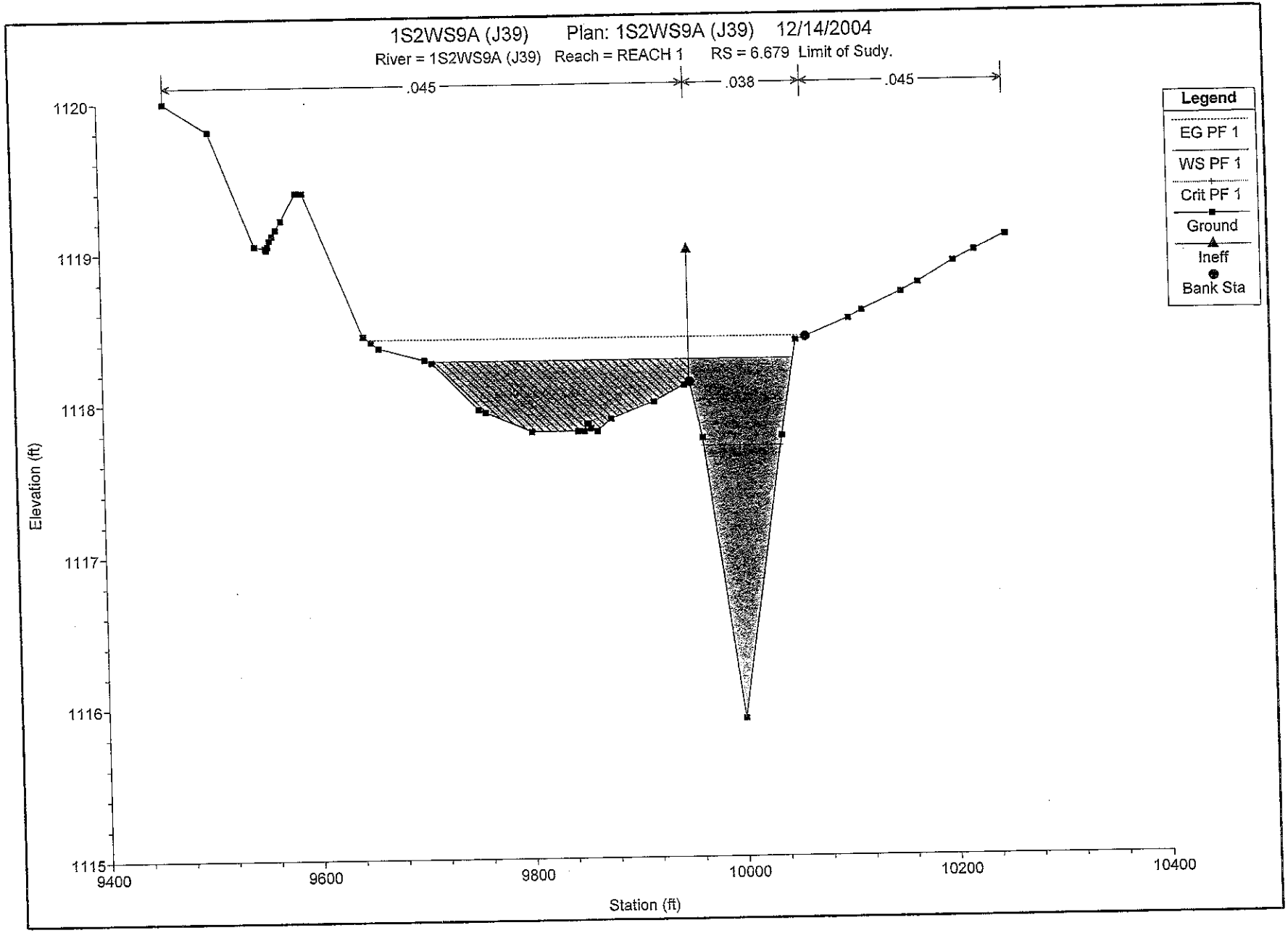

1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 5.222 Upstream of Rainbow Valley Road.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1051.0
1050.5
1050.0
1049.5
1049.0
1048.5
1048.0
1047.5
1047.0
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 5.455
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1064
1062
1060
1058
1056
1054
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 5.752
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1074
1073
1072
1071
1070
1069
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 6.086
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1094
1092
1090
1088
1086
1084
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 6.374
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1105
1104
1103
1102
1101
1100
1099
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS9A (J39) Reach = REACH 1 RS = 6.679 Limit of Sudy.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1120
1119
1118
1117
1116
1115
9400
9600
9800
10000
10200
10400
Station (ft)

MODEL: 1S2WS9A (J39)

REACH: 1S2WS27 (J16)

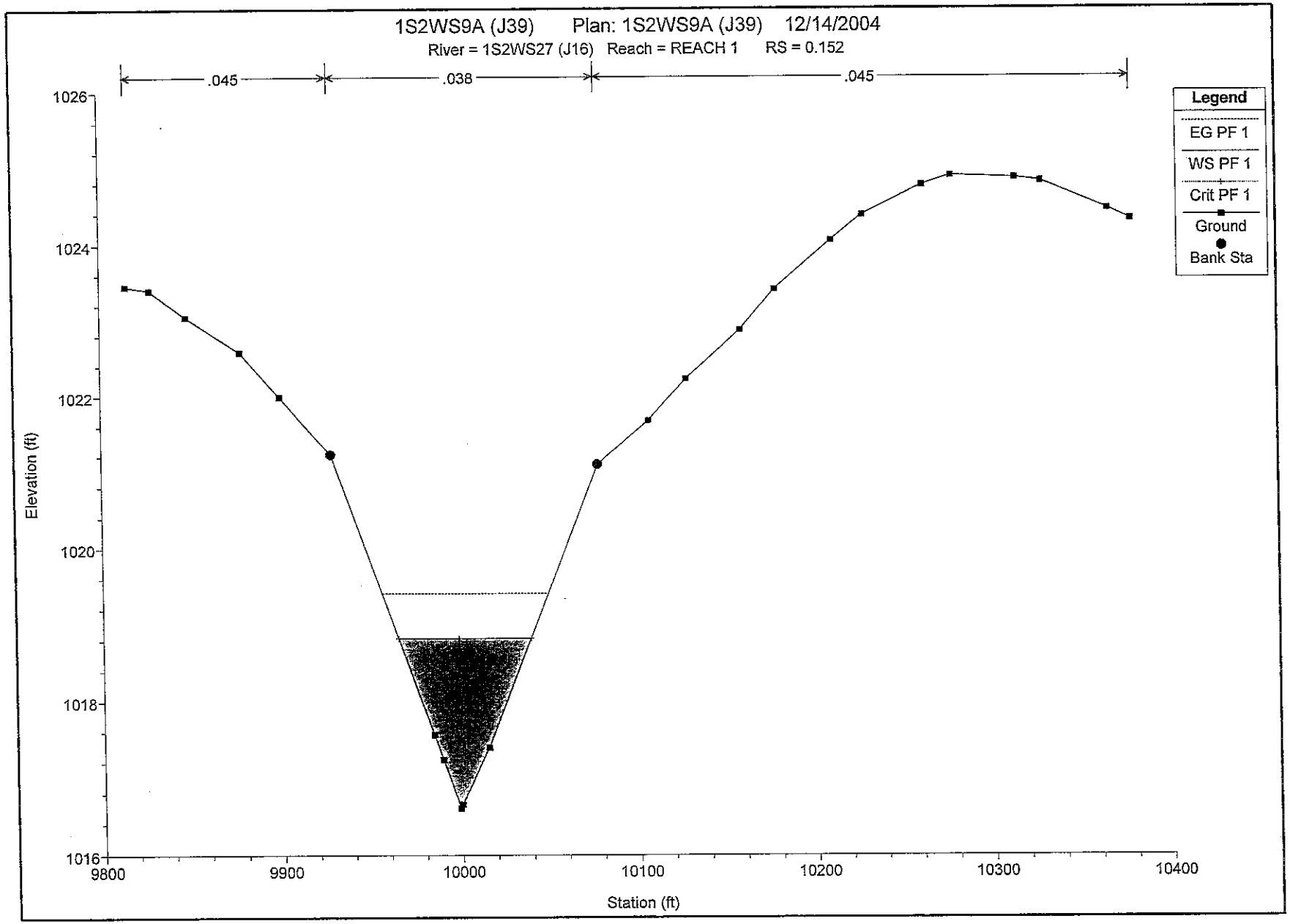
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

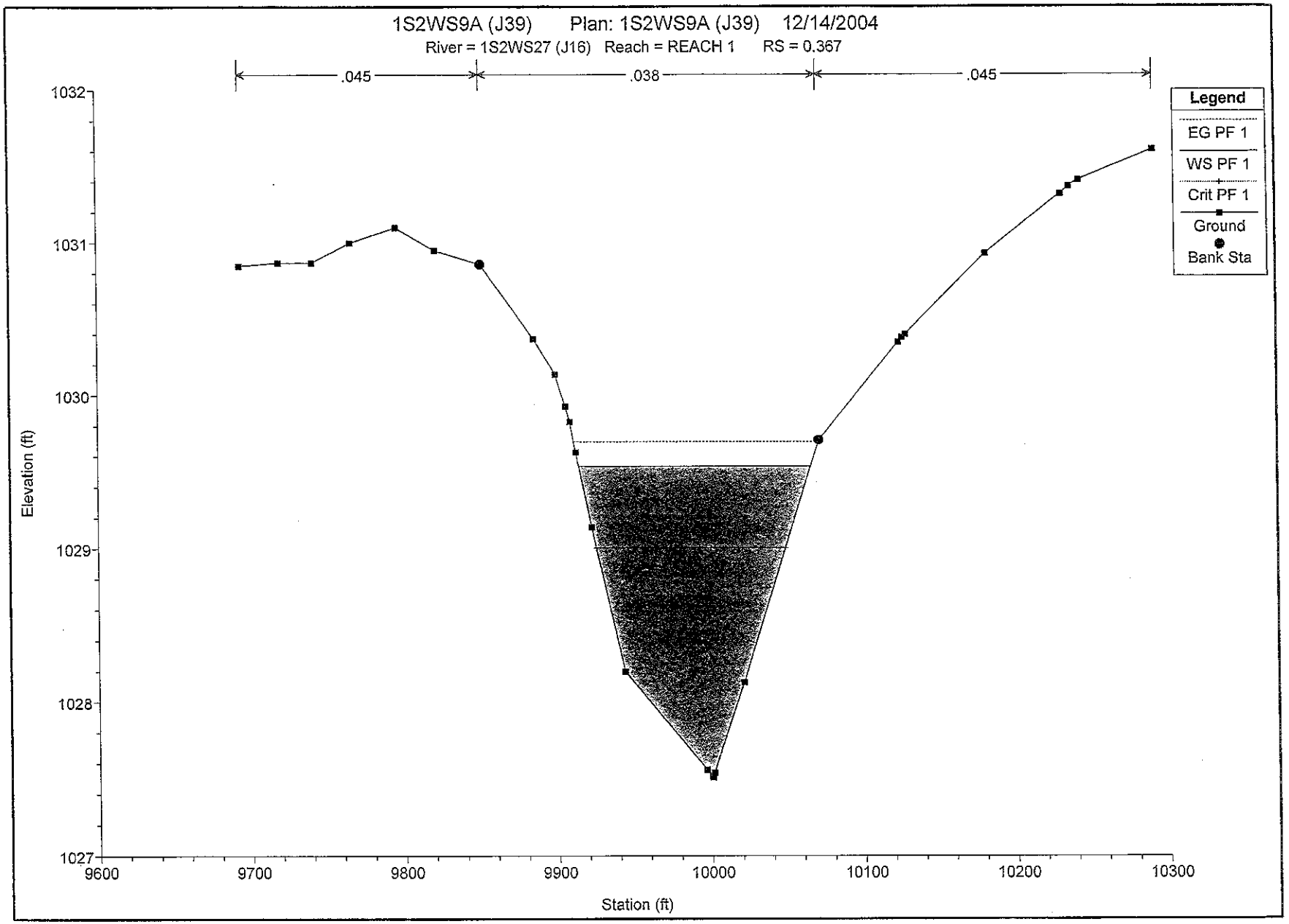
Change in Discharge based on Reach Length

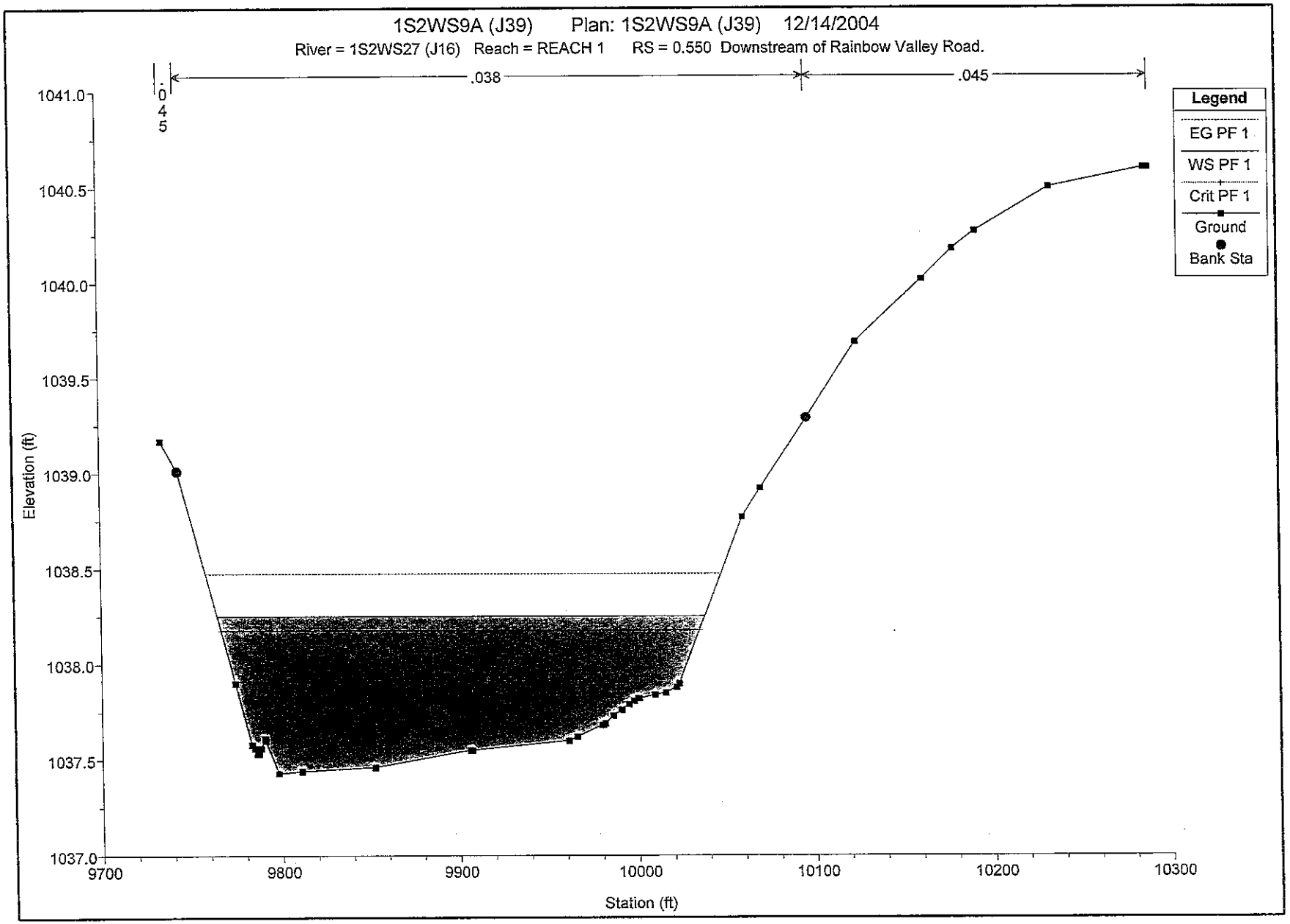
Wash ID: 1S2WS27 (J16)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
J16	0.550	650	650	700
J16	0.367	590	590	600
CPJ16	0.152	519	520	500

The initial discharge comes from CPJ11.


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS27 (J16) Reach = REACH 1 RS = 0.152
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1026
1024
1022
1020
1018
1016
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS27 (J16) Reach = REACH 1 RS = 0.367
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1032
1031
1030
1029
1028
1027
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS27 (J16) Reach = REACH 1 RS = 0.550 Downstream of Rainbow Valley Road.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1041.0
1040.5
1040.0
1039.5
1039.0
1038.5
1038.0
1037.5
1037.0
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S2WS9A (J39)

REACH: 1S2WS22 (J20)

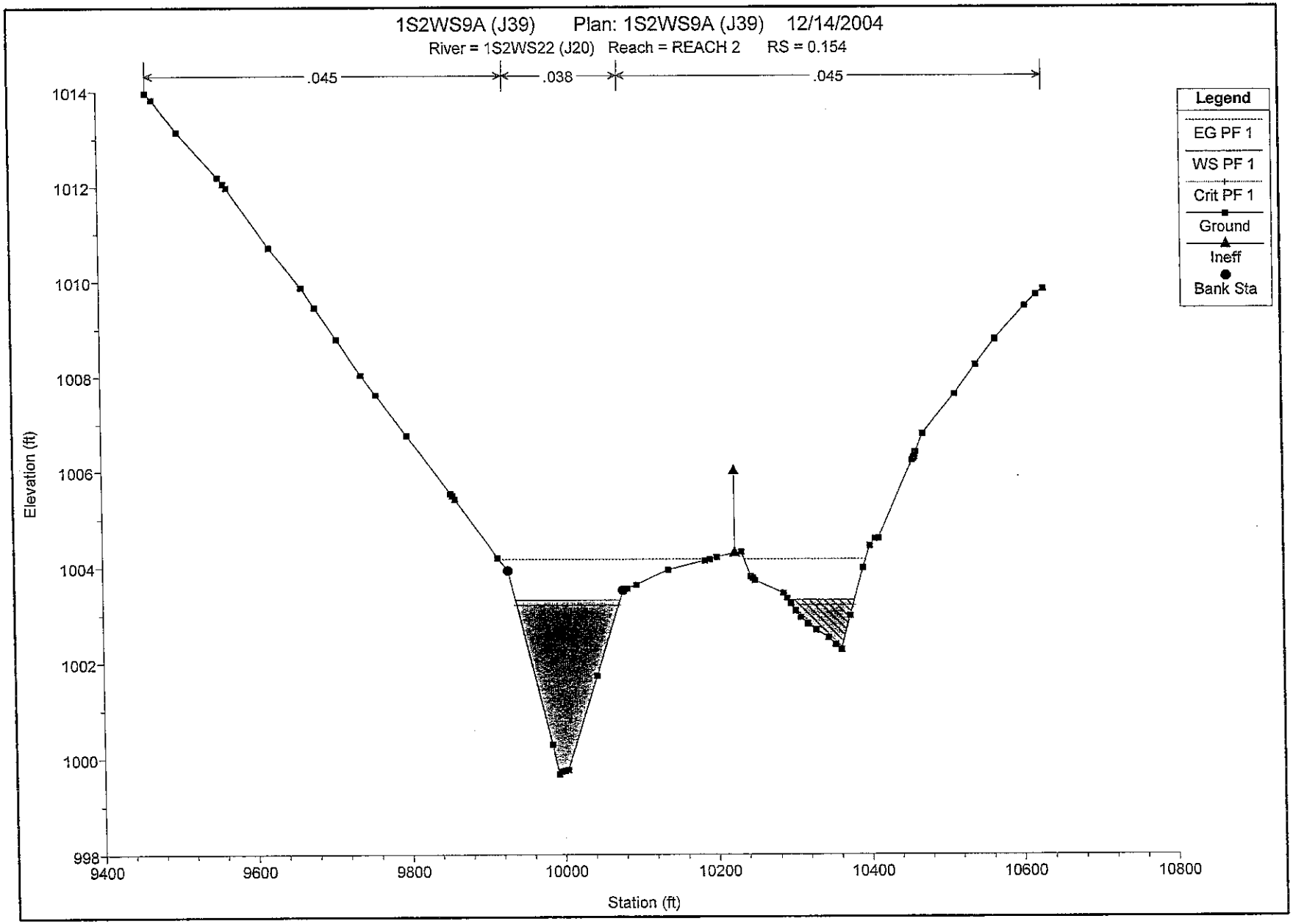
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

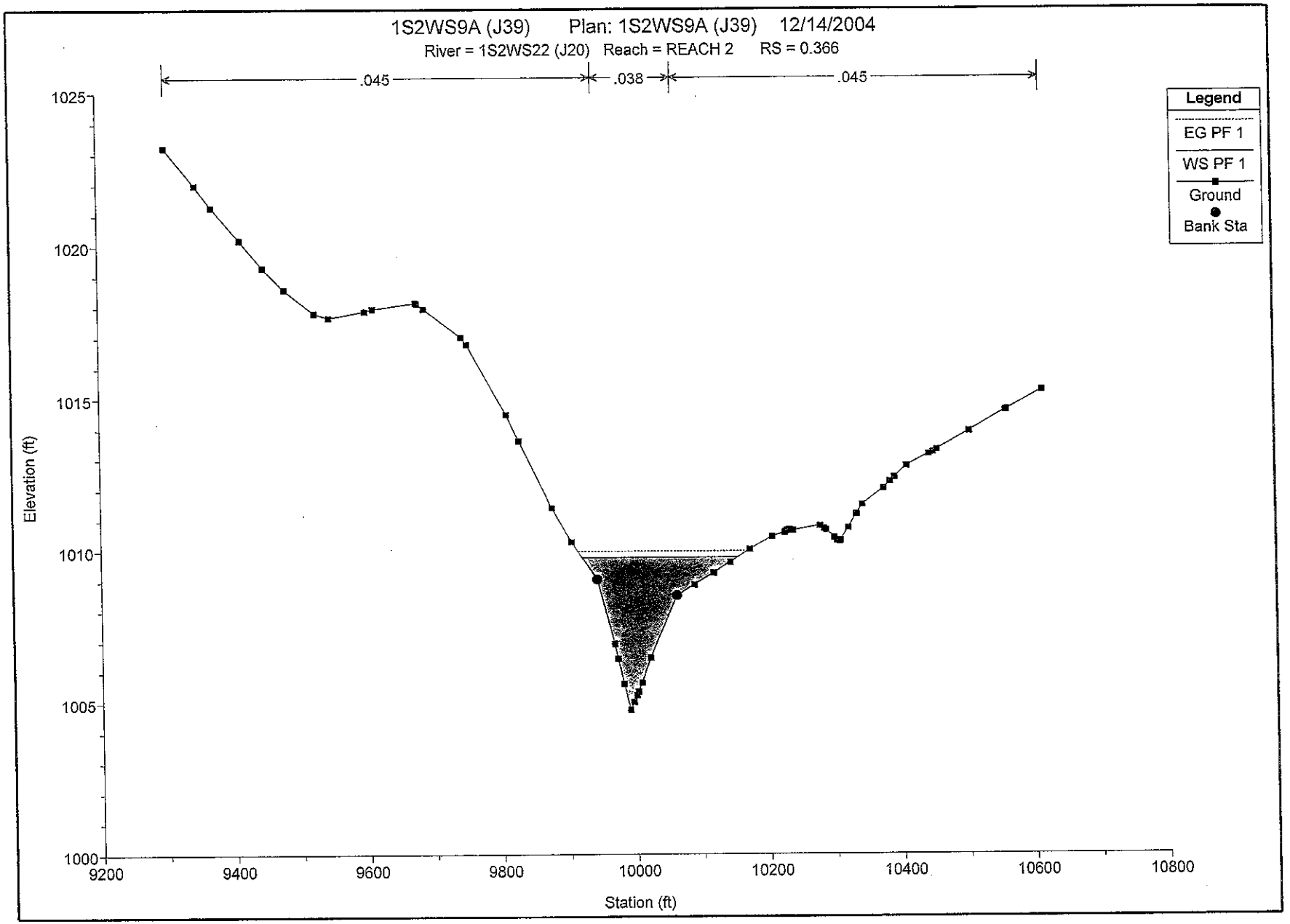
Change in Discharge based on Reach Length

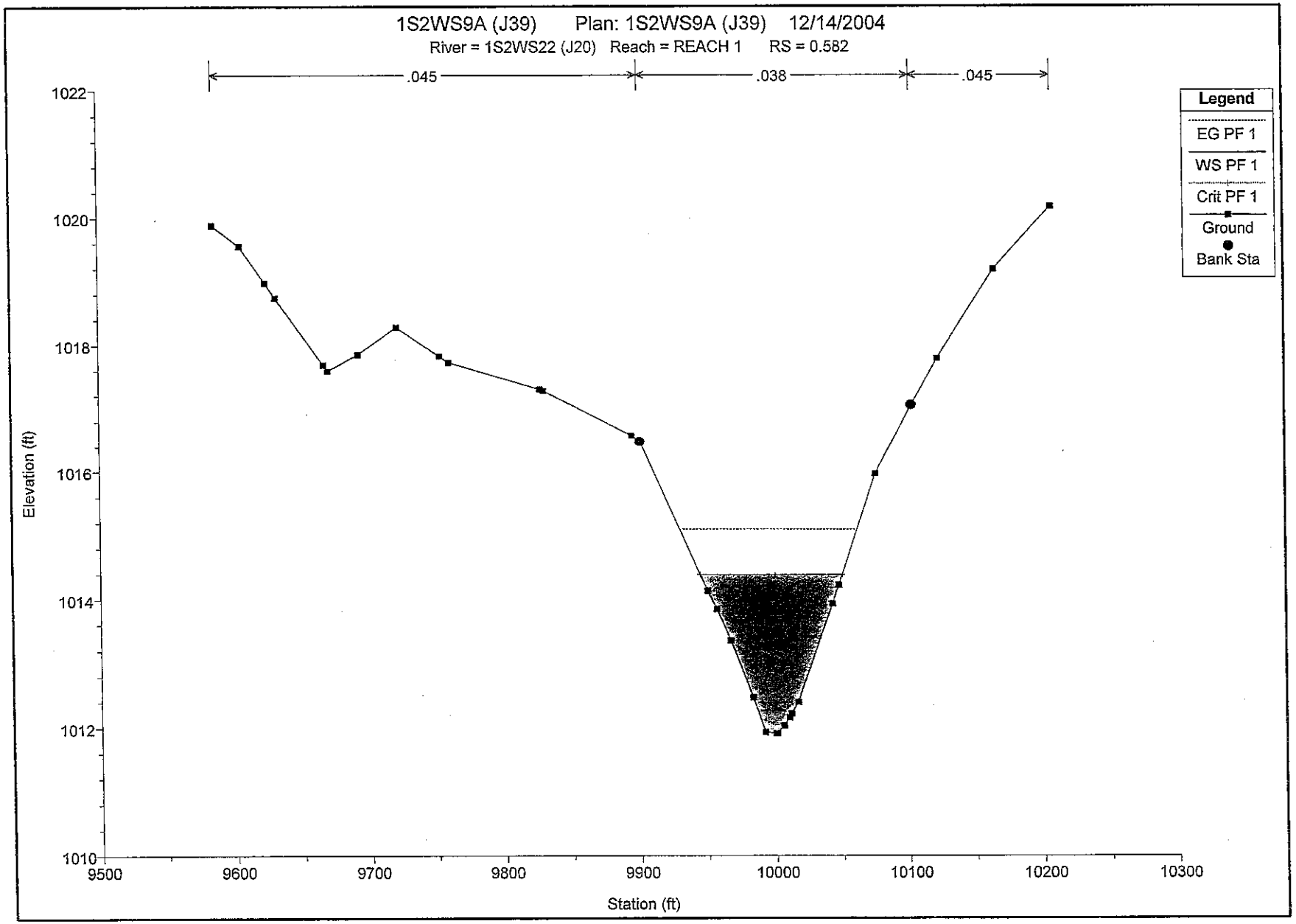
Wash ID: 1S2WS22 (J20)

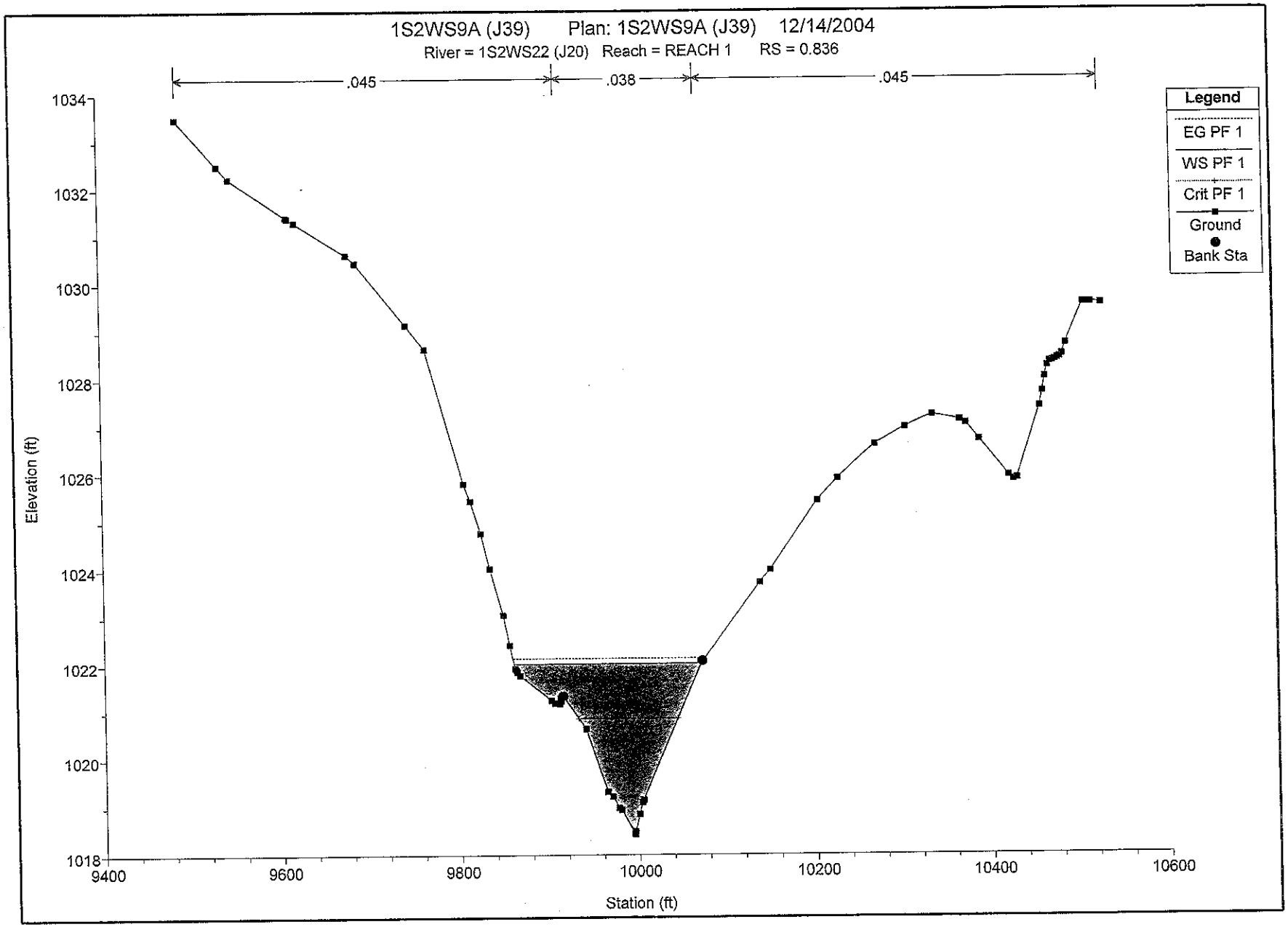
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
J15	1.136	701	700	700
J15	0.836	857	860	900
CPJ15A	0.582	990	990	1000
CPJ15	0.366	1391	1390	1400
J20	0.154	1973	1970	2000
CPJ20	0.000	2395	2400	2400

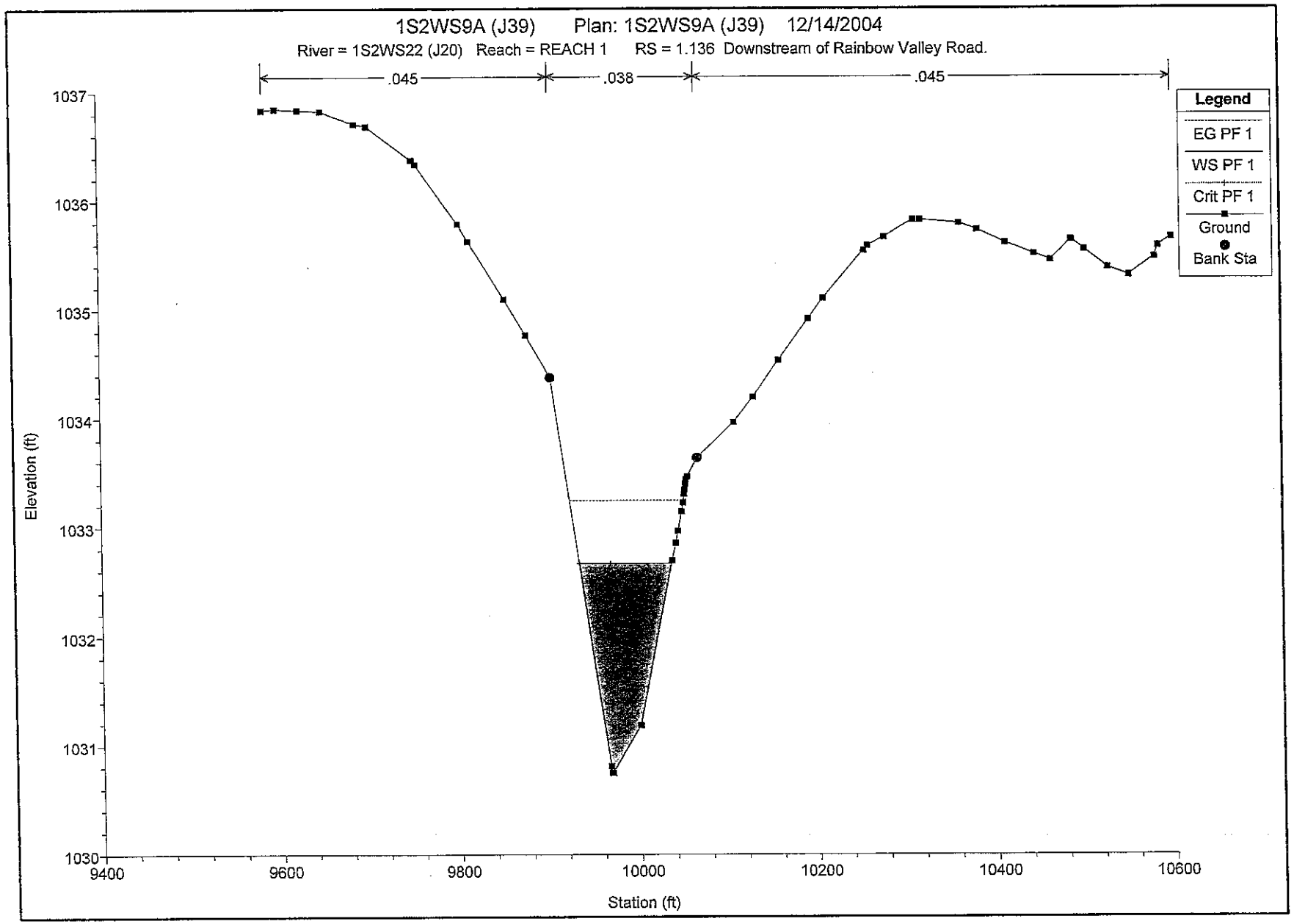
0.154 is the last x-section of the model.
X-section 0 was used in the spreadsheet to calculate q's for the x-sections.
The initial discharge comes from CPJ10.


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS22 (J20) Reach = REACH 2 RS = 0.154
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1014
1012
1010
1008
1006
1004
1002
1000
998
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS22 (J20) Reach = REACH 2 RS = 0.366
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1025
1020
1015
1010
1005
1000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS22 (J20) Reach = REACH 1 RS = 0.582
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1022
1020
1018
1016
1014
1012
1010
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS22 (J20) Reach = REACH 1 RS = 0.836
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1034
1032
1030
1028
1026
1024
1022
1020
1018
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S2WS9A (J39) Plan: 1S2WS9A (J39) 12/14/2004
River = 1S2WS22 (J20) Reach = REACH 1 RS = 1.136 Downstream of Rainbow Valley Road.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1037
1036
1035
1034
1033
1032
1031
1030
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 1S2WS9B (J40)

REACH: 1S2WS9B (J40)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

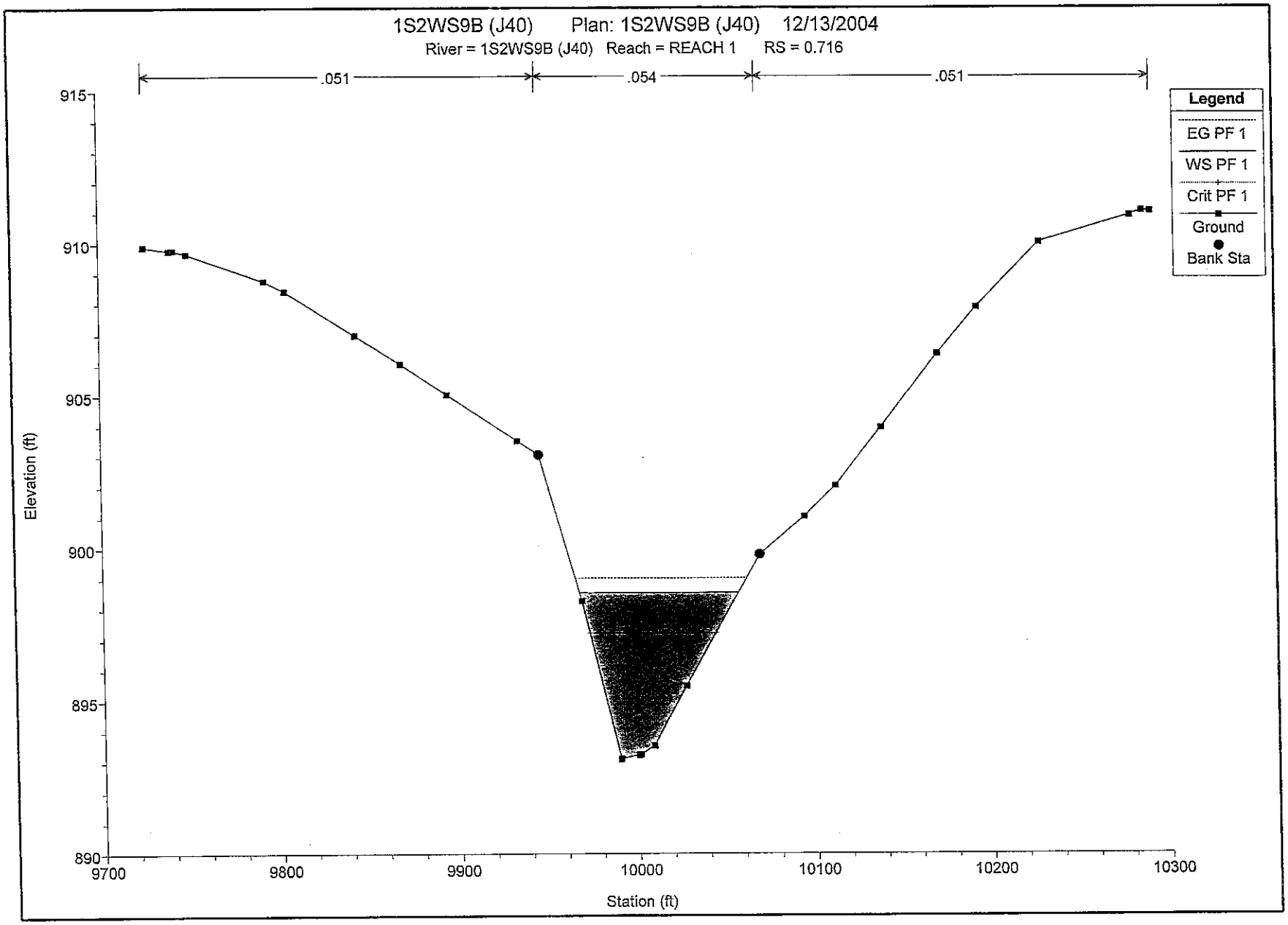
Wash ID: 1S2WS9B (J40)

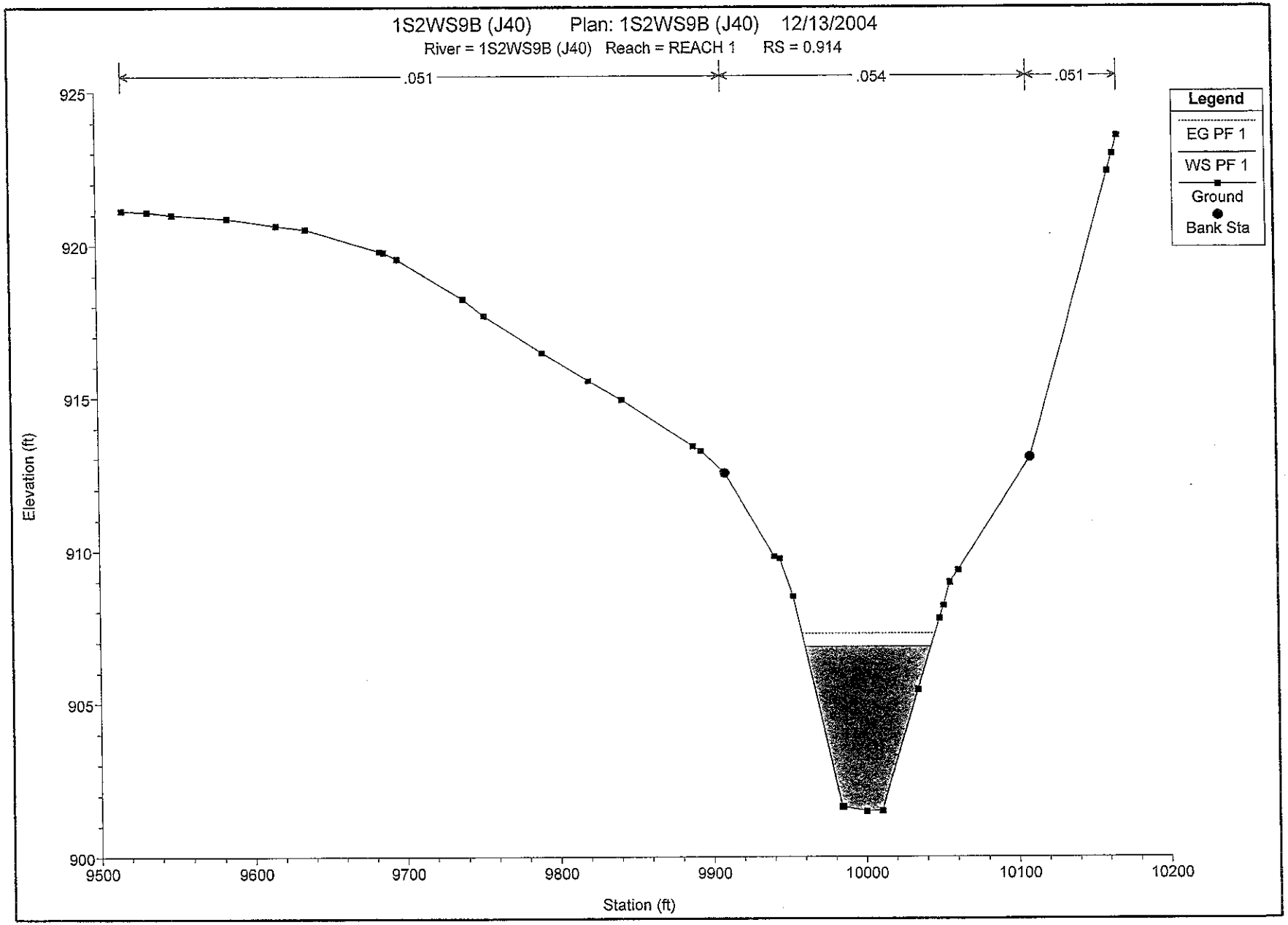
Subbasin: J40

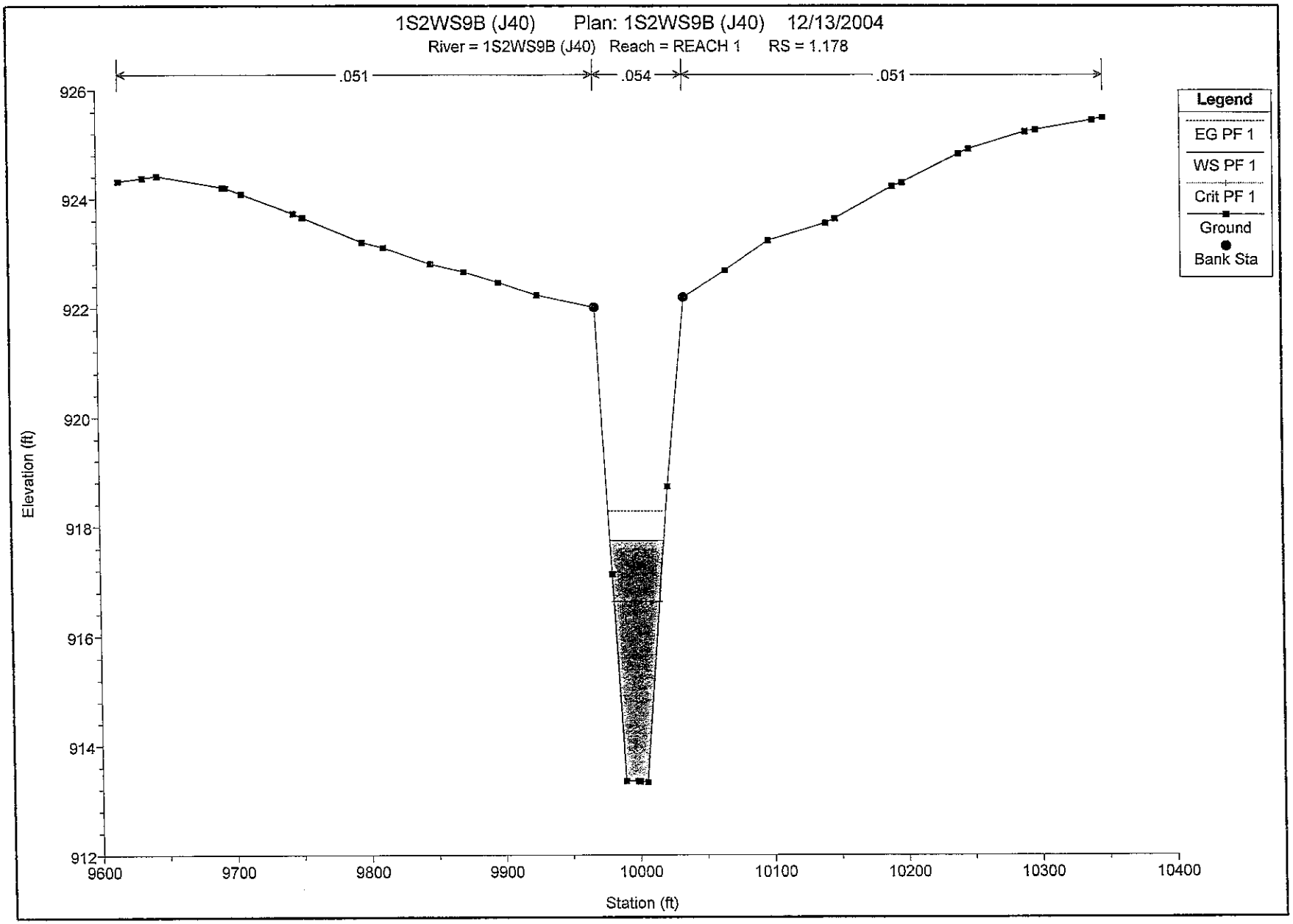
Total Discharge (cfs) = 1577

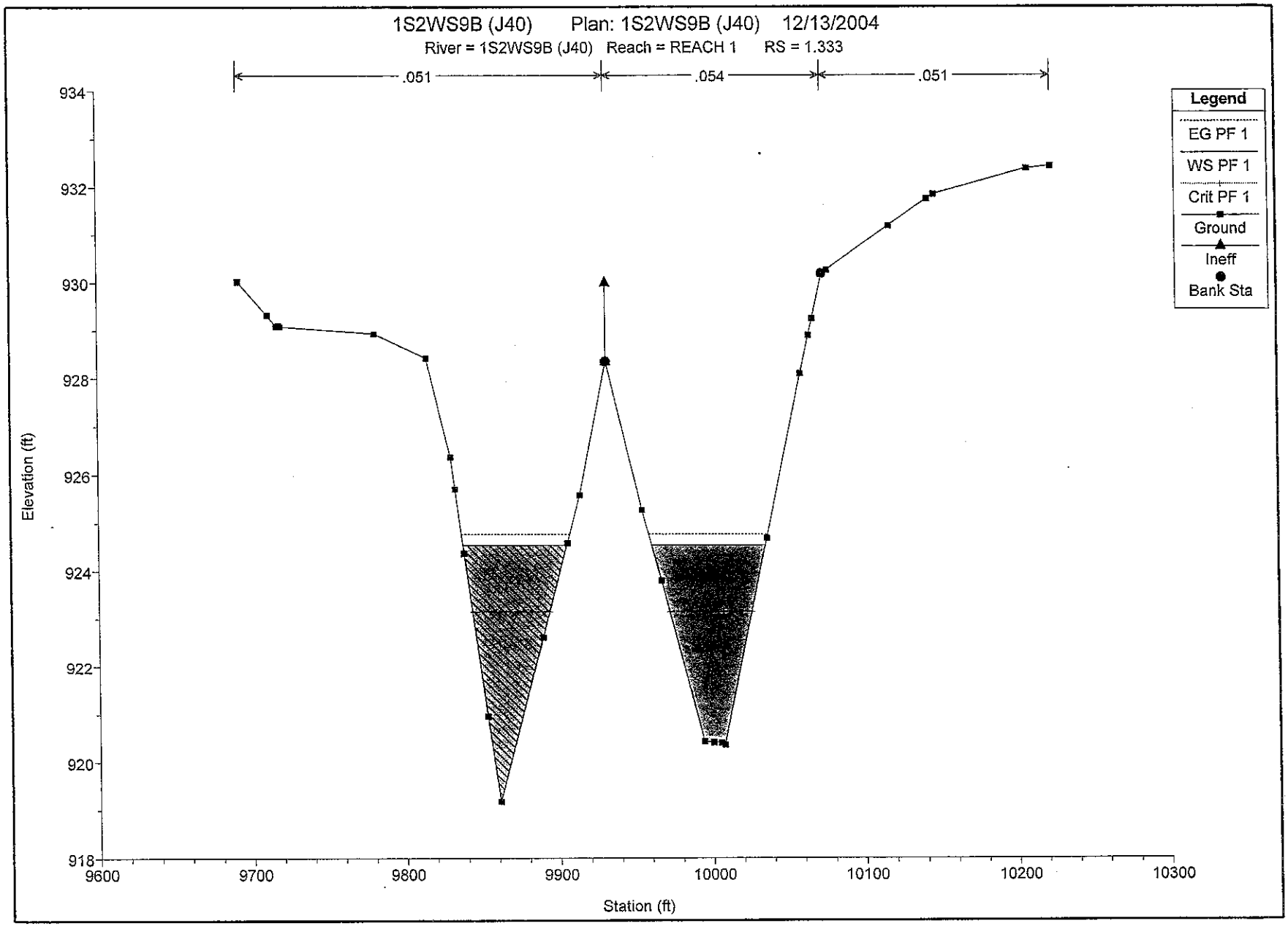
Total Area (acres) = 573

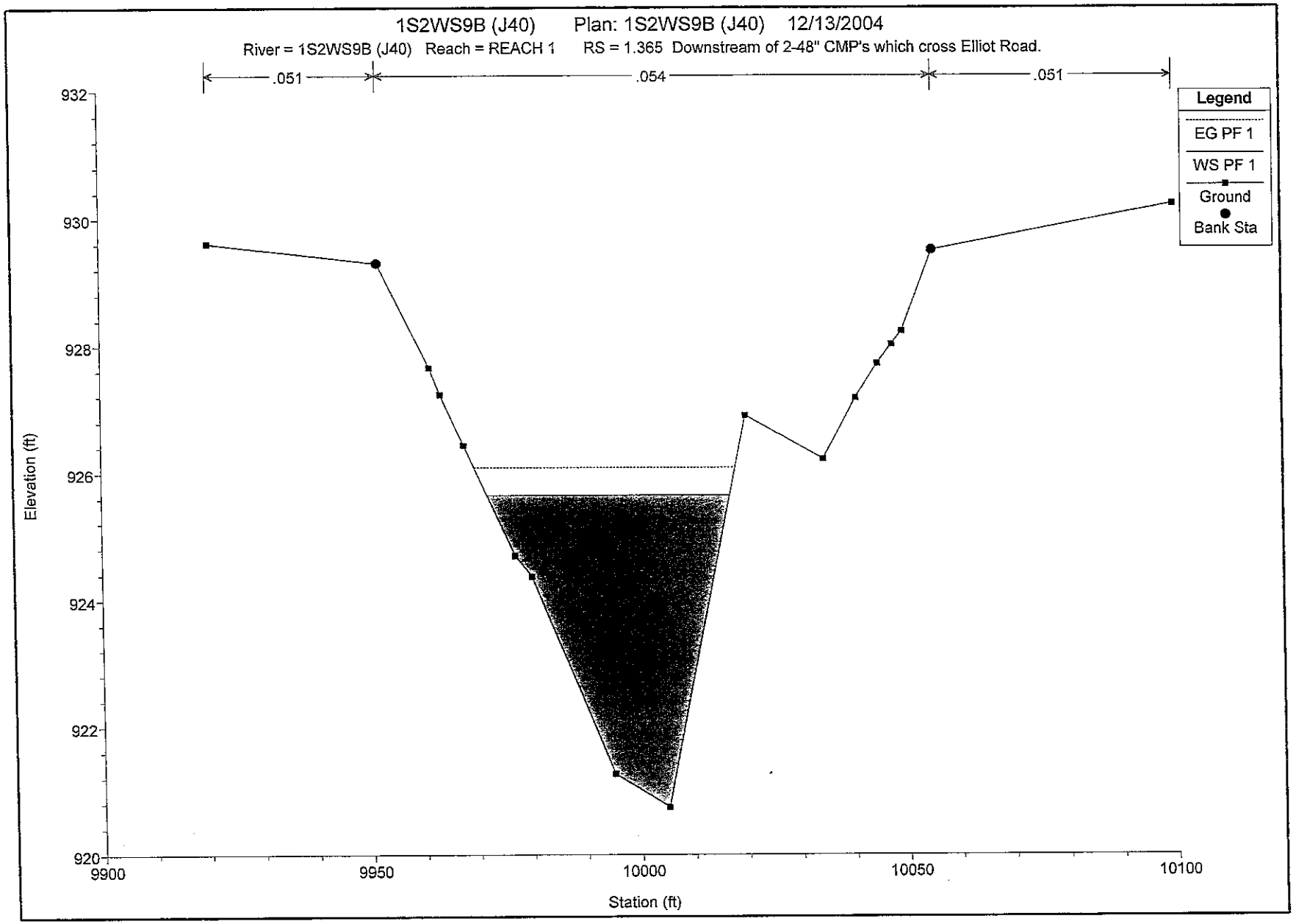
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.702	115	20.1	320
1.448	130	22.7	360
1.405	241	42.1	660
1.365	241	42.1	660
1.333	251	43.8	690
1.178	264	46.0	730
0.914	550	95.9	1510
0.716	571	99.6	1570

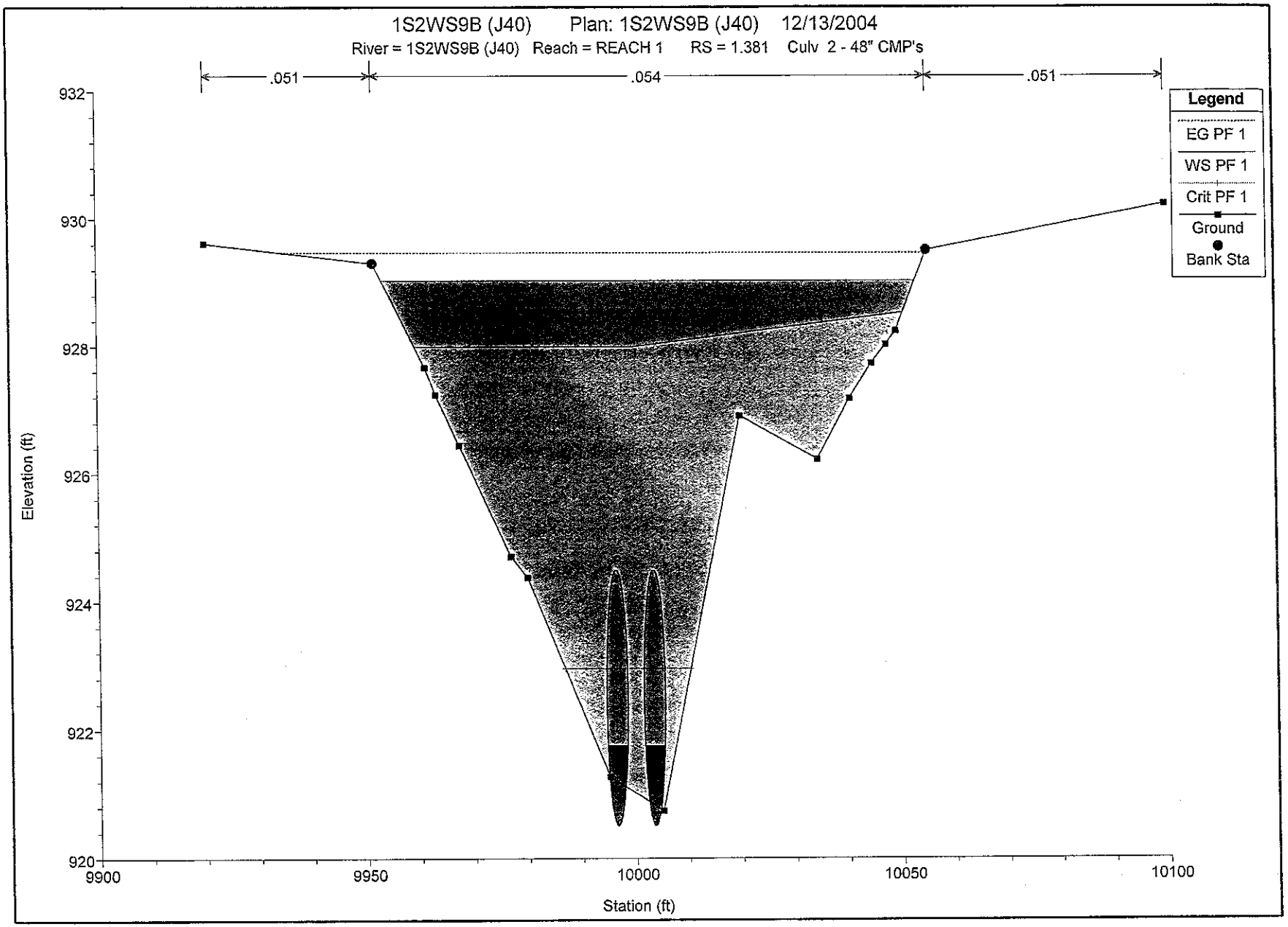

1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 0.716
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
915
910
905
900
895
890
9700
9800
9900
10000
10100
10200
10300
Station (ft)

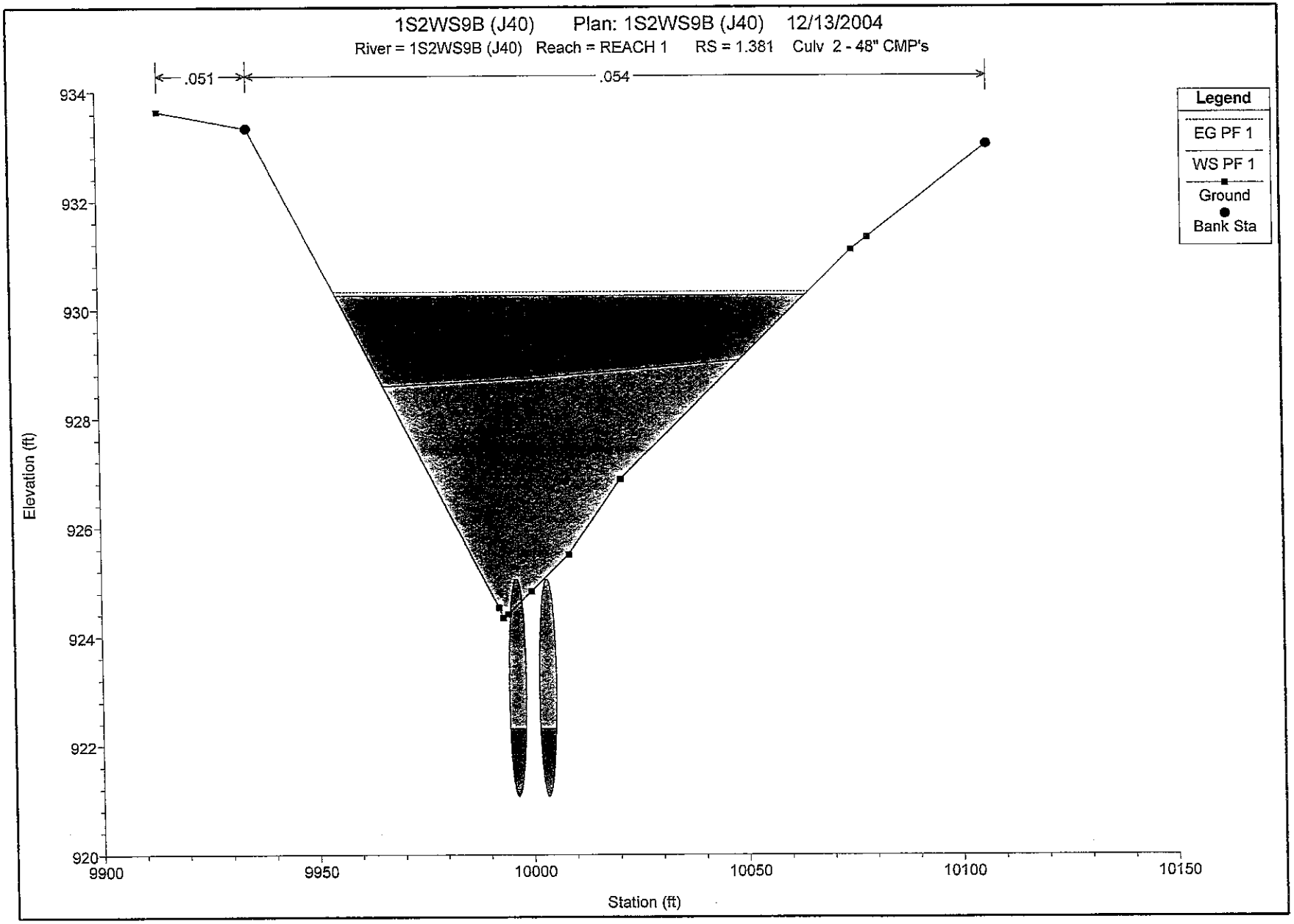

1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 0.914
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
925
920
915
910
905
900
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

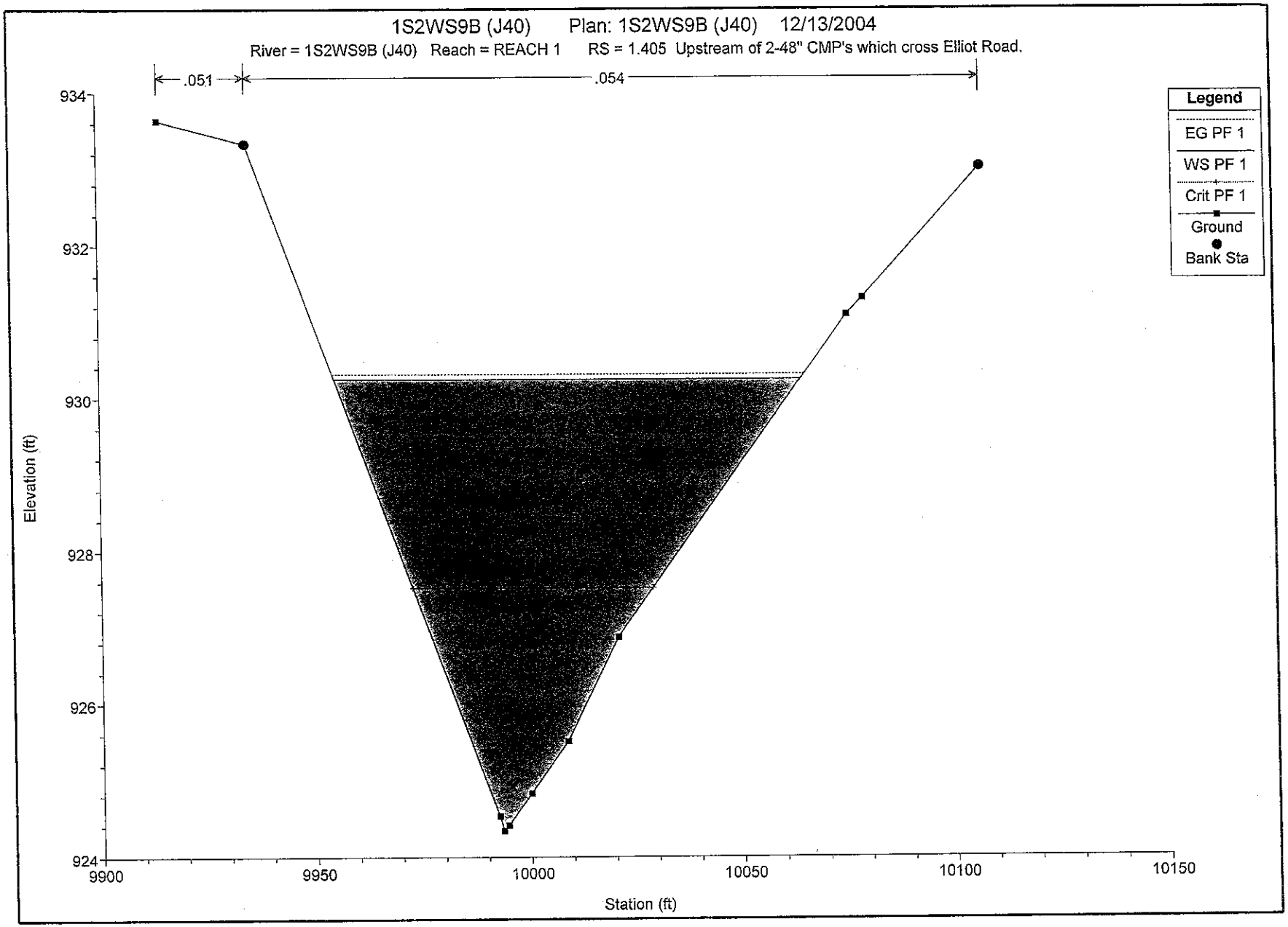

1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.178
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
926
924
922
920
918
916
914
912
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

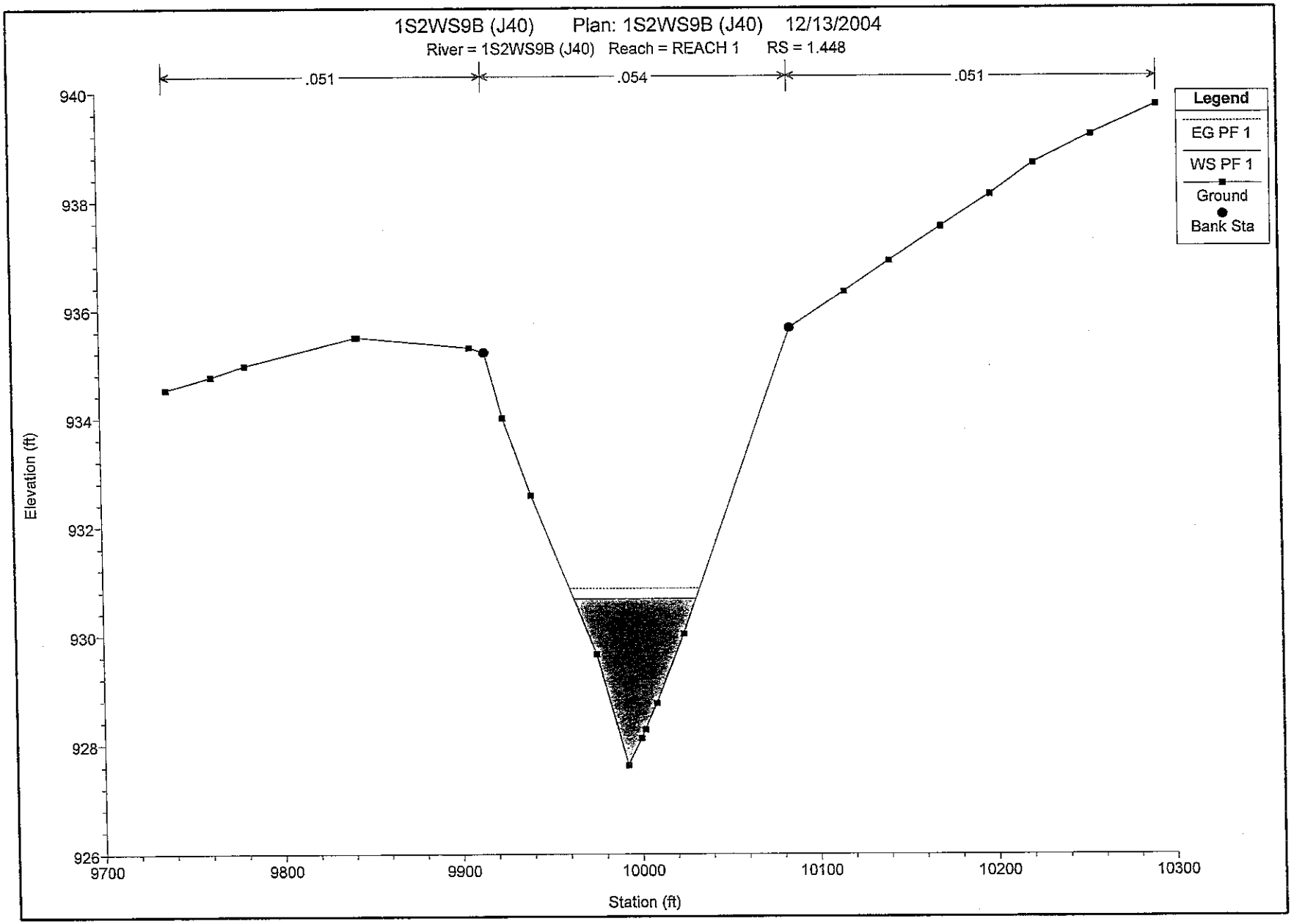

1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.333
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
934
932
930
928
926
924
922
920
918
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

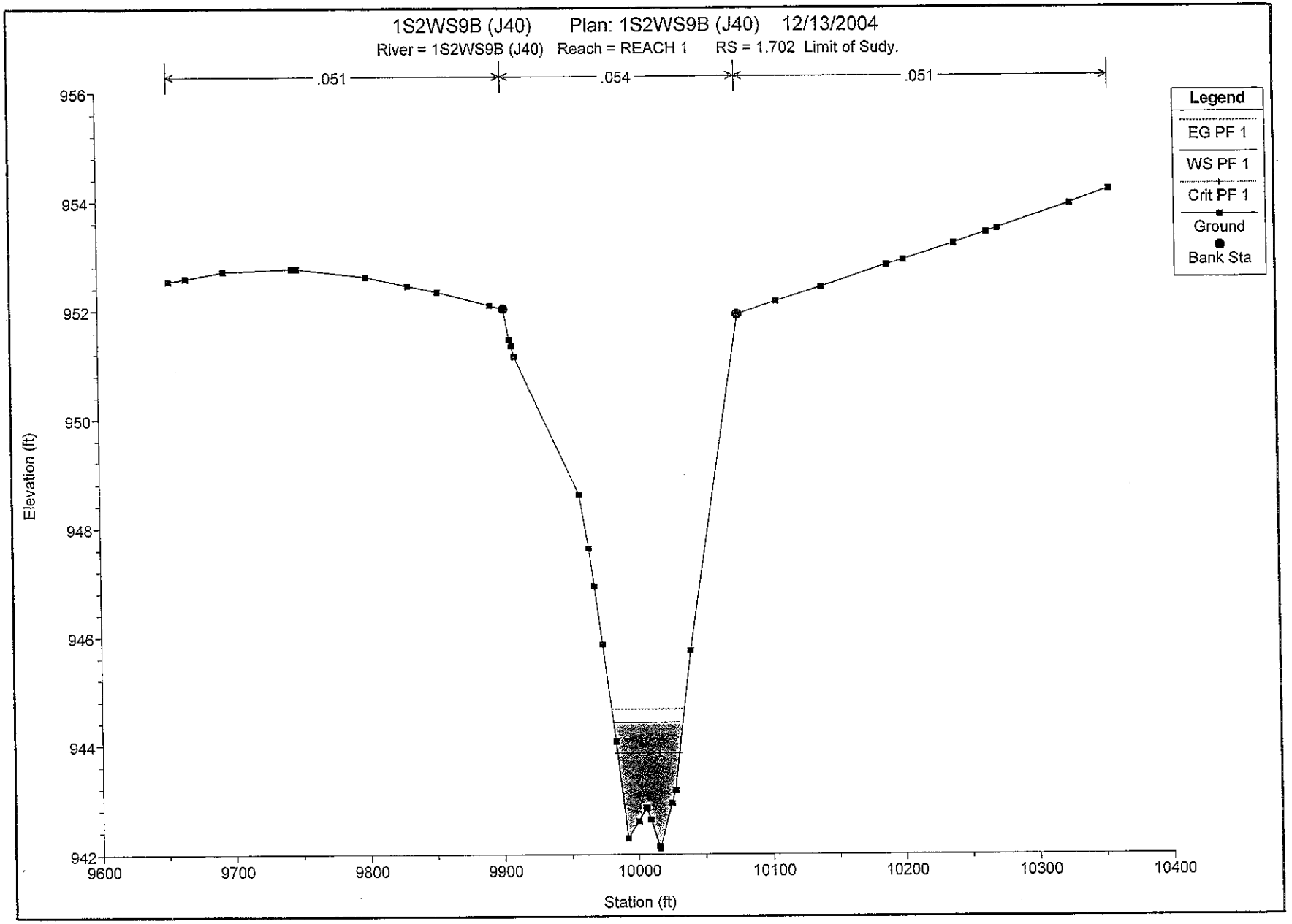

1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.365 Downstream of 2-48" CMP's which cross Elliot Road.
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
932
930
928
926
924
922
920
9900
9950
10000
10050
10100
Station (ft)


1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.381 Culv 2 - 48" CMP's
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
932
930
928
926
924
922
920
9900
9950
10000
10050
10100
Station (ft)


1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.381 Culv 2 - 48" CMP's
.051
.054
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
934
932
930
928
926
924
922
920
9900
9950
10000
10050
10100
10150
Station (ft)


1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.405 Upstream of 2-48" CMP's which cross Elliot Road.
.051
.054
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
934
932
930
928
926
924
9900
9950
10000
10050
10100
10150
Station (ft)


1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.448
.051
.054
.051
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
940
938
936
934
932
930
928
926
9700
9800
9900
10000
10100
10200
10300
Station (ft)


1S2WS9B (J40) Plan: 1S2WS9B (J40) 12/13/2004
River = 1S2WS9B (J40) Reach = REACH 1 RS = 1.702 Limit of Sudy.
.051
.054
.051
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
956
954
952
950
948
946
944
942
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

MODEL: 1S3WS24A (A60)

REACH: 1S3WS24A (A60)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 1S3WS24A (A60)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPA59	1.202	3642	3640	3600
A60	0.958	3906	3910	3900
A60	0.724	4158	4160	4200
A60	0.572	4323	4320	4300
A60	0.294	4623	4620	4600
CPA60	0.130	4800	4800	4800

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 1S3WS24A (A60)

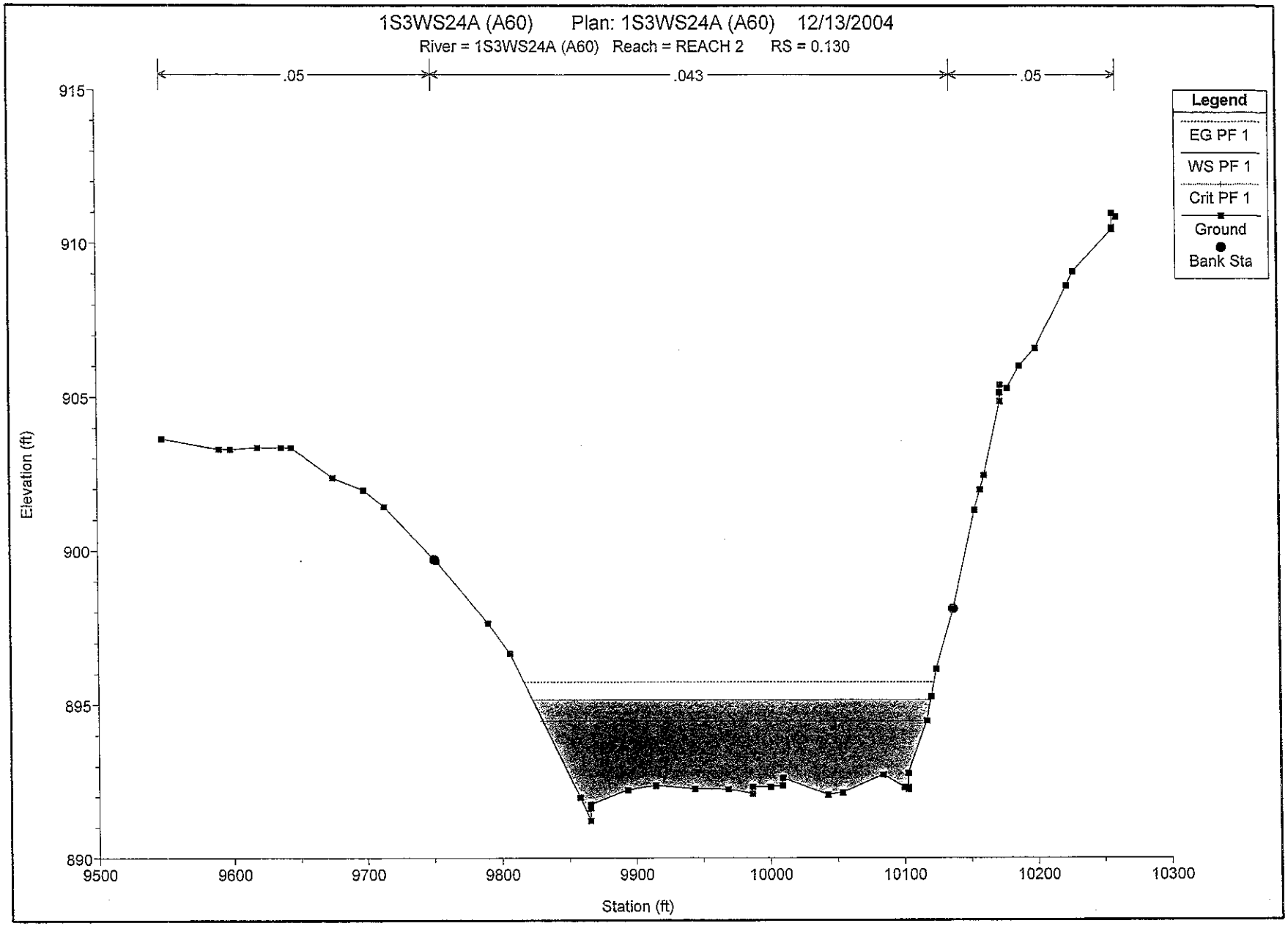
Subbasin: A58

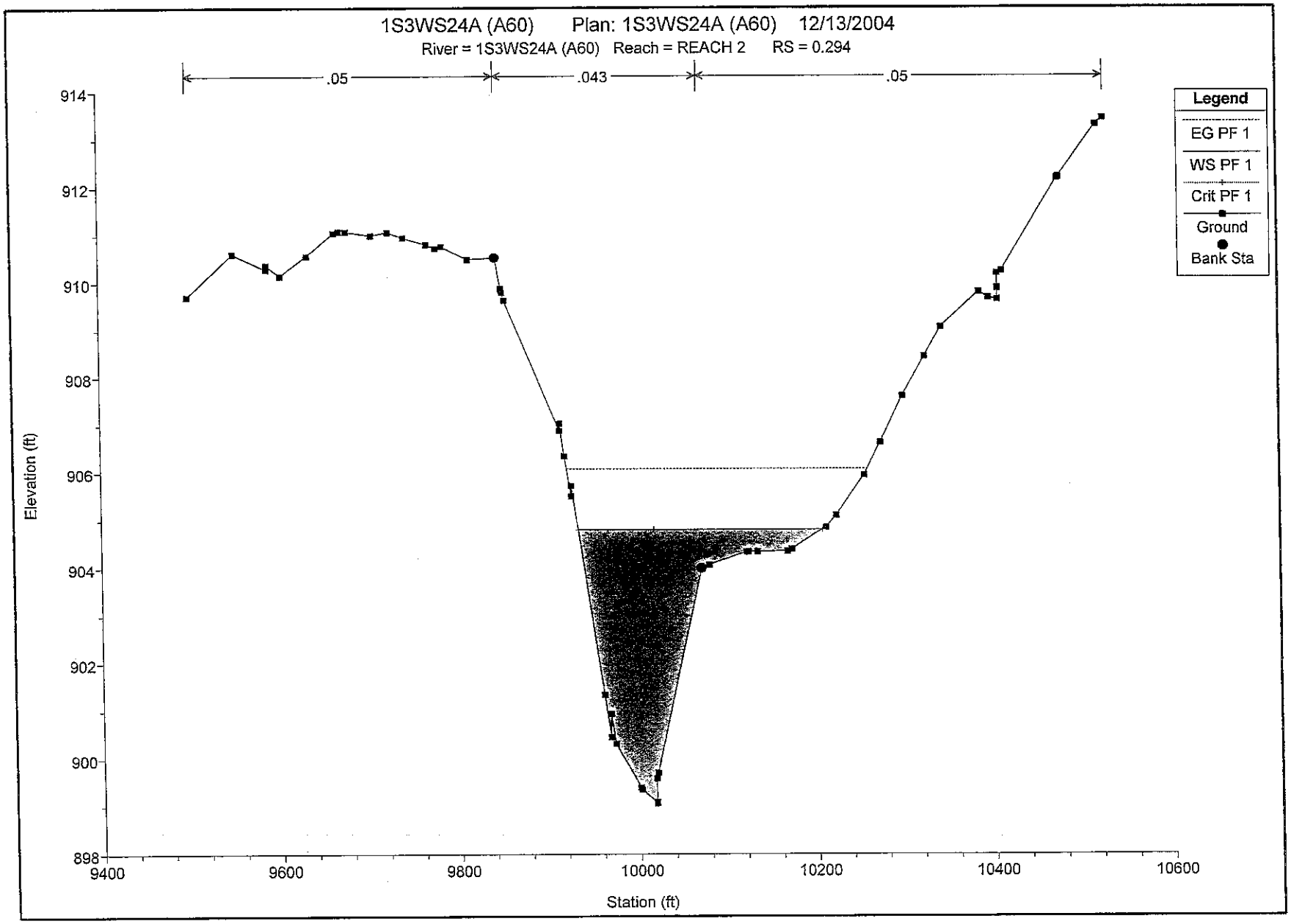
Total Discharge (cfs) = 2225

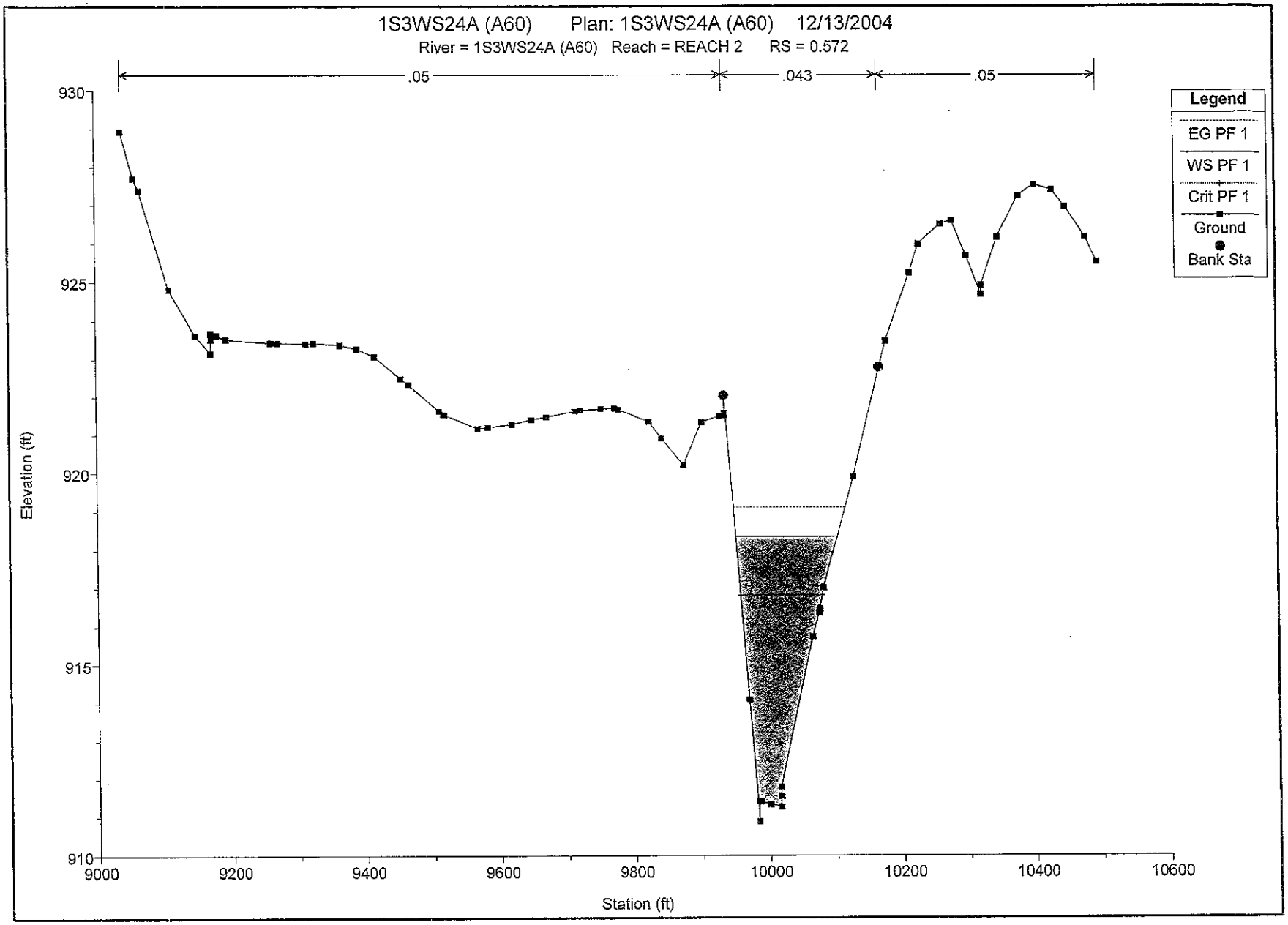
Total Area (acres) = 1364

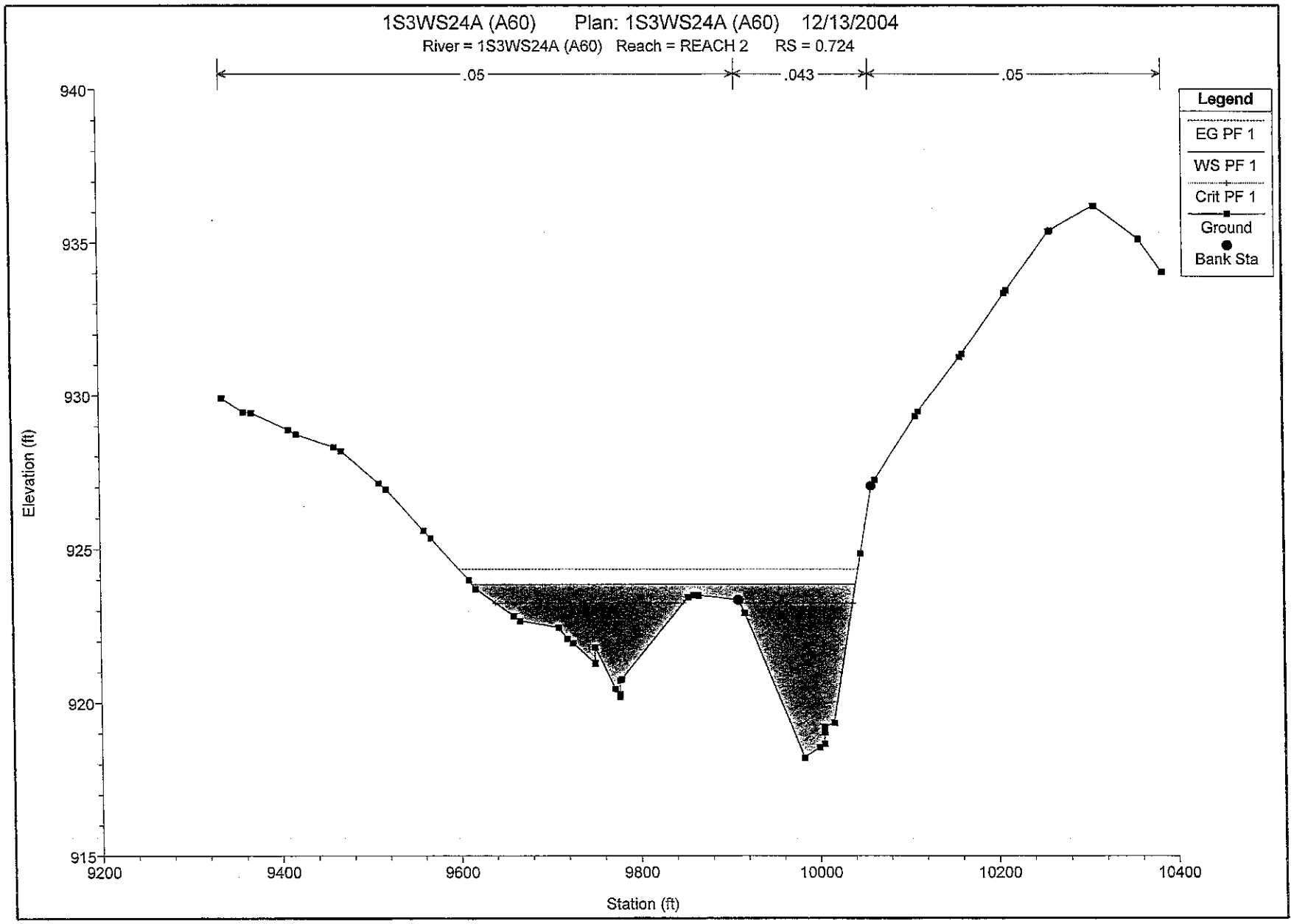
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
3.653	429	31.5	700
3.416	567	41.6	930
3.186	828	60.7	1350
2.944	992	72.7	1620
2.672	1090	79.9	1780
2.425	1163	85.3	1900
2.224	1225	89.8	2000
1.825	1340	98.2	2190
1.503	1354	99.3	2210
1.202	1364	100.0	2230

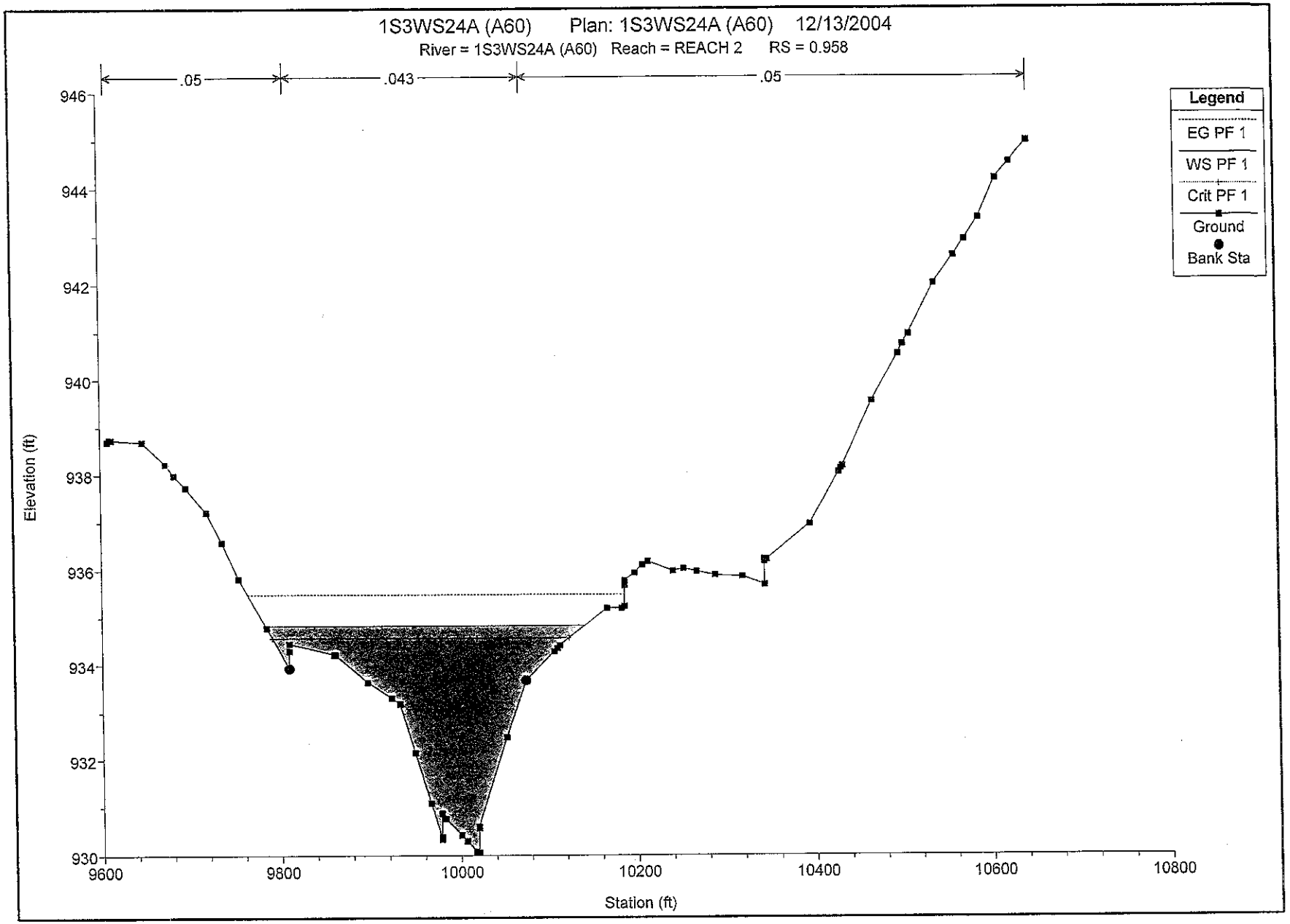
1.202 uses the combined flow, not just the subbasin flow.

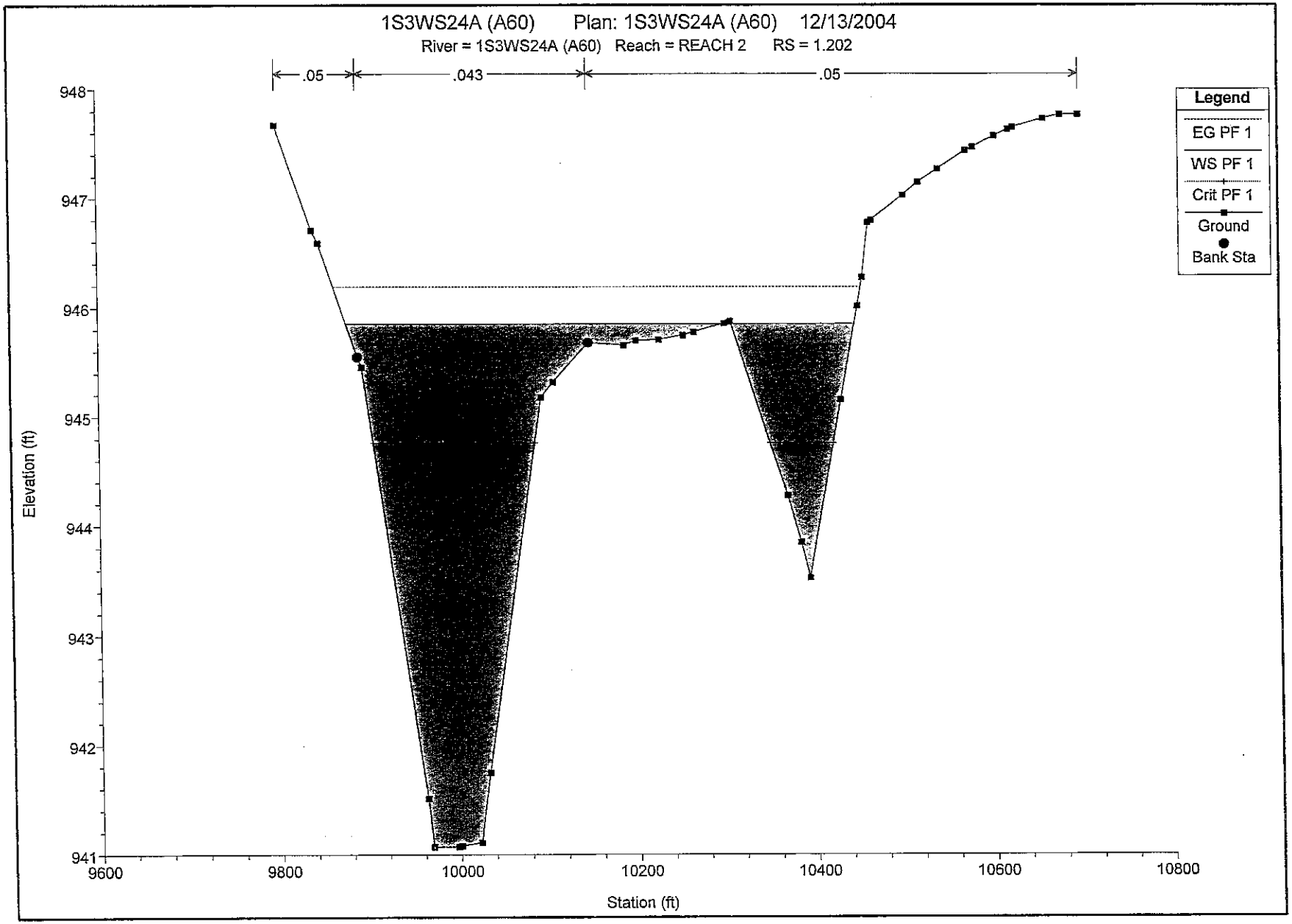

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 2 RS = 0.130
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
915
910
905
900
895
890
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

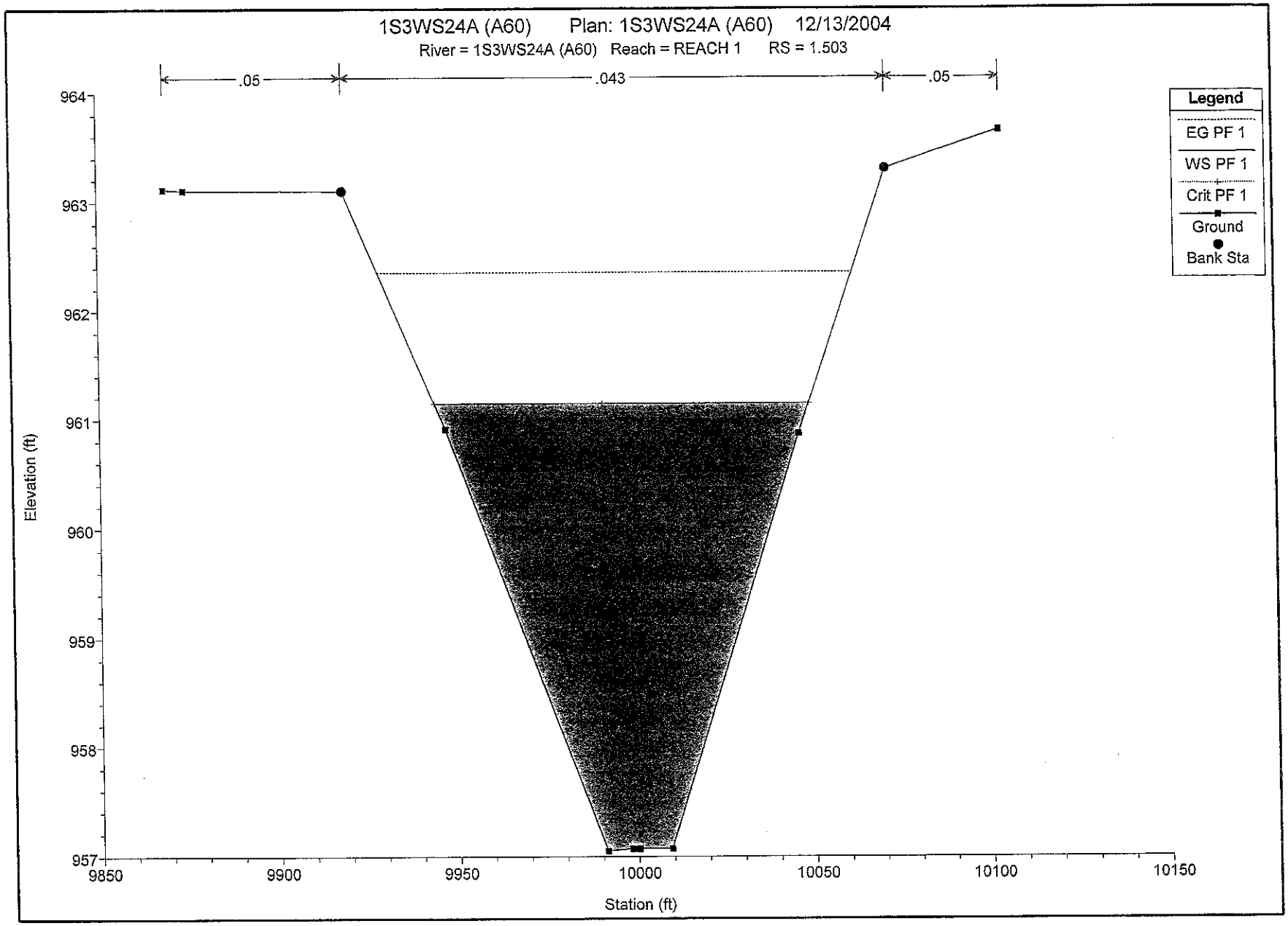

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 2 RS = 0.294
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
914
912
910
908
906
904
902
900
898
9400
9600
9800
10000
10200
10400
10600
Station (ft)

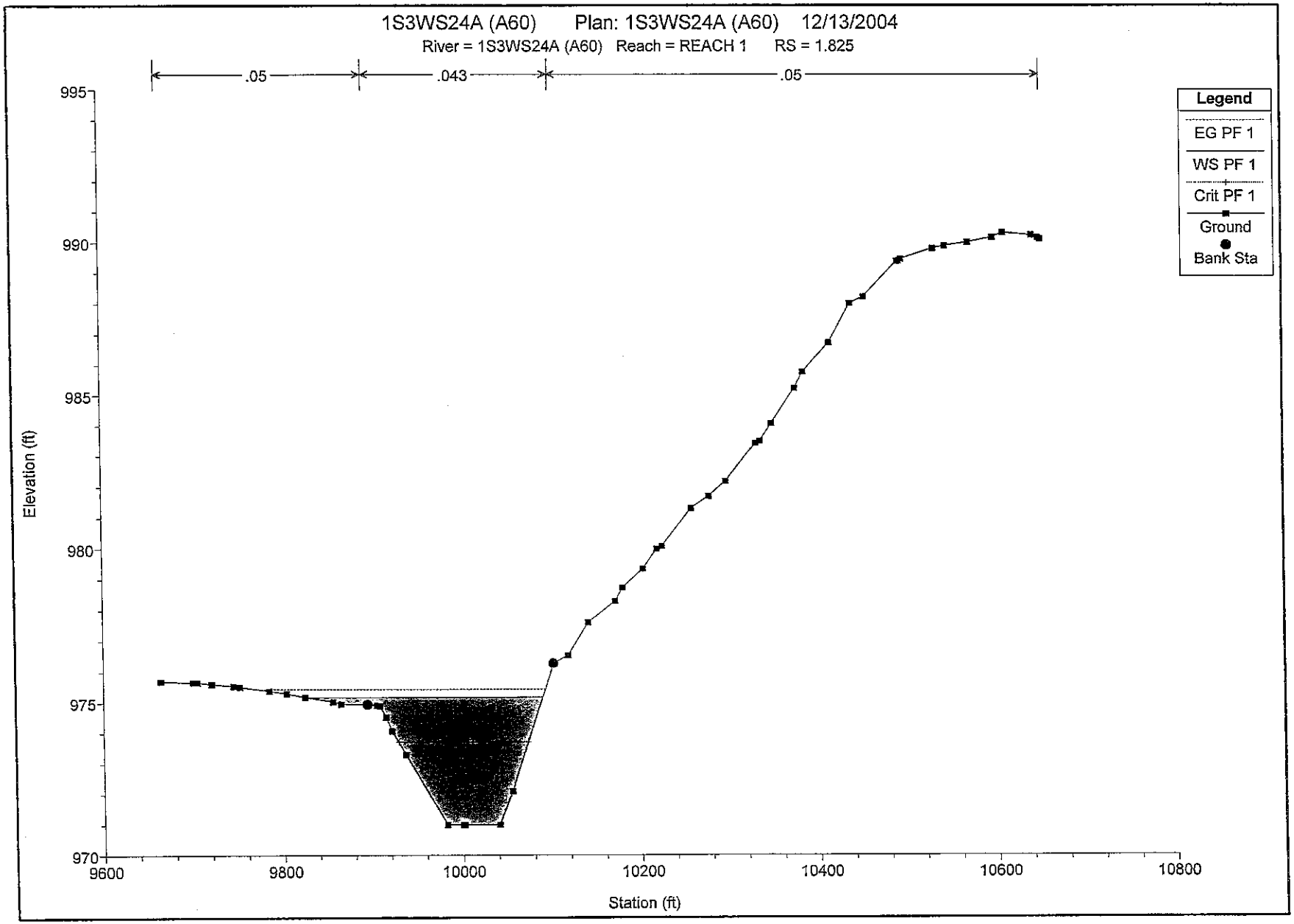

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 2 RS = 0.572
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
930
925
920
915
910
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

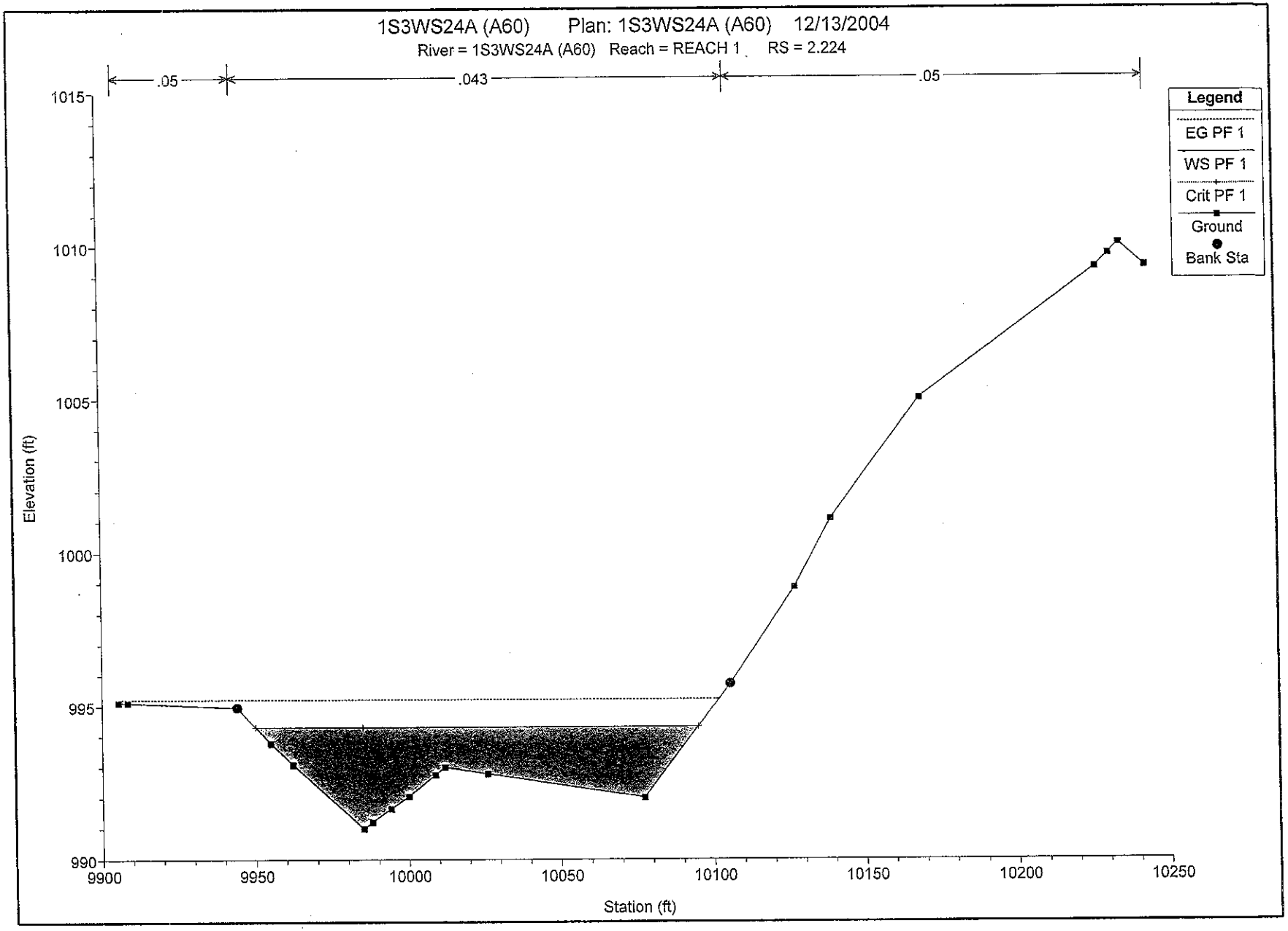

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 2 RS = 0.724
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
940
935
930
925
920
915
9200
9400
9600
9800
10000
10200
10400
Station (ft)

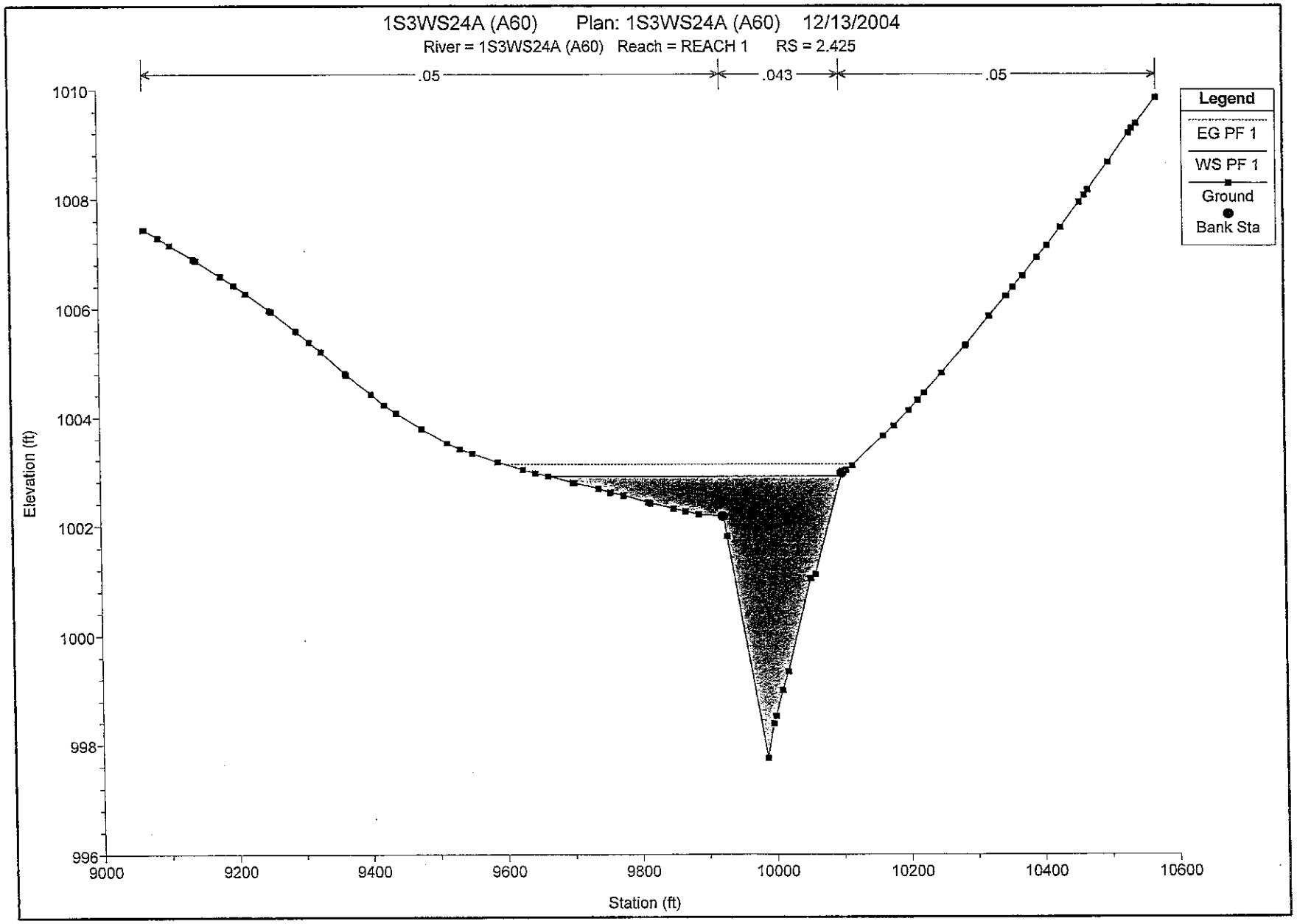

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 2 RS = 0.958
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
946
944
942
940
938
936
934
932
930
9600
9800
10000
10200
10400
10600
10800
Station (ft)

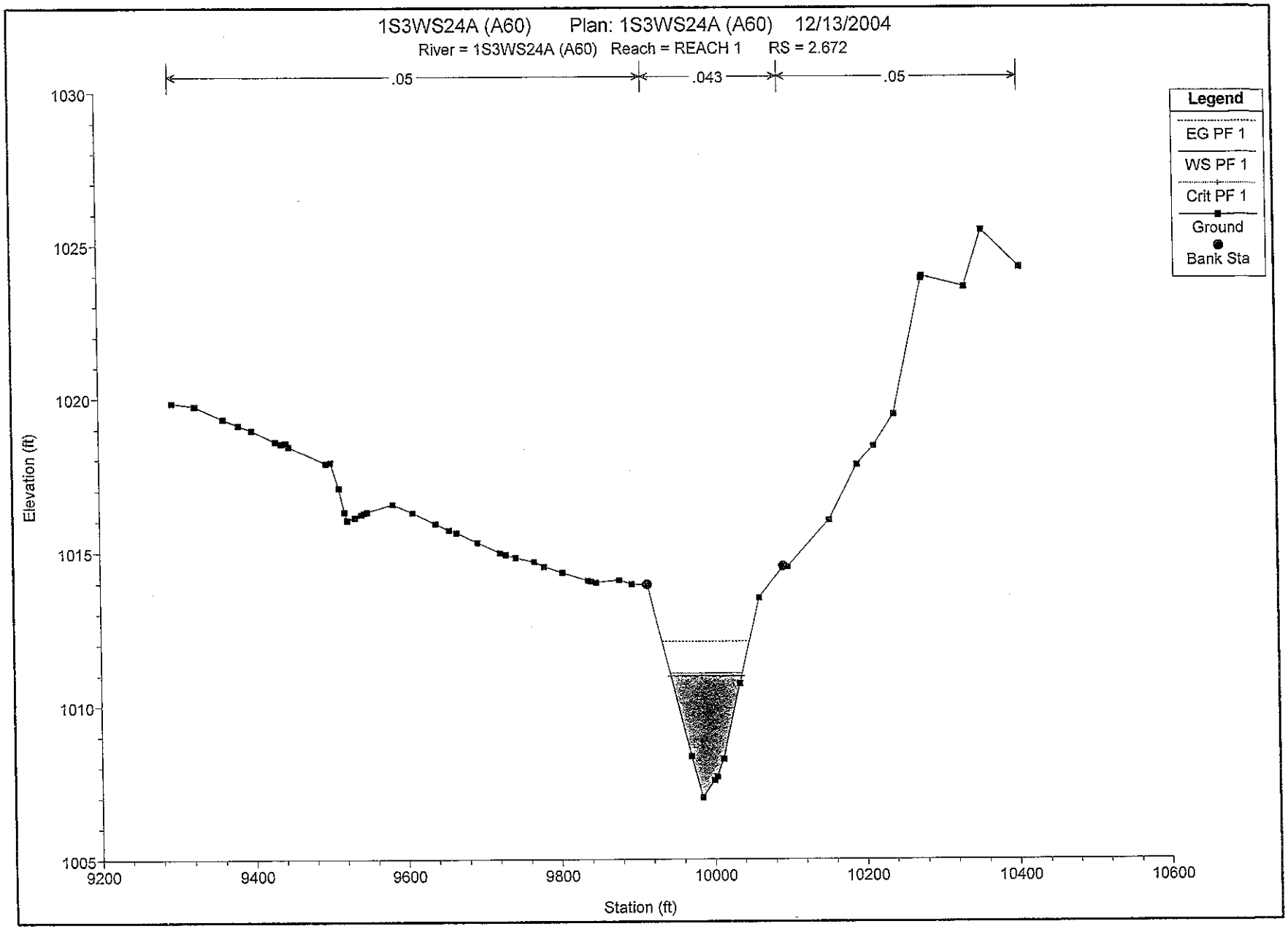

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 2 RS = 1.202
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
948
947
946
945
944
943
942
941
9600
9800
10000
10200
10400
10600
10800
Station (ft)

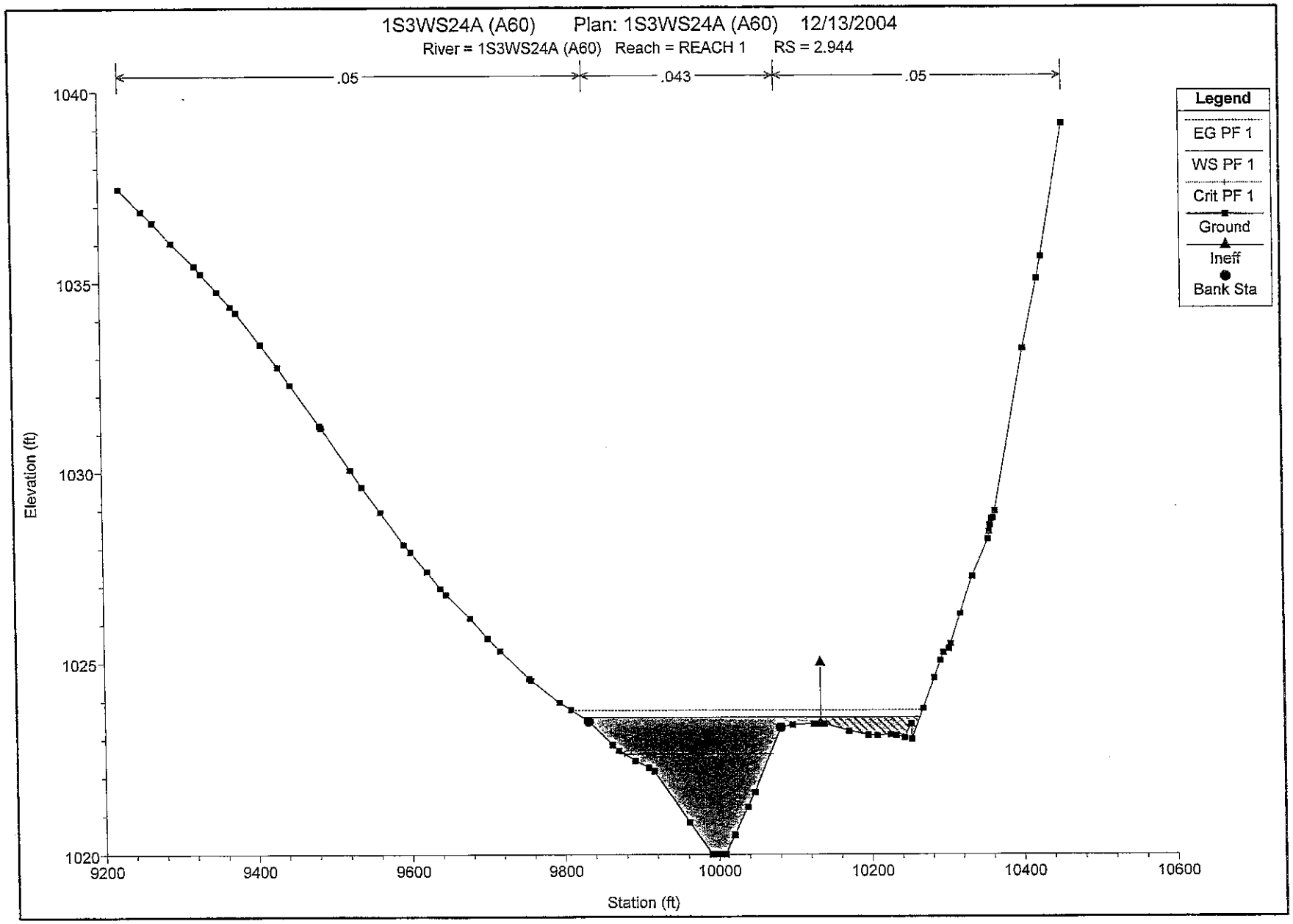

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 1.503
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
964
963
962
961
960
959
958
957
9850
9900
9950
10000
10050
10100
10150
Station (ft)

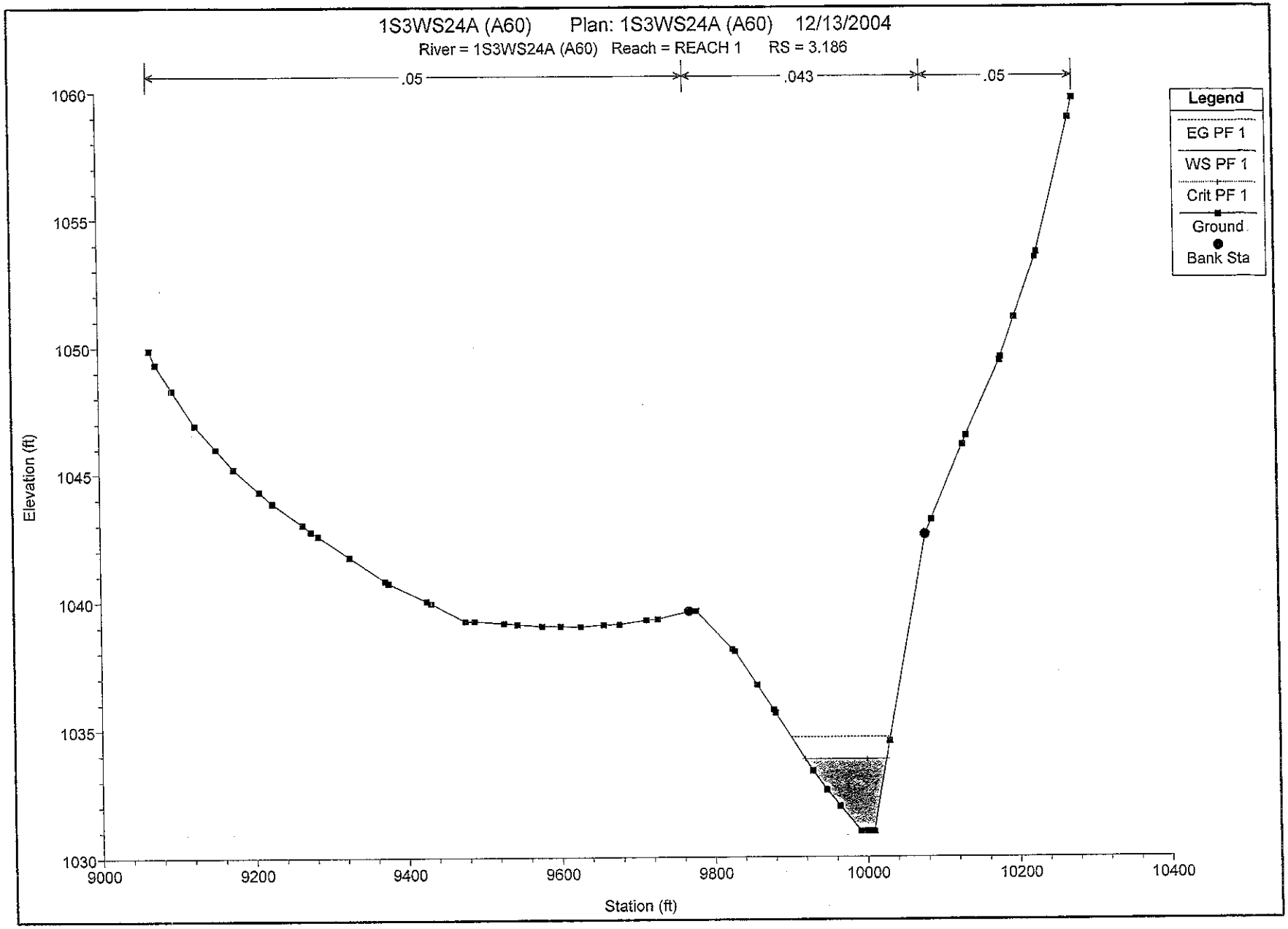

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 1.825
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
995
990
985
980
975
970
9600
9800
10000
10200
10400
10600
10800
Station (ft)

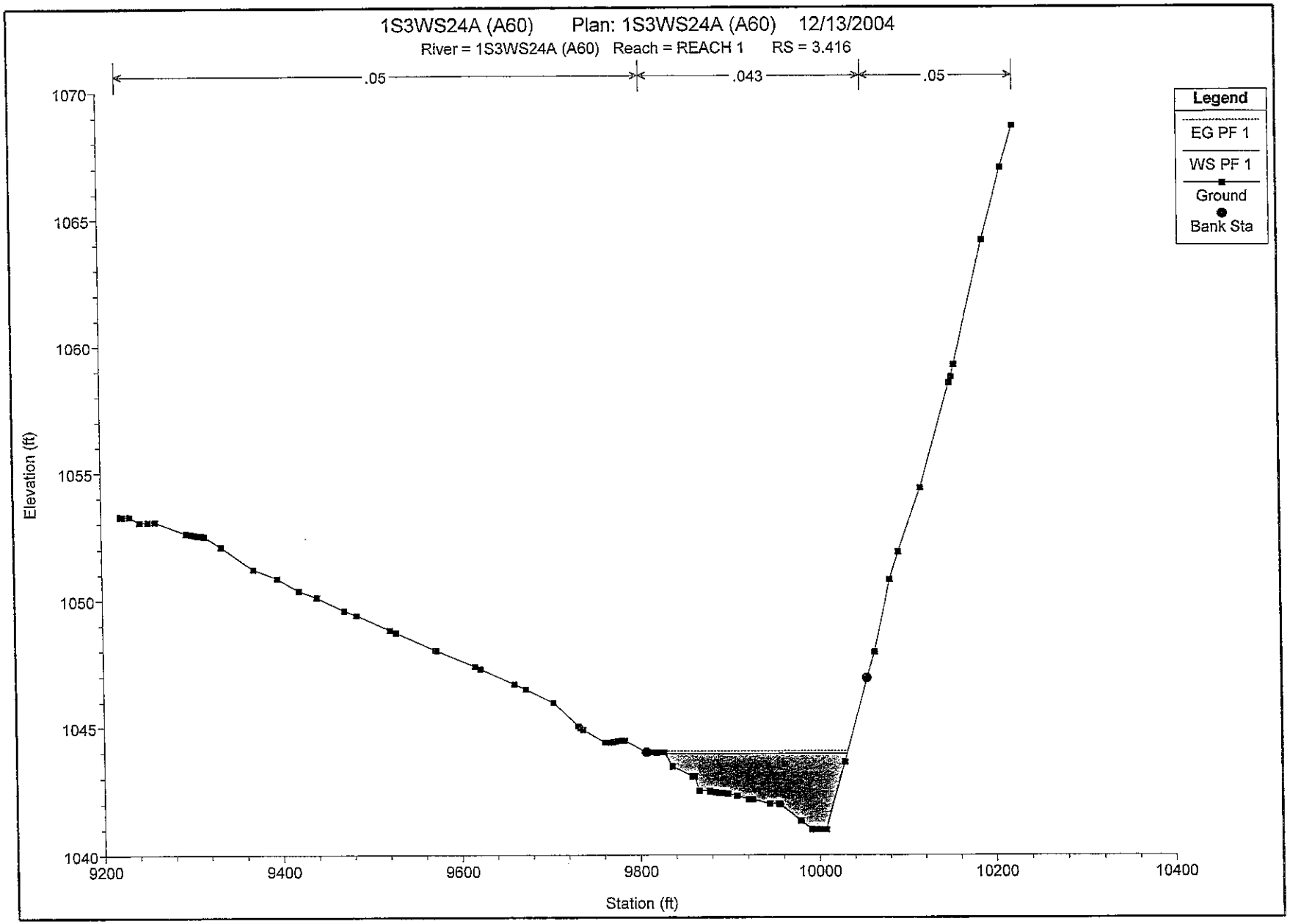

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 2.224
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1015
1010
1005
1000
995
990
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

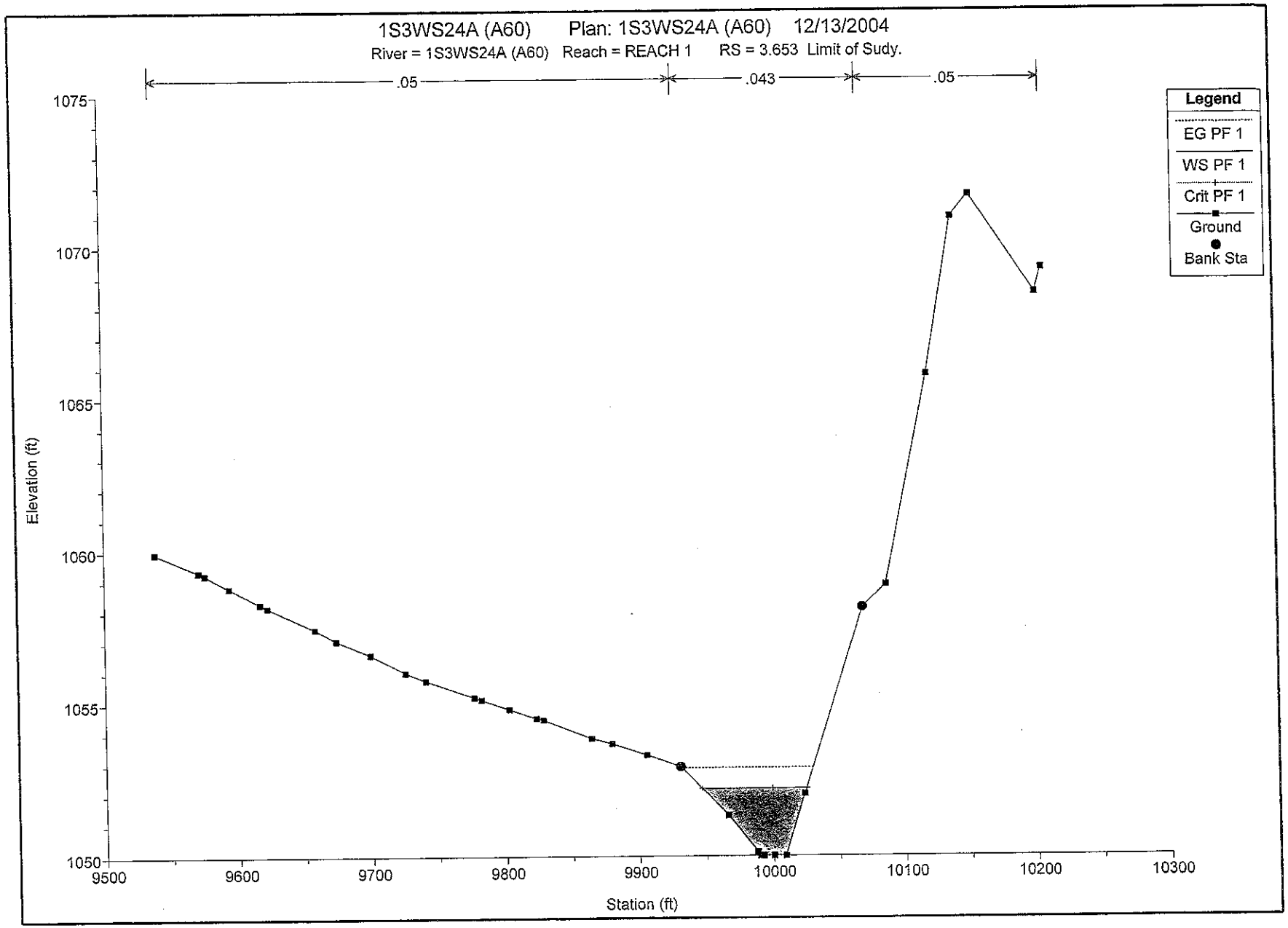

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 2.425
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1010
1008
1006
1004
1002
1000
998
996
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 2.672
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1030
1025
1020
1015
1010
1005
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 2.944
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1040
1035
1030
1025
1020
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 3.186
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1060
1055
1050
1045
1040
1035
1030
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 3.416
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1070
1065
1060
1055
1050
1045
1040
9200
9400
9600
9800
10000
10200
10400
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24A (A60) Reach = REACH 1 RS = 3.653 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1075
1070
1065
1060
1055
1050
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 1S3WS24A (A60)

REACH: 1S3WS24B (A59)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

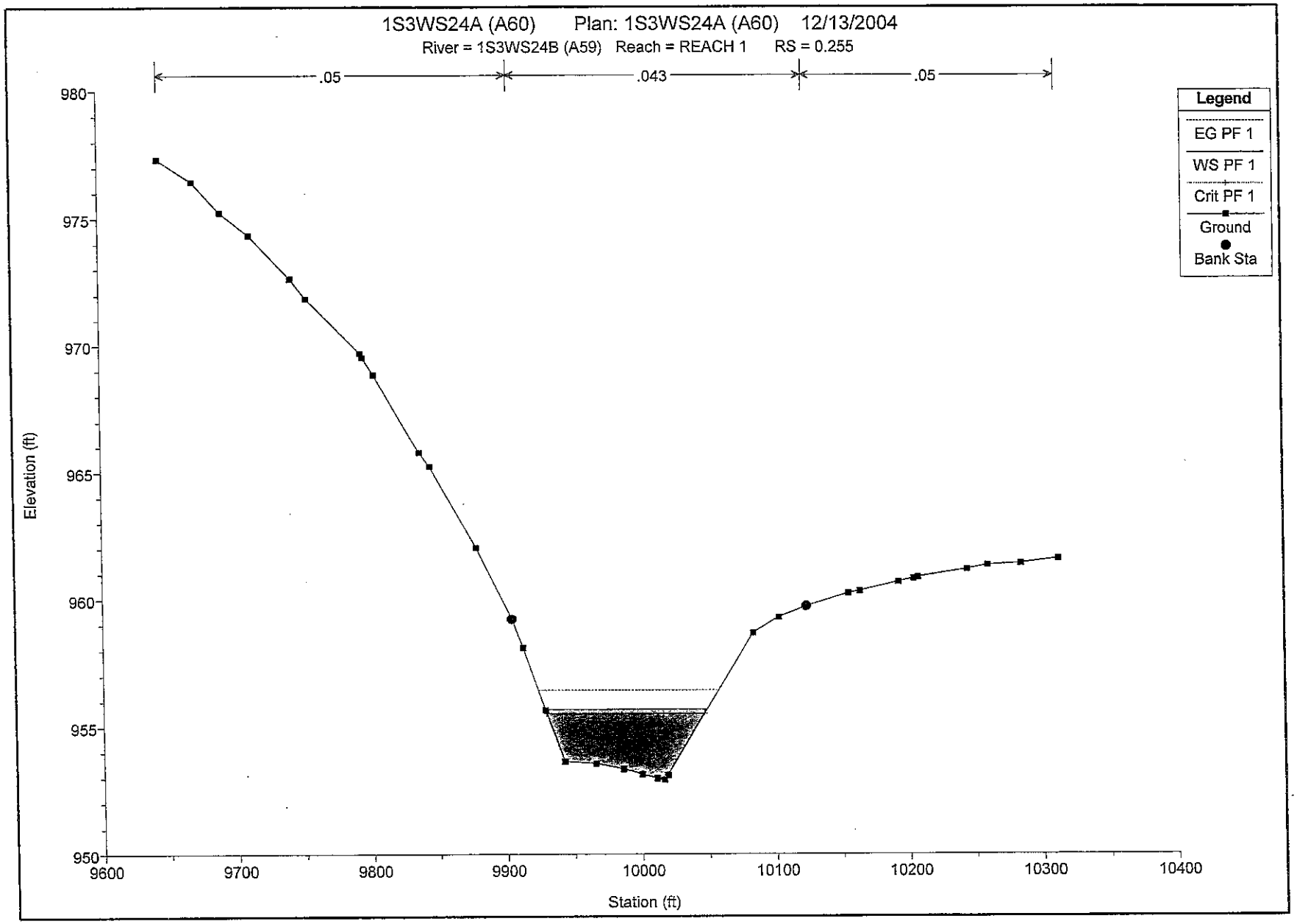
Wash ID: 1S3WS24B (A59)

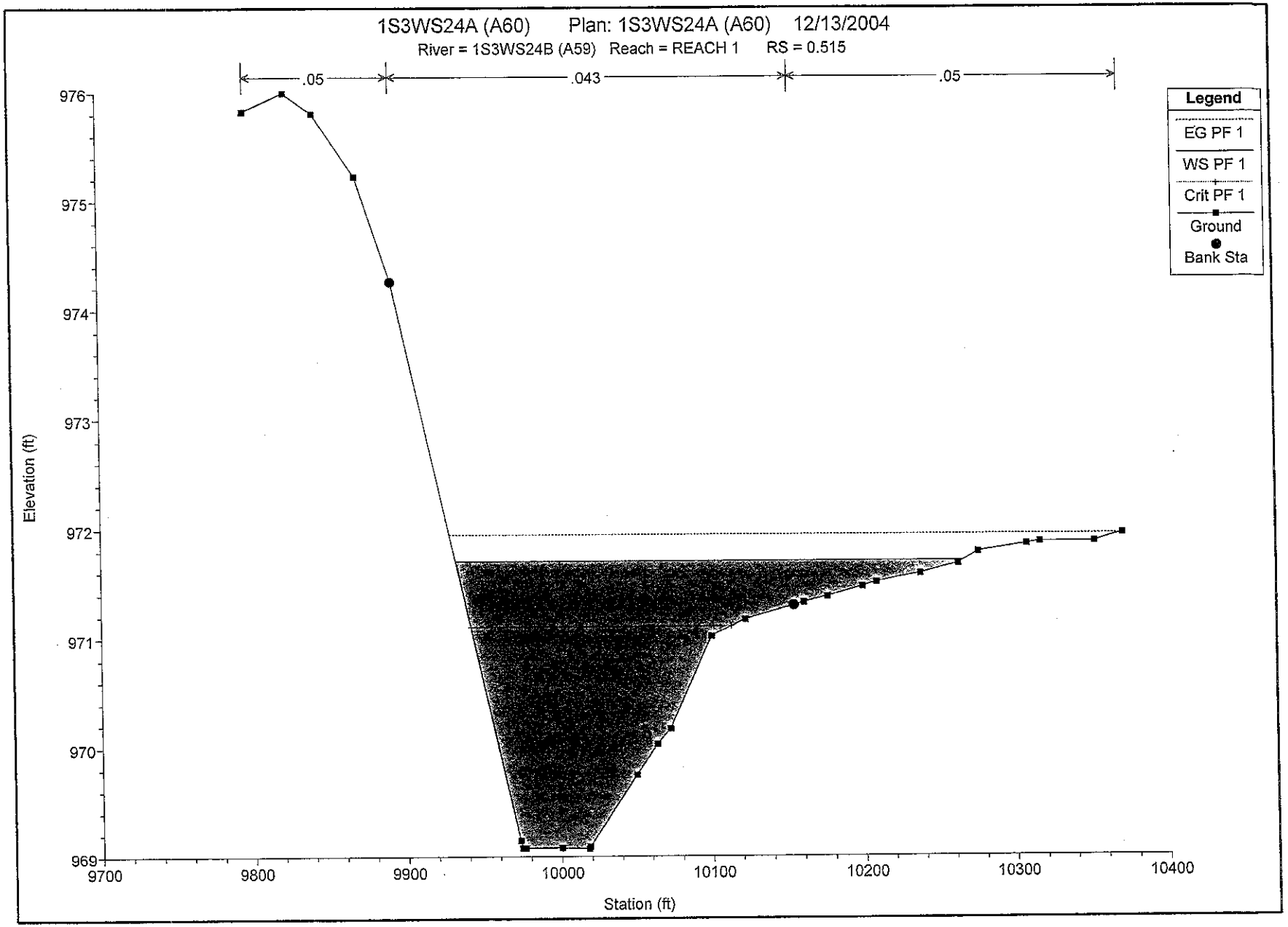
Subbasin: A59

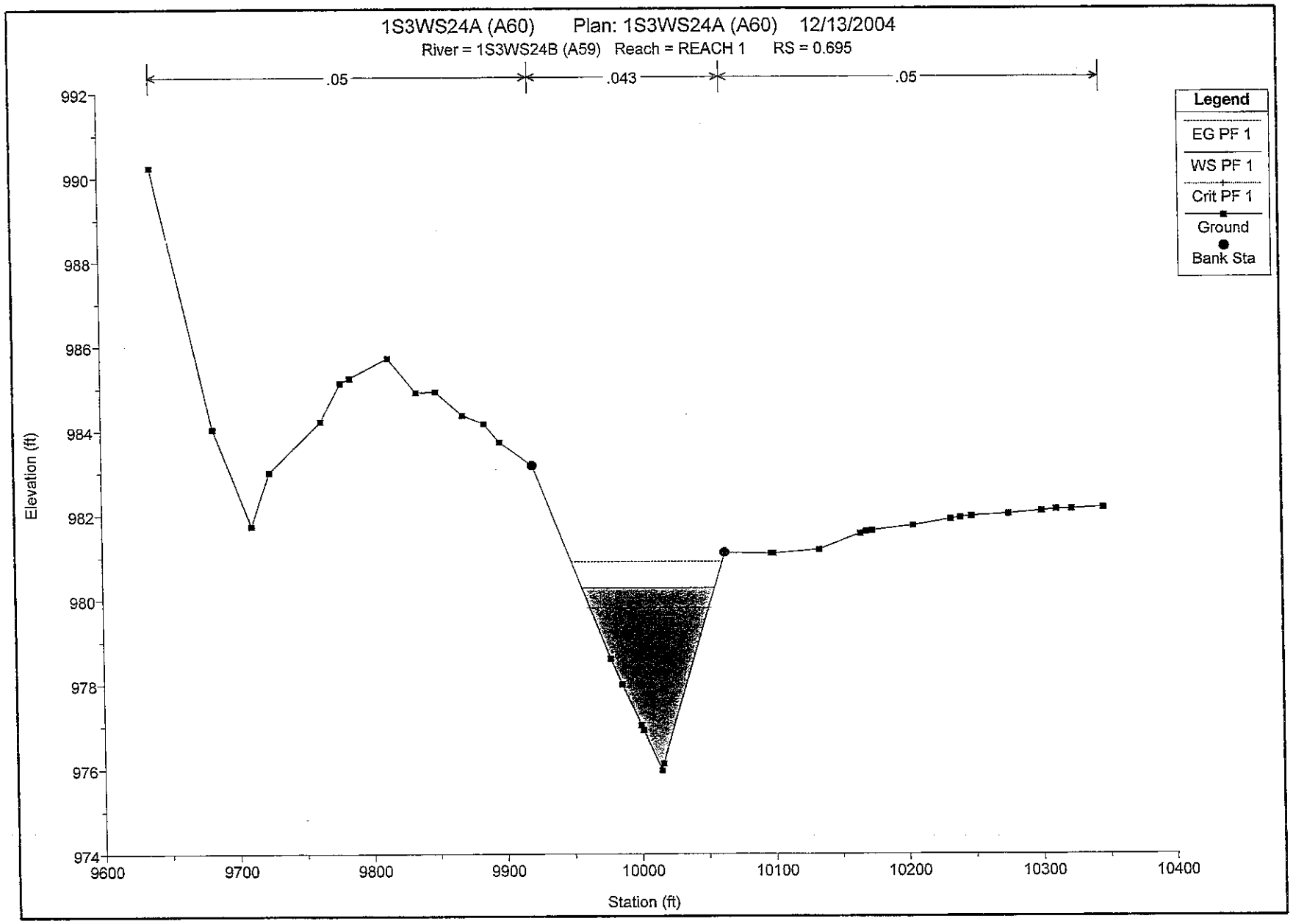
Total Discharge (cfs) = 1762

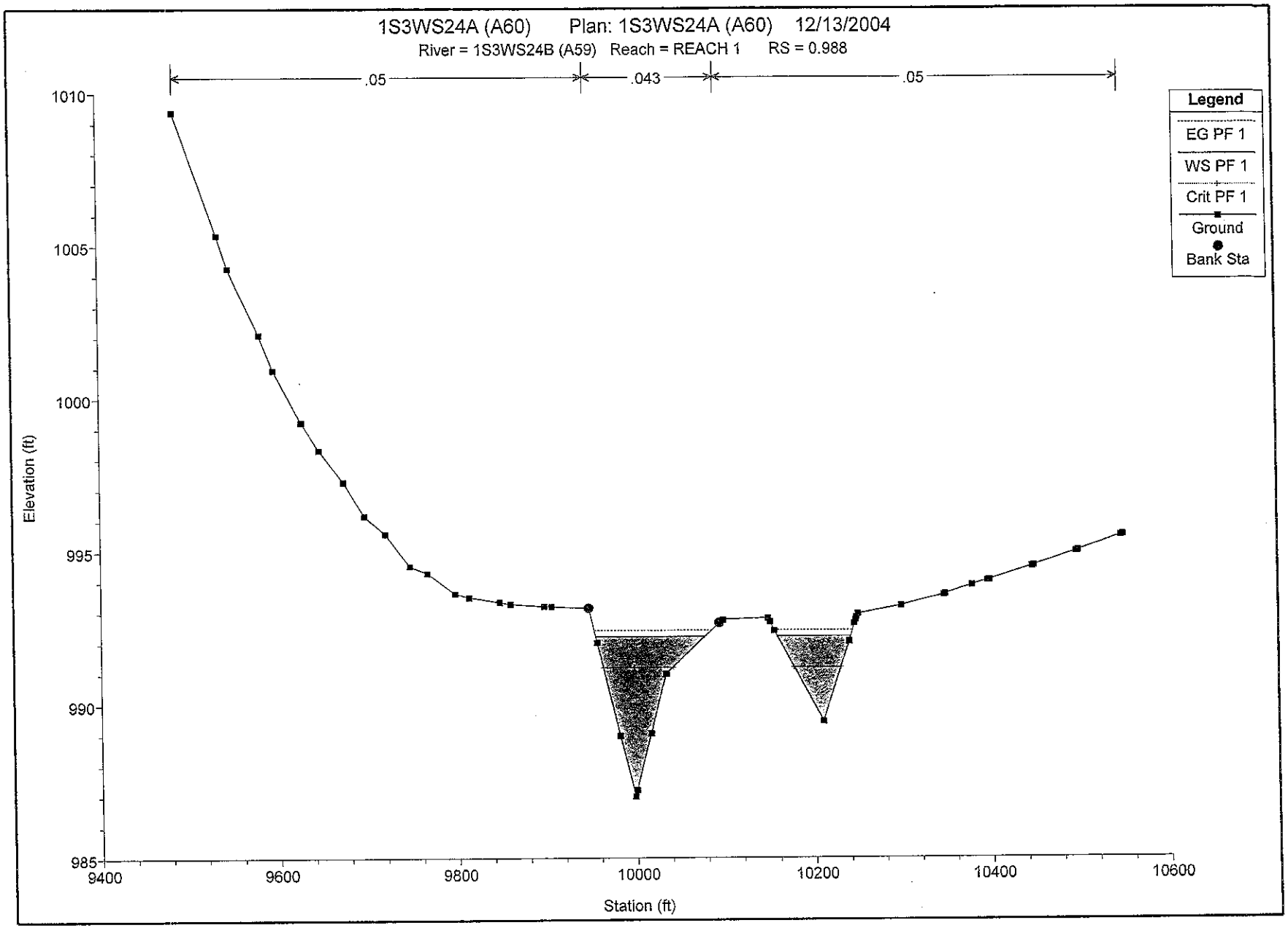
Total Area (acres) = 803

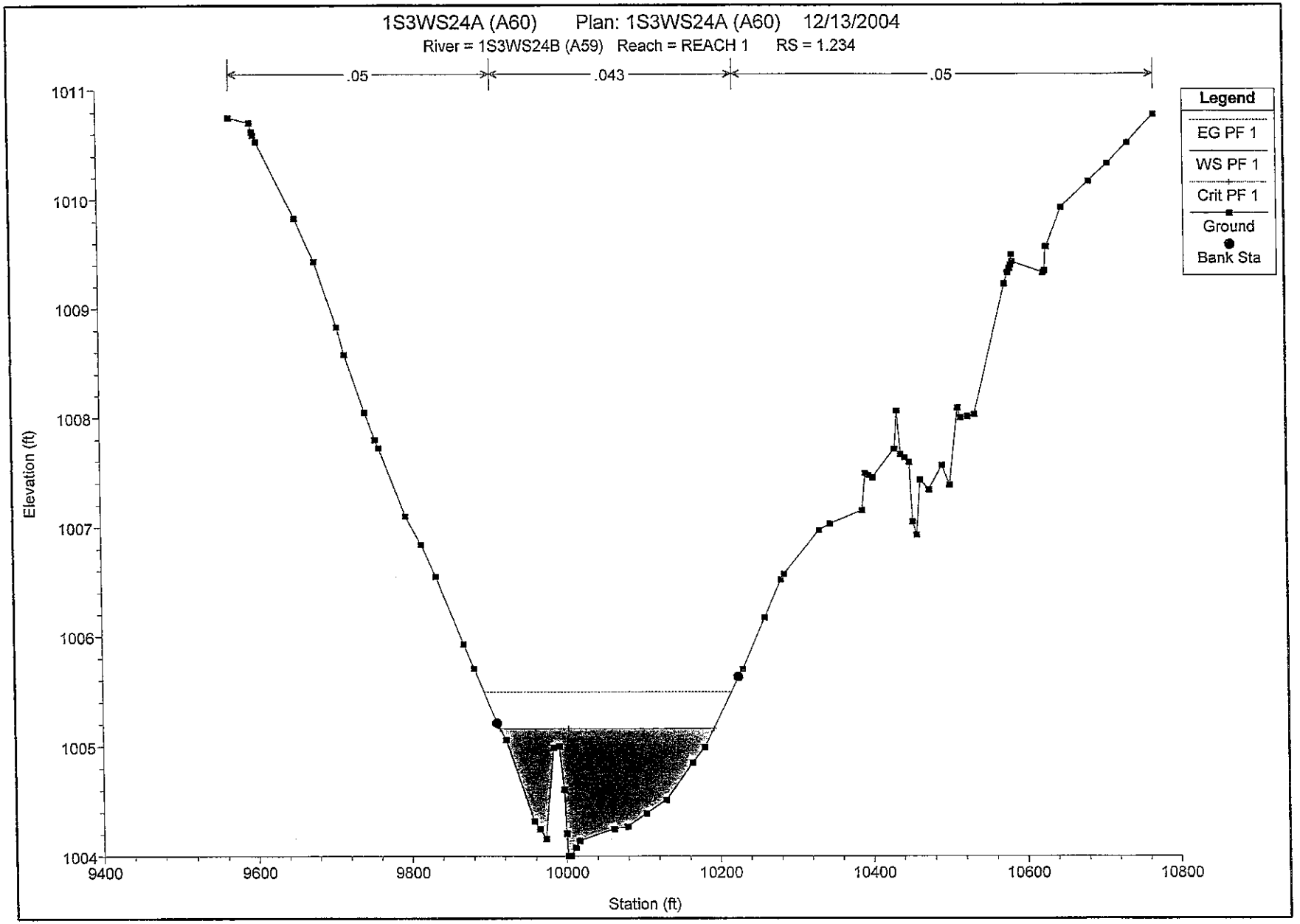
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.901	207	25.8	450
1.672	262	32.7	580
1.465	305	38.0	670
1.234	383	47.7	840
0.988	591	73.6	1300
0.695	623	77.6	1370
0.515	634	79.0	1390
0.255	738	91.9	1620

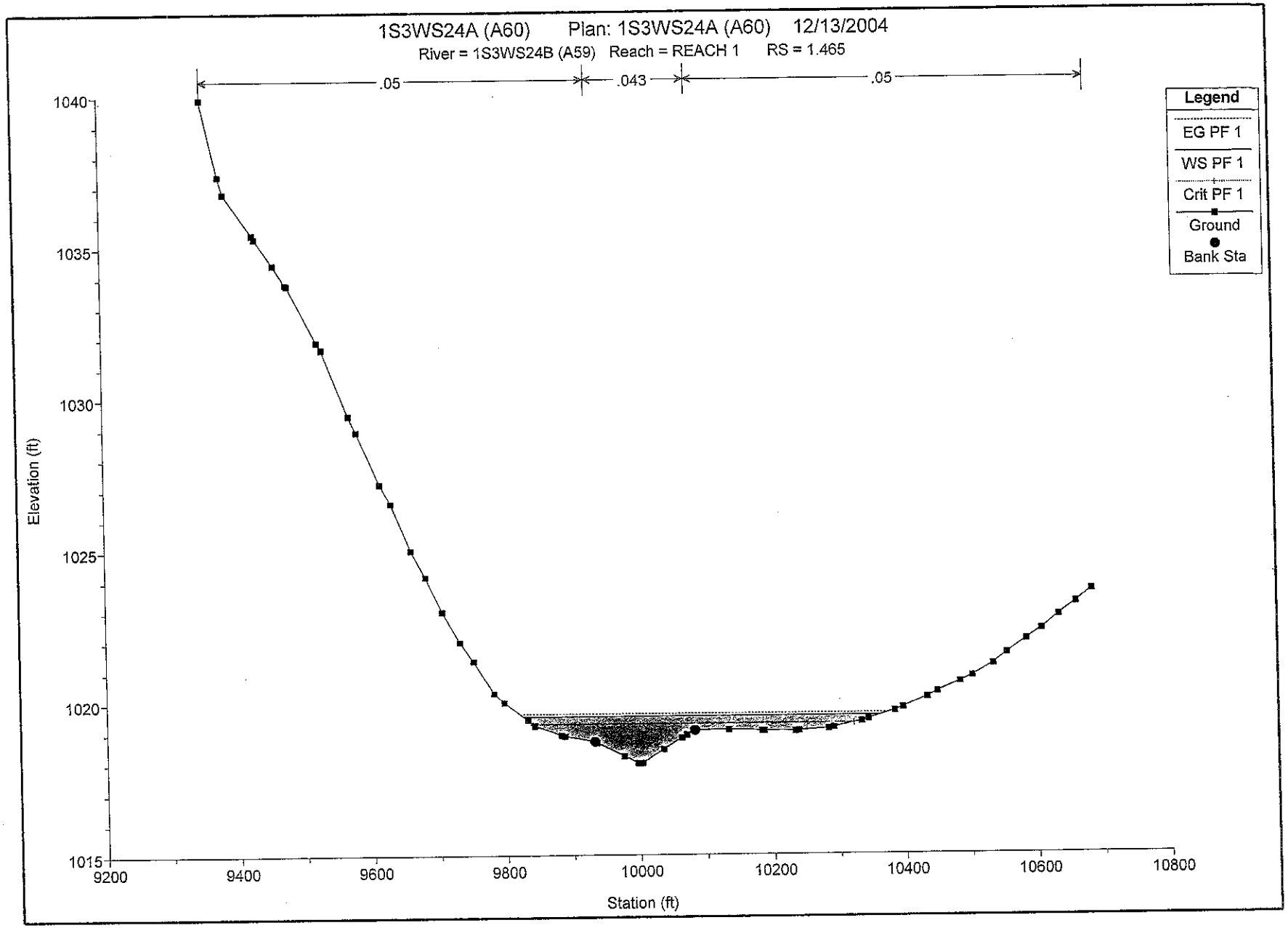

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 0.255
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
980
975
970
965
960
955
950
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

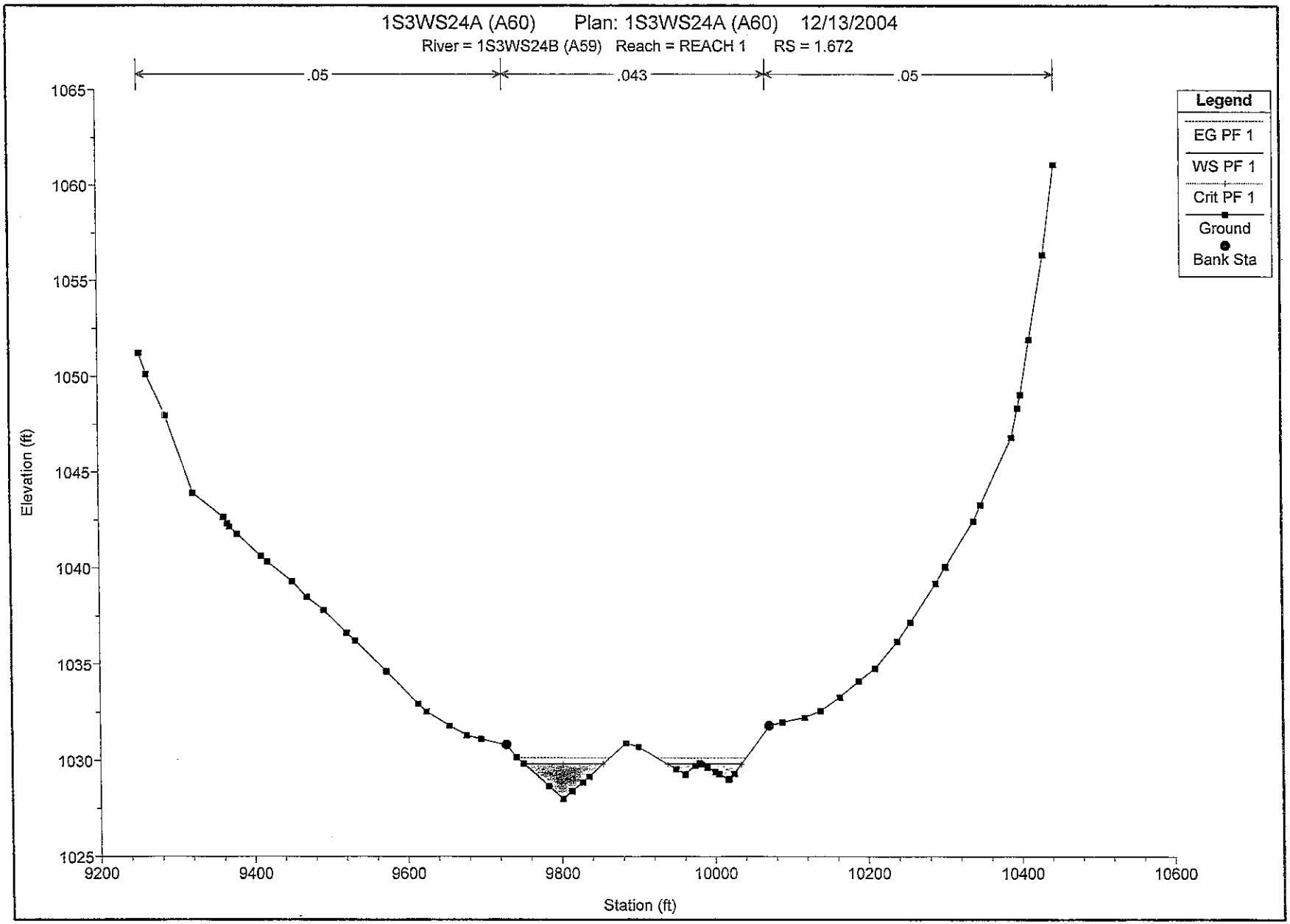

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 0.515
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
976
975
974
973
972
971
970
969
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

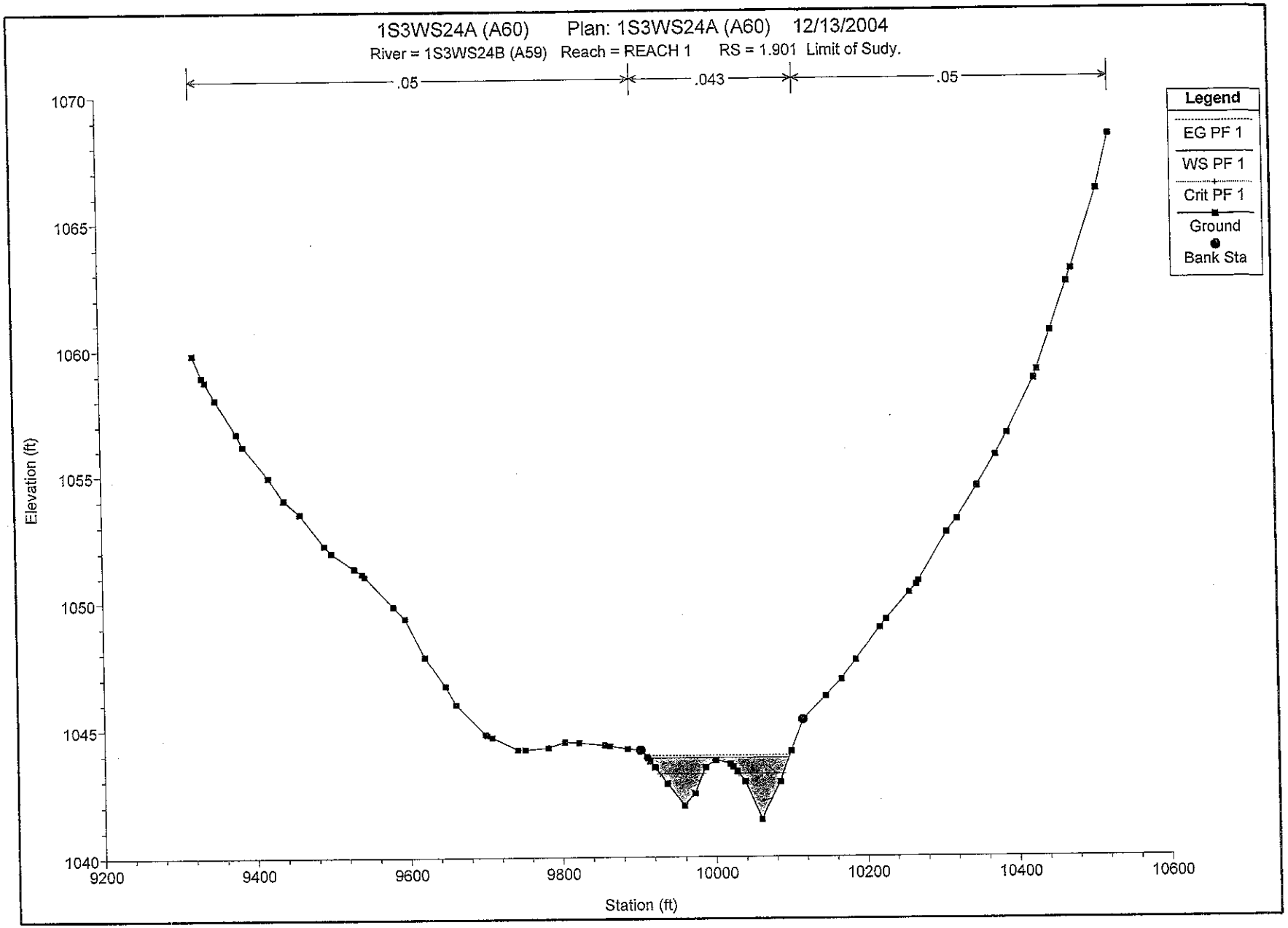

1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 0.695
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
992
990
988
986
984
982
980
978
976
974
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 0.988
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1010
1005
1000
995
990
985
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 1.234
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1011
1010
1009
1008
1007
1006
1005
1004
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 1.465
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1040
1035
1030
1025
1020
1015
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 1.672
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1065
1060
1055
1050
1045
1040
1035
1030
1025
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


1S3WS24A (A60) Plan: 1S3WS24A (A60) 12/13/2004
River = 1S3WS24B (A59) Reach = REACH 1 RS = 1.901 Limit of Sudy.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1070
1065
1060
1055
1050
1045
1040
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 2S1WS31 (B46)

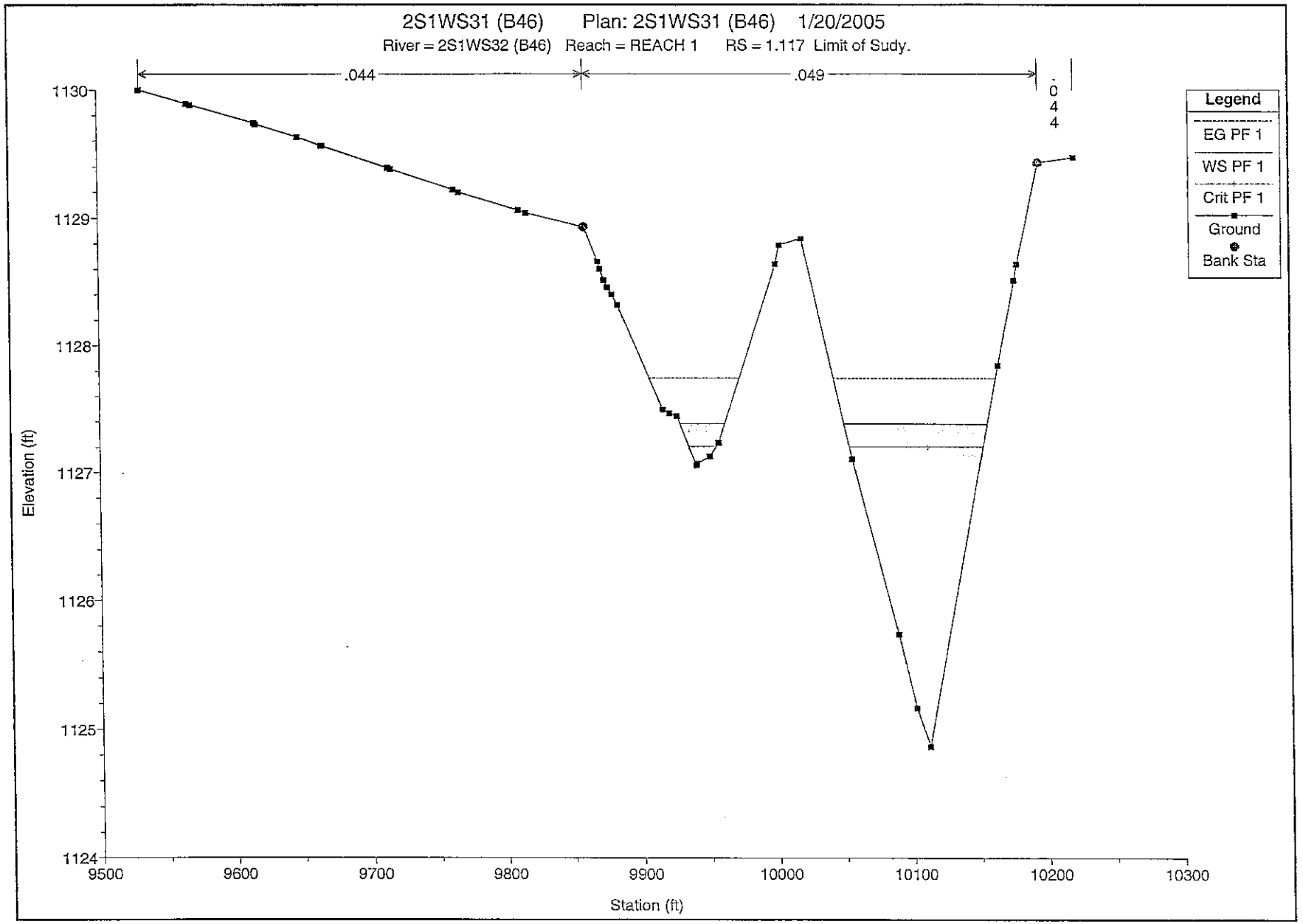
REACH: 2S1WS31 (B46)

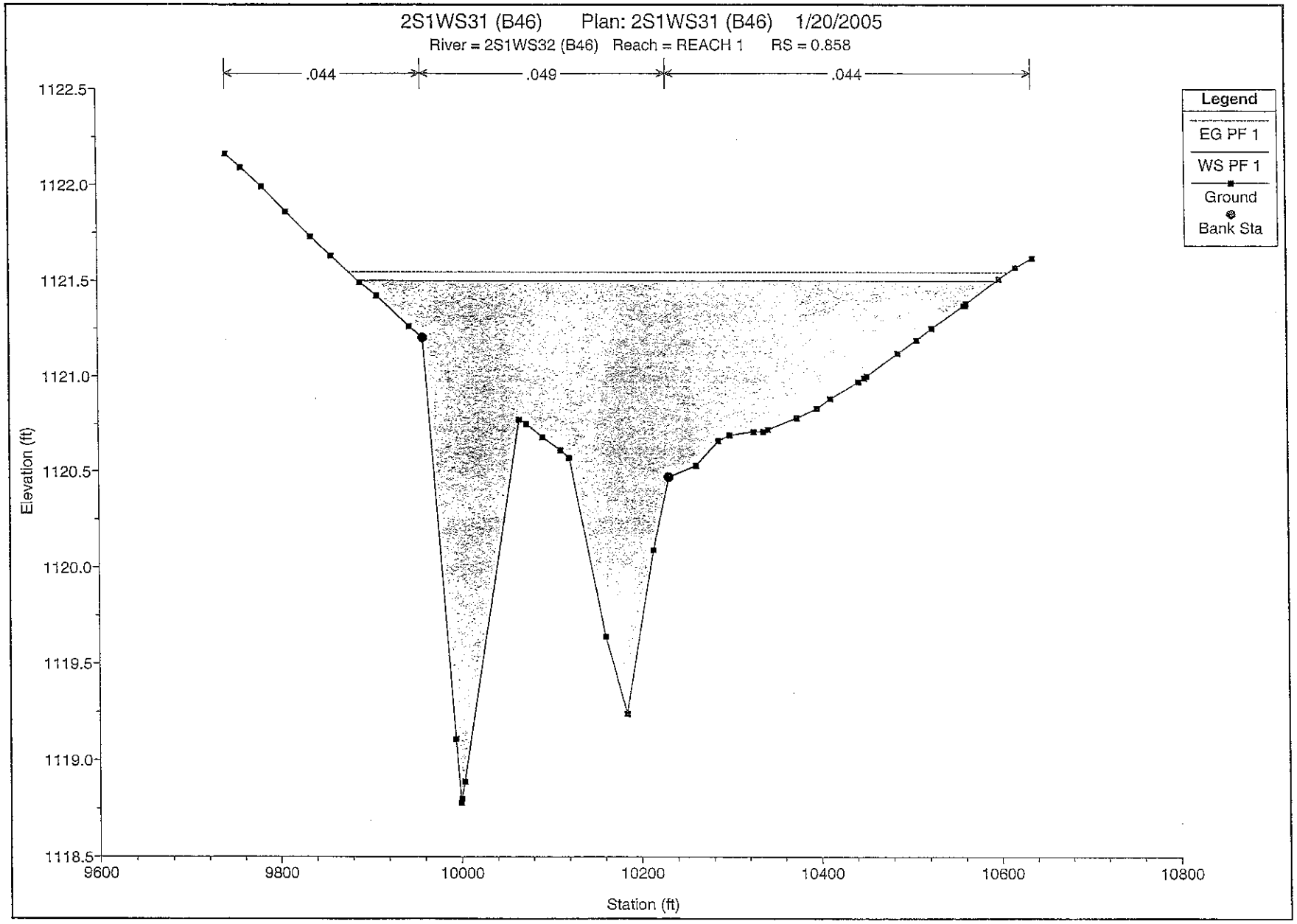
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

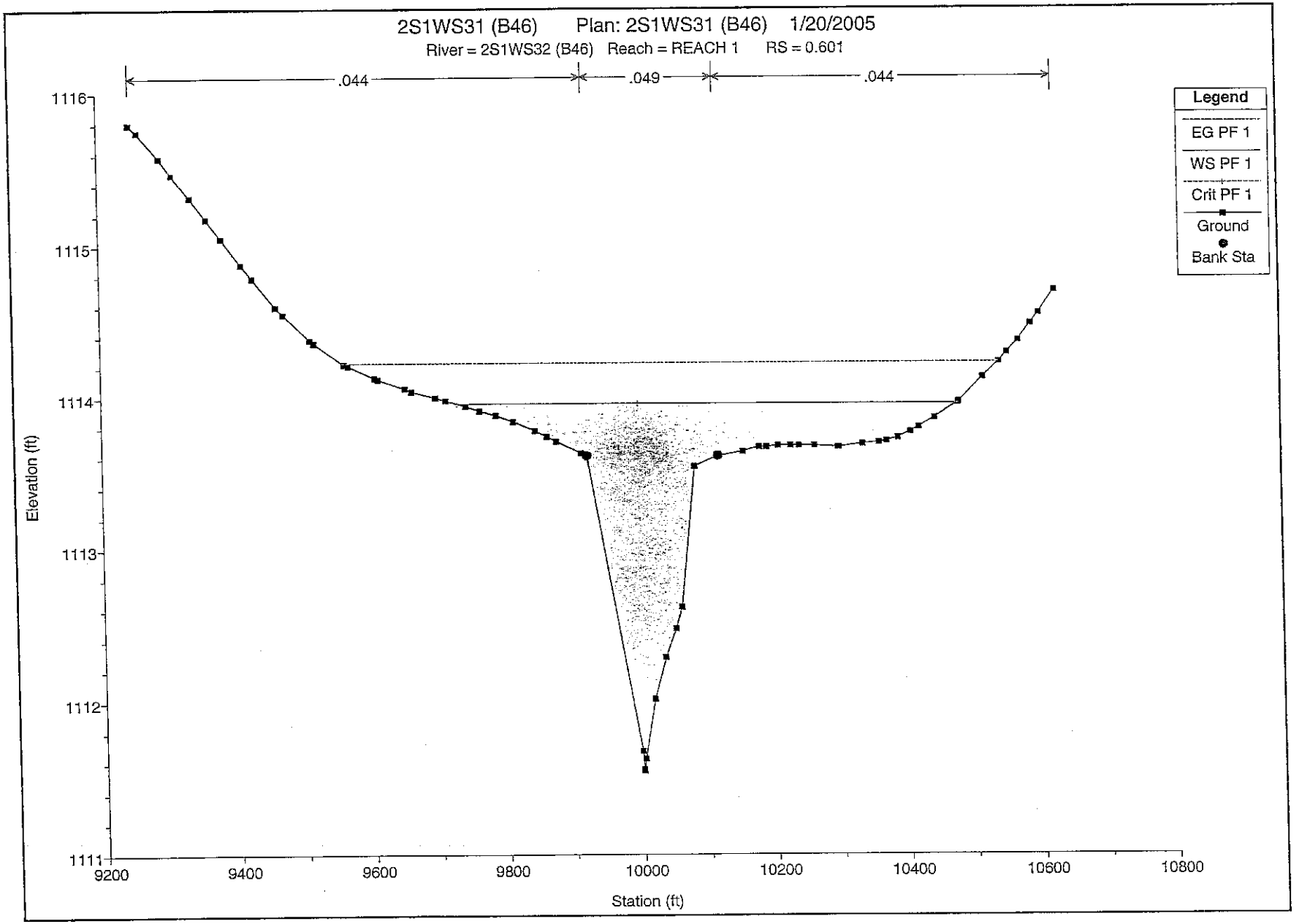
Change in Discharge based on Reach Length

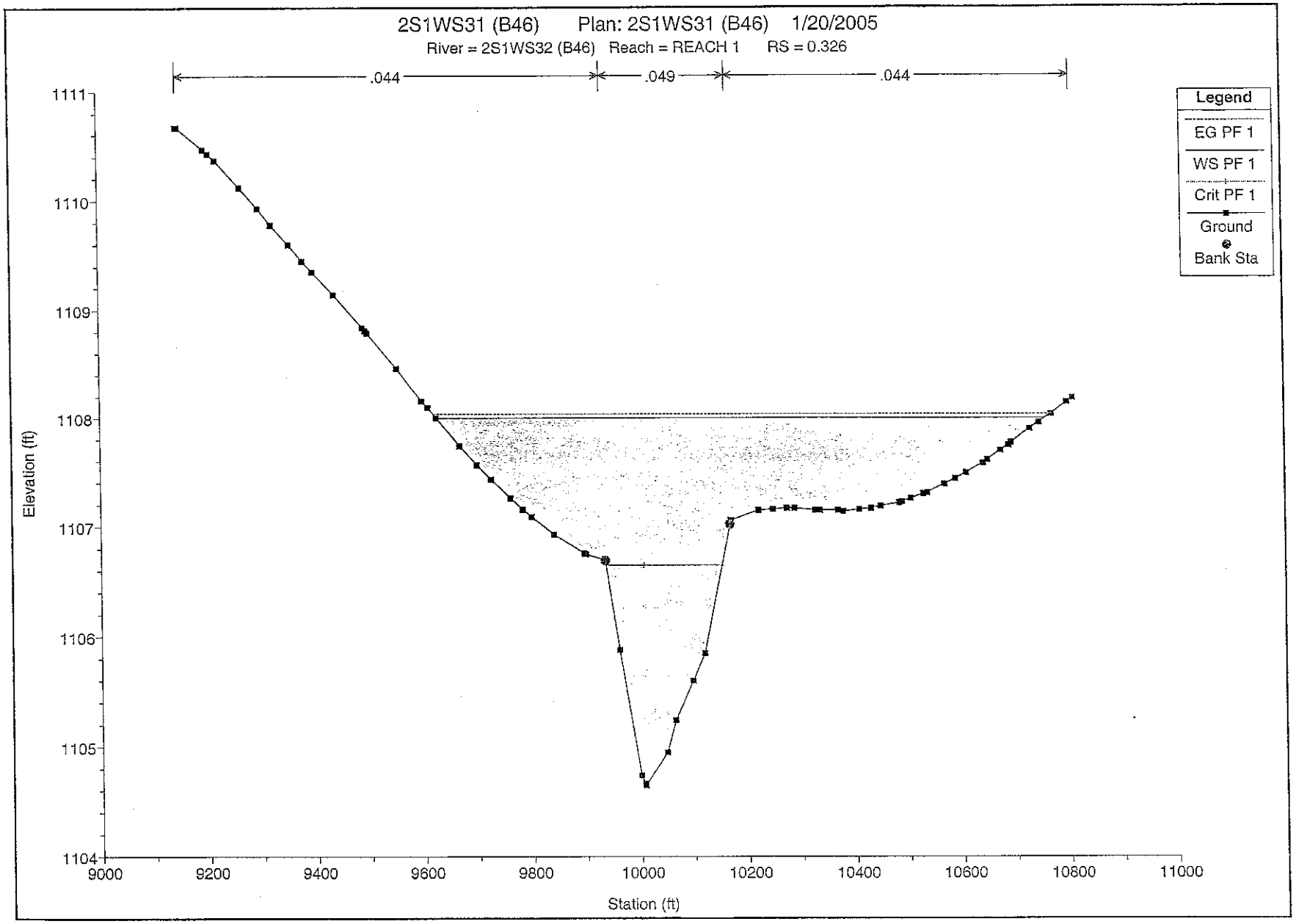
Wash ID: 2S1WS31 (B46)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPB41	1.117	687	690	700
B46	0.858	977	980	1000
B46	0.601	1266	1270	1300
CPB46	0.326	1574	1570	1600


2S1WS31 (B46) Plan: 2S1WS31 (B46) 1/20/2005
River = 2S1WS32 (B46) Reach = REACH 1 RS = 1.117 Limit of Sudy.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1130
1129
1128
1127
1126
1125
1124
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S1WS31 (B46) Plan: 2S1WS31 (B46) 1/20/2005
River = 2S1WS32 (B46) Reach = REACH 1 RS = 0.858
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1122.5
1122.0
1121.5
1121.0
1120.5
1120.0
1119.5
1119.0
1118.5
9600
9800
10000
10200
10400
10600
10800
Station (ft)


2S1WS31 (B46) Plan: 2S1WS31 (B46) 1/20/2005
River = 2S1WS32 (B46) Reach = REACH 1 RS = 0.601
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1116
1115
1114
1113
1112
1111
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


2S1WS31 (B46) Plan: 2S1WS31 (B46) 1/20/2005
River = 2S1WS32 (B46) Reach = REACH 1 RS = 0.326
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1111
1110
1109
1108
1107
1106
1105
1104
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

MODEL: 2S2WS15 (A37)

REACH: 2S2WS15 (A37)

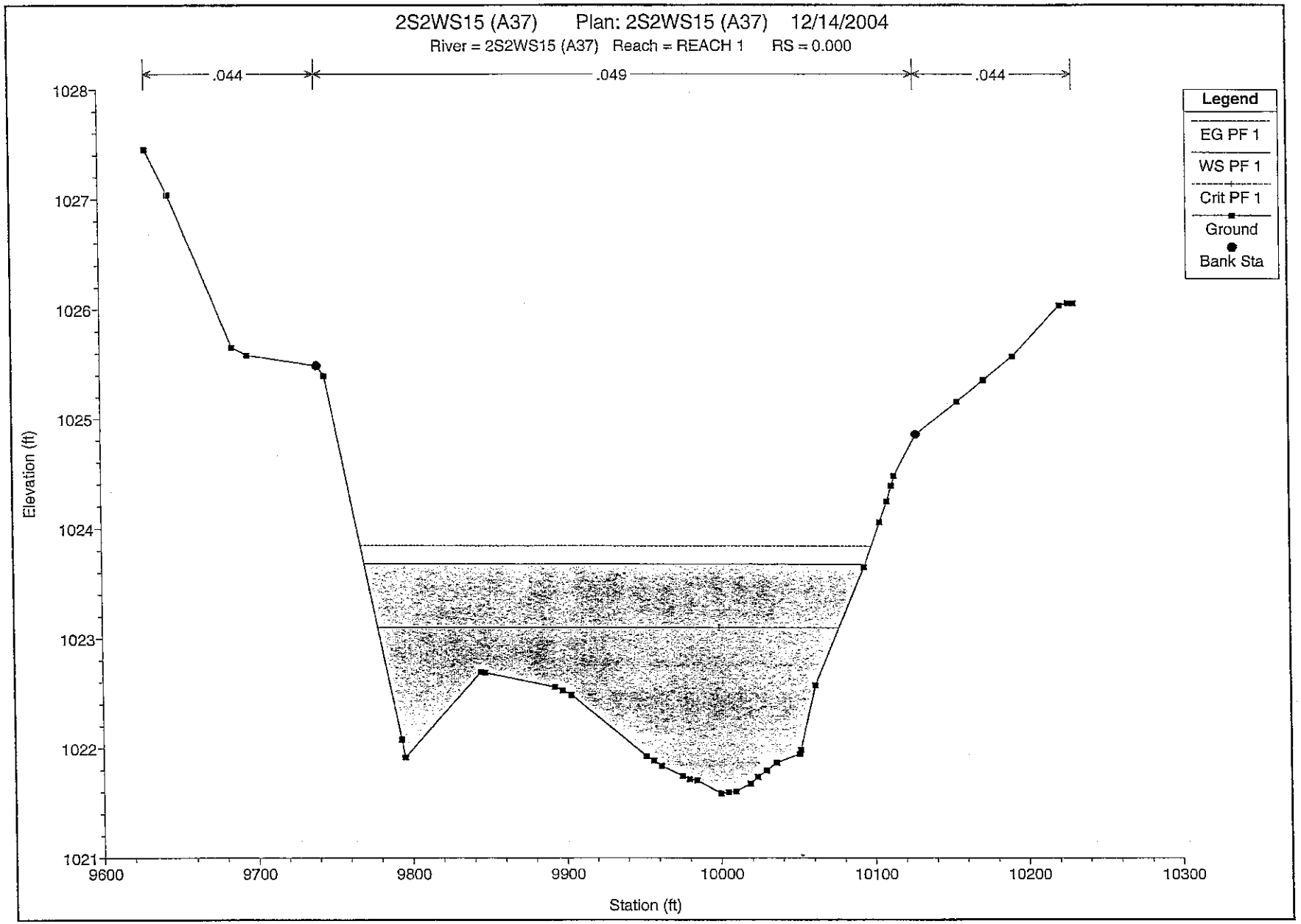
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

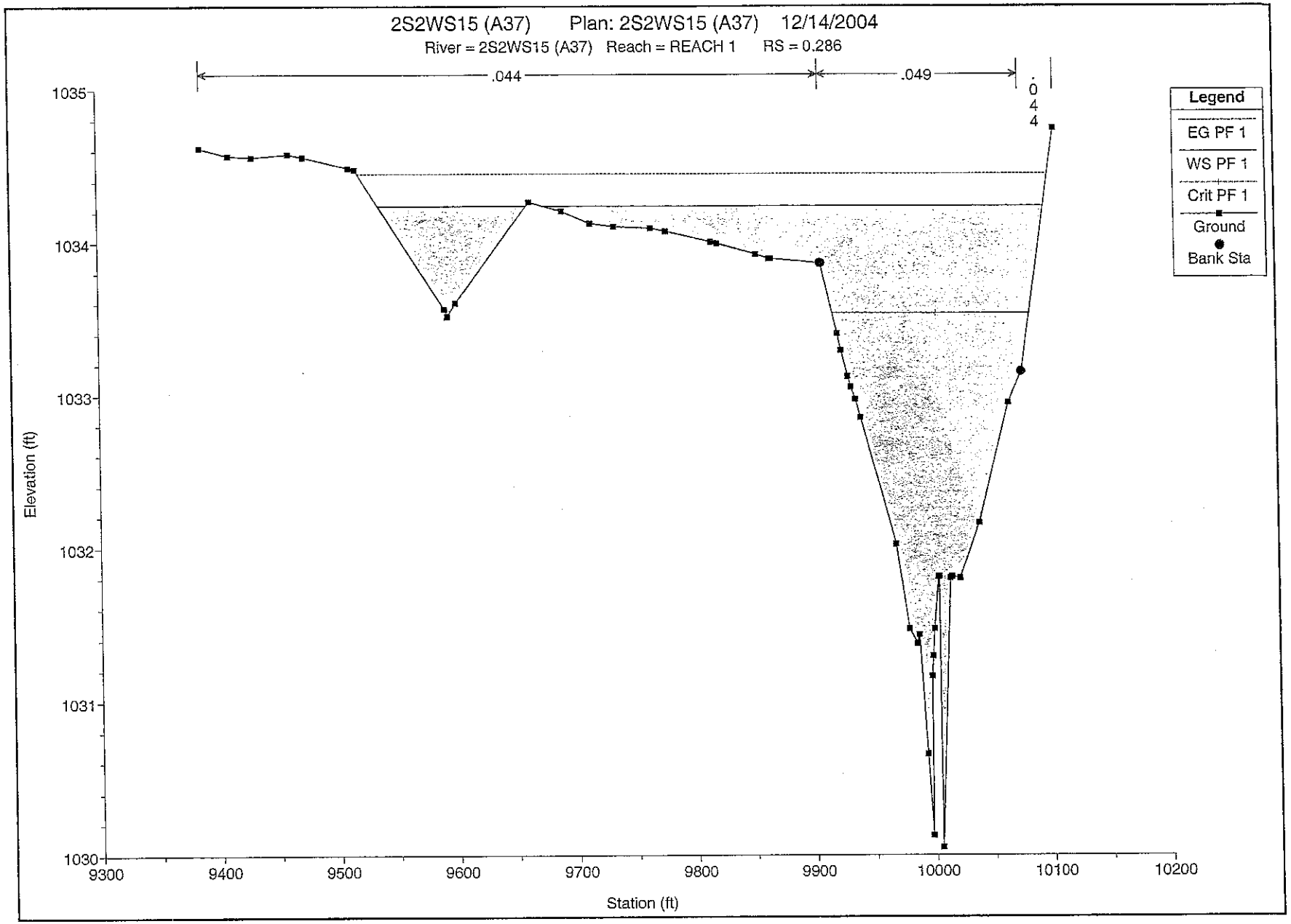
Change in Discharge based on Reach Length

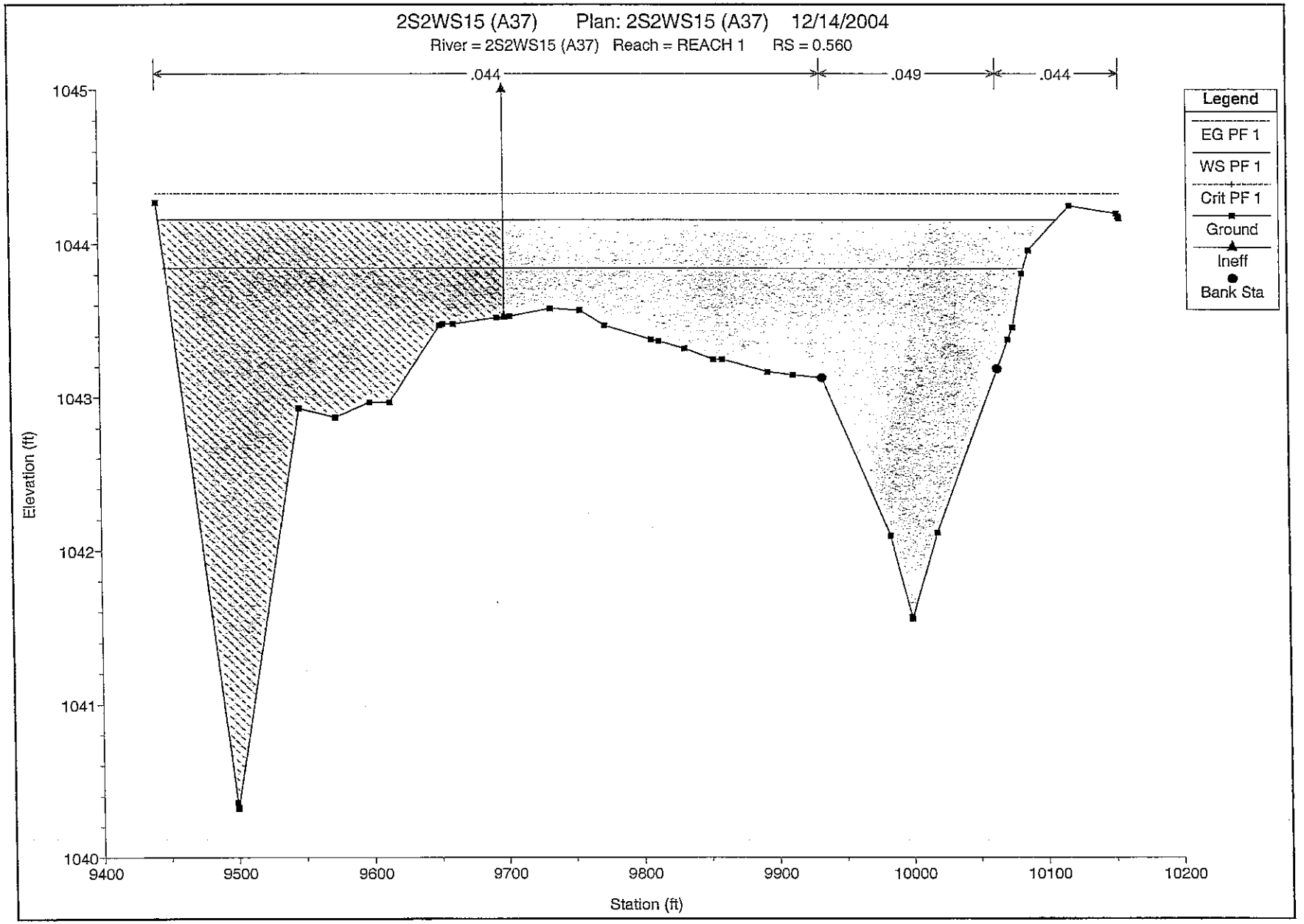
Wash ID: 2S2WS15 (A37)

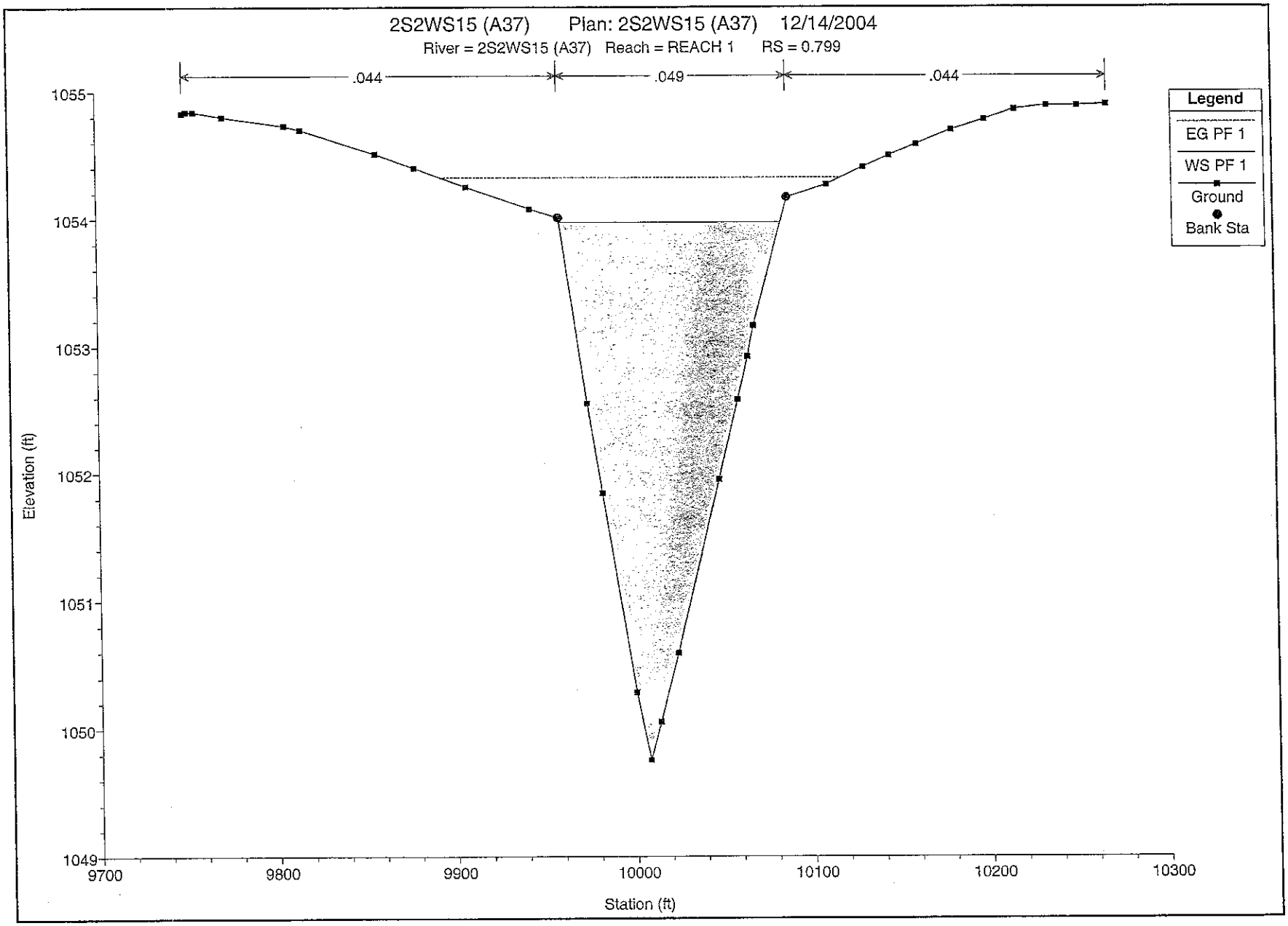
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
A11	5.019	984	980	1000
A11	4.775	1033	1030	1000
A11	4.444	1099	1100	1100
A11	4.151	1158	1160	1200
A11	3.934	1201	1200	1200
A11	3.680	1252	1250	1300
A11	3.418	1304	1300	1300
CPA11	3.145	1359	1360	1400
A14	2.877	1294	1290	1300
A14	2.616	1231	1230	1200
A14	2.322	1159	1160	1200
A14	2.097	1105	1100	1100
CPA14	1.867	1049	1050	1000
A37	1.617	1103	1100	1100
A37	1.379	1155	1160	1200
A37	1.054	1226	1230	1200
A37	0.799	1282	1280	1300
A37	0.560	1334	1330	1300
A37	0.286	1394	1390	1400
CPA37	0.000	1456	1460	1500

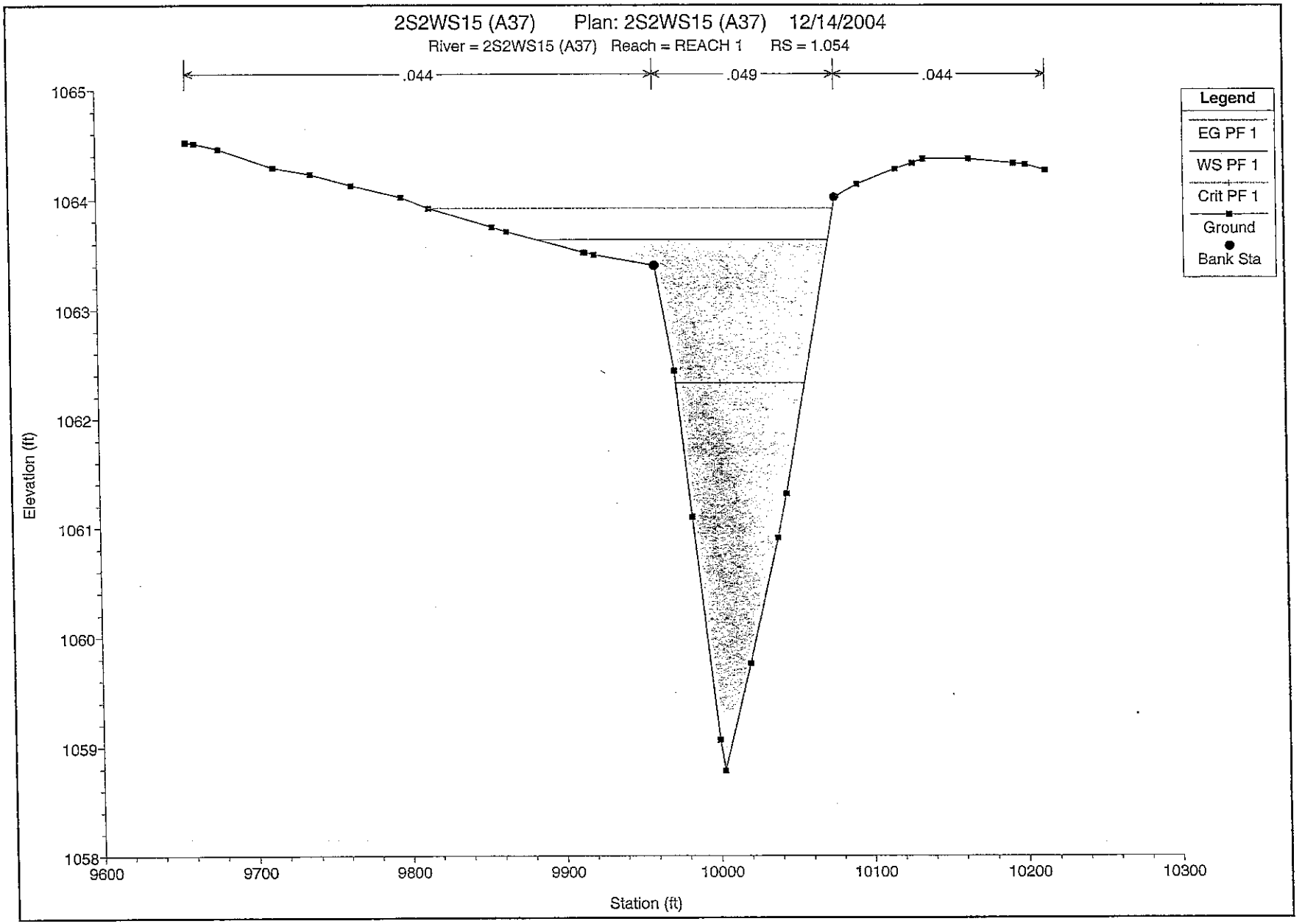
Initial discharge is DA02B from divert at CPA02

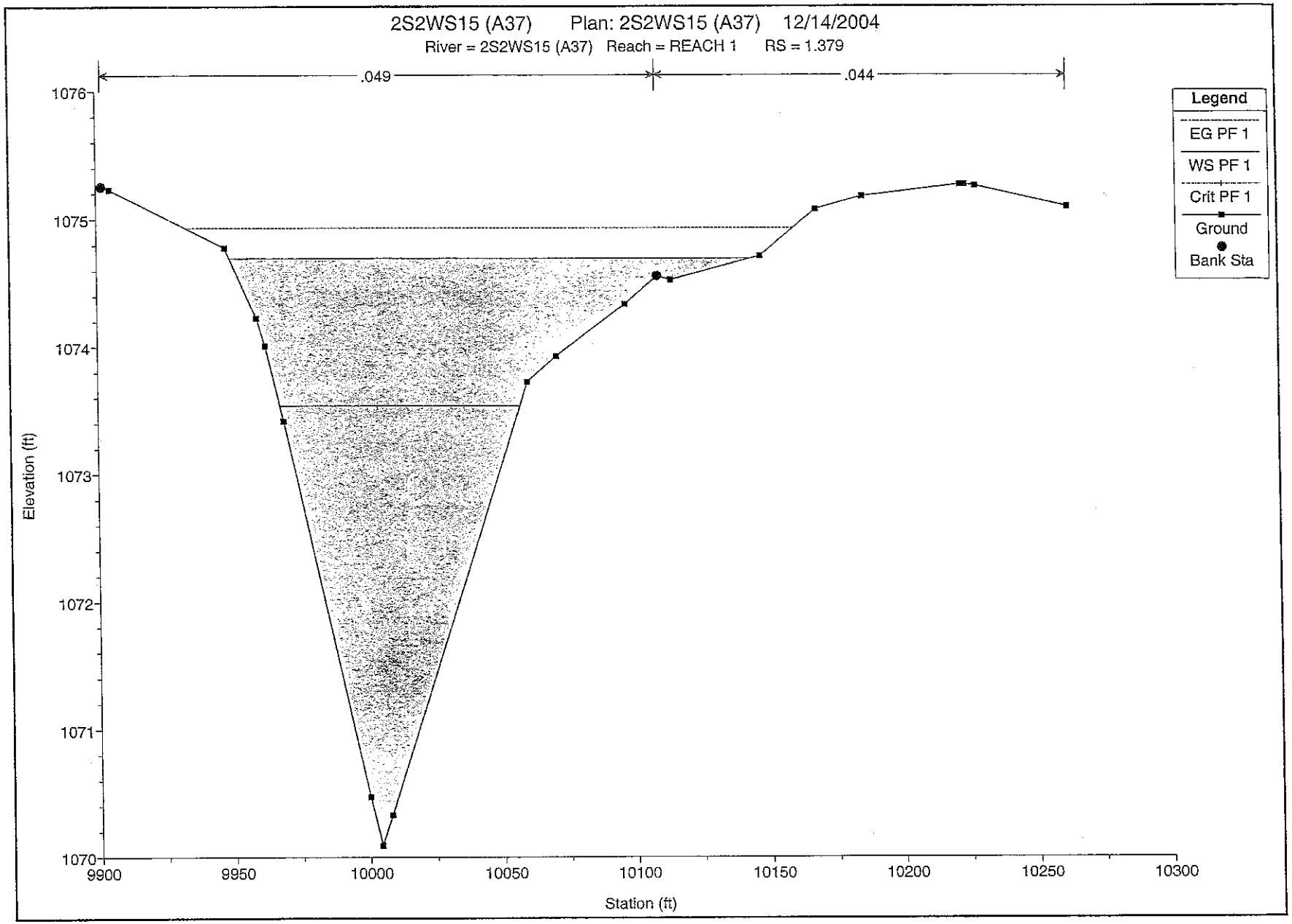

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1028
1027
1026
1025
1024
1023
1022
1021
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

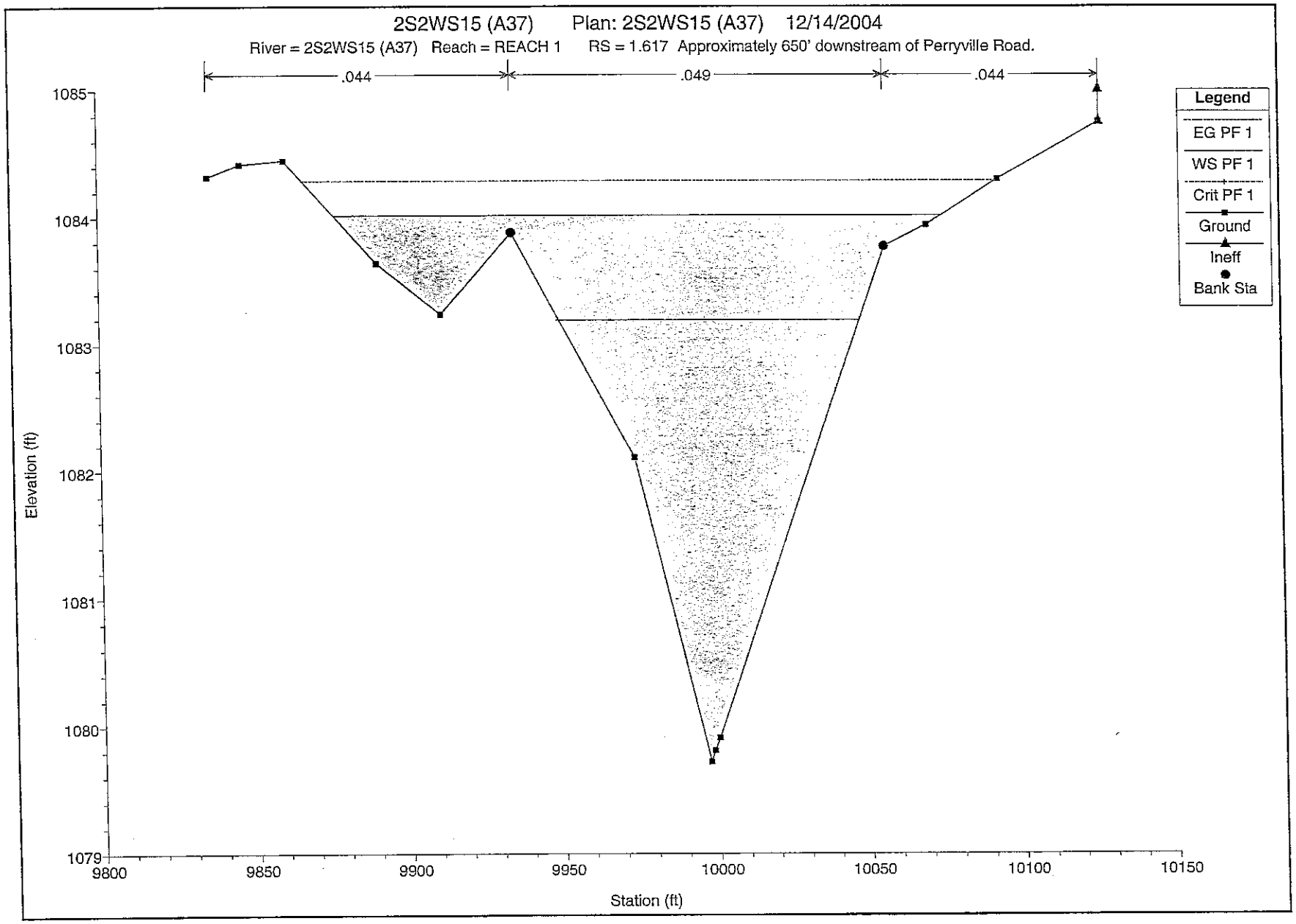

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 0.286
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1035
1034
1033
1032
1031
1030
9300
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

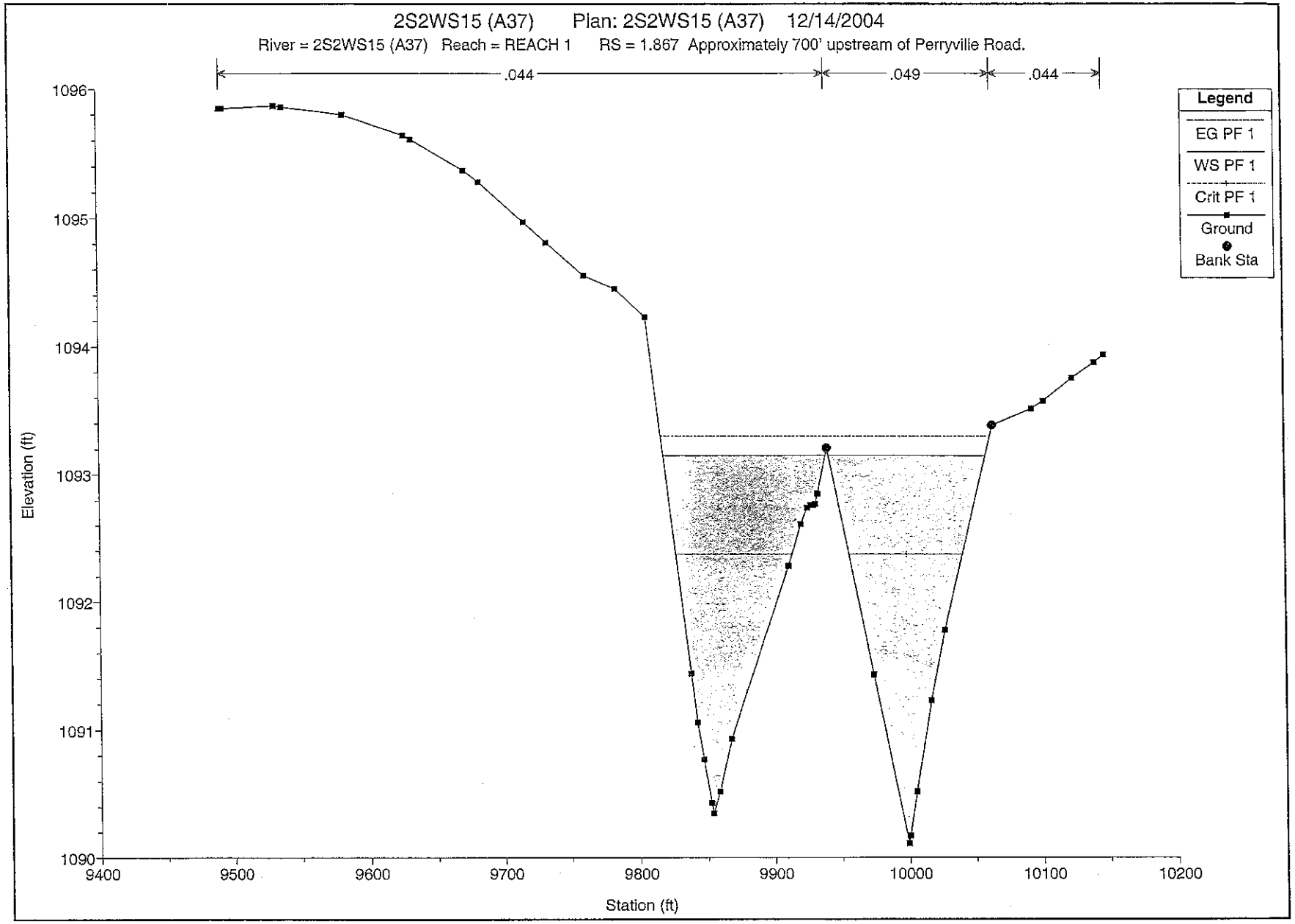

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 0.560
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1045
1044
1043
1042
1041
1040
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

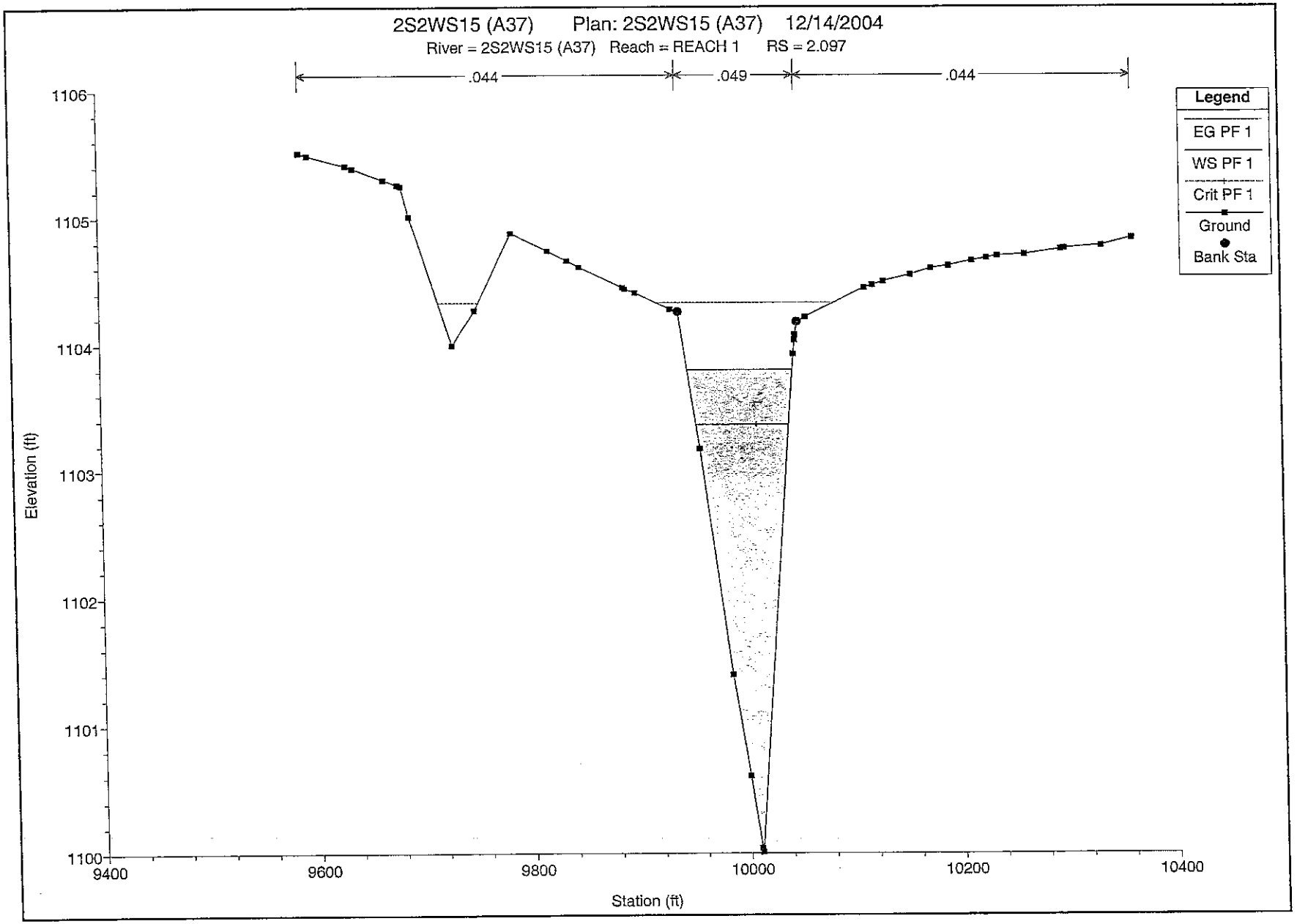

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 0.799
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1055
1054
1053
1052
1051
1050
1049
9700
9800
9900
10000
10100
10200
10300
Station (ft)

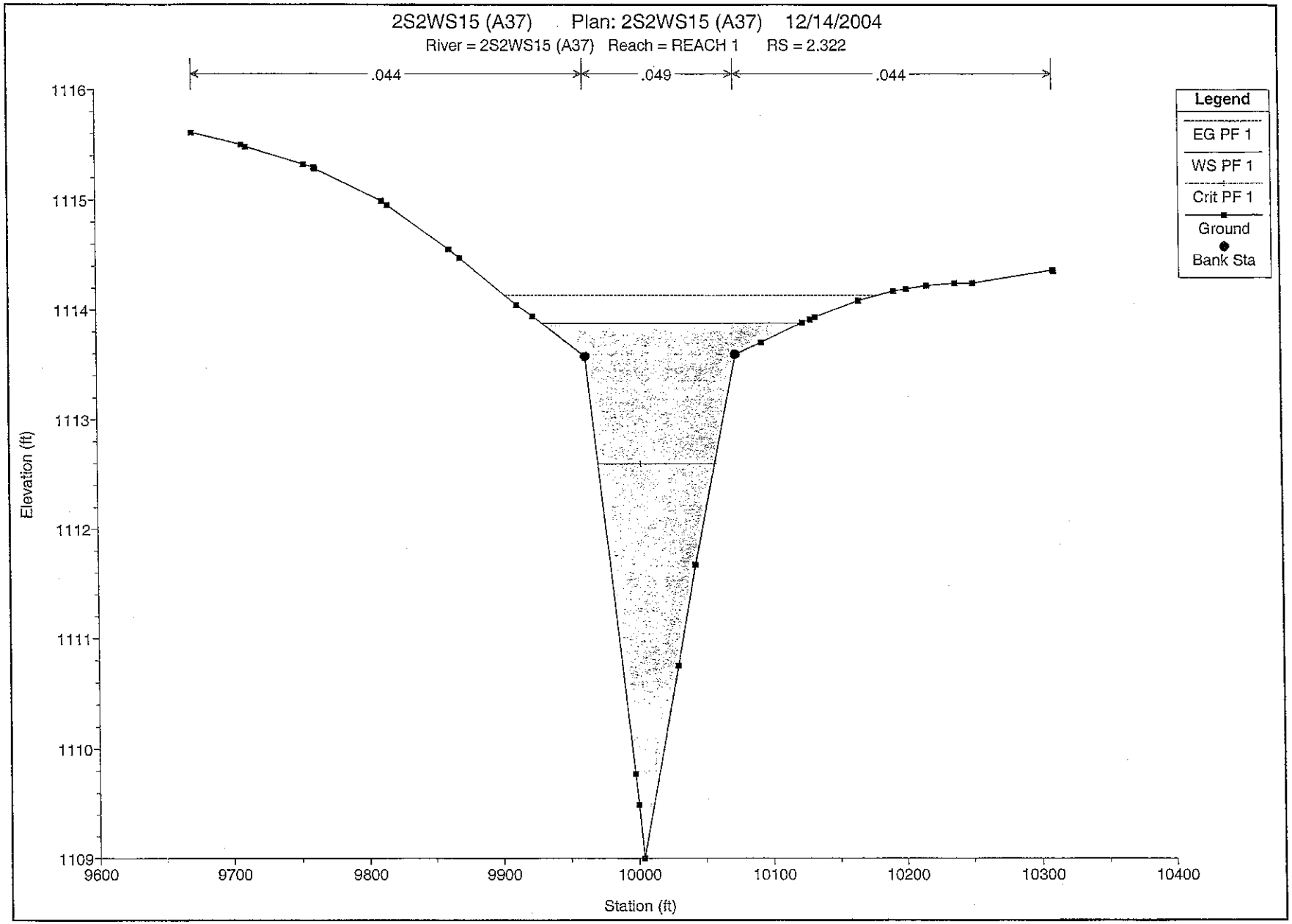

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 1.054
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1065
1064
1063
1062
1061
1060
1059
1058
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

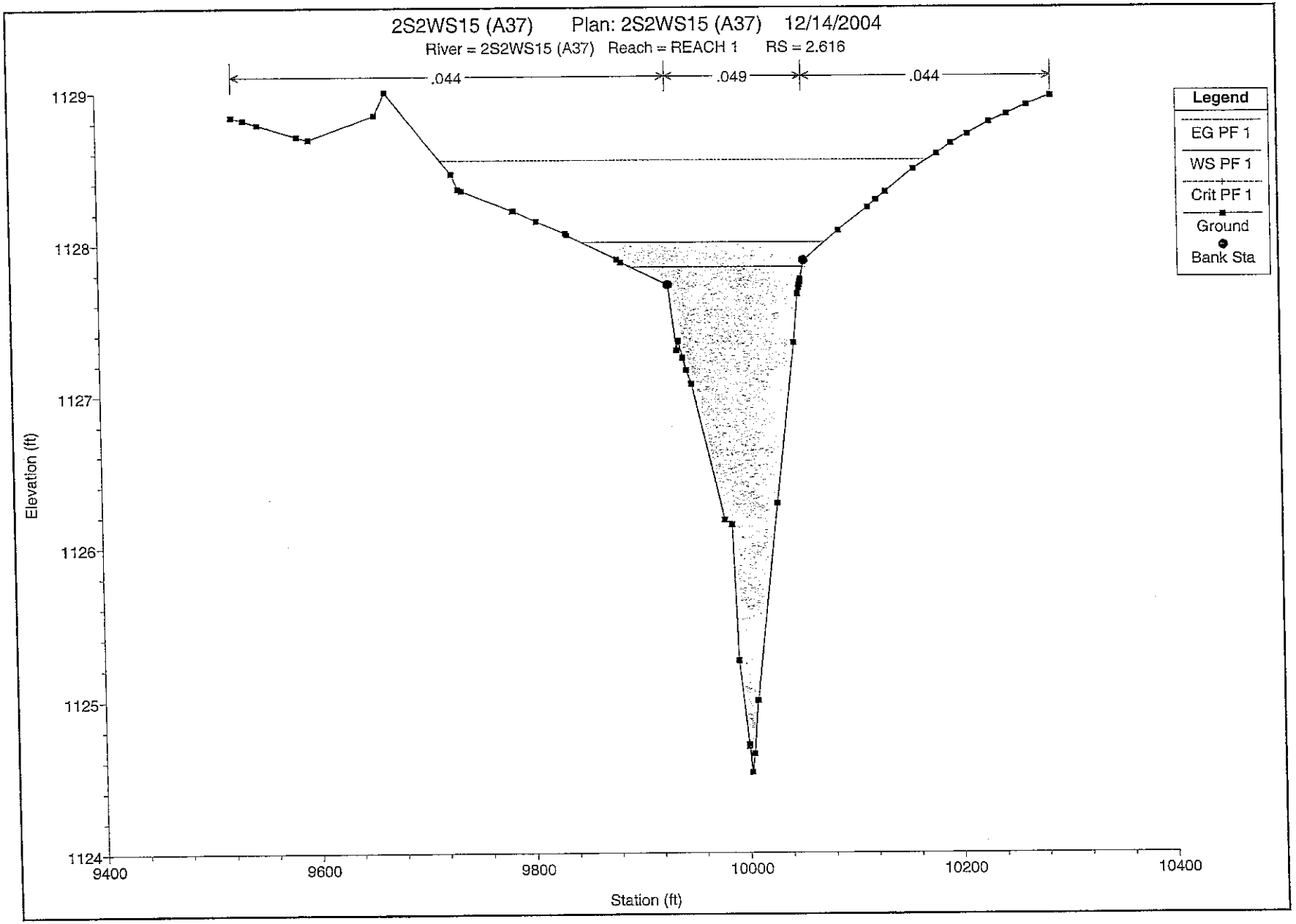

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 1.379
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1076
1075
1074
1073
1072
1071
1070
9900
9950
10000
10050
10100
10150
10200
10250
10300
Station (ft)

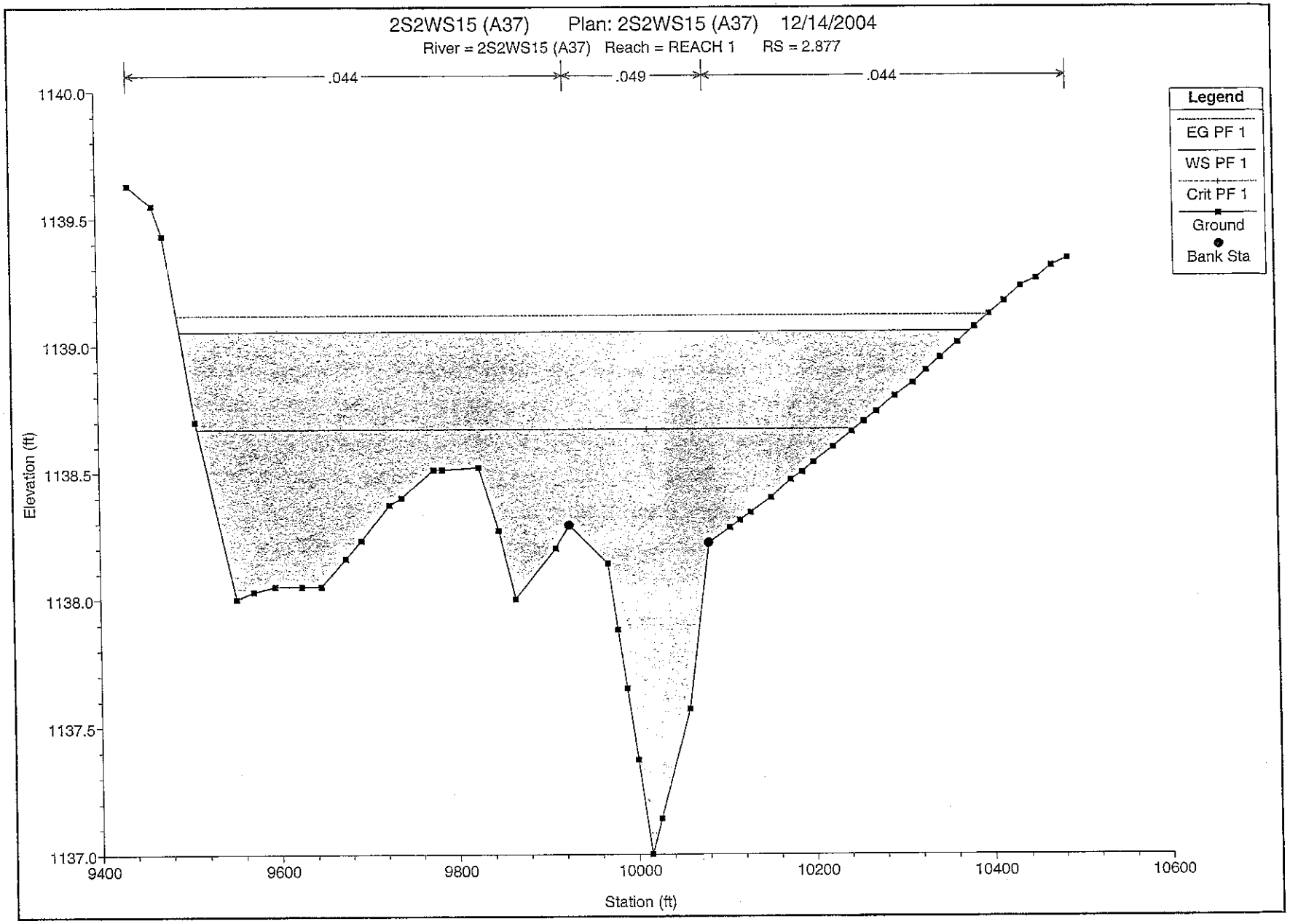

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 1.617 Approximately 650' downstream of Perryville Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1085
1084
1083
1082
1081
1080
1079
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)

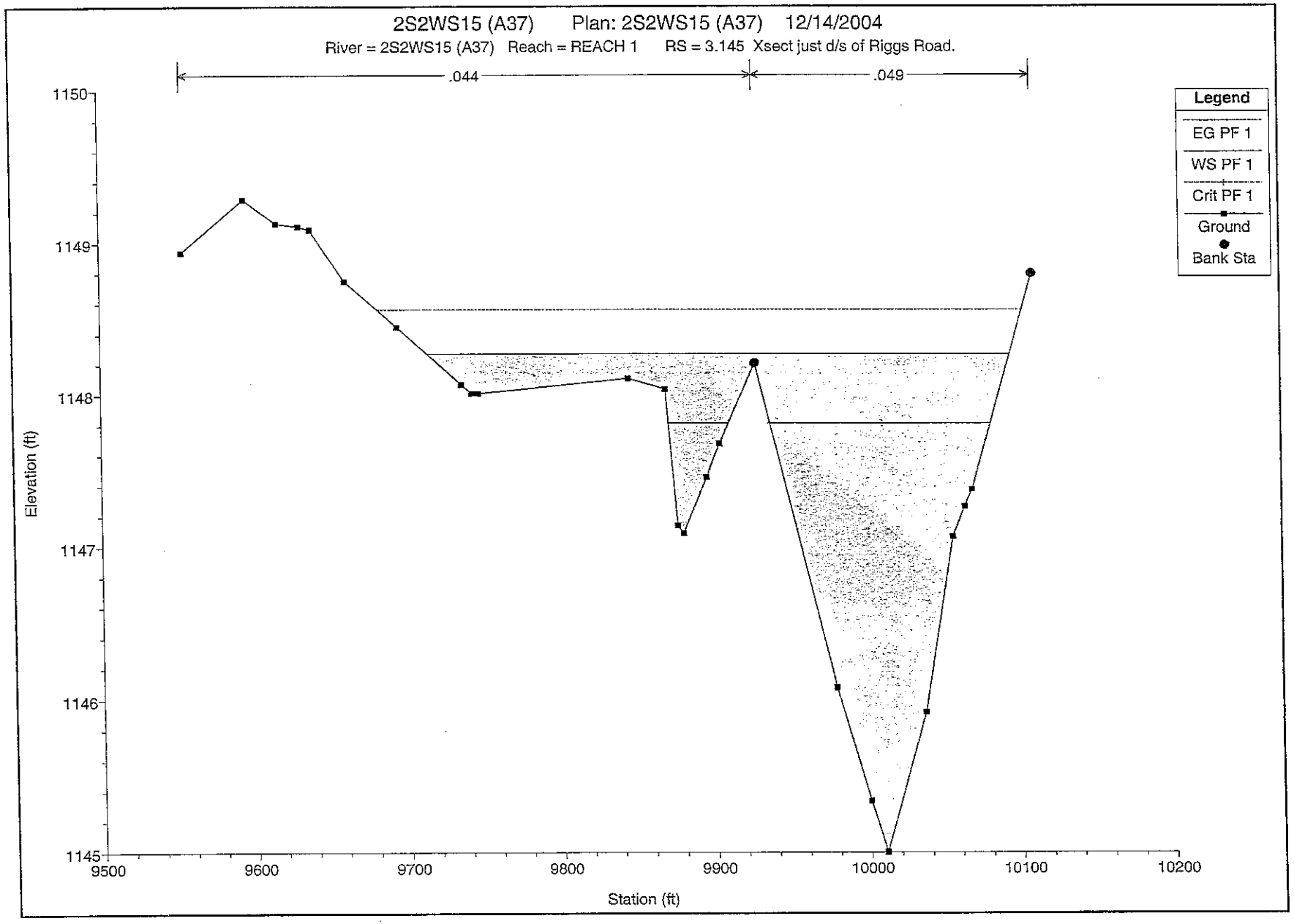

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 1.867 Approximately 700' upstream of Perryville Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1096
1095
1094
1093
1092
1091
1090
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

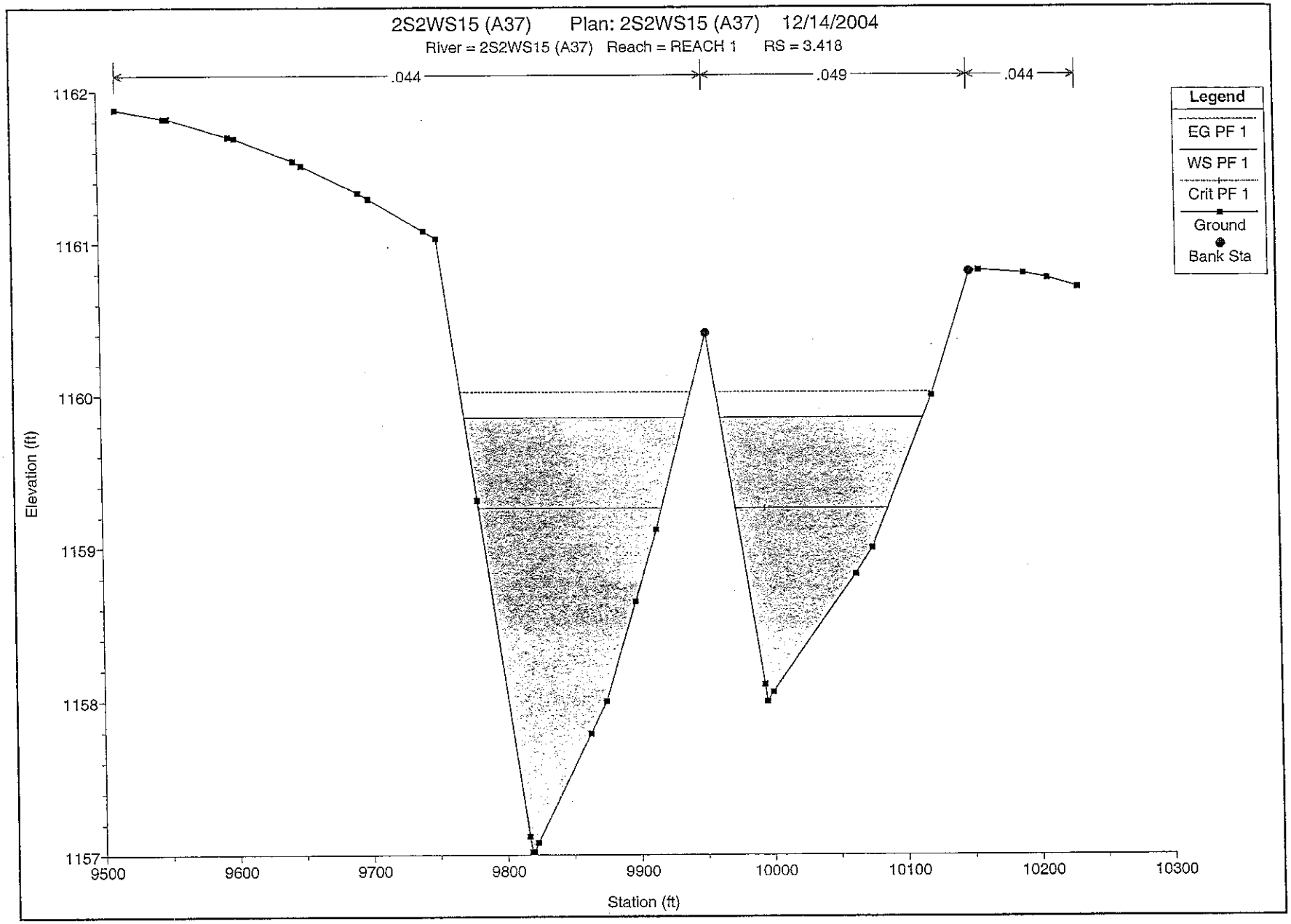

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 2.097
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1106
1105
1104
1103
1102
1101
1100
9400
9600
9800
10000
10200
10400
Station (ft)

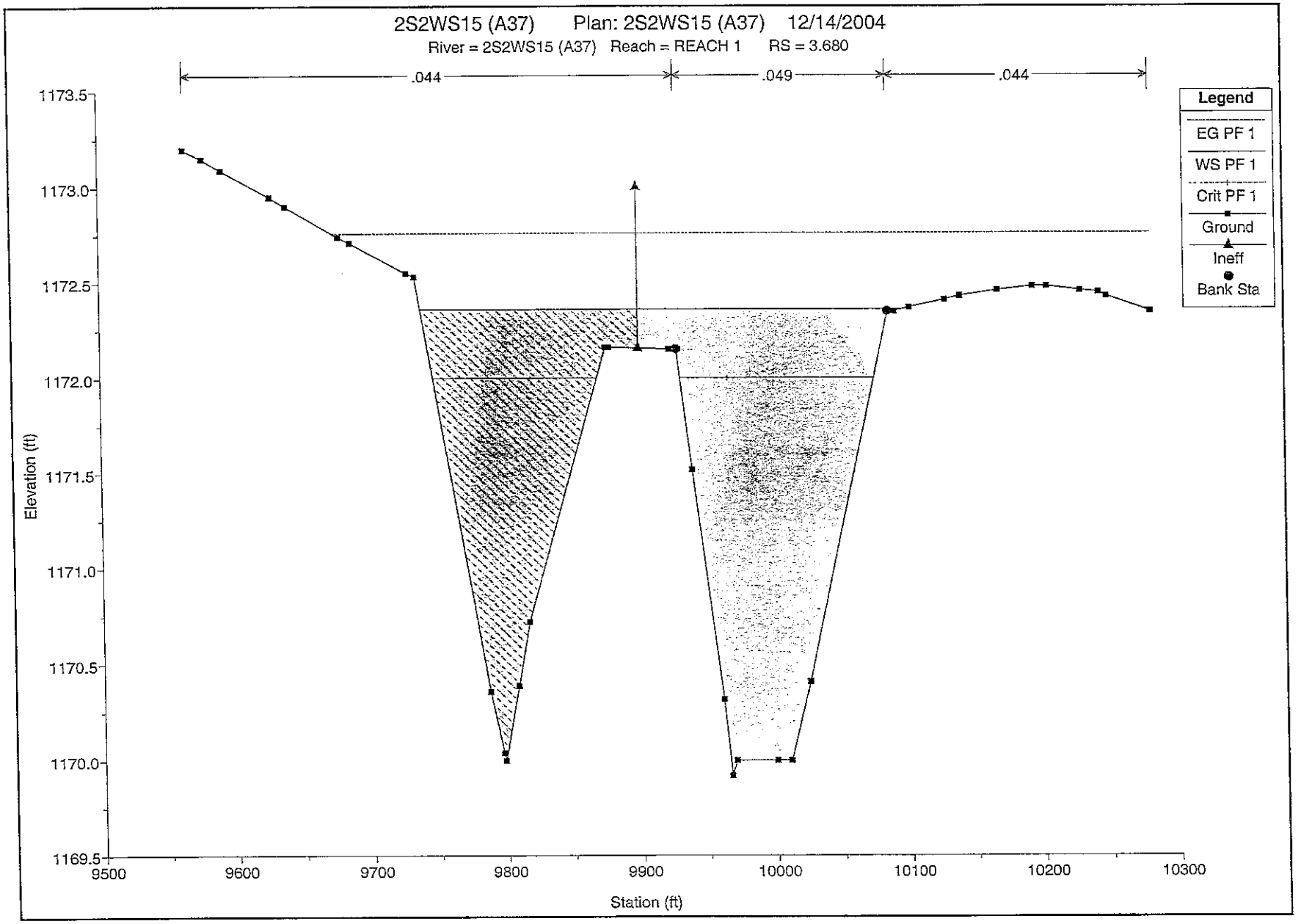

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 2.322
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1116
1115
1114
1113
1112
1111
1110
1109
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

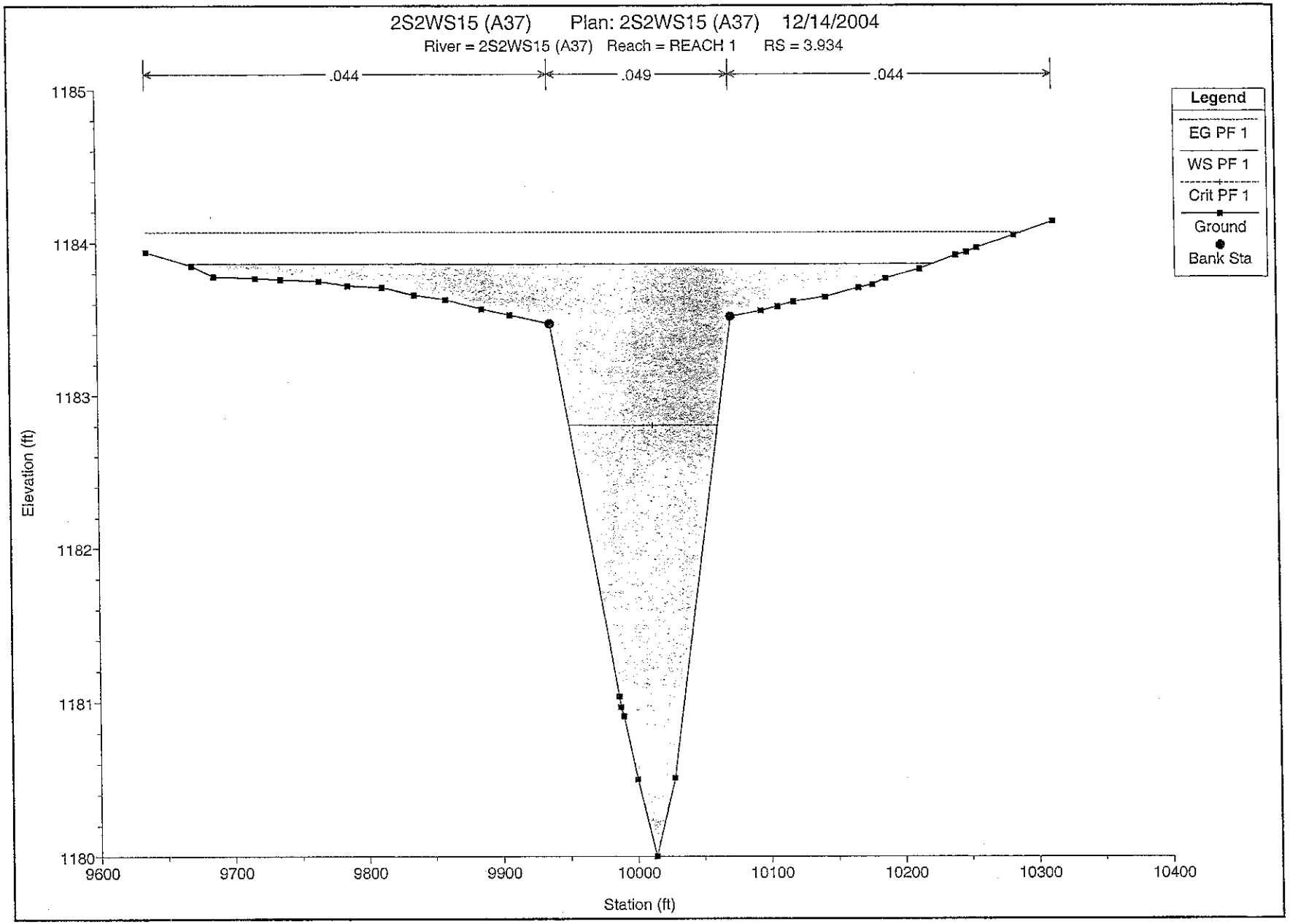

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 2.616
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1129
1128
1127
1126
1125
1124
9400
9600
9800
10000
10200
10400
Station (ft)

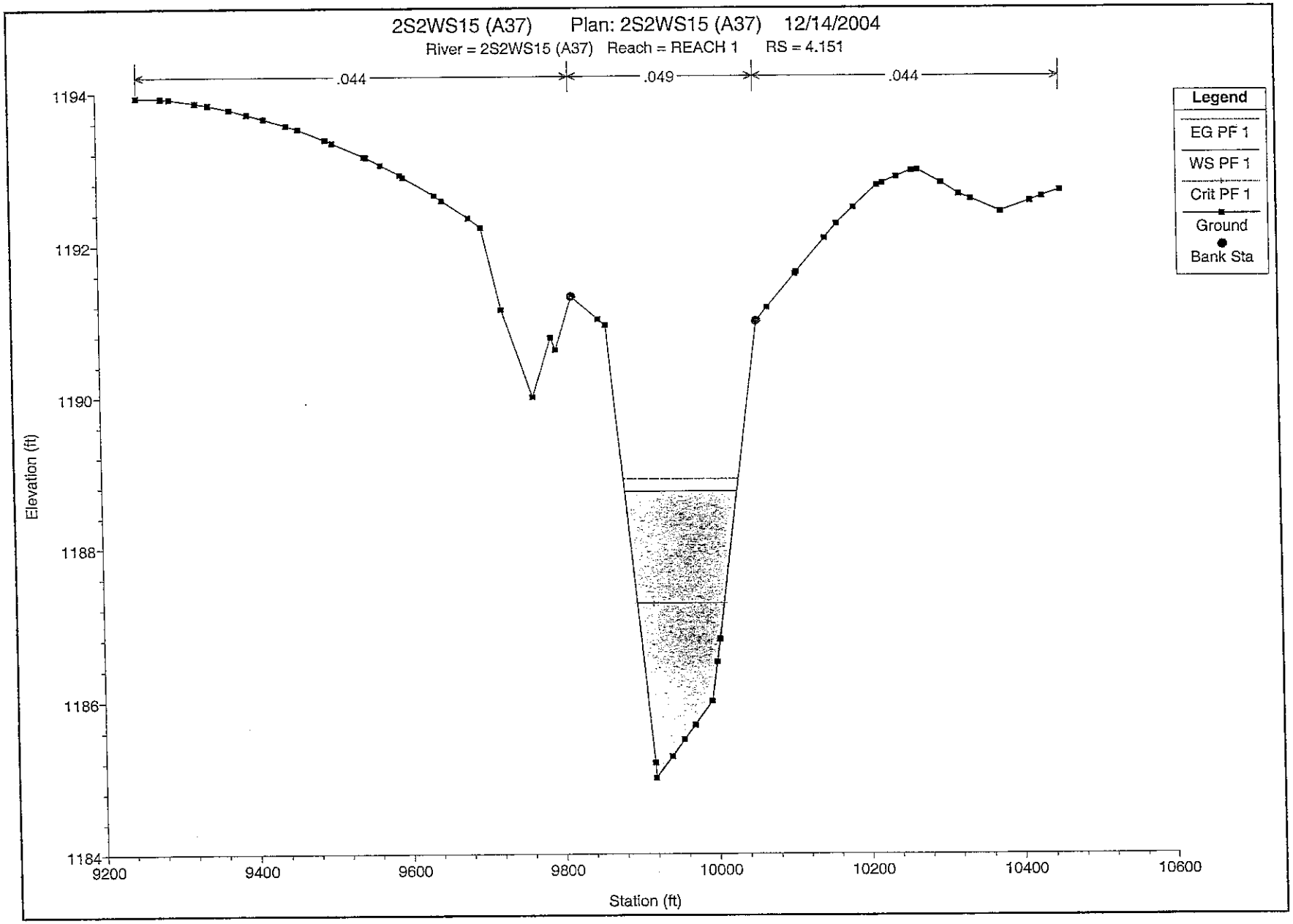

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 2.877
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1140.0
1139.5
1139.0
1138.5
1138.0
1137.5
1137.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

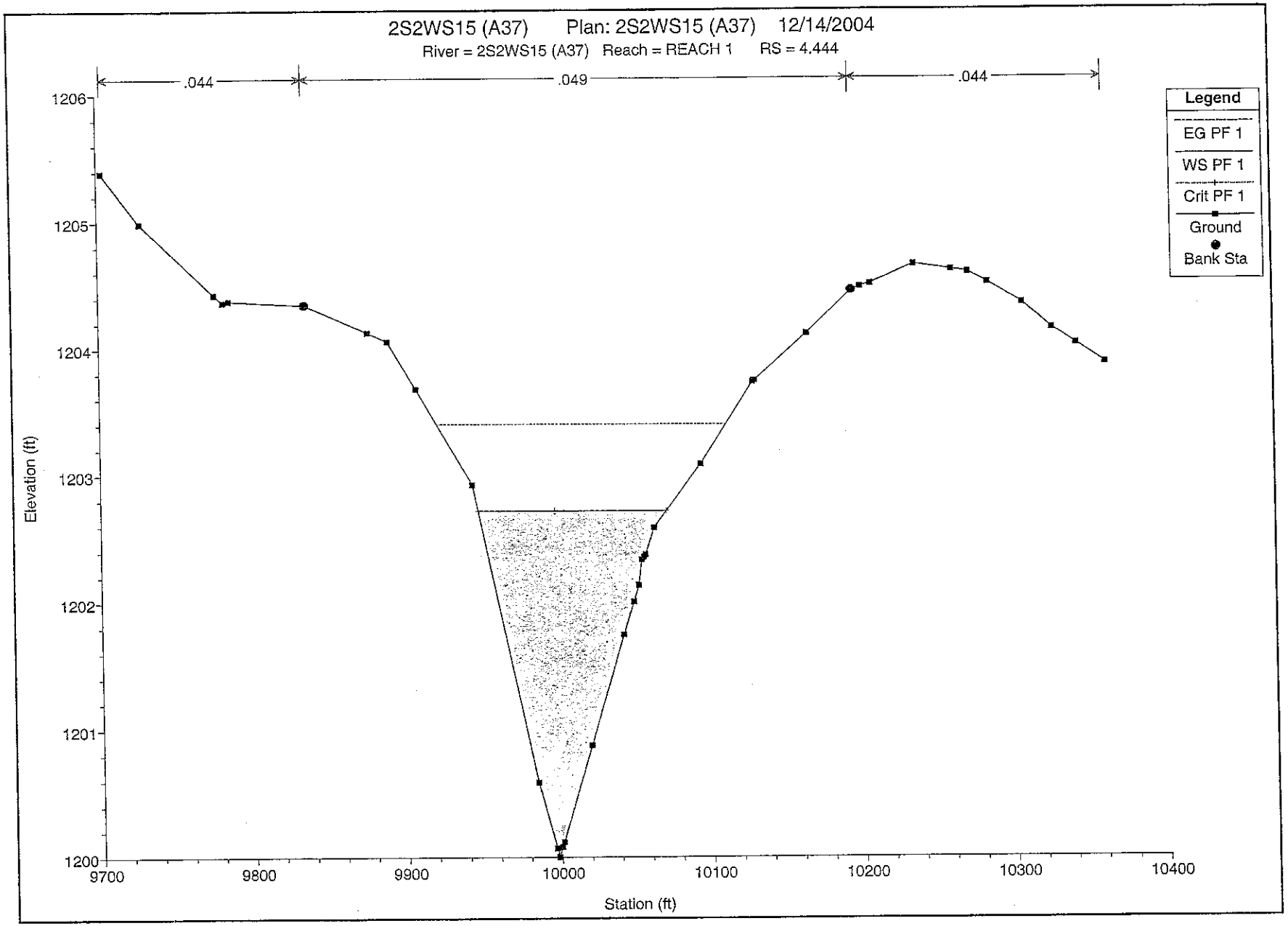

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 3.145 Xsect just d/s of Riggs Road.
.044
.049
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1150
1149
1148
1147
1146
1145
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

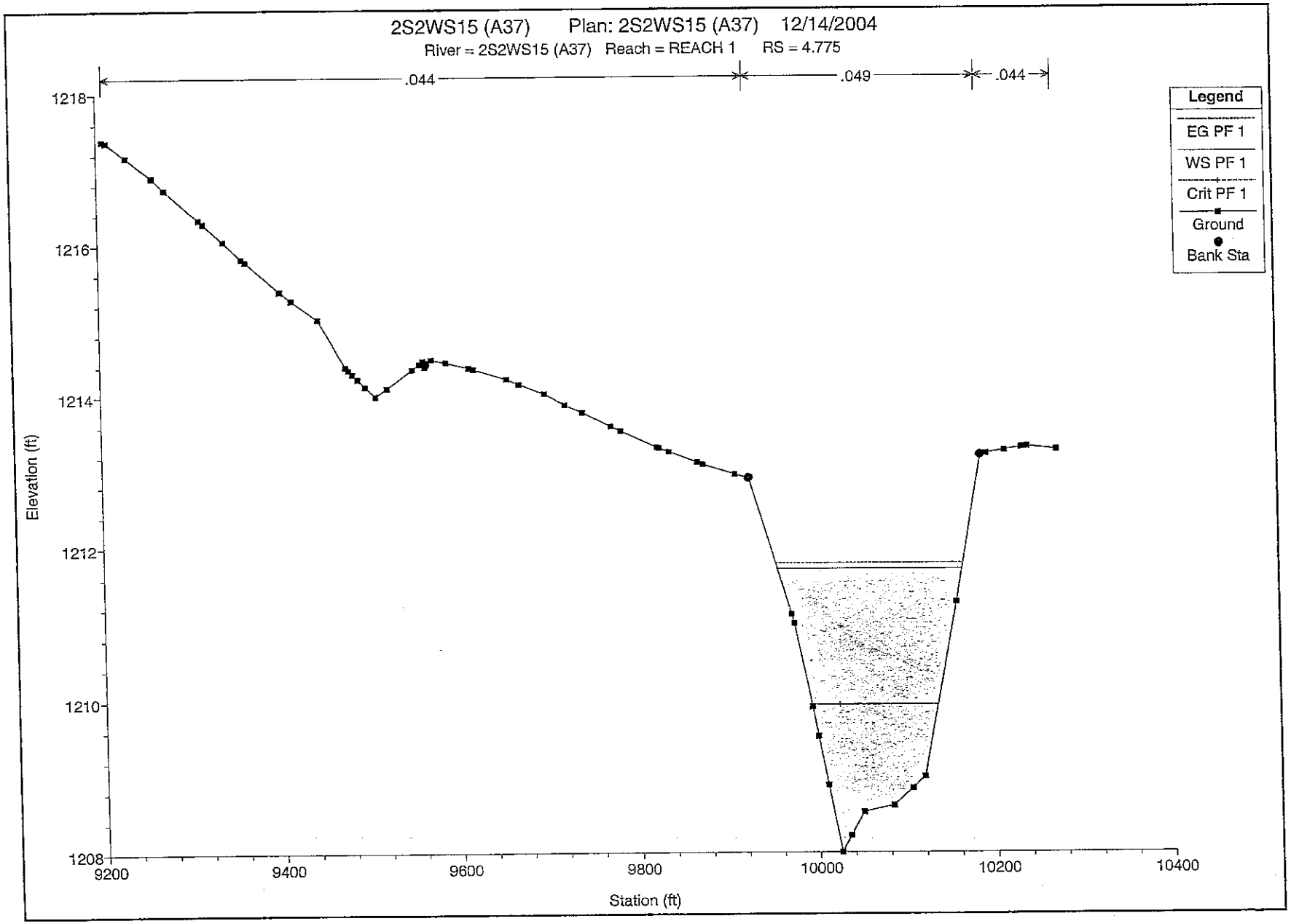

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 3.418
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1162
1161
1160
1159
1158
1157
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

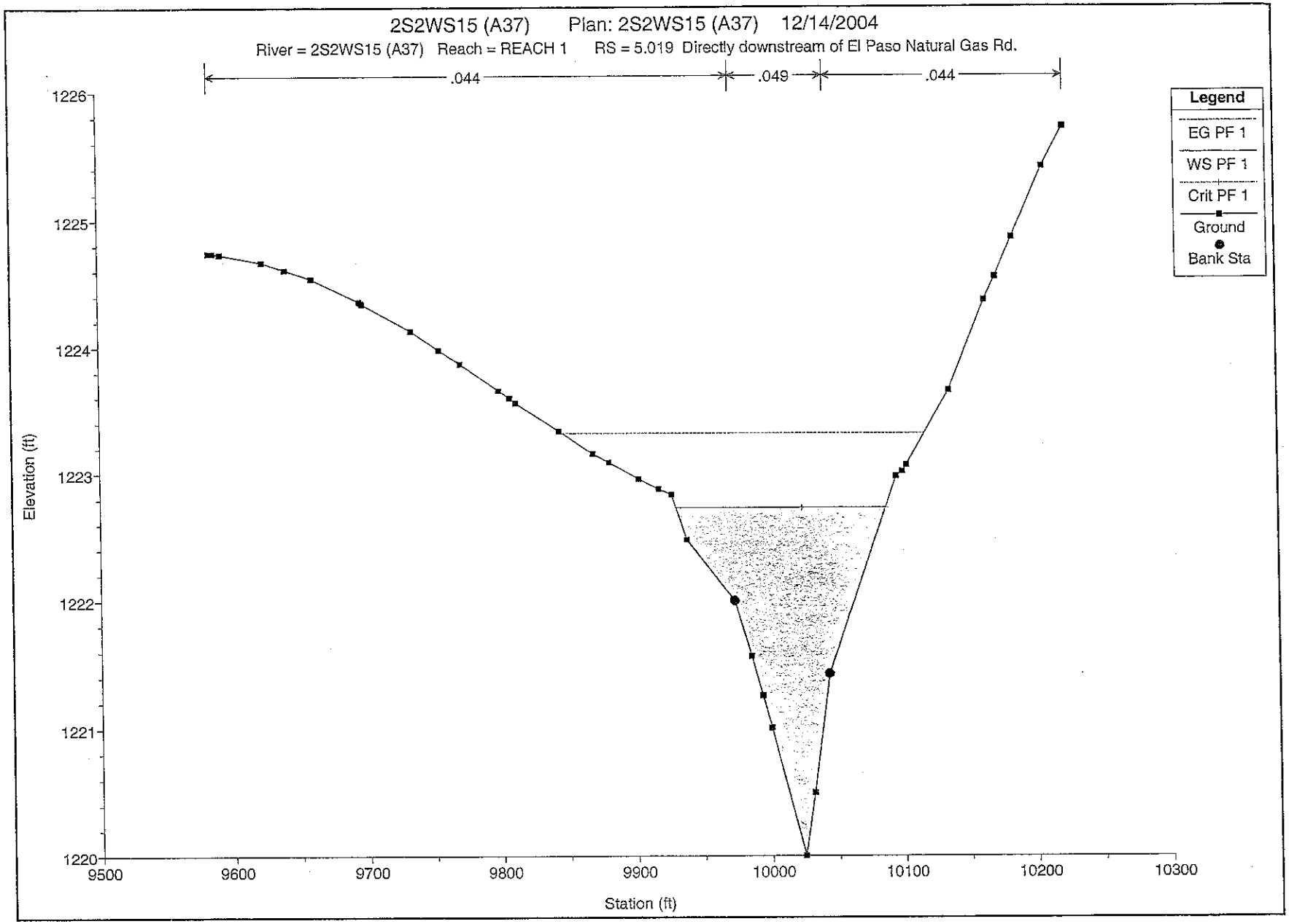

2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 3.680
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1173.5
1173.0
1172.5
1172.0
1171.5
1171.0
1170.5
1170.0
1169.5
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 3.934
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1185
1184
1183
1182
1181
1180
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 4.151
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1194
1192
1190
1188
1186
1184
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 4.444
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1206
1205
1204
1203
1202
1201
1200
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 4.775
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1218
1216
1214
1212
1210
1208
9200
9400
9600
9800
10000
10200
10400
Station (ft)


2S2WS15 (A37) Plan: 2S2WS15 (A37) 12/14/2004
River = 2S2WS15 (A37) Reach = REACH 1 RS = 5.019 Directly downstream of El Paso Natural Gas Rd.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1226
1225
1224
1223
1222
1221
1220
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 2S2WS16A (A35)

REACH: 2S2WS16A (A35)

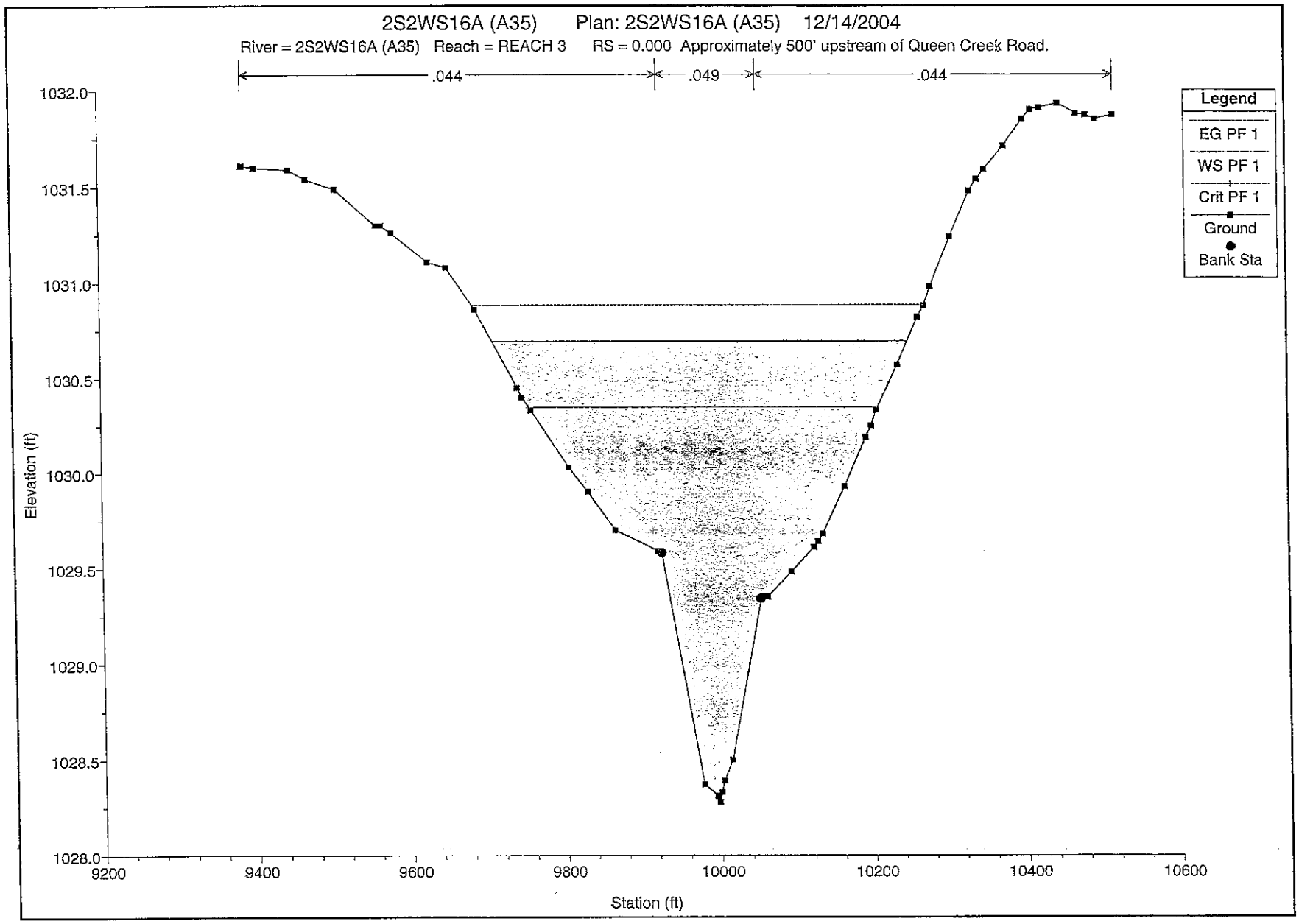
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

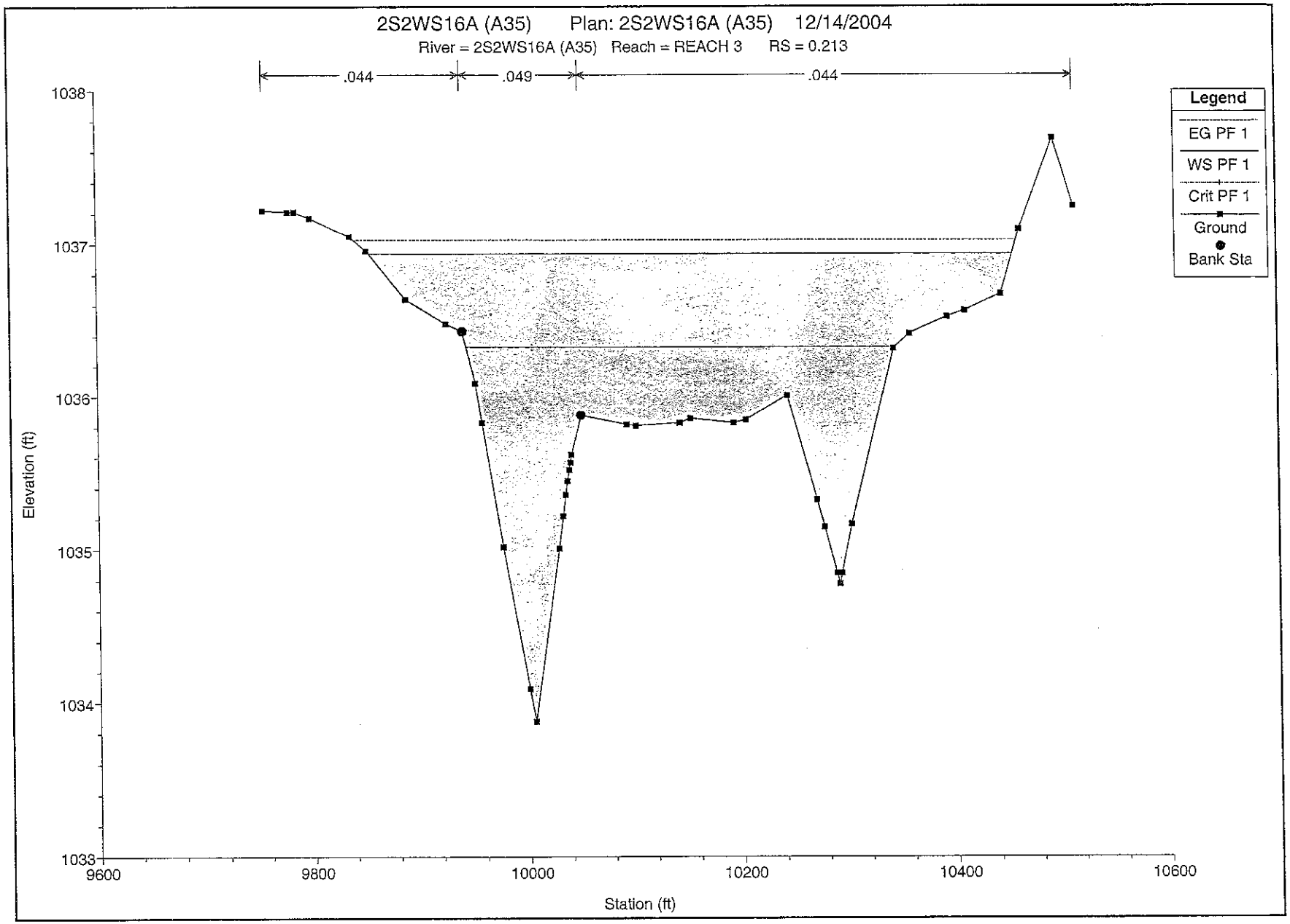
Change in Discharge based on Reach Length

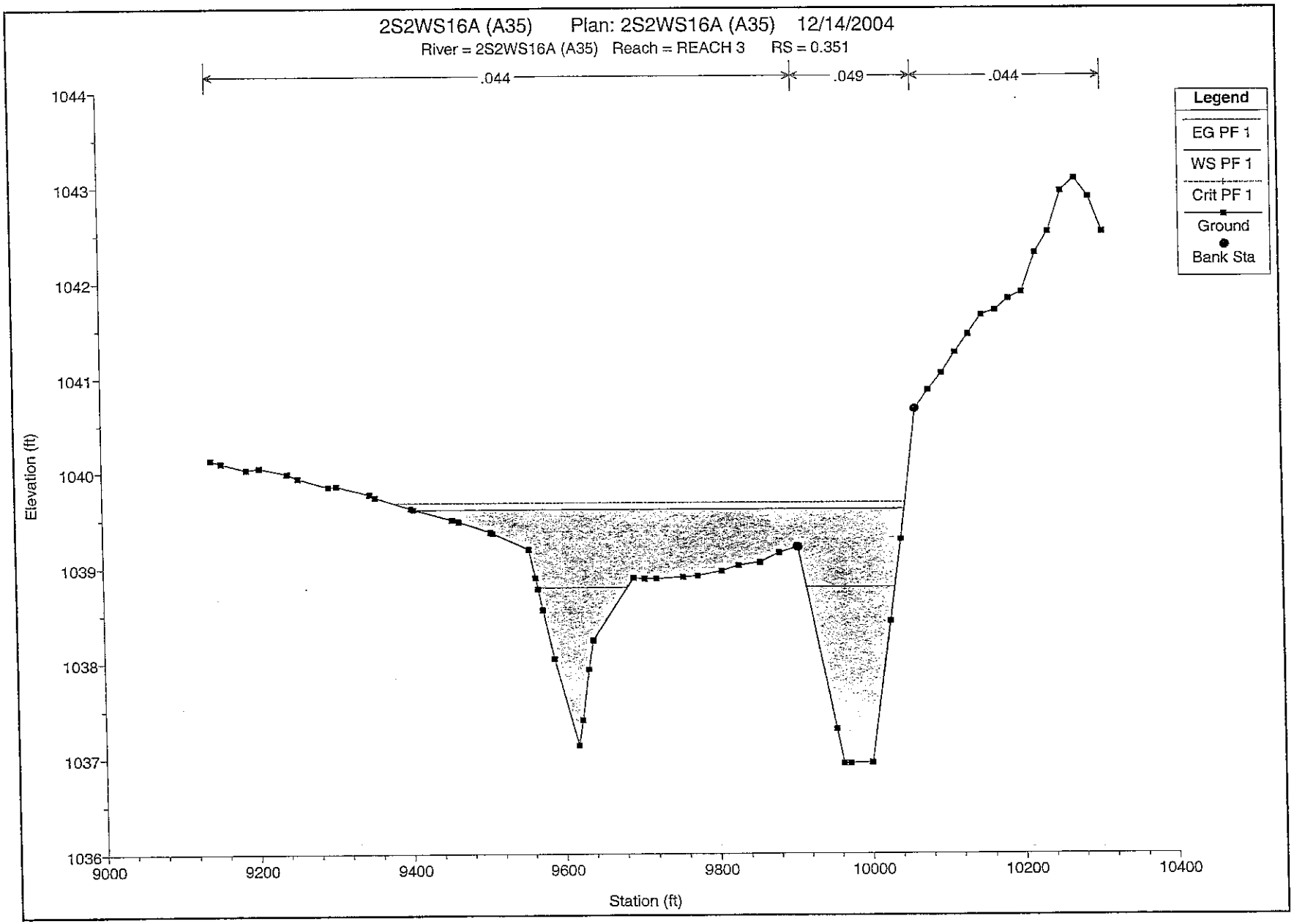
Wash ID: 2S2WS16A (A35)

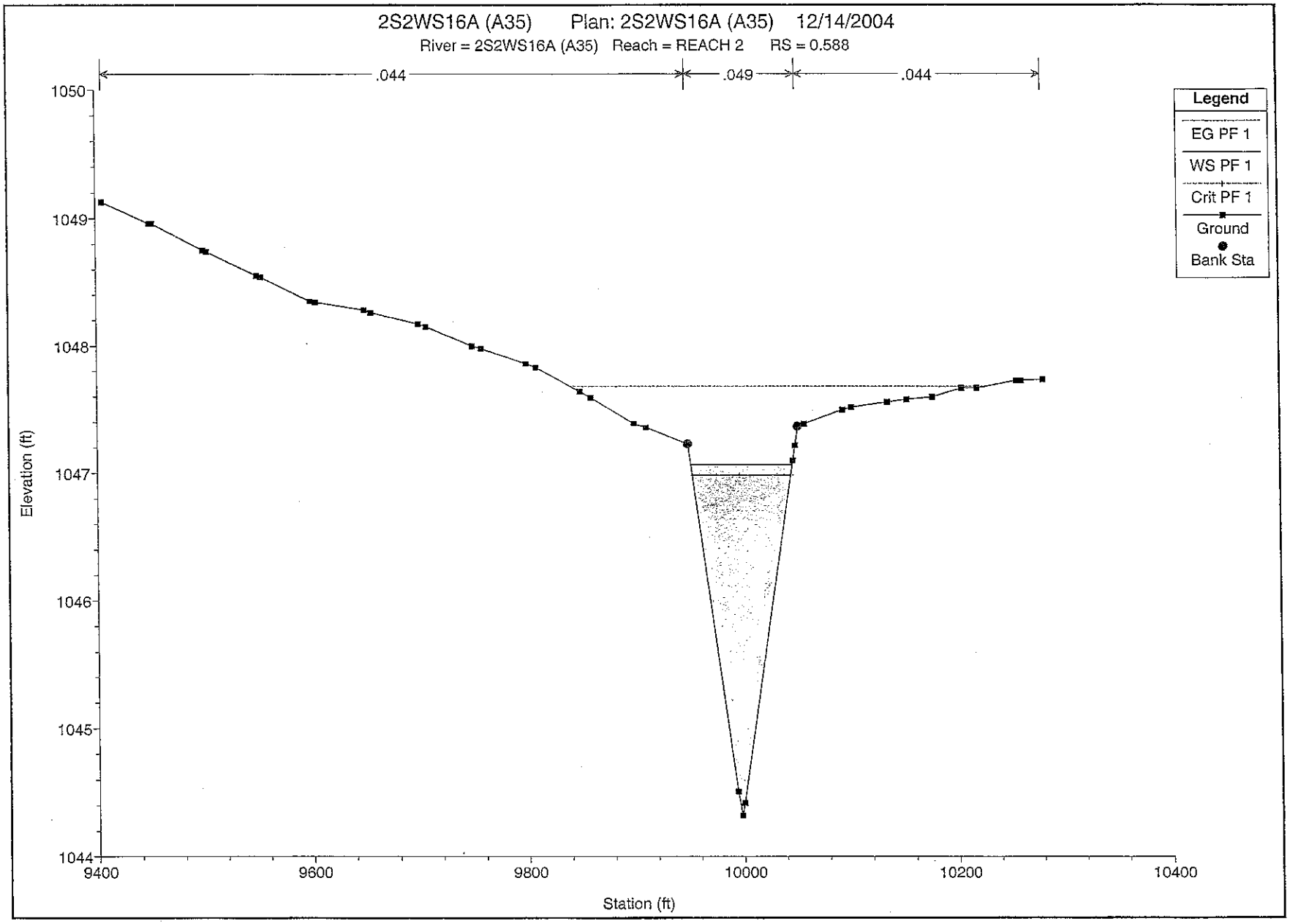
Subbasin	X-section	Discharge	Q (nearest 10)	Q (nearest 100)
A10	4.711	837	840	800
A10	4.426	934	930	900
A10	4.194	1012	1010	1000
A10	3.954	1094	1090	1100
A10	3.708	1177	1180	1200
A10	3.458	1262	1260	1300
A10	3.199	1350	1350	1300
A10	2.957	1432	1430	1400
A10	2.701	1519	1520	1500
A10	2.377	1628	1630	1600
CPA10	2.157	1703	1700	1700
A34	1.888	892	890	900
A34	1.632	880	880	900
A34	1.364	867	870	900
A34	1.114	855	860	900
A34	0.859	843	840	800
CPA34	0.588	830	830	800
A35	0.351	1192	1190	1200
A35	0.213	1402	1400	1400
CPA35	0.000	1727	1730	1700

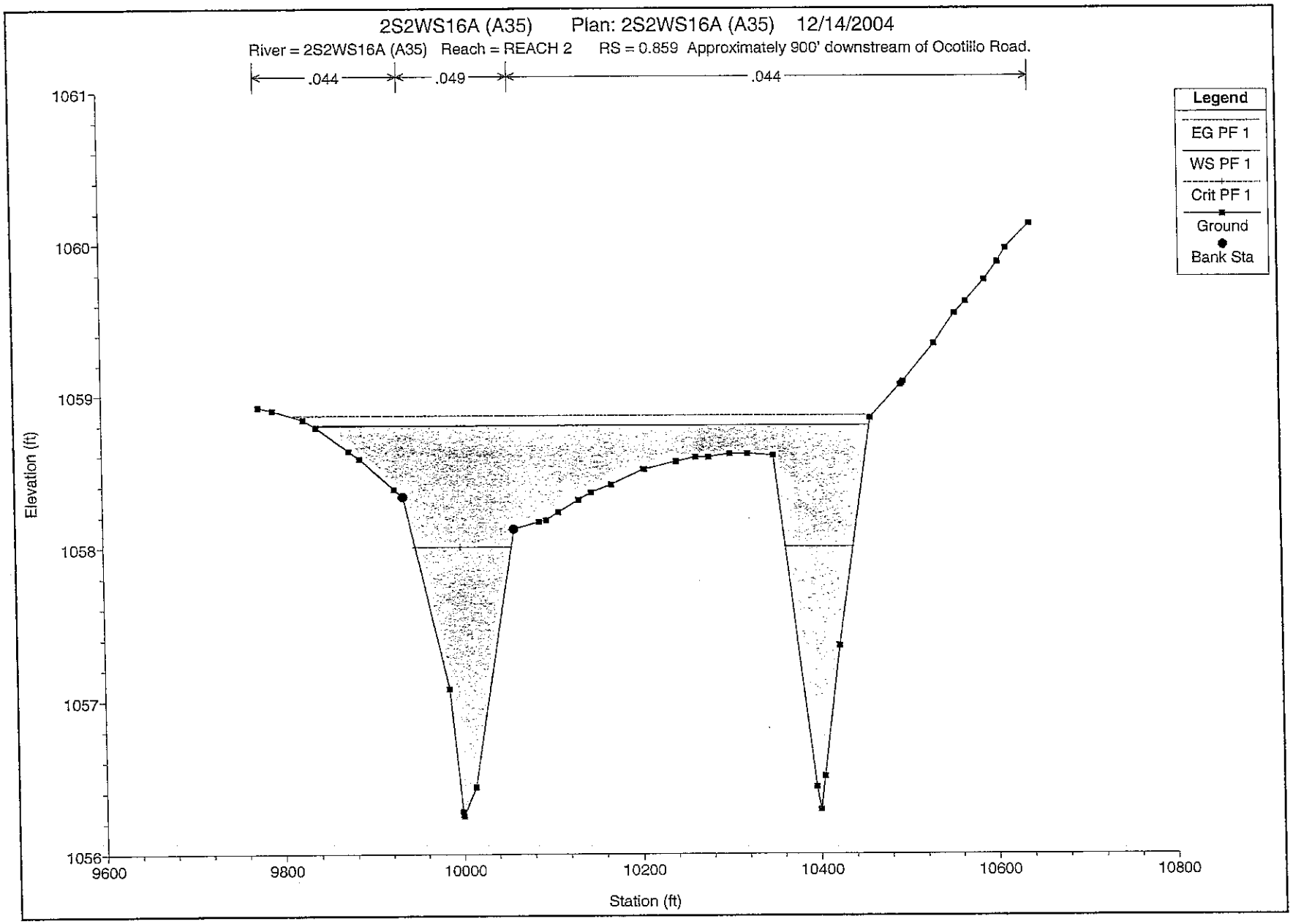
Notes:
1. Discharge at X-section 4.818 taken as remainder flow from CPA02 after diverts DA02A and DA02B
2. X-section 1.995 is remainder flow from CPA10 after divert DA10

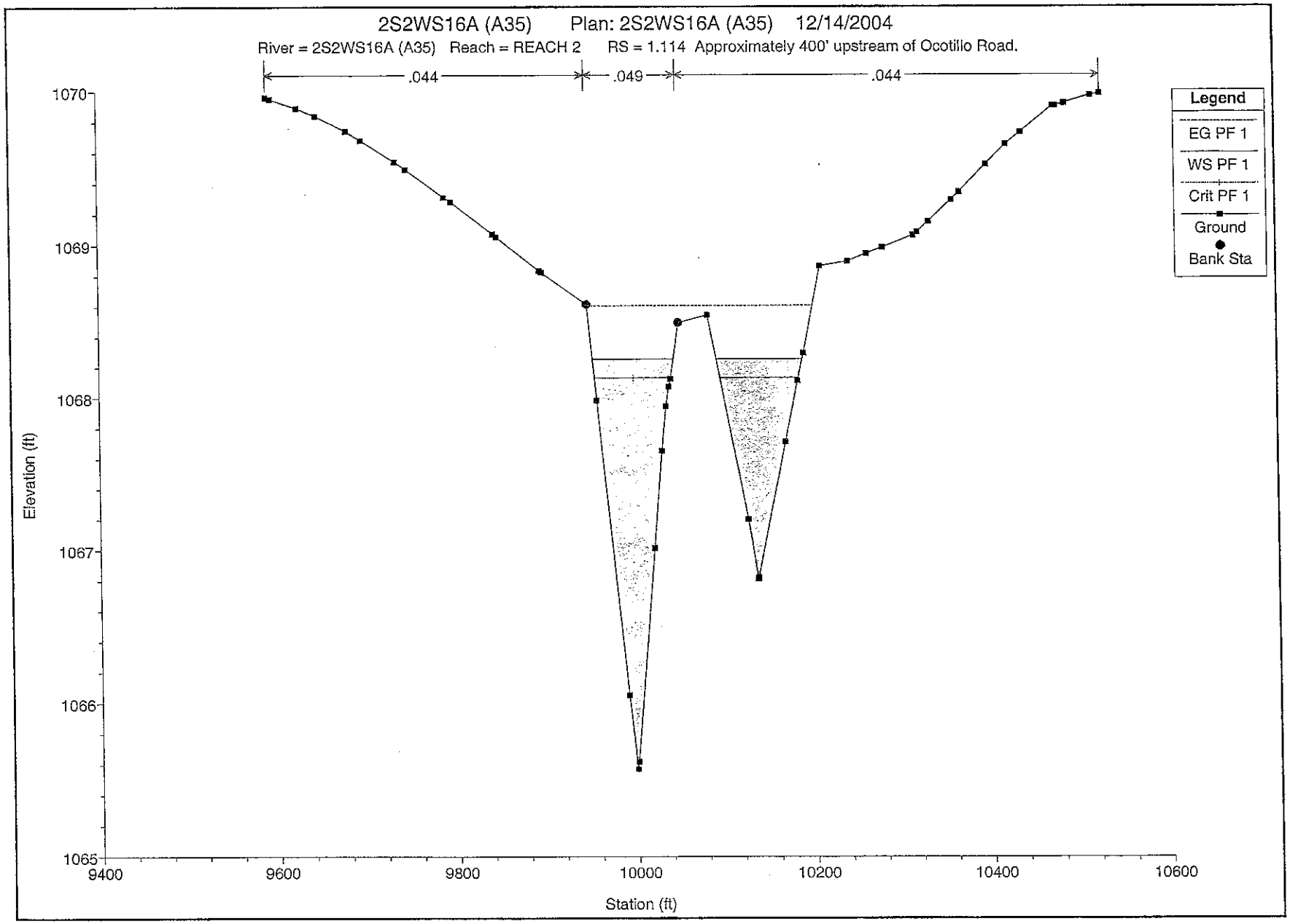

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 3 RS = 0.000 Approximately 500' upstream of Queen Creek Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1032.0
1031.5
1031.0
1030.5
1030.0
1029.5
1029.0
1028.5
1028.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

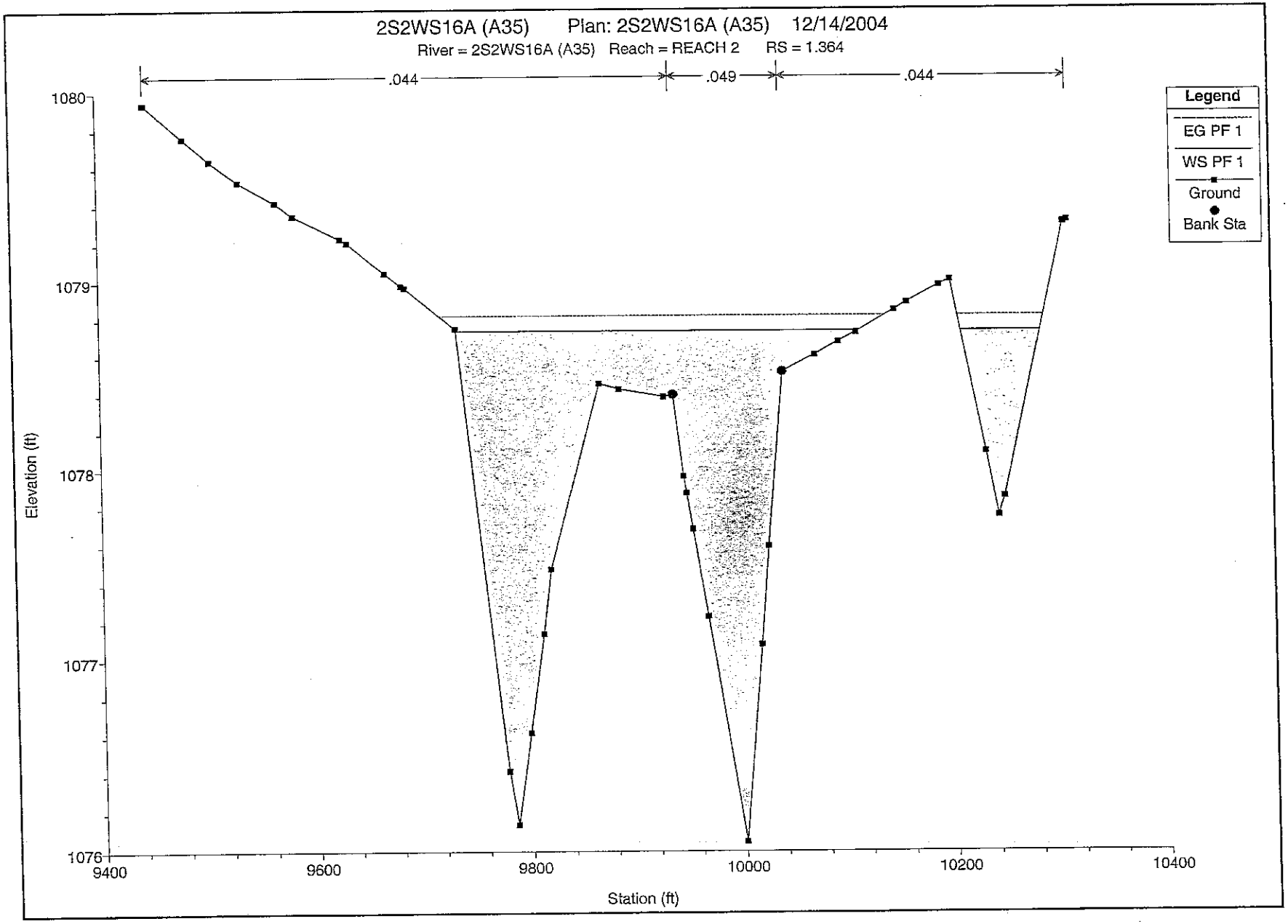

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 3 RS = 0.213
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1038
1037
1036
1035
1034
1033
9600
9800
10000
10200
10400
10600
Station (ft)

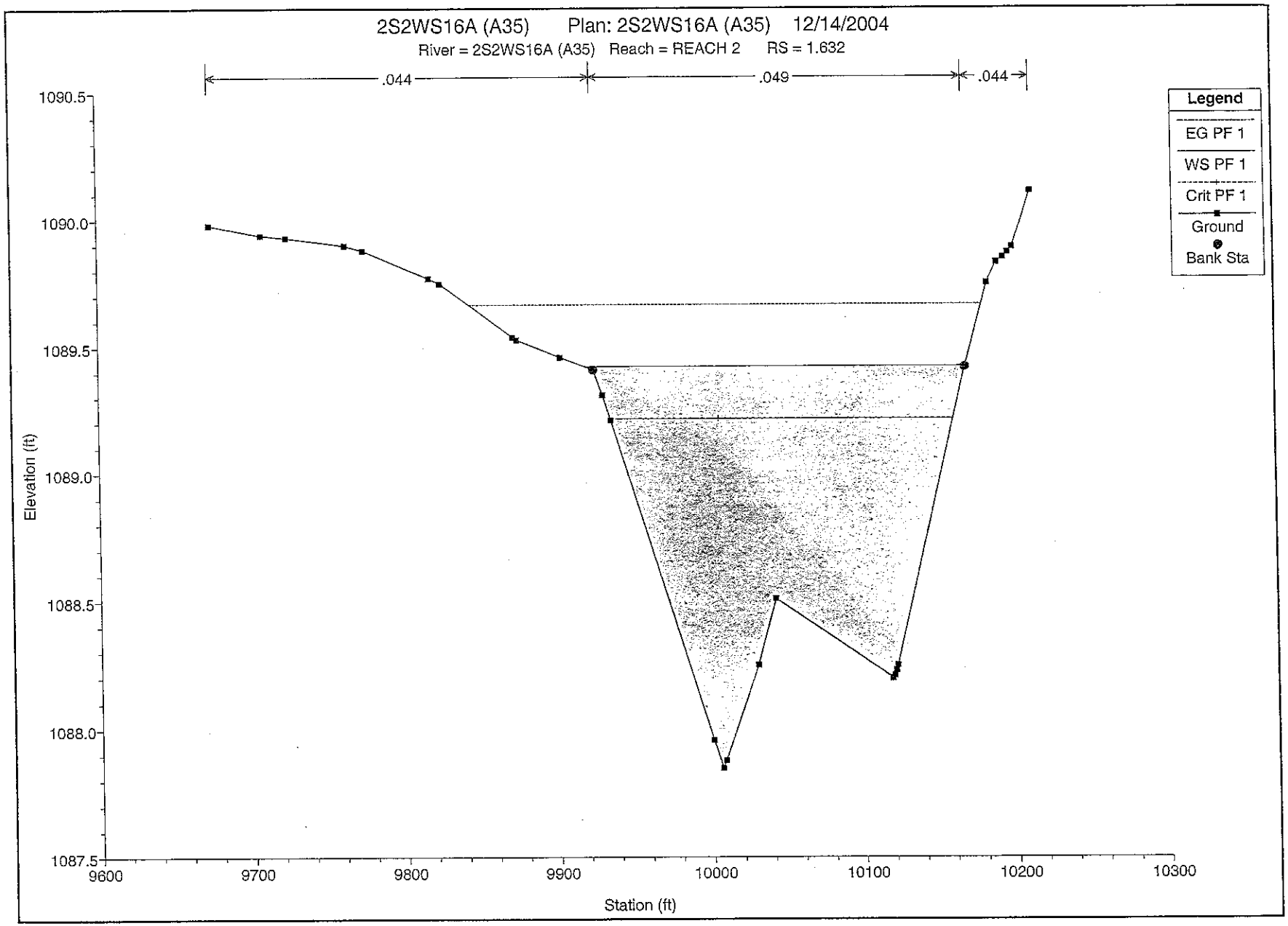

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 3 RS = 0.351
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1044
1043
1042
1041
1040
1039
1038
1037
1036
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

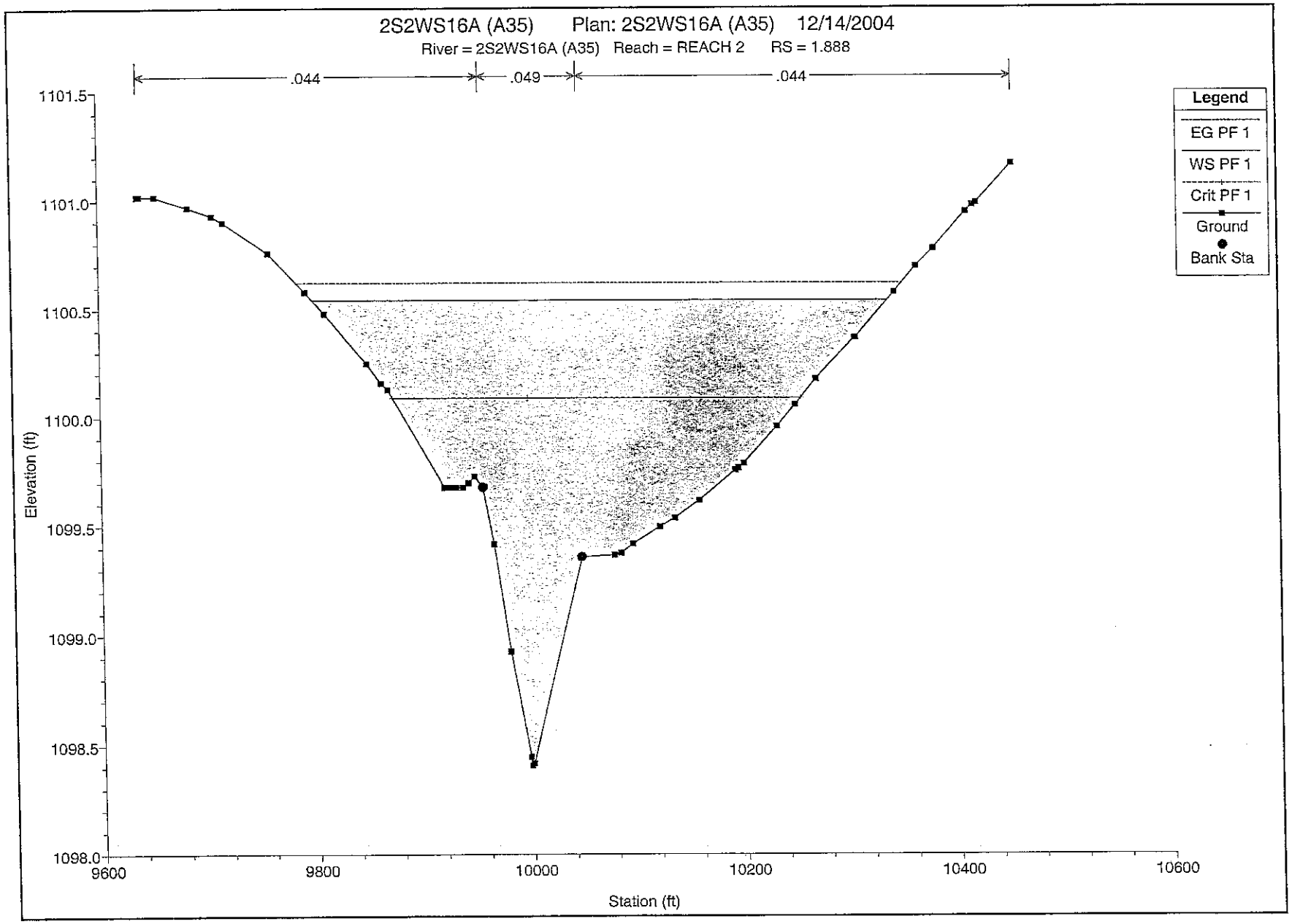

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 2 RS = 0.588
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1050
1049
1048
1047
1046
1045
1044
9400
9600
9800
10000
10200
10400
Station (ft)

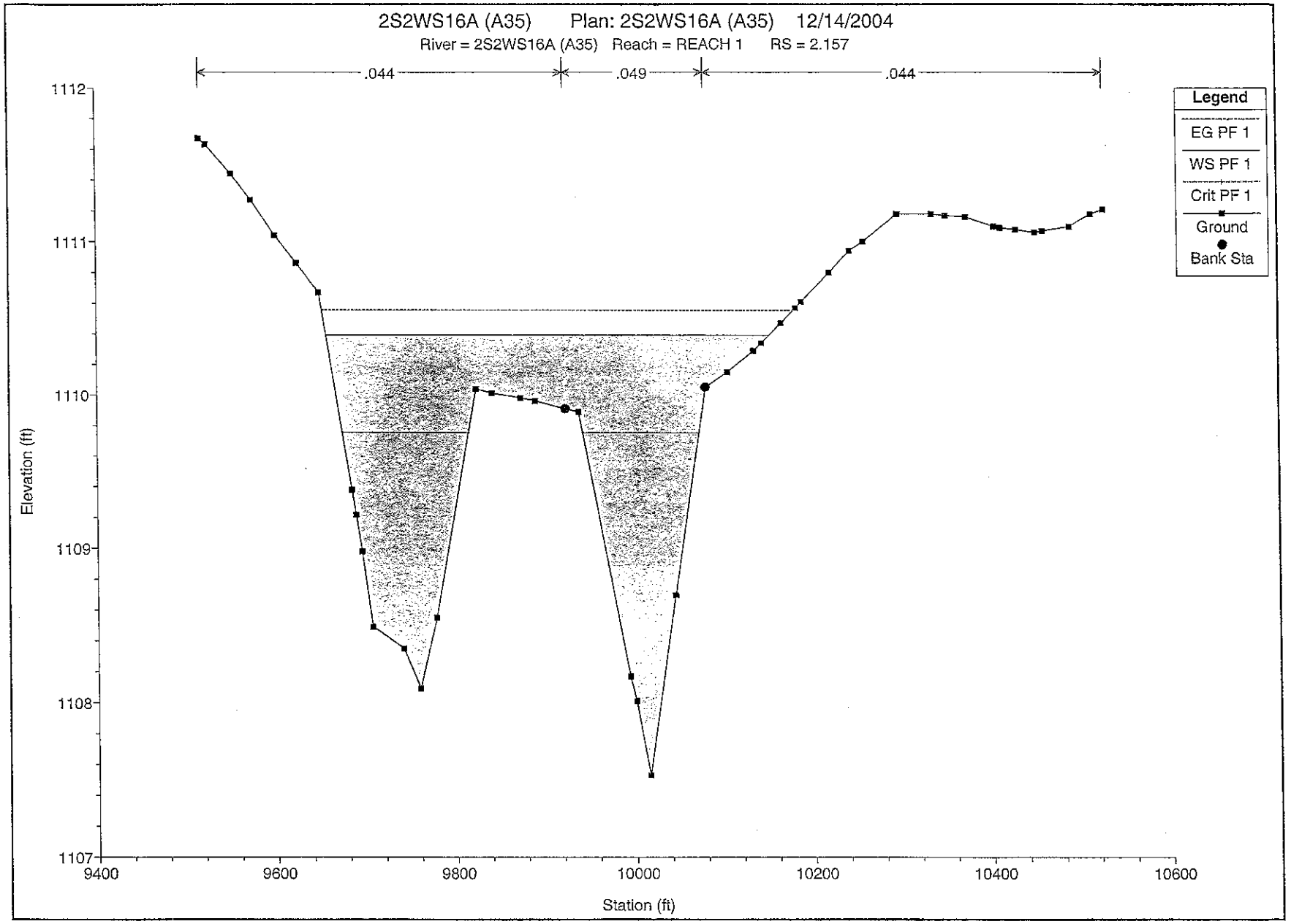

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 2 RS = 0.859 Approximately 900' downstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1061
1060
1059
1058
1057
1056
9600
9800
10000
10200
10400
10600
10800
Station (ft)

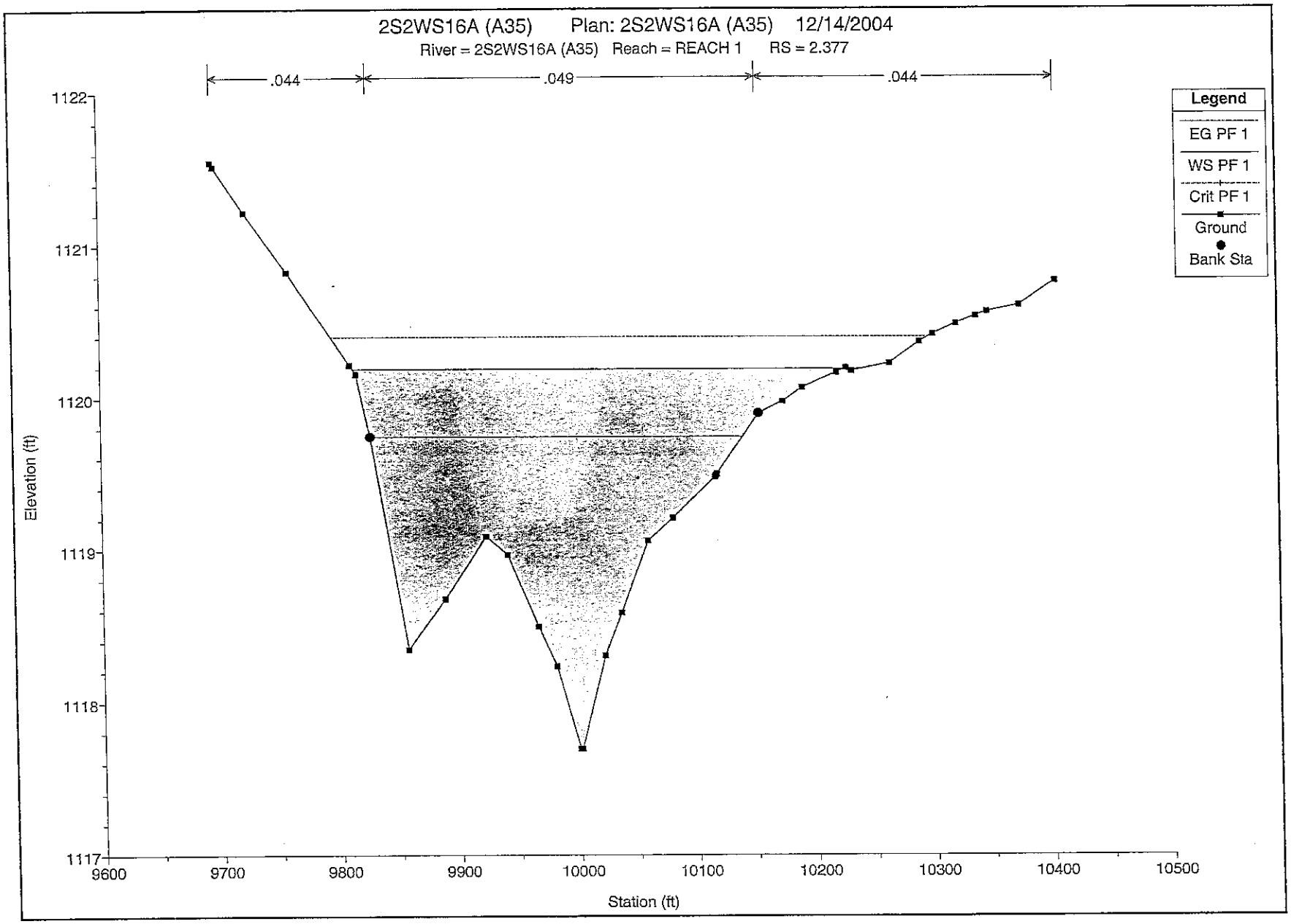

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 2 RS = 1.114 Approximately 400' upstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1070
1069
1068
1067
1066
1065
9400
9600
9800
10000
10200
10400
10600
Station (ft)

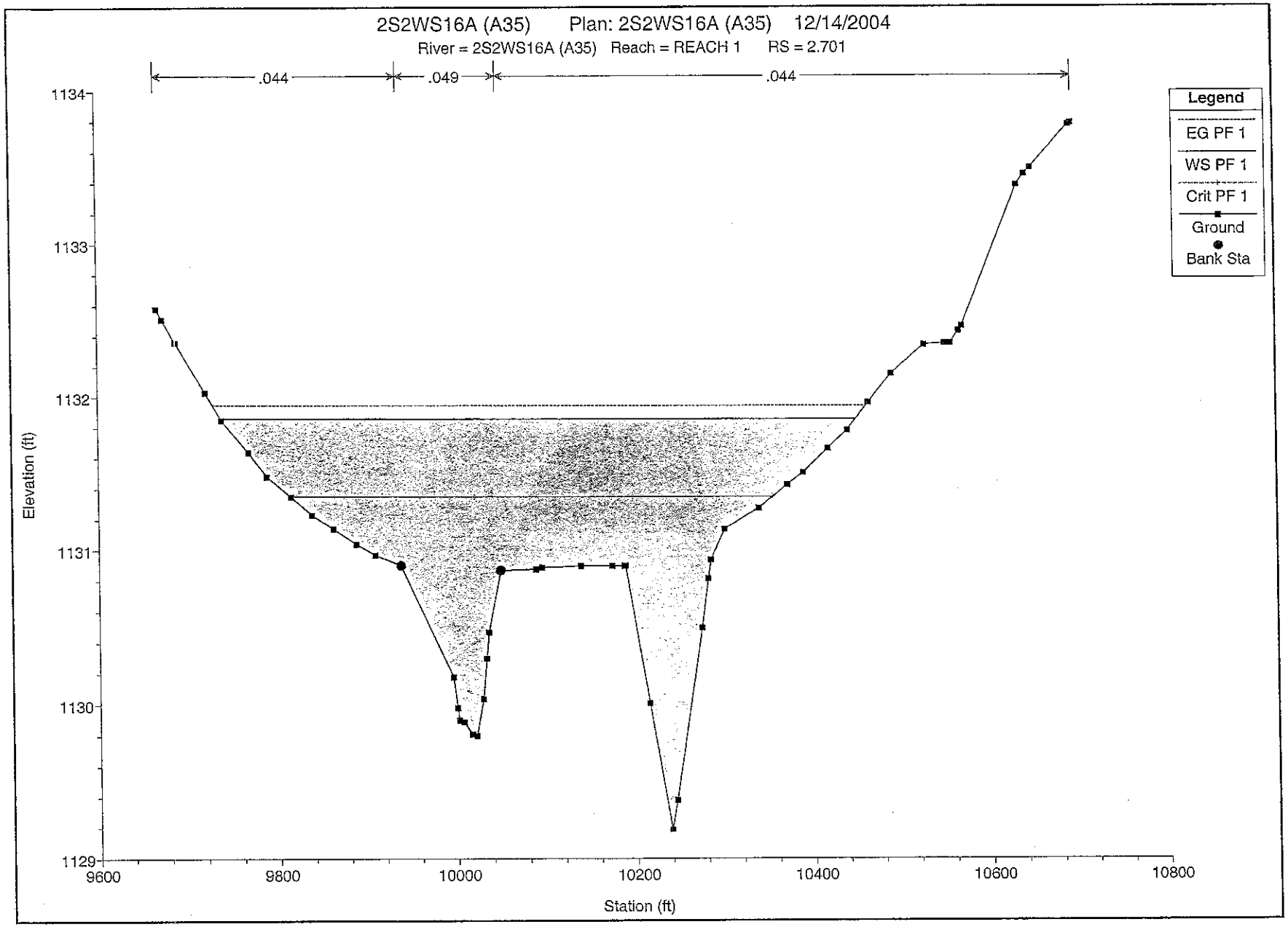

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 2 RS = 1.364
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1080
1079
1078
1077
1076
9400
9600
9800
10000
10200
10400
Station (ft)

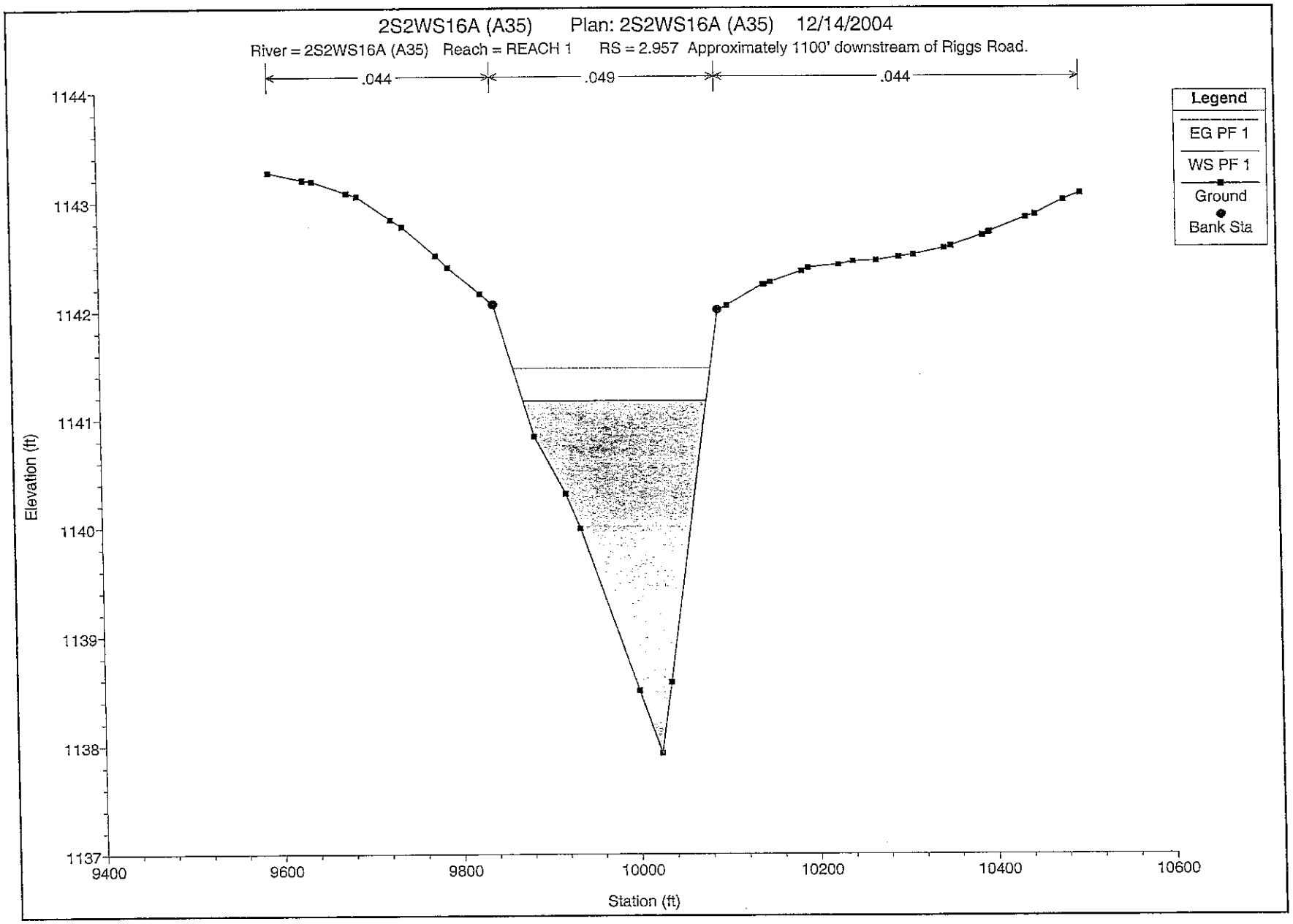

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 2 RS = 1.632
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1090.5
1090.0
1089.5
1089.0
1088.5
1088.0
1087.5
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

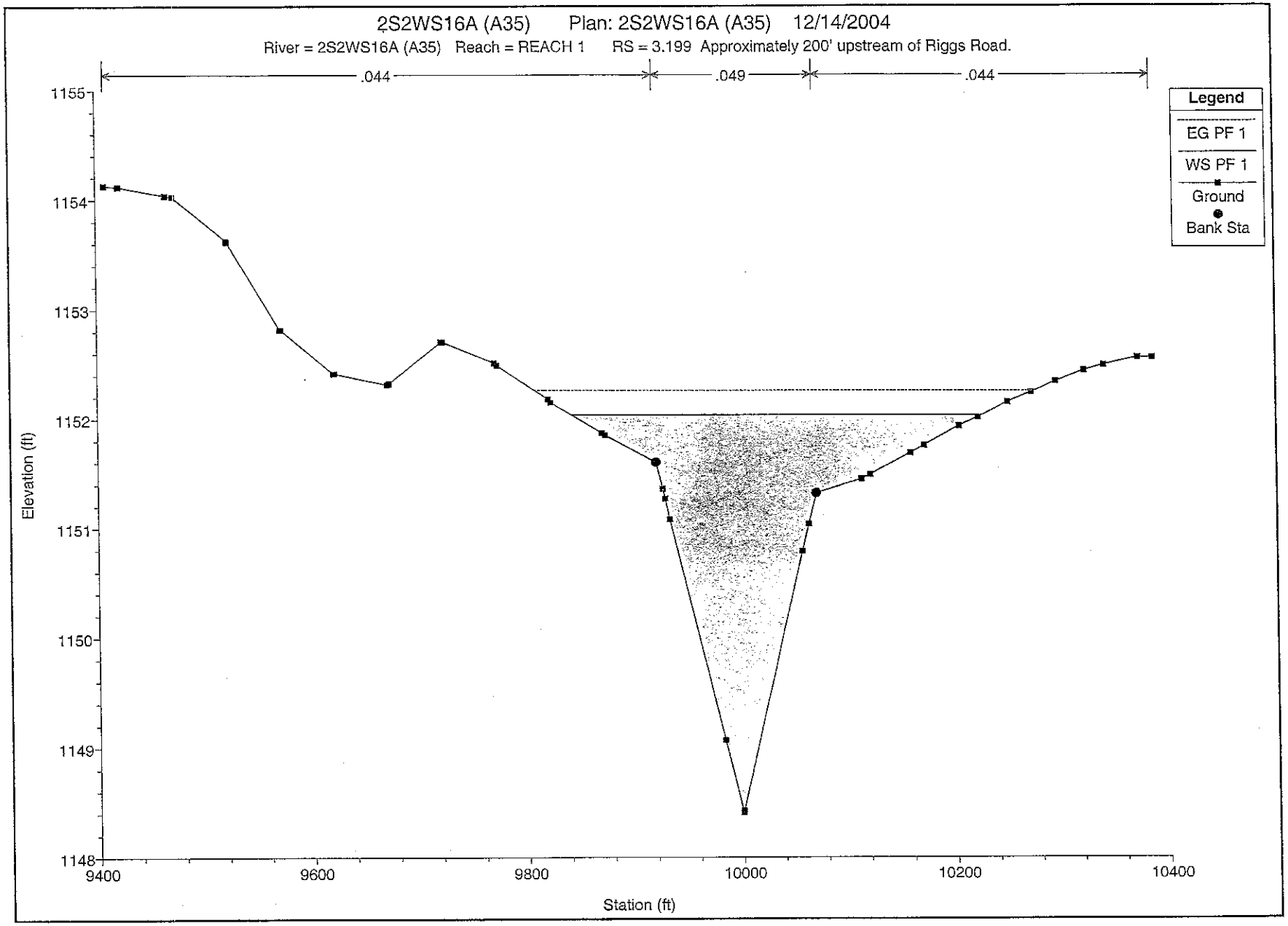

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 2 RS = 1.888
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1101.5
1101.0
1100.5
1100.0
1099.5
1099.0
1098.5
1098.0
9600
9800
10000
10200
10400
10600
Station (ft)

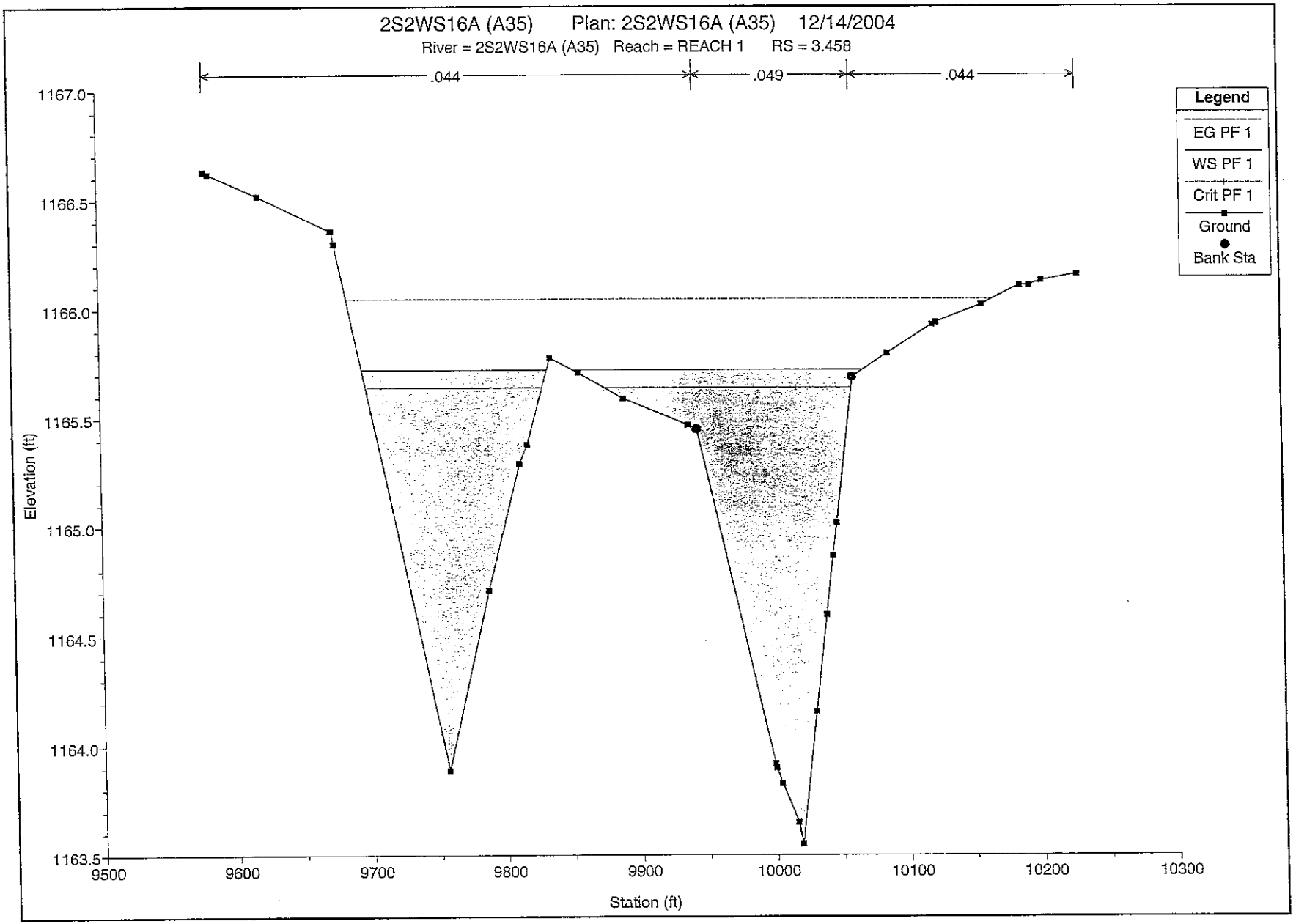

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 2.157
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1112
1111
1110
1109
1108
1107
9400
9600
9800
10000
10200
10400
10600
Station (ft)

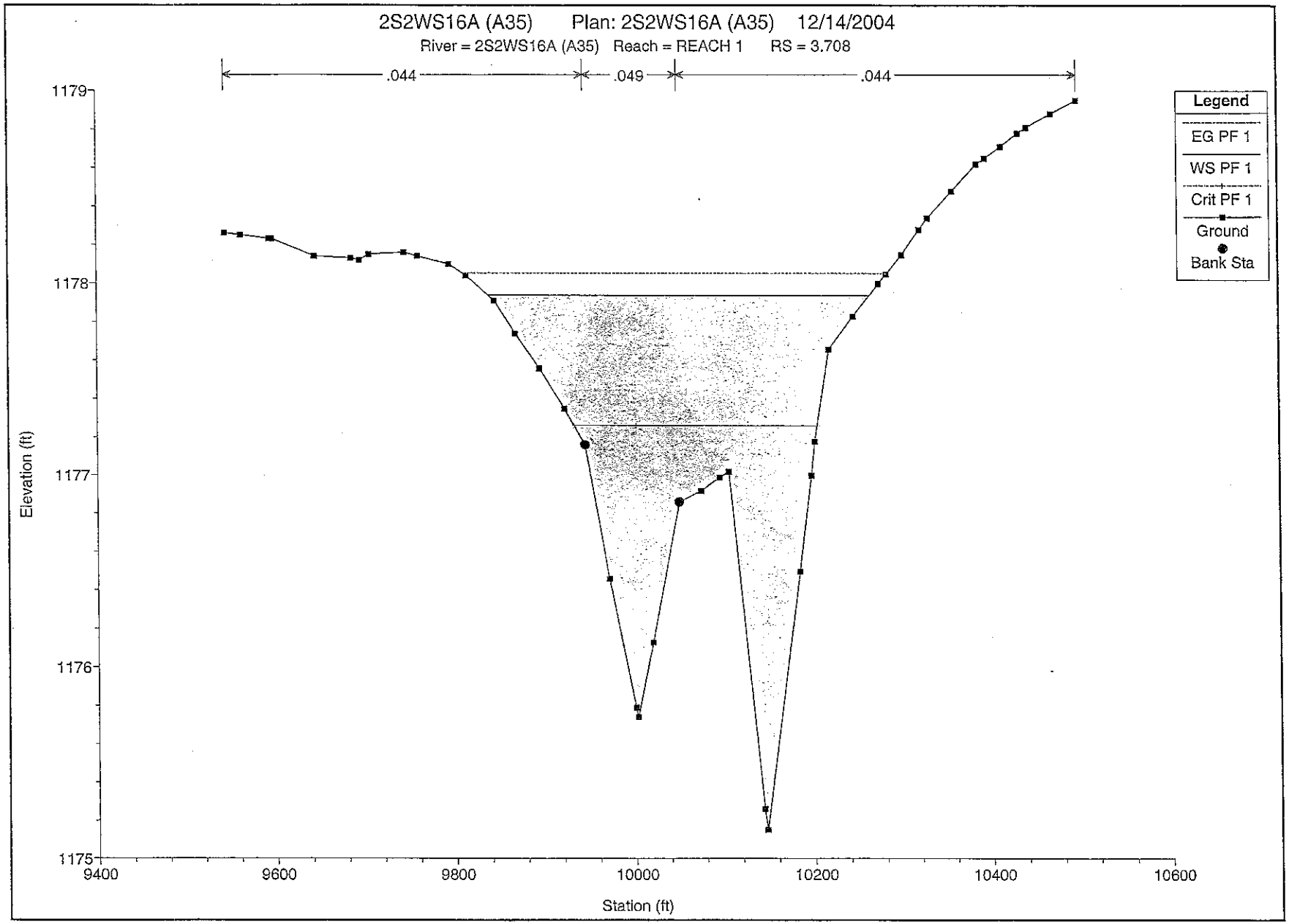

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 2.377
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1122
1121
1120
1119
1118
1117
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

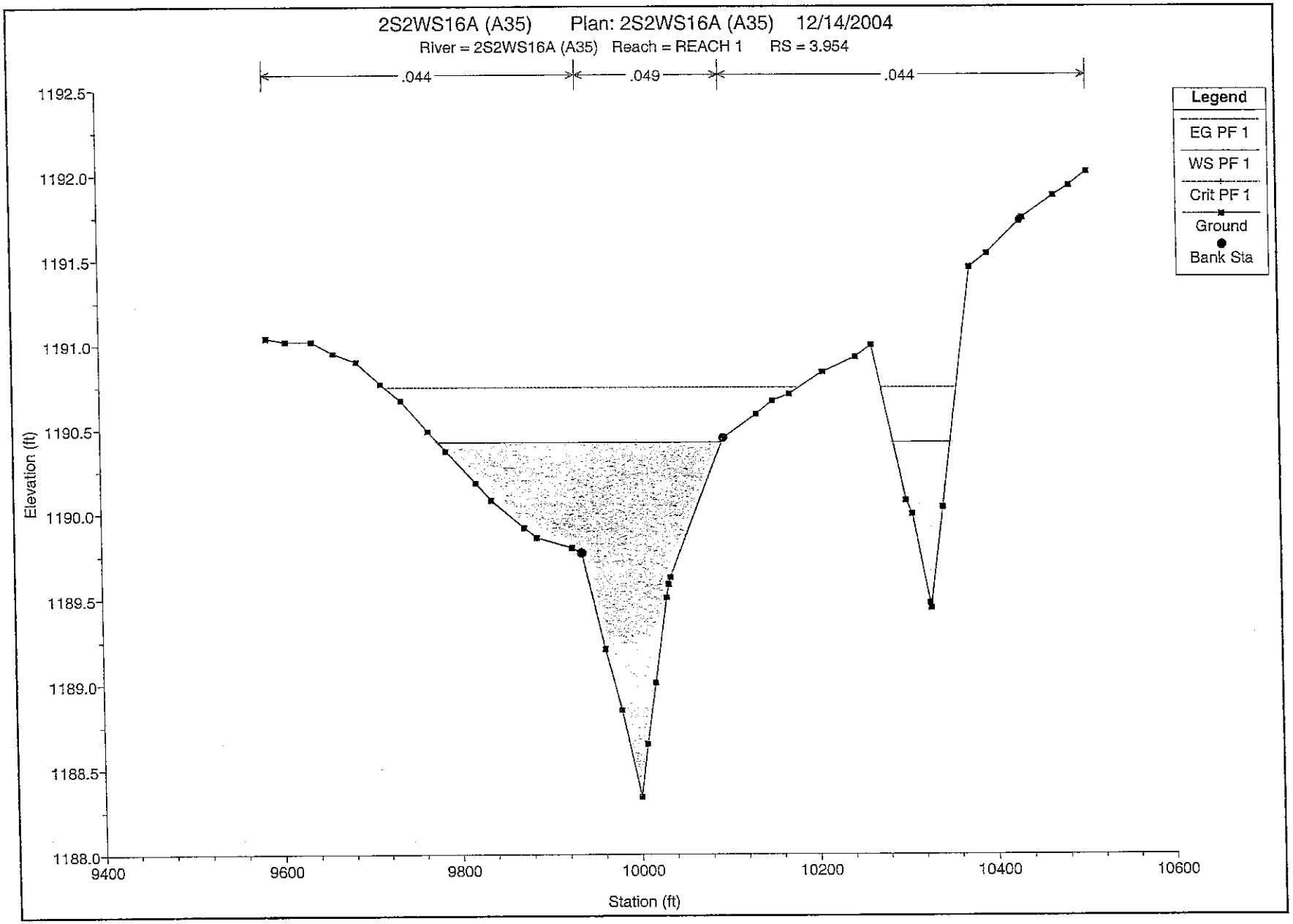

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 2.701
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1134
1133
1132
1131
1130
1129
9600
9800
10000
10200
10400
10600
10800
Station (ft)

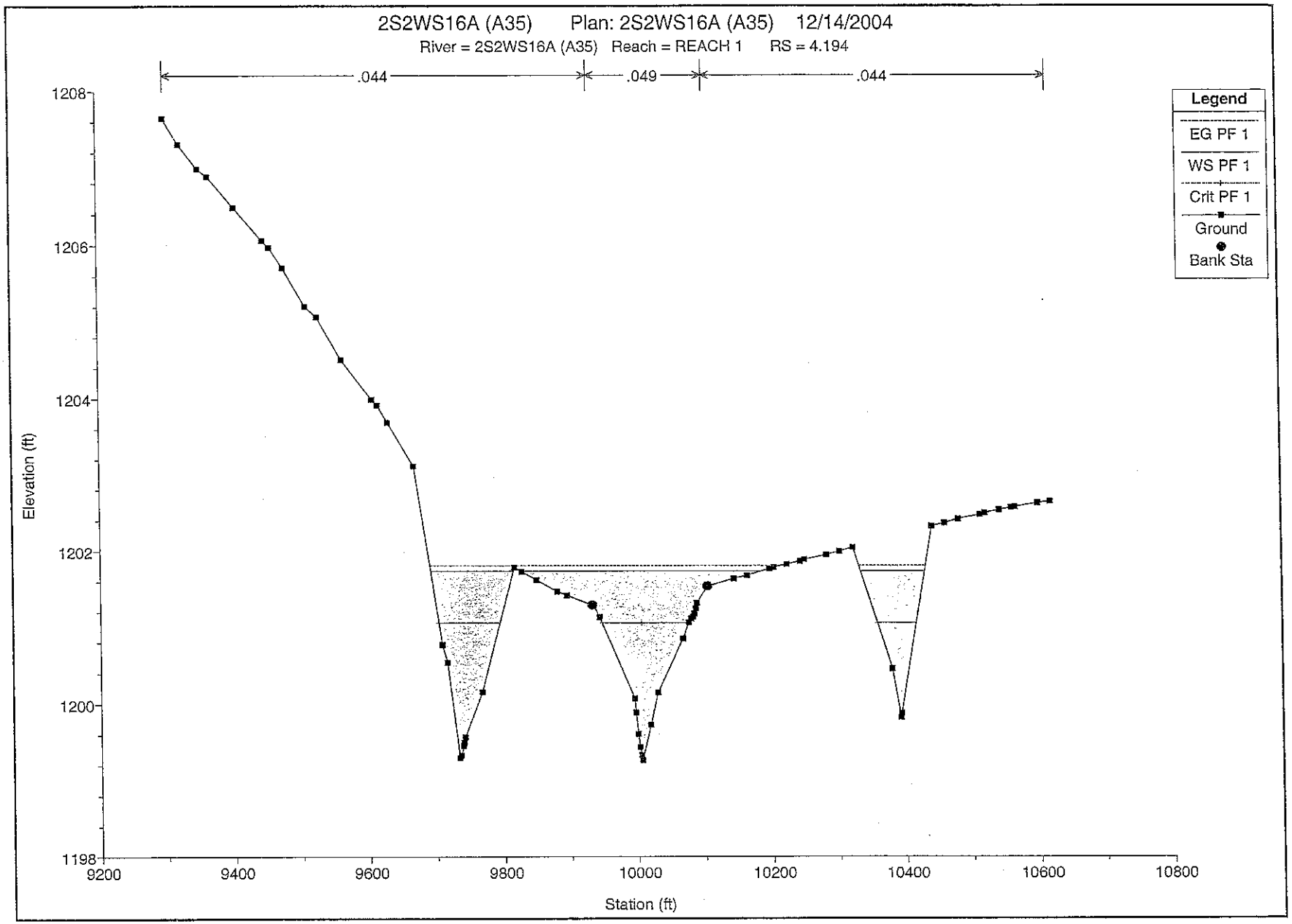

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 2.957 Approximately 1100' downstream of Riggs Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1144
1143
1142
1141
1140
1139
1138
1137
9400
9600
9800
10000
10200
10400
10600
Station (ft)

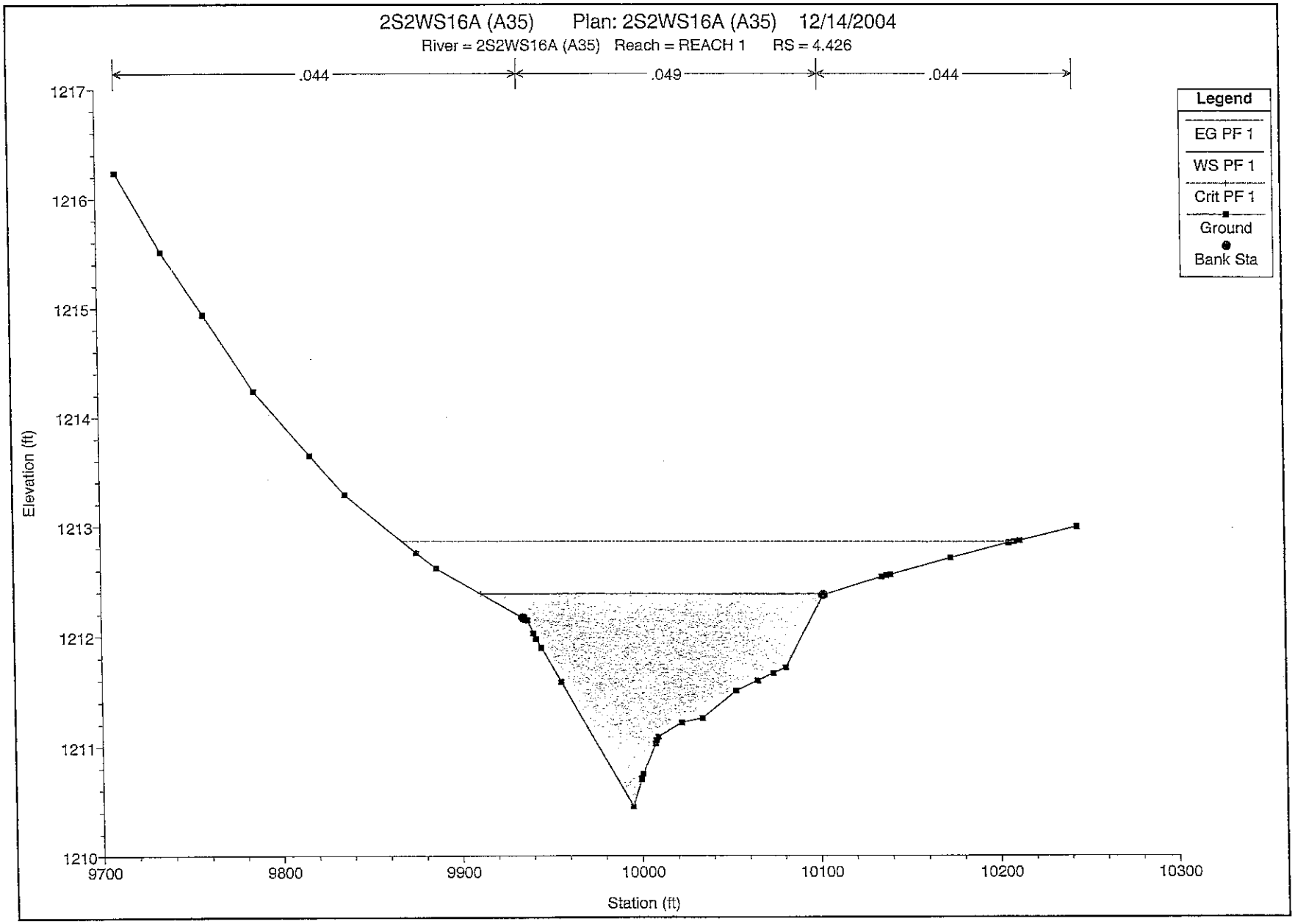

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 3.199 Approximately 200' upstream of Riggs Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1155
1154
1153
1152
1151
1150
1149
1148
9400
9600
9800
10000
10200
10400
Station (ft)

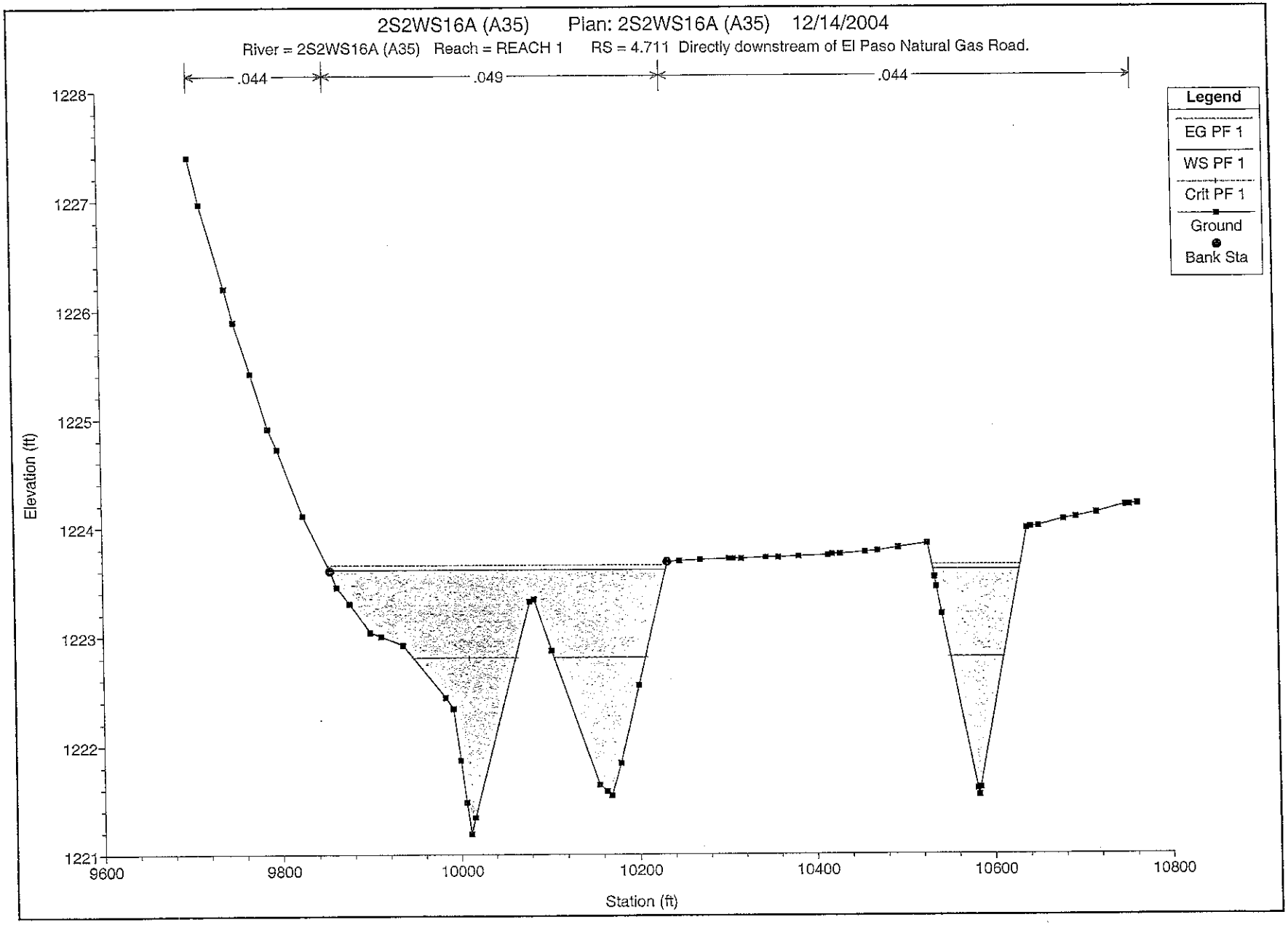

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 3.458
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1167.0
1166.5
1166.0
1165.5
1165.0
1164.5
1164.0
1163.5
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 3.708
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1179
1178
1177
1176
1175
9400
9600
9800
10000
10200
10400
10600
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 3.954
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1192.5
1192.0
1191.5
1191.0
1190.5
1190.0
1189.5
1189.0
1188.5
1188.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 4.194
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1208
1206
1204
1202
1200
1198
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 4.426
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1217
1216
1215
1214
1213
1212
1211
1210
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16A (A35) Reach = REACH 1 RS = 4.711 Directly downstream of El Paso Natural Gas Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1228
1227
1226
1225
1224
1223
1222
1221
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: 2S2WS16A (A35)

REACH: 2S2WS16B (A15)

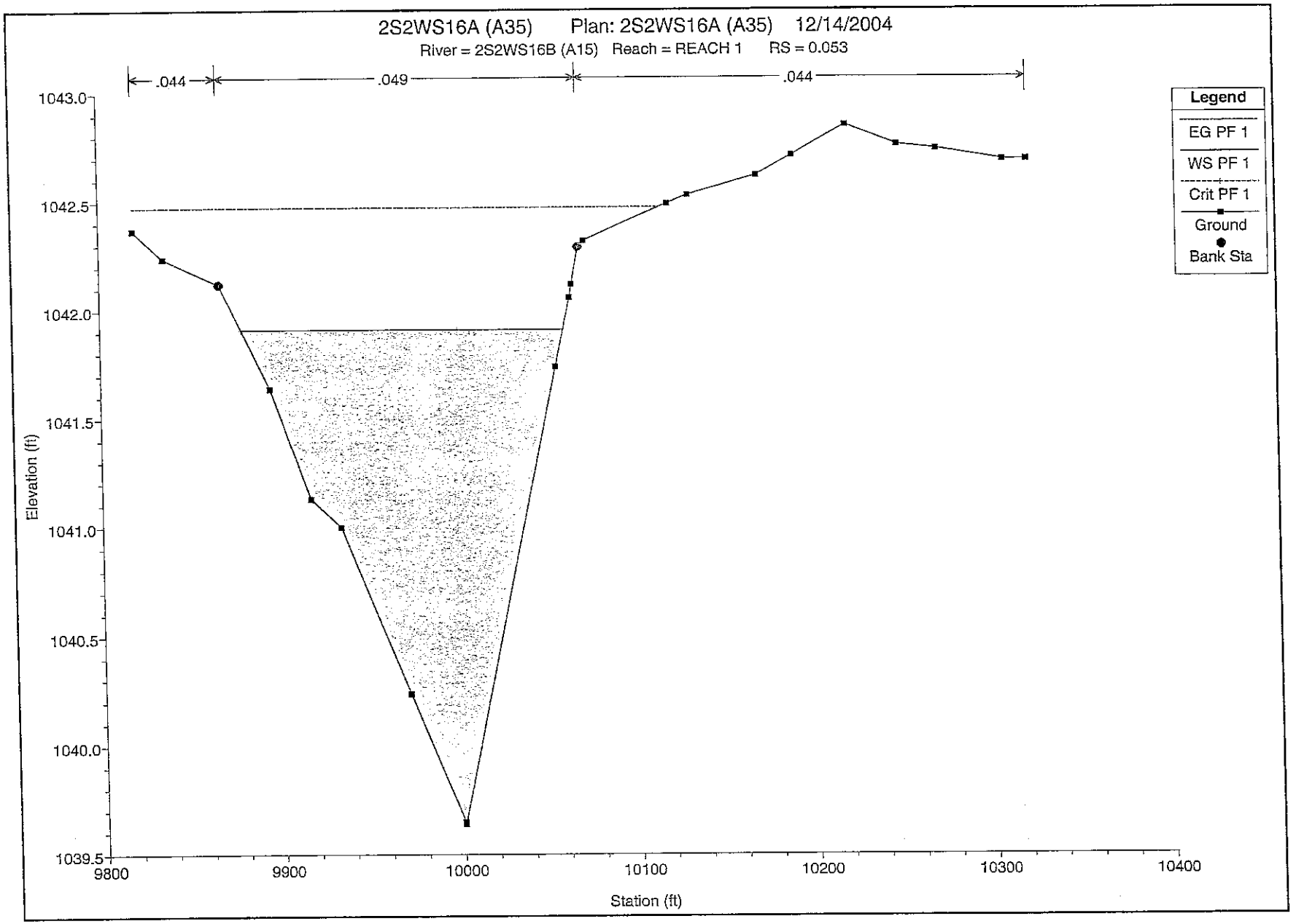
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

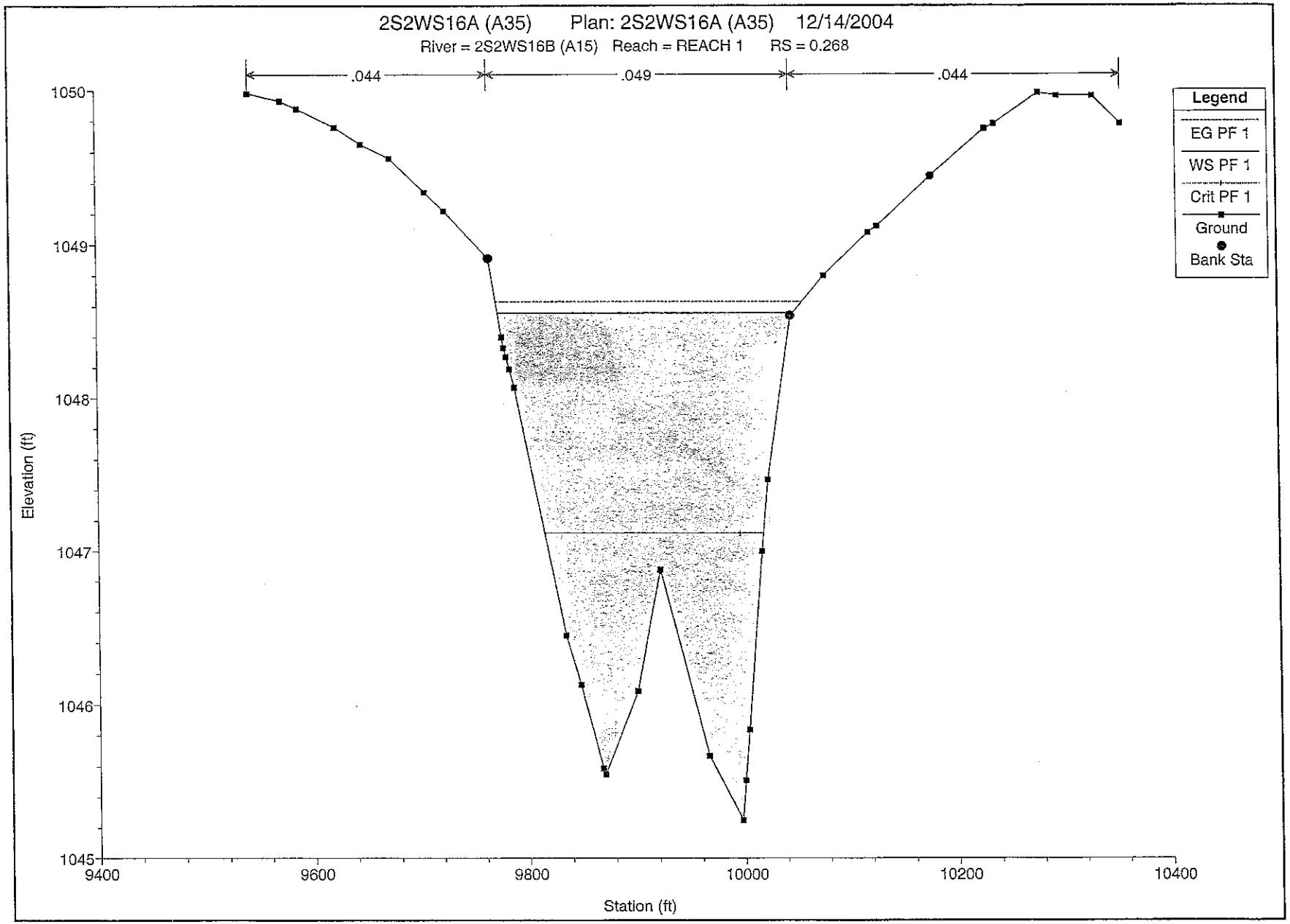
Change in Discharge based on Reach Length

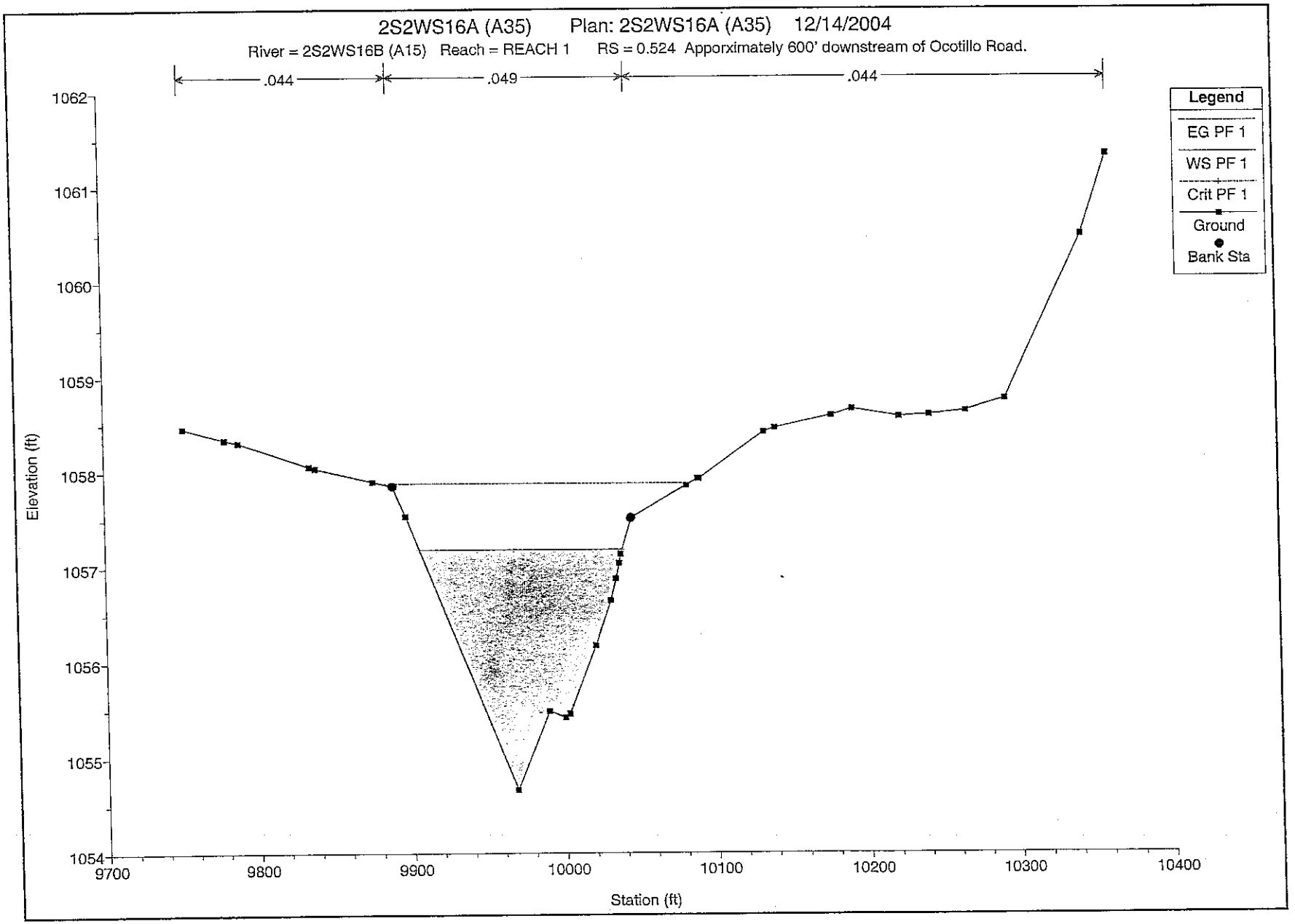
Wash ID: 2S2WS16B (A15)

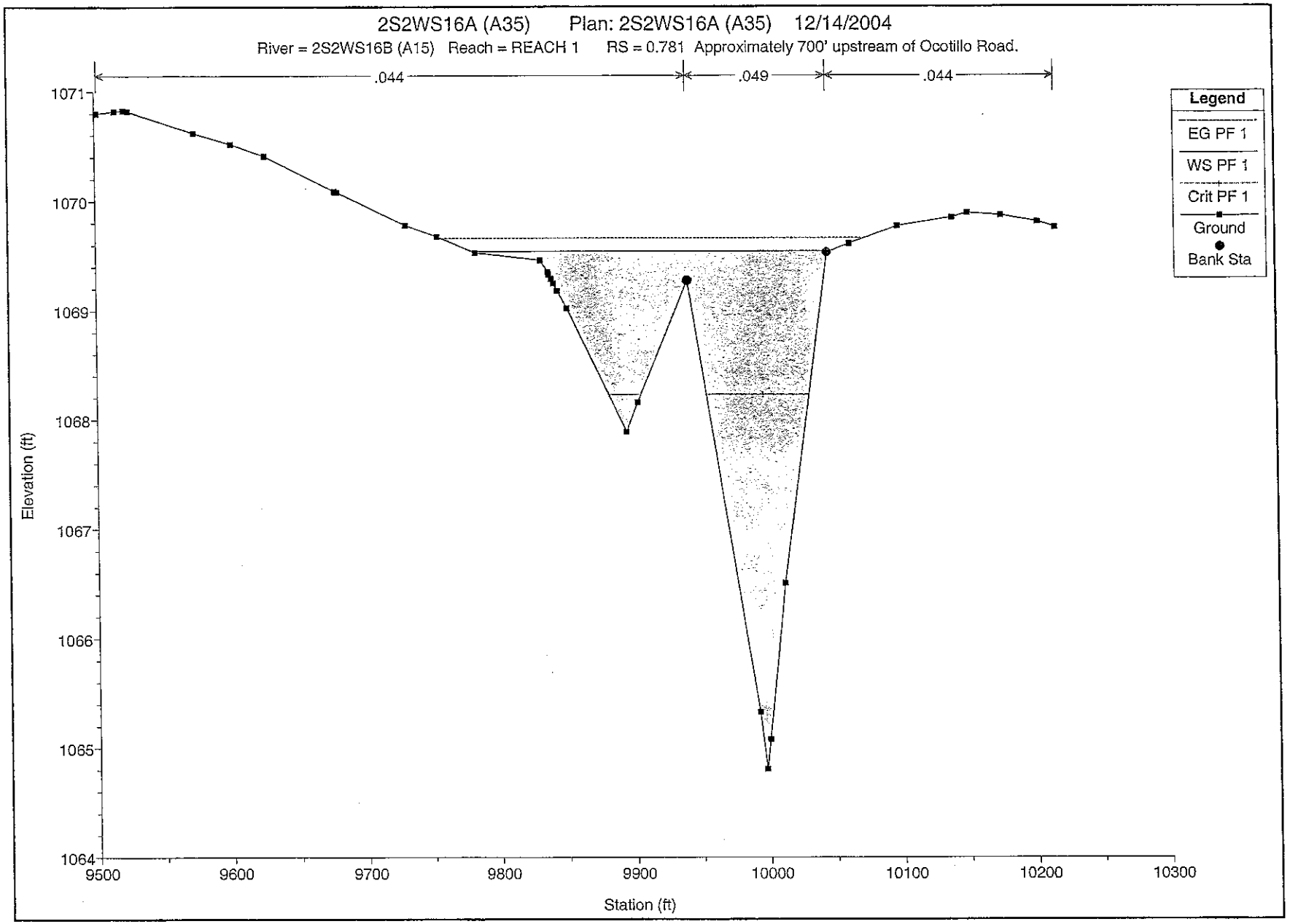
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
A15	2.077	680	680	700
A15	1.815	719	720	700
A15	1.550	758	760	800
A15	1.308	794	790	800
A15	1.047	833	830	800
A15	0.781	872	870	900
CPA15	0.524	910	910	900
CPA16	0.524	1205	1210	1200
A35	0.268	1205	1210	1200
A35	0.053	1205	1210	1200

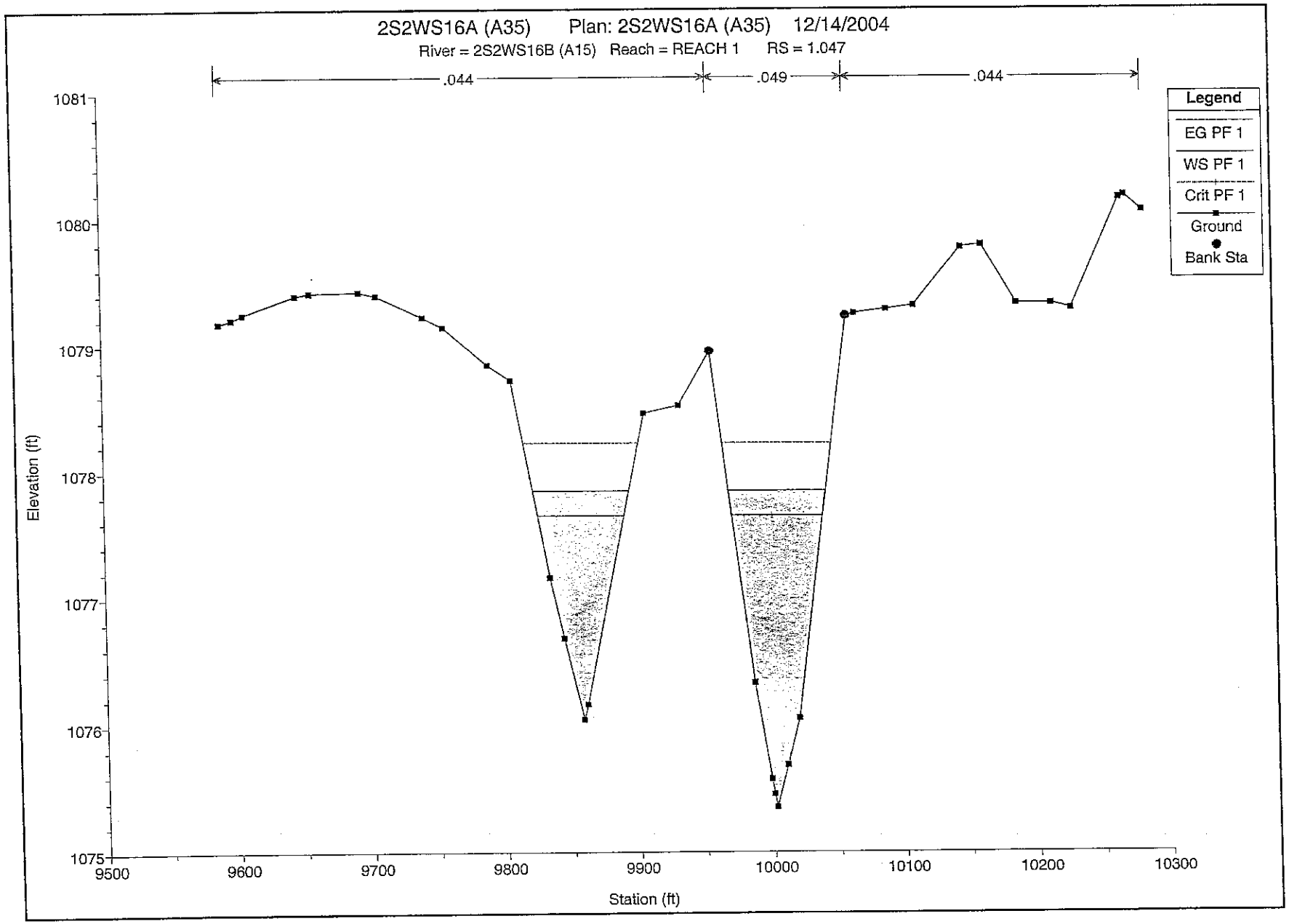
The Q at 0.524 is 1210. The first x-section is used to calculate appropriate q's upstream. A secondary wash combines at 0.524 hence the signifcant increase in Q.

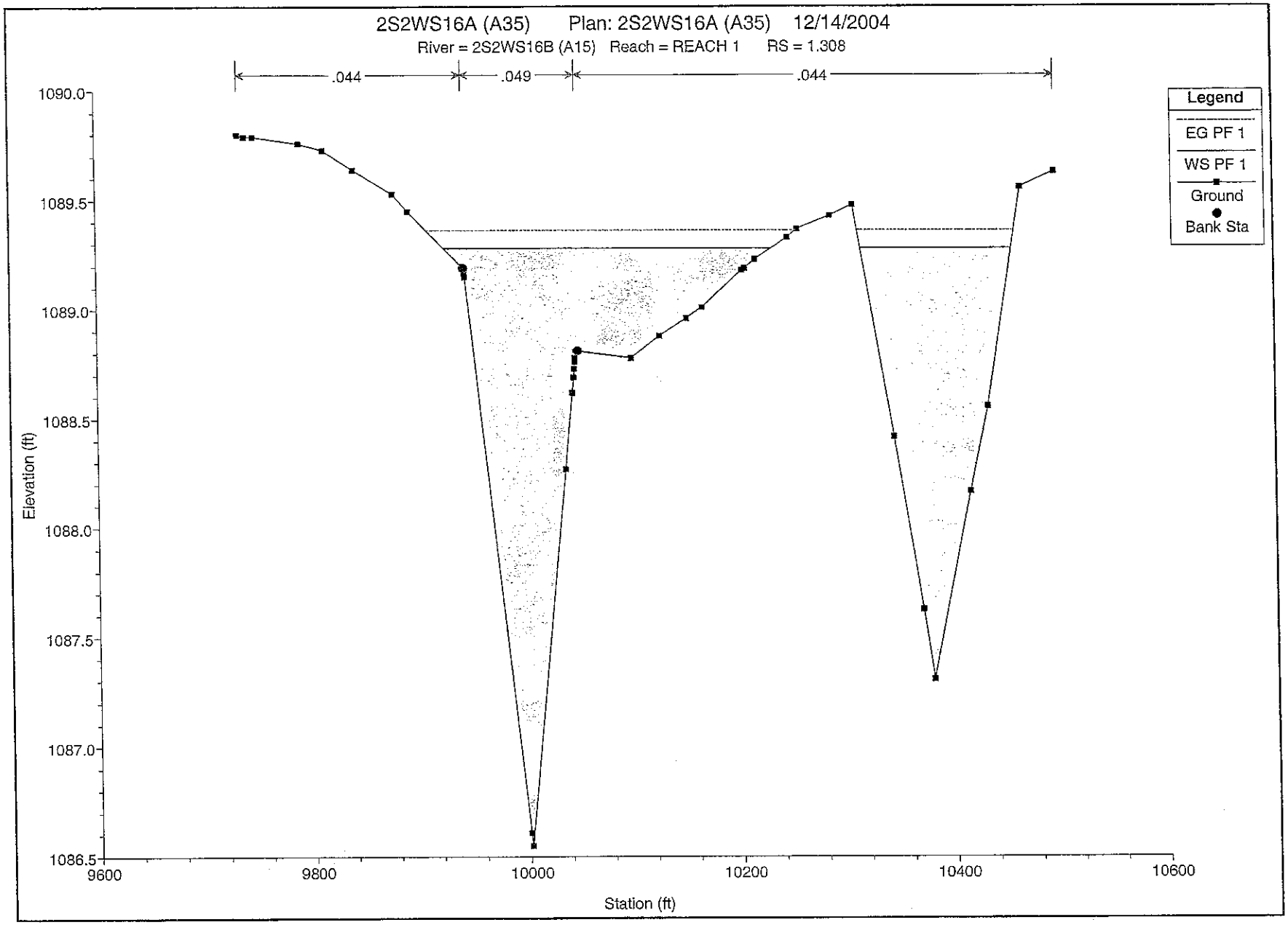

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 0.053
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1043.0
1042.5
1042.0
1041.5
1041.0
1040.5
1040.0
1039.5
9800
9900
10000
10100
10200
10300
10400
Station (ft)

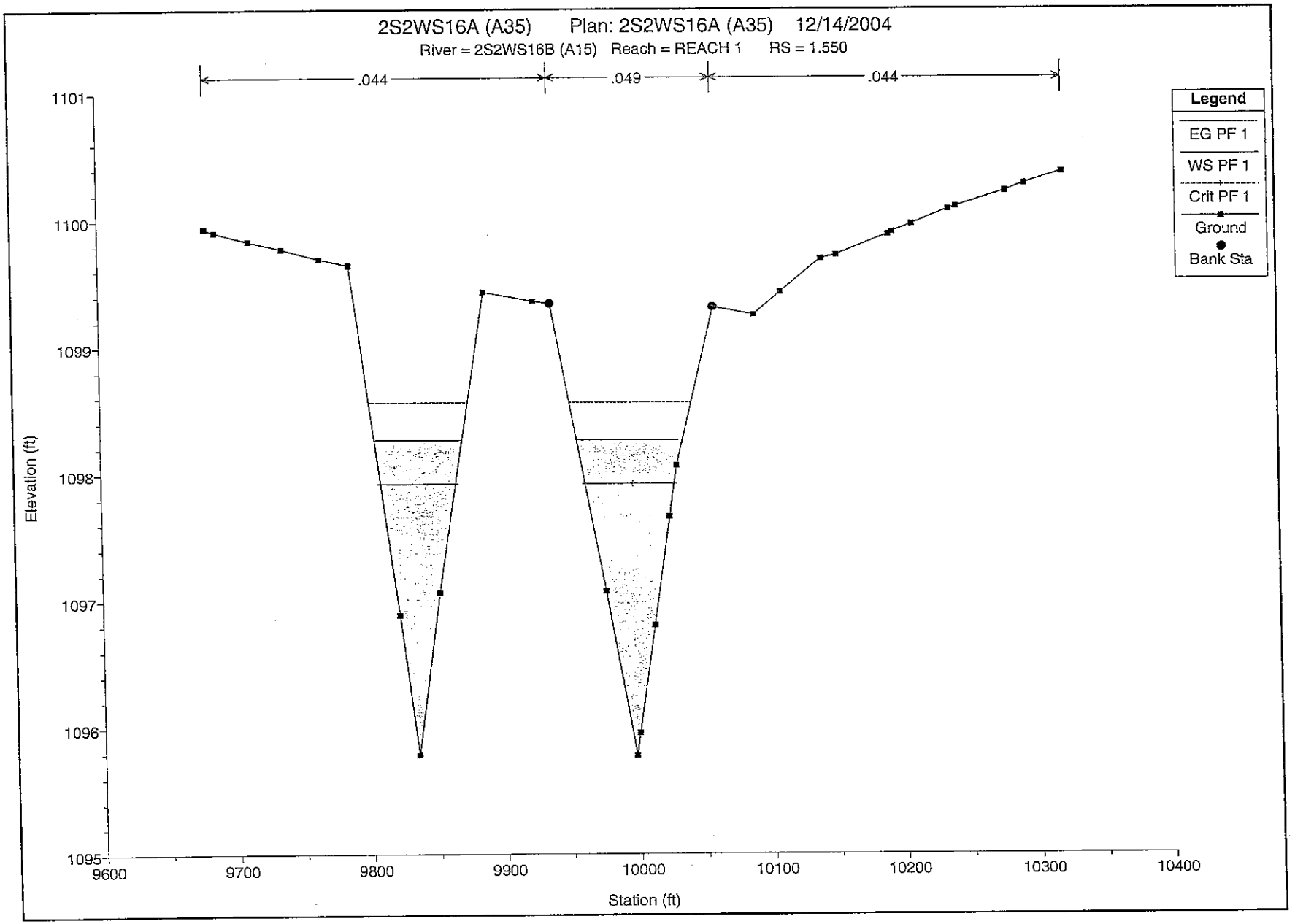

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 0.268
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1050
1049
1048
1047
1046
1045
9400
9600
9800
10000
10200
10400
Station (ft)

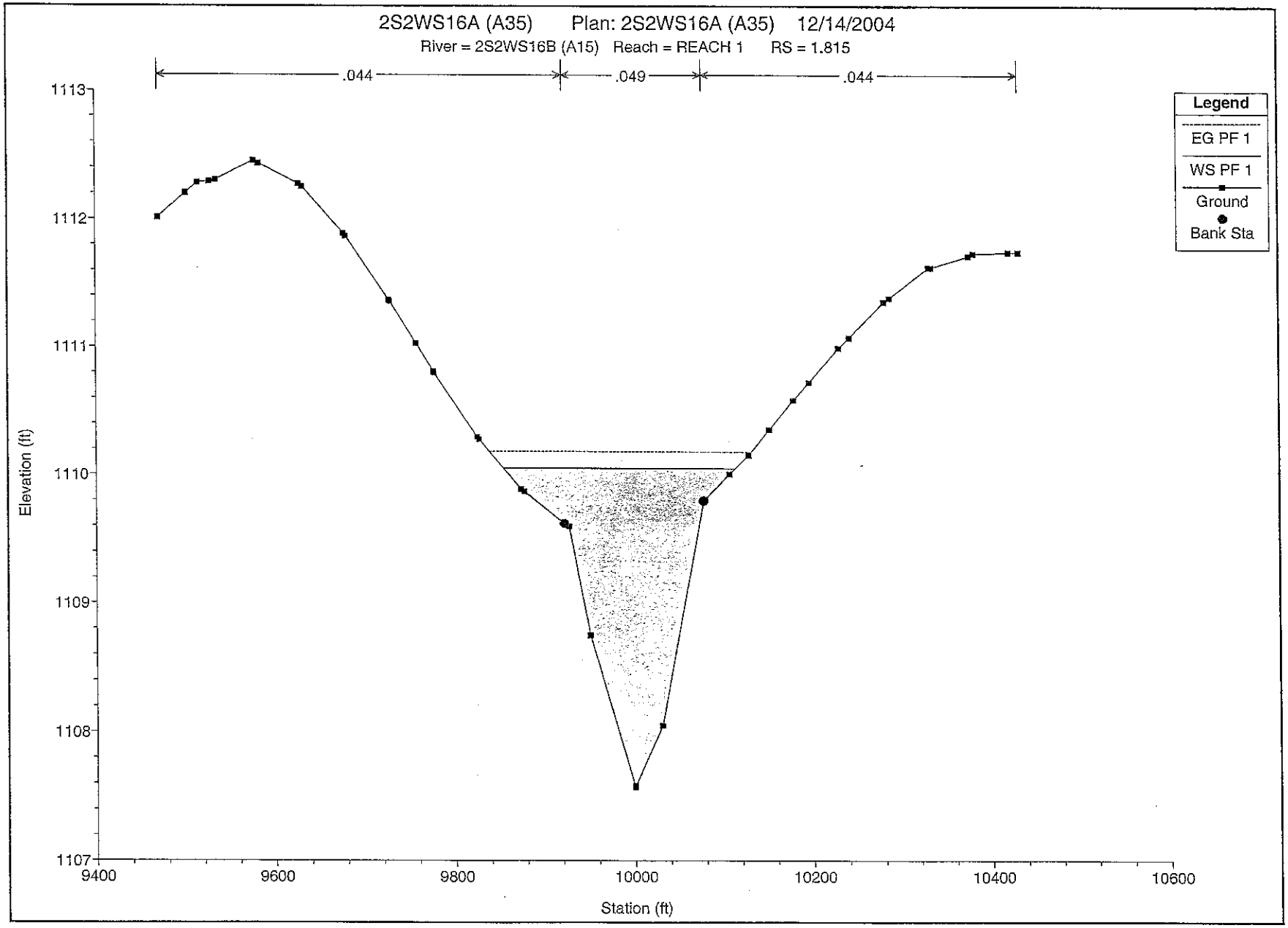

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 0.524 Apporximately 600' downstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1062
1061
1060
1059
1058
1057
1056
1055
1054
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

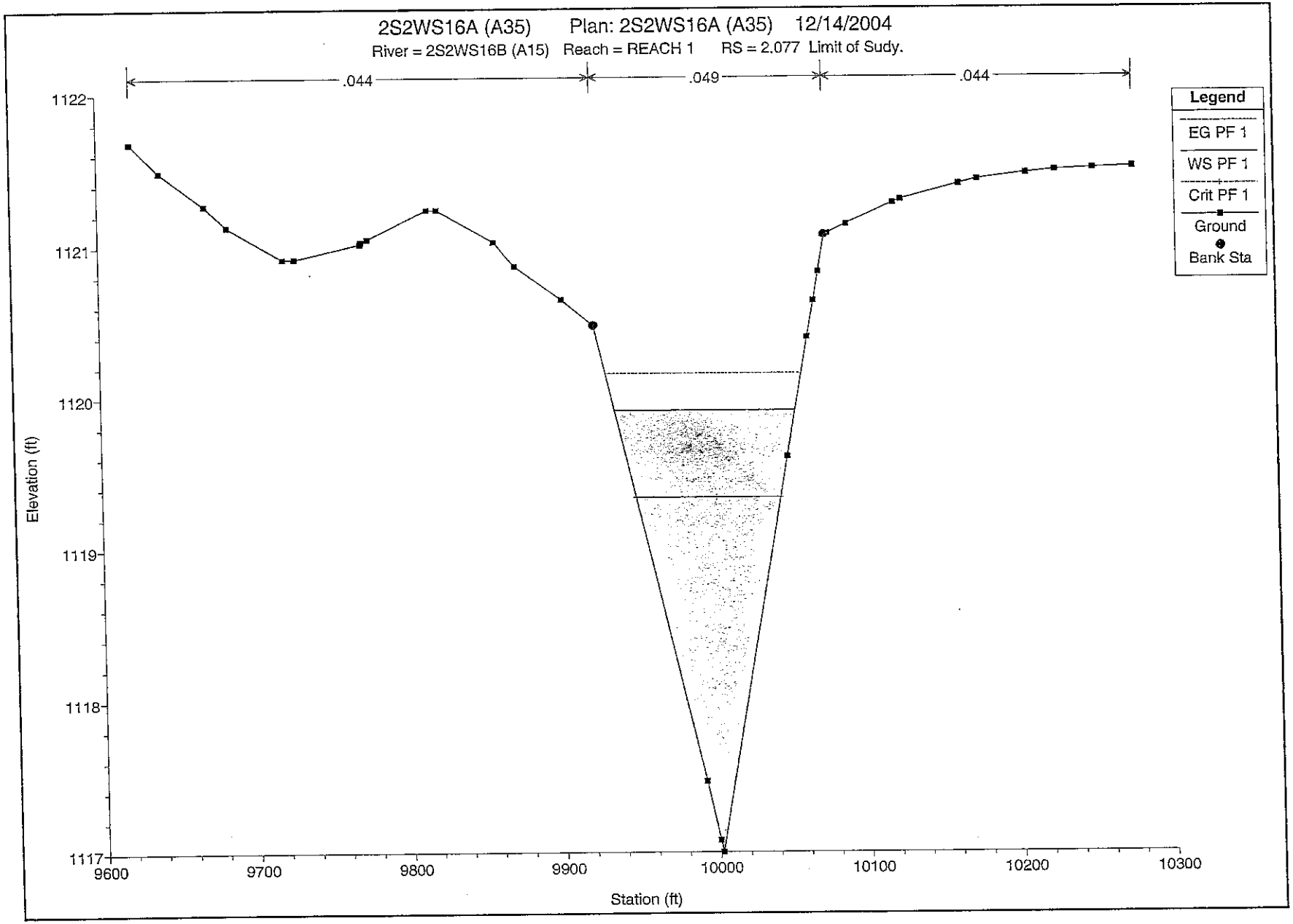

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 0.781 Approximately 700' upstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1071
1070
1069
1068
1067
1066
1065
1064
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 1.047
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1081
1080
1079
1078
1077
1076
1075
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 1.308
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1090.0
1089.5
1089.0
1088.5
1088.0
1087.5
1087.0
1086.5
9600
9800
10000
10200
10400
10600
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 1.550
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1101
1100
1099
1098
1097
1096
1095
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 1.815
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1113
1112
1111
1110
1109
1108
1107
9400
9600
9800
10000
10200
10400
10600
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS16B (A15) Reach = REACH 1 RS = 2.077 Limit of Sudy.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1122
1121
1120
1119
1118
1117
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 2S2WS16A (A35)

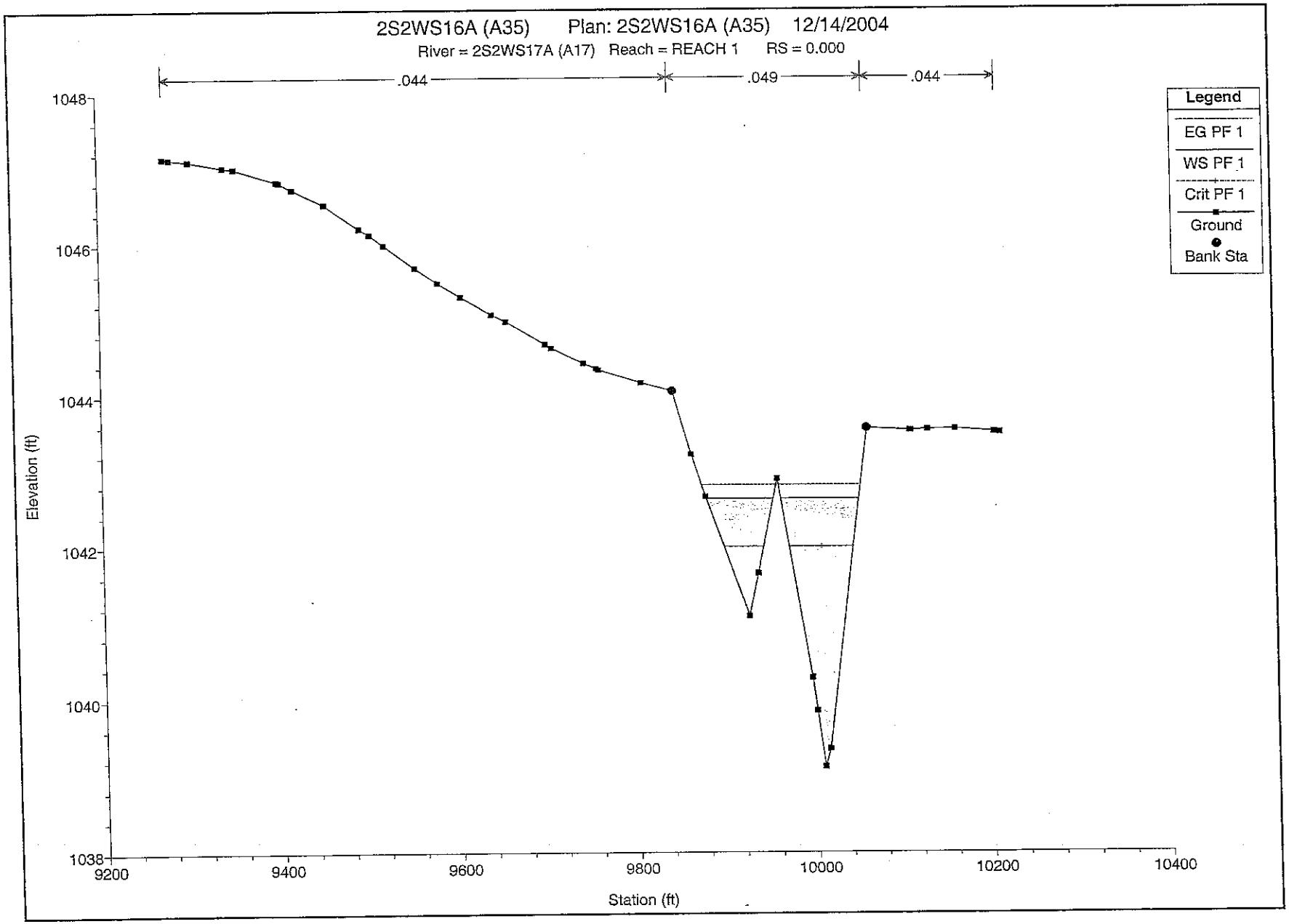
REACH: 2S2WS17A (A17)

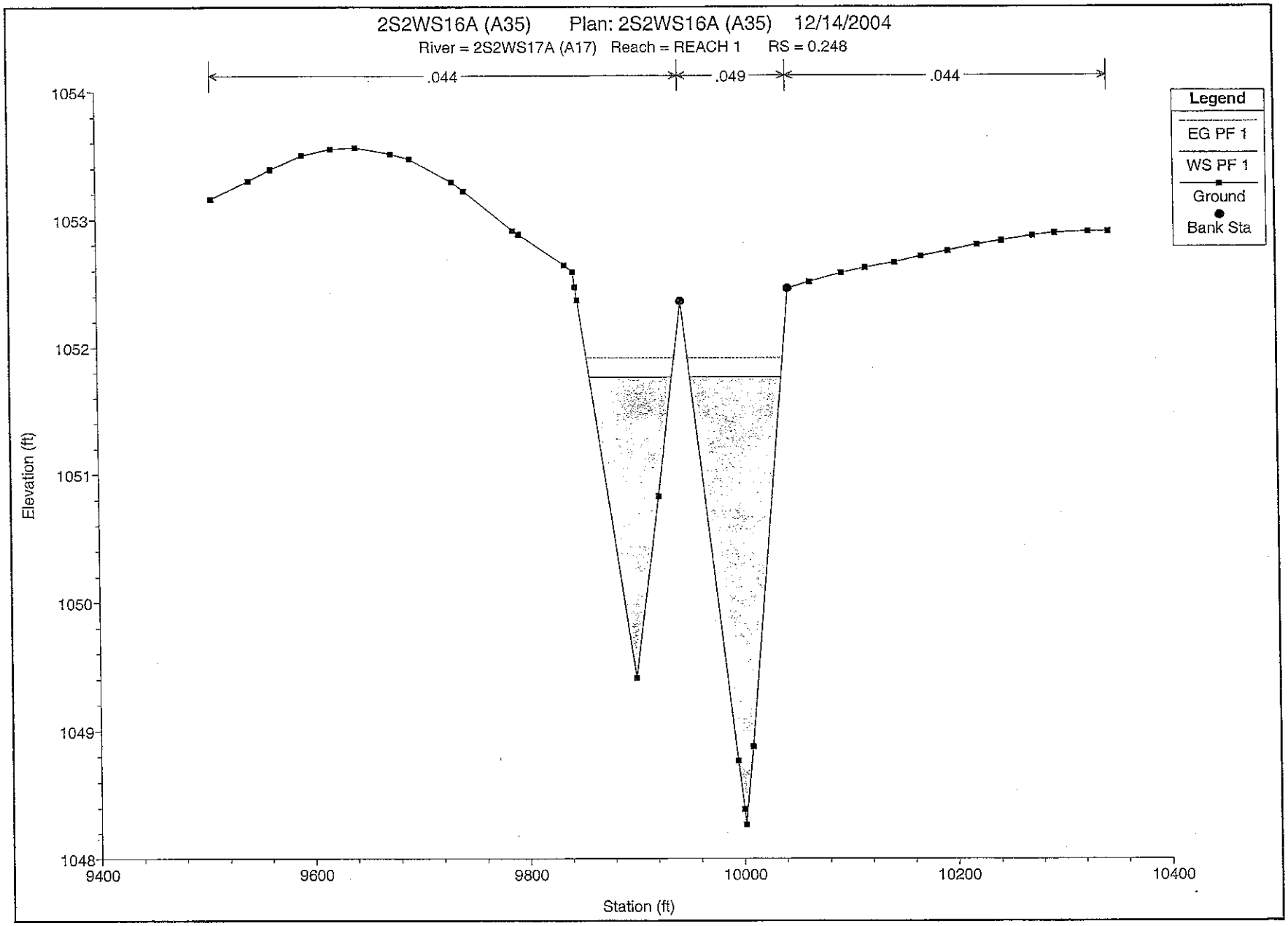
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

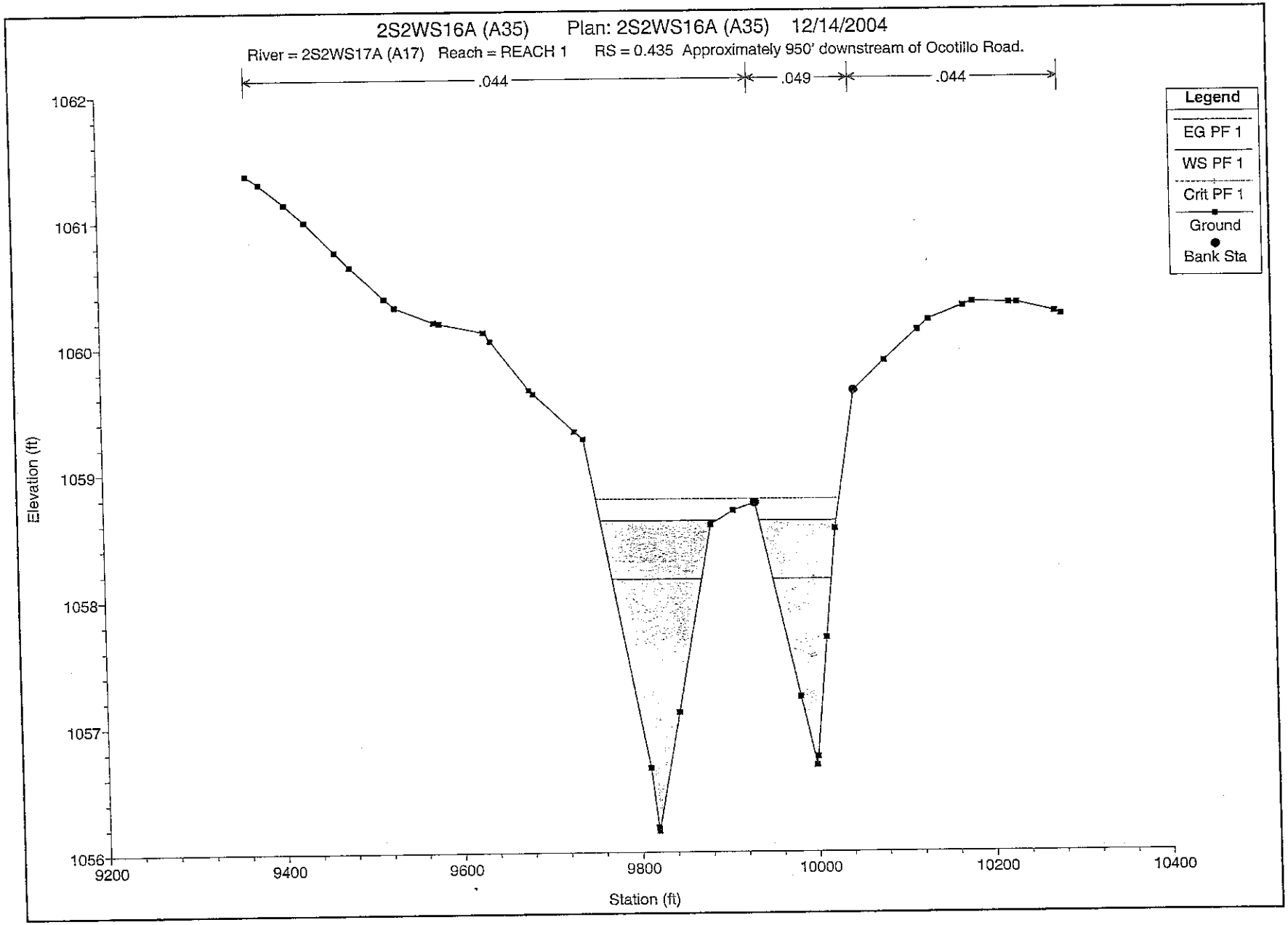
Change in Discharge based on Reach Length

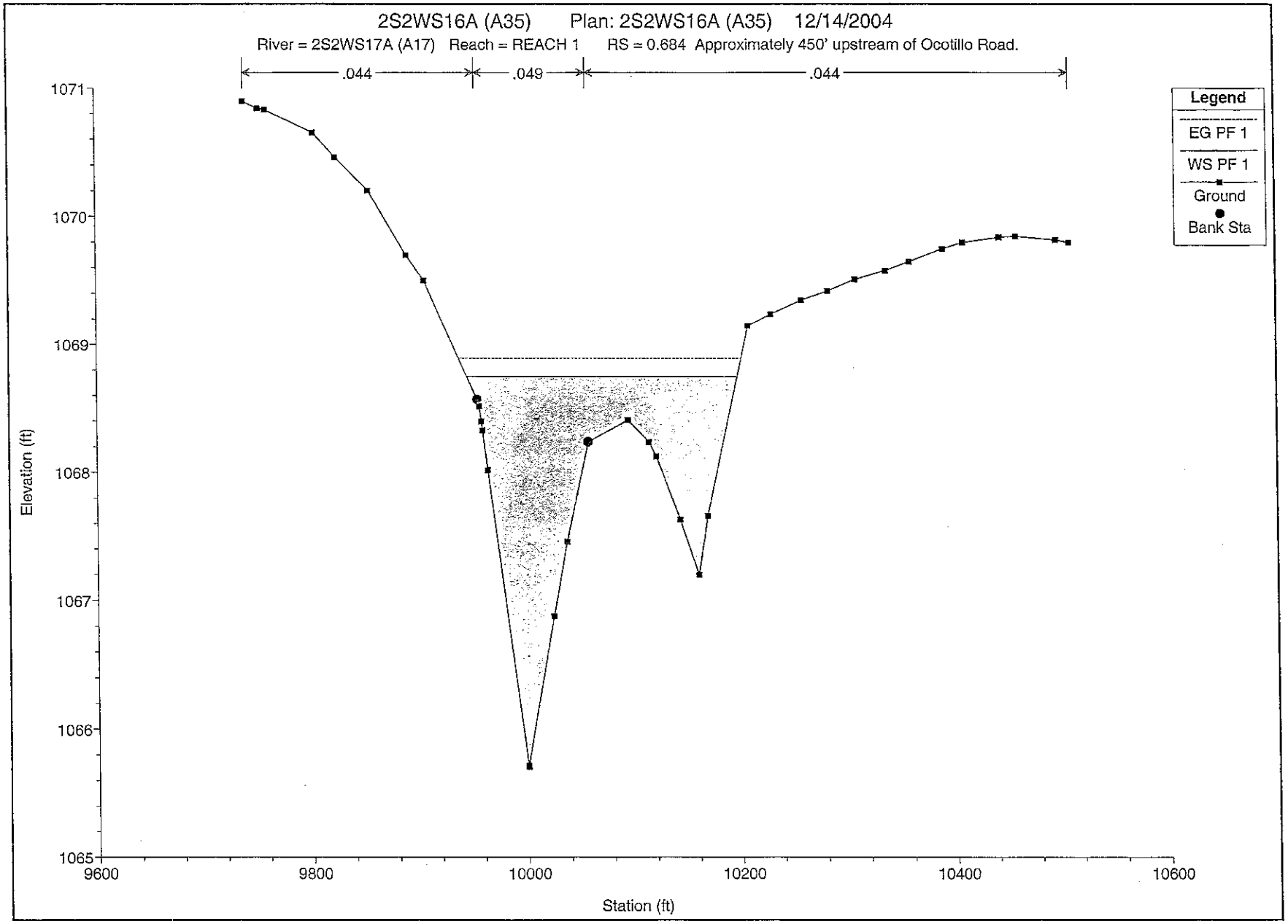
Wash ID: 2S2WS17A (A17)

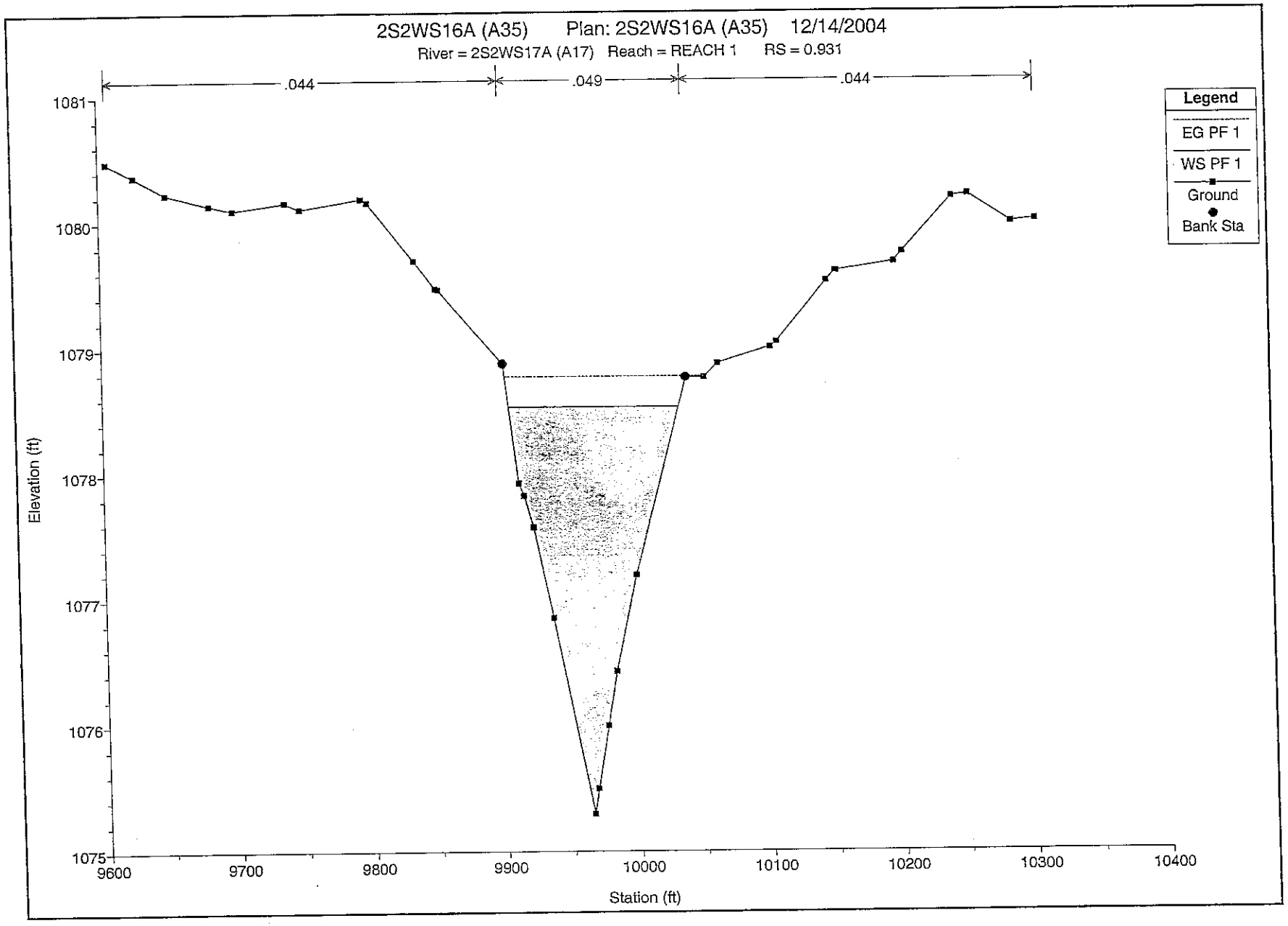
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
DVA10	1.473	811	810	800
A17	1.217	798	800	800
A17	0.931	784	780	800
A17	0.684	771	770	800
A17	0.435	759	760	800
A17	0.248	749	750	700
CPA17	0.000	737	740	700

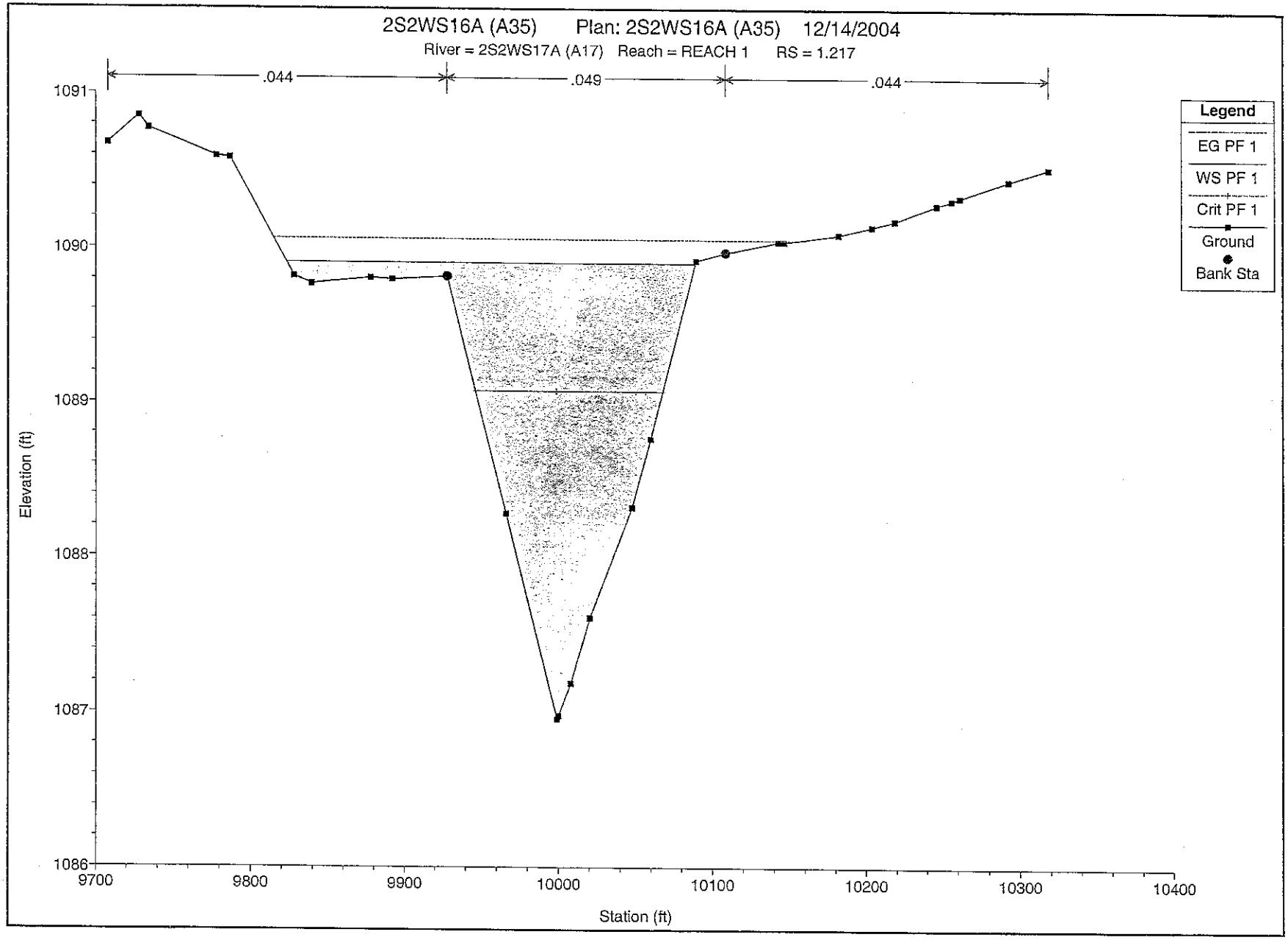

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1048
1046
1044
1042
1040
1038
9200
9400
9600
9800
10000
10200
10400
Station (ft)

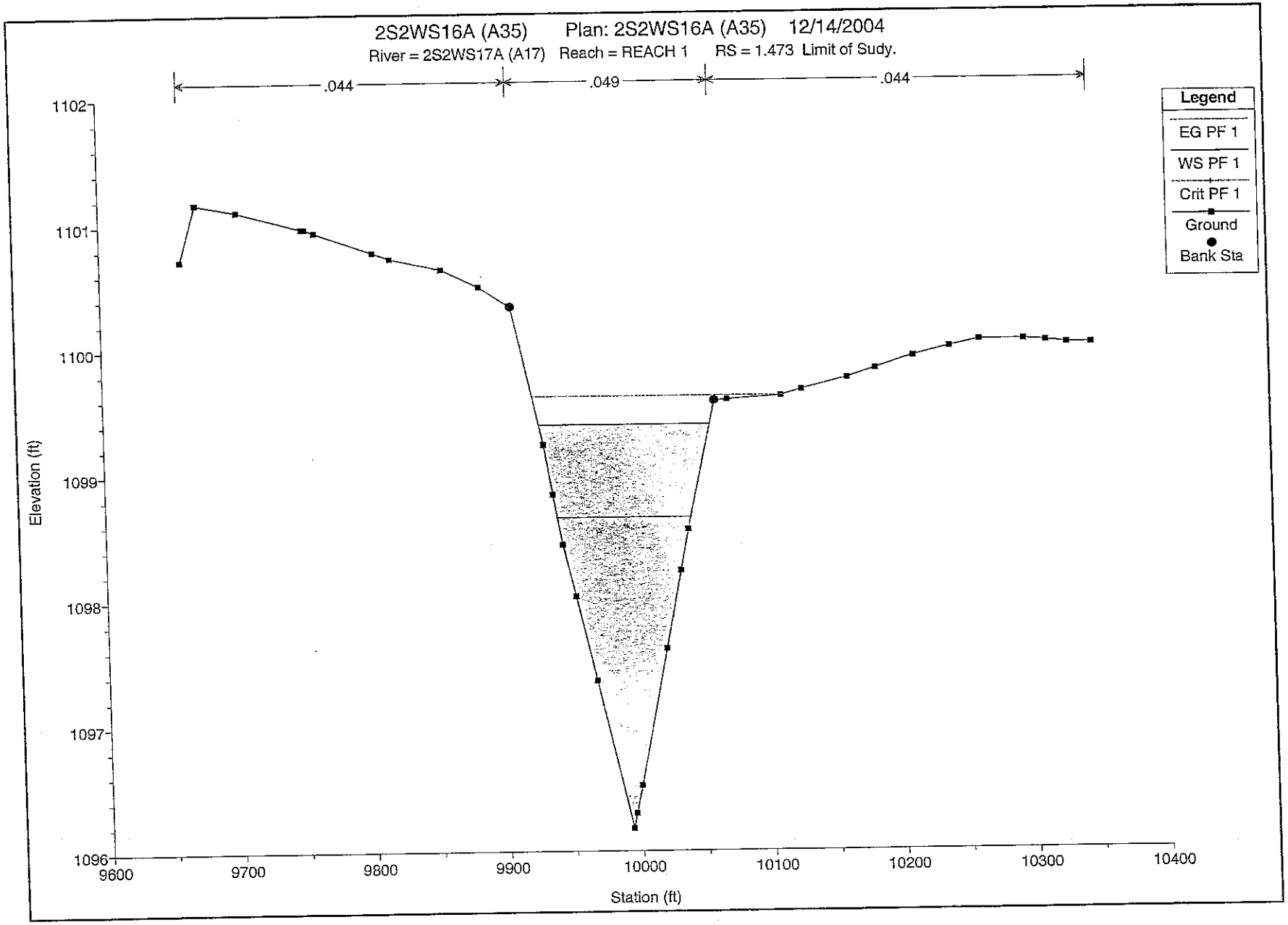

2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 0.248
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1054
1053
1052
1051
1050
1049
1048
9400
9600
9800
10000
10200
10400
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 0.435 Approximately 950' downstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1062
1061
1060
1059
1058
1057
1056
9200
9400
9600
9800
10000
10200
10400
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 0.684 Approximately 450' upstream of Ocotillo Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1071
1070
1069
1068
1067
1066
1065
9600
9800
10000
10200
10400
10600
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 0.931
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1081
1080
1079
1078
1077
1076
1075
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 1.217
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1091
1090
1089
1088
1087
1086
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS16A (A35) Plan: 2S2WS16A (A35) 12/14/2004
River = 2S2WS17A (A17) Reach = REACH 1 RS = 1.473 Limit of Sudy.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1102
1101
1100
1099
1098
1097
1096
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

MODEL: 2S2WS26 (A41)

REACH: 2S2WS26 (A41)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 2S2WS26 (A41)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
A12(L)	0.640	1205	1210	1200
A41	0.330	1116	1120	1100
A41	0.000	1022	1020	1000
CPA41	-1.000	735	740	700

Notes:
1. A12(L) designates a local CP in Subbasin A12
2. Since the stream only continues a short distance past the CP it is assumed the Q at the CP carries through.

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

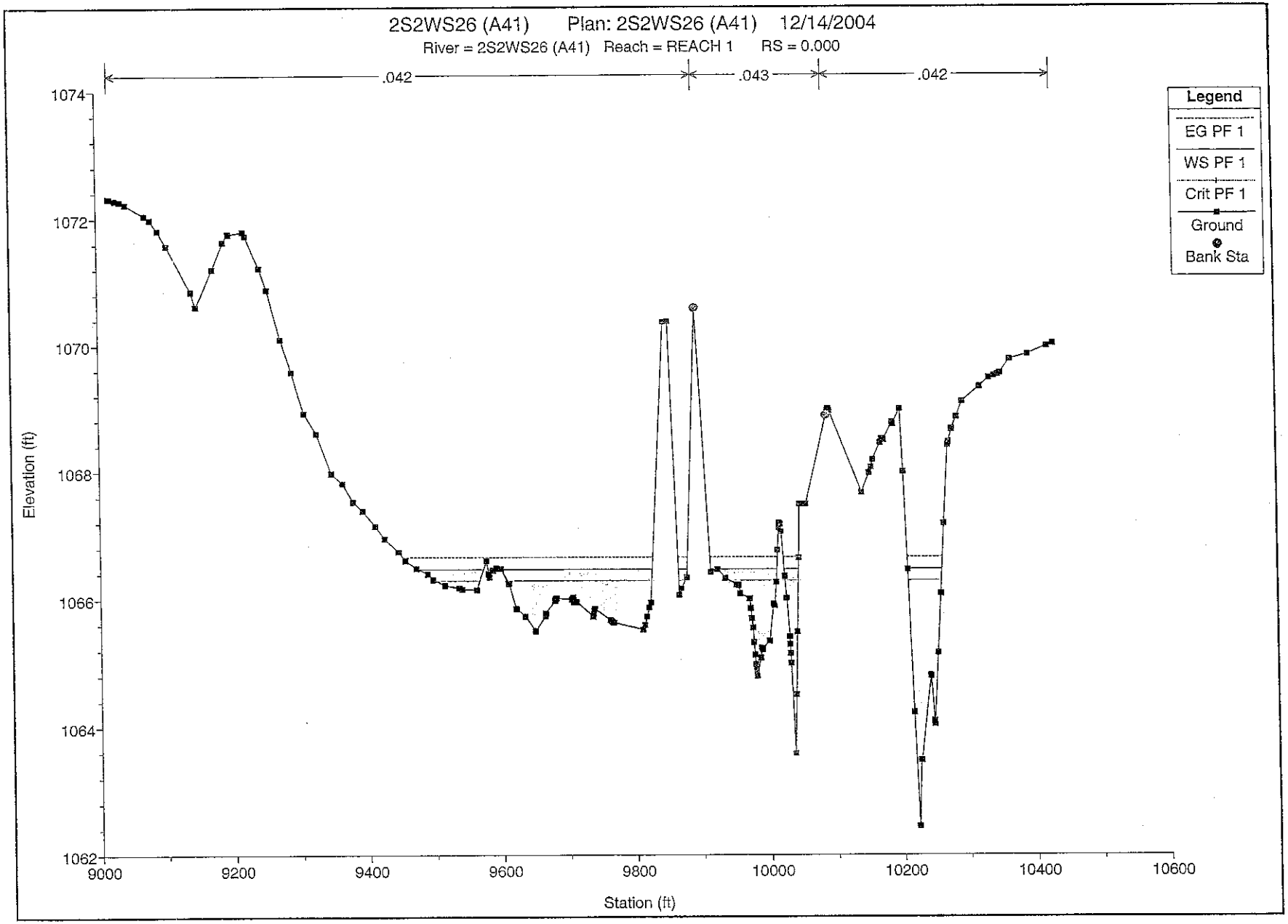
Wash ID: 2S2WS26 (A41)

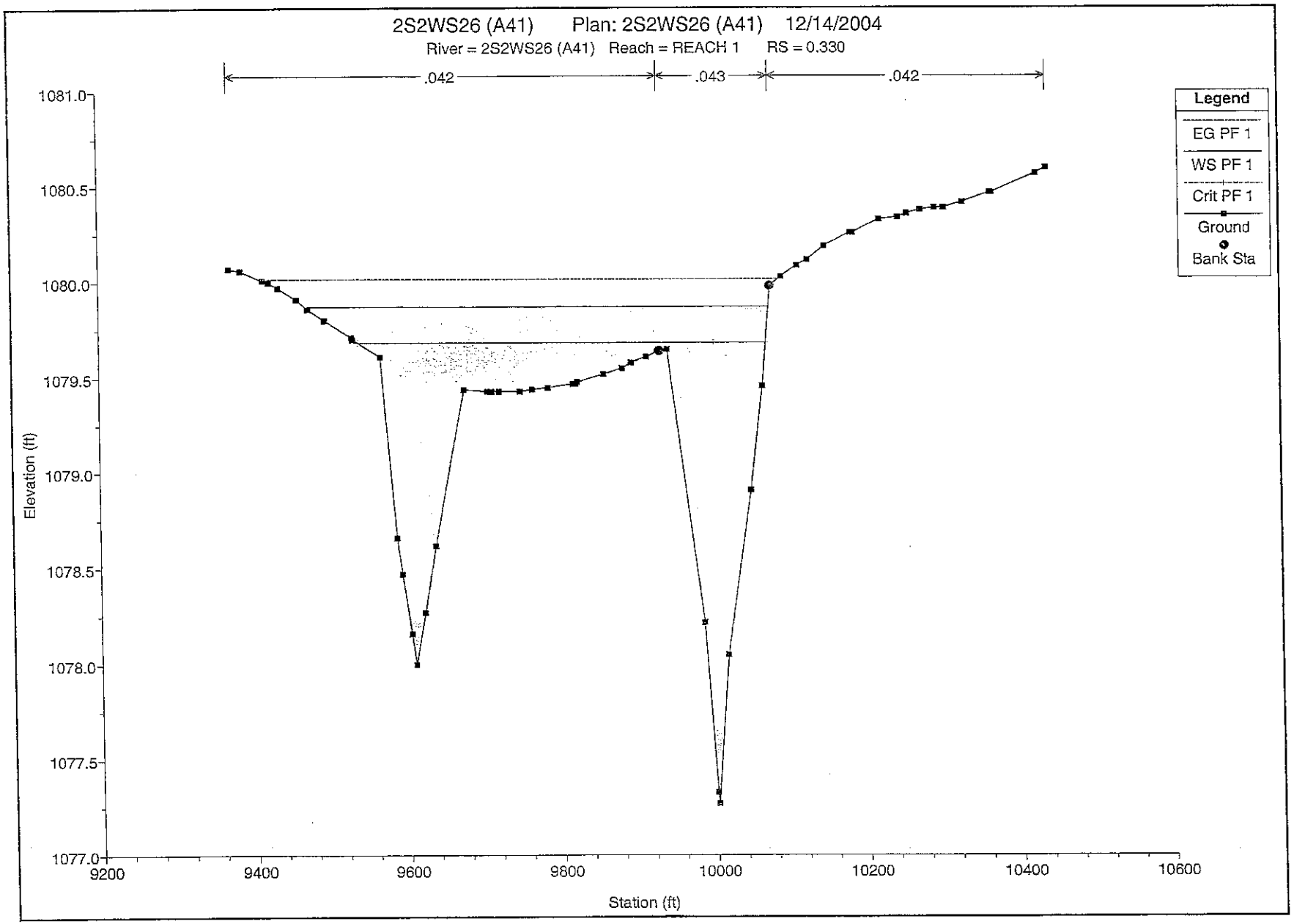
Subbasin: A12

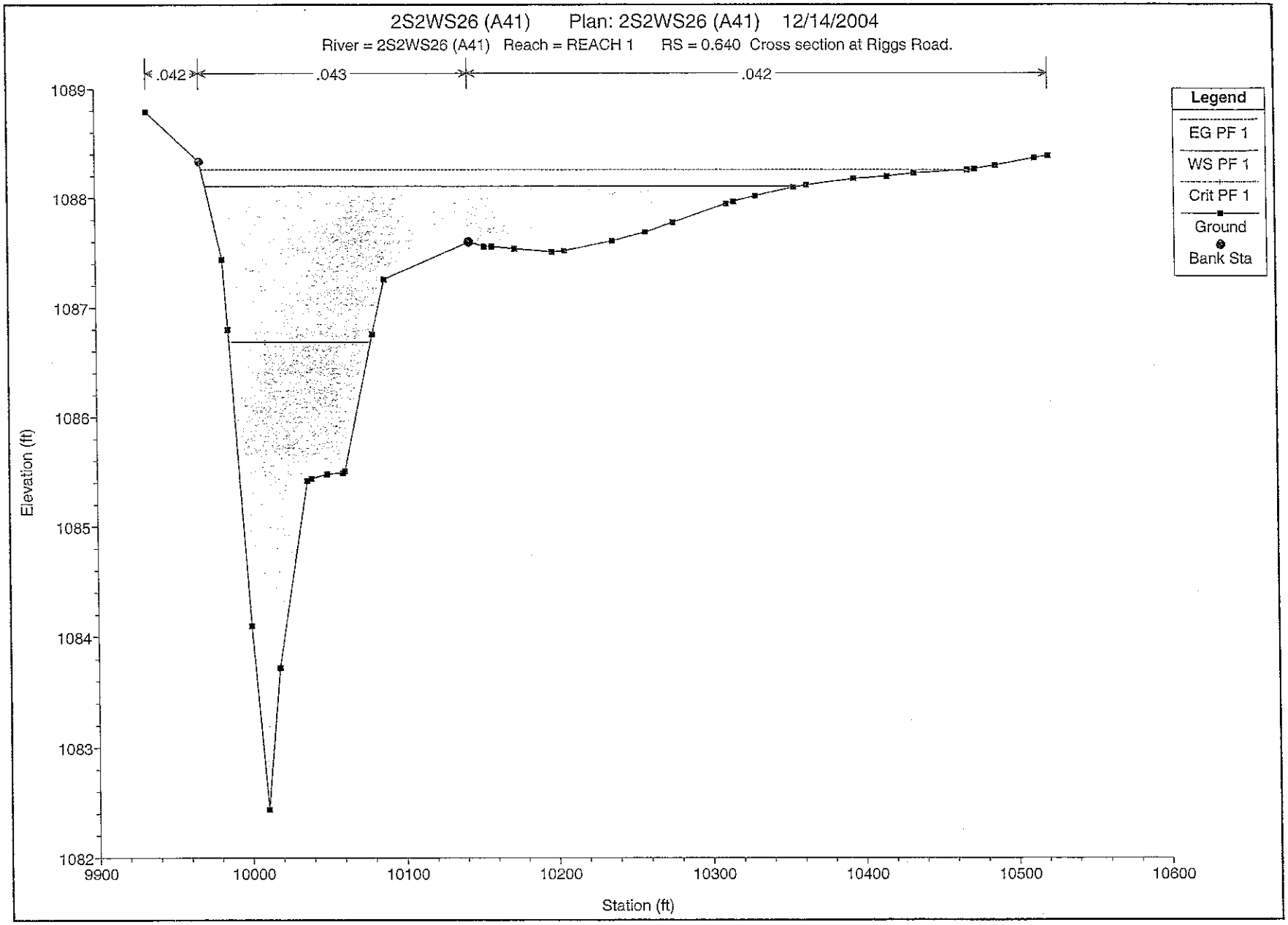
Total Discharge (cfs) = 1205

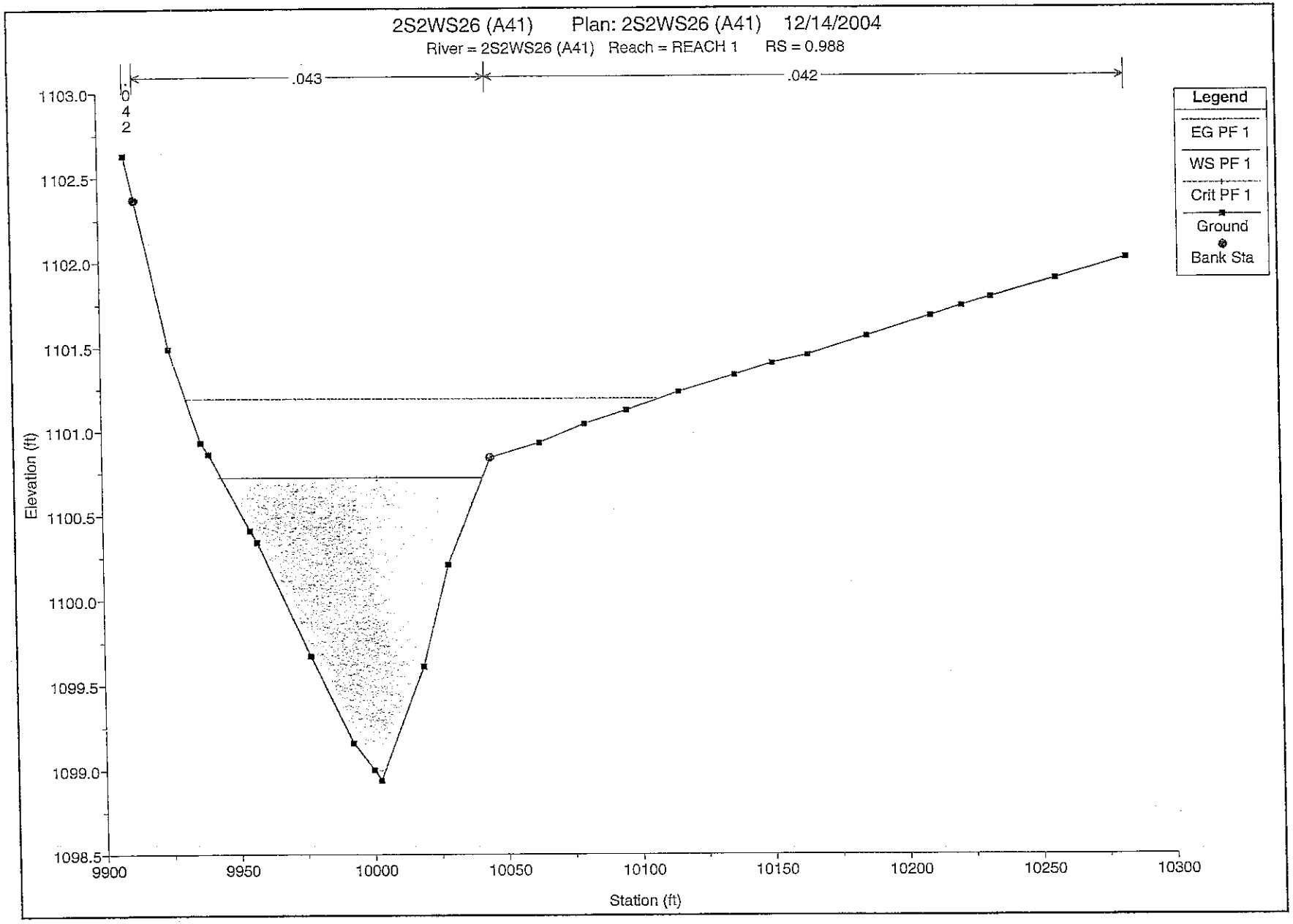
Total Area (acres) = 681

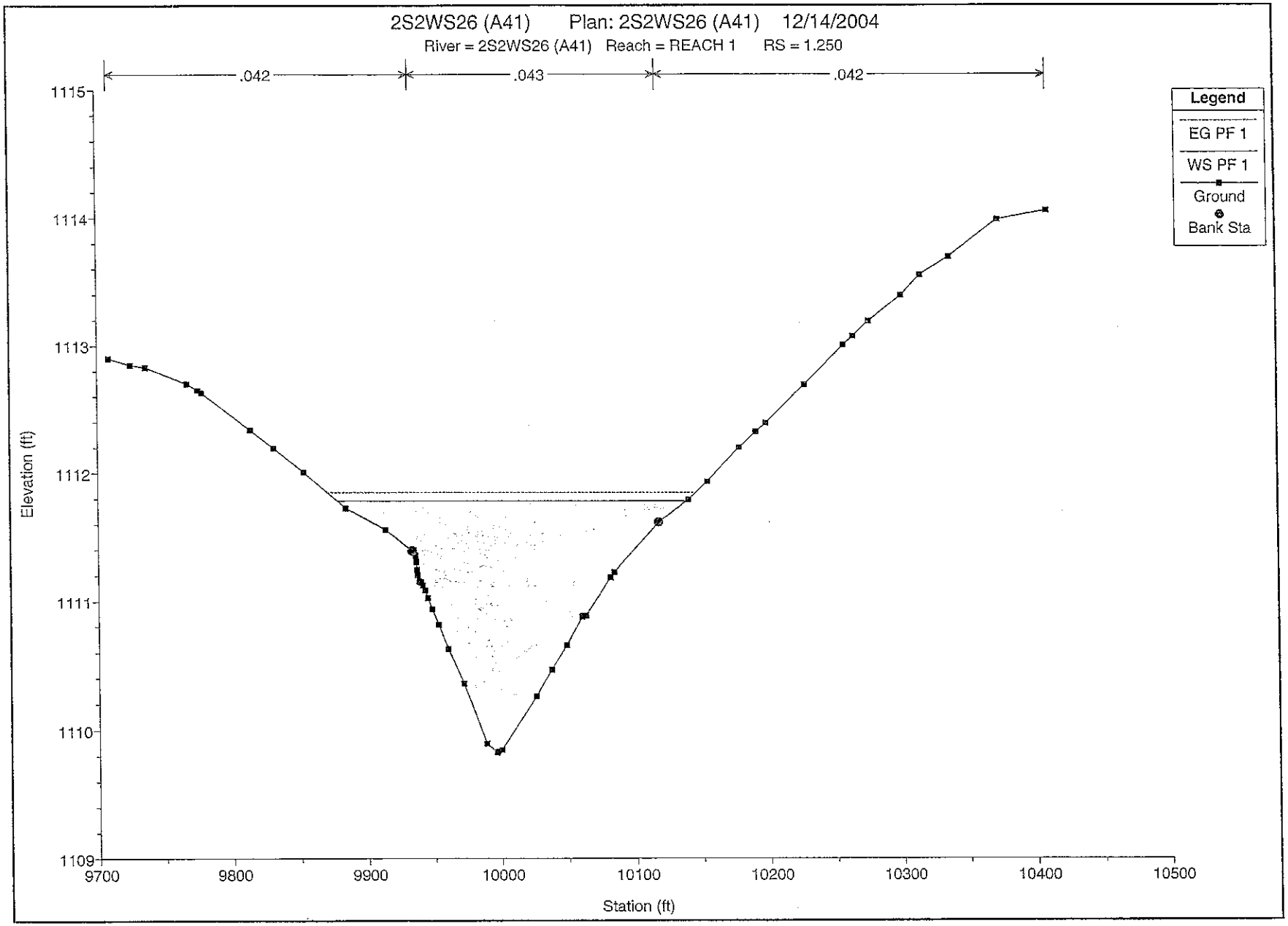
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
2.531	113	16.6	200
2.274	148	21.7	260
2.020	177	26.0	310
1.771	196	28.8	350
1.513	218	32.1	390
1.250	241	35.3	430
0.988	278	40.8	490
0.640	681	100.0	1210

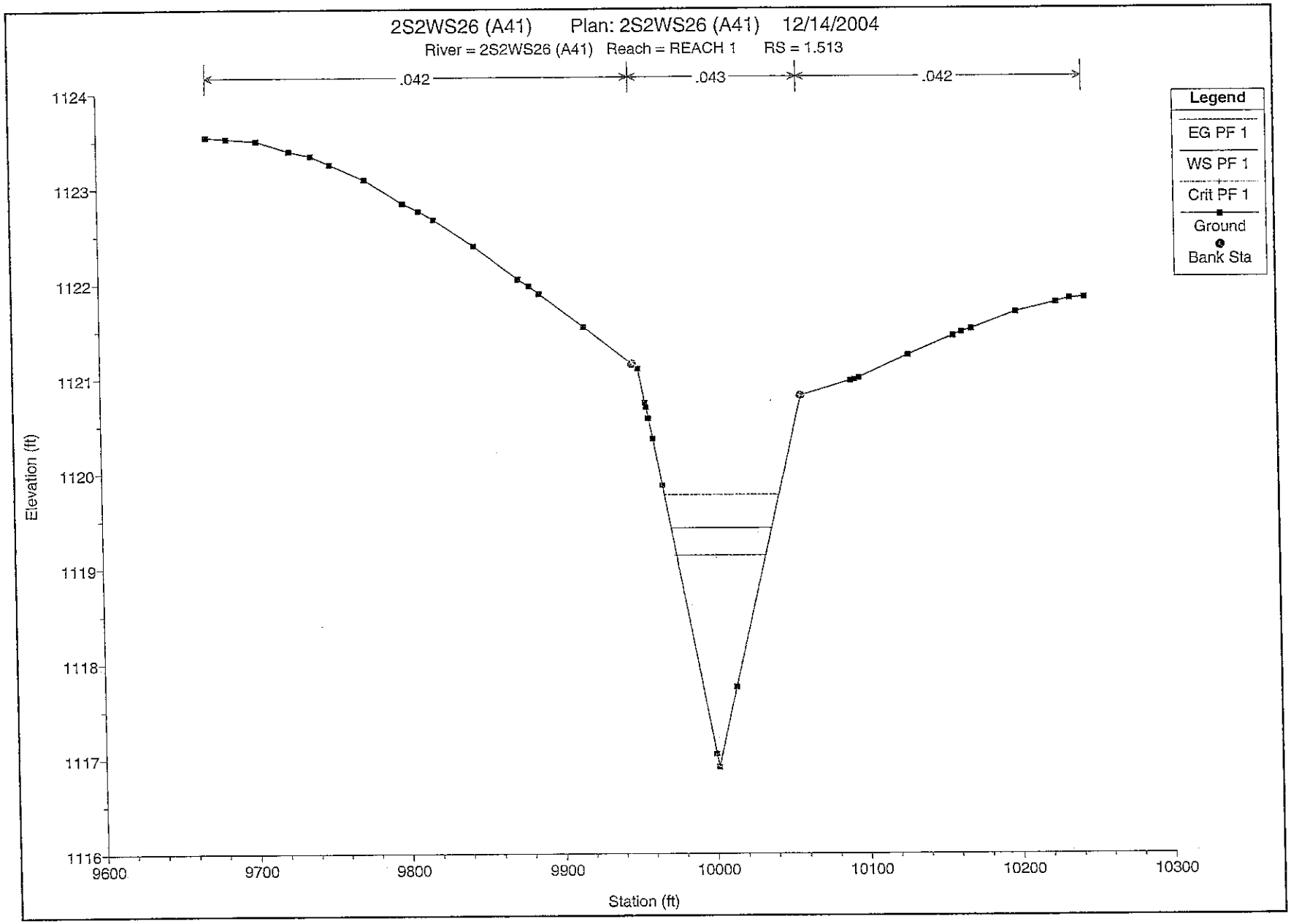

2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 0.000
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1074
1072
1070
1068
1066
1064
1062
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

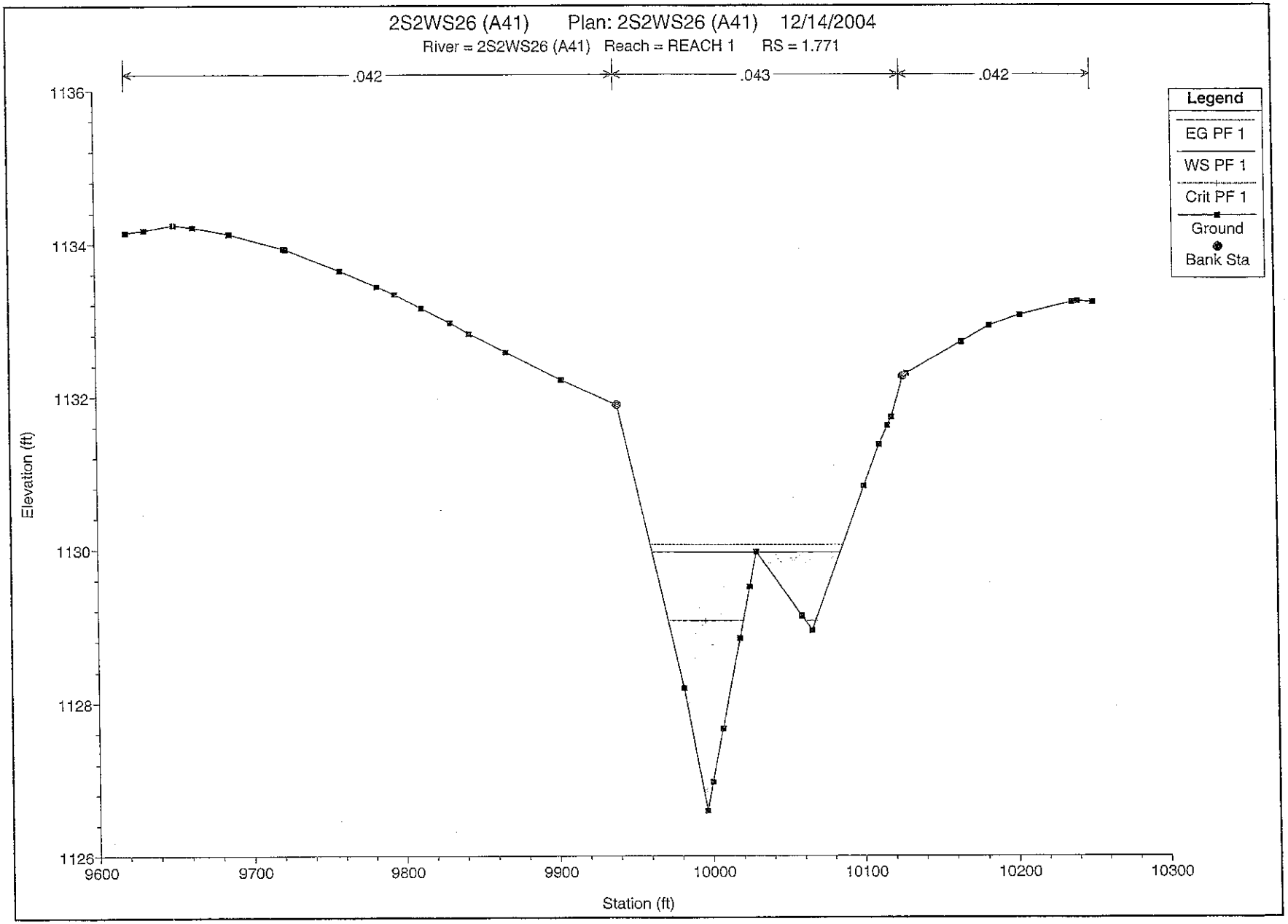

2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 0.330
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1081.0
1080.5
1080.0
1079.5
1079.0
1078.5
1078.0
1077.5
1077.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

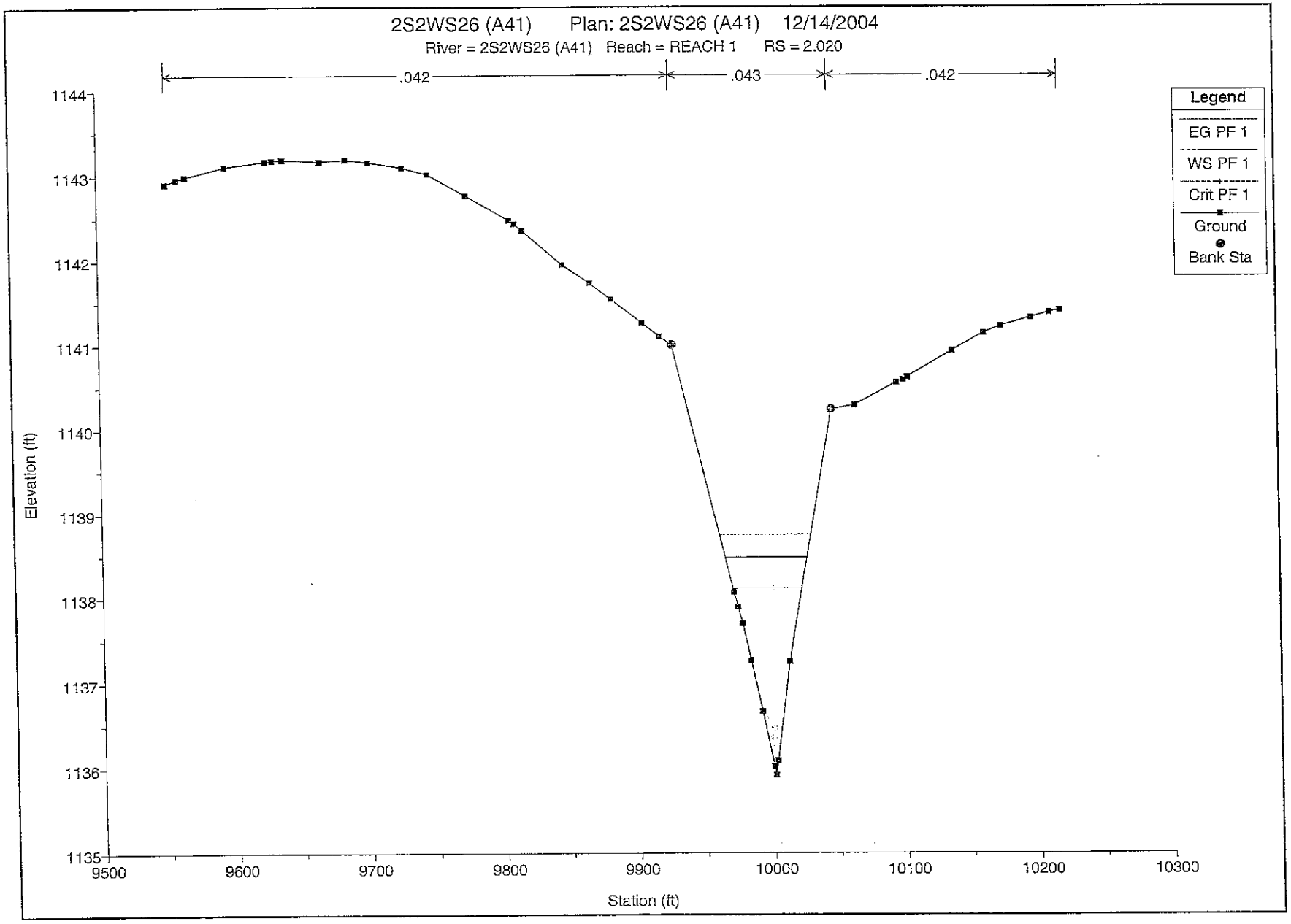

2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 0.640 Cross section at Riggs Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1089
1088
1087
1086
1085
1084
1083
1082
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)

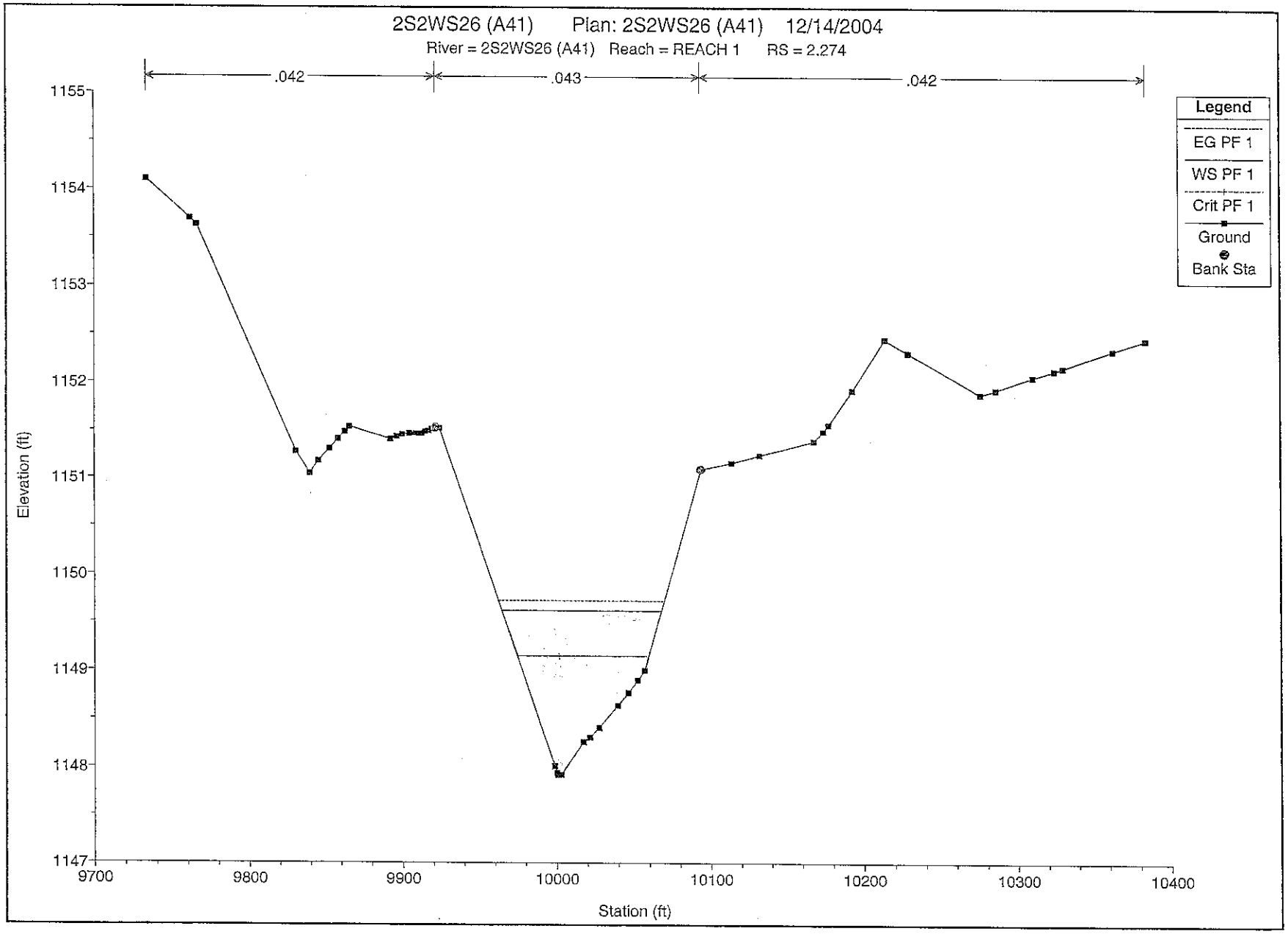

2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 0.988
.043
.042
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1103.0
1102.5
1102.0
1101.5
1101.0
1100.5
1100.0
1099.5
1099.0
1098.5
9900
9950
10000
10050
10100
10150
10200
10250
10300
Station (ft)

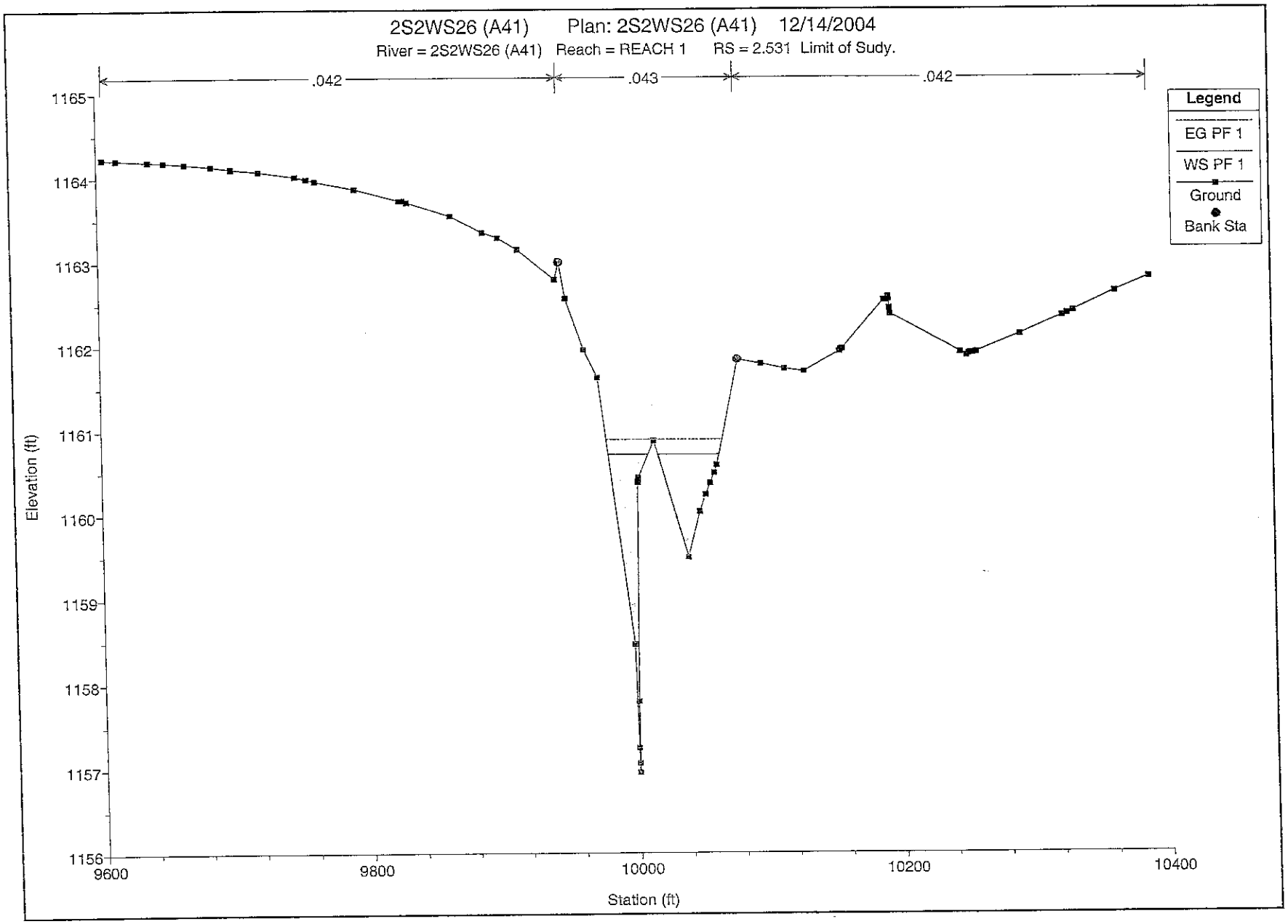

2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 1.250
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1115
1114
1113
1112
1111
1110
1109
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 1.513
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1124
1123
1122
1121
1120
1119
1118
1117
1116
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 1.771
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1136
1134
1132
1130
1128
1126
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 2.020
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1144
1143
1142
1141
1140
1139
1138
1137
1136
1135
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 2.274
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1155
1154
1153
1152
1151
1150
1149
1148
1147
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS26 (A41) Plan: 2S2WS26 (A41) 12/14/2004
River = 2S2WS26 (A41) Reach = REACH 1 RS = 2.531 Limit of Sudy.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1165
1164
1163
1162
1161
1160
1159
1158
1157
1156
9600
9800
10000
10200
10400
Station (ft)

MODEL: 2S2WS35A (B58)

REACH: 2S2WS35A (B58)

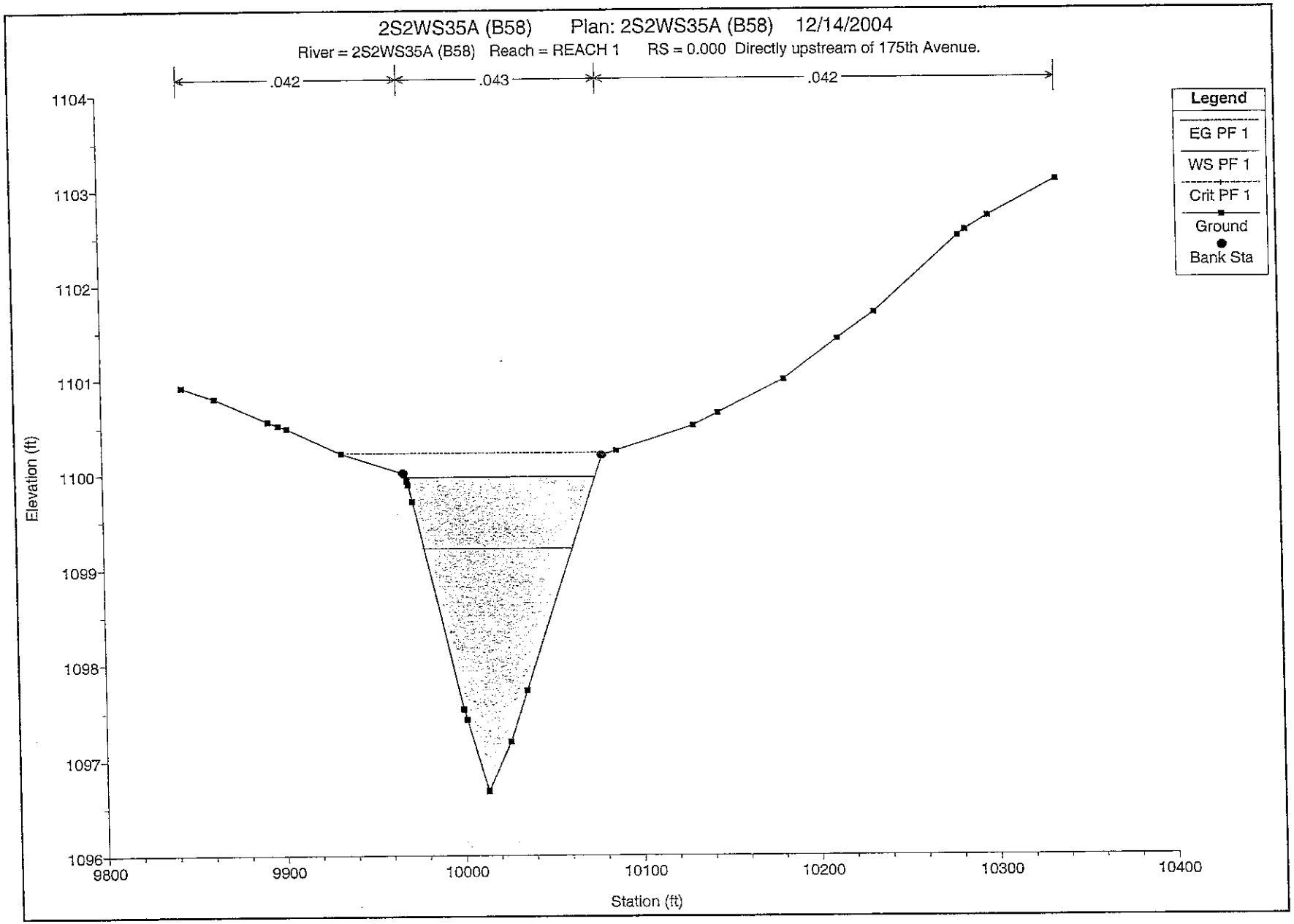
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

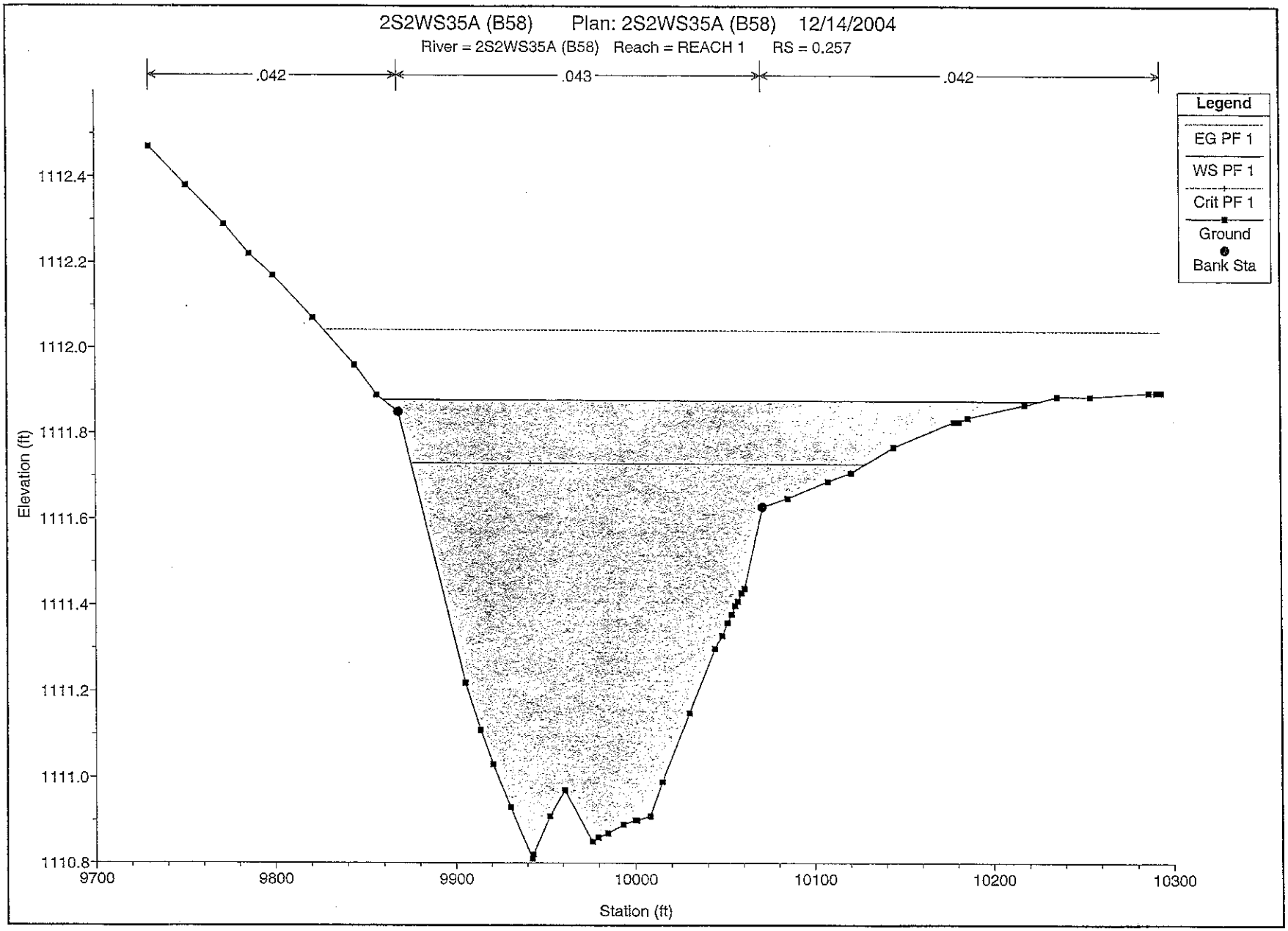
Change in Discharge based on Reach Length

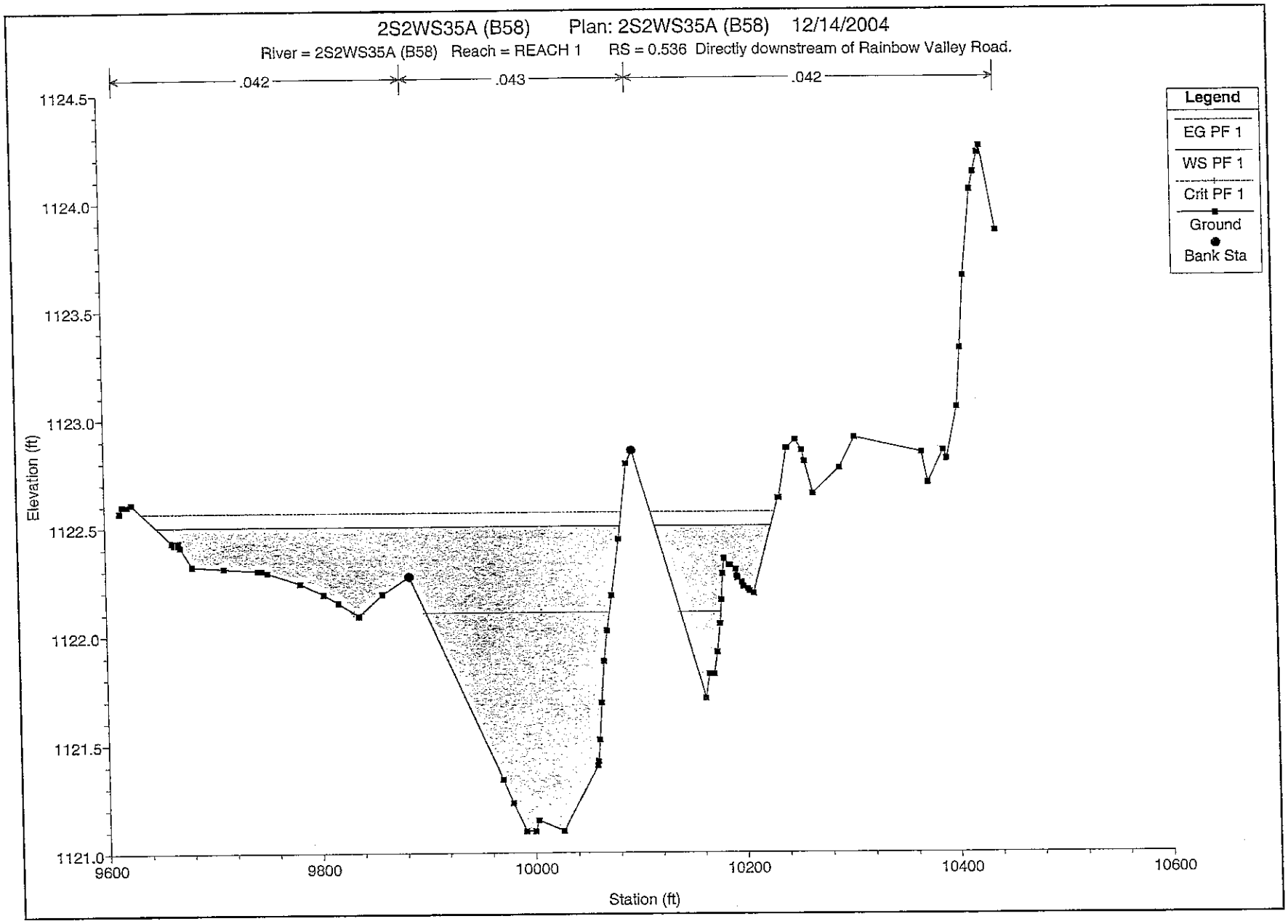
Wash ID: 2S2WS35A (B58)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
B56	0.536	509	510	500
CPB56	0.257	509	510	500
CPB58	0.000	741	740	700

The cross-section upstream of CPB56 is close to the CP therefore, it was assumed to have the same Q.


2S2WS35A (B58) Plan: 2S2WS35A (B58) 12/14/2004
River = 2S2WS35A (B58) Reach = REACH 1 RS = 0.000 Directly upstream of 175th Avenue.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1104
1103
1102
1101
1100
1099
1098
1097
1096
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS35A (B58) Plan: 2S2WS35A (B58) 12/14/2004
River = 2S2WS35A (B58) Reach = REACH 1 RS = 0.257
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1112.4
1112.2
1112.0
1111.8
1111.6
1111.4
1111.2
1111.0
1110.8
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS35A (B58) Plan: 2S2WS35A (B58) 12/14/2004
River = 2S2WS35A (B58) Reach = REACH 1 RS = 0.536 Directly downstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1124.5
1124.0
1123.5
1123.0
1122.5
1122.0
1121.5
1121.0
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 2S2WS35B (B29)

REACH: 2S2WS35B (B29)

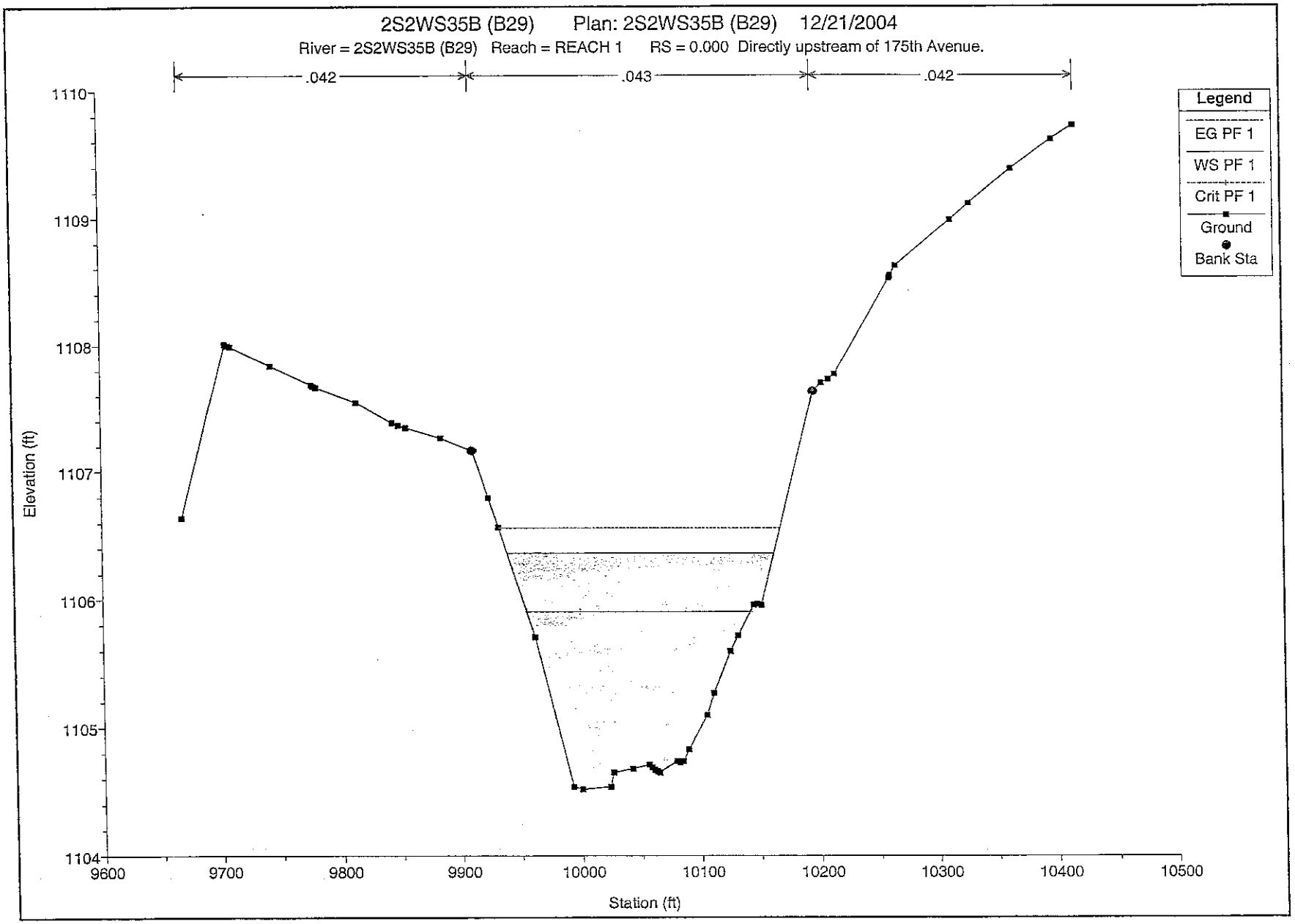
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

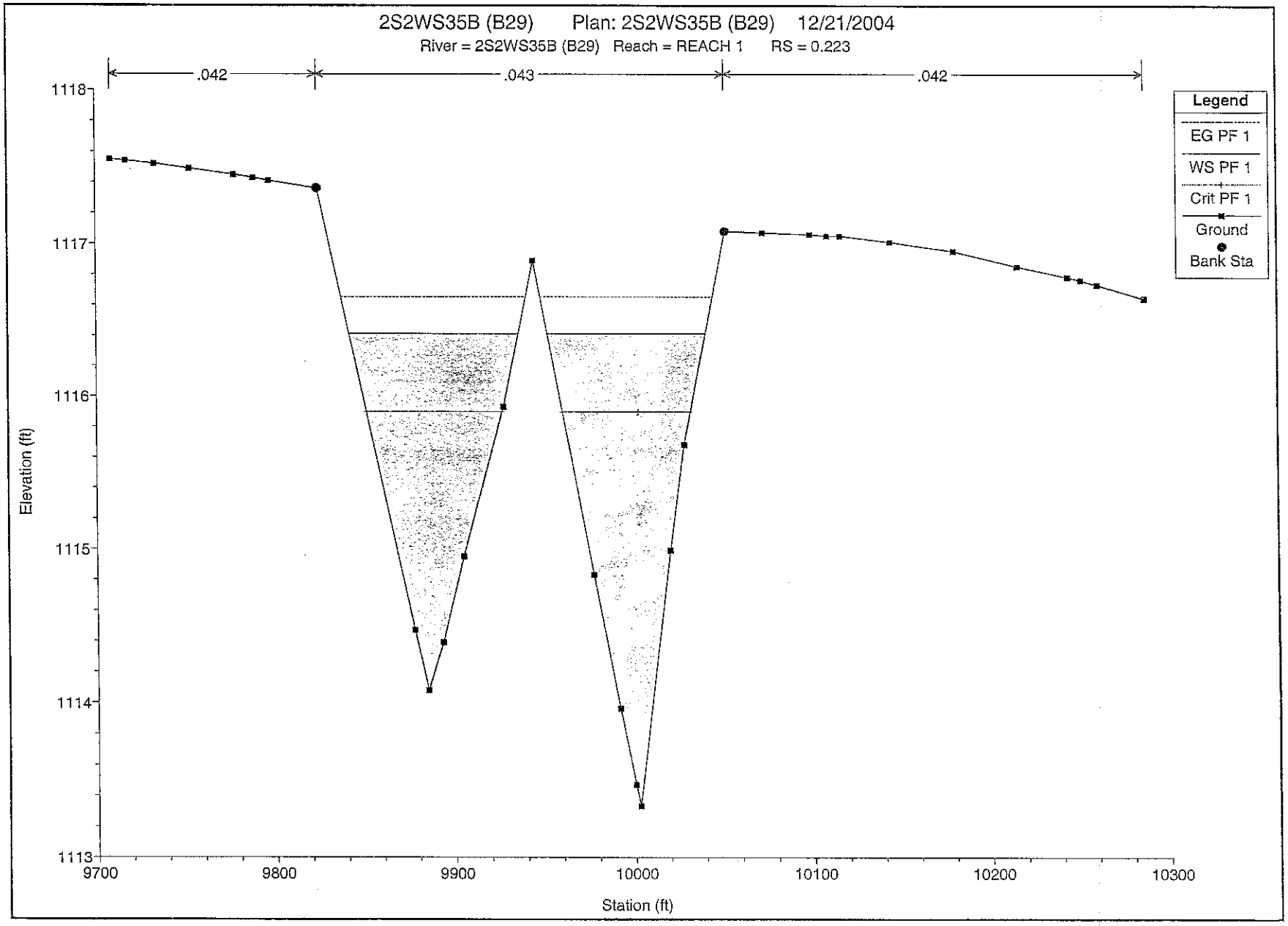
Change in Discharge based on Reach Length

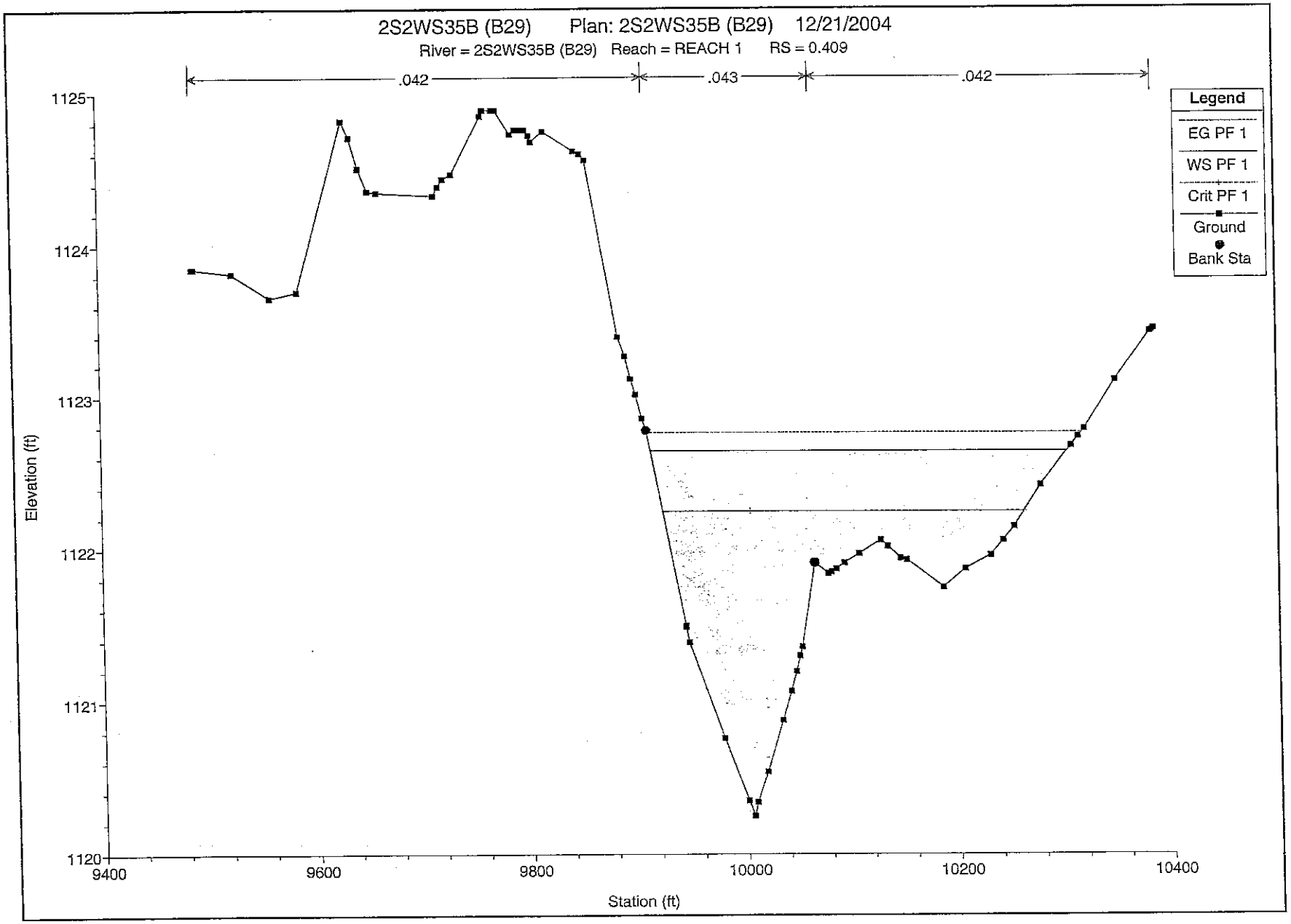
Wash ID: 2S2WS35B (B29)

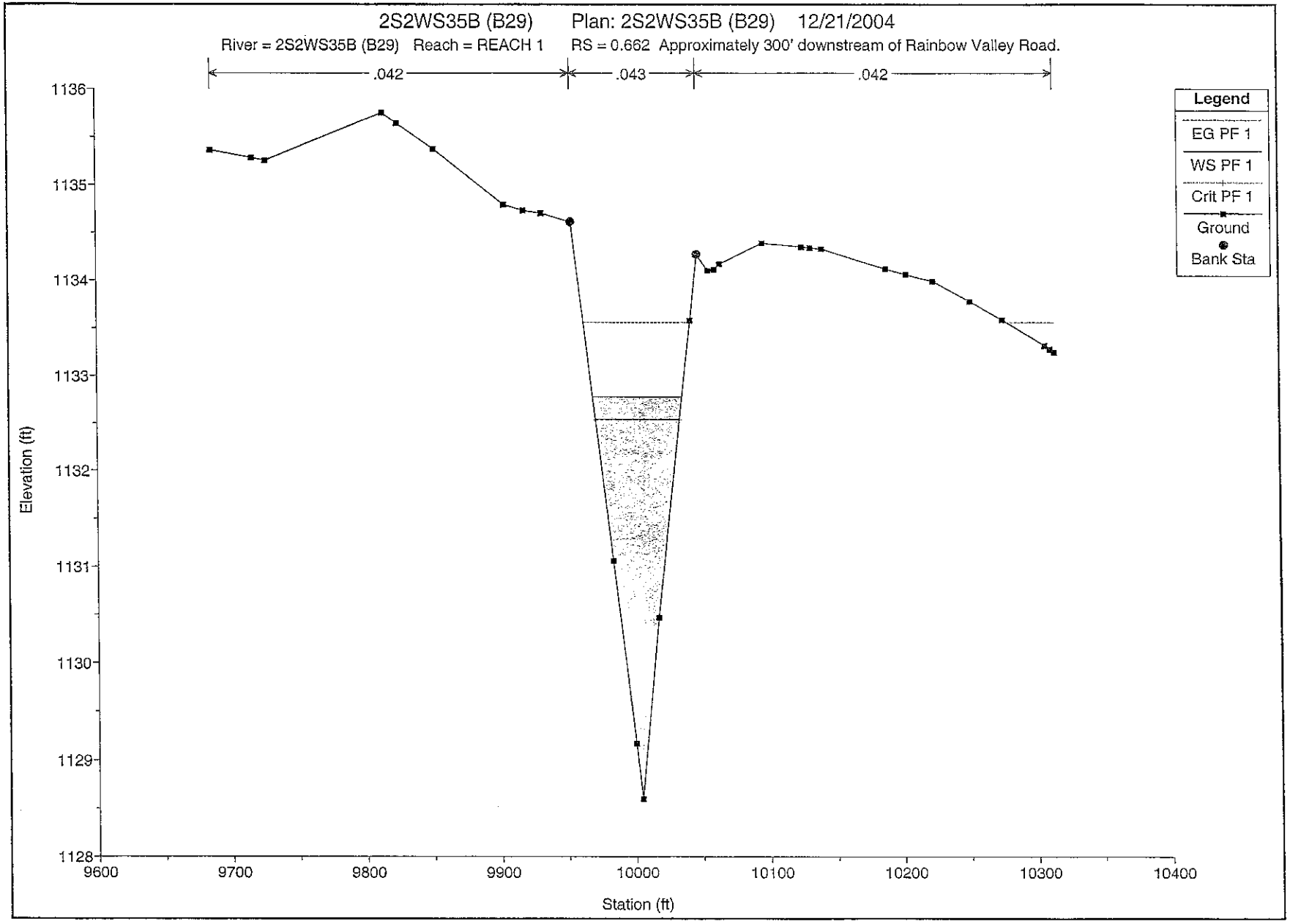
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
B29	0.871	965	970	1000
B29	0.662	965	970	1000
B29	0.409	965	970	1000
B29	0.223	965	970	1000
CPB29	0.000	965	970	1000

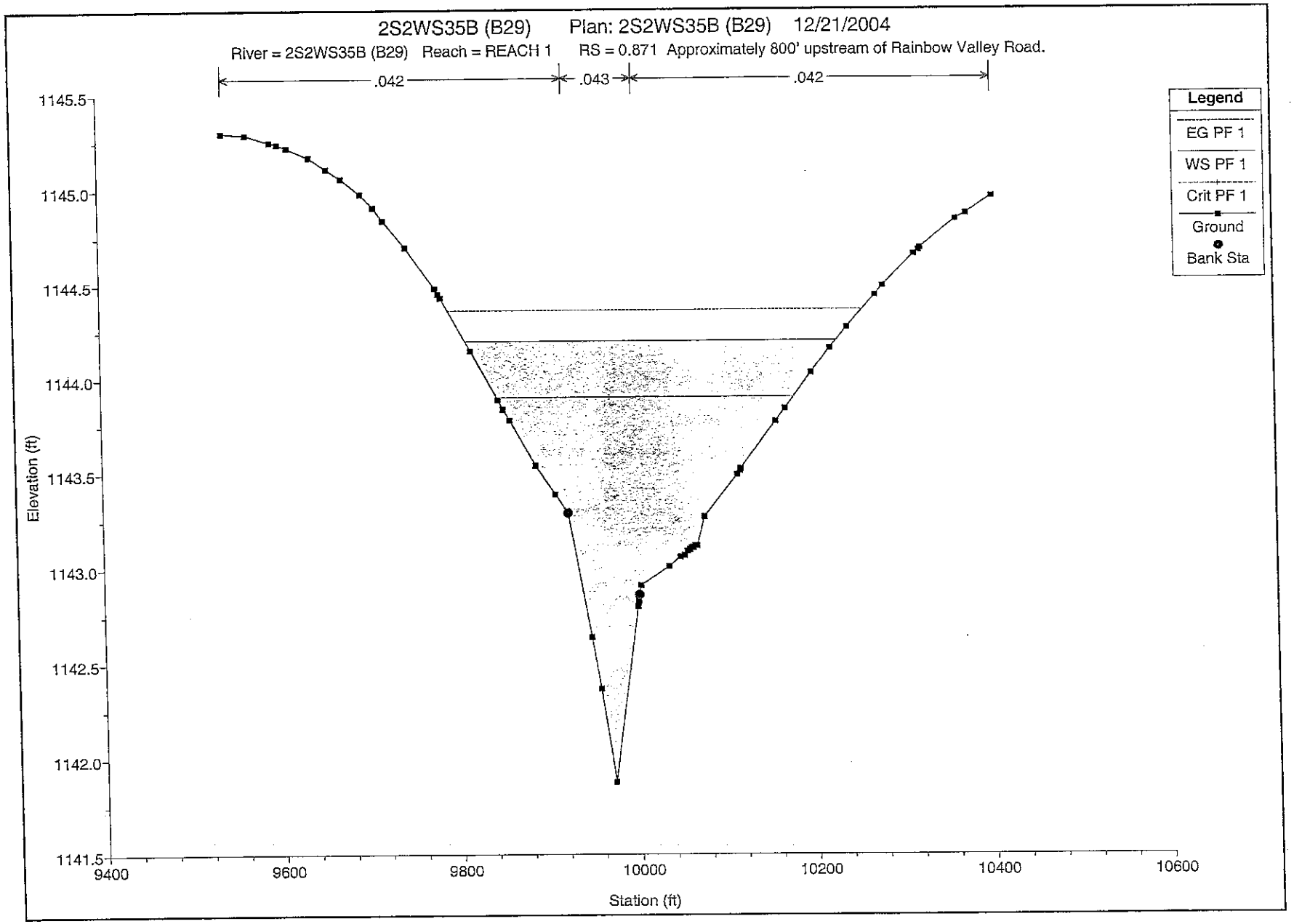
A majority of the area combines, therefore the Q was assumed to be at the peak for the entire reach.


2S2WS35B (B29) Plan: 2S2WS35B (B29) 12/21/2004
River = 2S2WS35B (B29) Reach = REACH 1 RS = 0.000 Directly upstream of 175th Avenue.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1110
1109
1108
1107
1106
1105
1104
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


2S2WS35B (B29) Plan: 2S2WS35B (B29) 12/21/2004
River = 2S2WS35B (B29) Reach = REACH 1 RS = 0.223
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1118
1117
1116
1115
1114
1113
9700
9800
9900
10000
10100
10200
10300
Station (ft)


2S2WS35B (B29) Plan: 2S2WS35B (B29) 12/21/2004
River = 2S2WS35B (B29) Reach = REACH 1 RS = 0.409
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1125
1124
1123
1122
1121
1120
9400
9600
9800
10000
10200
10400
Station (ft)


2S2WS35B (B29) Plan: 2S2WS35B (B29) 12/21/2004
River = 2S2WS35B (B29) Reach = REACH 1 RS = 0.662 Approximately 300' downstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1136
1135
1134
1133
1132
1131
1130
1129
1128
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


2S2WS35B (B29) Plan: 2S2WS35B (B29) 12/21/2004
River = 2S2WS35B (B29) Reach = REACH 1 RS = 0.871 Approximately 800' upstream of Rainbow Valley Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1145.5
1145.0
1144.5
1144.0
1143.5
1143.0
1142.5
1142.0
1141.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 3S1WS4A (H71)

REACH: 3S1WS4A (H71)

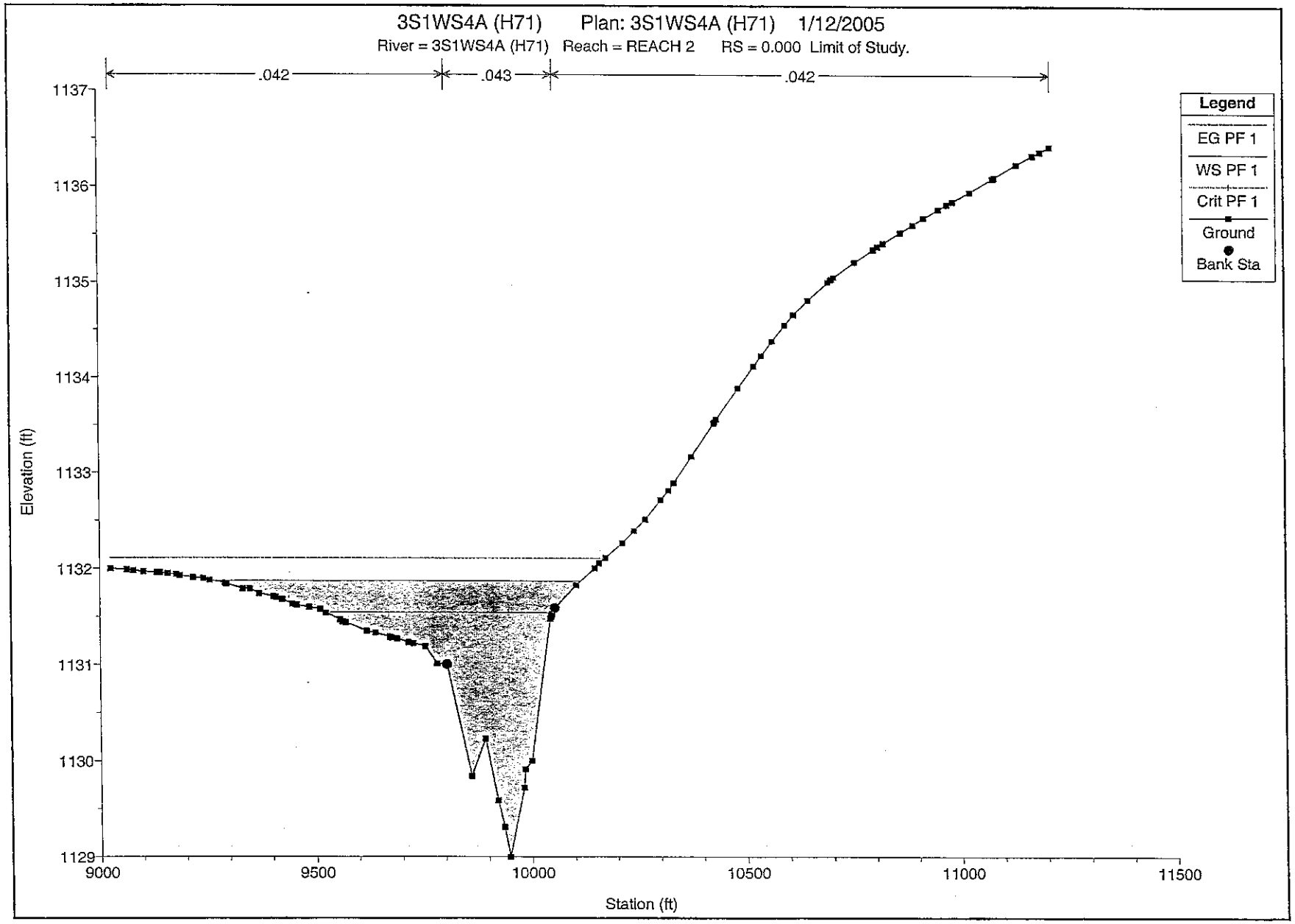
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

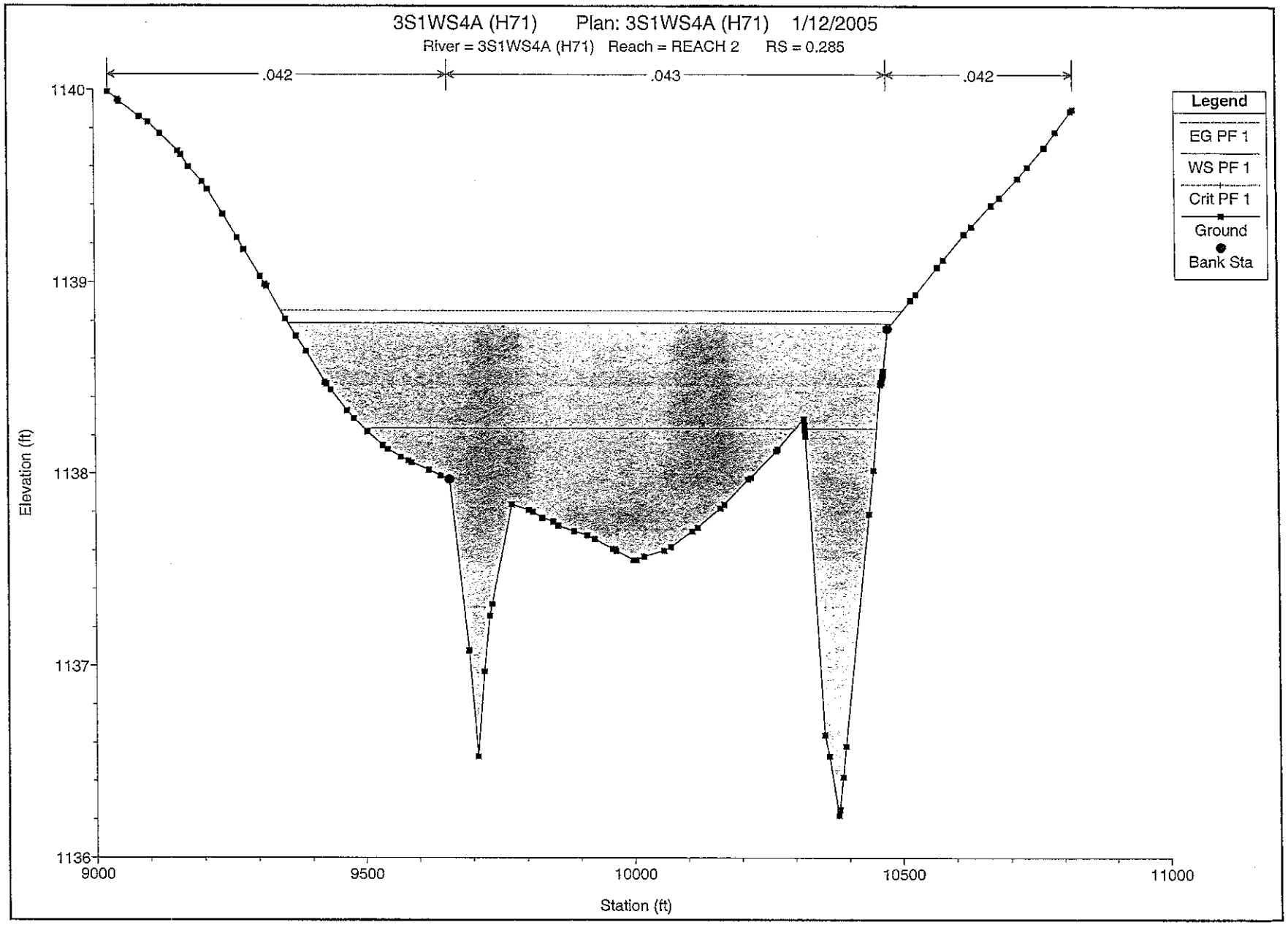
Change in Discharge based on Reach Length

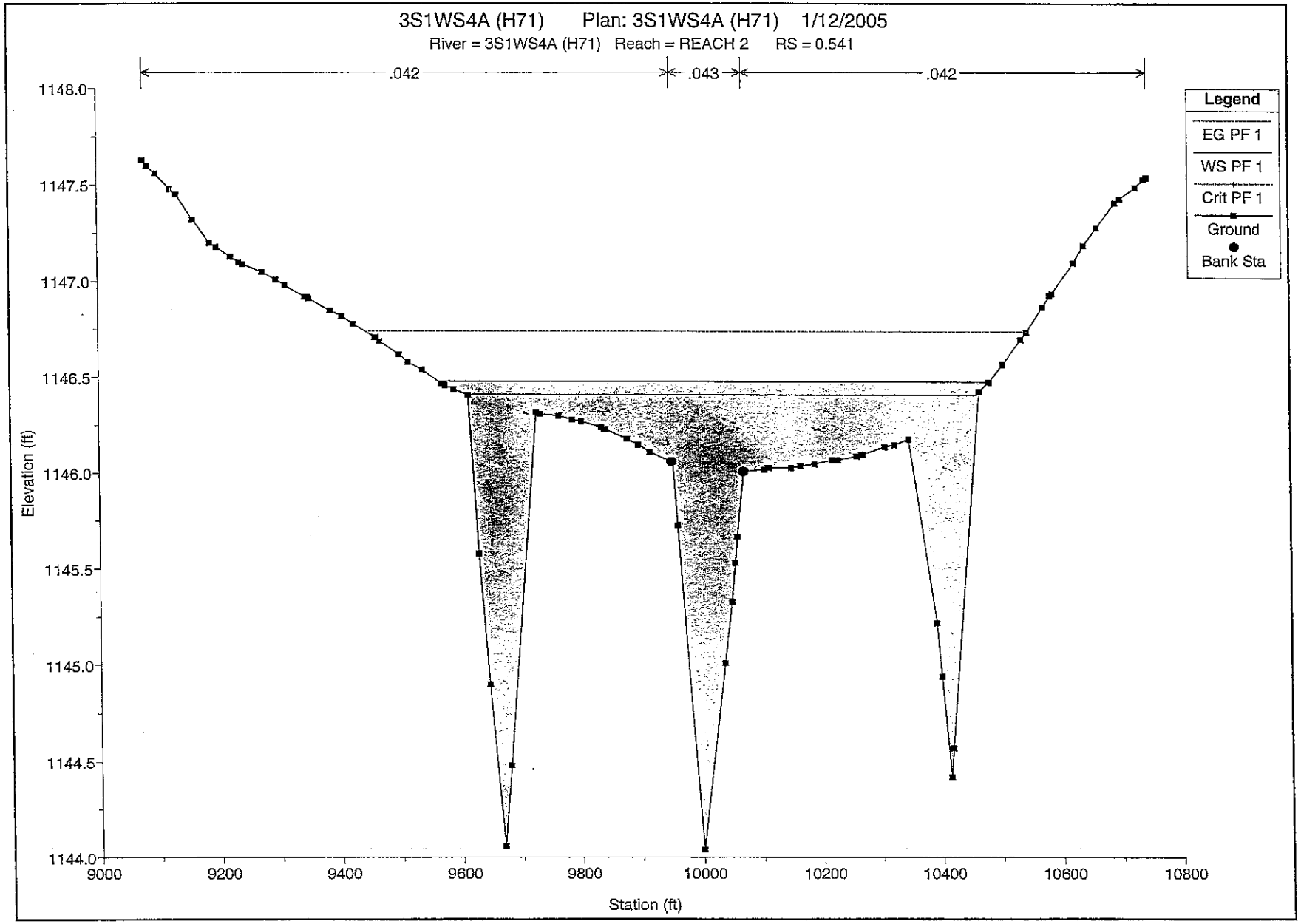
Wash ID: 3S1WS4A (H71)

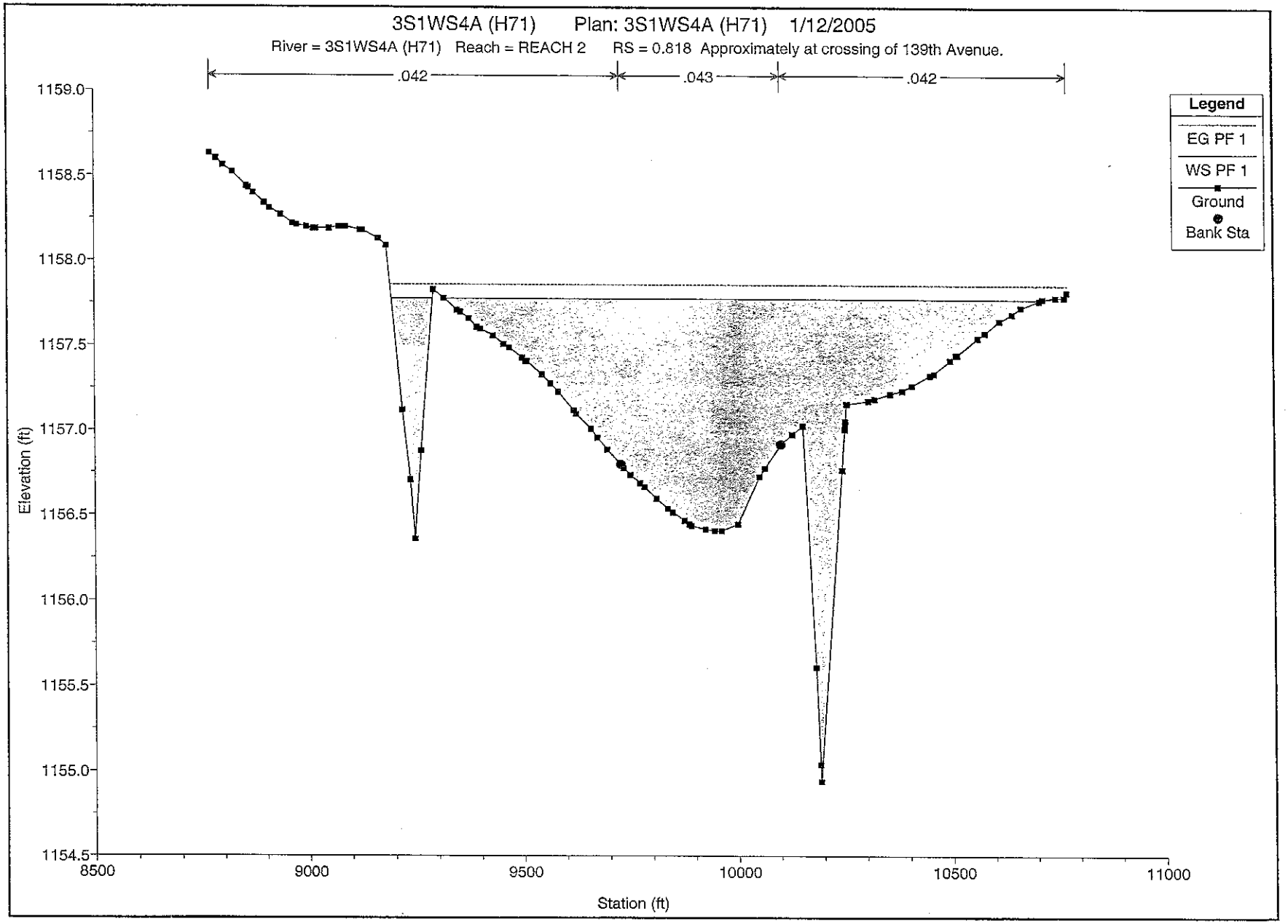
Subbasin	X-section	Discharge	Q (nearest 10)	Q (nearest 100)
CPH22	5.920	2281	2280	2300
H23	5.678	2758	2760	2800
H23	5.438	3232	3230	3200
H23	5.167	3766	3770	3800
H23	4.938	4218	4220	4200
CPH23	4.717	4654	4650	4700
CPH23	4.717	4654	4650	4700
H62	4.487	4530	4530	4500
H62	4.230	4391	4390	4400
H62	3.967	4248	4250	4200
CPH62	3.687	4097	4100	4100
H63	3.423	4137	4140	4100
H63	3.221	4167	4170	4200
H63	2.979	4203	4200	4200
CPH63	2.812	4228	4230	4200
DVH63	2.579	2620	2620	2600
H66	2.303	2560	2560	2600
H66	2.069	2509	2510	2500
H66	1.814	2454	2450	2500
H66	1.570	2401	2400	2400
CPH66	1.291	2340	2340	2300
H71	1.050	2309	2310	2300
H71	0.818	2279	2280	2300
H71	0.541	2243	2240	2200
H71	0.285	2210	2210	2200
CPH71	0.000	2173	2170	2200

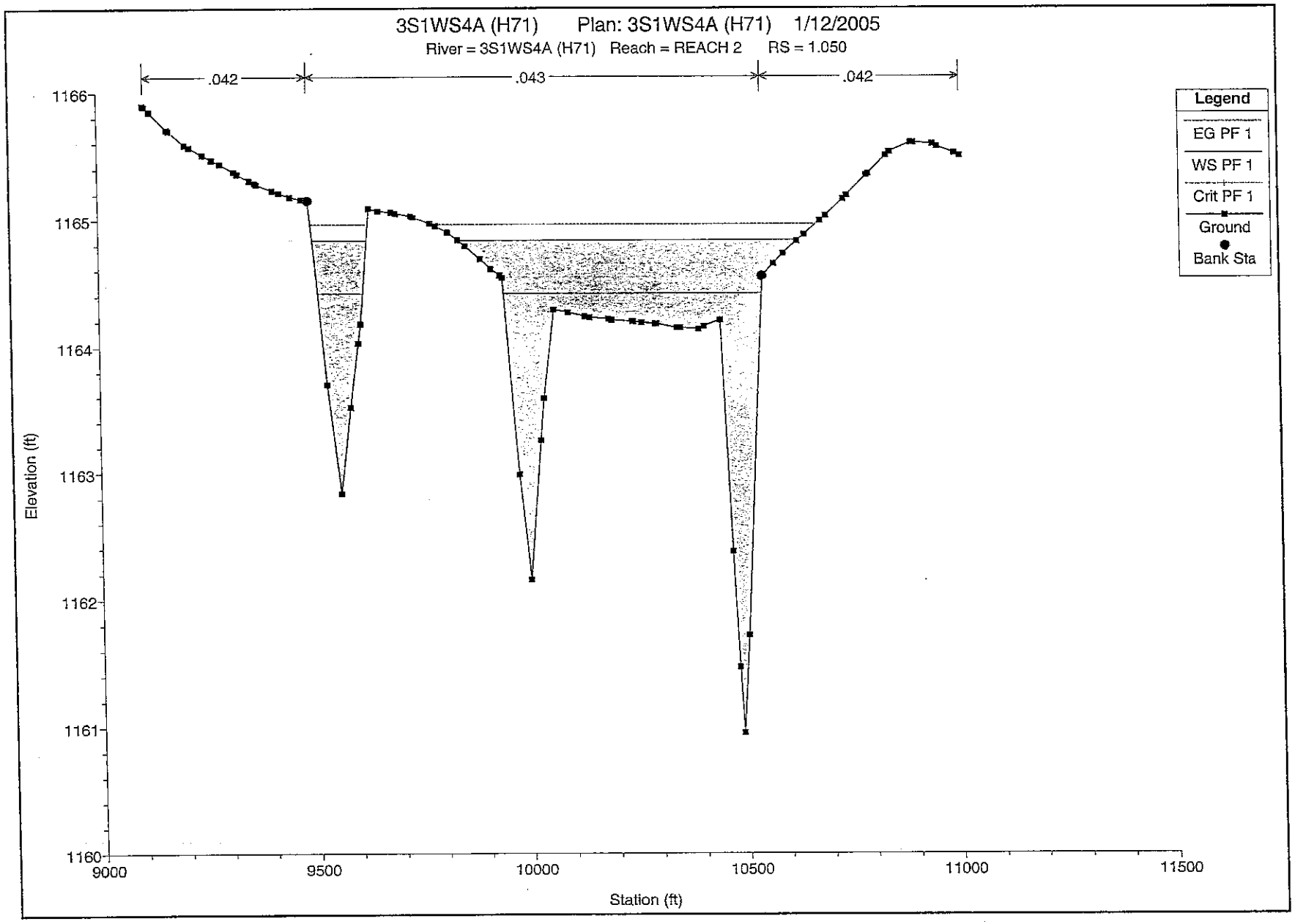
1. CPH22 is local runoff from H22.

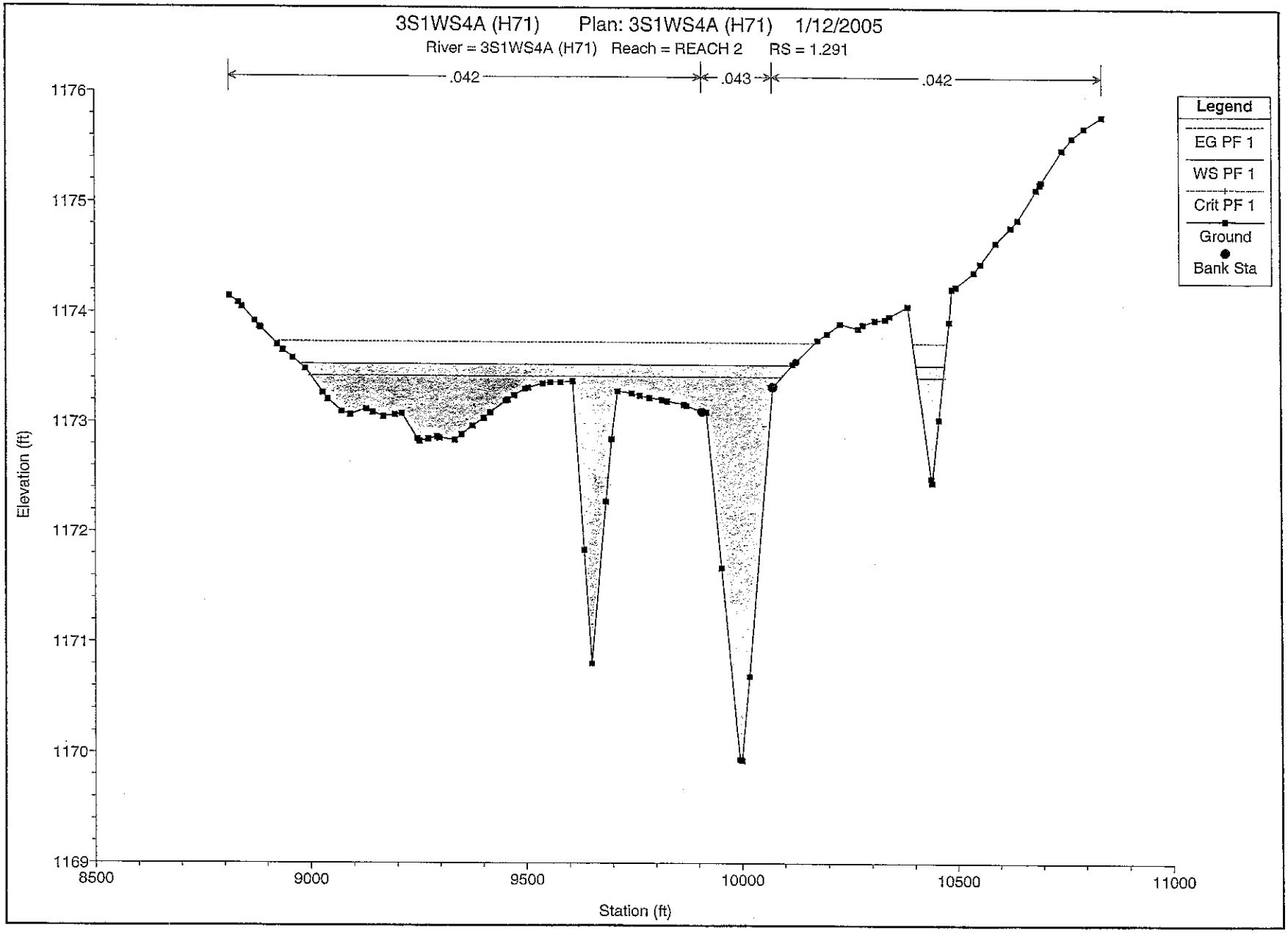

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 0.000 Limit of Study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1137
1136
1135
1134
1133
1132
1131
1130
1129
9000
9500
10000
10500
11000
11500
Station (ft)

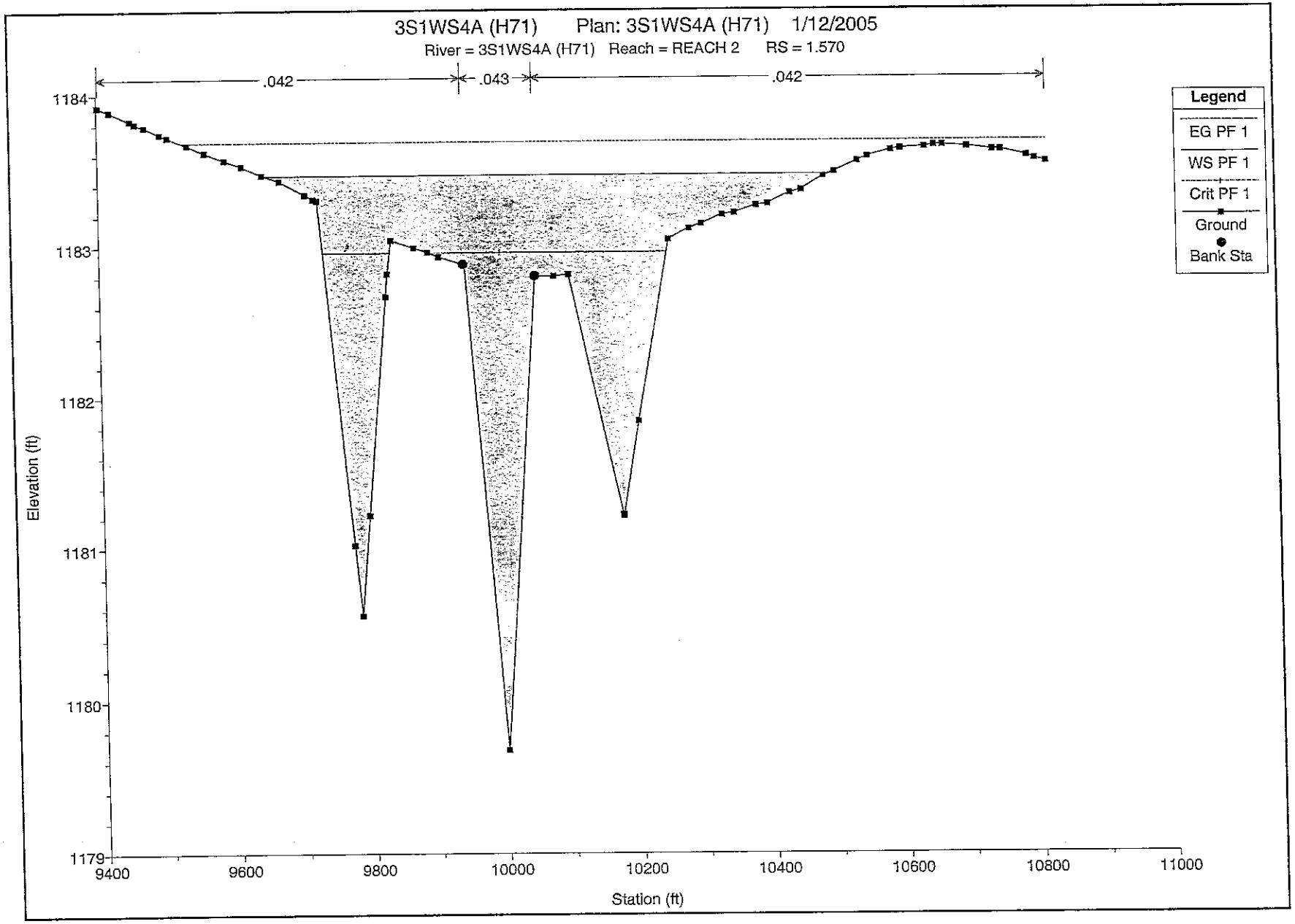

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 0.285
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1140
1139
1138
1137
1136
9000
9500
10000
10500
11000
Station (ft)

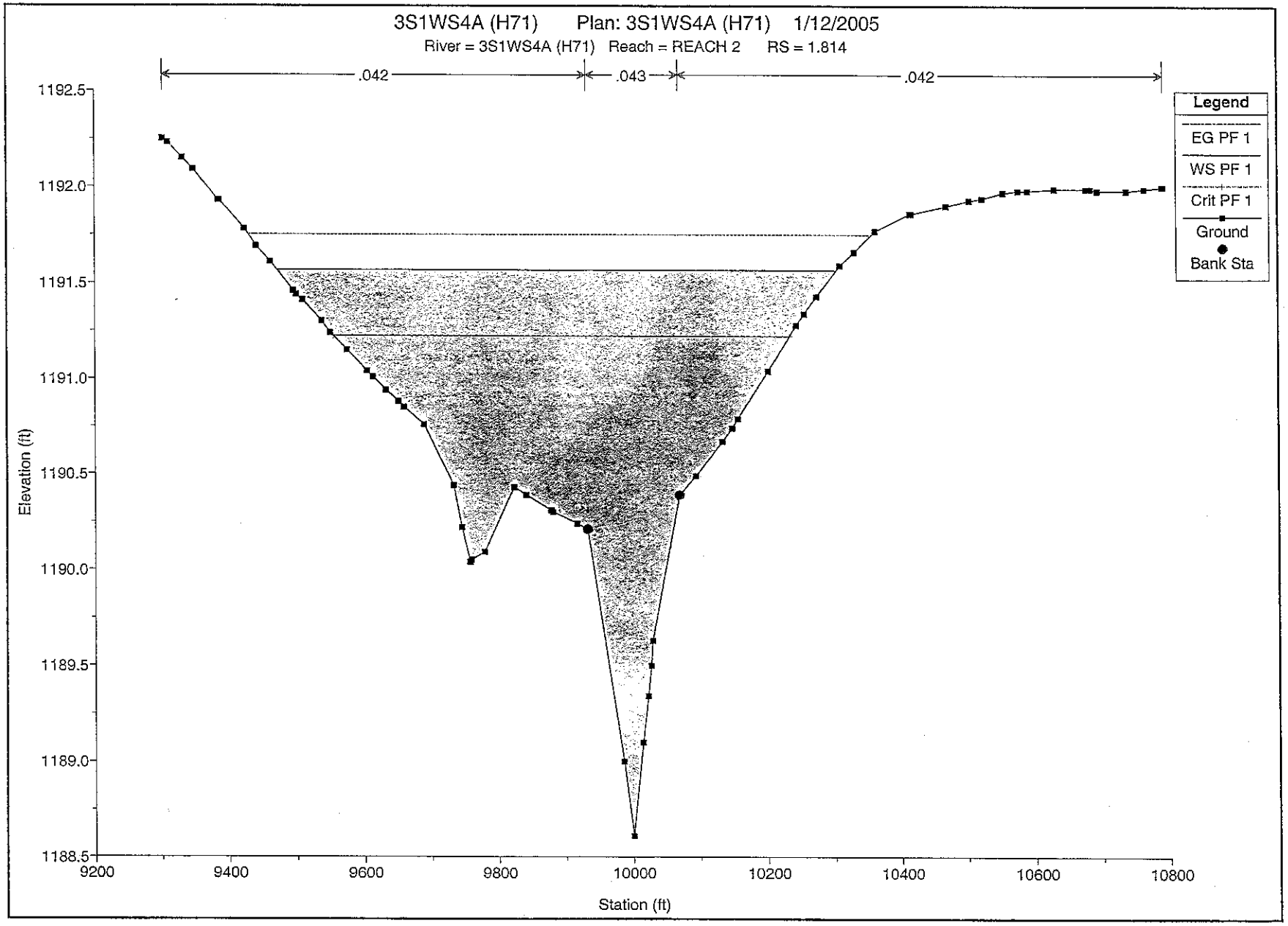

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 0.541
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1148.0
1147.5
1147.0
1146.5
1146.0
1145.5
1145.0
1144.5
1144.0
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

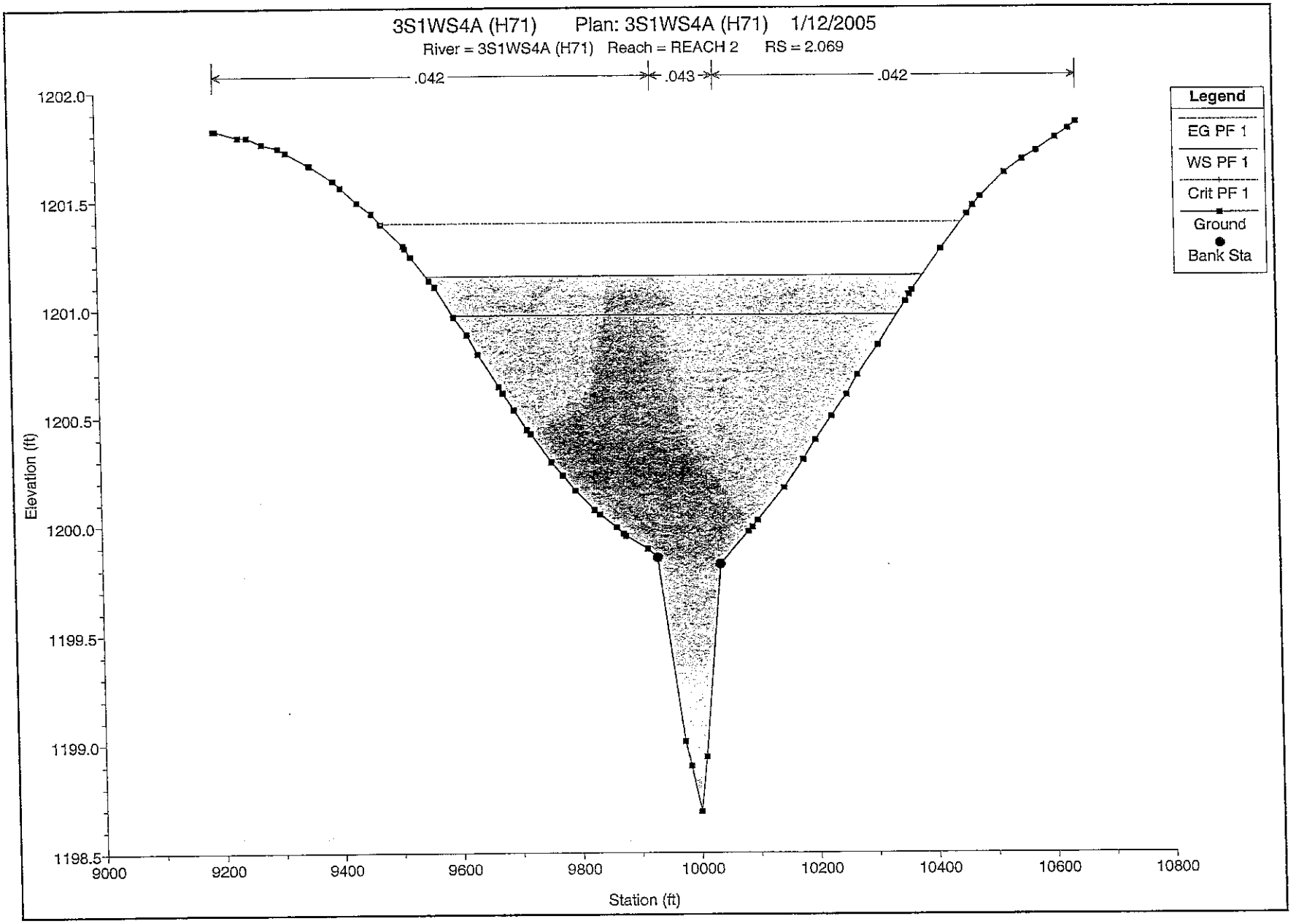

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 0.818 Approximately at crossing of 139th Avenue.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1159.0
1158.5
1158.0
1157.5
1157.0
1156.5
1156.0
1155.5
1155.0
1154.5
8500
9000
9500
10000
10500
11000
Station (ft)

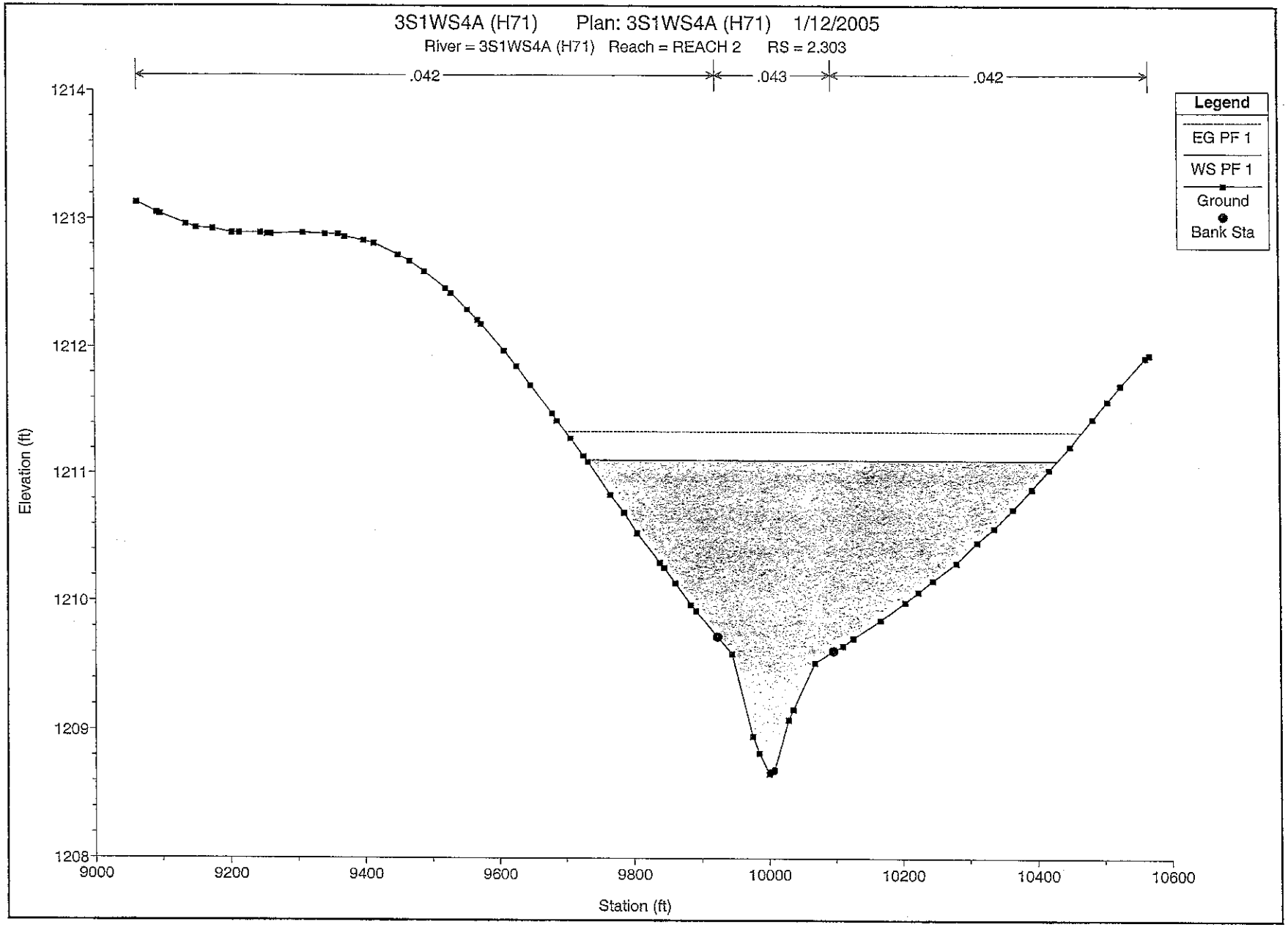

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 1.050
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1166
1165
1164
1163
1162
1161
1160
9000
9500
10000
10500
11000
11500
Station (ft)

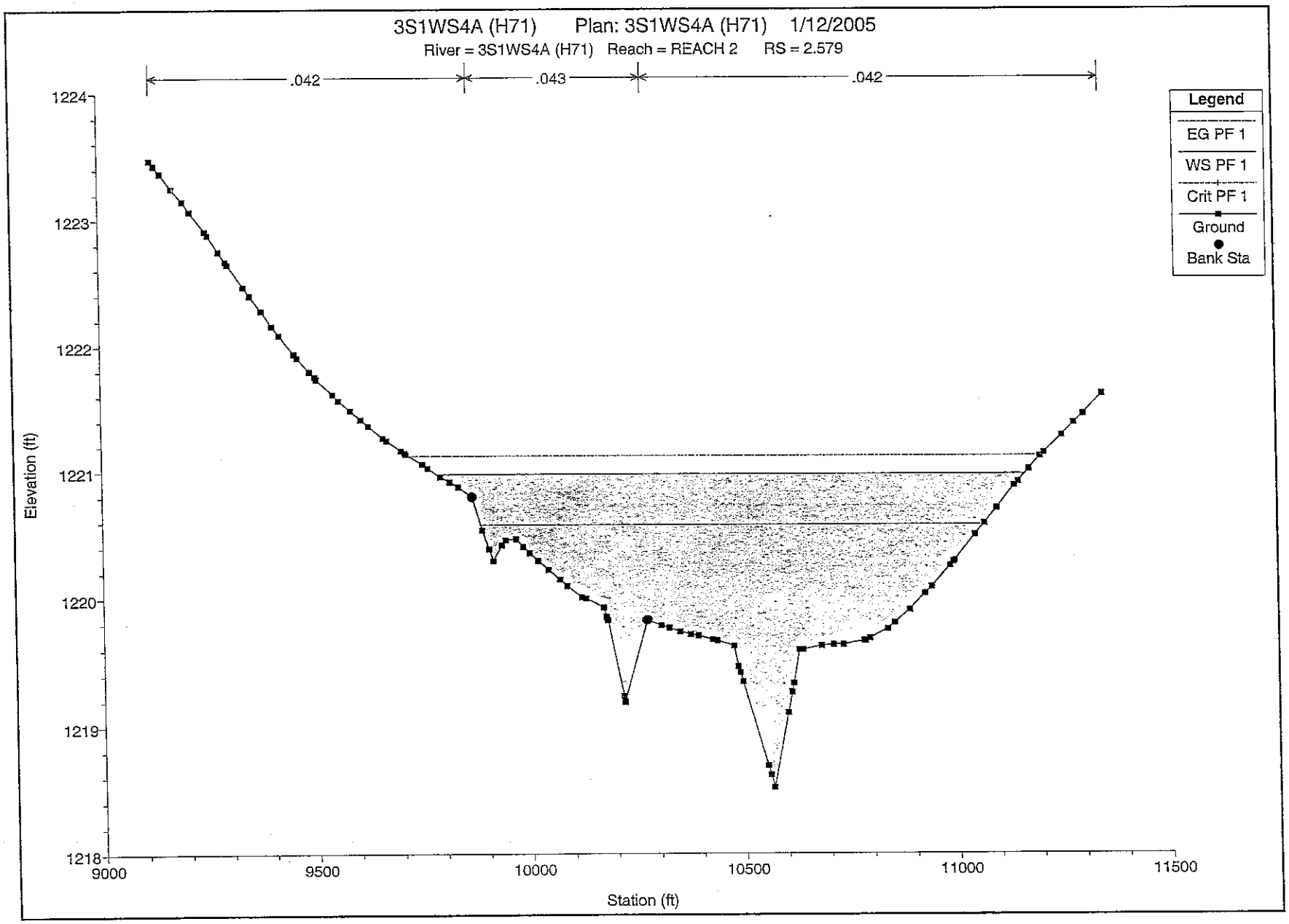

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 1.291
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1176
1175
1174
1173
1172
1171
1170
1169
8500
9000
9500
10000
10500
11000
Station (ft)

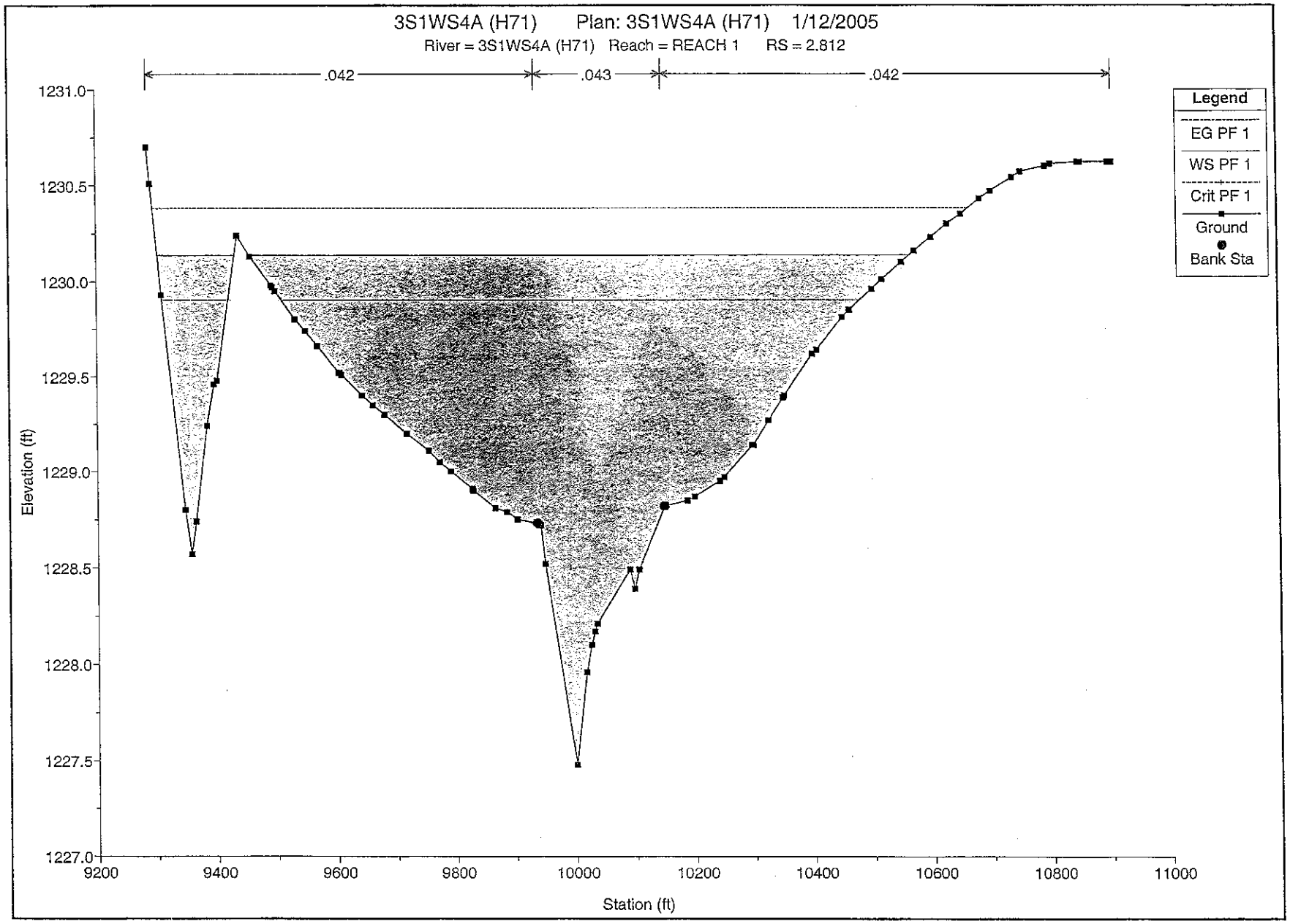

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 1.570
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1184
1183
1182
1181
1180
1179
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

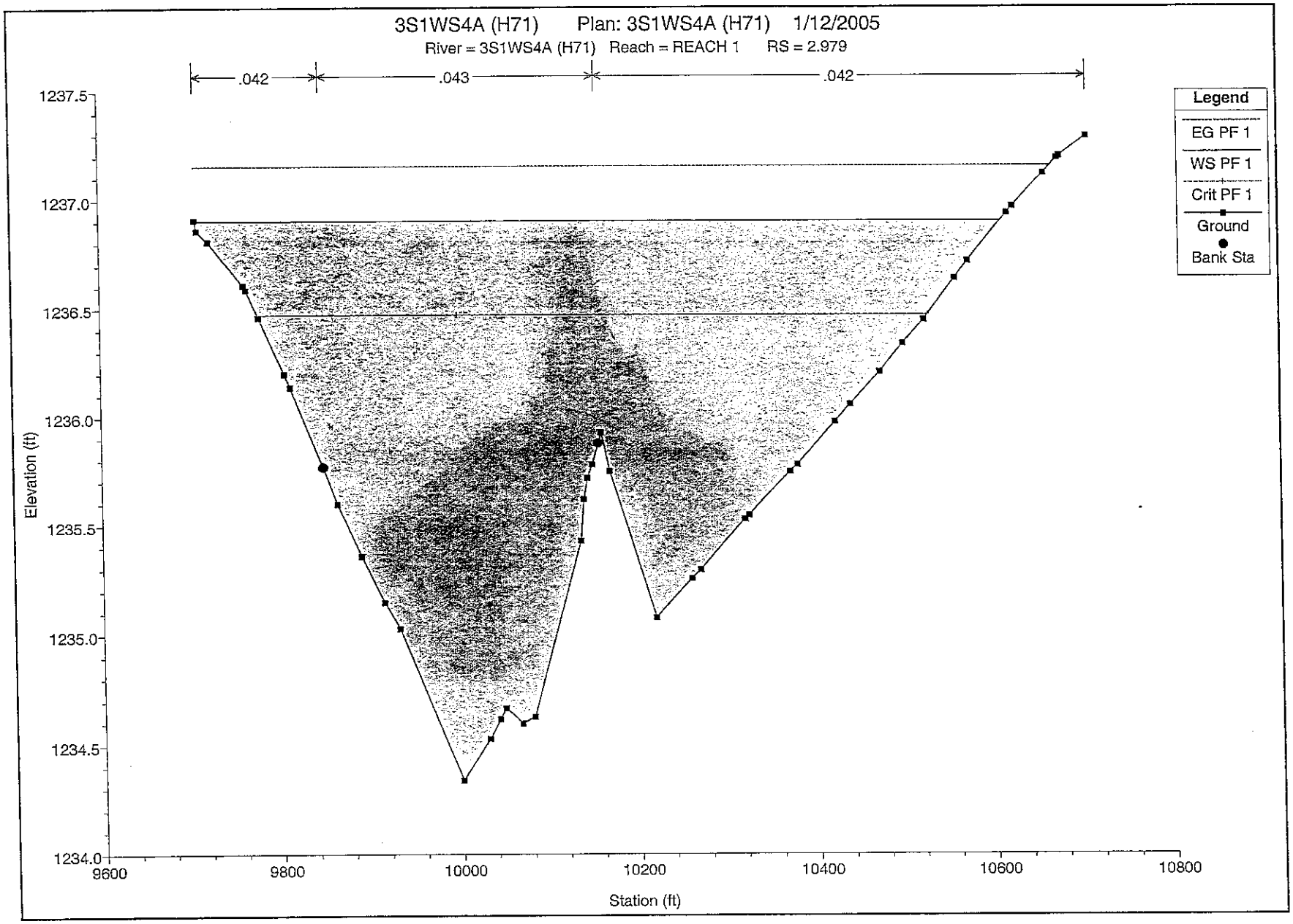

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 1.814
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1192.5
1192.0
1191.5
1191.0
1190.5
1190.0
1189.5
1189.0
1188.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

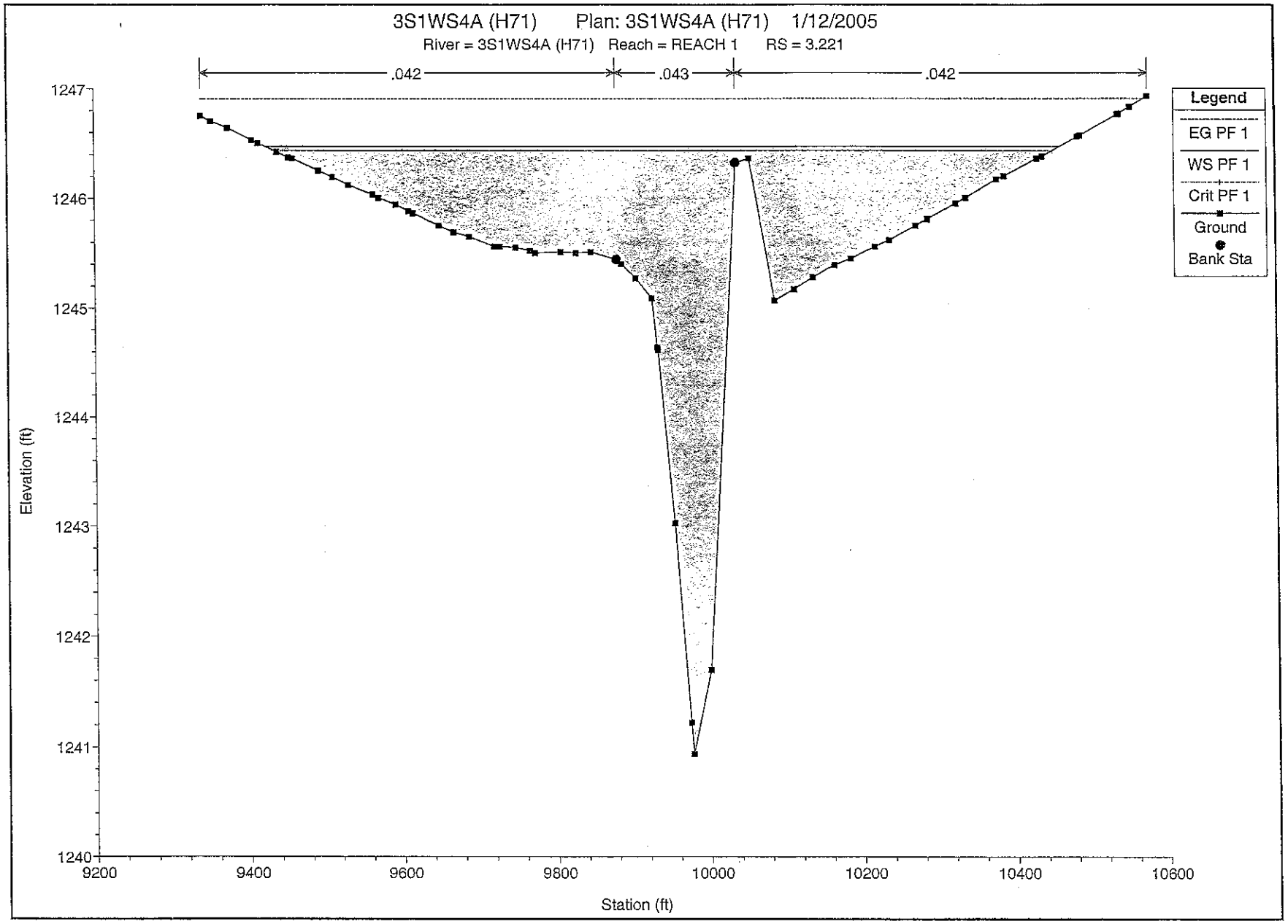

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 2.069
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1202.0
1201.5
1201.0
1200.5
1200.0
1199.5
1199.0
1198.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

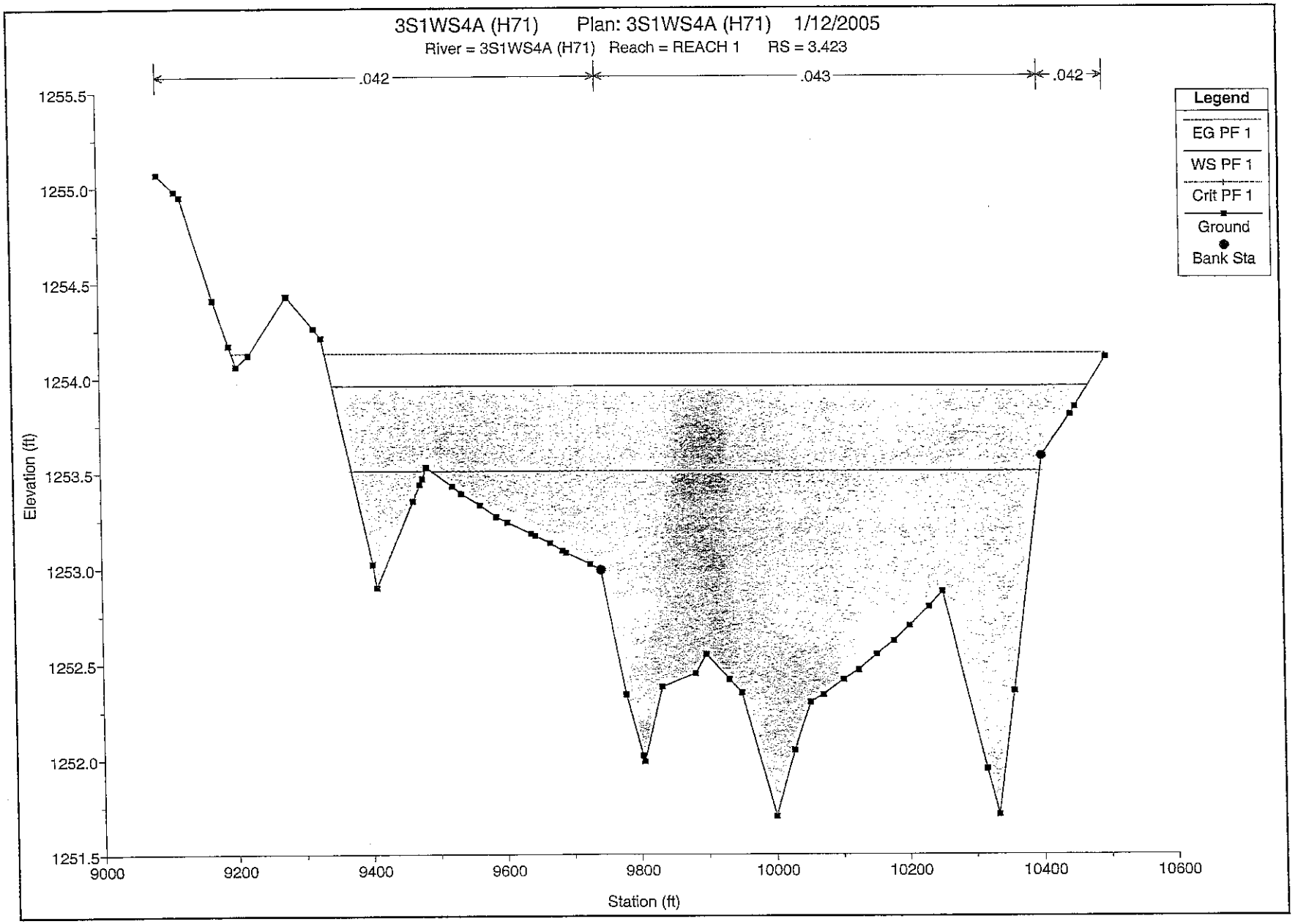

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 2.303
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1214
1213
1212
1211
1210
1209
1208
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

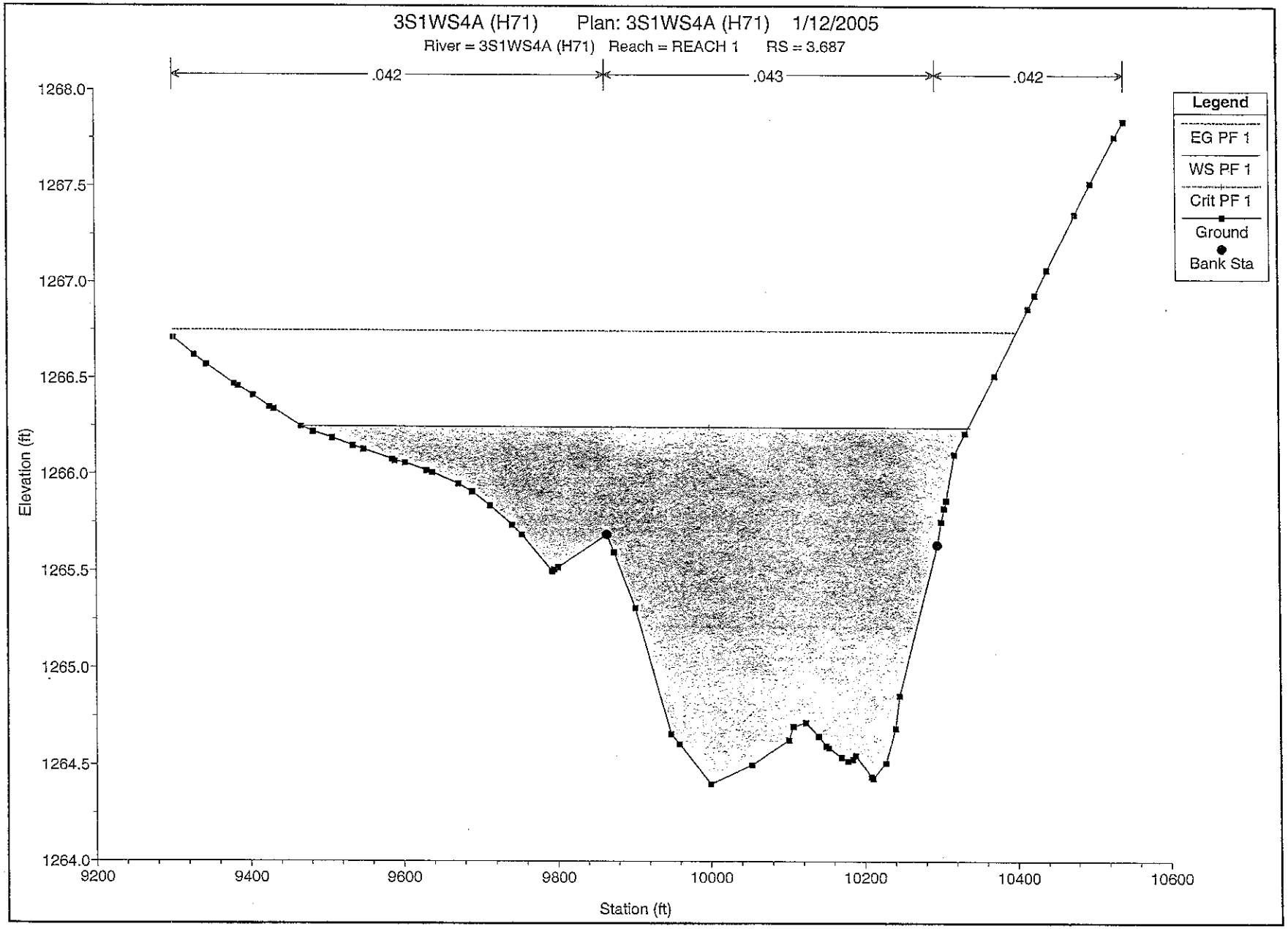

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 2 RS = 2.579
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1224
1223
1222
1221
1220
1219
1218
9000
9500
10000
10500
11000
11500
Station (ft)

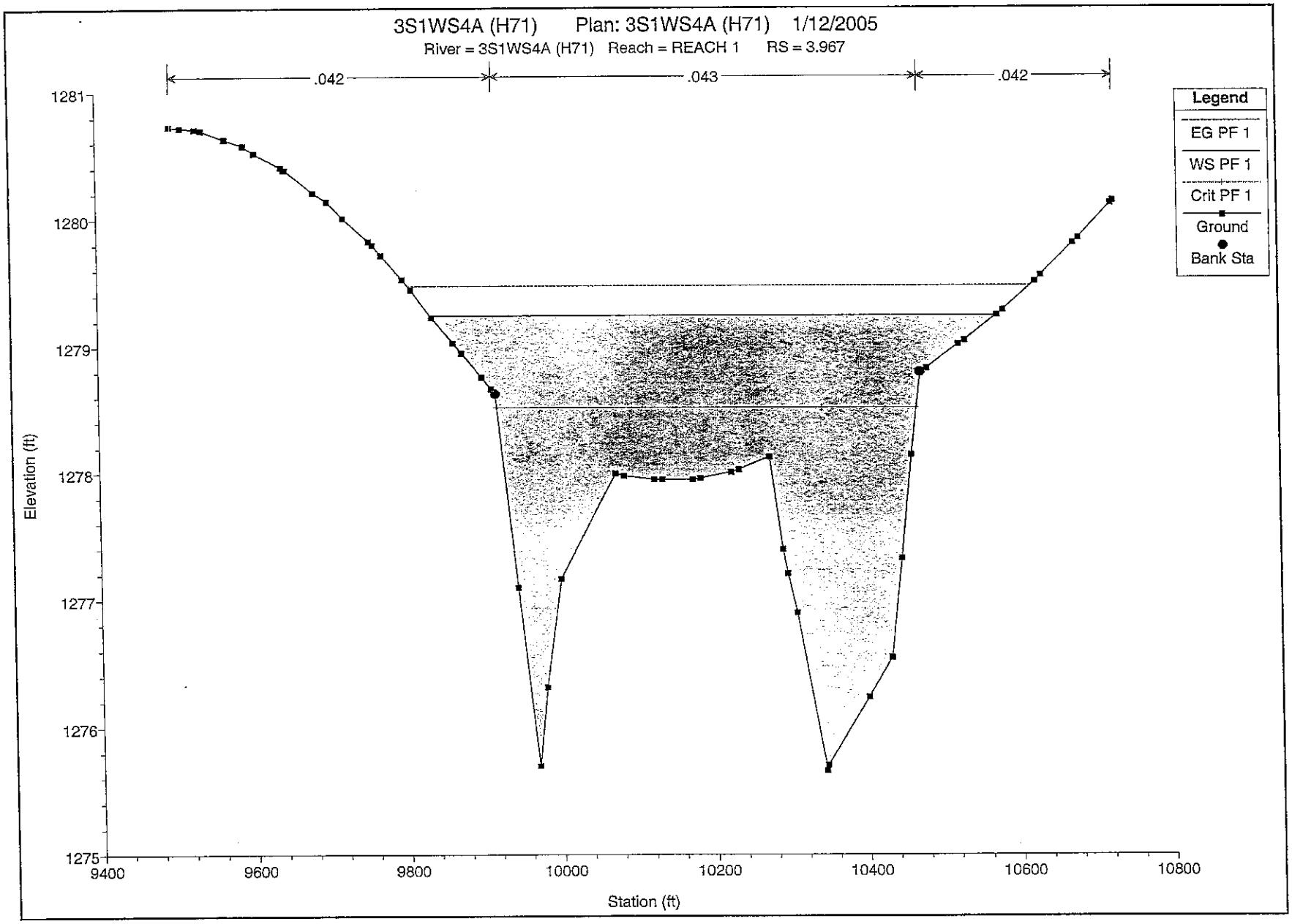

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 2.812
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1231.0
1230.5
1230.0
1229.5
1229.0
1228.5
1228.0
1227.5
1227.0
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

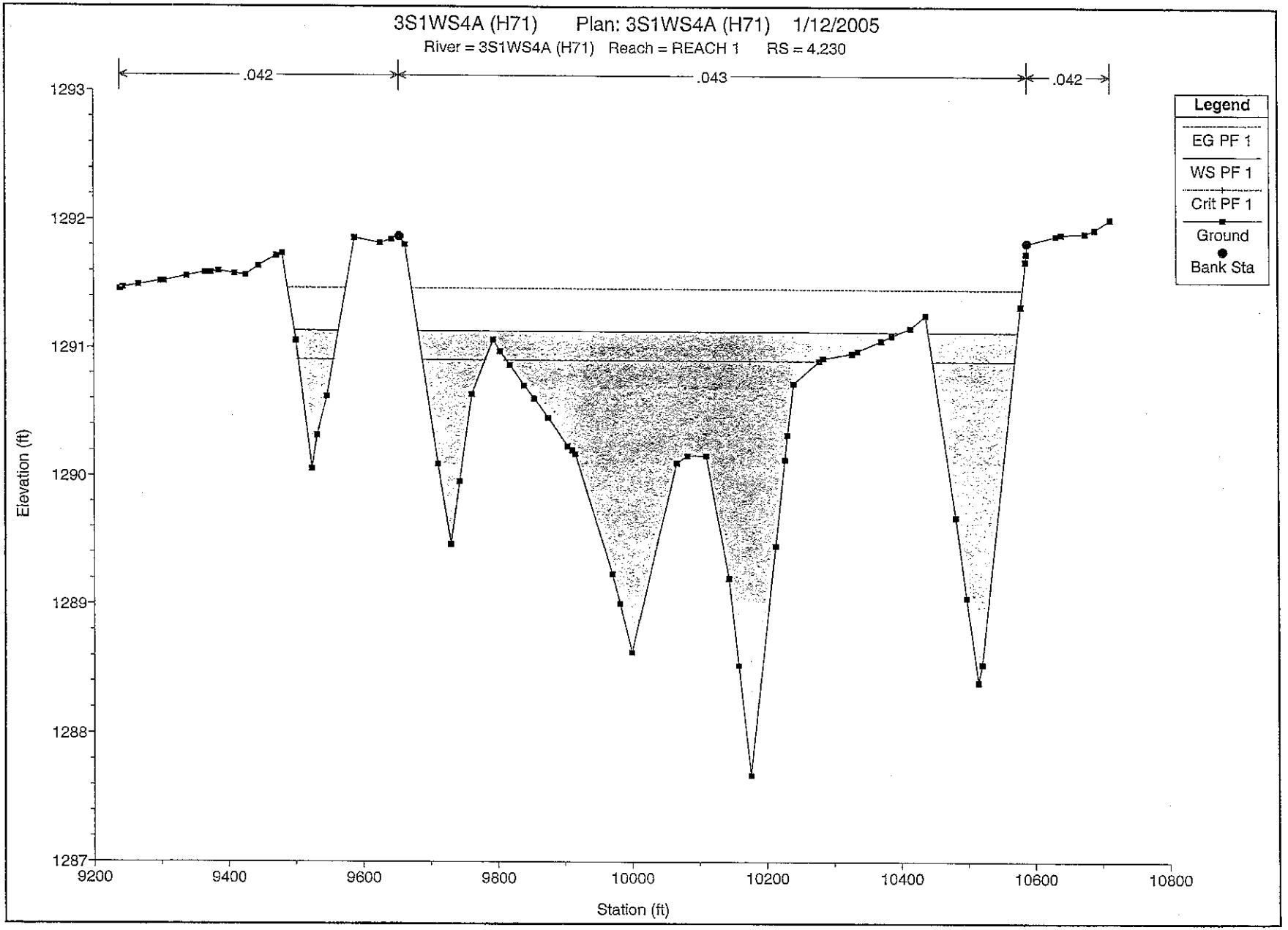

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 2.979
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1237.5
1237.0
1236.5
1236.0
1235.5
1235.0
1234.5
1234.0
9600
9800
10000
10200
10400
10600
10800
Station (ft)

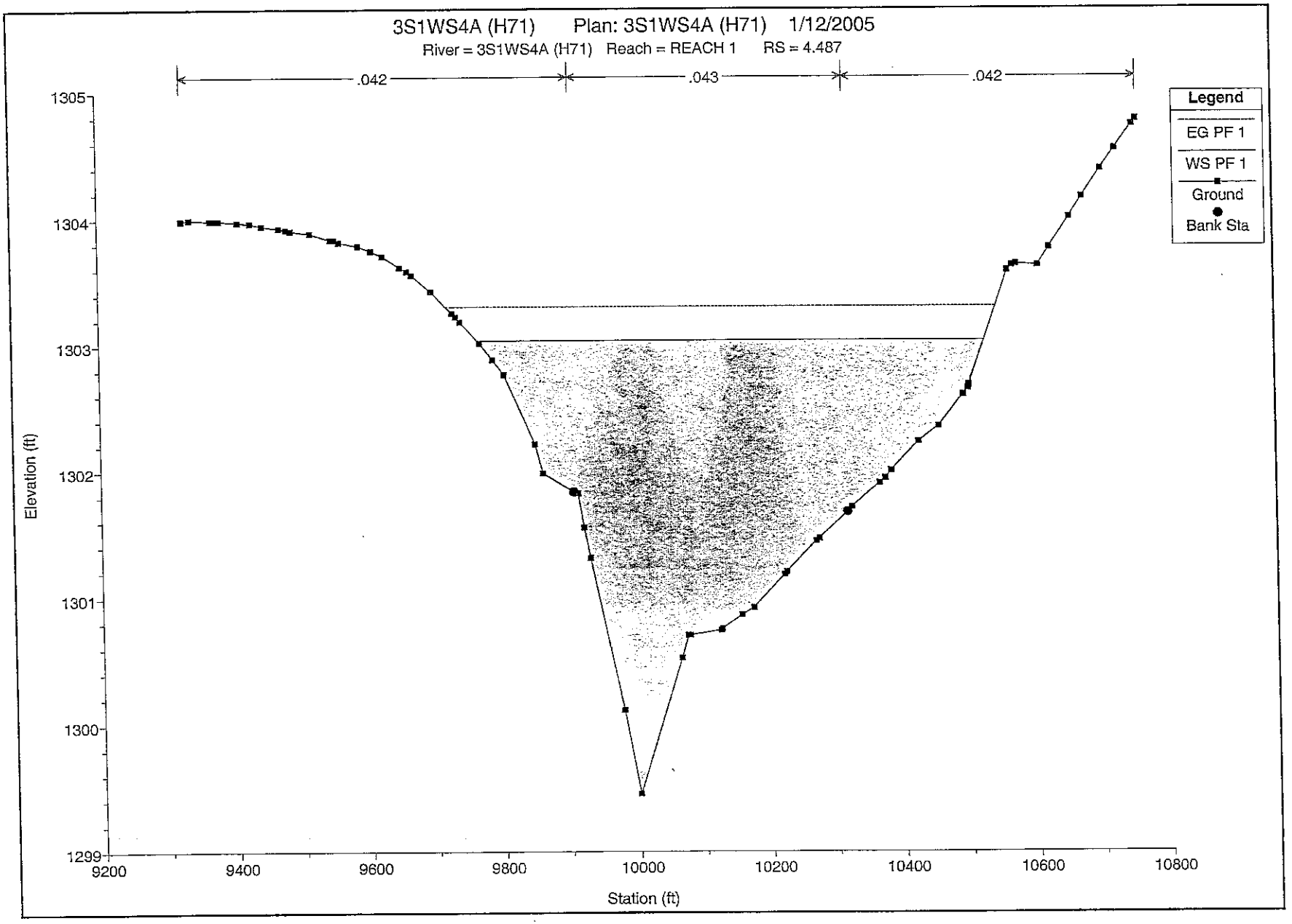

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 3.221
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1247
1246
1245
1244
1243
1242
1241
1240
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

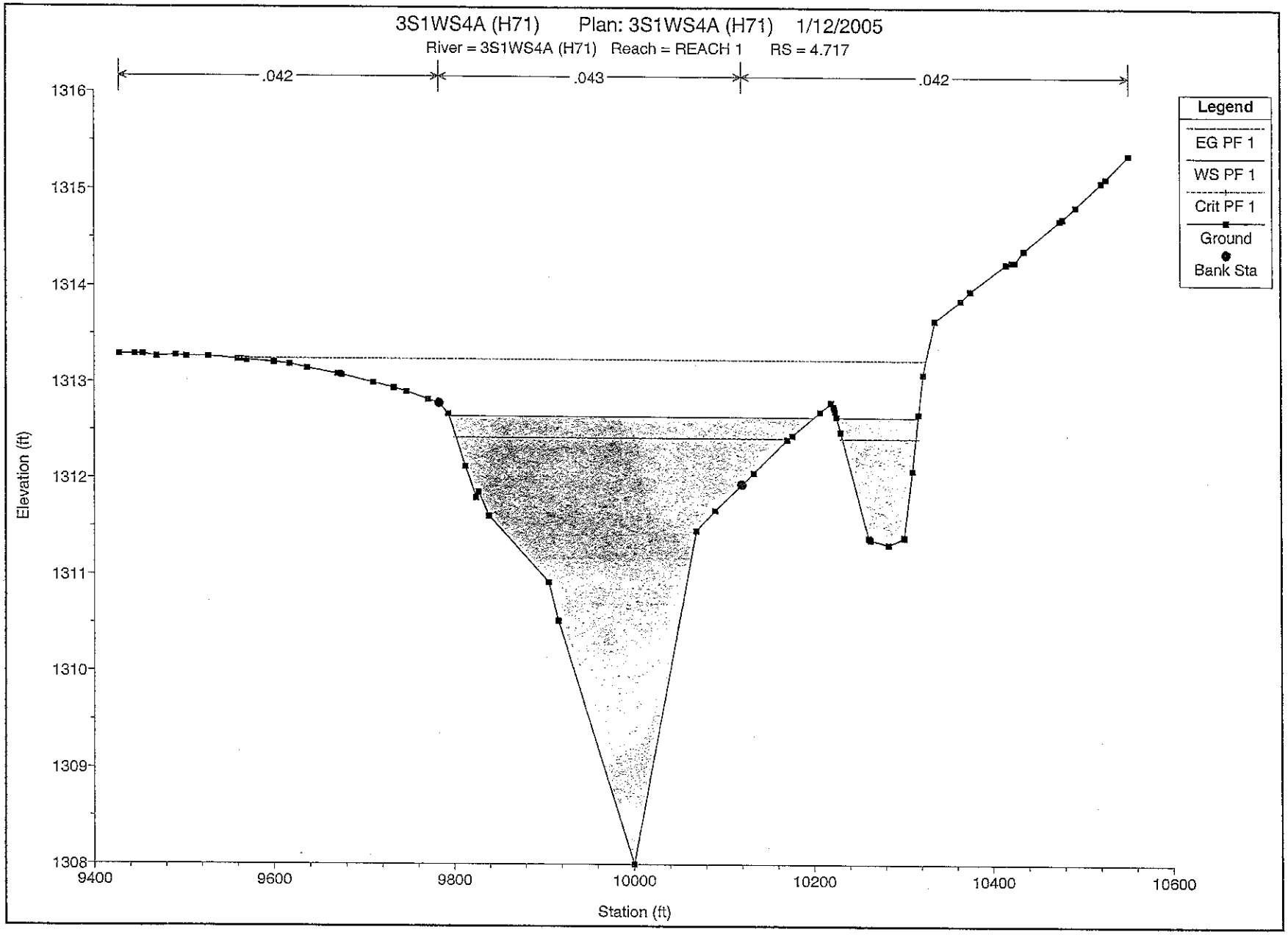

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 3.423
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1255.5
1255.0
1254.5
1254.0
1253.5
1253.0
1252.5
1252.0
1251.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

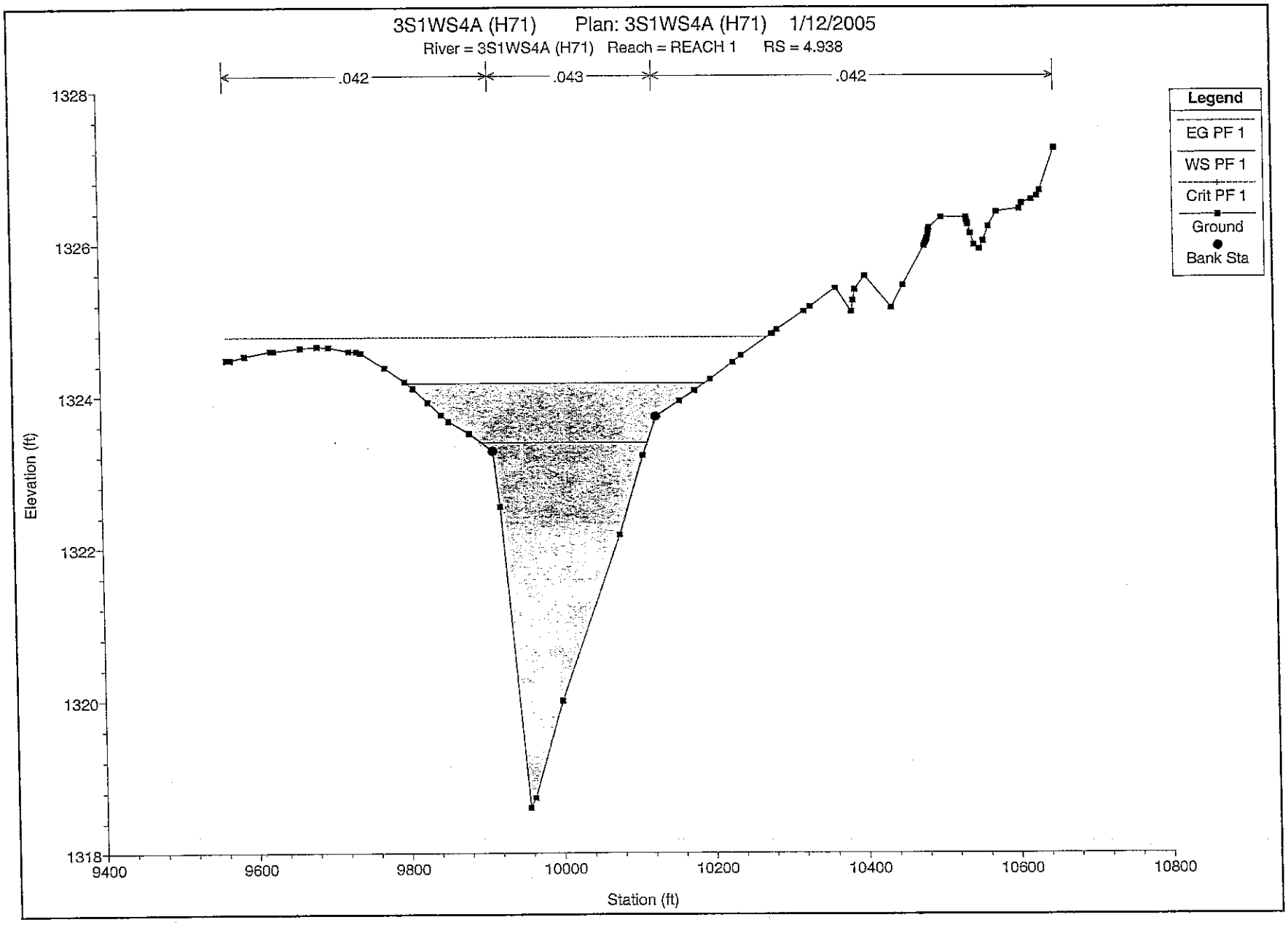

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 3.687
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1268.0
1267.5
1267.0
1266.5
1266.0
1265.5
1265.0
1264.5
1264.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

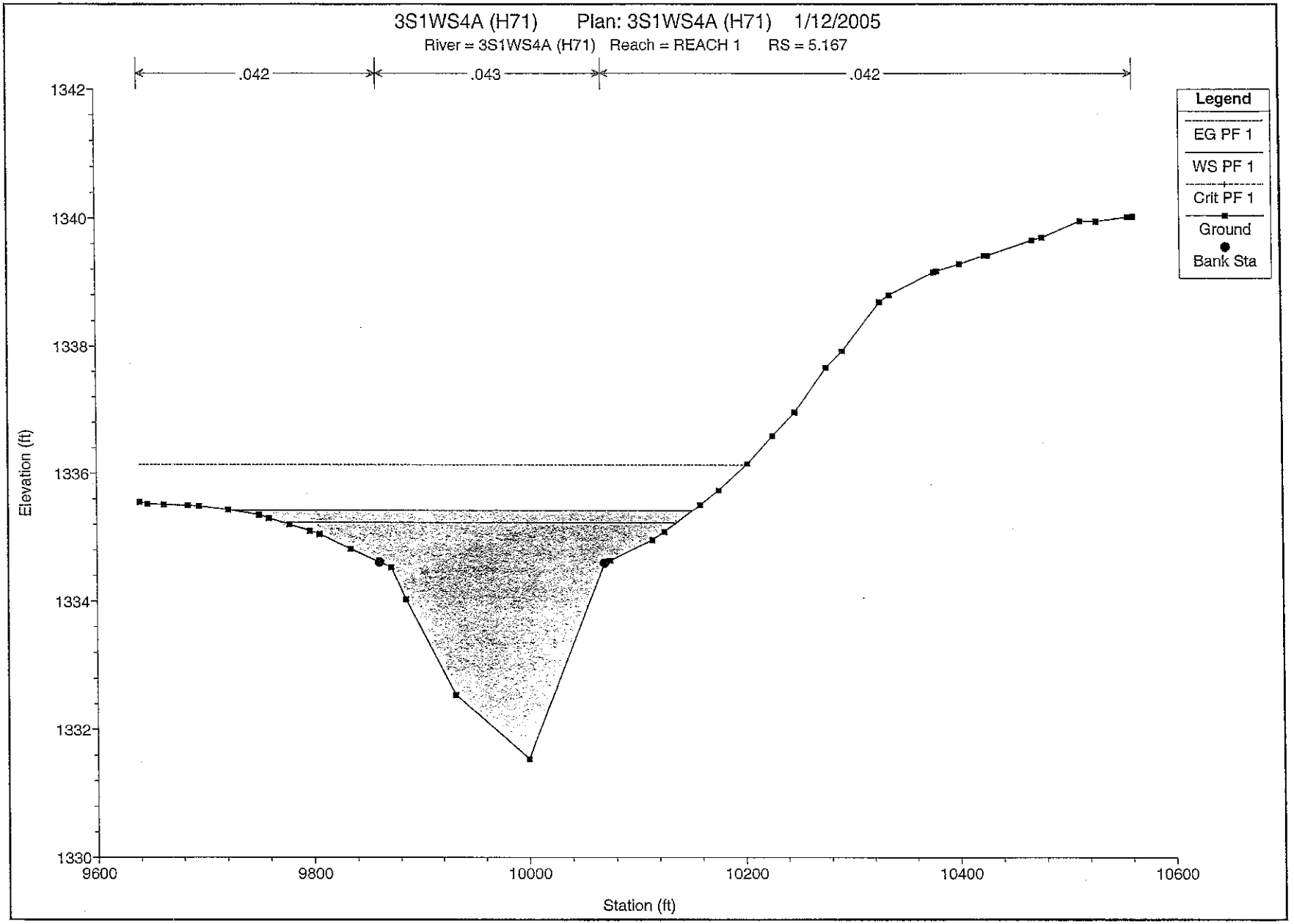

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 3.967
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1281
1280
1279
1278
1277
1276
1275
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

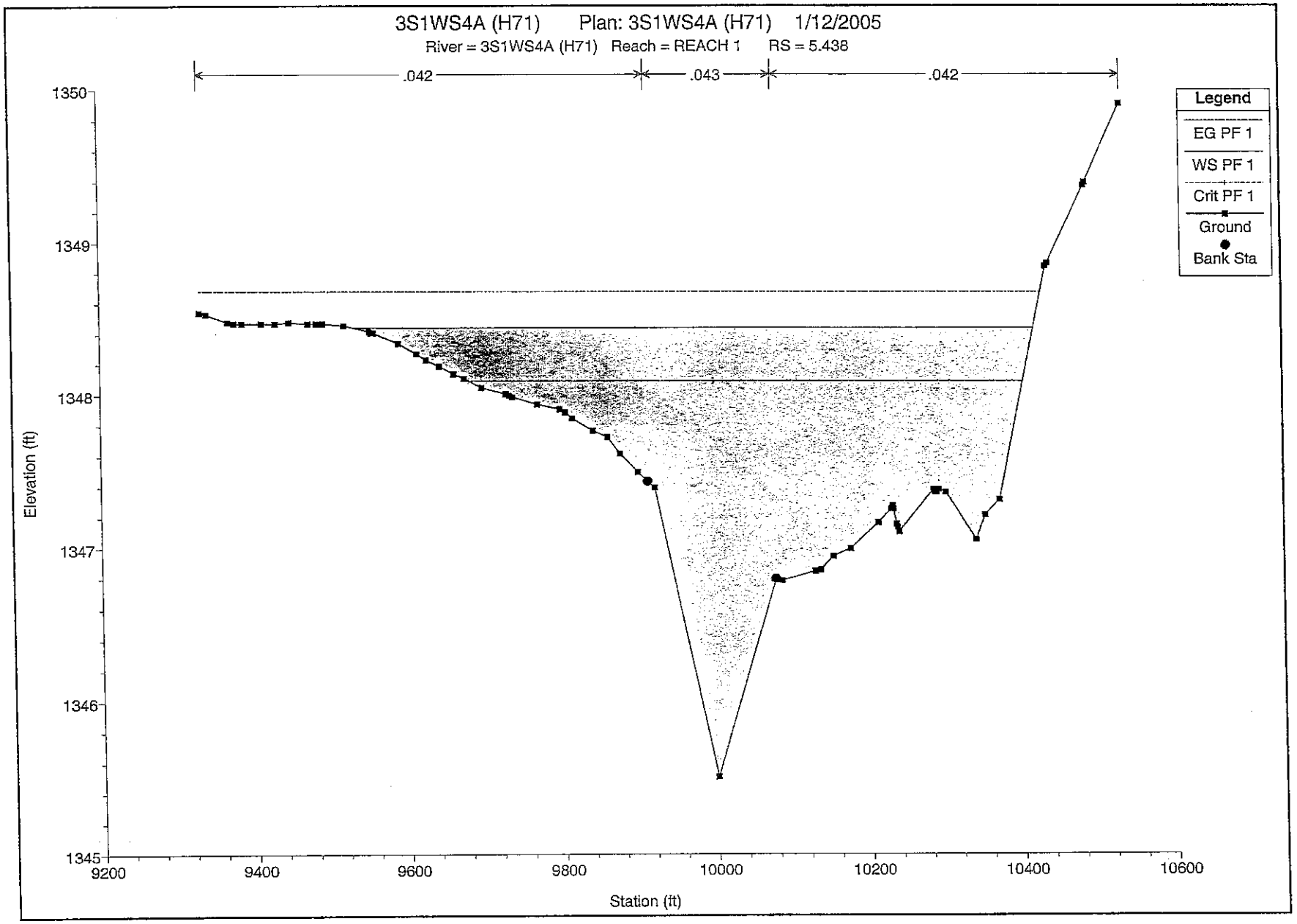

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 4.230
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1293
1292
1291
1290
1289
1288
1287
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

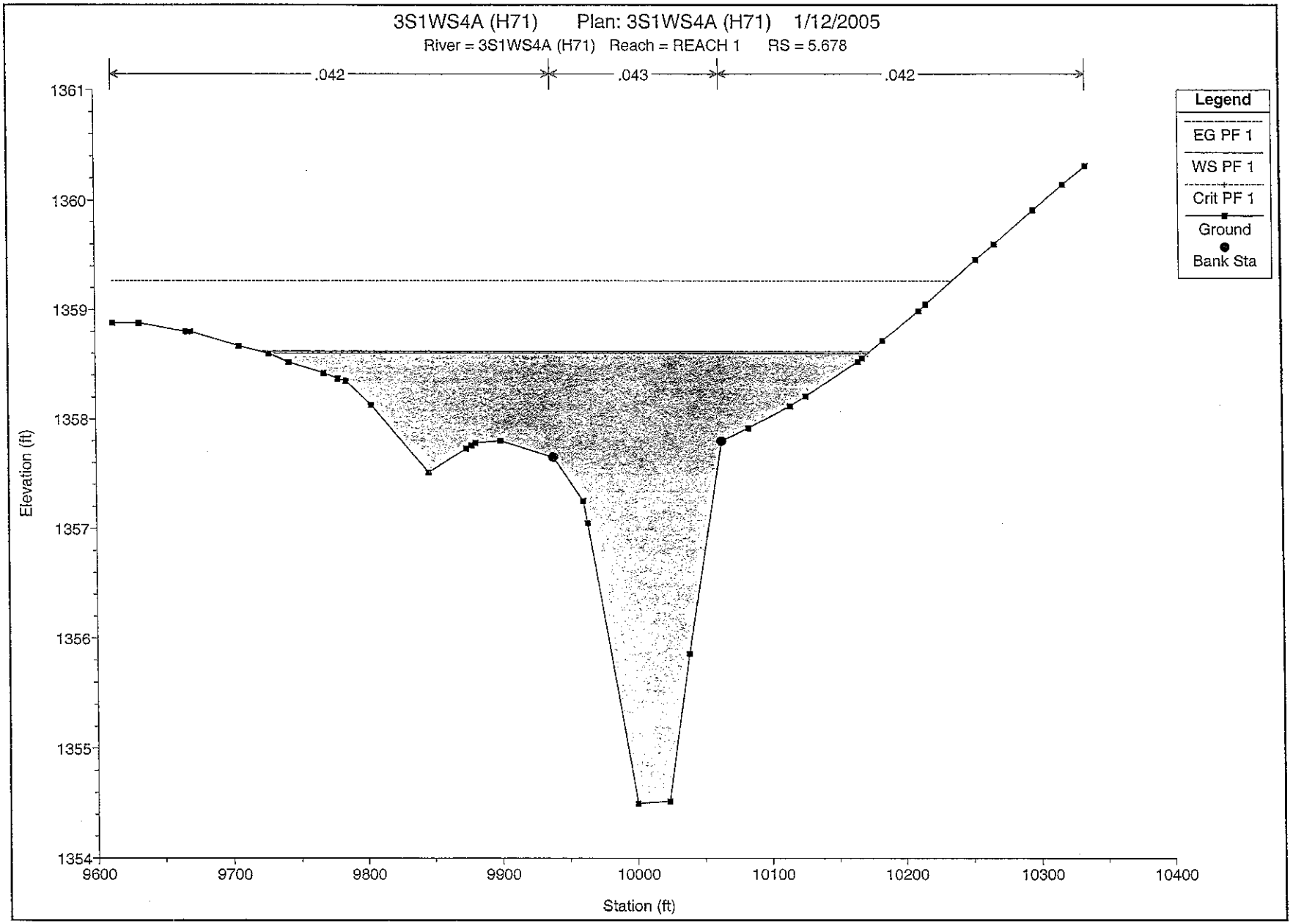

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 4.487
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1305
1304
1303
1302
1301
1300
1299
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

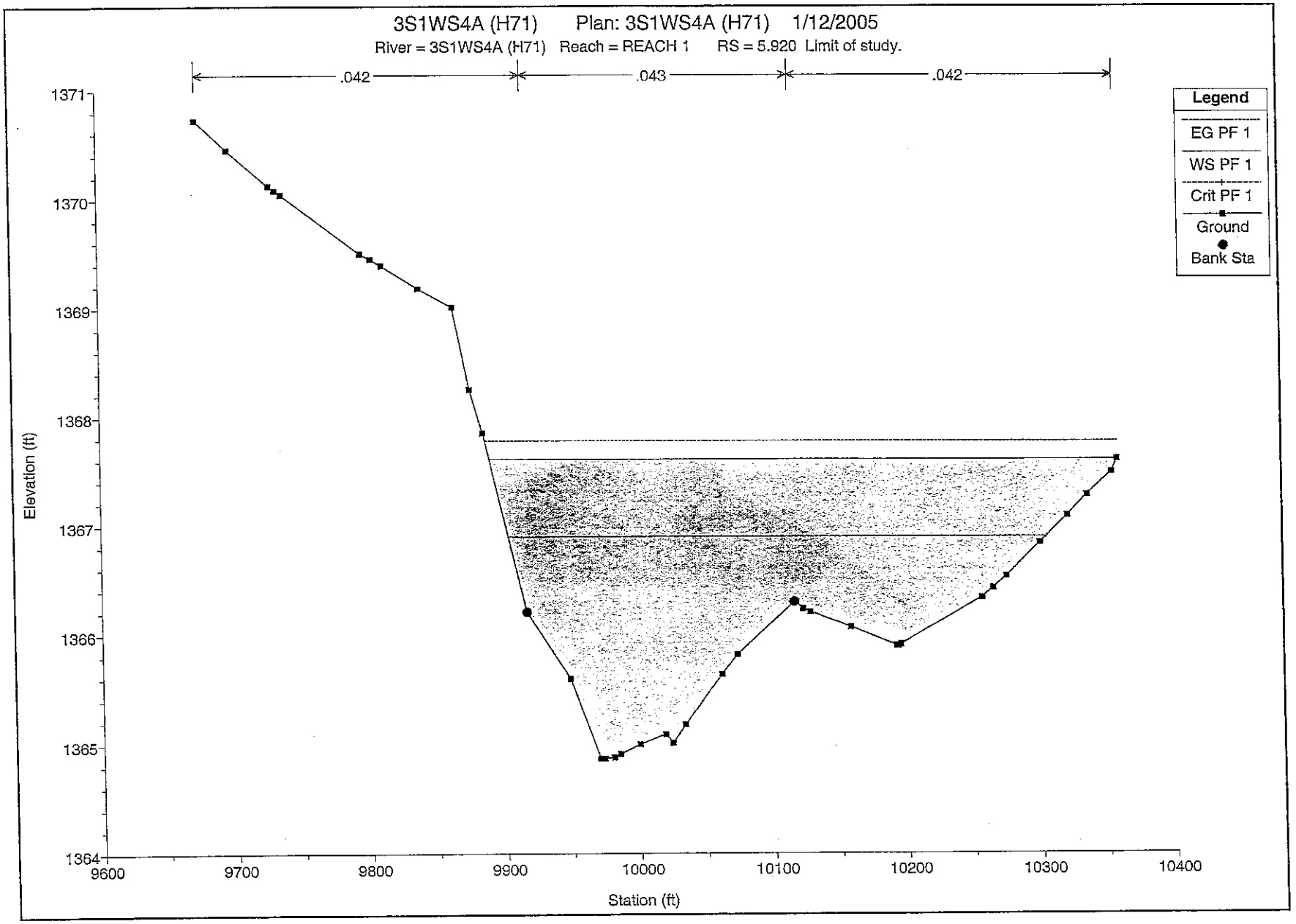

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 4.717
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1316
1315
1314
1313
1312
1311
1310
1309
1308
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 4.938
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1328
1326
1324
1322
1320
1318
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 5.167
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1342
1340
1338
1336
1334
1332
1330
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 5.438
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1350
1349
1348
1347
1346
1345
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 5.678
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1361
1360
1359
1358
1357
1356
1355
1354
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4A (H71) Reach = REACH 1 RS = 5.920 Limit of study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1371
1370
1369
1368
1367
1366
1365
1364
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

MODEL: 3S1WS4A (H71)

REACH: 3S1WS4B (H73)

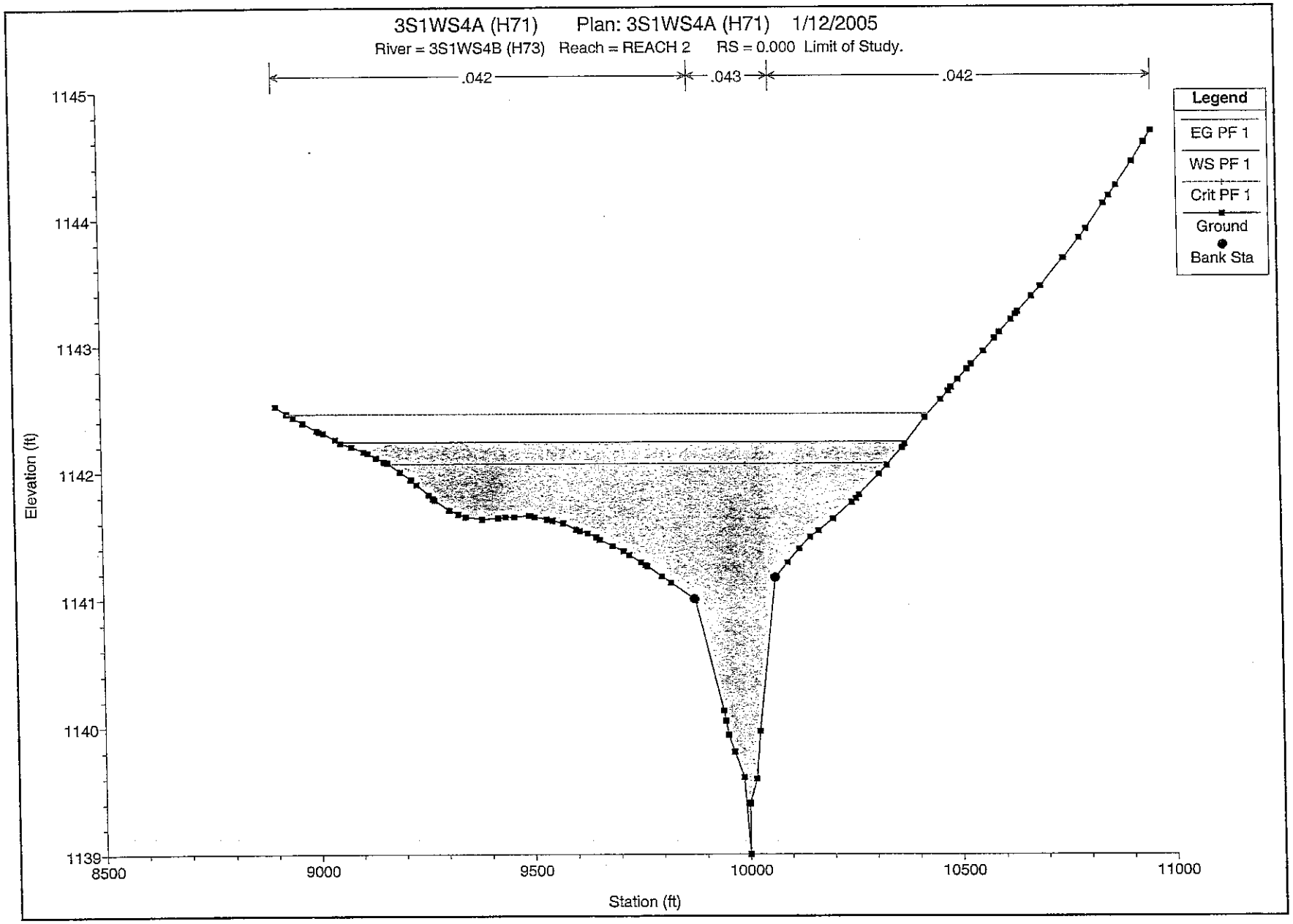
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

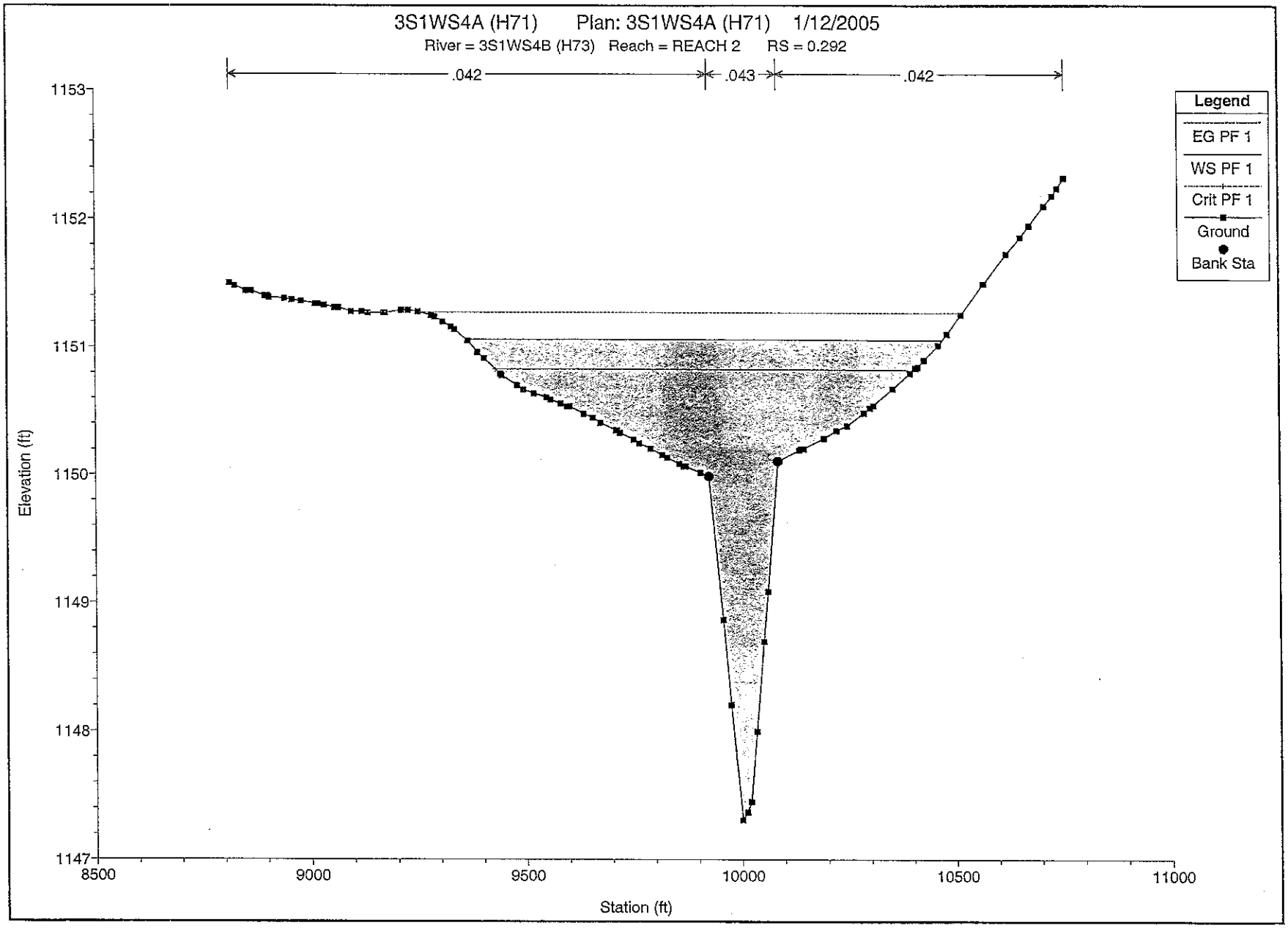
Change in Discharge based on Reach Length

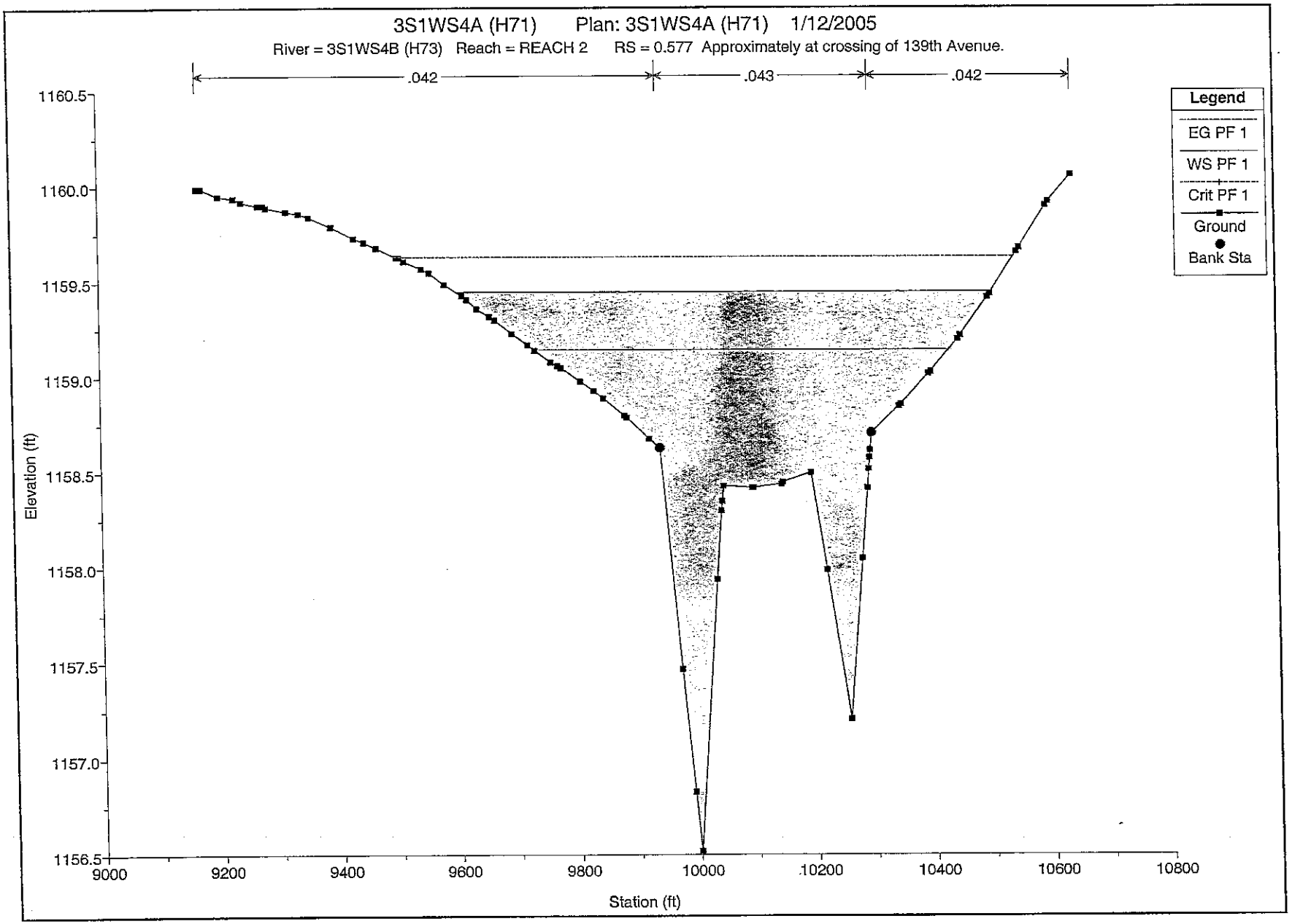
Wash ID: 3S1WS4B (H73)

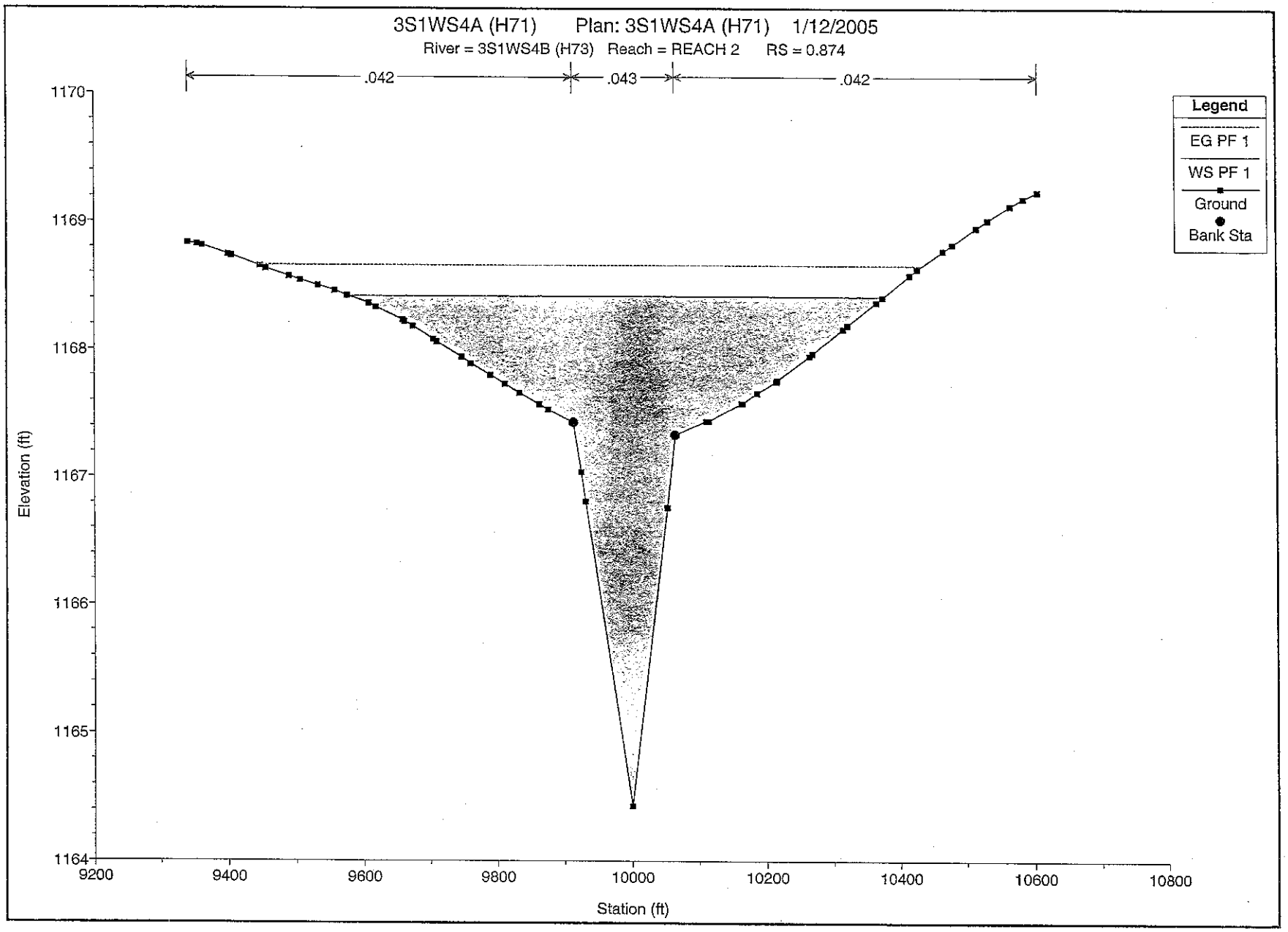
Subbasin	X-section	Discharge	Q (nearest 10)	Q (nearest 100)
DVH63	2.316	1608	1610	1600
H53	2.076	1561	1560	1600
H53	1.836	1513	1510	1500
H53	1.589	1465	1460	1500
CPH53	1.378	1423	1420	1400
CPH52B	1.378	2316	2320	2300
H54	1.125	2293	2290	2300
H54	0.874	2270	2270	2300
CPH54	0.577	2243	2240	2200
H73	0.292	2710	2710	2700
CPH73	0.000	3189	3190	3200

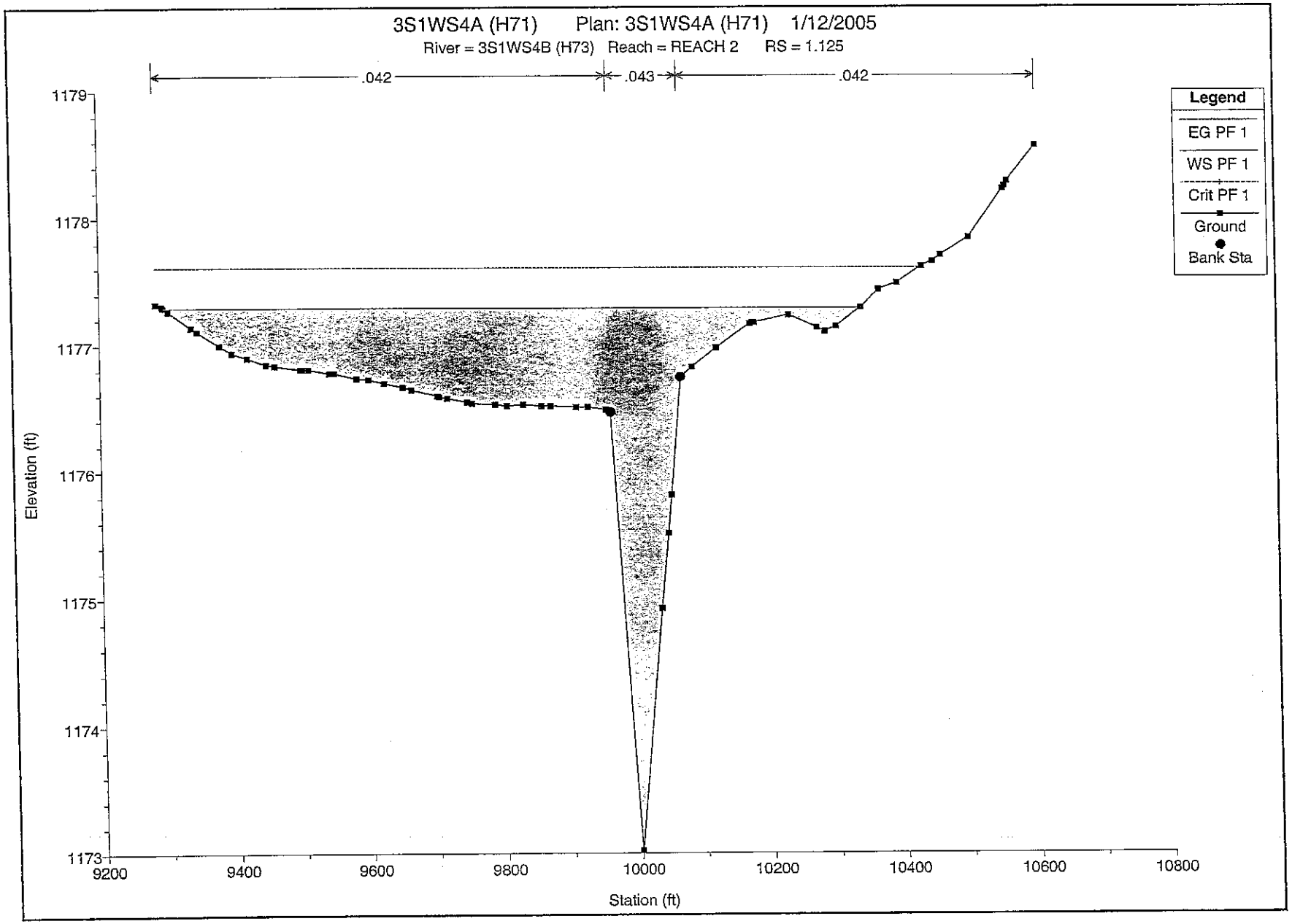
1. X-section 1.378 is the confluence of 3 subbasins, upstream only H53 is used,
1. downstream the combined flow at CPH52B is used

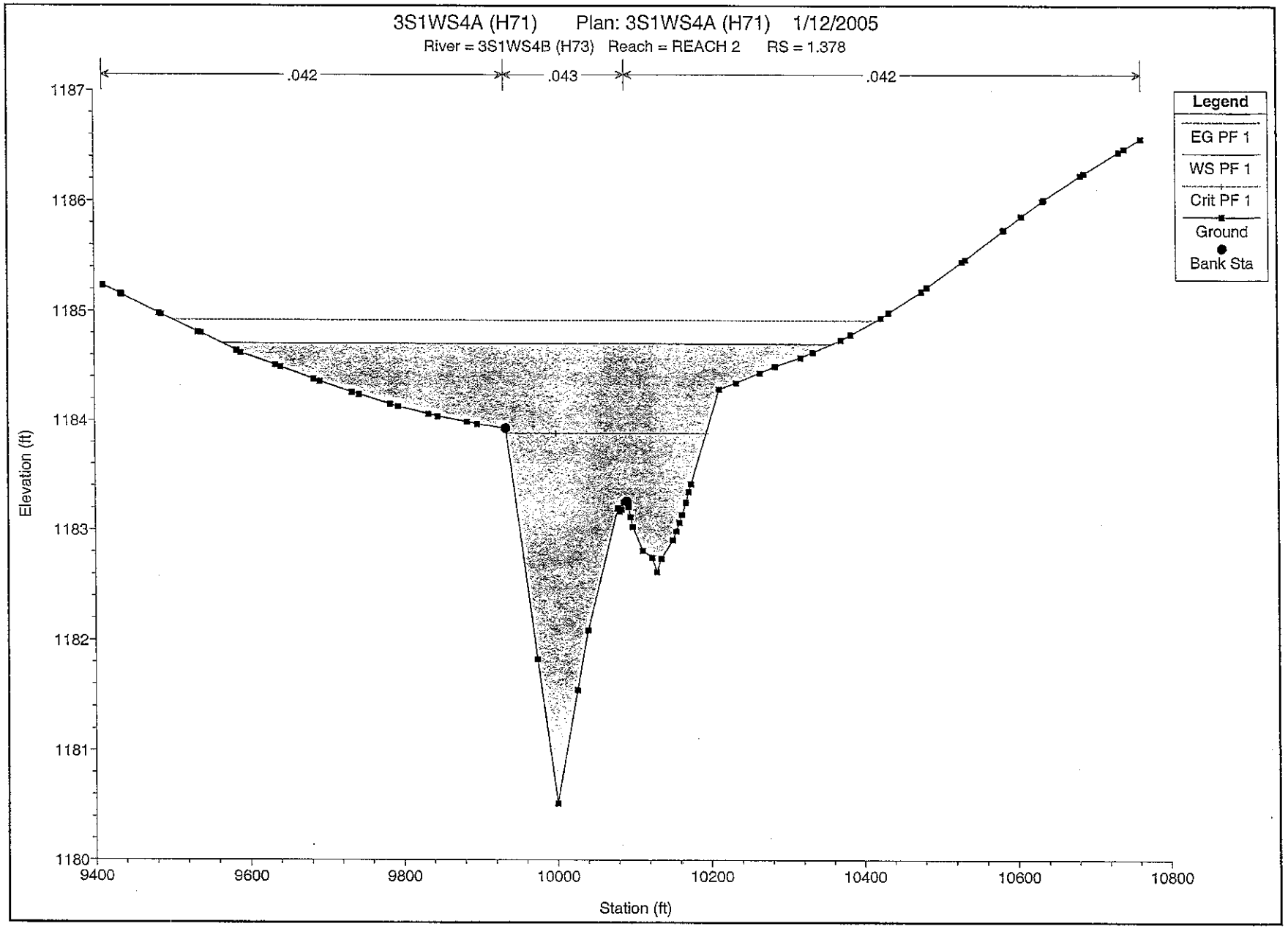

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 2 RS = 0.000 Limit of Study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1145
1144
1143
1142
1141
1140
1139
8500
9000
9500
10000
10500
11000
Station (ft)

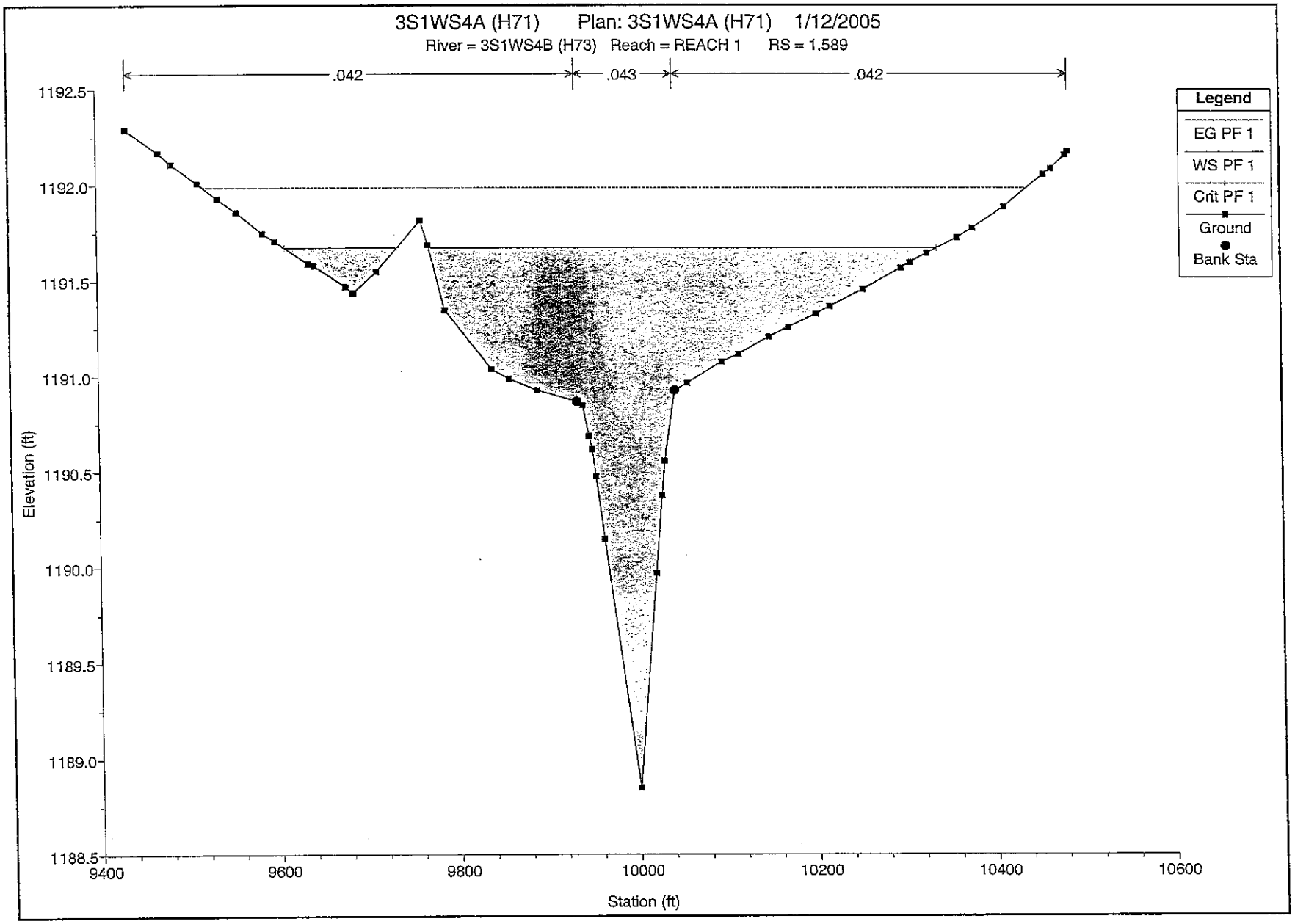

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 2 RS = 0.292
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1153
1152
1151
1150
1149
1148
1147
8500
9000
9500
10000
10500
11000
Station (ft)

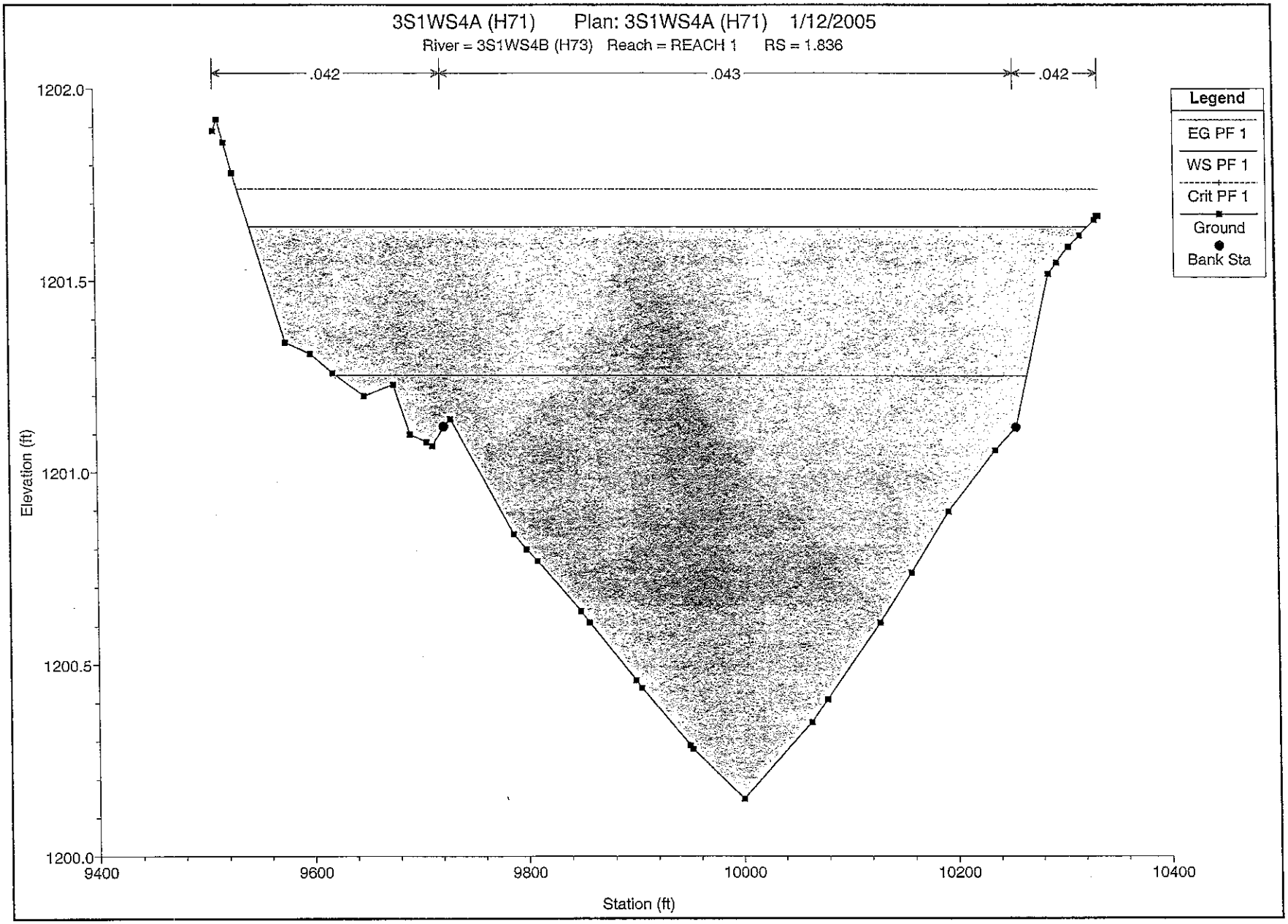

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 2 RS = 0.577 Approximately at crossing of 139th Avenue.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1160.5
1160.0
1159.5
1159.0
1158.5
1158.0
1157.5
1157.0
1156.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

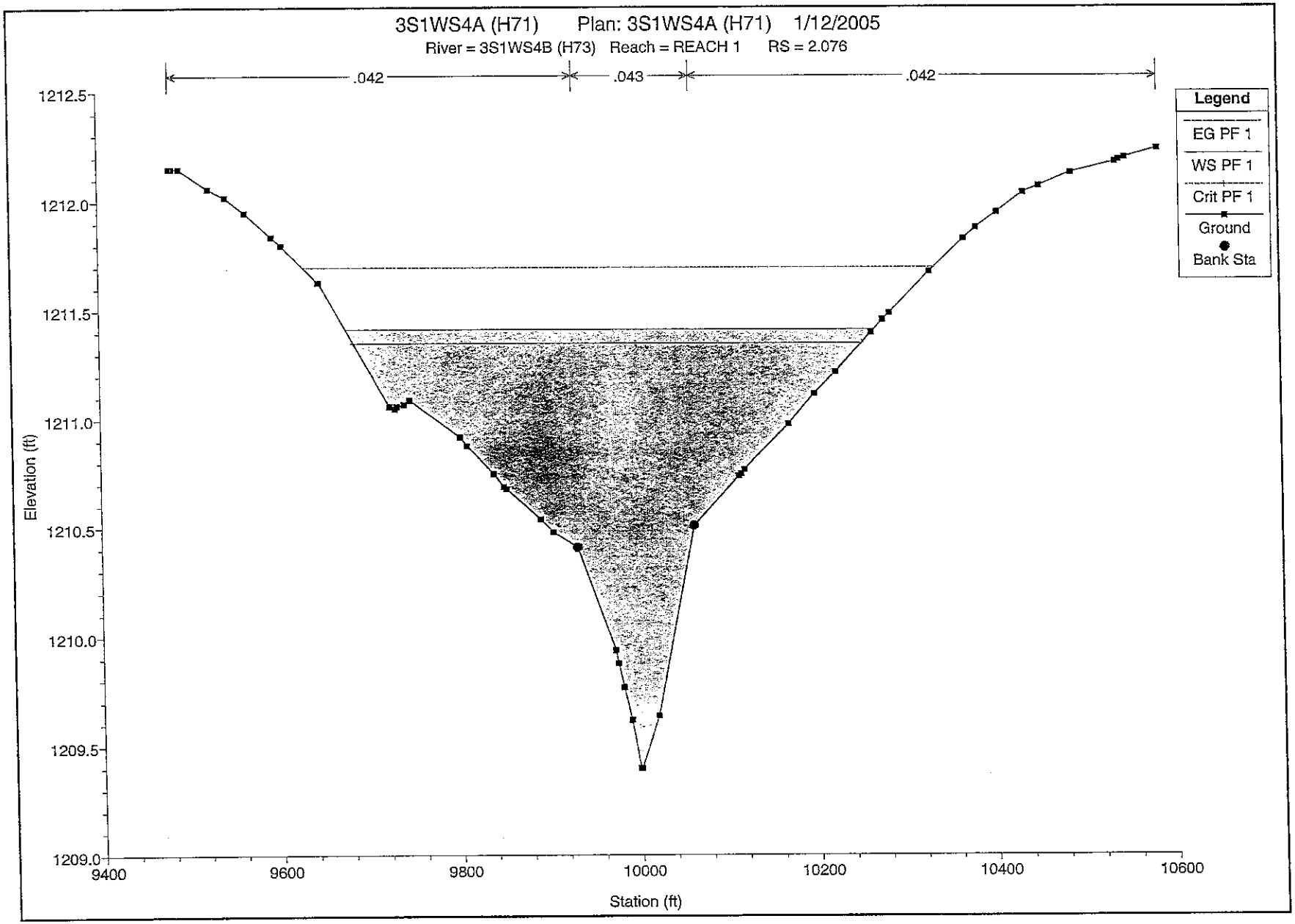

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 2 RS = 0.874
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1170
1169
1168
1167
1166
1165
1164
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

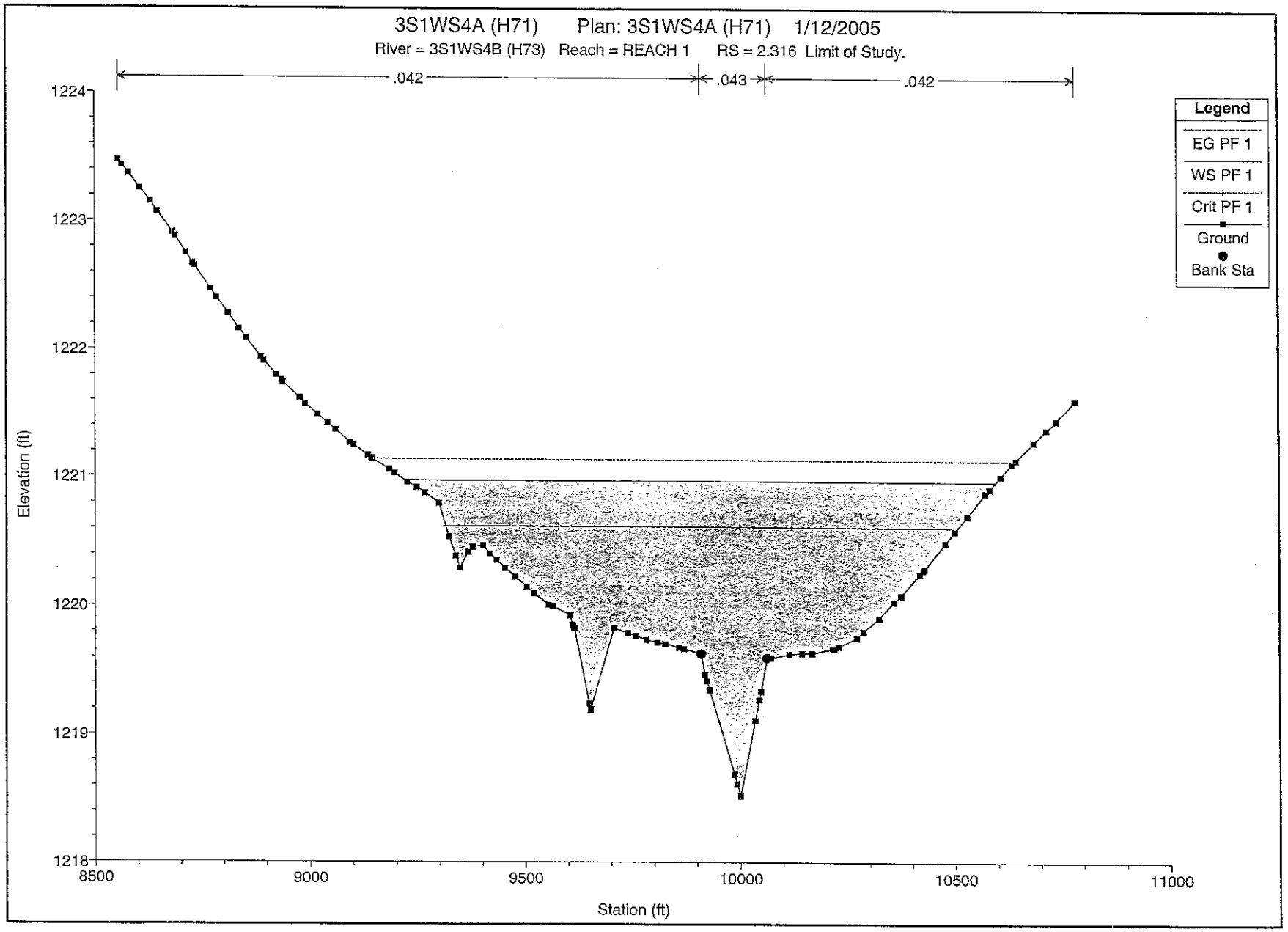

3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 2 RS = 1.125
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1179
1178
1177
1176
1175
1174
1173
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 2 RS = 1.378
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1187
1186
1185
1184
1183
1182
1181
1180
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 1 RS = 1.589
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1192.5
1192.0
1191.5
1191.0
1190.5
1190.0
1189.5
1189.0
1188.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 1 RS = 1.836
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1202.0
1201.5
1201.0
1200.5
1200.0
9400
9600
9800
10000
10200
10400
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 1 RS = 2.076
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1212.5
1212.0
1211.5
1211.0
1210.5
1210.0
1209.5
1209.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS4B (H73) Reach = REACH 1 RS = 2.316 Limit of Study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1224
1223
1222
1221
1220
1219
1218
8500
9000
9500
10000
10500
11000
Station (ft)

MODEL: 3S1WS4A (H71)

REACH: 3S1WS3 (H29)

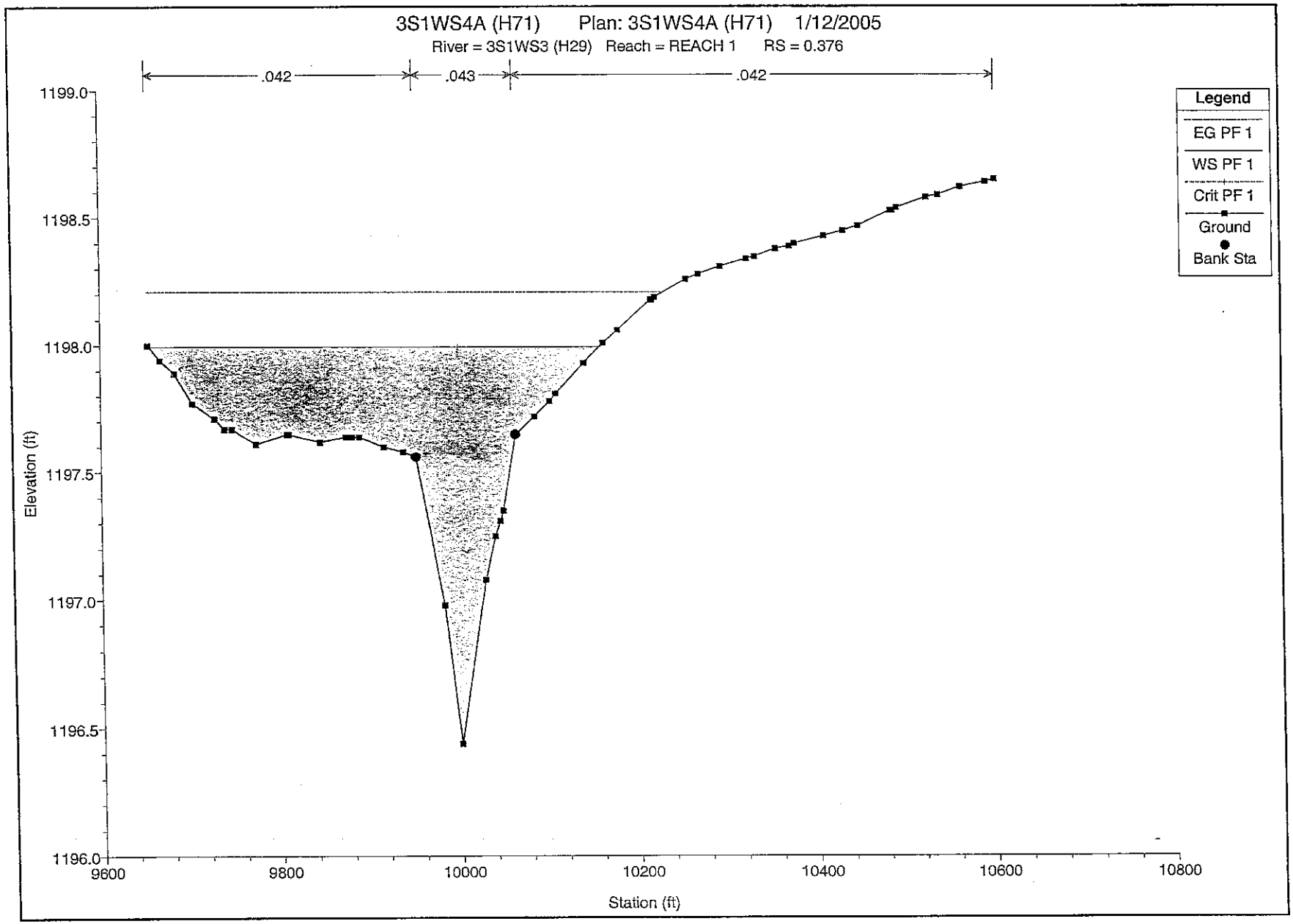
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

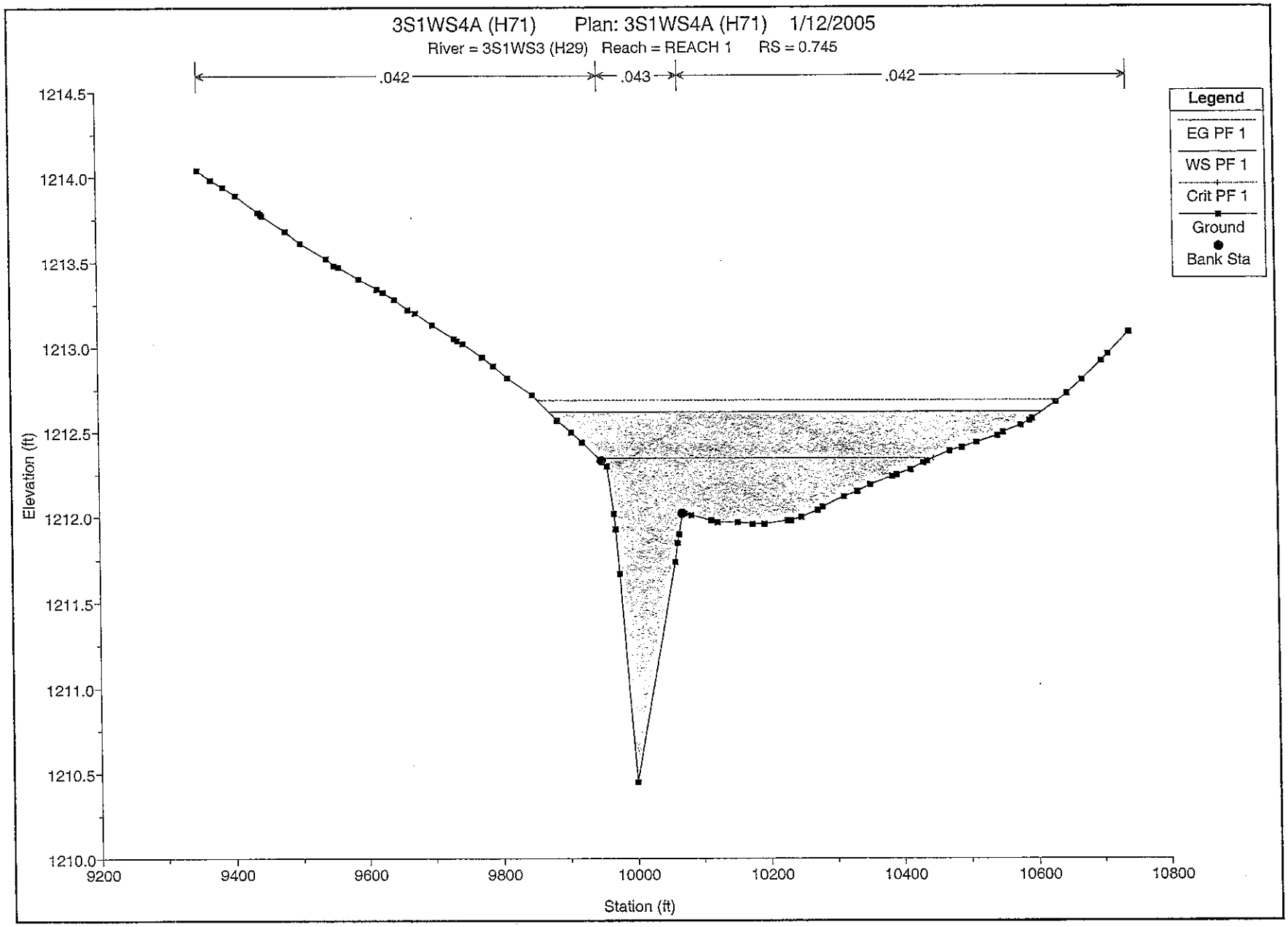
Change in Discharge based on Reach Length

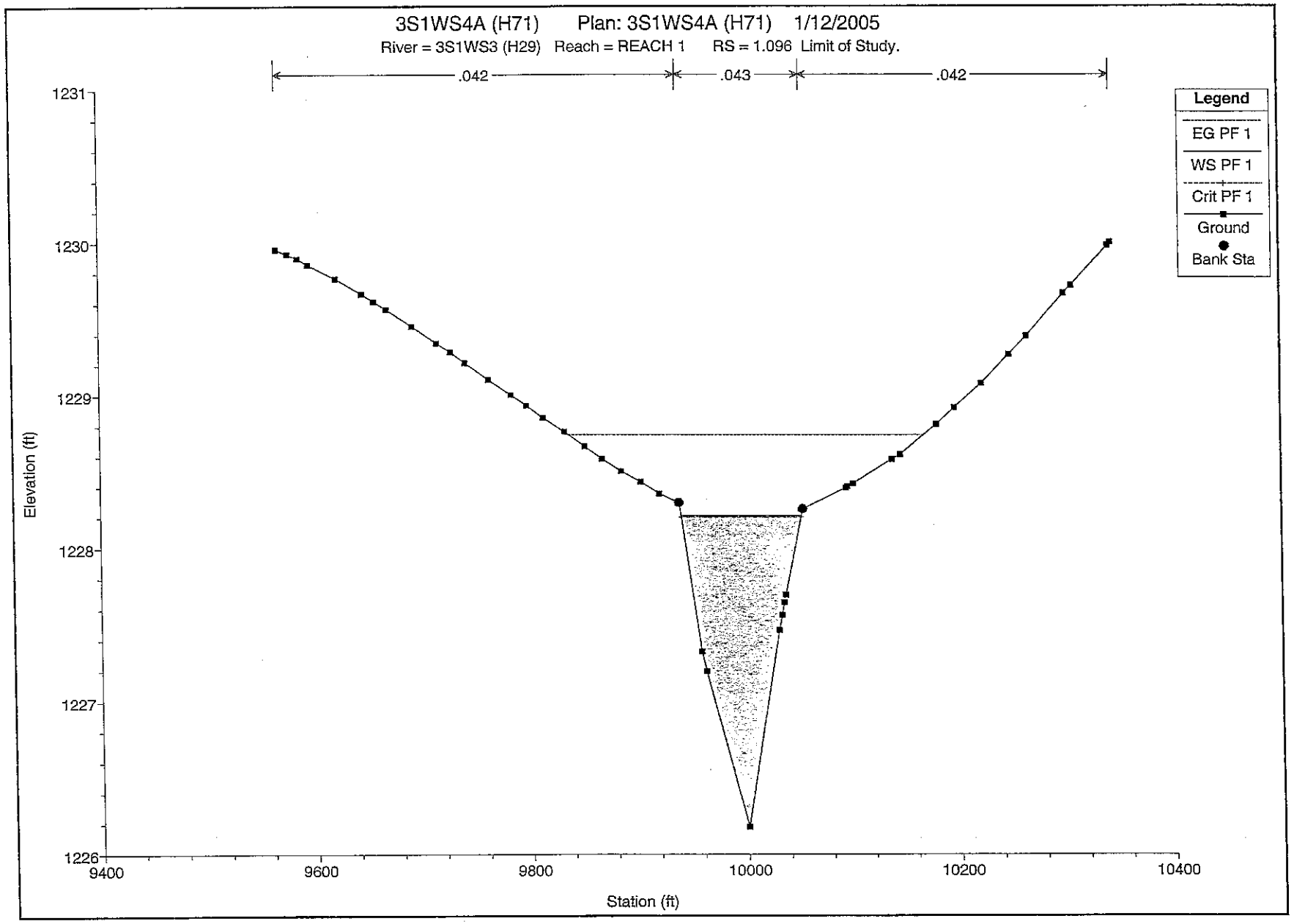
Wash ID: 3S1WS3 (H29)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPH51	1.096	703	700	700
H52	0.745	685	690	700
H52	0.376	666	670	700
CPH52	0.000	647	650	600

X-sect 0.000 does not exist, CPH52 is the downstream confluence with wash H73


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS3 (H29) Reach = REACH 1 RS = 0.376
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1199.0
1198.5
1198.0
1197.5
1197.0
1196.5
1196.0
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS3 (H29) Reach = REACH 1 RS = 0.745
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1214.5
1214.0
1213.5
1213.0
1212.5
1212.0
1211.5
1211.0
1210.5
1210.0
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS4A (H71) Plan: 3S1WS4A (H71) 1/12/2005
River = 3S1WS3 (H29) Reach = REACH 1 RS = 1.096 Limit of Study.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1231
1230
1229
1228
1227
1226
9400
9600
9800
10000
10200
10400
Station (ft)

MODEL: 3S1WS5 (B45)

REACH: 3S1WS5 (B45)

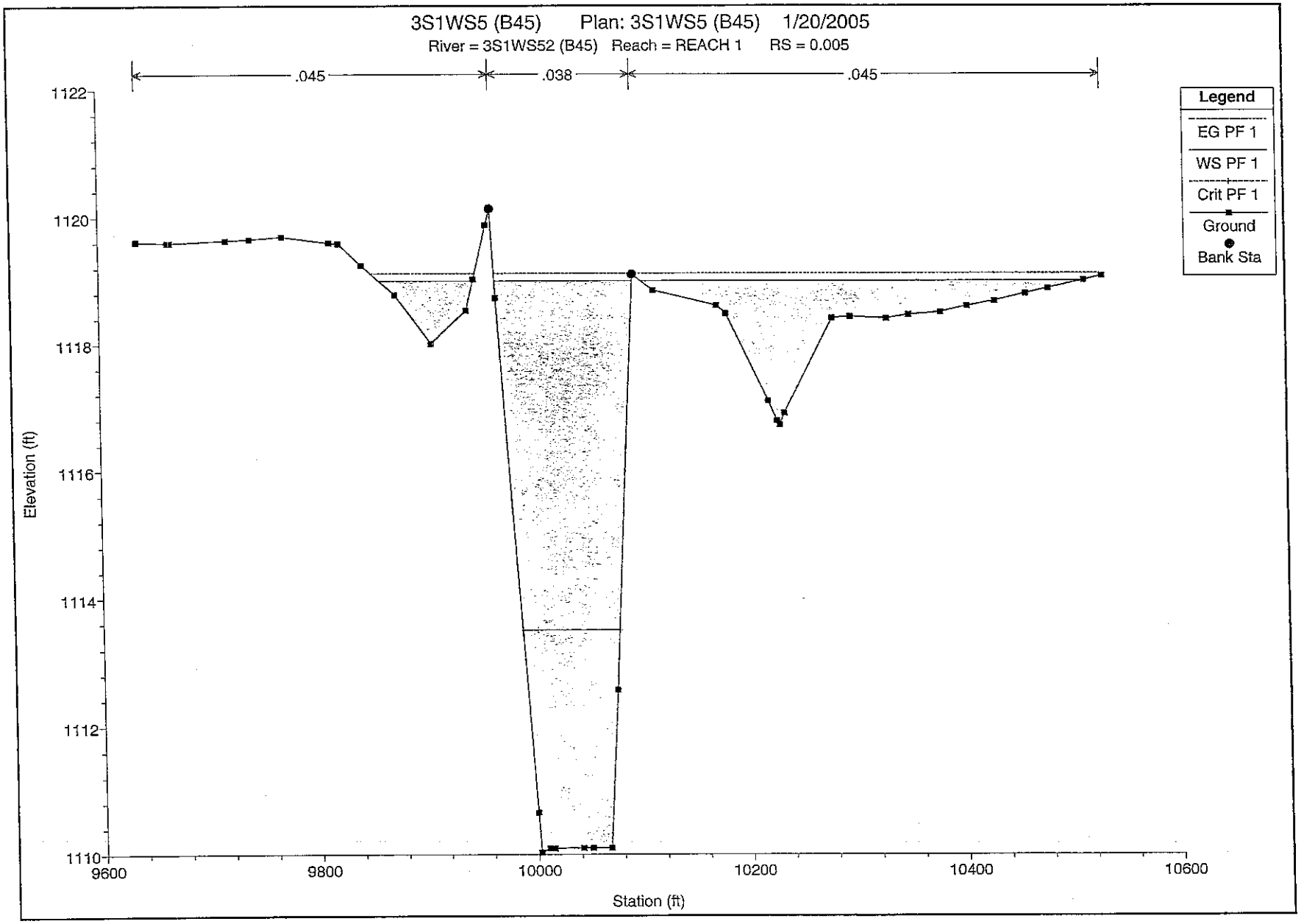
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

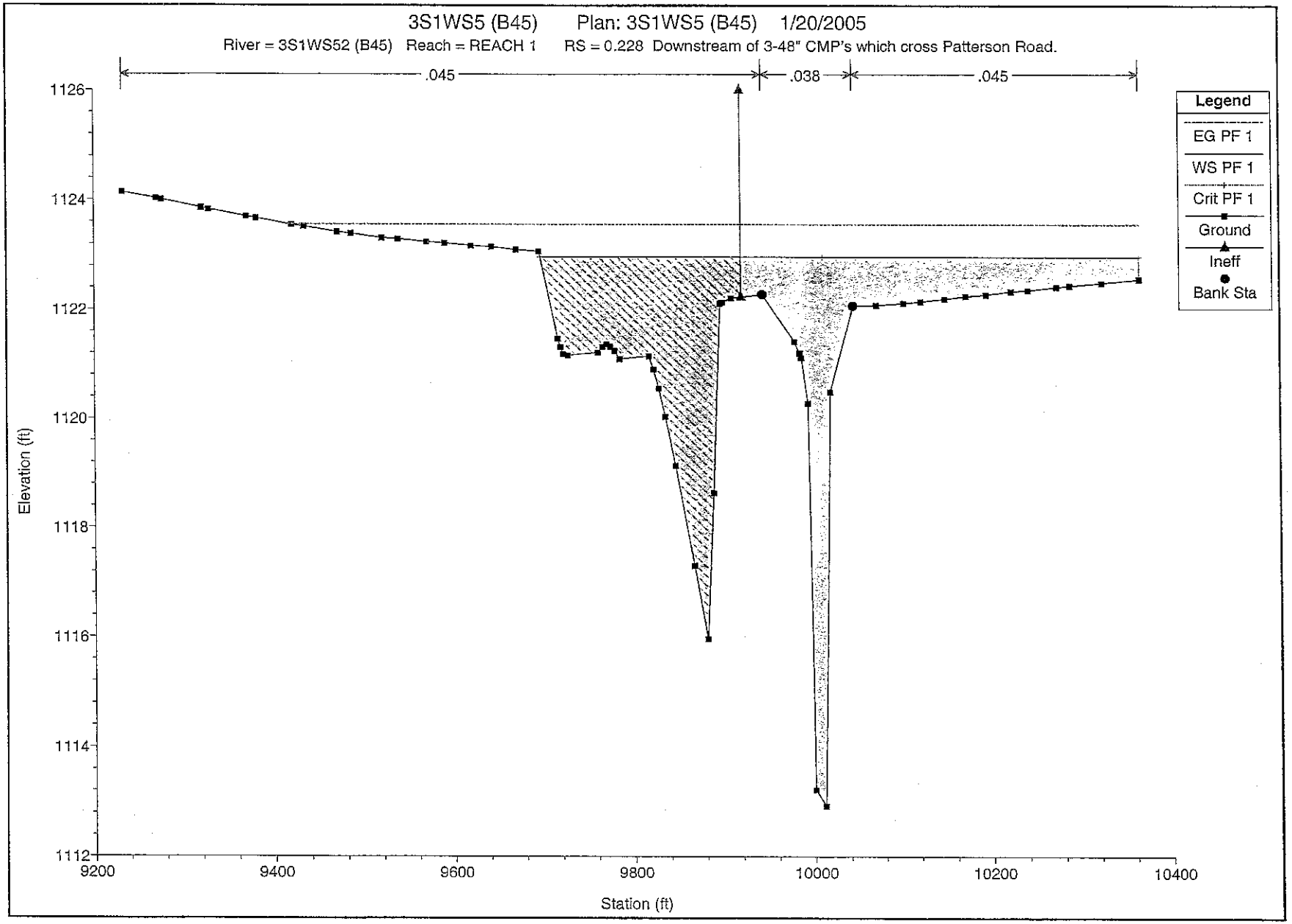
Change in Discharge based on Reach Length

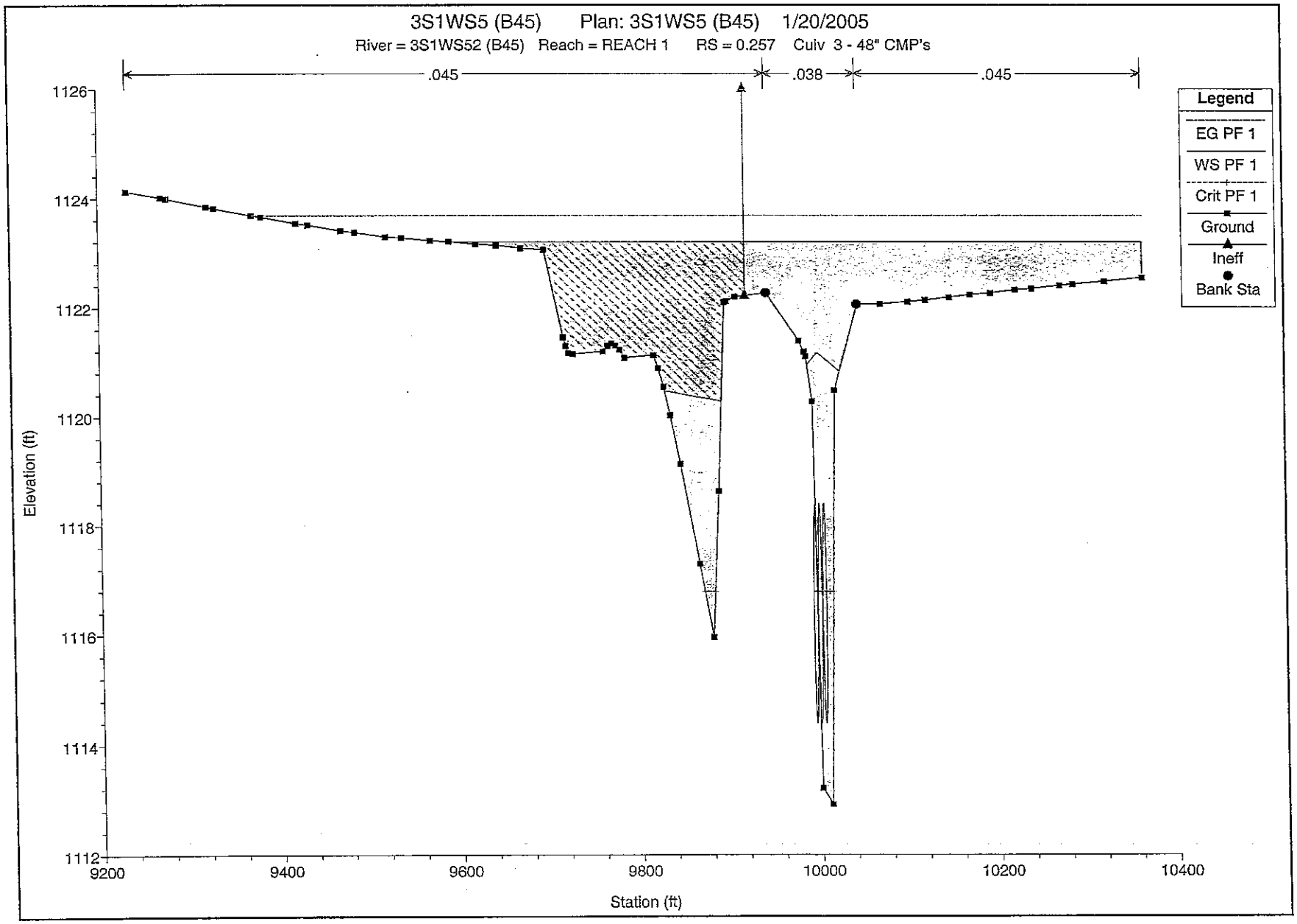
Wash ID: 3S1WS5 (B45)

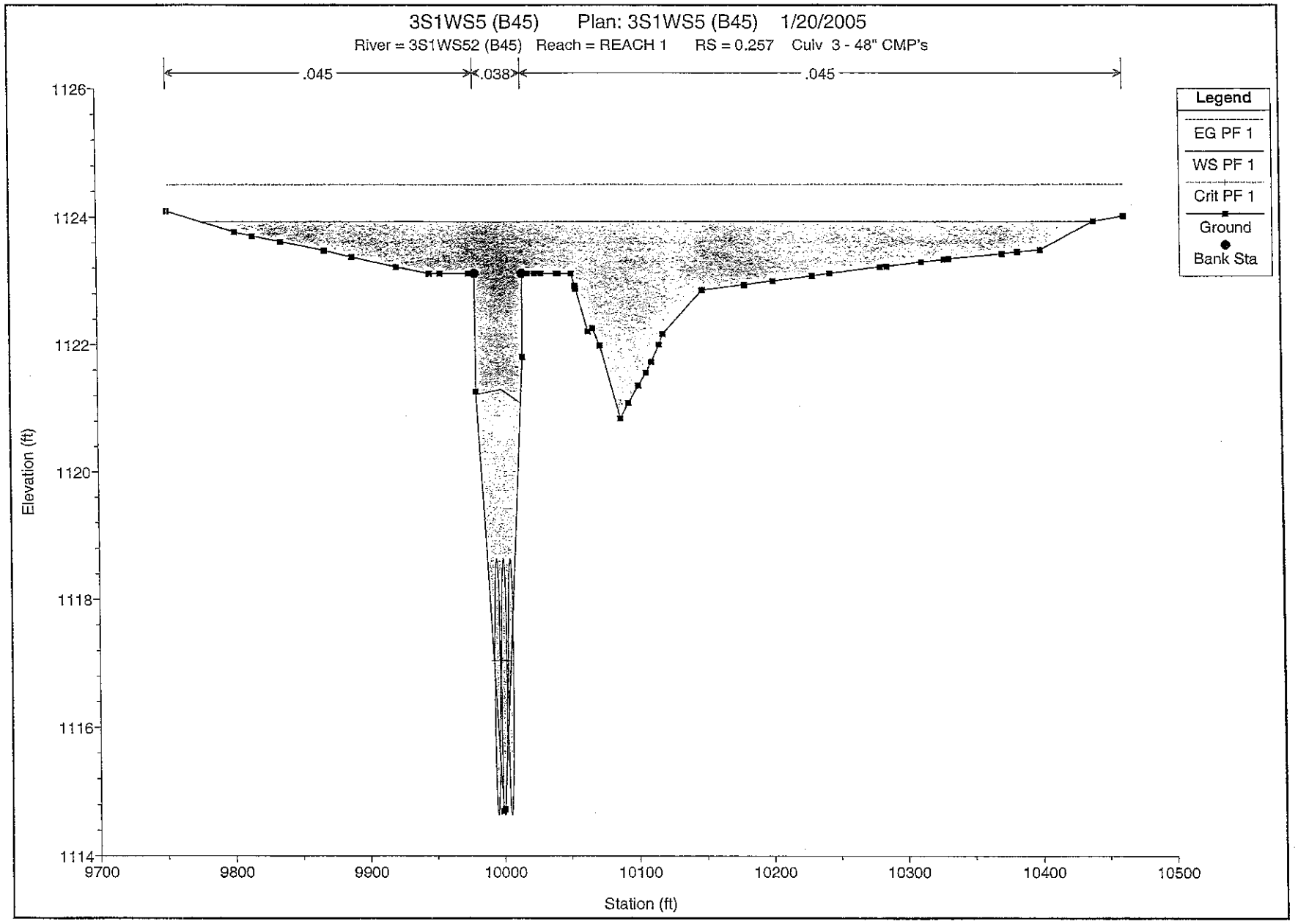
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
B14	3.093	3061	3060	3100
B14	2.790	2984	2980	3000
B14	2.540	2920	2920	2900
B14	2.317	2863	2860	2900
B14	2.095	2807	2810	2800
CPB14	1.860	2747	2750	2700
B45	1.617	2726	2730	2700
B45	1.360	2703	2700	2700
B45	1.110	2681	2680	2700
B45	0.857	2658	2660	2700
B45	0.643	2639	2640	2600
B45	0.382	2616	2620	2600
B45	0.265	2606	2610	2600
B45	0.228	2603	2600	2600
CPB45	0.005	2583	2580	2600

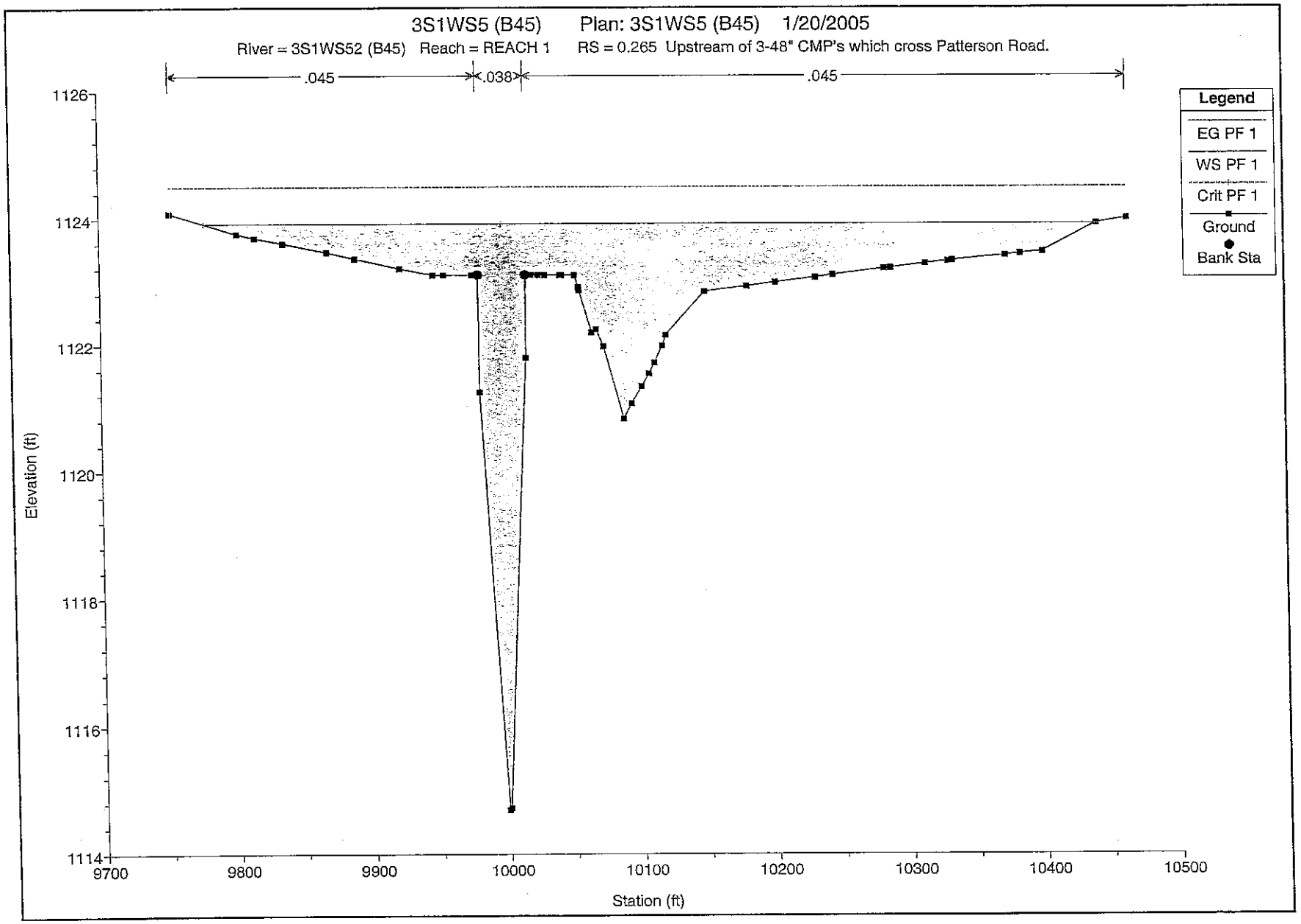
Notes:
1. Initial discharge of diverted flow DB13 from CPB13 is 3061 cfs.

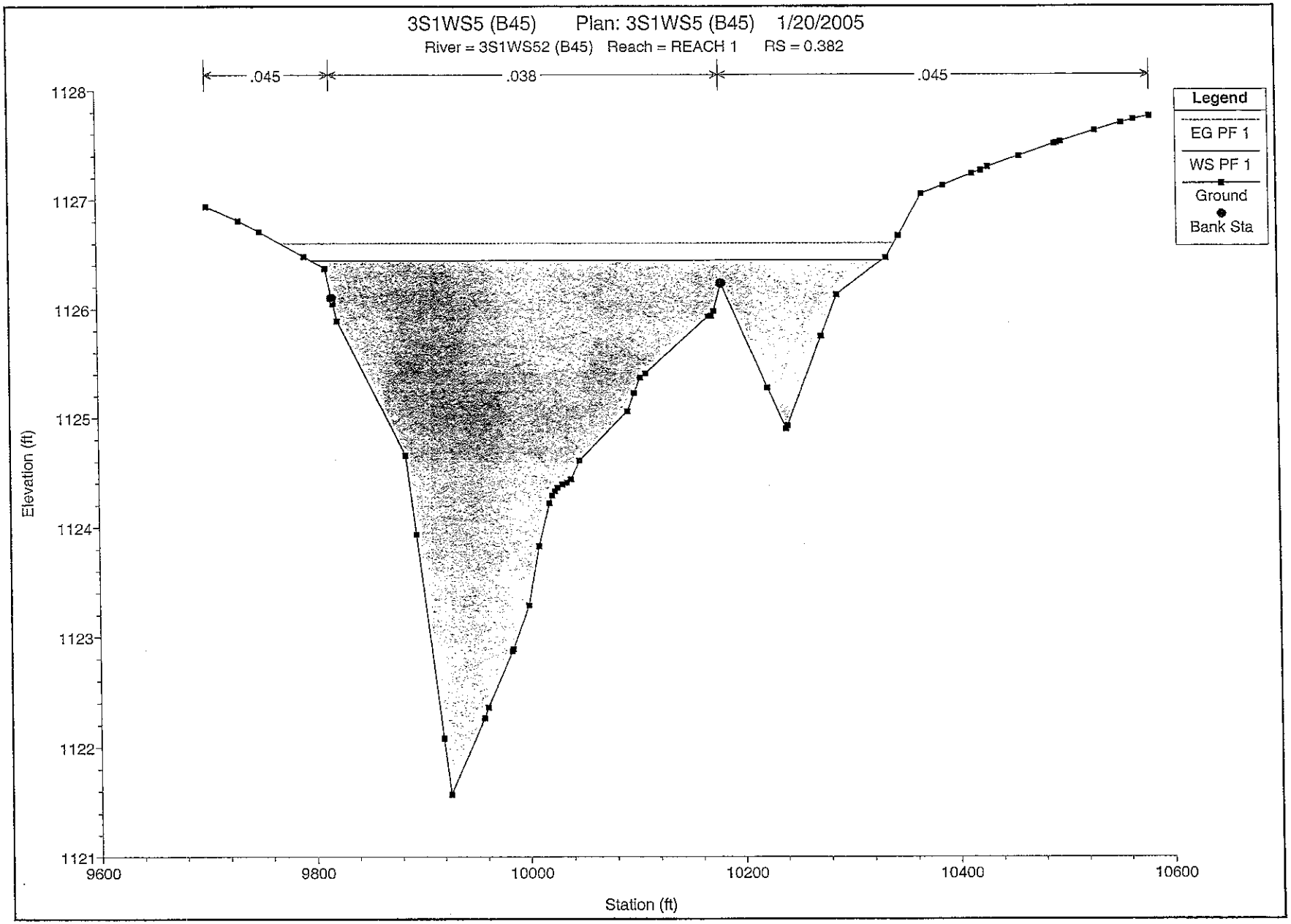

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.005
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1122
1120
1118
1116
1114
1112
1110
9600
9800
10000
10200
10400
10600
Station (ft)

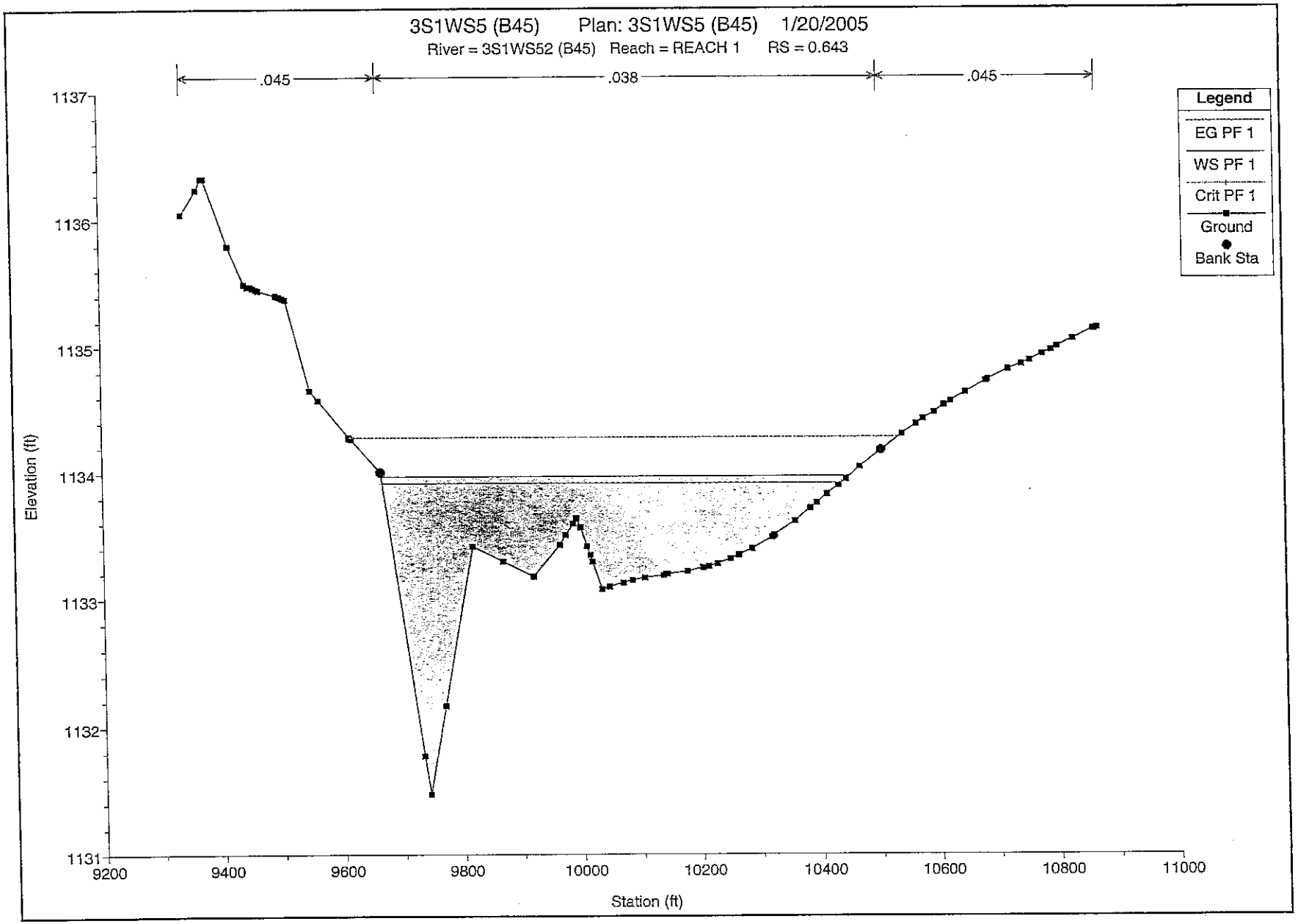

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.228 Downstream of 3-48" CMP's which cross Patterson Road.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1126
1124
1122
1120
1118
1116
1114
1112
9200
9400
9600
9800
10000
10200
10400
Station (ft)

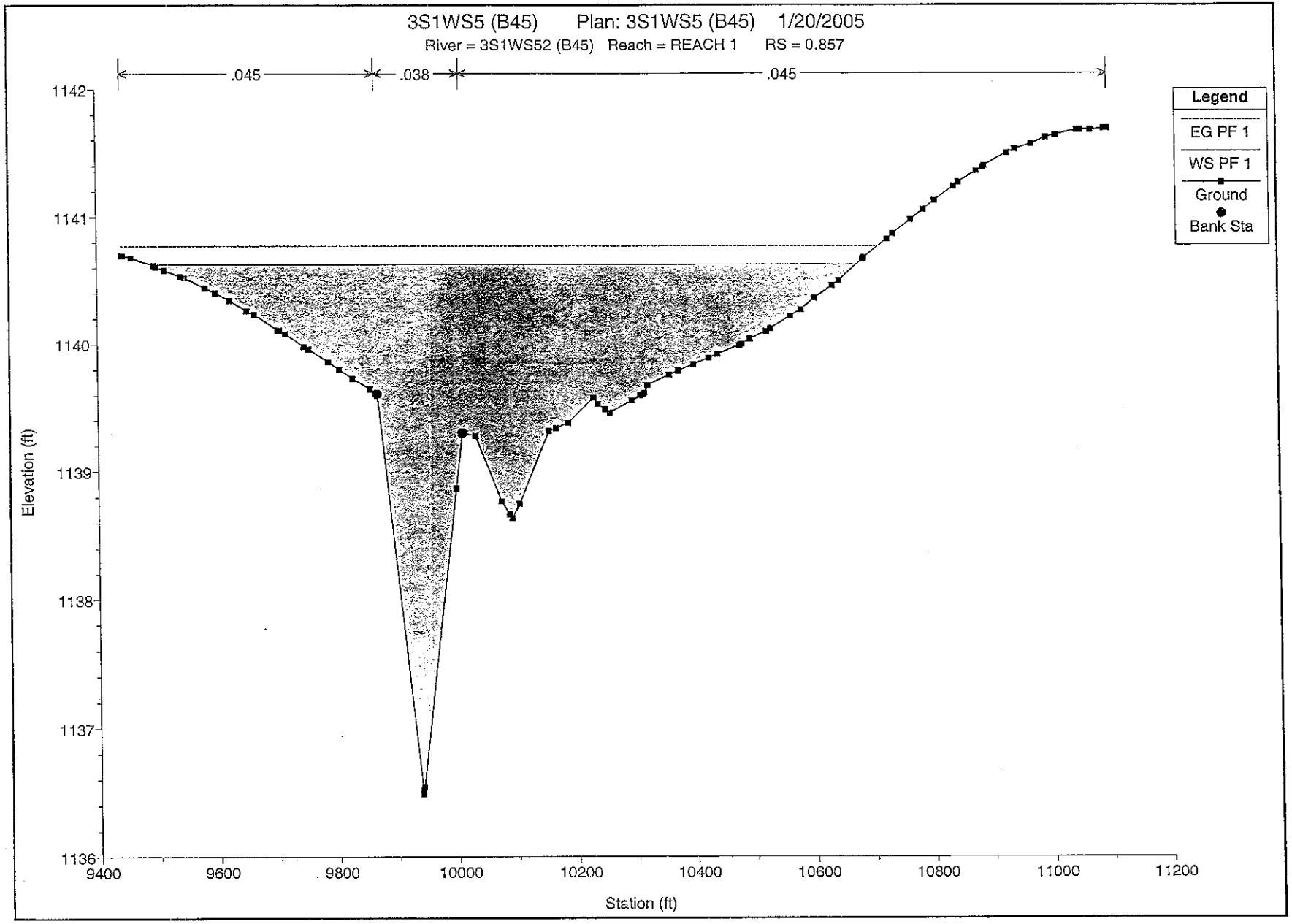

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.257 Culv 3 - 48" CMP's
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1126
1124
1122
1120
1118
1116
1114
1112
9200
9400
9600
9800
10000
10200
10400
Station (ft)

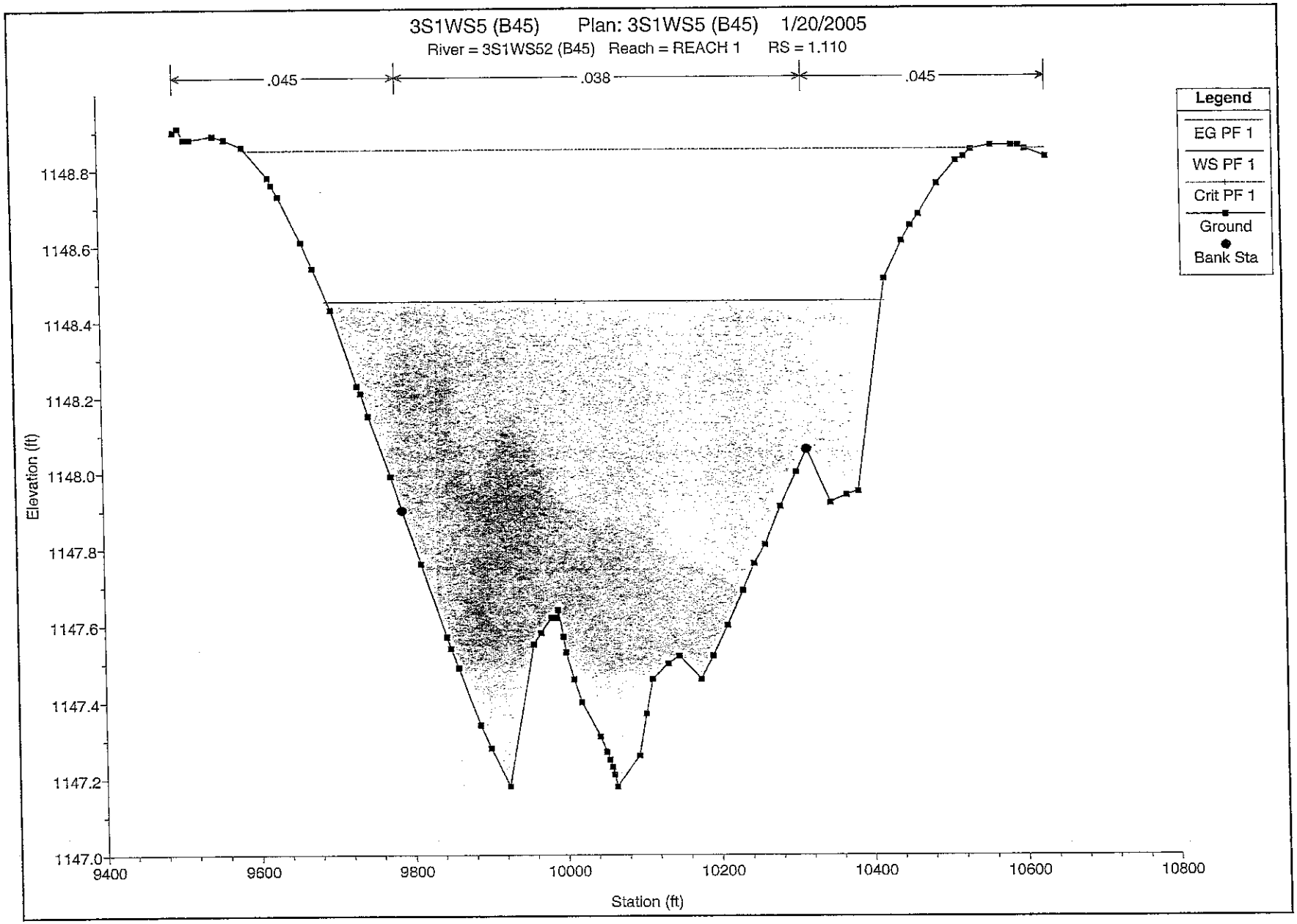

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.257 Culv 3 - 48" CMP's
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1126
1124
1122
1120
1118
1116
1114
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

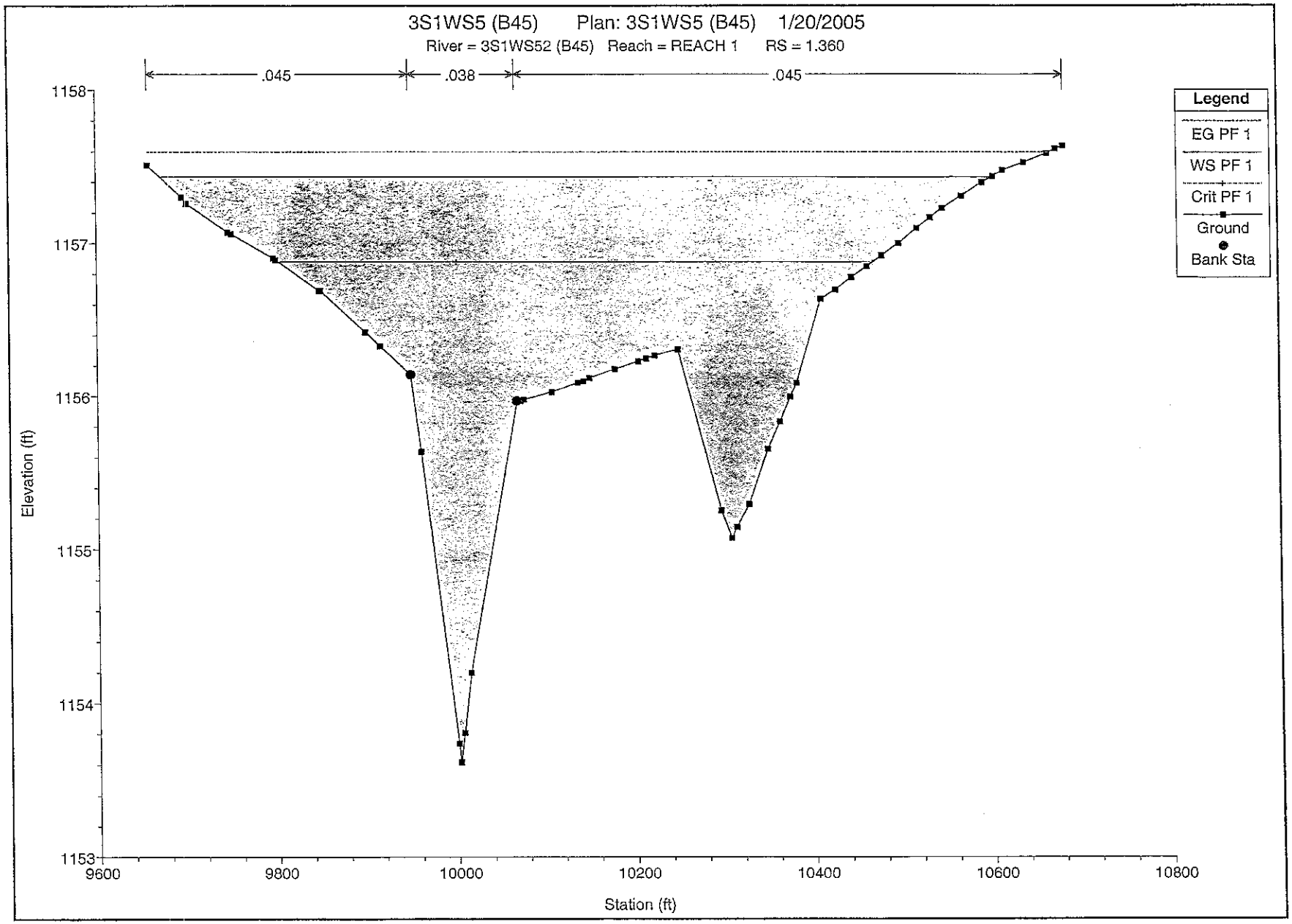

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.265 Upstream of 3-48" CMP's which cross Patterson Road.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1126
1124
1122
1120
1118
1116
1114
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

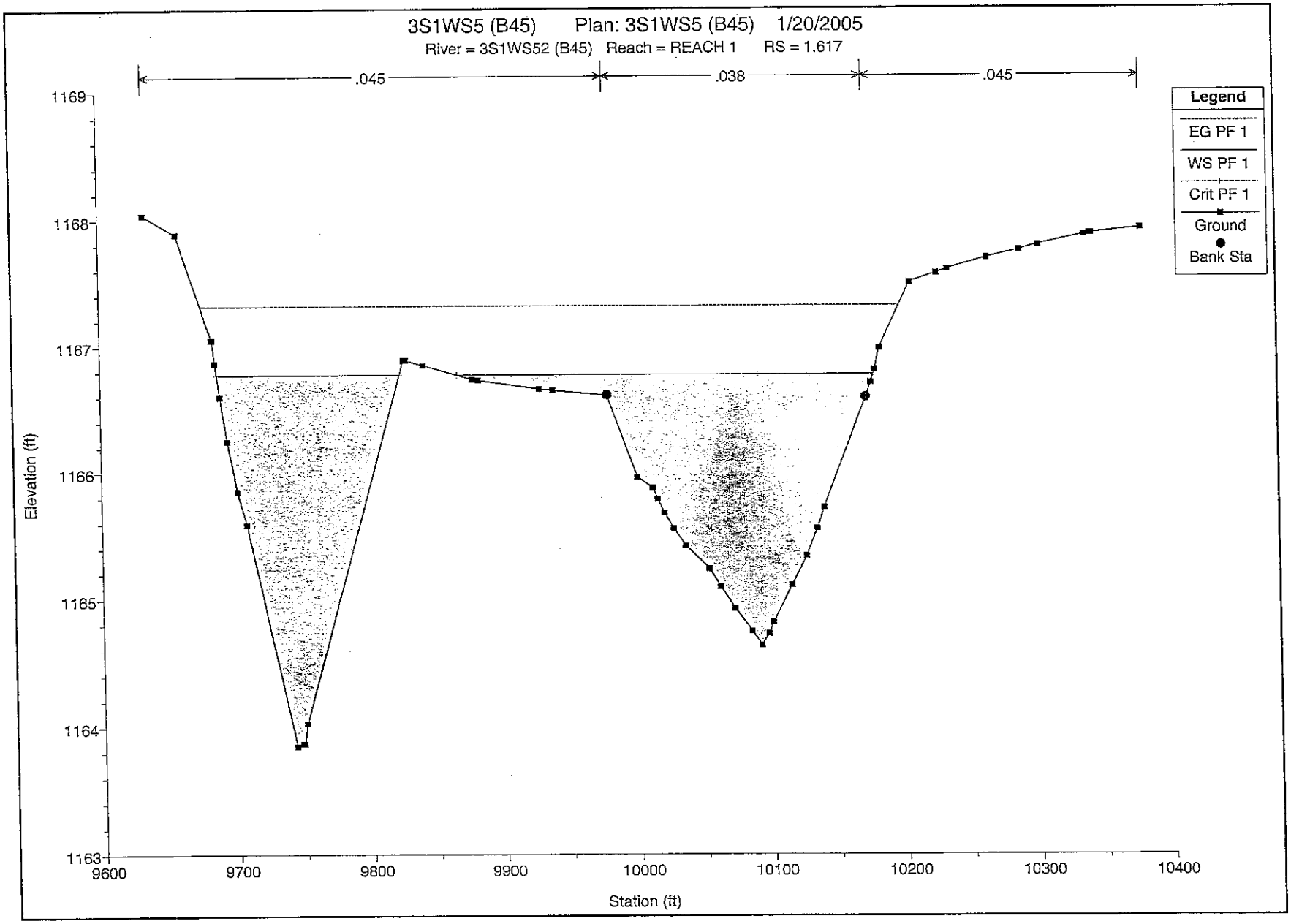

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.382
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1128
1127
1126
1125
1124
1123
1122
1121
9600
9800
10000
10200
10400
10600
Station (ft)

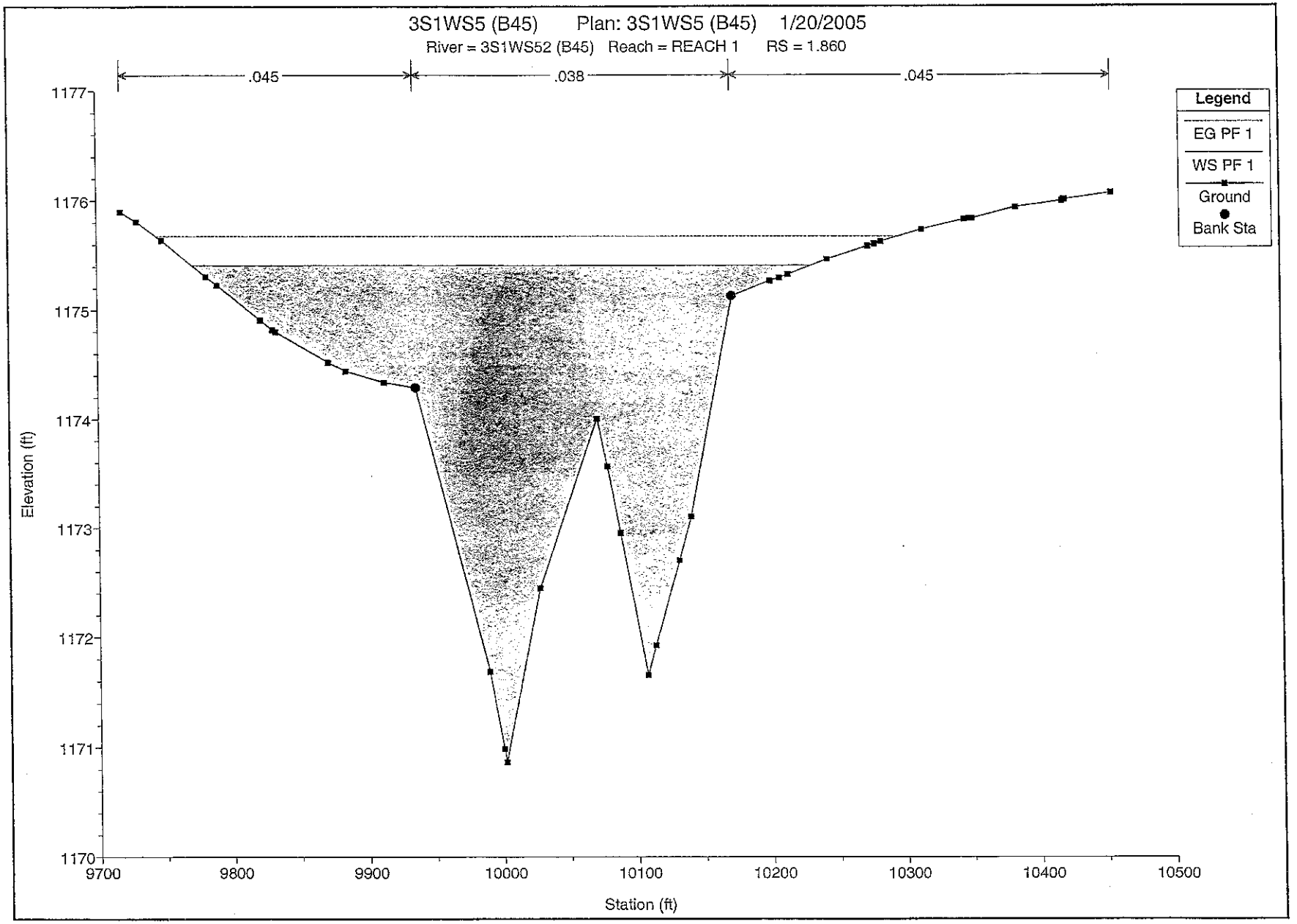

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.643
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1137
1136
1135
1134
1133
1132
1131
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

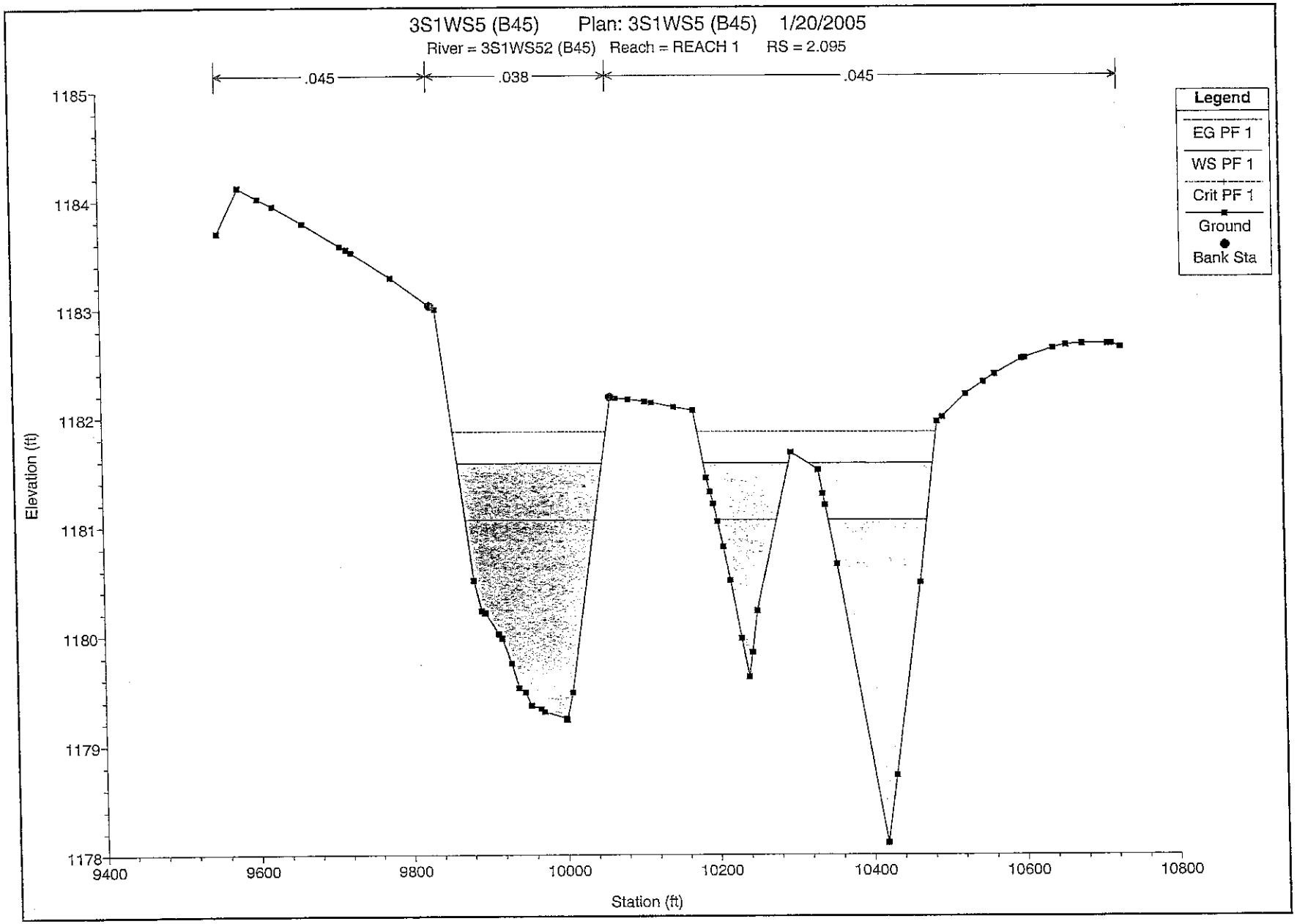

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 0.857
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1142
1141
1140
1139
1138
1137
1136
9400
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

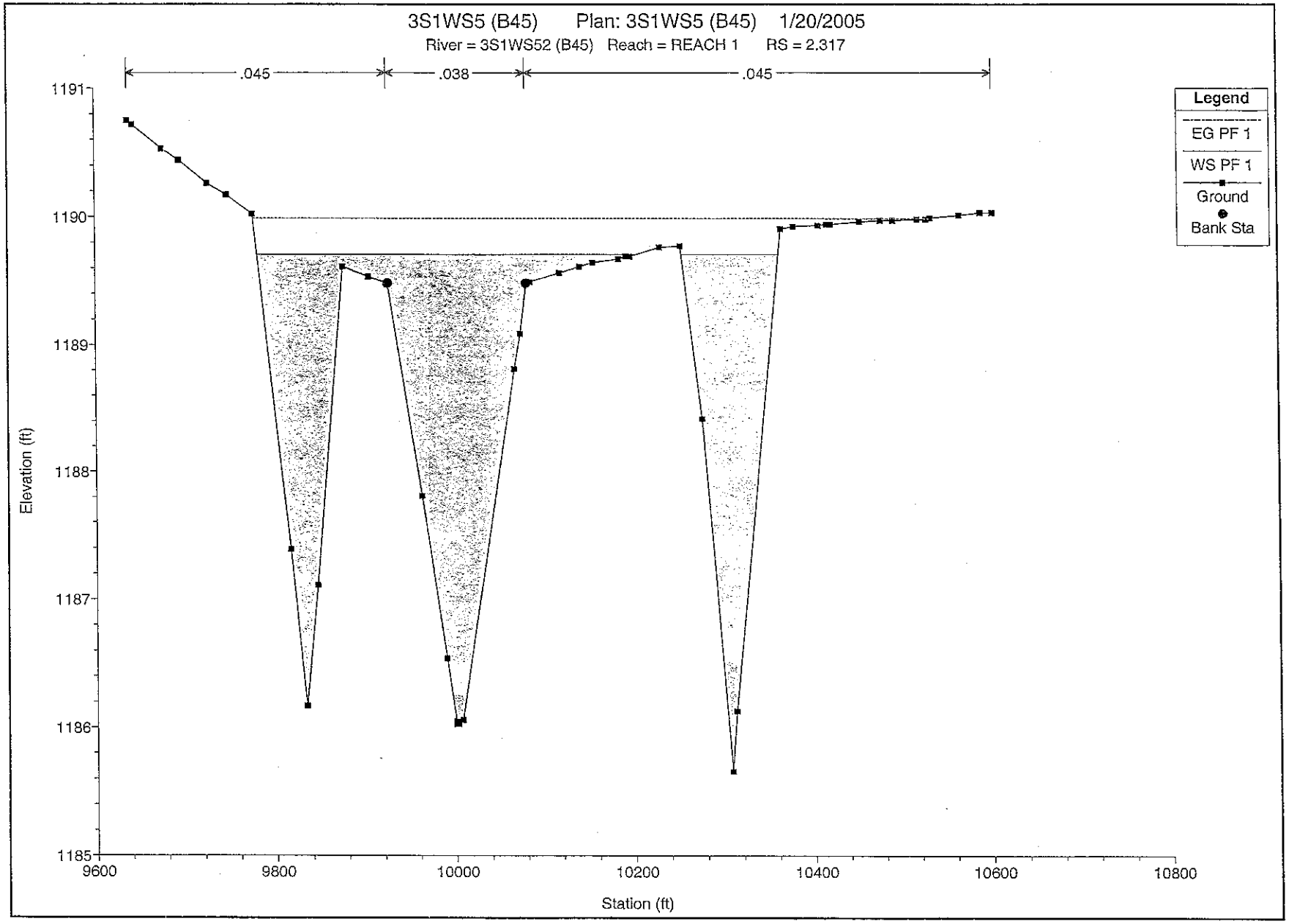

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 1.110
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1148.8
1148.6
1148.4
1148.2
1148.0
1147.8
1147.6
1147.4
1147.2
1147.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

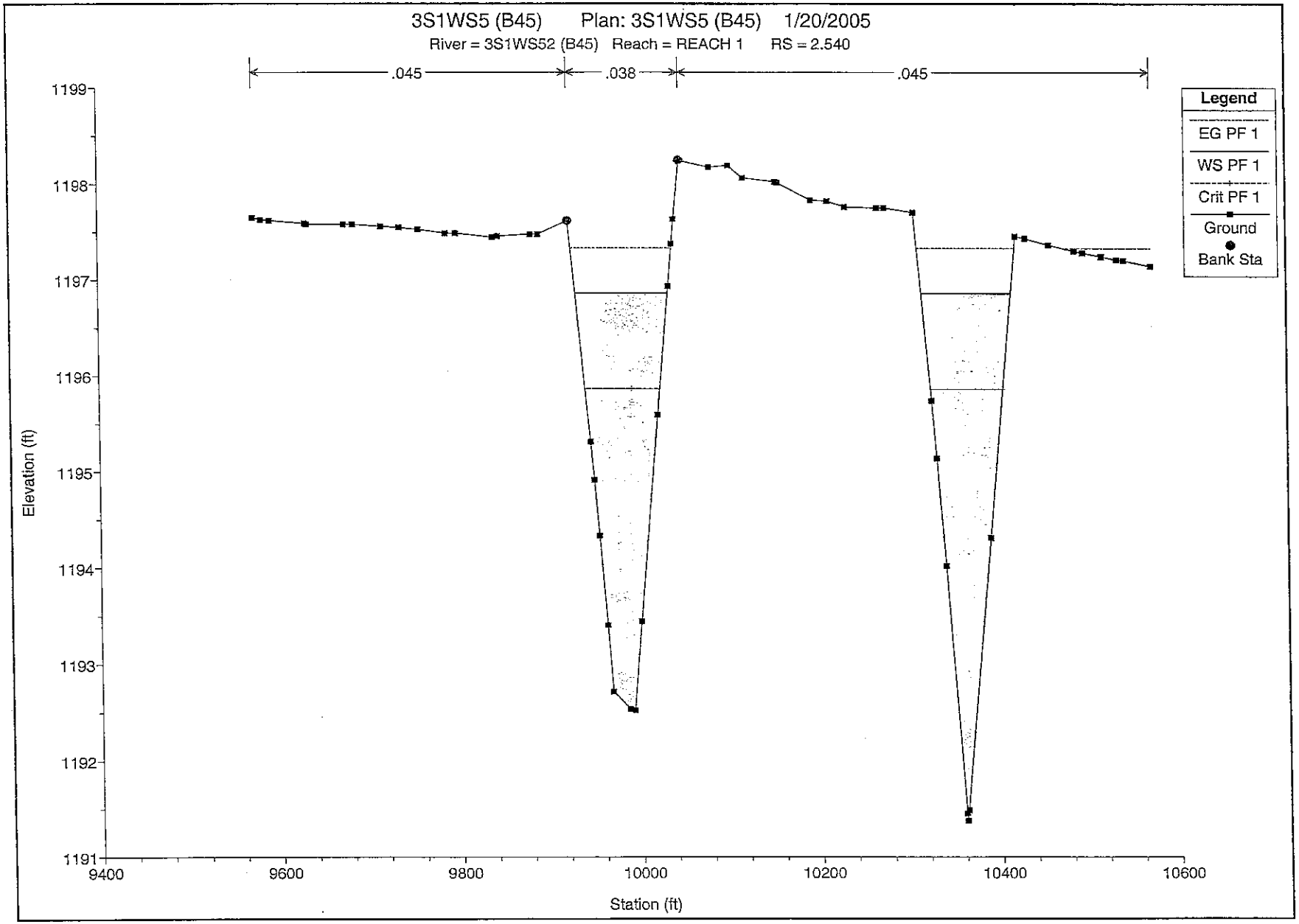

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 1.360
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1158
1157
1156
1155
1154
1153
9600
9800
10000
10200
10400
10600
10800
Station (ft)

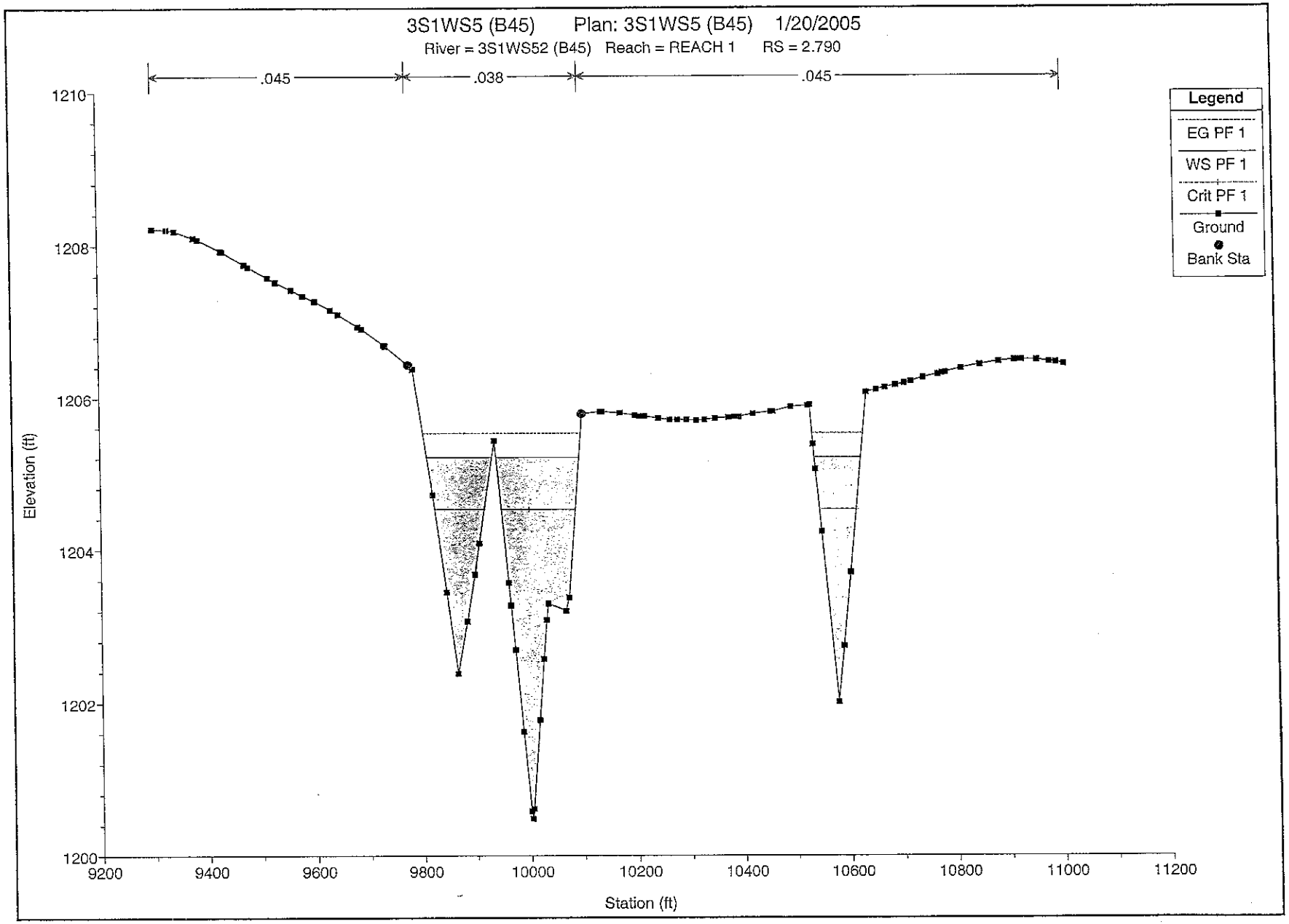

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 1.617
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1169
1168
1167
1166
1165
1164
1163
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

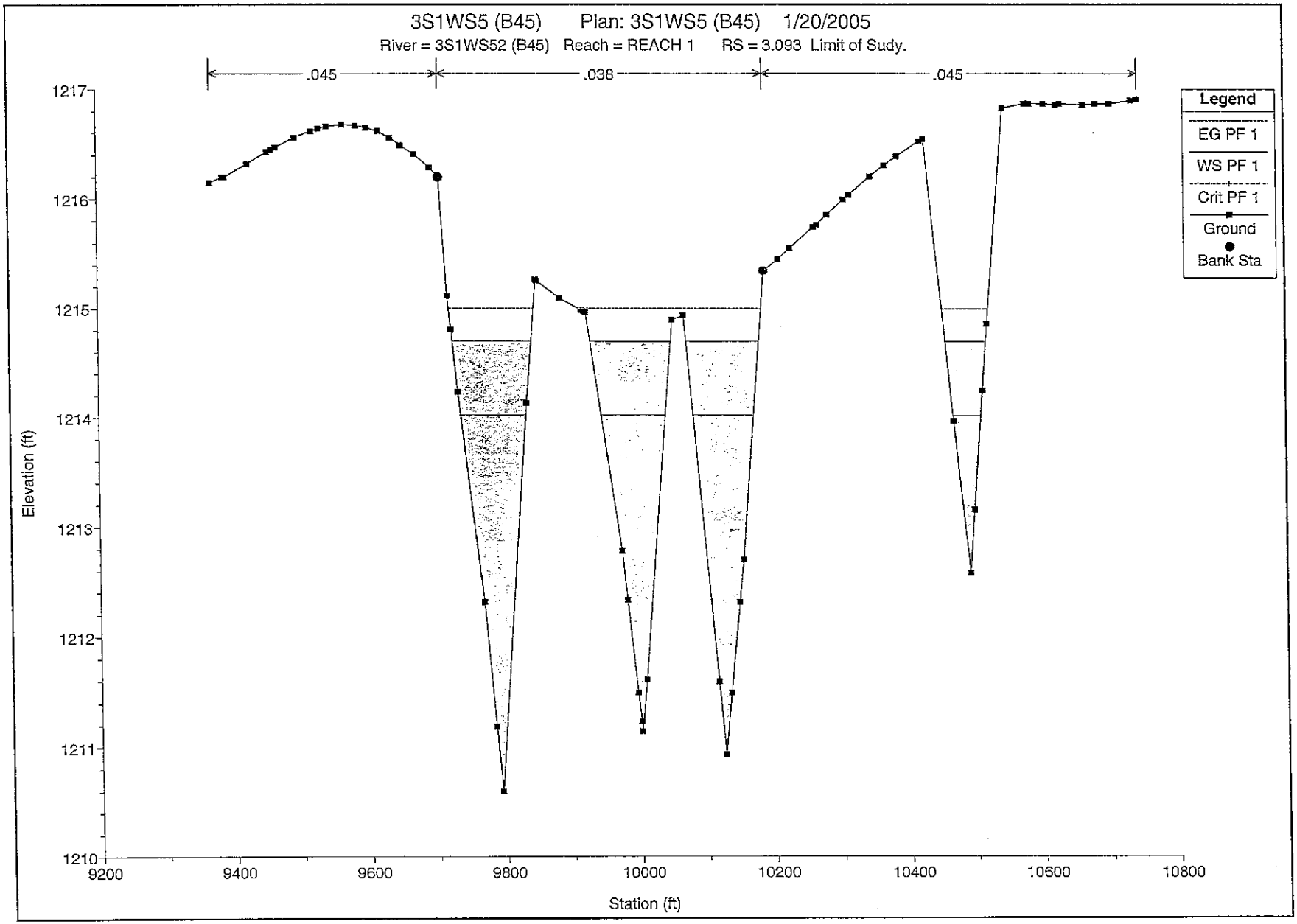

3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 1.860
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1177
1176
1175
1174
1173
1172
1171
1170
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 2.095
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1185
1184
1183
1182
1181
1180
1179
1178
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 2.317
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1191
1190
1189
1188
1187
1186
1185
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 2.540
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1199
1198
1197
1196
1195
1194
1193
1192
1191
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 2.790
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1210
1208
1206
1204
1202
1200
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)


3S1WS5 (B45) Plan: 3S1WS5 (B45) 1/20/2005
River = 3S1WS52 (B45) Reach = REACH 1 RS = 3.093 Limit of Sudy.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1217
1216
1215
1214
1213
1212
1211
1210
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: 3S1WS6 (B47)

REACH: 3S1WS6 (B47)

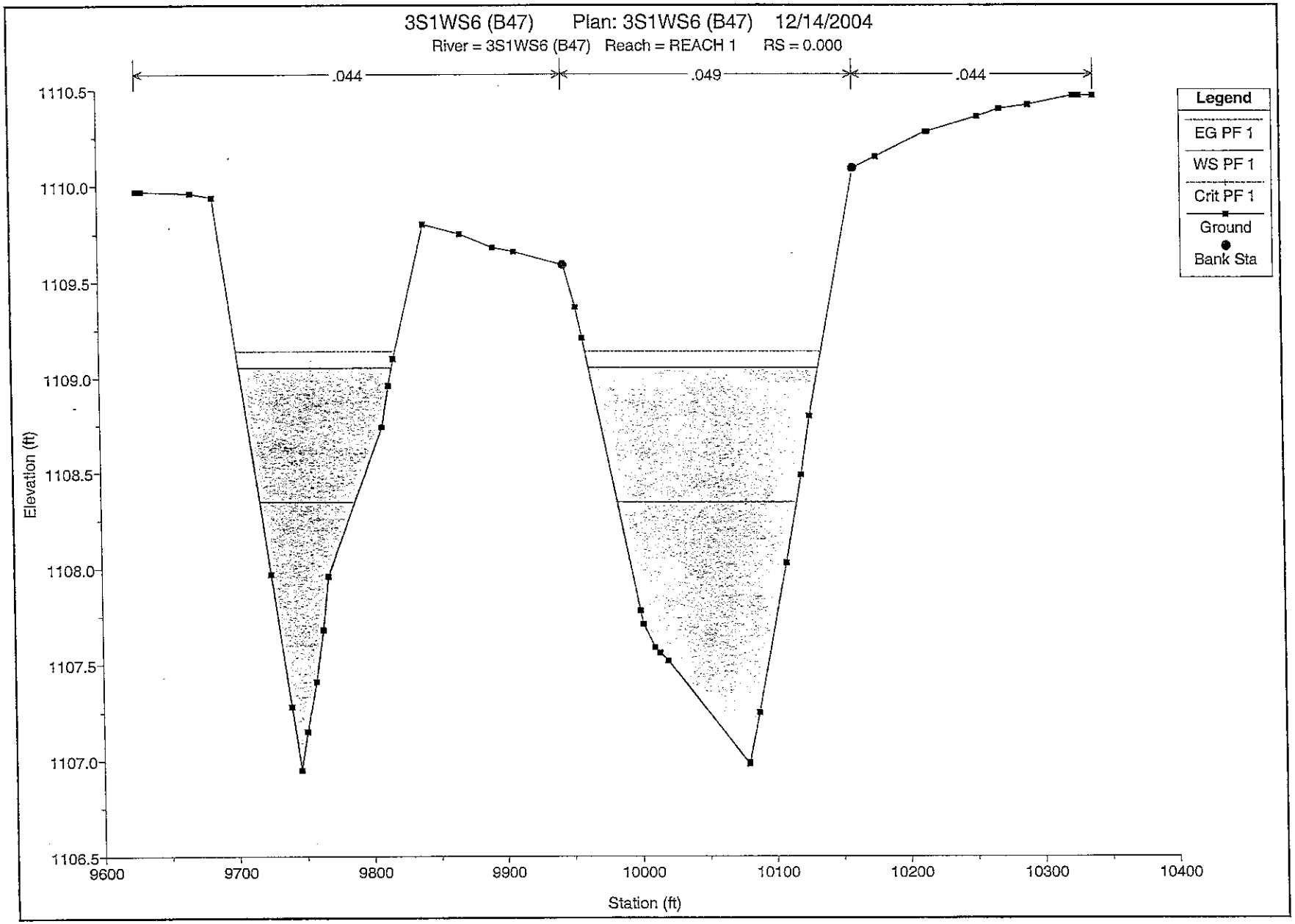
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

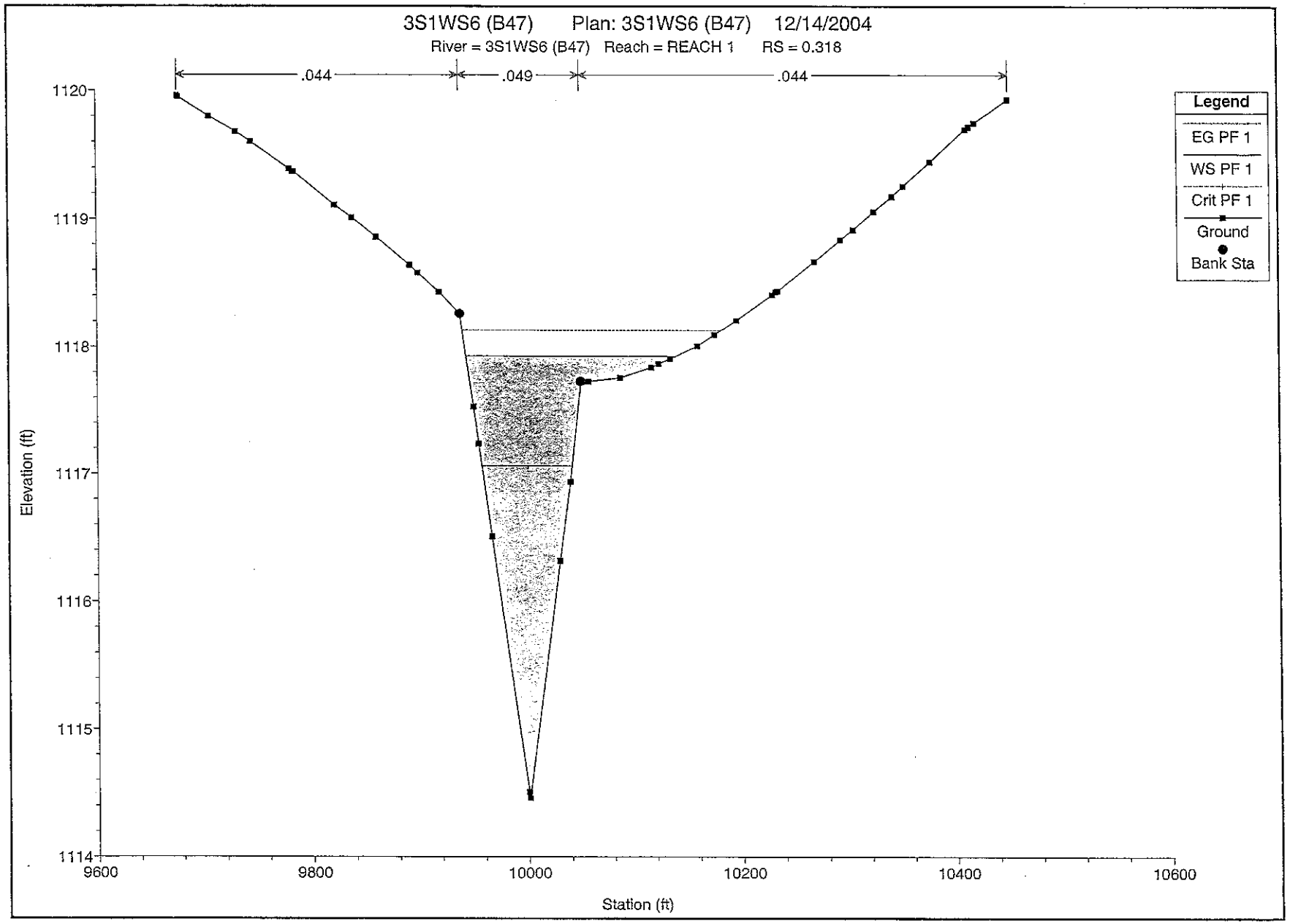
Change in Discharge based on Reach Length

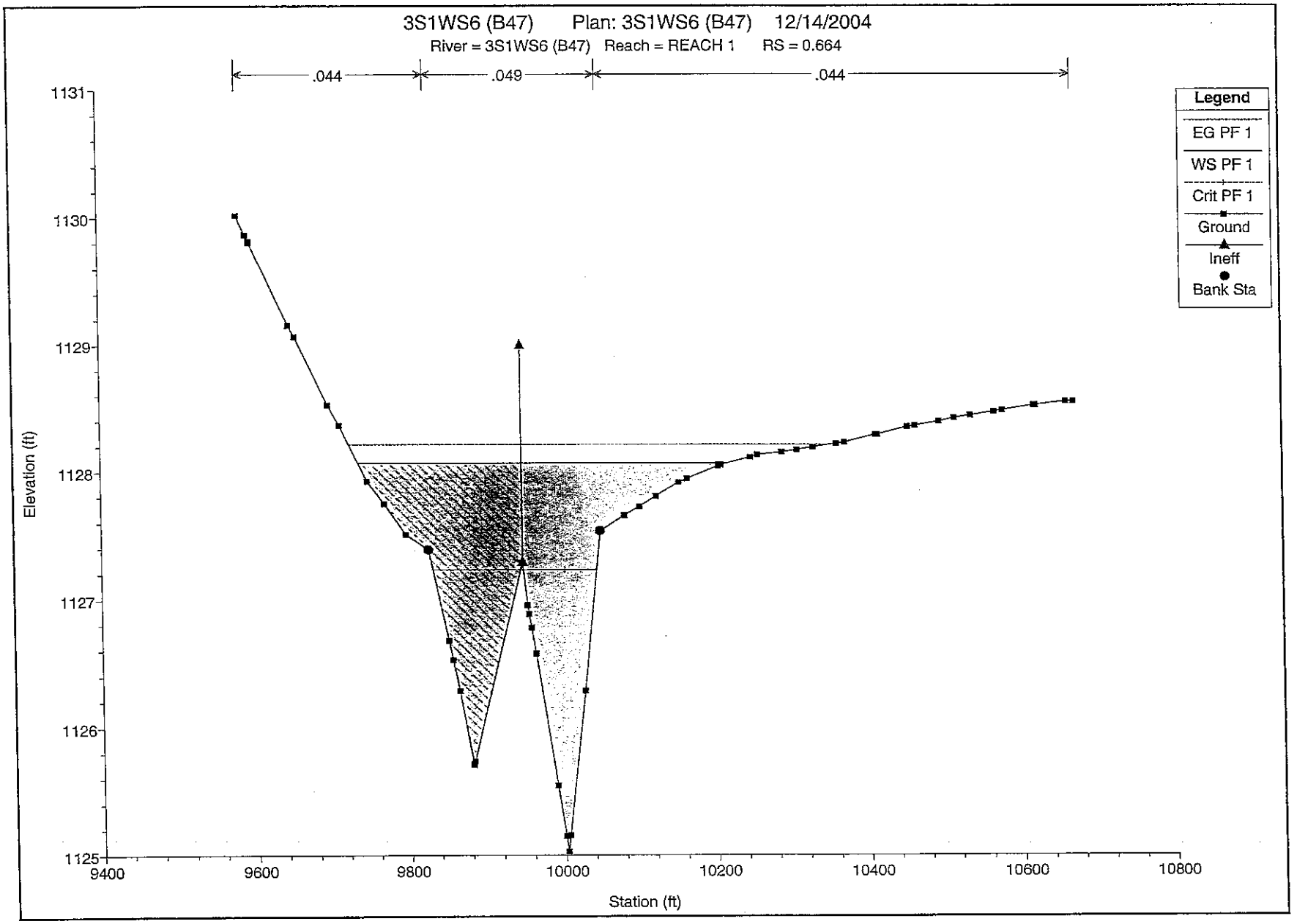
Wash ID: 3S1WS6 (B47)

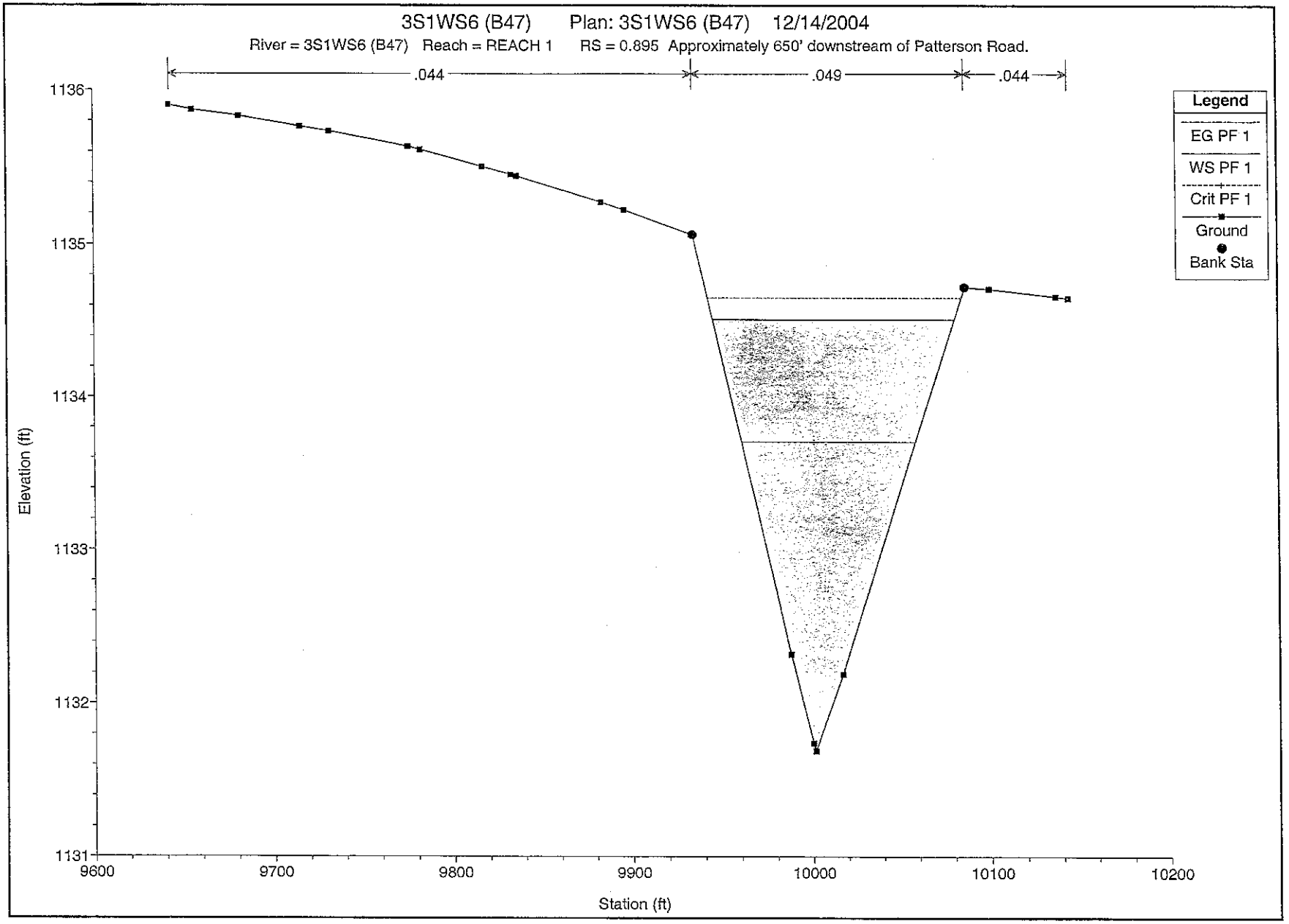
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPB19	1.151	540	540	500
B48	0.895	592	590	600
B48	0.664	639	640	600
B48	0.318	710	710	700
CPB48	0.000	775	780	800

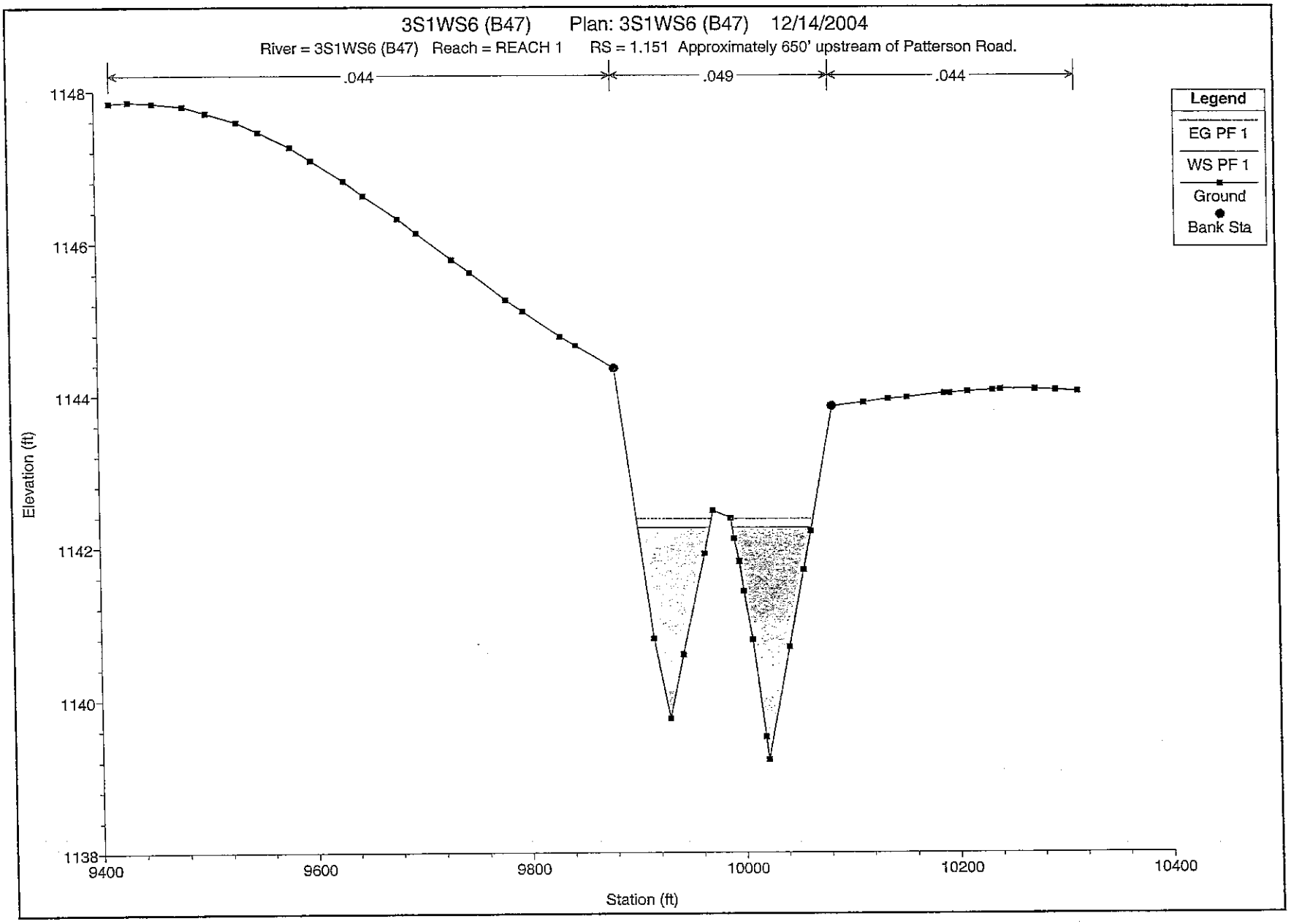
Notes:
1. Initial discharge of 540 cfs is from runoff of subbasin B19


3S1WS6 (B47) Plan: 3S1WS6 (B47) 12/14/2004
River = 3S1WS6 (B47) Reach = REACH 1 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1110.5
1110.0
1109.5
1109.0
1108.5
1108.0
1107.5
1107.0
1106.5
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S1WS6 (B47) Plan: 3S1WS6 (B47) 12/14/2004
River = 3S1WS6 (B47) Reach = REACH 1 RS = 0.318
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1120
1119
1118
1117
1116
1115
1114
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS6 (B47) Plan: 3S1WS6 (B47) 12/14/2004
River = 3S1WS6 (B47) Reach = REACH 1 RS = 0.664
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1131
1130
1129
1128
1127
1126
1125
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S1WS6 (B47) Plan: 3S1WS6 (B47) 12/14/2004
River = 3S1WS6 (B47) Reach = REACH 1 RS = 0.895 Approximately 650' downstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1136
1135
1134
1133
1132
1131
9600
9700
9800
9900
10000
10100
10200
Station (ft)


3S1WS6 (B47) Plan: 3S1WS6 (B47) 12/14/2004
River = 3S1WS6 (B47) Reach = REACH 1 RS = 1.151 Approximately 650' upstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1148
1146
1144
1142
1140
1138
9400
9600
9800
10000
10200
10400
Station (ft)

MODEL: 3S1WS9 (B12)

REACH: 3S1WS9 (B12)

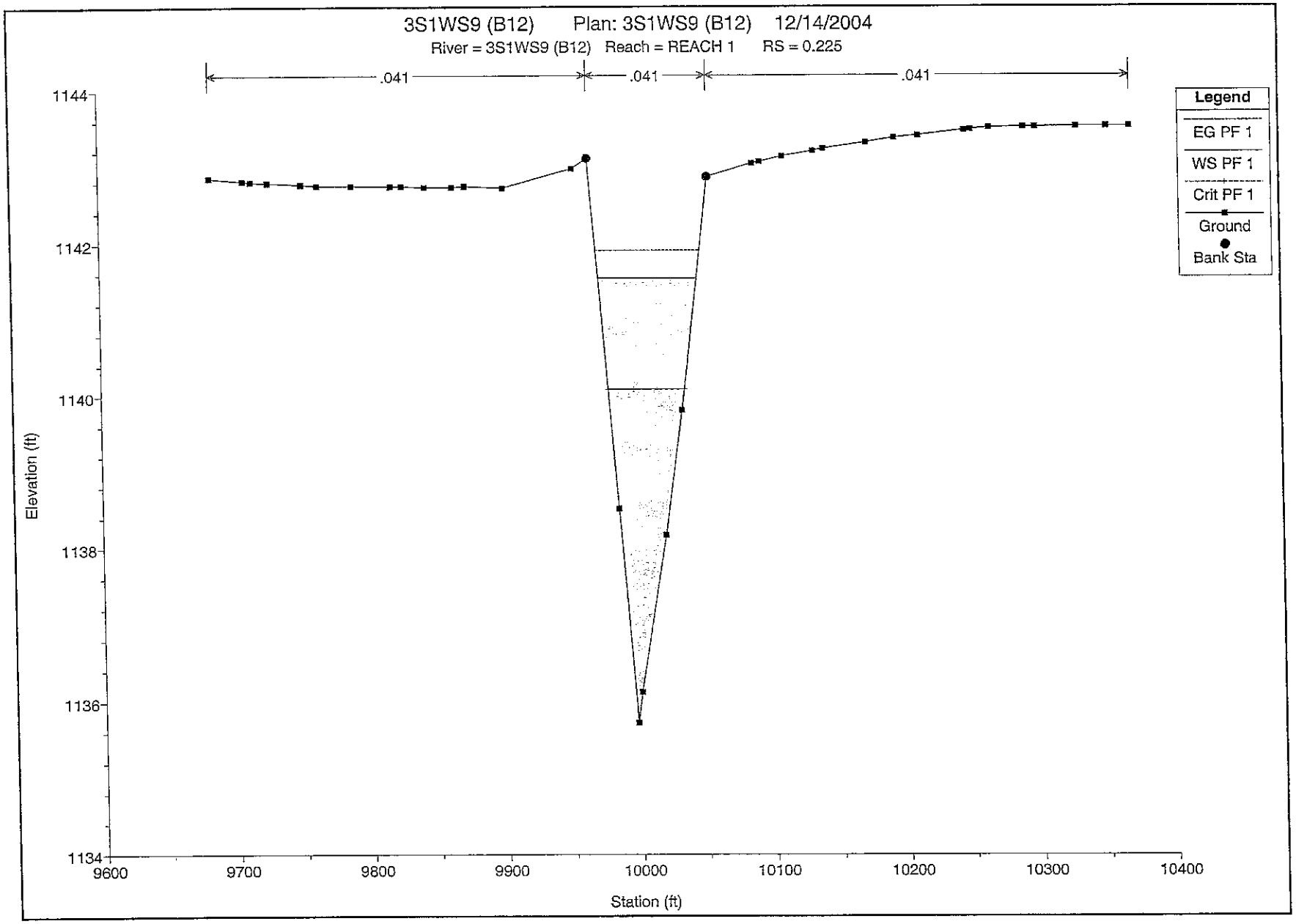
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

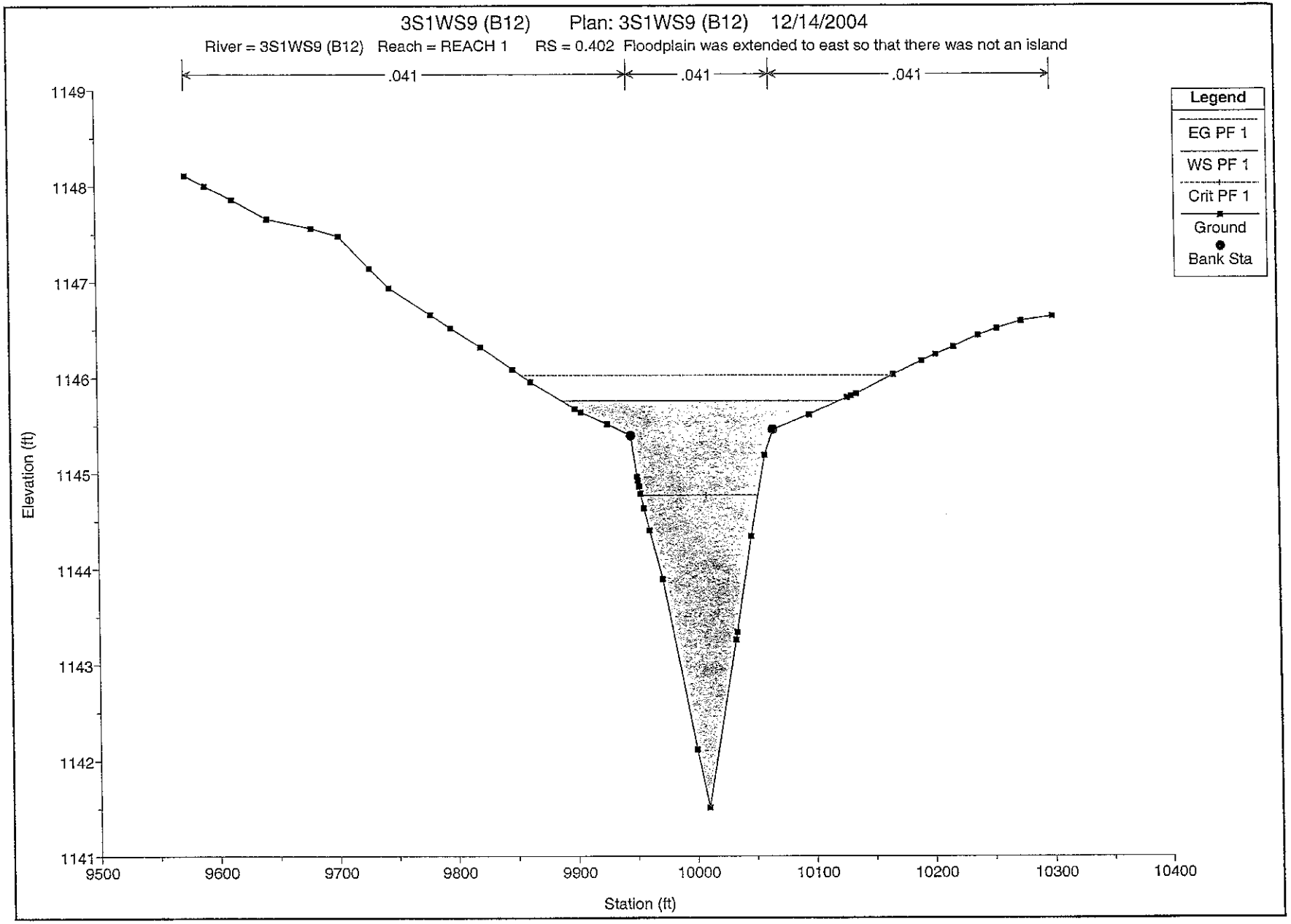
Change in Discharge based on Reach Length

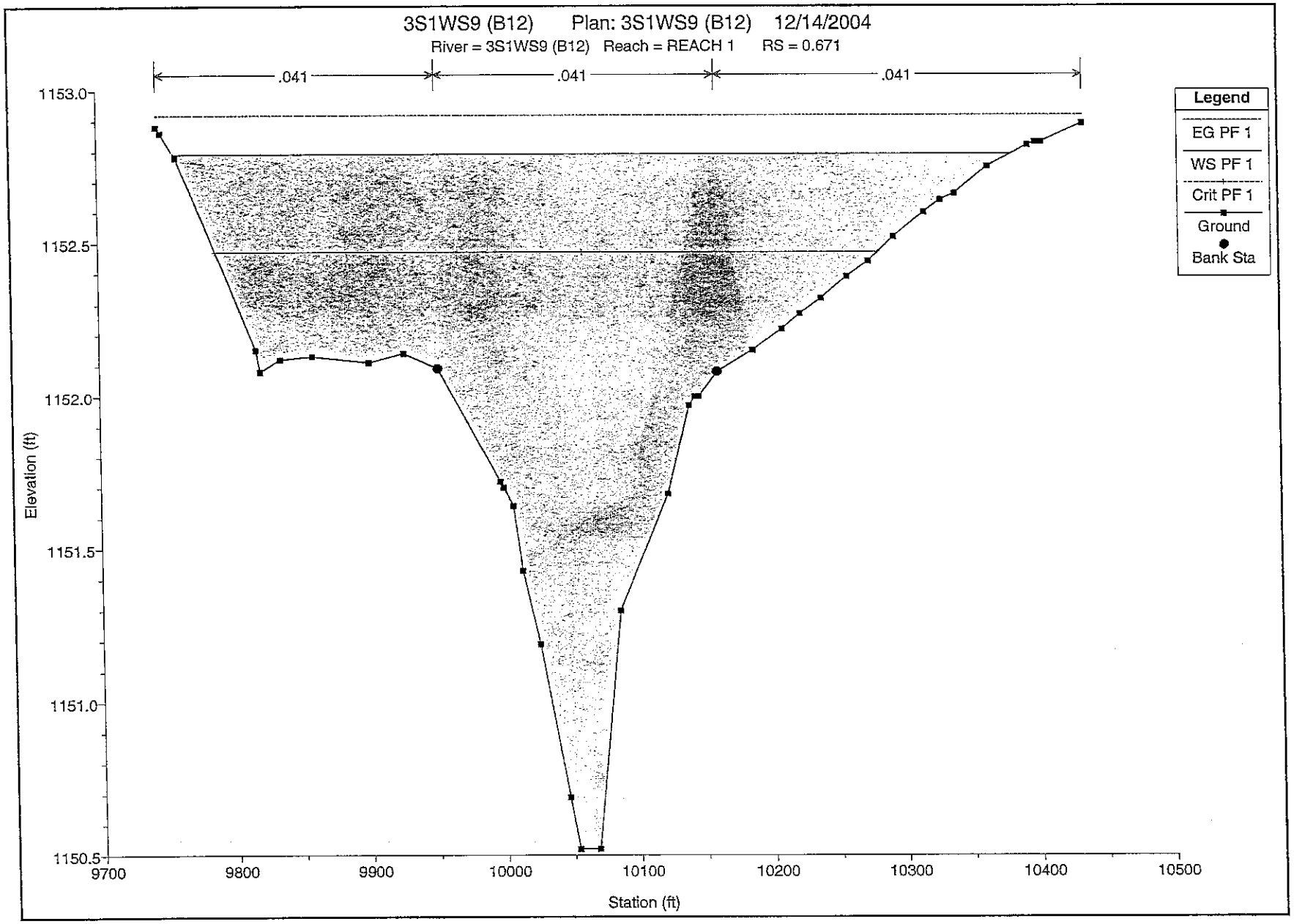
Wash ID: 3S1WS9 (B12)

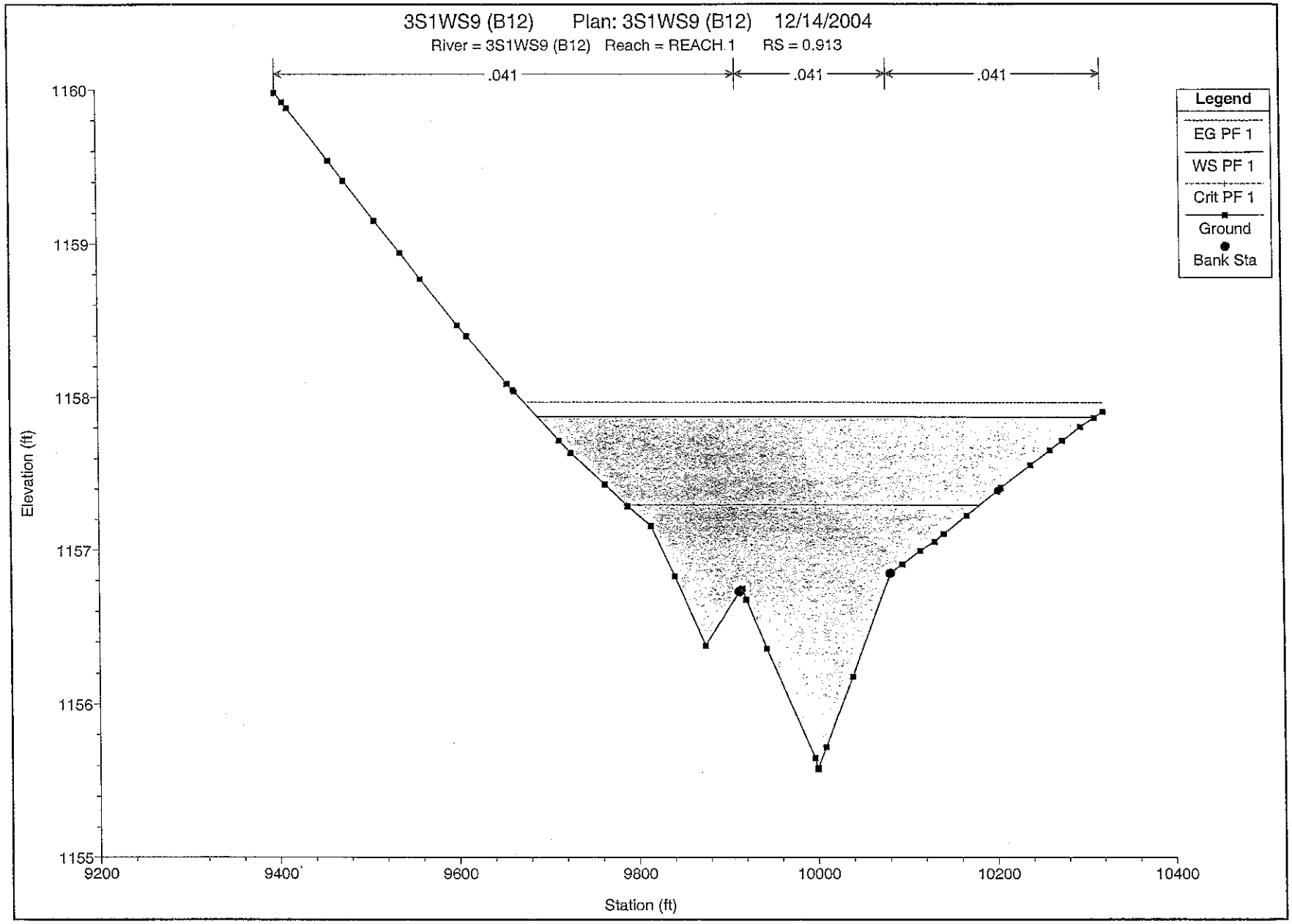
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
B06	2.238	753	750	800
B10	1.977	847	850	800
B10	1.684	953	950	1000
B10	1.443	1040	1040	1000
B10	1.196	1130	1130	1100
CPB10	0.913	1232	1230	1200
B12	0.671	1181	1180	1200
B12	0.402	1125	1130	1100
CPB12A	0.225	1088	1090	1100

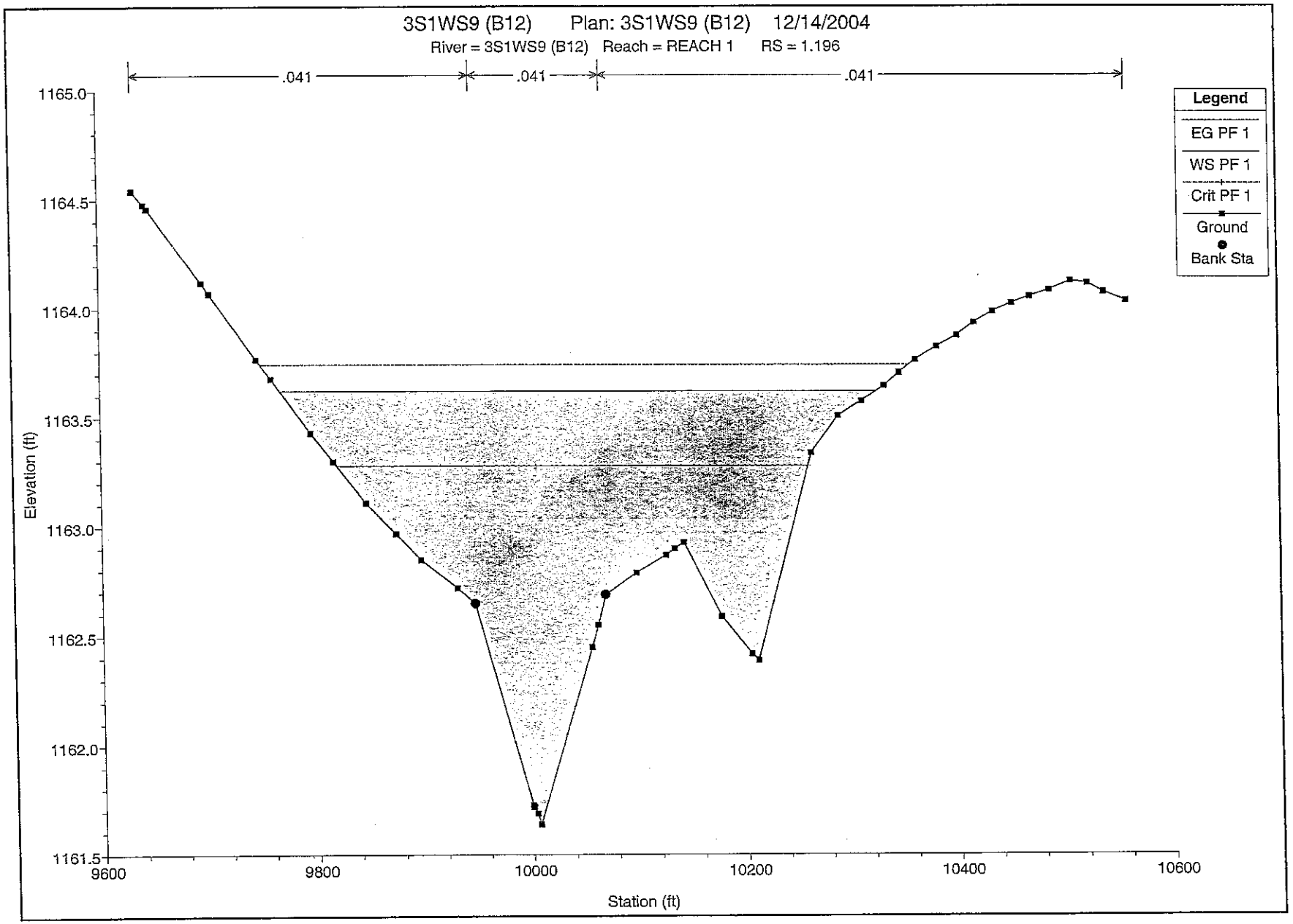
Notes:
1. Initial discharge of 753 cfs is runoff from Subbasin B06.

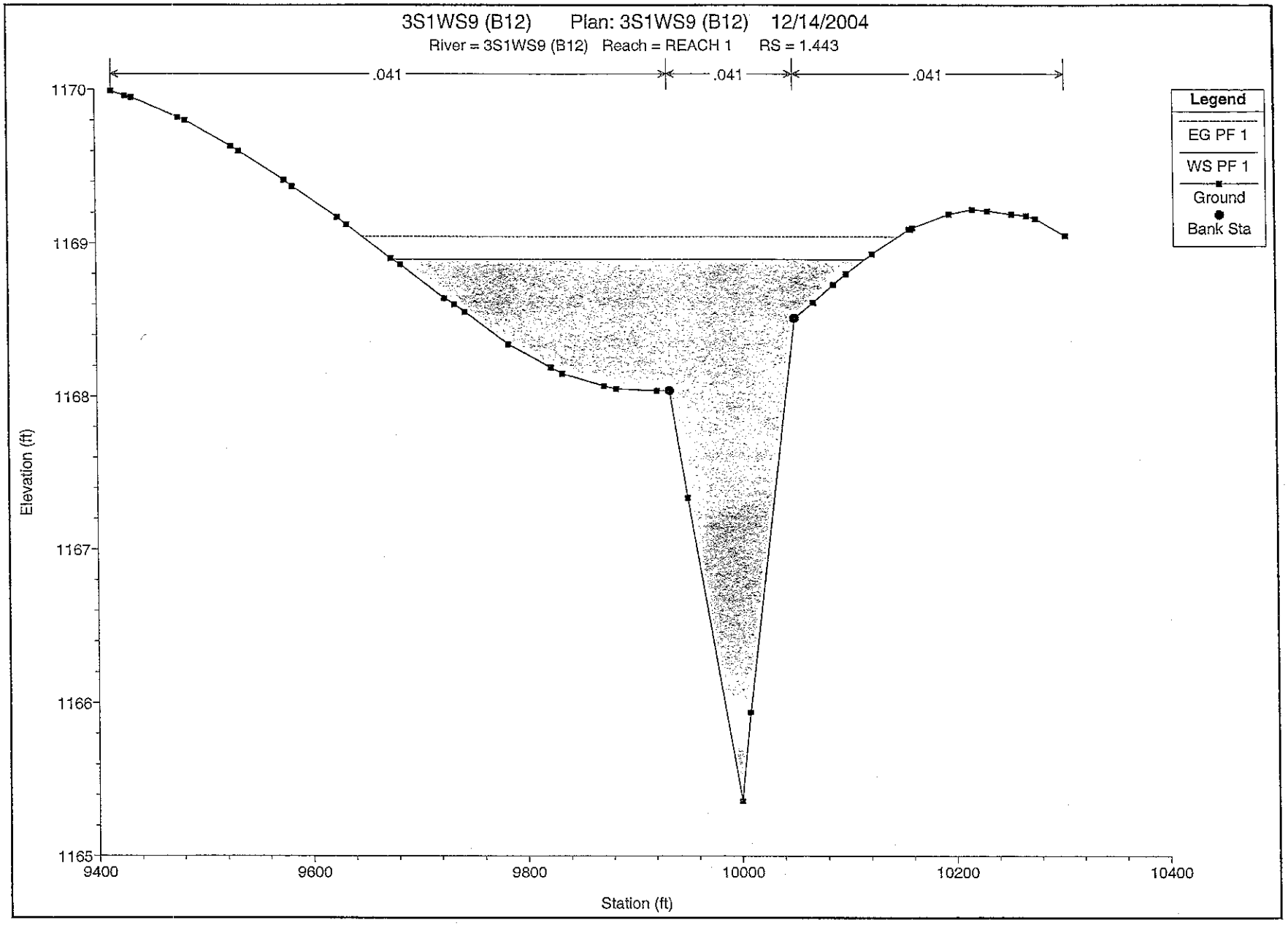

3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 0.225
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1144
1142
1140
1138
1136
1134
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

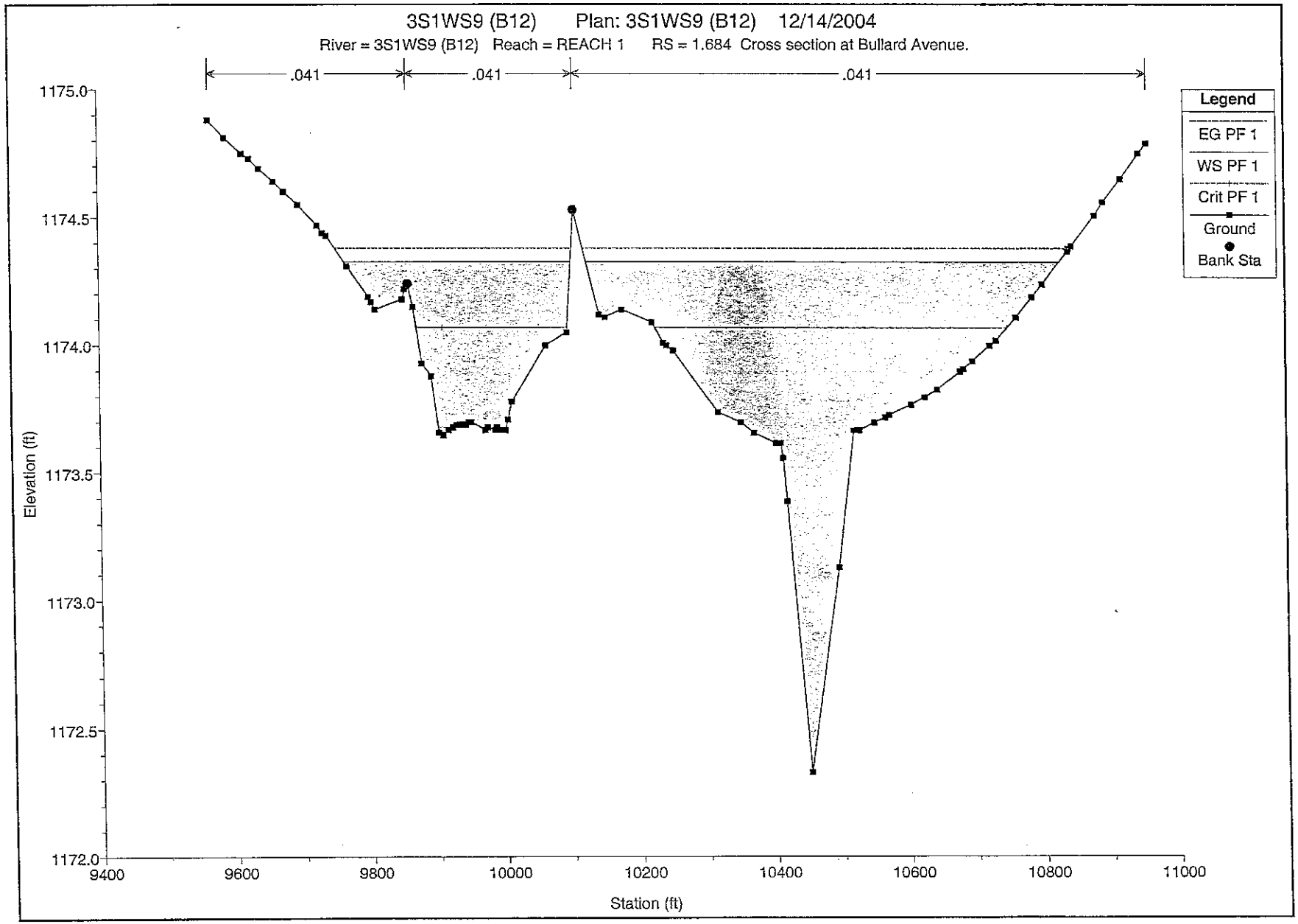

3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 0.402 Floodplain was extended to east so that there was not an island
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1149
1148
1147
1146
1145
1144
1143
1142
1141
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

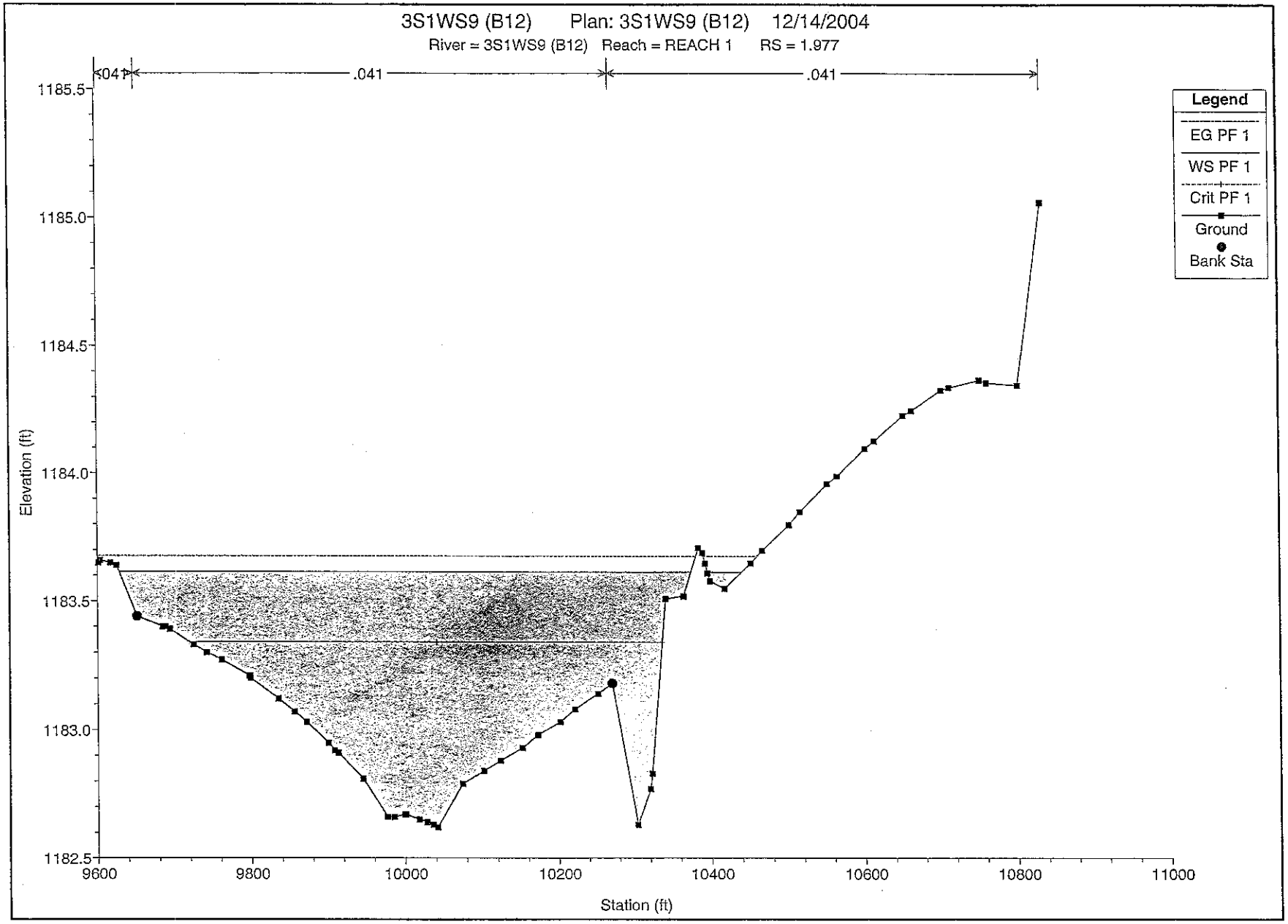

3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 0.671
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1153.0
1152.5
1152.0
1151.5
1151.0
1150.5
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

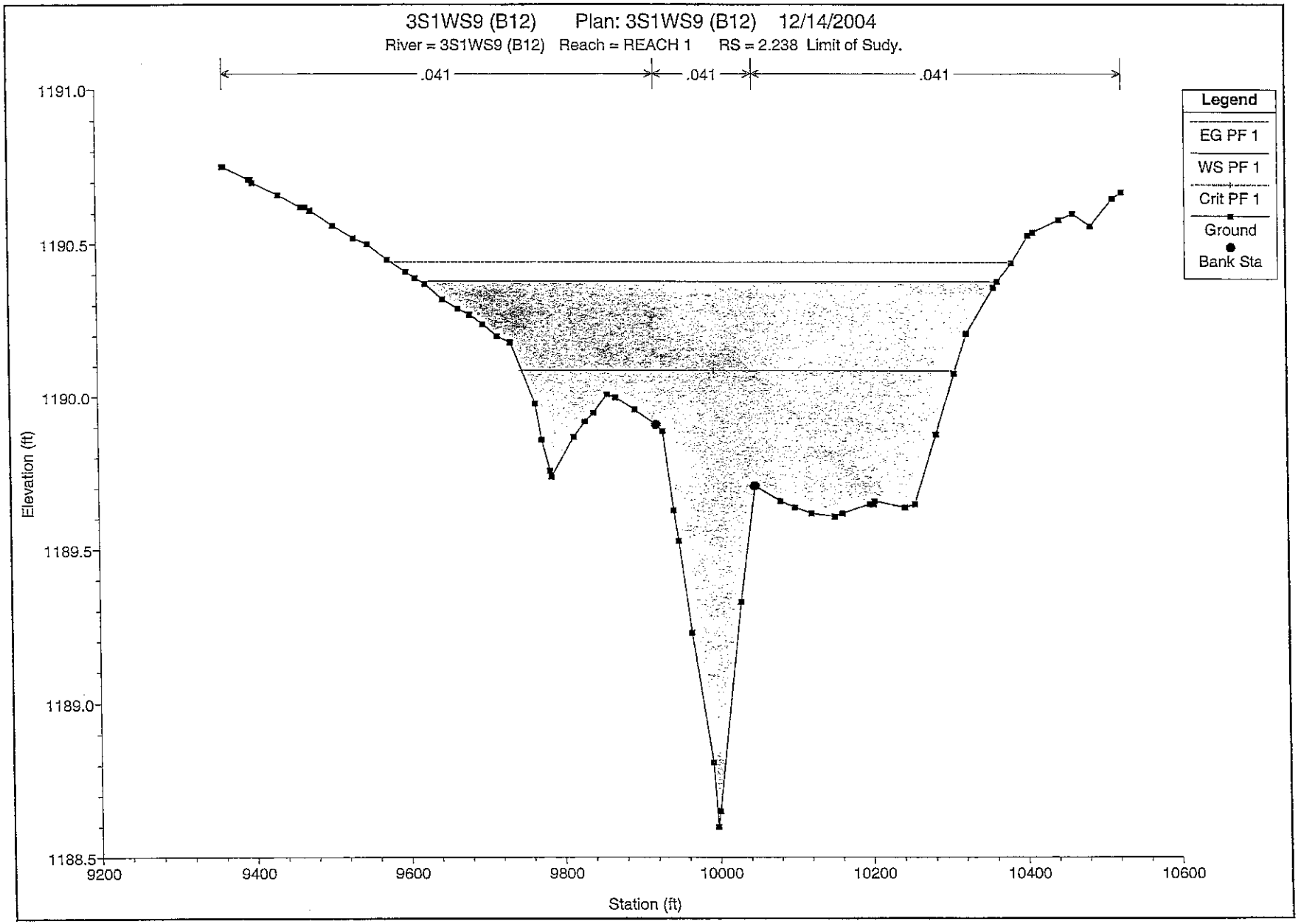

3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH.1 RS = 0.913
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1160
1159
1158
1157
1156
1155
9200
9400
9600
9800
10000
10200
10400
Station (ft)


3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 1.196
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1165.0
1164.5
1164.0
1163.5
1163.0
1162.5
1162.0
1161.5
9600
9800
10000
10200
10400
10600
Station (ft)


3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 1.443
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1170
1169
1168
1167
1166
1165
9400
9600
9800
10000
10200
10400
Station (ft)


3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 1.684 Cross section at Bullard Avenue.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1175.0
1174.5
1174.0
1173.5
1173.0
1172.5
1172.0
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 1.977
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1185.5
1185.0
1184.5
1184.0
1183.5
1183.0
1182.5
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


3S1WS9 (B12) Plan: 3S1WS9 (B12) 12/14/2004
River = 3S1WS9 (B12) Reach = REACH 1 RS = 2.238 Limit of Sudy.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1191.0
1190.5
1190.0
1189.5
1189.0
1188.5
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 3S2WS2A (B33)

REACH: 3S2WS2A (B33)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 3S2WS2A (B33)

Subbasin: B22

Total Discharge (cfs) = 821

Total Area (acres) = 351

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
2.220	339	96.7	790
2.003	351	99.9	820

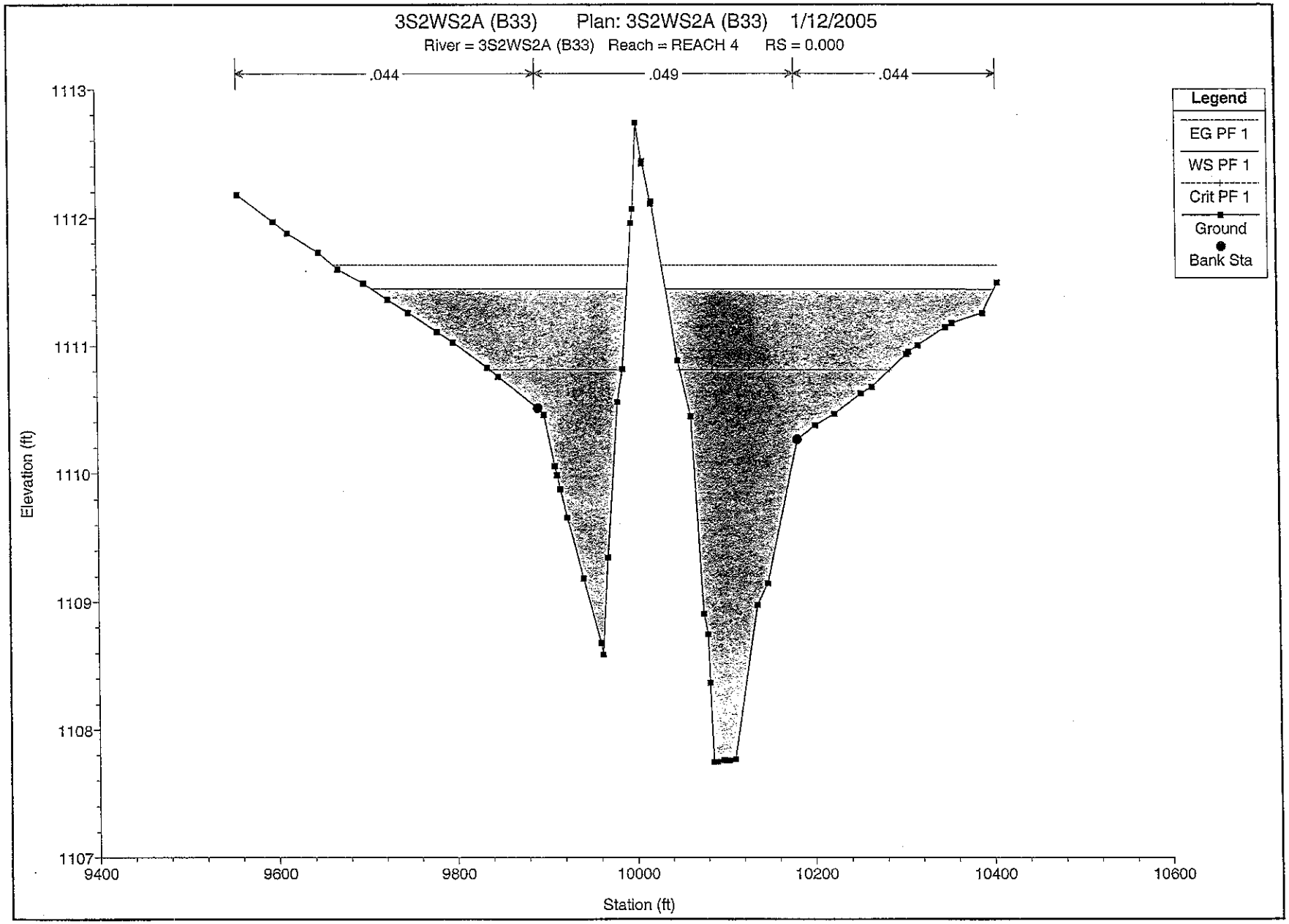
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

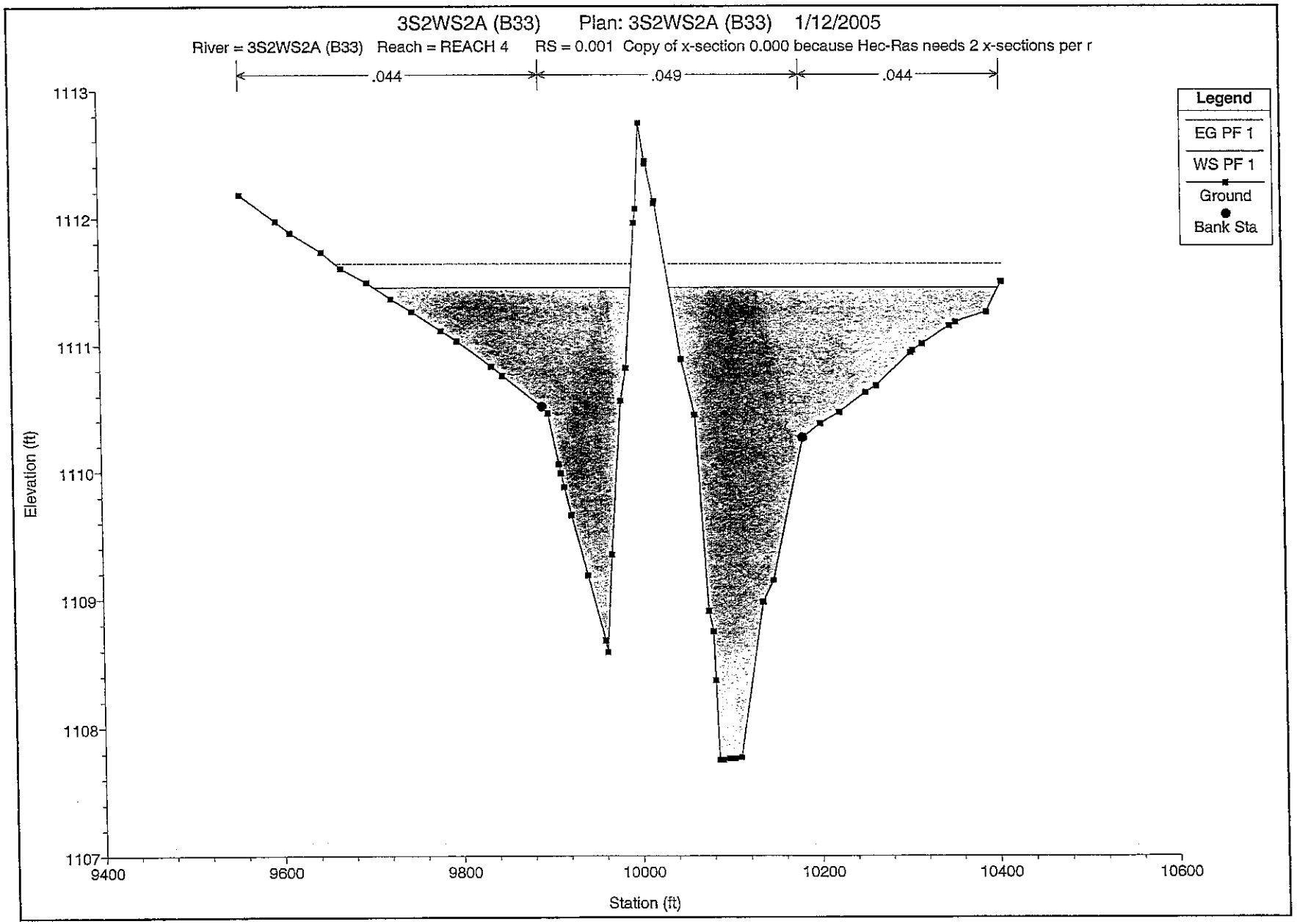
Change in Discharge based on Reach Length

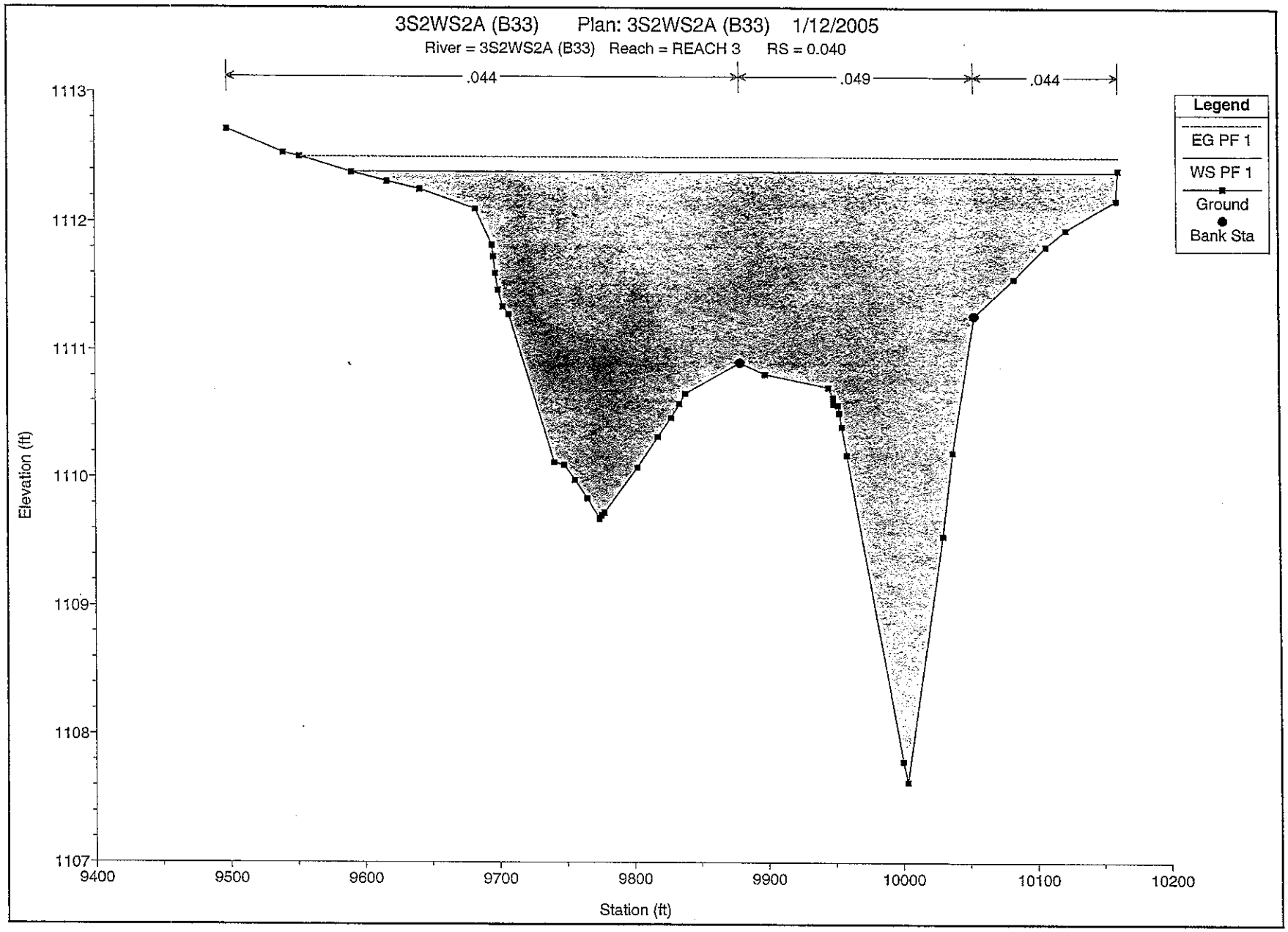
Wash ID: 3S2WS2A (B33)

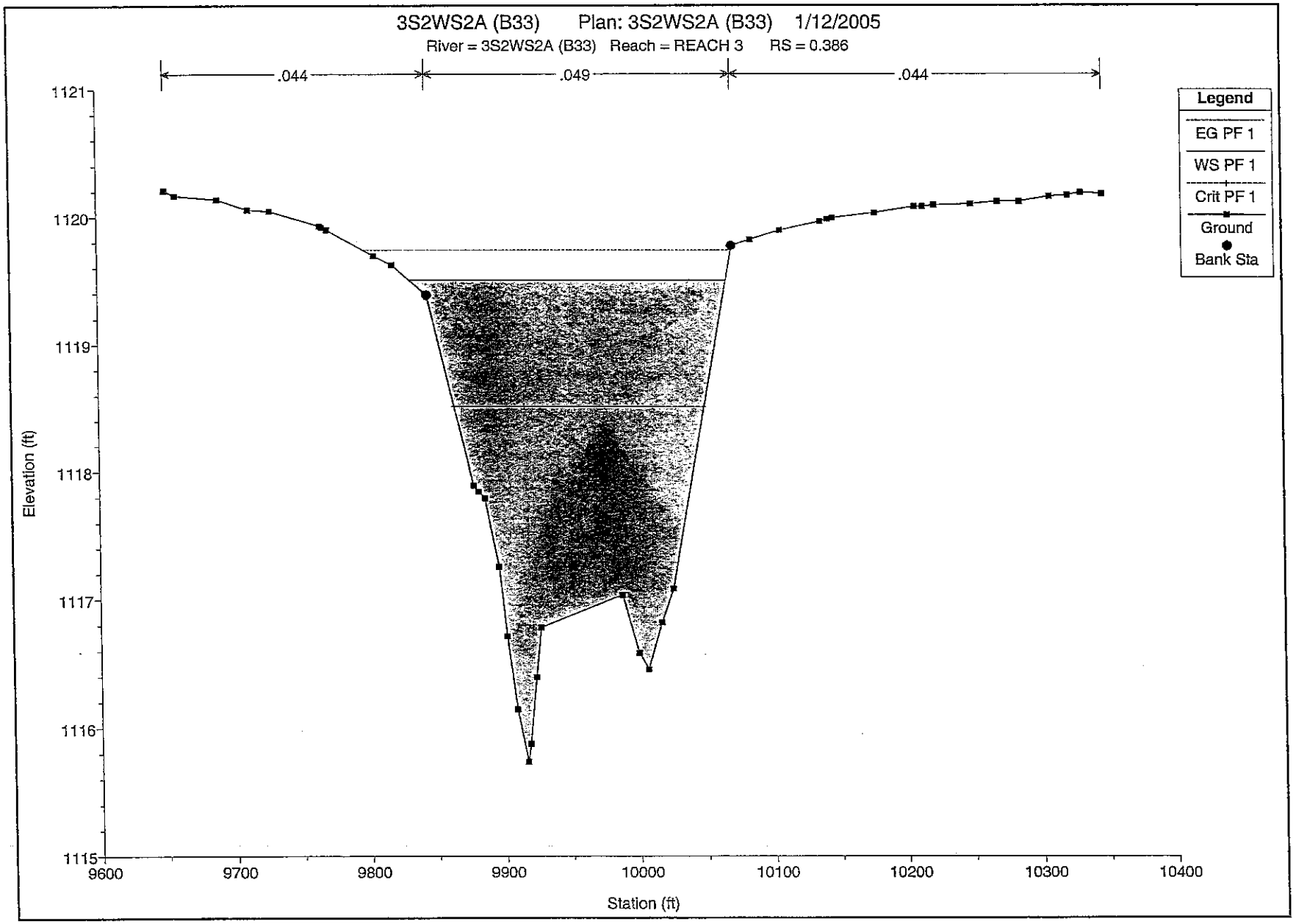
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
B22	2.003	821	820	800
B37	1.659	926	930	900
B37	1.419	999	1000	1000
B37	1.252	1049	1050	1000
CPB37	1.040	1114	1110	1100
B26	0.807	1154	1150	1200
B26	0.561	1197	1200	1200
CPB26	0.386	1227	1230	1200
CPB35	0.386	1839	1840	1800
CPB33	0.040	2215	2220	2200
CPB33	0.000	2215	2220	2200

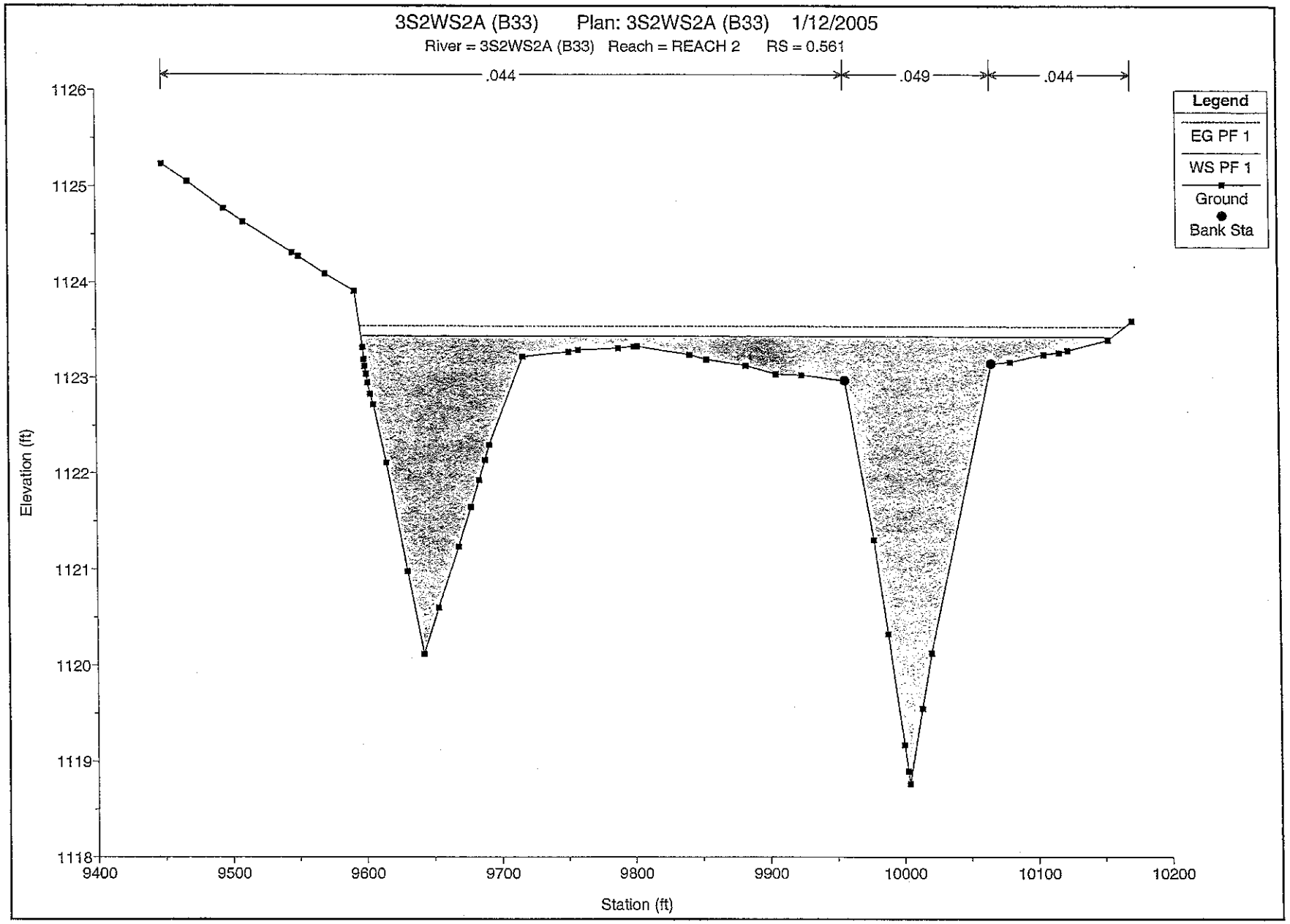
Notes:
1. Q at X-section 1.963 is local discharge of 821 cfs from Subbasin B22
2. Discharge at 0.040 is close enough to to 100% of the reach length to use the flow at CPB33.
3. There are two discharges at 0.386 to better model flow rates. At 0.386, two flows come together.
3. The upstream flows are modeled between the discharge at CPB37 and CPB26.
3. The flow used in the HEC-RAS cross section is 1840.

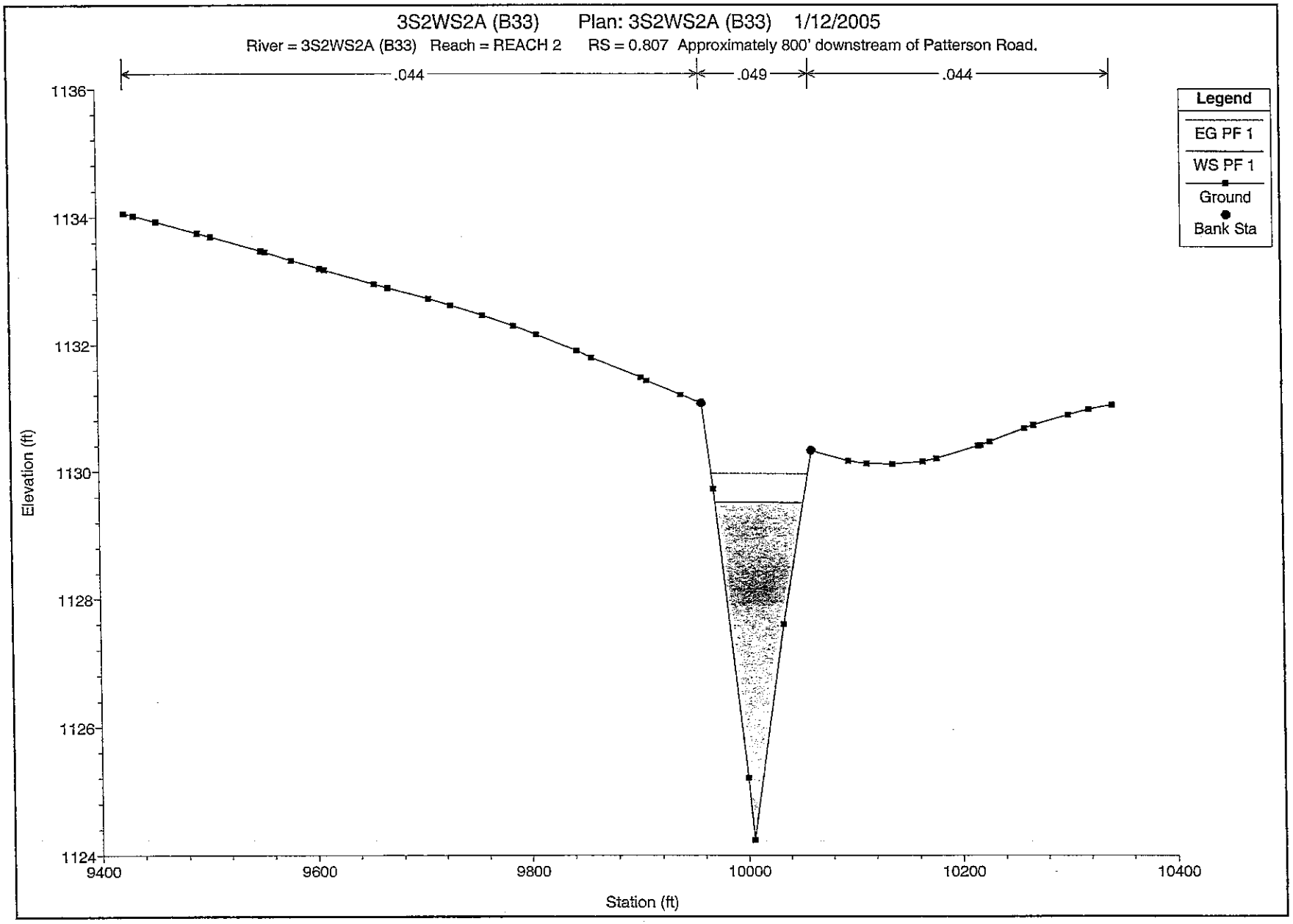

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 4 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1113
1112
1111
1110
1109
1108
1107
9400
9600
9800
10000
10200
10400
10600
Station (ft)

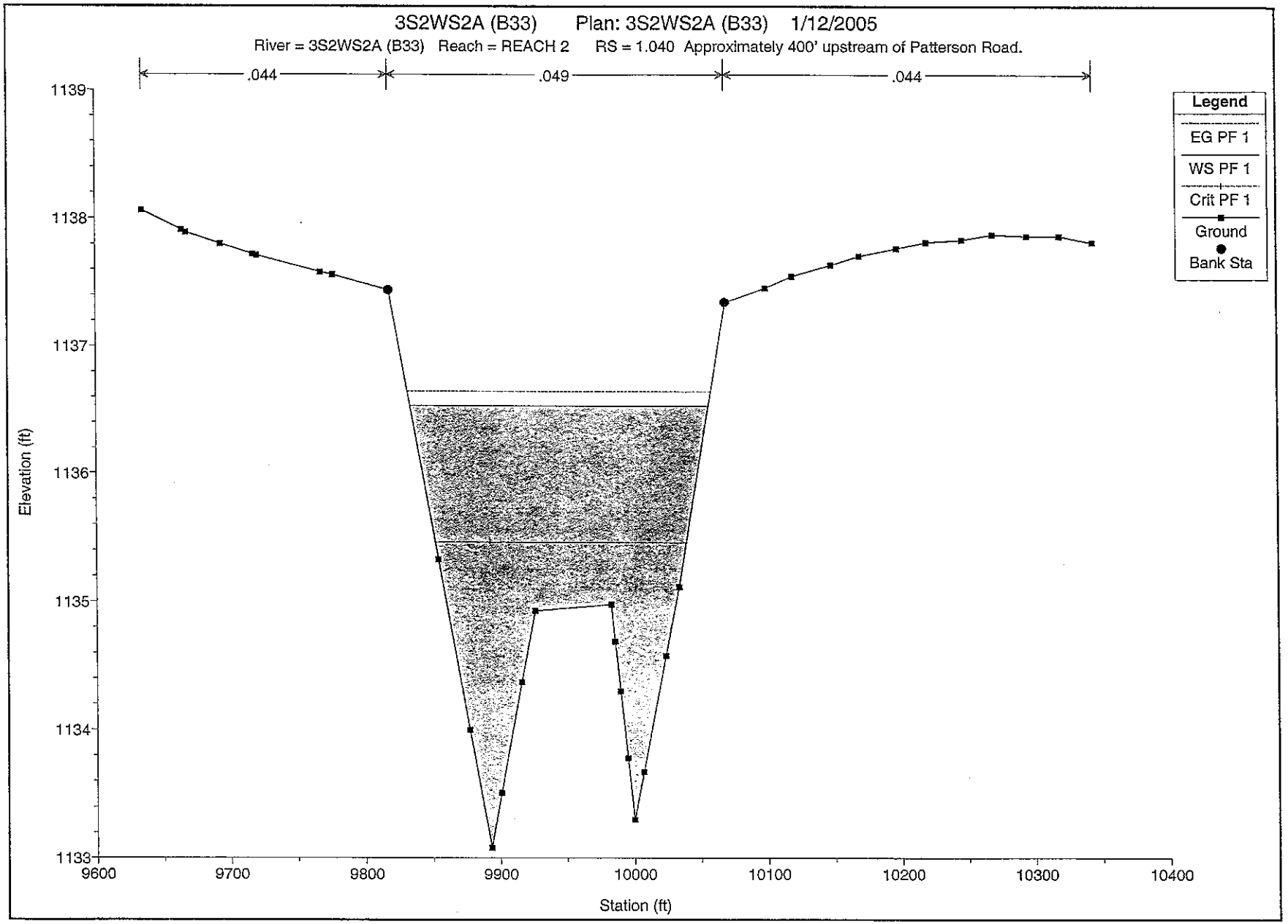

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 4 RS = 0.001 Copy of x-section 0.000 because Hec-Ras needs 2 x-sections per r
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1113
1112
1111
1110
1109
1108
1107
9400
9600
9800
10000
10200
10400
10600
Station (ft)

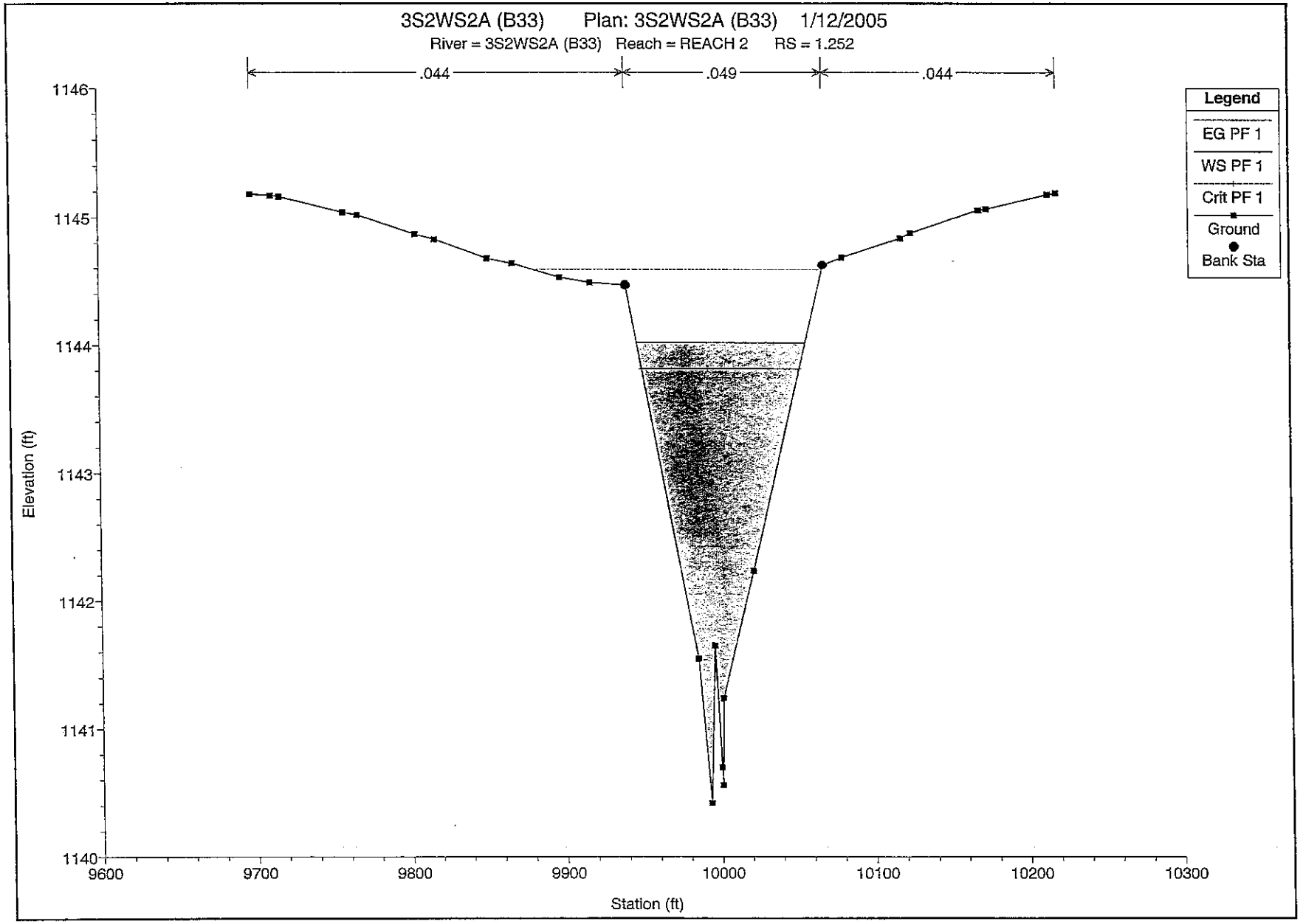

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 3 RS = 0.040
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1113
1112
1111
1110
1109
1108
1107
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

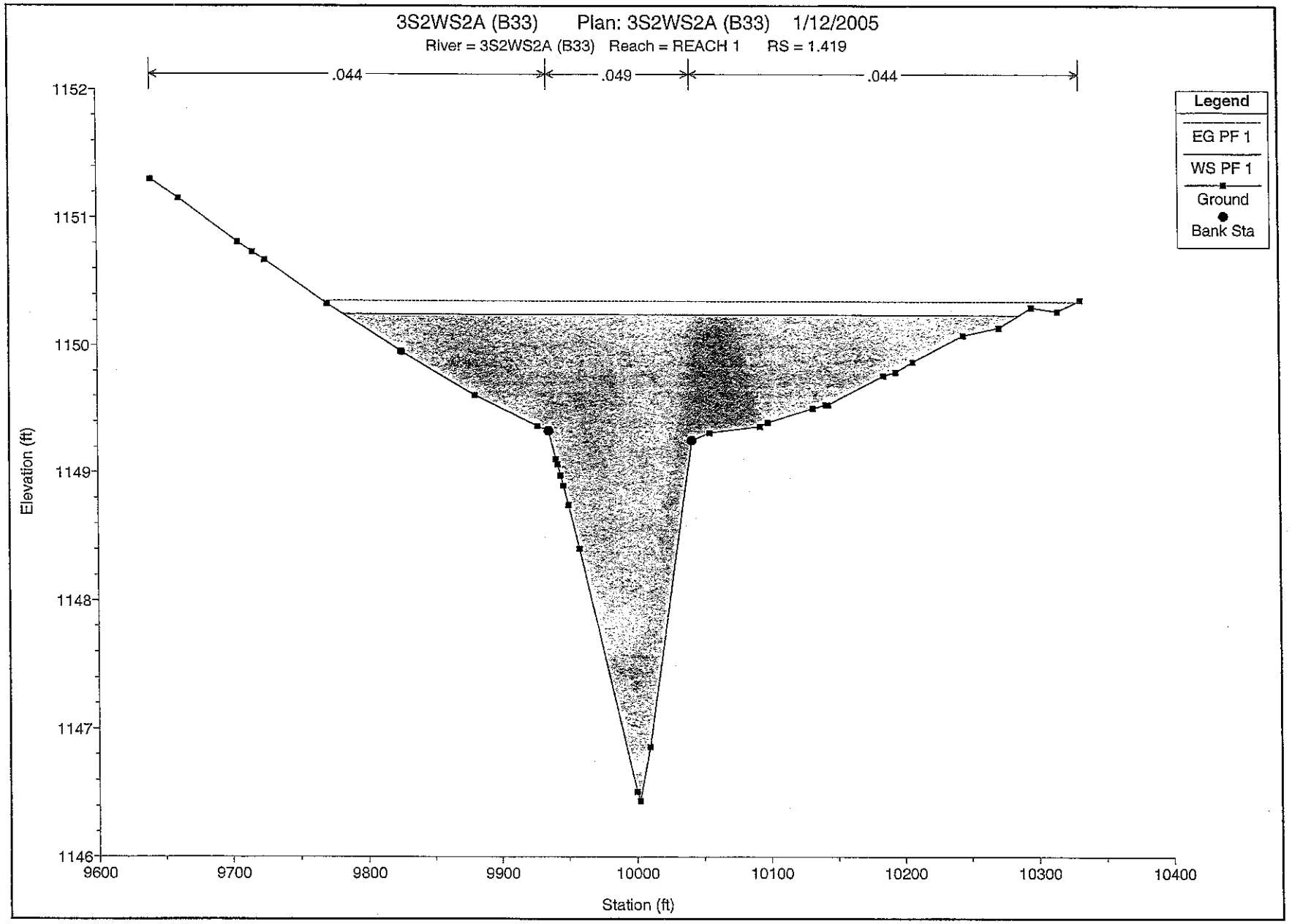

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 3 RS = 0.386
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1121
1120
1119
1118
1117
1116
1115
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

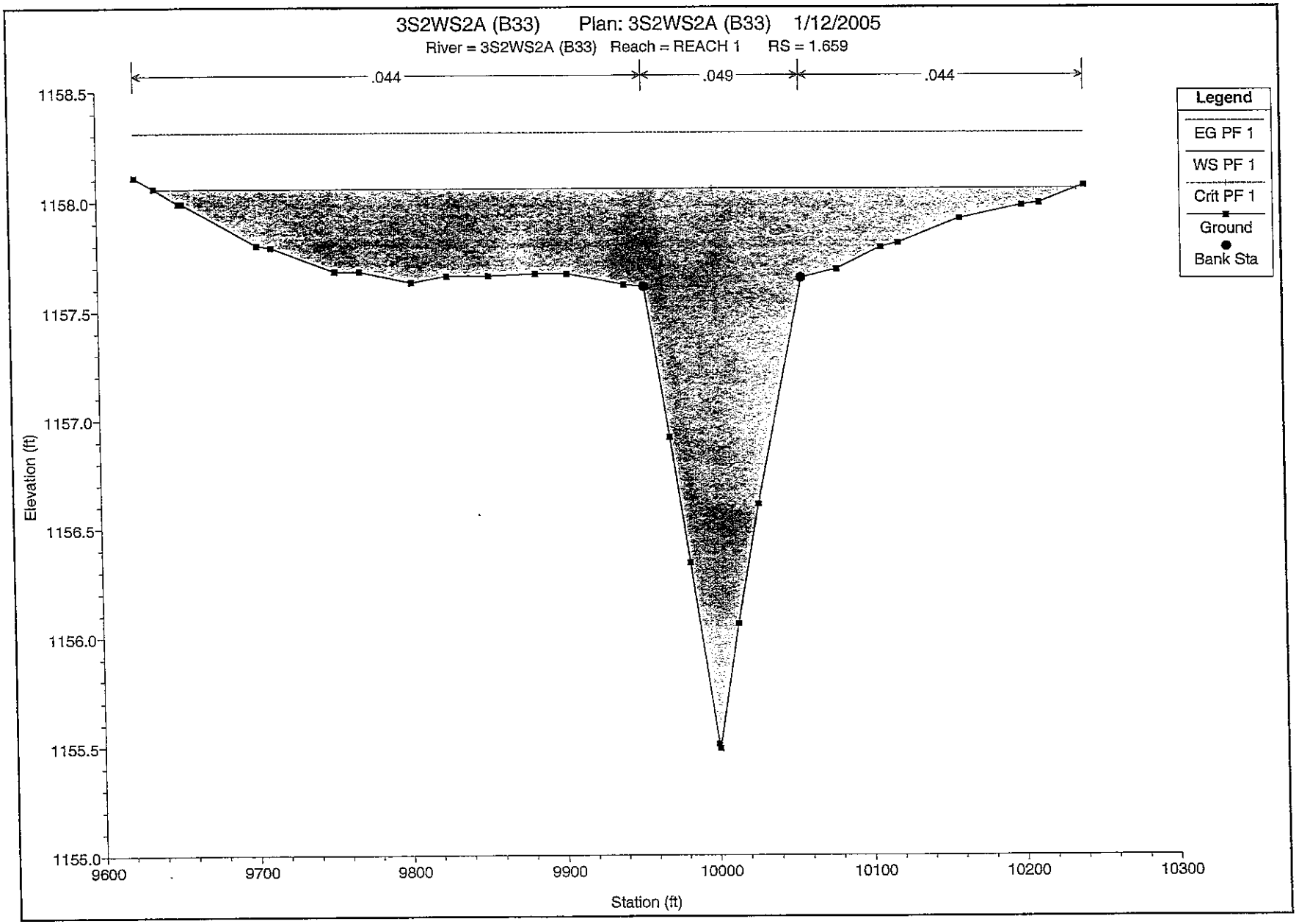

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 2 RS = 0.561
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1126
1125
1124
1123
1122
1121
1120
1119
1118
9400
9500
9600
9700
9800
9900
10000
10100
10200
Station (ft)

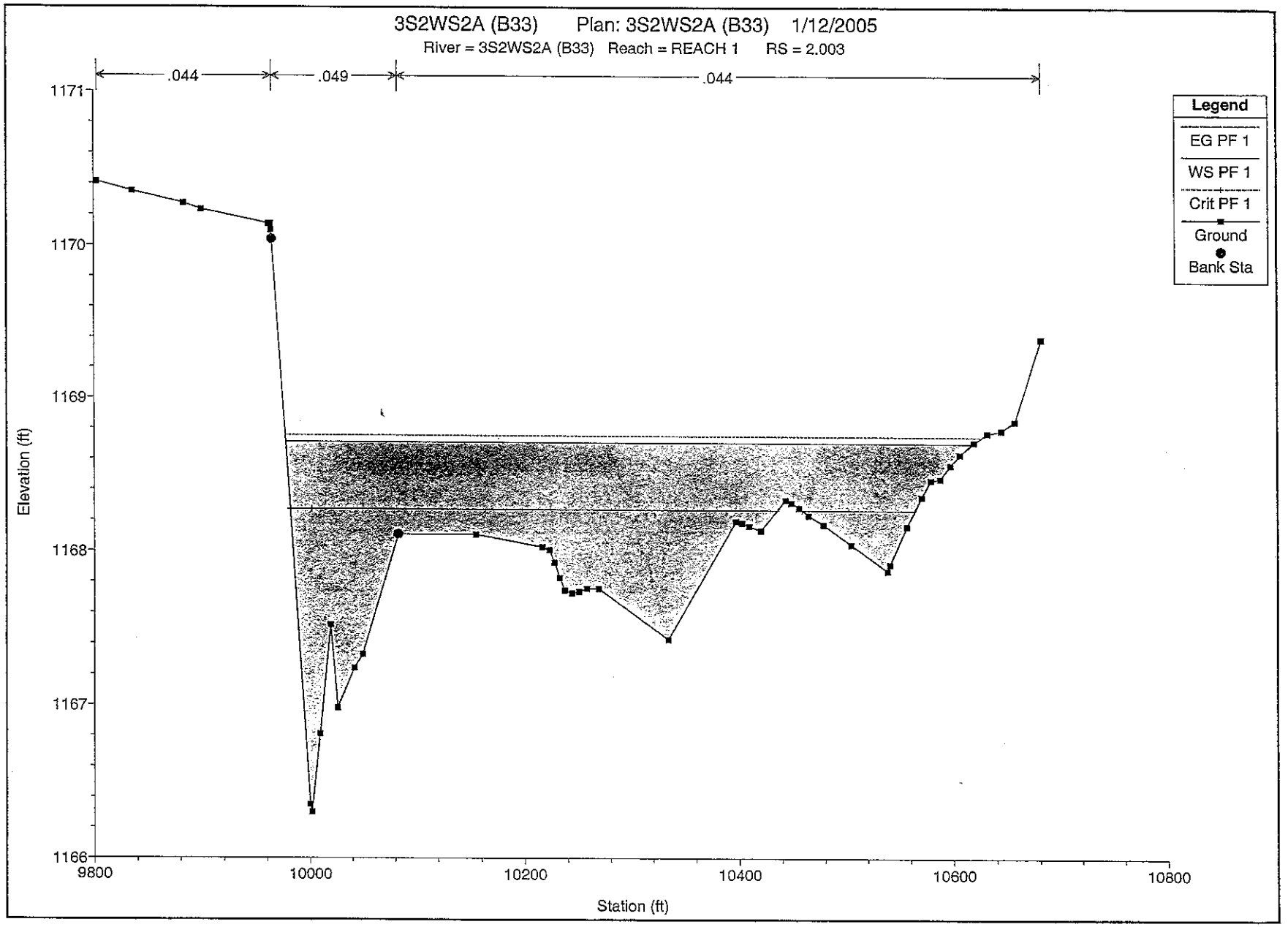

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 2 RS = 0.807 Approximately 800' downstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1136
1134
1132
1130
1128
1126
1124
9400
9600
9800
10000
10200
10400
Station (ft)

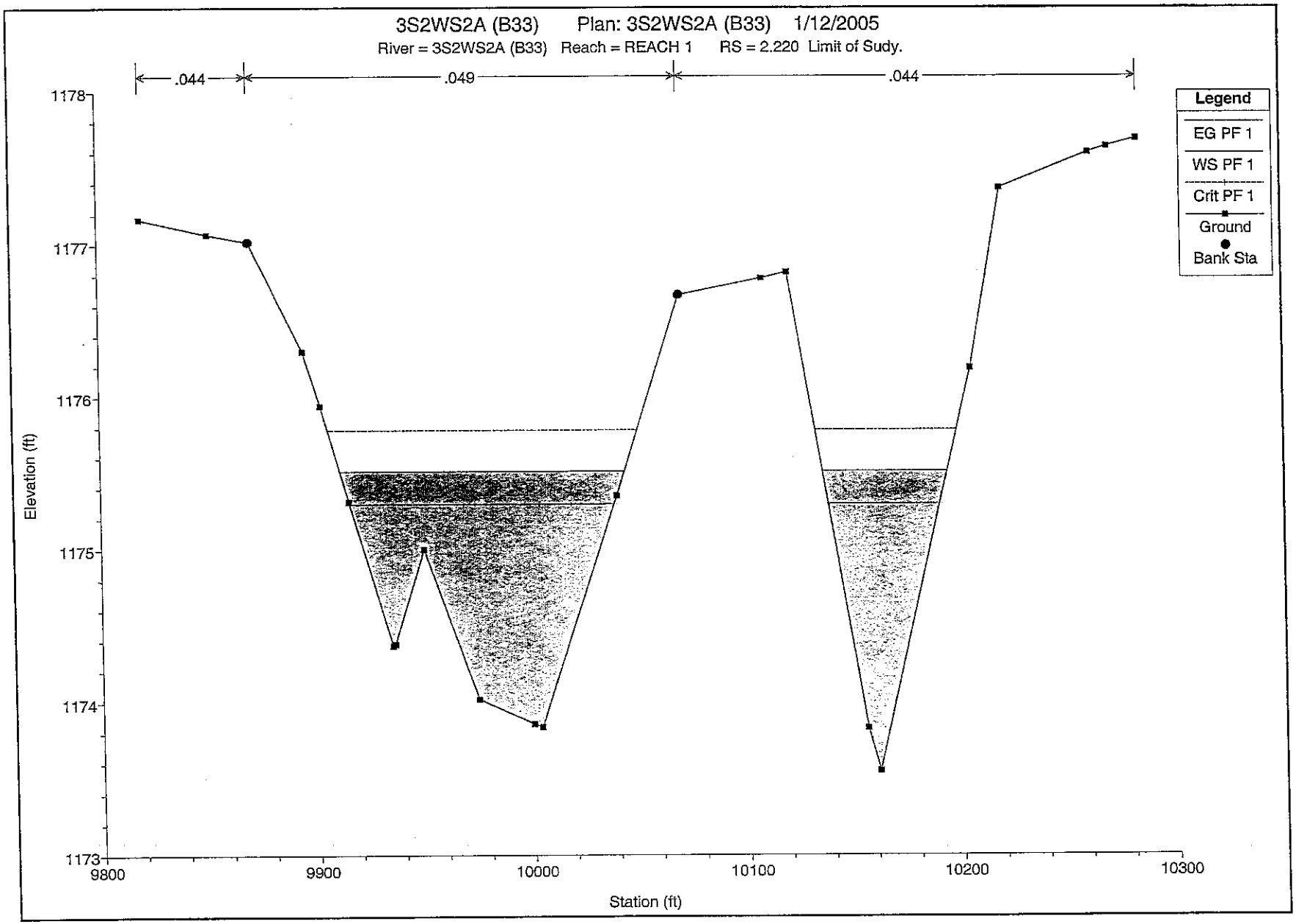

3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 2 RS = 1.040 Approximately 400' upstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1139
1138
1137
1136
1135
1134
1133
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 2 RS = 1.252
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1146
1145
1144
1143
1142
1141
1140
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 1 RS = 1.419
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1152
1151
1150
1149
1148
1147
1146
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 1 RS = 1.659
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1158.5
1158.0
1157.5
1157.0
1156.5
1156.0
1155.5
1155.0
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 1 RS = 2.003
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1171
1170
1169
1168
1167
1166
9800
10000
10200
10400
10600
10800
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2A (B33) Reach = REACH 1 RS = 2.220 Limit of Sudy.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1178
1177
1176
1175
1174
1173
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 3S2WS2A (B33)

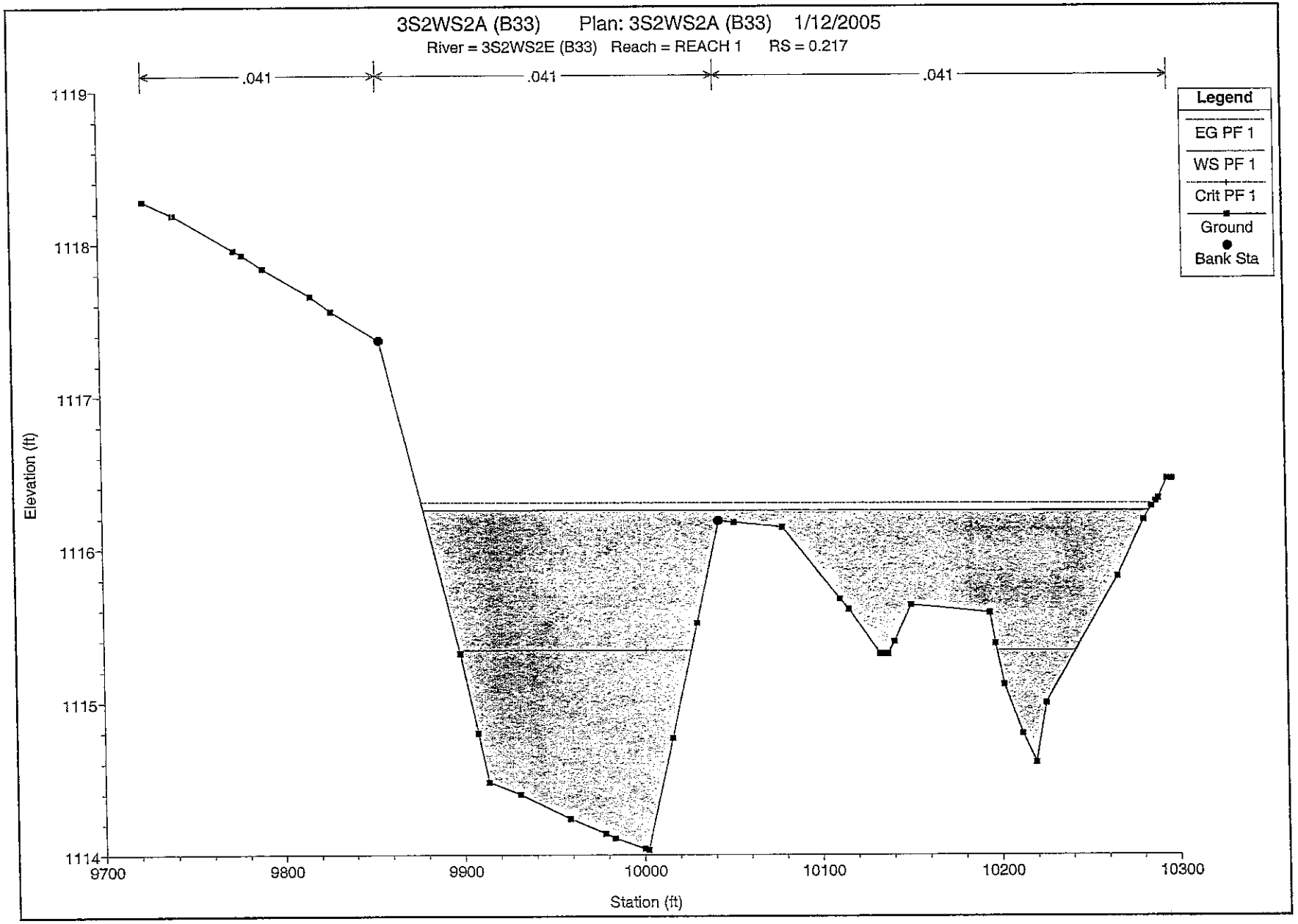
REACH: 3S2WS2E (B33)

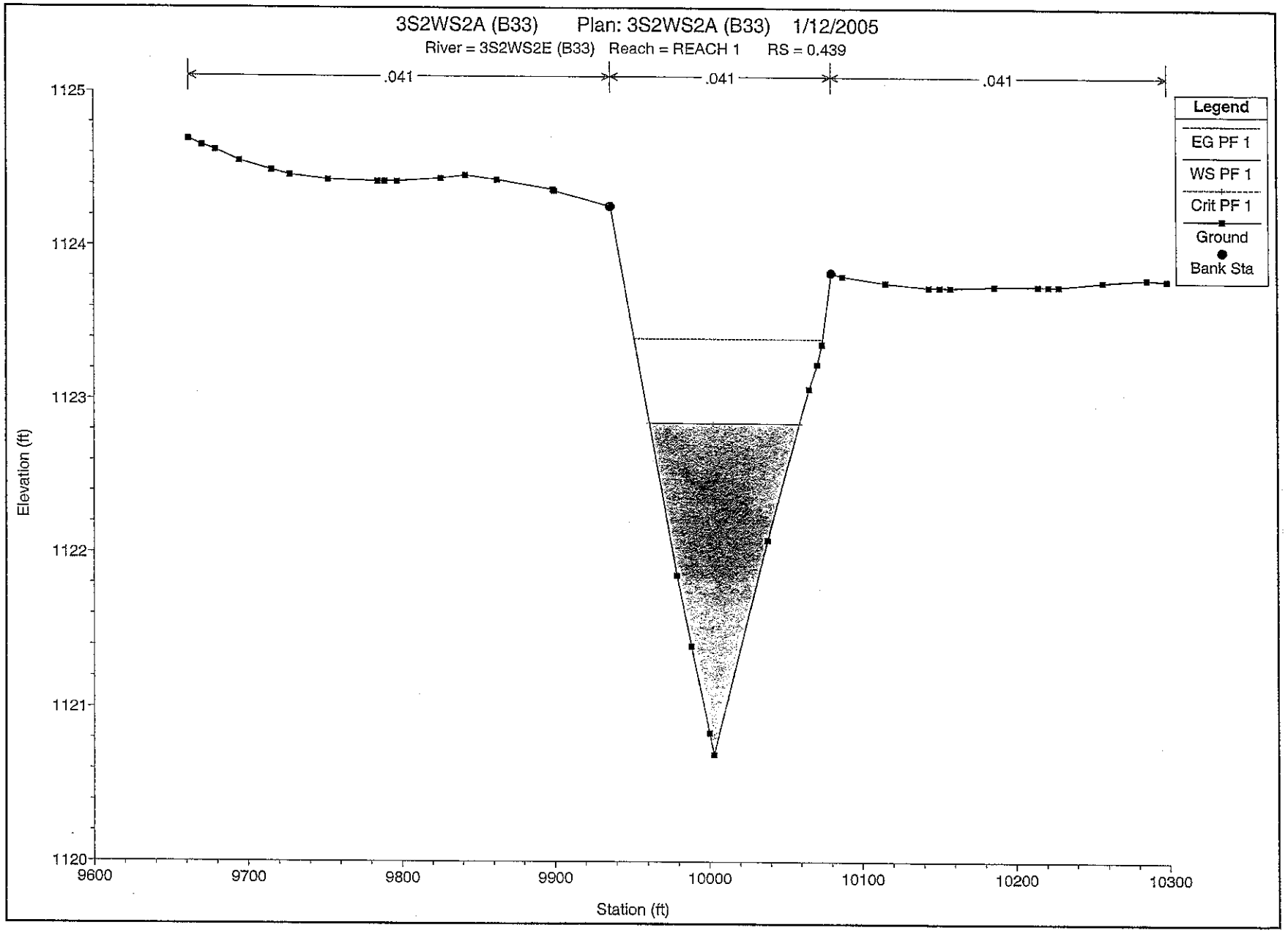
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

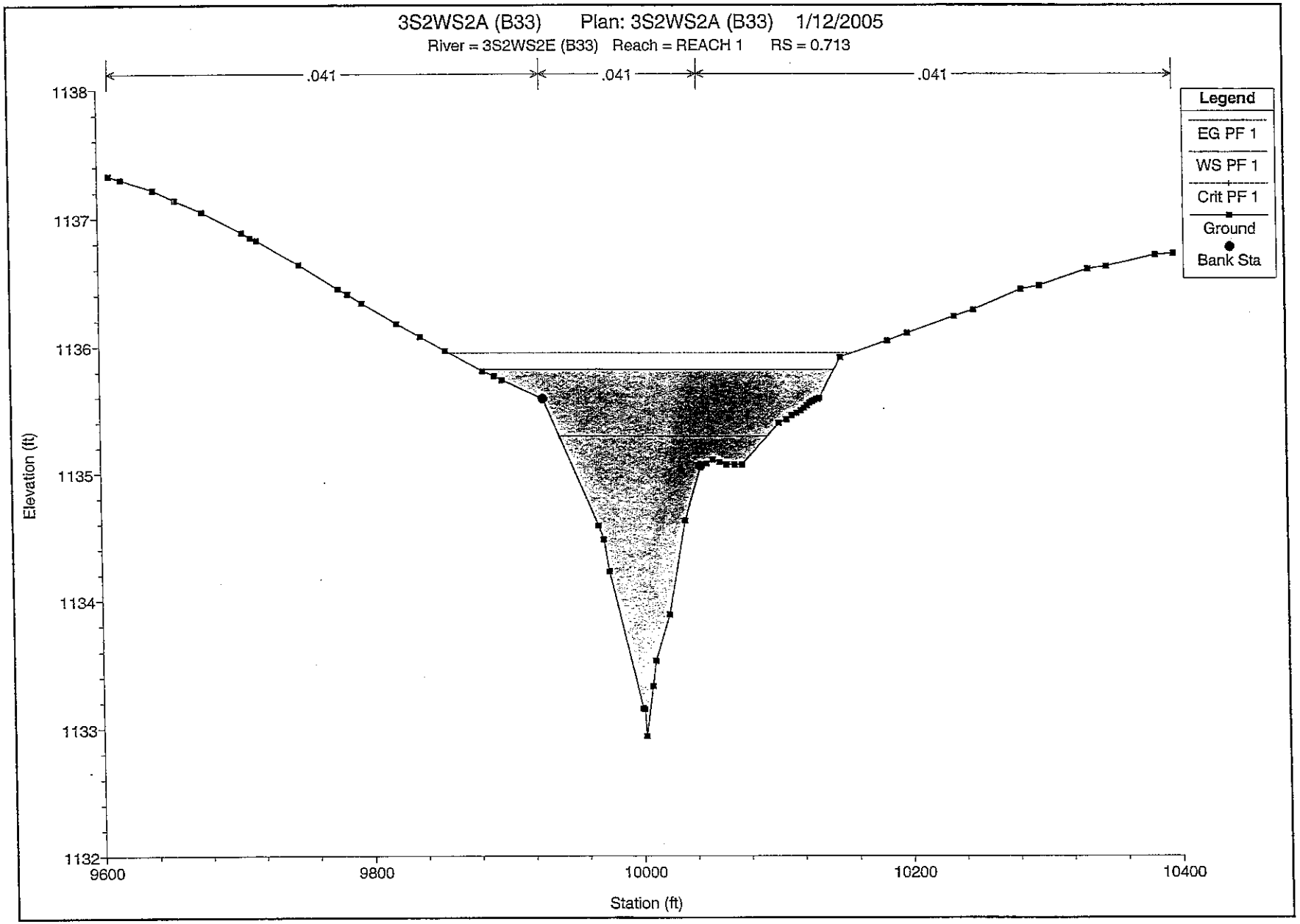
Change in Discharge based on Reach Length

Wash ID: 3S2WS2E (B33)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPB34	0.713	598	600	600
B33	0.439	633	630	600
B33	0.217	662	660	700
CPB33A	0.000	690	690	700


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2E (B33) Reach = REACH 1 RS = 0.217
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1119
1118
1117
1116
1115
1114
9700
9800
9900
10000
10100
10200
10300
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2E (B33) Reach = REACH 1 RS = 0.439
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1125
1124
1123
1122
1121
1120
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2E (B33) Reach = REACH 1 RS = 0.713
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1138
1137
1136
1135
1134
1133
1132
9600
9800
10000
10200
10400
Station (ft)

MODEL: 3S2WS2A (B33)

REACH: 3S2WS11 (B37)

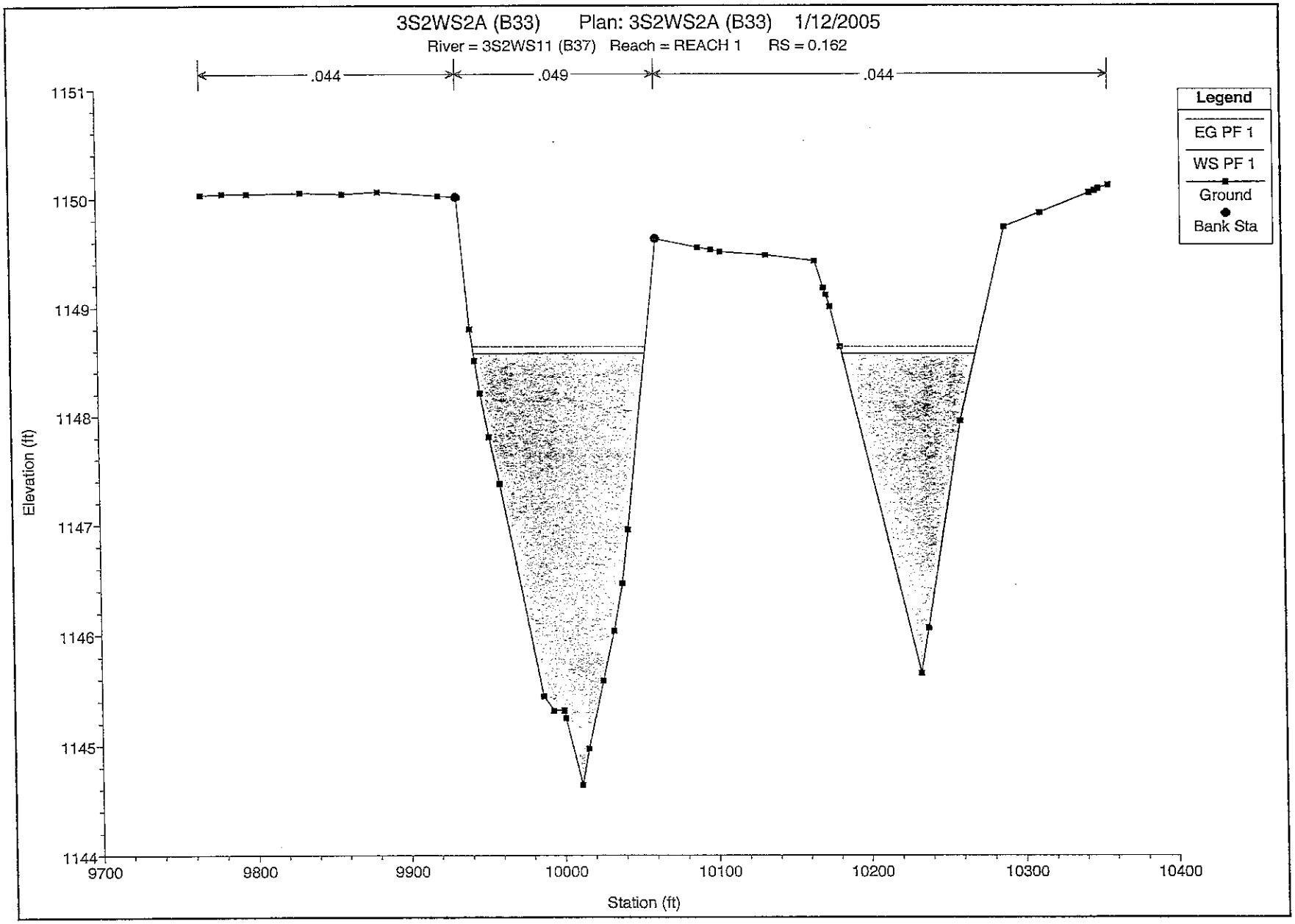
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

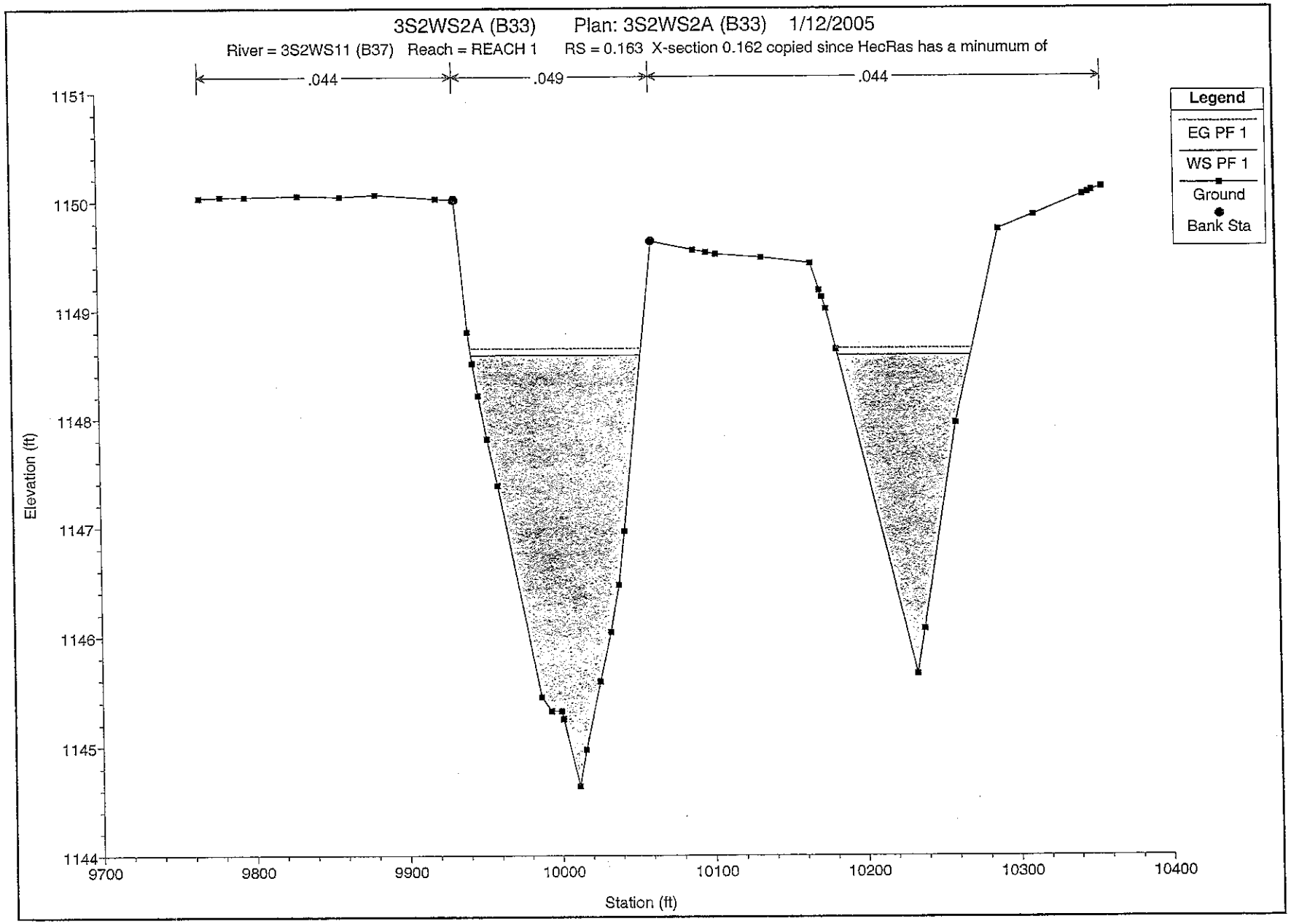
Change in Discharge based on Reach Length

Wash ID: 3S2WS11 (B37)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPB24	0.163	740	740	700
B37	0.162	740	740	700

Notes:
1. 0.155 is a duplicate cross section since hec-ras requires 2 x-sections per reach.
2. The distance between X-sections is short, therefore the Q is unchanged.


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS11 (B37) Reach = REACH 1 RS = 0.162
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1151
1150
1149
1148
1147
1146
1145
1144
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS11 (B37) Reach = REACH 1 RS = 0.163 X-section 0.162 copied since HecRas has a minumum of
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1151
1150
1149
1148
1147
1146
1145
1144
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

MODEL: 3S2WS2A (B33)

REACH: 3S2WS2D (B35)

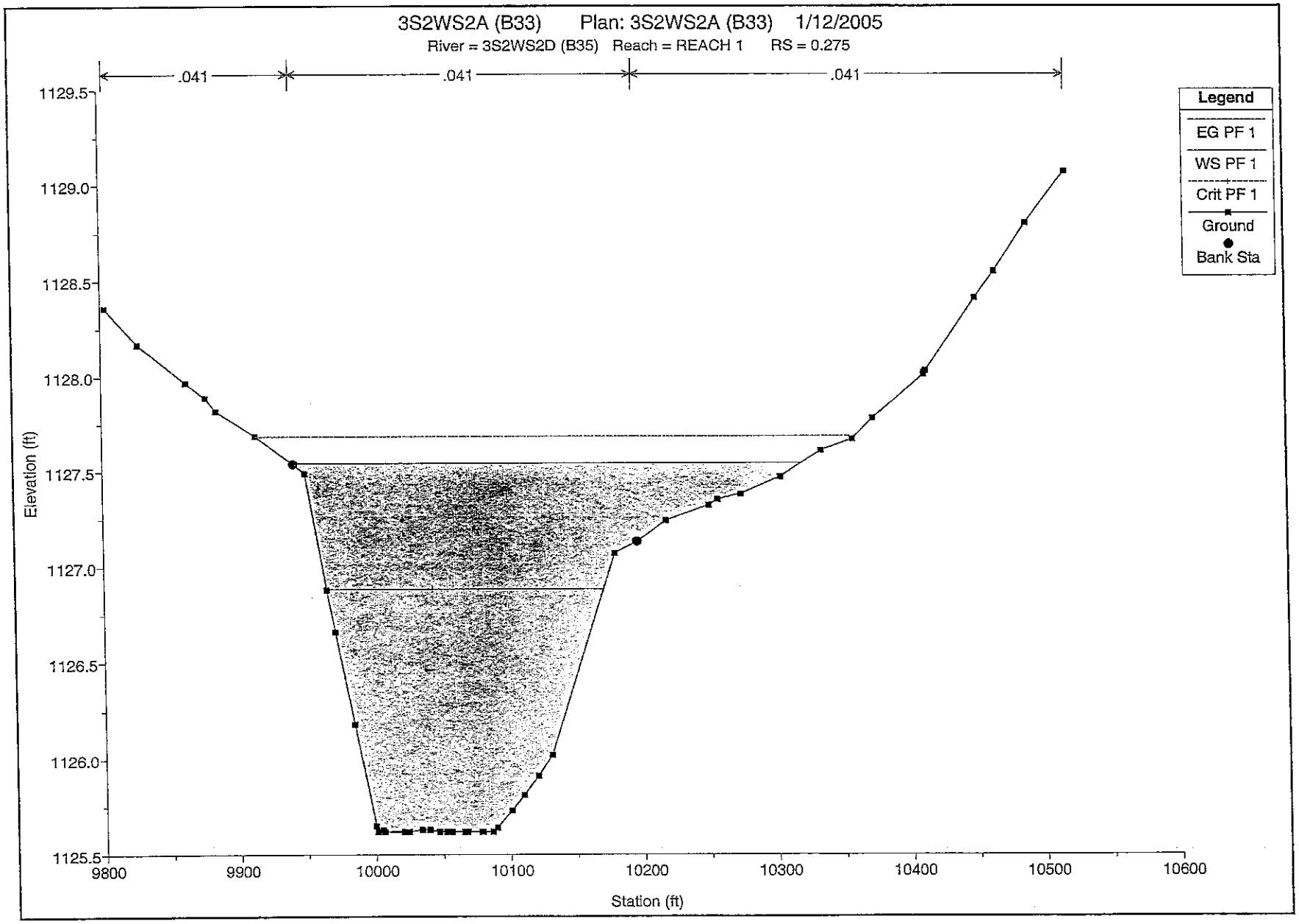
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

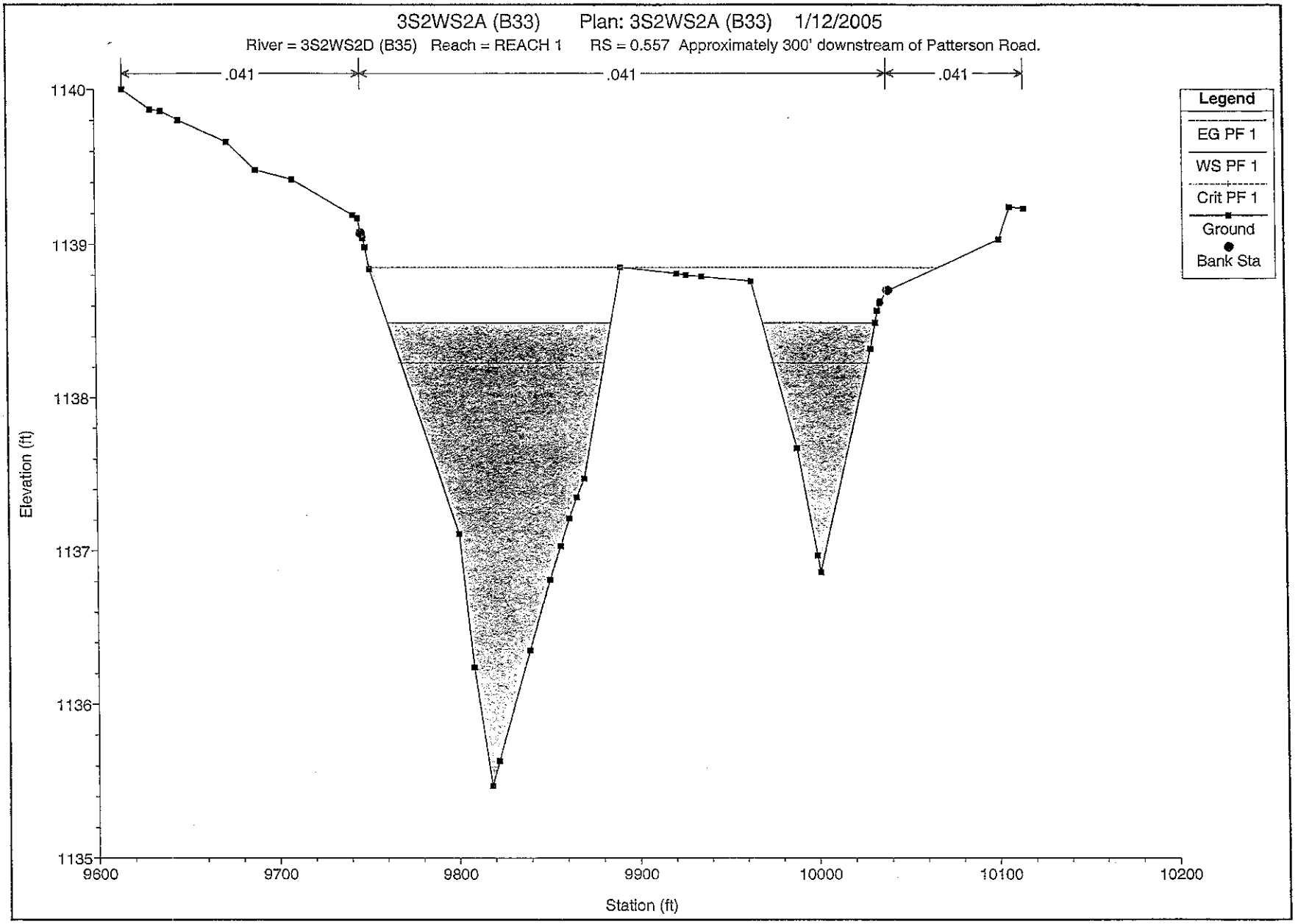
Change in Discharge based on Reach Length

Wash ID: 3S2WS2D (B35)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
B27	0.557	1093	1090	1100
B35	0.275	1087	1090	1100
CPB35A	0.000	1082	1080	1100

Notes:
1. Q at X-section 0.557 is discharge of 1093 cfs from local subbasin B27
2. Cross section 0.000 does not exist (used to give more accurate discharge).


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2D (B35) Reach = REACH 1 RS = 0.275
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1129.5
1129.0
1128.5
1128.0
1127.5
1127.0
1126.5
1126.0
1125.5
9800
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)


3S2WS2A (B33) Plan: 3S2WS2A (B33) 1/12/2005
River = 3S2WS2D (B35) Reach = REACH 1 RS = 0.557 Approximately 300' downstream of Patterson Road.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1140
1139
1138
1137
1136
1135
9600
9700
9800
9900
10000
10100
10200
Station (ft)

MODEL: 3S2WS2B (B65)

REACH: 3S2WS2B (B65)

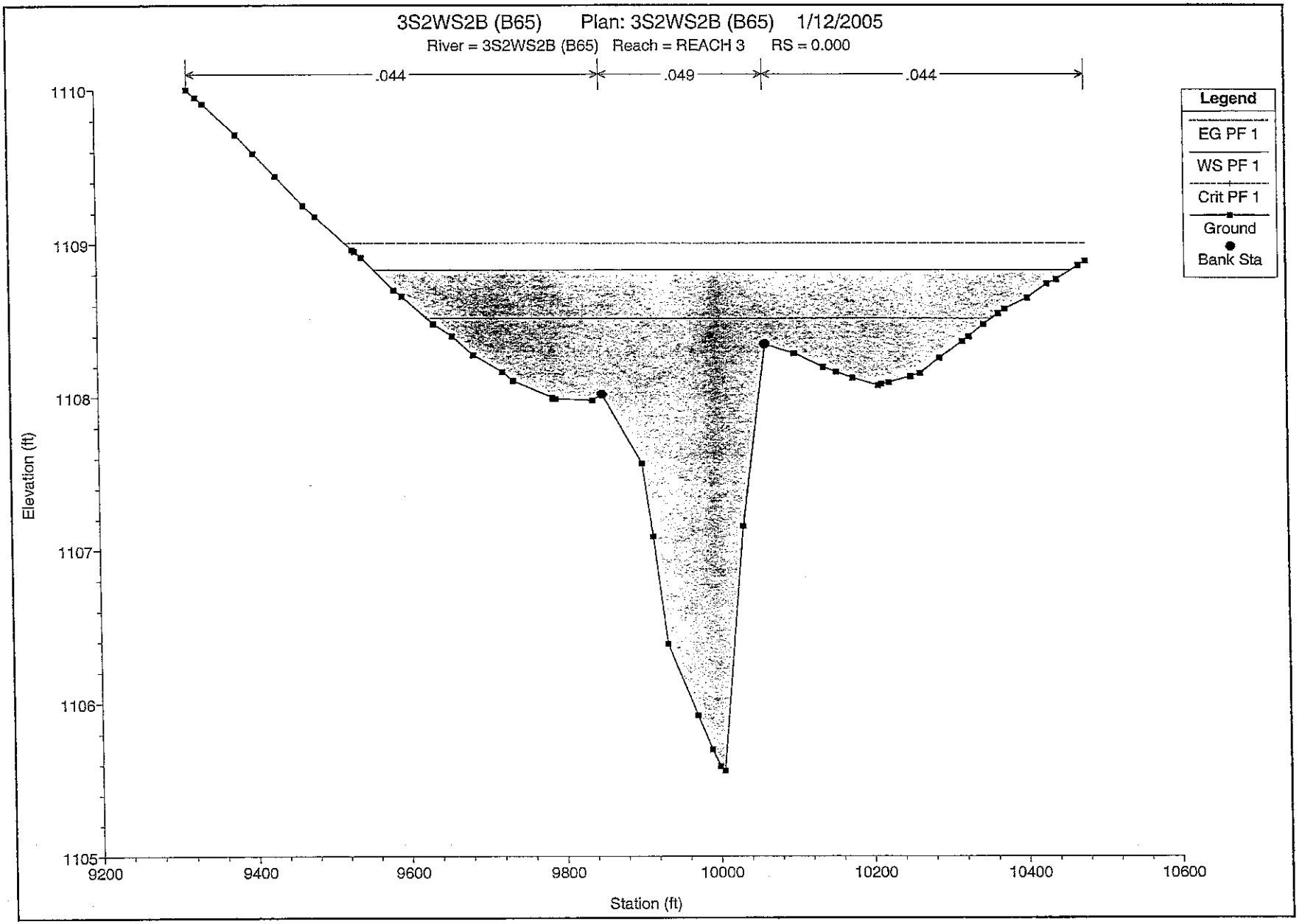
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

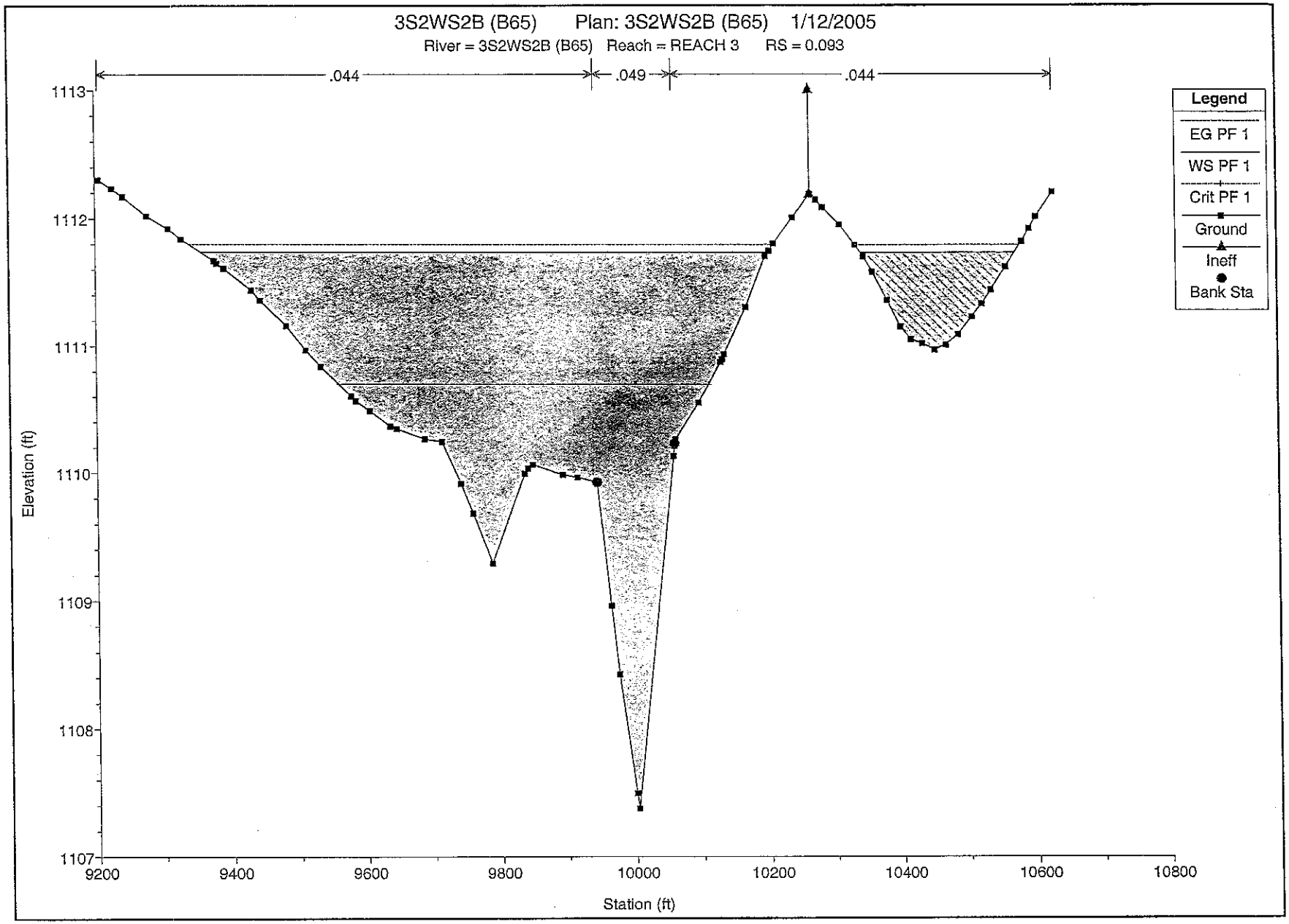
Change in Discharge based on Reach Length

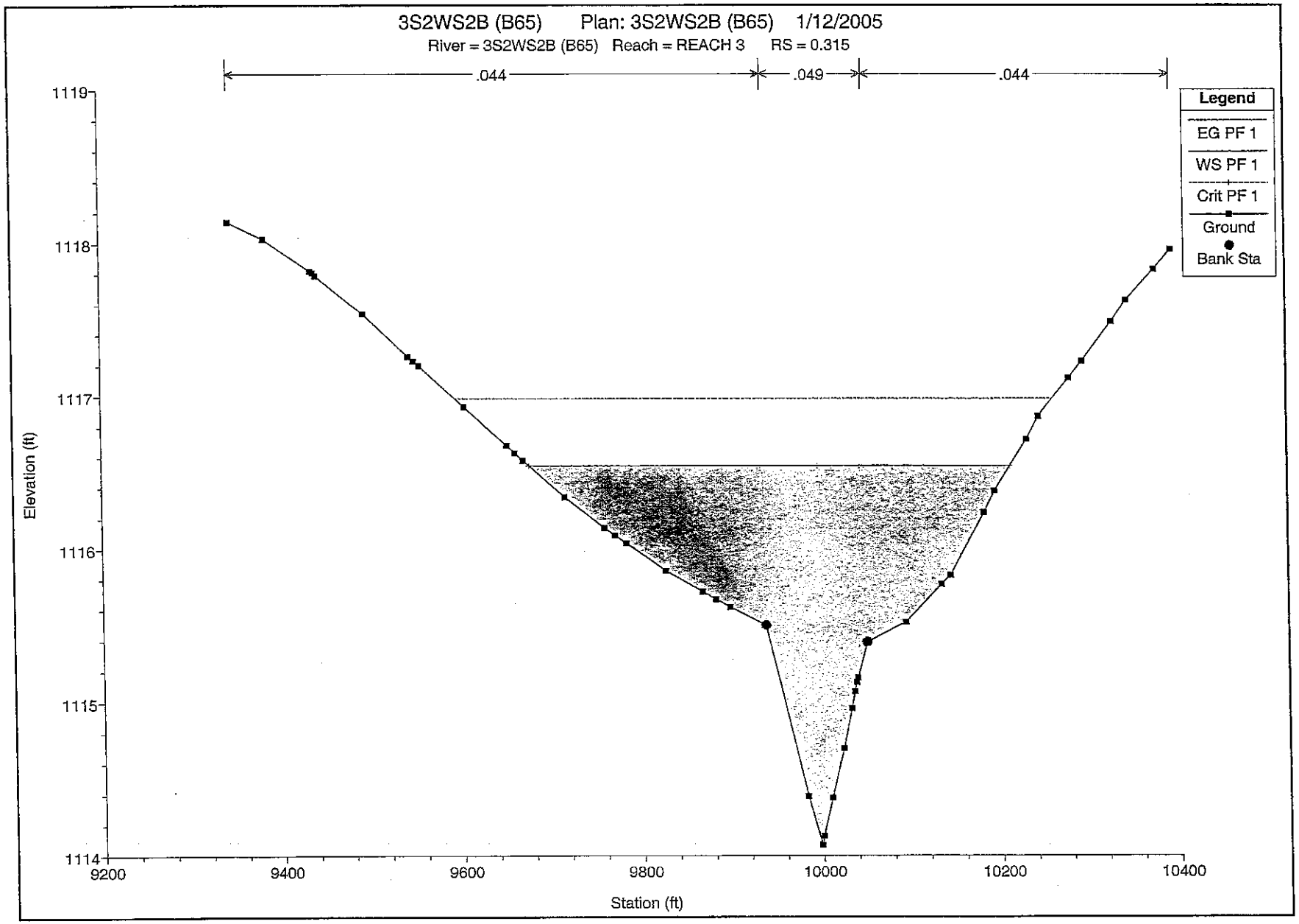
Wash ID: 3S2WS2B (B65)

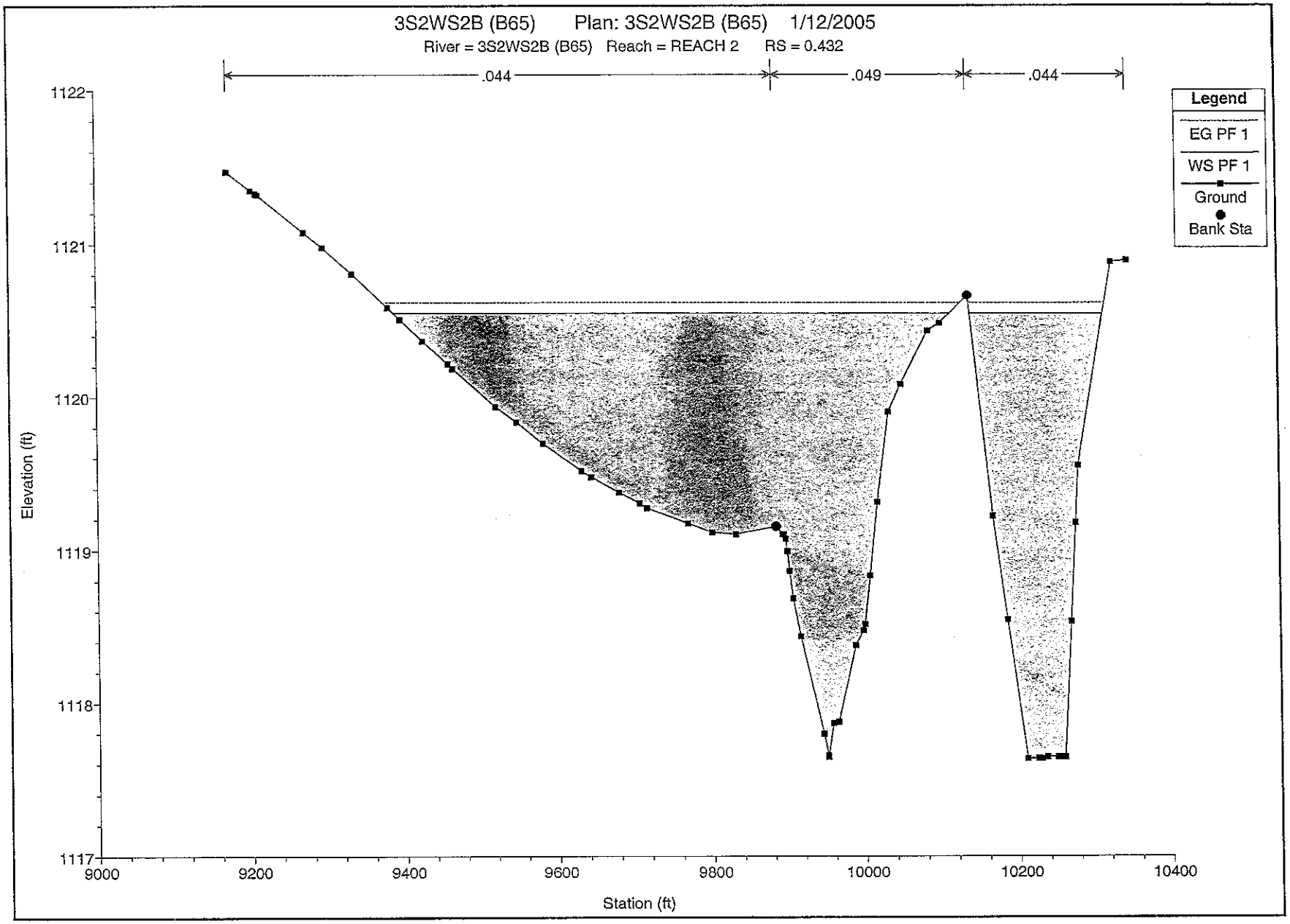
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPB16	2.297	2544	2540	2500
B39	2.042	2458	2460	2500
B39	1.785	2370	2370	2400
B39	1.530	2284	2280	2300
B39	1.303	2207	2210	2200
CPB39A	1.085	2133	2130	2100
CPB39	1.085	2328	2330	2300
B54	0.823	2289	2290	2300
B54	0.630	2261	2260	2300
CPB54	0.432	2232	2230	2200
B65	0.315	2213	2210	2200
CPB38	0.093	2177	2180	2200
CPB65	0.000	2189	2190	2200

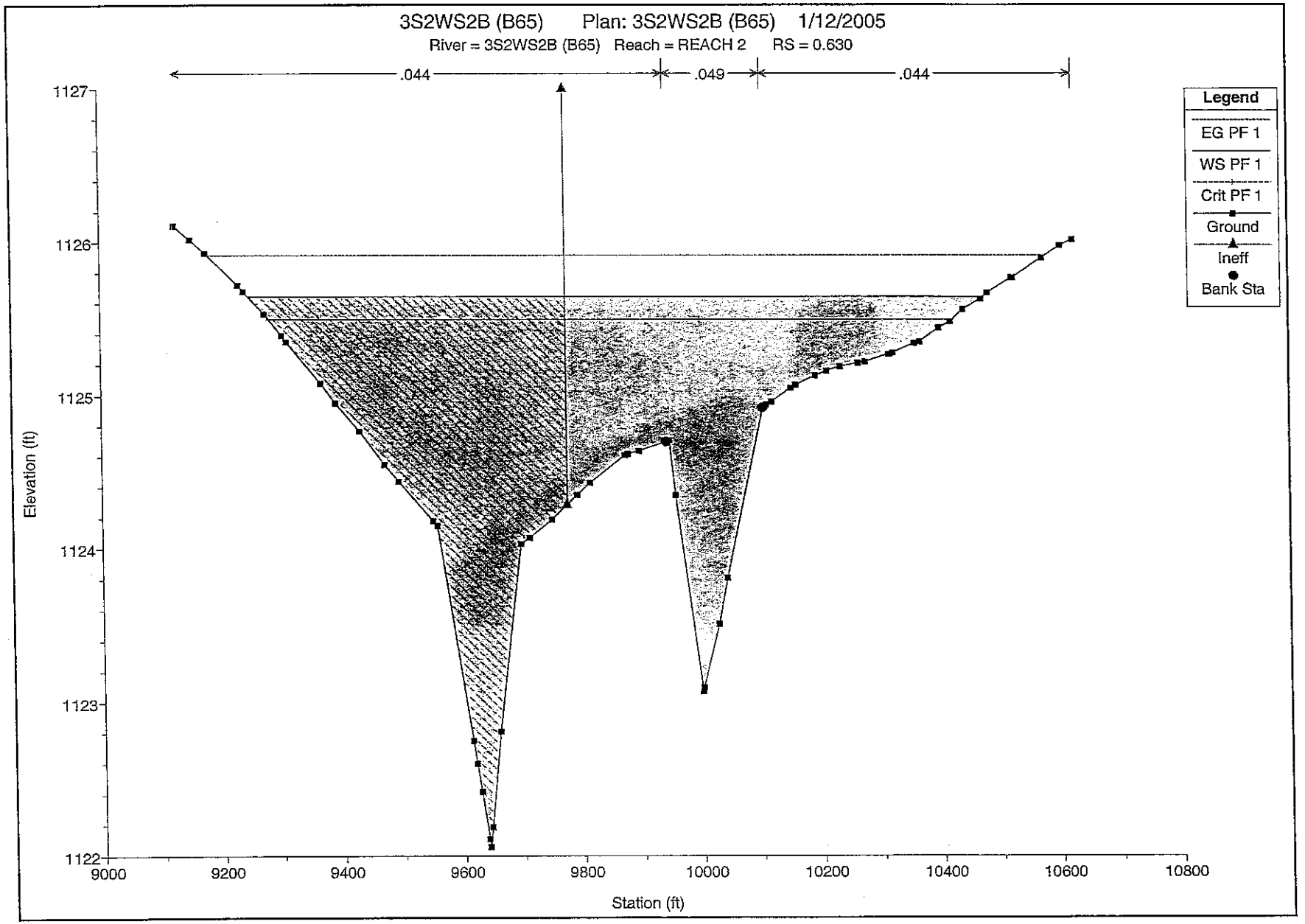
1. The flow at 1.085 is CPB39. The initial 1.085 cross section is used to model more accurate discharges.

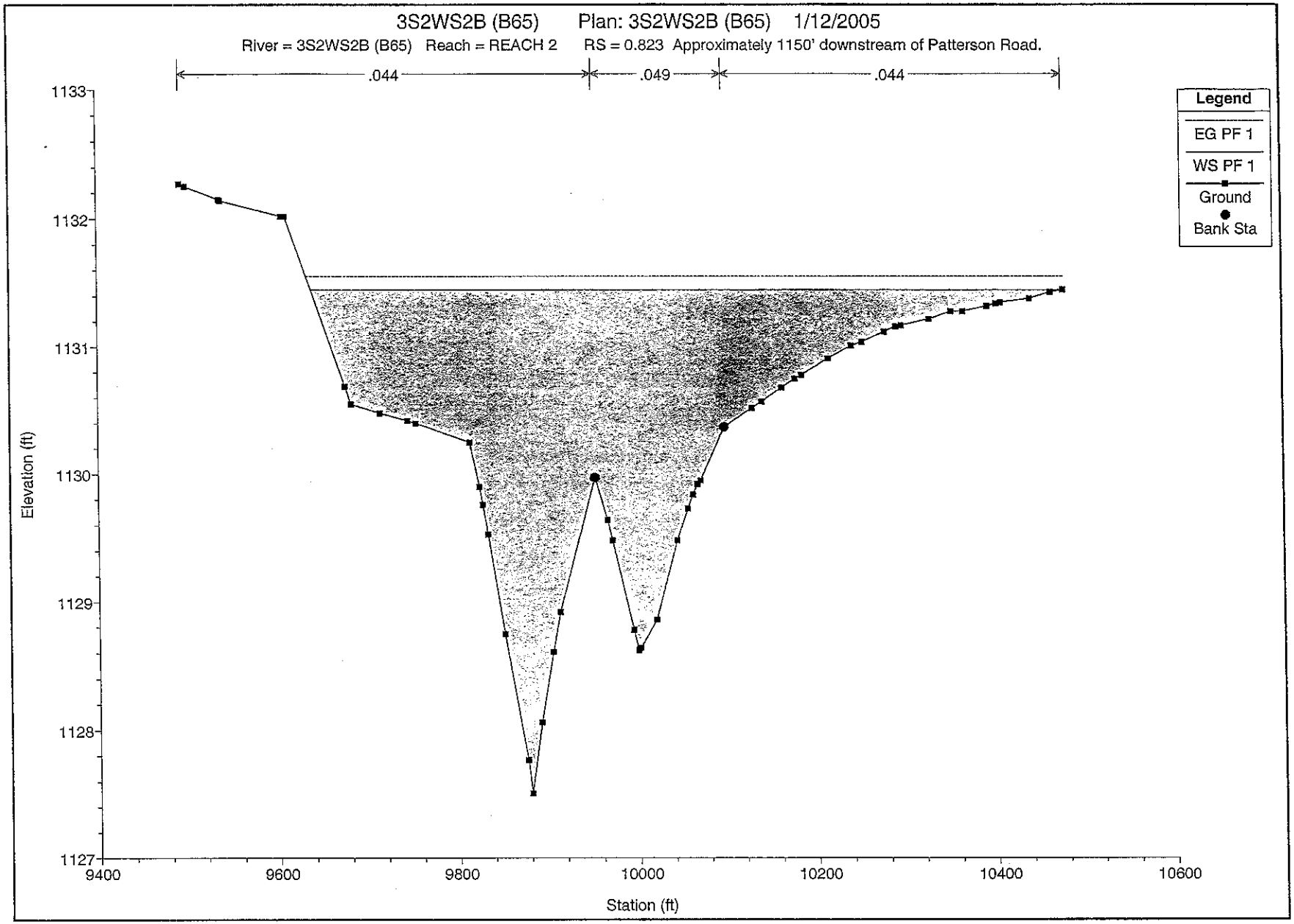

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 3 RS = 0.000
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1110
1109
1108
1107
1106
1105
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

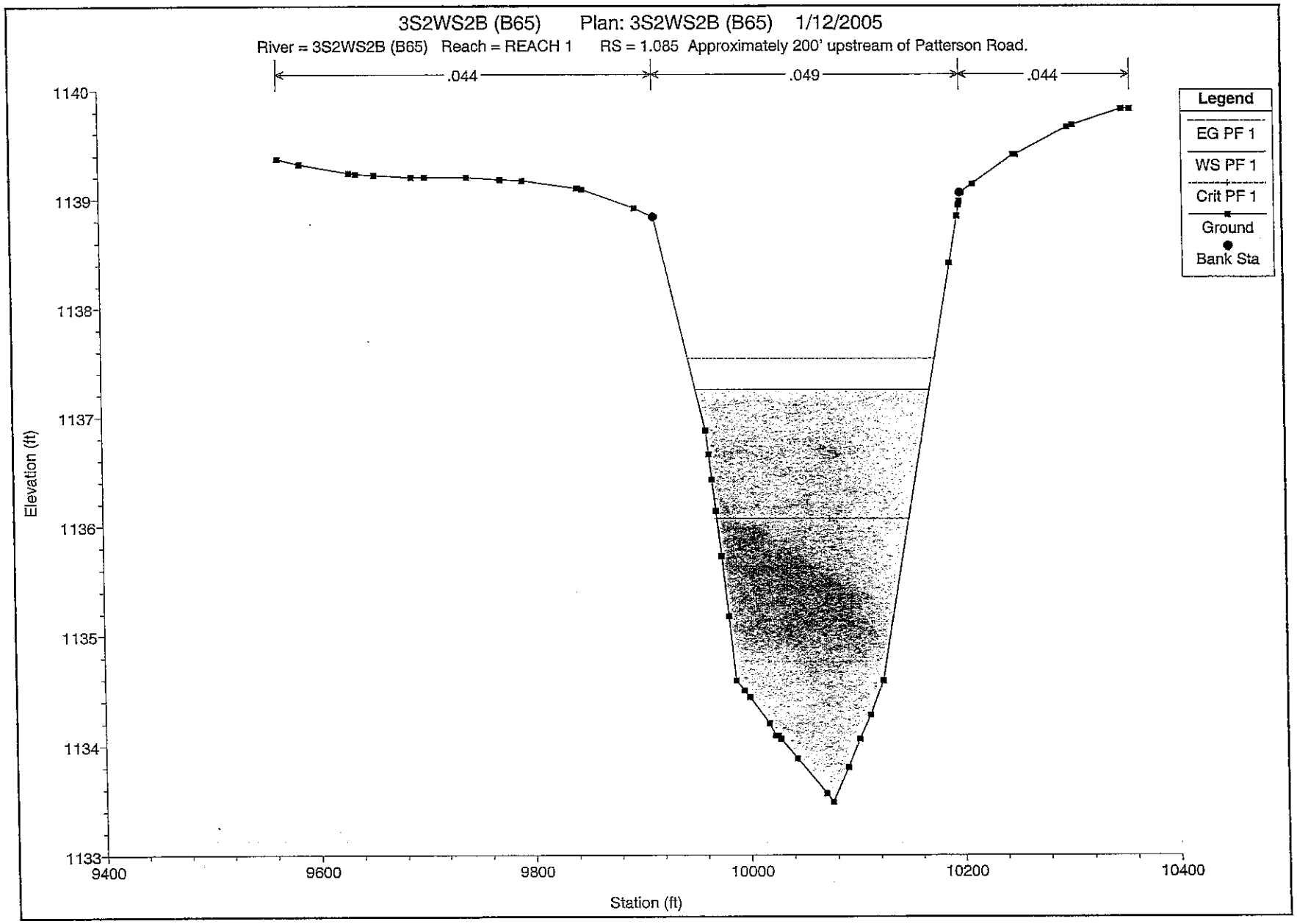

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 3 RS = 0.093
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1113
1112
1111
1110
1109
1108
1107
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

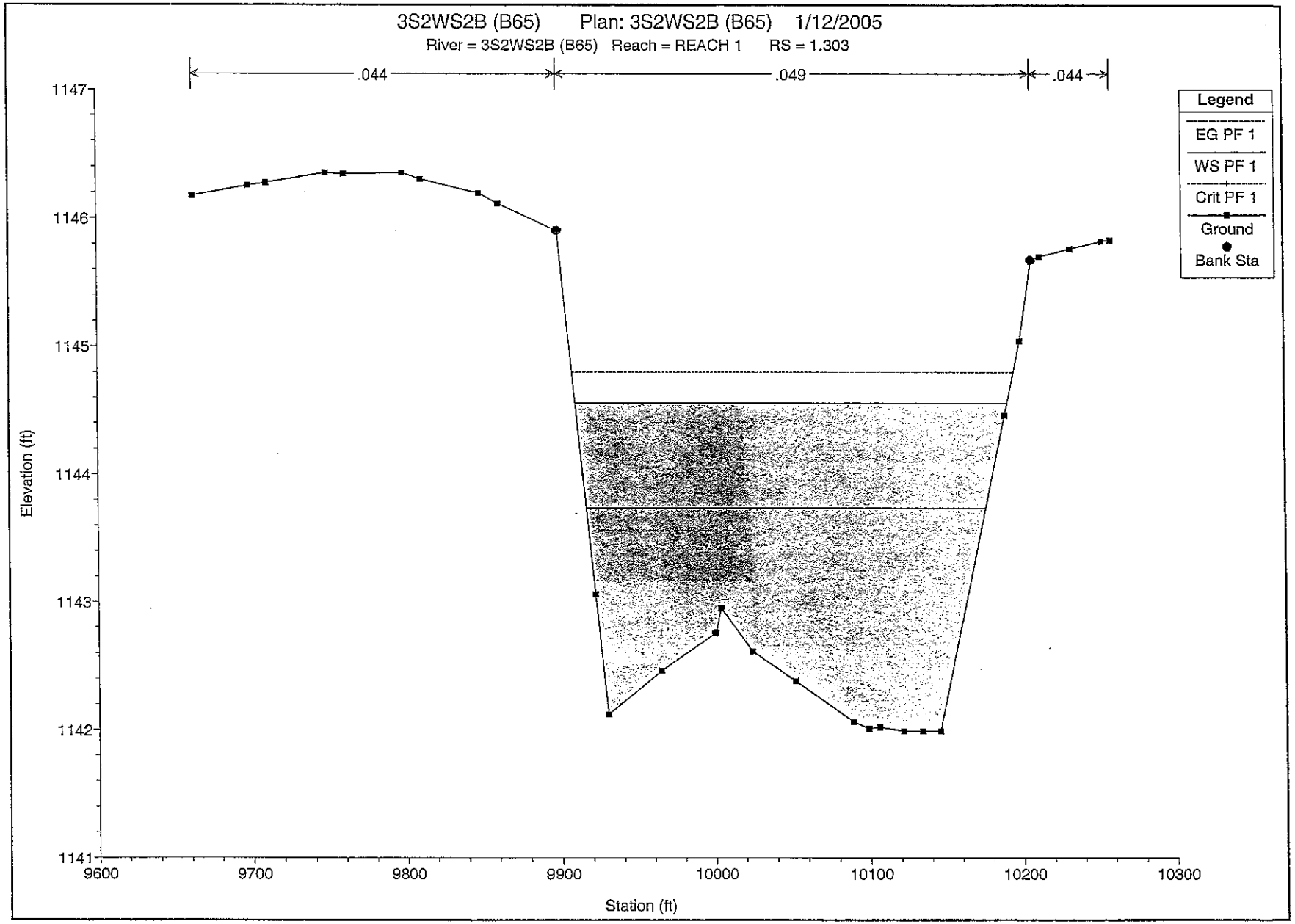

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 3 RS = 0.315
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1119
1118
1117
1116
1115
1114
9200
9400
9600
9800
10000
10200
10400
Station (ft)

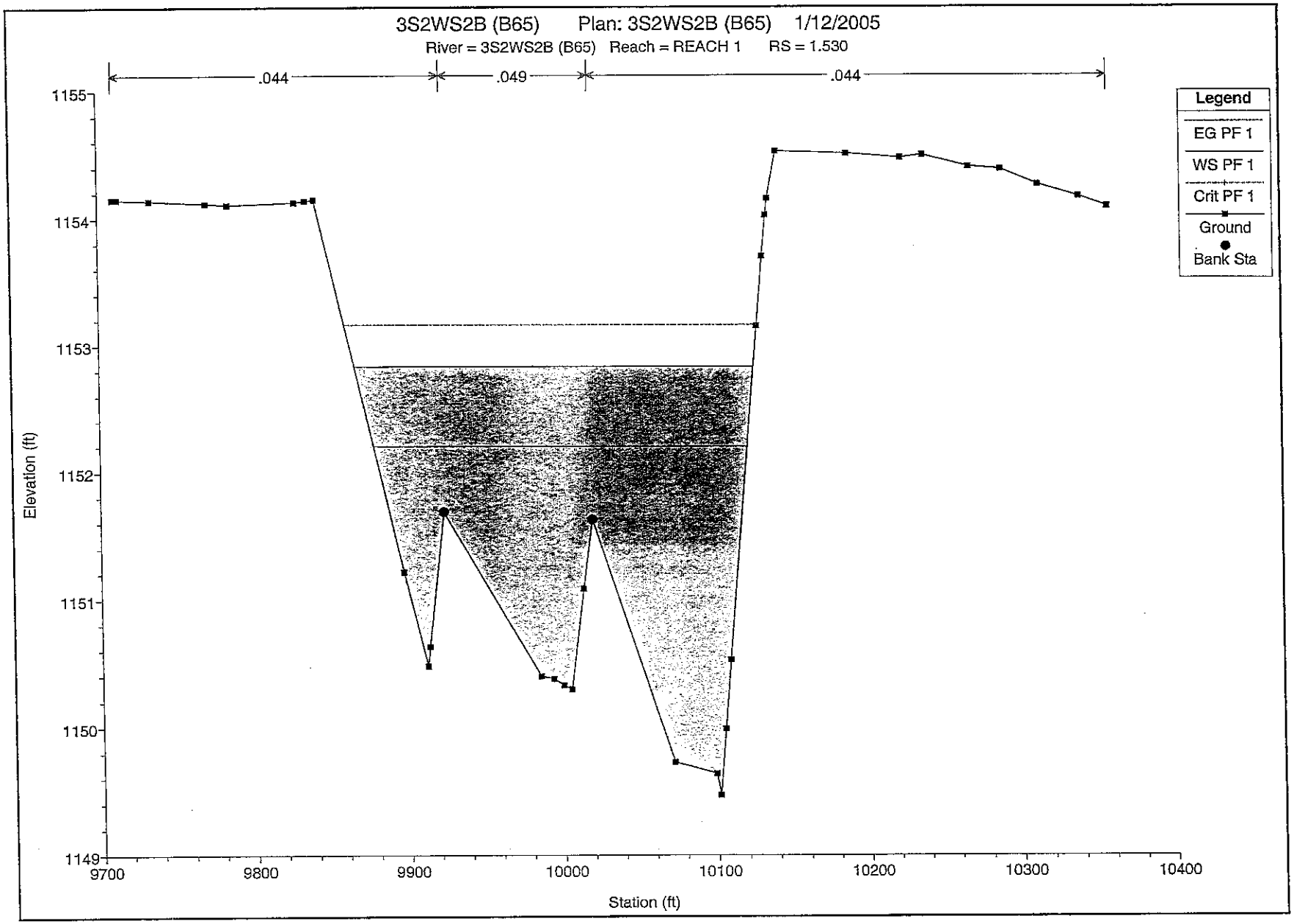

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 2 RS = 0.432
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1122
1121
1120
1119
1118
1117
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

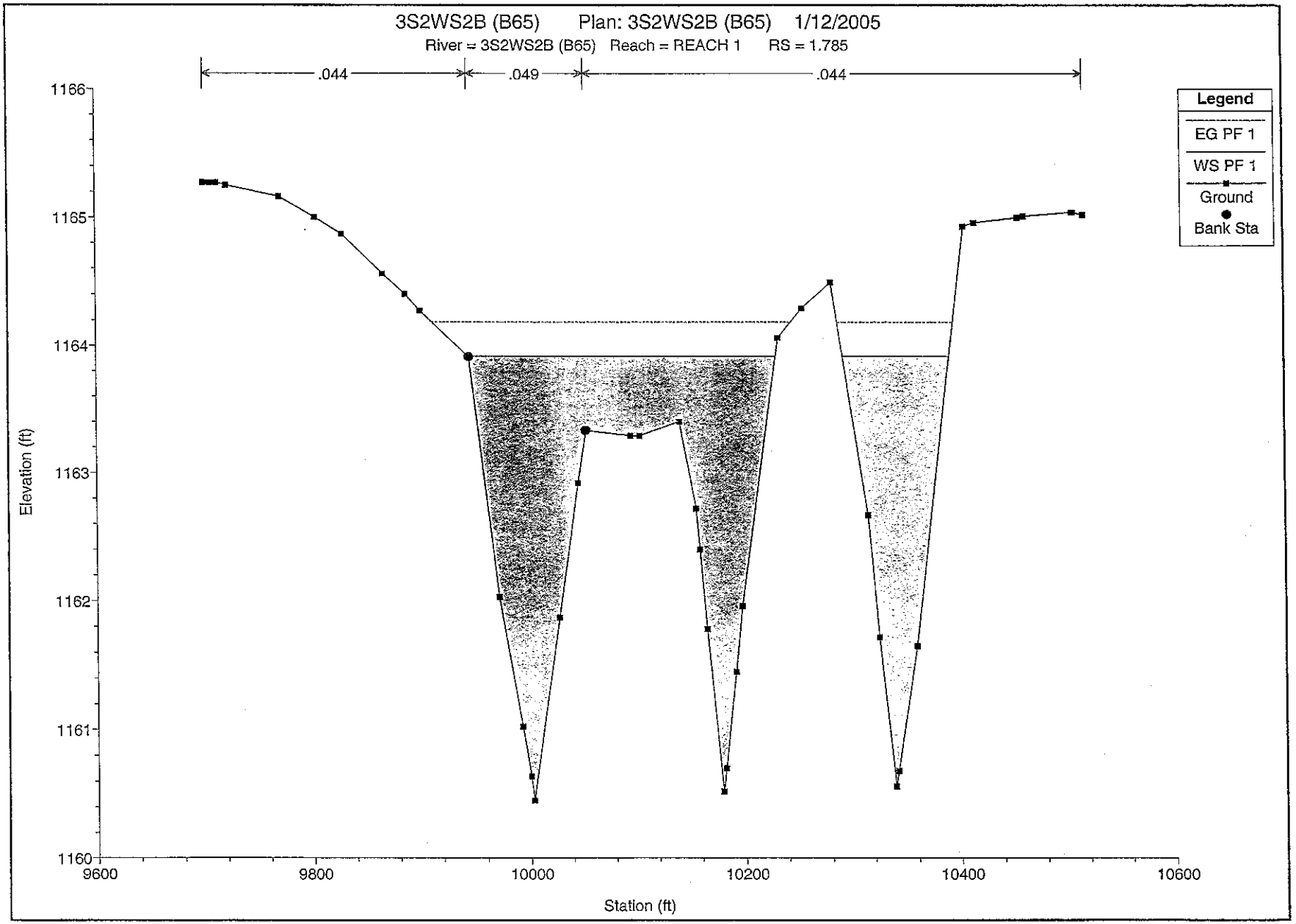

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 2 RS = 0.630
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1127
1126
1125
1124
1123
1122
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

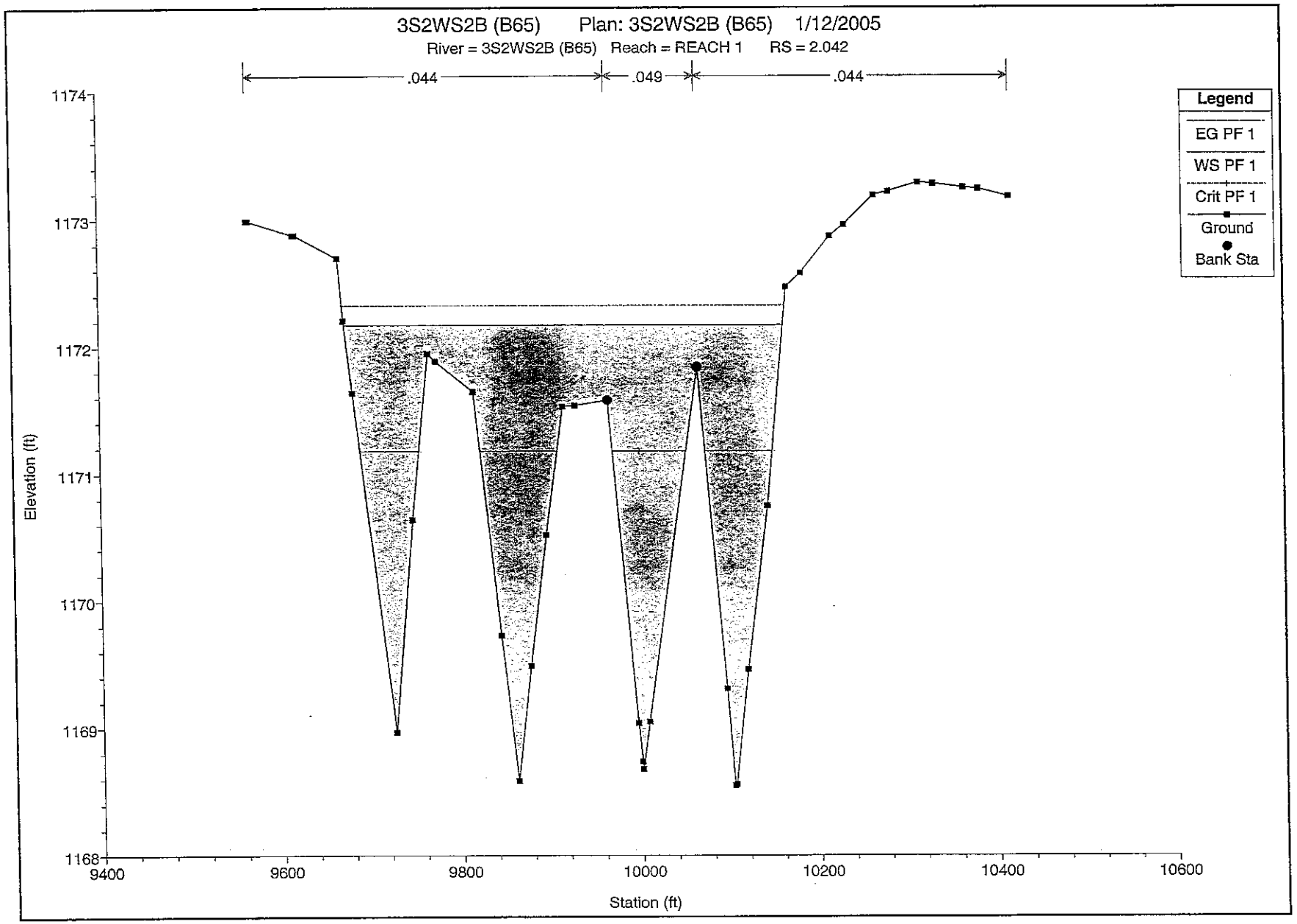

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 2 RS = 0.823 Approximately 1150' downstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1133
1132
1131
1130
1129
1128
1127
9400
9600
9800
10000
10200
10400
10600
Station (ft)

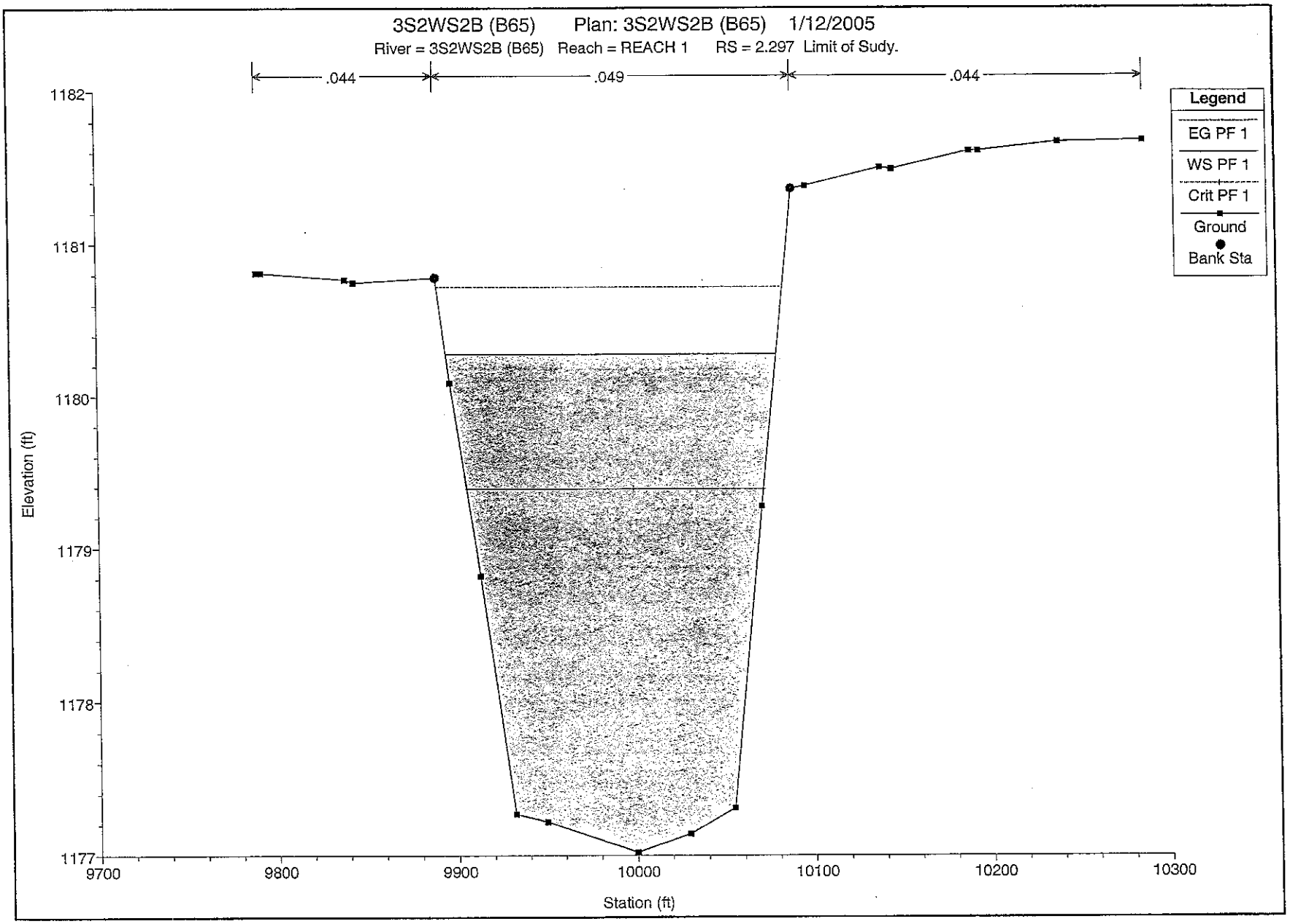

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 1 RS = 1.085 Approximately 200' upstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1140
1139
1138
1137
1136
1135
1134
1133
9400
9600
9800
10000
10200
10400
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 1 RS = 1.303
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1147
1146
1145
1144
1143
1142
1141
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 1 RS = 1.530
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1155
1154
1153
1152
1151
1150
1149
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 1 RS = 1.785
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1166
1165
1164
1163
1162
1161
1160
9600
9800
10000
10200
10400
10600
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 1 RS = 2.042
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1174
1173
1172
1171
1170
1169
1168
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2B (B65) Reach = REACH 1 RS = 2.297 Limit of Sudy.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1182
1181
1180
1179
1178
1177
9700
9800
9900
10000
10100
10200
10300
Station (ft)

MODEL: 3S2WS2B (B65)

REACH: 3S2WS1 (B54)

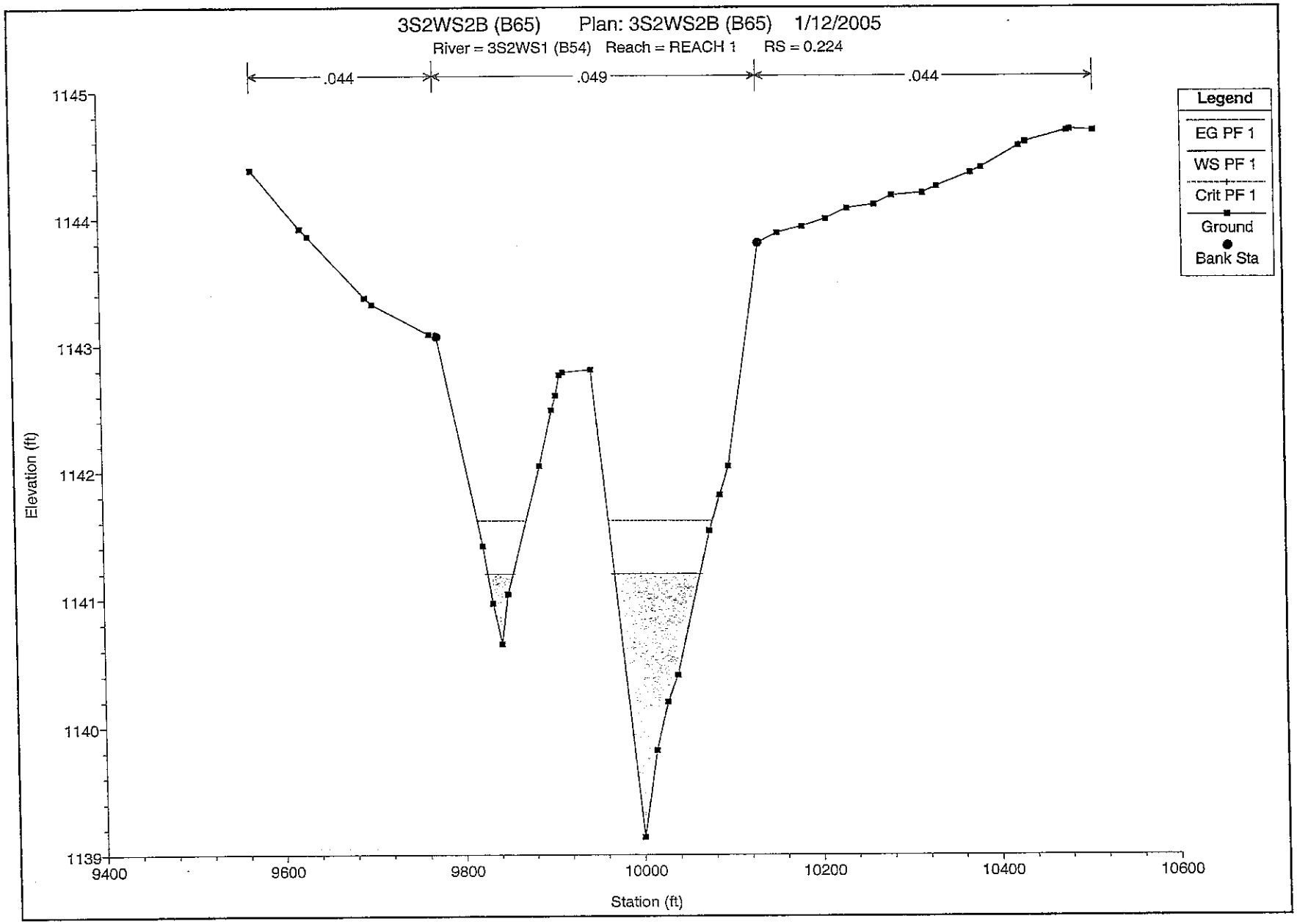
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

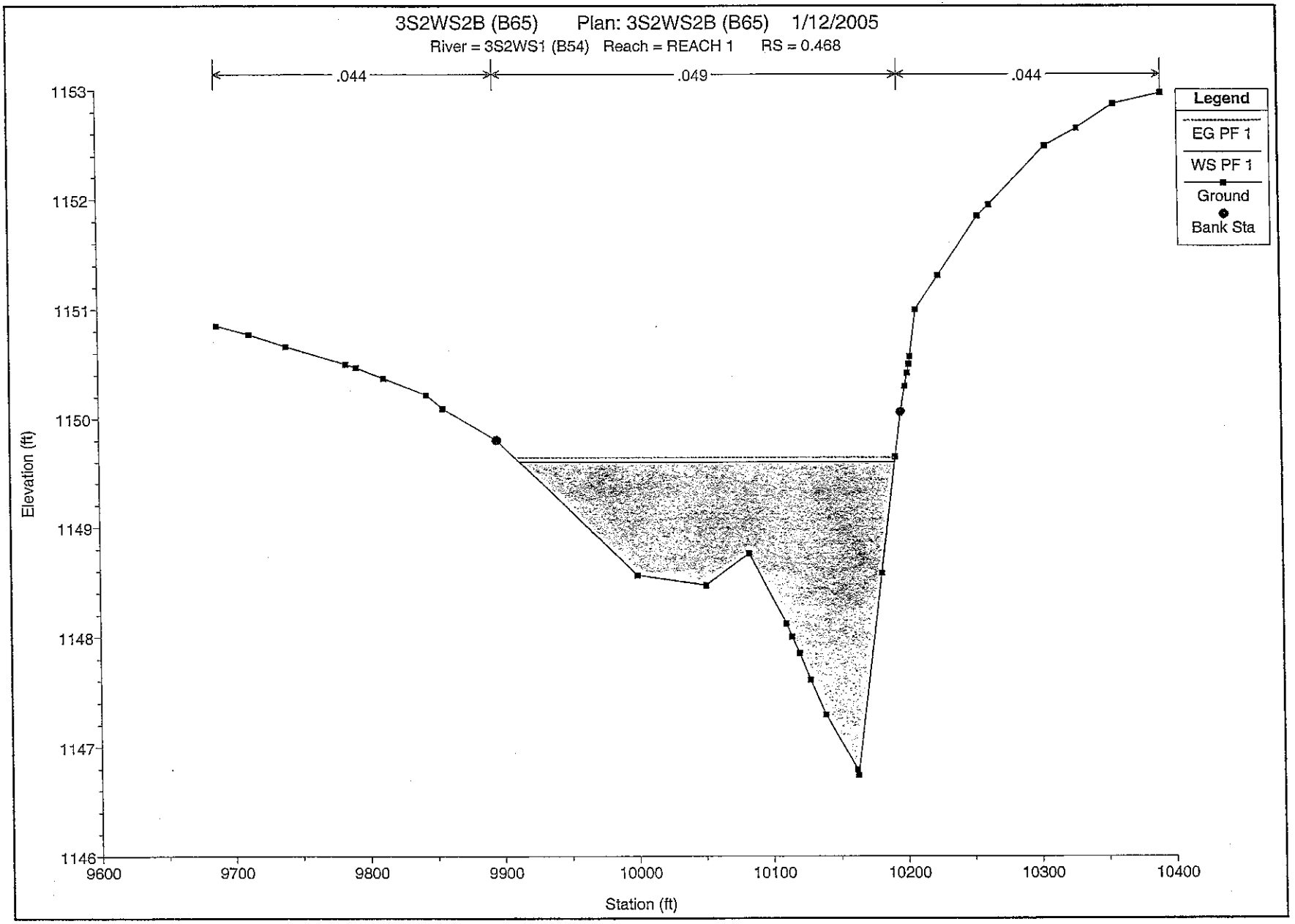
Change in Discharge based on Reach Length

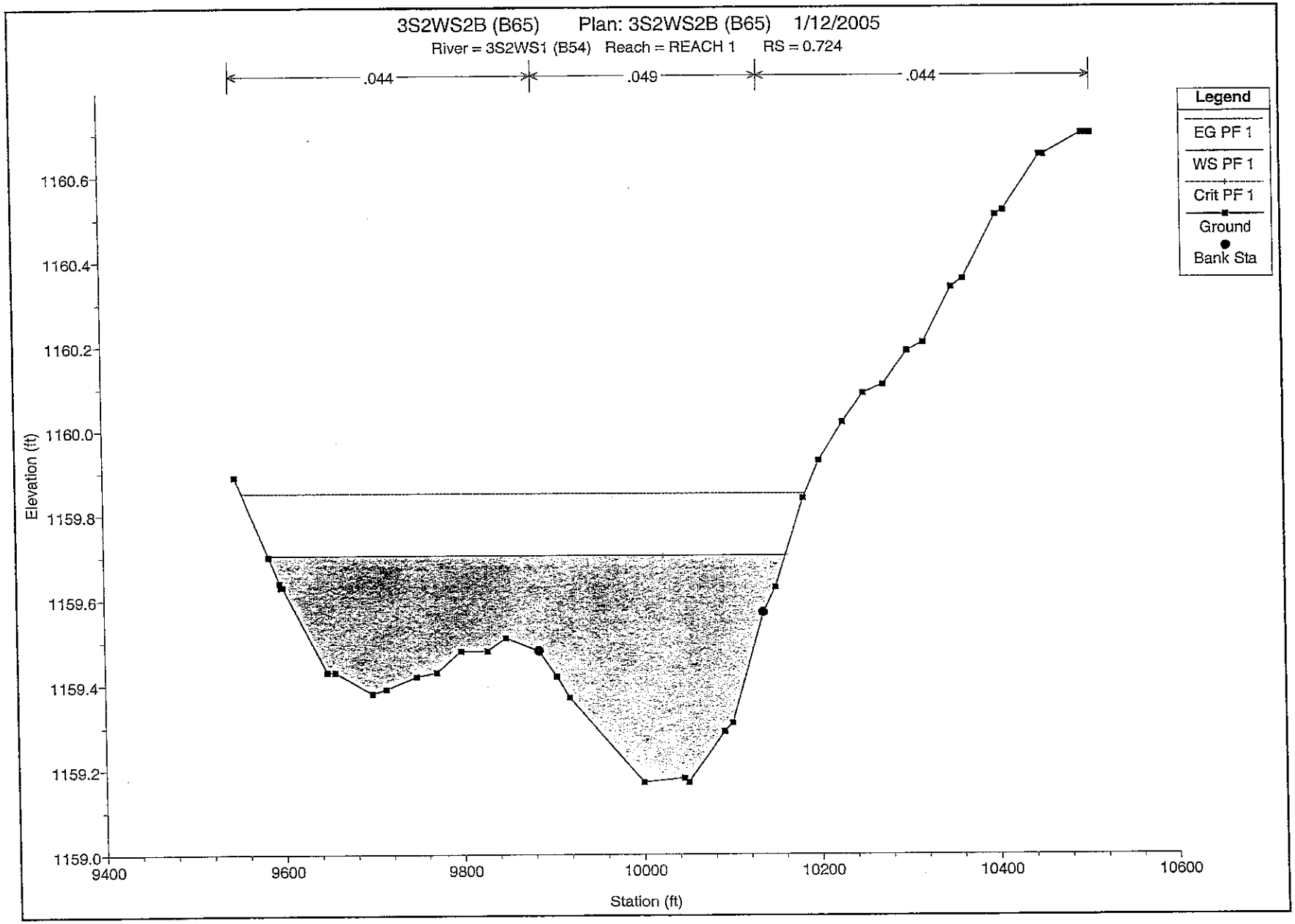
Wash ID: 3S2WS1 (B54)

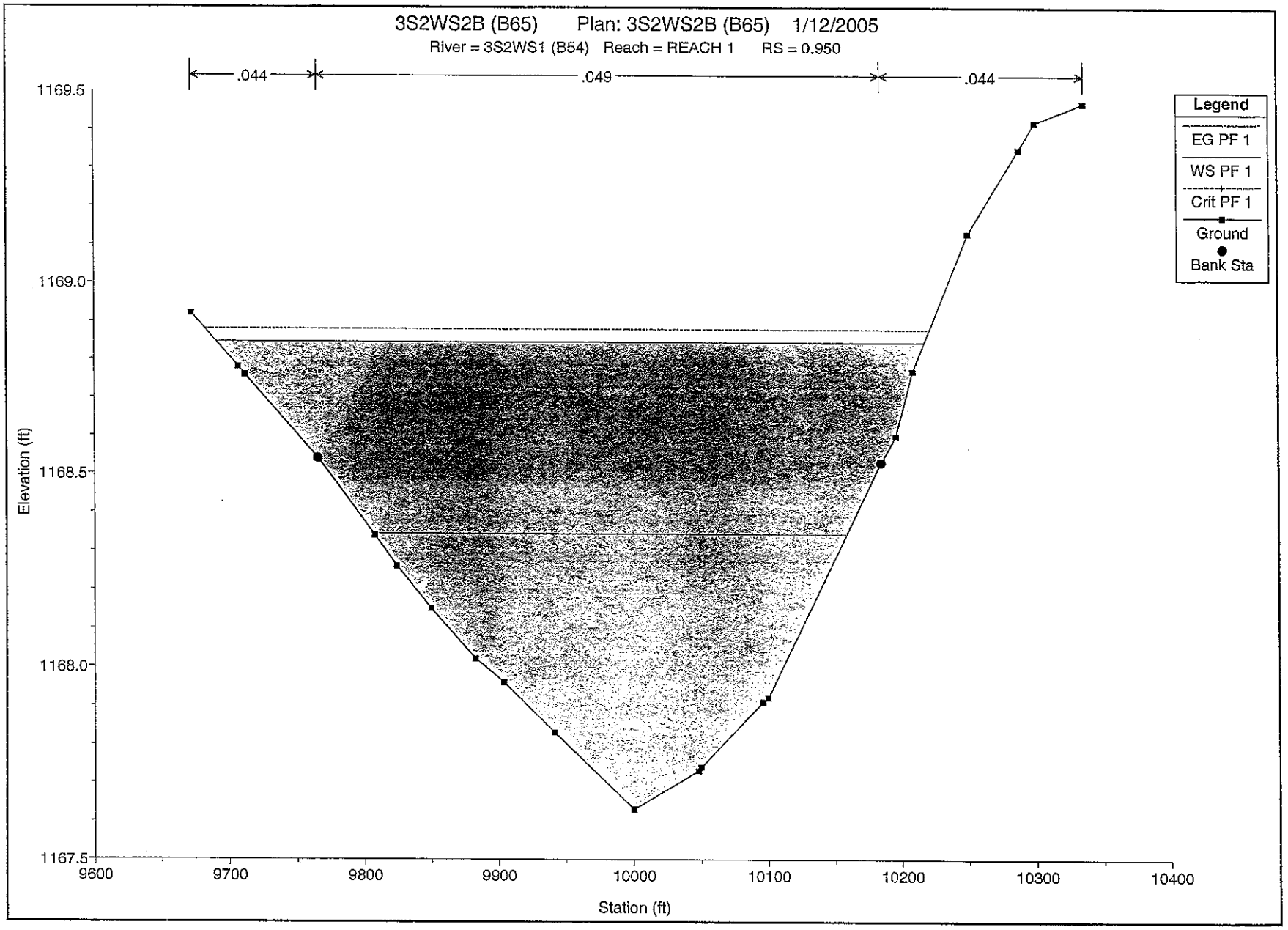
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
DRB03B	2.950	542	540	500
B18	1.702	534	530	500
B18	1.453	532	530	500
B18	1.132	530	530	500
B18	0.950	528	530	500
B18	0.724	527	530	500
B18	0.468	525	530	500
B18	0.224	524	520	500
CPB18	0.000	522	520	500

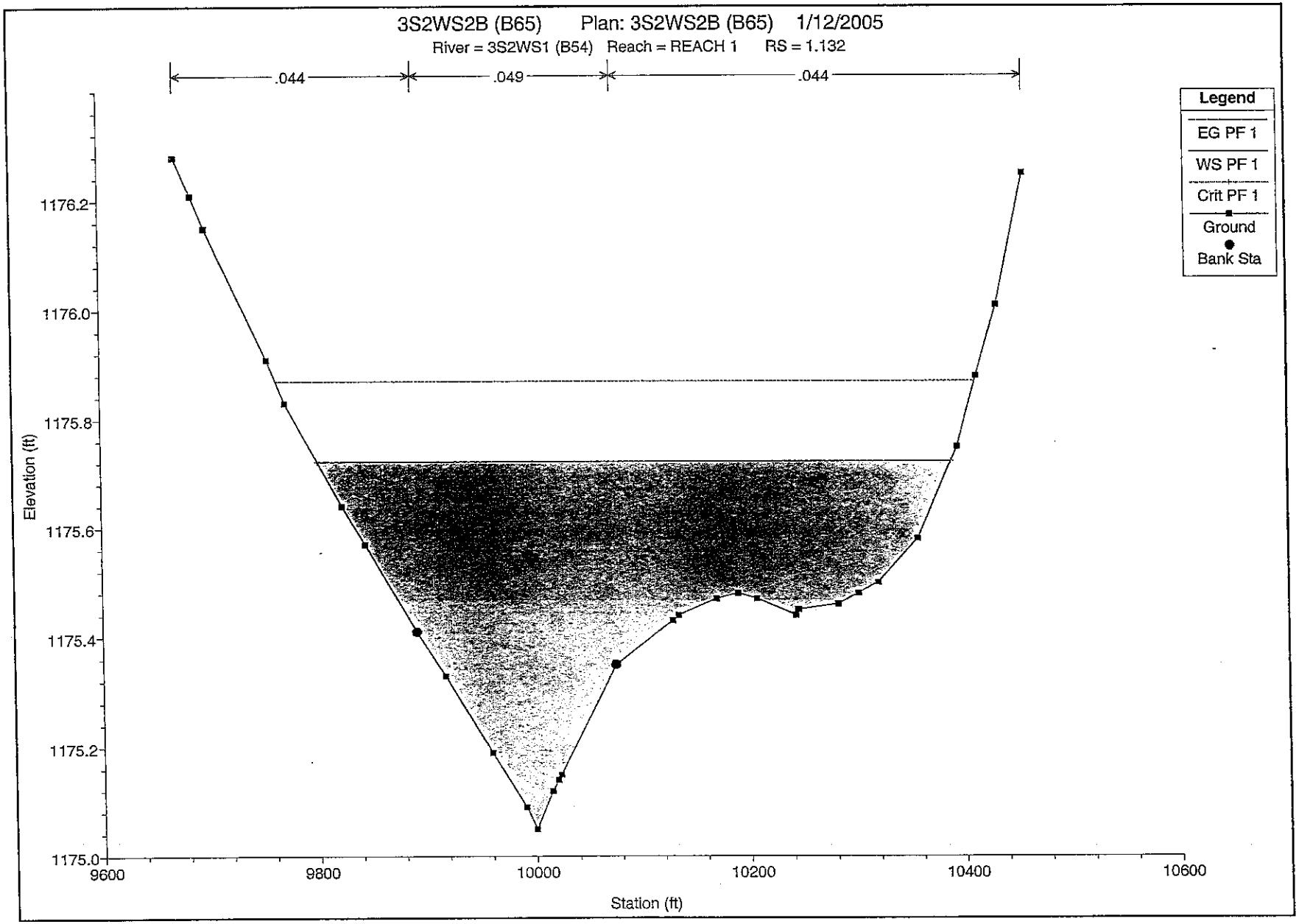
1. X-section 0.000 does not exist in HEC-RAS. Used to model more accurate discharges.
2. X-section 2.950 does not exist in HEC-RAS. Used to model discharge between concentration points.

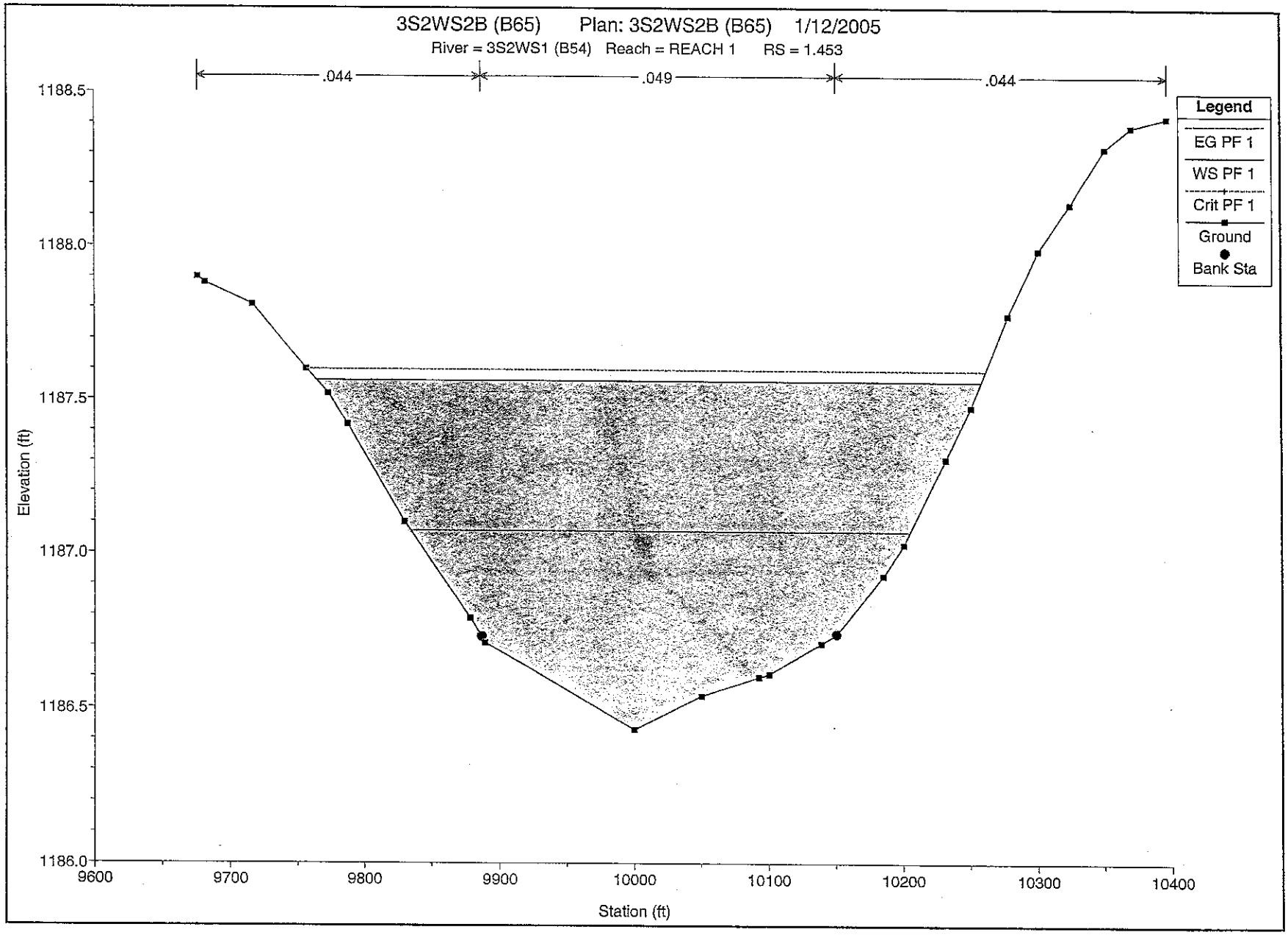

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 0.224
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1145
1144
1143
1142
1141
1140
1139
9400
9600
9800
10000
10200
10400
10600
Station (ft)

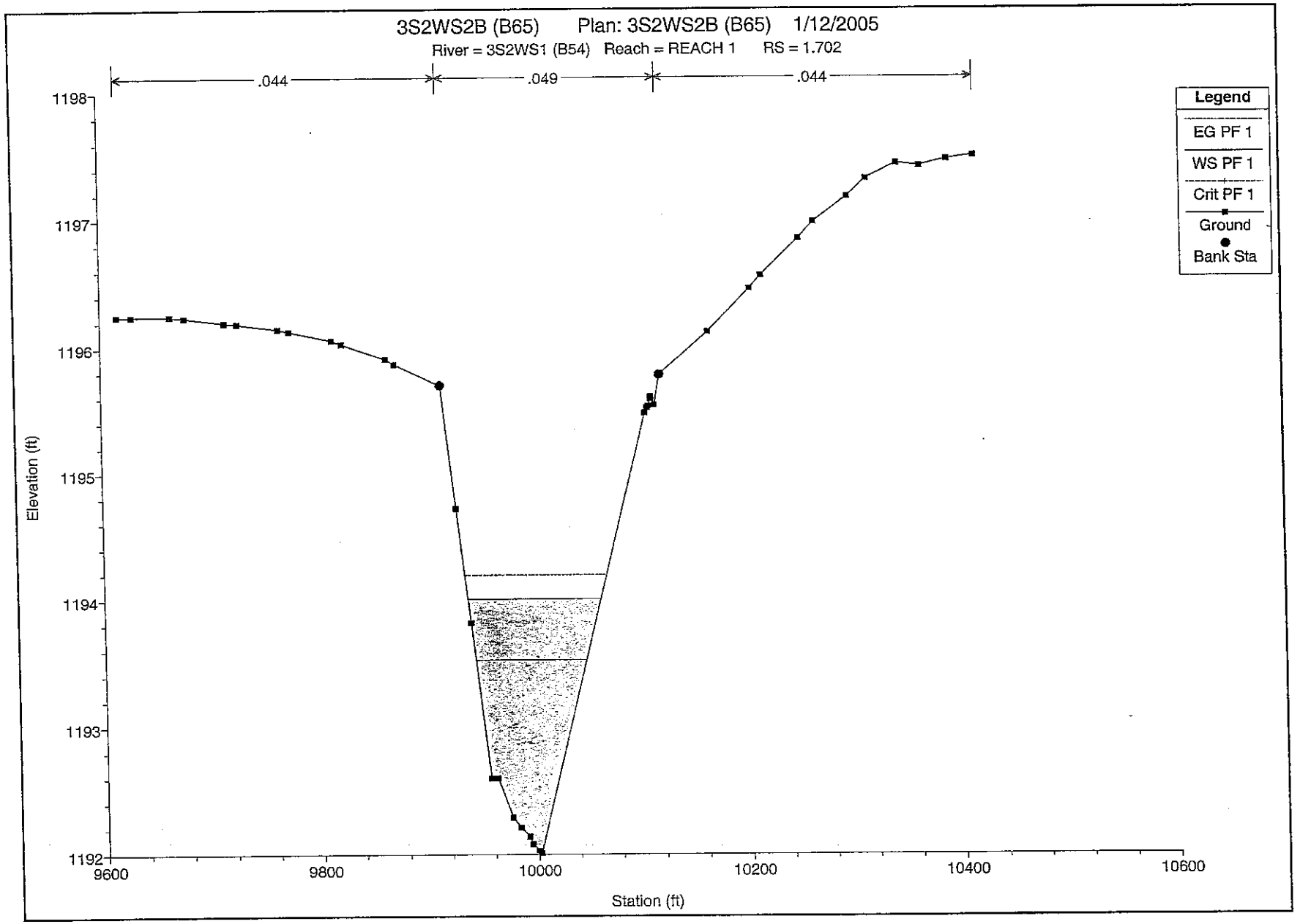

3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 0.468
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1153
1152
1151
1150
1149
1148
1147
1146
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 0.724
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1160.6
1160.4
1160.2
1160.0
1159.8
1159.6
1159.4
1159.2
1159.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 0.950
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1169.5
1169.0
1168.5
1168.0
1167.5
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 1.132
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1176.2
1176.0
1175.8
1175.6
1175.4
1175.2
1175.0
9600
9800
10000
10200
10400
10600
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 1.453
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1188.5
1188.0
1187.5
1187.0
1186.5
1186.0
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS1 (B54) Reach = REACH 1 RS = 1.702
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1198
1197
1196
1195
1194
1193
1192
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 3S2WS2B (B65)

REACH: 3S2WS2C (B38)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

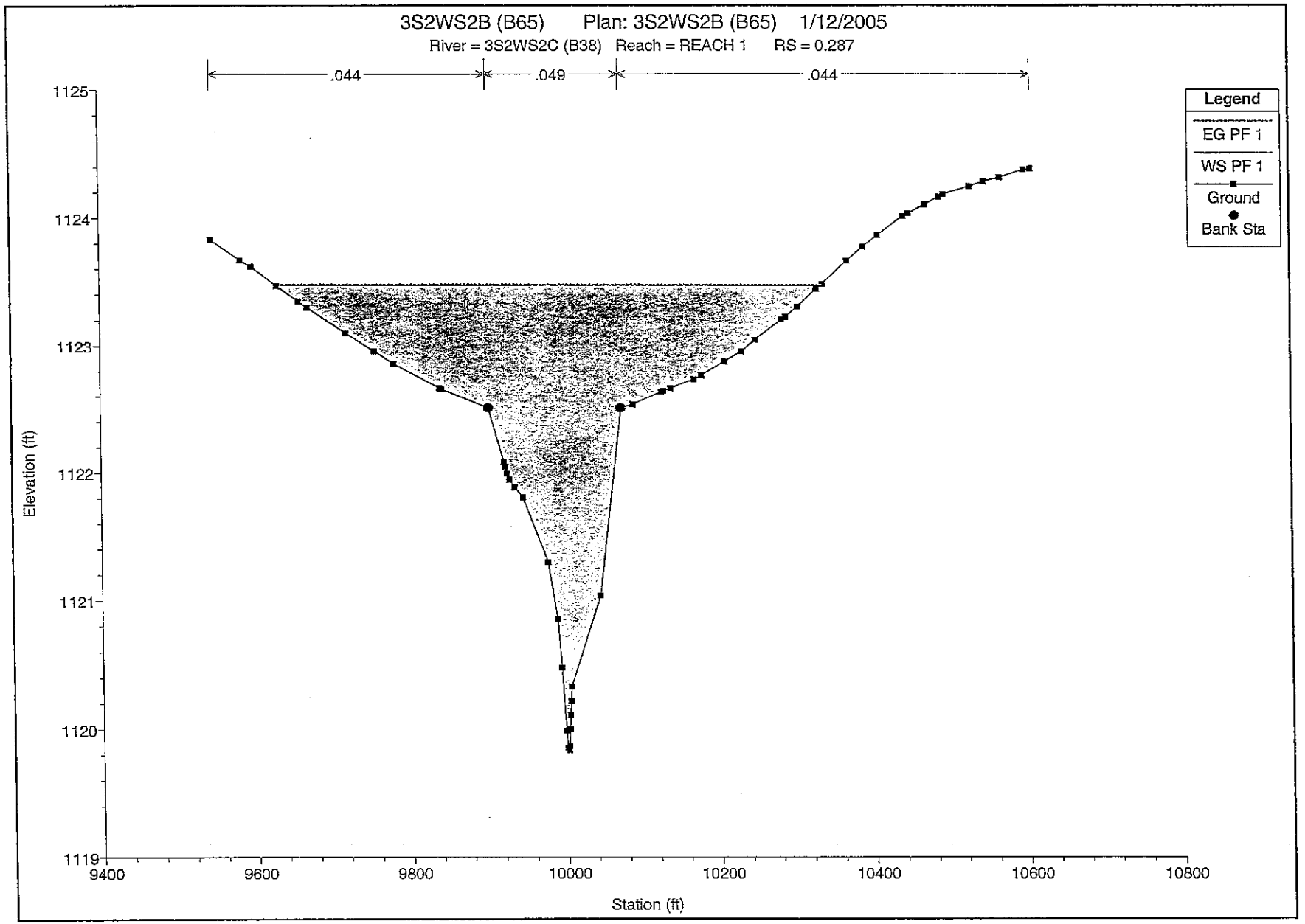
Wash ID: 3S2WS2C (B38)

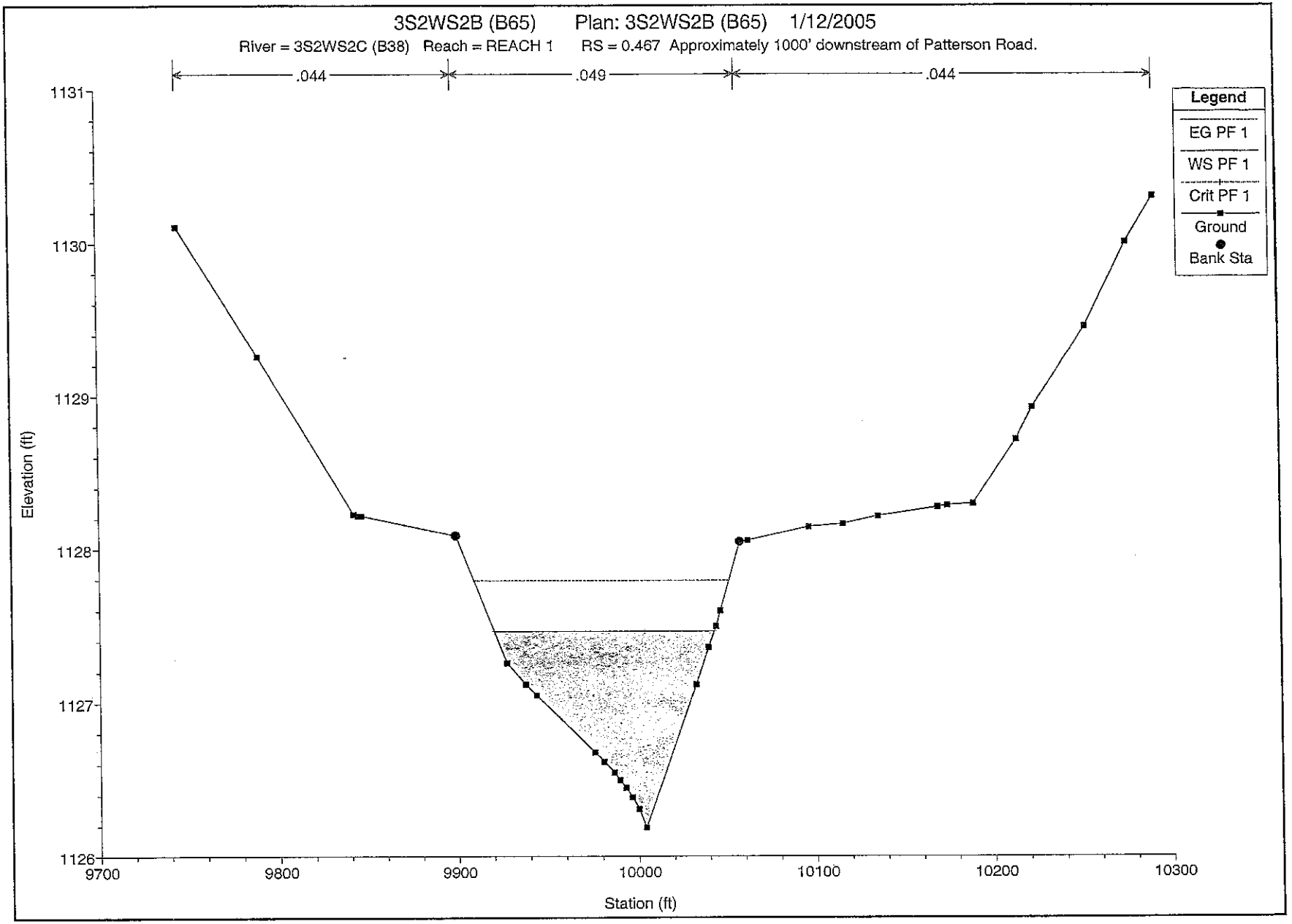
Subbasin: B38

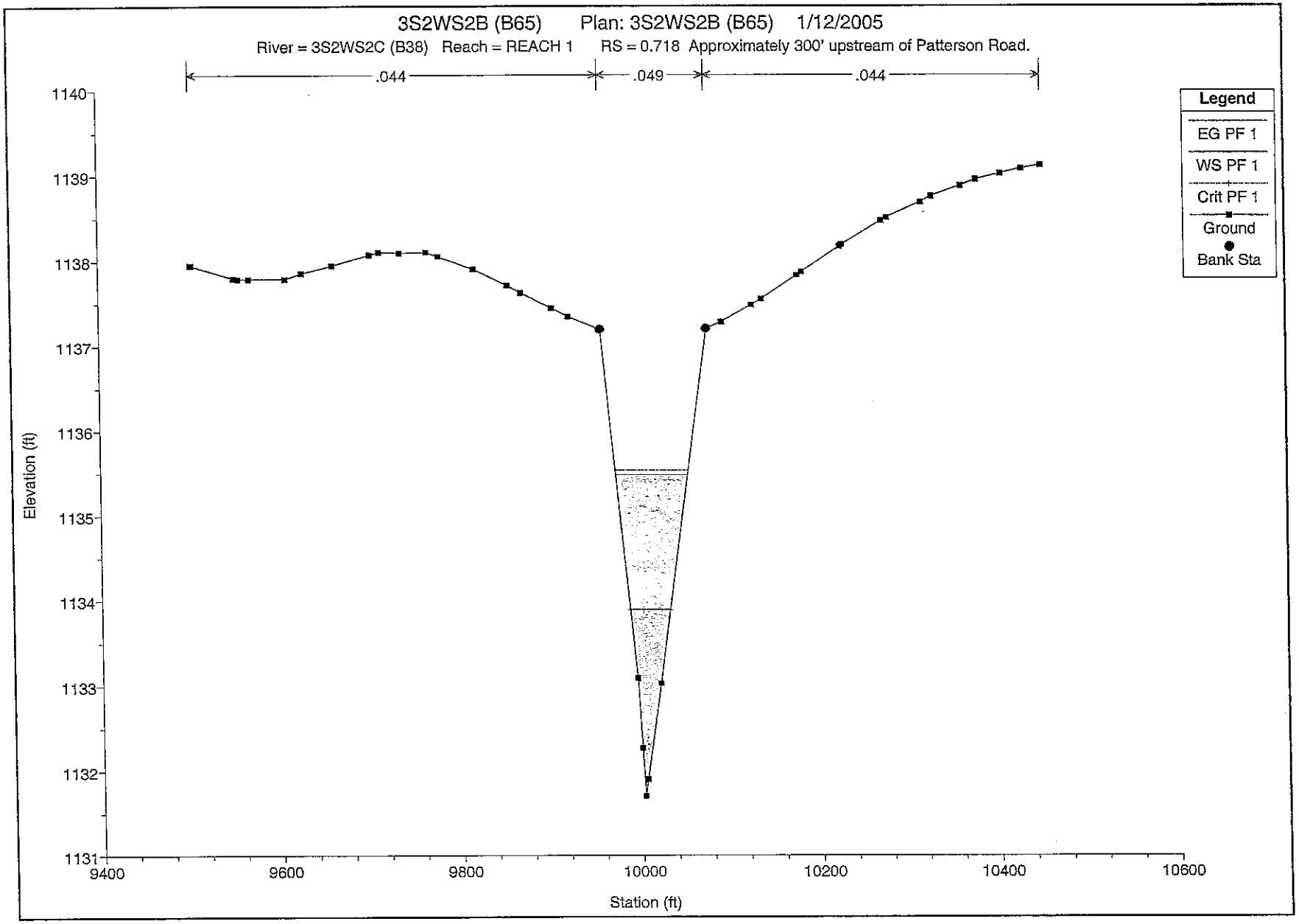
Total Discharge (cfs) = 543

Total Area (acres) = 296

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.718	153	51.8	280
0.467	195	65.9	360
0.287	230	77.7	420


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2C (B38) Reach = REACH 1 RS = 0.287
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1125
1124
1123
1122
1121
1120
1119
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2C (B38) Reach = REACH 1 RS = 0.467 Approximately 1000' downstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1131
1130
1129
1128
1127
1126
9700
9800
9900
10000
10100
10200
10300
Station (ft)


3S2WS2B (B65) Plan: 3S2WS2B (B65) 1/12/2005
River = 3S2WS2C (B38) Reach = REACH 1 RS = 0.718 Approximately 300' upstream of Patterson Road.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1140
1139
1138
1137
1136
1135
1134
1133
1132
1131
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: 4S1ES21 (E45)

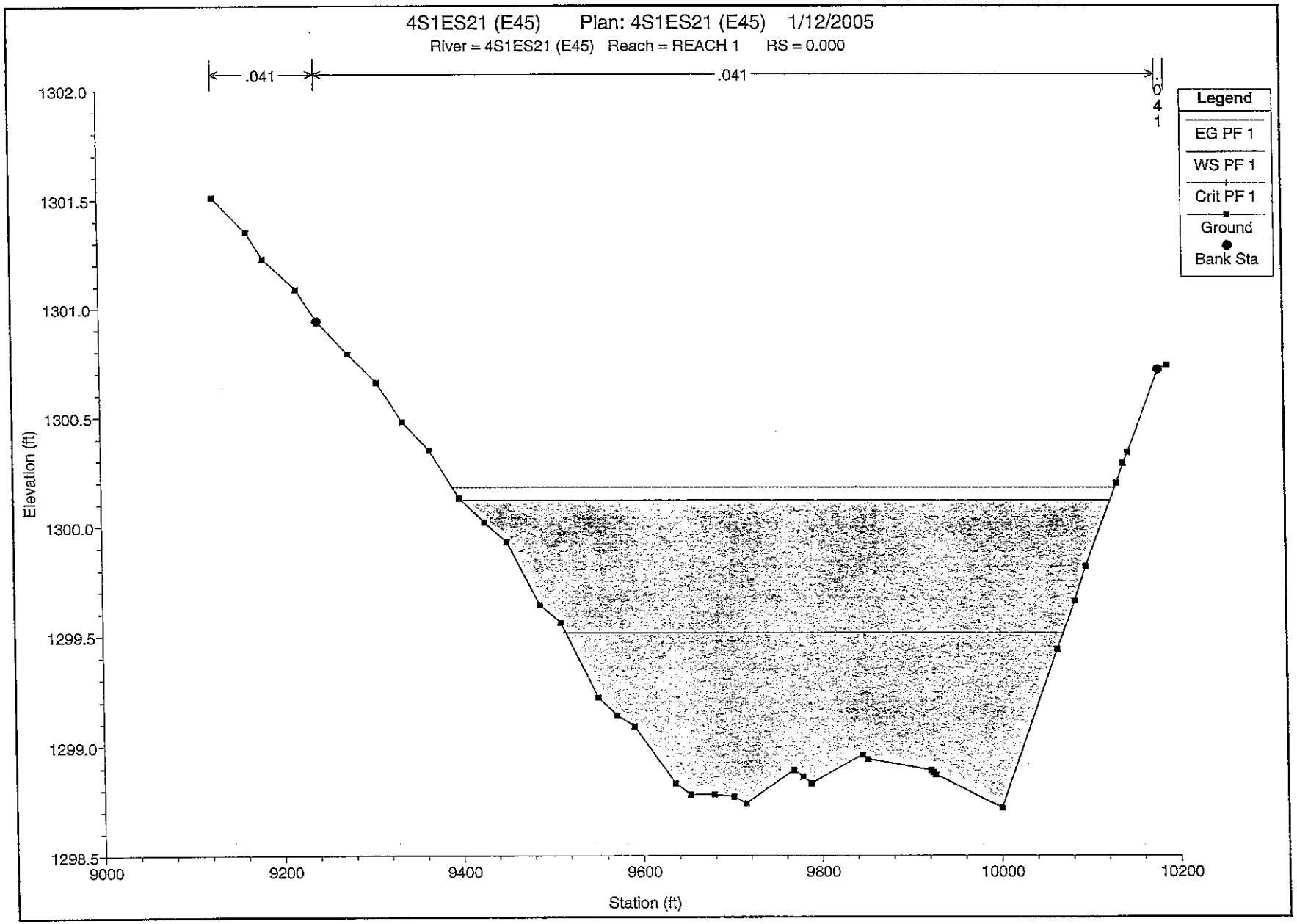
REACH: 4S1ES21 (E45)

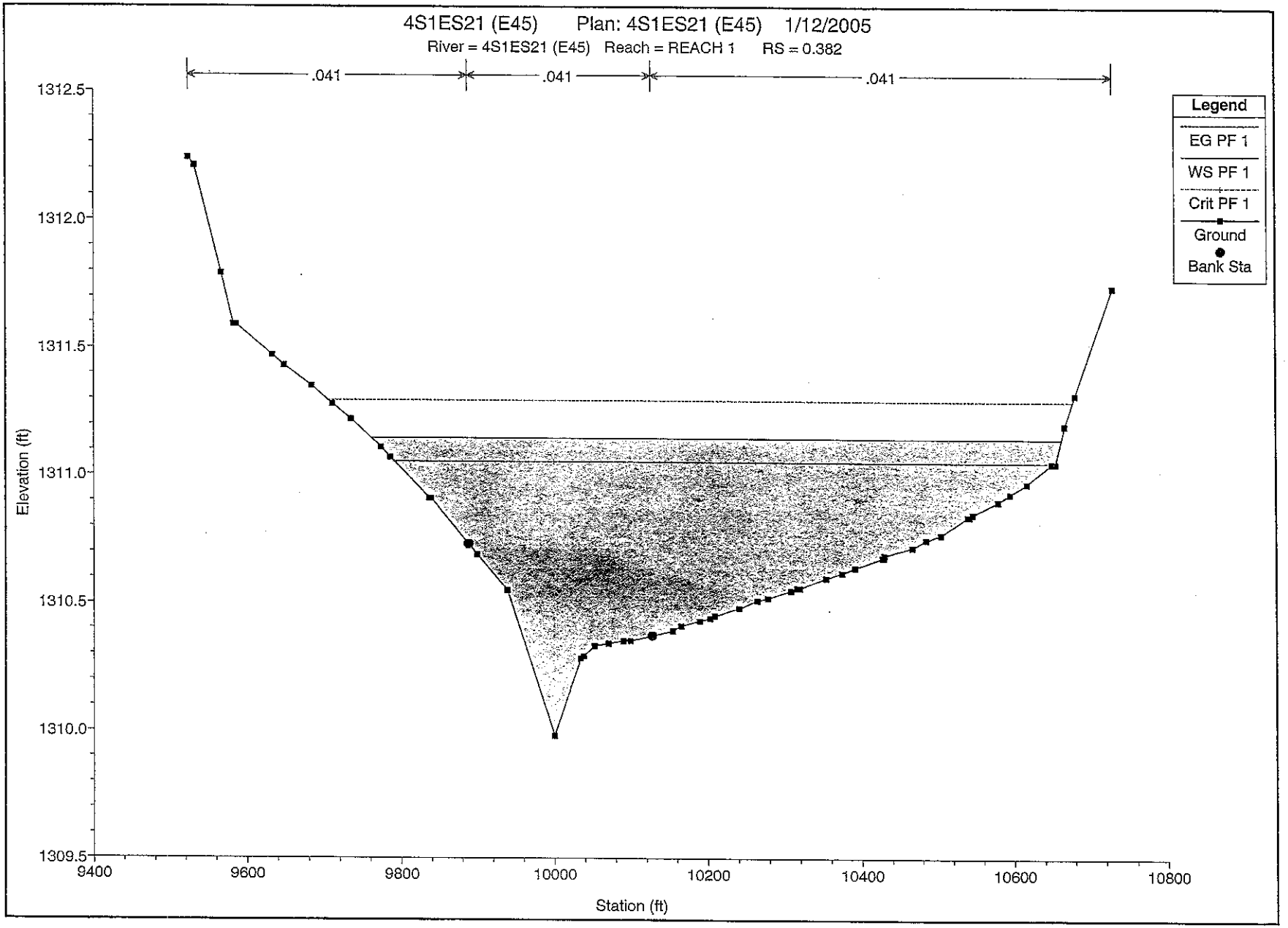
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

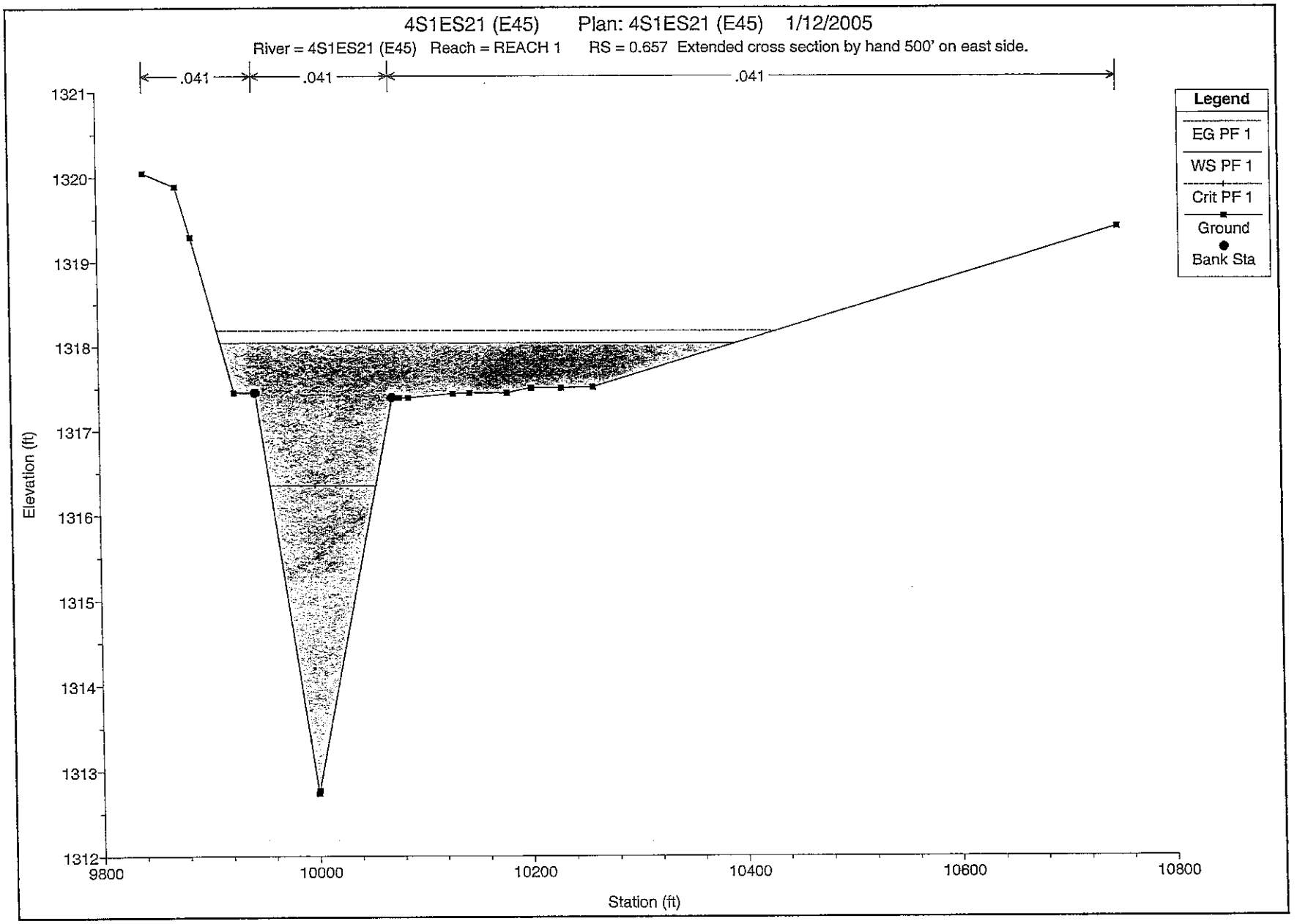
Change in Discharge based on Reach Length

Wash ID: 4S1ES21 (E45)

The discharge used for the cross-sections was DVE25 from the with railroad model.
The discharge used at all cross-sections is 1370 cfs.


4S1ES21 (E45) Plan: 4S1ES21 (E45) 1/12/2005
River = 4S1ES21 (E45) Reach = REACH 1 RS = 0.000
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1302.0
1301.5
1301.0
1300.5
1300.0
1299.5
1299.0
1298.5
9000
9200
9400
9600
9800
10000
10200
Station (ft)


4S1ES21 (E45) Plan: 4S1ES21 (E45) 1/12/2005
River = 4S1ES21 (E45) Reach = REACH 1 RS = 0.382
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1312.5
1312.0
1311.5
1311.0
1310.5
1310.0
1309.5
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


4S1ES21 (E45) Plan: 4S1ES21 (E45) 1/12/2005
River = 4S1ES21 (E45) Reach = REACH 1 RS = 0.657 Extended cross section by hand 500' on east side.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1321
1320
1319
1318
1317
1316
1315
1314
1313
1312
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: 4S1ES23 (F20)

REACH: 4S1ES23 (F20)

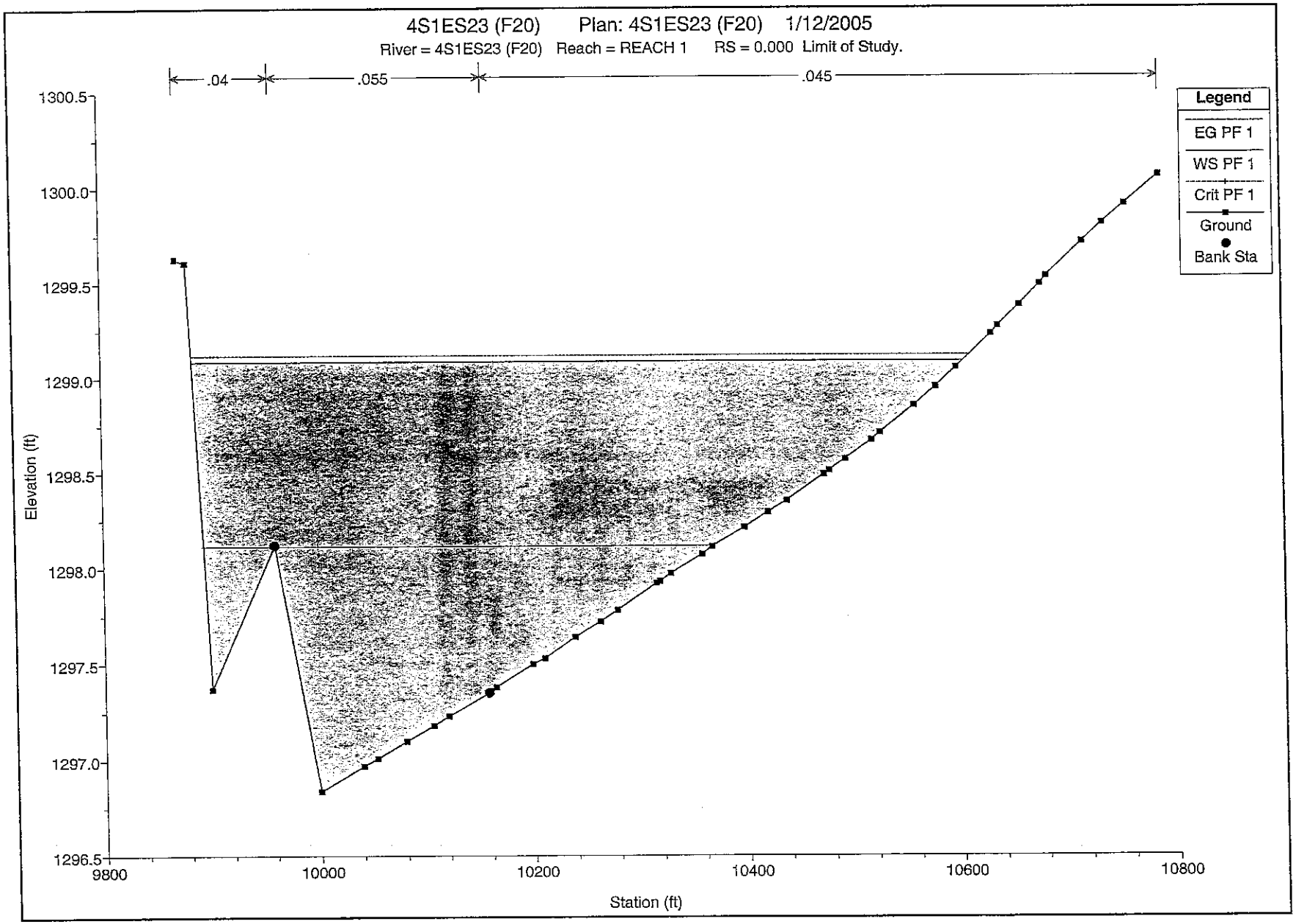
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

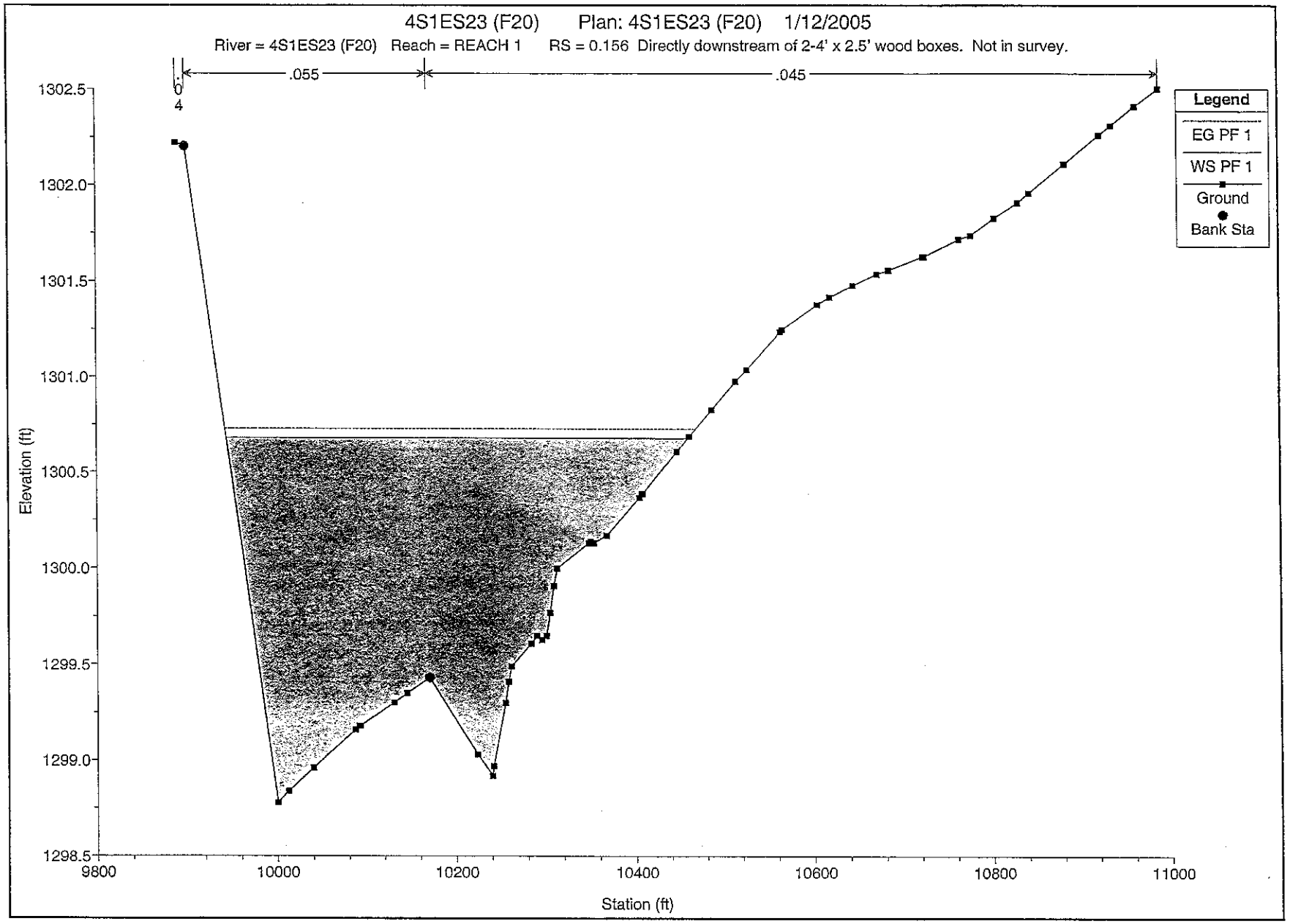
Change in Discharge based on Reach Length

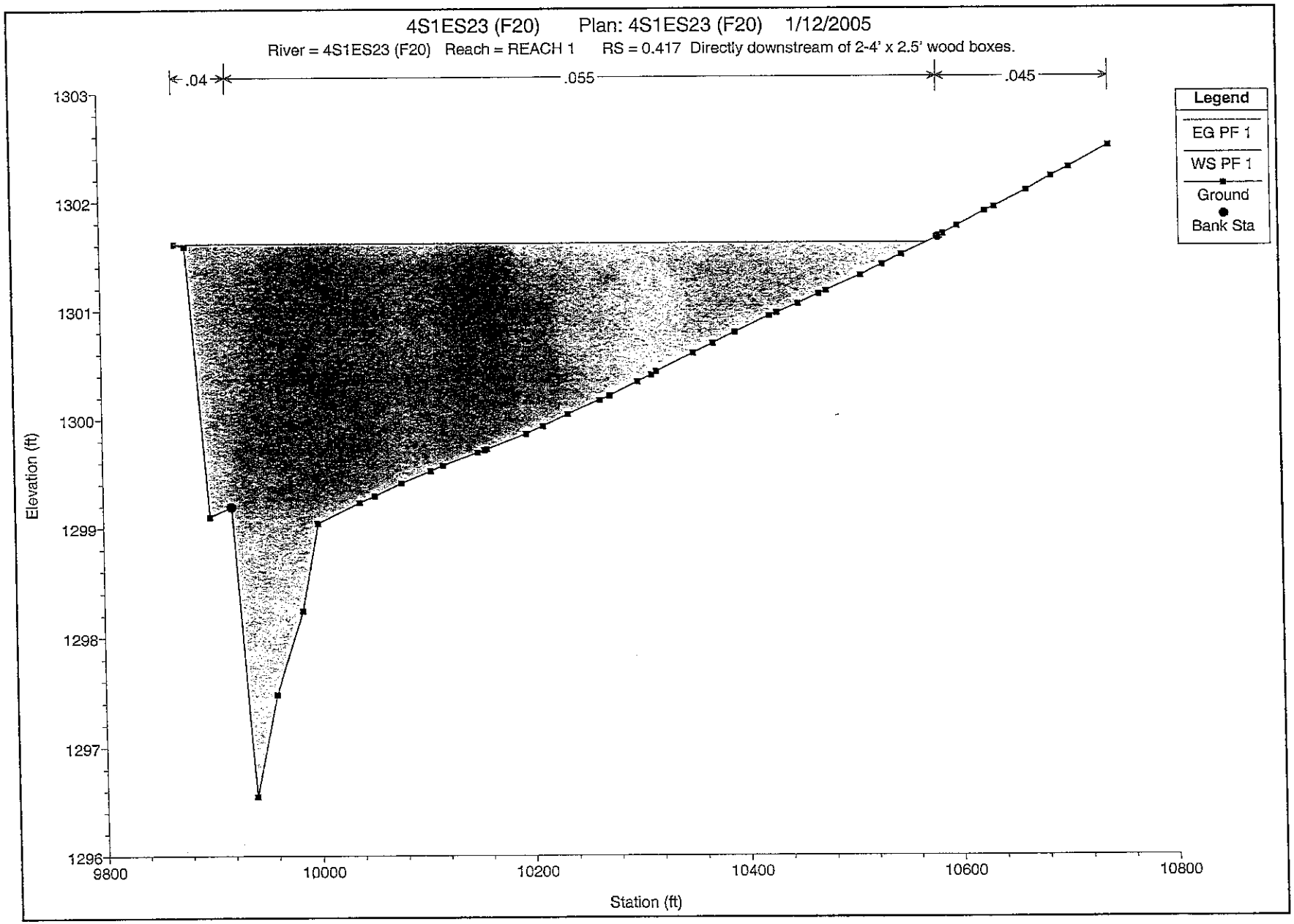
Wash ID: 4S1ES23 (F20)

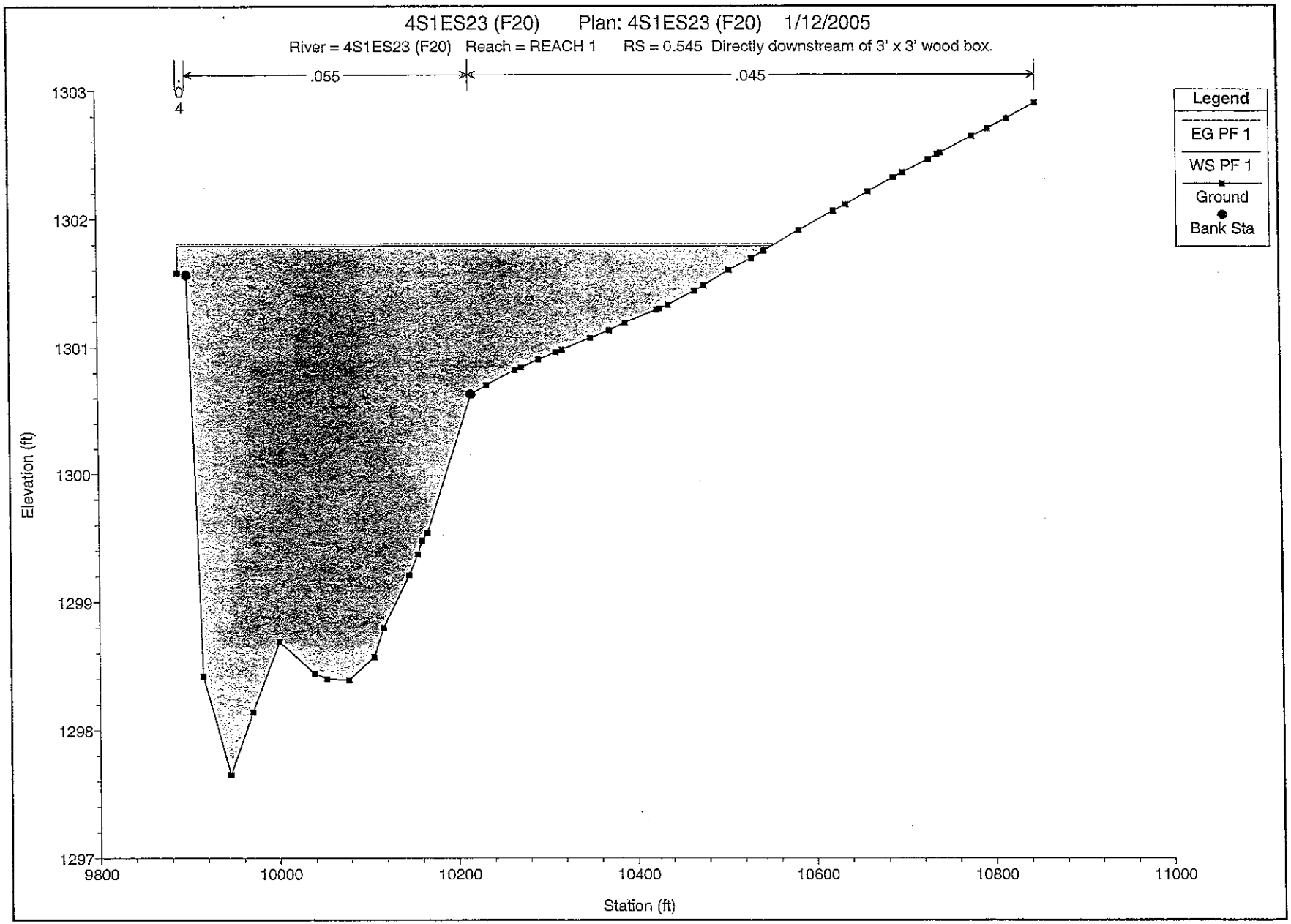
New Stream Mile	CP Divert	With Storage Discharge	Rounded
4.645	DE32	445	450
4.447	DE53	239	240
4.099	DE31	219	220
3.890	DE30	228	230
3.640	**	980	980
3.357	DE38	1823	1820
3.086	***	1823	1820
2.950	****	1799	1800
2.833	DE25	1050	1050
2.611	DE36	967	970
2.352	DE54	738	740
2.033	DF26	566	570
1.752	*	1947	1950
1.524	DF27	477	480
1.358	DF28A	115	120
1.132	DF28B	0	0
0.775	PNDF03	172	170
0.545	PNDF04	1101	1100
0.417	DF29	545	550
0.156	**	990	990
0.000	PNDF05	1256	1260

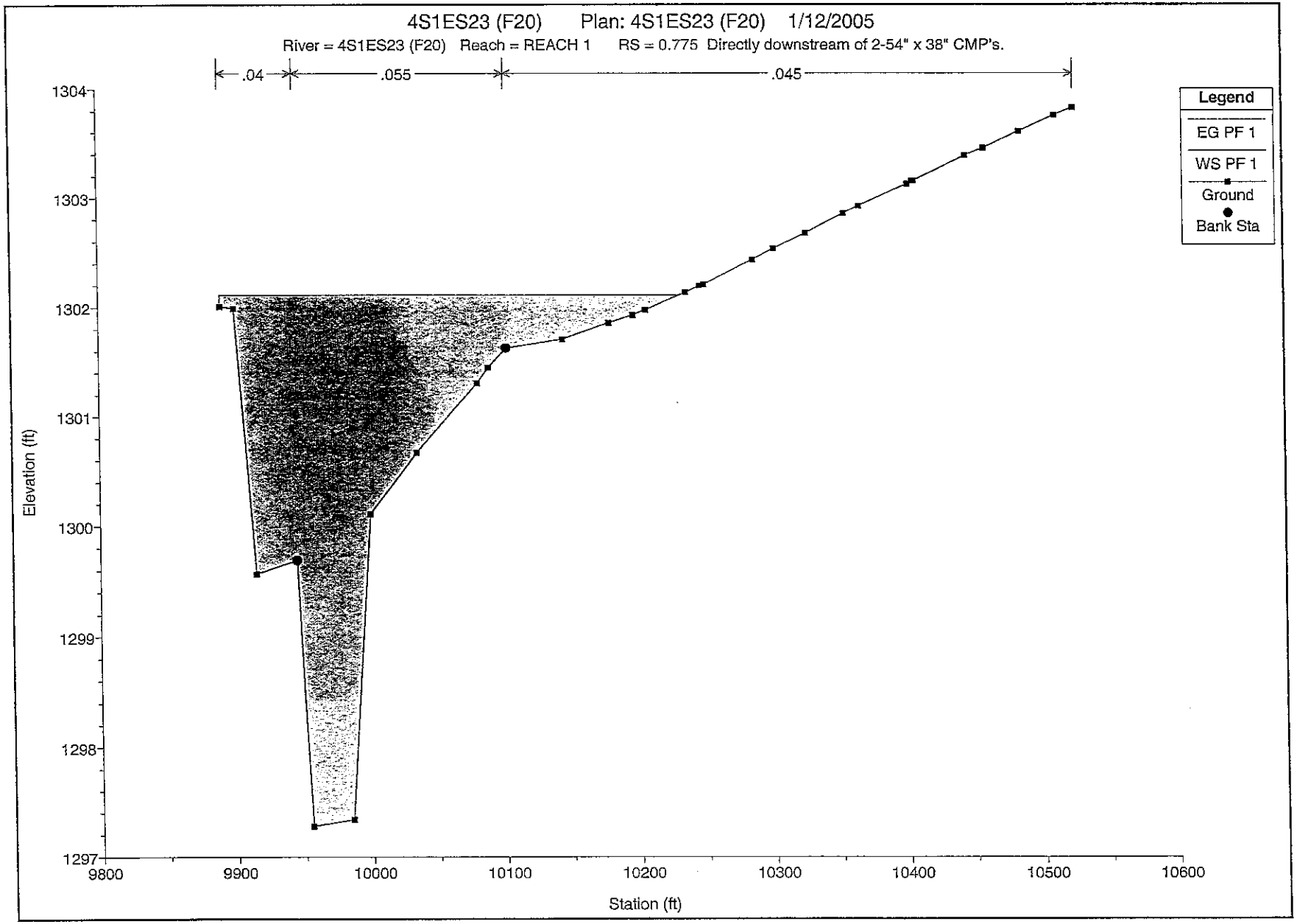
*PNDF01 (Q=2256) - Structure (Q=309) = 1947
**Used discharges based upon reach length
***There is no structure or significant inflow at cross section. Used discharge from previous cross section
****Used DI/DQ record for structure 32 to calculate what continued to the east based upon flow at CPE25.

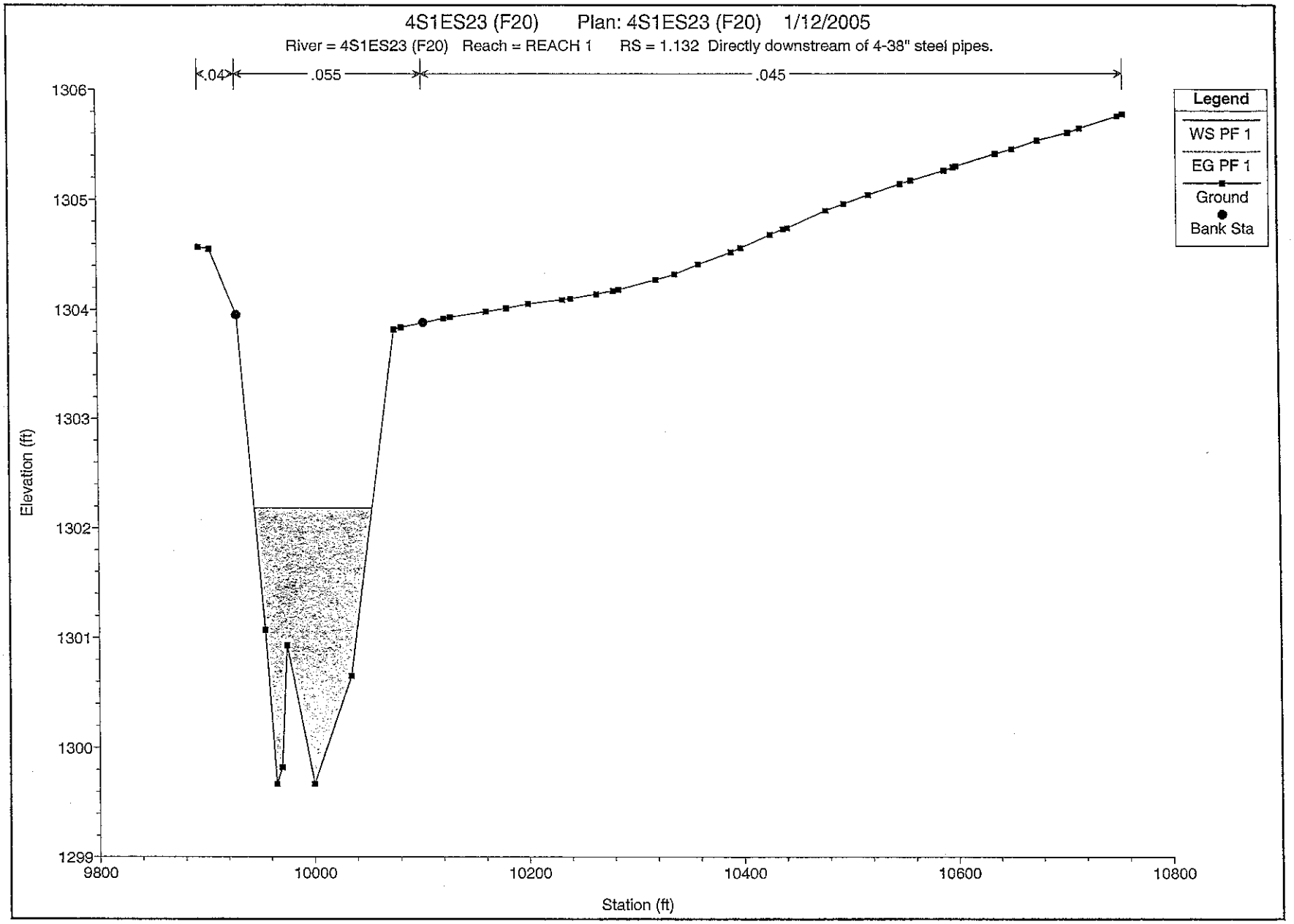

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 0.000 Limit of Study.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1300.5
1300.0
1299.5
1299.0
1298.5
1298.0
1297.5
1297.0
1296.5
9800
10000
10200
10400
10600
10800
Station (ft)

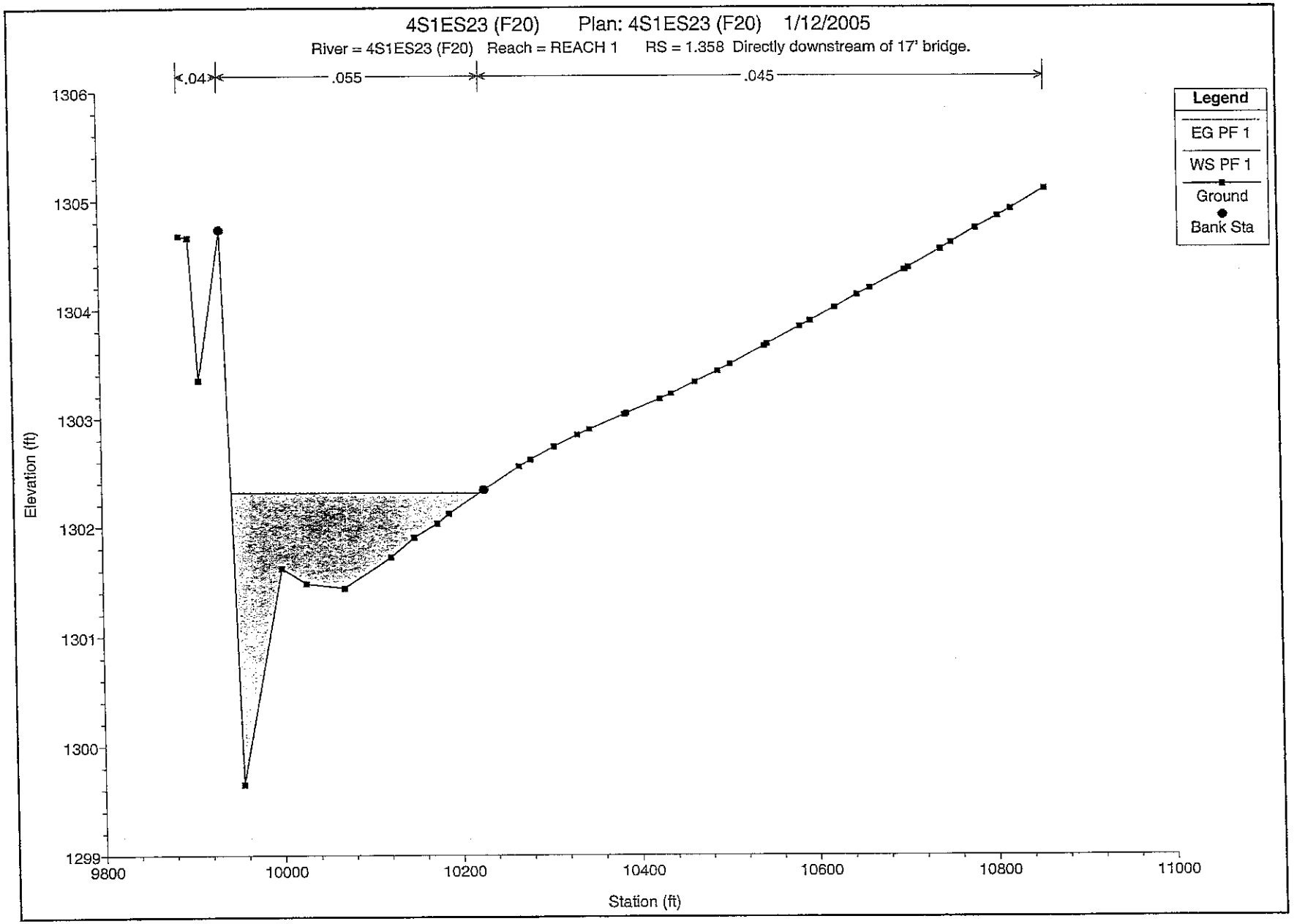

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 0.156 Directly downstream of 2-4' x 2.5' wood boxes. Not in survey.
.055
.045
0
4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1302.5
1302.0
1301.5
1301.0
1300.5
1300.0
1299.5
1299.0
1298.5
9800
10000
10200
10400
10600
10800
11000
Station (ft)

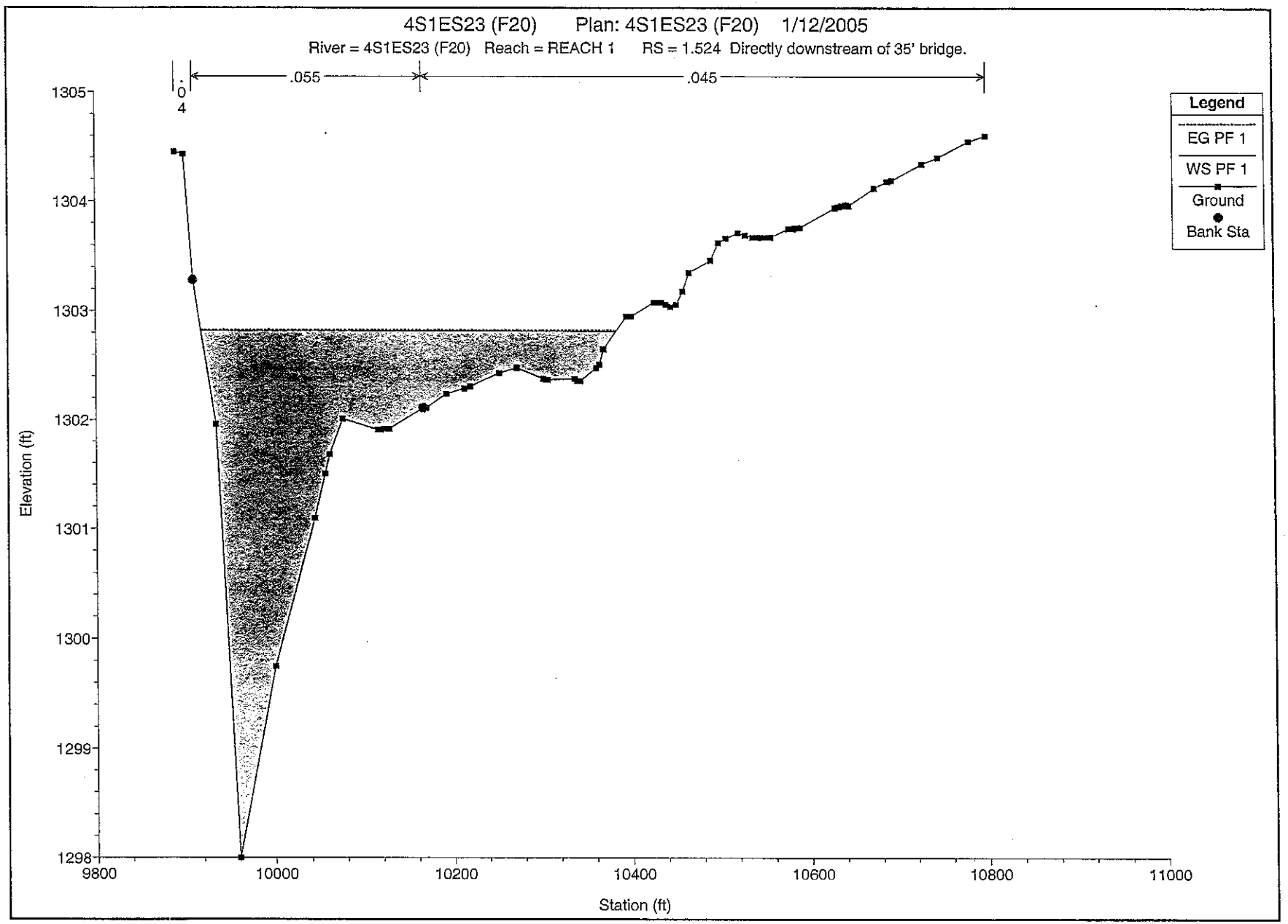

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 0.417 Directly downstream of 2-4' x 2.5' wood boxes.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1303
1302
1301
1300
1299
1298
1297
1296
9800
10000
10200
10400
10600
10800
Station (ft)

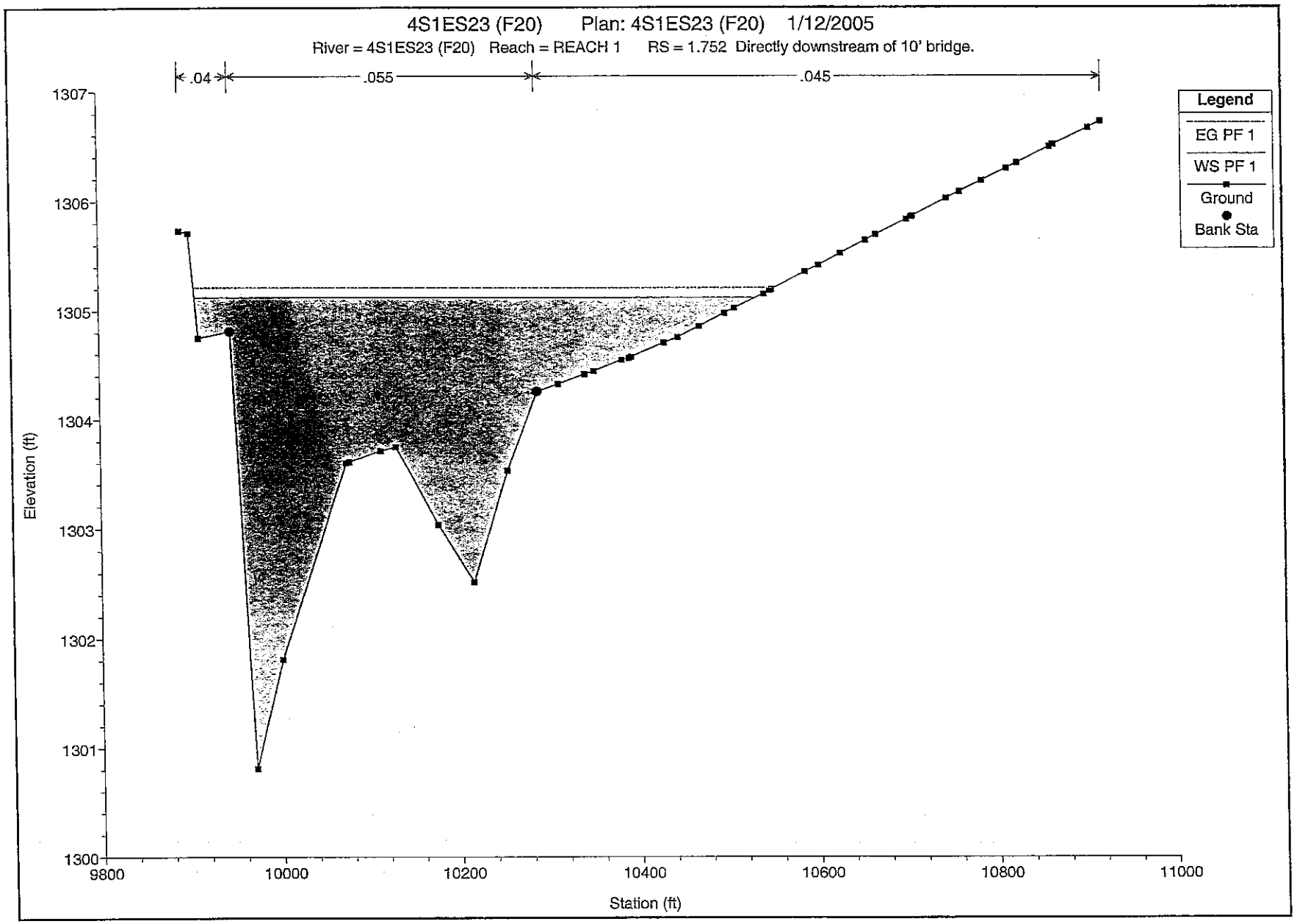

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 0.545 Directly downstream of 3' x 3' wood box.
.055
.045
0.4
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1303
1302
1301
1300
1299
1298
1297
9800
10000
10200
10400
10600
10800
11000
Station (ft)

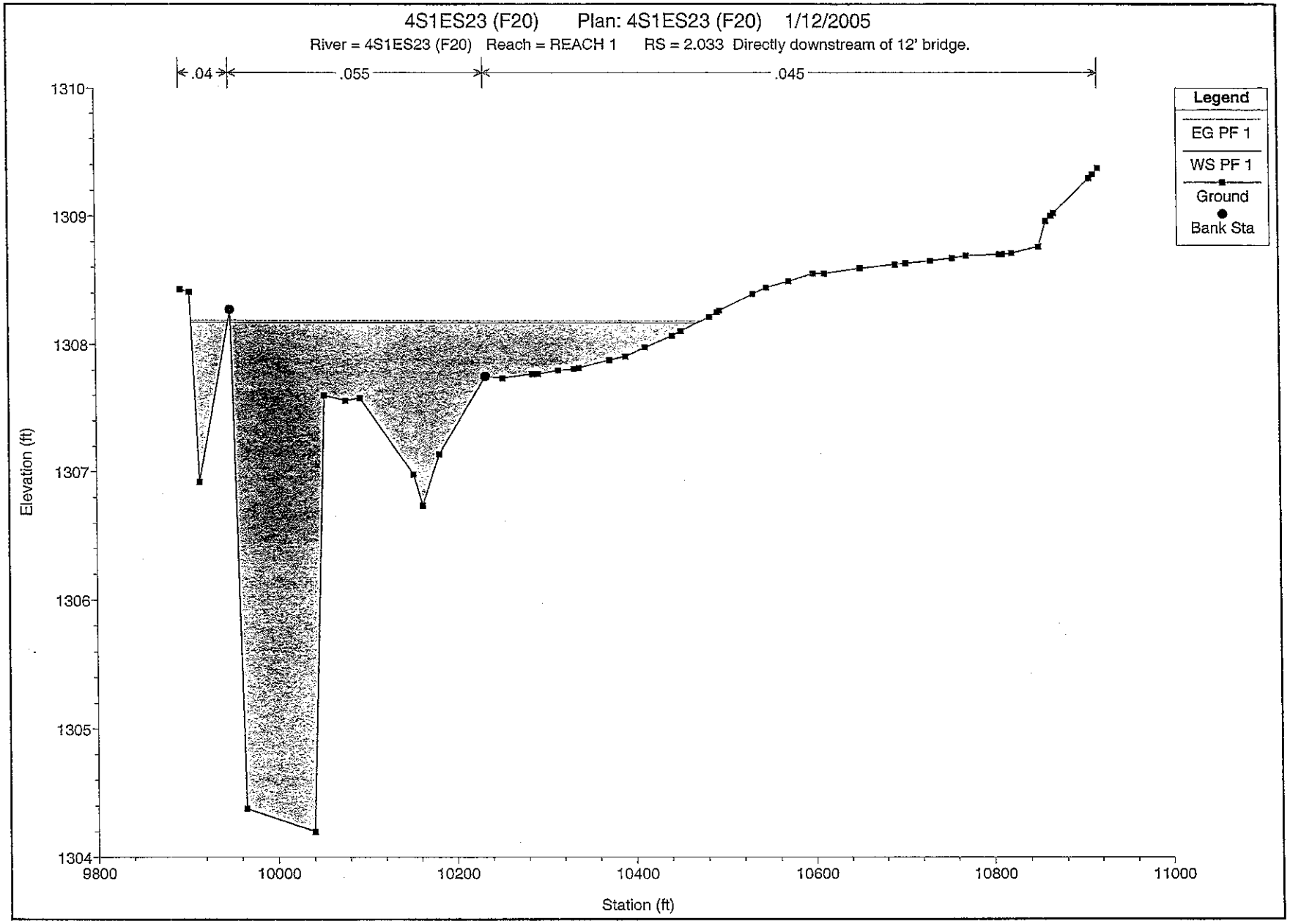

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 0.775 Directly downstream of 2-54" x 38" CMP's.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1304
1303
1302
1301
1300
1299
1298
1297
9800
9900
10000
10100
10200
10300
10400
10500
10600
Station (ft)

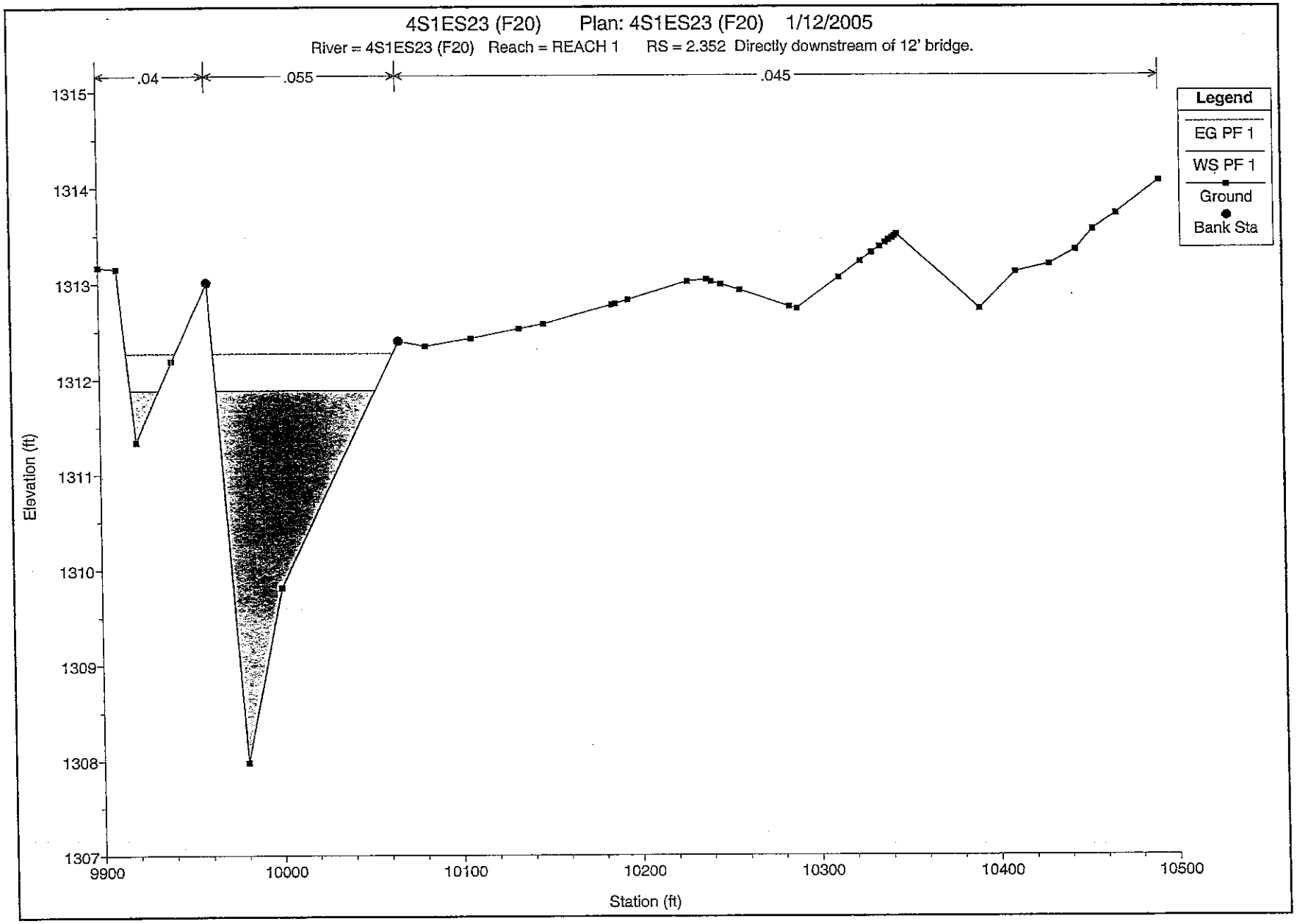

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 1.132 Directly downstream of 4-38" steel pipes.
.04
.055
.045
Legend
WS PF 1
EG PF 1
Ground
Bank Sta
Elevation (ft)
1306
1305
1304
1303
1302
1301
1300
1299
9800
10000
10200
10400
10600
10800
Station (ft)

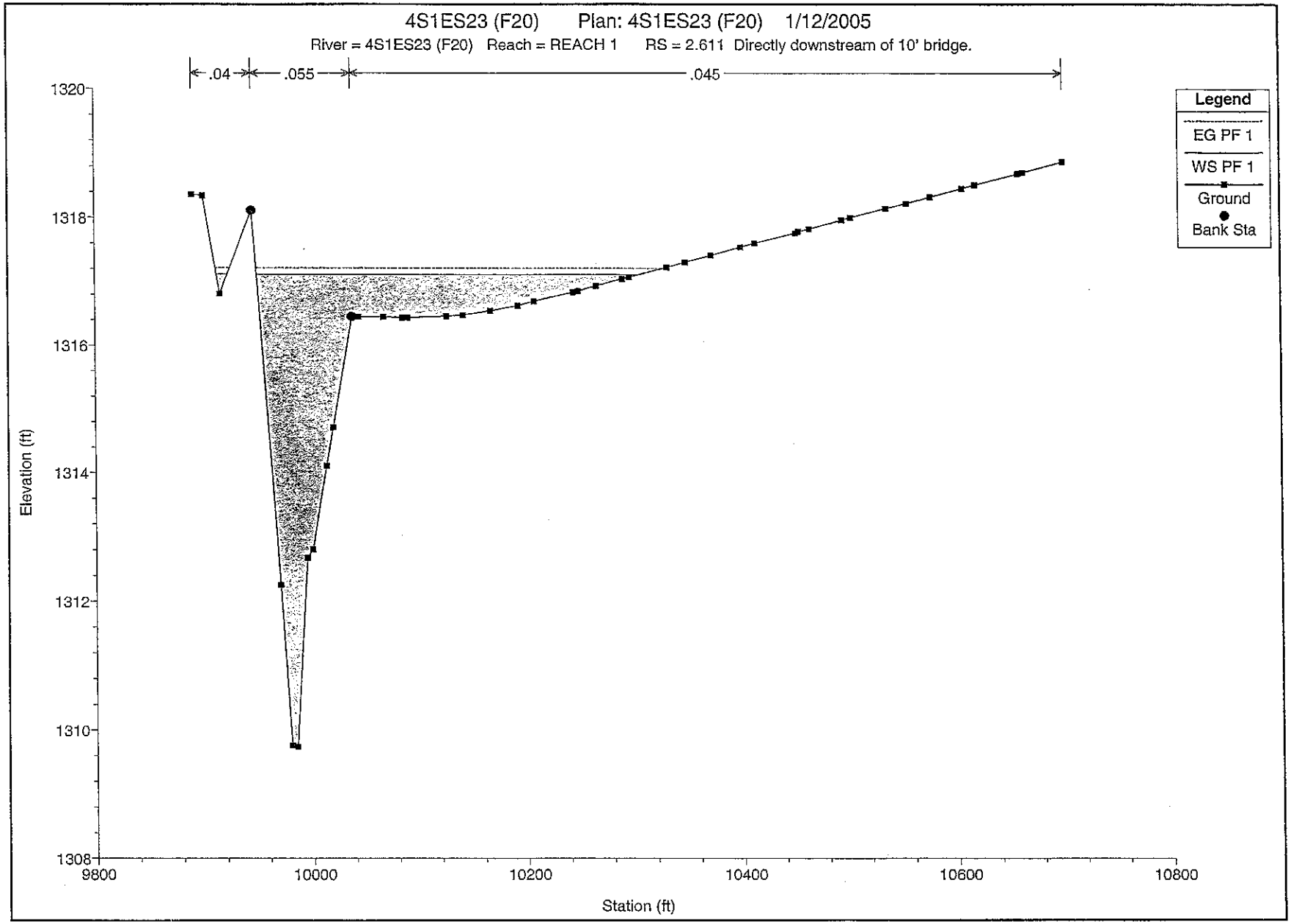

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 1.358 Directly downstream of 17' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1306
1305
1304
1303
1302
1301
1300
1299
9800
10000
10200
10400
10600
10800
11000
Station (ft)

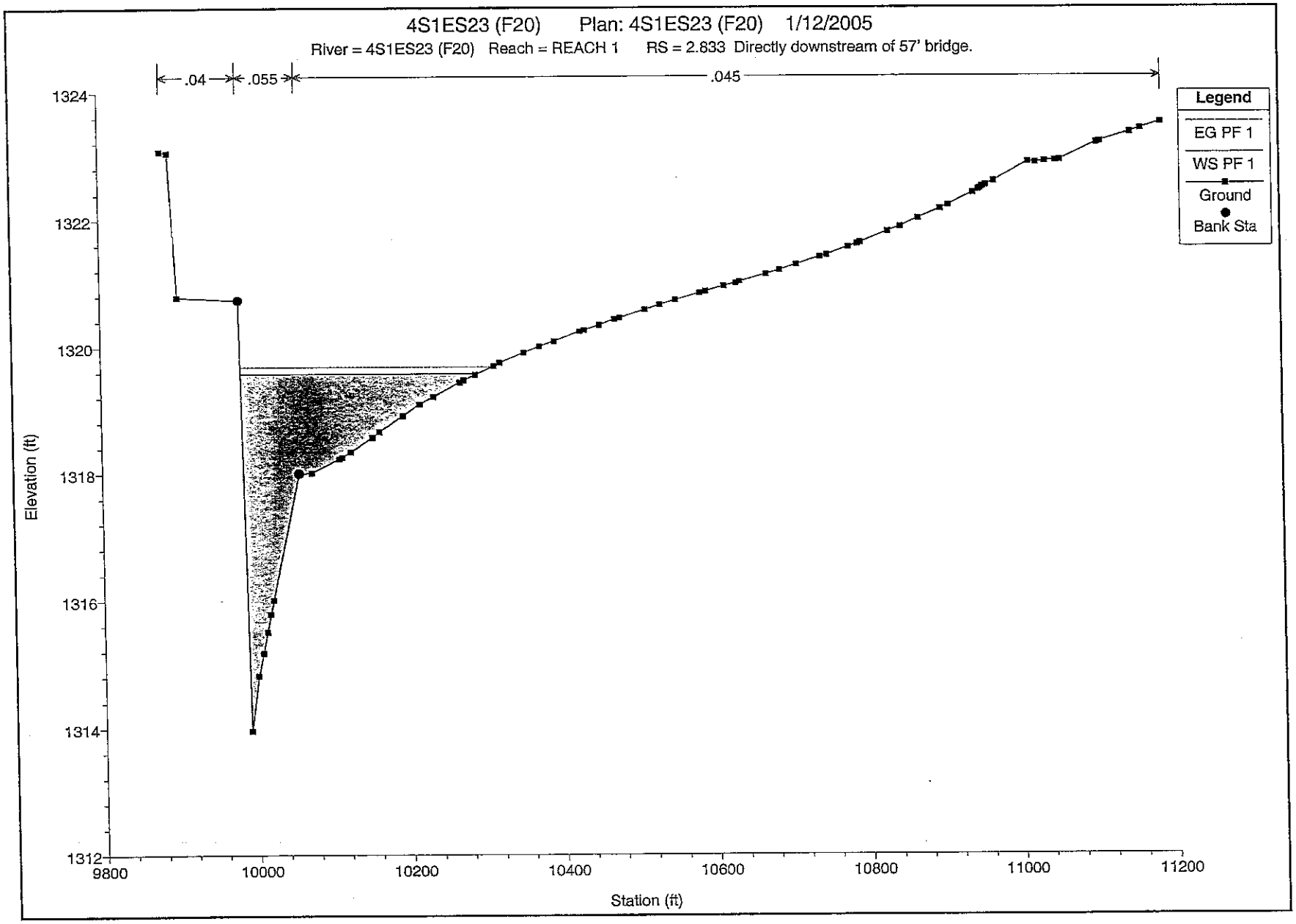

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 1.524 Directly downstream of 35' bridge.
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1305
1304
1303
1302
1301
1300
1299
1298
9800
10000
10200
10400
10600
10800
11000
Station (ft)

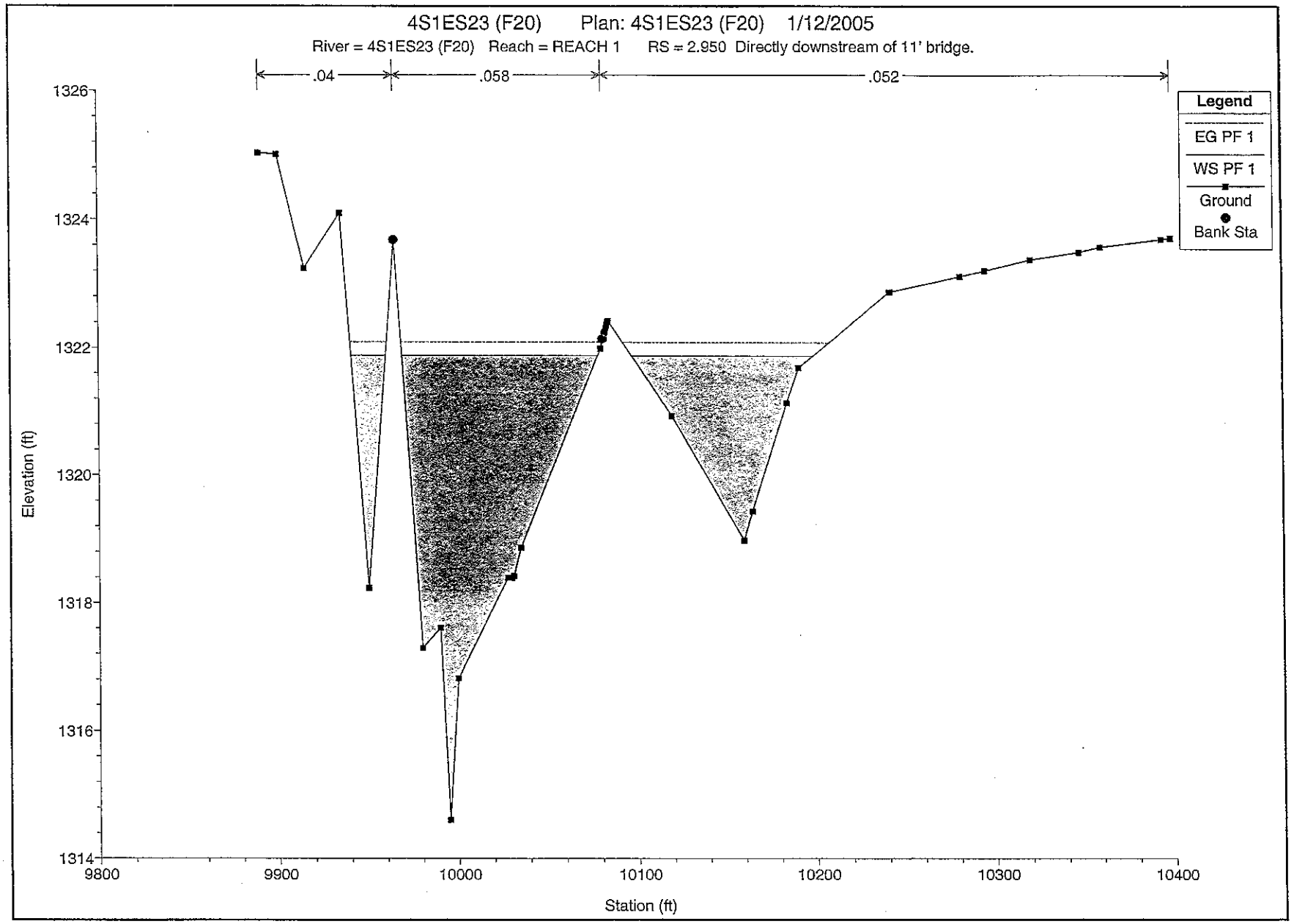

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 1.752 Directly downstream of 10' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1307
1306
1305
1304
1303
1302
1301
1300
9800
10000
10200
10400
10600
10800
11000
Station (ft)

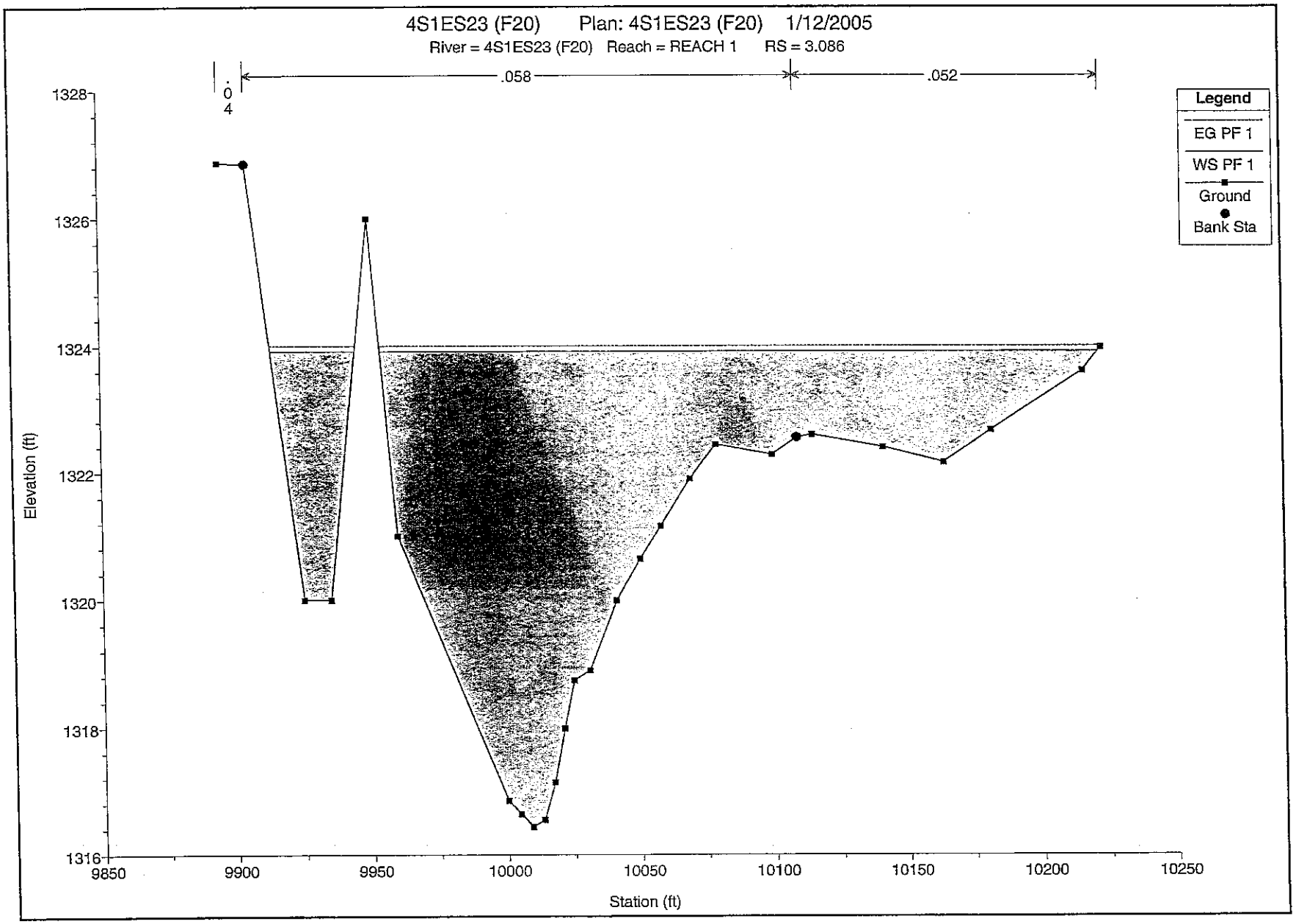

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 2.033 Directly downstream of 12' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1310
1309
1308
1307
1306
1305
1304
9800
10000
10200
10400
10600
10800
11000
Station (ft)

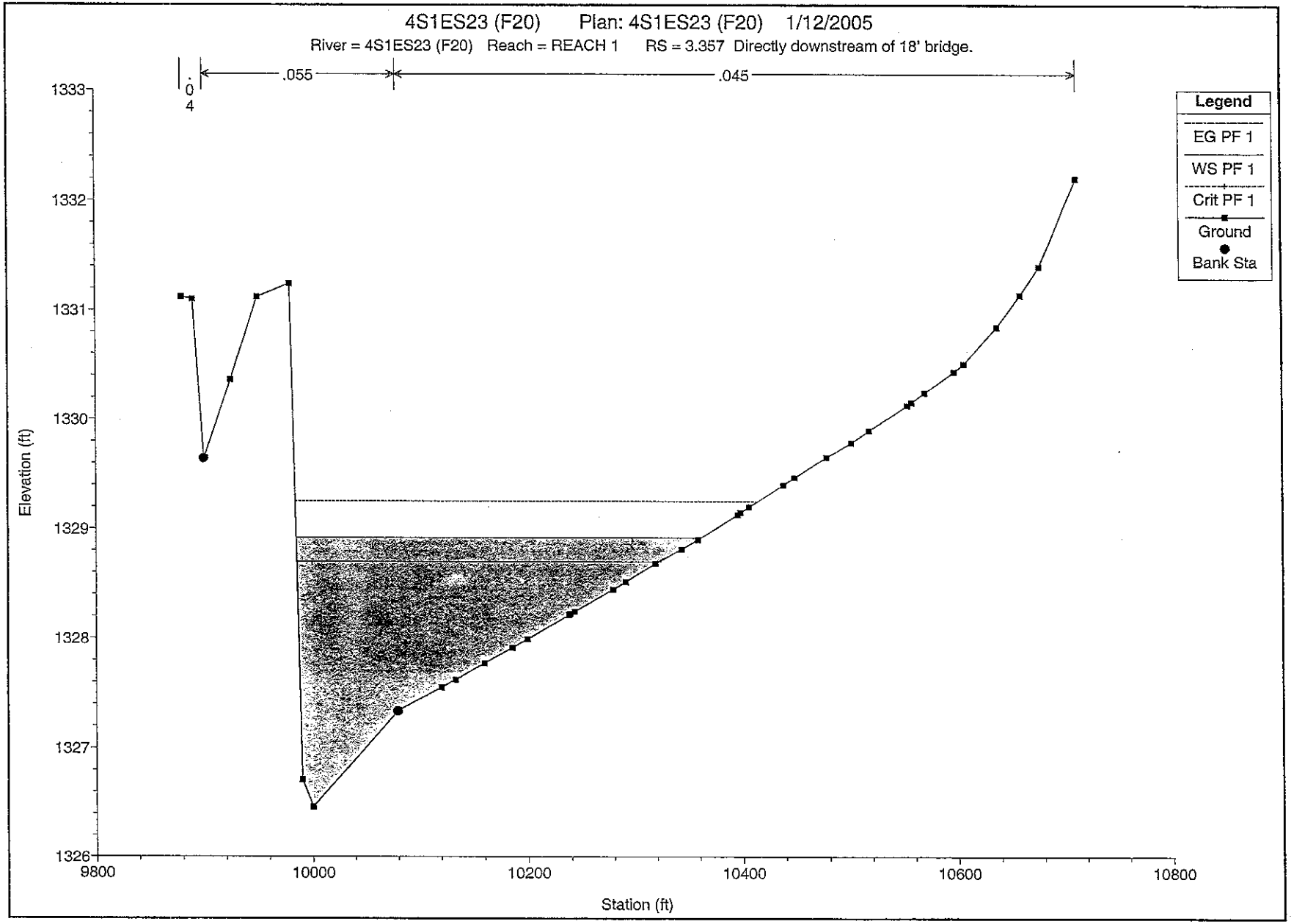

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 2.352 Directly downstream of 12' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1315
1314
1313
1312
1311
1310
1309
1308
1307
9900
10000
10100
10200
10300
10400
10500
Station (ft)

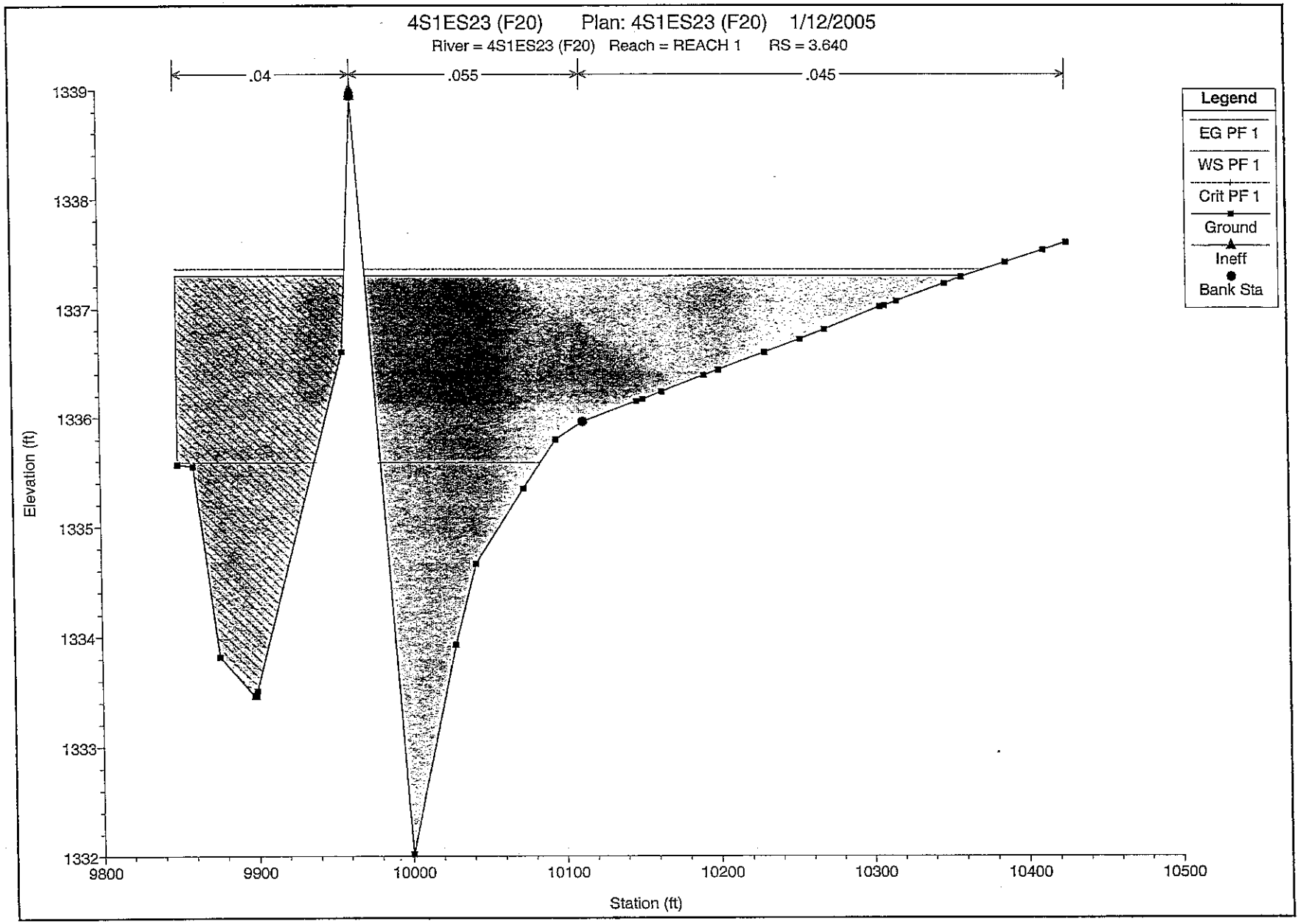

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 2.611 Directly downstream of 10' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1320
1318
1316
1314
1312
1310
1308
9800
10000
10200
10400
10600
10800
Station (ft)

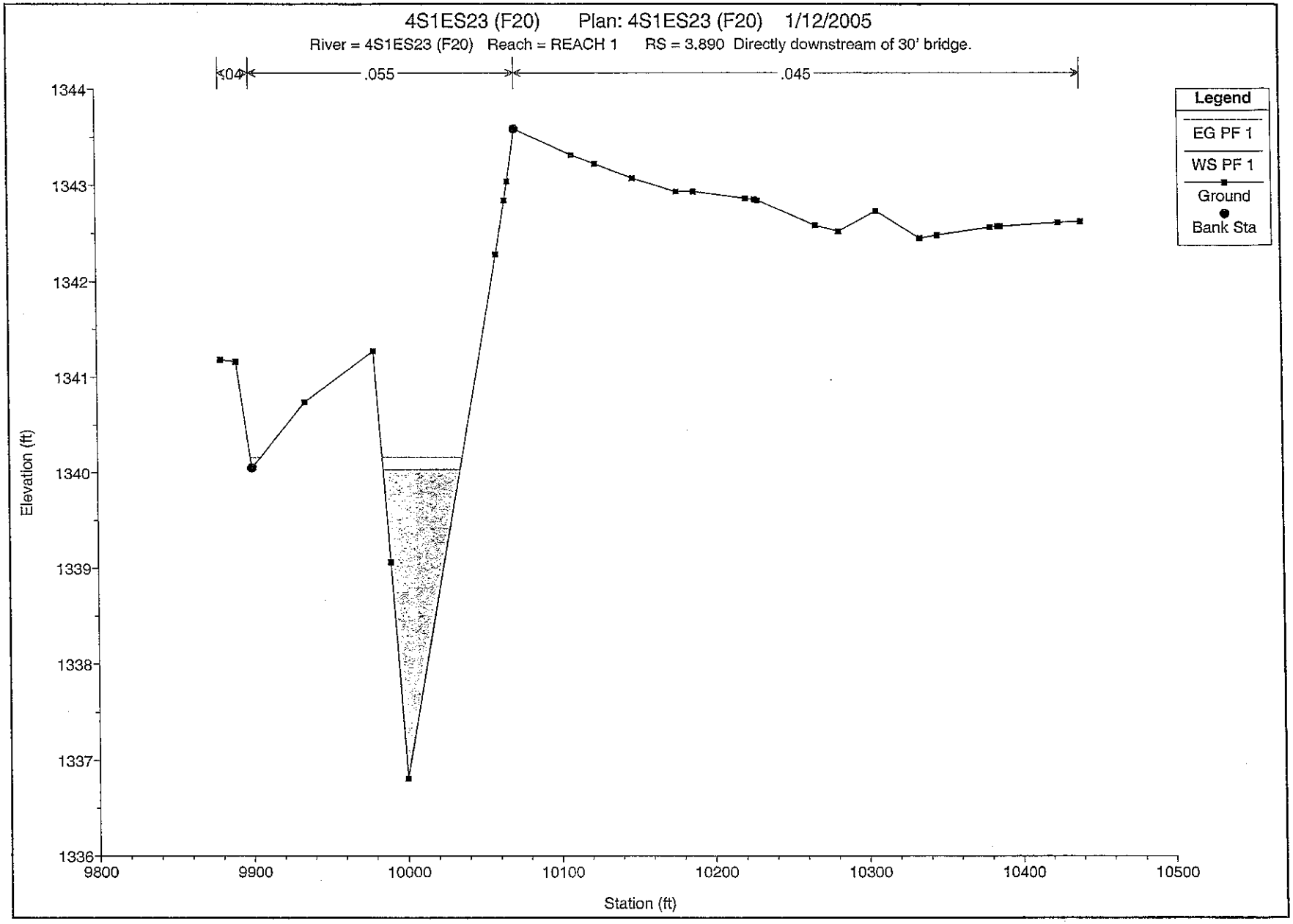

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 2.833 Directly downstream of 57' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1324
1322
1320
1318
1316
1314
1312
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

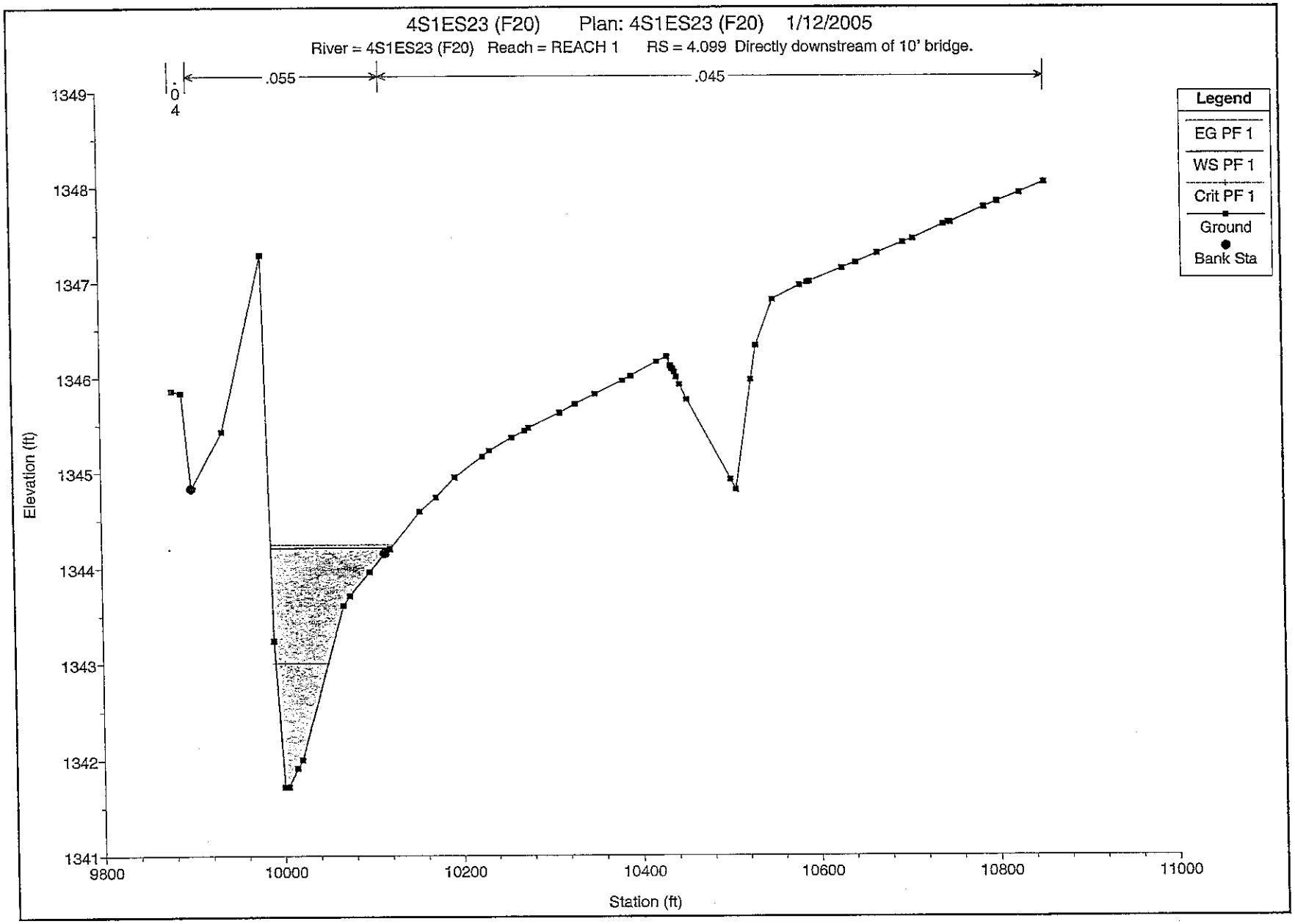

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 2.950 Directly downstream of 11' bridge.
.04
.058
.052
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1326
1324
1322
1320
1318
1316
1314
9800
9900
10000
10100
10200
10300
10400
Station (ft)

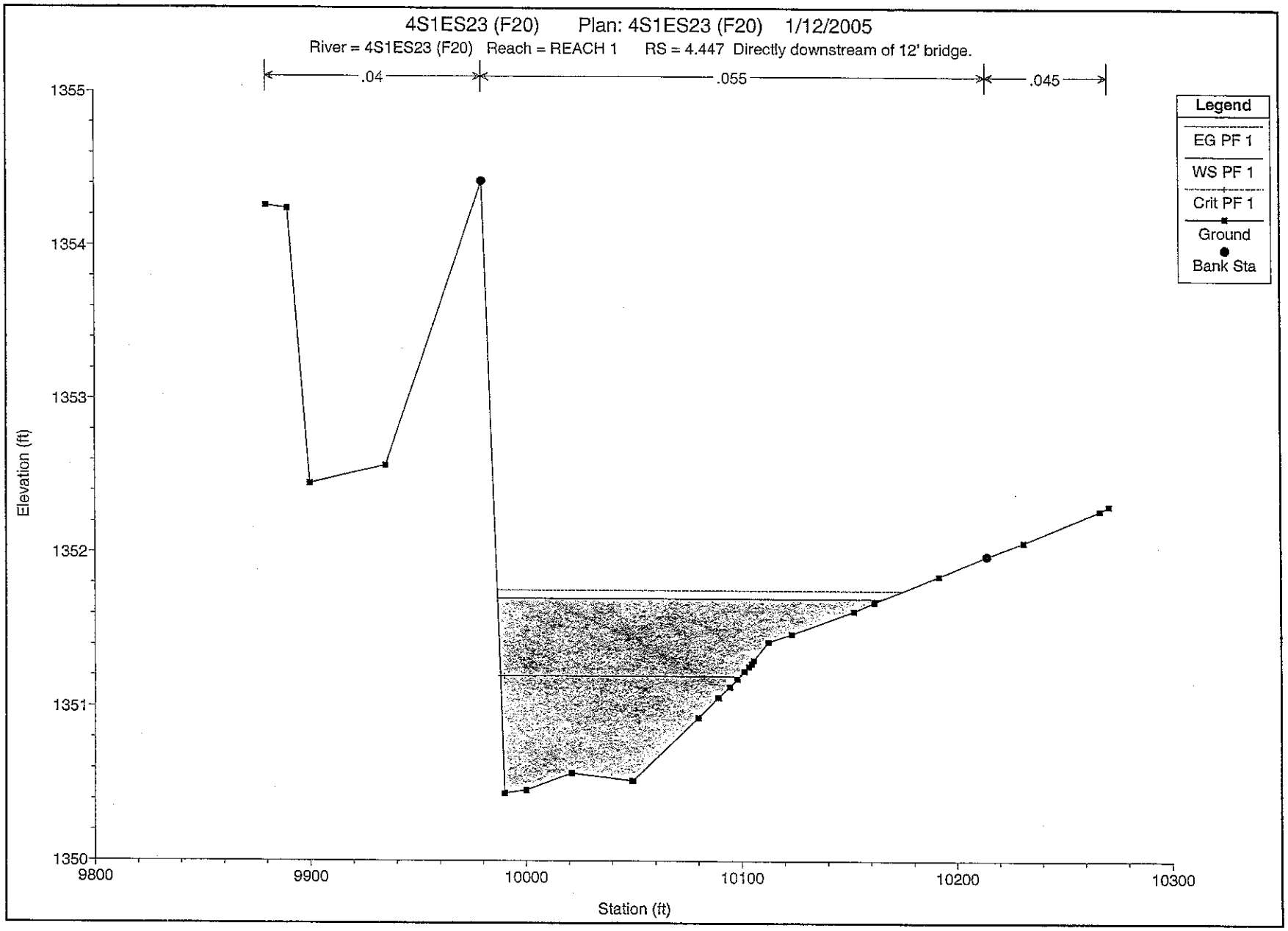

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 3.086
.058
.052
.04
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1328
1326
1324
1322
1320
1318
1316
9850
9900
9950
10000
10050
10100
10150
10200
10250
Station (ft)

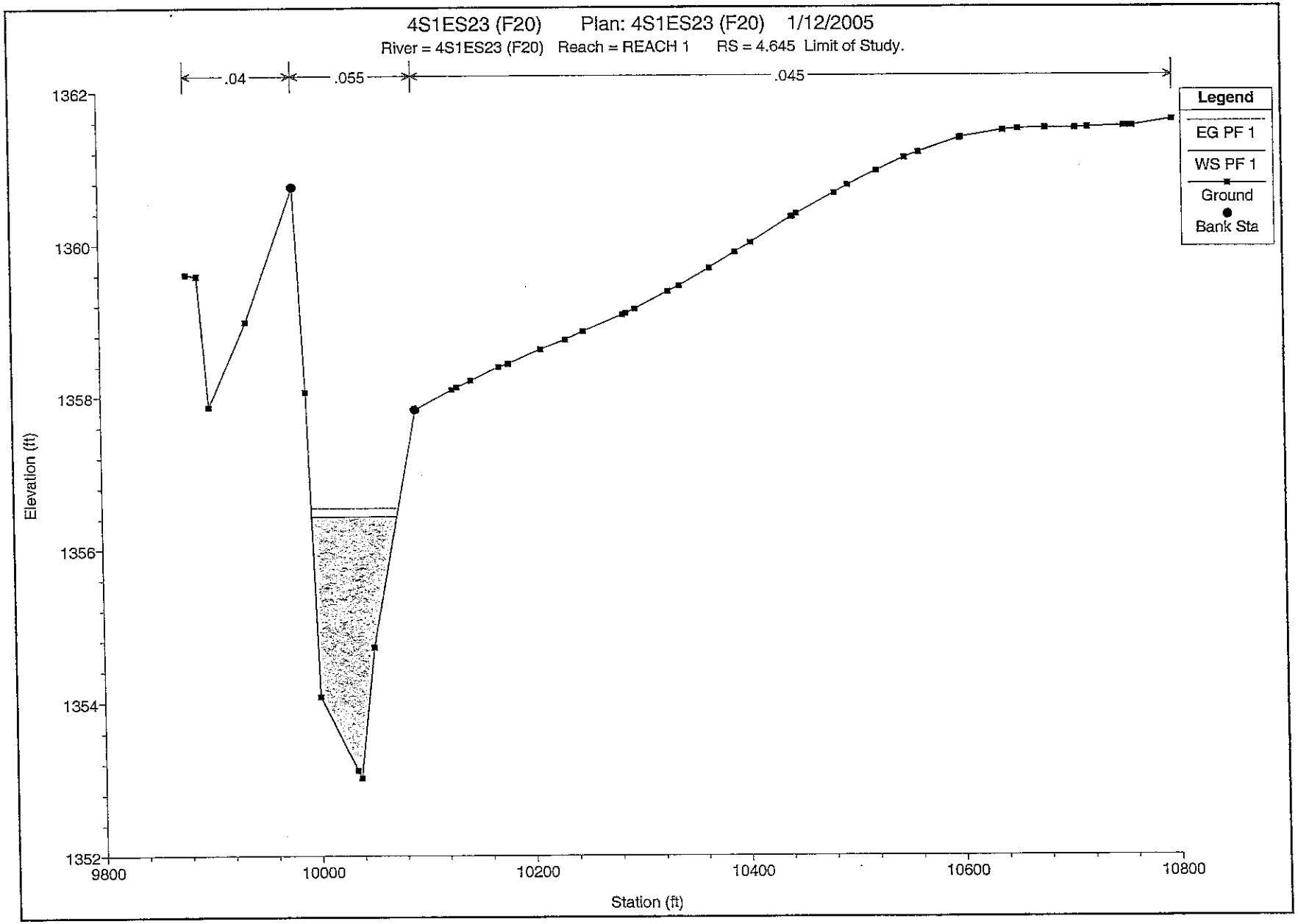

4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 3.357 Directly downstream of 18' bridge.
.055
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1333
1332
1331
1330
1329
1328
1327
1326
9800
10000
10200
10400
10600
10800
Station (ft)


4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 3.640
.04
.055
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1339
1338
1337
1336
1335
1334
1333
1332
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 3.890 Directly downstream of 30' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1344
1343
1342
1341
1340
1339
1338
1337
1336
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 4.099 Directly downstream of 10' bridge.
.055
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1349
1348
1347
1346
1345
1344
1343
1342
1341
9800
10000
10200
10400
10600
10800
11000
Station (ft)


4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 4.447 Directly downstream of 12' bridge.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1355
1354
1353
1352
1351
1350
9800
9900
10000
10100
10200
10300
Station (ft)


4S1ES23 (F20) Plan: 4S1ES23 (F20) 1/12/2005
River = 4S1ES23 (F20) Reach = REACH 1 RS = 4.645 Limit of Study.
.04
.055
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1362
1360
1358
1356
1354
1352
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: WATERMAN WASH

REACH: WATERMAN WASH

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: Waterman Wash

New Stream Mile	CP RIV	With Storage Discharge	Without Storage Discharge	Peak Q
25.295	F35RIV	2953	3651	3650
25.005	F35RIV	2953	3651	3650
24.668	E48RIV	4233	4148	4230
24.518	E48RIV	4233	4148	4230
24.268	G27RIV	5804	6058	6060
23.877	G27RIV	5804	6058	6060
23.597	G27RIV	5804	6058	6060
23.330	G28RIV	5750	6015	6020
23.143	G28RIV	5750	6015	6020
22.828	E51RIV	5814	6106	6110
22.542	E51RIV	5814	6106	6110
22.283	E41RIV	5911	6078	6080
21.997	E41RIV	5911	6078	6080
21.733	G30RIV	7302	7399	7400
21.566	G30RIV	7302	7399	7400
21.285	D27RIV	8152	8246	8250
21.008	D27RIV	8152	8246	8250
20.752	D27RIV	8152	8246	8250
20.461	D29RIV	9368	9468	9470
20.245	D29RIV	9368	9468	9470
19.845	D31RIV	9431	9543	9540
19.551	G33RIV	9404	9511	9510
19.344	G33RIV	9404	9511	9510
19.134	D32RIV	9657	9769	9770
18.961	D33RIV	11267	11487	11490
18.798	G36RIV	11279	11488	11490
18.567	G37RIV	11054	11315	11320
18.319	G37RIV	11054	11315	11320
18.159	G38RIV	11043	11270	11270
17.913	D42RIV	10924	11148	11150
17.646	D42RIV	10924	11148	11150
17.414	D41RIV	10825	11068	11070
17.195	D41RIV	10825	11068	11070
16.974	G40RIV	13145	13378	13380
16.710	D40RIV	13001	13264	13260
16.451	D39RIV	13209	13431	13430
16.242	G42RIV	14820	15070	15070
16.012	G42RIV	14820	15070	15070
15.795	B08RIV	15265	15485	15490
15.600	B12RIV	21366	21726	22850

Note: Discharge at 15.600 is 22850, taken from Flood Insurance Study, Maricopa County Arizona.

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: Waterman Wash

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPF29	27.427	1348	1350	1300
F32	27.258	1407	1410	1400
F32	27.052	1480	1480	1500
F32	26.756	1583	1580	1600
F32	26.604	1637	1640	1600
CPF32	26.307	1741	1740	1700
F33RIV	26.055	2140	2140	2100
RIV	25.765	2936	2940	2900
F34RIV	25.571	3469	3470	3500

1. RIV is between concentration points F33RIV and F34RIV along Waterman Wash.

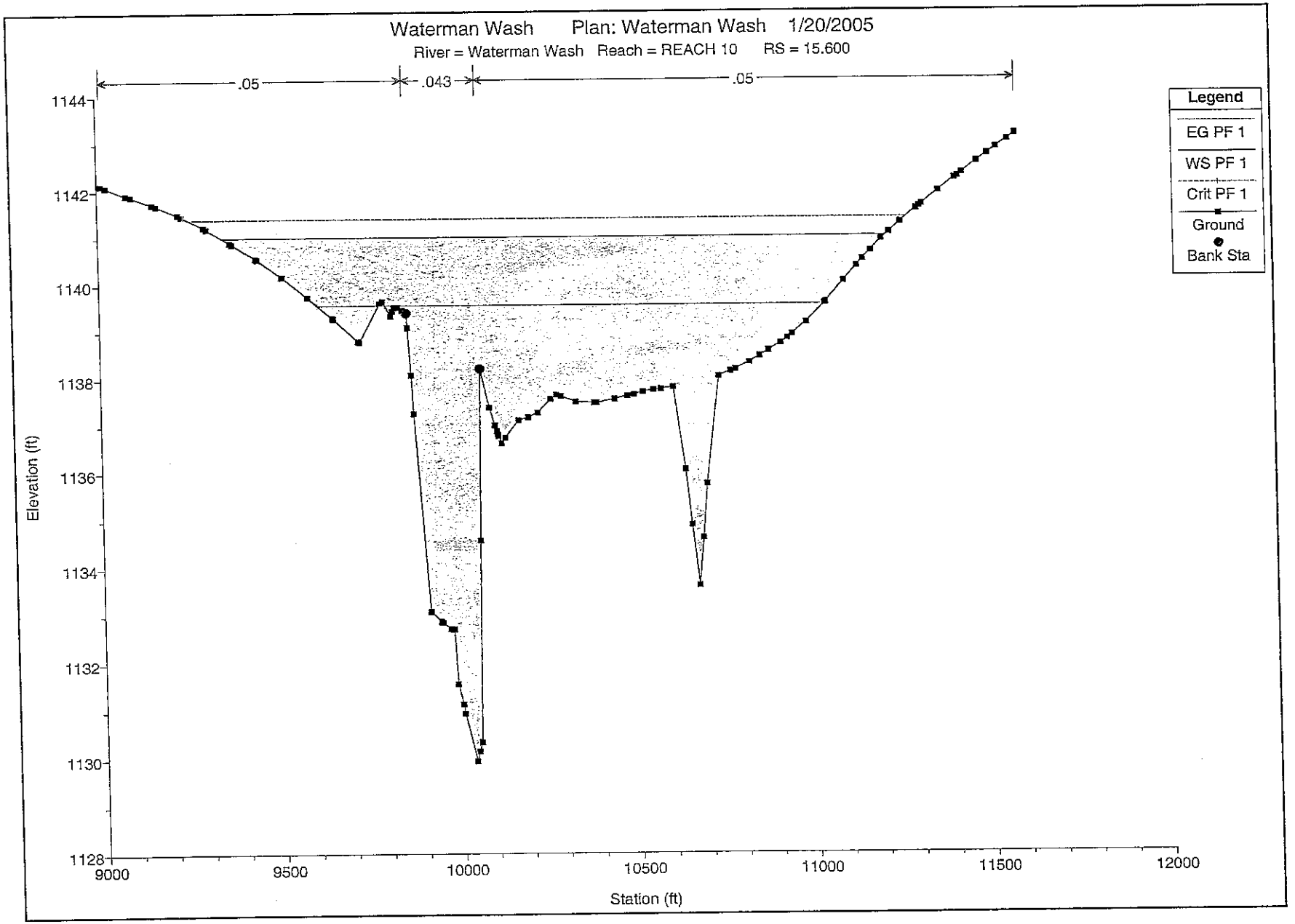
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

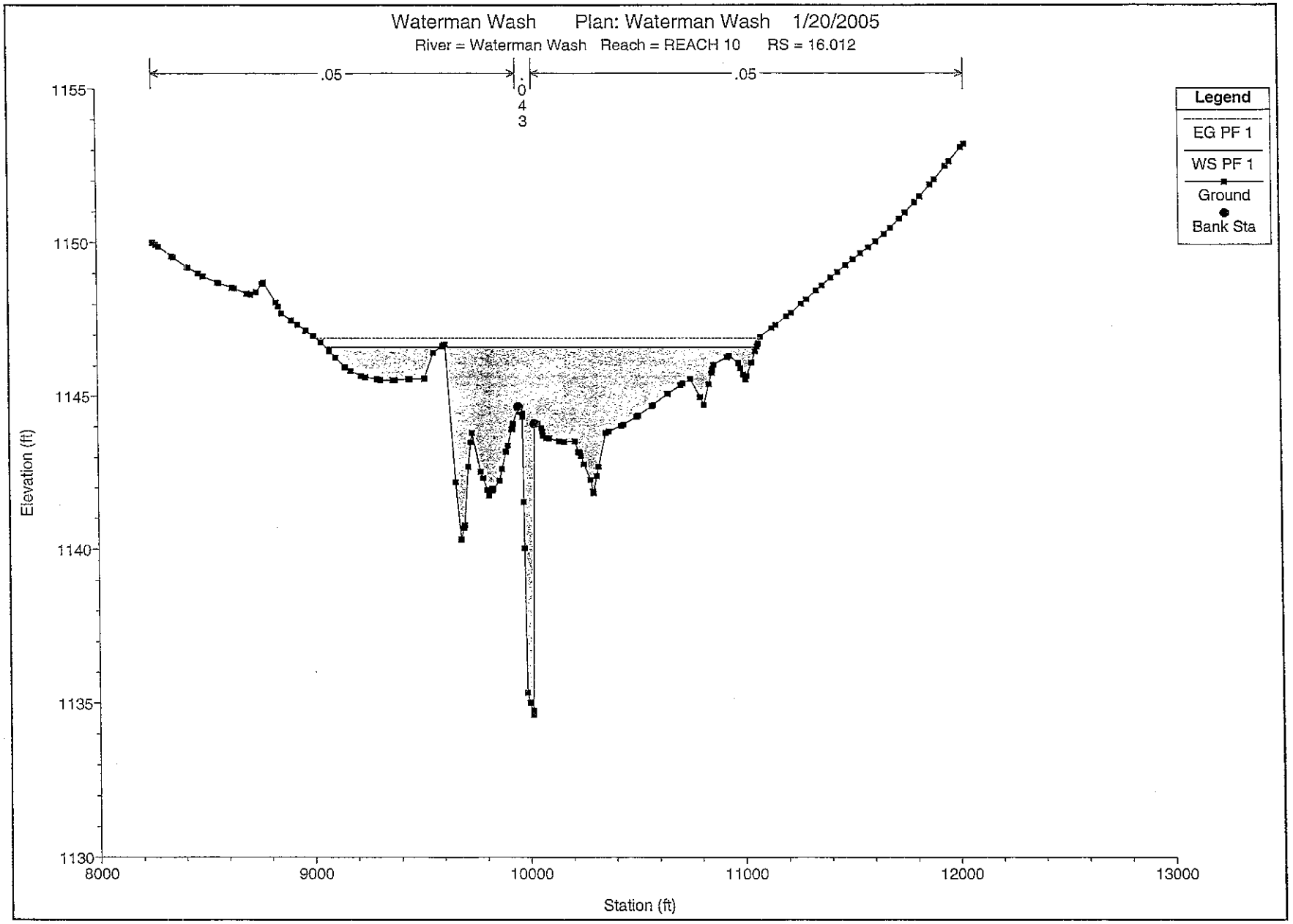
Change in Discharge based on Reach Length

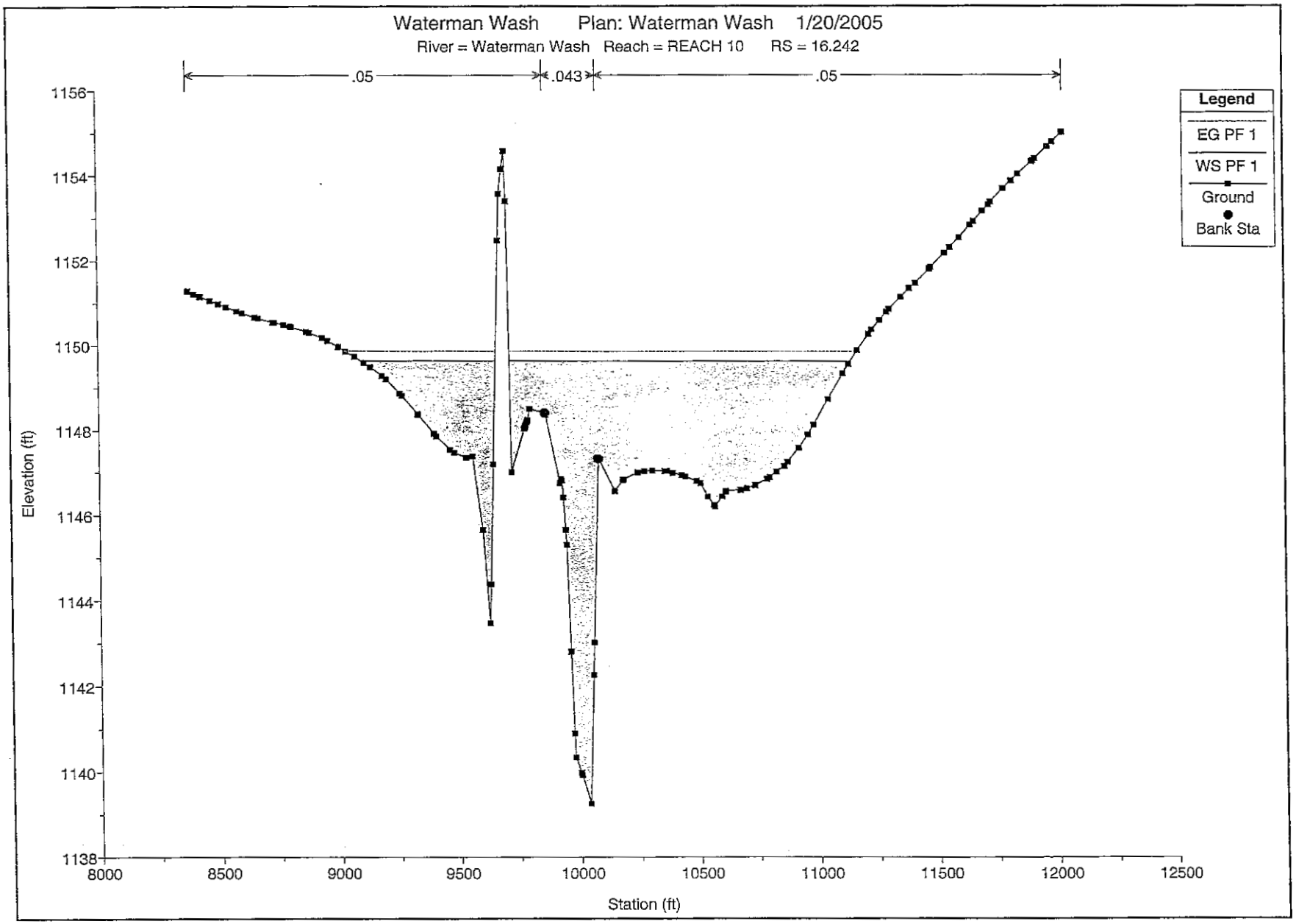
Wash ID: Waterman Wash

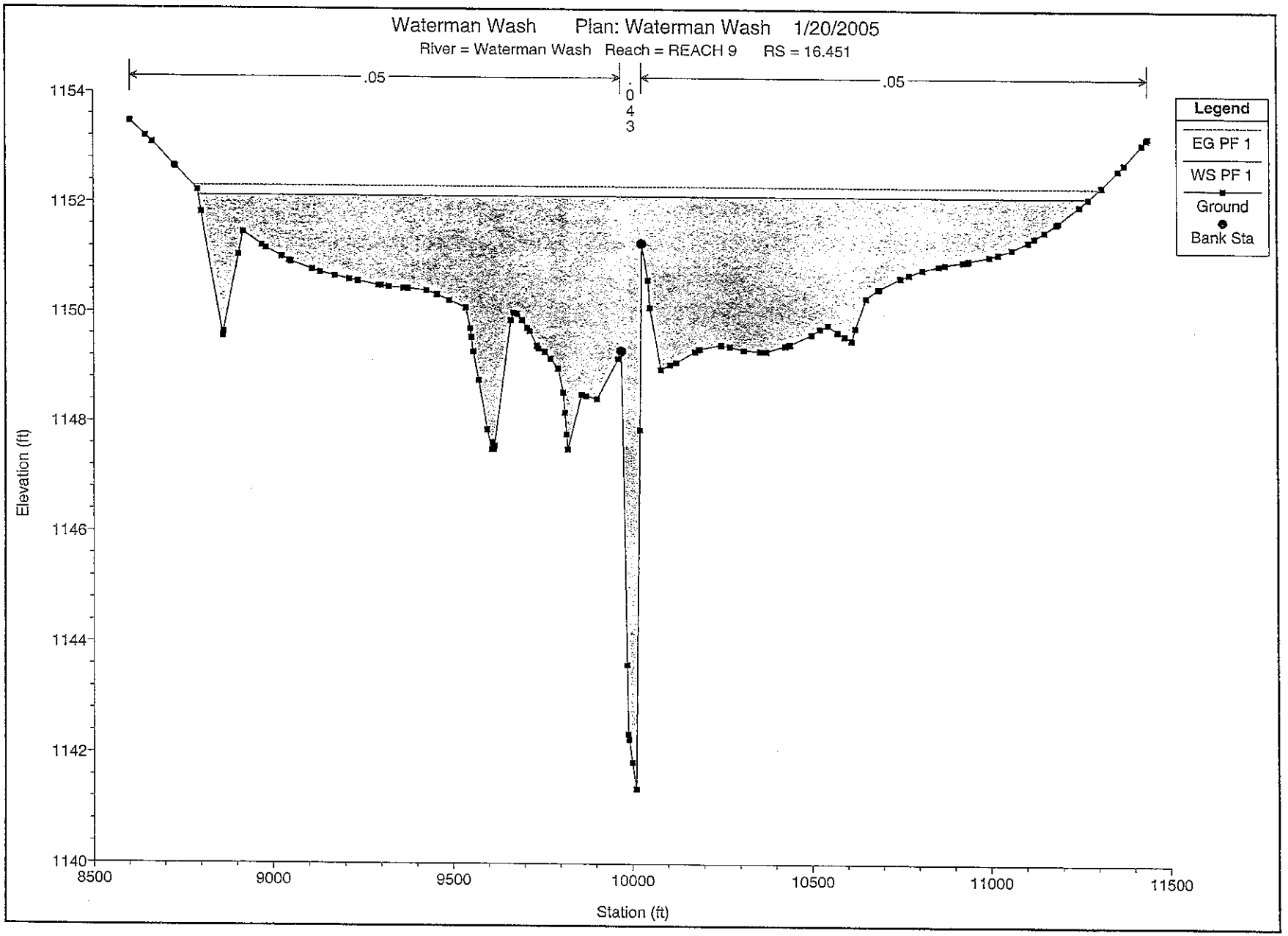
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPF05*	36.434	2317	2320	2300
CPF05*	36.218	2317	2320	2300
CPF05*	35.983	2317	2320	2300
F08	35.793	2418	2420	2400
F08	35.505	2571	2570	2600
F08	35.269	2696	2700	2700
F08	35.038	2819	2820	2800
F08	34.810	2940	2940	2900
F08	34.577	3063	3060	3100
F08	34.373	3172	3170	3200
CPF08	34.182	3273	3270	3300
F09	33.940	3167	3170	3200
F09	33.690	3057	3060	3100
F09	33.427	2941	2940	2900
F09	33.189	2837	2840	2800
F09	32.903	2711	2710	2700
F09	32.659	2604	2600	2600
F09	32.449	2512	2510	2500
F09	32.215	2409	2410	2400
F09	31.976	2304	2300	2300
F09	31.763	2211	2210	2200
CPF09	31.513	2101	2100	2100
F19	31.252	2074	2070	2100
F19	30.971	2045	2040	2000
F19	30.734	2020	2020	2000
F19	30.488	1995	1990	2000
F19	30.248	1970	1970	2000
F19	30.018	1946	1950	1900
F19	29.780	1921	1920	1900
CPF19	29.515	1894	1890	1900
DVF19	29.515	940	940	900
F21	29.273	1006	1010	1000
F21	29.034	1072	1070	1100
CPF21	28.777	1142	1140	1100
F29	28.556	1180	1180	1200
F29	28.305	1223	1220	1200
F29	28.019	1271	1270	1300
F29	27.788	1311	1310	1300
CPF29	27.570	1348	1350	1300

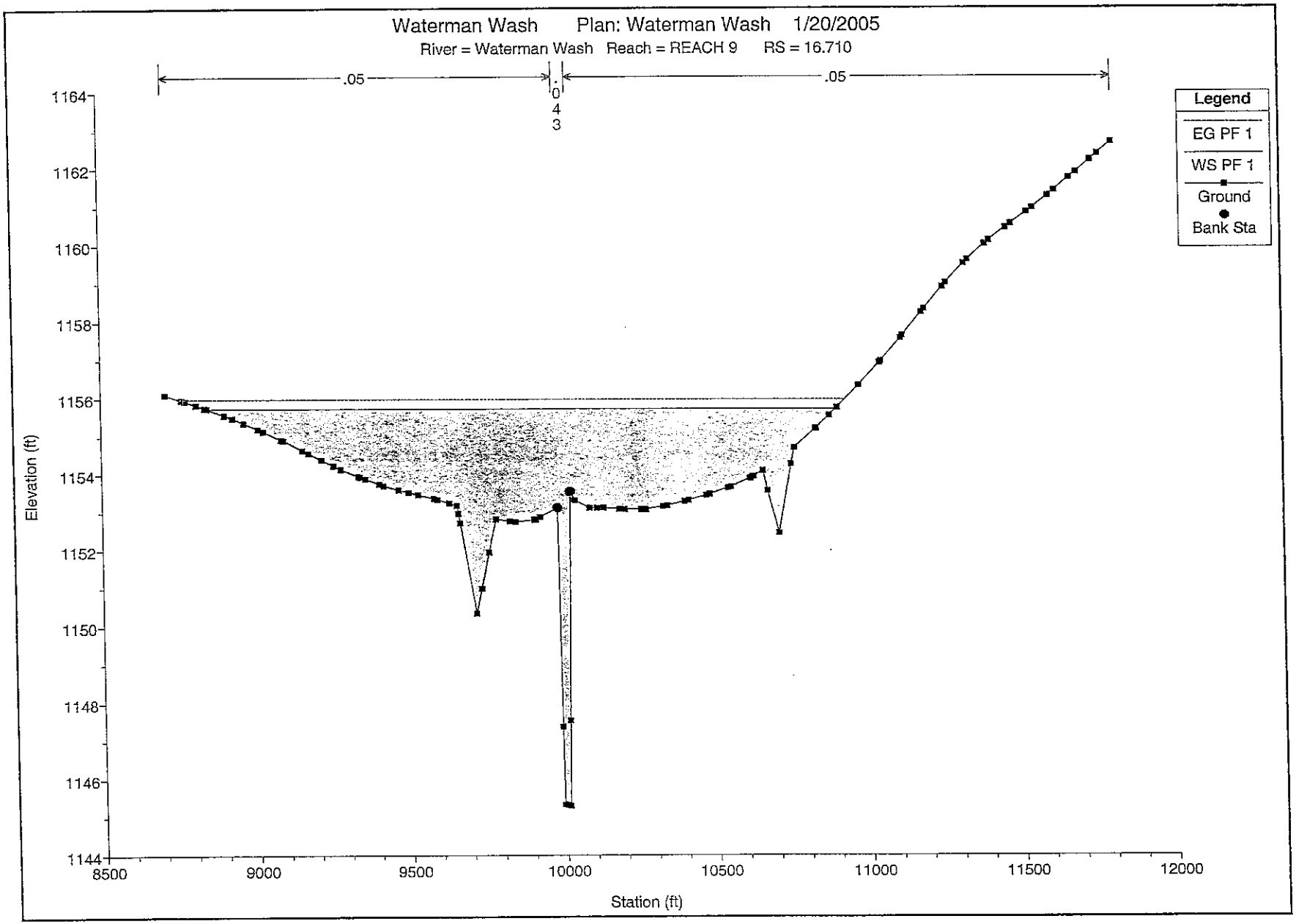
*Nearly 100% of contributing area, assumed 100% of discharge.

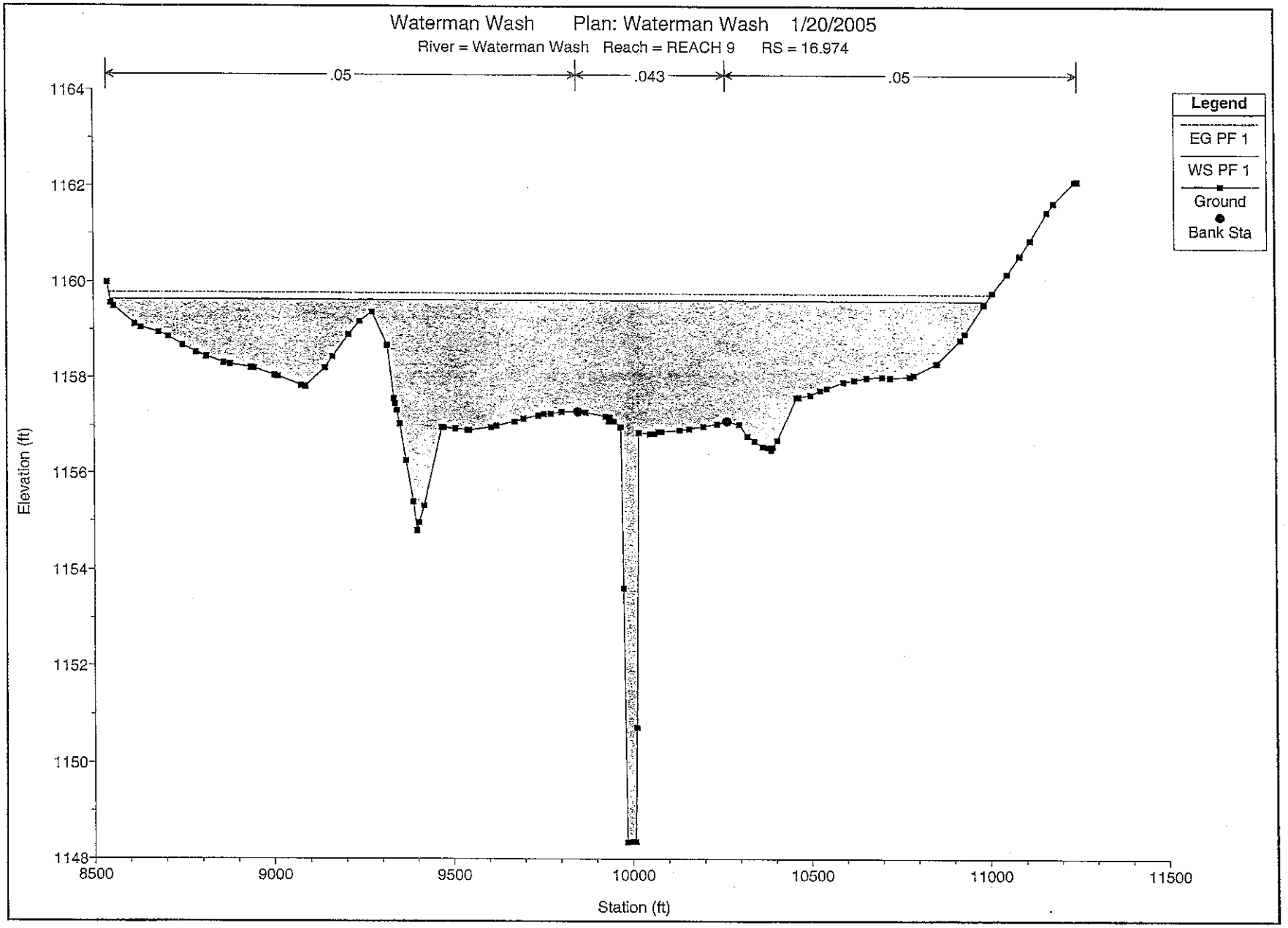

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 10 RS = 15.600
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1144
1142
1140
1138
1136
1134
1132
1130
1128
9000
9500
10000
10500
11000
11500
12000
Station (ft)

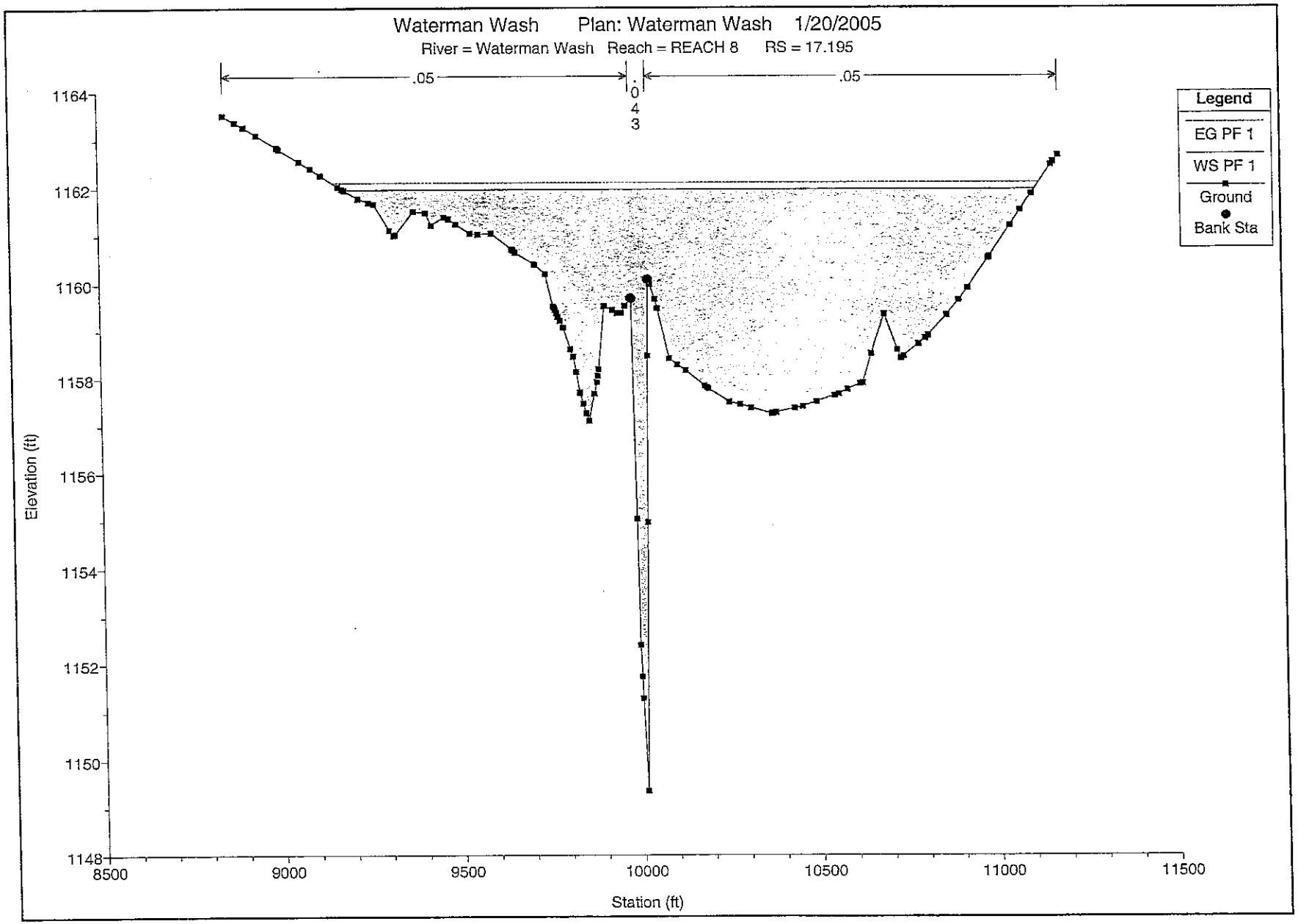

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 10 RS = 16.012
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1155
1150
1145
1140
1135
1130
8000
9000
10000
11000
12000
13000
Station (ft)

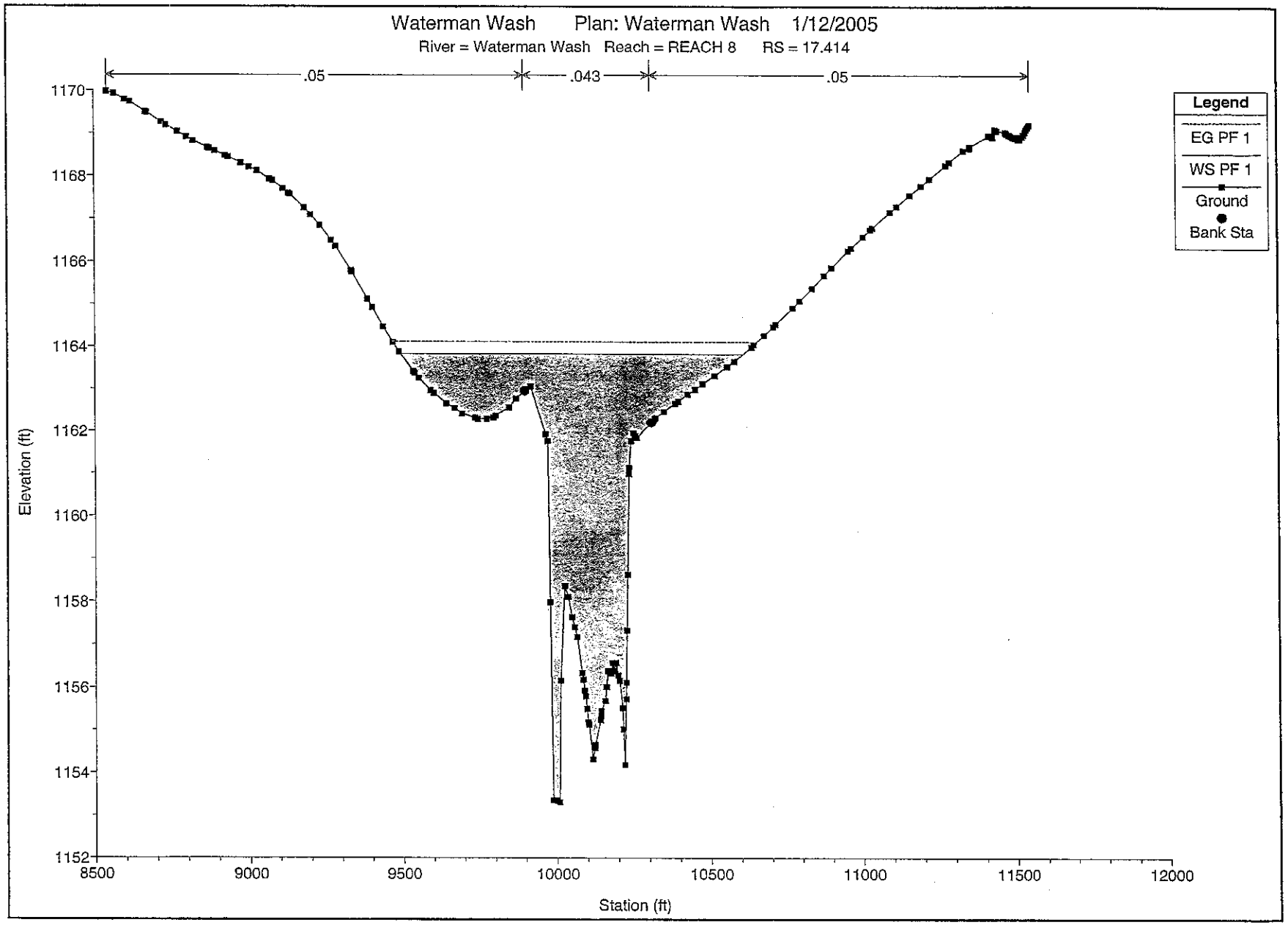

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 10 RS = 16.242
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1156
1154
1152
1150
1148
1146
1144
1142
1140
1138
8000
8500
9000
9500
10000
10500
11000
11500
12000
12500
Station (ft)

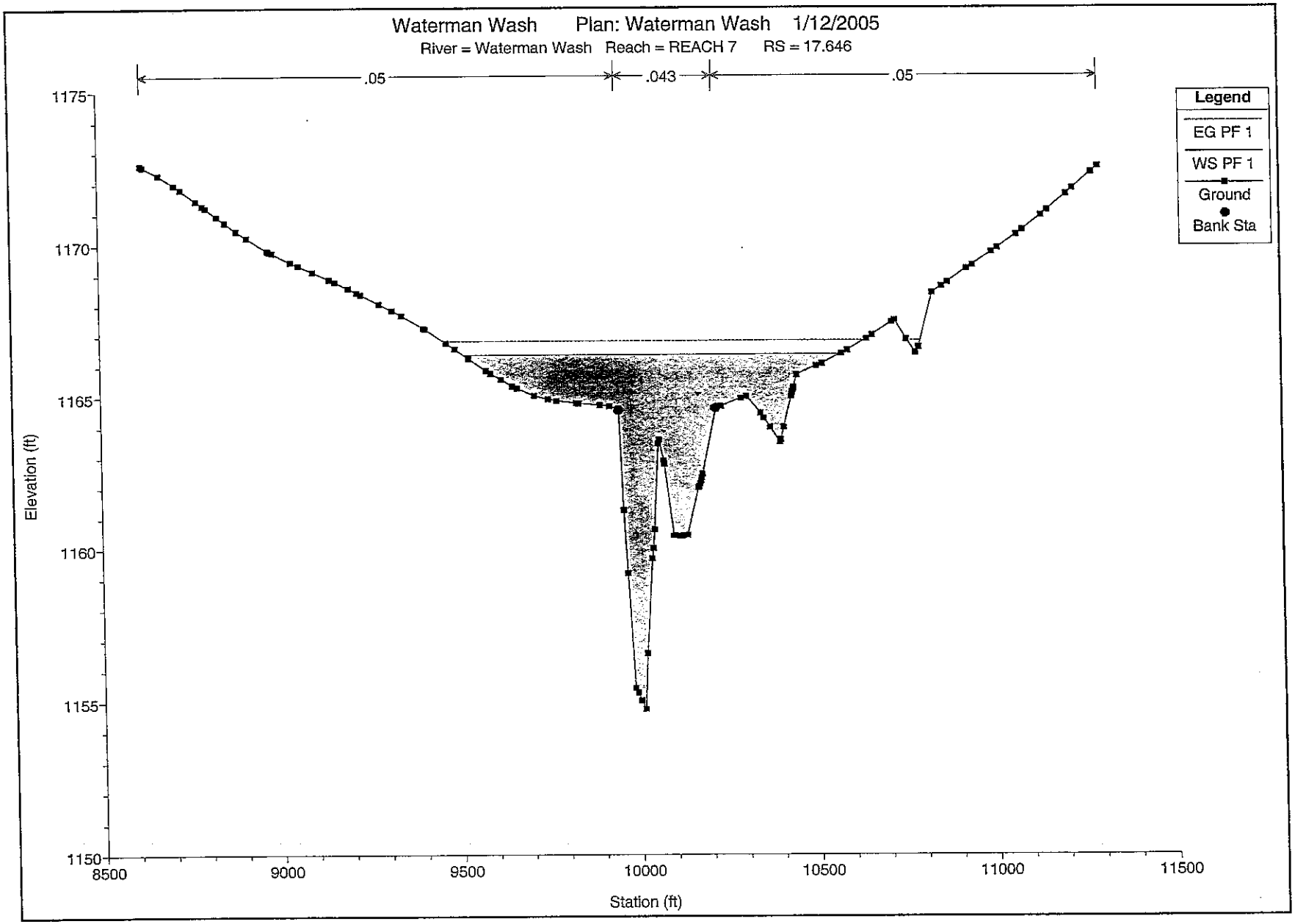

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 9 RS = 16.451
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1154
1152
1150
1148
1146
1144
1142
1140
8500
9000
9500
10000
10500
11000
11500
Station (ft)

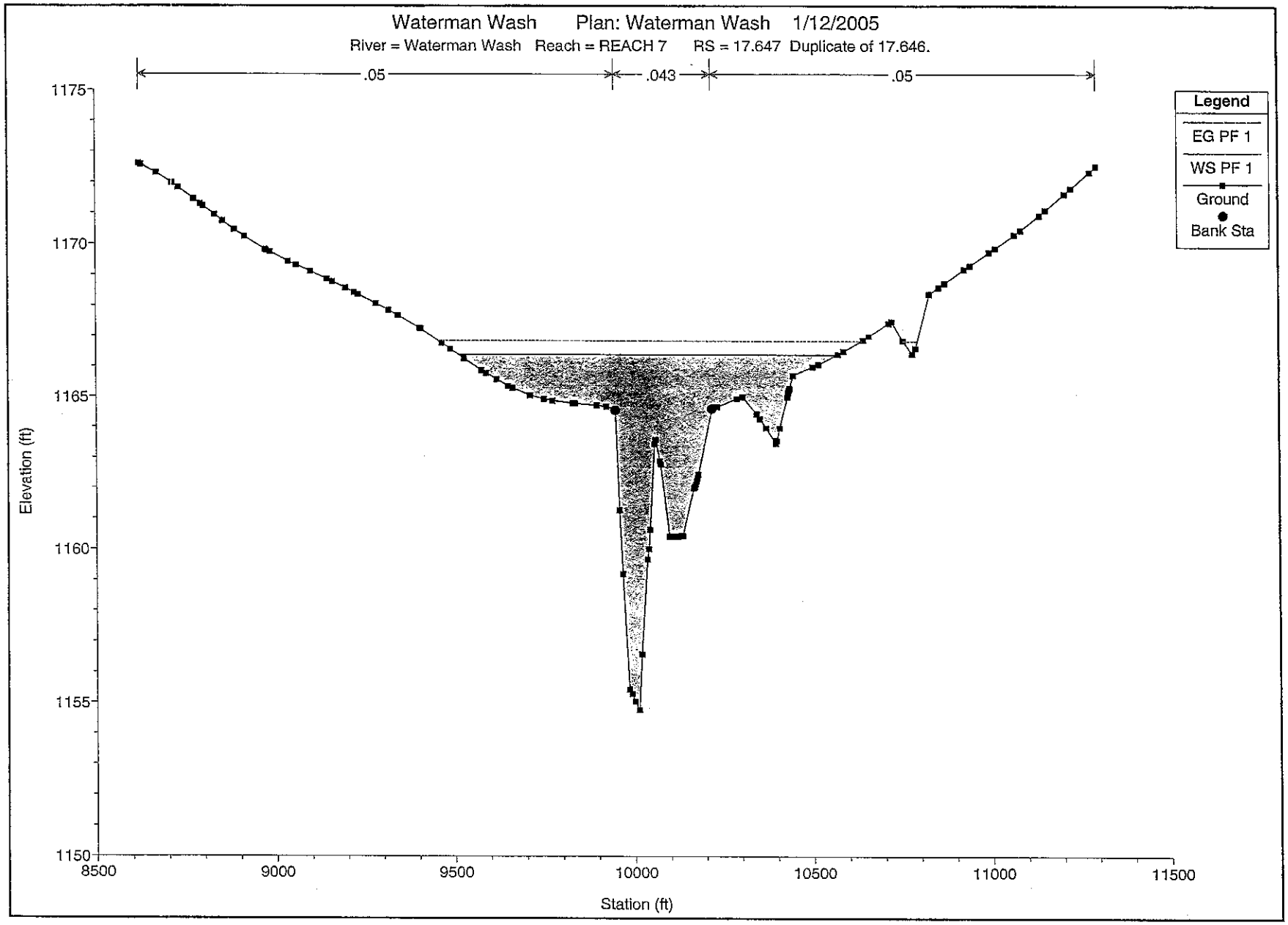

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 9 RS = 16.710
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1164
1162
1160
1158
1156
1154
1152
1150
1148
1146
1144
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

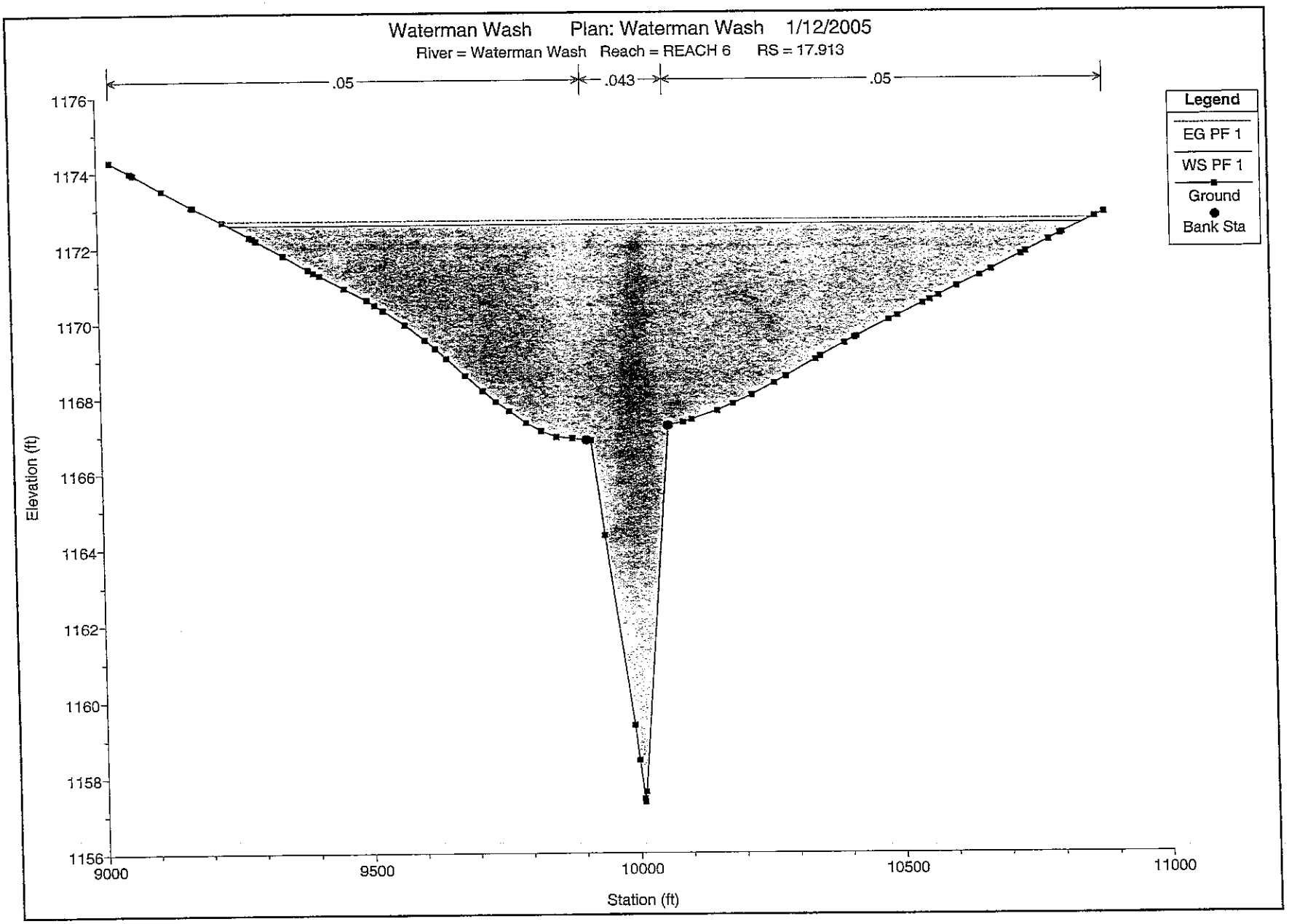

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 9 RS = 16.974
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1164
1162
1160
1158
1156
1154
1152
1150
1148
8500
9000
9500
10000
10500
11000
11500
Station (ft)

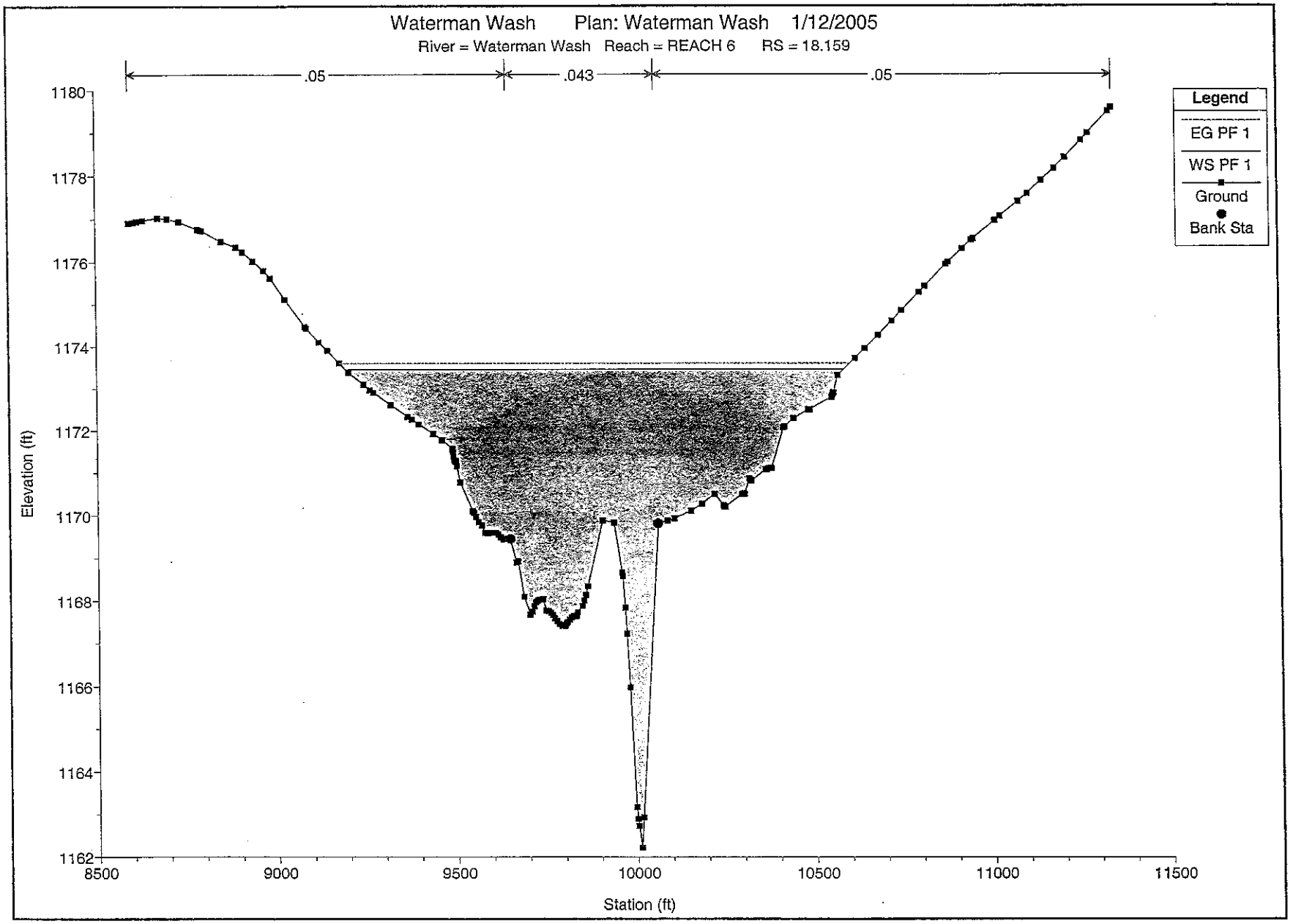

Waterman Wash Plan: Waterman Wash 1/20/2005
River = Waterman Wash Reach = REACH 8 RS = 17.195
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1164
1162
1160
1158
1156
1154
1152
1150
1148
8500
9000
9500
10000
10500
11000
11500
Station (ft)

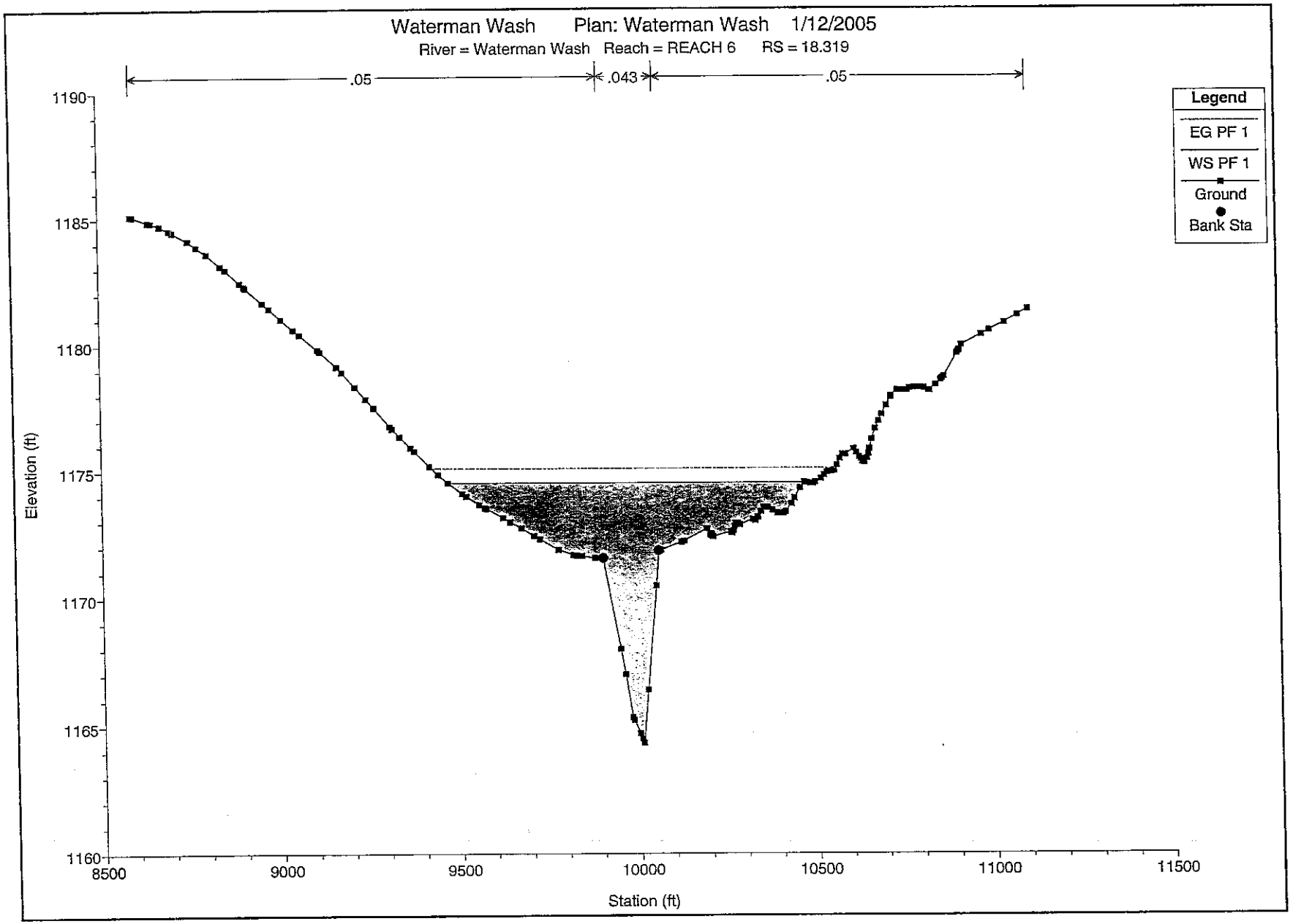

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 8 RS = 17.414
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1170
1168
1166
1164
1162
1160
1158
1156
1154
1152
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

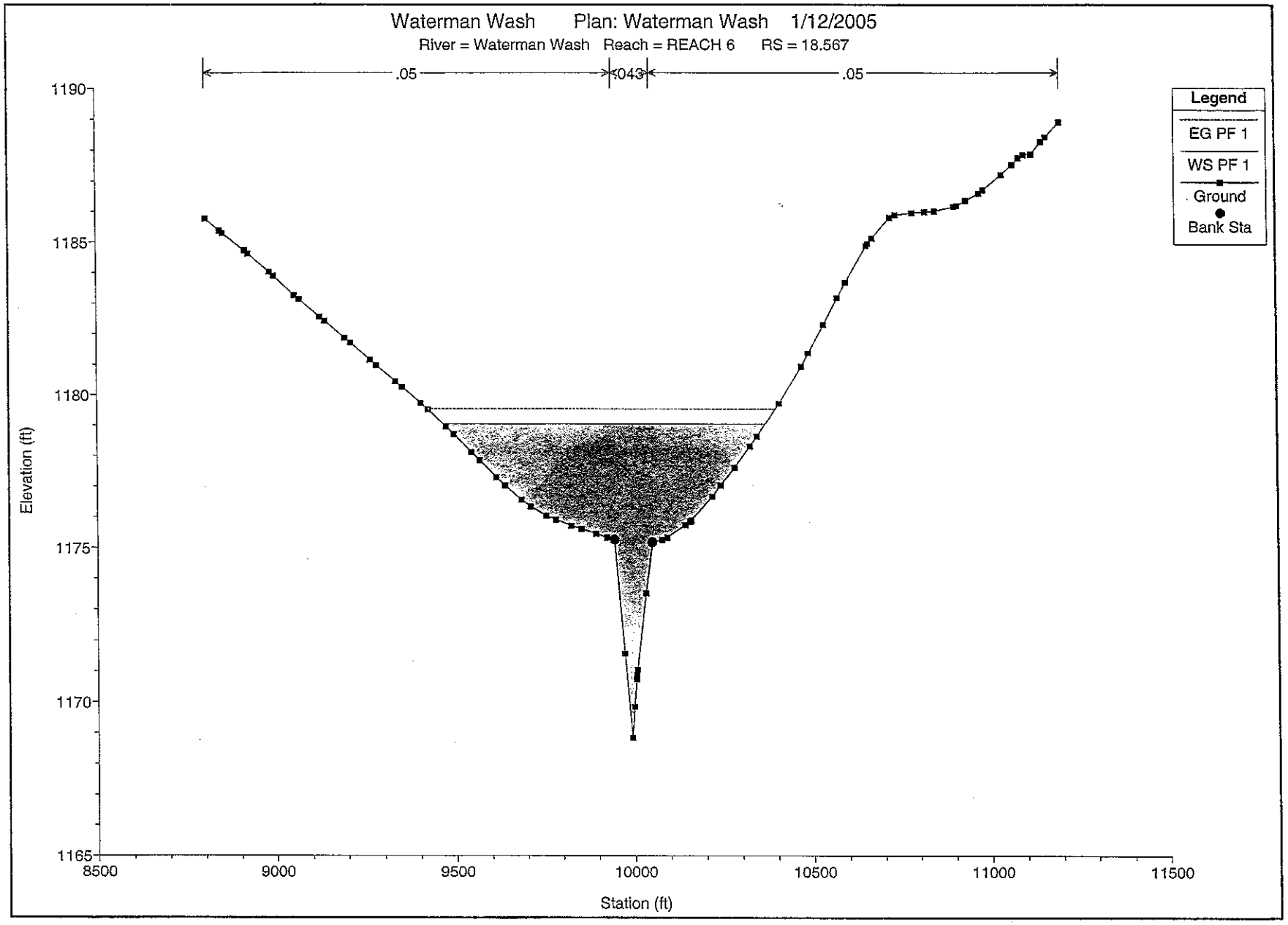

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 7 RS = 17.646
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1175
1170
1165
1160
1155
1150
8500
9000
9500
10000
10500
11000
11500
Station (ft)

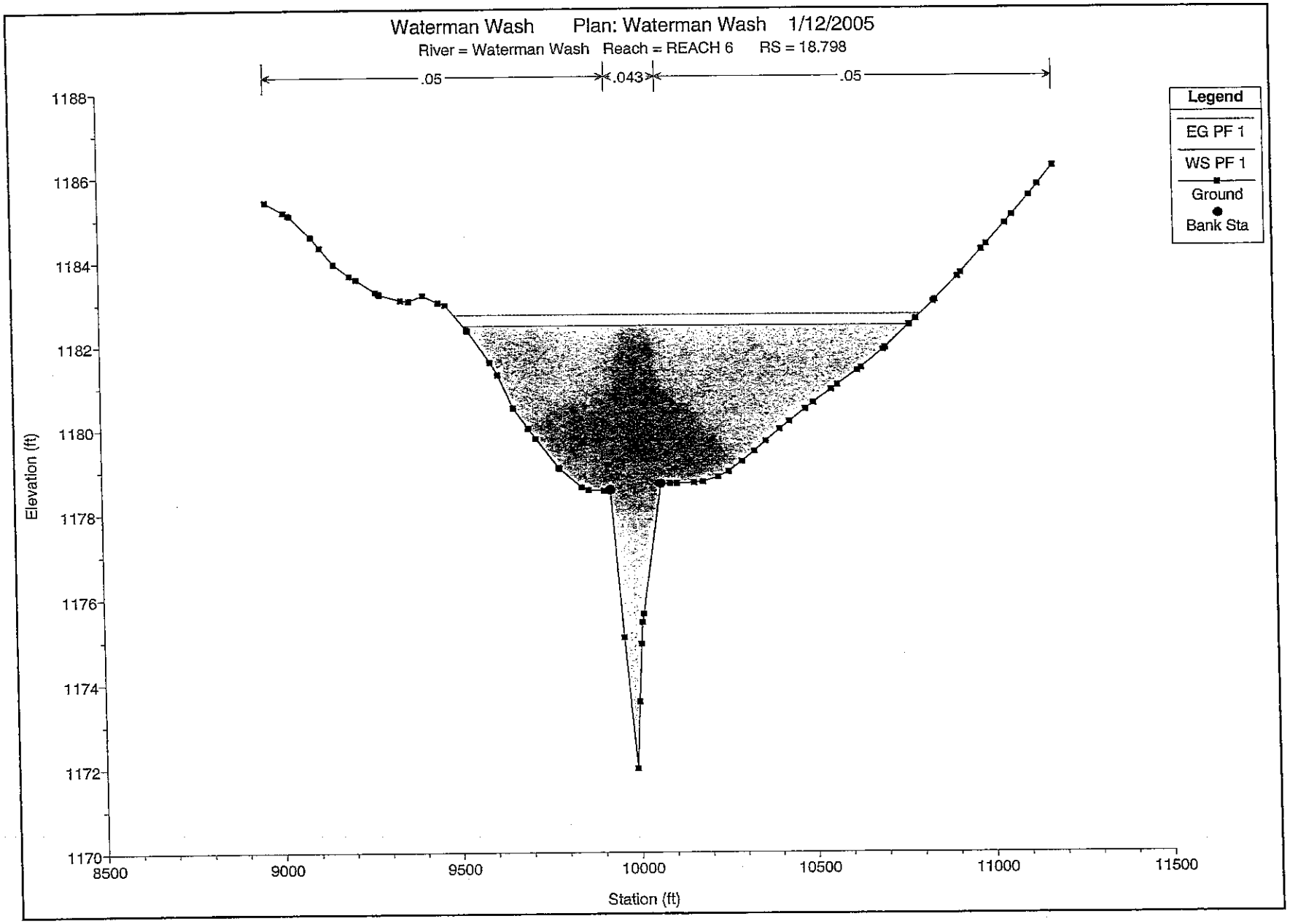

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 7 RS = 17.647 Duplicate of 17.646.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1175
1170
1165
1160
1155
1150
8500
9000
9500
10000
10500
11000
11500
Station (ft)

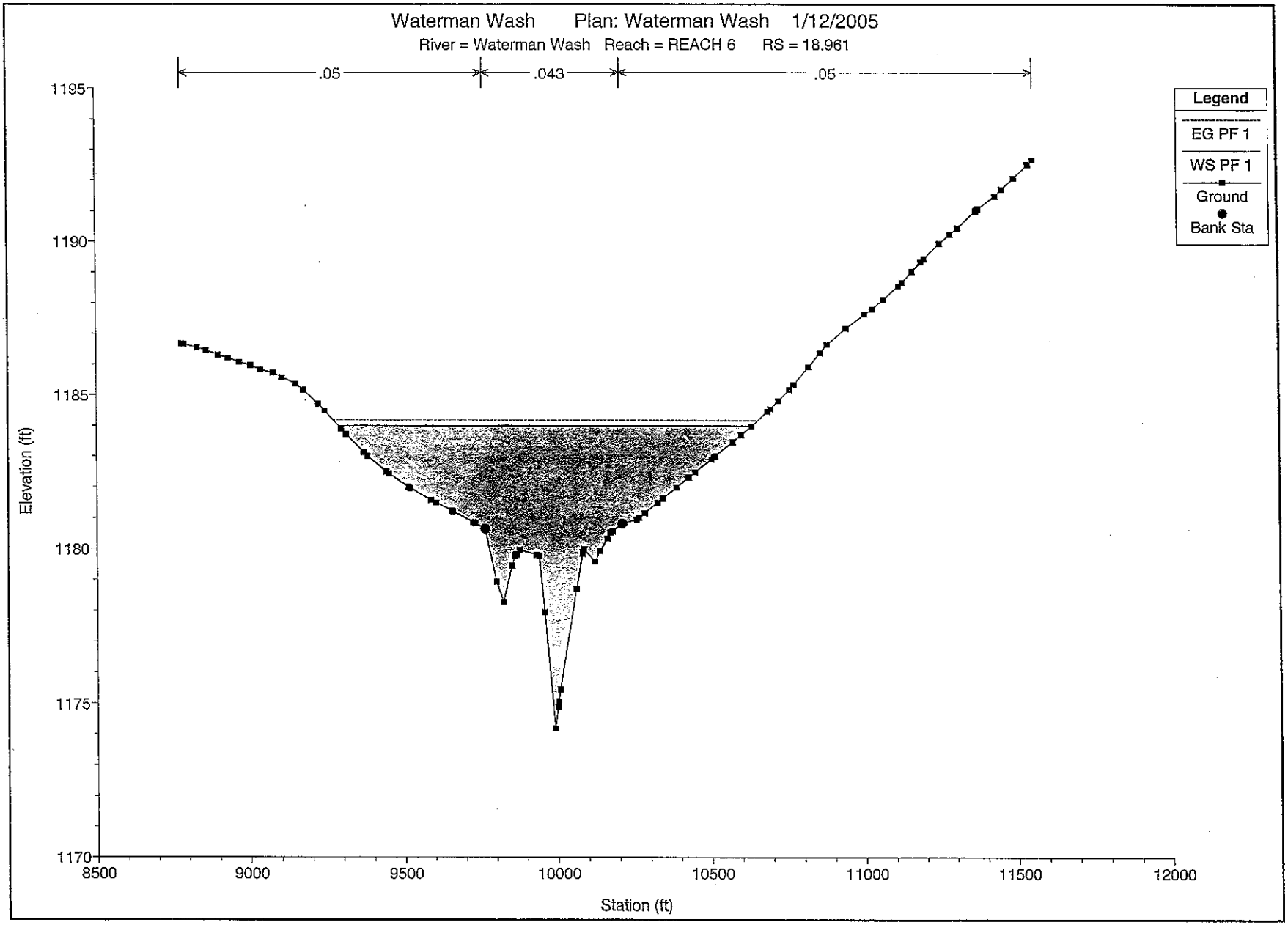

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 6 RS = 17.913
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1176
1174
1172
1170
1168
1166
1164
1162
1160
1158
1156
9000
9500
10000
10500
11000
Station (ft)

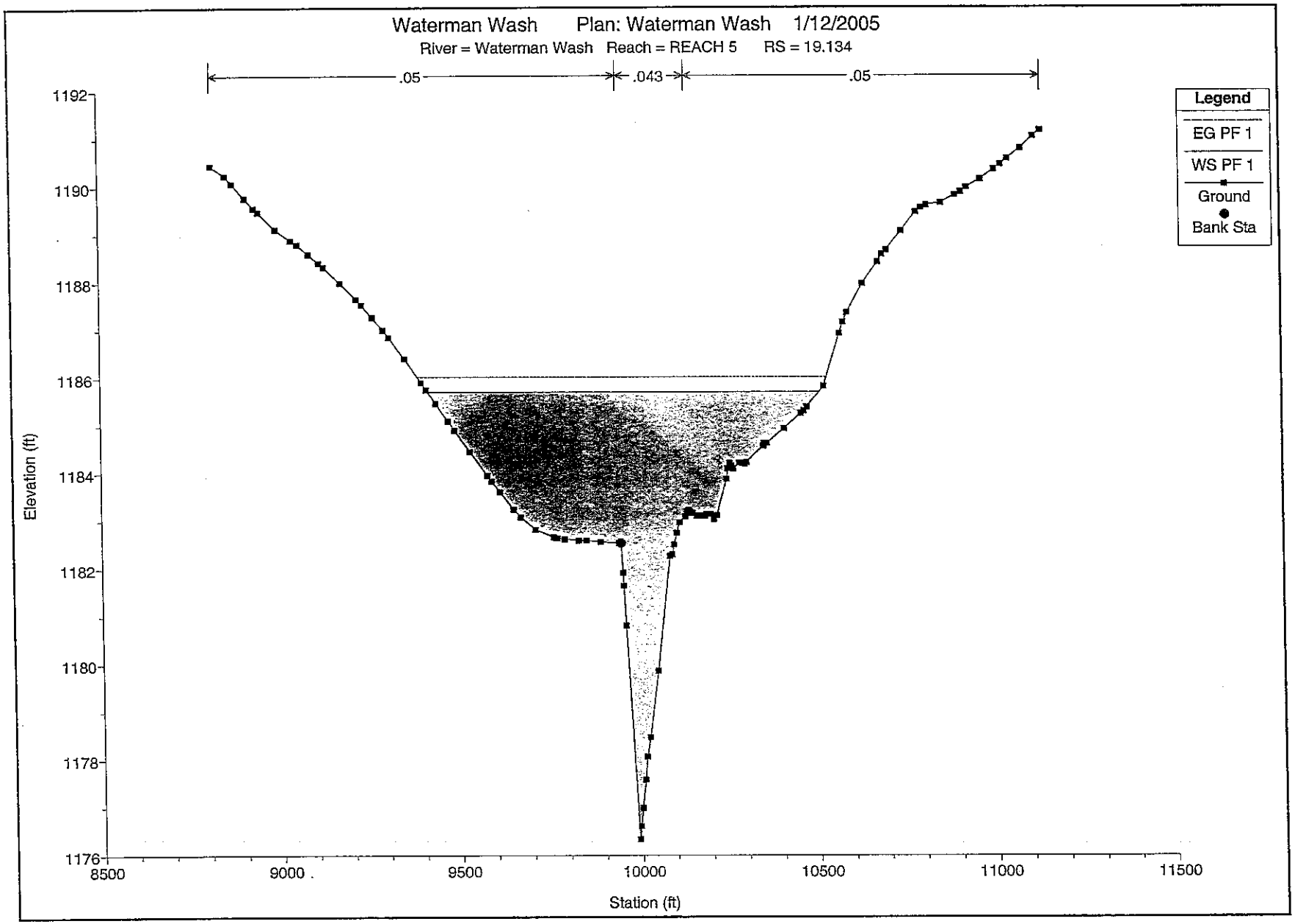

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 6 RS = 18.159
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1180
1178
1176
1174
1172
1170
1168
1166
1164
1162
8500
9000
9500
10000
10500
11000
11500
Station (ft)

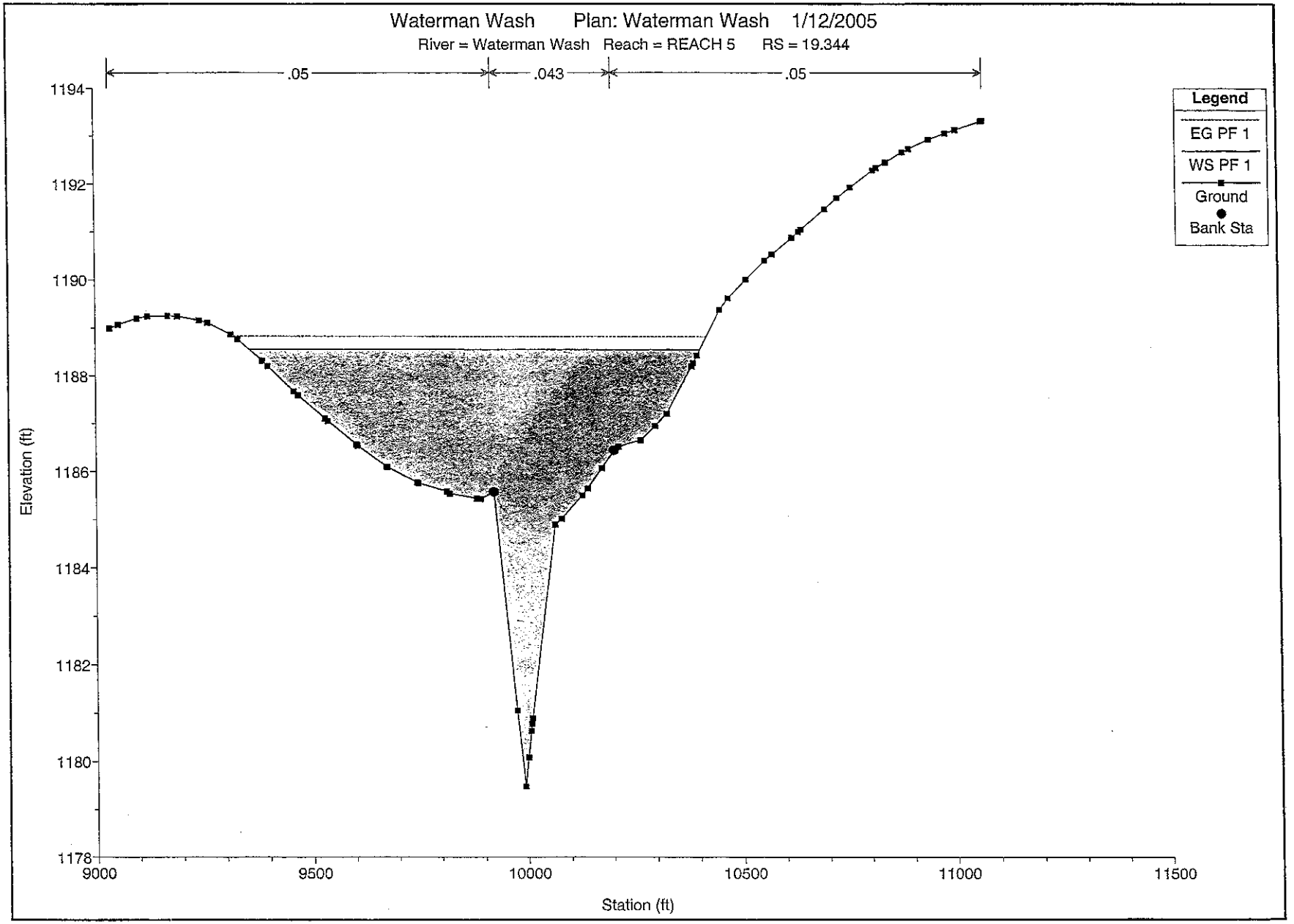

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 6 RS = 18.319
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1190
1185
1180
1175
1170
1165
1160
8500
9000
9500
10000
10500
11000
11500
Station (ft)

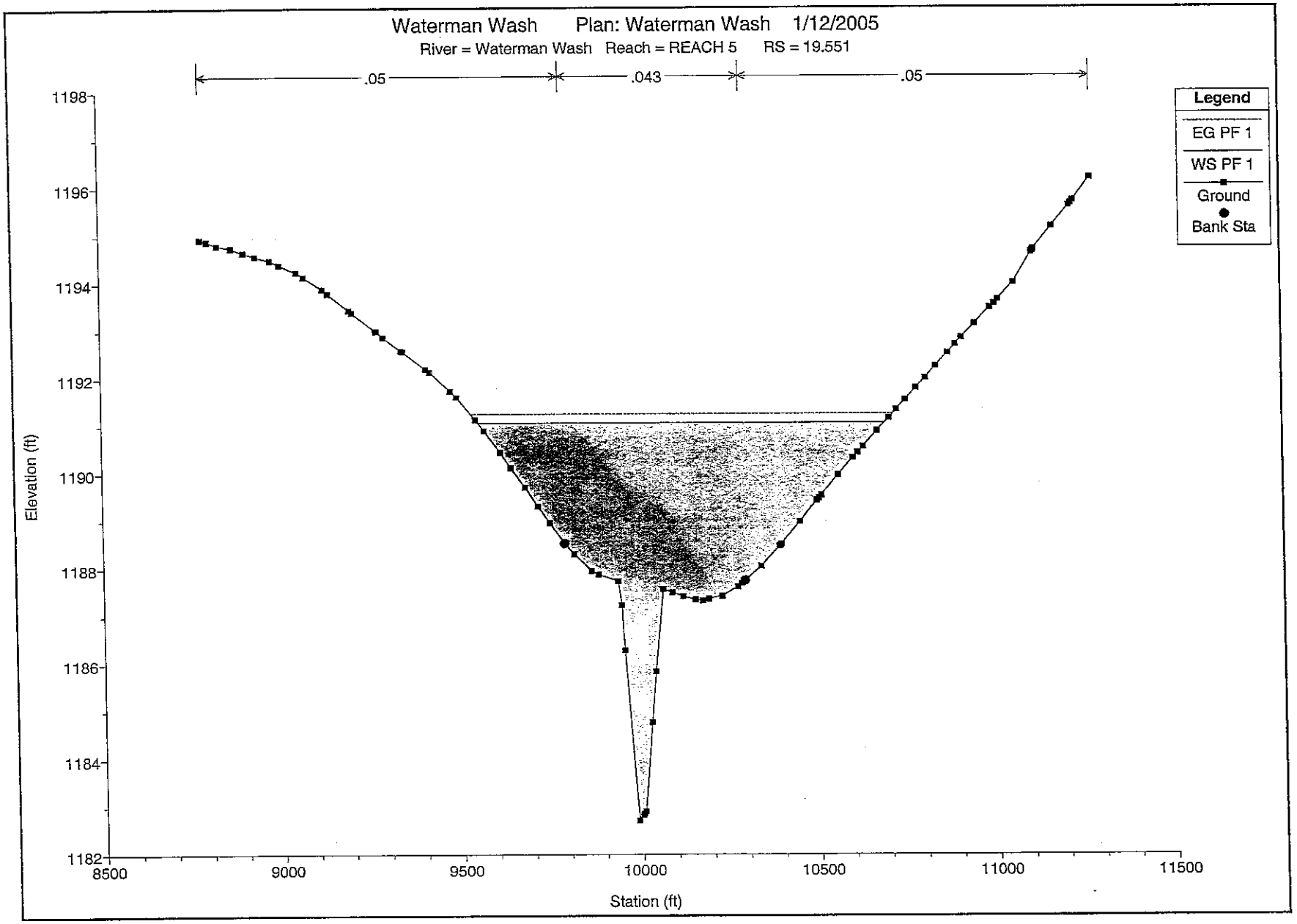

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 6 RS = 18.567
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1190
1185
1180
1175
1170
1165
8500
9000
9500
10000
10500
11000
11500
Station (ft)

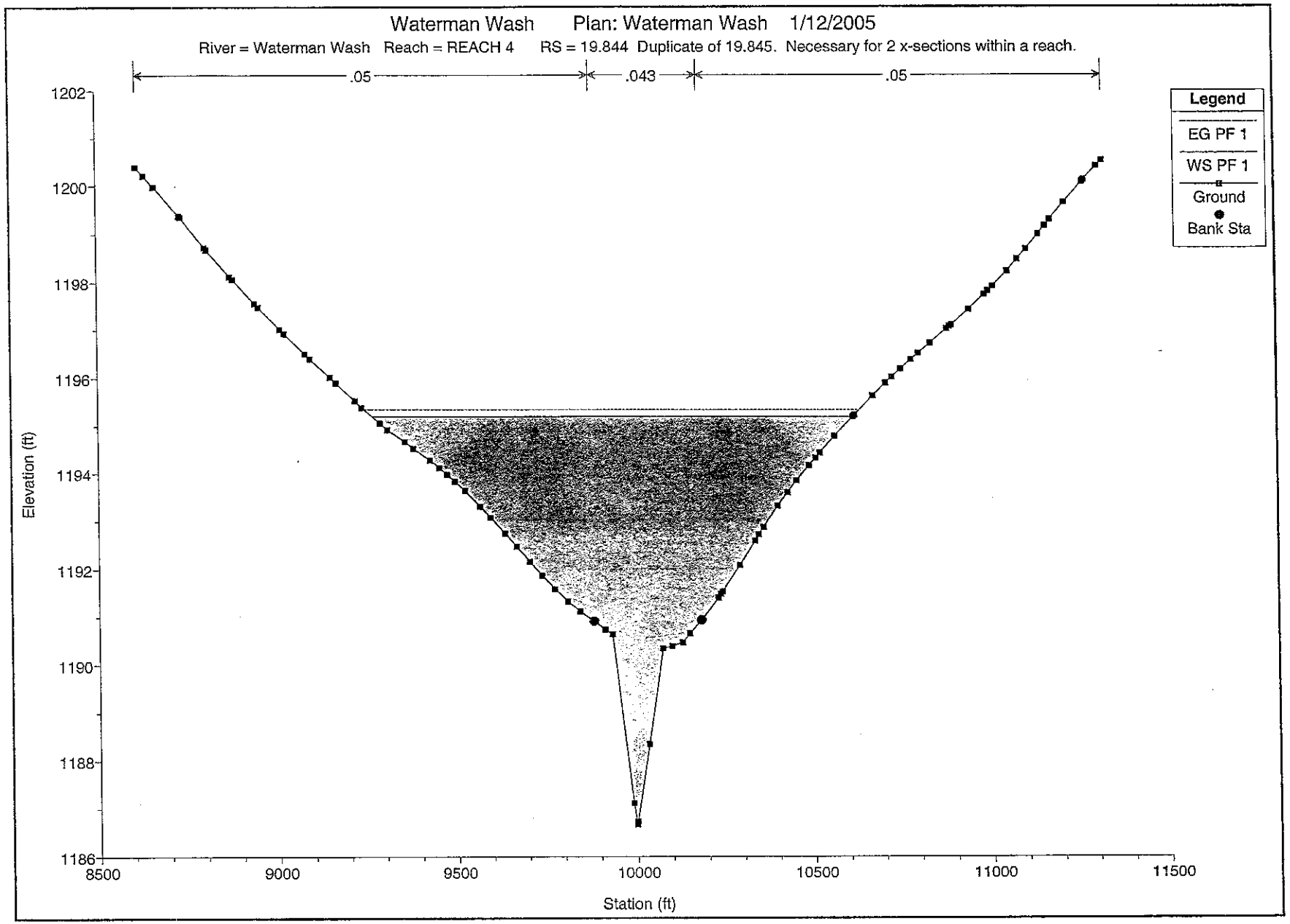

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 6 RS = 18.798
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1188
1186
1184
1182
1180
1178
1176
1174
1172
1170
8500
9000
9500
10000
10500
11000
11500
Station (ft)

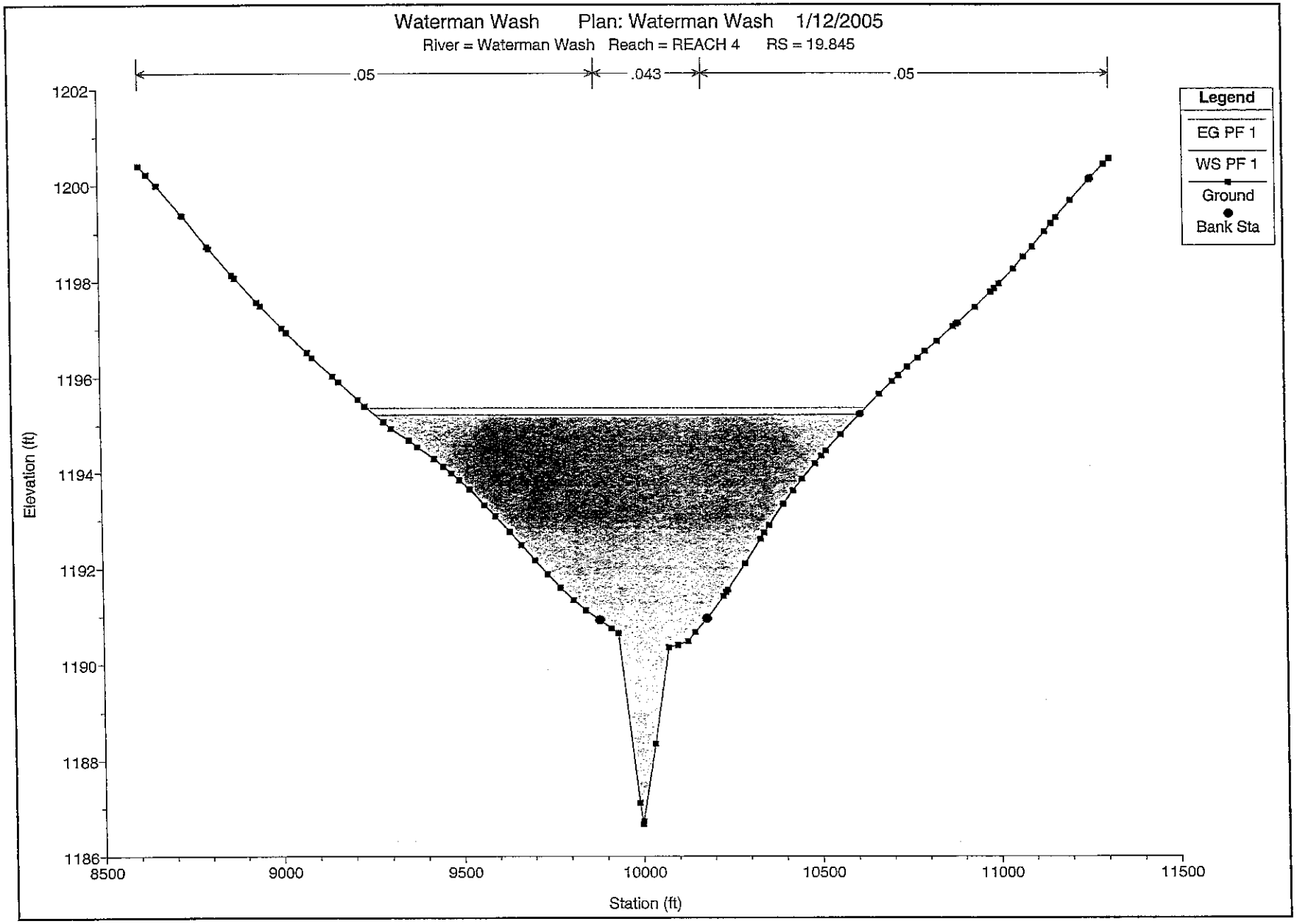

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 6 RS = 18.961
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1195
1190
1185
1180
1175
1170
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

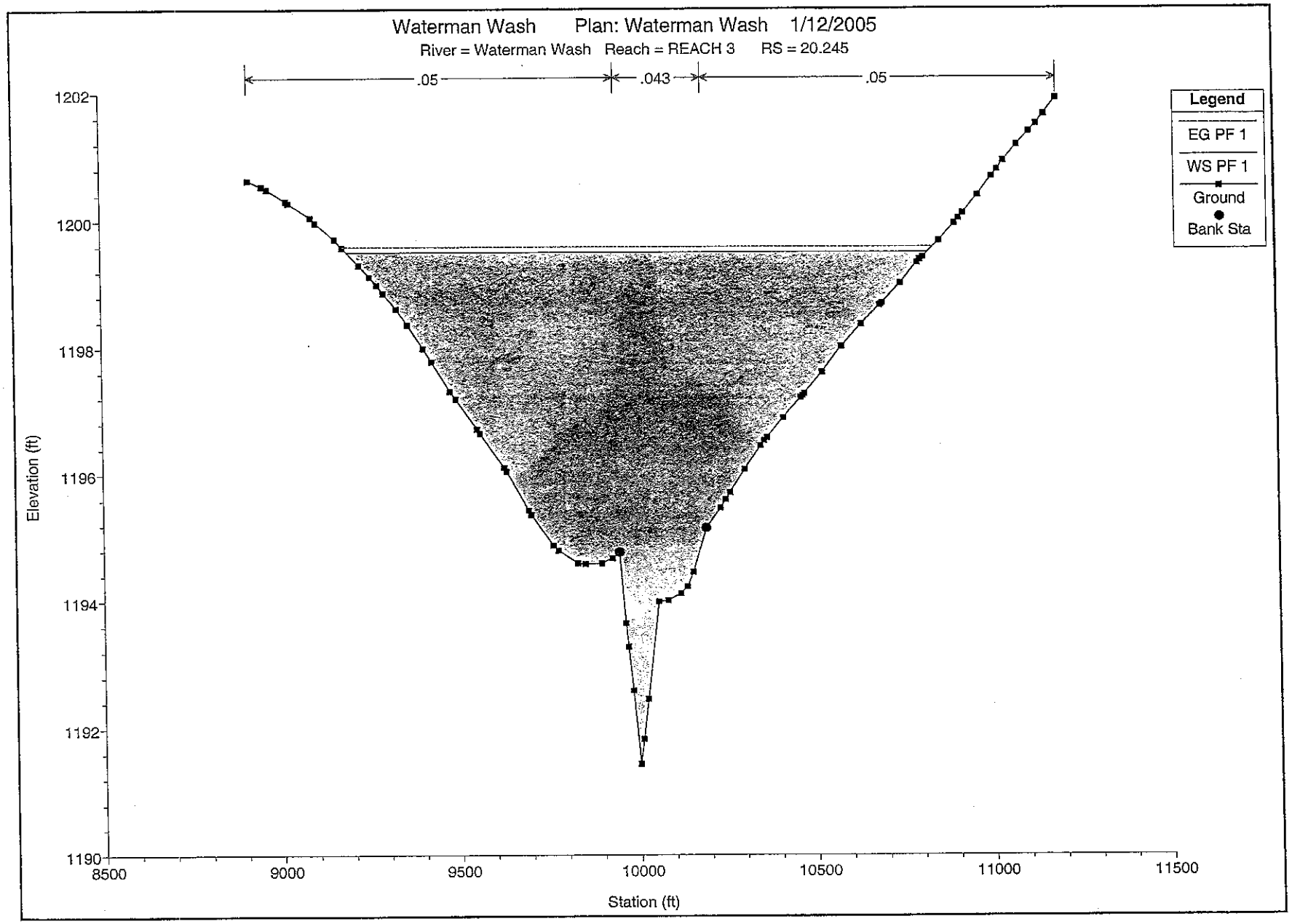

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 5 RS = 19.134
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1192
1190
1188
1186
1184
1182
1180
1178
1176
8500
9000
9500
10000
10500
11000
11500
Station (ft)

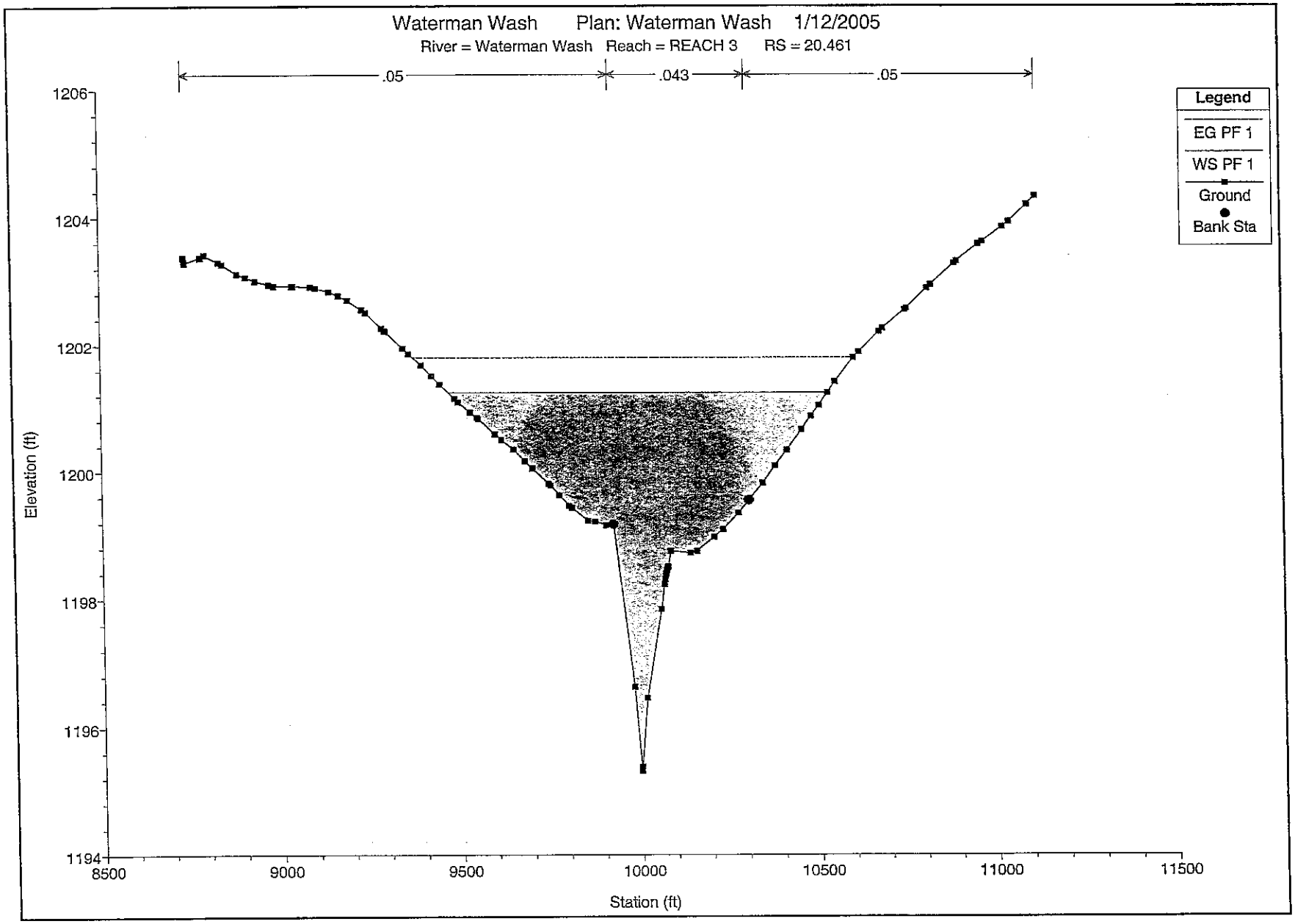

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 5 RS = 19.344
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1194
1192
1190
1188
1186
1184
1182
1180
1178
9000
9500
10000
10500
11000
11500
Station (ft)

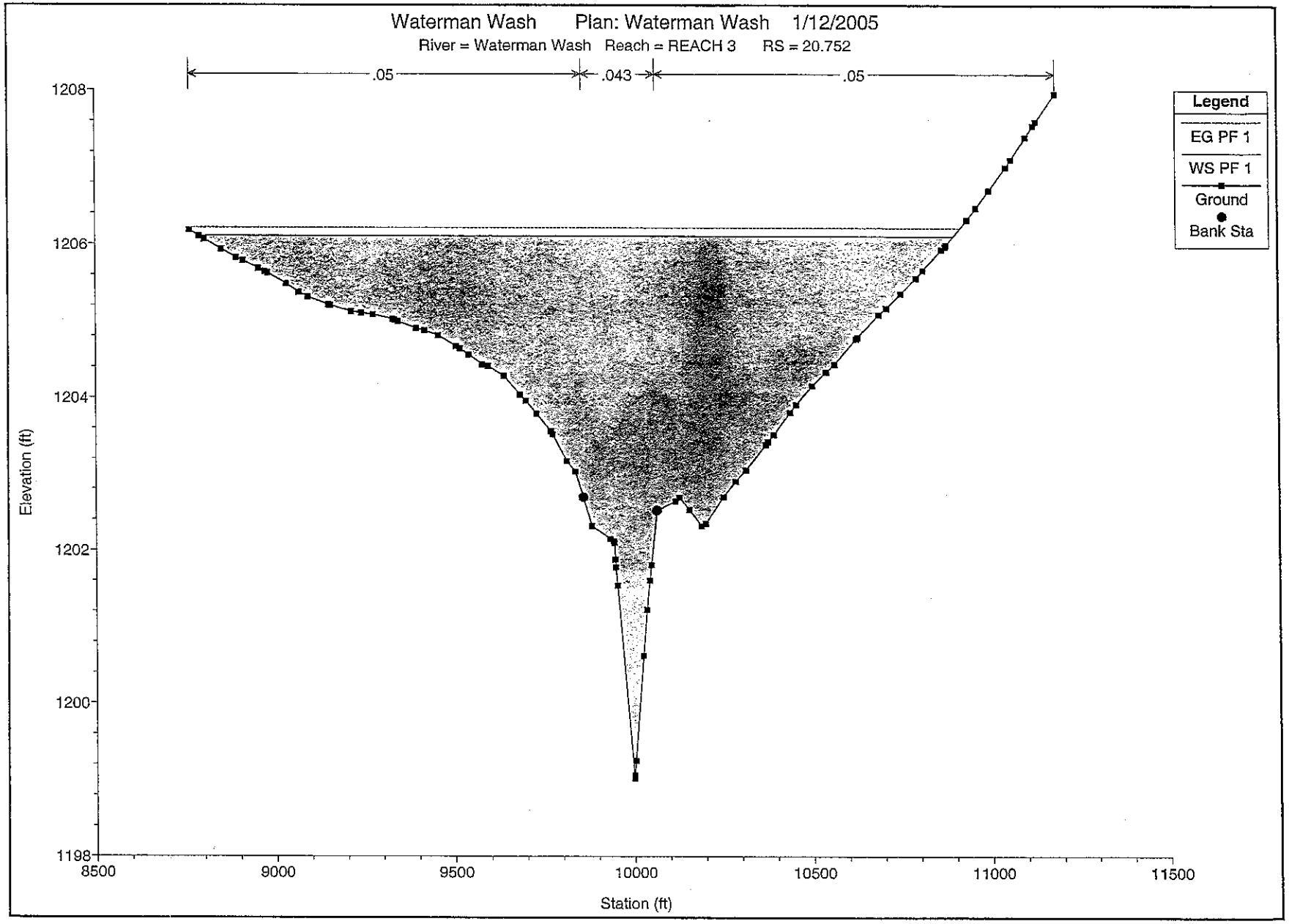

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 5 RS = 19.551
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1198
1196
1194
1192
1190
1188
1186
1184
1182
8500
9000
9500
10000
10500
11000
11500
Station (ft)

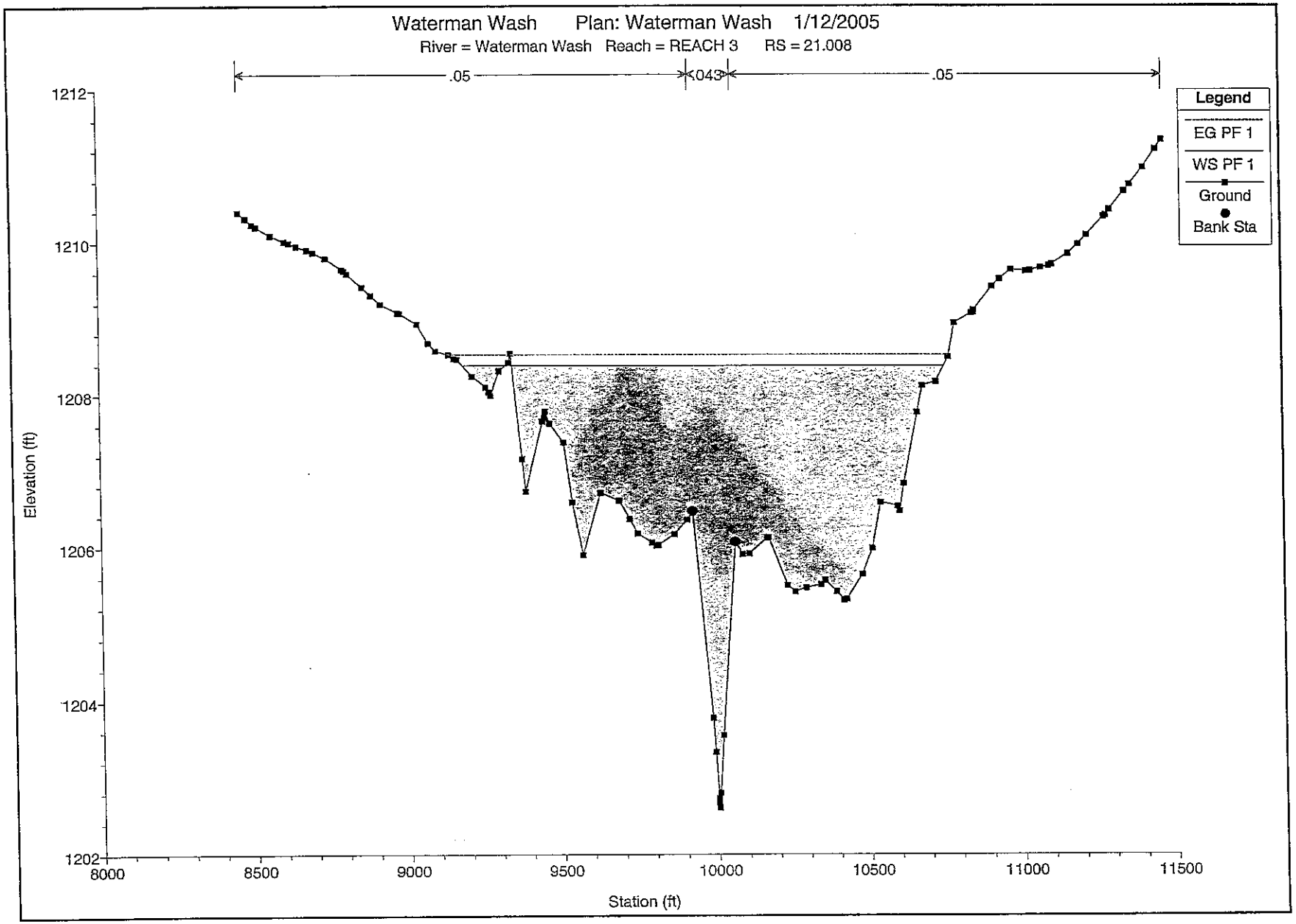

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 4 RS = 19.844 Duplicate of 19.845. Necessary for 2 x-sections within a reach.
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1202
1200
1198
1196
1194
1192
1190
1188
1186
8500
9000
9500
10000
10500
11000
11500
Station (ft)

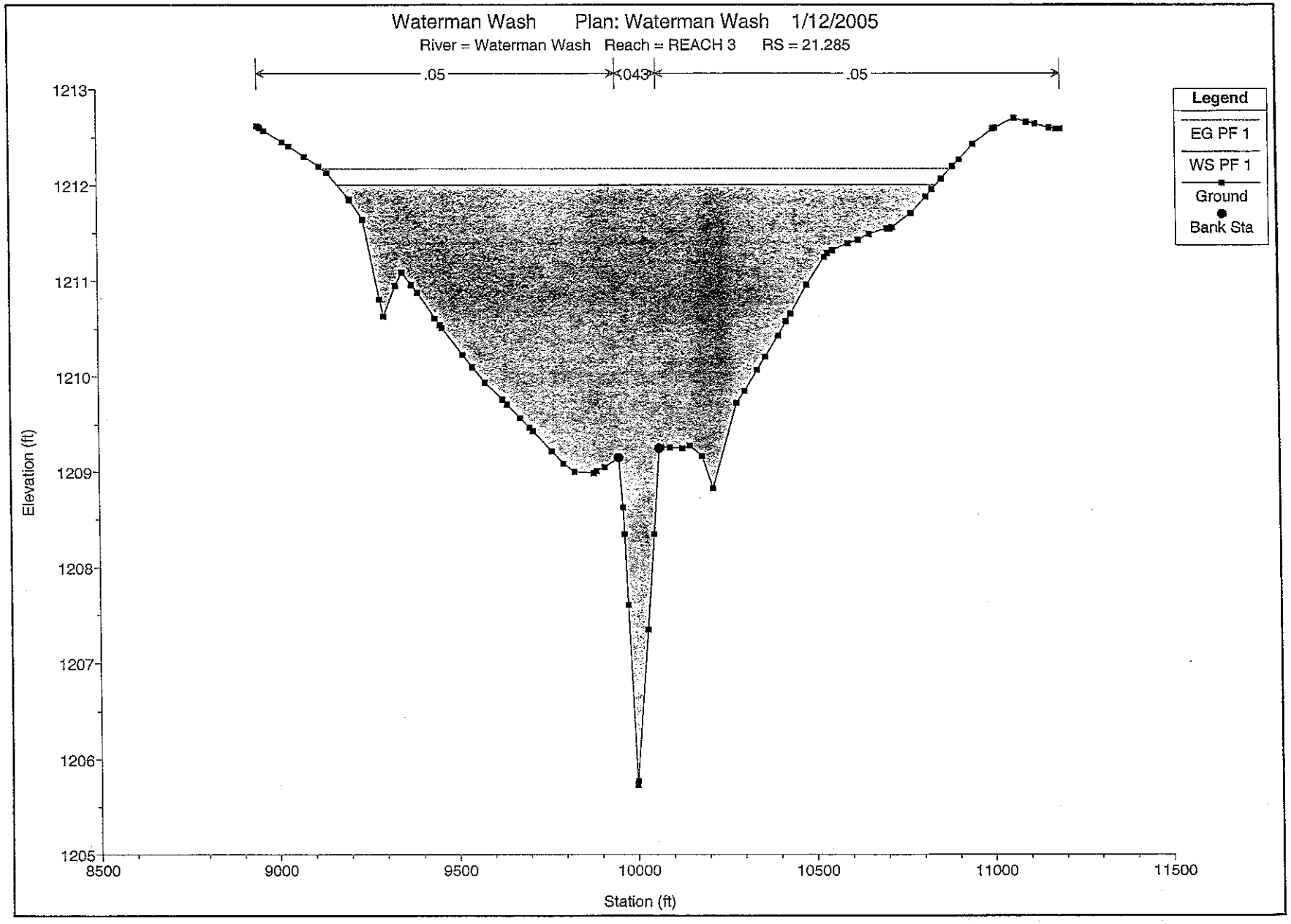

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 4 RS = 19.845
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1202
1200
1198
1196
1194
1192
1190
1188
1186
8500
9000
9500
10000
10500
11000
11500
Station (ft)

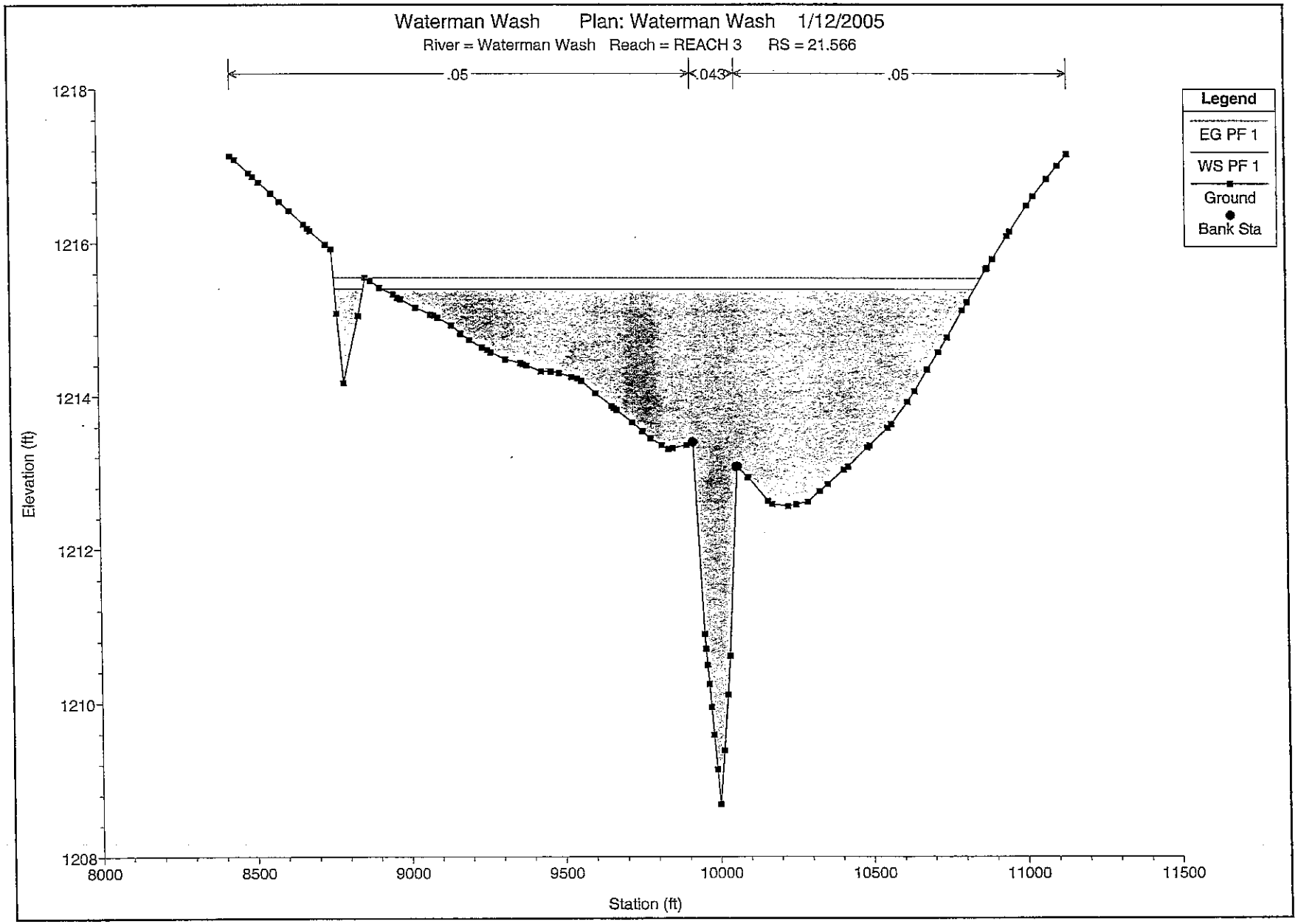

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 20.245
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1202
1200
1198
1196
1194
1192
1190
8500
9000
9500
10000
10500
11000
11500
Station (ft)

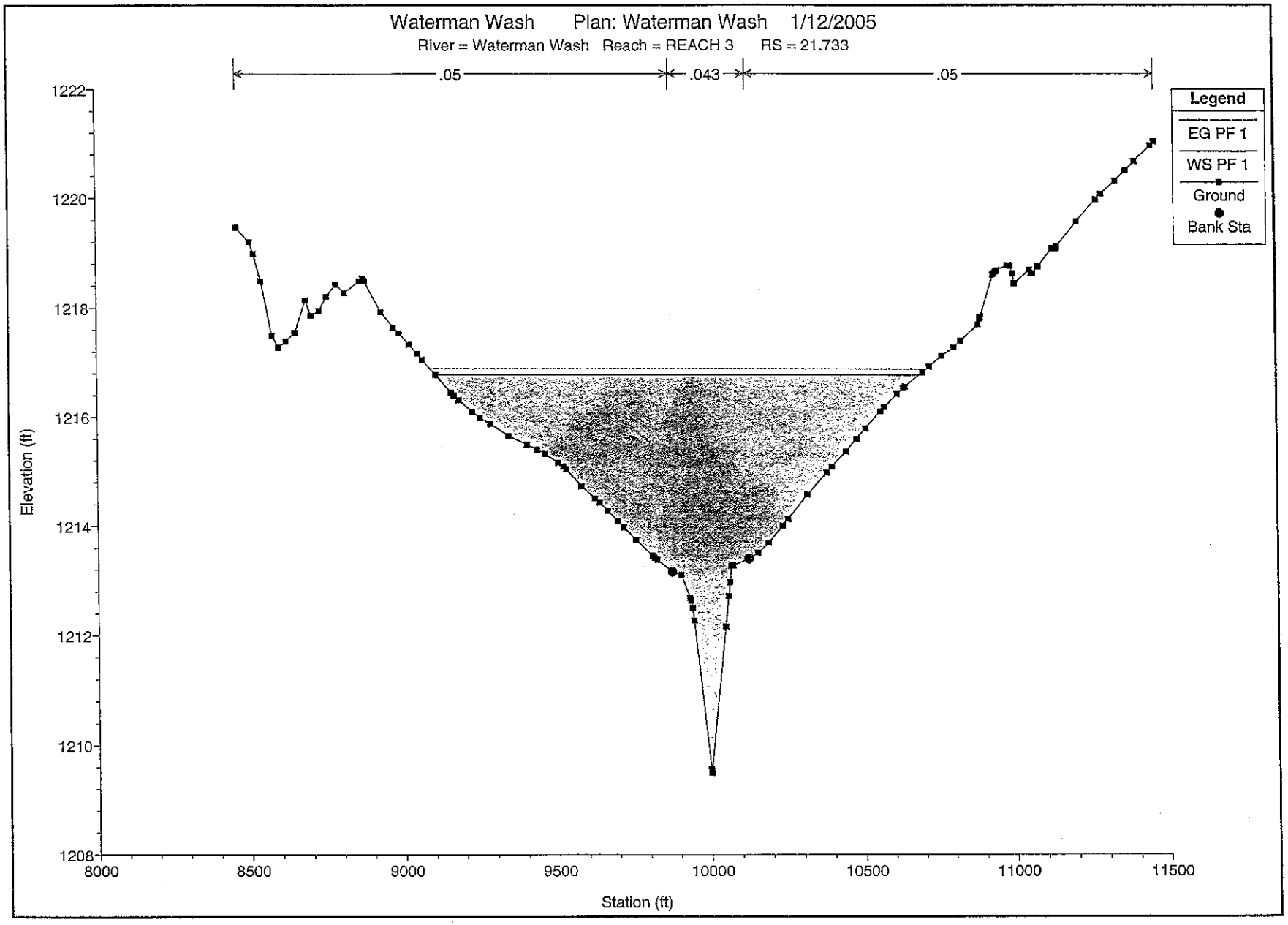

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 20.461
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1206
1204
1202
1200
1198
1196
1194
8500
9000
9500
10000
10500
11000
11500
Station (ft)

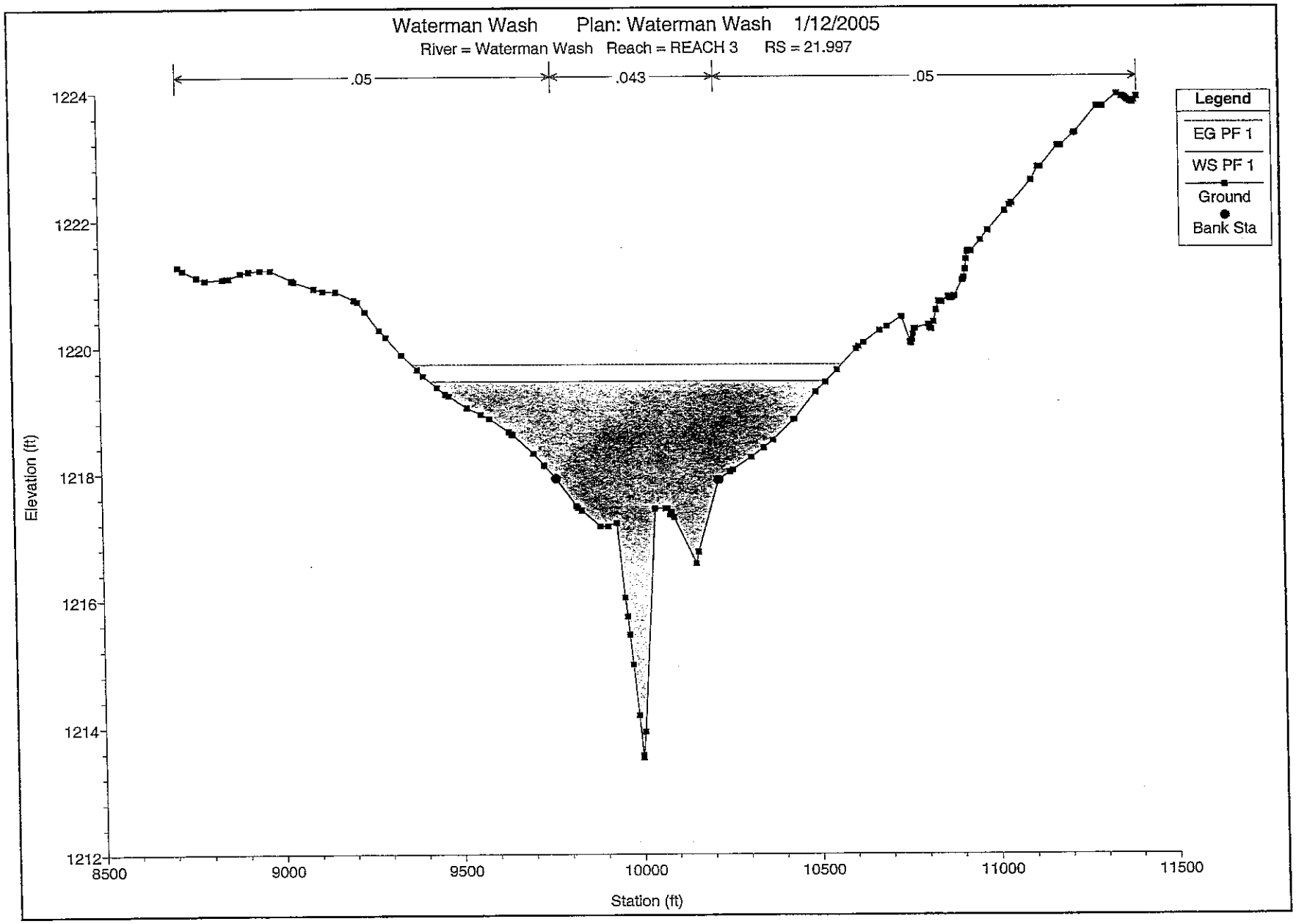

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 20.752
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1208
1206
1204
1202
1200
1198
8500
9000
9500
10000
10500
11000
11500
Station (ft)

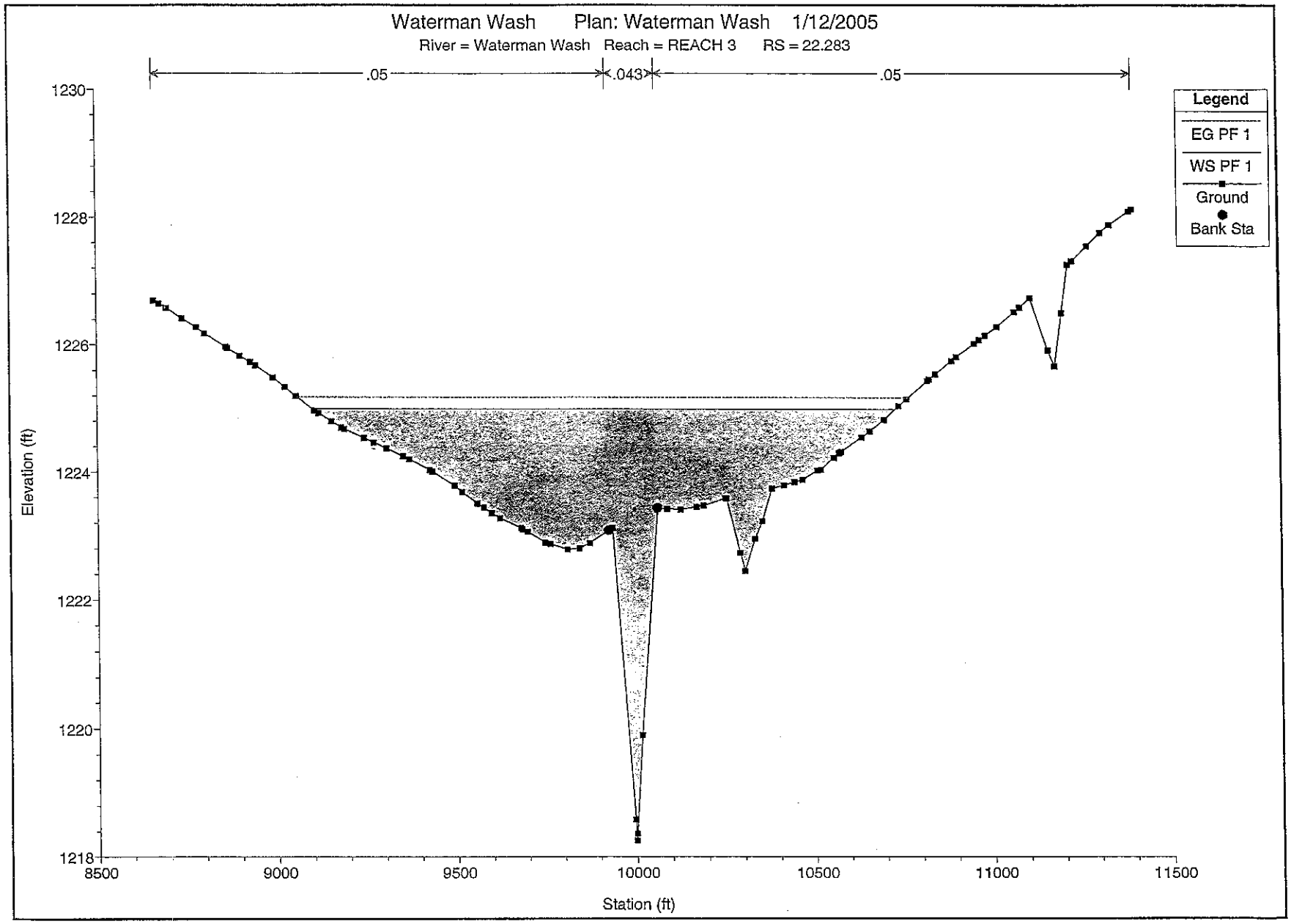

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 21.008
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1212
1210
1208
1206
1204
1202
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

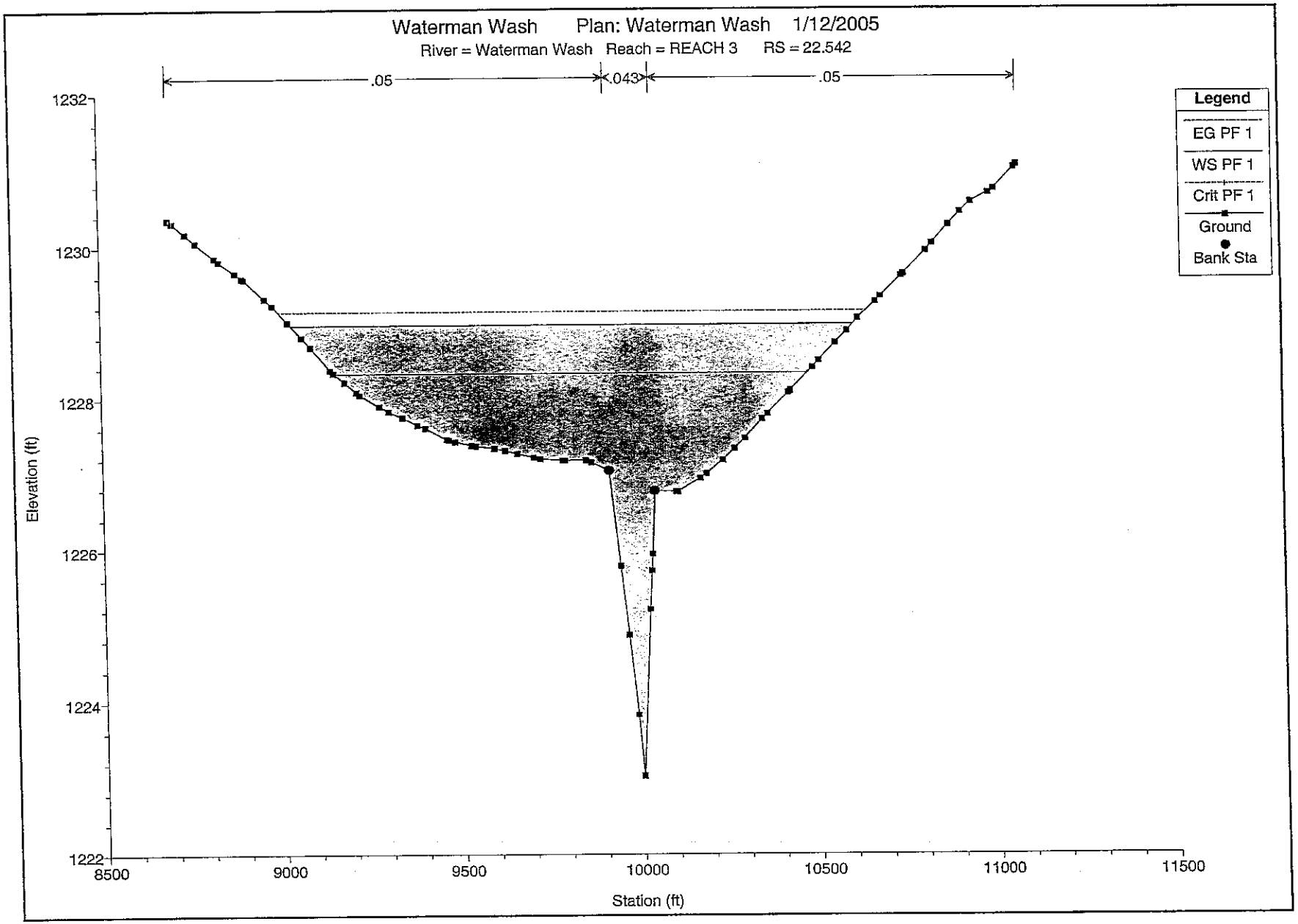

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 21.285
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1213
1212
1211
1210
1209
1208
1207
1206
1205
8500
9000
9500
10000
10500
11000
11500
Station (ft)

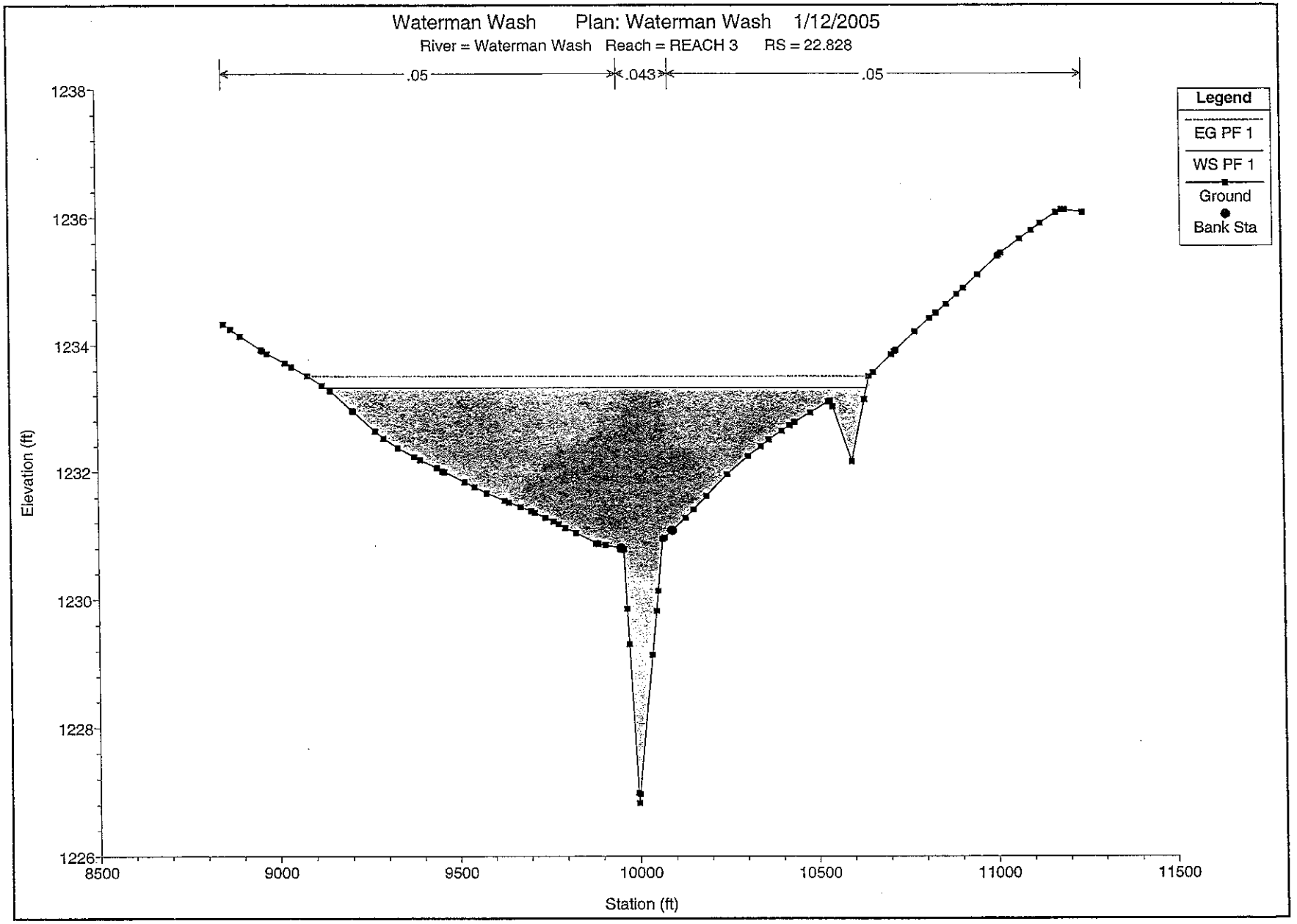

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 21.566
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1218
1216
1214
1212
1210
1208
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

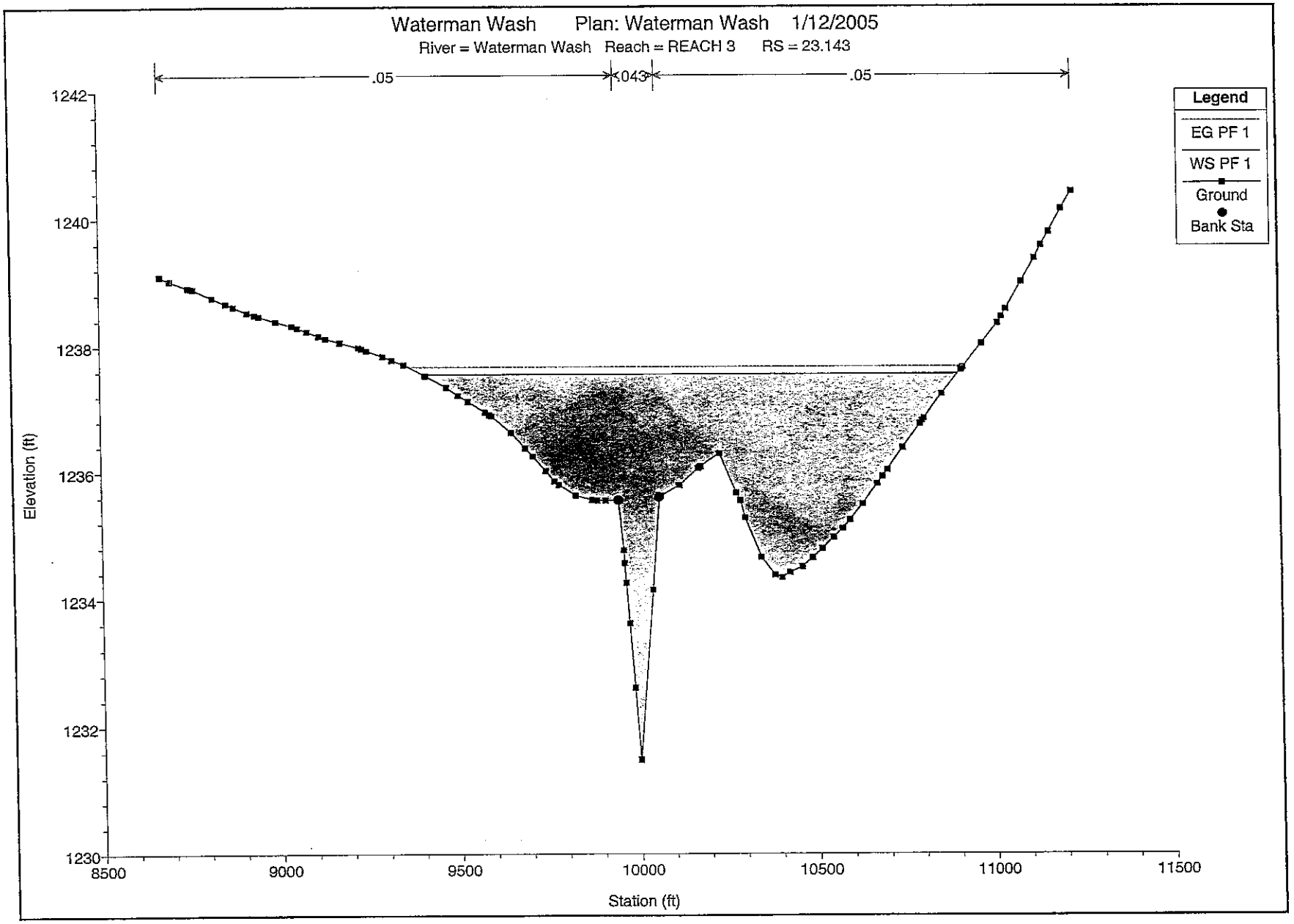

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 21.733
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1222
1220
1218
1216
1214
1212
1210
1208
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

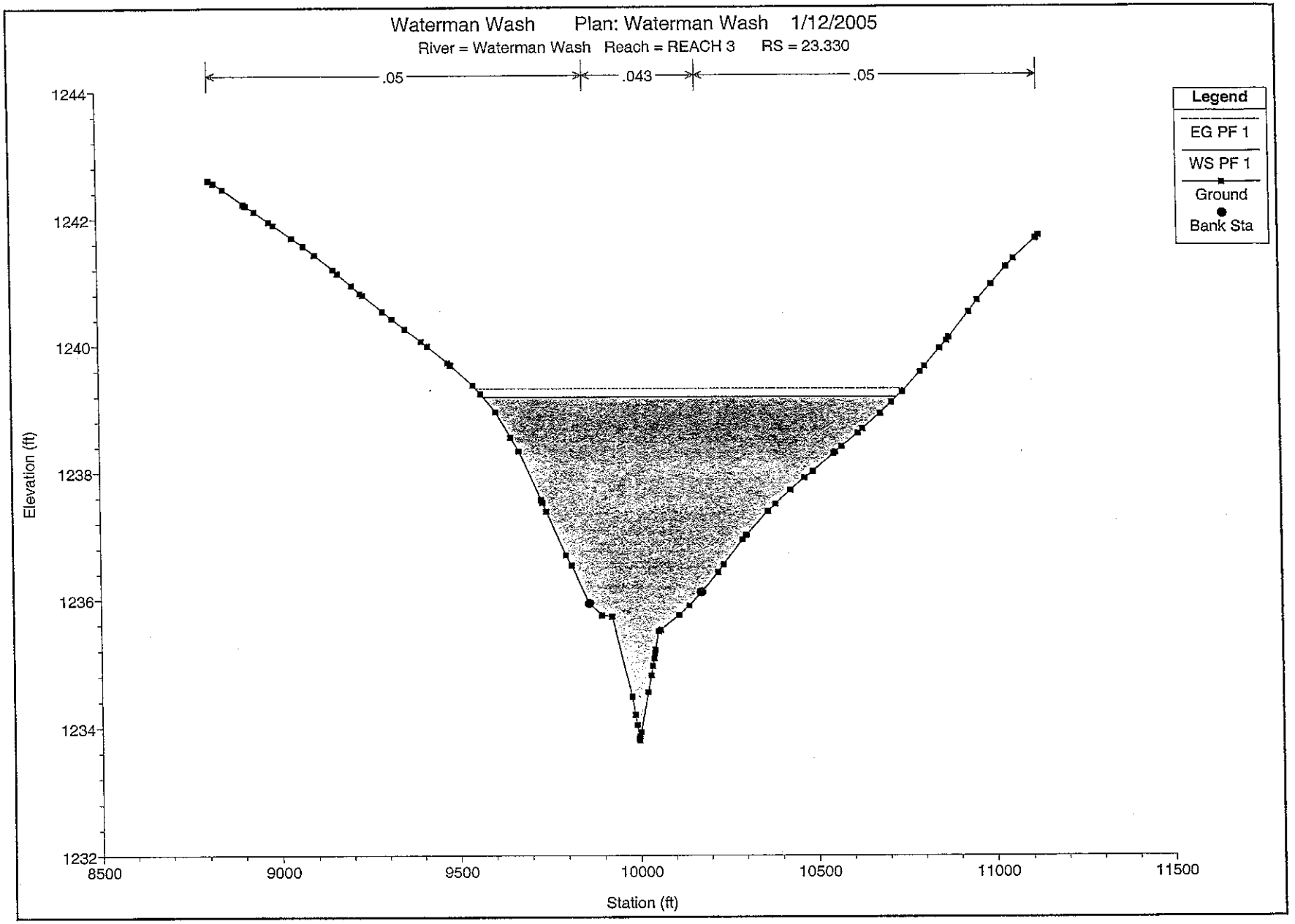

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 21.997
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1224
1222
1220
1218
1216
1214
1212
8500
9000
9500
10000
10500
11000
11500
Station (ft)

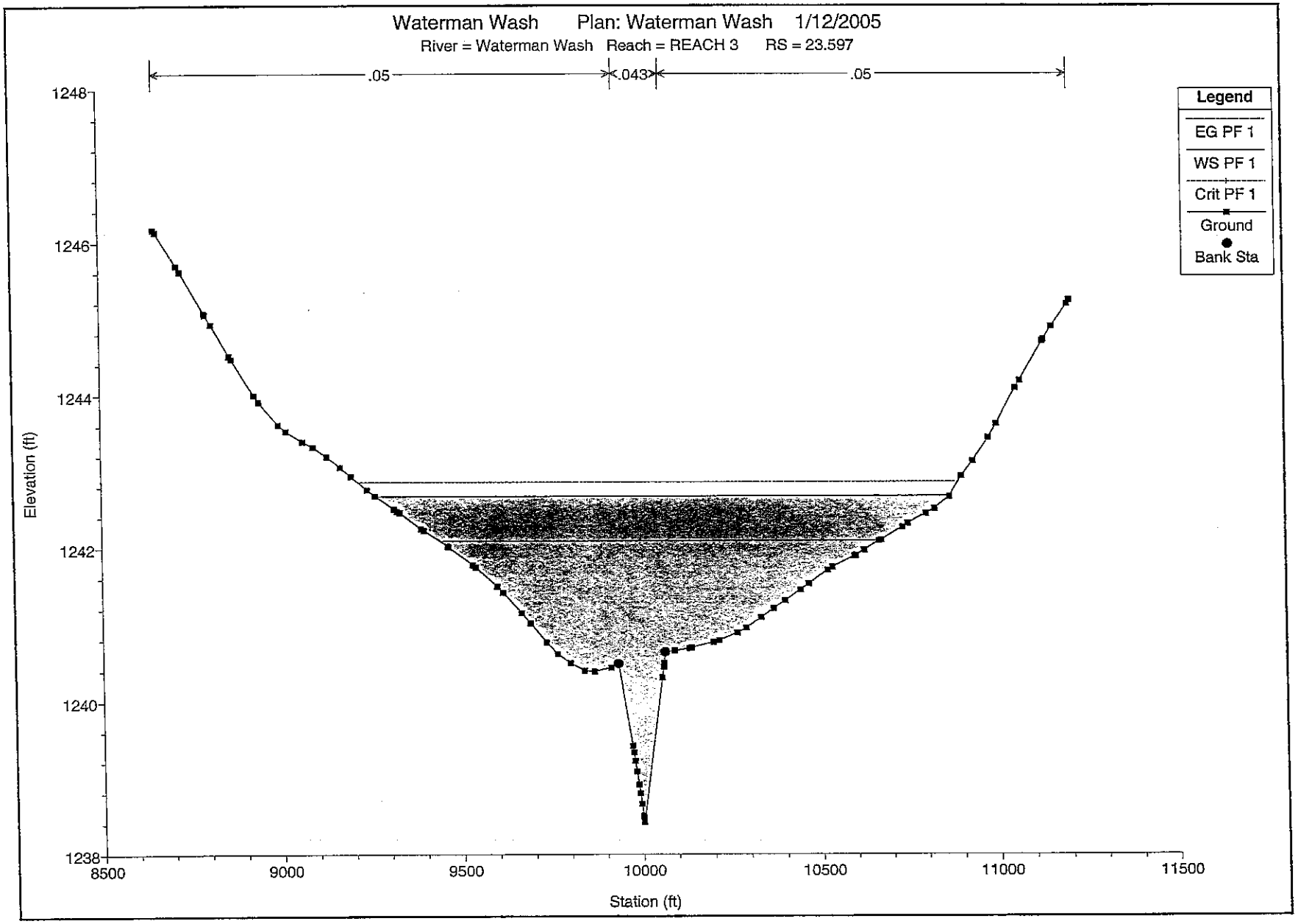

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 22.283
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1230
1228
1226
1224
1222
1220
1218
8500
9000
9500
10000
10500
11000
11500
Station (ft)

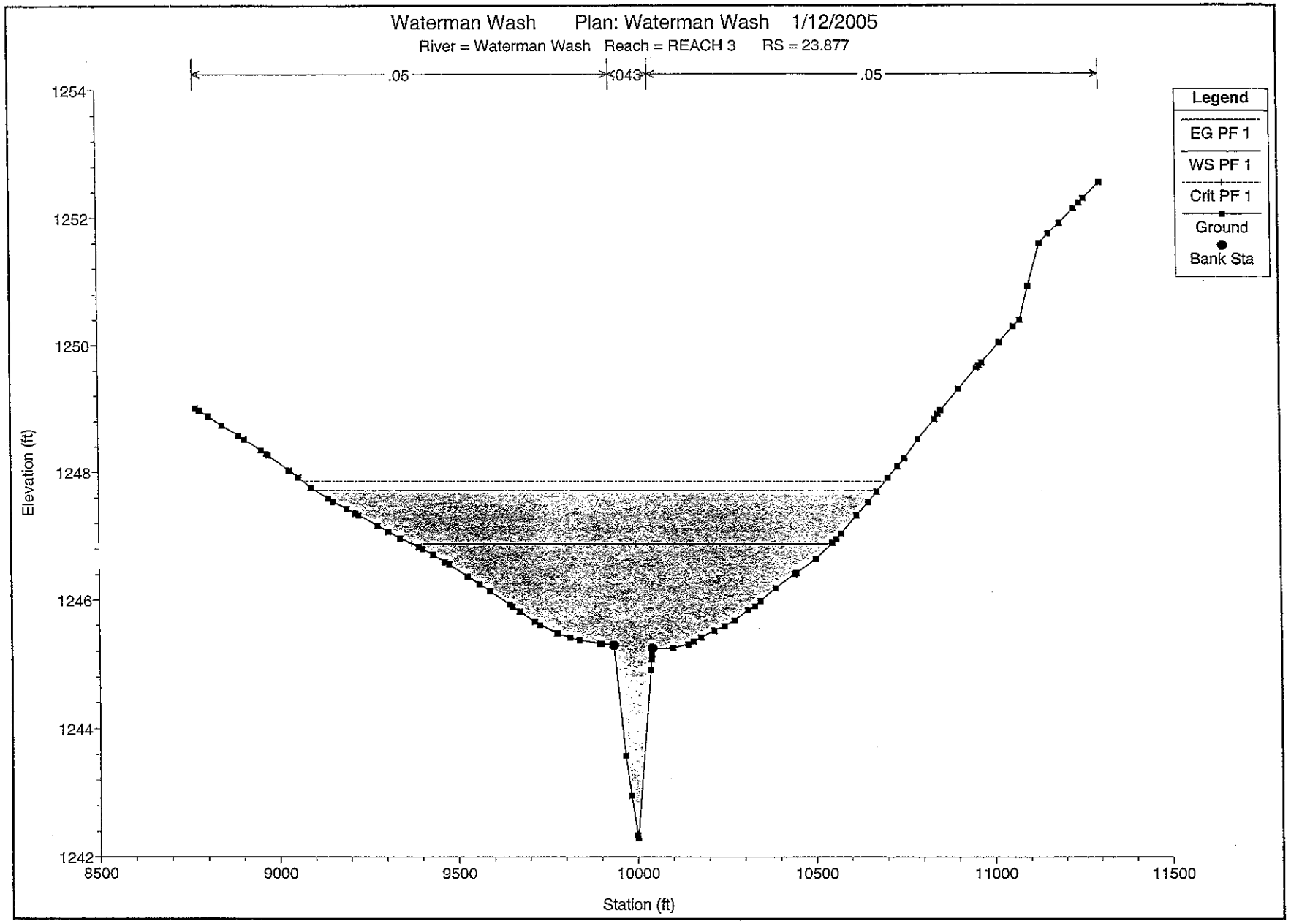

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 22.542
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1232
1230
1228
1226
1224
1222
8500
9000
9500
10000
10500
11000
11500
Station (ft)

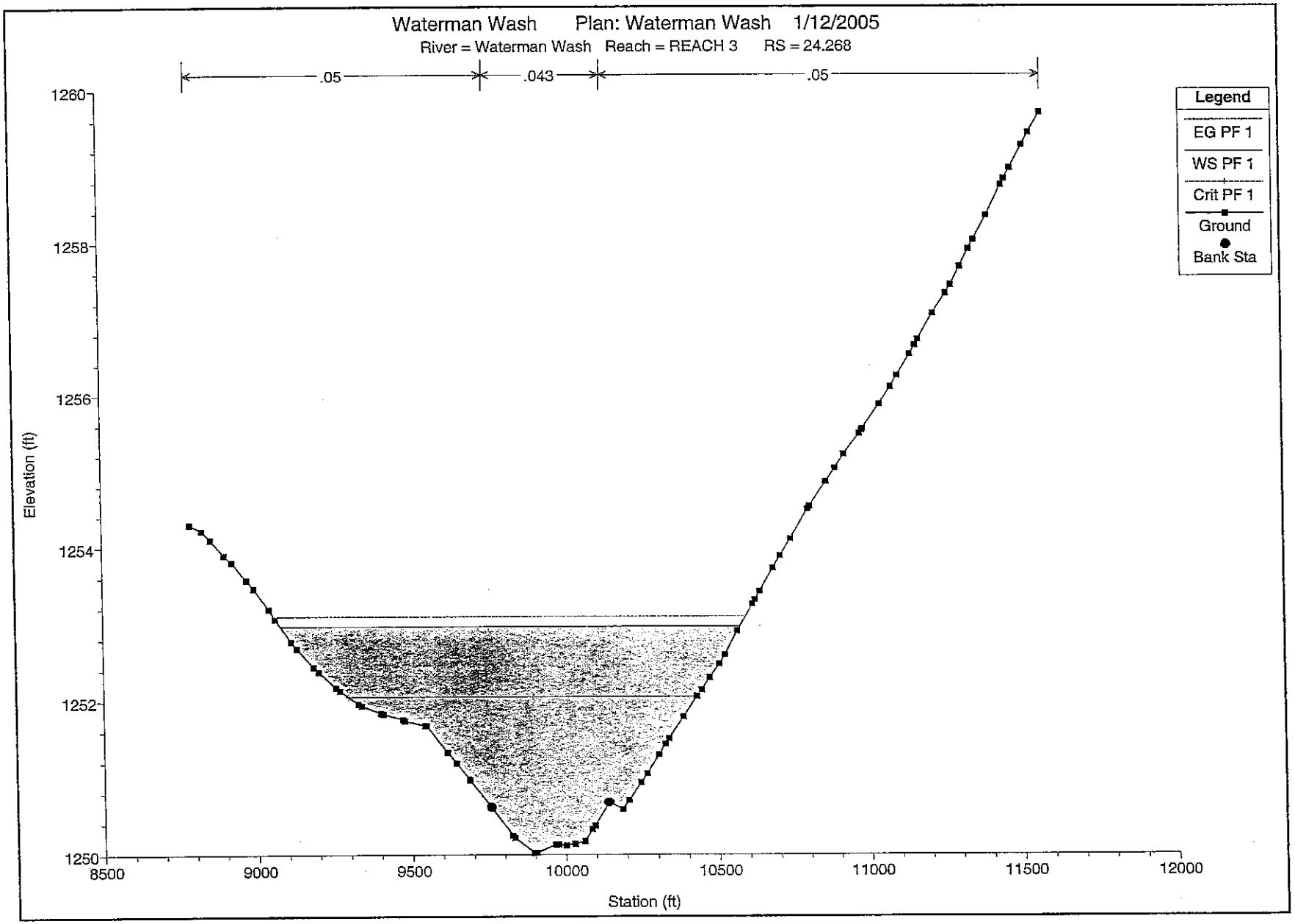

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 22.828
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1238
1236
1234
1232
1230
1228
1226
8500
9000
9500
10000
10500
11000
11500
Station (ft)

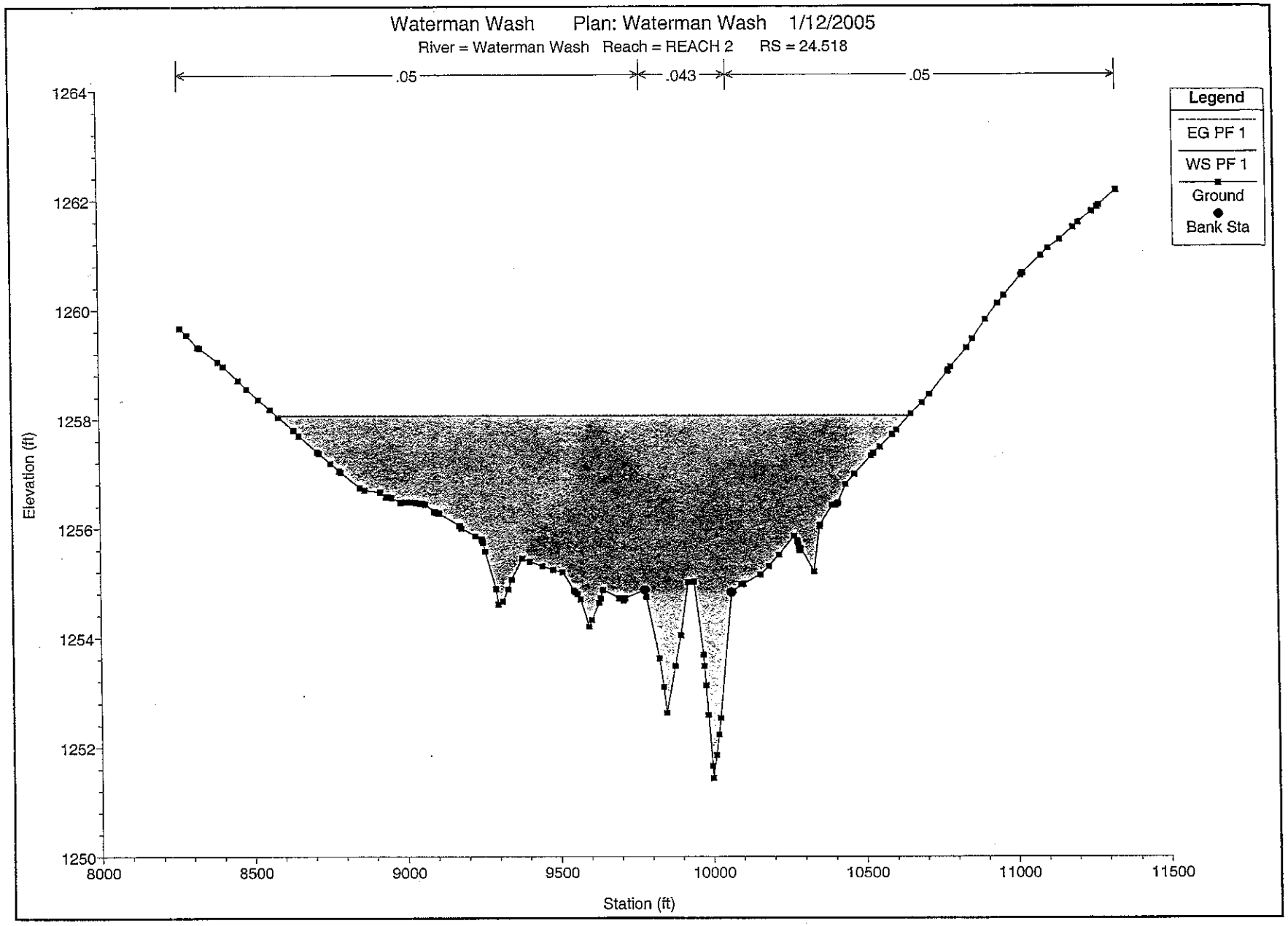

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 23.143
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1242
1240
1238
1236
1234
1232
1230
8500
9000
9500
10000
10500
11000
11500
Station (ft)

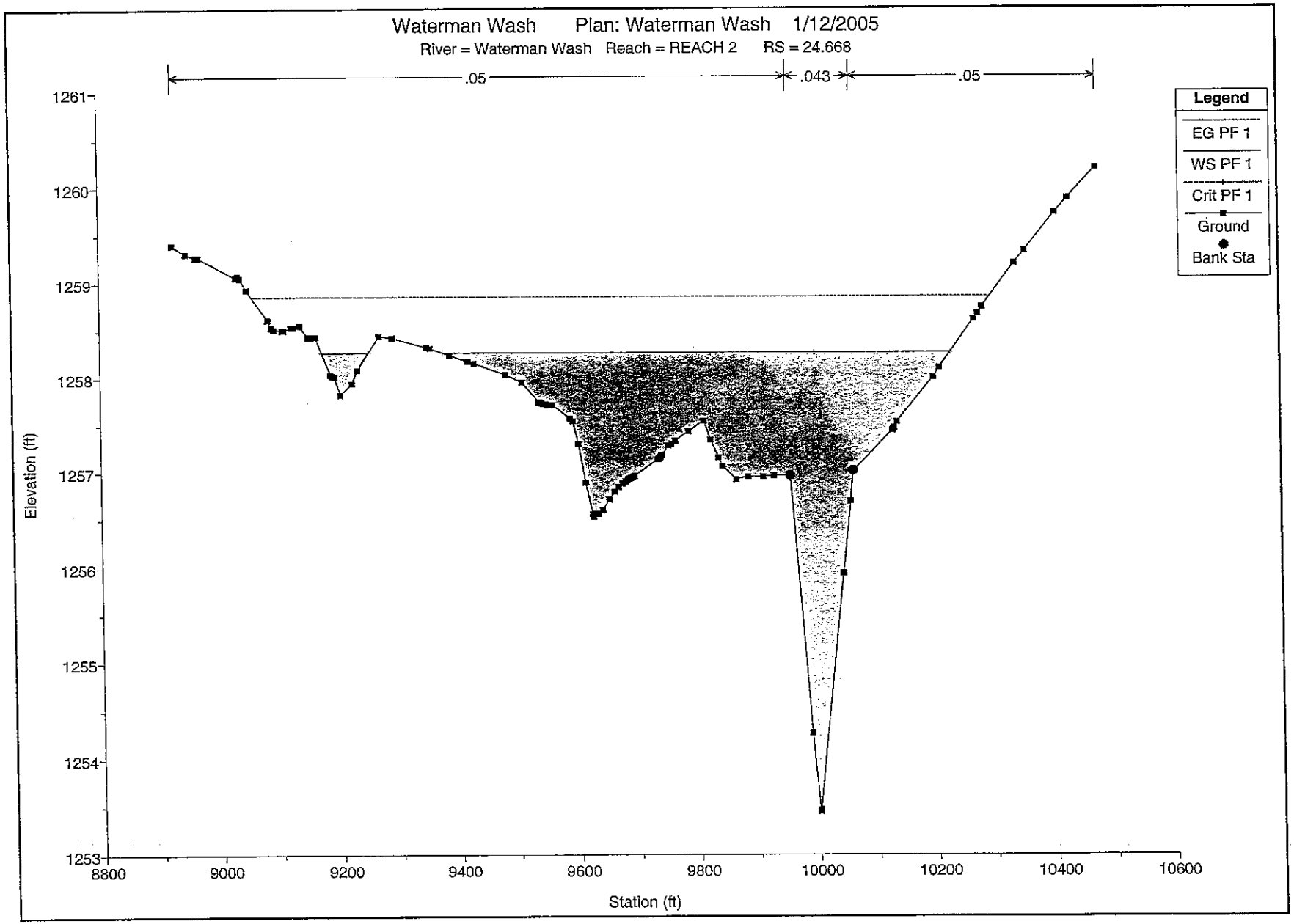

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 23.330
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1244
1242
1240
1238
1236
1234
1232
8500
9000
9500
10000
10500
11000
11500
Station (ft)

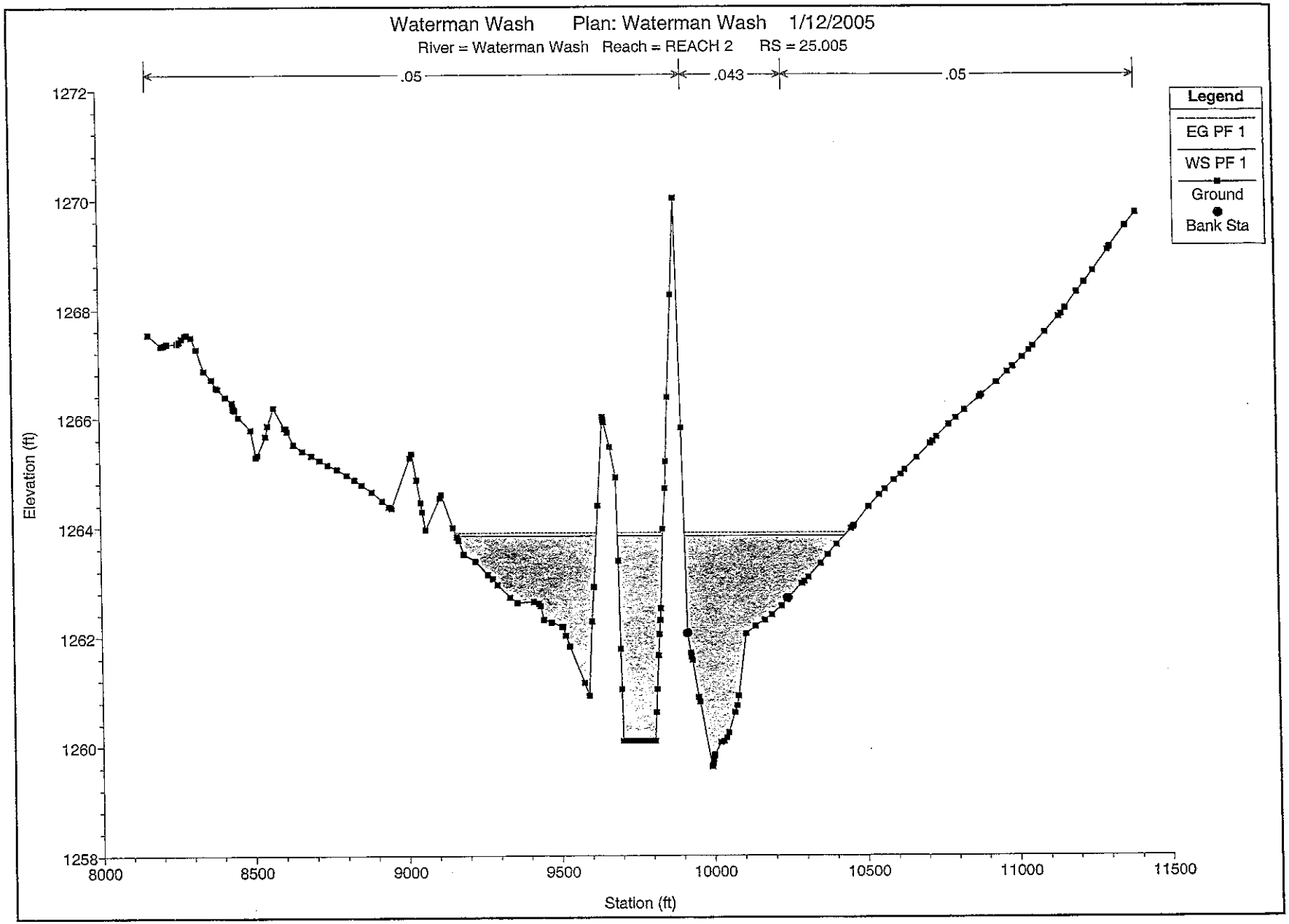

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 23.597
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1248
1246
1244
1242
1240
1238
8500
9000
9500
10000
10500
11000
11500
Station (ft)

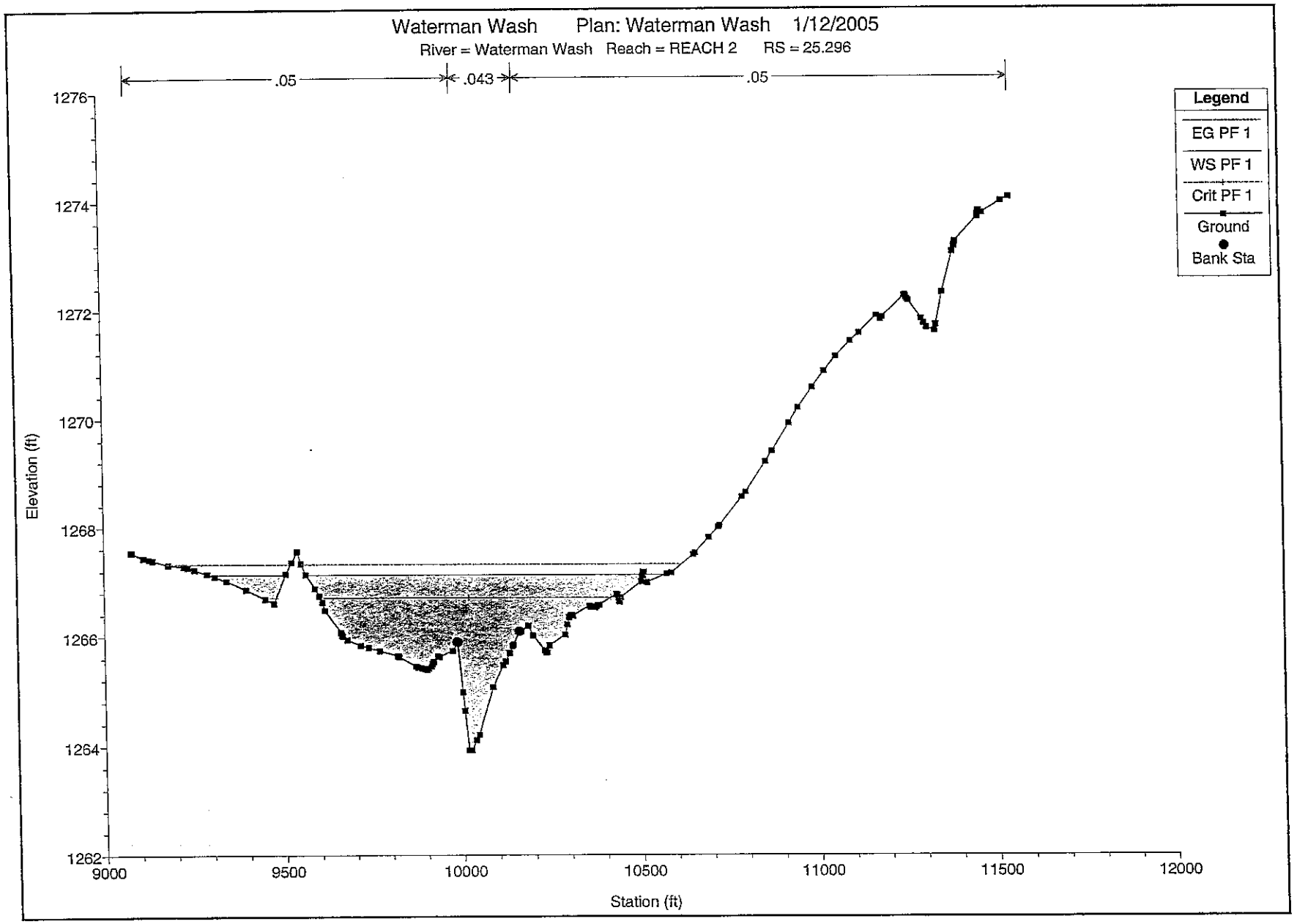

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 23.877
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1254
1252
1250
1248
1246
1244
1242
8500
9000
9500
10000
10500
11000
11500
Station (ft)

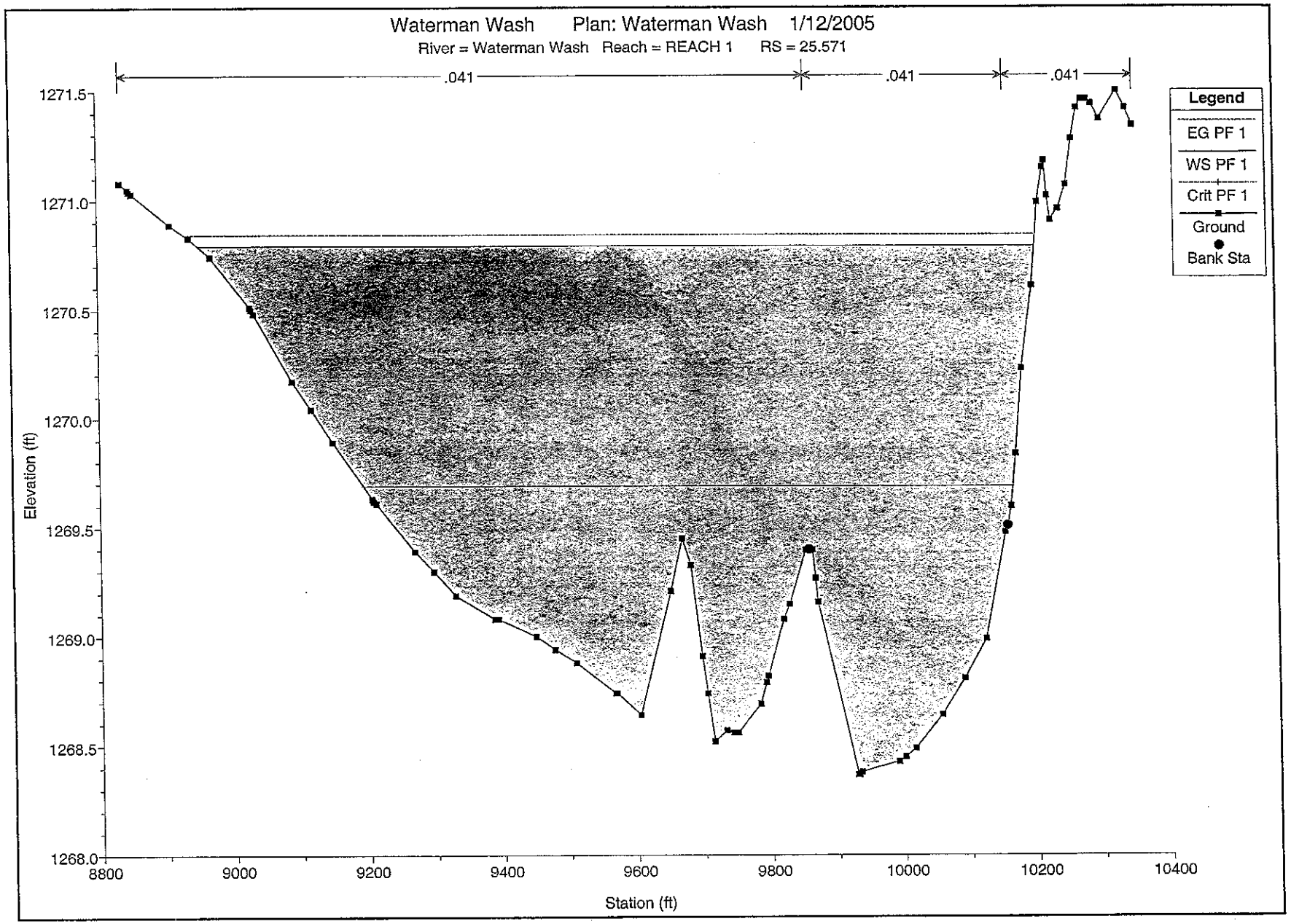

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 3 RS = 24.268
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1260
1258
1256
1254
1252
1250
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

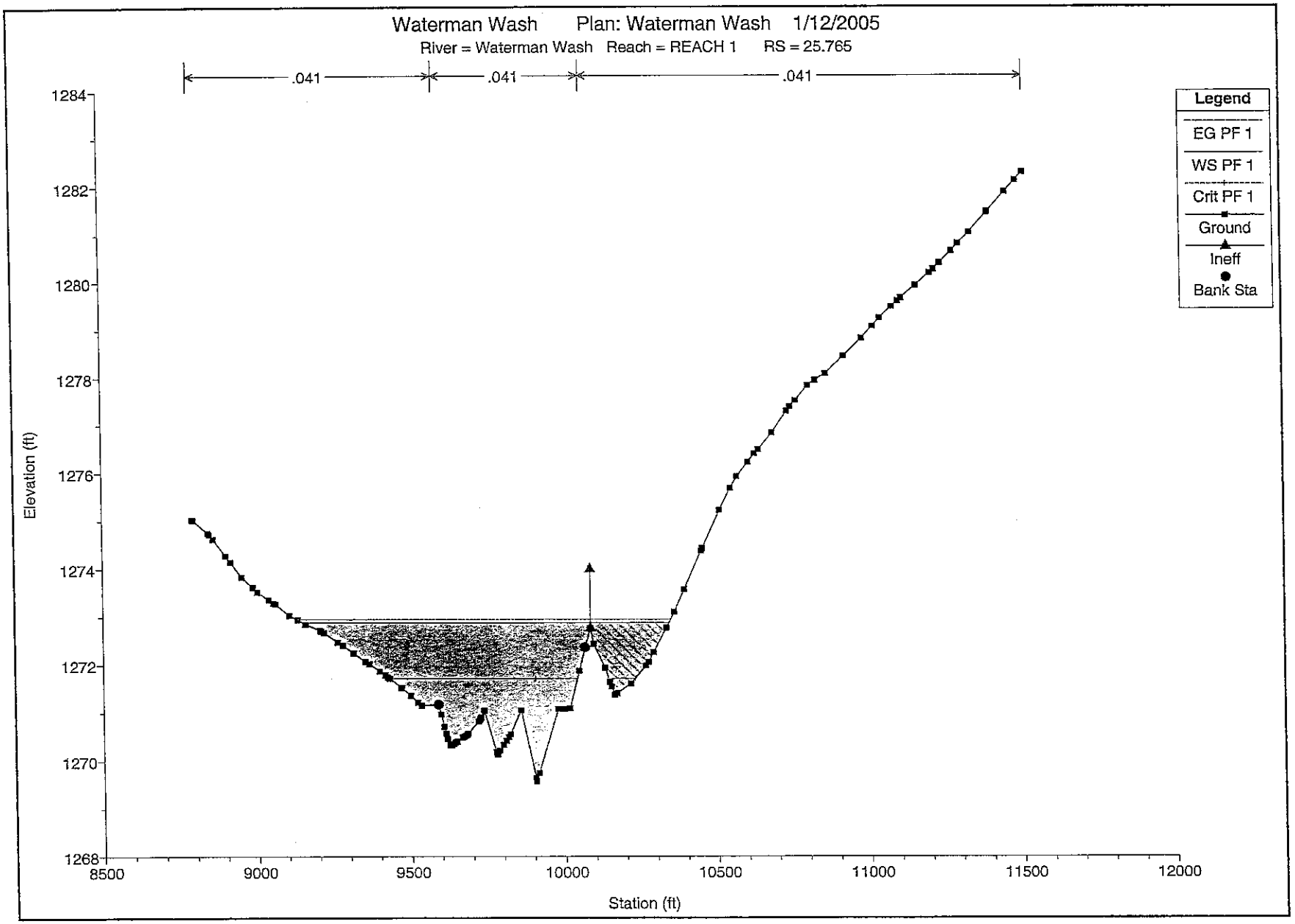

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 2 RS = 24.518
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1264
1262
1260
1258
1256
1254
1252
1250
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

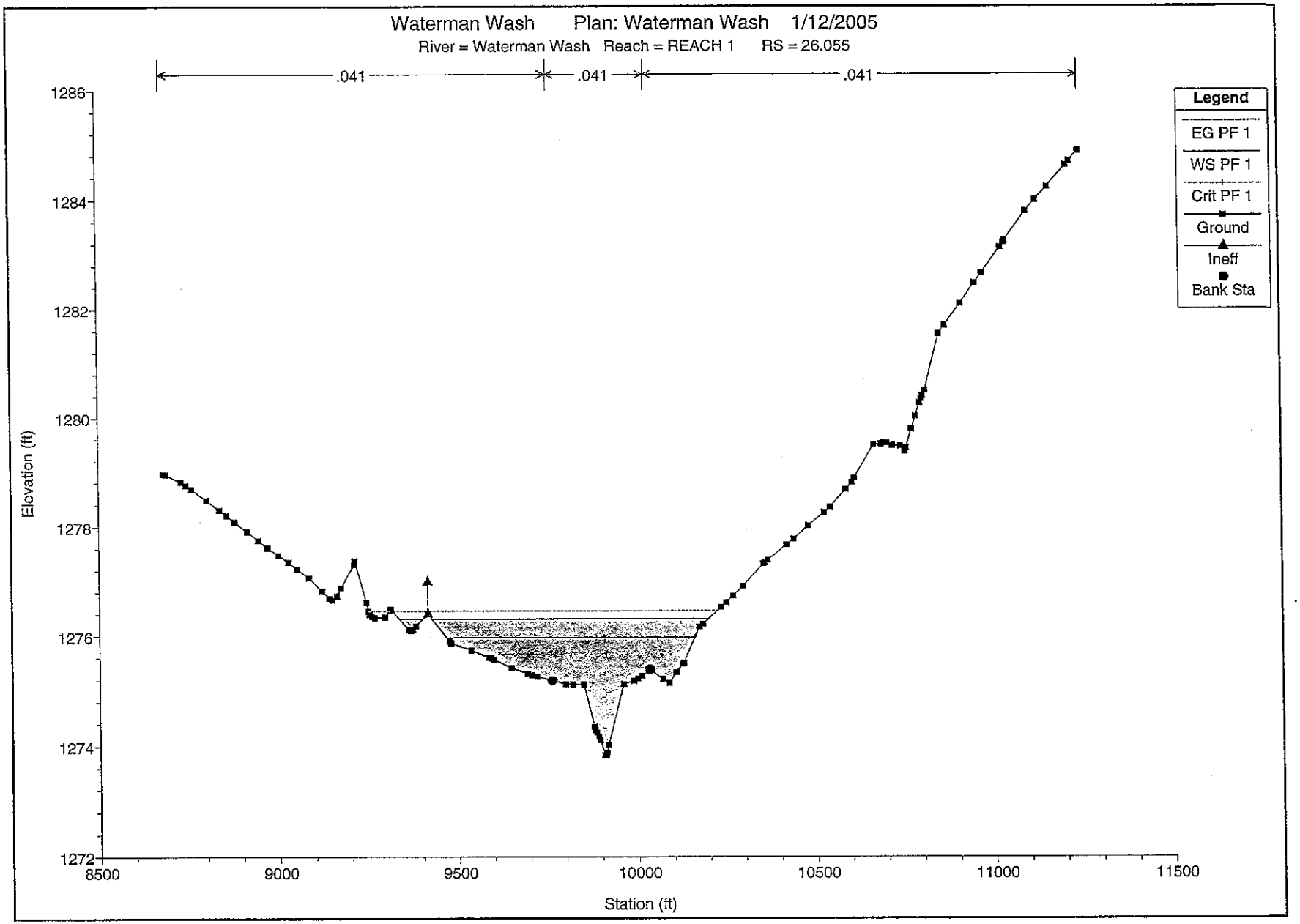

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 2 RS = 24.668
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1261
1260
1259
1258
1257
1256
1255
1254
1253
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

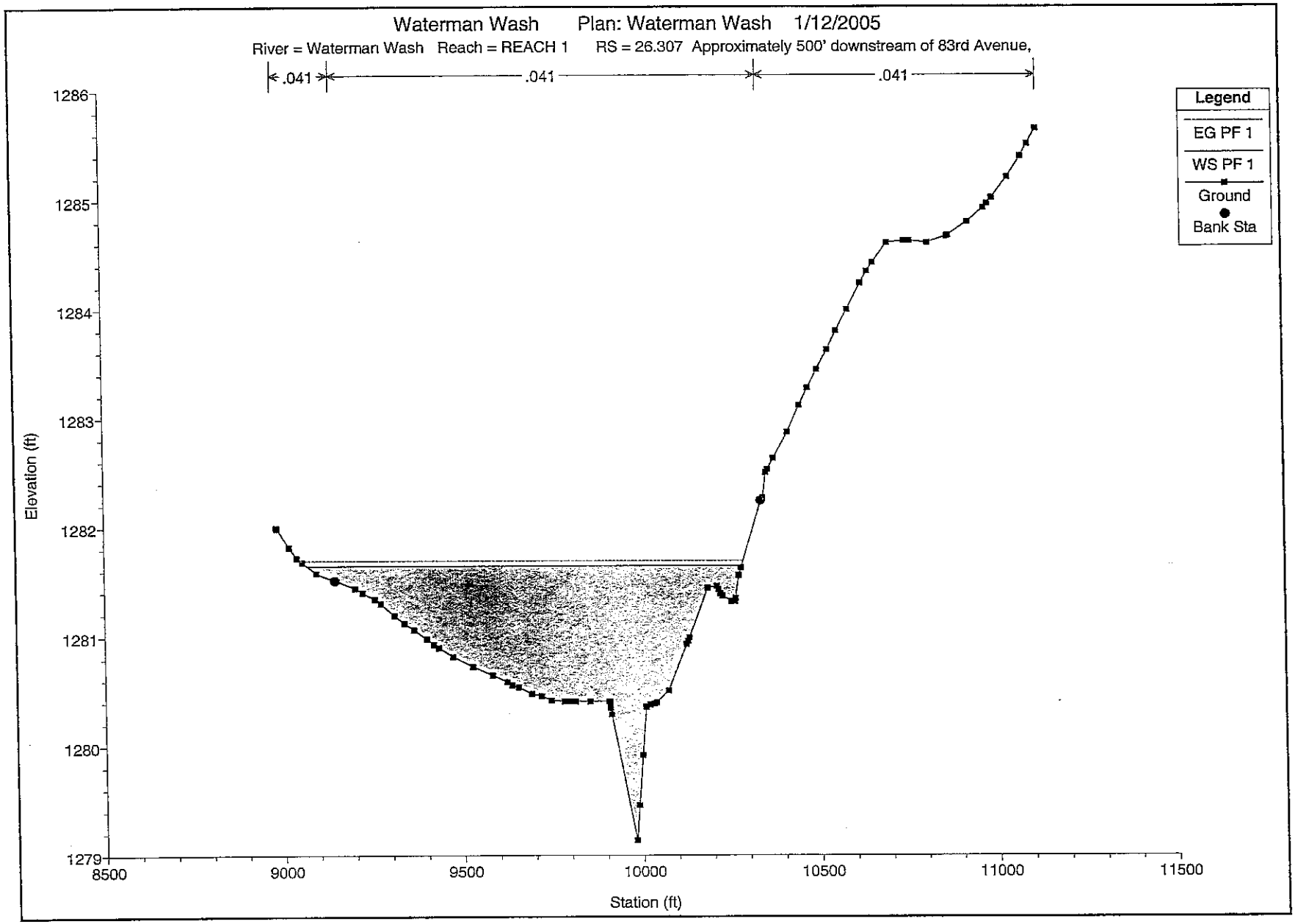

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 2 RS = 25.005
.05
.043
.05
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1272
1270
1268
1266
1264
1262
1260
1258
8000
8500
9000
9500
10000
10500
11000
11500
Station (ft)

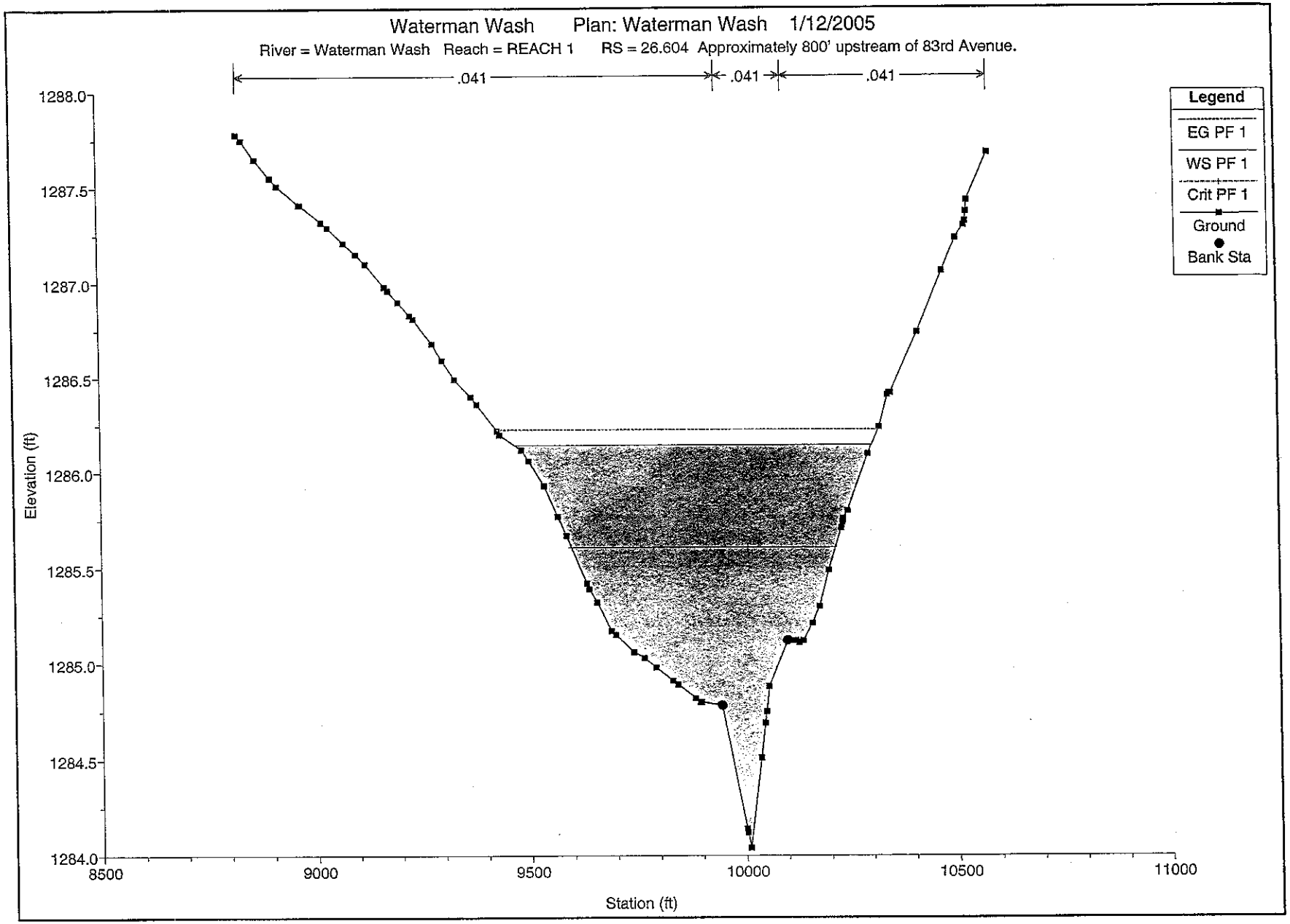

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 2 RS = 25.296
.05
.043
.05
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1276
1274
1272
1270
1268
1266
1264
1262
9000
9500
10000
10500
11000
11500
12000
Station (ft)

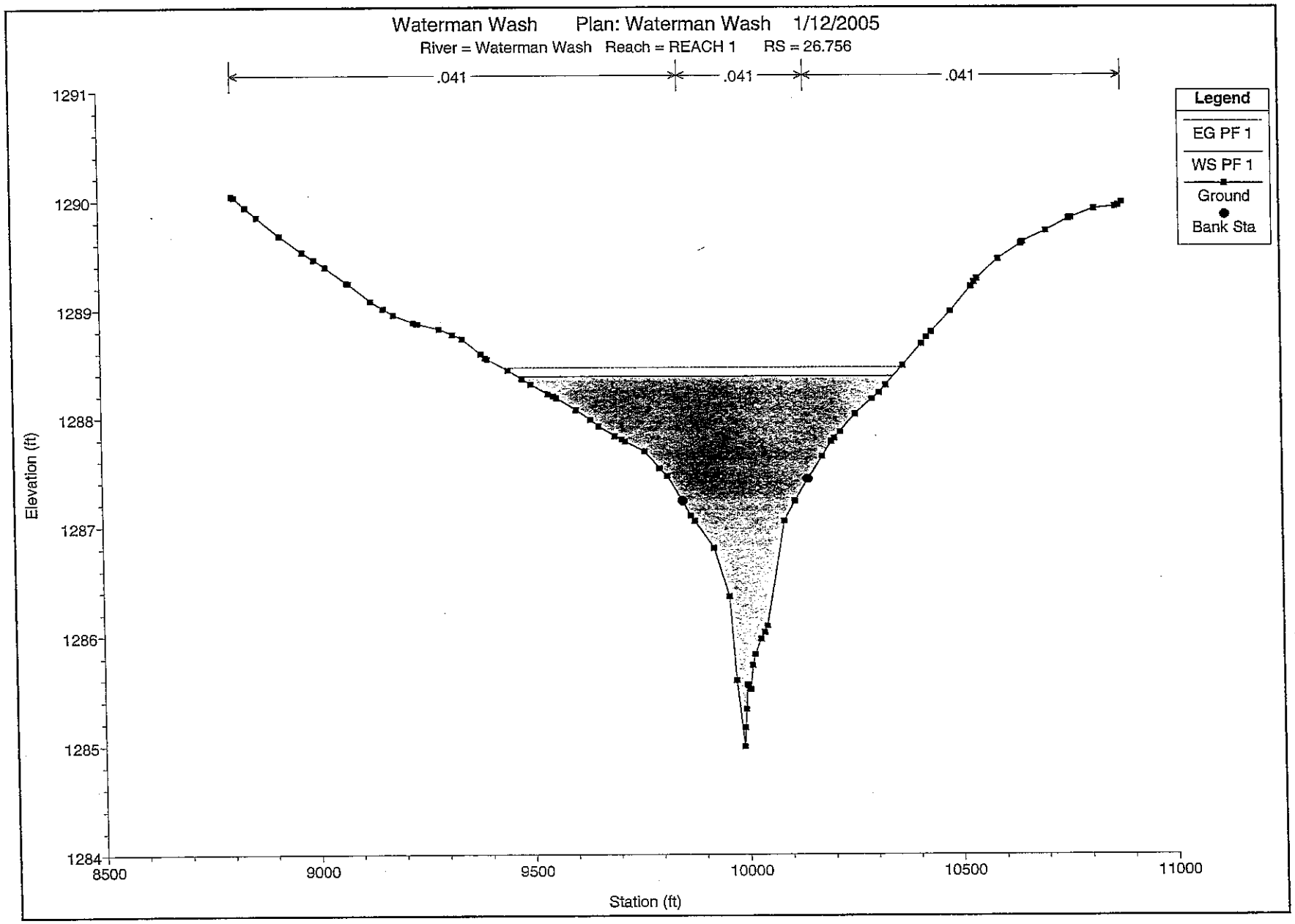

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 25.571
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1271.5
1271.0
1270.5
1270.0
1269.5
1269.0
1268.5
1268.0
8800
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)

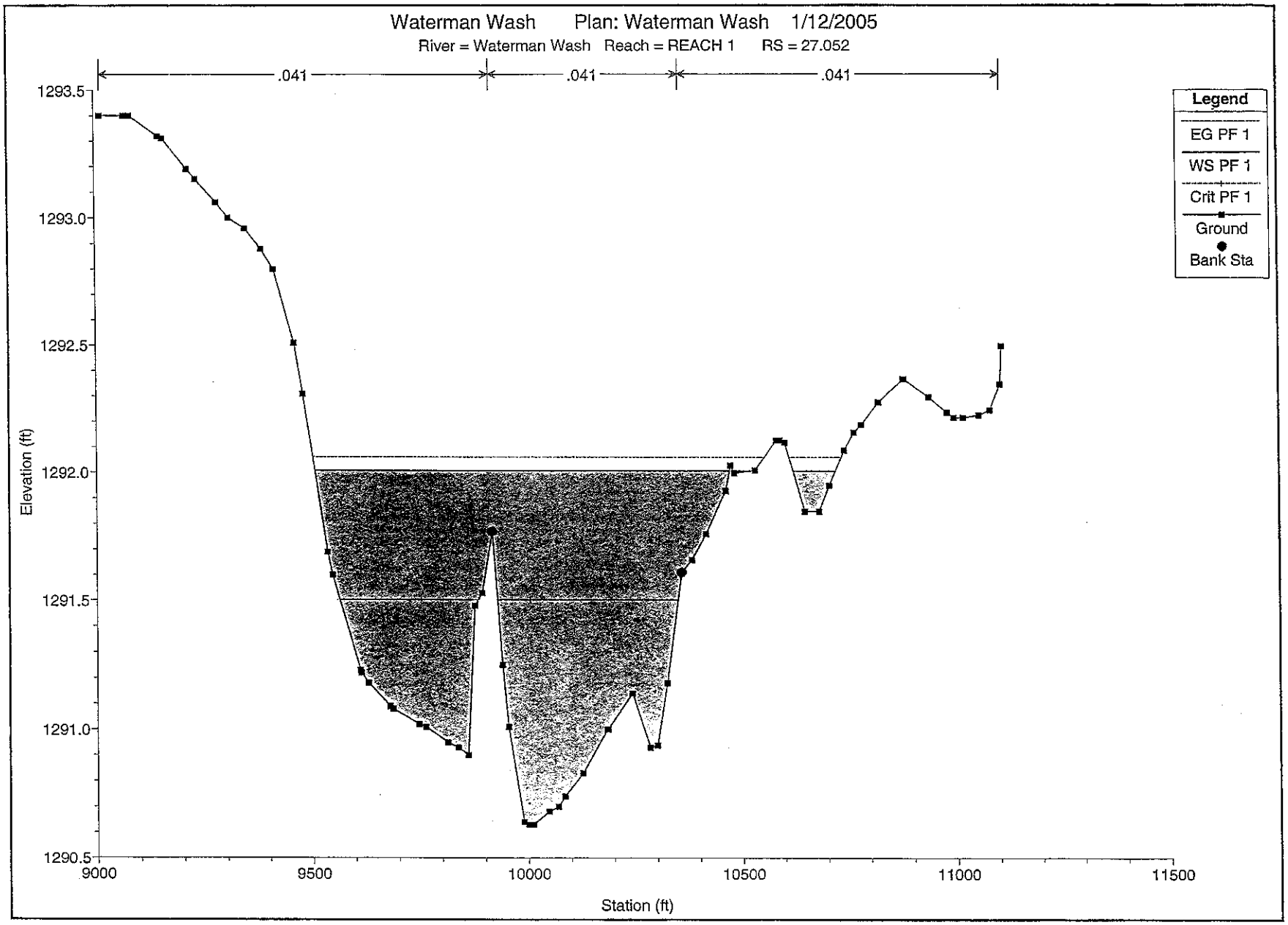

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 25.765
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1284
1282
1280
1278
1276
1274
1272
1270
1268
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

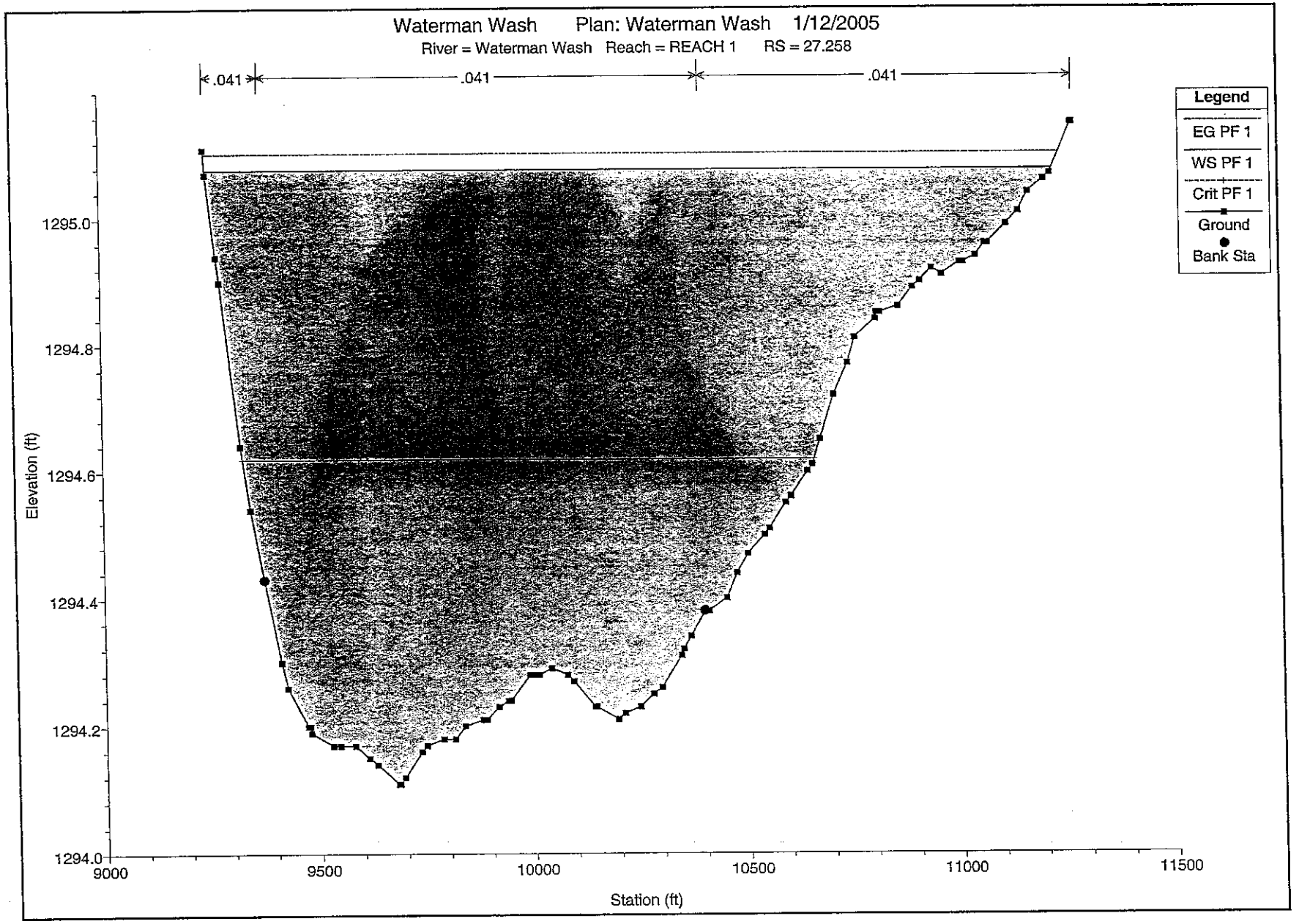

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 26.055
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1286
1284
1282
1280
1278
1276
1274
1272
8500
9000
9500
10000
10500
11000
11500
Station (ft)

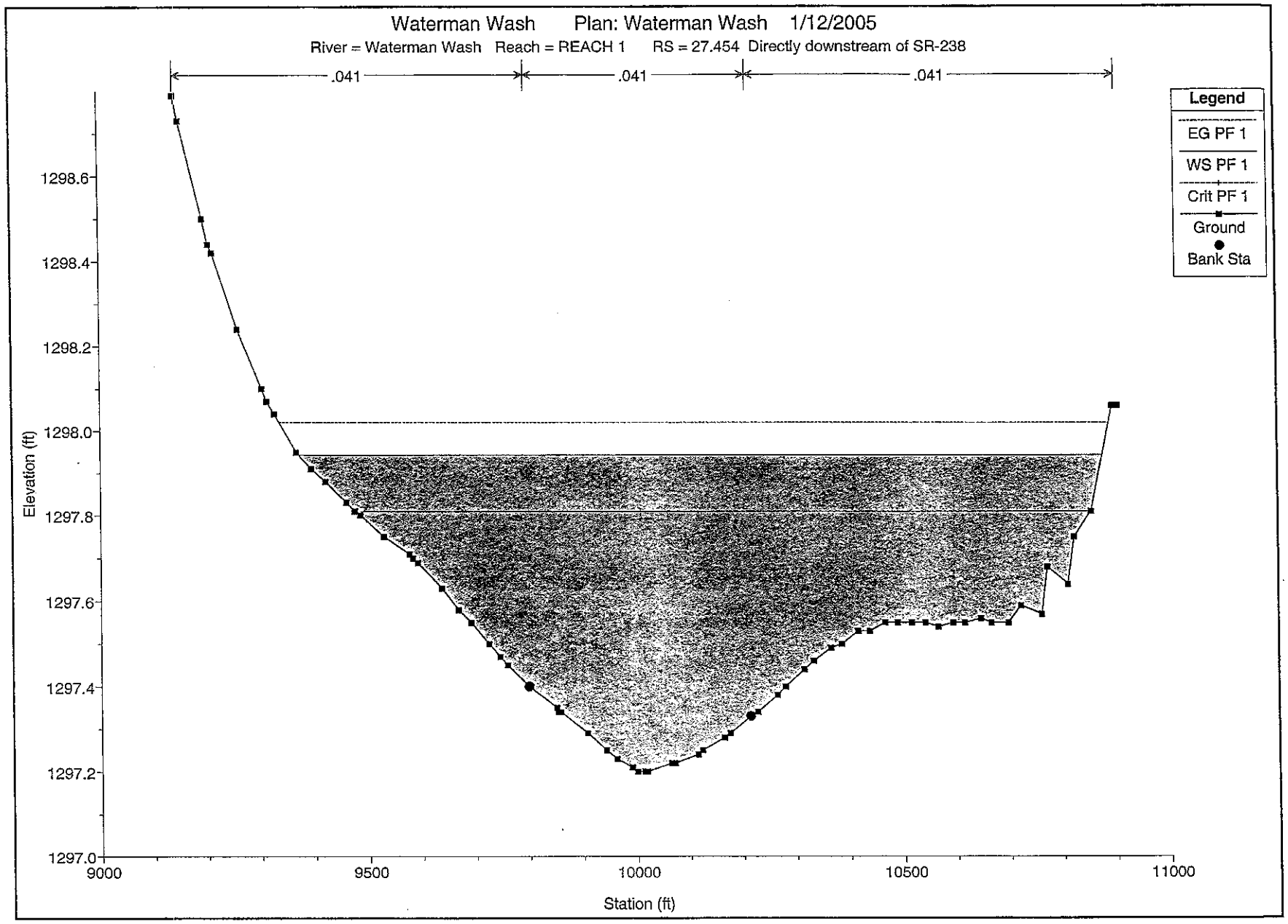

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 26.307 Approximately 500' downstream of 83rd Avenue,
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1286
1285
1284
1283
1282
1281
1280
1279
8500
9000
9500
10000
10500
11000
11500
Station (ft)

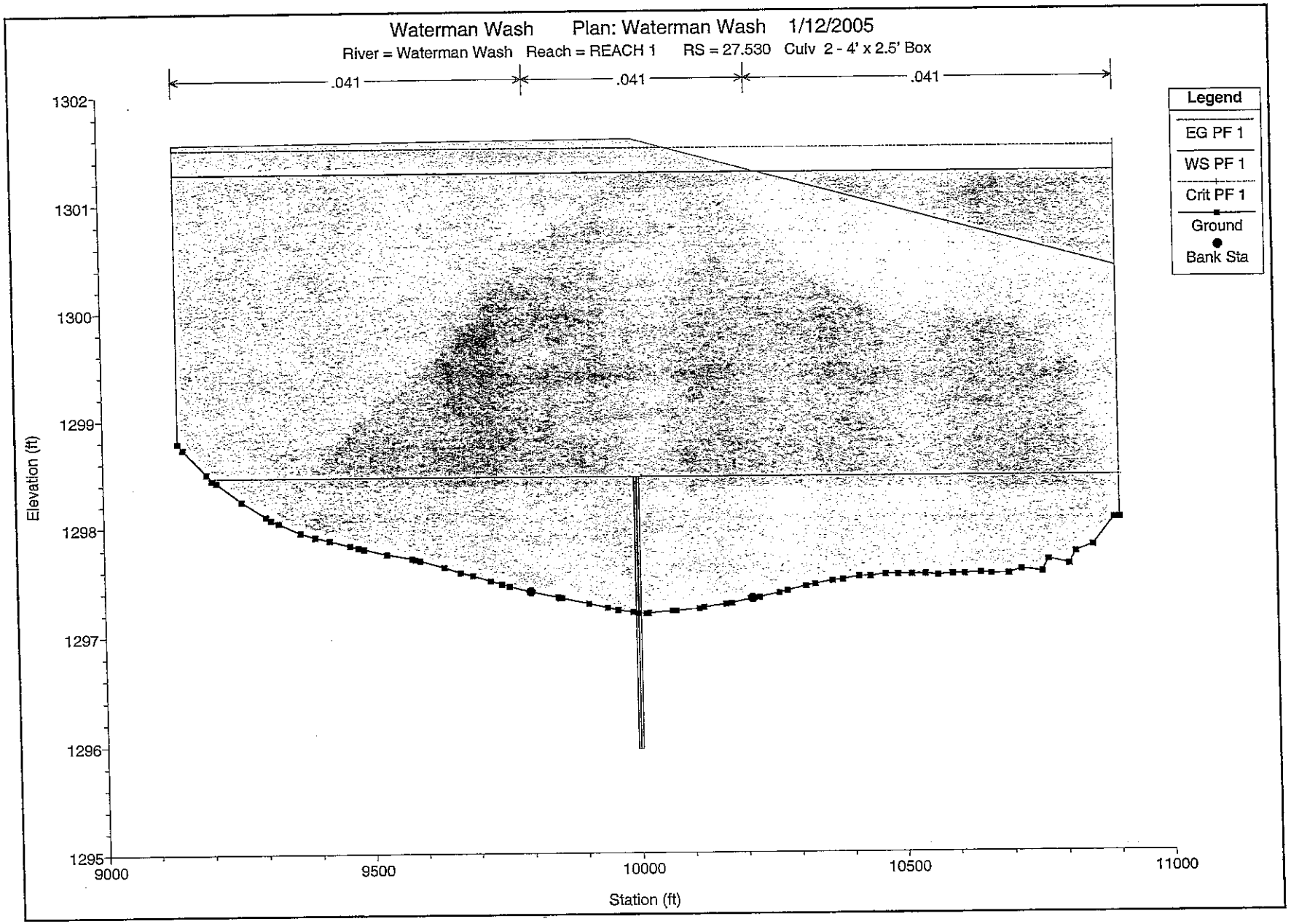

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 26.604 Approximately 800' upstream of 83rd Avenue.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1288.0
1287.5
1287.0
1286.5
1286.0
1285.5
1285.0
1284.5
1284.0
8500
9000
9500
10000
10500
11000
Station (ft)

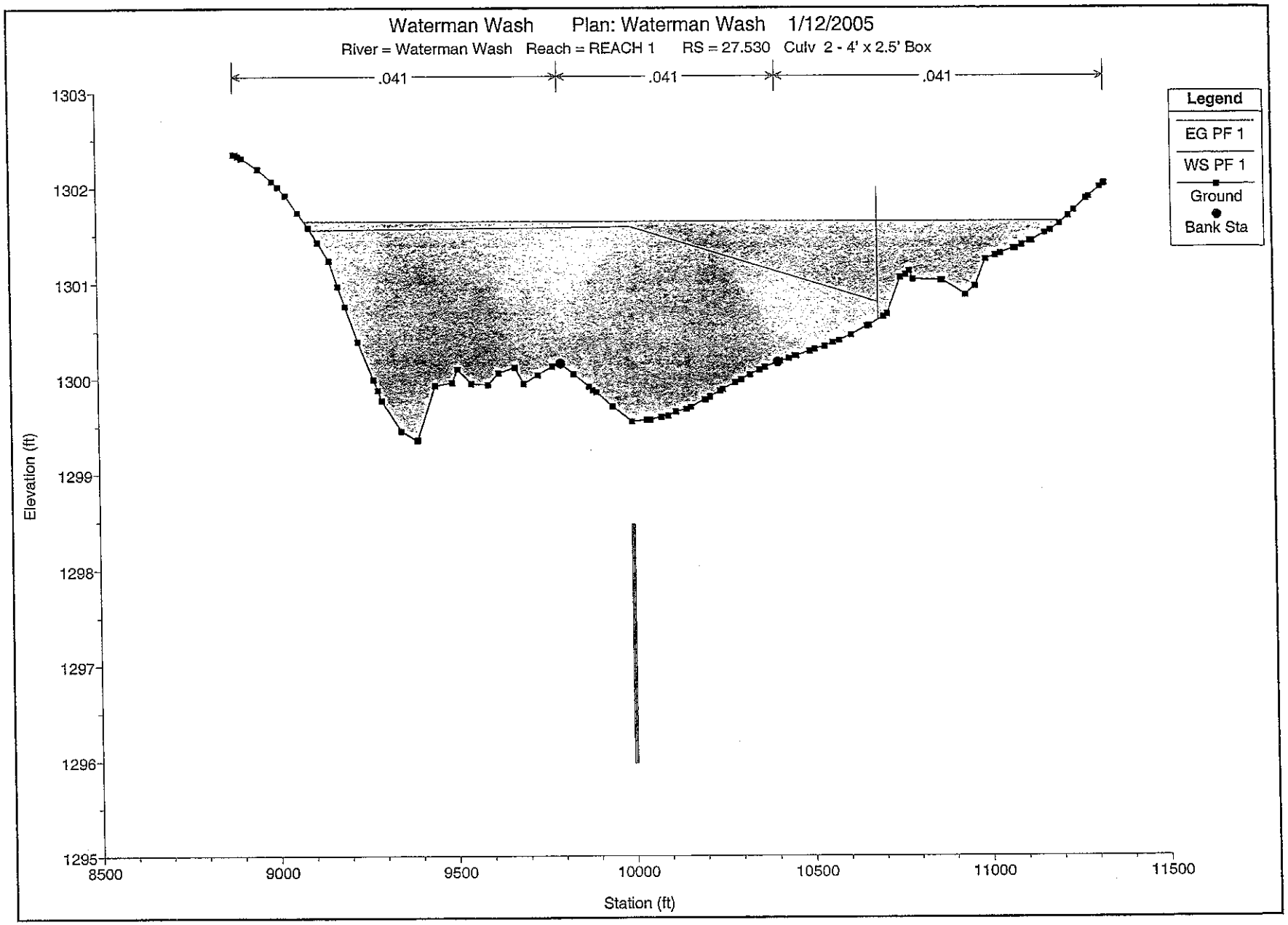

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 26.756
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1291
1290
1289
1288
1287
1286
1285
1284
8500
9000
9500
10000
10500
11000
Station (ft)

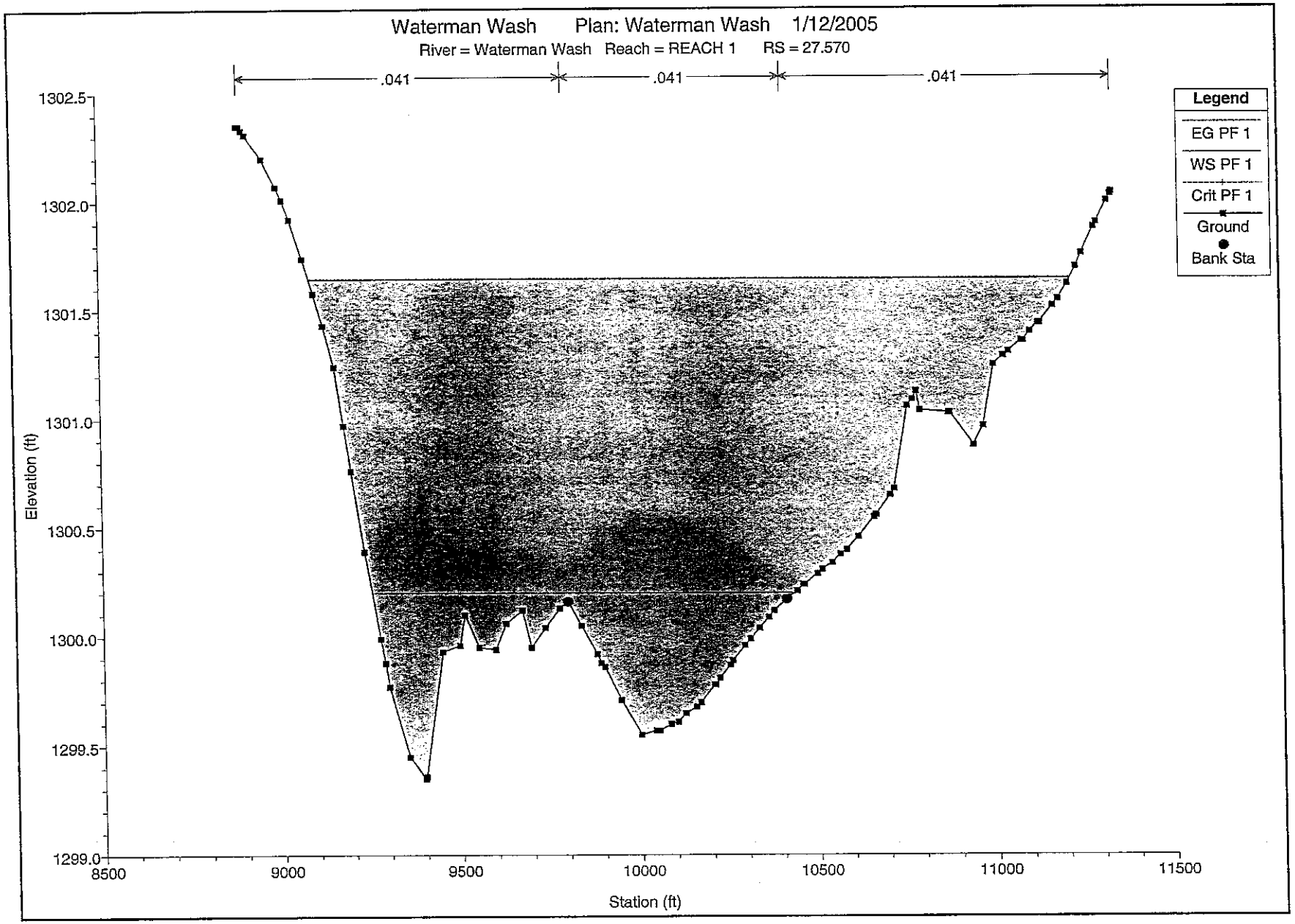

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.052
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1293.5
1293.0
1292.5
1292.0
1291.5
1291.0
1290.5
9000
9500
10000
10500
11000
11500
Station (ft)

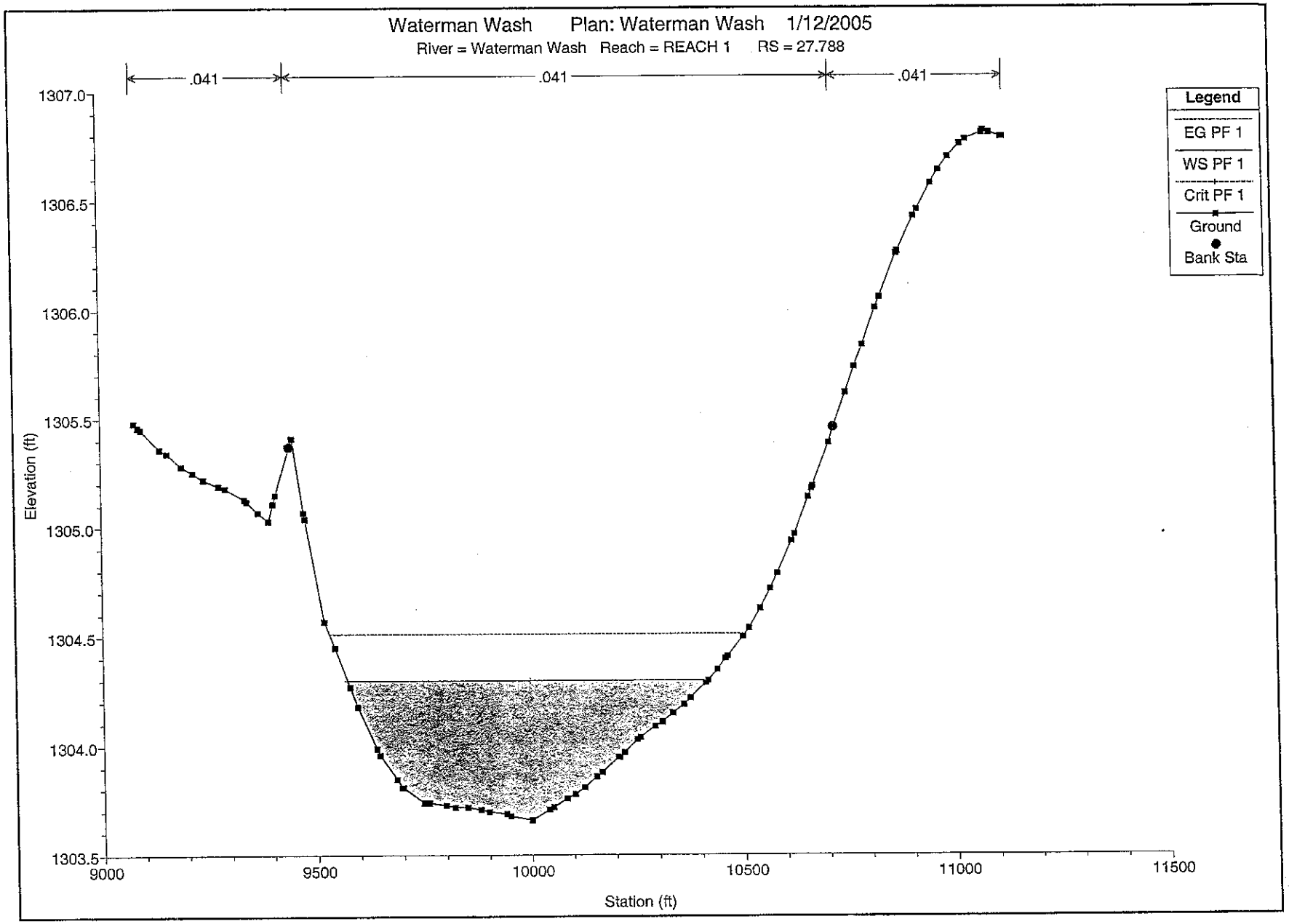

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.258
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1295.0
1294.8
1294.6
1294.4
1294.2
1294.0
9000
9500
10000
10500
11000
11500
Station (ft)

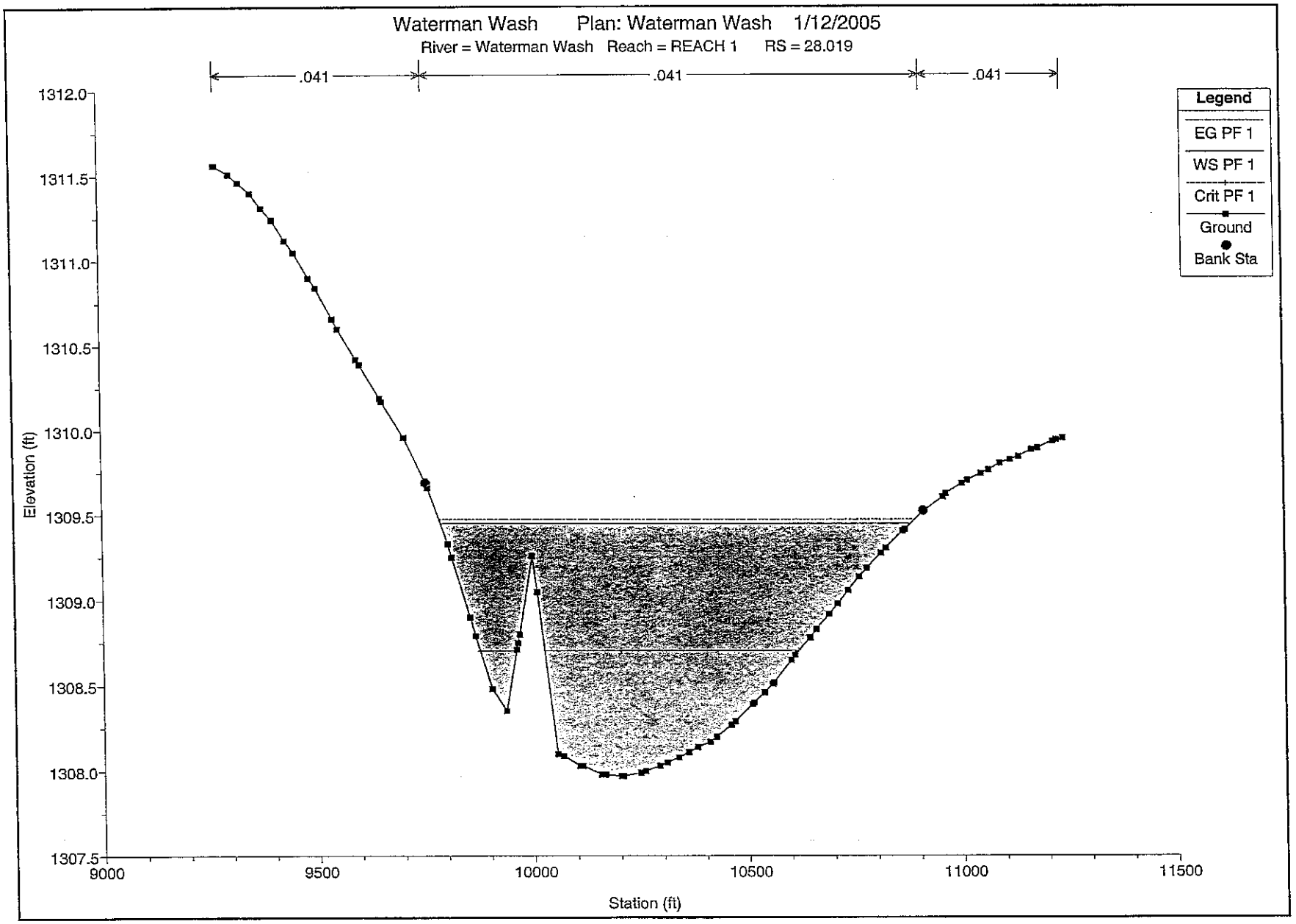

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.454 Directly downstream of SR-238
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1298.6
1298.4
1298.2
1298.0
1297.8
1297.6
1297.4
1297.2
1297.0
9000
9500
10000
10500
11000
Station (ft)

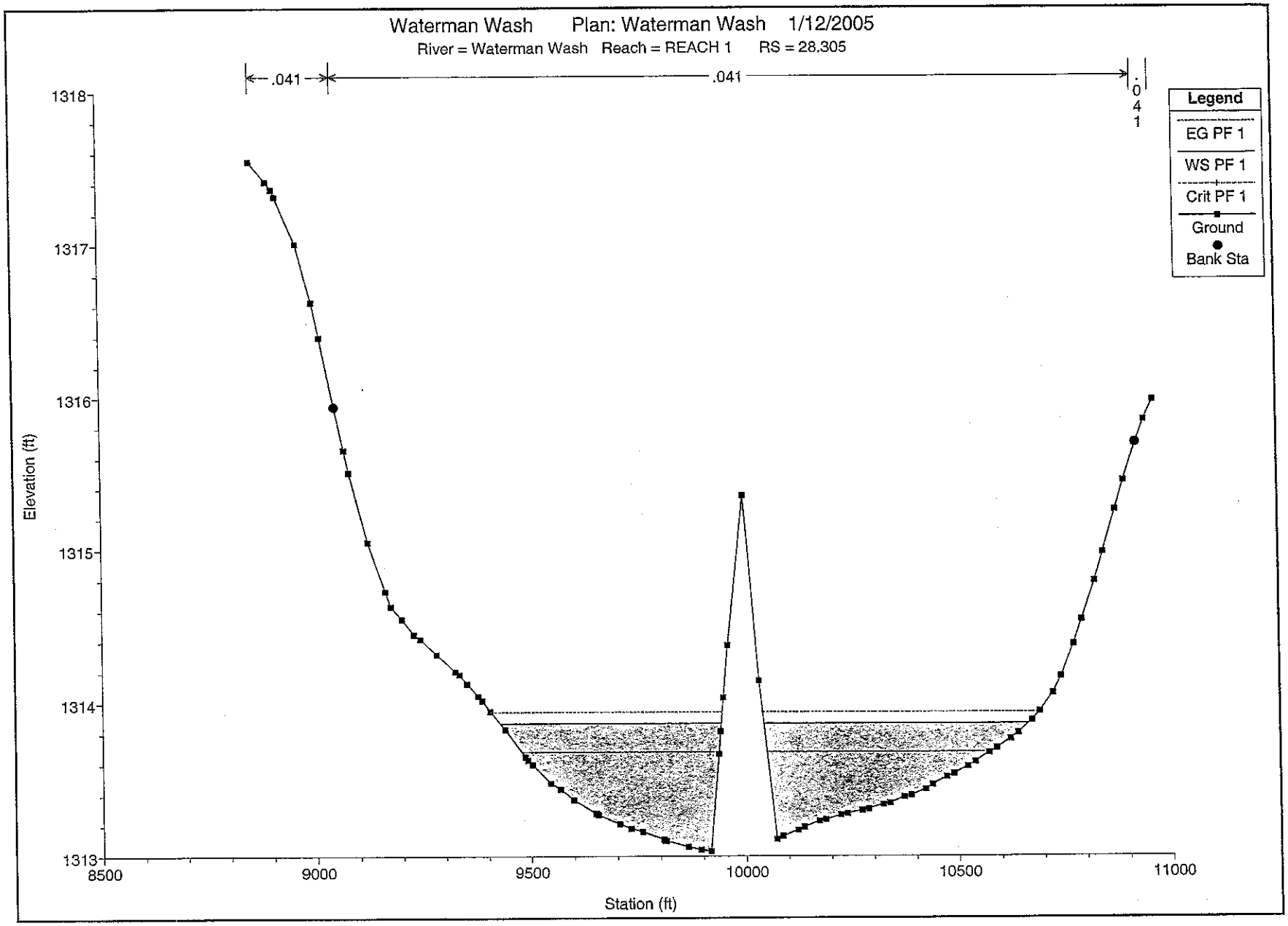

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.530 Culv 2 - 4' x 2.5' Box
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1302
1301
1300
1299
1298
1297
1296
1295
9000
9500
10000
10500
11000
Station (ft)

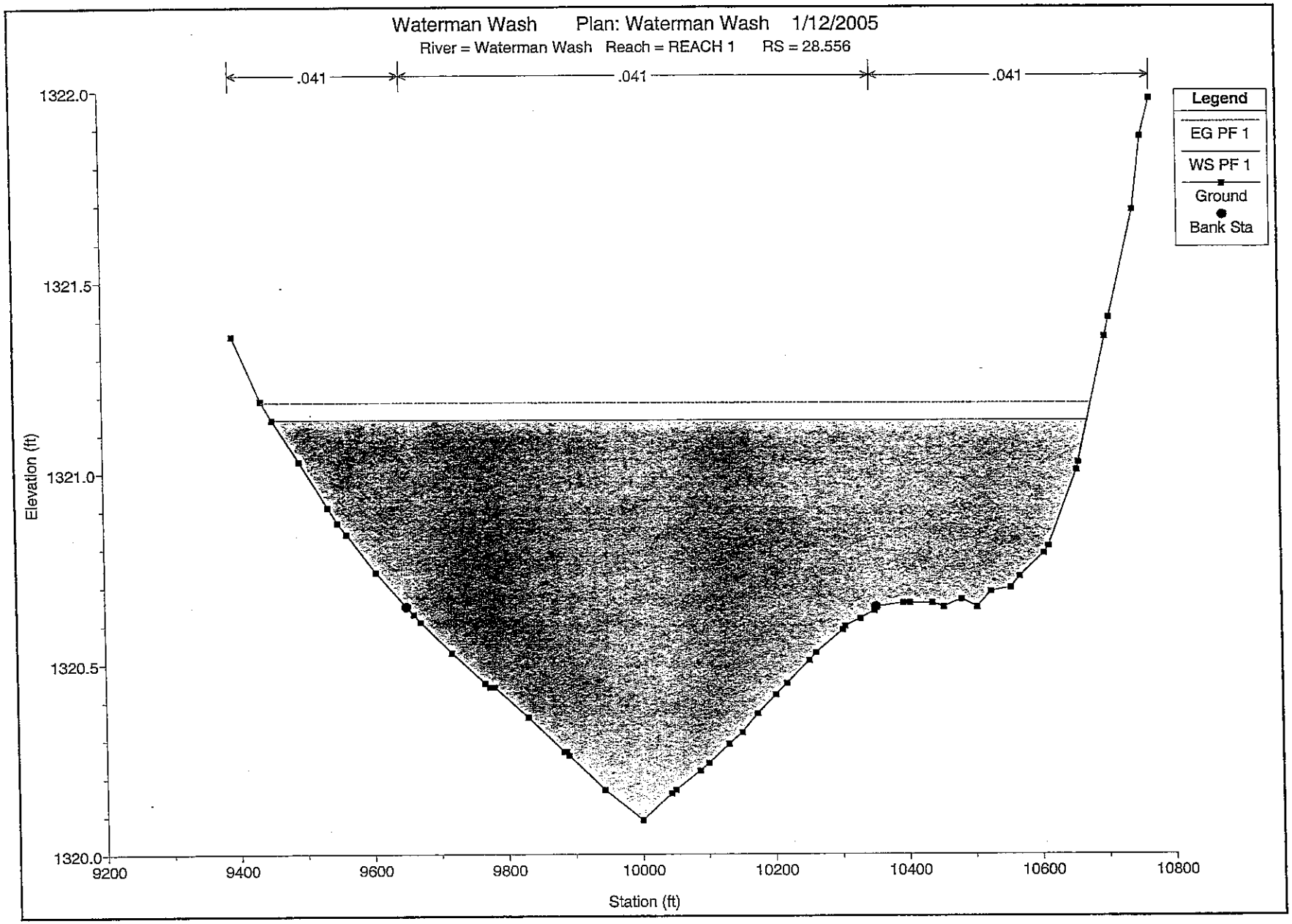

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.530 Culv 2 - 4' x 2.5' Box
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1303
1302
1301
1300
1299
1298
1297
1296
1295
8500
9000
9500
10000
10500
11000
11500
Station (ft)

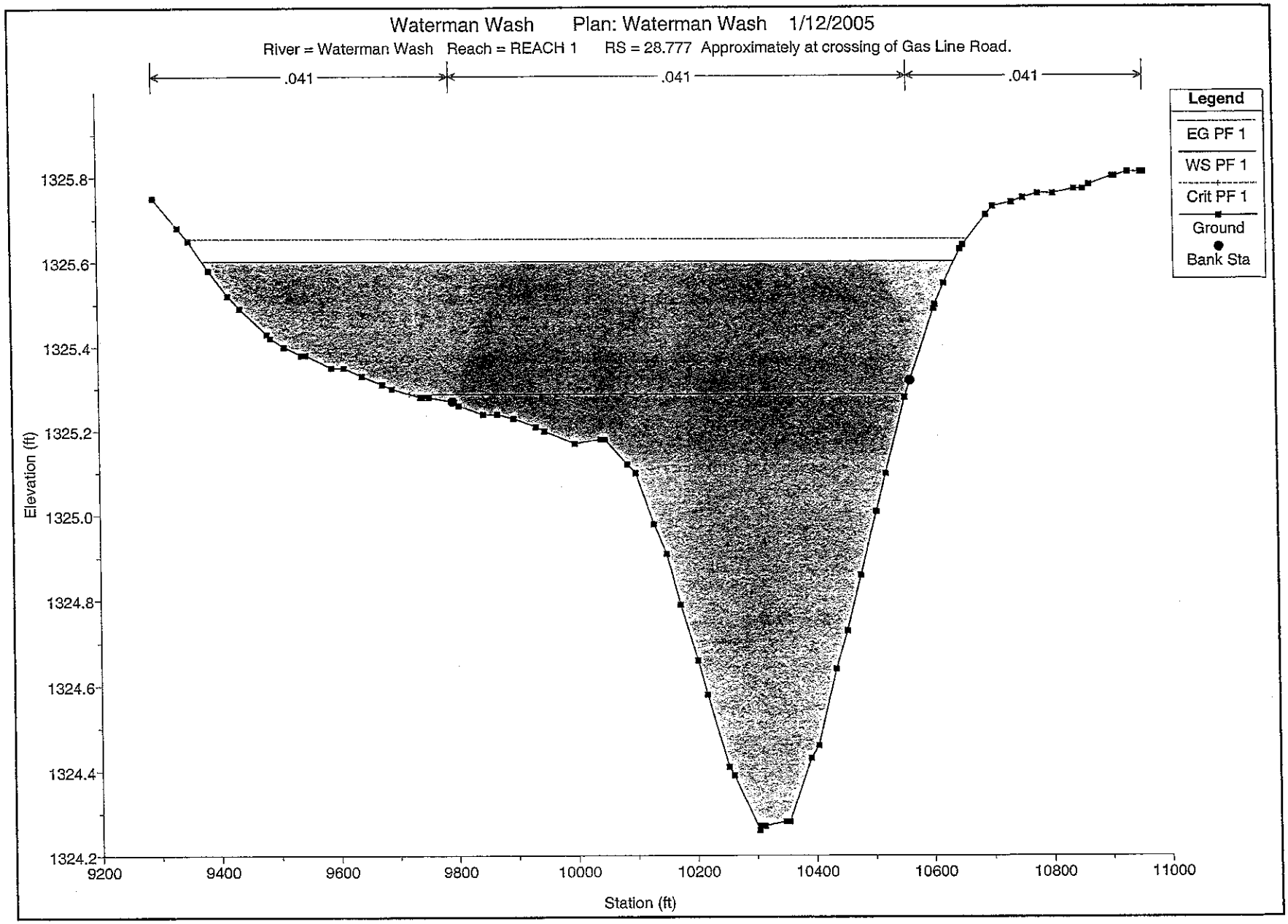

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.570
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1302.5
1302.0
1301.5
1301.0
1300.5
1300.0
1299.5
1299.0
8500
9000
9500
10000
10500
11000
11500
Station (ft)

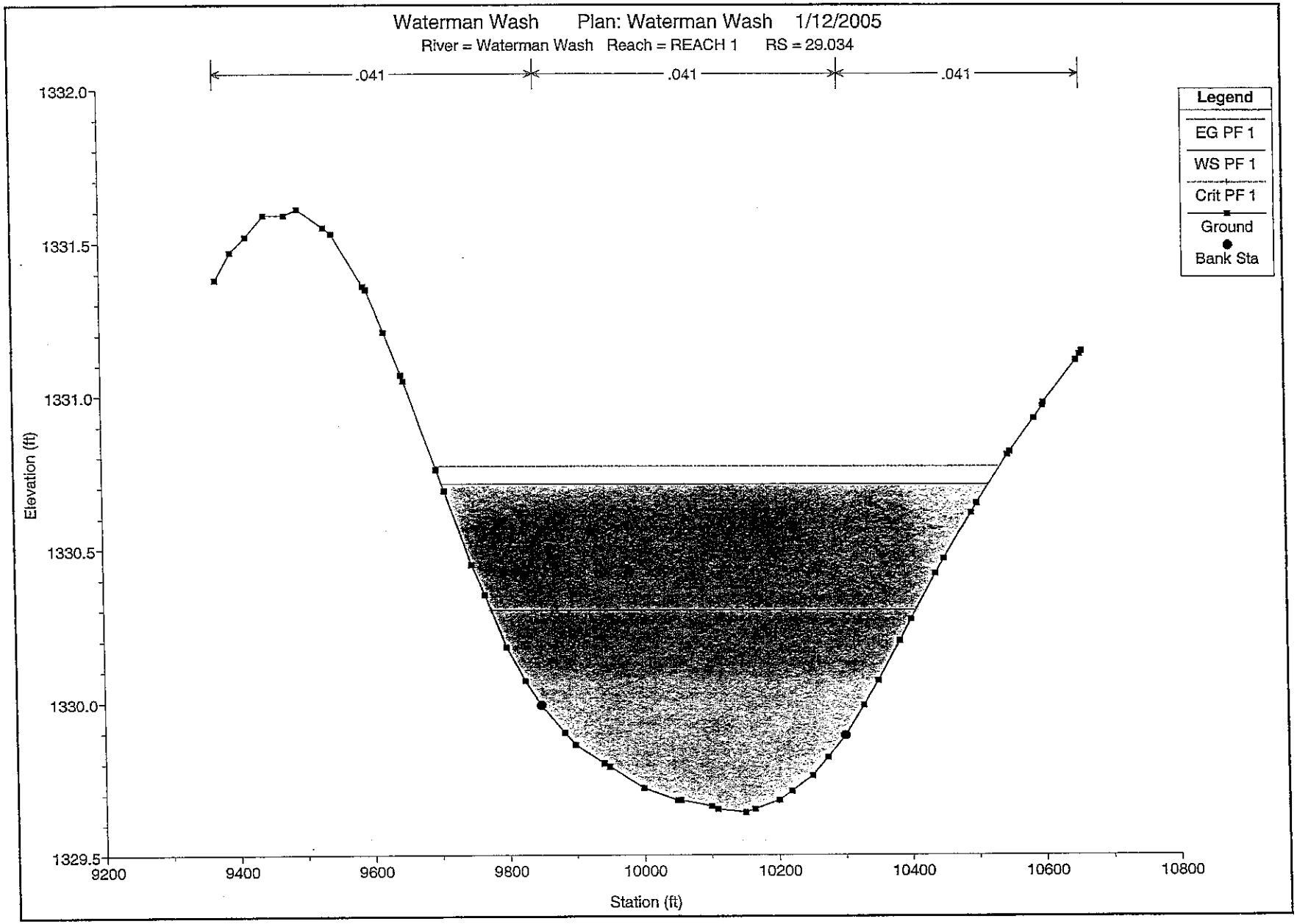

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 27.788
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1307.0
1306.5
1306.0
1305.5
1305.0
1304.5
1304.0
1303.5
9000
9500
10000
10500
11000
11500
Station (ft)

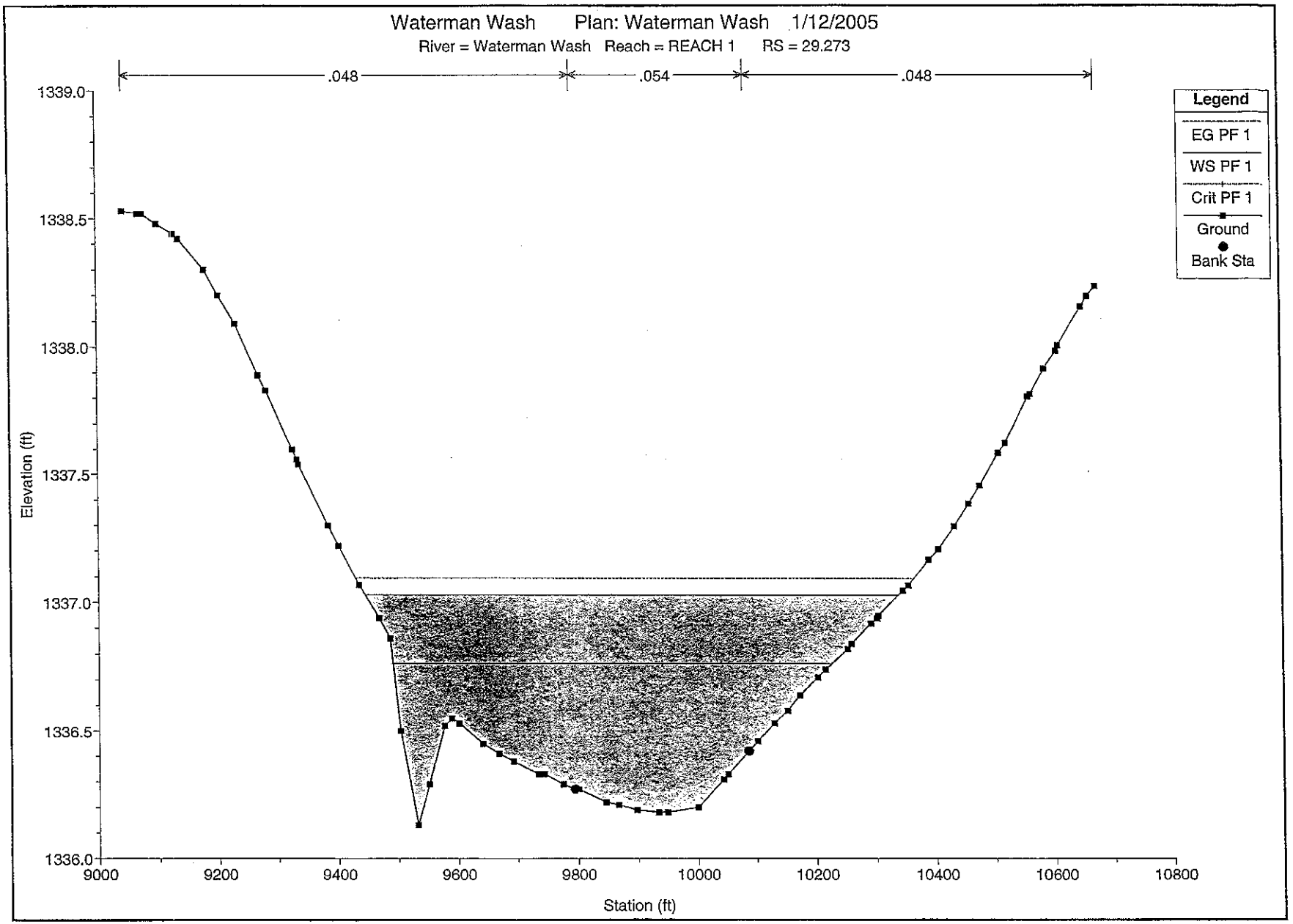

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 28.019
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1312.0
1311.5
1311.0
1310.5
1310.0
1309.5
1309.0
1308.5
1308.0
1307.5
9000
9500
10000
10500
11000
11500
Station (ft)

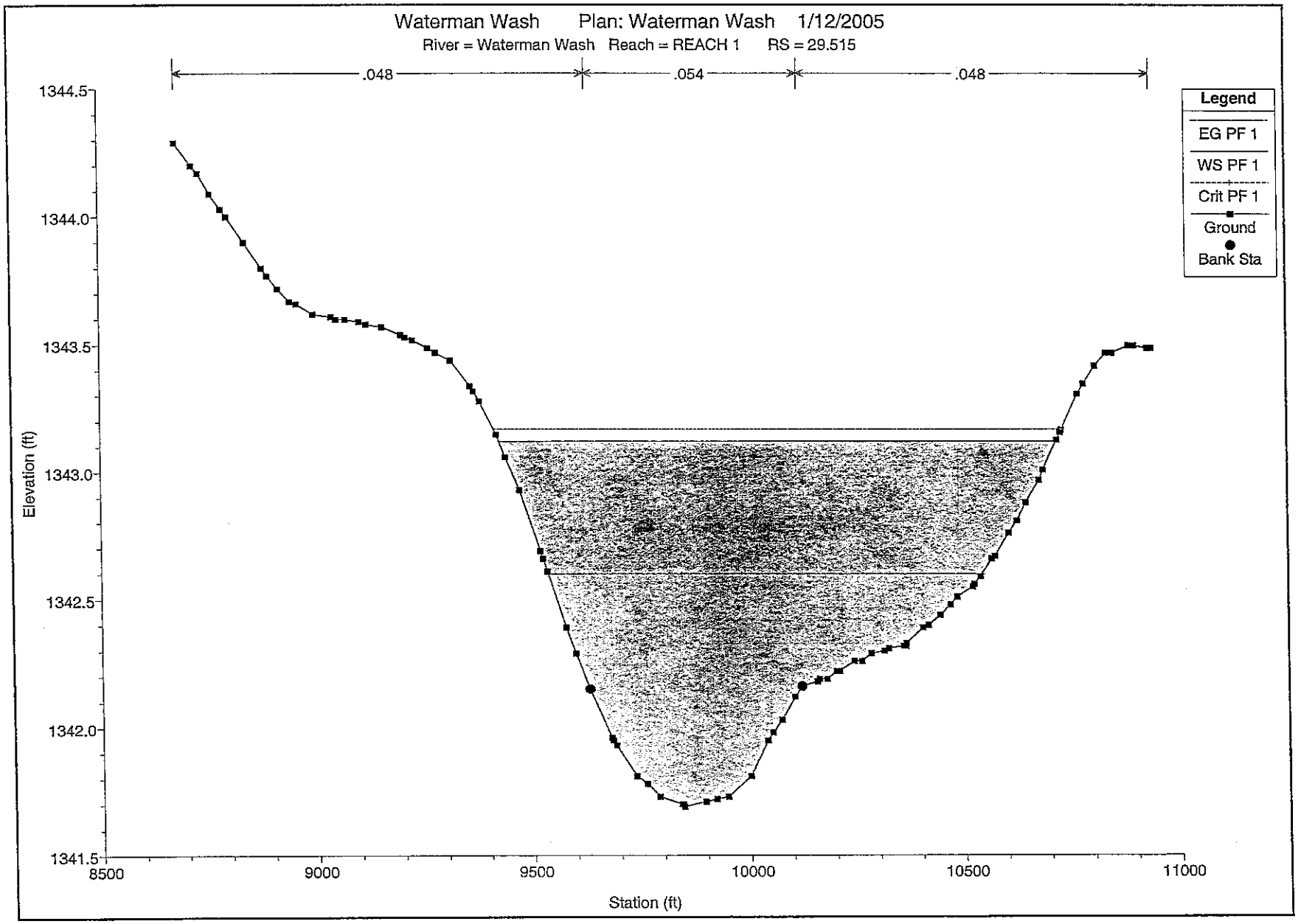

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 28.305
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1318
1317
1316
1315
1314
1313
8500
9000
9500
10000
10500
11000
Station (ft)

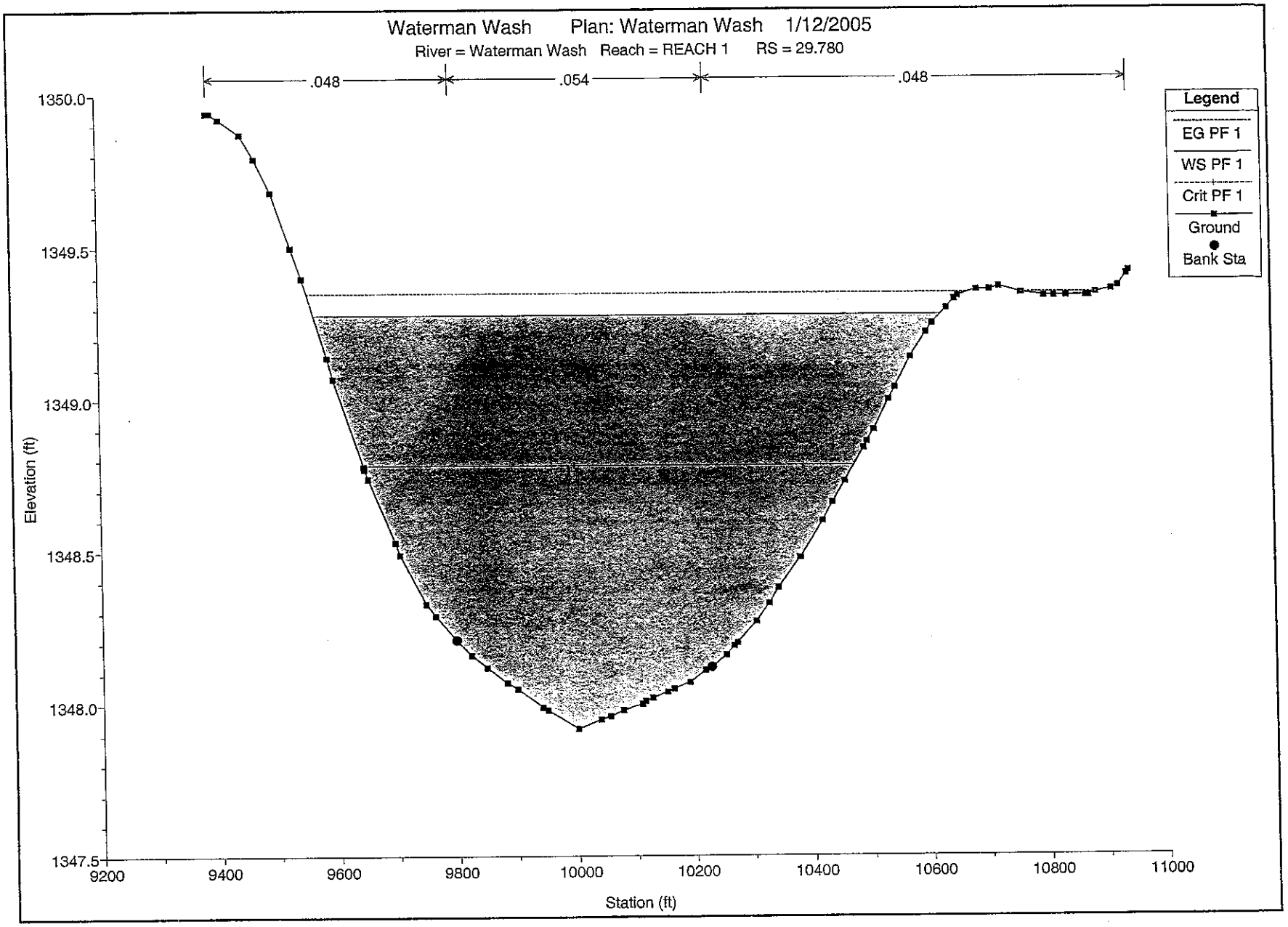

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 28.556
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
1322.0
1321.5
1321.0
1320.5
1320.0
Elevation (ft)
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

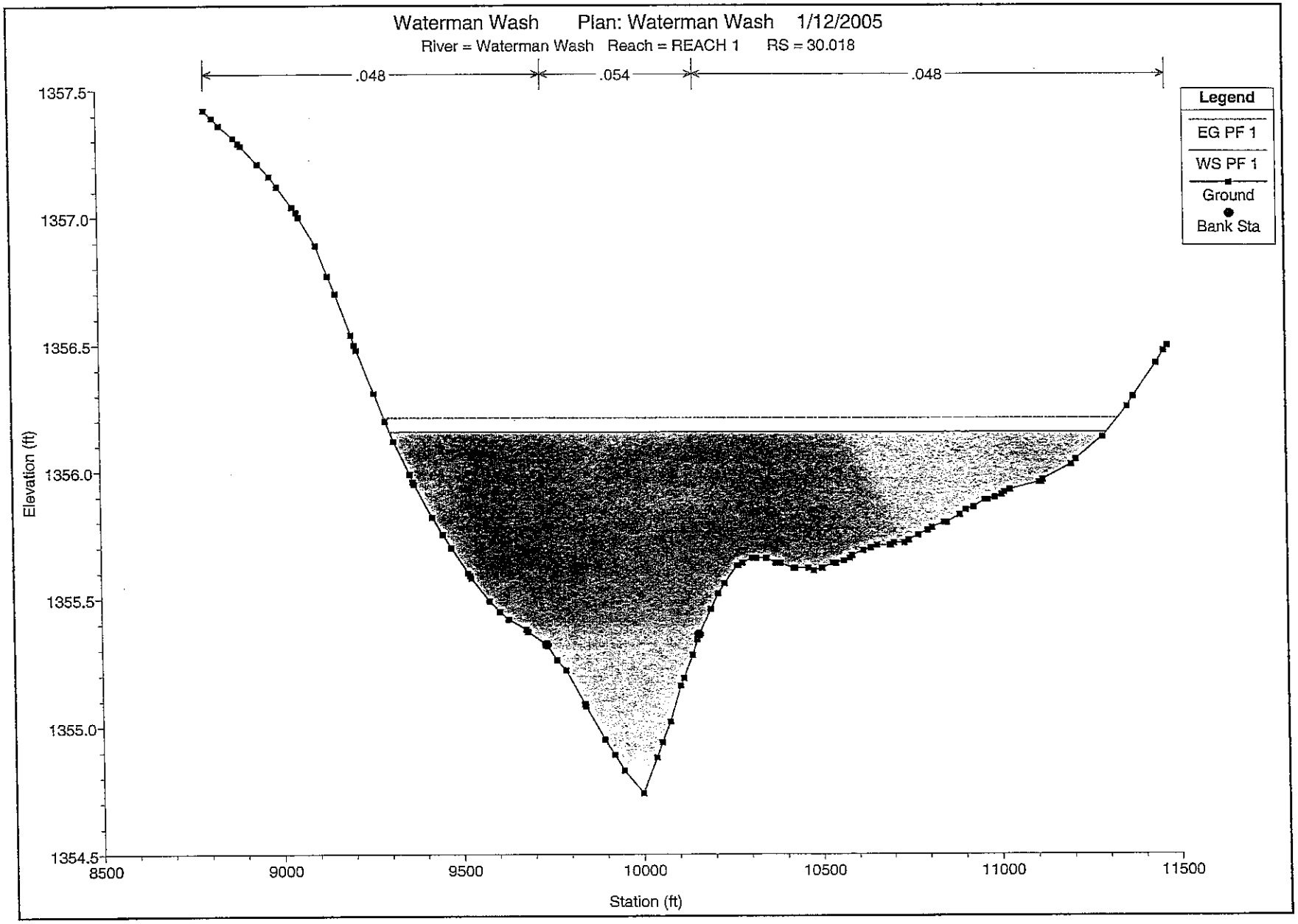

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 28.777 Approximately at crossing of Gas Line Road.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1325.8
1325.6
1325.4
1325.2
1325.0
1324.8
1324.6
1324.4
1324.2
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

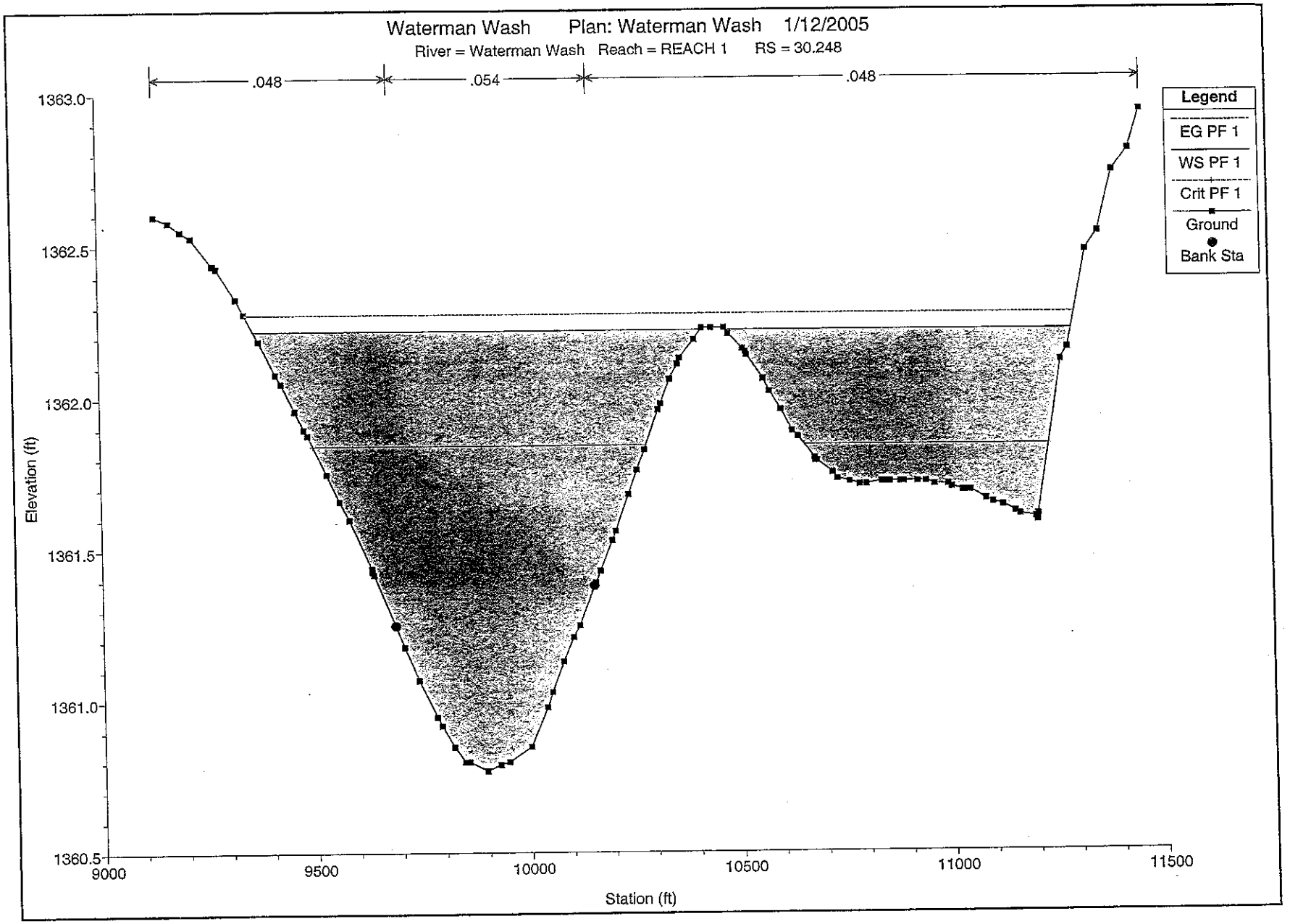

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 29.034
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1332.0
1331.5
1331.0
1330.5
1330.0
1329.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

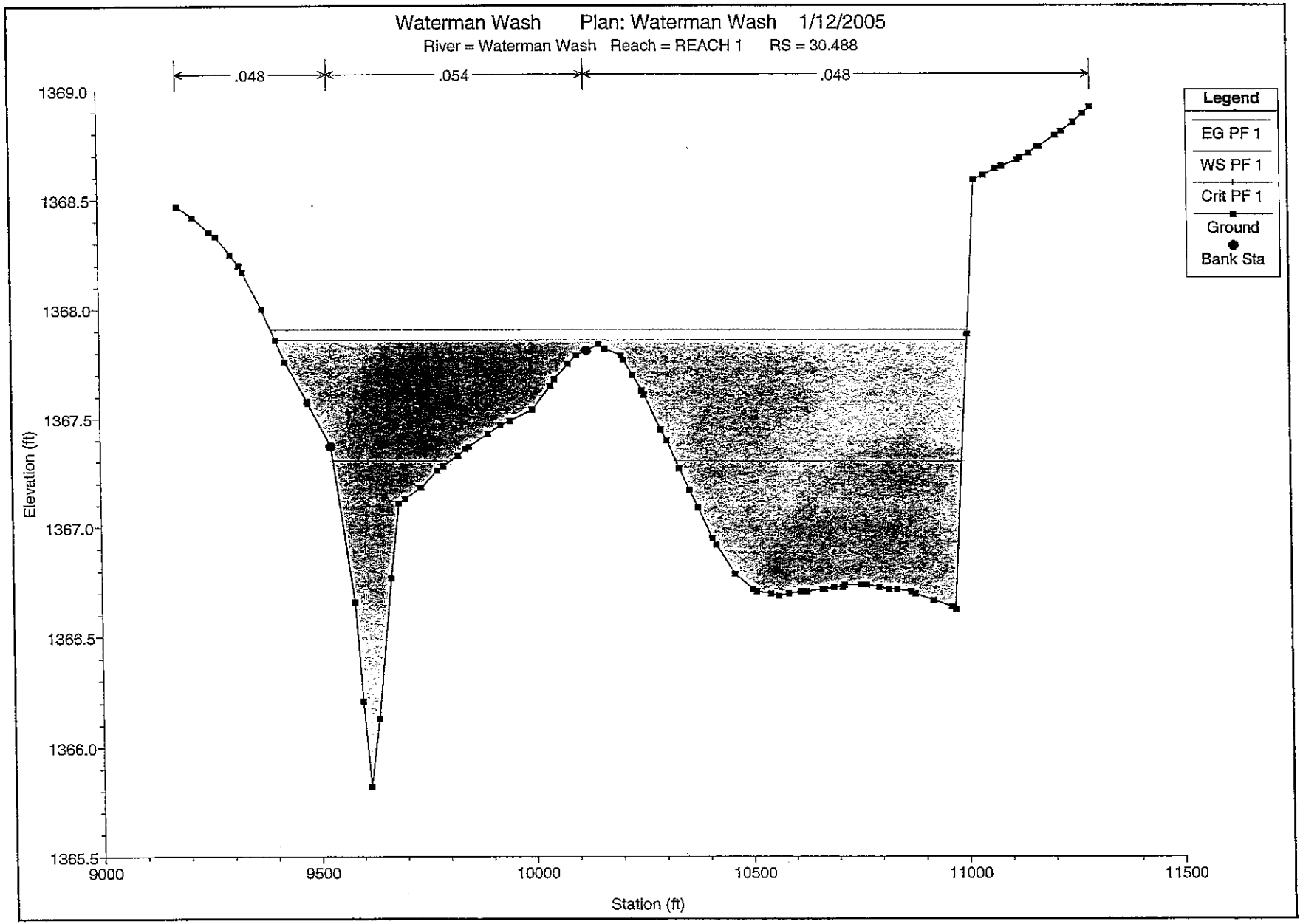

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 29.273
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1339.0
1338.5
1338.0
1337.5
1337.0
1336.5
1336.0
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

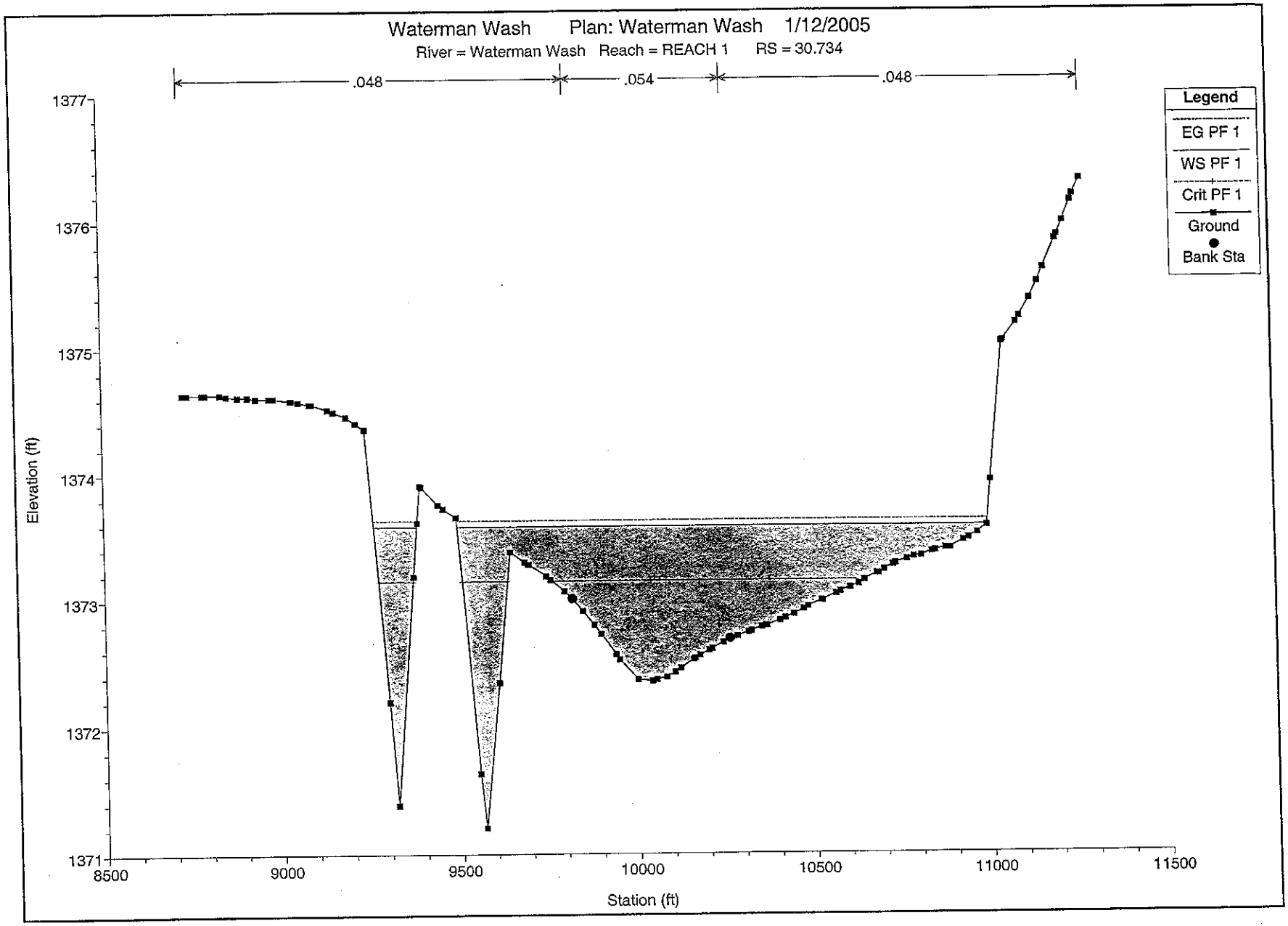

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 29.515
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1344.5
1344.0
1343.5
1343.0
1342.5
1342.0
1341.5
8500
9000
9500
10000
10500
11000
Station (ft)

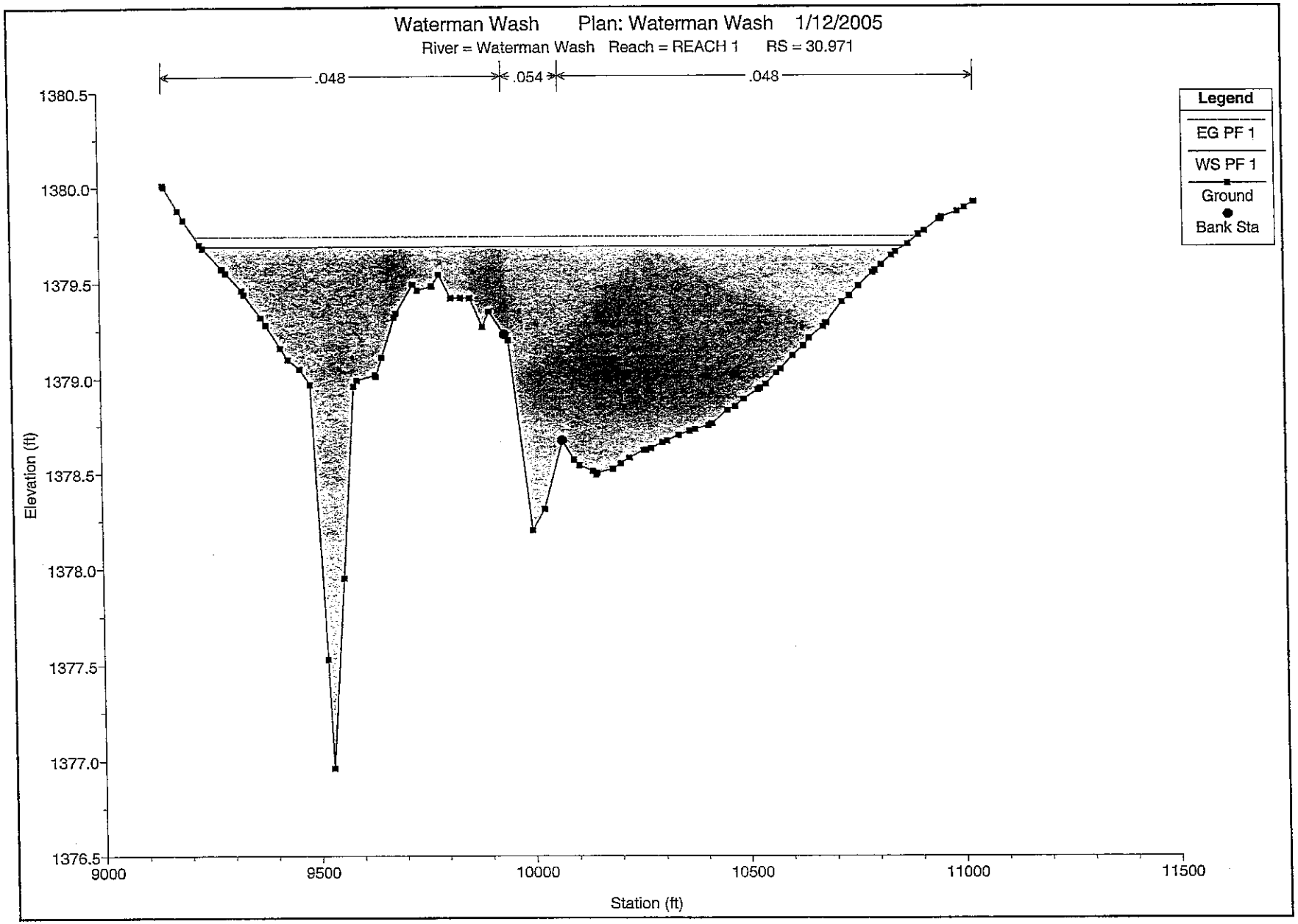

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 29.780
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1350.0
1349.5
1349.0
1348.5
1348.0
1347.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

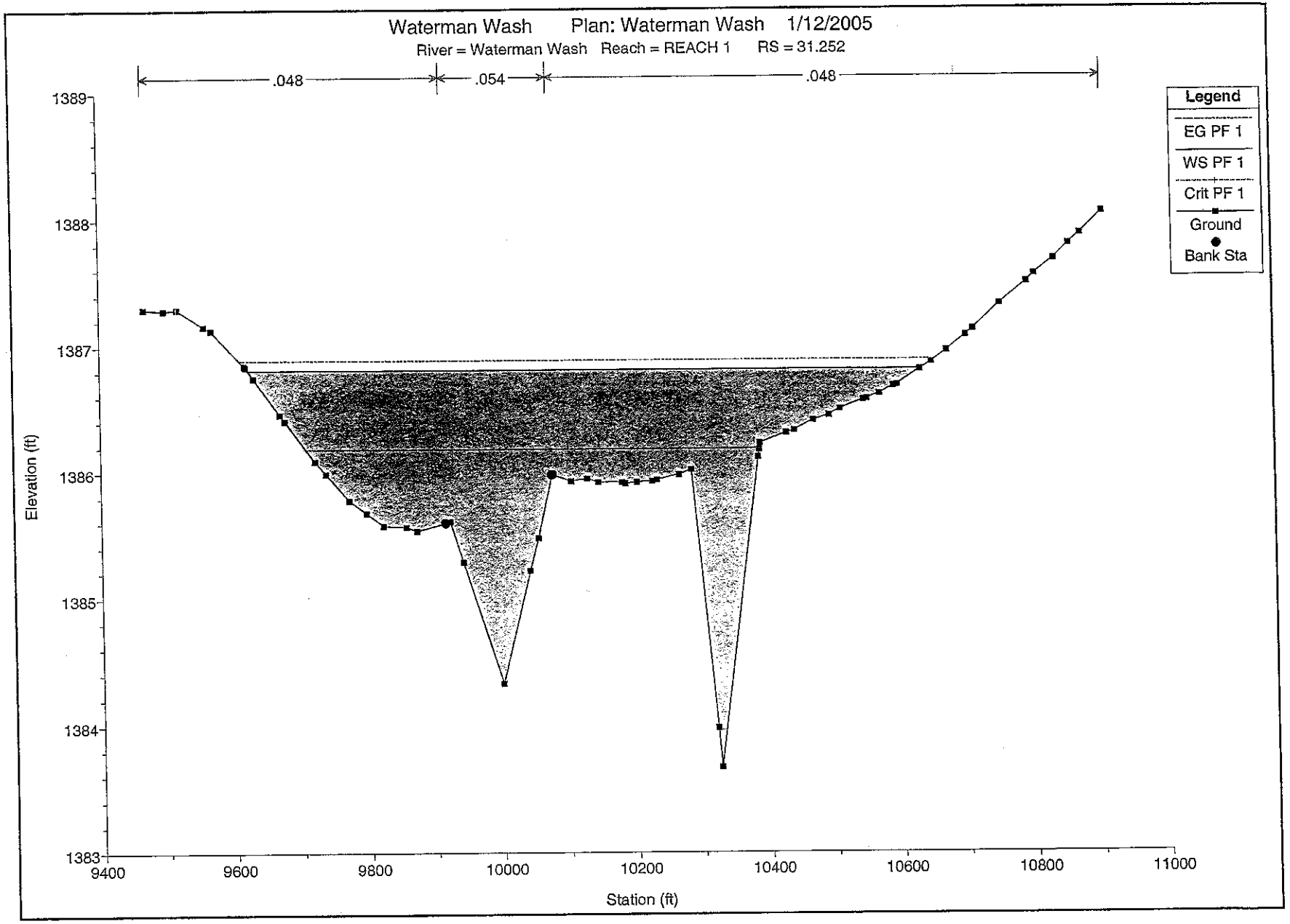

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 30.018
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1357.5
1357.0
1356.5
1356.0
1355.5
1355.0
1354.5
8500
9000
9500
10000
10500
11000
11500
Station (ft)

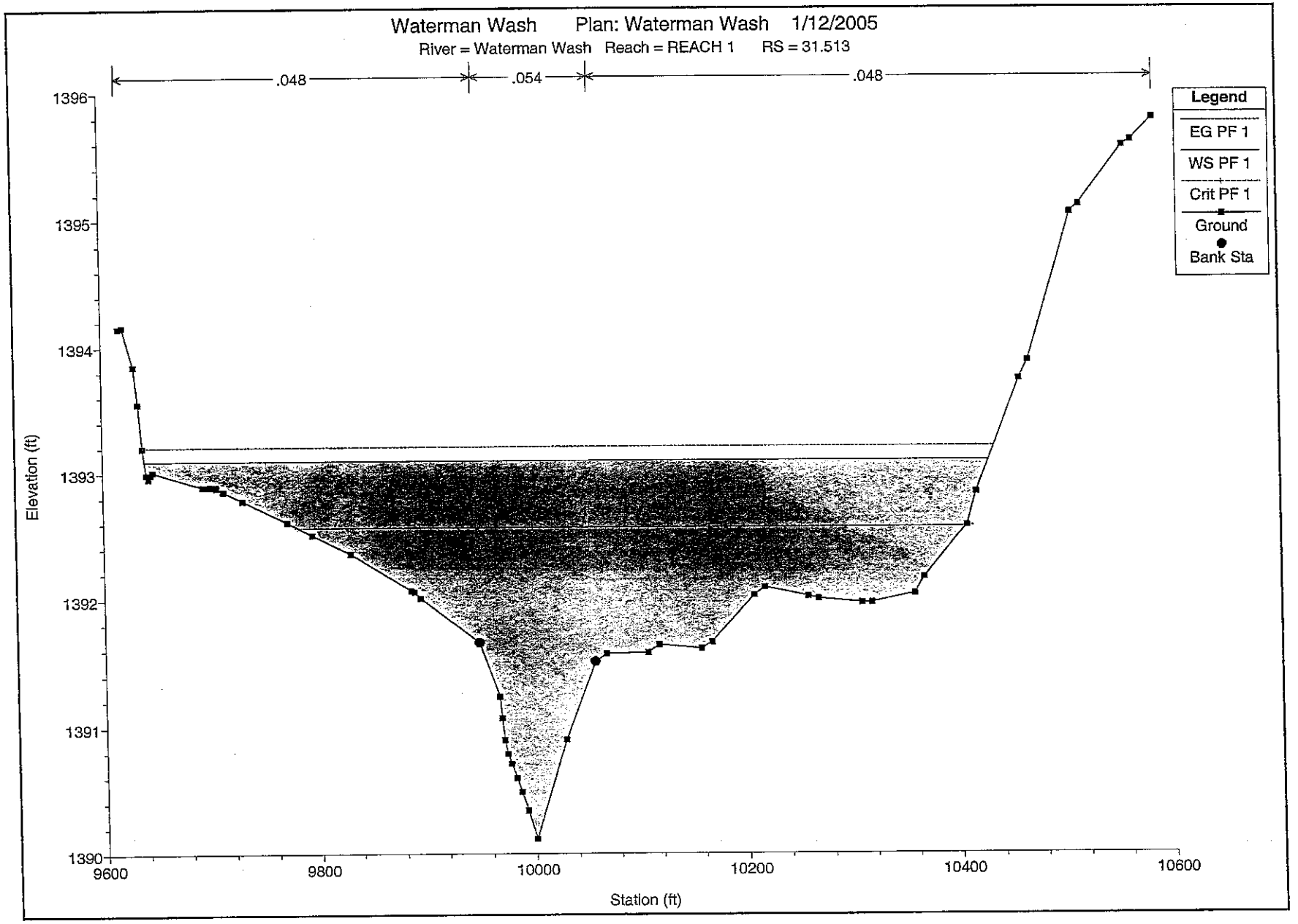

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 30.248
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1363.0
1362.5
1362.0
1361.5
1361.0
1360.5
9000
9500
10000
10500
11000
11500
Station (ft)

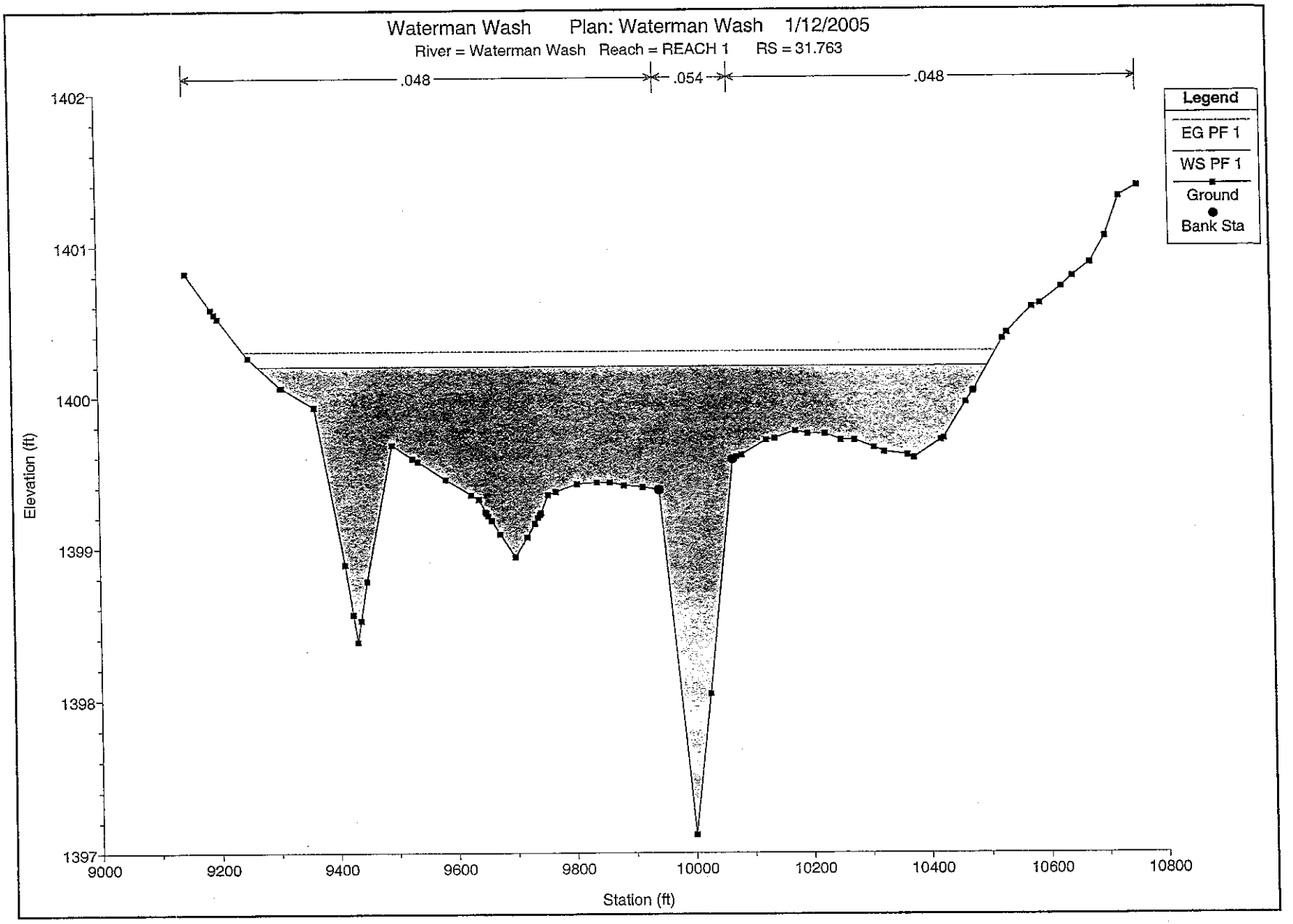

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 30.488
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1369.0
1368.5
1368.0
1367.5
1367.0
1366.5
1366.0
1365.5
9000
9500
10000
10500
11000
11500
Station (ft)

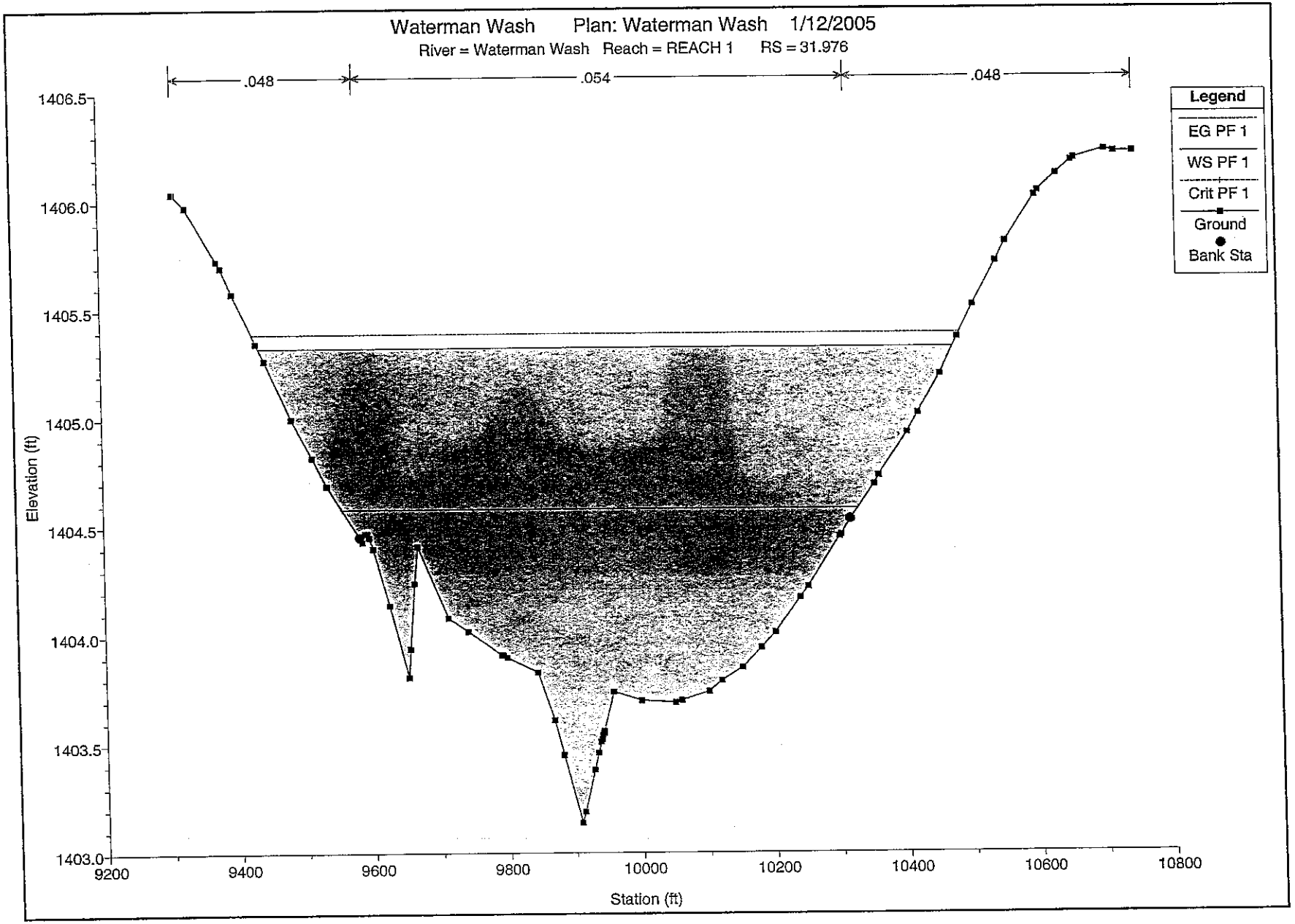

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 30.734
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1377
1376
1375
1374
1373
1372
1371
8500
9000
9500
10000
10500
11000
11500
Station (ft)

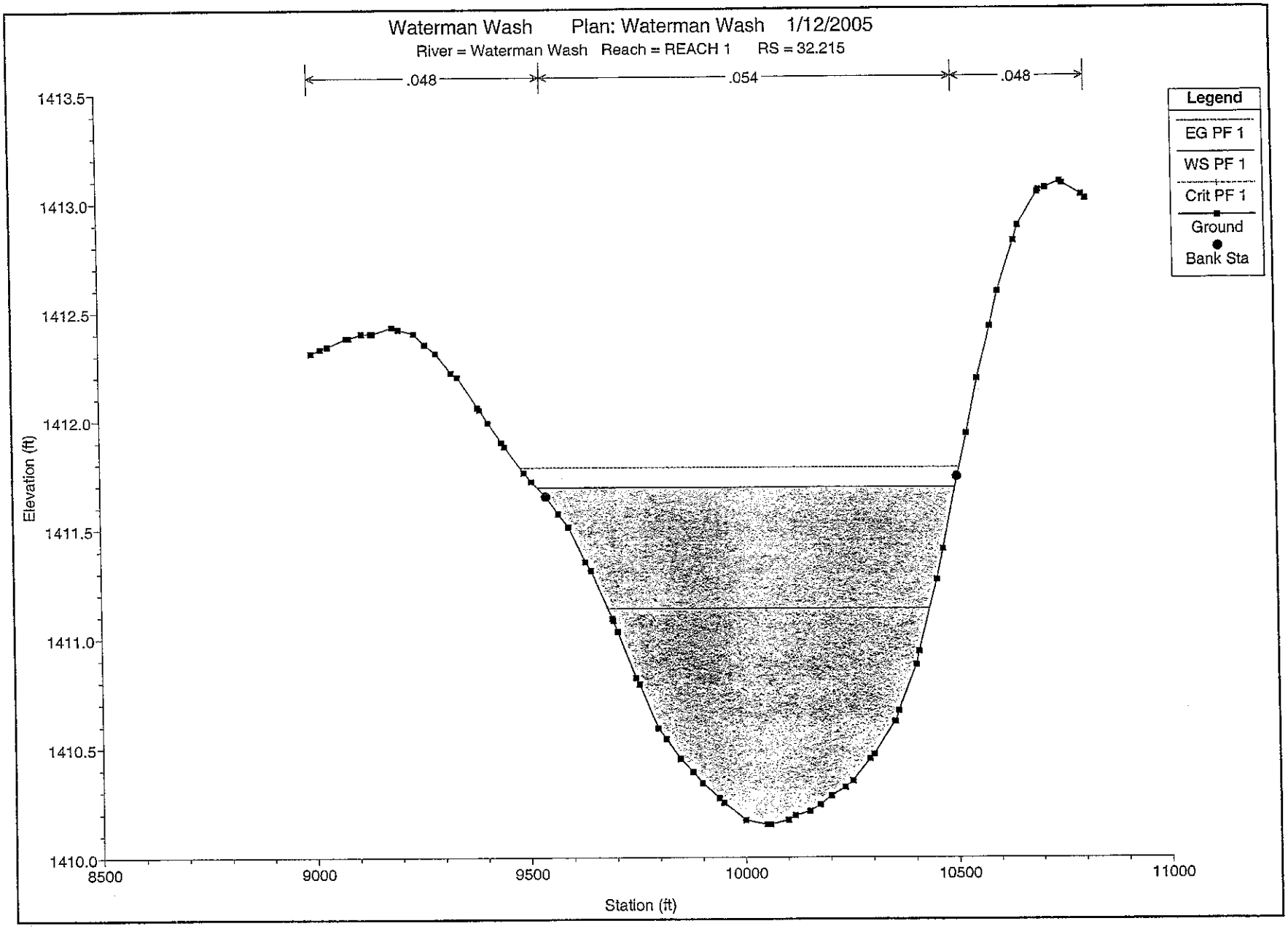

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 30.971
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1380.5
1380.0
1379.5
1379.0
1378.5
1378.0
1377.5
1377.0
1376.5
9000
9500
10000
10500
11000
11500
Station (ft)

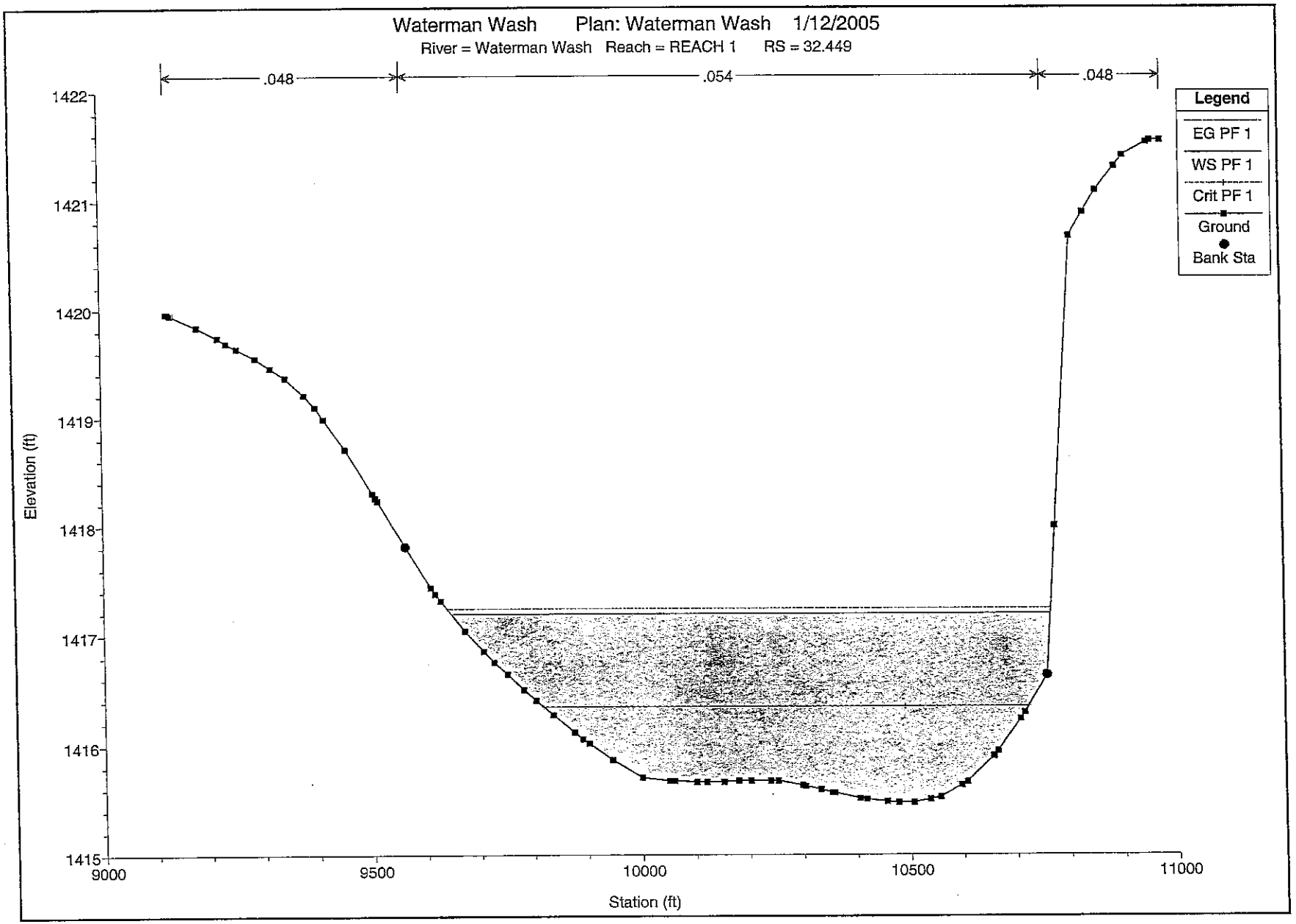

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 31.252
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1389
1388
1387
1386
1385
1384
1383
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

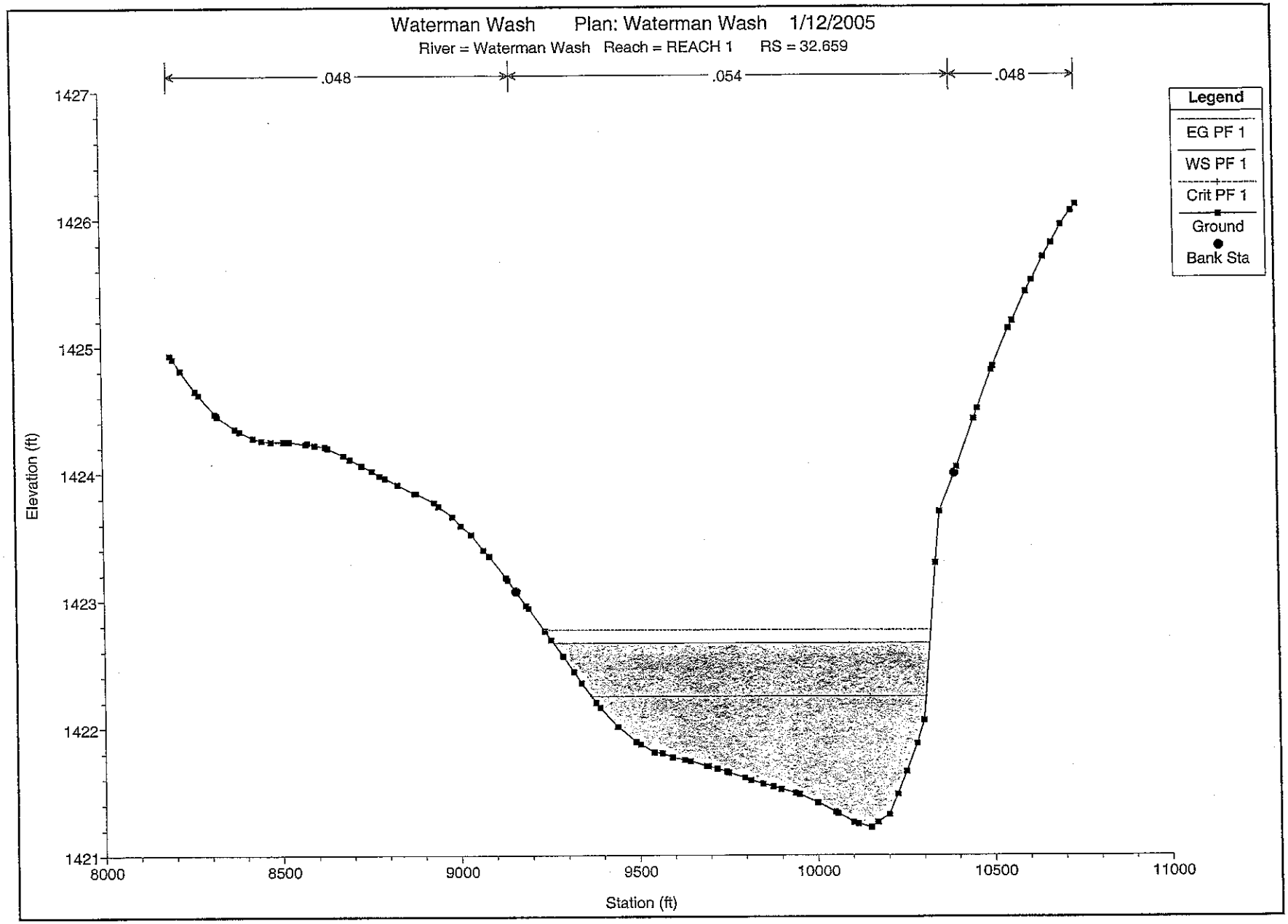

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 31.513
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1396
1395
1394
1393
1392
1391
1390
9600
9800
10000
10200
10400
10600
Station (ft)

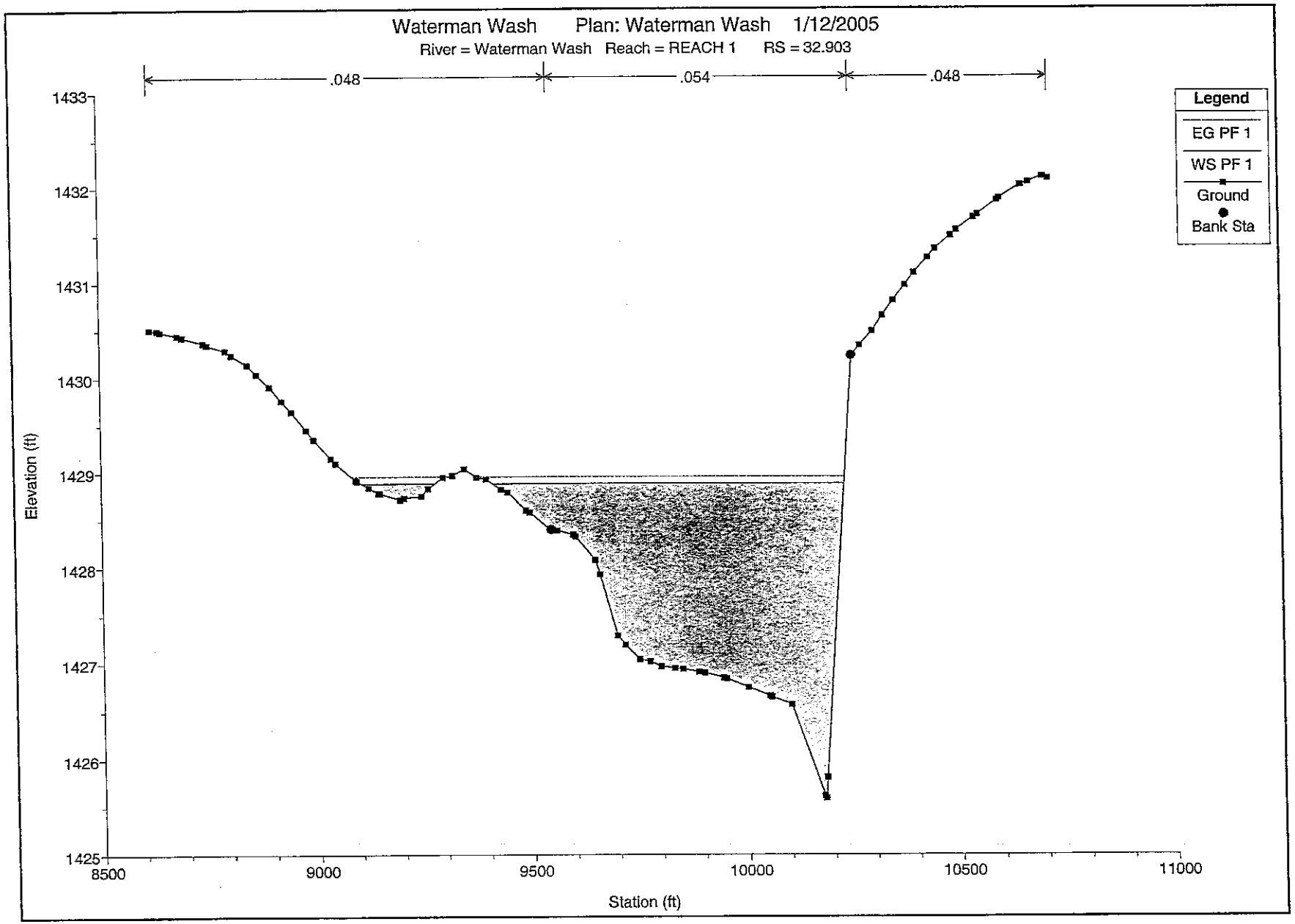

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 31.763
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1402
1401
1400
1399
1398
1397
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

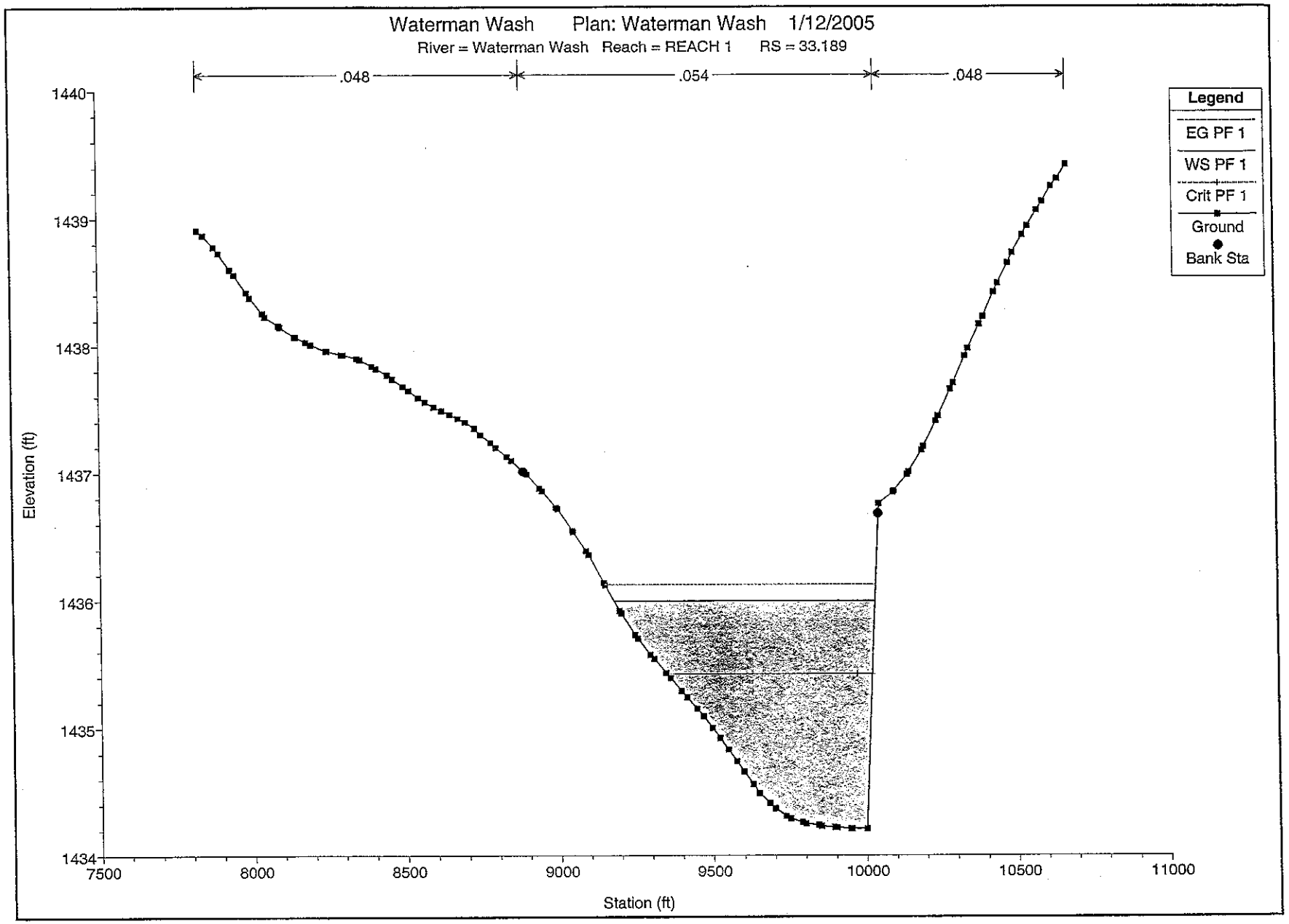

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 31.976
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1406.5
1406.0
1405.5
1405.0
1404.5
1404.0
1403.5
1403.0
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

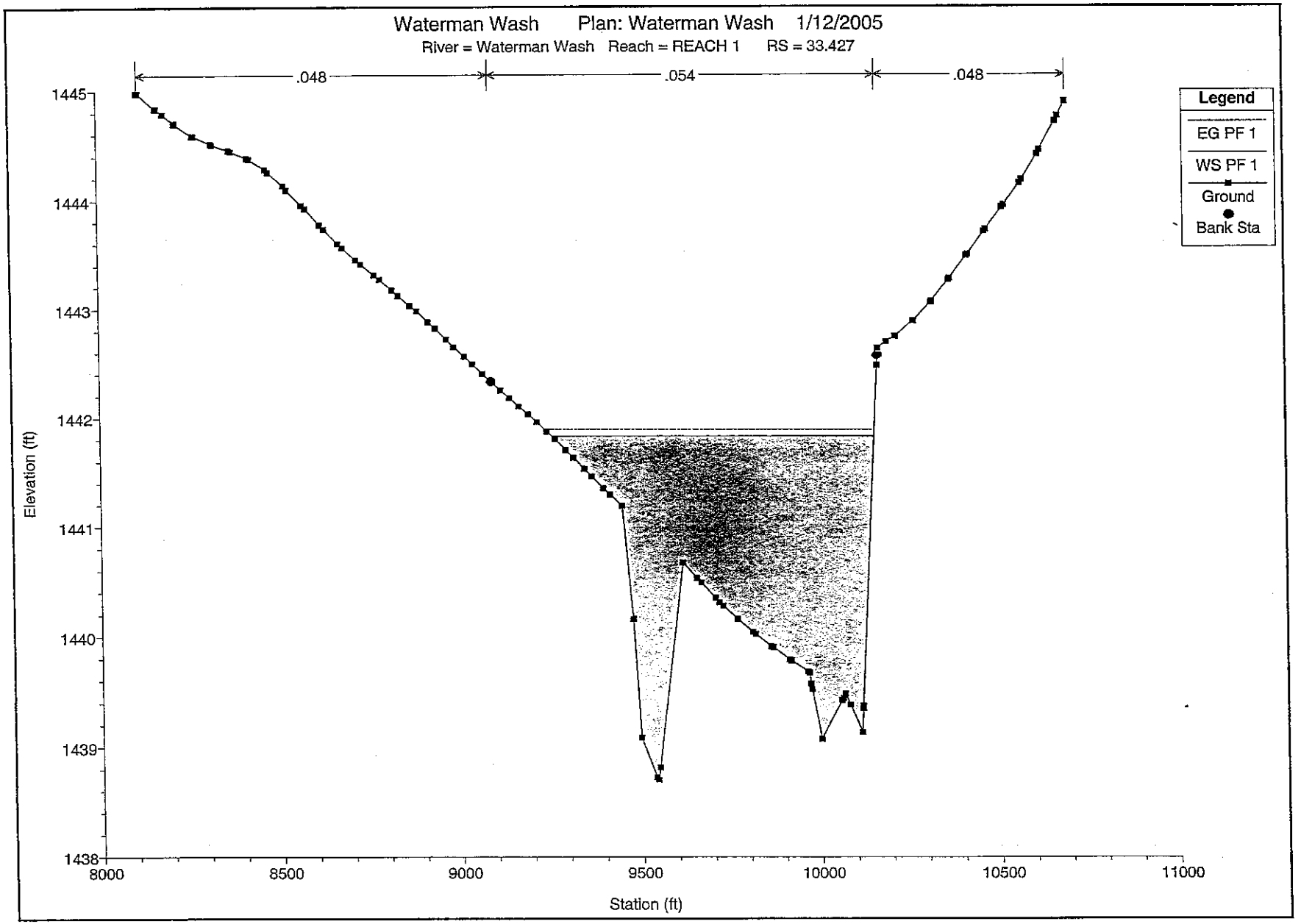

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 32.215
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1413.5
1413.0
1412.5
1412.0
1411.5
1411.0
1410.5
1410.0
8500
9000
9500
10000
10500
11000
Station (ft)

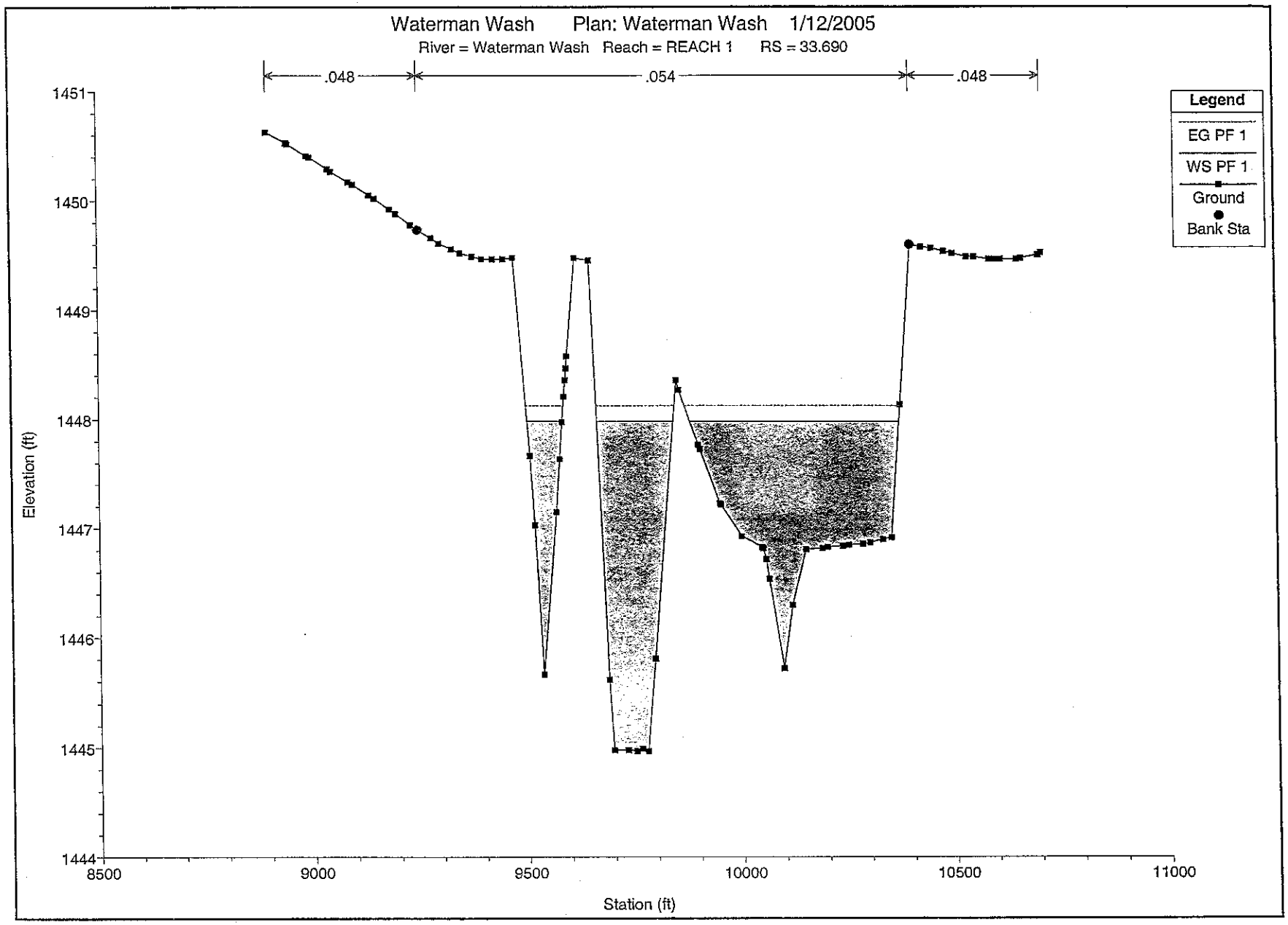

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 32.449
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1422
1421
1420
1419
1418
1417
1416
1415
9000
9500
10000
10500
11000
Station (ft)

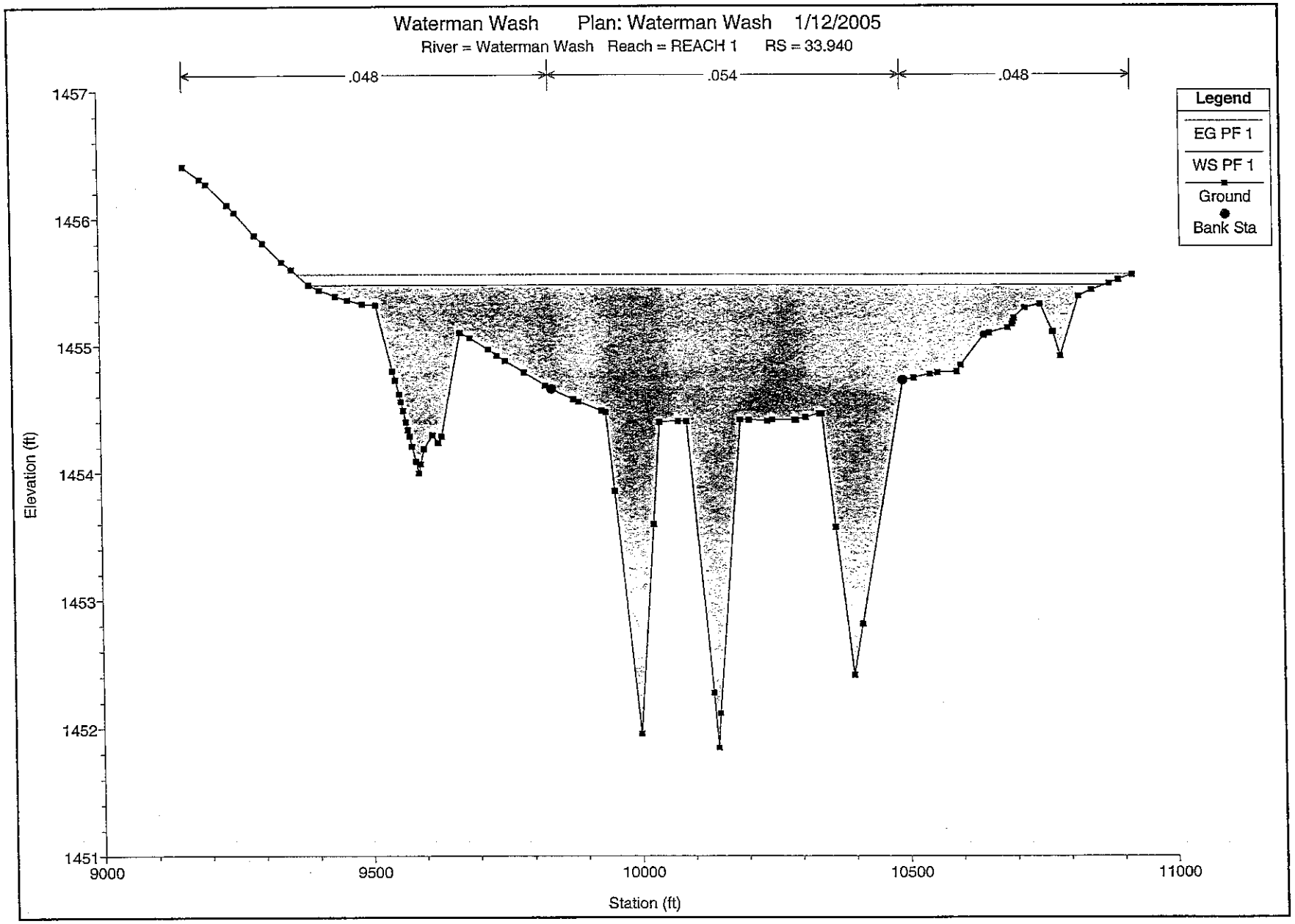

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 32.659
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1427
1426
1425
1424
1423
1422
1421
8000
8500
9000
9500
10000
10500
11000
Station (ft)

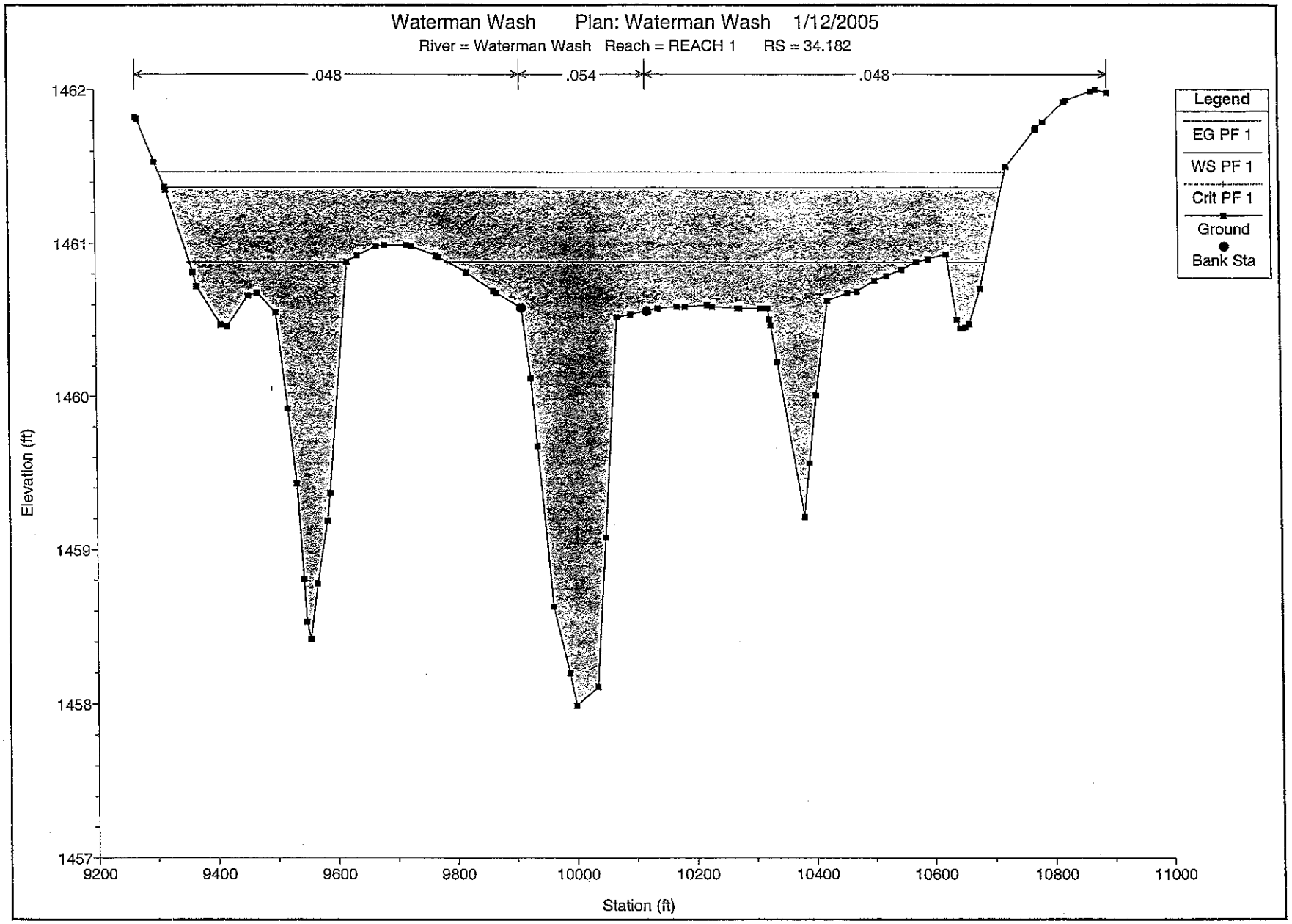

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 32.903
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1433
1432
1431
1430
1429
1428
1427
1426
1425
8500
9000
9500
10000
10500
11000
Station (ft)

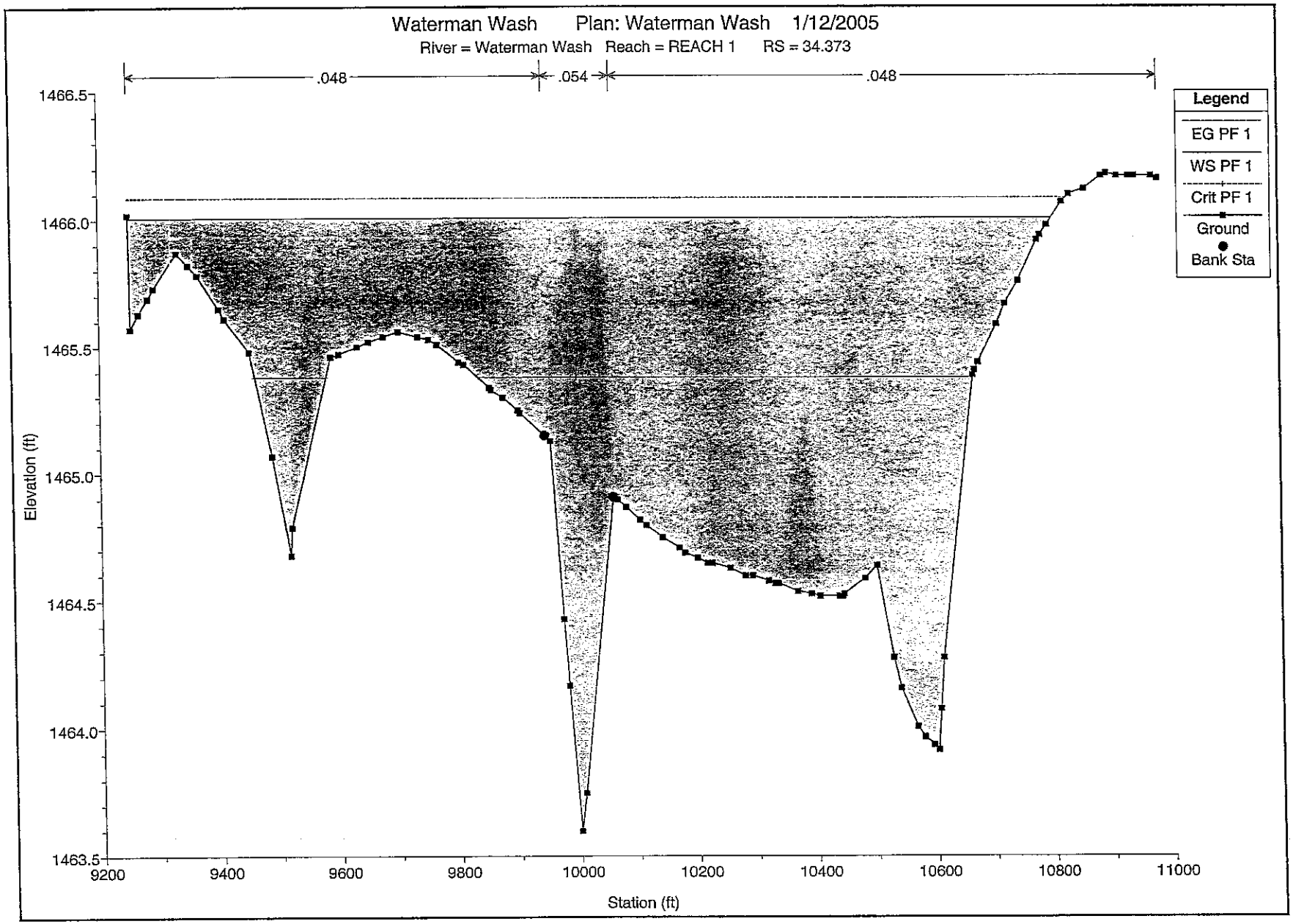

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 33.189
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1440
1439
1438
1437
1436
1435
1434
7500
8000
8500
9000
9500
10000
10500
11000
Station (ft)

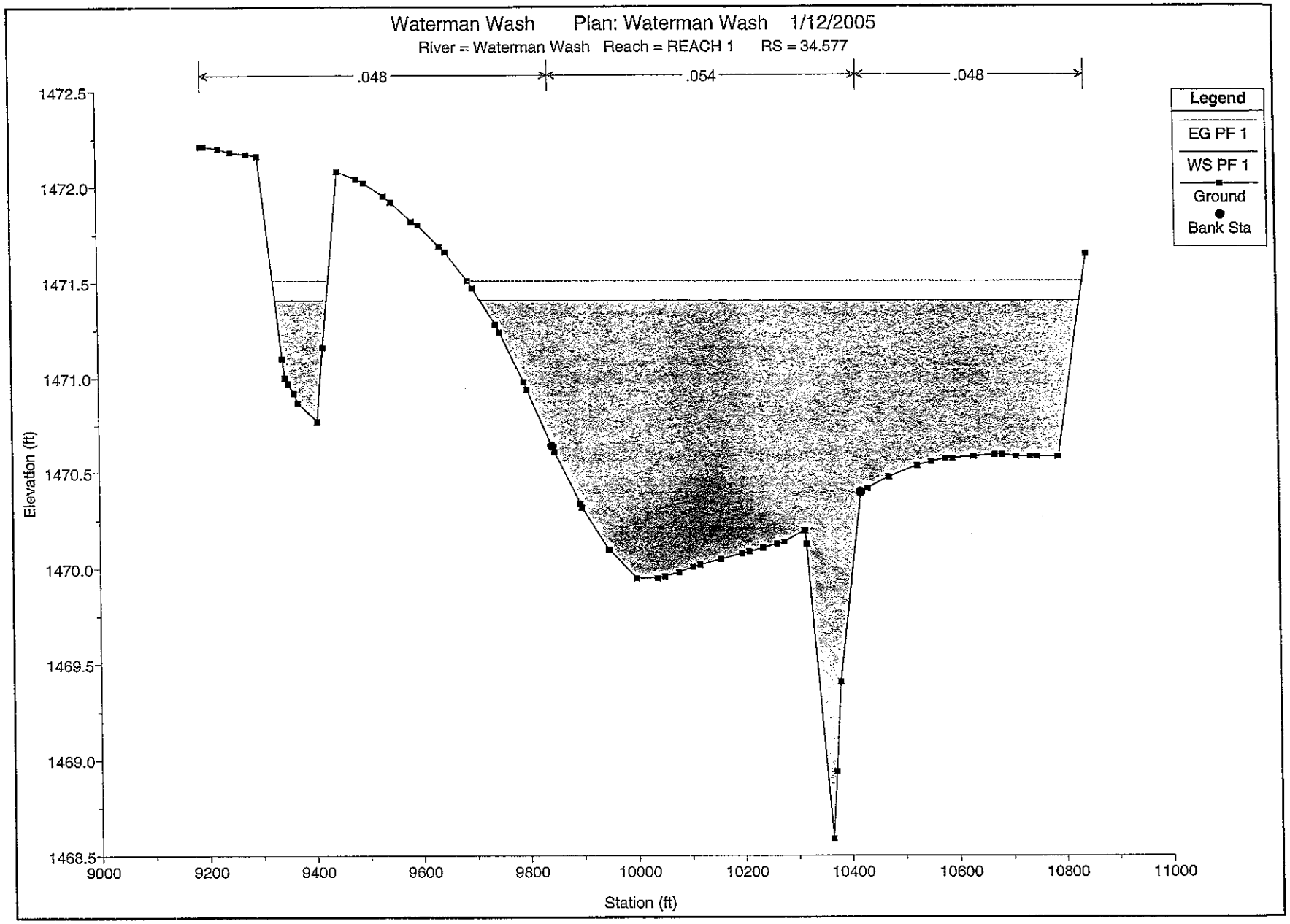

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 33.427
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1445
1444
1443
1442
1441
1440
1439
1438
8000
8500
9000
9500
10000
10500
11000
Station (ft)

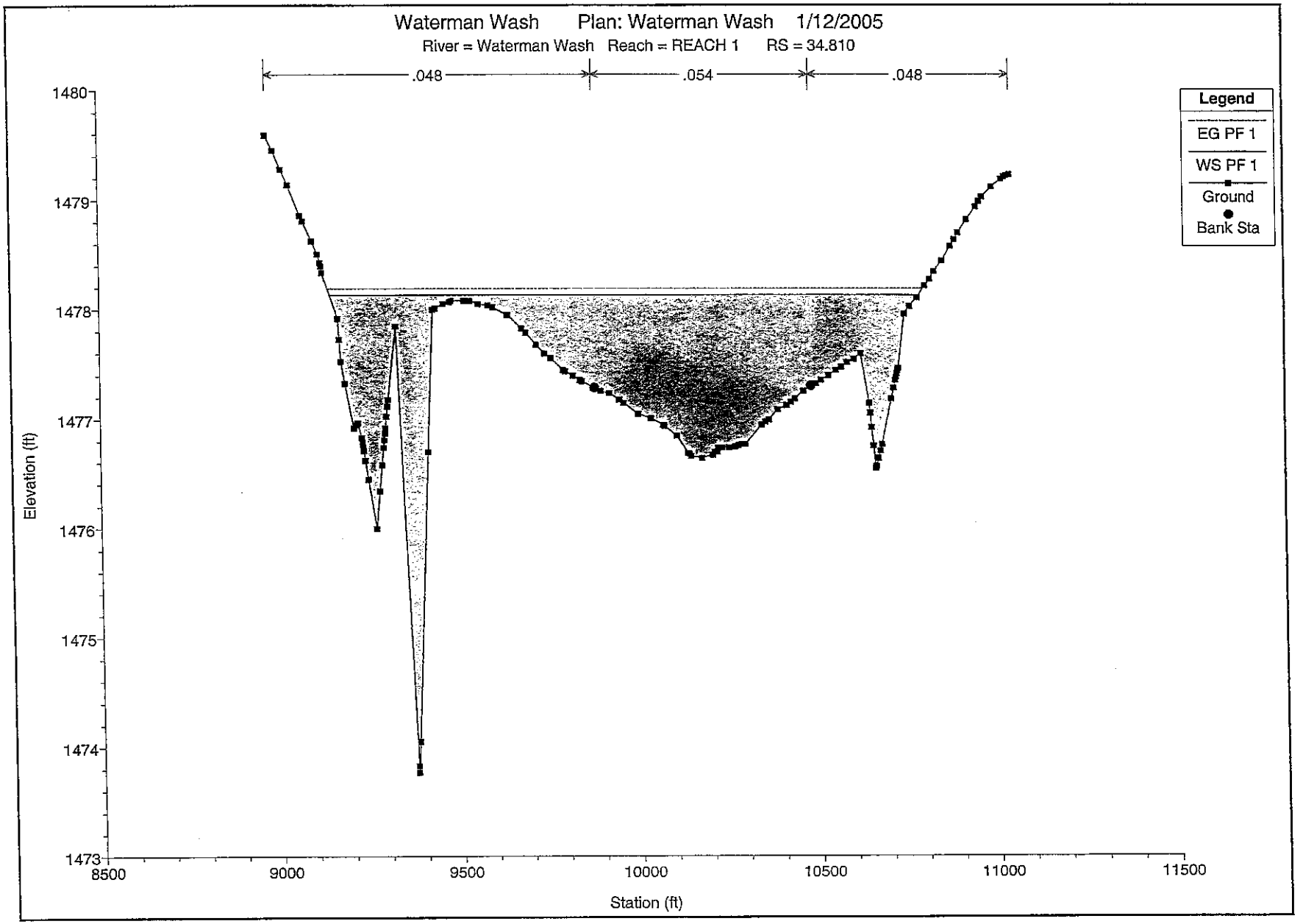

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 33.690
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1451
1450
1449
1448
1447
1446
1445
1444
8500
9000
9500
10000
10500
11000
Station (ft)

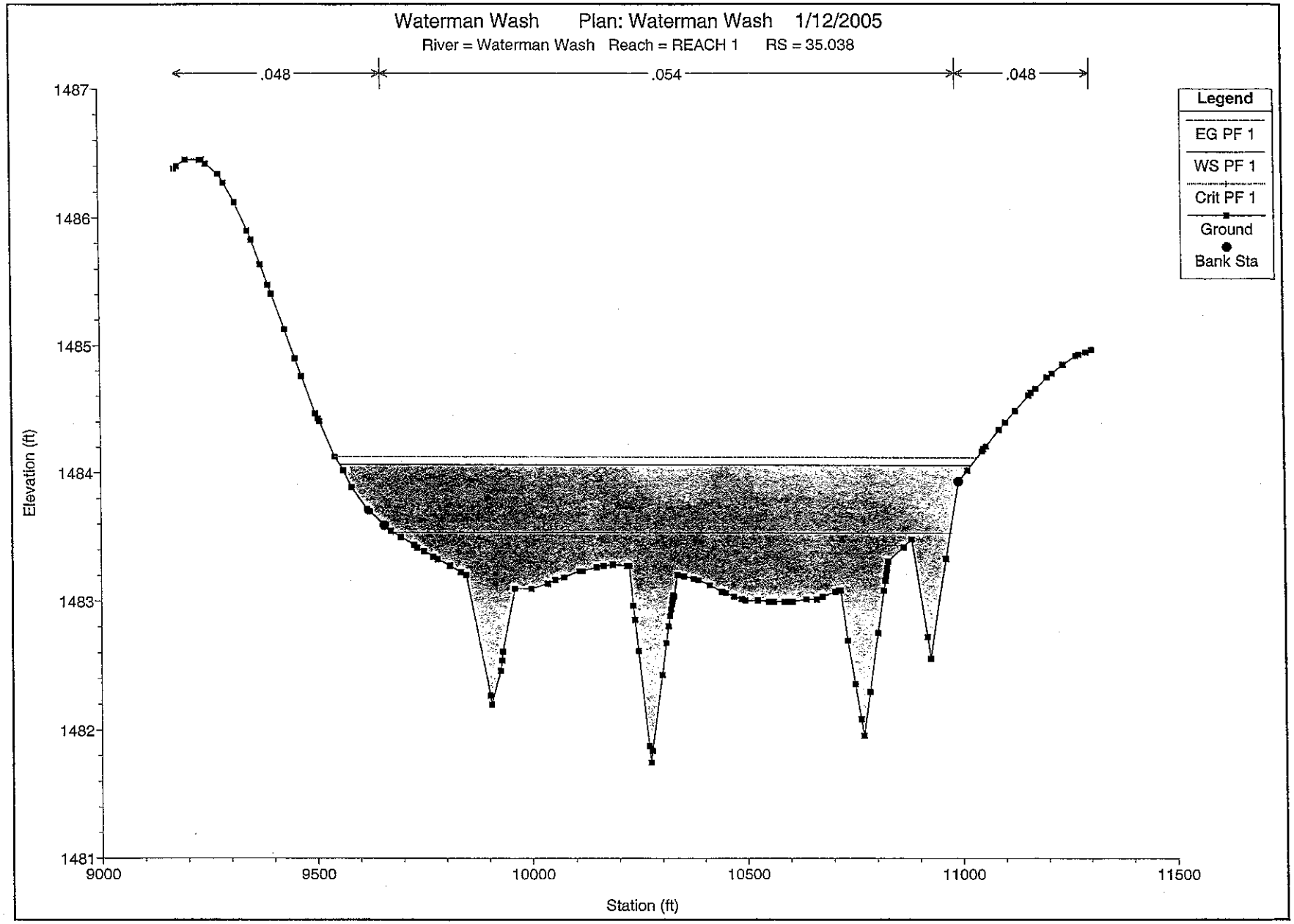

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 33.940
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1457
1456
1455
1454
1453
1452
1451
9000
9500
10000
10500
11000
Station (ft)

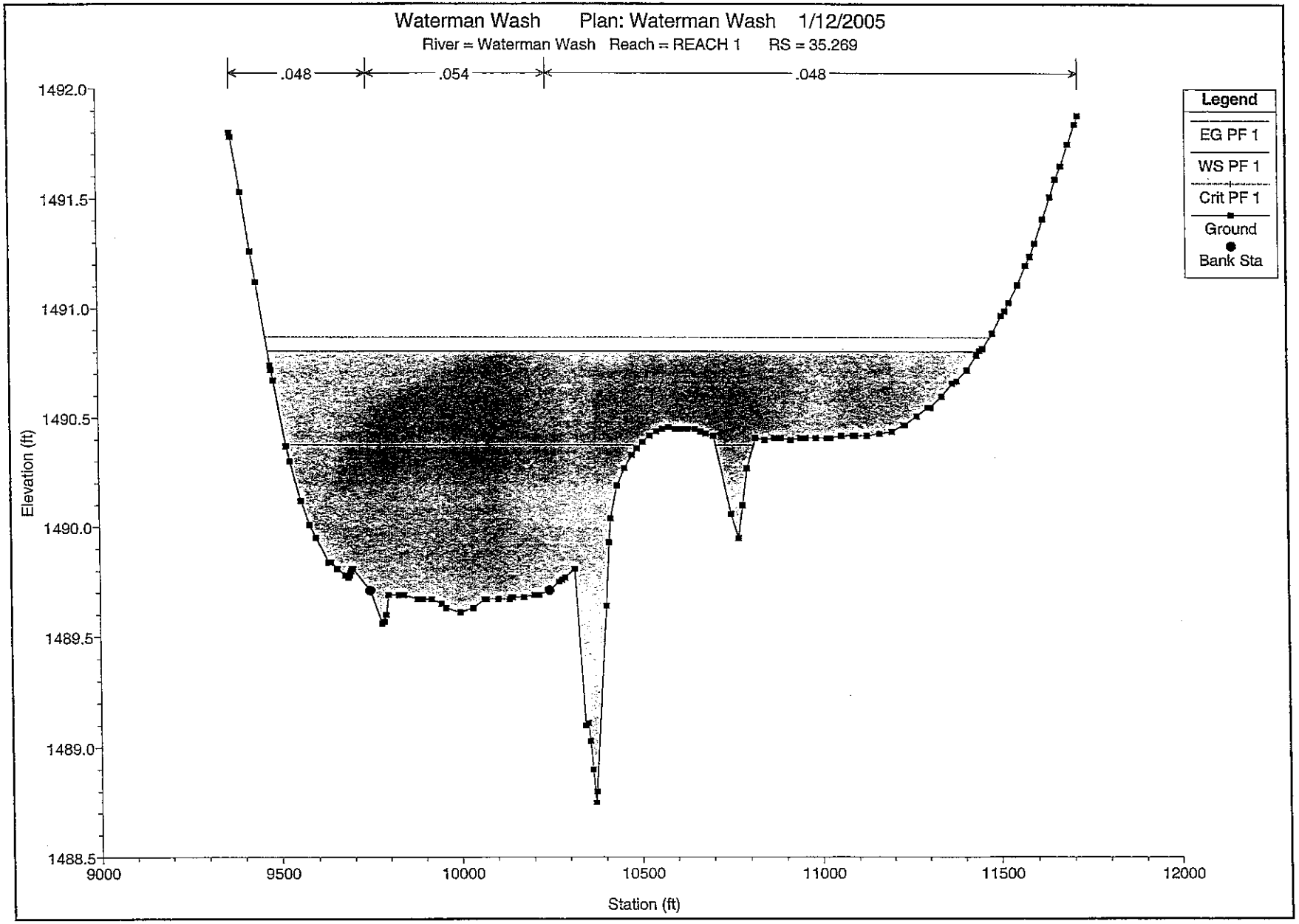

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 34.182
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1462
1461
1460
1459
1458
1457
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

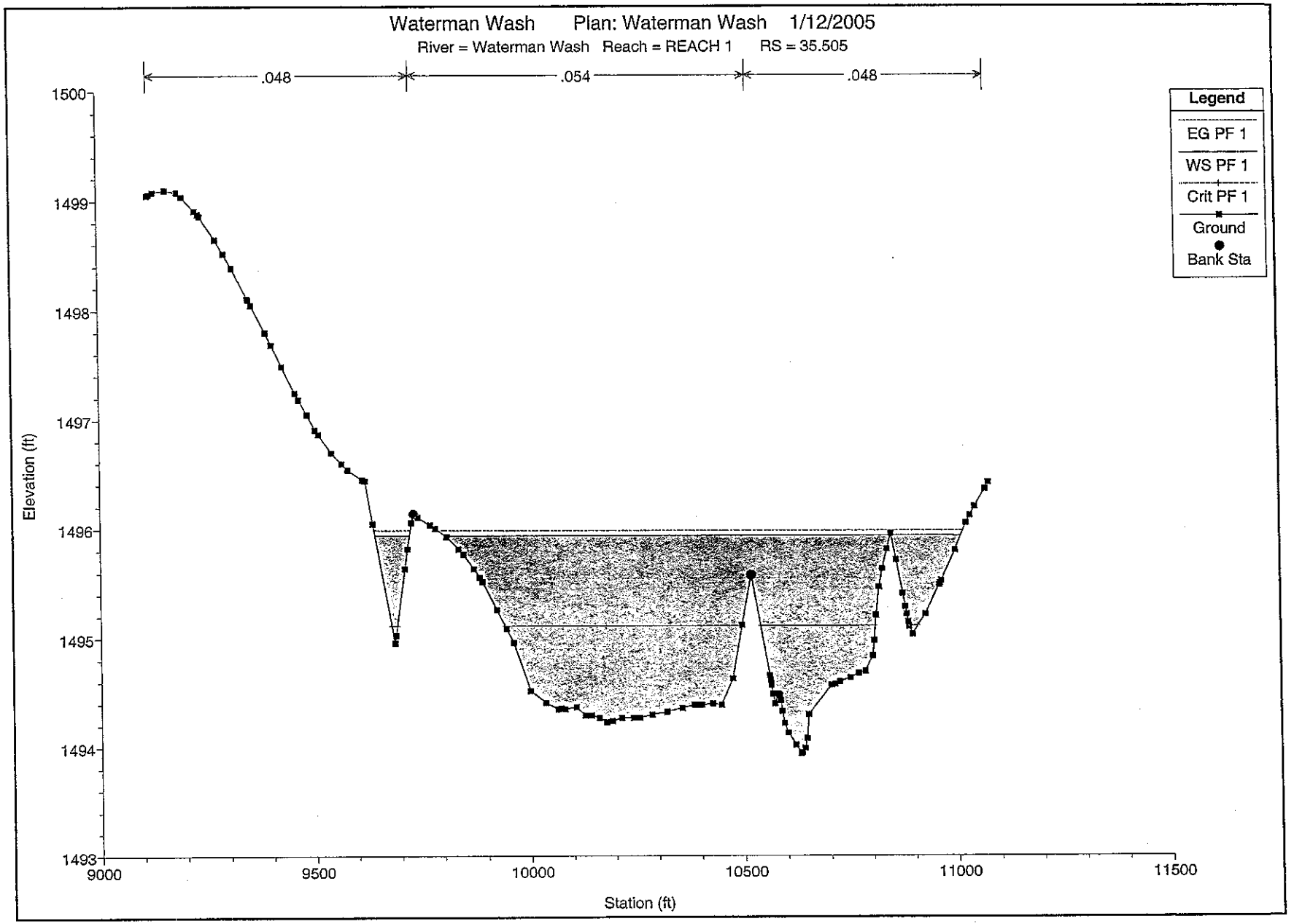

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 34.373
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1466.5
1466.0
1465.5
1465.0
1464.5
1464.0
1463.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

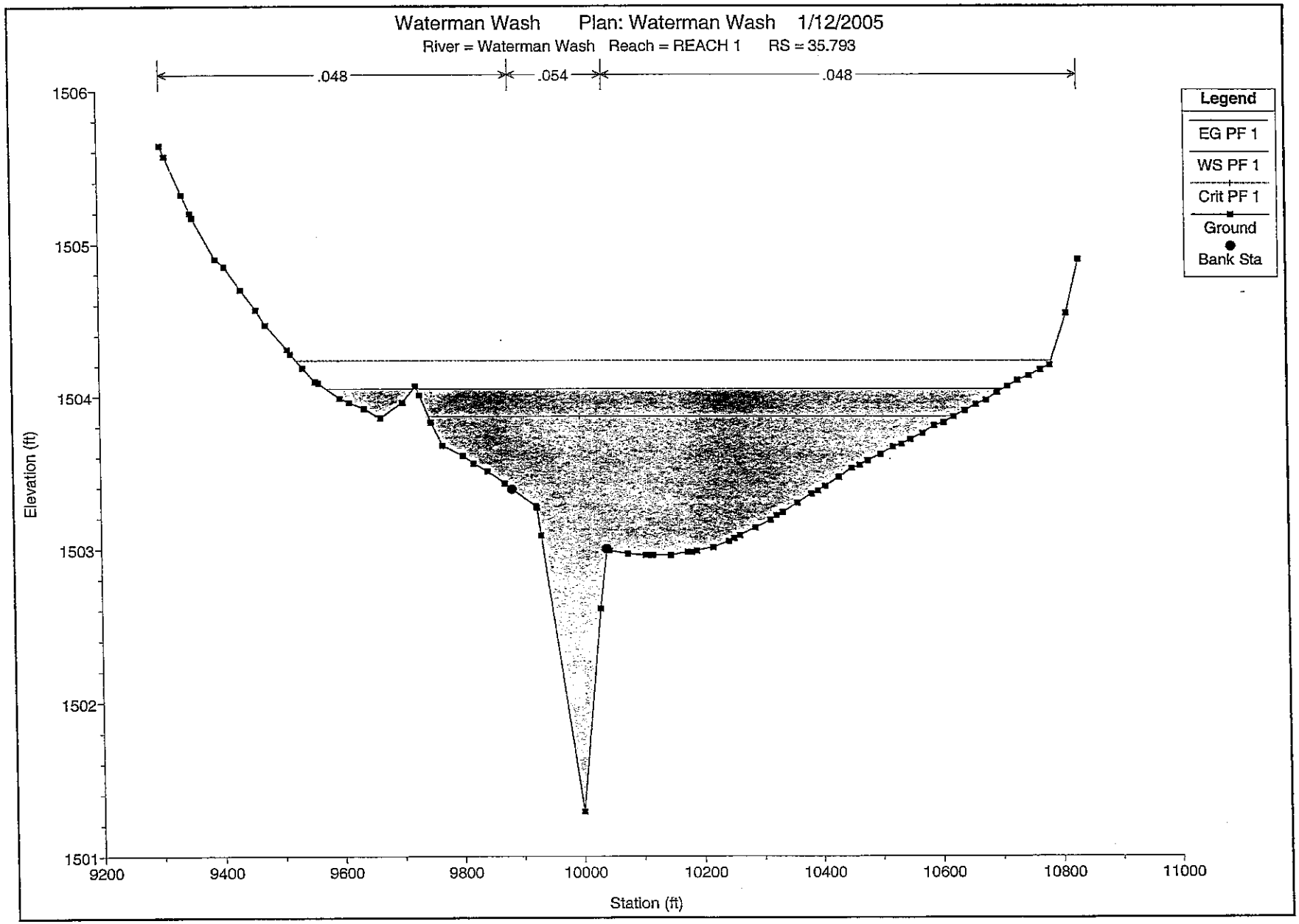

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 34.577
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1472.5
1472.0
1471.5
1471.0
1470.5
1470.0
1469.5
1469.0
1468.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

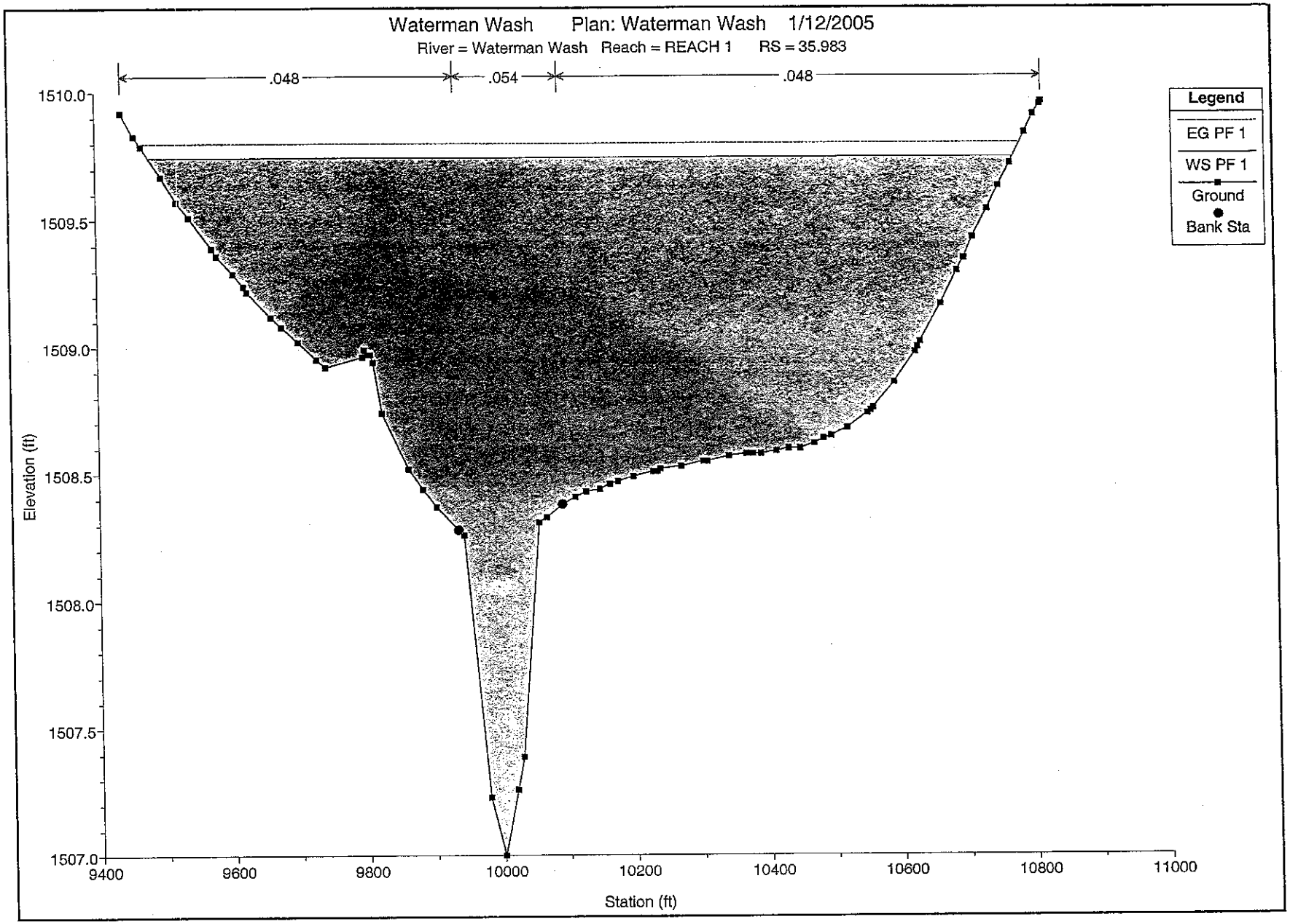

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 34.810
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1480
1479
1478
1477
1476
1475
1474
1473
8500
9000
9500
10000
10500
11000
11500
Station (ft)

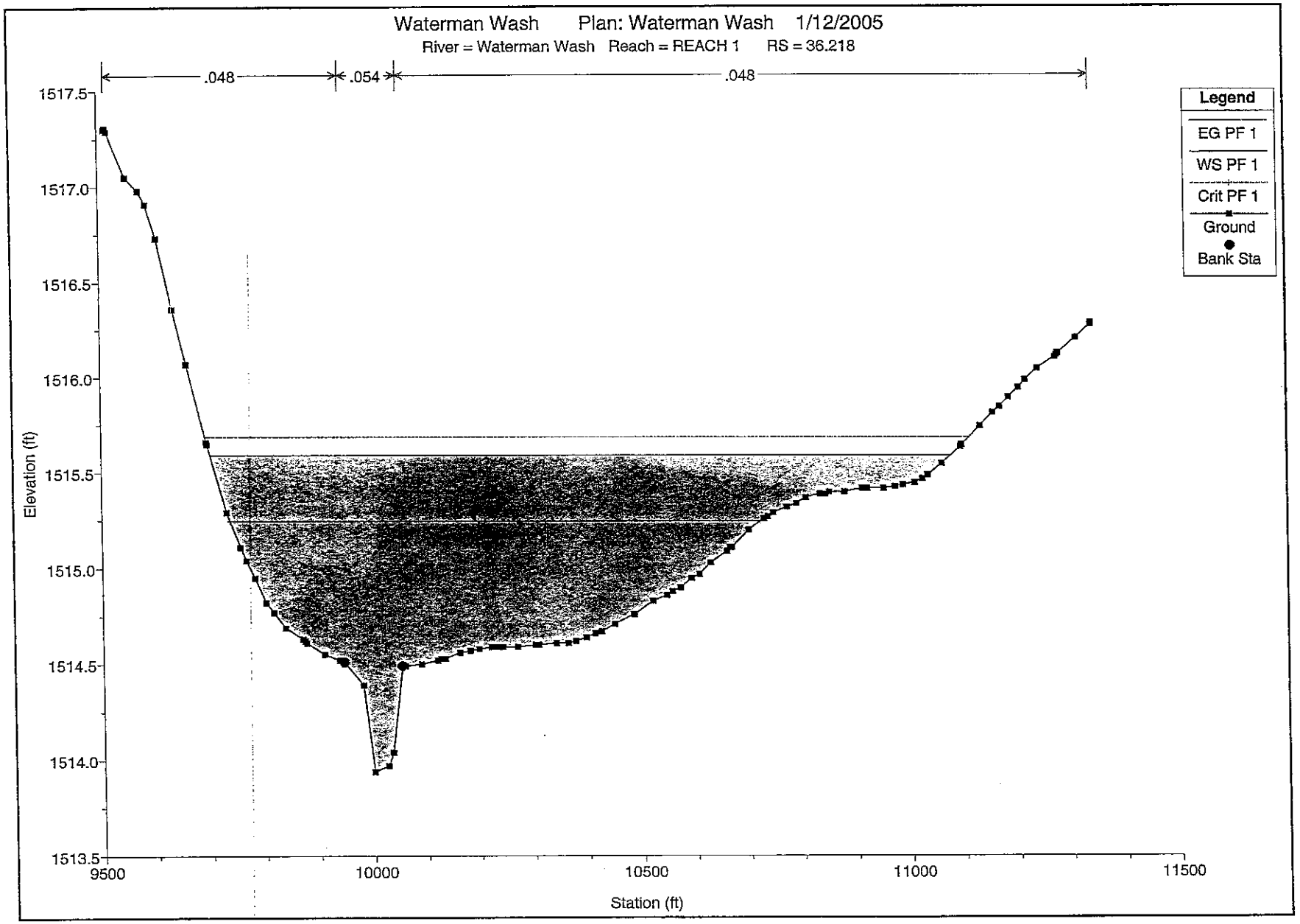

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 35.038
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1487
1486
1485
1484
1483
1482
1481
9000
9500
10000
10500
11000
11500
Station (ft)

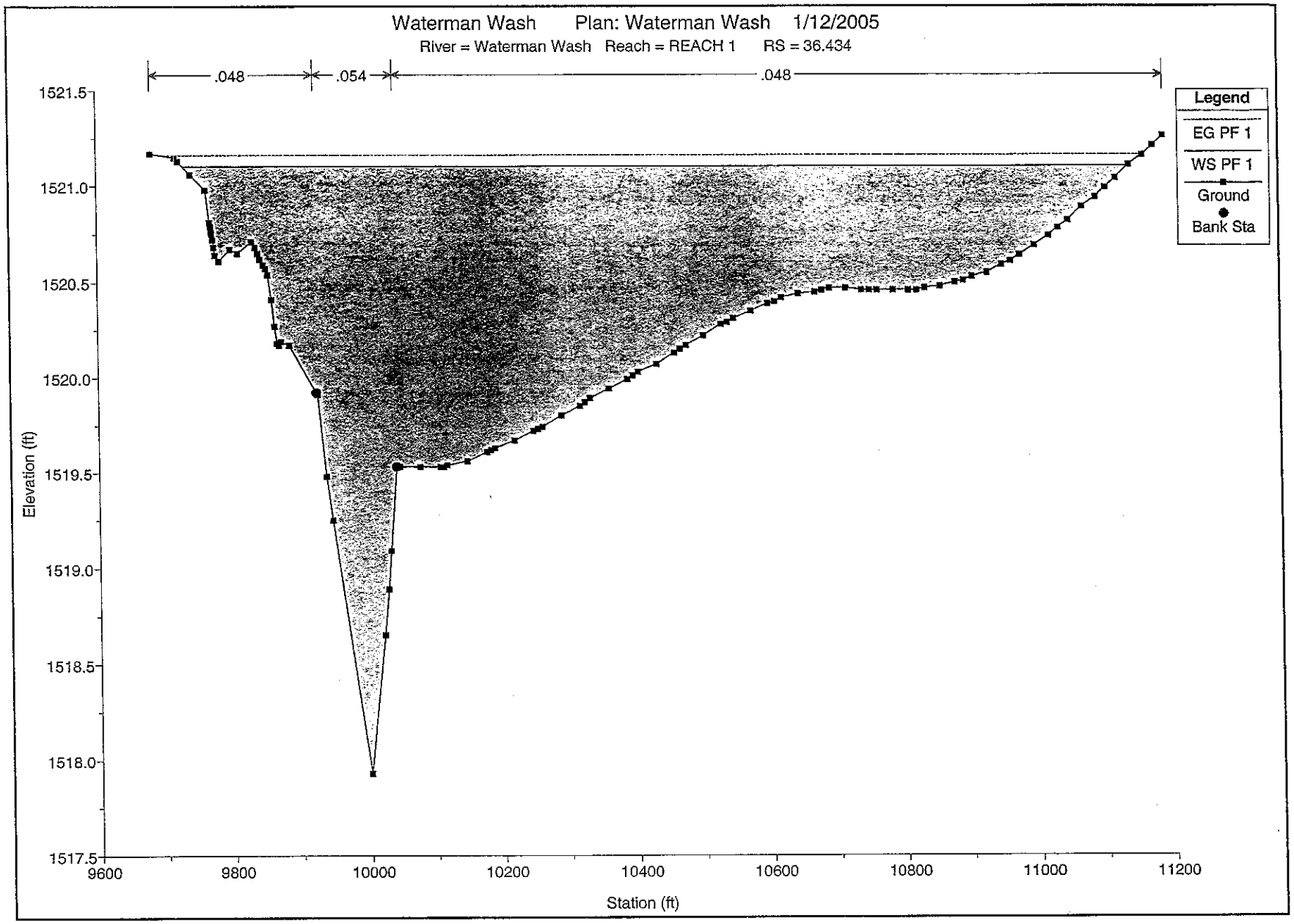

Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 35.269
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1492.0
1491.5
1491.0
1490.5
1490.0
1489.5
1489.0
1488.5
9000
9500
10000
10500
11000
11500
12000
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 35.505
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1500
1499
1498
1497
1496
1495
1494
1493
9000
9500
10000
10500
11000
11500
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 35.793
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1506
1505
1504
1503
1502
1501
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 35.983
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1510.0
1509.5
1509.0
1508.5
1508.0
1507.5
1507.0
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 36.218
.048
.054
.048
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1517.5
1517.0
1516.5
1516.0
1515.5
1515.0
1514.5
1514.0
1513.5
9500
10000
10500
11000
11500
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = Waterman Wash Reach = REACH 1 RS = 36.434
.048
.054
.048
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1521.5
1521.0
1520.5
1520.0
1519.5
1519.0
1518.5
1518.0
1517.5
9600
9800
10000
10200
10400
10600
10800
11000
11200
Station (ft)

MODEL: WATERMAN WASH

REACH: 3S1WS15B (D39)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 3S1WS15B (D39)

Subbasin: D35

Total Discharge (cfs) = 984

Total Area (acres) = 754

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
3.202	510	67.6	670
2.941	671	89.0	880
2.582	747	99.1	980
2.341	754	99.9	980

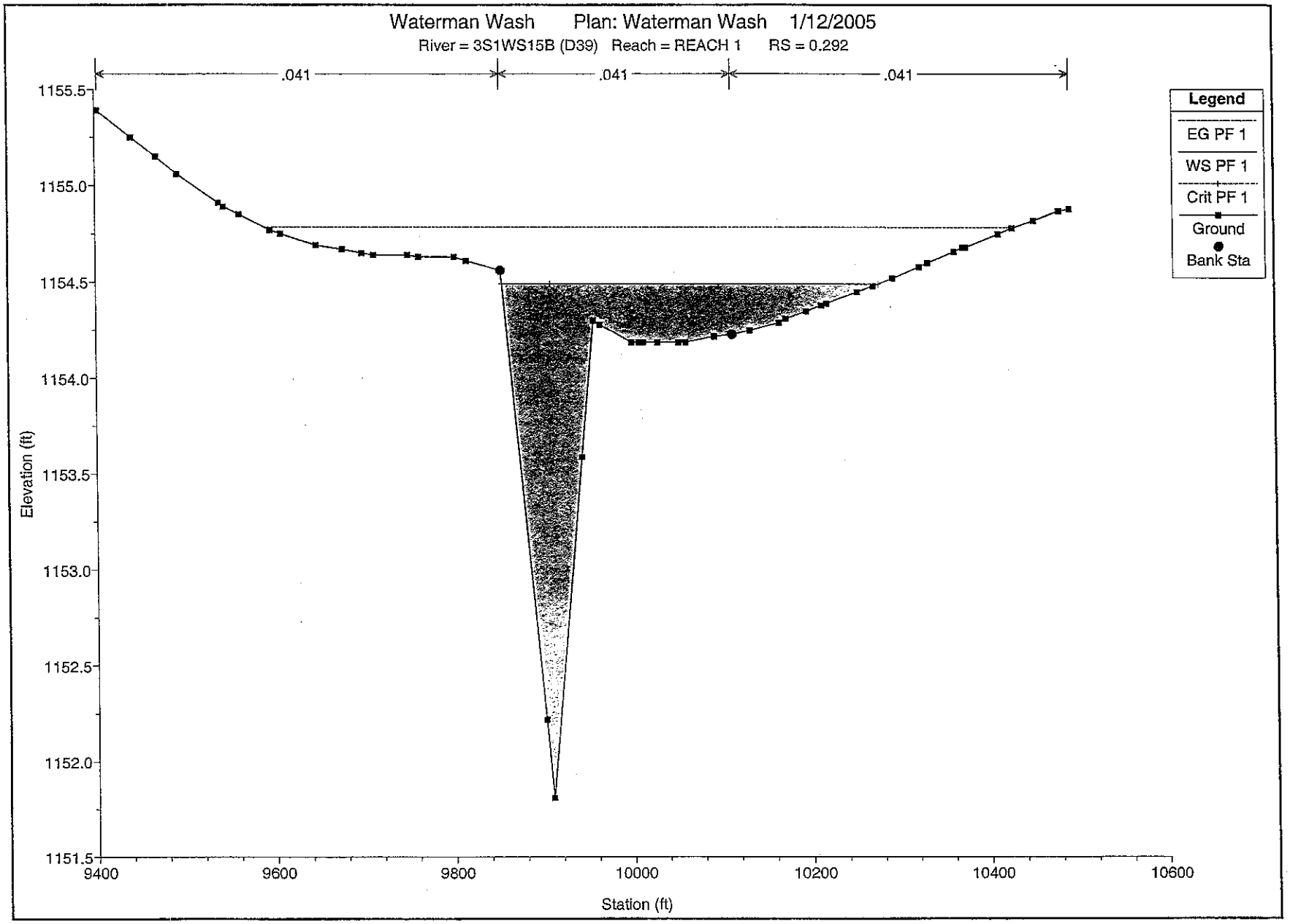
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

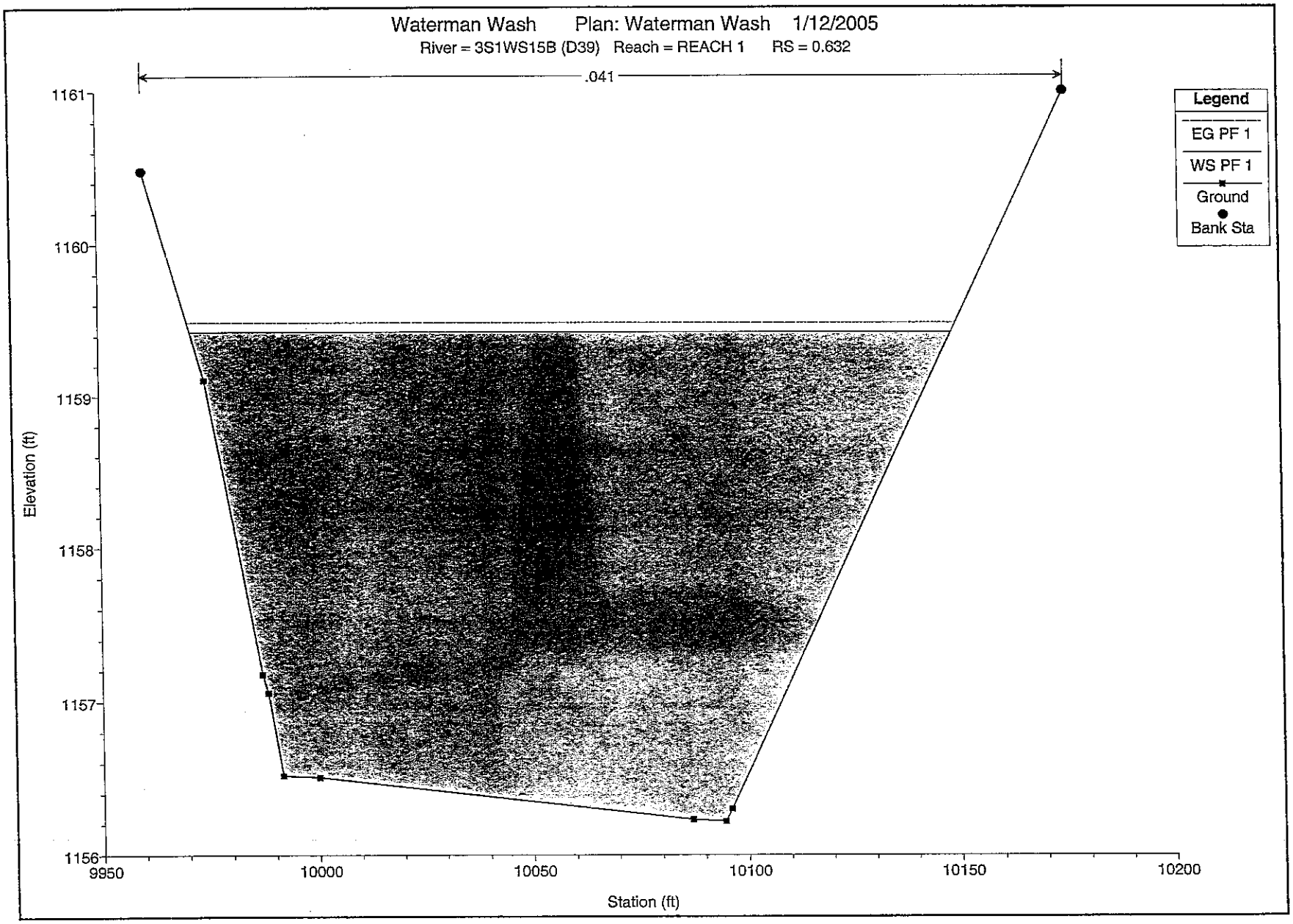
Change in Discharge based on Reach Length

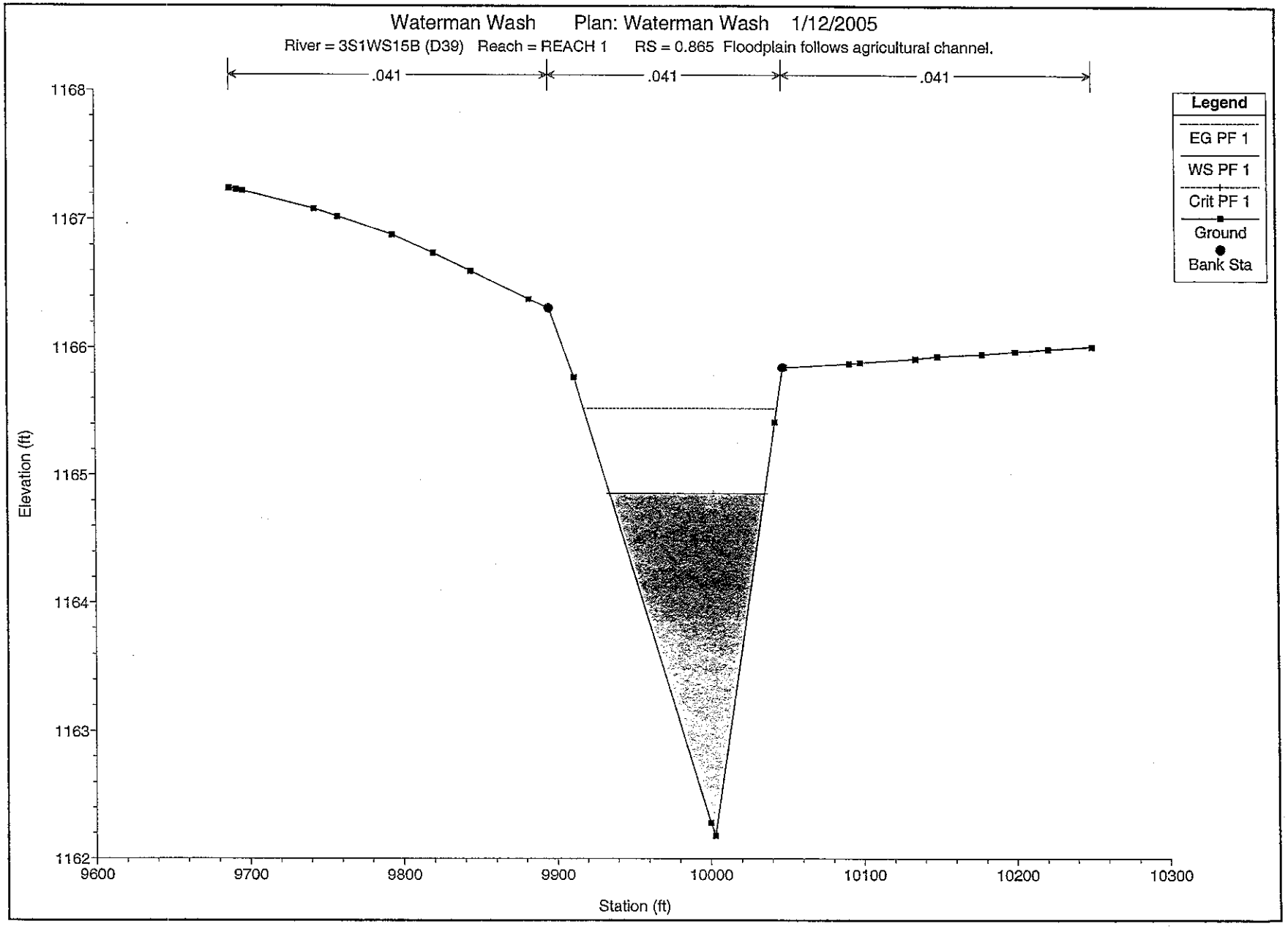
Wash ID: 3S1WS15B (D39)

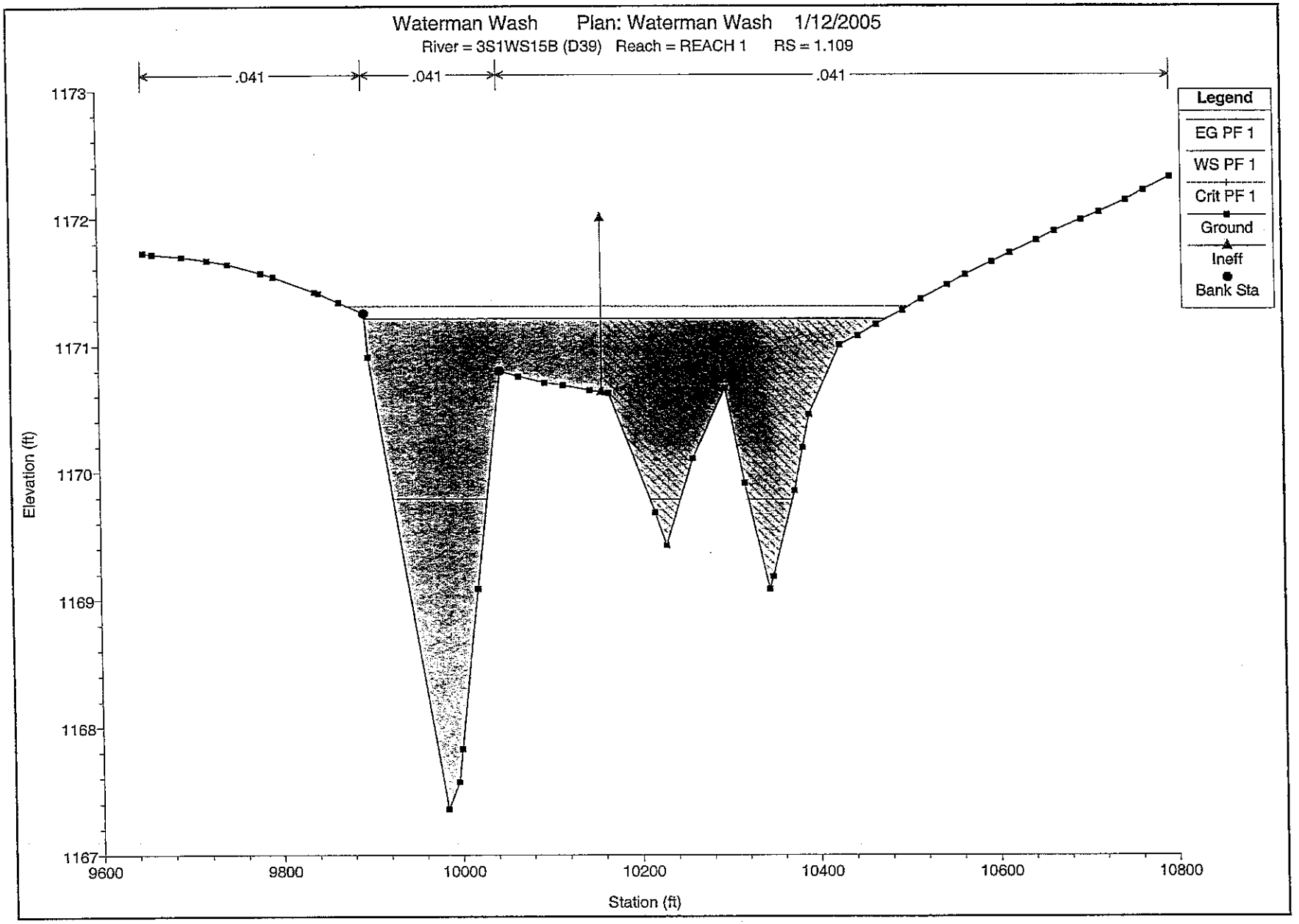
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPD35	2.341	1069	1070	1100
D37	2.074	1032	1030	1000
D37	1.817	997	1000	1000
D37	1.534	958	960	1000
D37	1.334	931	930	900
CPD37	1.109	900	900	900
D39	0.865	885	890	900
D39	0.632	871	870	900
D39	0.292	851	850	900
CPD39	0.017	834	830	800

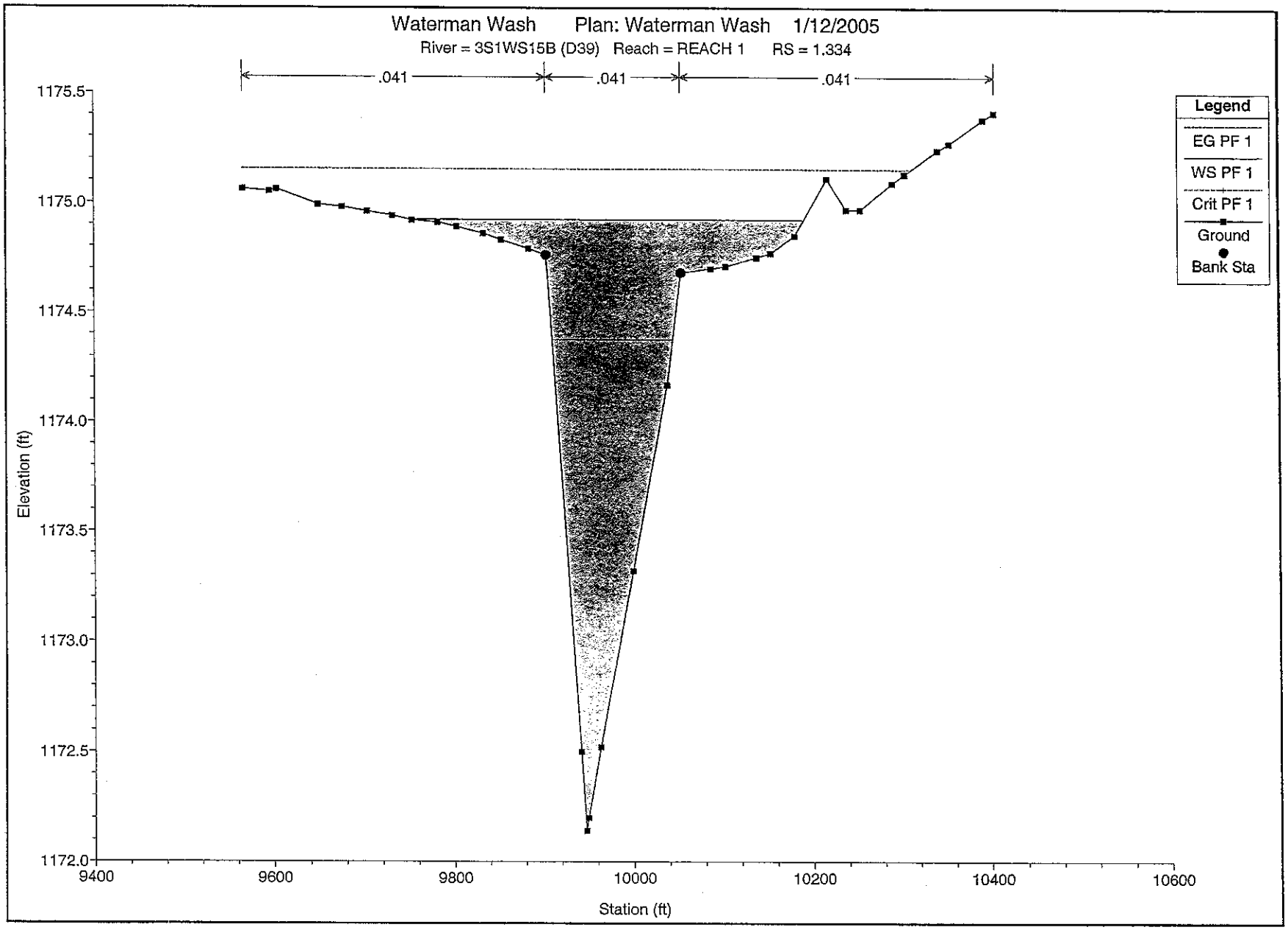
0.017 deleted. Left in spreadsheet for calculation purposes.

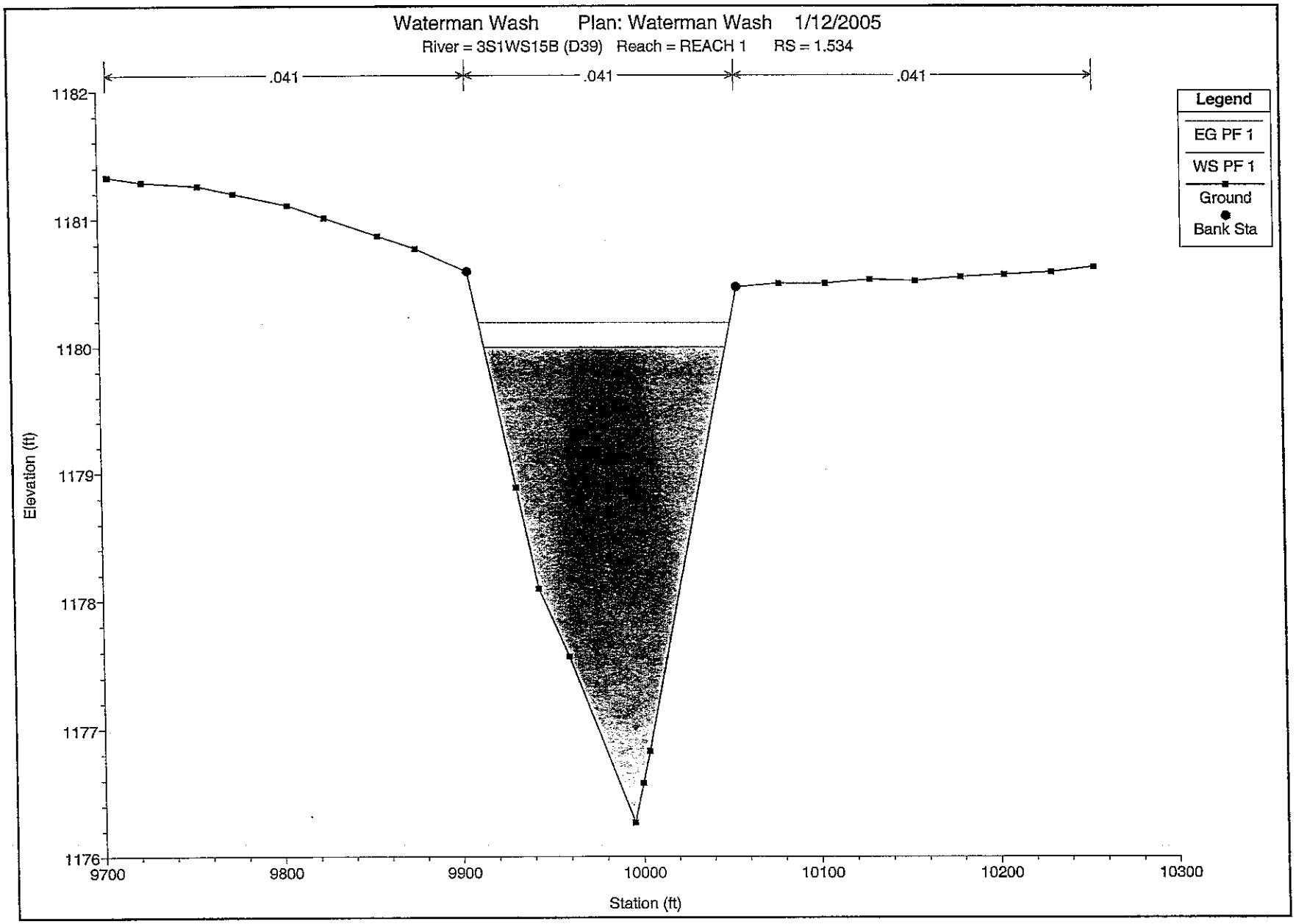

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 0.292
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1155.5
1155.0
1154.5
1154.0
1153.5
1153.0
1152.5
1152.0
1151.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

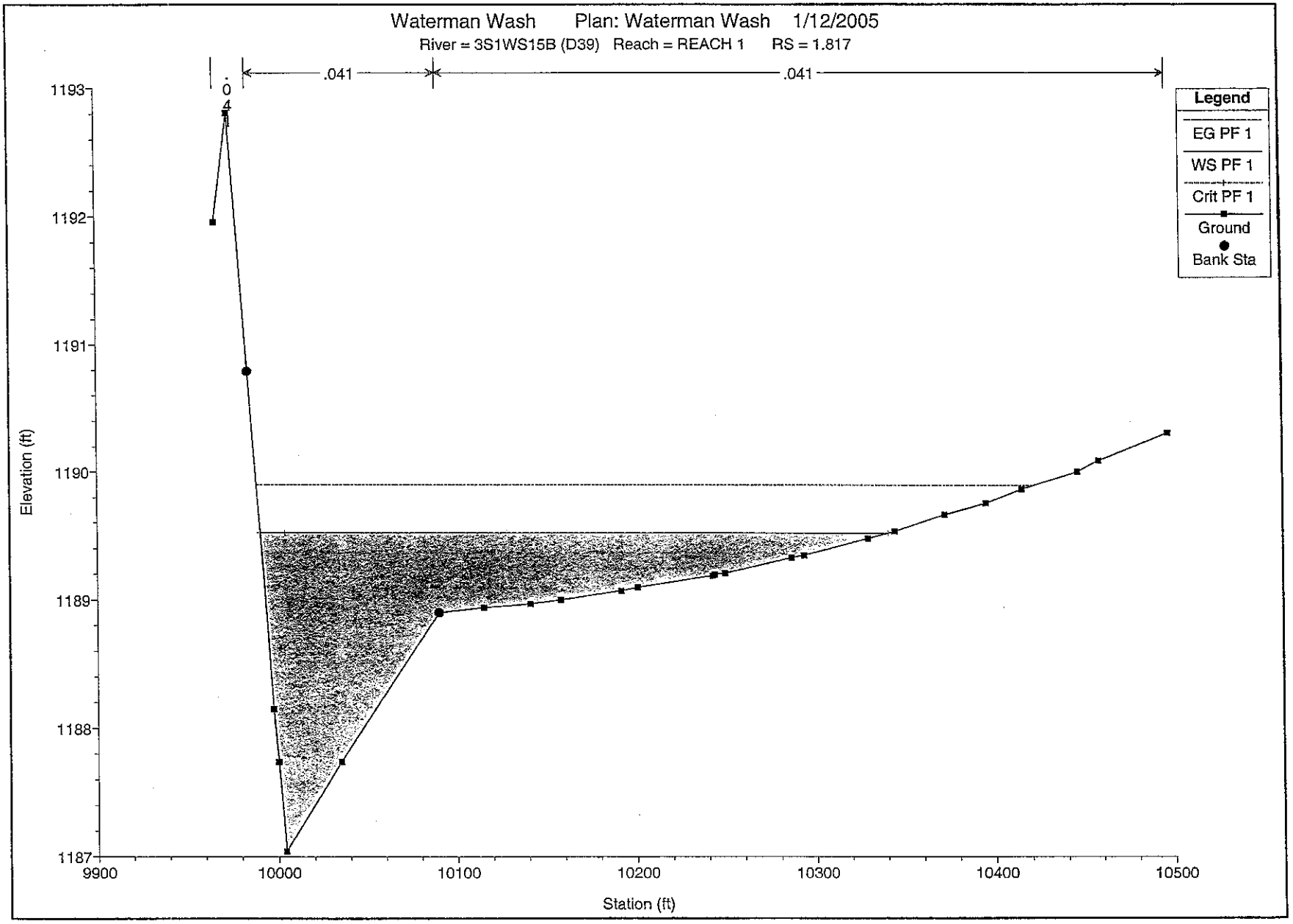

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 0.632
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1161
1160
1159
1158
1157
1156
9950
10000
10050
10100
10150
10200
Station (ft)

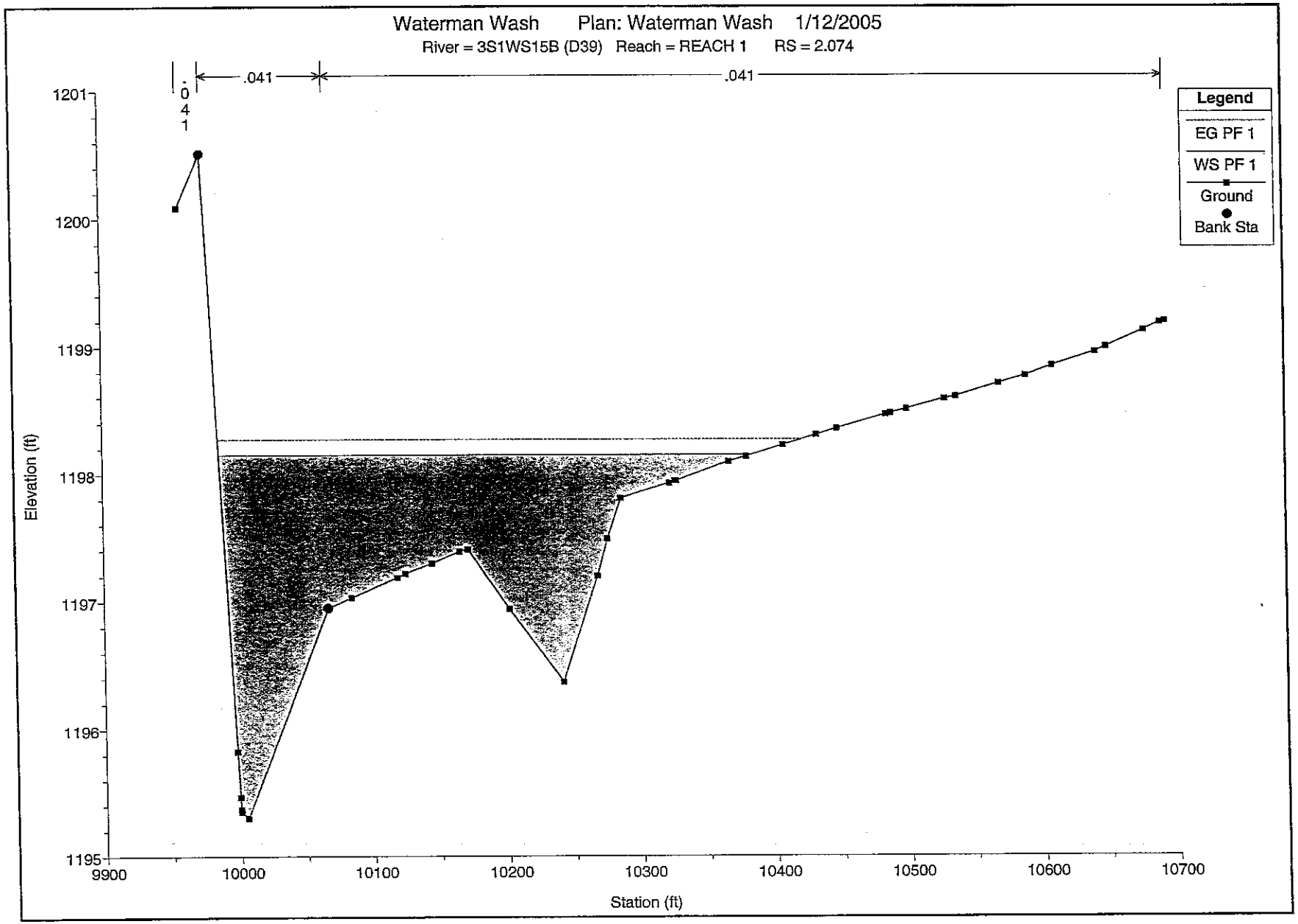

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 0.865 Floodplain follows agricultural channel.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1168
1167
1166
1165
1164
1163
1162
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

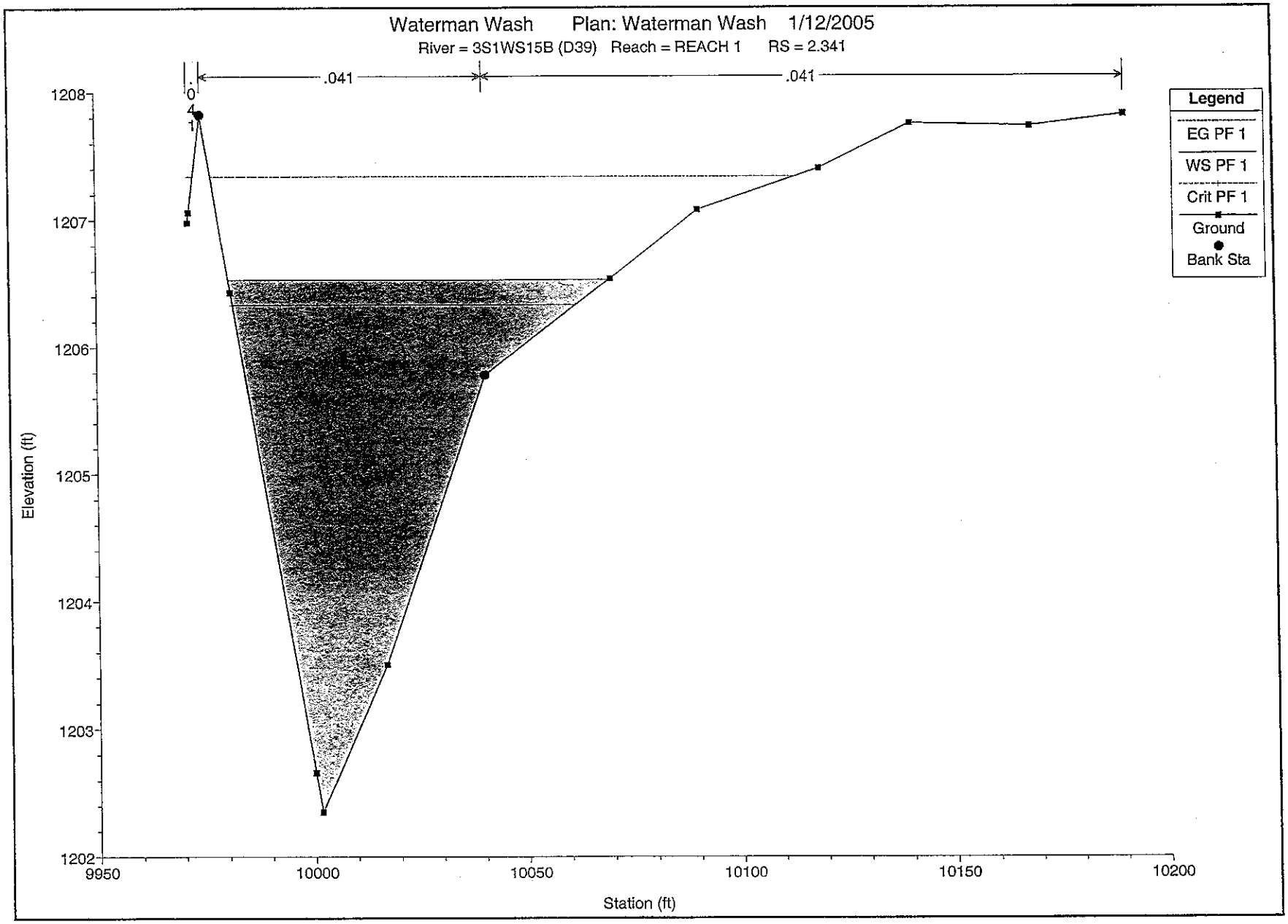

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 1.109
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1173
1172
1171
1170
1169
1168
1167
9600
9800
10000
10200
10400
10600
10800
Station (ft)

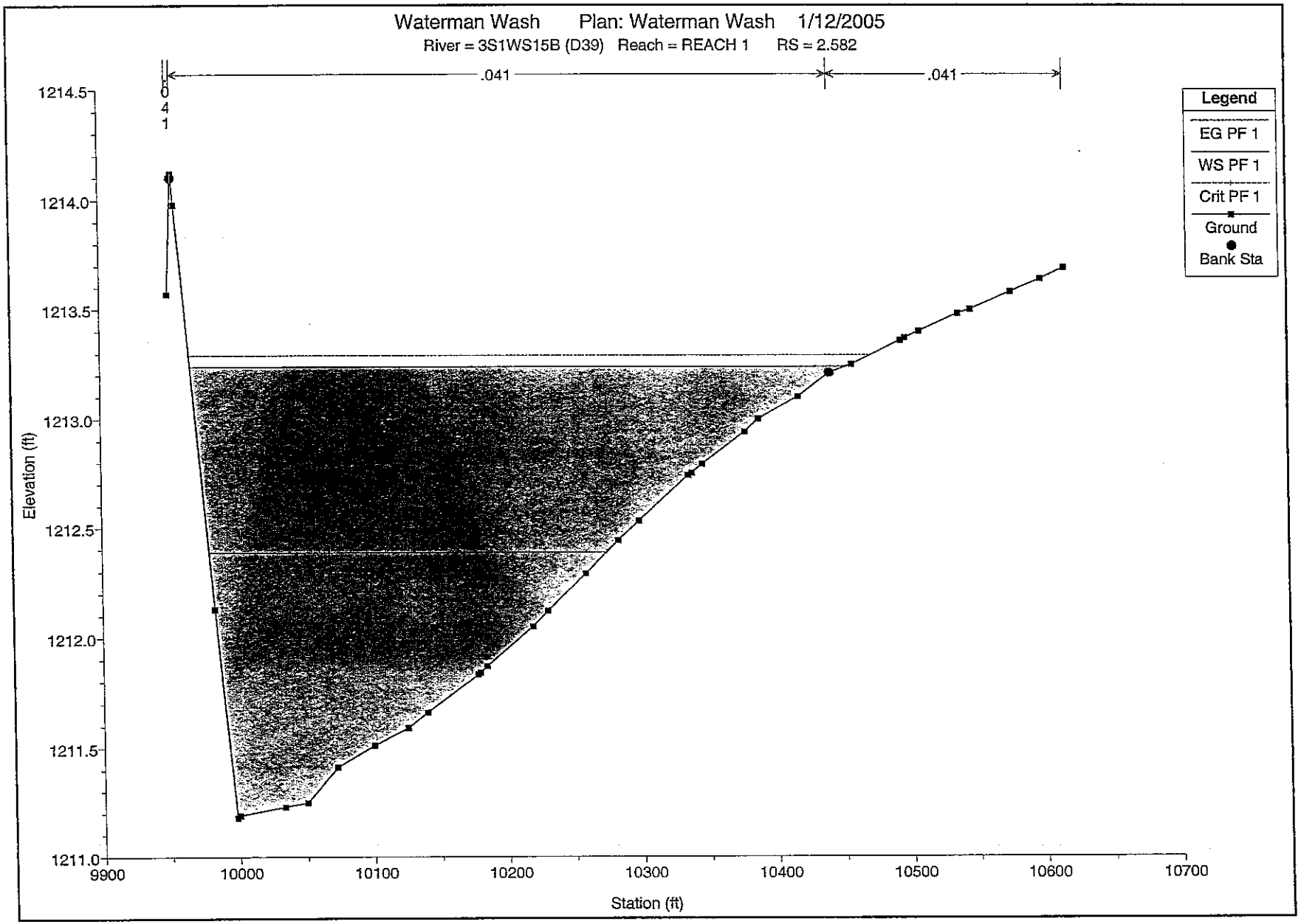

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 1.334
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1175.5
1175.0
1174.5
1174.0
1173.5
1173.0
1172.5
1172.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

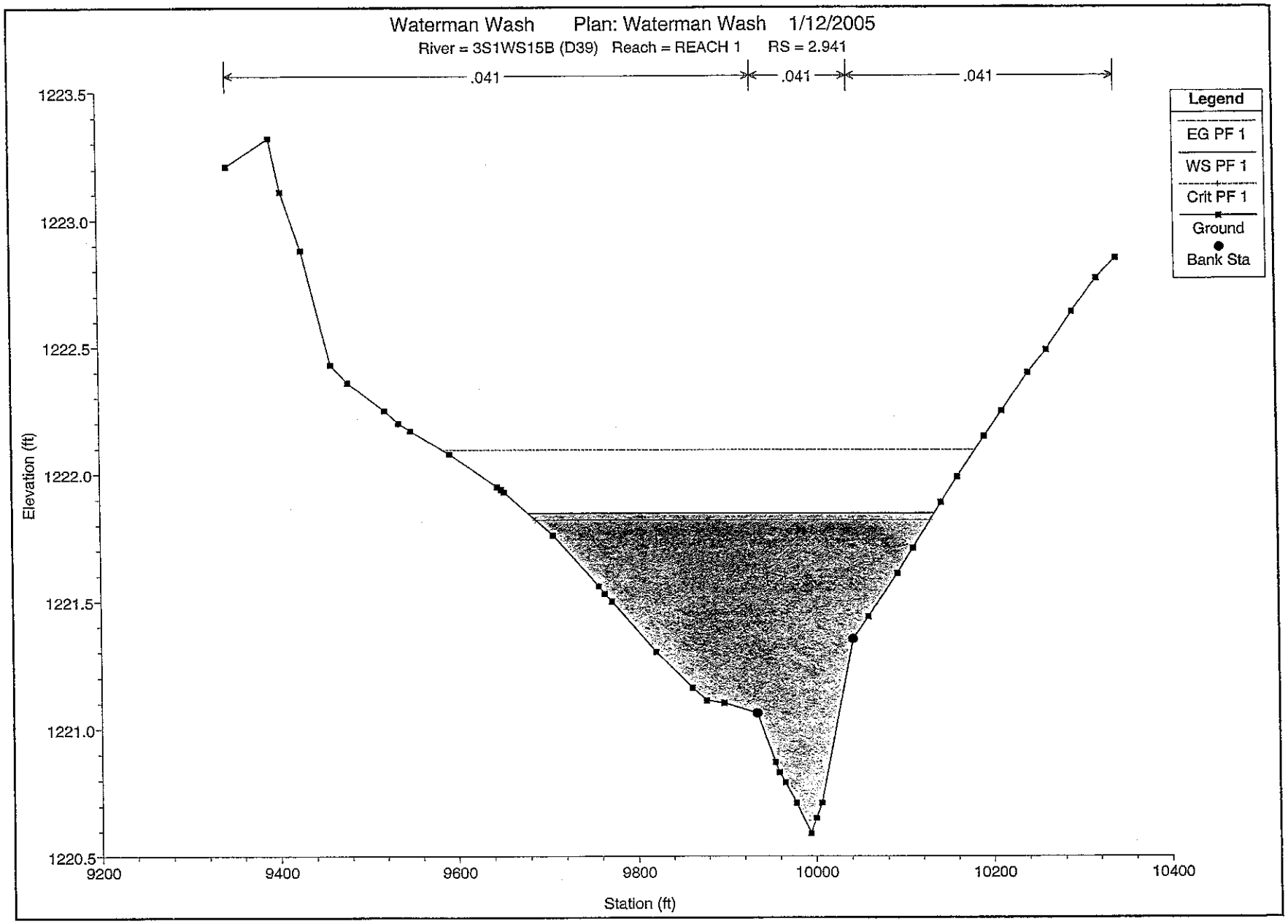

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 1.534
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1182
1181
1180
1179
1178
1177
1176
9700
9800
9900
10000
10100
10200
10300
Station (ft)

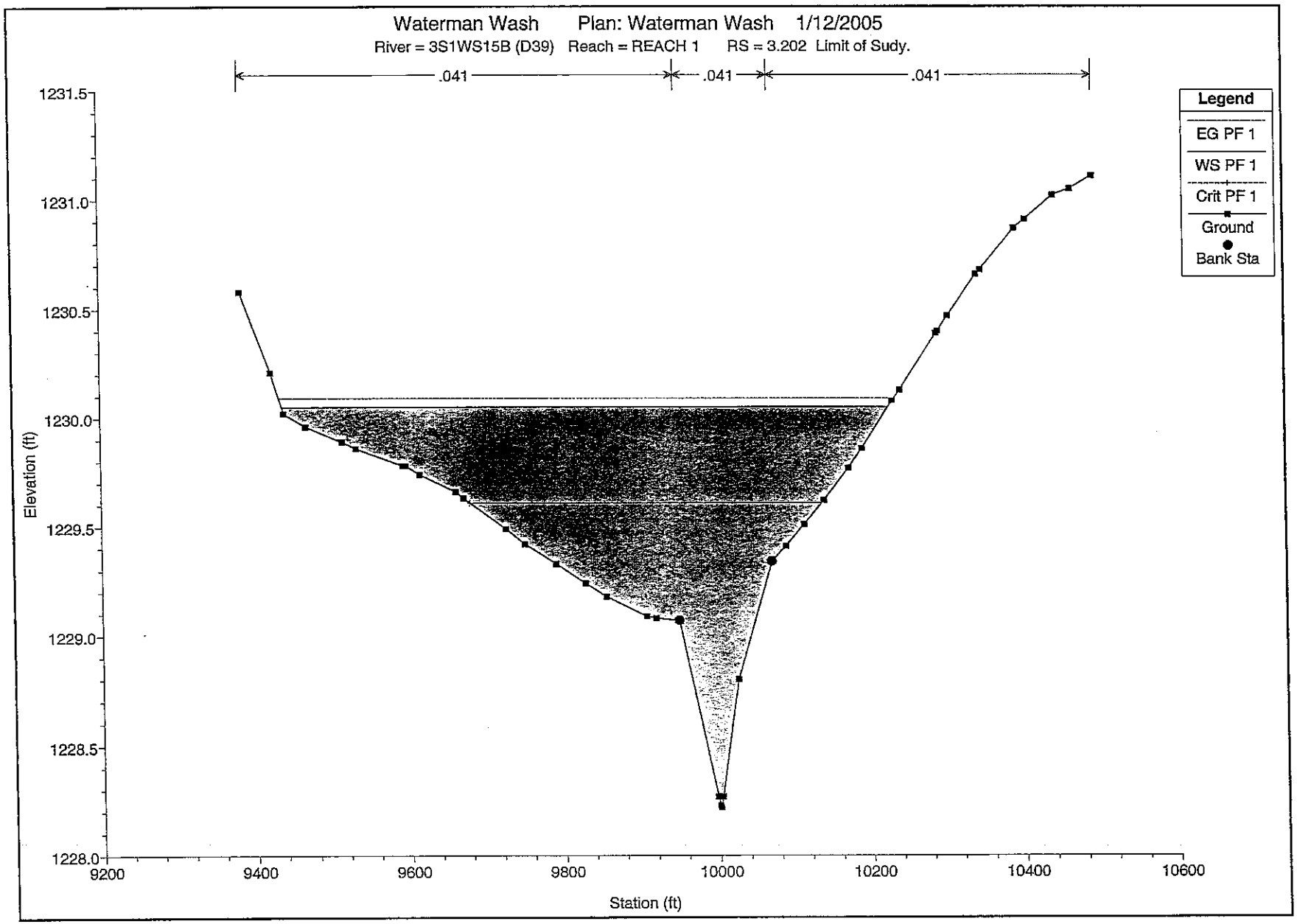

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 1.817
.041
.041
.04
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1193
1192
1191
1190
1189
1188
1187
9900
10000
10100
10200
10300
10400
10500
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 2.074
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1201
1200
1199
1198
1197
1196
1195
9900
10000
10100
10200
10300
10400
10500
10600
10700
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 2.341
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1208
1207
1206
1205
1204
1203
1202
9950
10000
10050
10100
10150
10200
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 2.582
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1214.5
1214.0
1213.5
1213.0
1212.5
1212.0
1211.5
1211.0
9900
10000
10100
10200
10300
10400
10500
10600
10700
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 2.941
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1223.5
1223.0
1222.5
1222.0
1221.5
1221.0
1220.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15B (D39) Reach = REACH 1 RS = 3.202 Limit of Sudy.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1231.5
1231.0
1230.5
1230.0
1229.5
1229.0
1228.5
1228.0
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: WATERMAN WASH

REACH: 3S1WS15A (G40)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 3S1WS15A (G40)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
G48	7.487	2724	2720	2700
G01	7.299	2738	2740	2700
G01	7.133	2750	2750	2700
G01	6.909	2766	2770	2800
G01	6.708	2781	2780	2800
G01	6.495	2796	2800	2800
G01	6.248	2814	2810	2800
G01	6.003	2832	2830	2800
G01	5.800	2847	2850	2800
G01	5.567	2864	2860	2900
G01	5.332	2881	2880	2900
G01	5.075	2900	2900	2900
G01	4.821	2919	2920	2900
G01	4.587	2936	2940	2900
G01	4.355	2953	2950	3000
G01	4.113	2970	2970	3000
G01	3.930	2984	2980	3000
CPG01	3.667	3003	3000	3000
G11	3.438	3580	3580	3600
G11	3.198	4184	4180	4200
G11	2.986	4718	4720	4700
G11	2.762	5282	5280	5300
G11	2.519	5895	5890	5900
CPG11	2.227	6630	6630	6600
DG11	1.993	3630	3630	3600
G40	1.752	3544	3540	3500
G40	1.533	3465	3470	3500
G40	1.285	3377	3380	3400
G40	1.042	3290	3290	3300
G40	0.801	3203	3200	3200
G40	0.575	3123	3120	3100
CPG40	0.378	3052	3050	3100

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

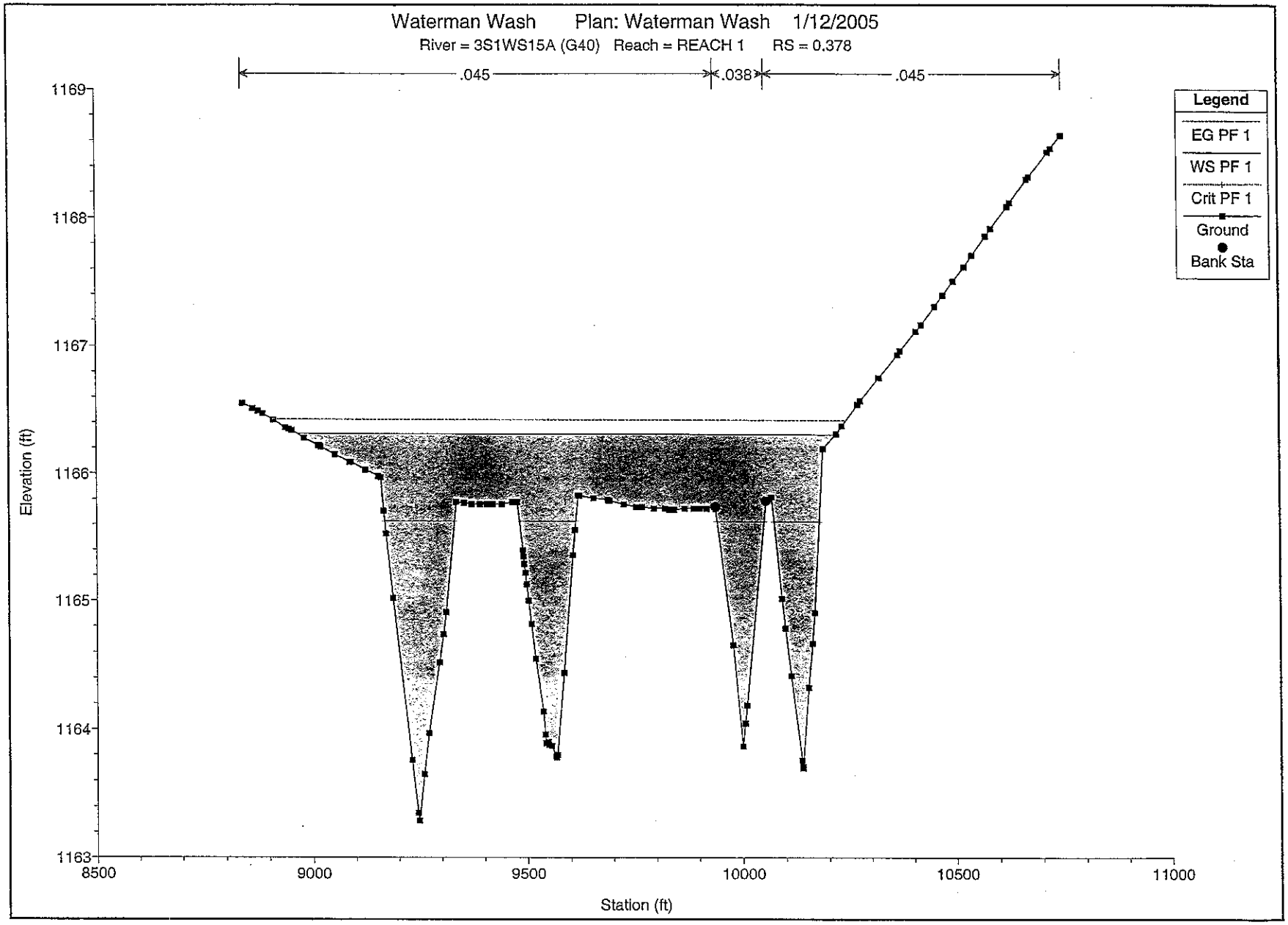
Wash ID: 3S1WS15A (G40)

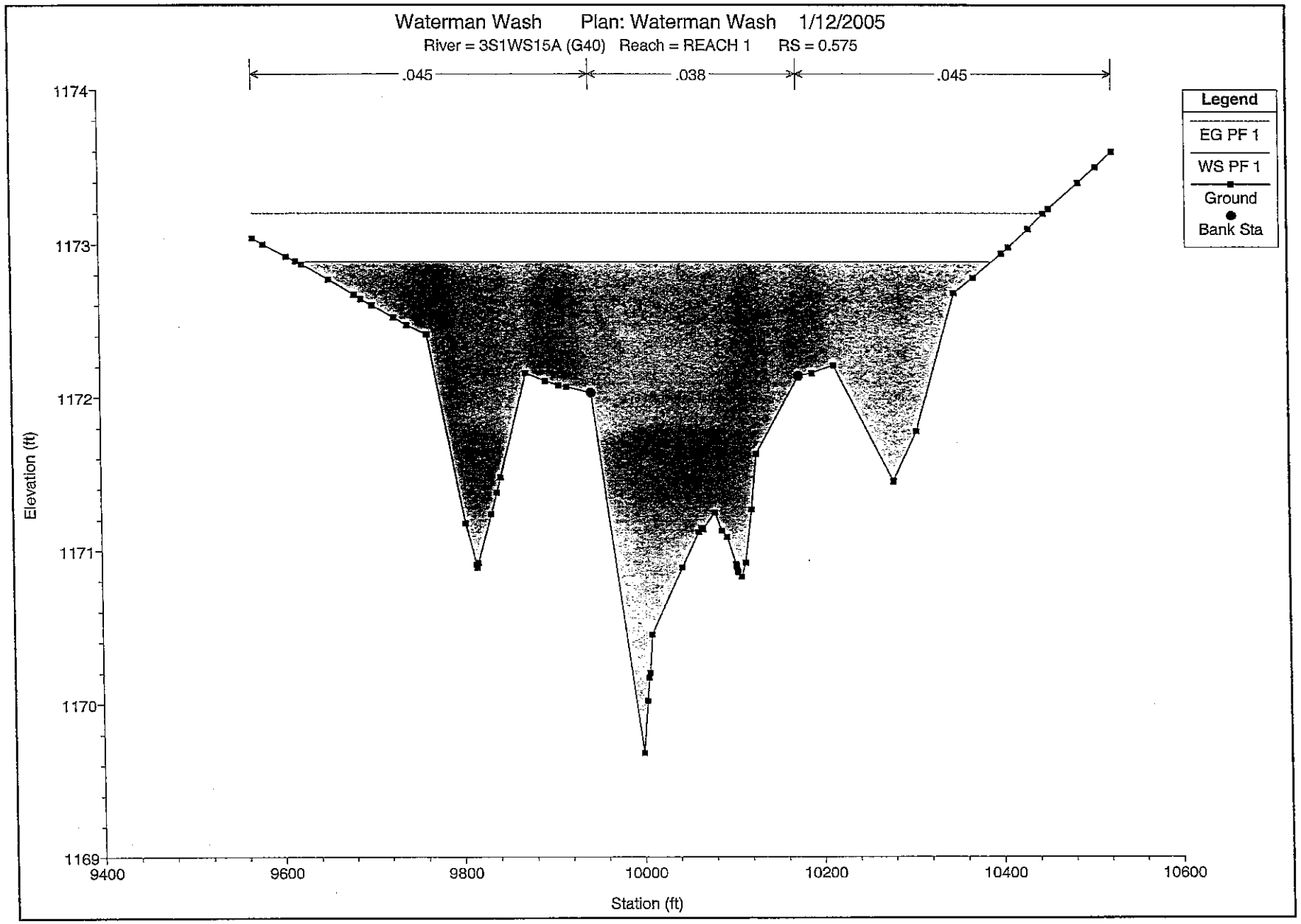
Subbasin: G48

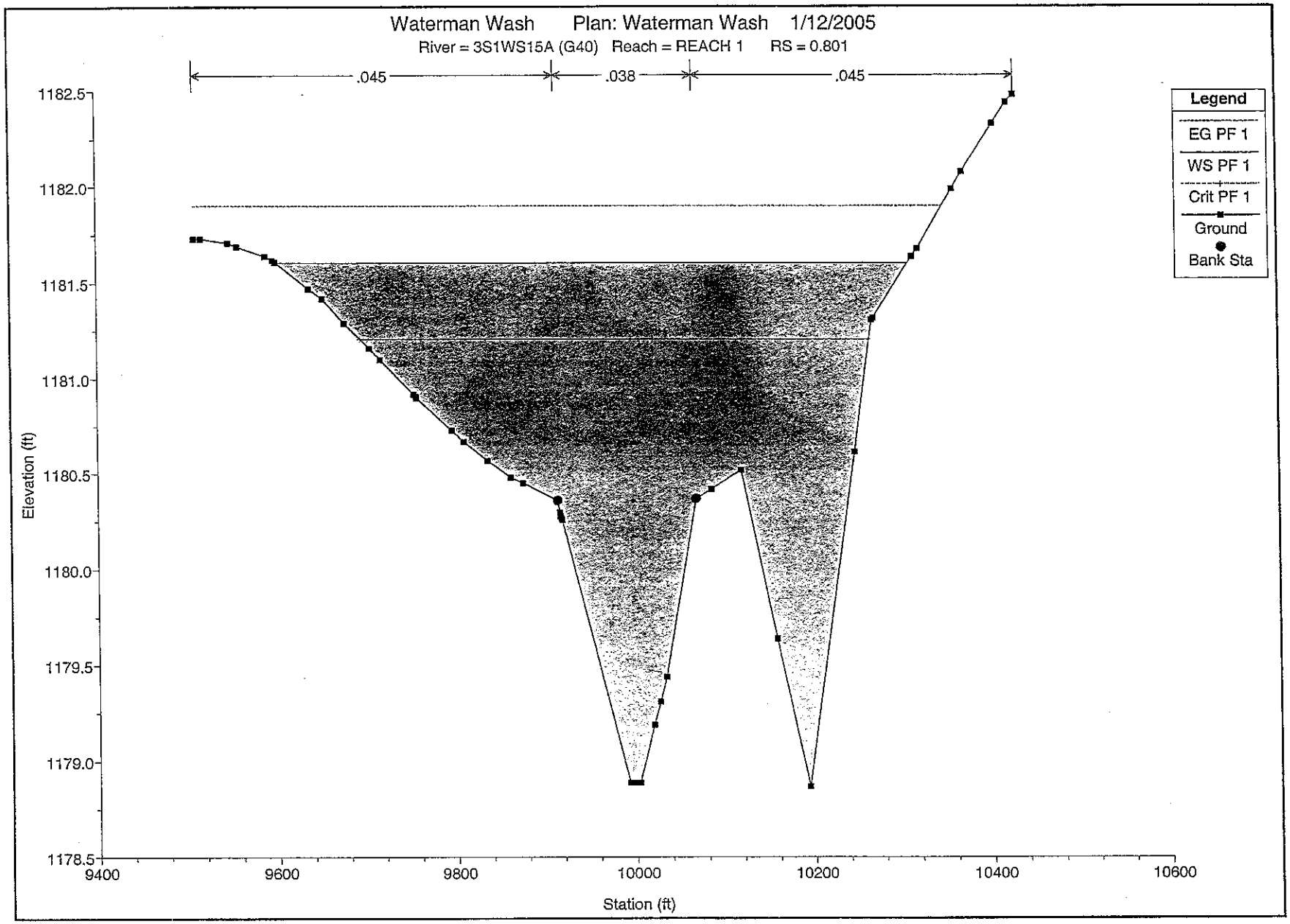
Total Discharge (cfs) = 2724

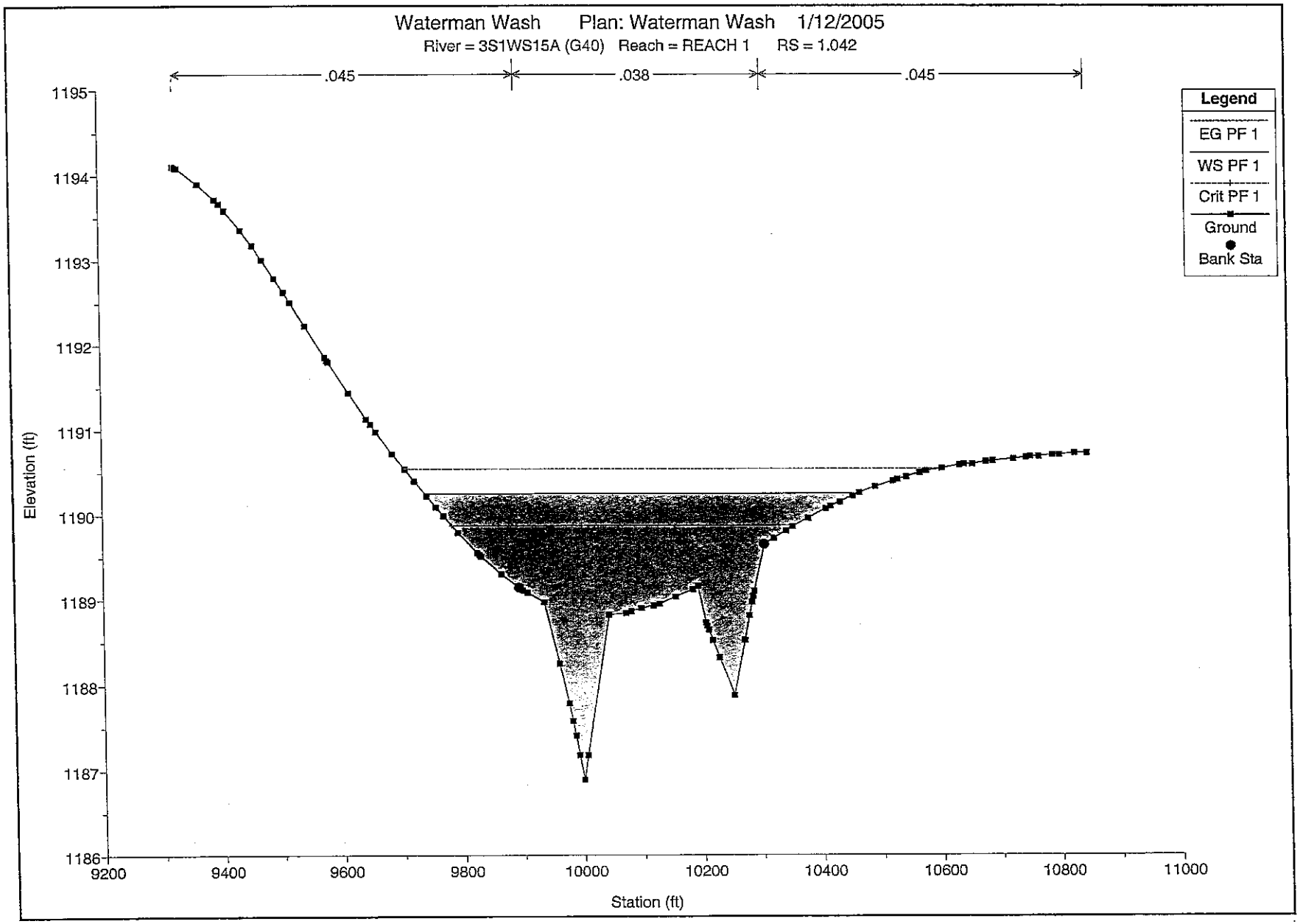
Total Area (acres) = 1222

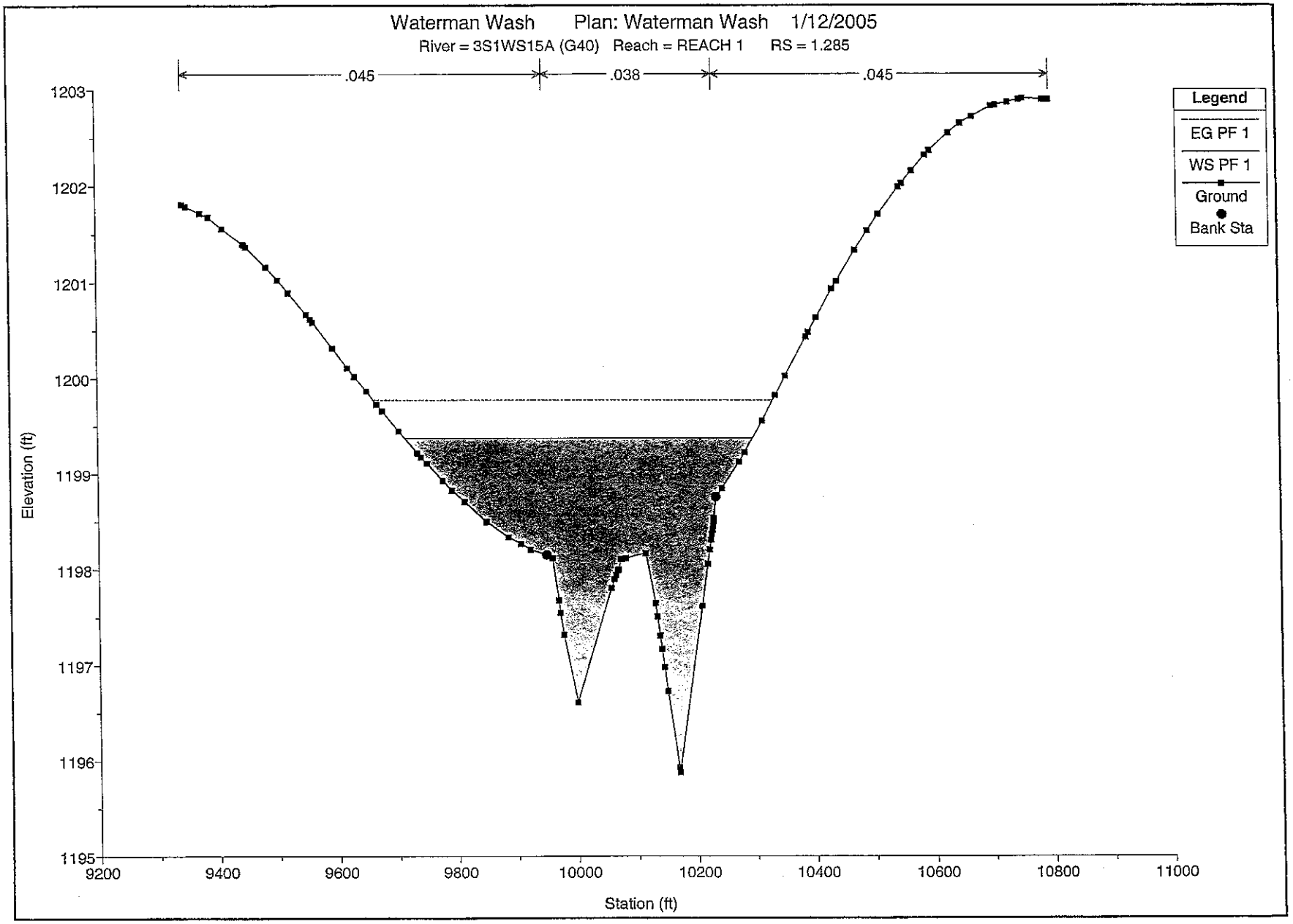
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
8.704	862	70.5	1920
8.502	924	75.6	2060
8.303	969	79.3	2160
8.111	1010	82.7	2250
7.905	1066	87.2	2380
7.708	1087	89.0	2420
7.487	1222	100.0	2720

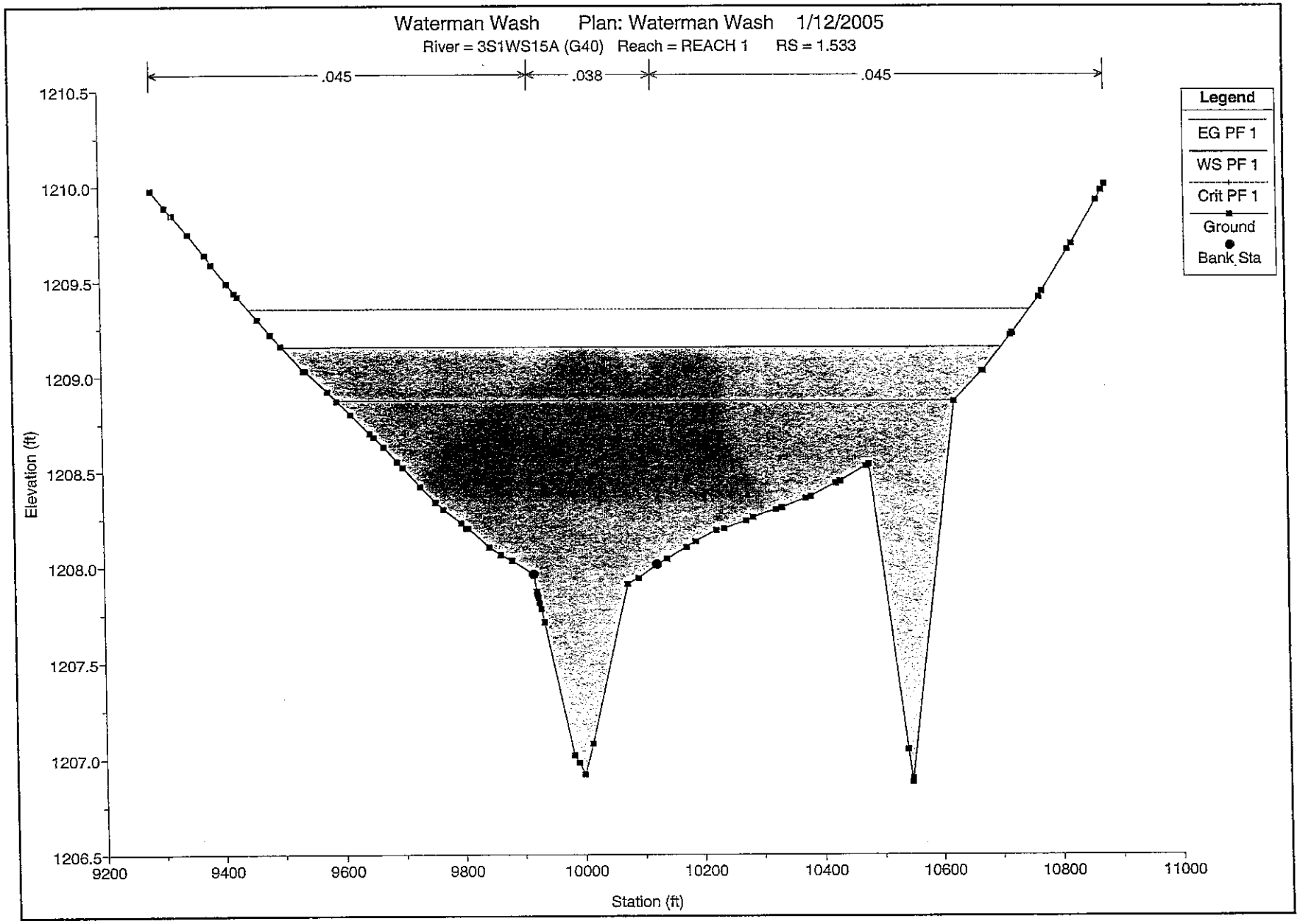

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 0.378
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1169
1168
1167
1166
1165
1164
1163
8500
9000
9500
10000
10500
11000
Station (ft)

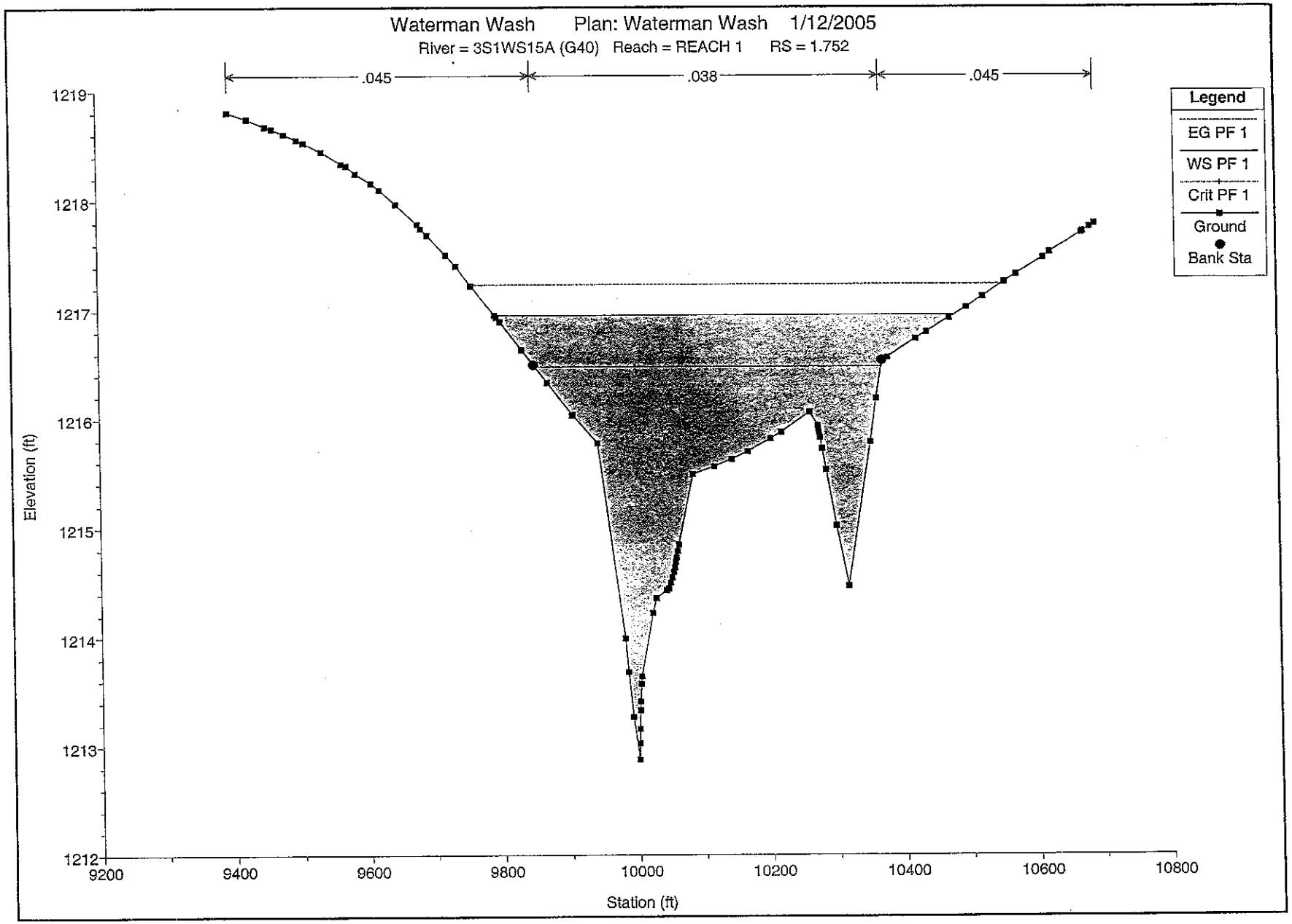

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 0.575
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1174
1173
1172
1171
1170
1169
9400
9600
9800
10000
10200
10400
10600
Station (ft)

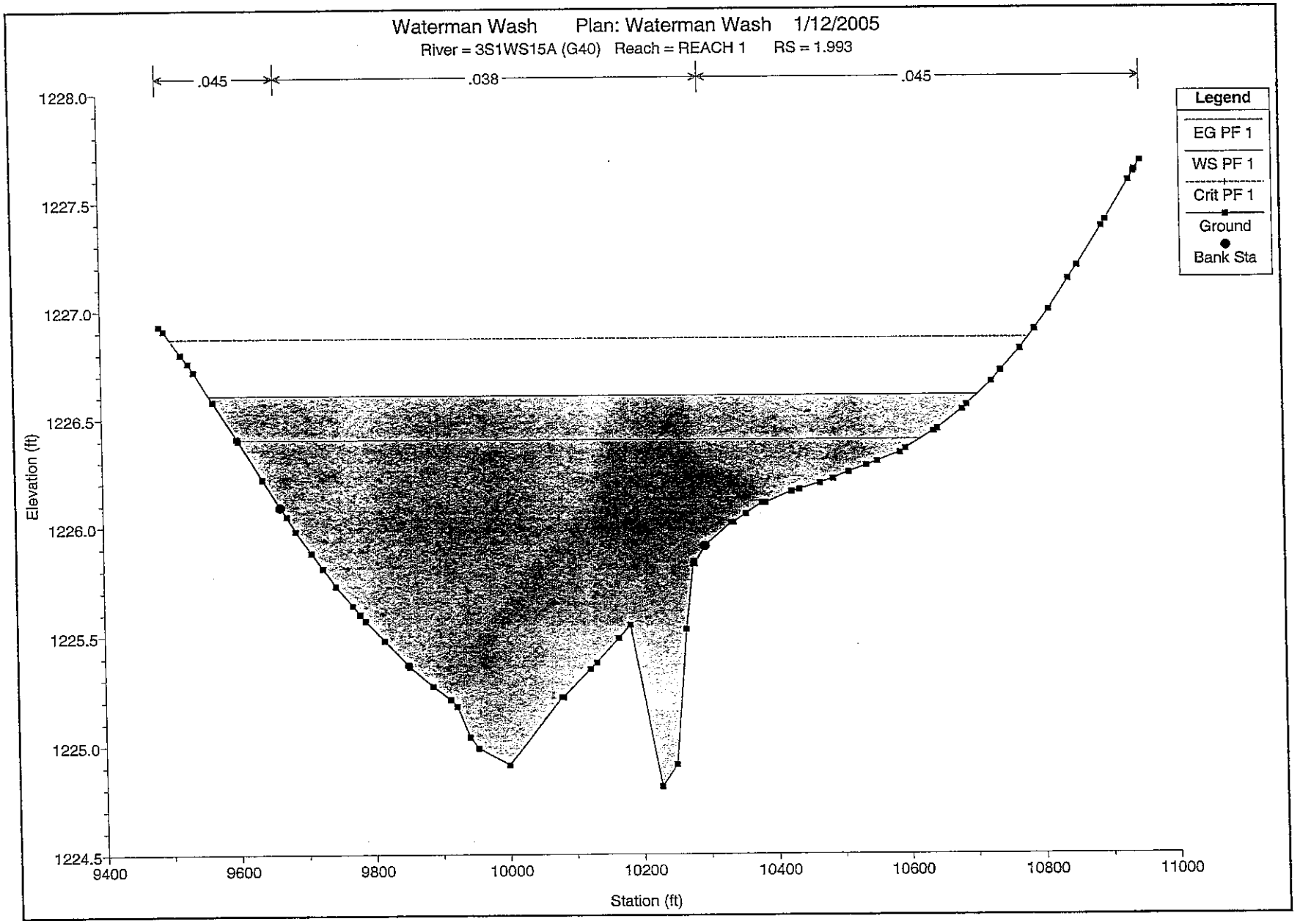

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 0.801
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1182.5
1182.0
1181.5
1181.0
1180.5
1180.0
1179.5
1179.0
1178.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)

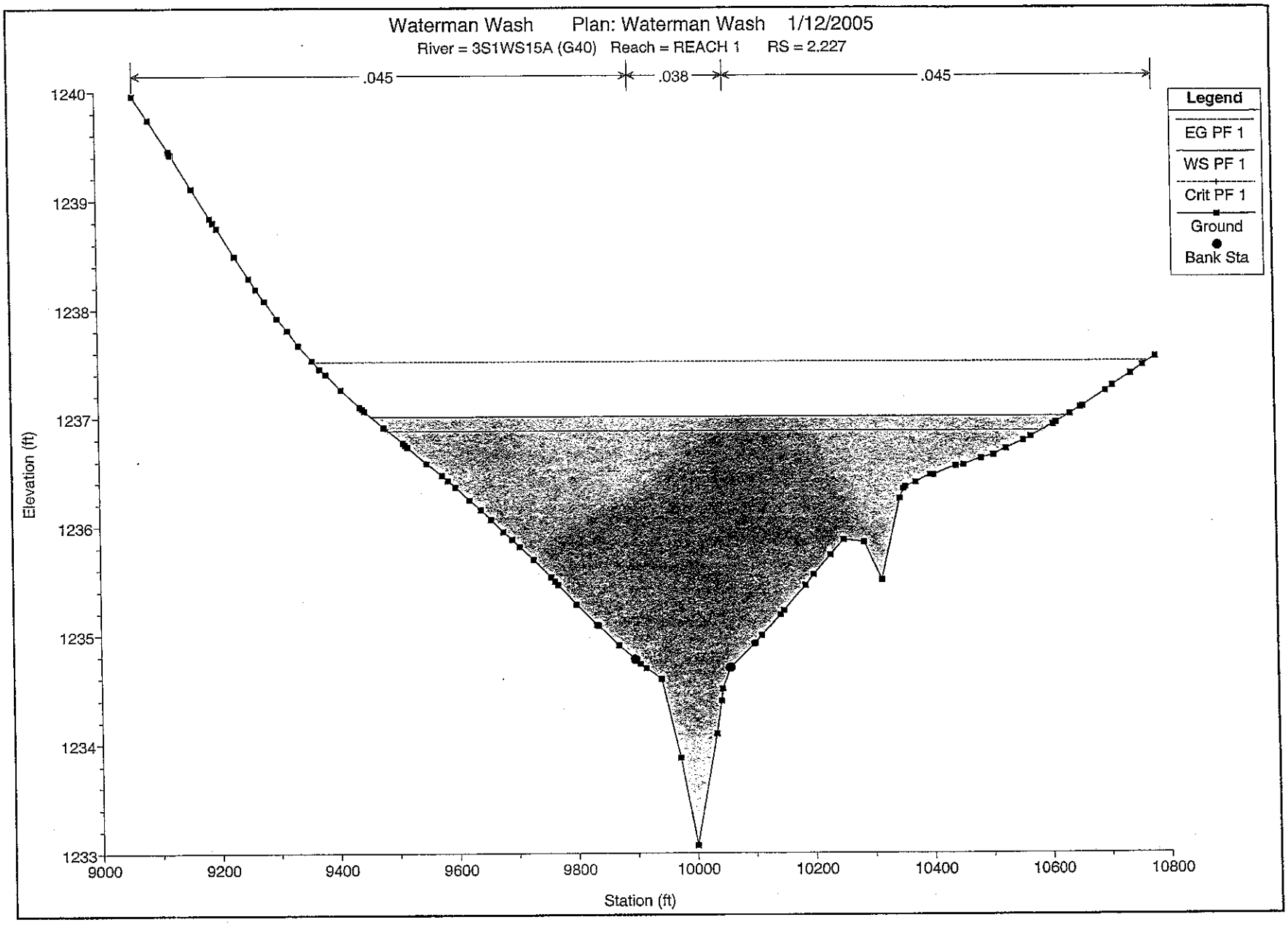

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 1.042
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1195
1194
1193
1192
1191
1190
1189
1188
1187
1186
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

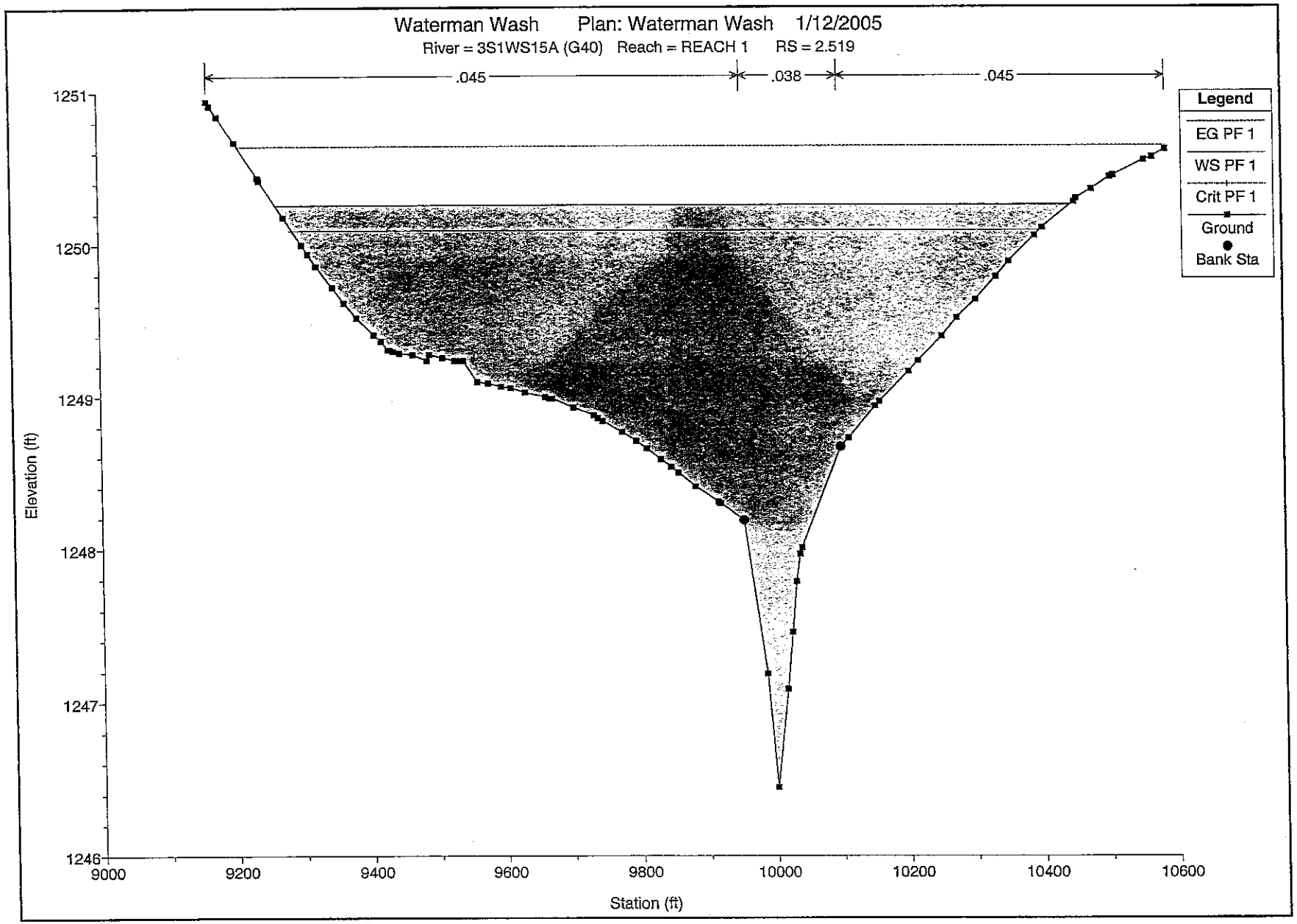

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 1.285
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1203
1202
1201
1200
1199
1198
1197
1196
1195
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

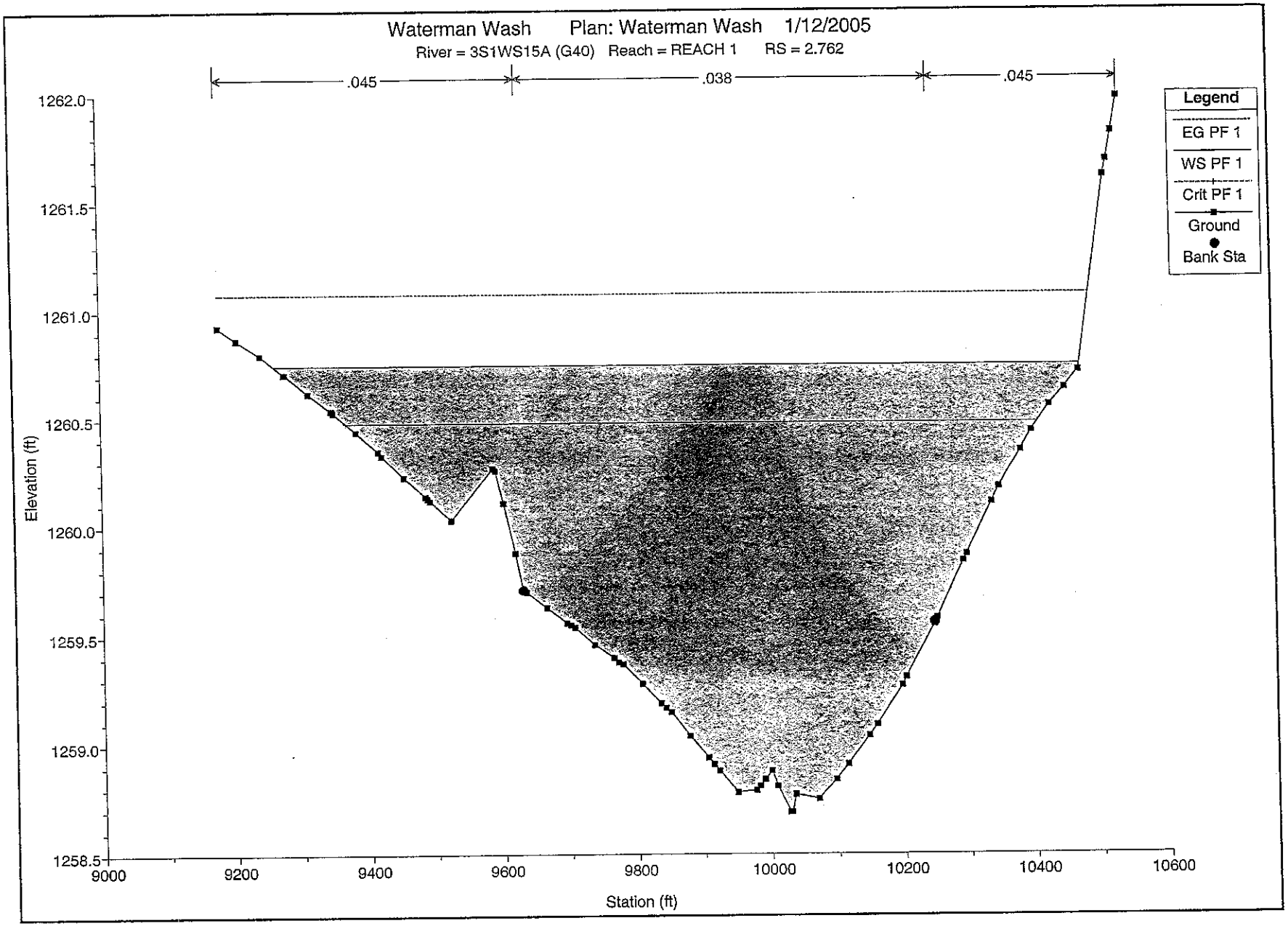

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 1.533
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1210.5
1210.0
1209.5
1209.0
1208.5
1208.0
1207.5
1207.0
1206.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

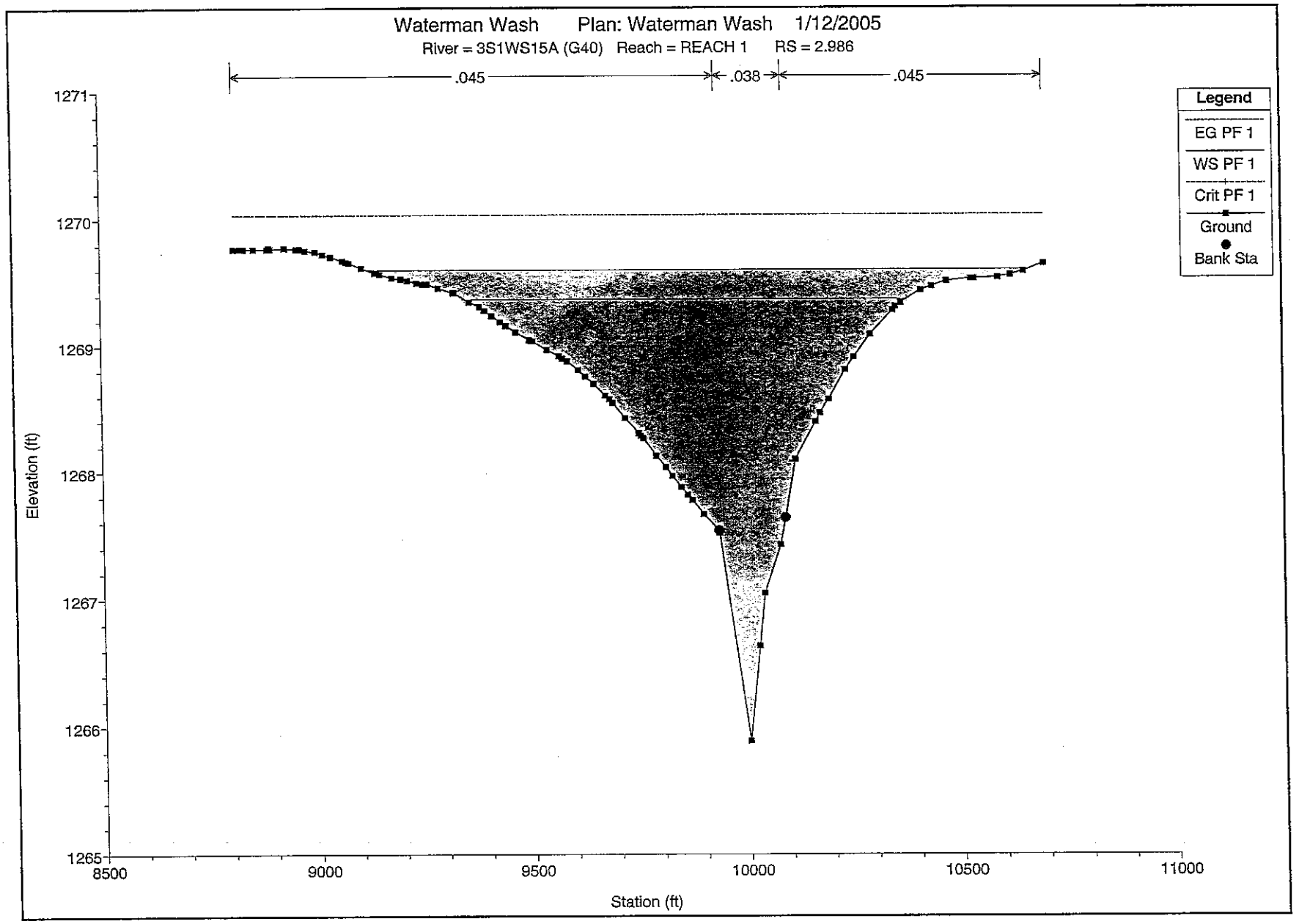

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 1.752
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1219
1218
1217
1216
1215
1214
1213
1212
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

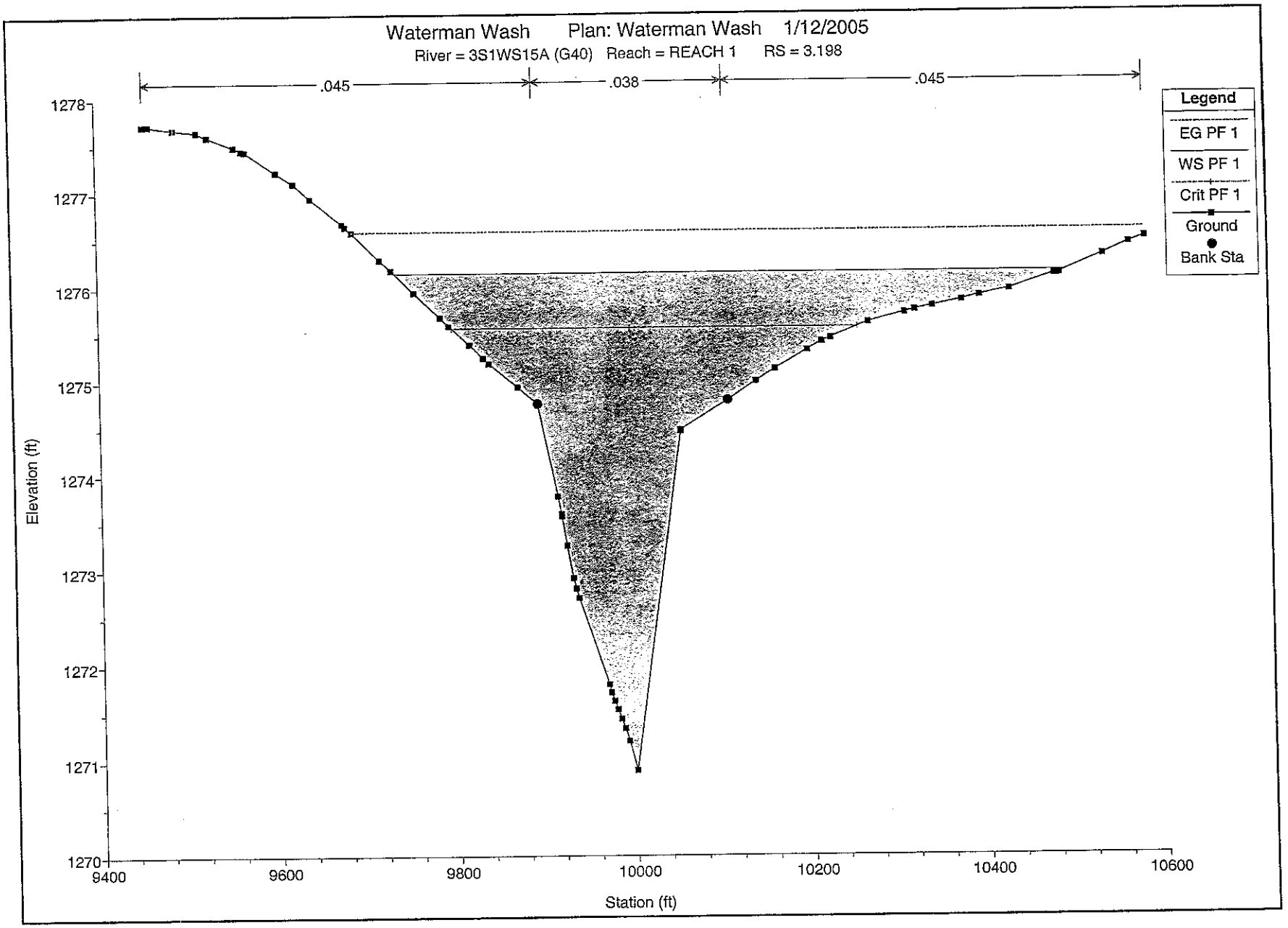

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 1.993
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1228.0
1227.5
1227.0
1226.5
1226.0
1225.5
1225.0
1224.5
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

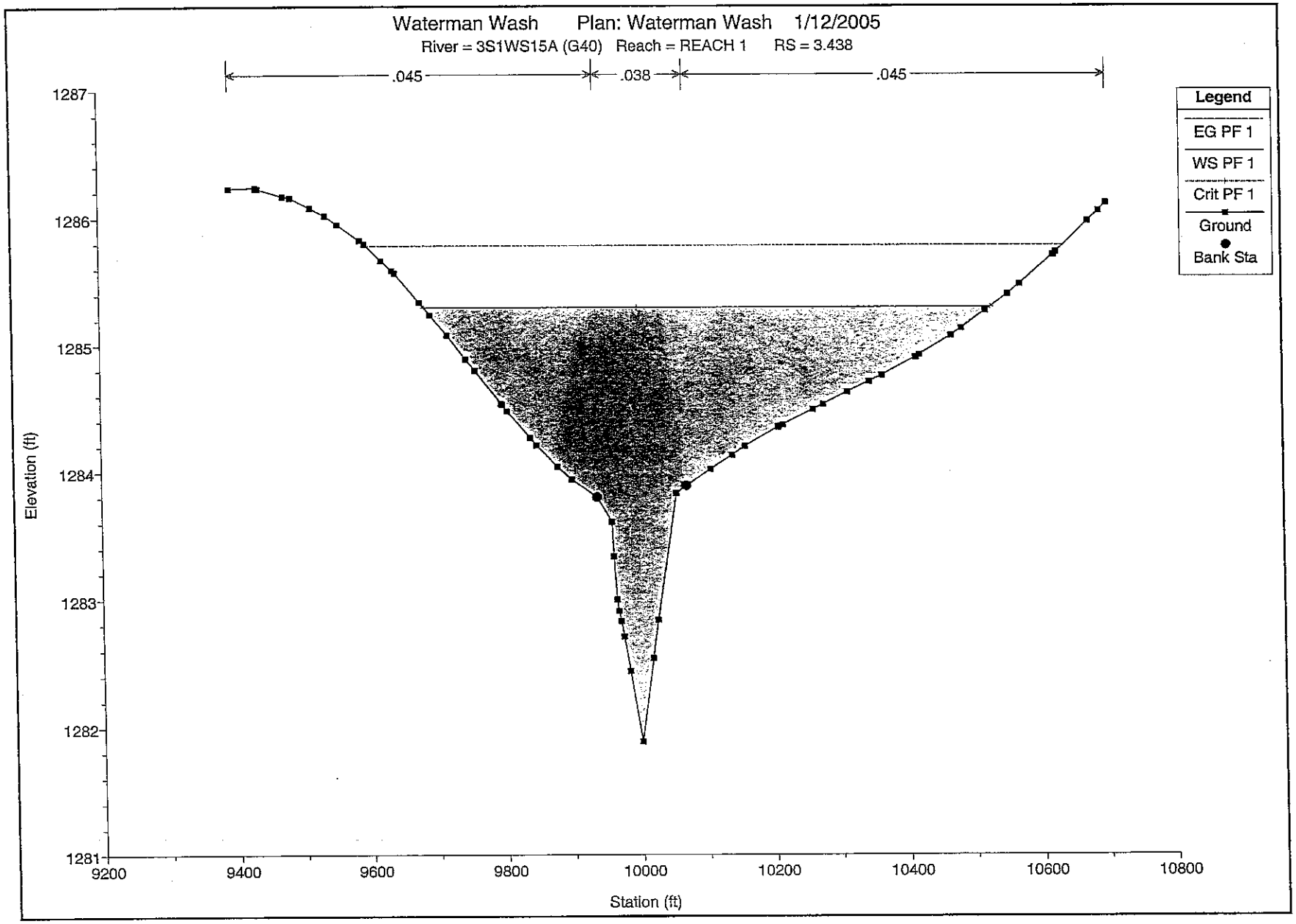

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 2.227
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1240
1239
1238
1237
1236
1235
1234
1233
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

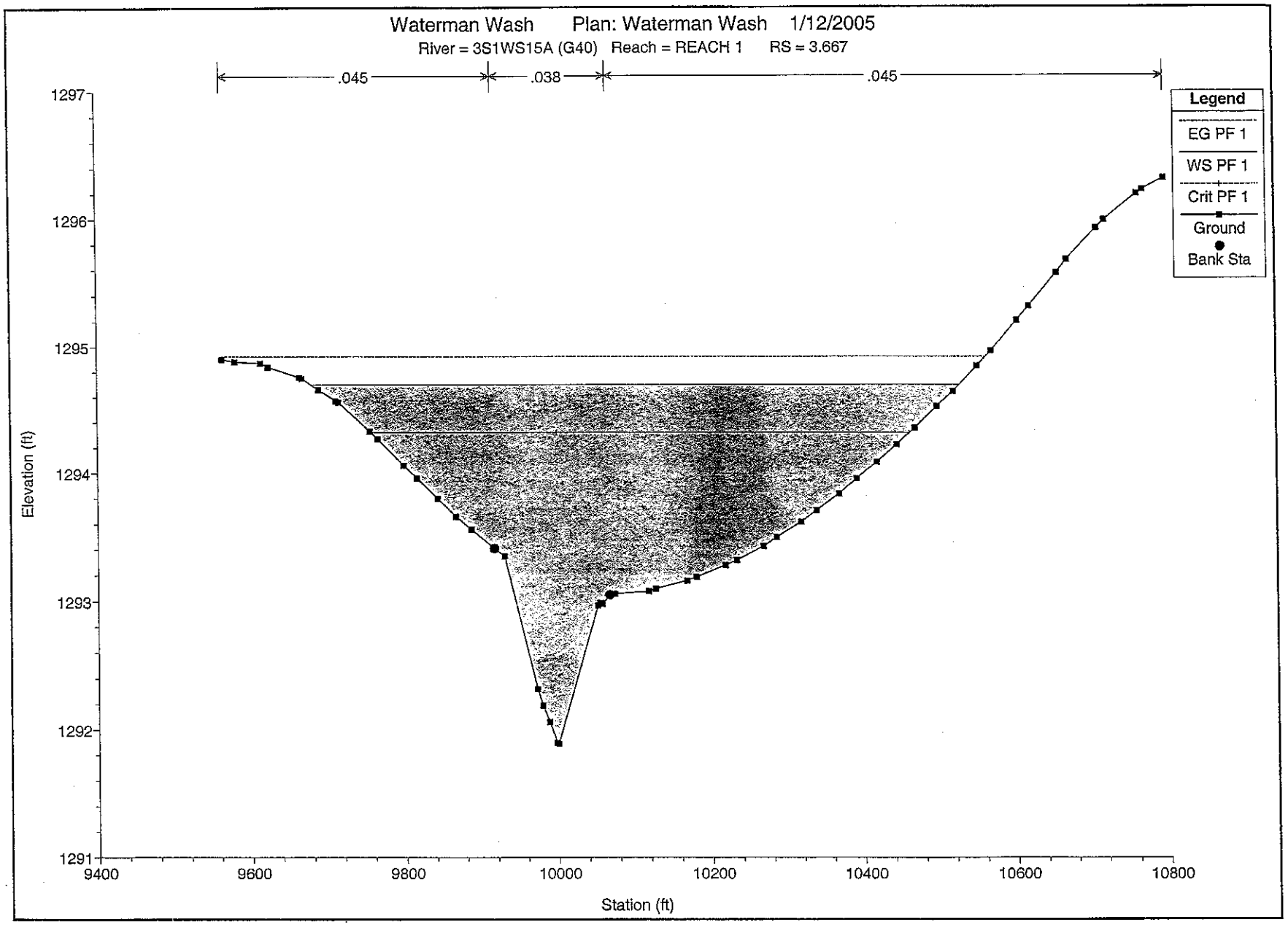

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 2.519
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1251
1250
1249
1248
1247
1246
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

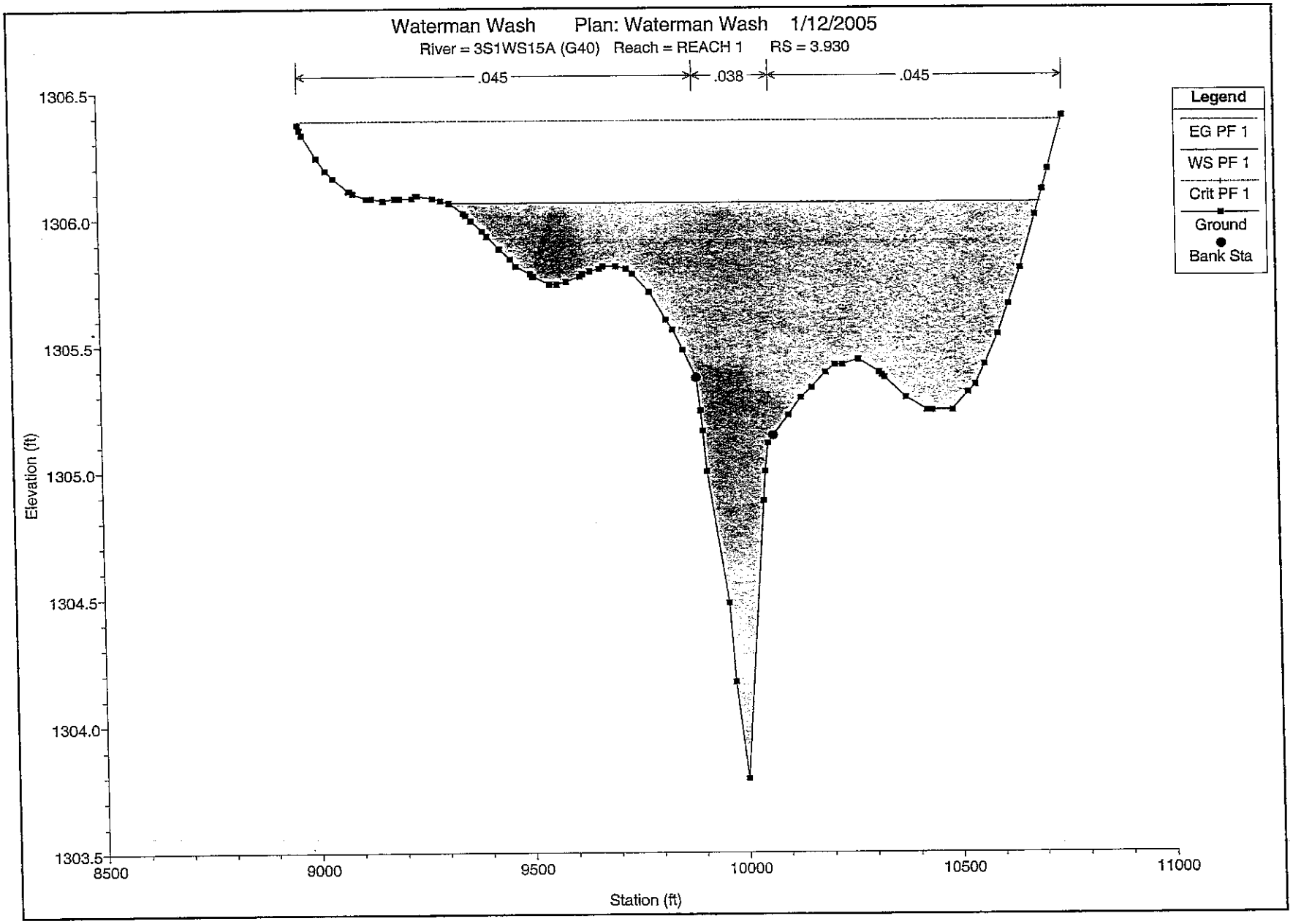

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 2.762
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1262.0
1261.5
1261.0
1260.5
1260.0
1259.5
1259.0
1258.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

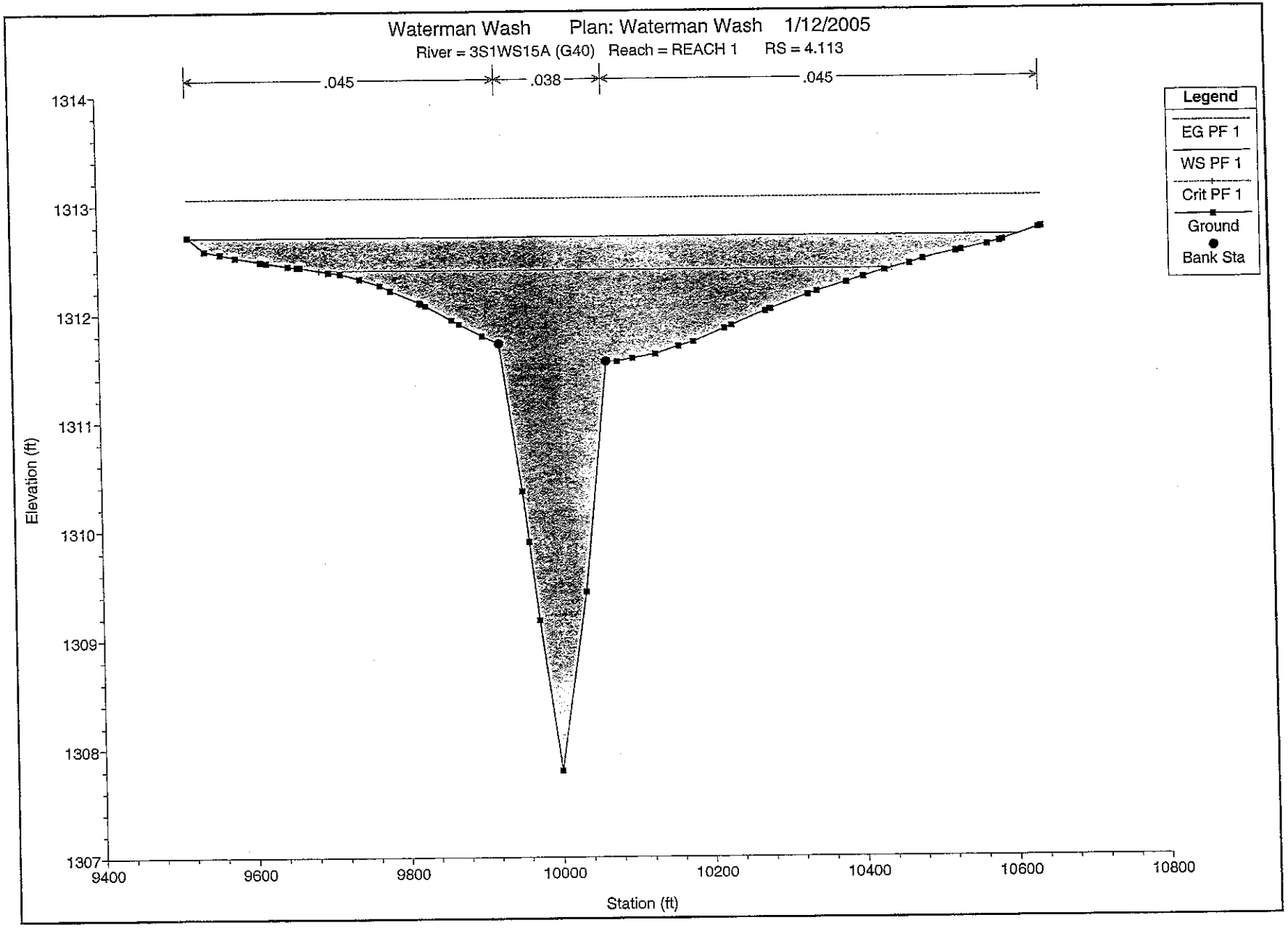

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 2.986
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1271
1270
1269
1268
1267
1266
1265
8500
9000
9500
10000
10500
11000
Station (ft)

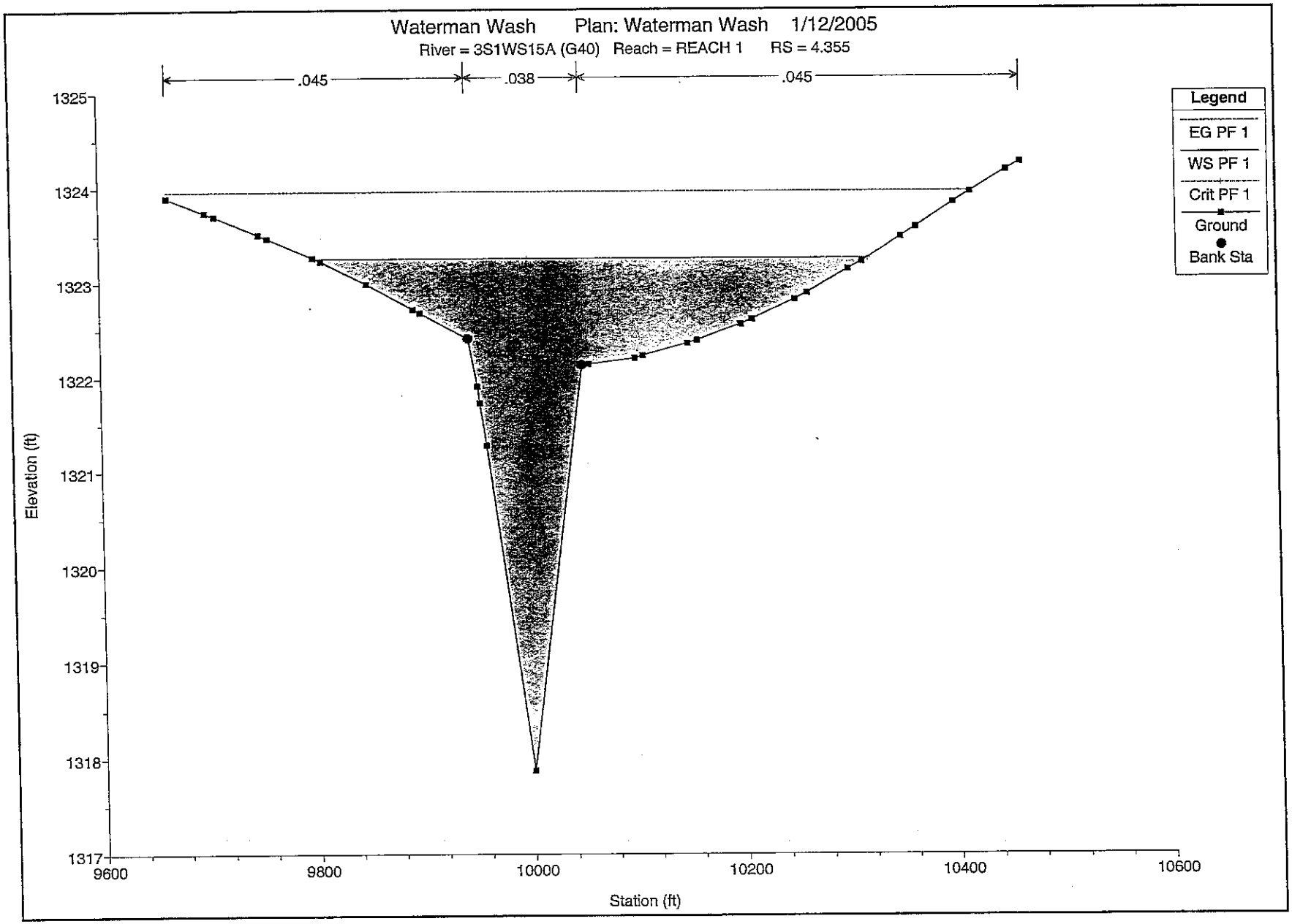

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 3.198
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1278
1277
1276
1275
1274
1273
1272
1271
1270
9400
9600
9800
10000
10200
10400
10600
Station (ft)

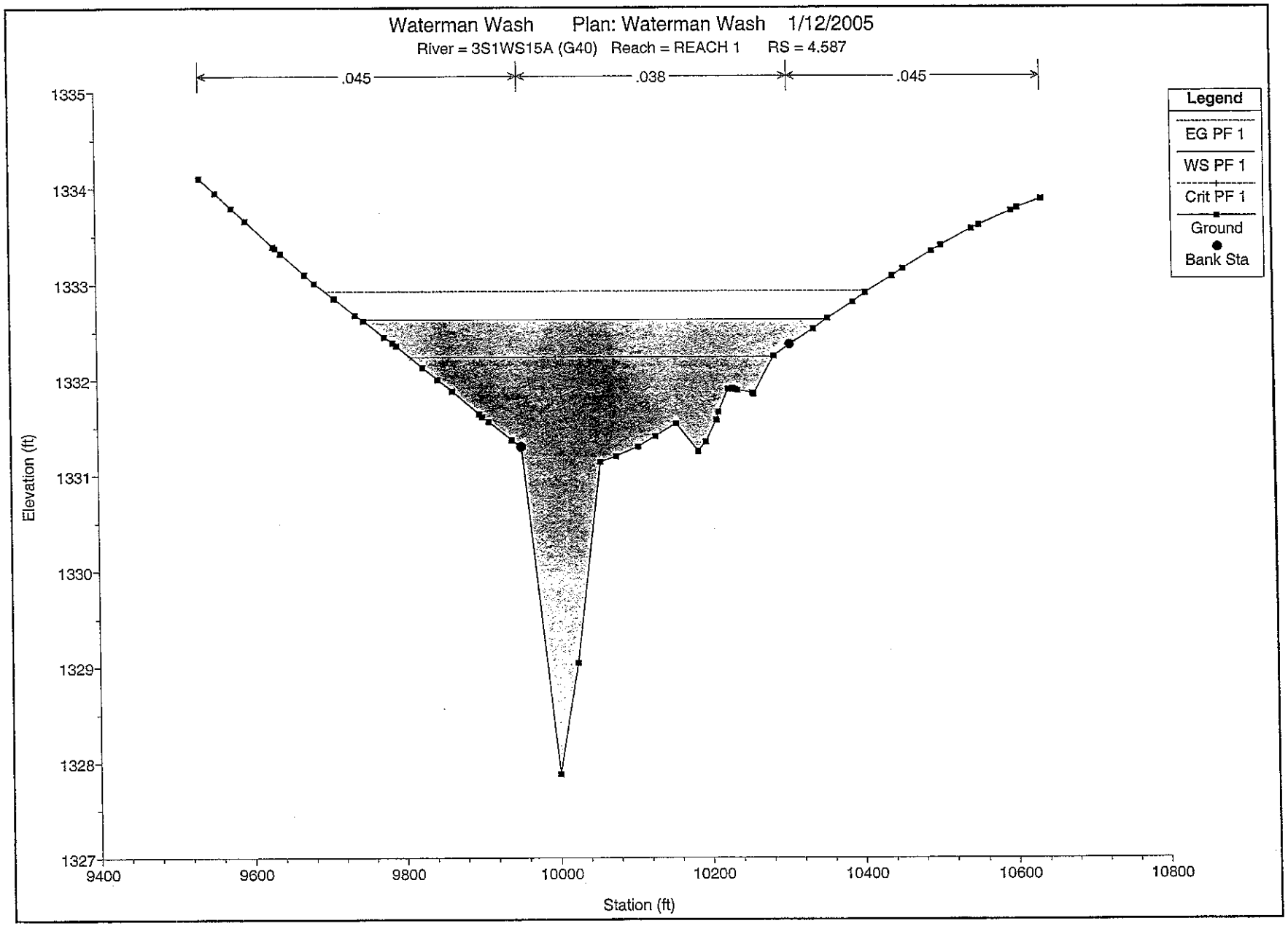

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 3.438
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1287
1286
1285
1284
1283
1282
1281
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

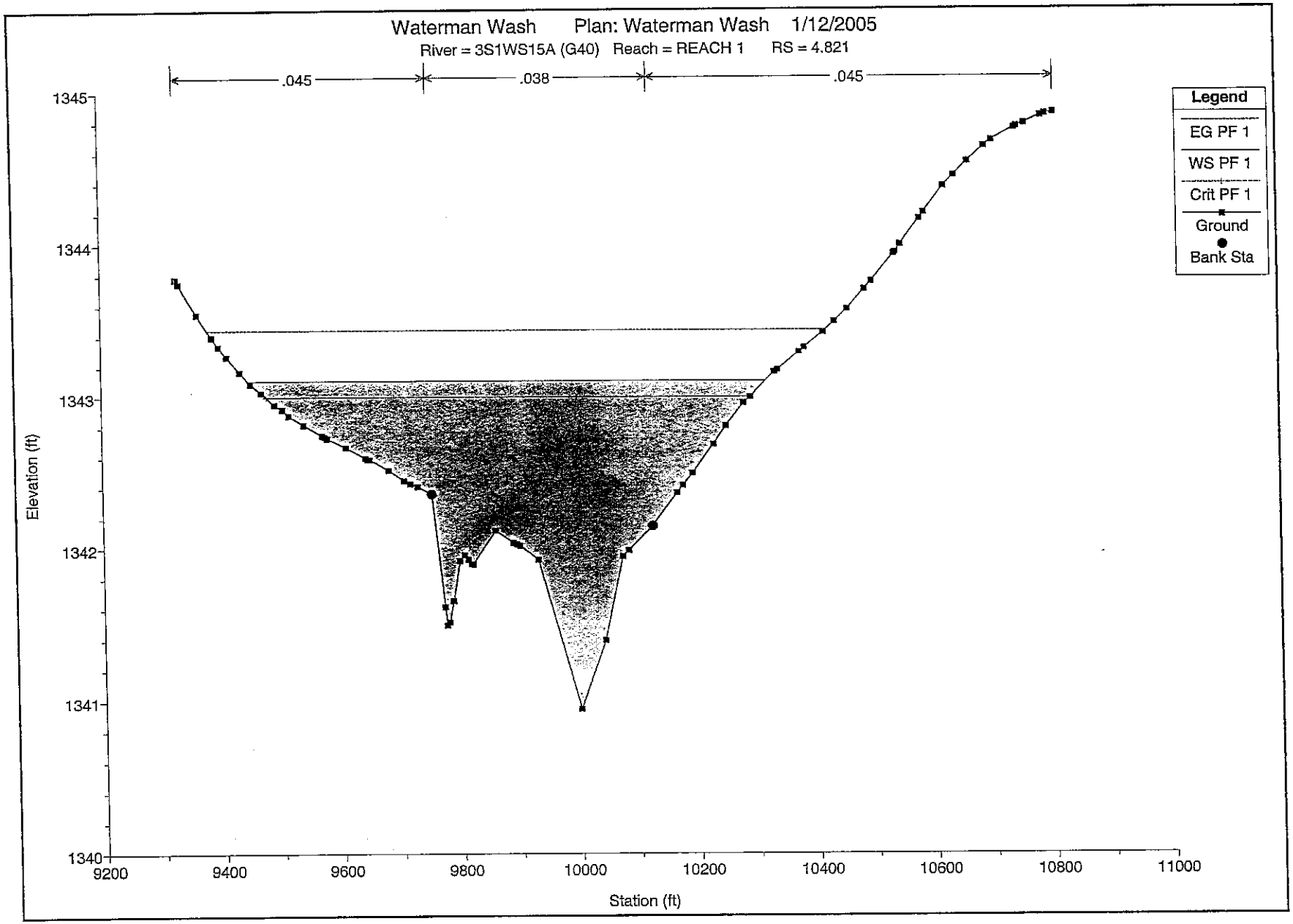

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 3.667
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1297
1296
1295
1294
1293
1292
1291
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

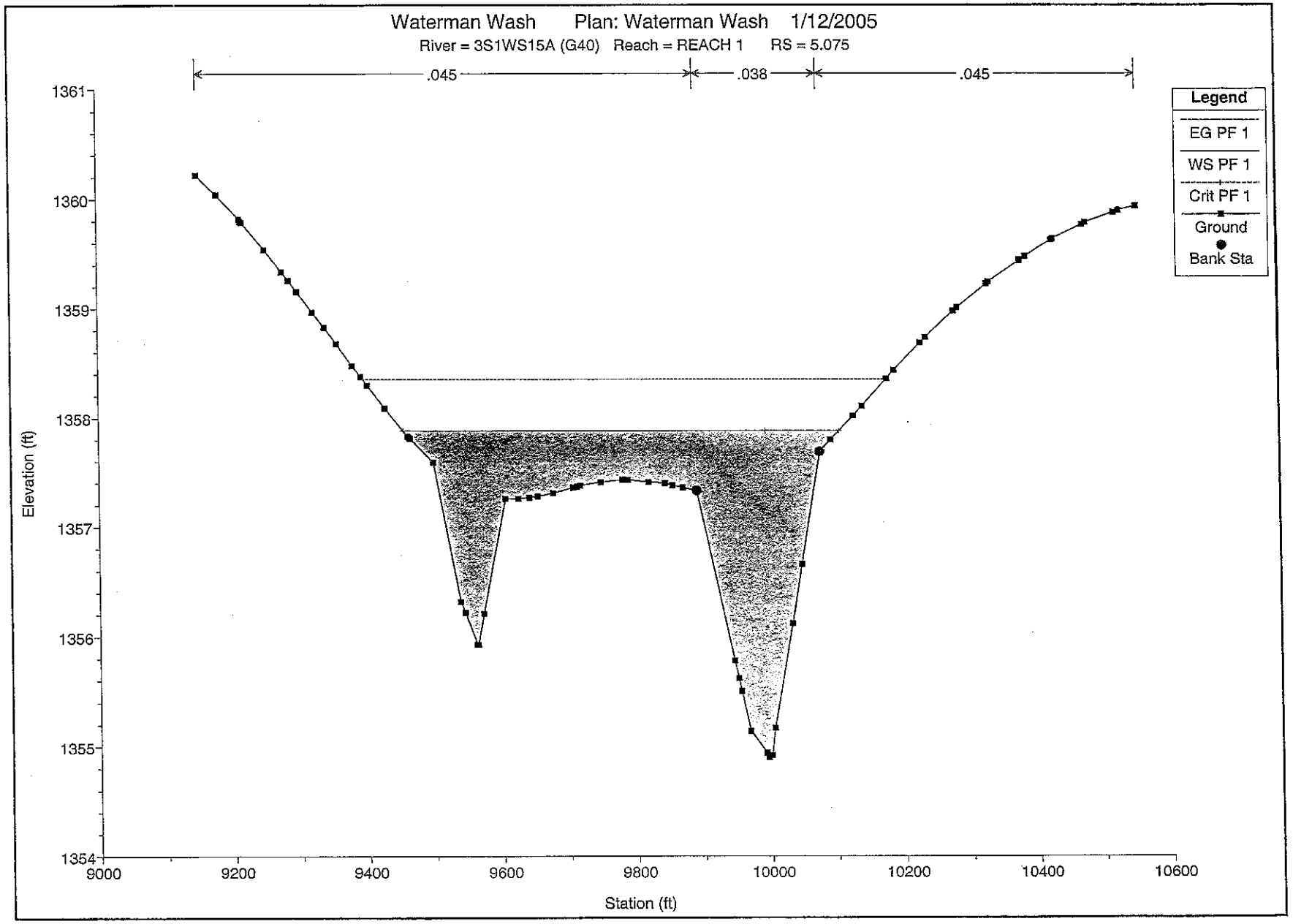

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 3.930
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1306.5
1306.0
1305.5
1305.0
1304.5
1304.0
1303.5
8500
9000
9500
10000
10500
11000
Station (ft)

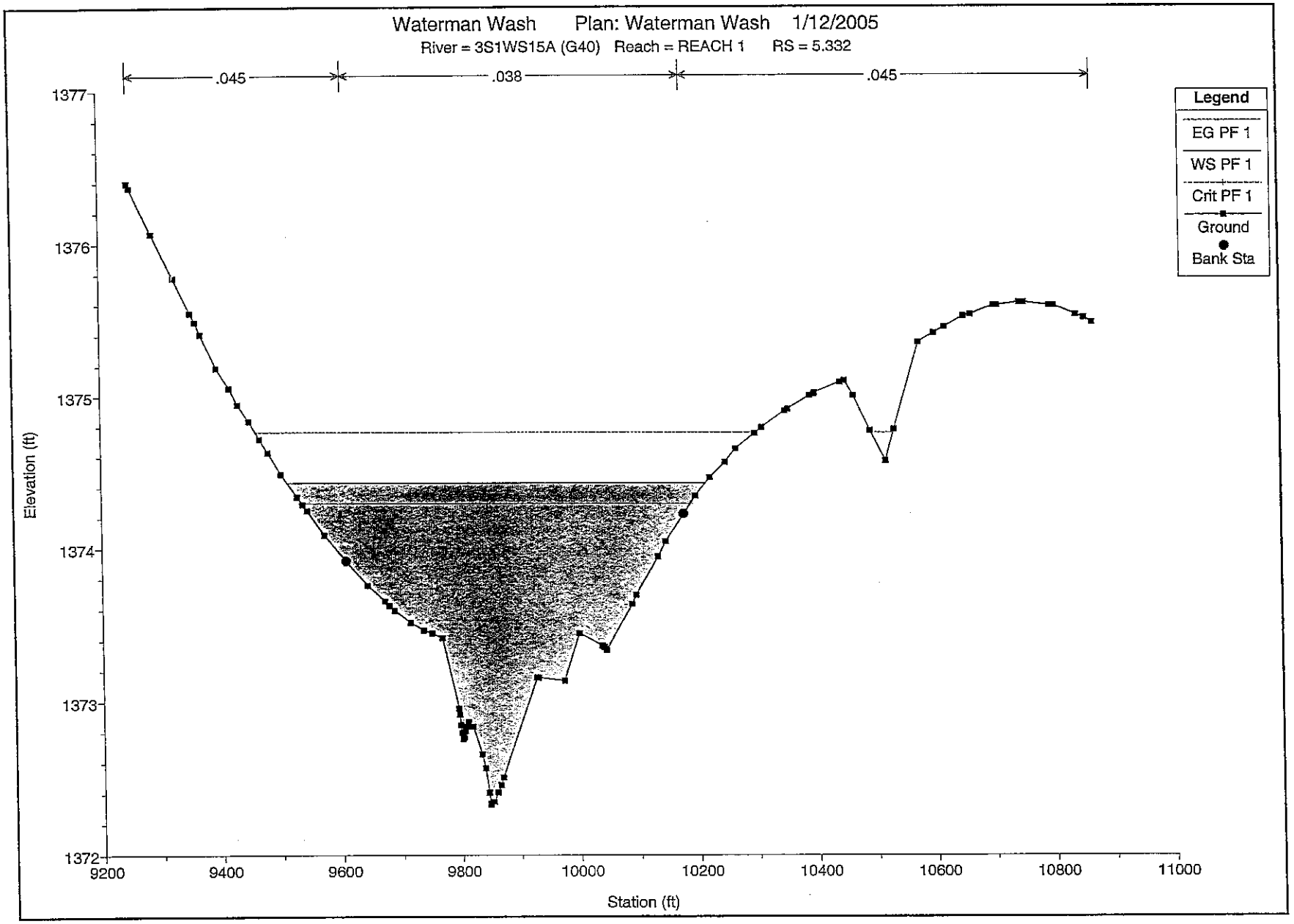

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 4.113
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1314
1313
1312
1311
1310
1309
1308
1307
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

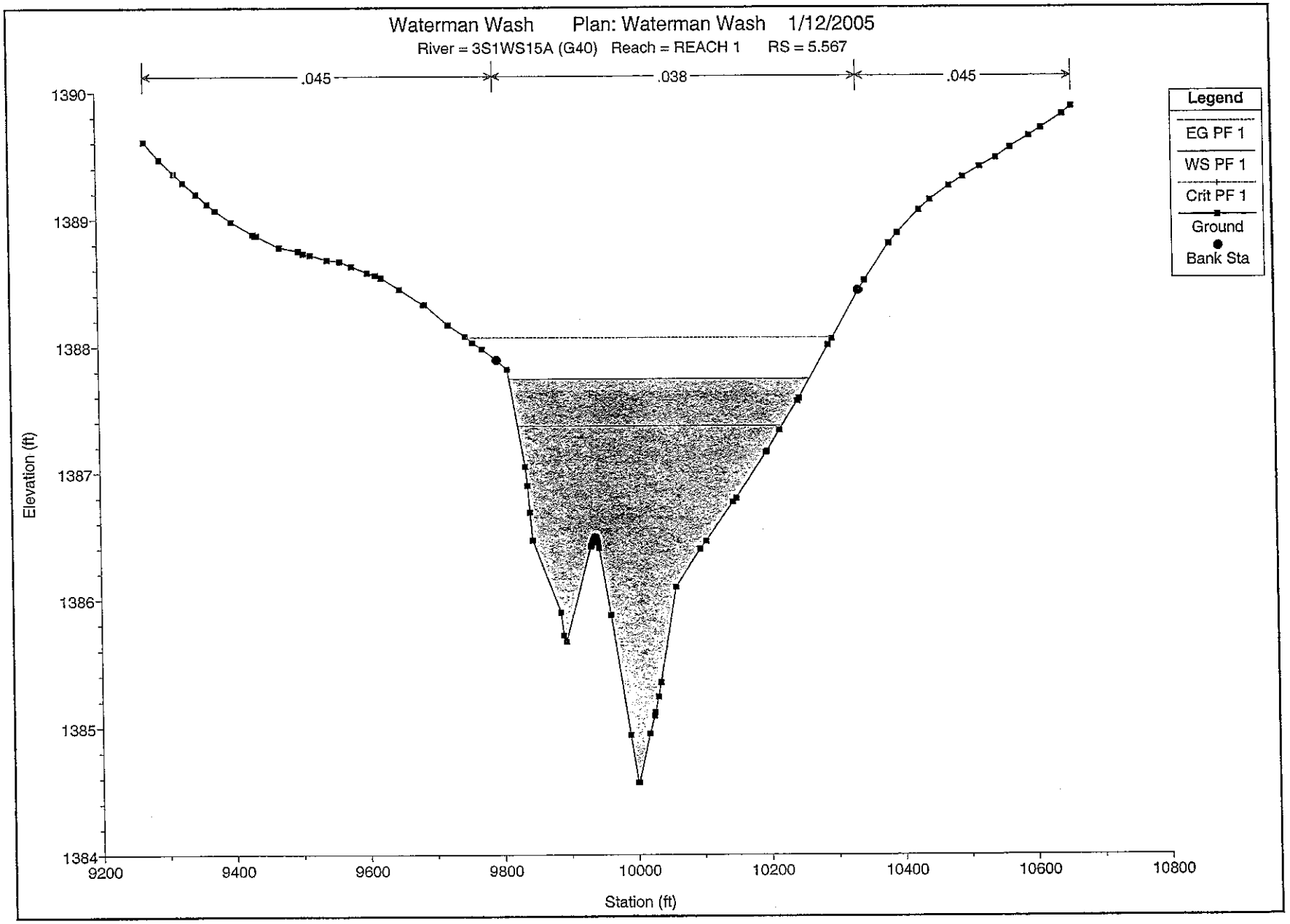

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 4.355
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1325
1324
1323
1322
1321
1320
1319
1318
1317
9600
9800
10000
10200
10400
10600
Station (ft)

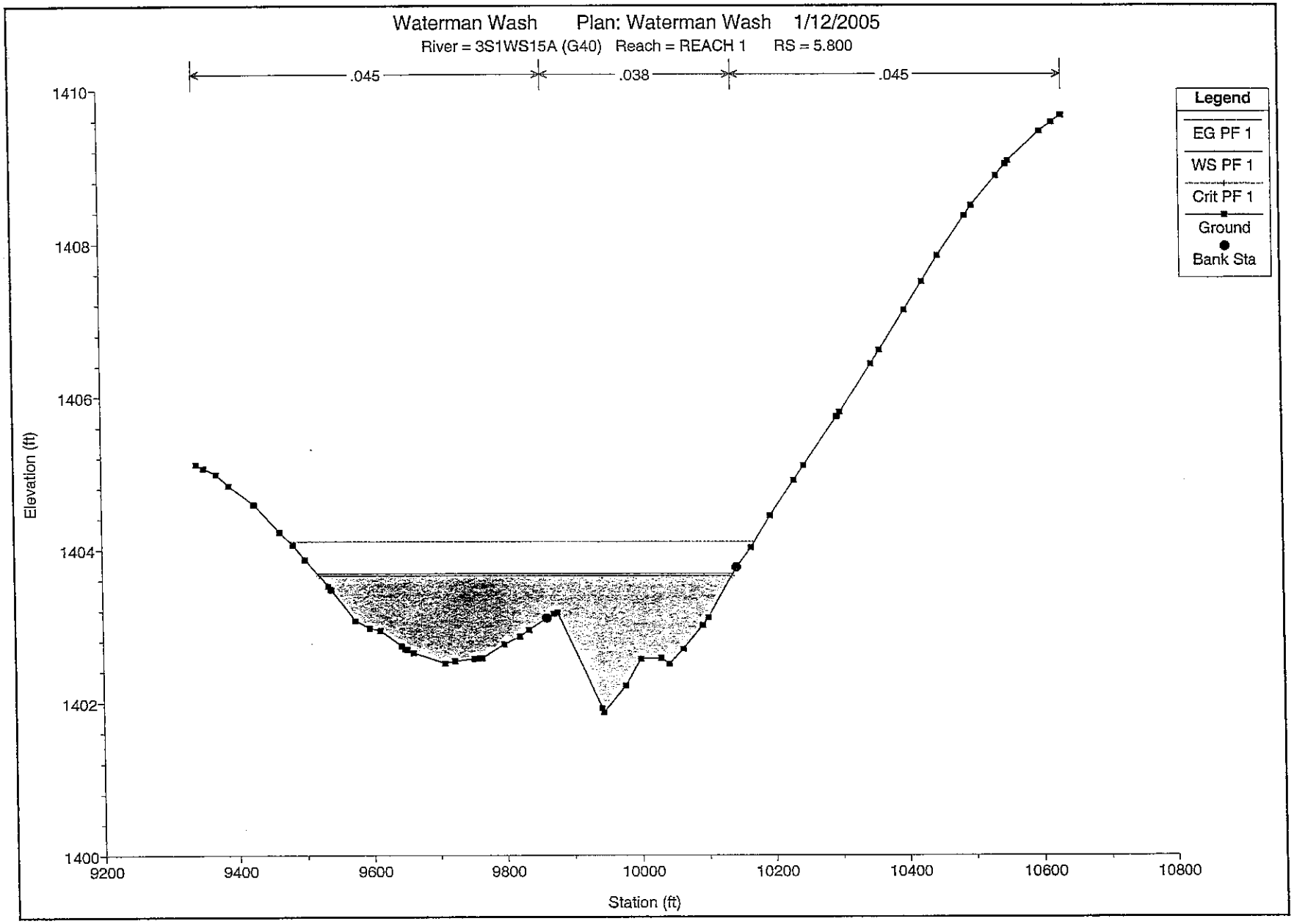

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 4.587
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1335
1334
1333
1332
1331
1330
1329
1328
1327
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

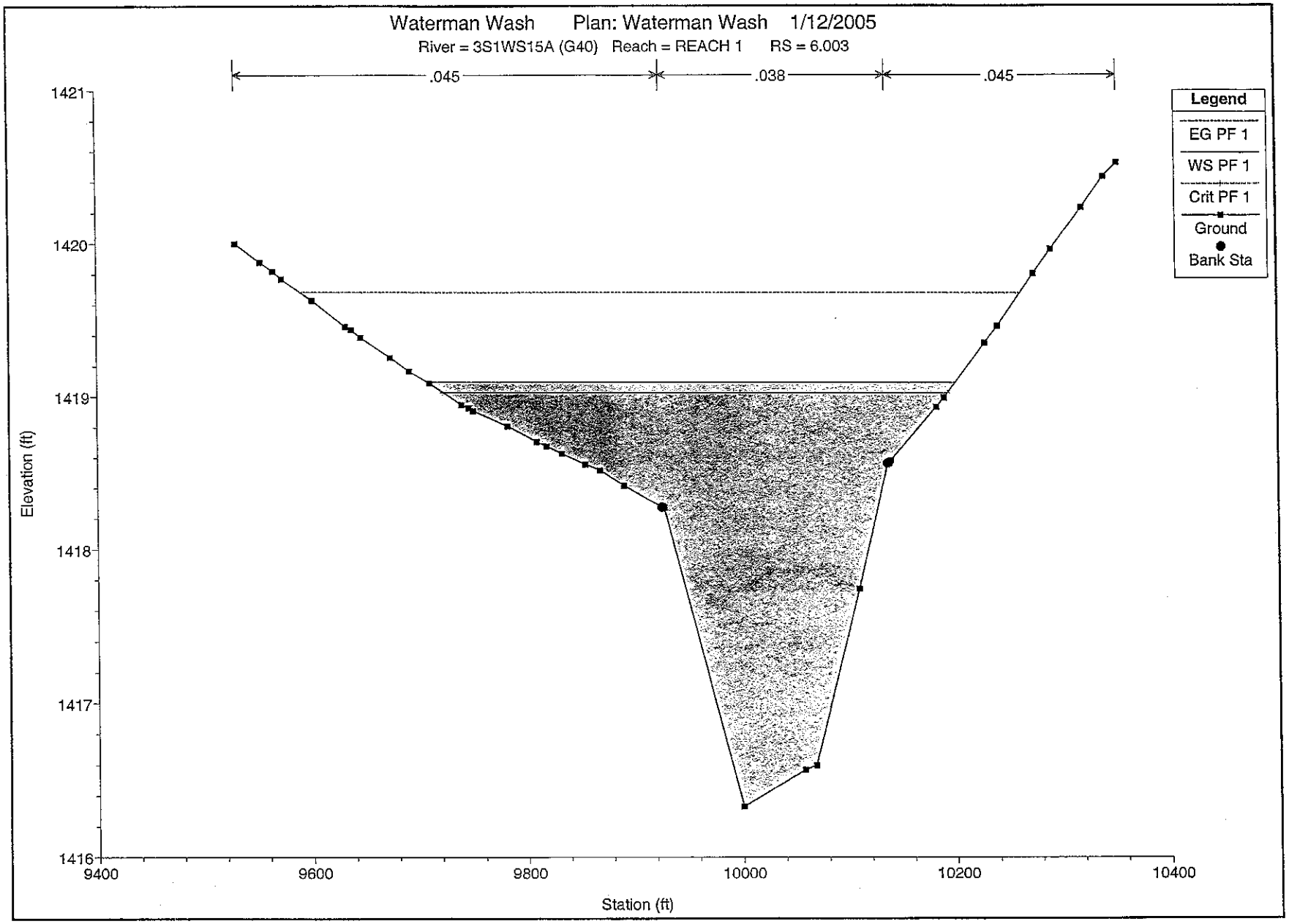

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 4.821
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1345
1344
1343
1342
1341
1340
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

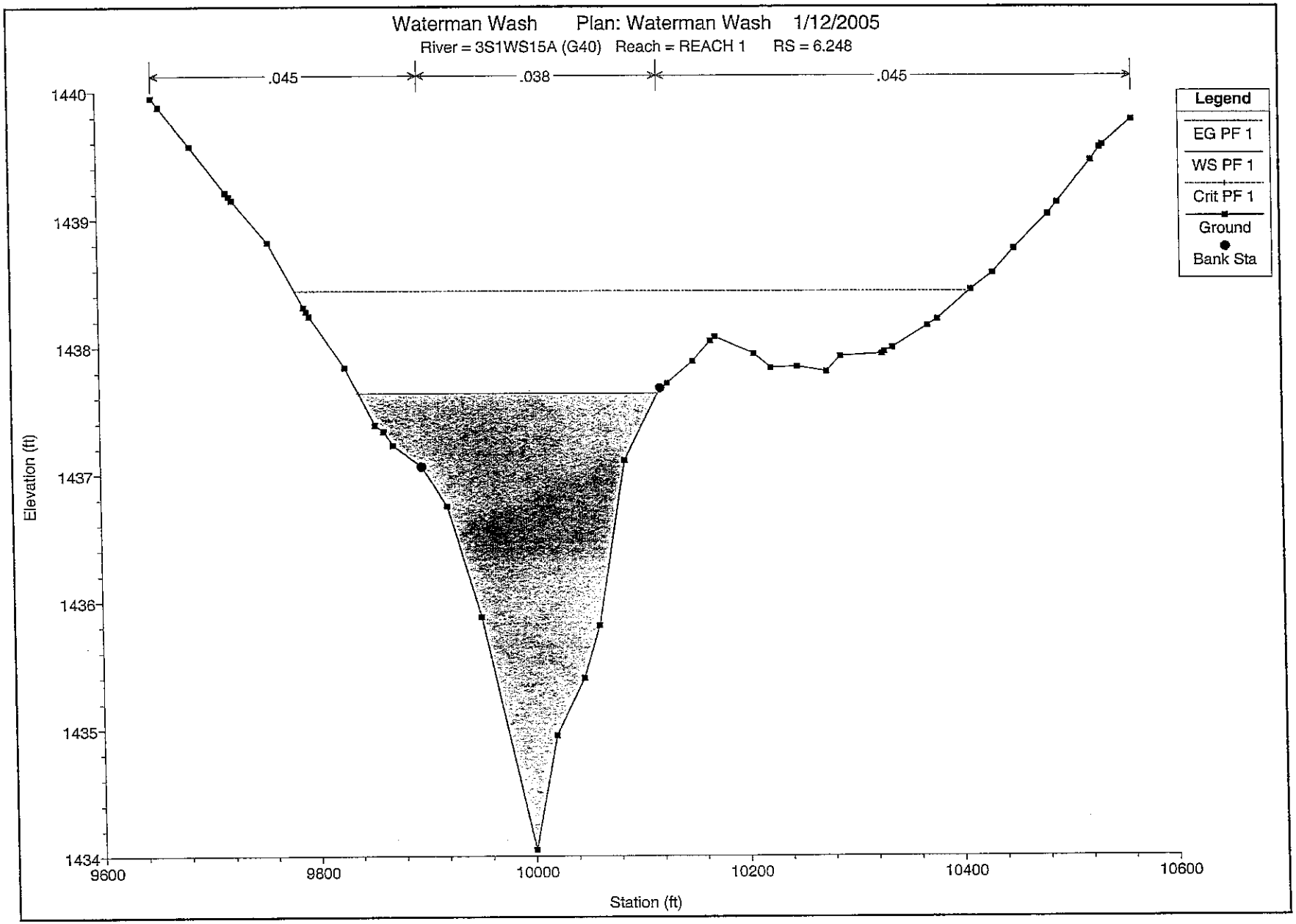

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 5.075
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1361
1360
1359
1358
1357
1356
1355
1354
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

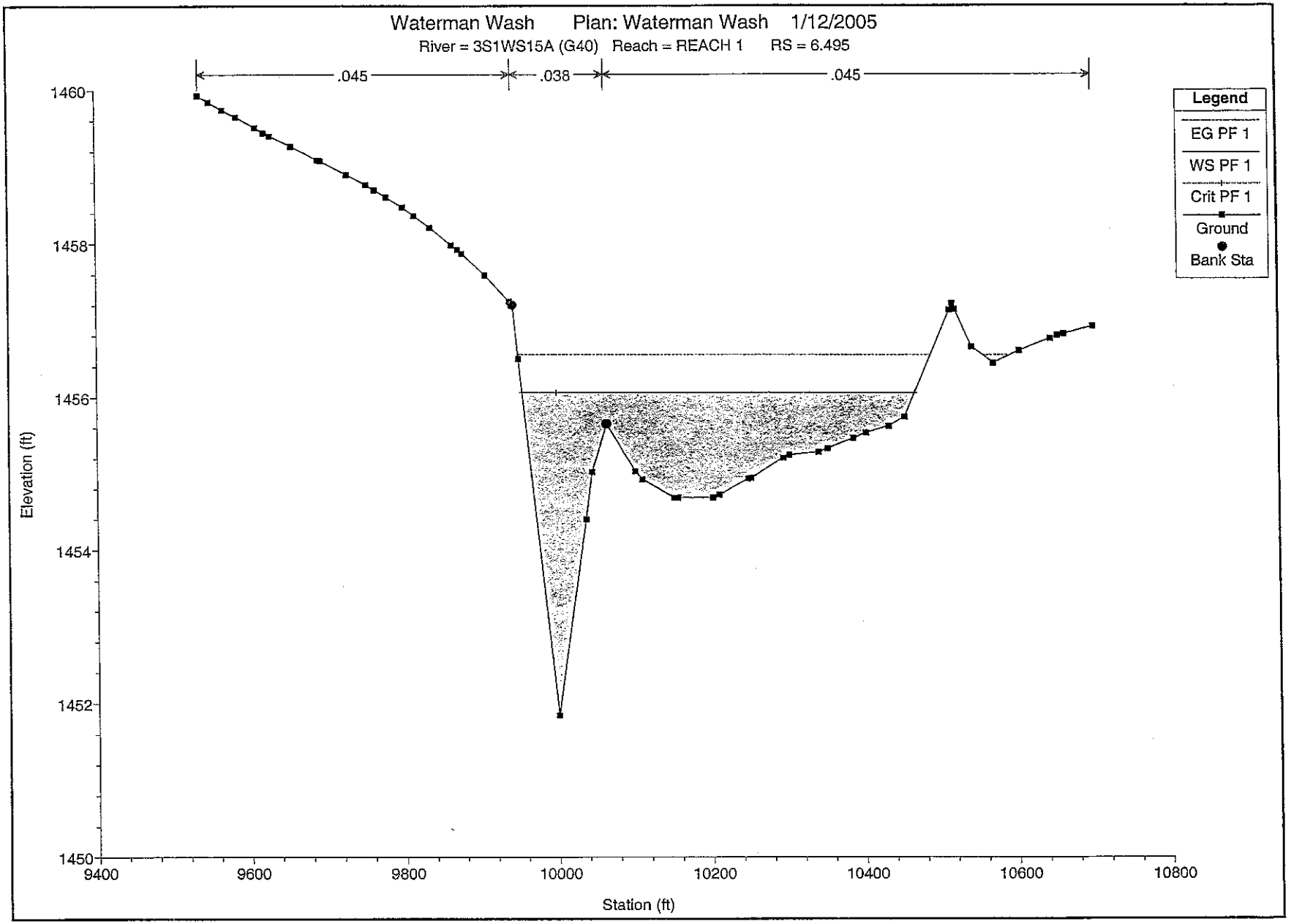

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 5.332
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1377
1376
1375
1374
1373
1372
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

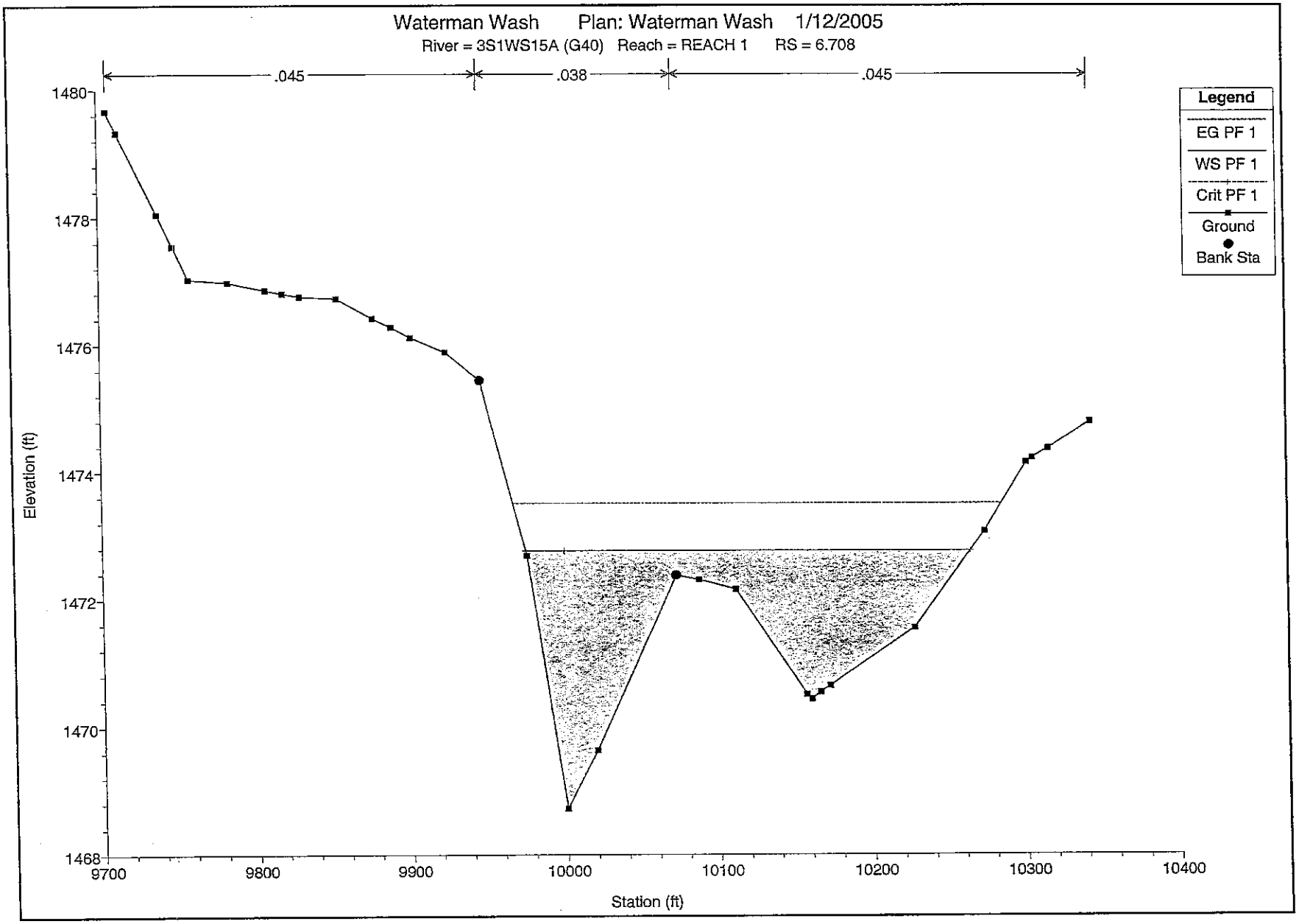

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 5.567
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1390
1389
1388
1387
1386
1385
1384
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

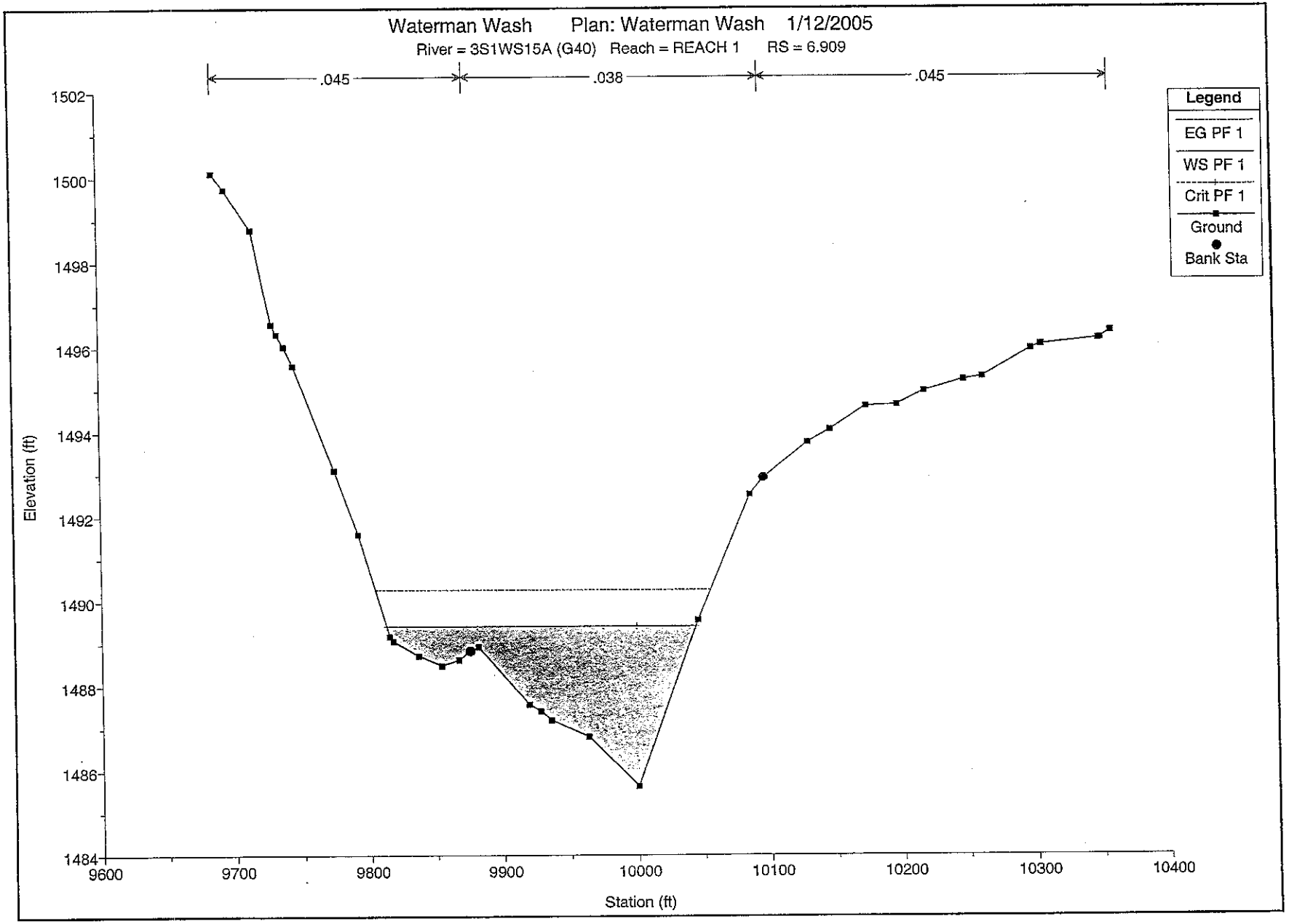

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 5.800
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1410
1408
1406
1404
1402
1400
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

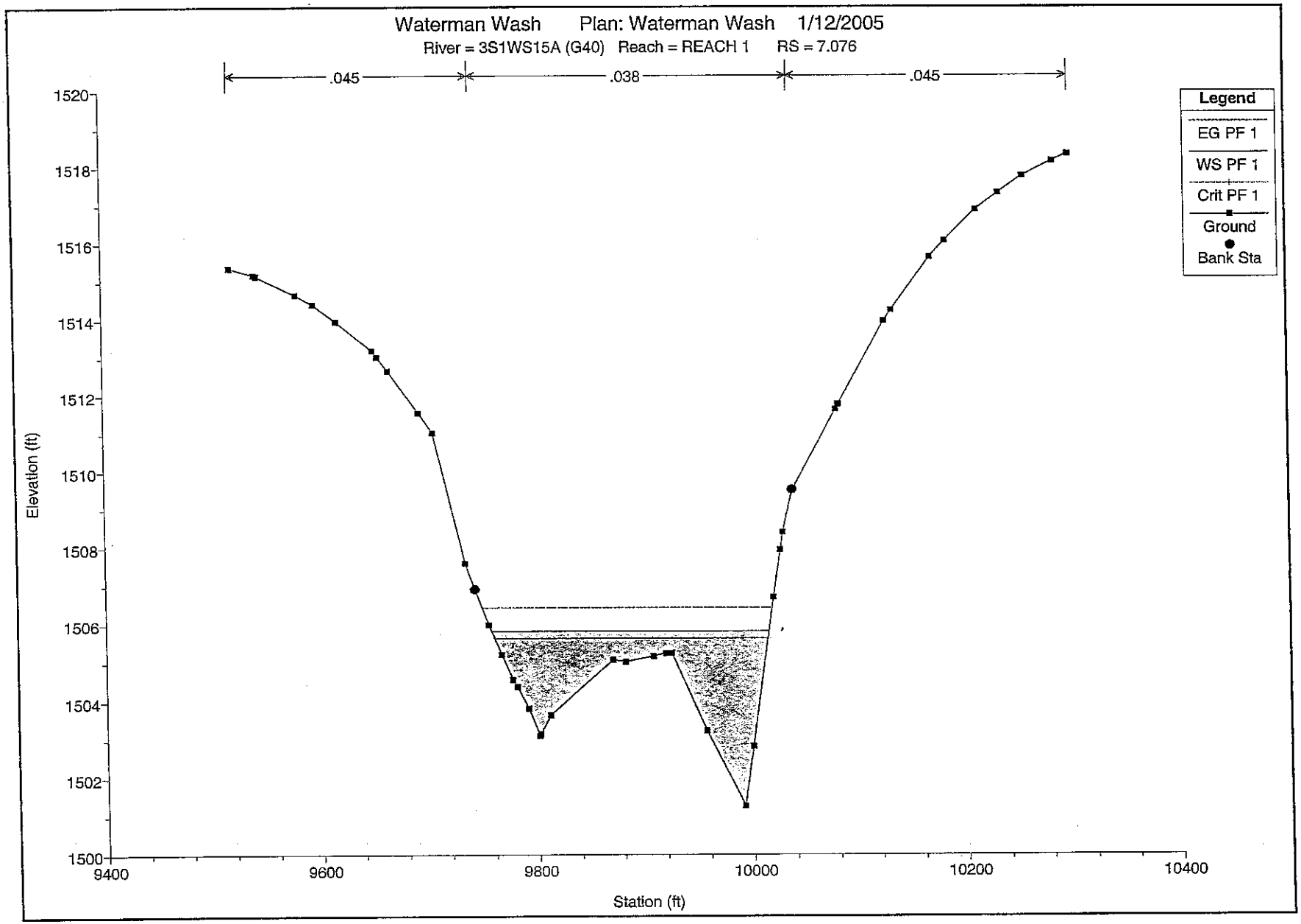

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 6.003
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1421
1420
1419
1418
1417
1416
9400
9600
9800
10000
10200
10400
Station (ft)

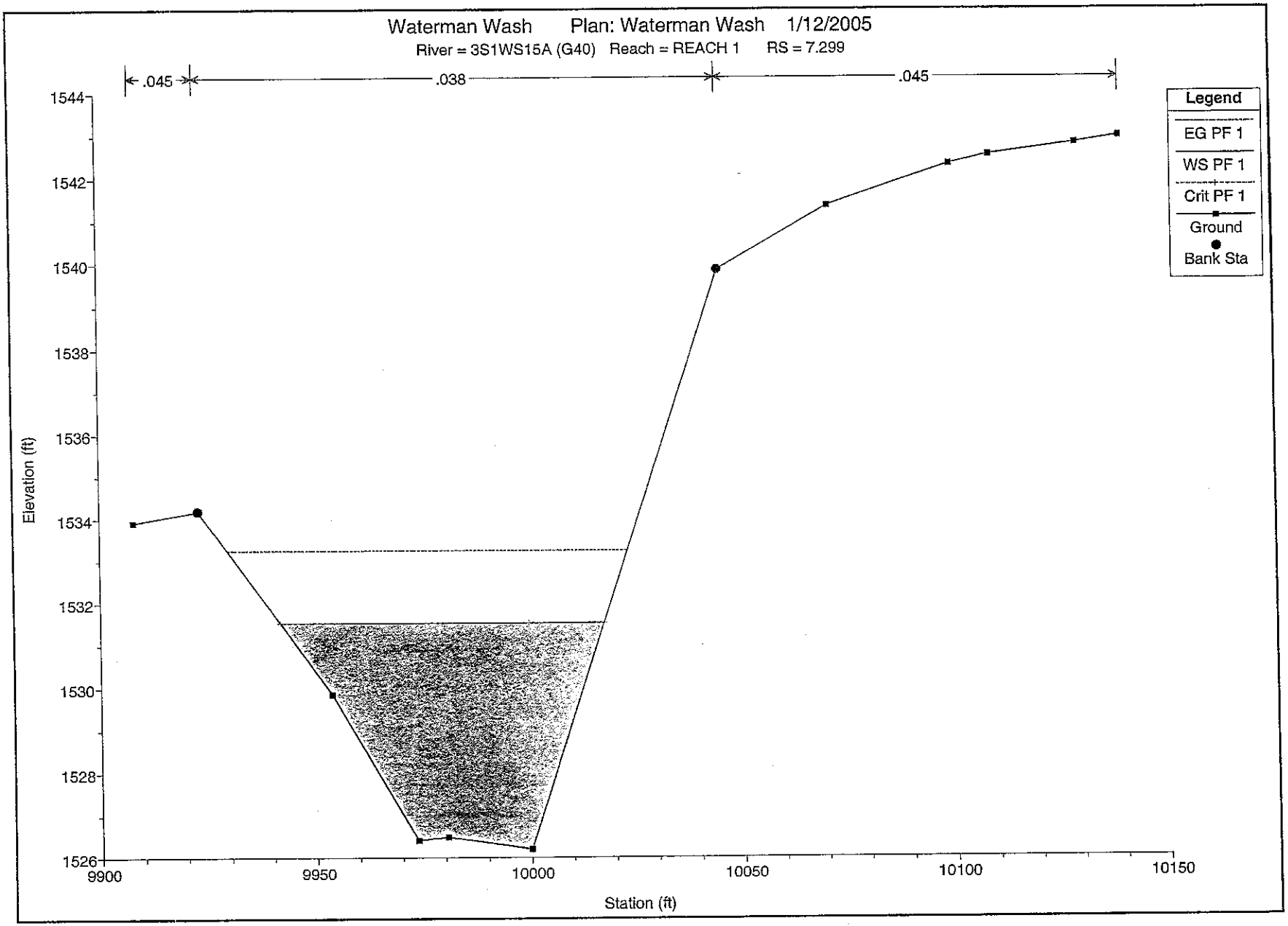

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 6.248
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1440
1439
1438
1437
1436
1435
1434
9600
9800
10000
10200
10400
10600
Station (ft)

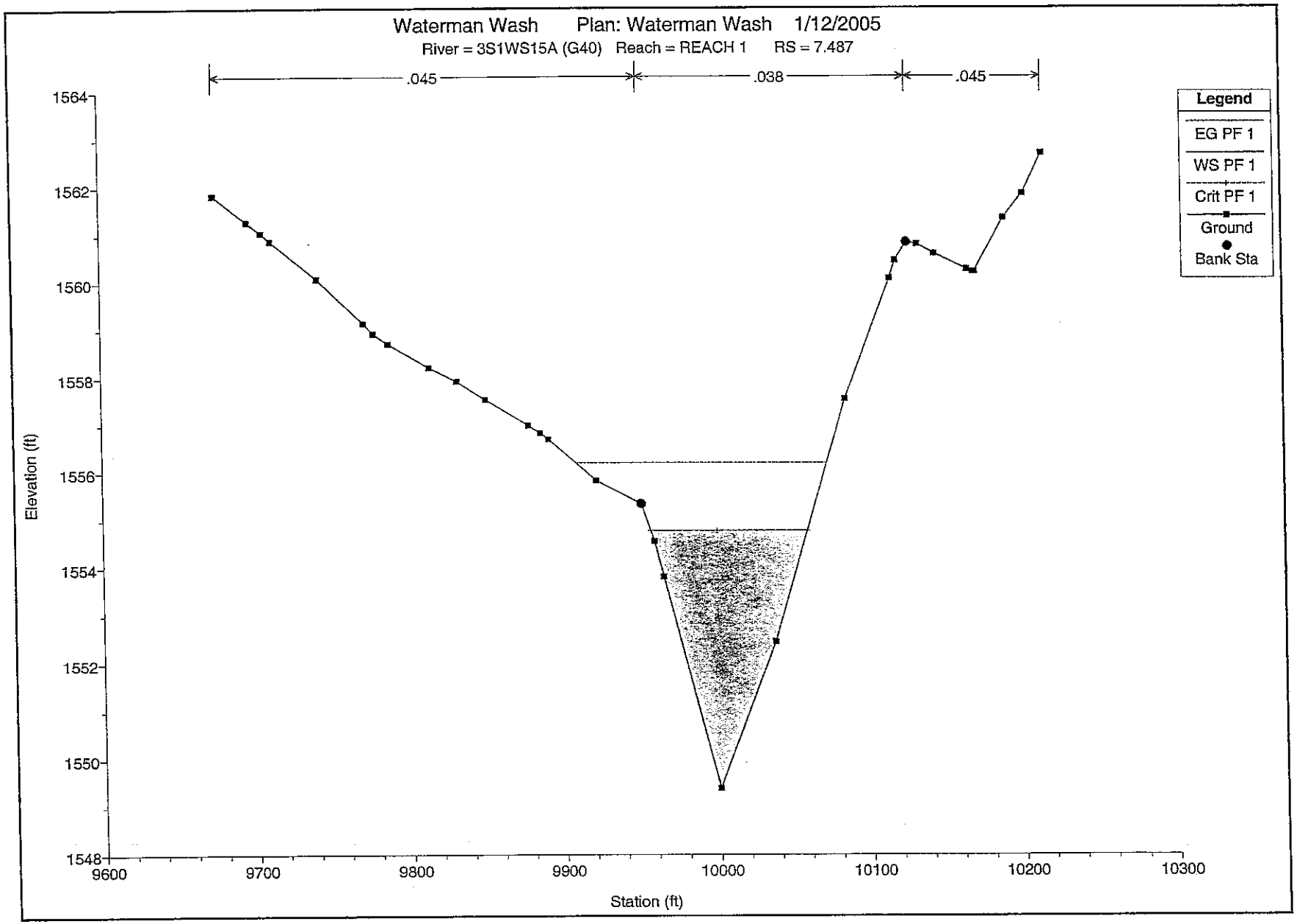

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 6.495
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1460
1458
1456
1454
1452
1450
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

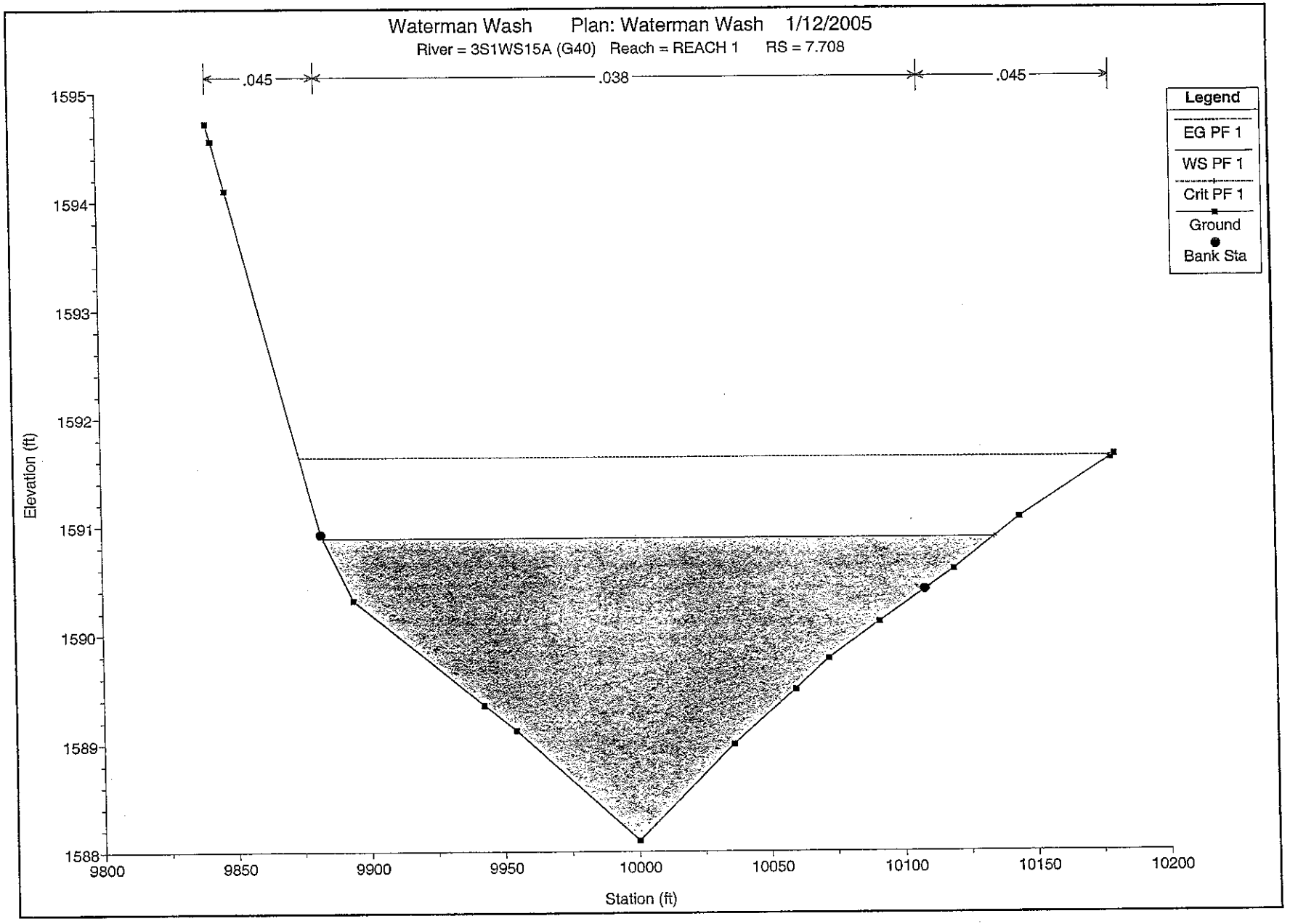

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 6.708
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1480
1478
1476
1474
1472
1470
1468
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

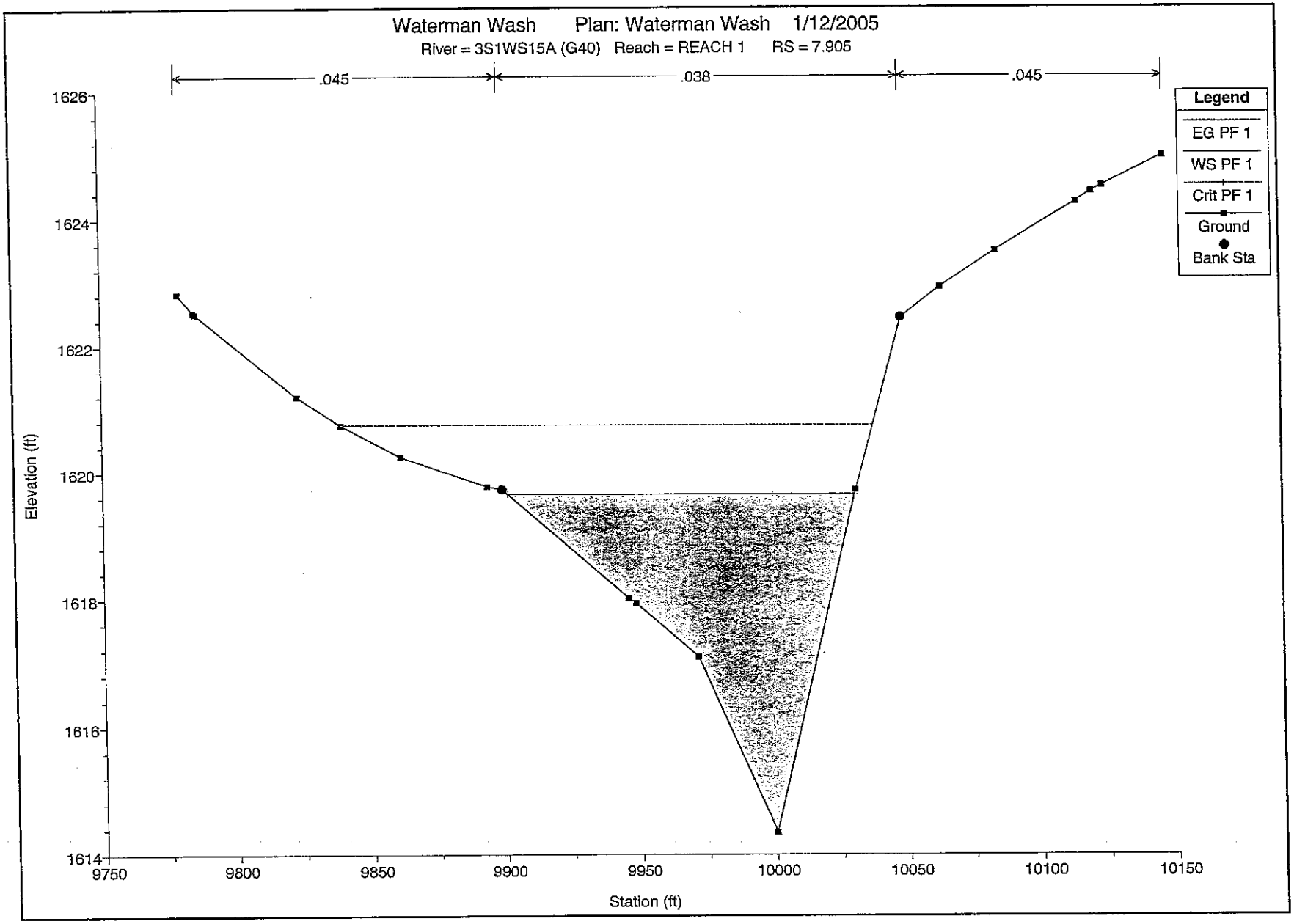

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 6.909
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1502
1500
1498
1496
1494
1492
1490
1488
1486
1484
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

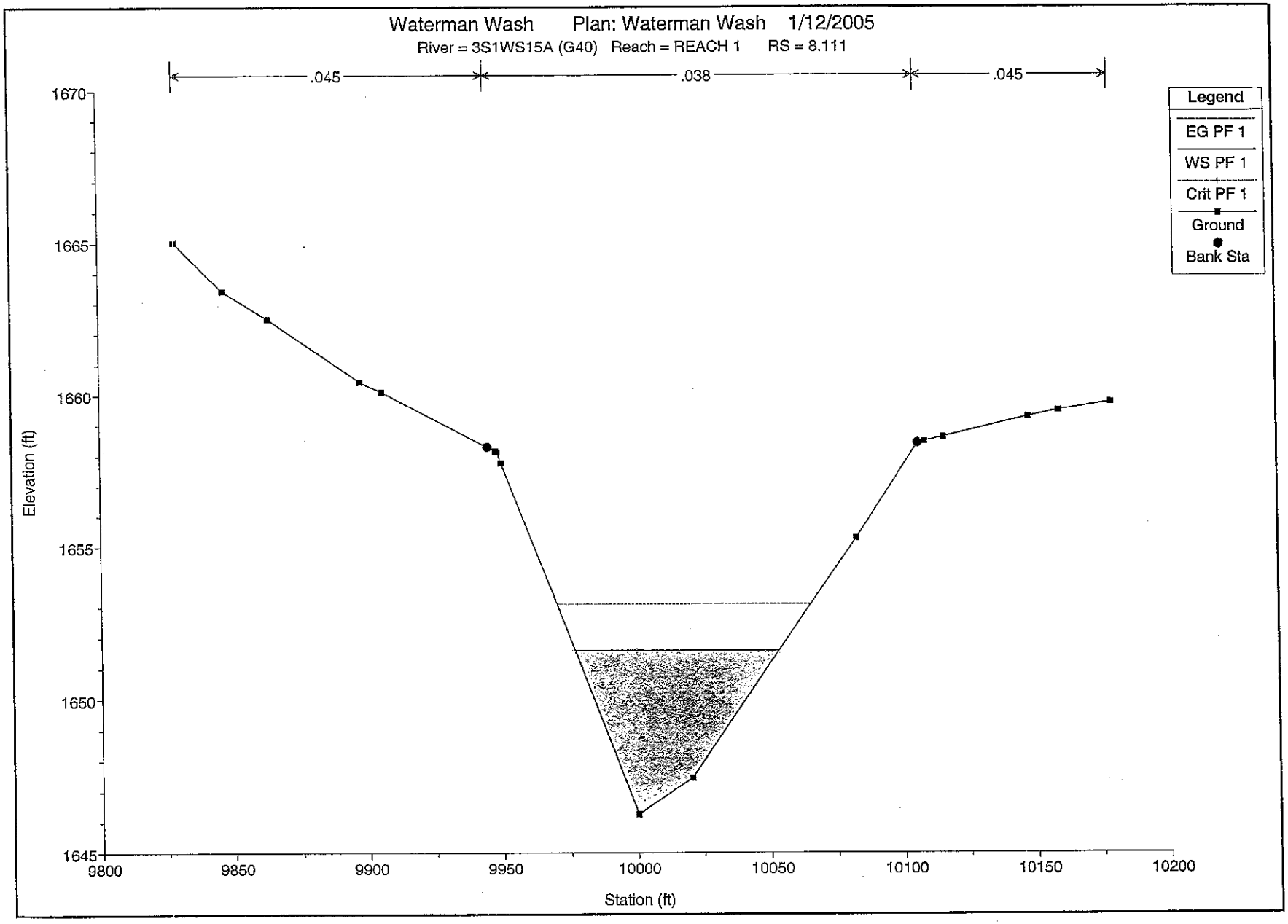

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 7.076
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1520
1518
1516
1514
1512
1510
1508
1506
1504
1502
1500
9400
9600
9800
10000
10200
10400
Station (ft)

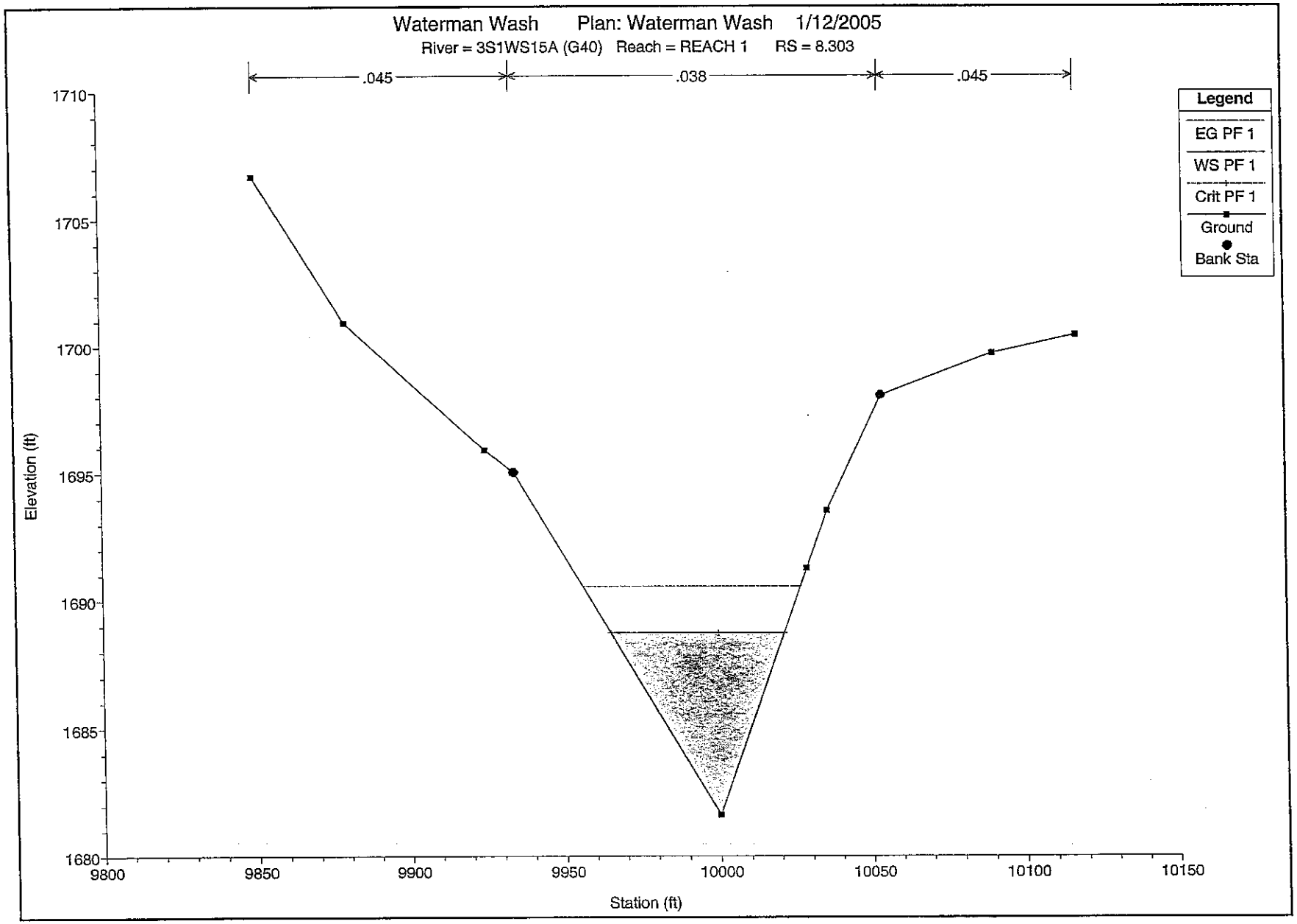

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 7.299
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1544
1542
1540
1538
1536
1534
1532
1530
1528
1526
9900
9950
10000
10050
10100
10150
Station (ft)

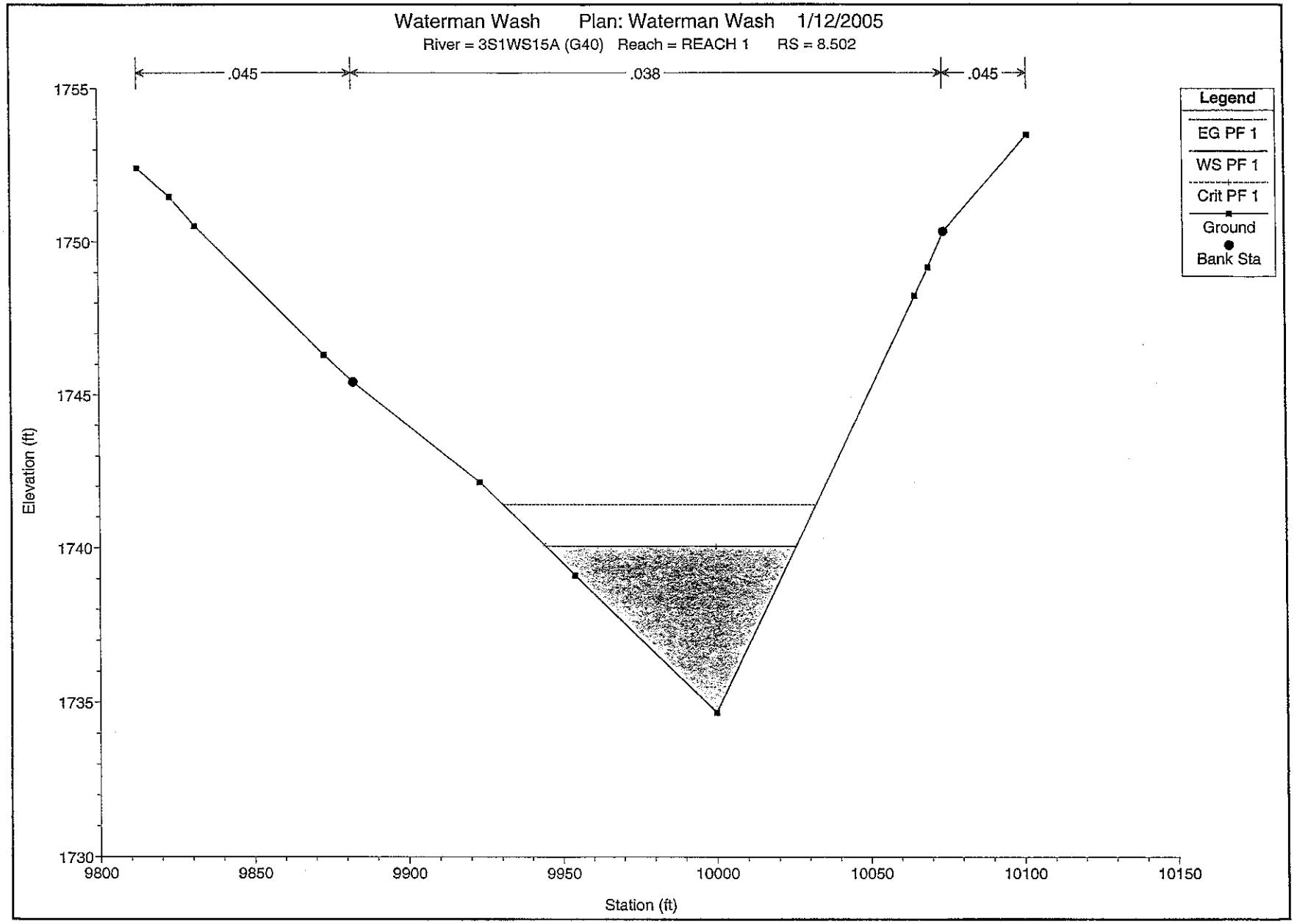

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 7.487
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1564
1562
1560
1558
1556
1554
1552
1550
1548
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

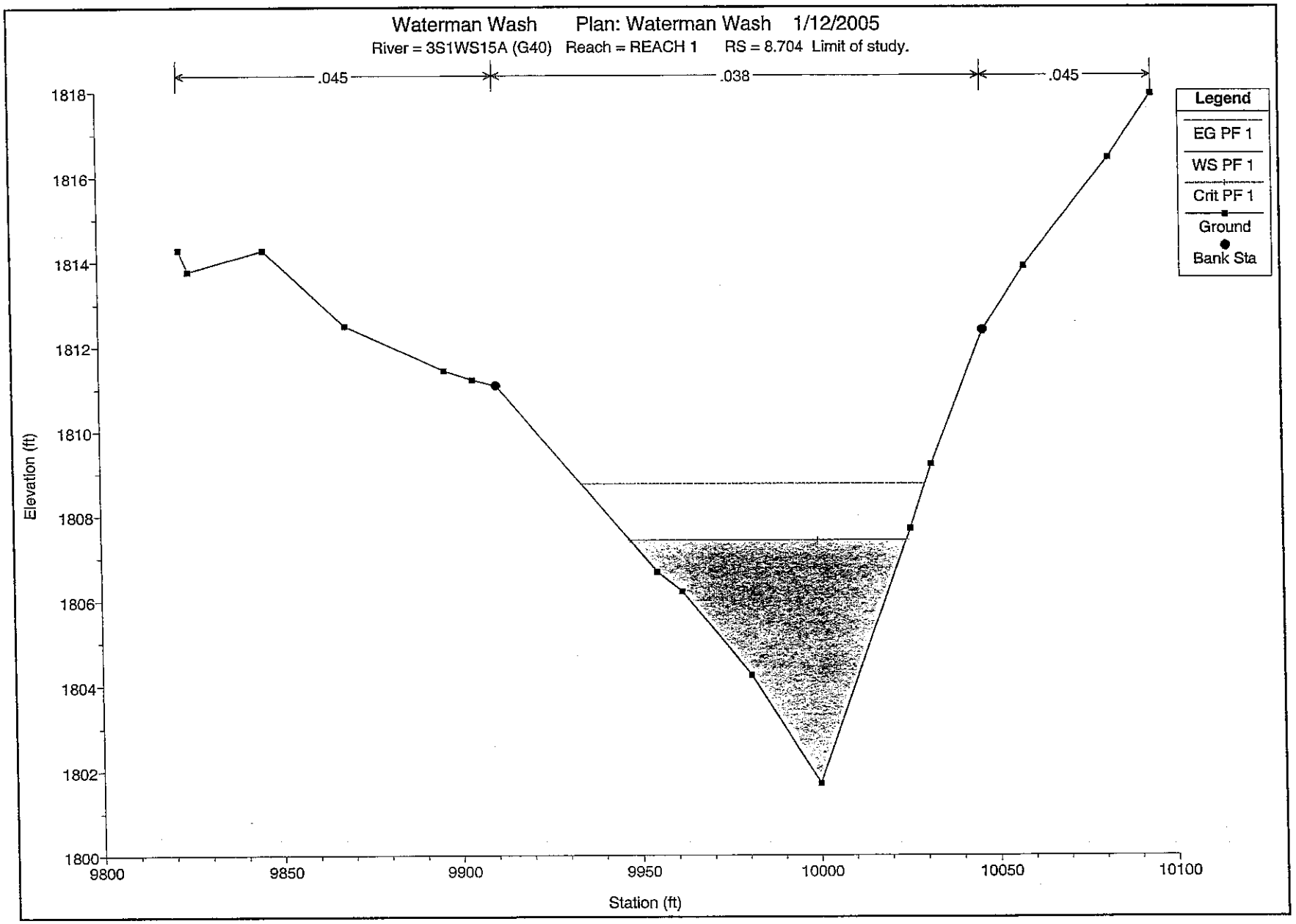

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 7.708
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1595
1594
1593
1592
1591
1590
1589
1588
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 7.905
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1626
1624
1622
1620
1618
1616
1614
9750
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 8.111
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1670
1665
1660
1655
1650
1645
9800
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 8.303
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1710
1705
1700
1695
1690
1685
1680
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 8.502
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1755
1750
1745
1740
1735
1730
9800
9850
9900
9950
10000
10050
10100
10150
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS15A (G40) Reach = REACH 1 RS = 8.704 Limit of study.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1818
1816
1814
1812
1810
1808
1806
1804
1802
1800
9800
9850
9900
9950
10000
10050
10100
Station (ft)

MODEL: WATERMAN WASH

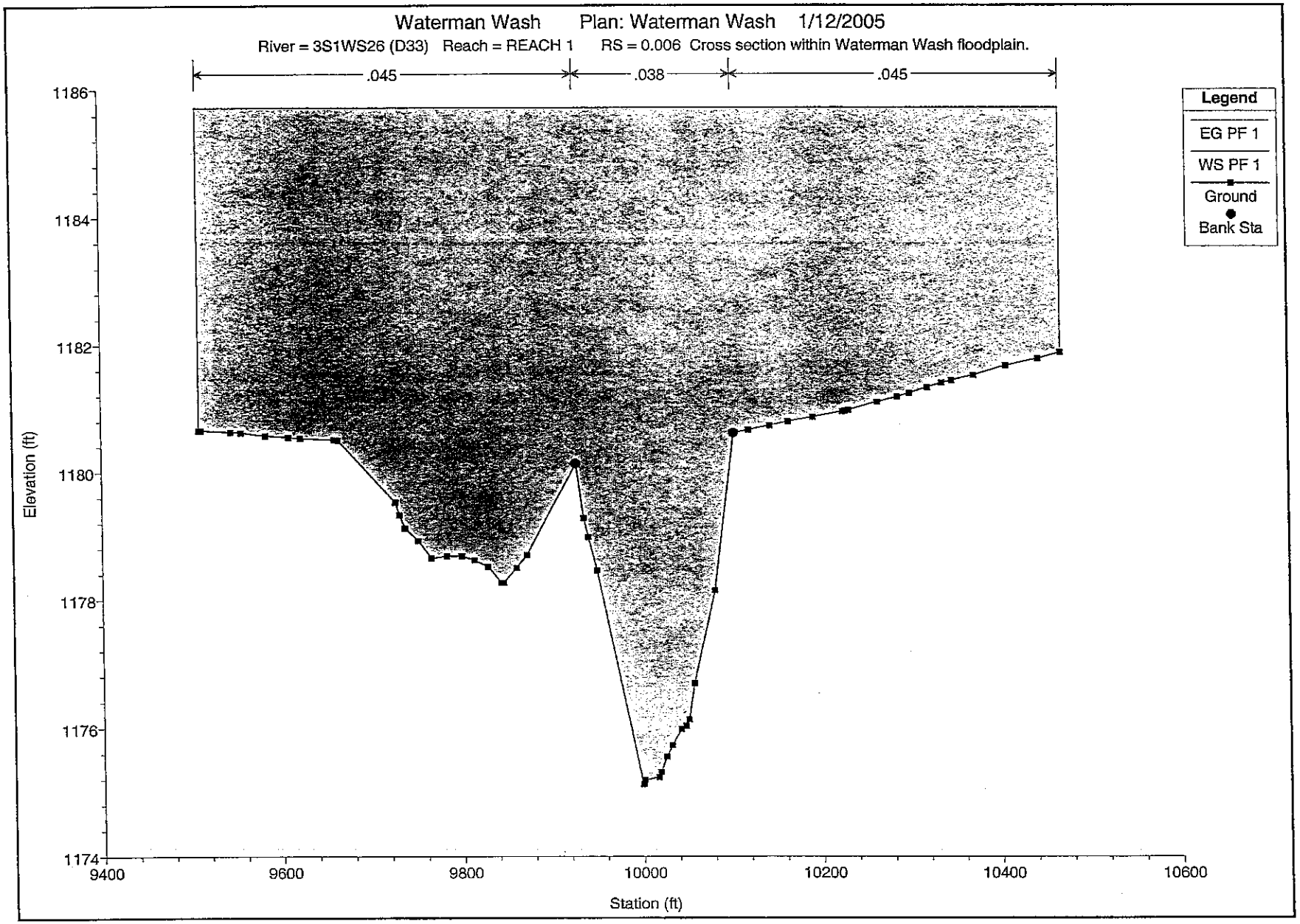
REACH: 3S1WS26 (D33)

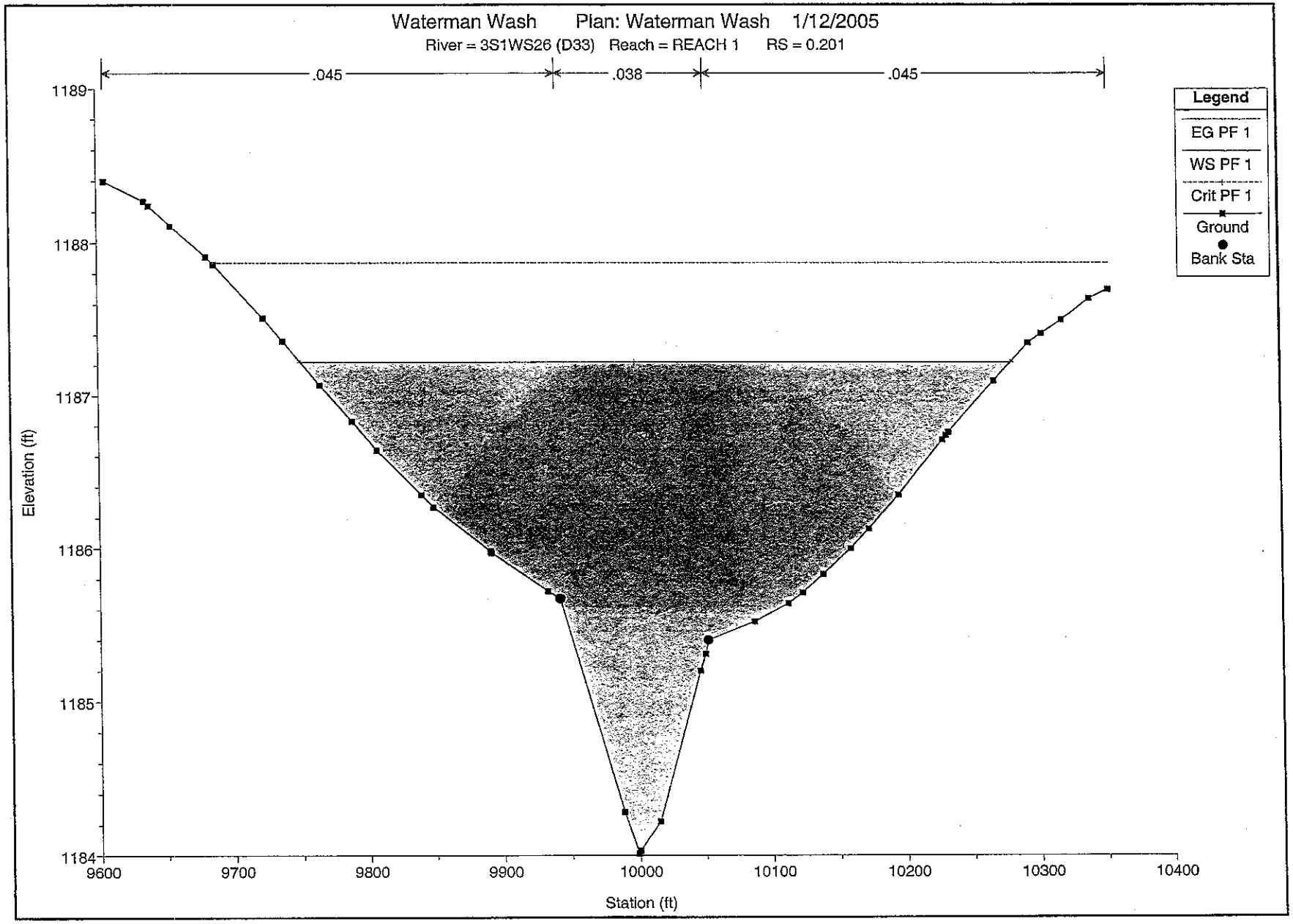
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

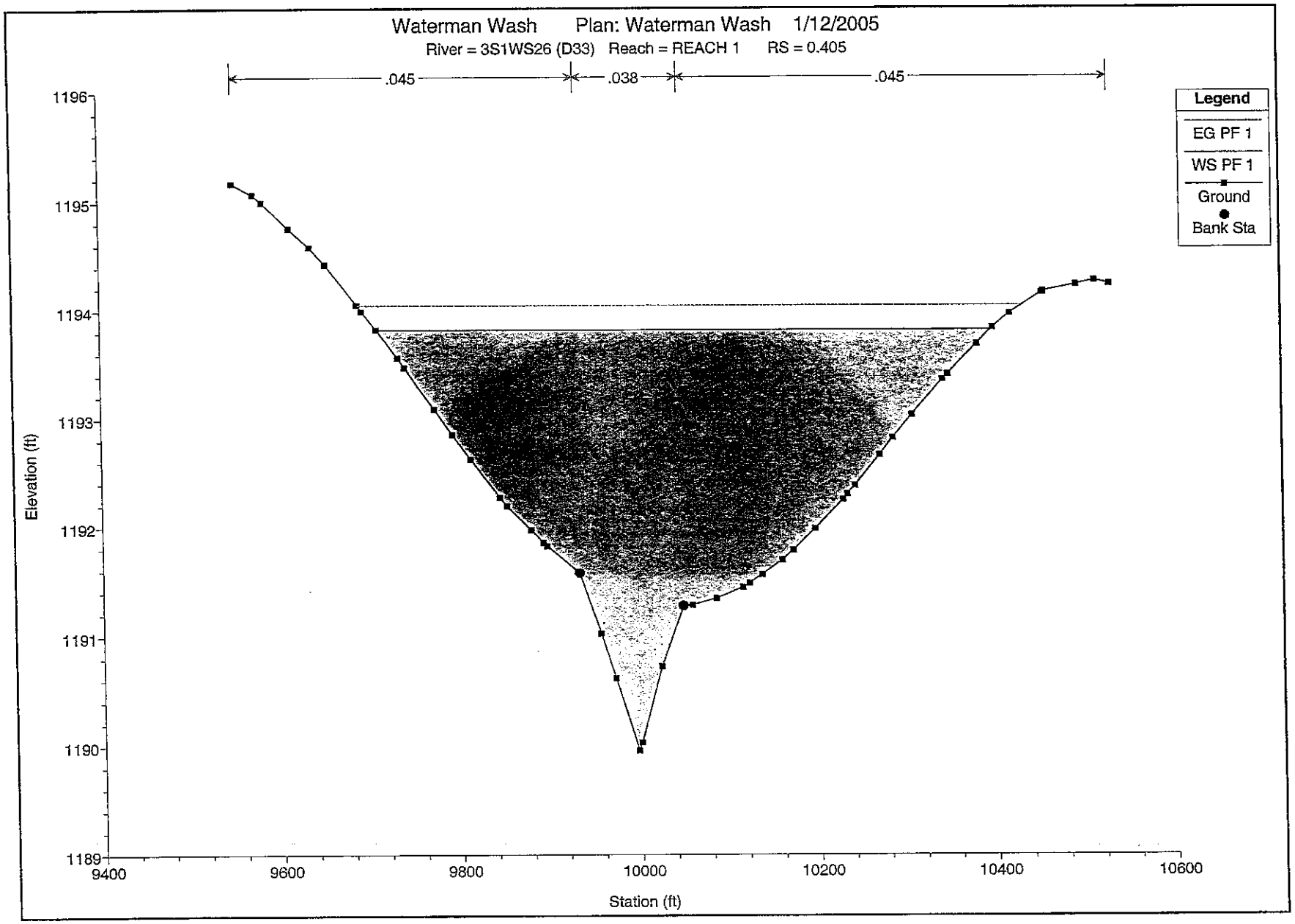
Change in Discharge based on Reach Length

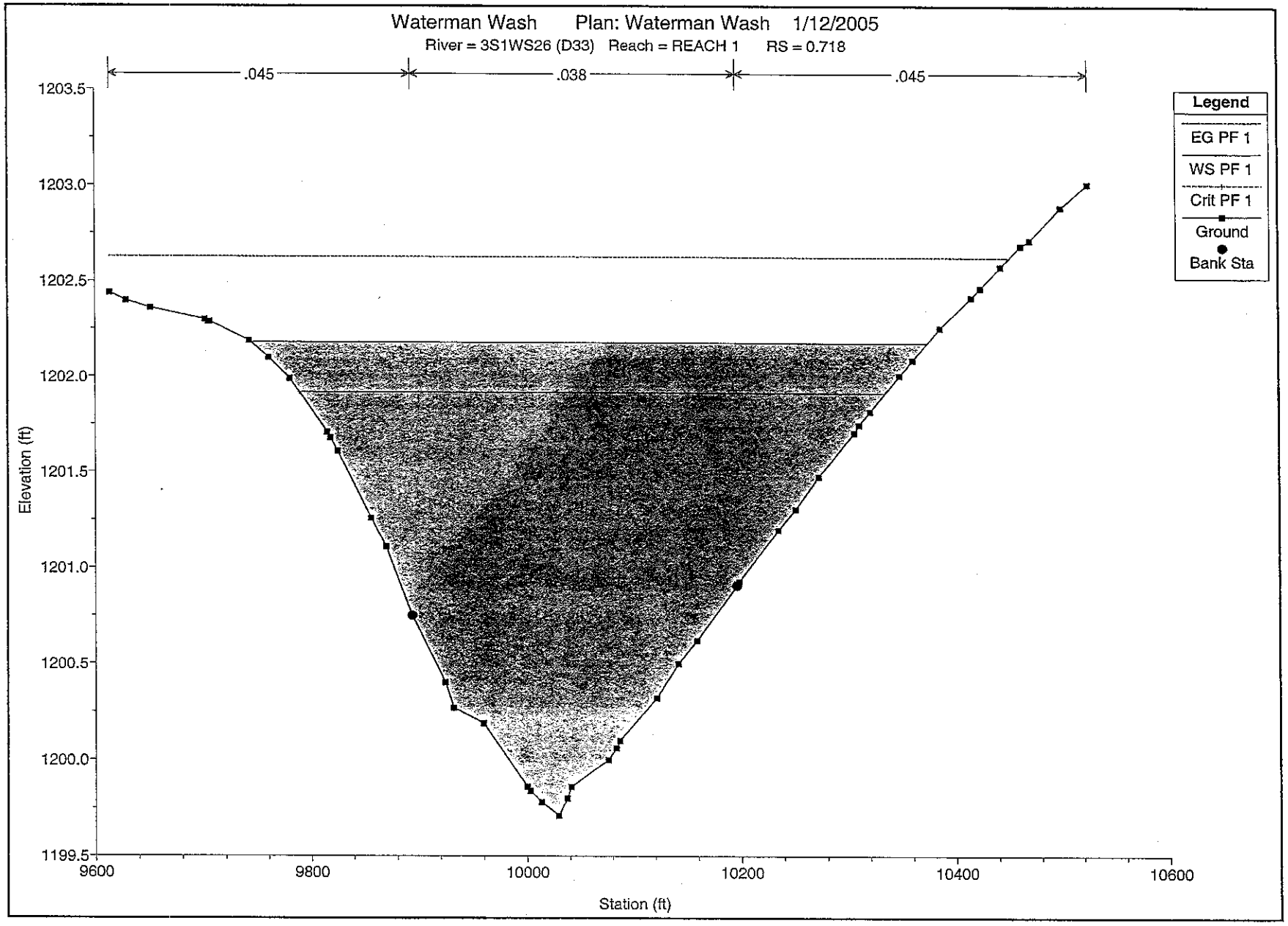
Wash ID: 3S1WS26 (D33)

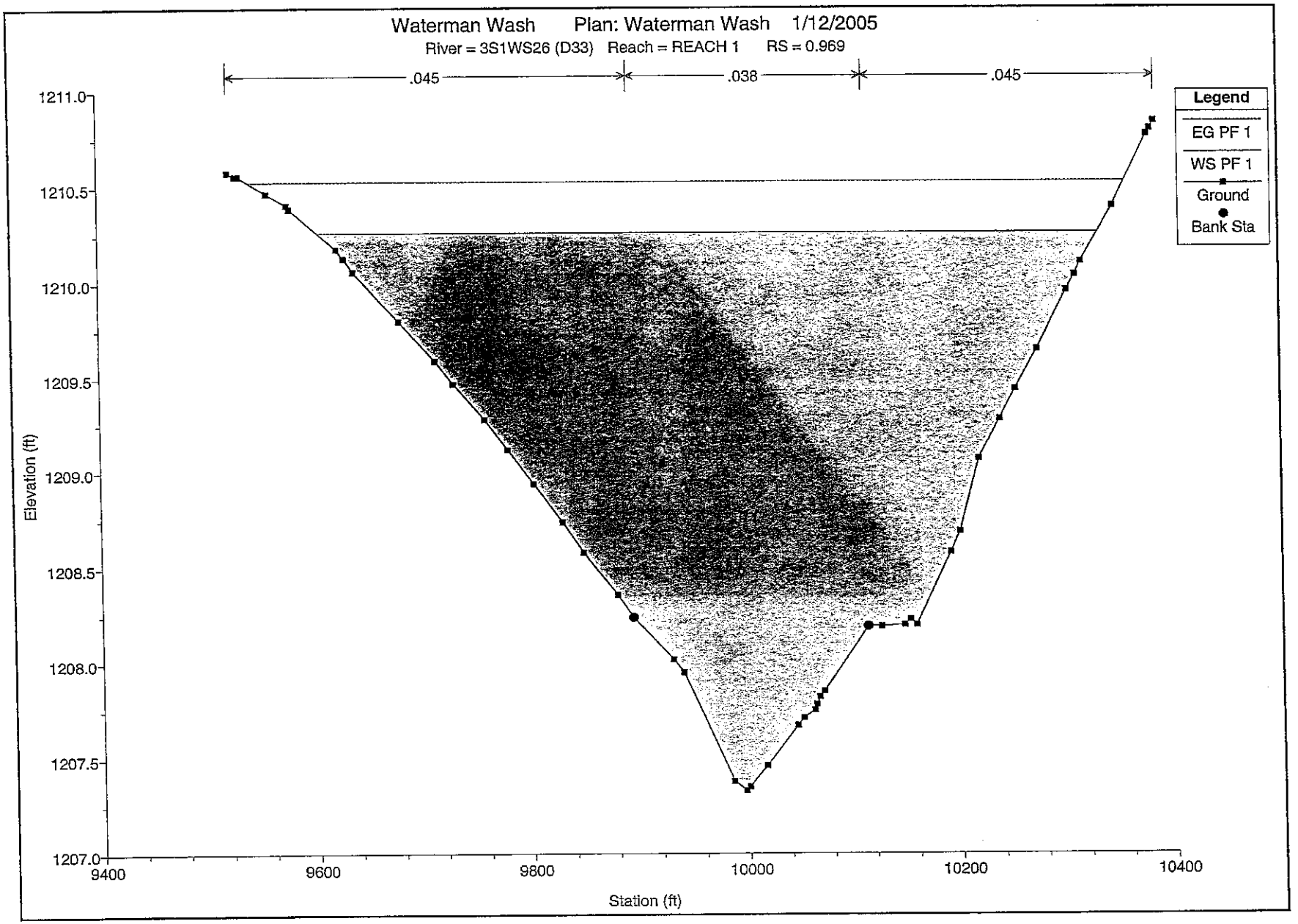
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPD22	2.227	4196	4200	4200
D33	1.965	4121	4120	4100
D33	1.704	4046	4050	4000
D33	1.457	3974	3970	4000
D33	1.217	3905	3910	3900
D33	0.969	3834	3830	3800
D33	0.718	3762	3760	3800
D33	0.405	3672	3670	3700
D33	0.201	3613	3610	3600
CPD33	0.006	3557	3560	3600

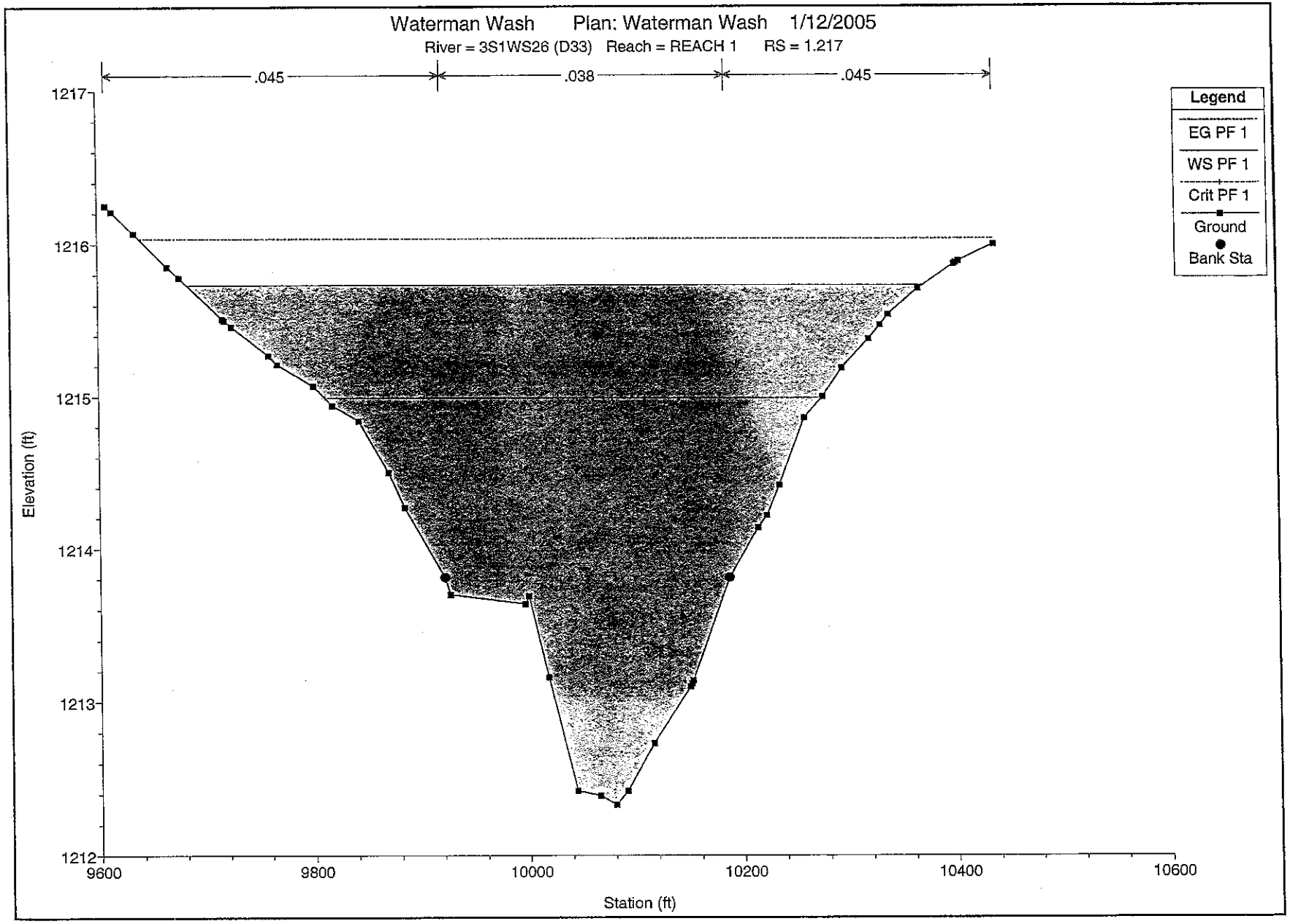

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 0.006 Cross section within Waterman Wash floodplain.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1186
1184
1182
1180
1178
1176
1174
9400
9600
9800
10000
10200
10400
10600
Station (ft)

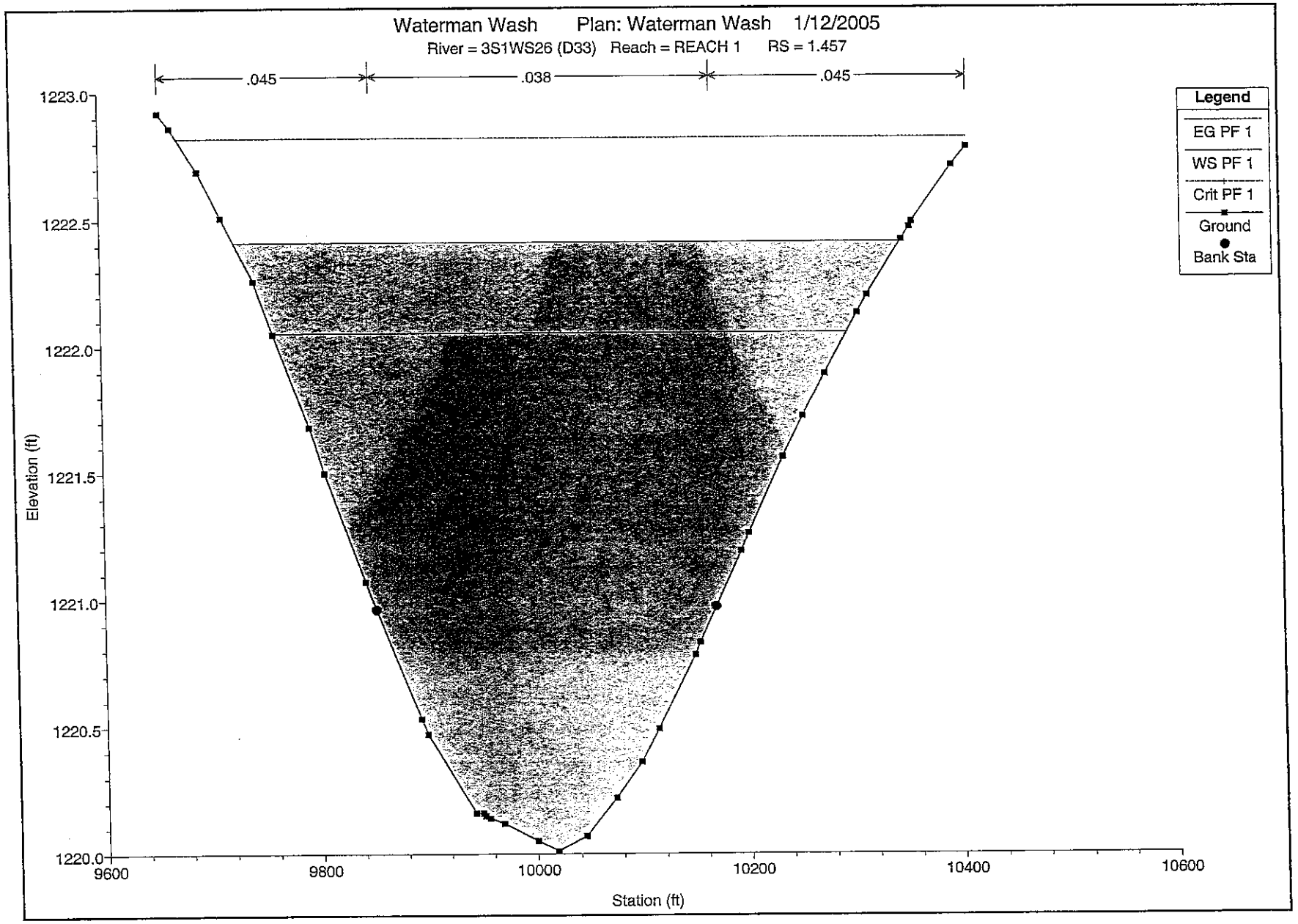

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 0.201
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1189
1188
1187
1186
1185
1184
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

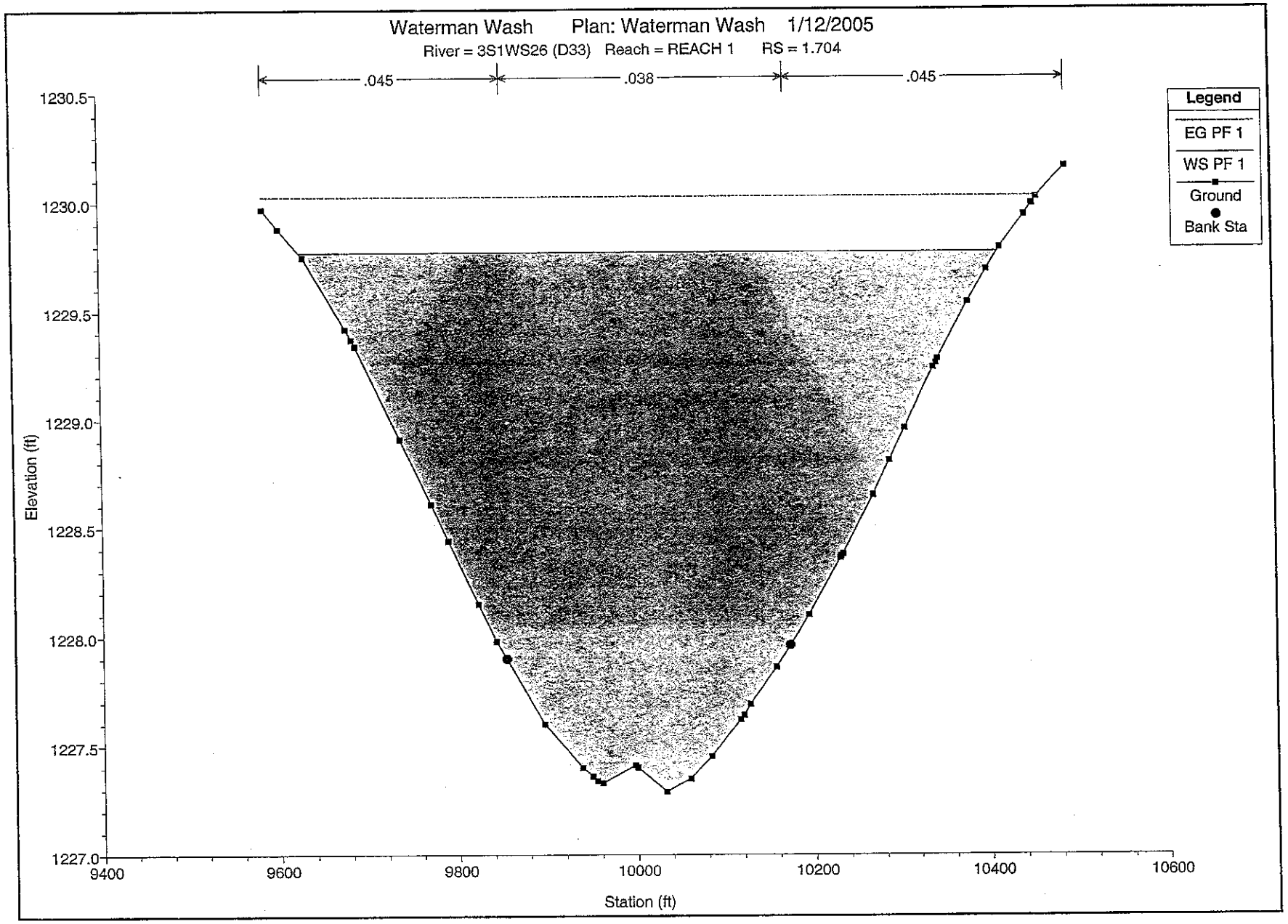

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 0.405
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1196
1195
1194
1193
1192
1191
1190
1189
9400
9600
9800
10000
10200
10400
10600
Station (ft)

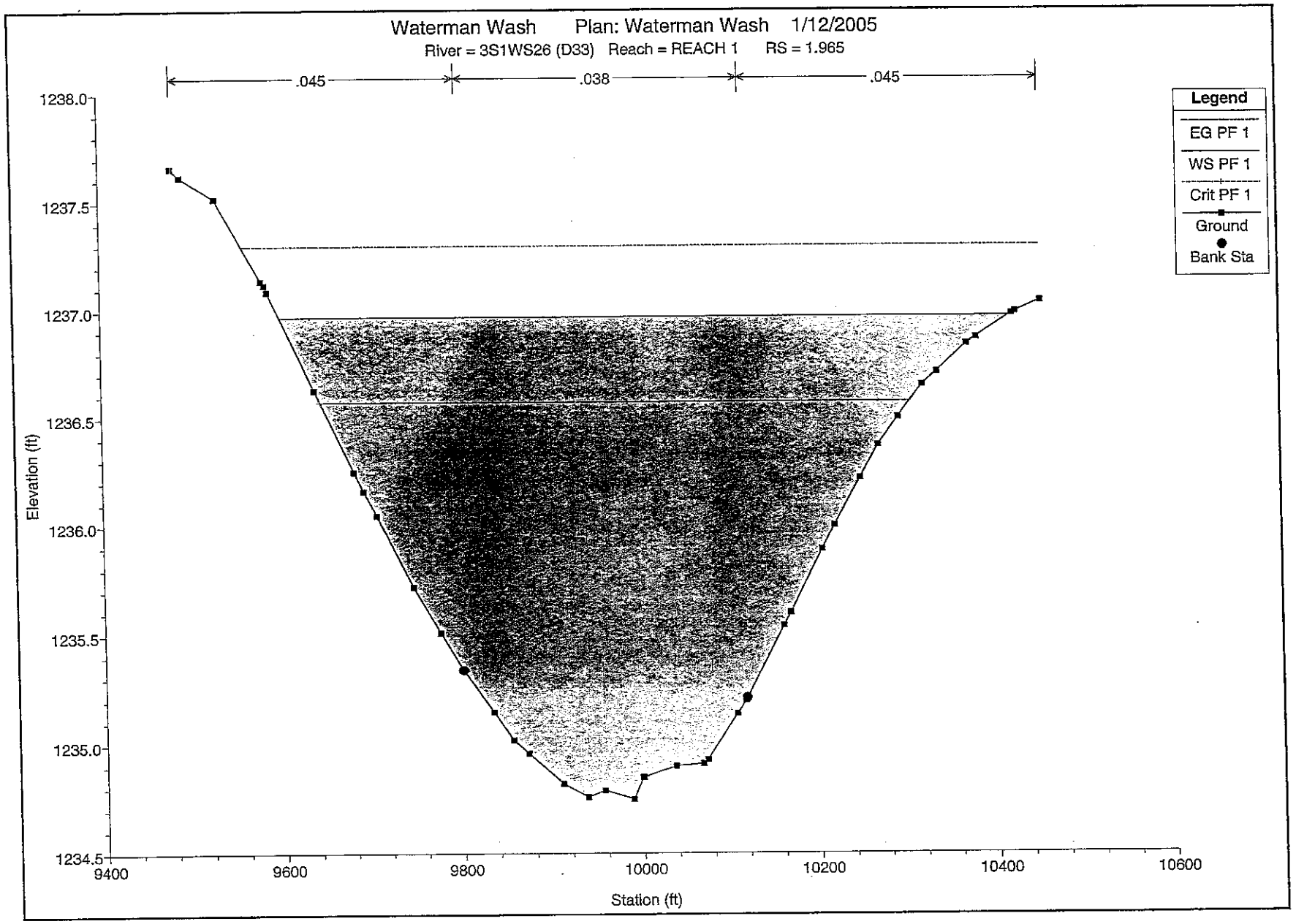

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 0.718
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1203.5
1203.0
1202.5
1202.0
1201.5
1201.0
1200.5
1200.0
1199.5
9600
9800
10000
10200
10400
10600
Station (ft)

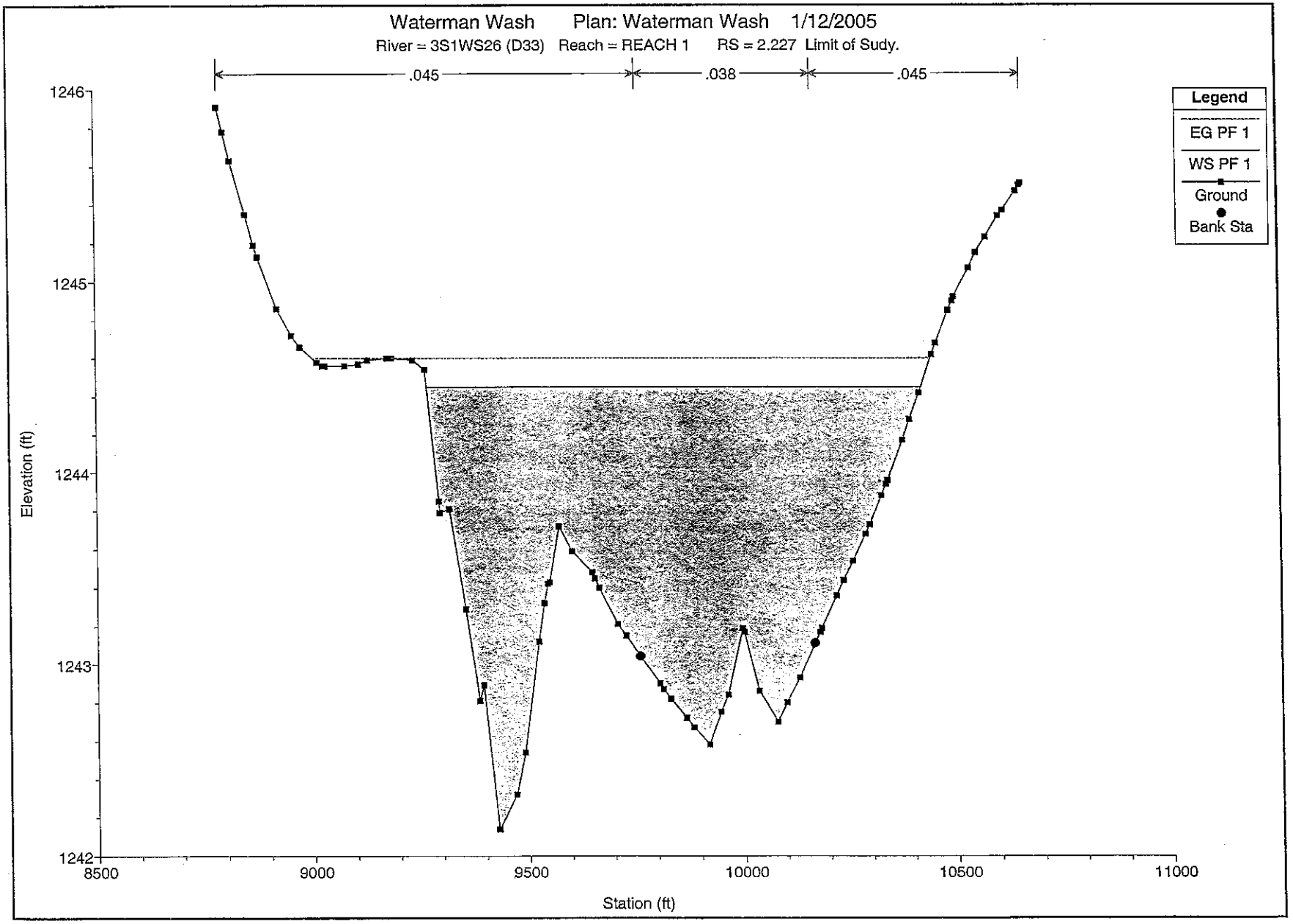

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 0.969
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1211.0
1210.5
1210.0
1209.5
1209.0
1208.5
1208.0
1207.5
1207.0
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 1.217
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1217
1216
1215
1214
1213
1212
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 1.457
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1223.0
1222.5
1222.0
1221.5
1221.0
1220.5
1220.0
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 1.704
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1230.5
1230.0
1229.5
1229.0
1228.5
1228.0
1227.5
1227.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 1.965
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1238.0
1237.5
1237.0
1236.5
1236.0
1235.5
1235.0
1234.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS26 (D33) Reach = REACH 1 RS = 2.227 Limit of Sudy.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1246
1245
1244
1243
1242
8500
9000
9500
10000
10500
11000
Station (ft)

MODEL: WATERMAN WASH

REACH: 3S1WS25B (D32)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

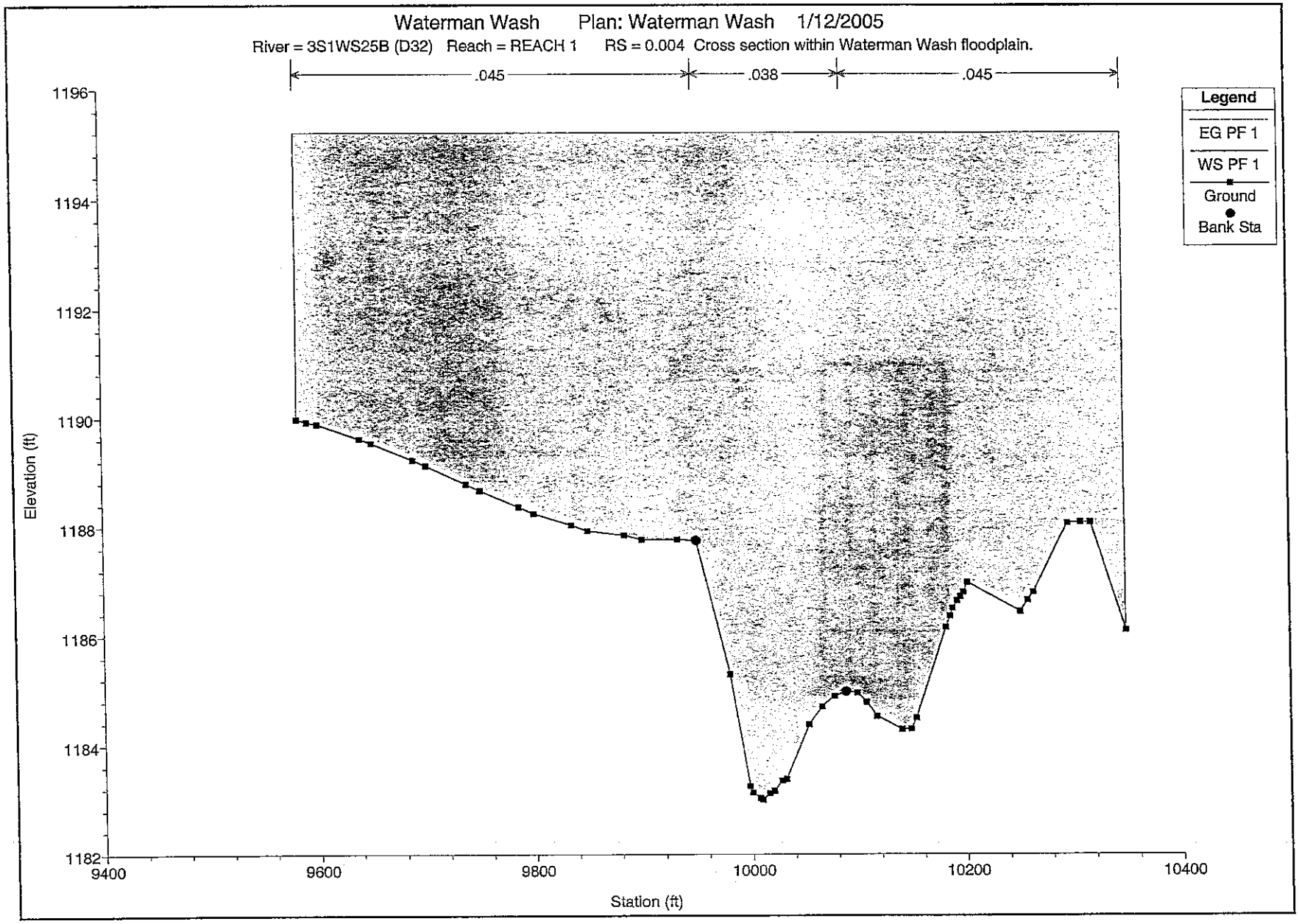
Wash ID: 3S1WS25B (D32)

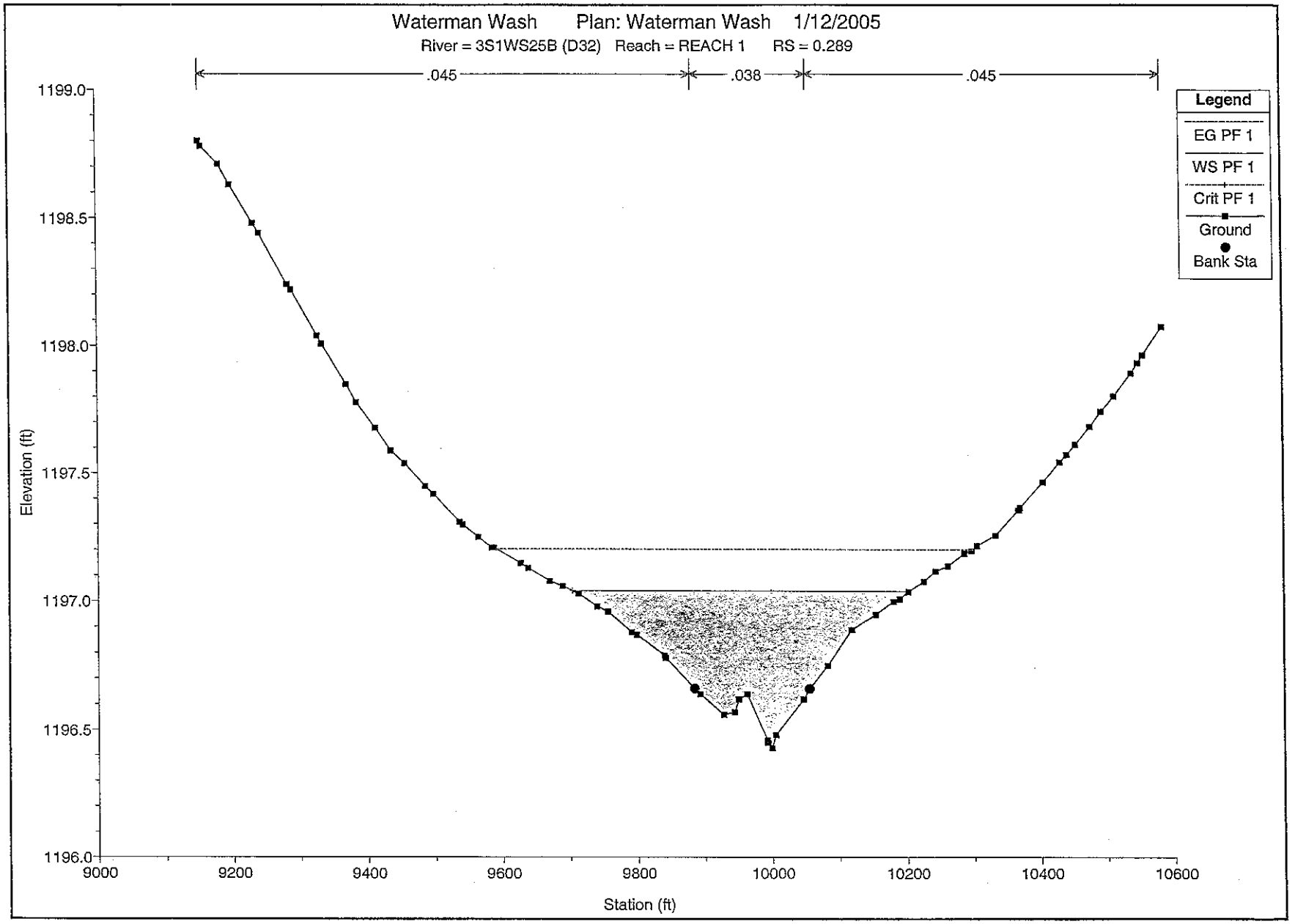
Subbasin: D32

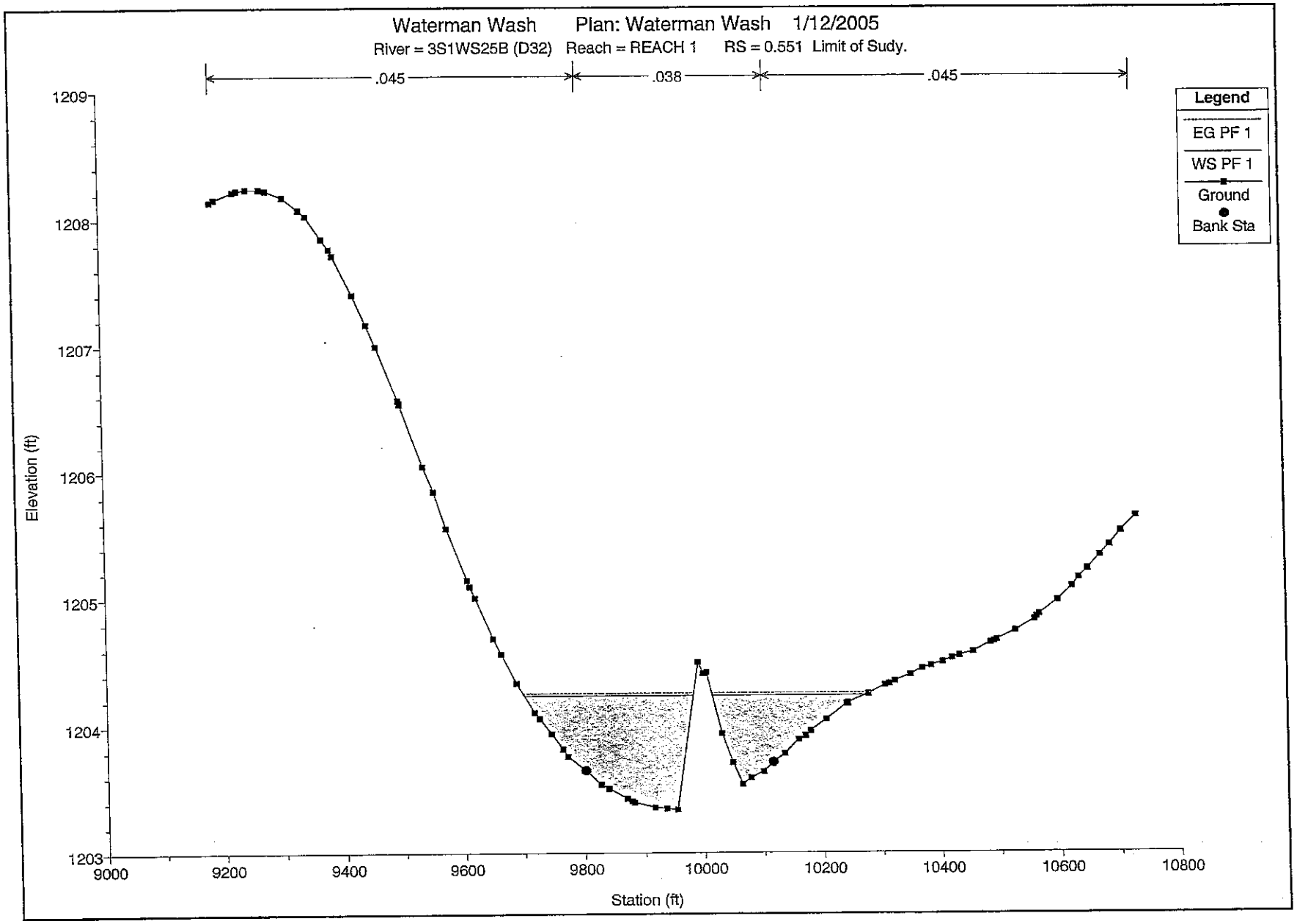
Total Discharge (cfs) = 617

Total Area (acres) = 321

X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
0.551	141	44.0	270
0.289	192	59.7	370
0.004	219	68.2	420


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25B (D32) Reach = REACH 1 RS = 0.004 Cross section within Waterman Wash floodplain.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1196
1194
1192
1190
1188
1186
1184
1182
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25B (D32) Reach = REACH 1 RS = 0.289
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1199.0
1198.5
1198.0
1197.5
1197.0
1196.5
1196.0
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25B (D32) Reach = REACH 1 RS = 0.551 Limit of Sudy.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1209
1208
1207
1206
1205
1204
1203
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: WATERMAN WASH

REACH: 3S1WS25A (D31)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

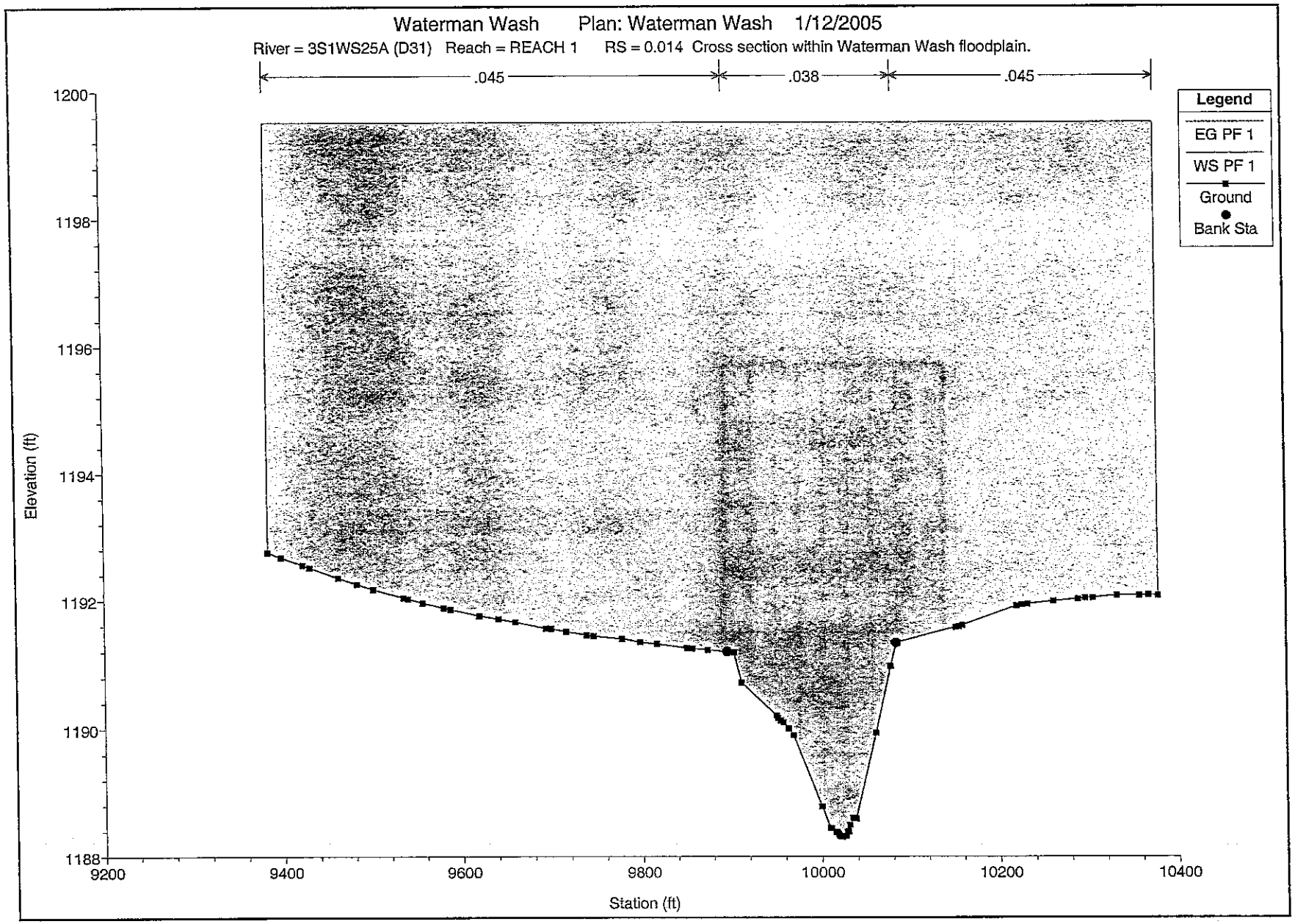
Wash ID: 3S1WS25A (D31)

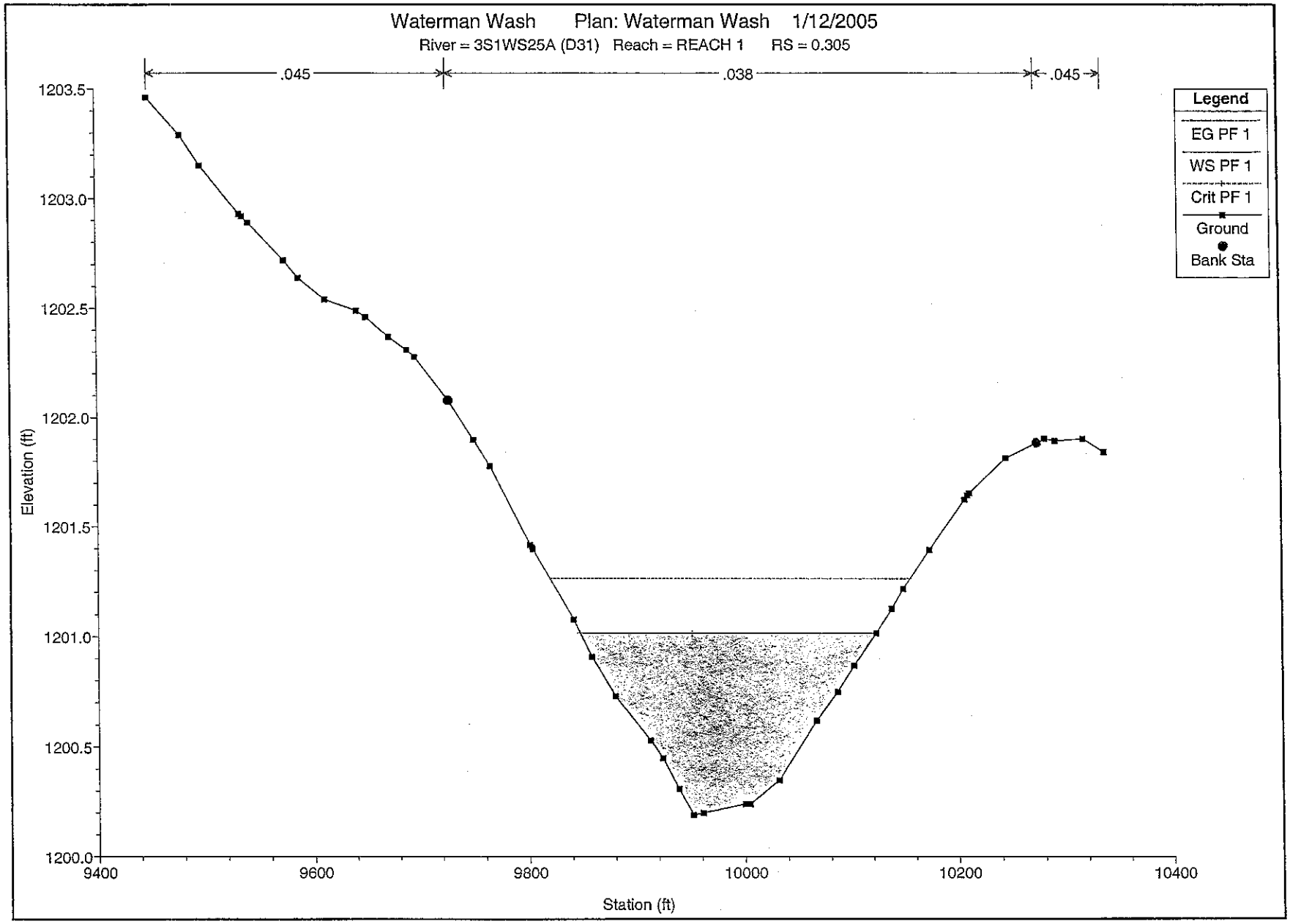
Subbasin: D31

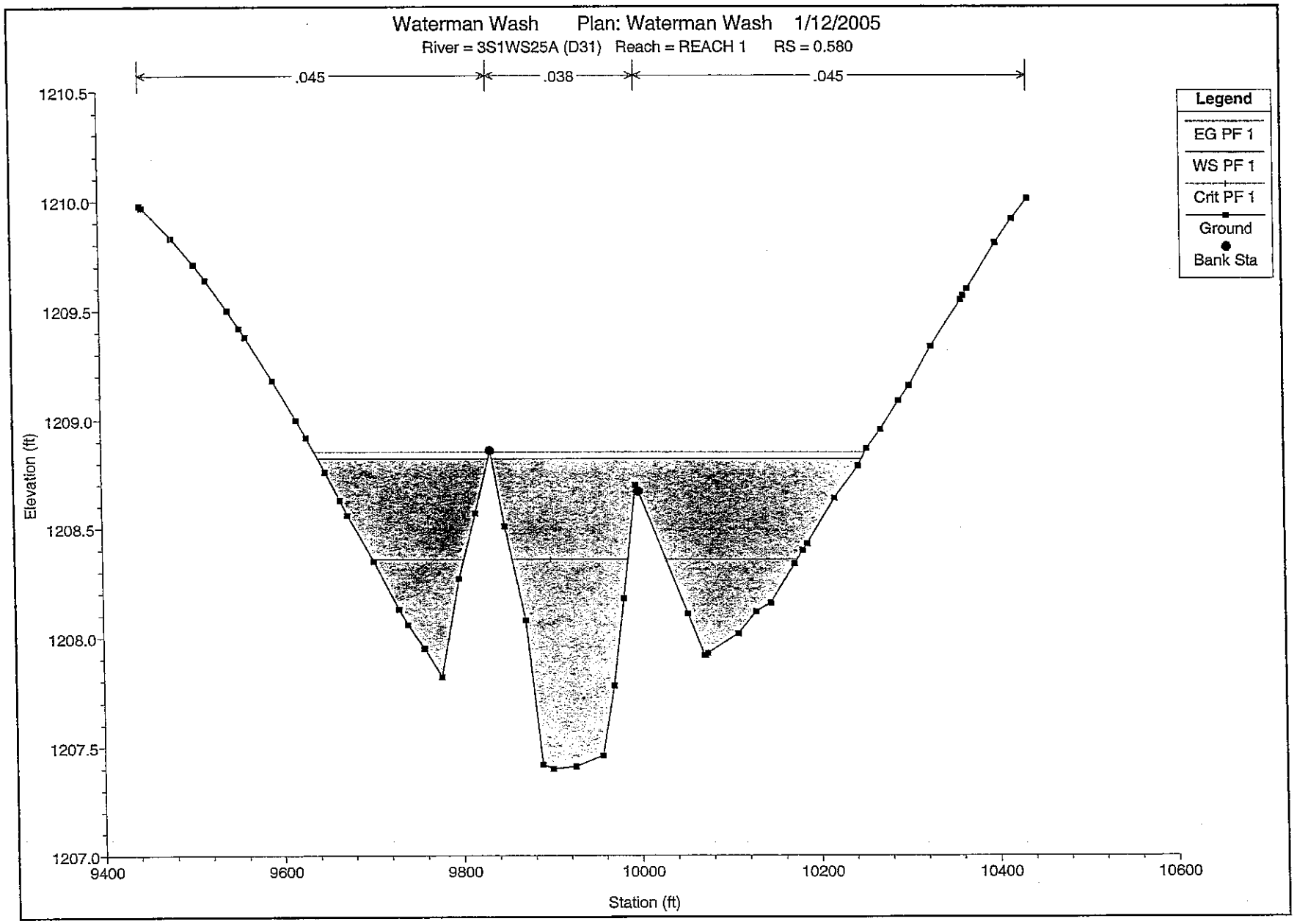
Total Discharge (cfs) = 607

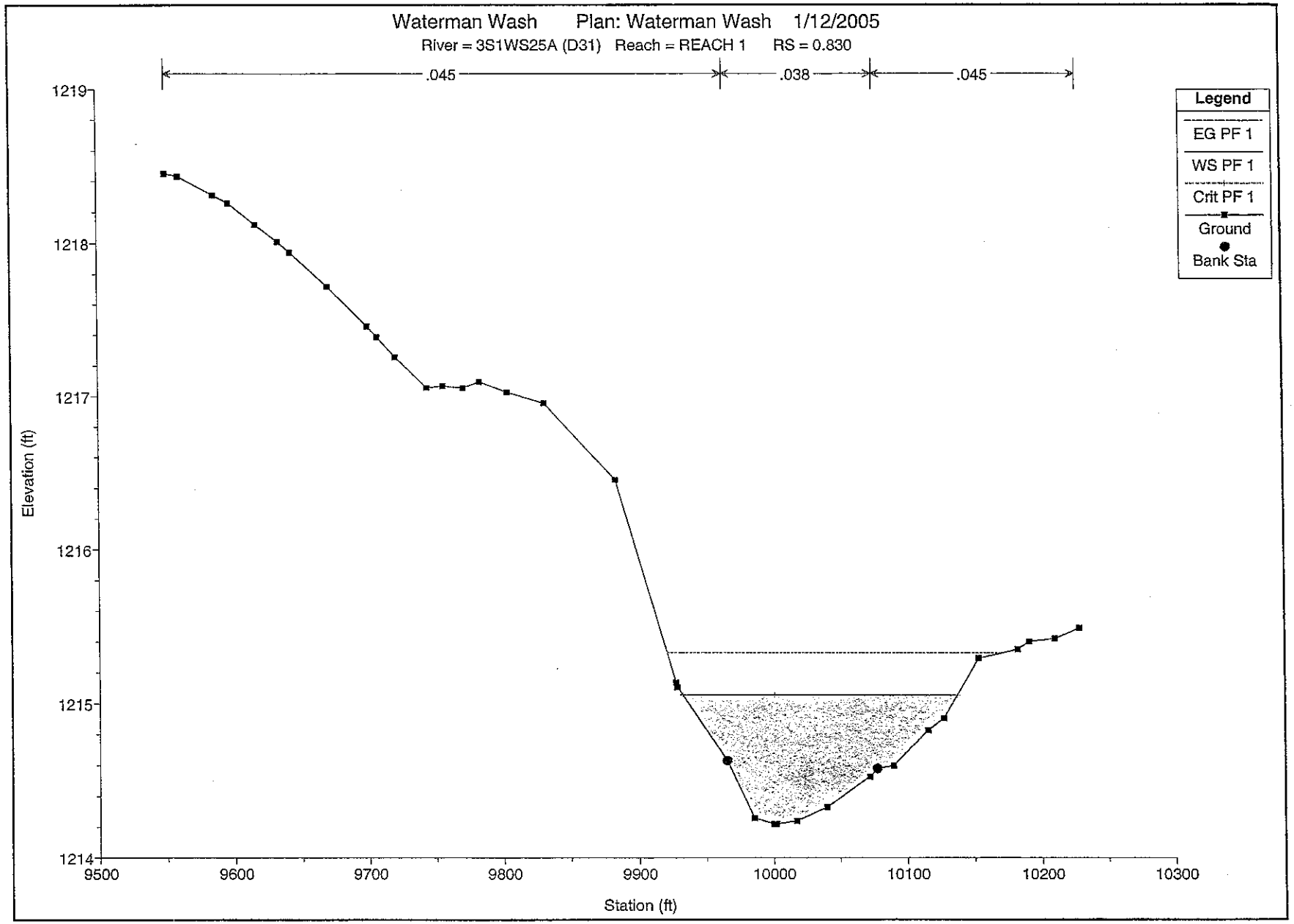
Total Area (acres) = 429

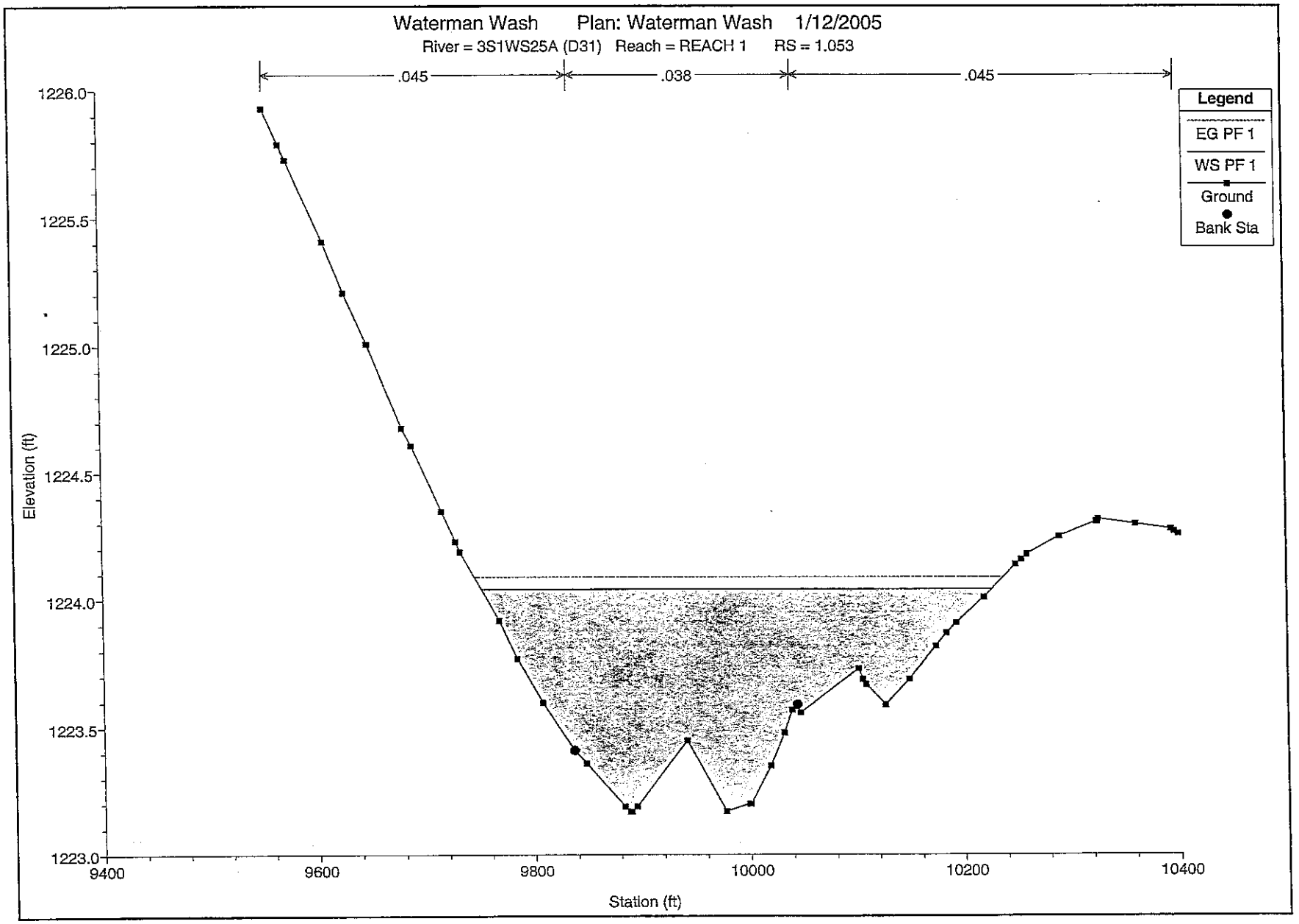
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
1.547	164	38.3	230
1.300	197	45.9	280
1.053	265	61.7	370
0.830	285	66.5	400
0.580	349	81.5	490
0.305	383	89.4	540
0.014	429	99.9	610

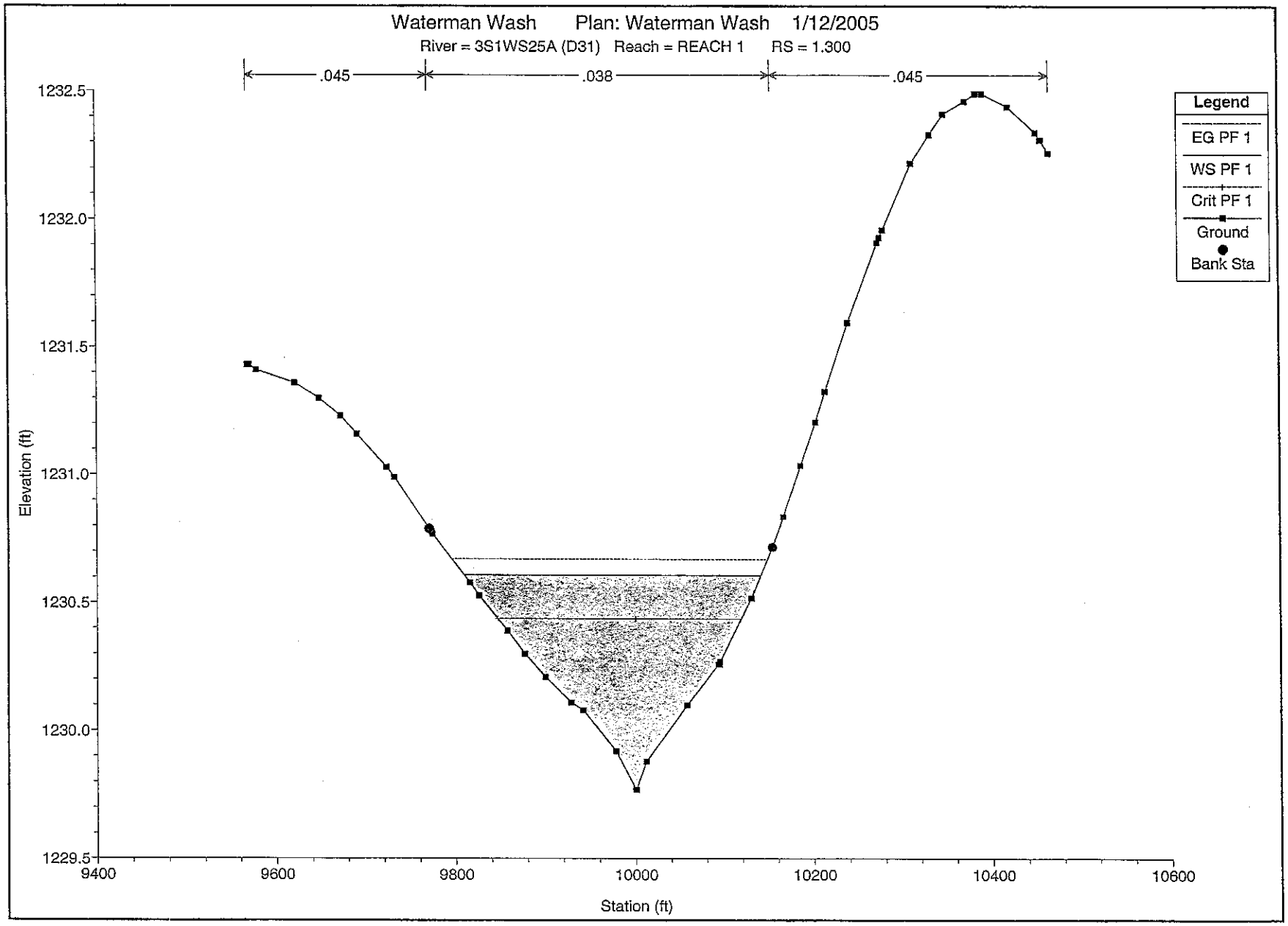

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 0.014 Cross section within Waterman Wash floodplain.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1200
1198
1196
1194
1192
1190
1188
9200
9400
9600
9800
10000
10200
10400
Station (ft)

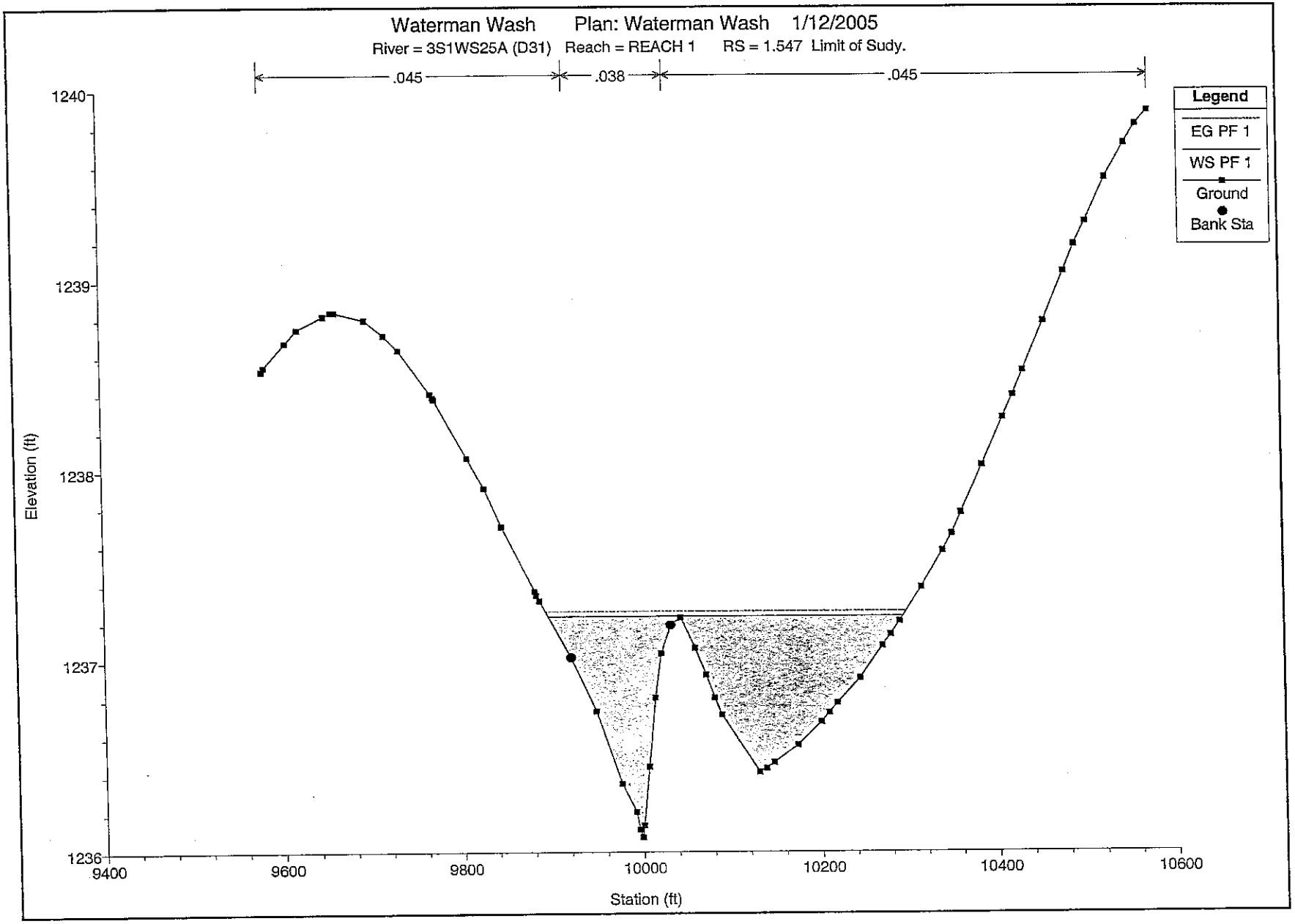

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 0.305
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1203.5
1203.0
1202.5
1202.0
1201.5
1201.0
1200.5
1200.0
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 0.580
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1210.5
1210.0
1209.5
1209.0
1208.5
1208.0
1207.5
1207.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 0.830
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1219
1218
1217
1216
1215
1214
9500
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 1.053
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1226.0
1225.5
1225.0
1224.5
1224.0
1223.5
1223.0
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 1.300
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1232.5
1232.0
1231.5
1231.0
1230.5
1230.0
1229.5
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS25A (D31) Reach = REACH 1 RS = 1.547 Limit of Sudy.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1240
1239
1238
1237
1236
9400
9600
9800
10000
10200
10400
10600
Station (ft)

MODEL: WATERMAN WASH

REACH: 4S1ES15A (F34)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 4S1ES15A (F34)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
DVF27	1.824	1779	1780	1800
F34	1.554	1801	1800	1800
F34	1.294	1822	1820	1800
F34	1.019	1844	1840	1800
F34	0.752	1865	1860	1900
F34	0.548	1881	1880	1900
CPF34	0.278	1903	1900	1900
F34RIV	0.278	3469	3470	3500

Initial discharge is the flow from the with railroad model at divert DF27 at CPF27.
The discharge at CPF27 is not used since flow is routed to the east behind the railroad.
The discharge at 0.278 is 3469 cfs.

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 4S1ES15A (F34)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPF17	4.859	1202	1200	1200
F24	4.621	1186	1190	1200
F24	4.363	1169	1170	1200
F24	4.125	1153	1150	1200
F24	3.888	1137	1140	1100
F24	3.646	1120	1120	1100
F24	3.406	1104	1100	1100
CPF24	3.118	1085	1090	1100
F27	2.888	1122	1120	1100
F27	2.642	1162	1160	1200
F27	2.400	1201	1200	1200
F27	2.104	1248	1250	1200
CPF27	1.926	1277	1280	1300

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

Wash ID: 4S1ES15A (F34)

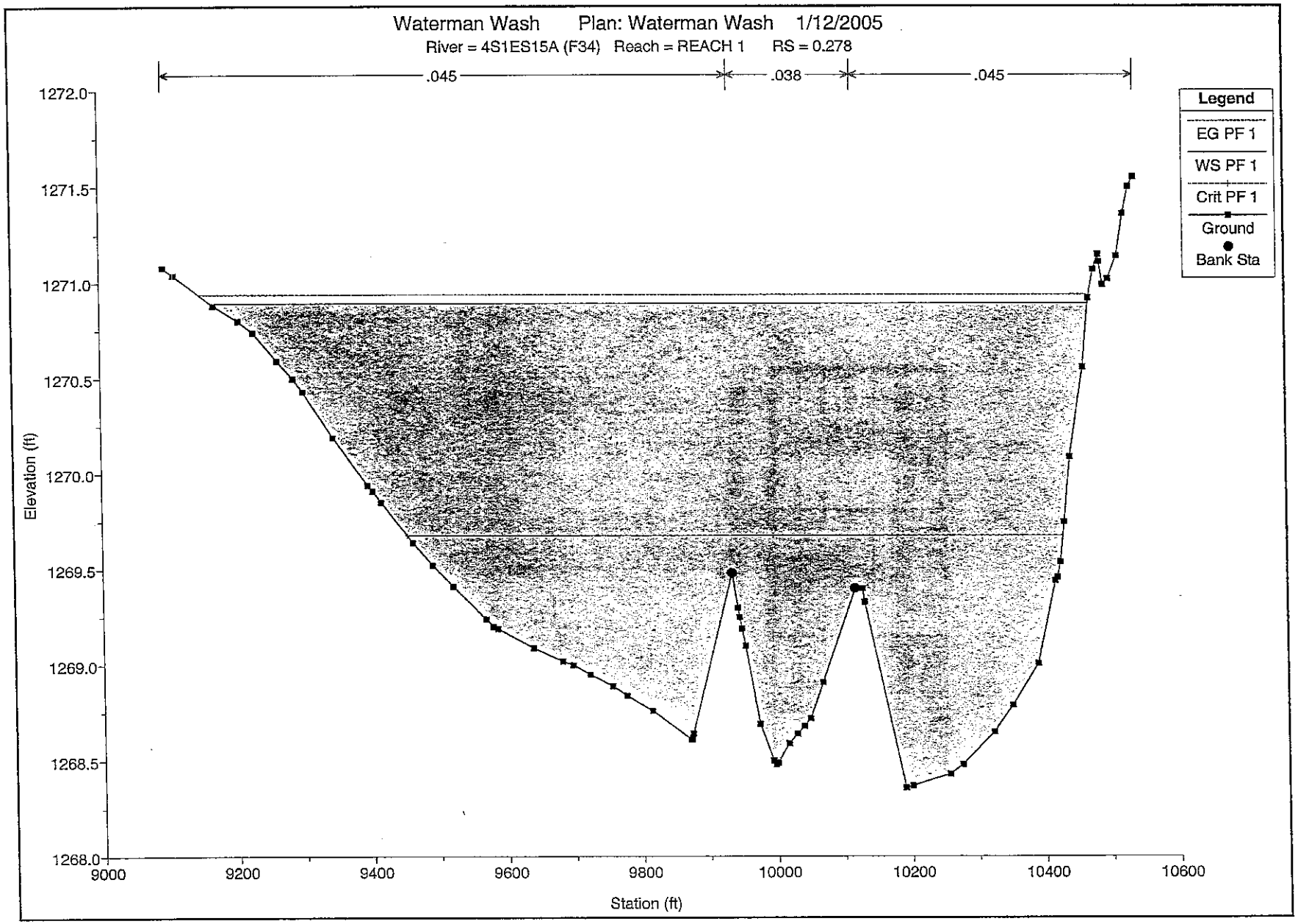
Subbasin: F17

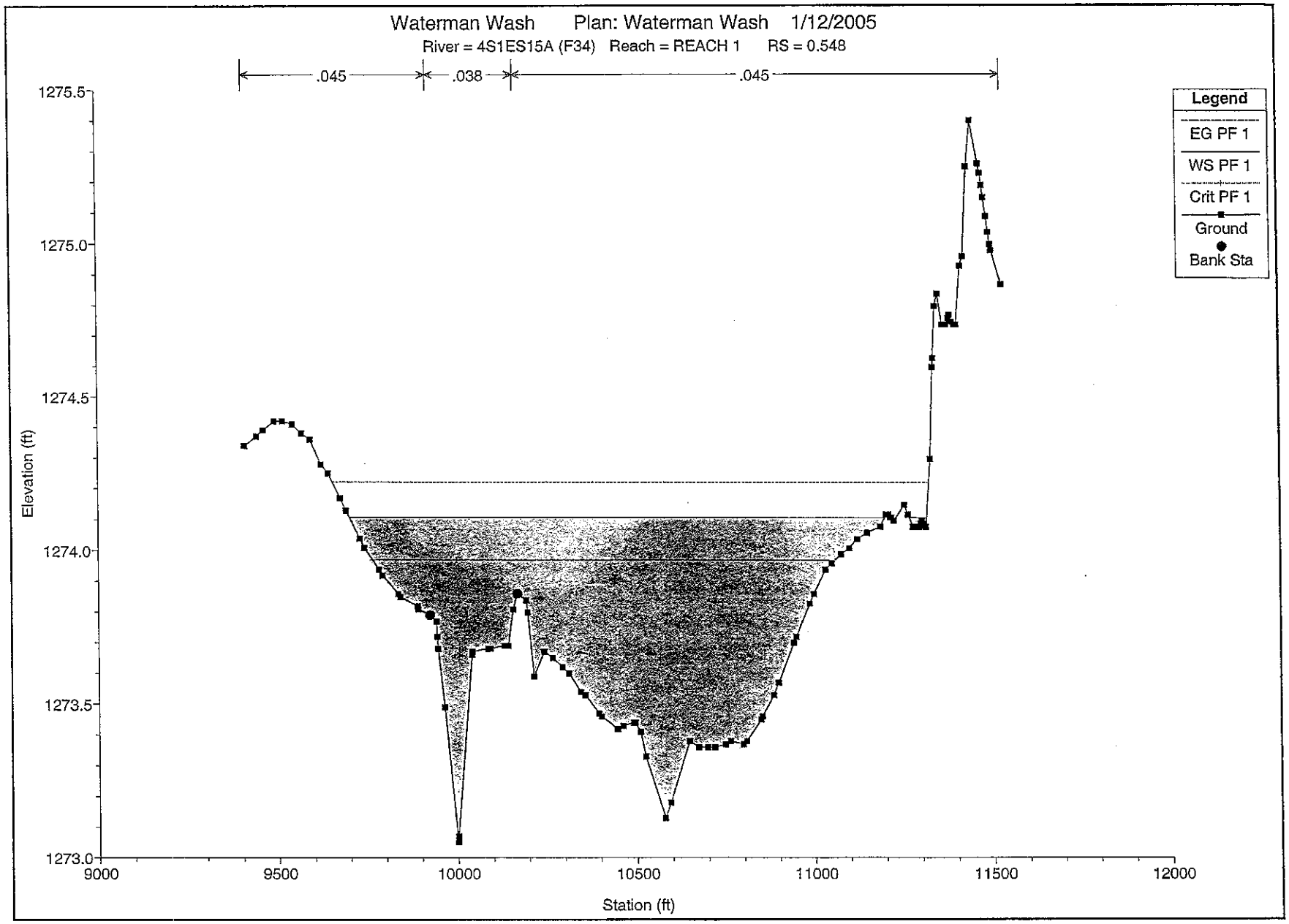
Total Discharge (cfs) = 1175

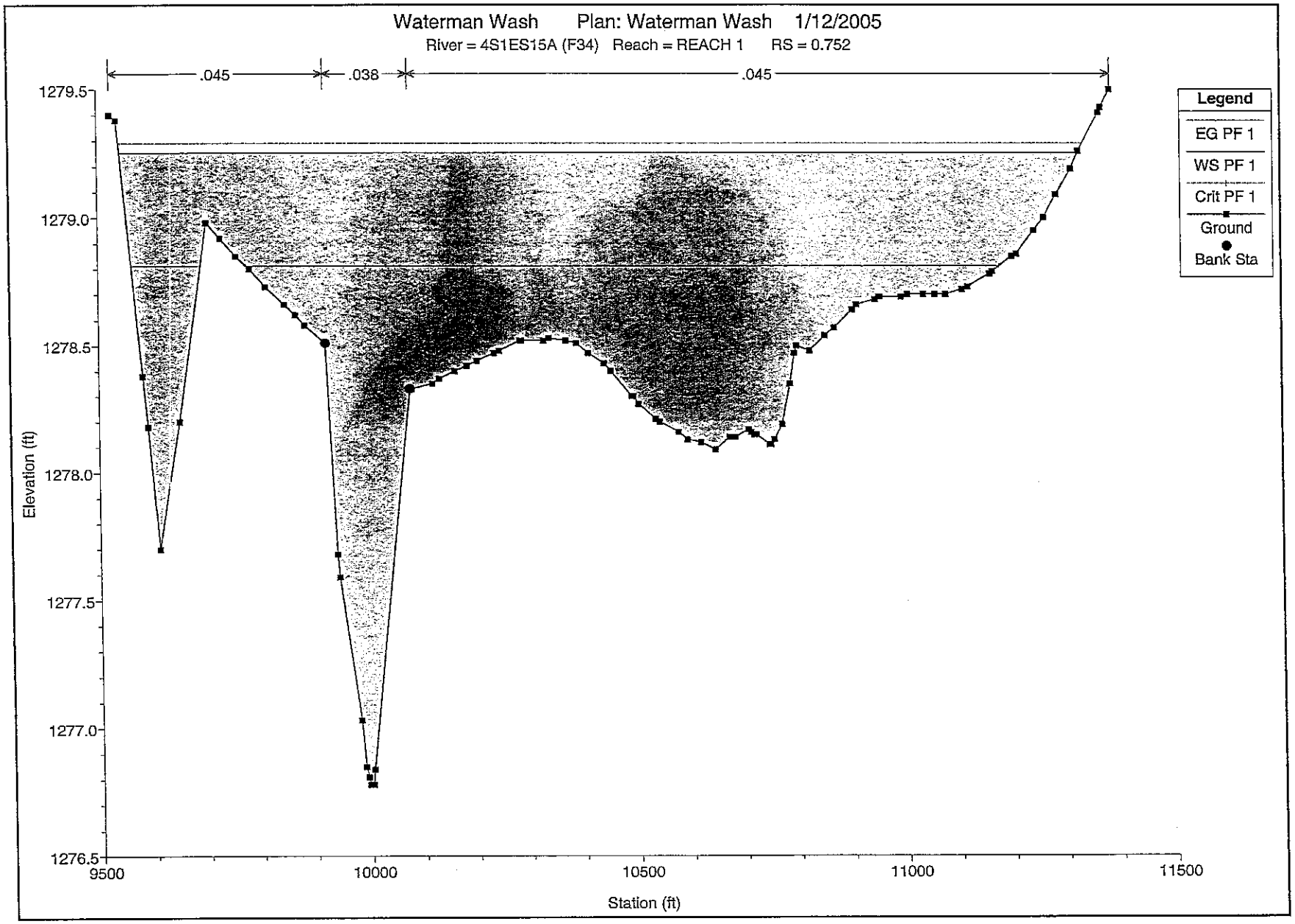
Total Area (acres) = 733

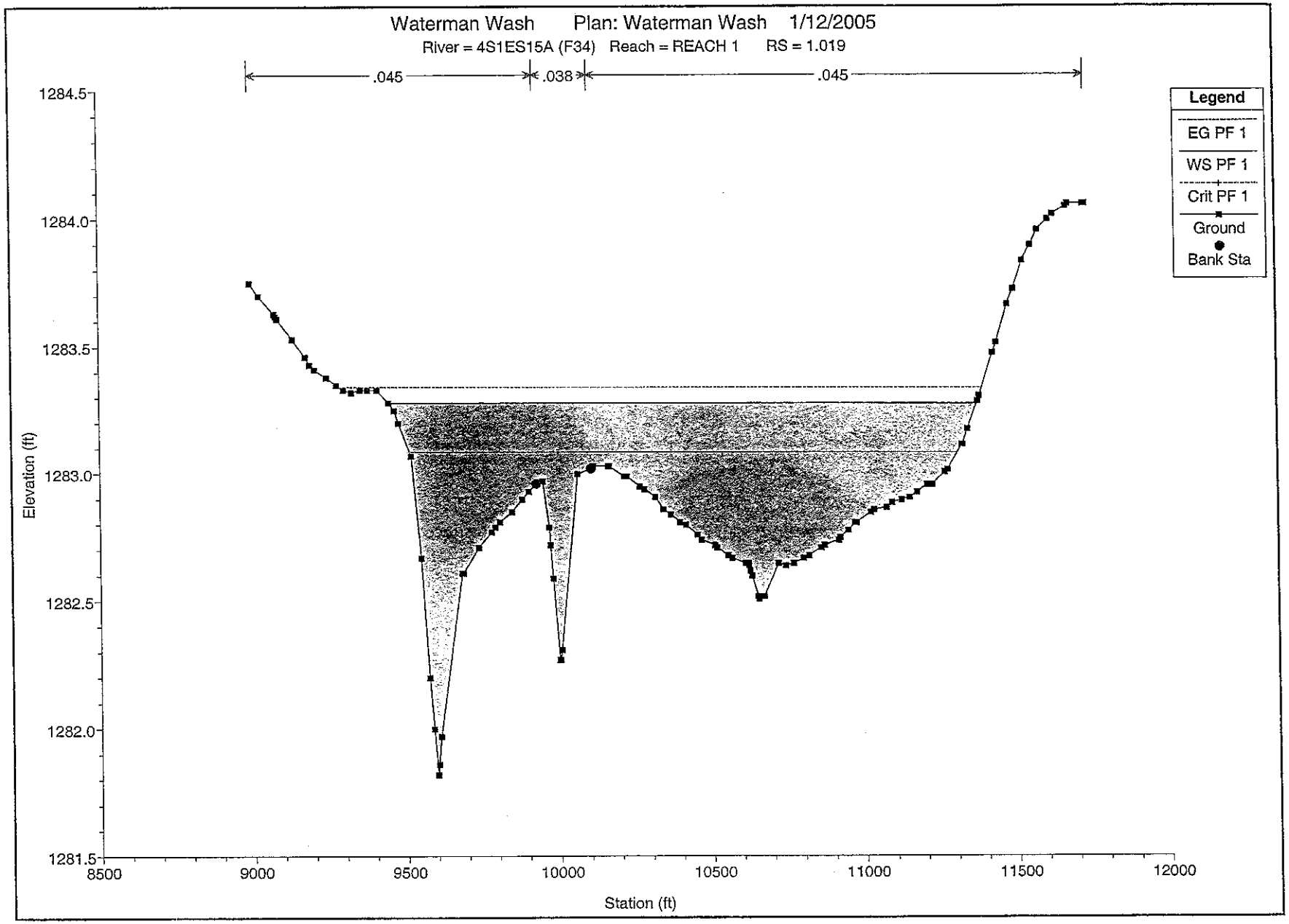
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
6.207	52	7.1	80
5.913	125	17.1	200
5.656	534	72.9	860
5.427	616	84.0	990
5.193*	692	94.4	1110

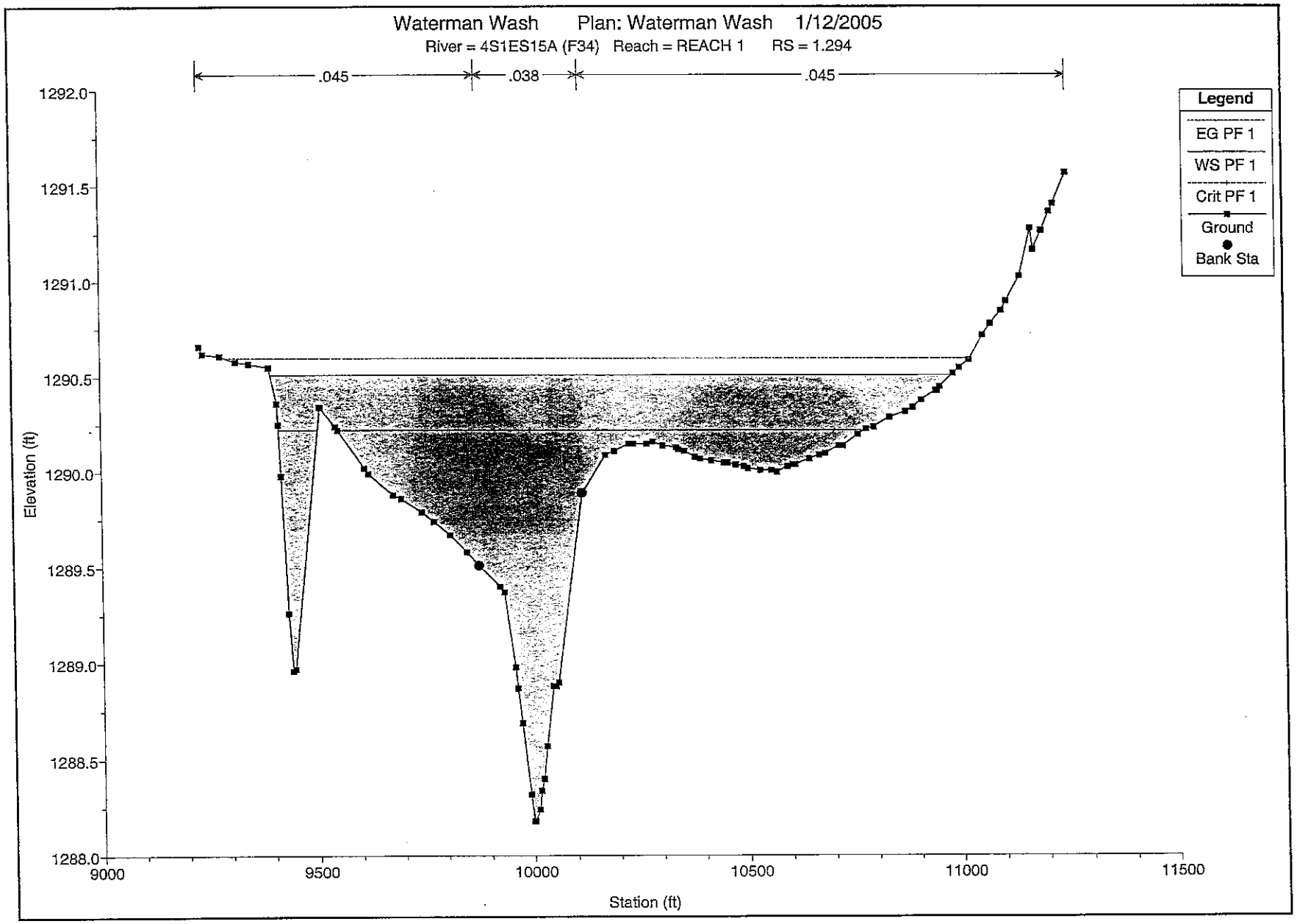
*Discharge at 5.193 = CPF17 - (1175 - 1110) cfs = 1137
CPF17 = 1202

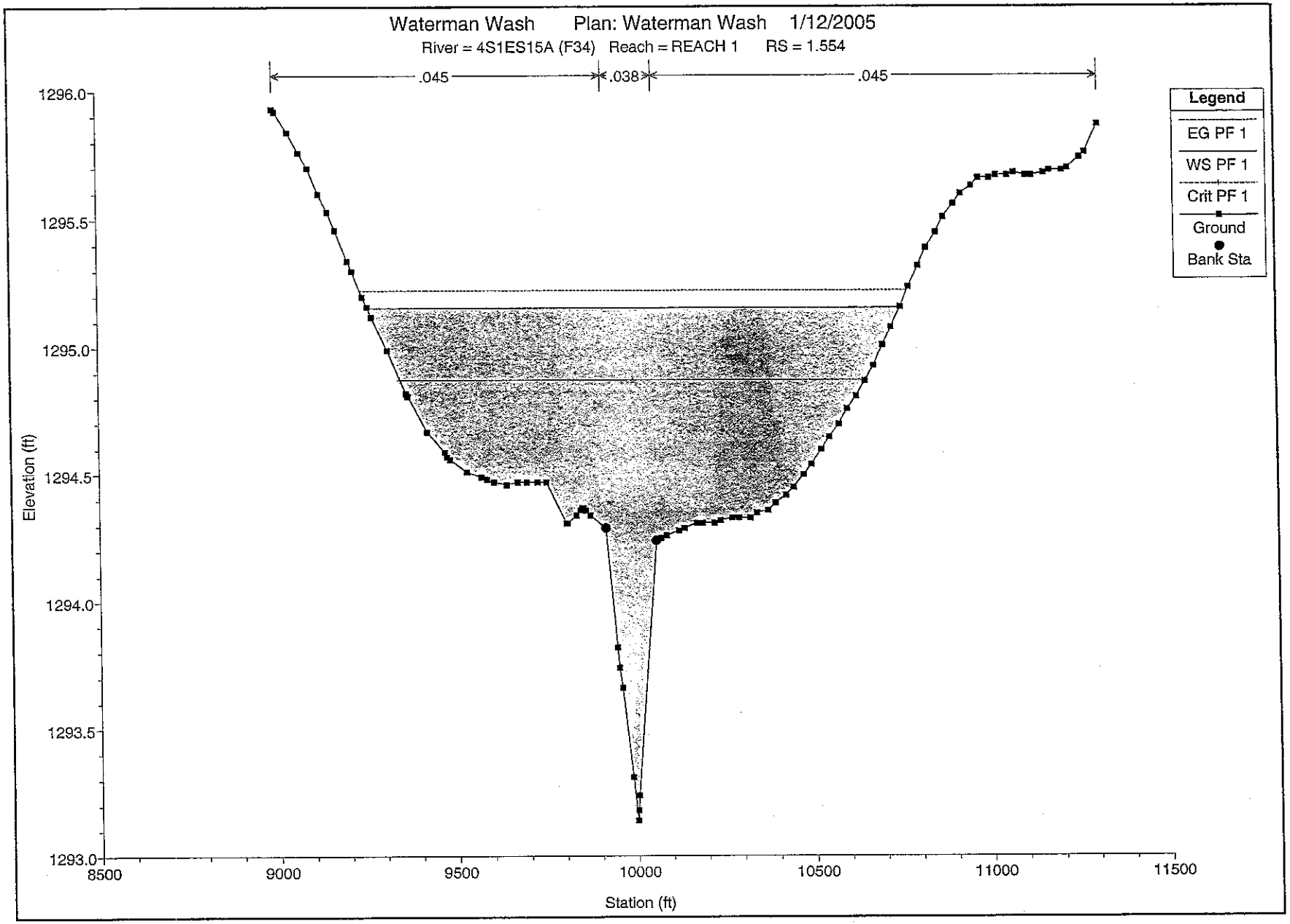

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 0.278
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1272.0
1271.5
1271.0
1270.5
1270.0
1269.5
1269.0
1268.5
1268.0
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

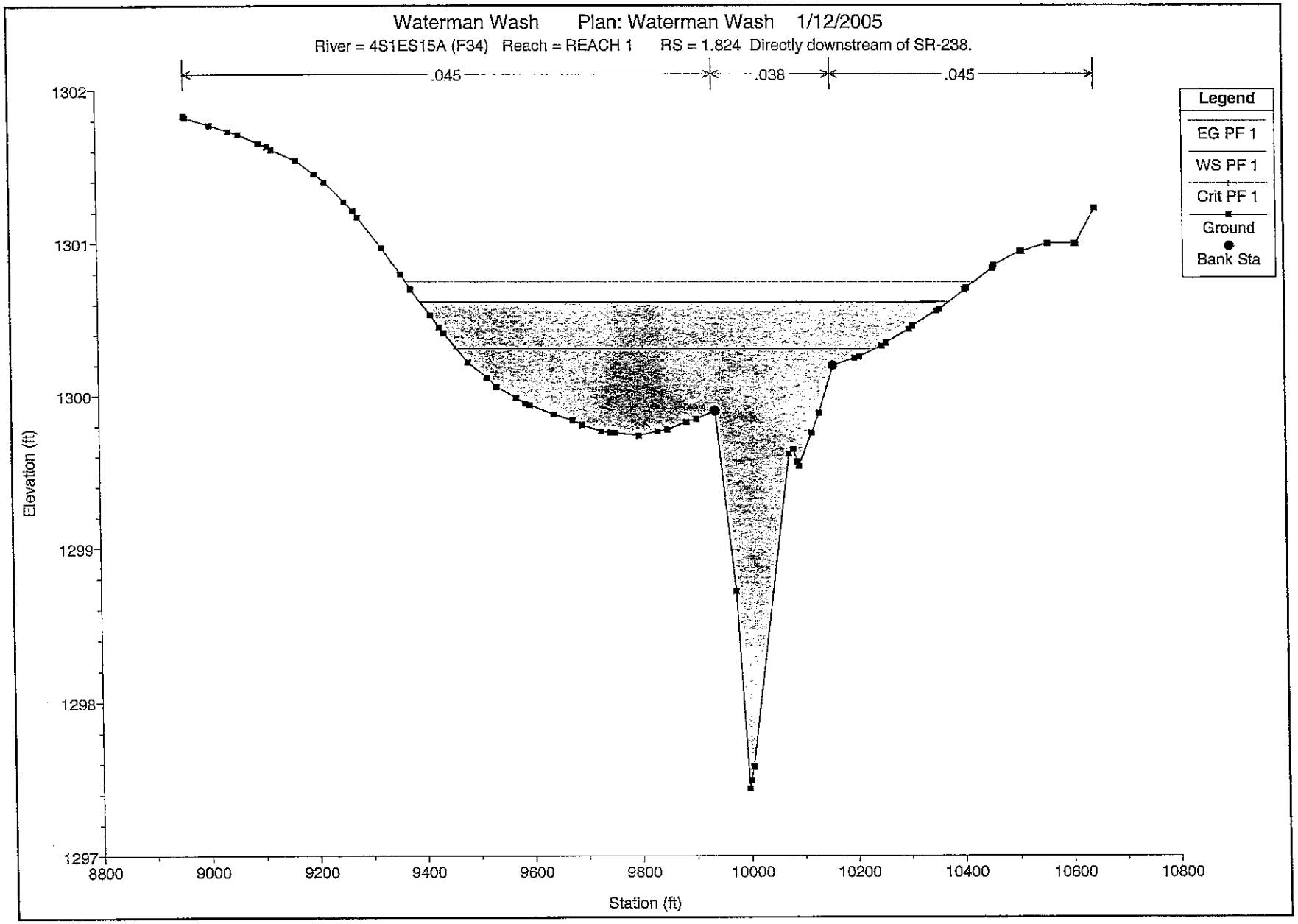

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 0.548
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1275.5
1275.0
1274.5
1274.0
1273.5
1273.0
9000
9500
10000
10500
11000
11500
12000
Station (ft)

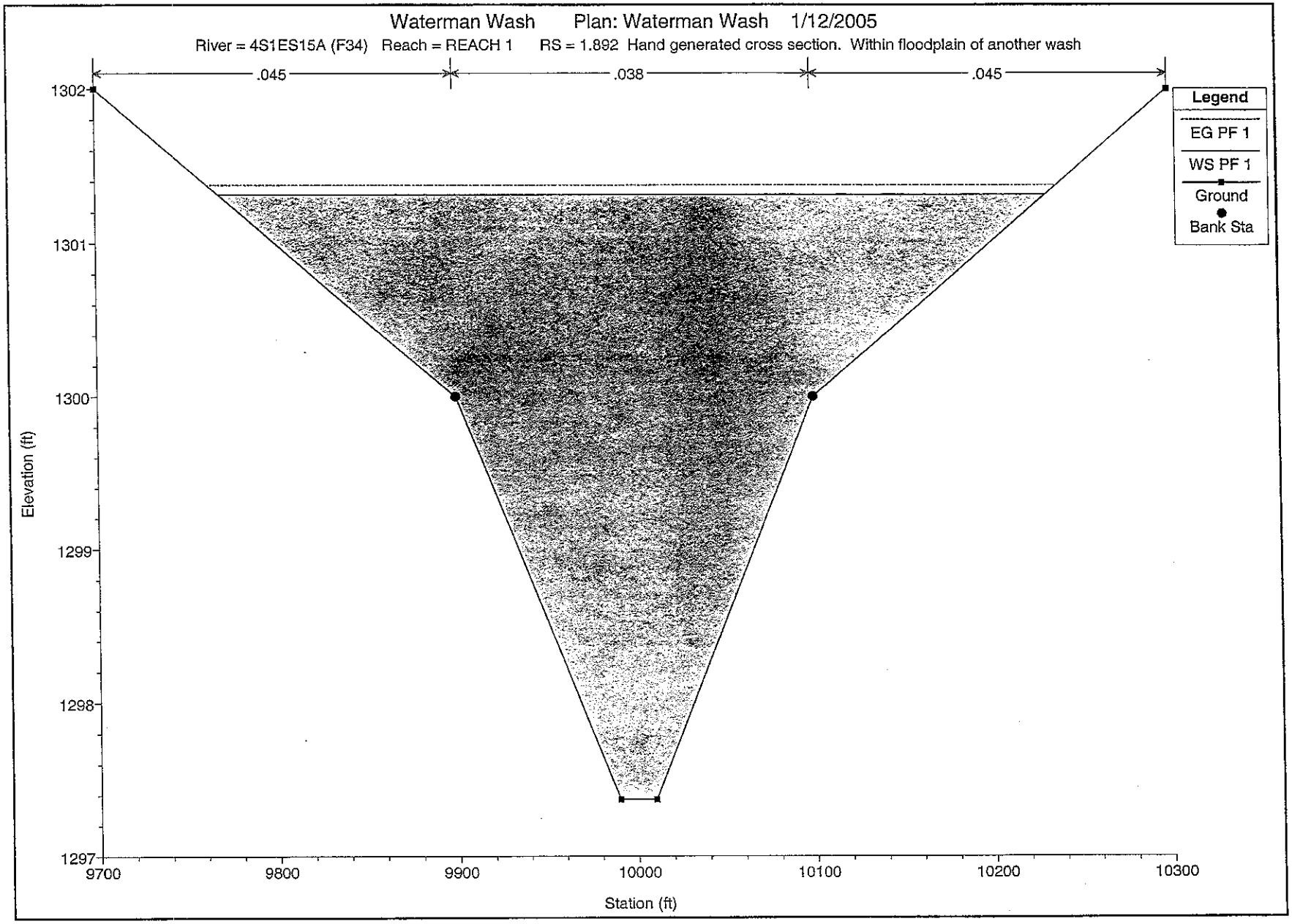

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 0.752
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1279.5
1279.0
1278.5
1278.0
1277.5
1277.0
1276.5
9500
10000
10500
11000
11500
Station (ft)

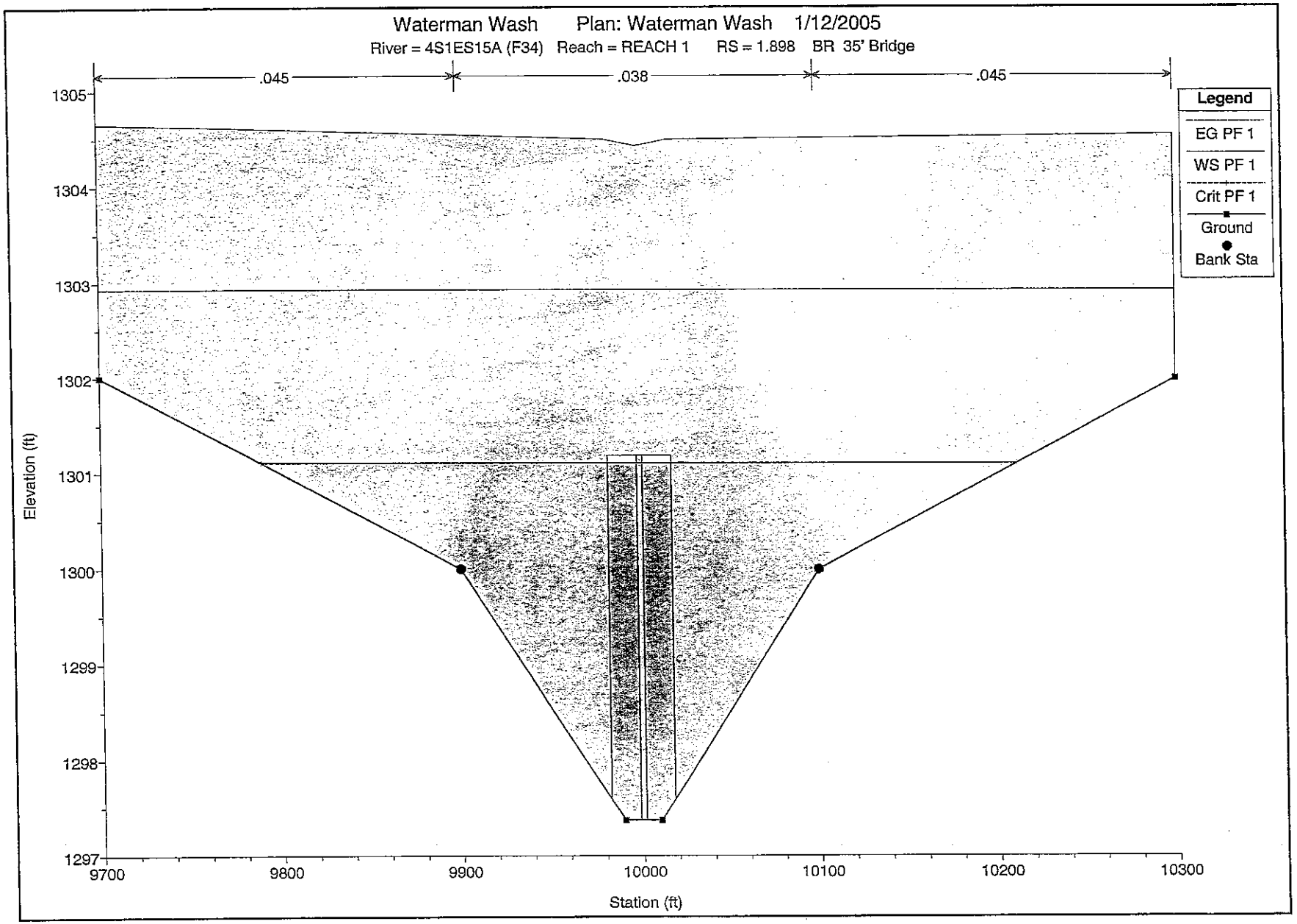

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.019
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1284.5
1284.0
1283.5
1283.0
1282.5
1282.0
1281.5
8500
9000
9500
10000
10500
11000
11500
12000
Station (ft)

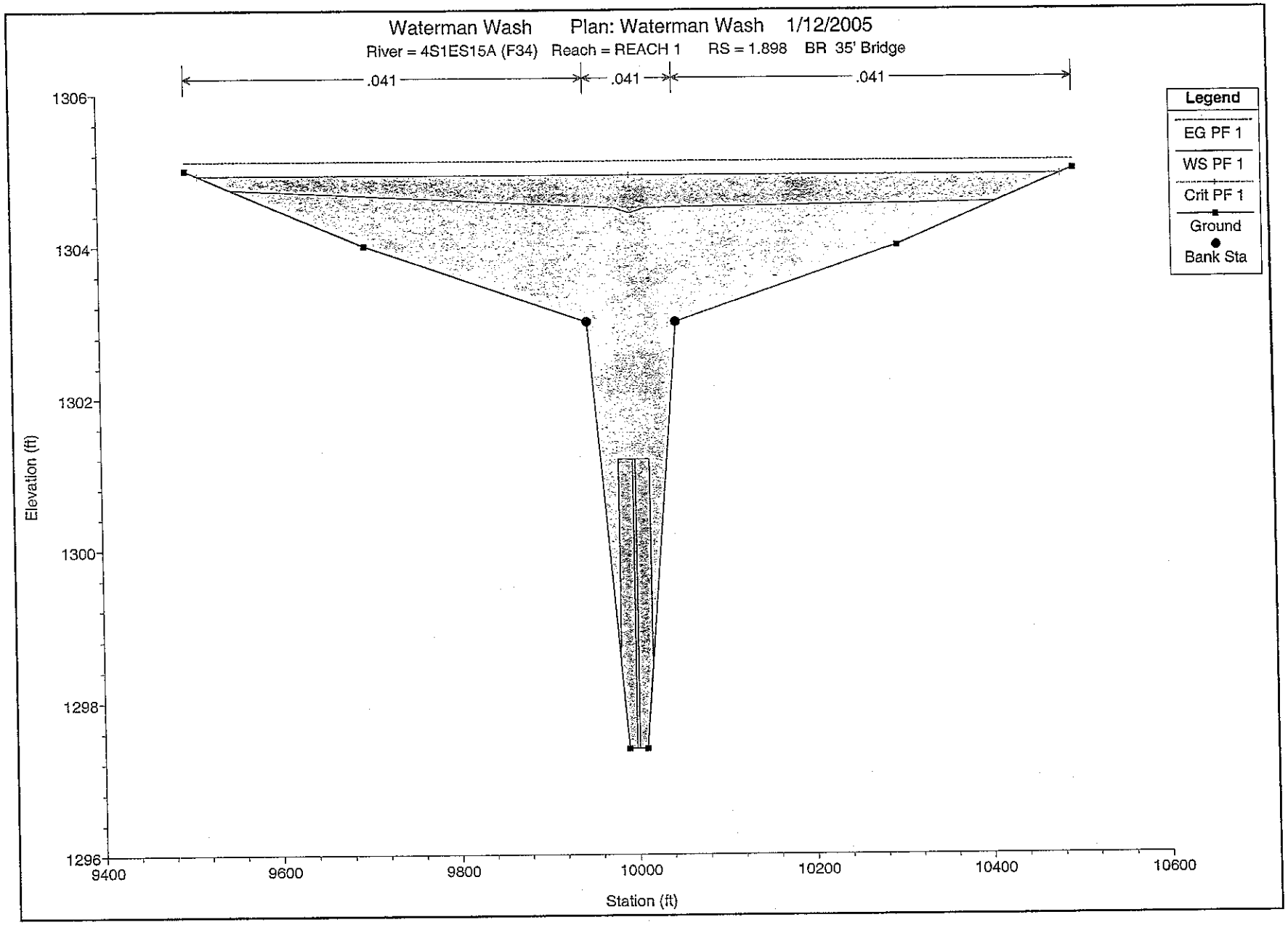

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.294
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1292.0
1291.5
1291.0
1290.5
1290.0
1289.5
1289.0
1288.5
1288.0
9000
9500
10000
10500
11000
11500
Station (ft)

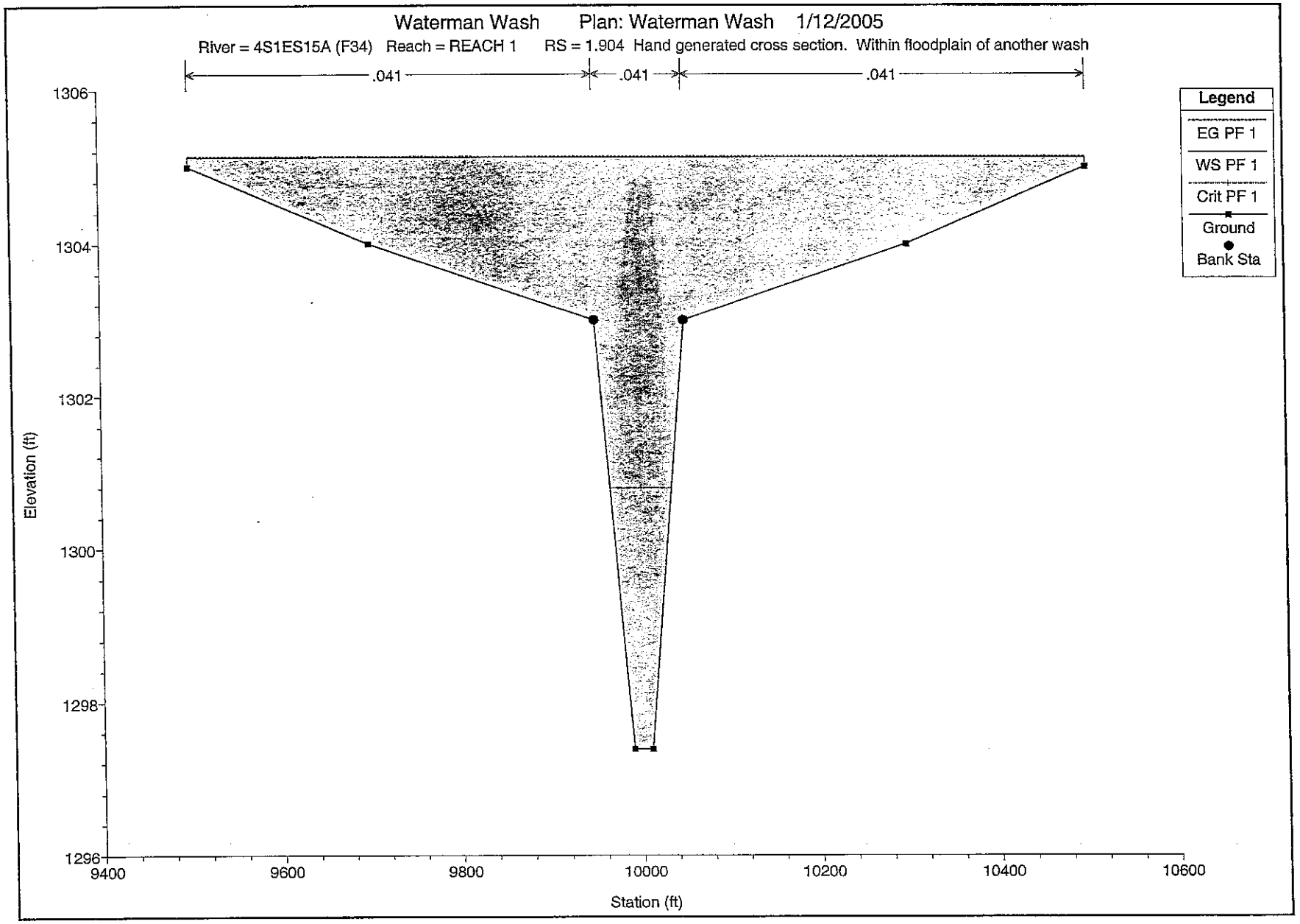

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.554
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1296.0
1295.5
1295.0
1294.5
1294.0
1293.5
1293.0
8500
9000
9500
10000
10500
11000
11500
Station (ft)

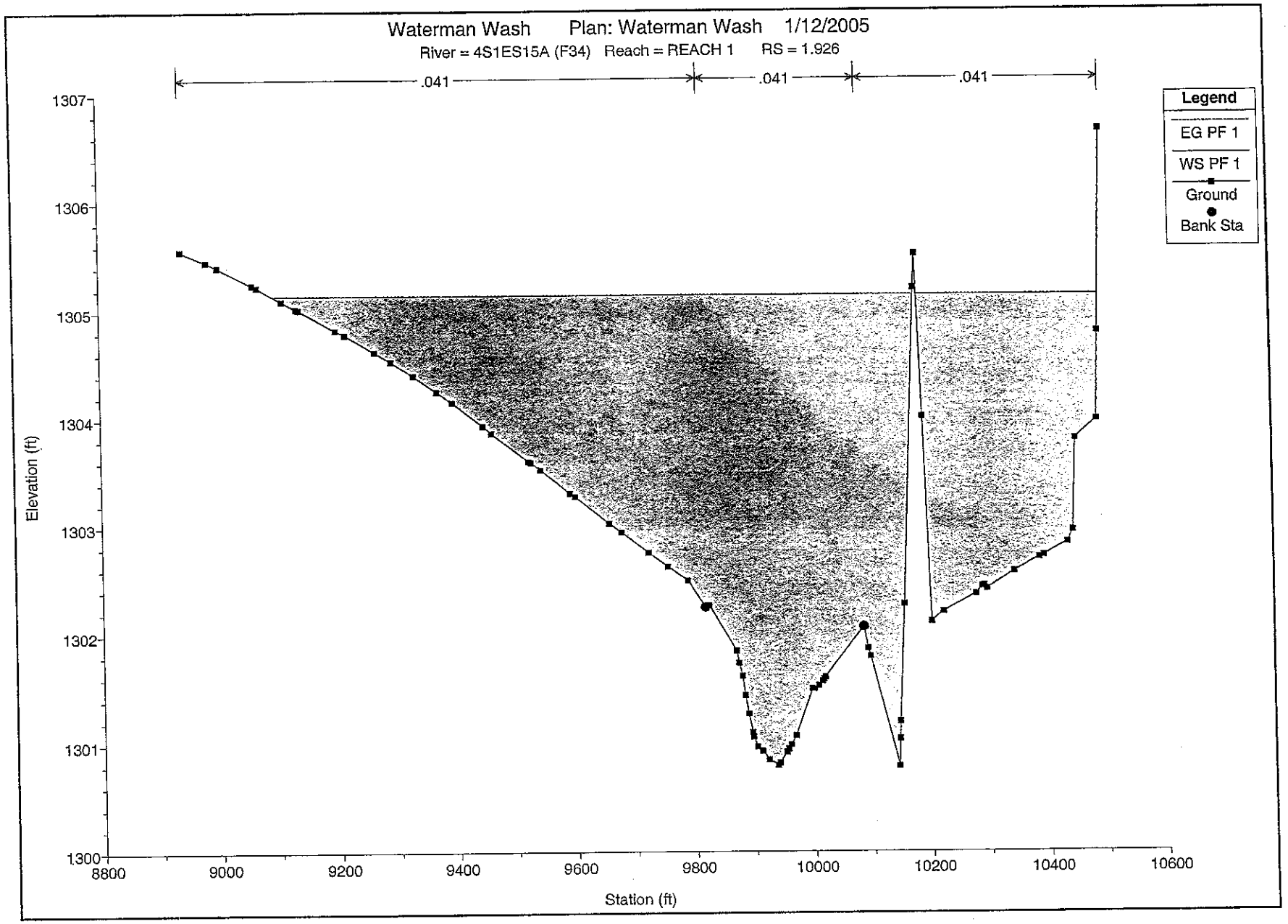

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.824 Directly downstream of SR-238.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1302
1301
1300
1299
1298
1297
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

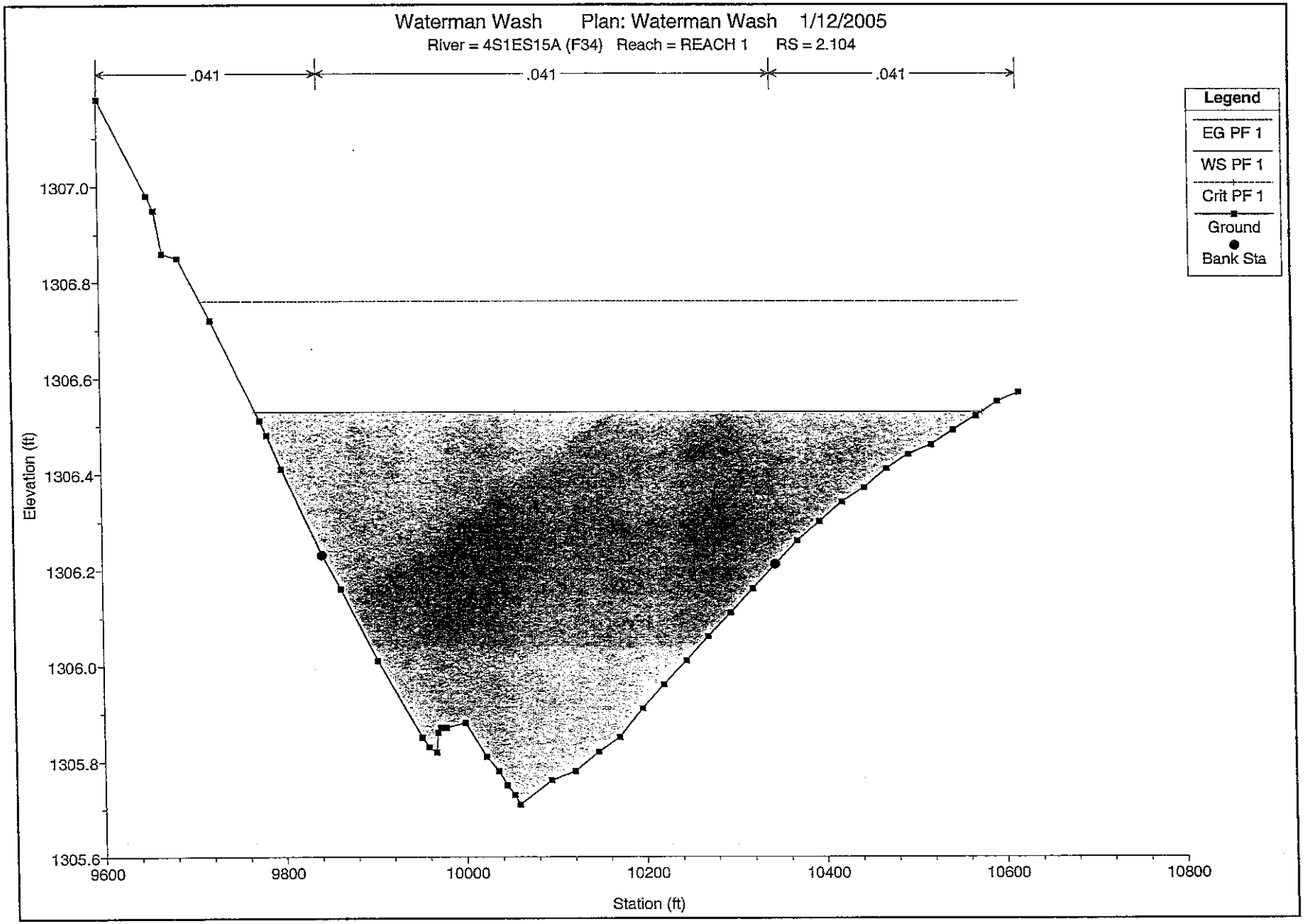

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.892 Hand generated cross section. Within floodplain of another wash
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1302
1301
1300
1299
1298
1297
9700
9800
9900
10000
10100
10200
10300
Station (ft)

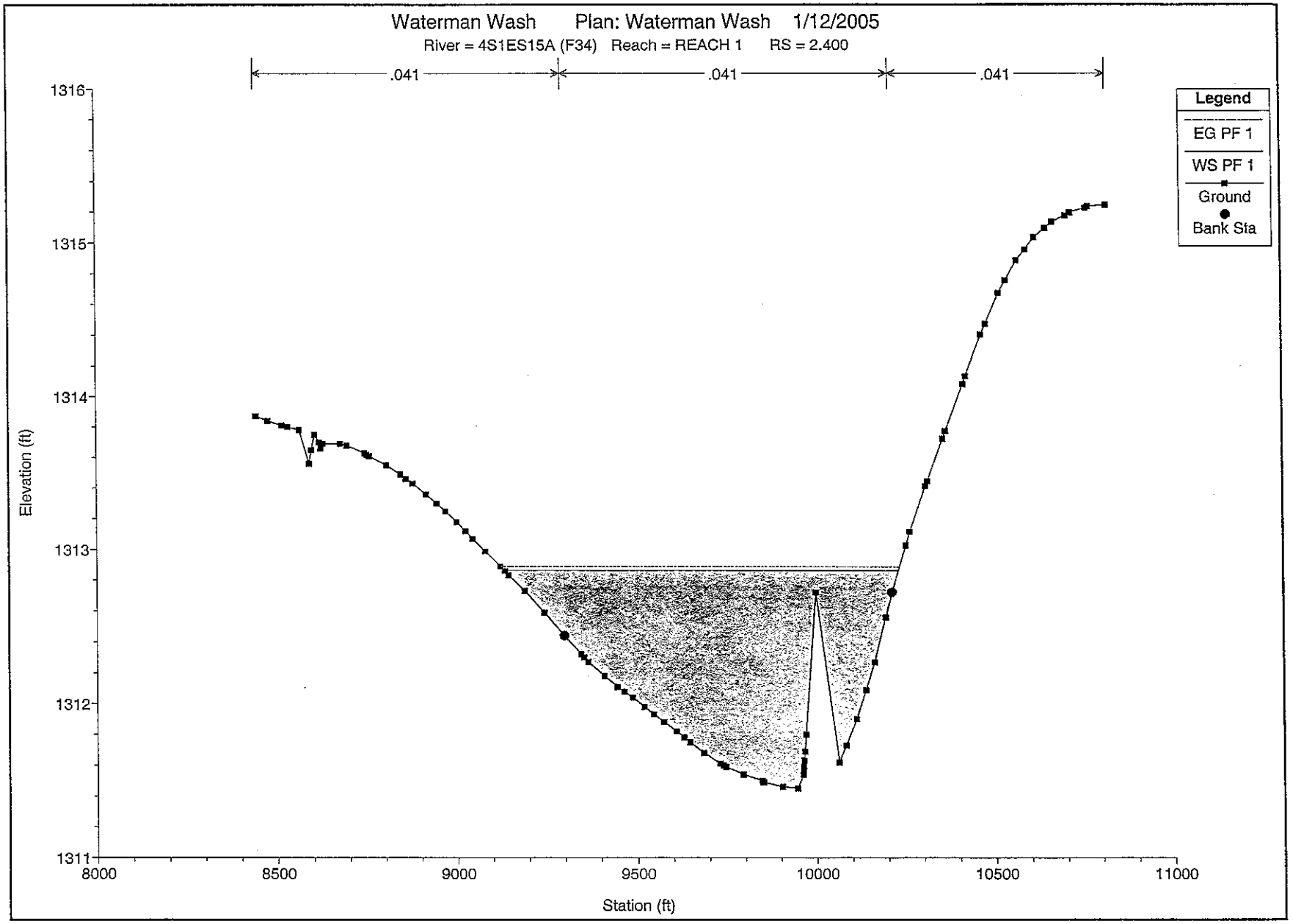

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.898 BR 35' Bridge
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1305
1304
1303
1302
1301
1300
1299
1298
1297
9700
9800
9900
10000
10100
10200
10300
Station (ft)

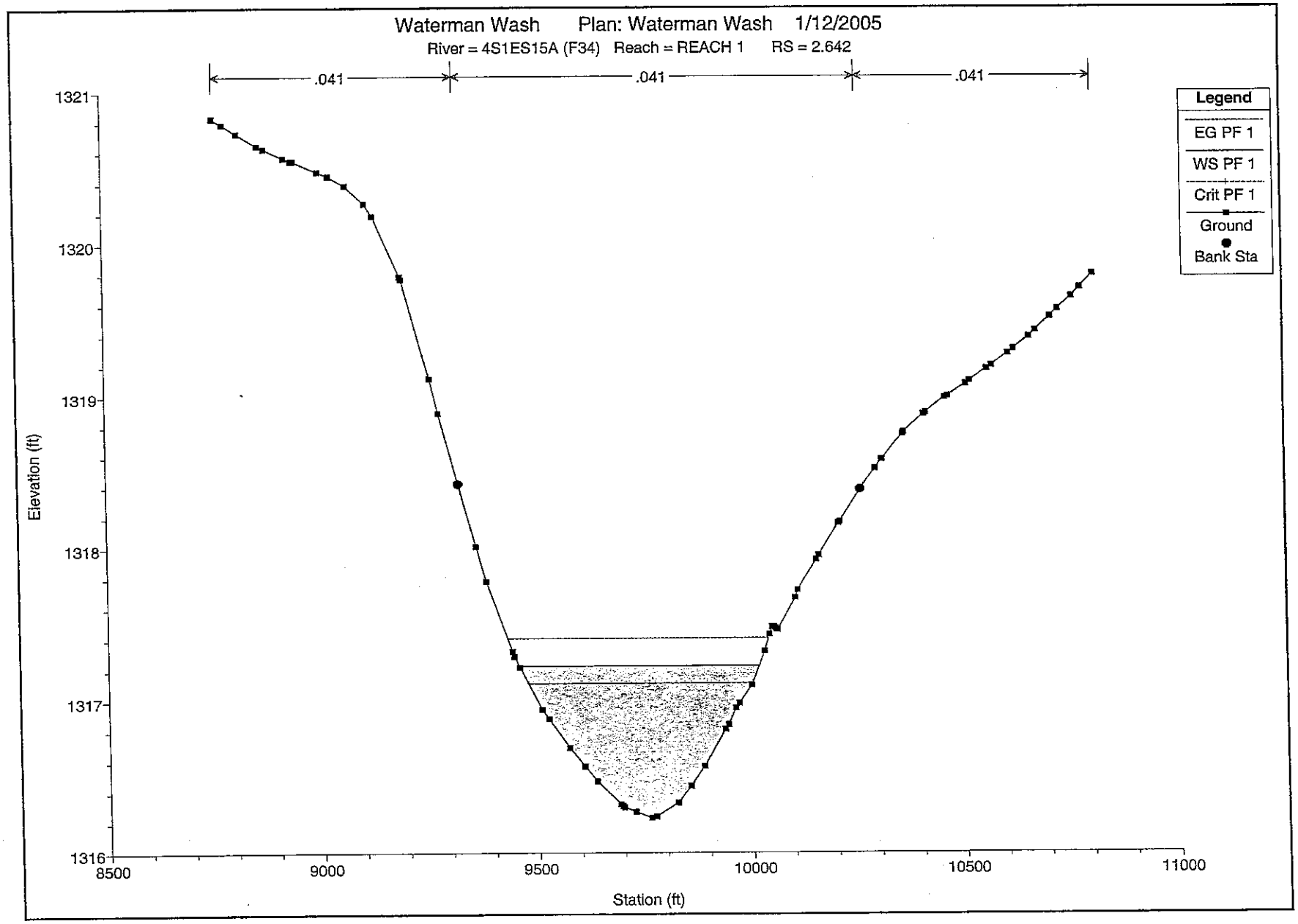

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.898 BR 35' Bridge
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1306
1304
1302
1300
1298
1296
9400
9600
9800
10000
10200
10400
10600
Station (ft)

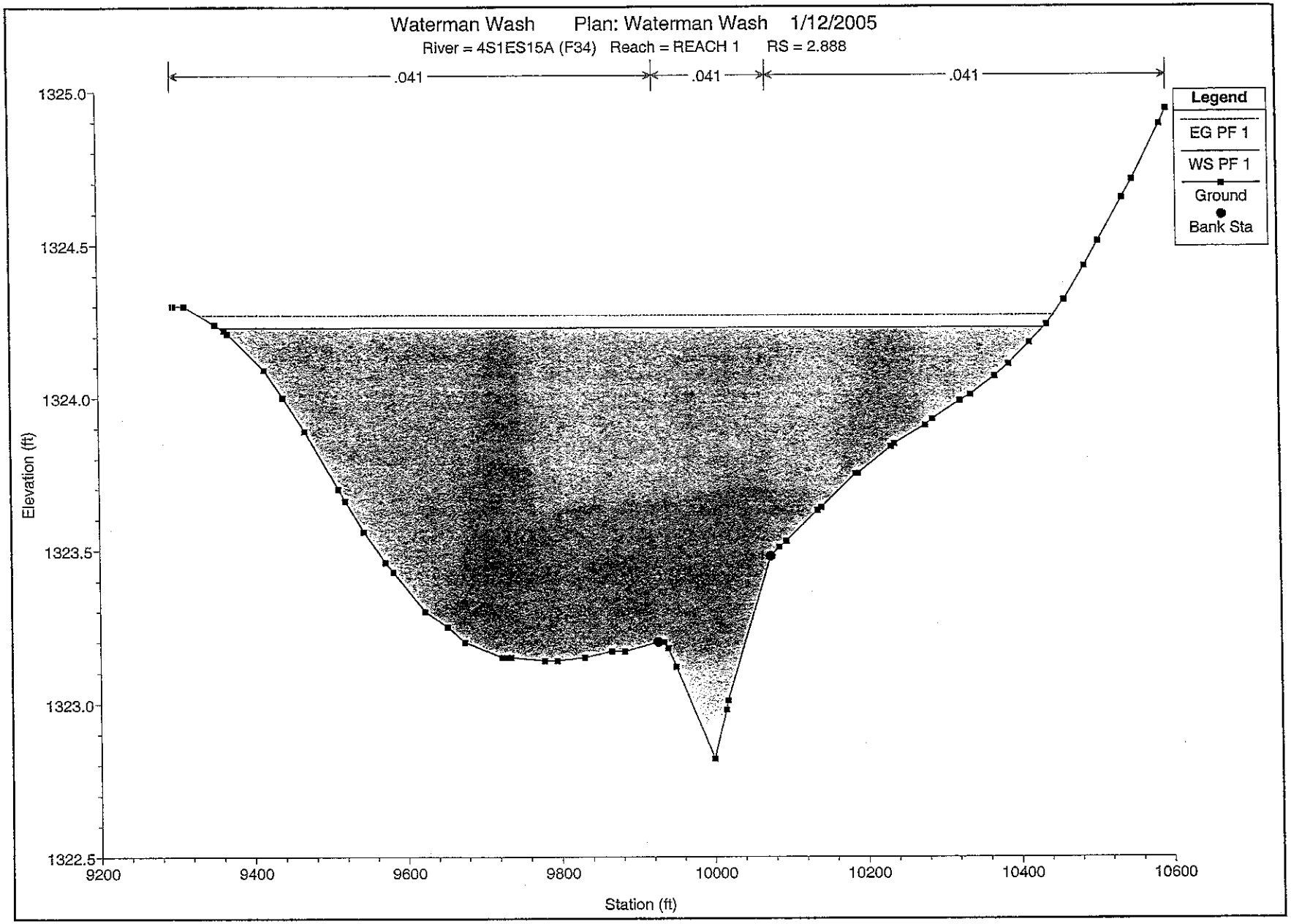

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.904 Hand generated cross section. Within floodplain of another wash
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1306
1304
1302
1300
1298
1296
9400
9600
9800
10000
10200
10400
10600
Station (ft)

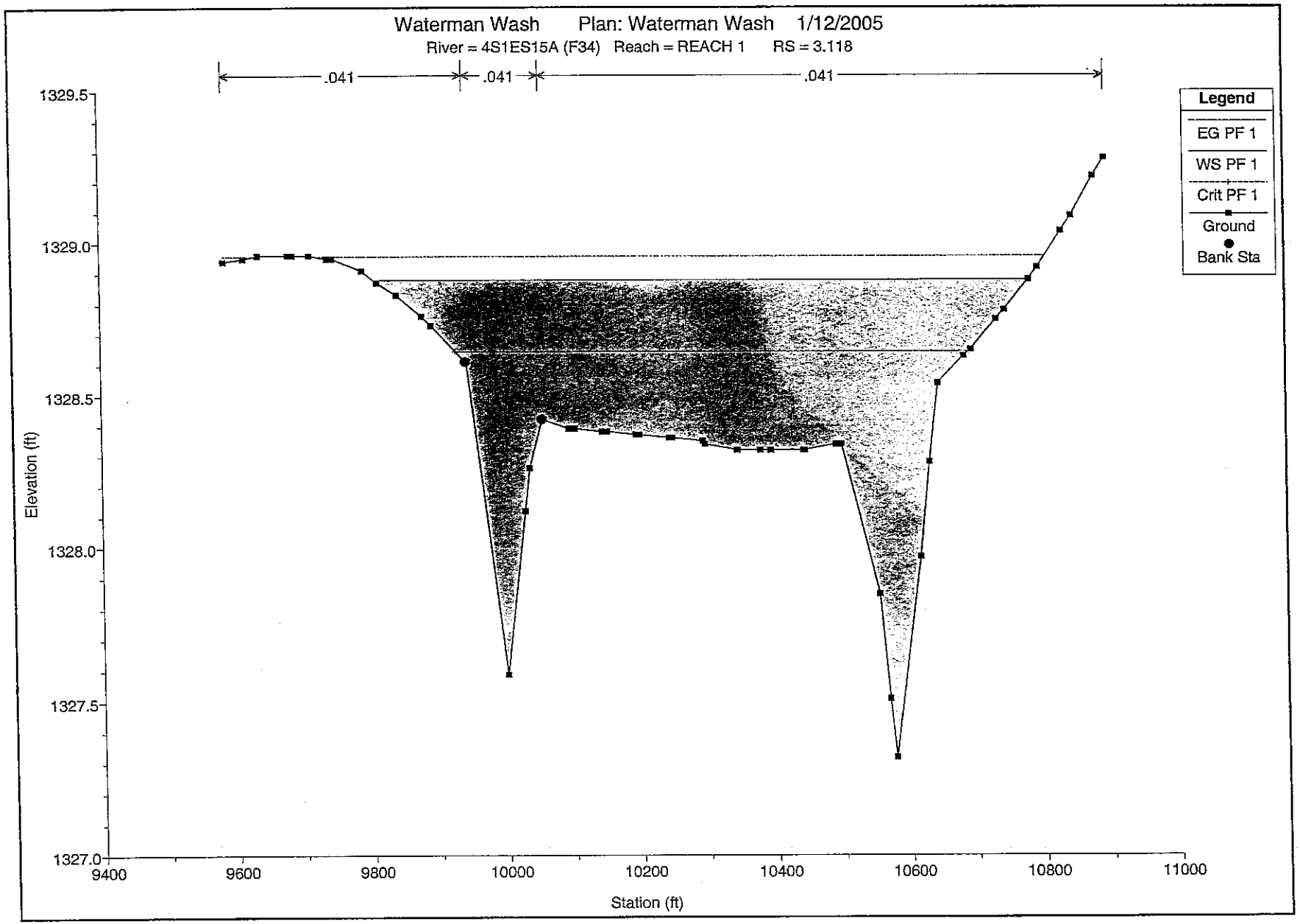

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 1.926
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1307
1306
1305
1304
1303
1302
1301
1300
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

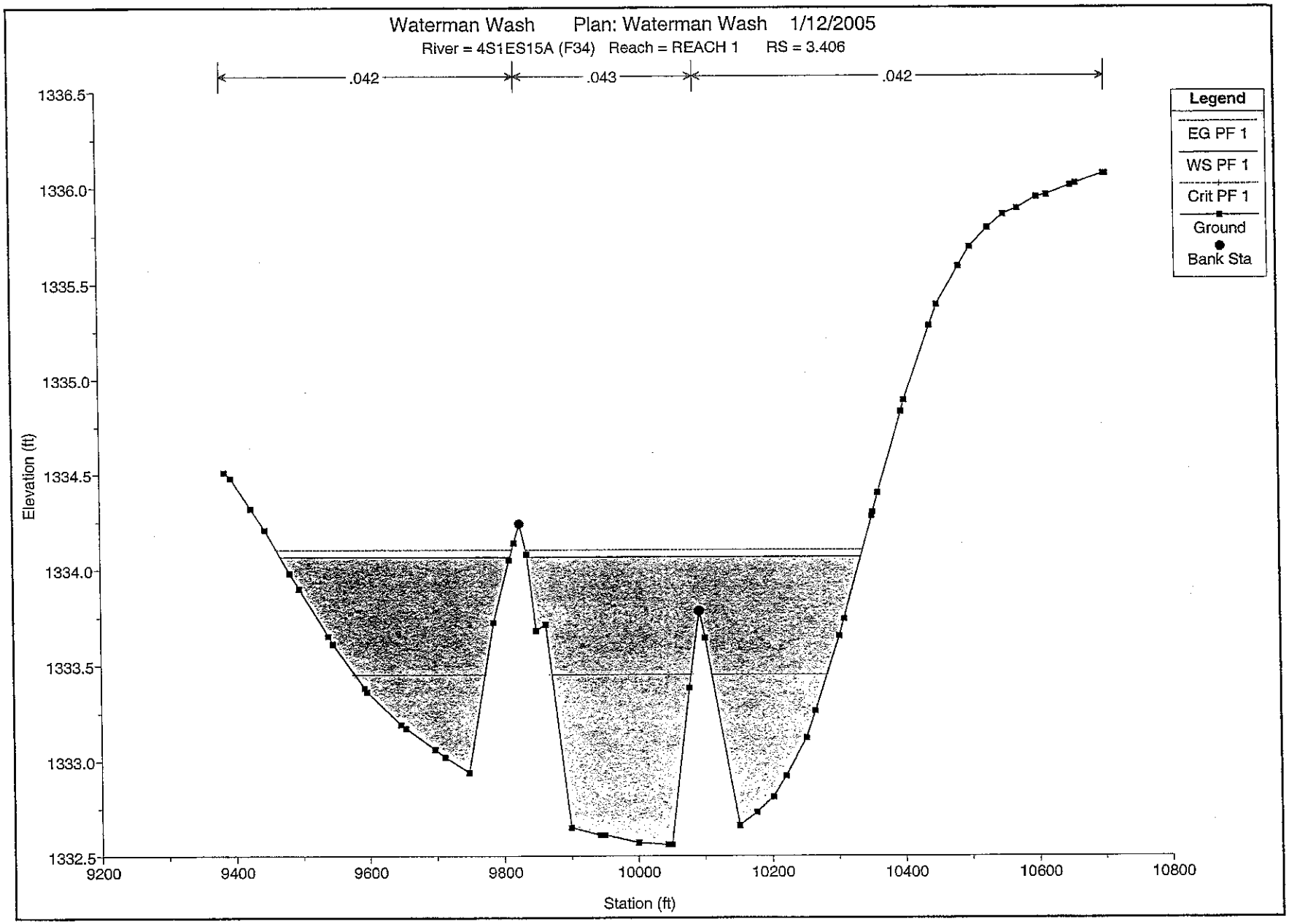

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 2.104
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1307.0
1306.8
1306.6
1306.4
1306.2
1306.0
1305.8
1305.6
9600
9800
10000
10200
10400
10600
10800
Station (ft)

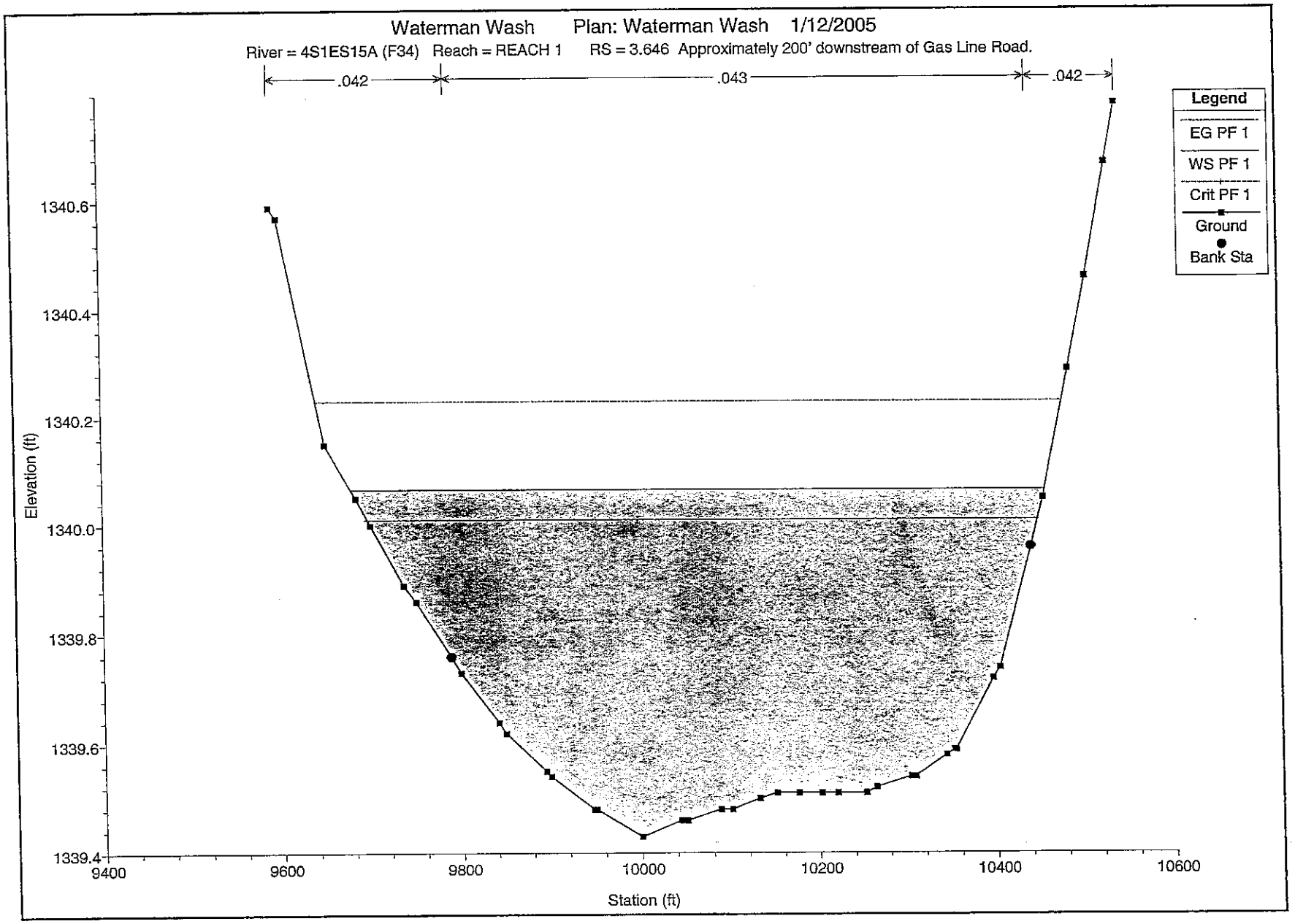

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 2.400
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1316
1315
1314
1313
1312
1311
8000
8500
9000
9500
10000
10500
11000
Station (ft)

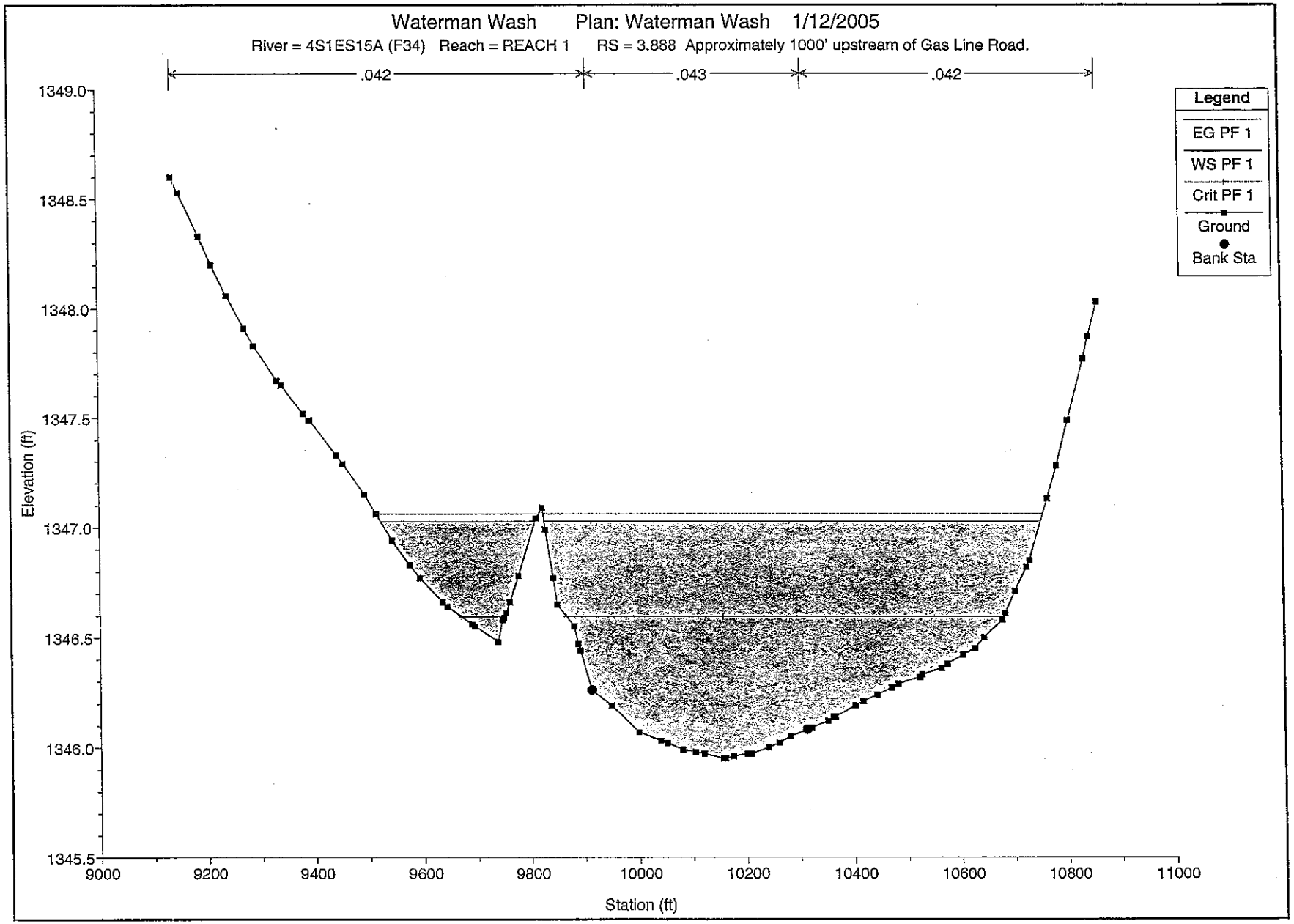

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 2.642
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1321
1320
1319
1318
1317
1316
8500
9000
9500
10000
10500
11000
Station (ft)

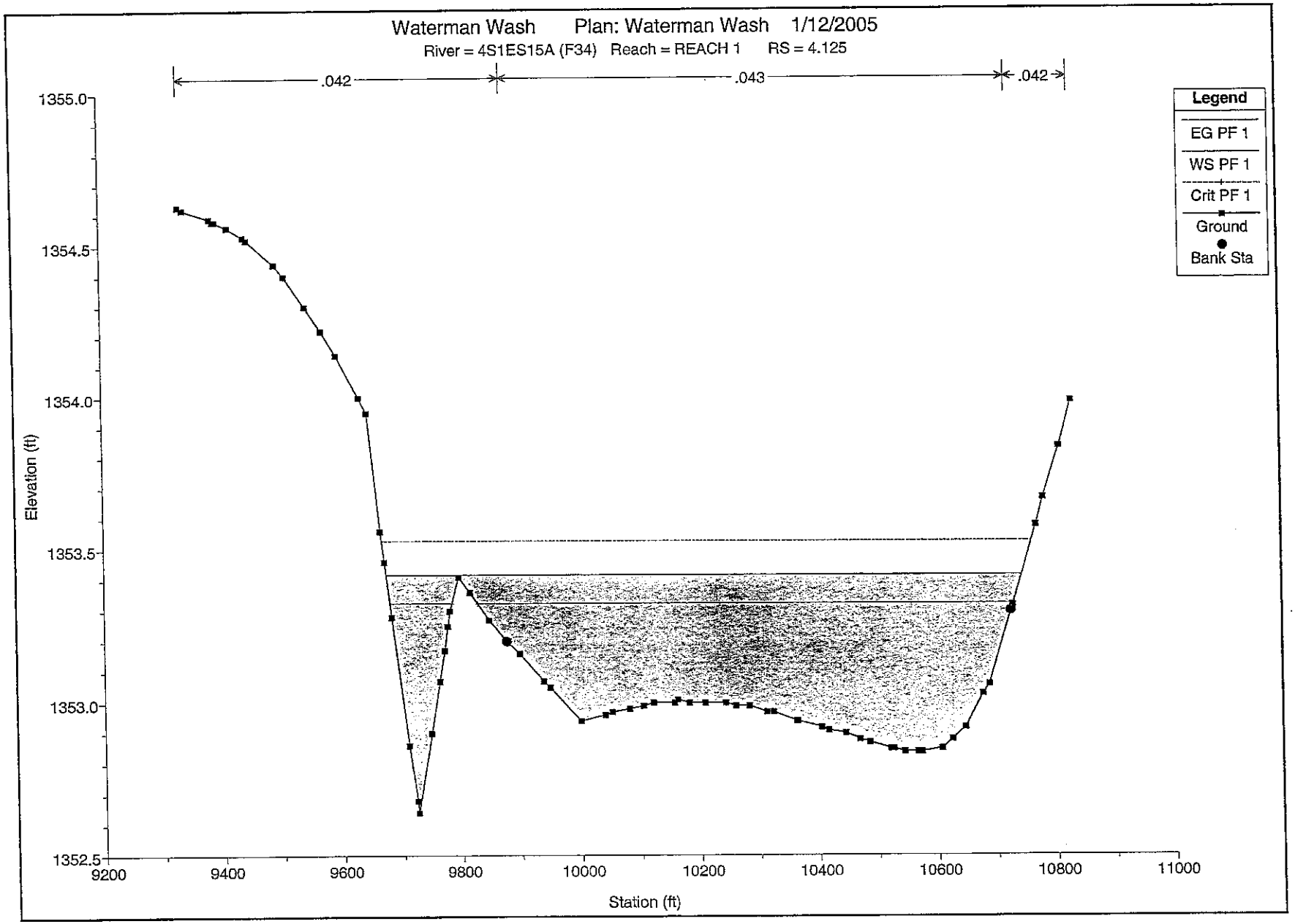

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 2.888
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1325.0
1324.5
1324.0
1323.5
1323.0
1322.5
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

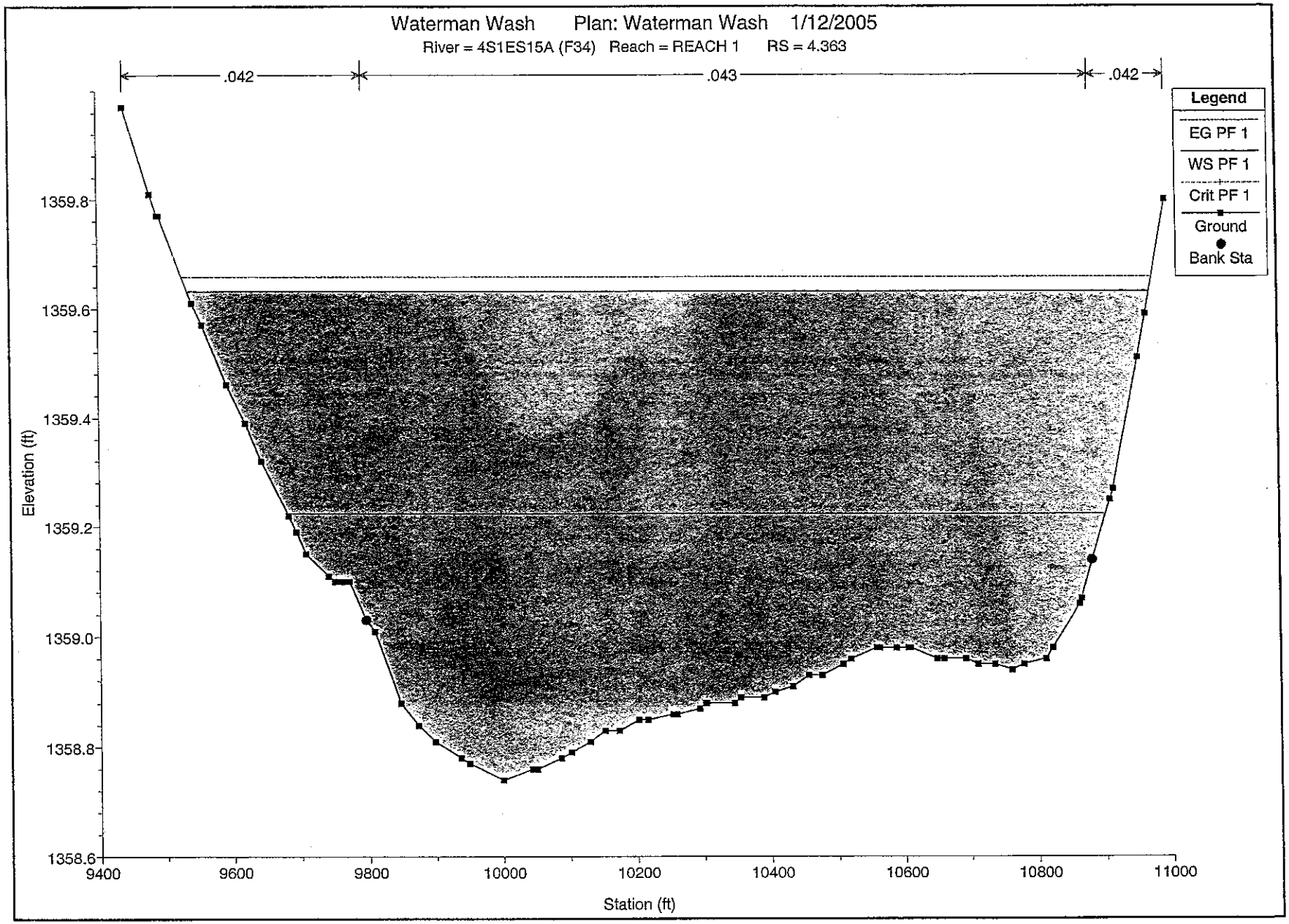

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 3.118
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1329.5
1329.0
1328.5
1328.0
1327.5
1327.0
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

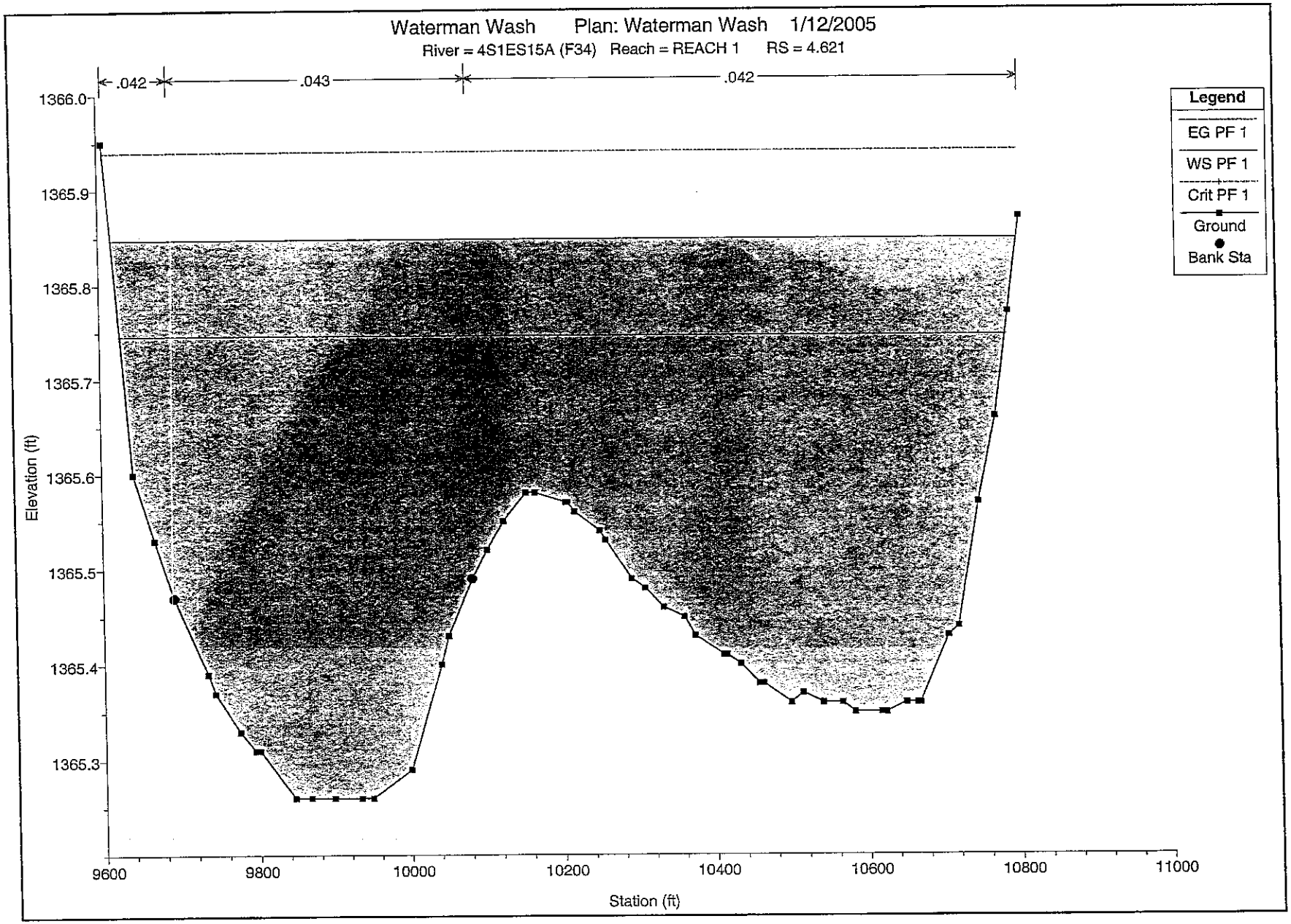

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 3.406
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1336.5
1336.0
1335.5
1335.0
1334.5
1334.0
1333.5
1333.0
1332.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

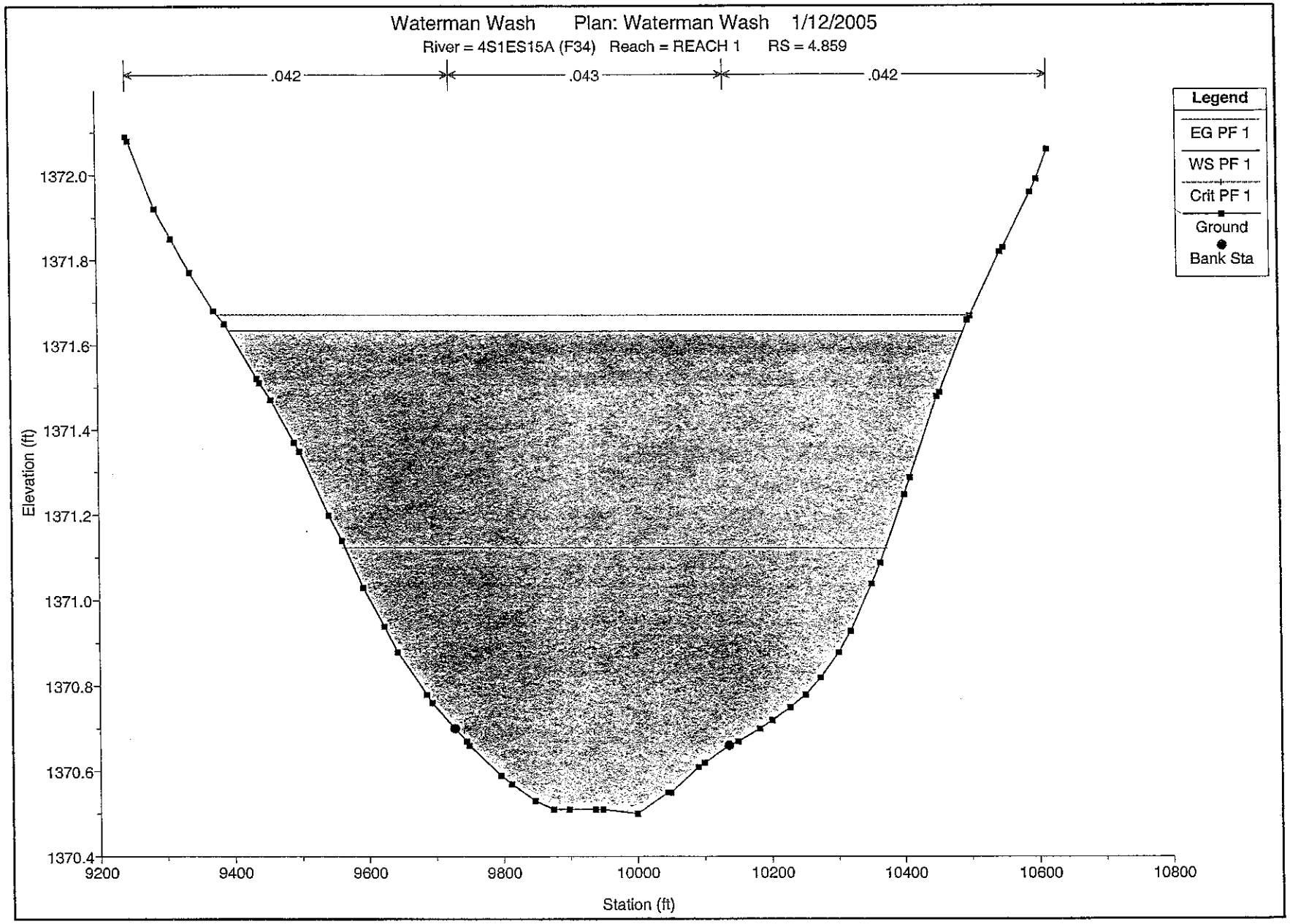

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 3.646 Approximately 200' downstream of Gas Line Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1340.6
1340.4
1340.2
1340.0
1339.8
1339.6
1339.4
9400
9600
9800
10000
10200
10400
10600
Station (ft)

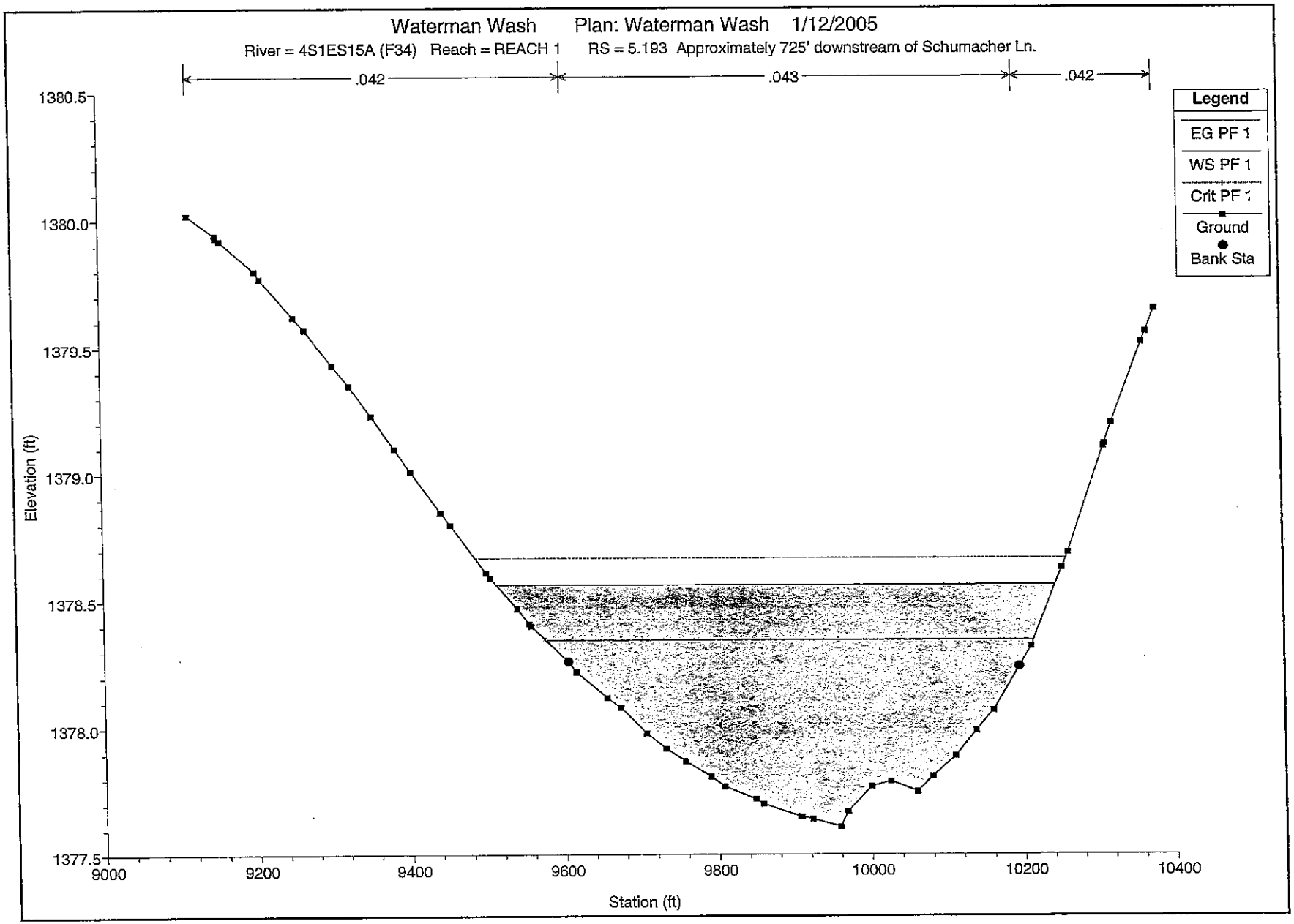

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 3.888 Approximately 1000' upstream of Gas Line Road.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1349.0
1348.5
1348.0
1347.5
1347.0
1346.5
1346.0
1345.5
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

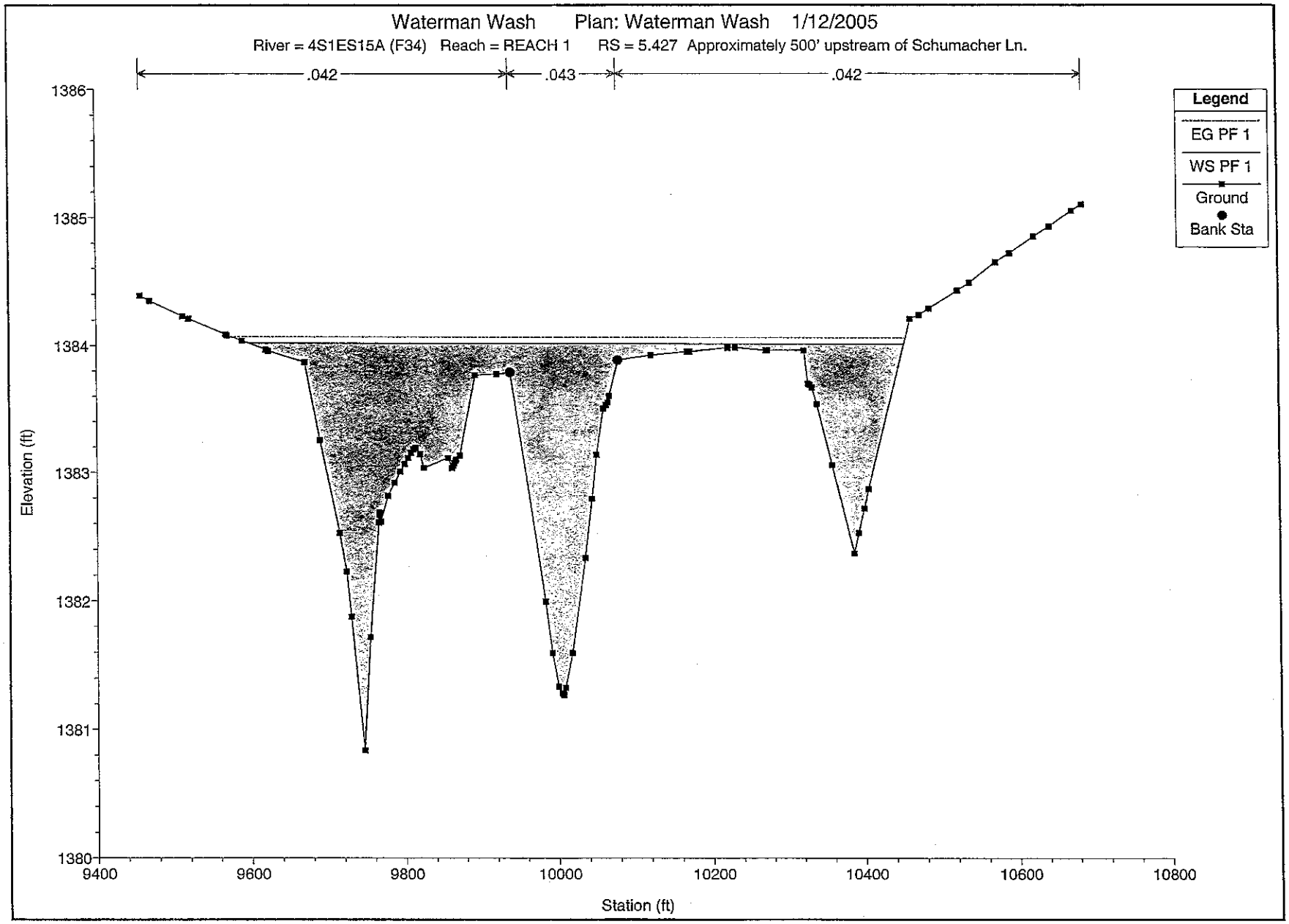

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 4.125
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1355.0
1354.5
1354.0
1353.5
1353.0
1352.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

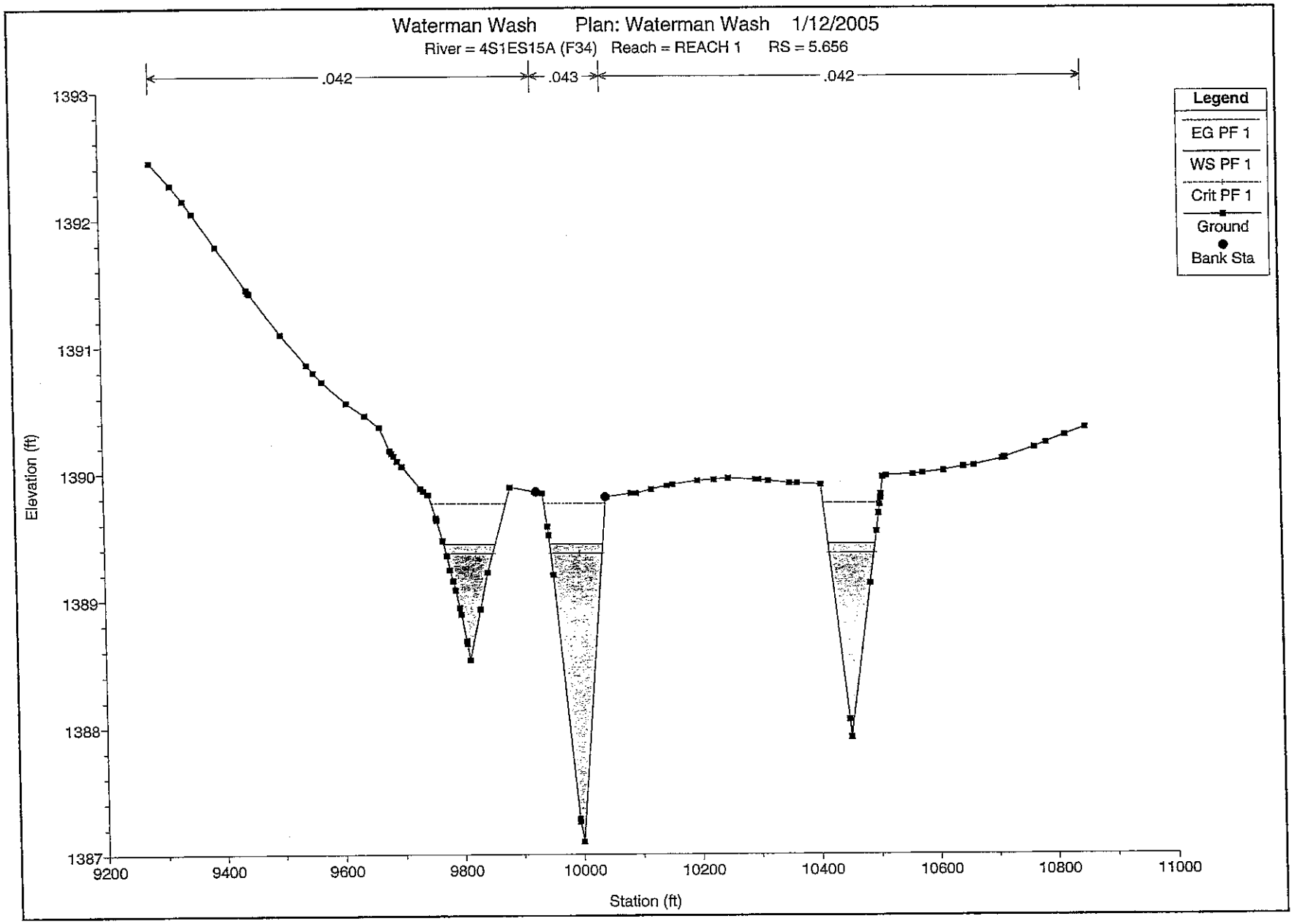

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 4.363
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1359.8
1359.6
1359.4
1359.2
1359.0
1358.8
1358.6
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

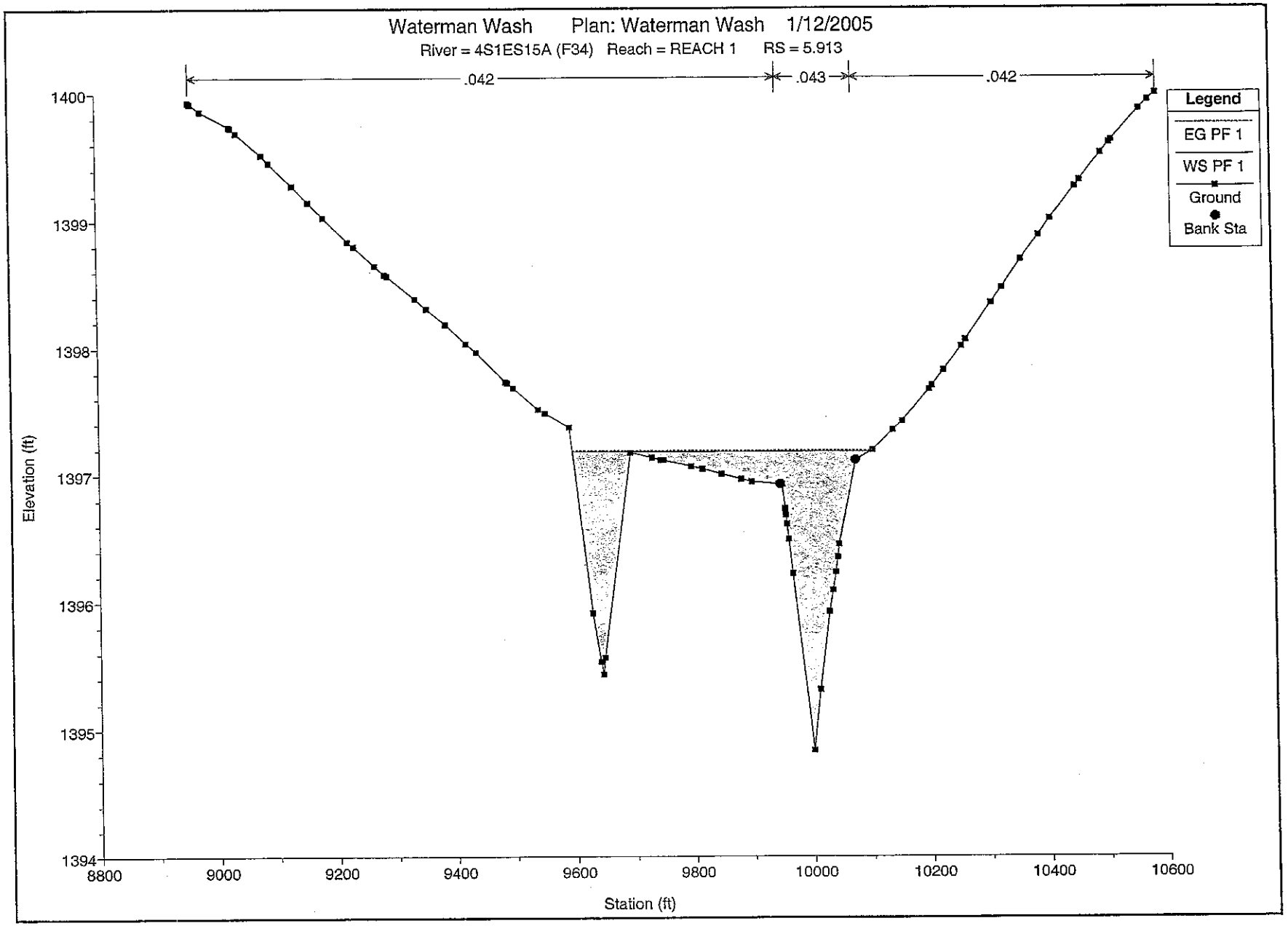

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 4.621
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1366.0
1365.9
1365.8
1365.7
1365.6
1365.5
1365.4
1365.3
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)

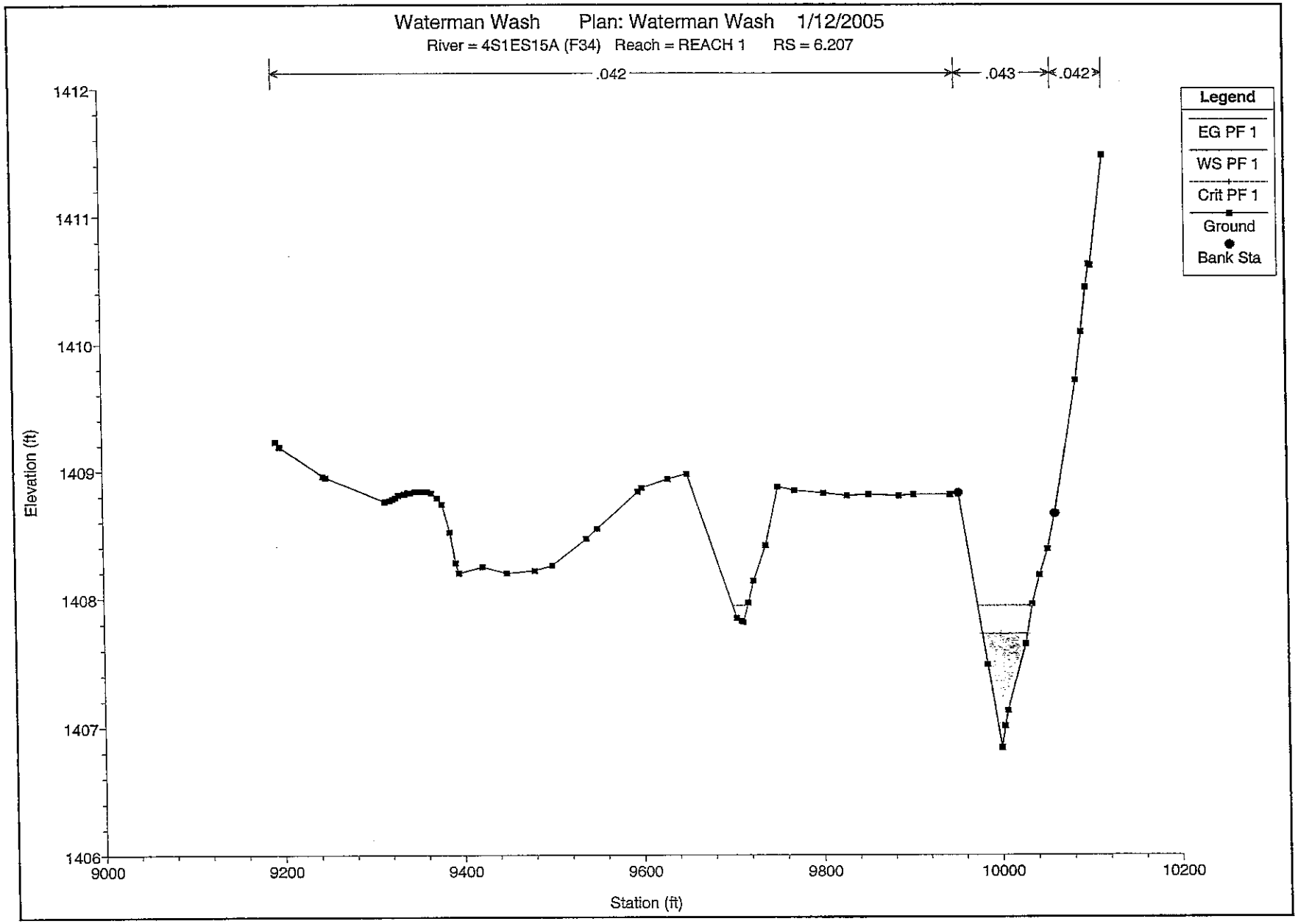

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 4.859
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1372.0
1371.8
1371.6
1371.4
1371.2
1371.0
1370.8
1370.6
1370.4
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 5.193 Approximately 725' downstream of Schumacher Ln.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1380.5
1380.0
1379.5
1379.0
1378.5
1378.0
1377.5
9000
9200
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 5.427 Approximately 500' upstream of Schumacher Ln.
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1386
1385
1384
1383
1382
1381
1380
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 5.656
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1393
1392
1391
1390
1389
1388
1387
9200
9400
9600
9800
10000
10200
10400
10600
10800
11000
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 5.913
.042
.043
.042
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1400
1399
1398
1397
1396
1395
1394
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES15A (F34) Reach = REACH 1 RS = 6.207
.042
.043
.042
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1412
1411
1410
1409
1408
1407
1406
9000
9200
9400
9600
9800
10000
10200
Station (ft)

MODEL: WATERMAN WASH

REACH: 4S1ES9 (E49)

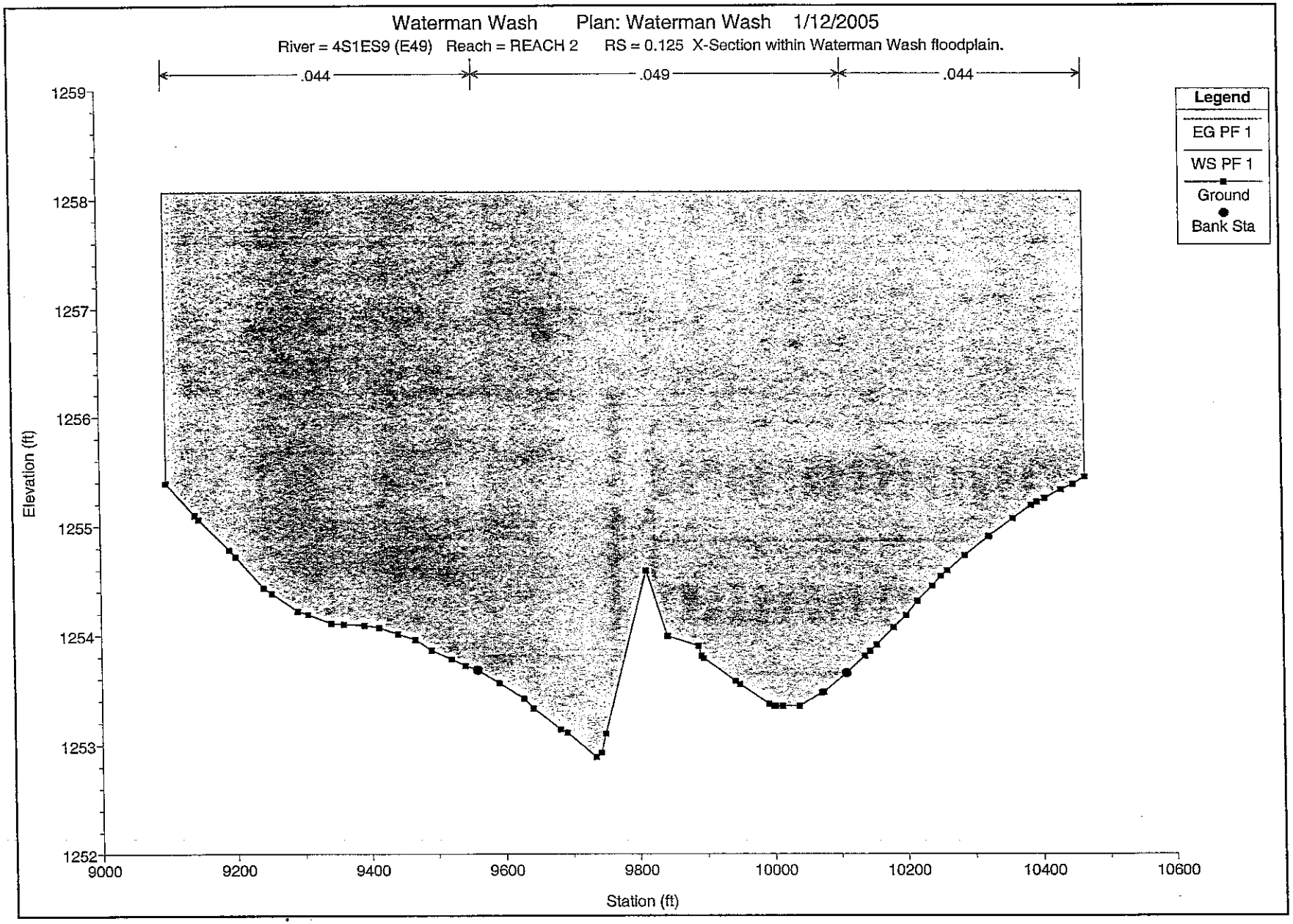
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

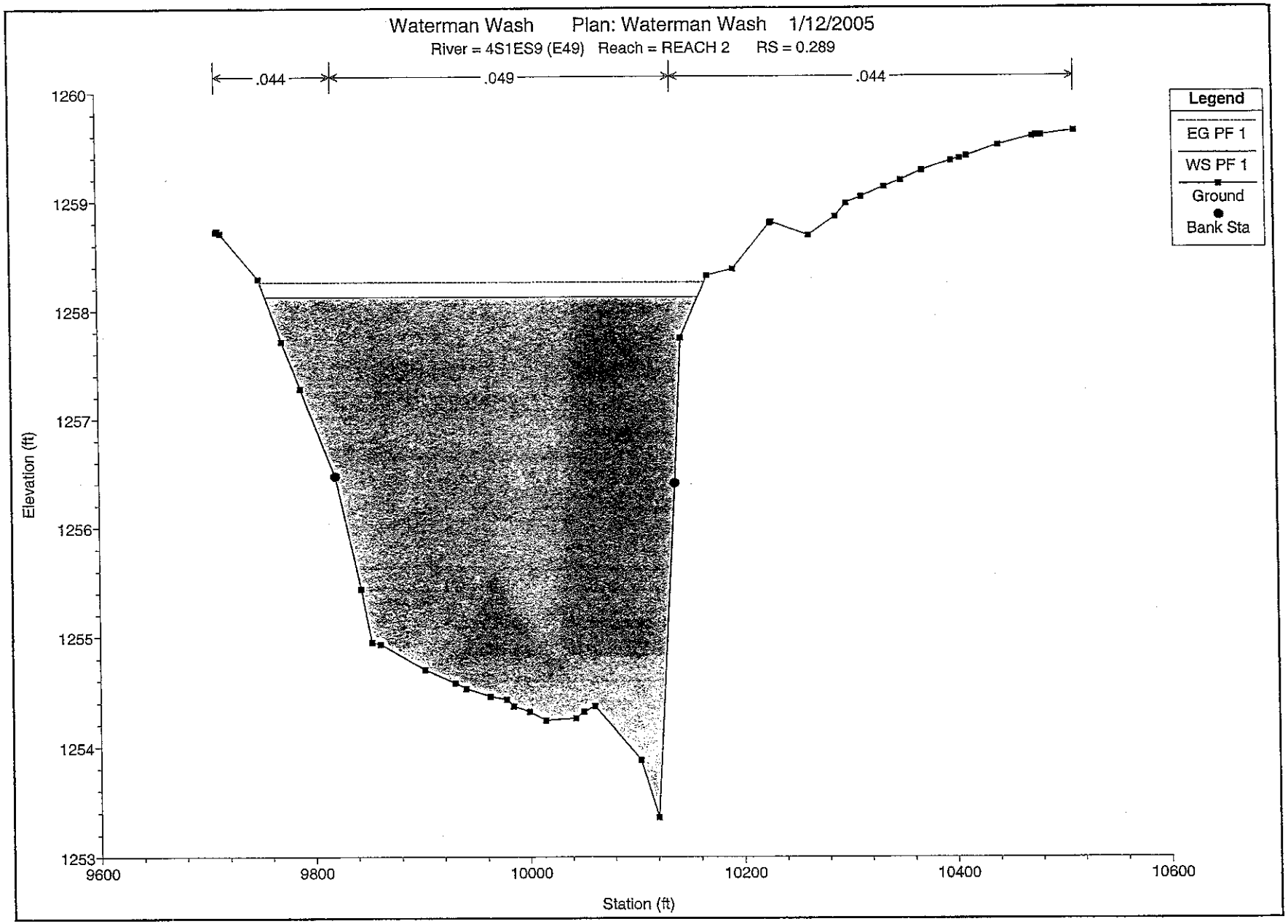
Change in Discharge based on Reach Length

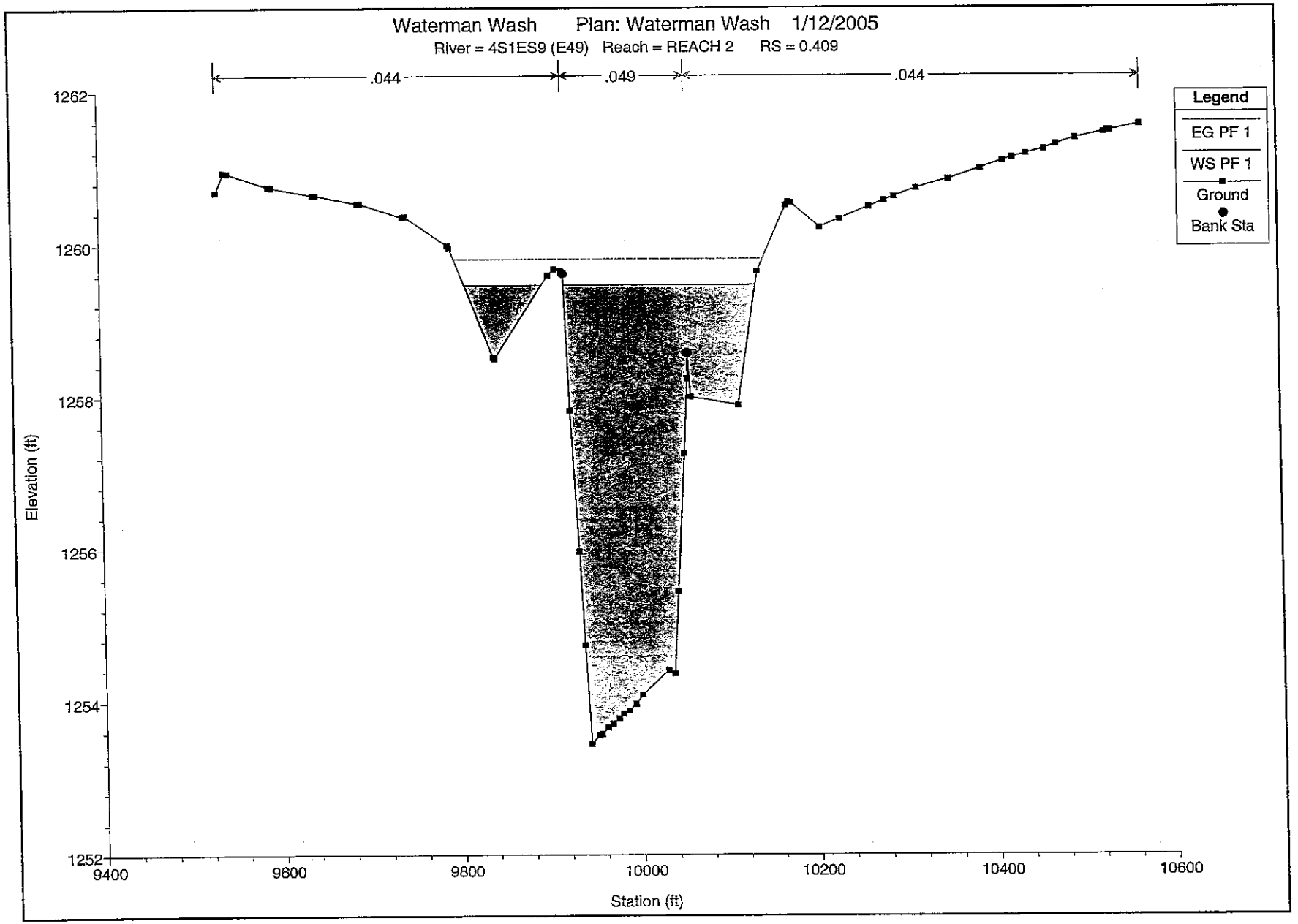
Wash ID: 4S1ES9 (E49)

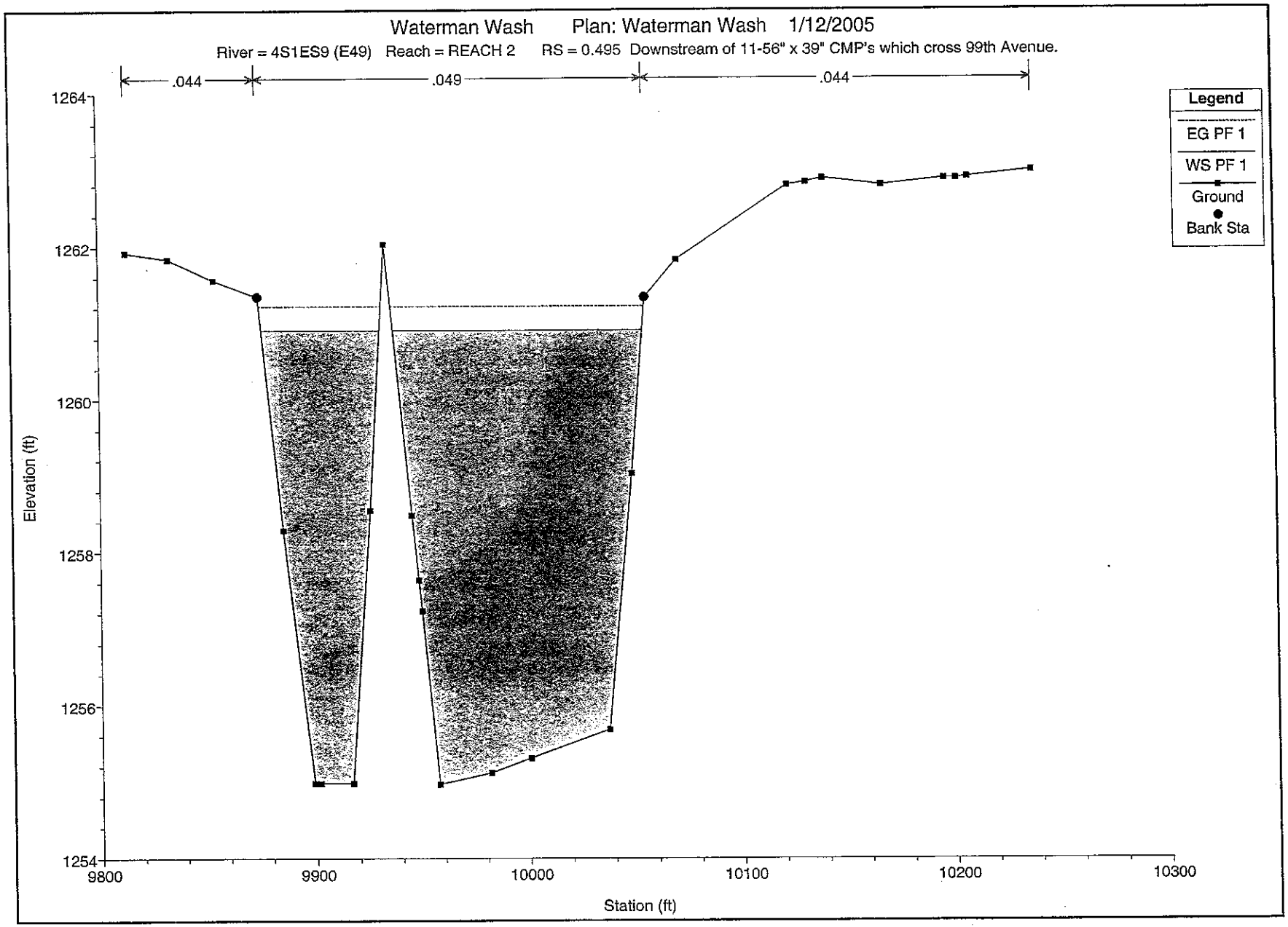
Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
CPE30	3.282	1383	1380	1400
E44	3.073	1628	1630	1600
E44	2.828	1916	1920	1900
E44	2.567	2222	2220	2200
E44	2.308	2526	2530	2500
E44	2.056	2821	2820	2800
E44	1.816	3103	3100	3100
CPE44	1.522	3448	3450	3400
E50	1.355	3453	3450	3500
E50	1.085	3461	3460	3500
E50	0.819	3468	3470	3500
E50	0.637	3474	3470	3500
CPE50	0.594	3475	3480	3500
E49	0.522	3473	3470	3500
E49	0.409	3469	3470	3500
E49	0.289	3465	3460	3500
CPE49	0.125	3459	3460	3500

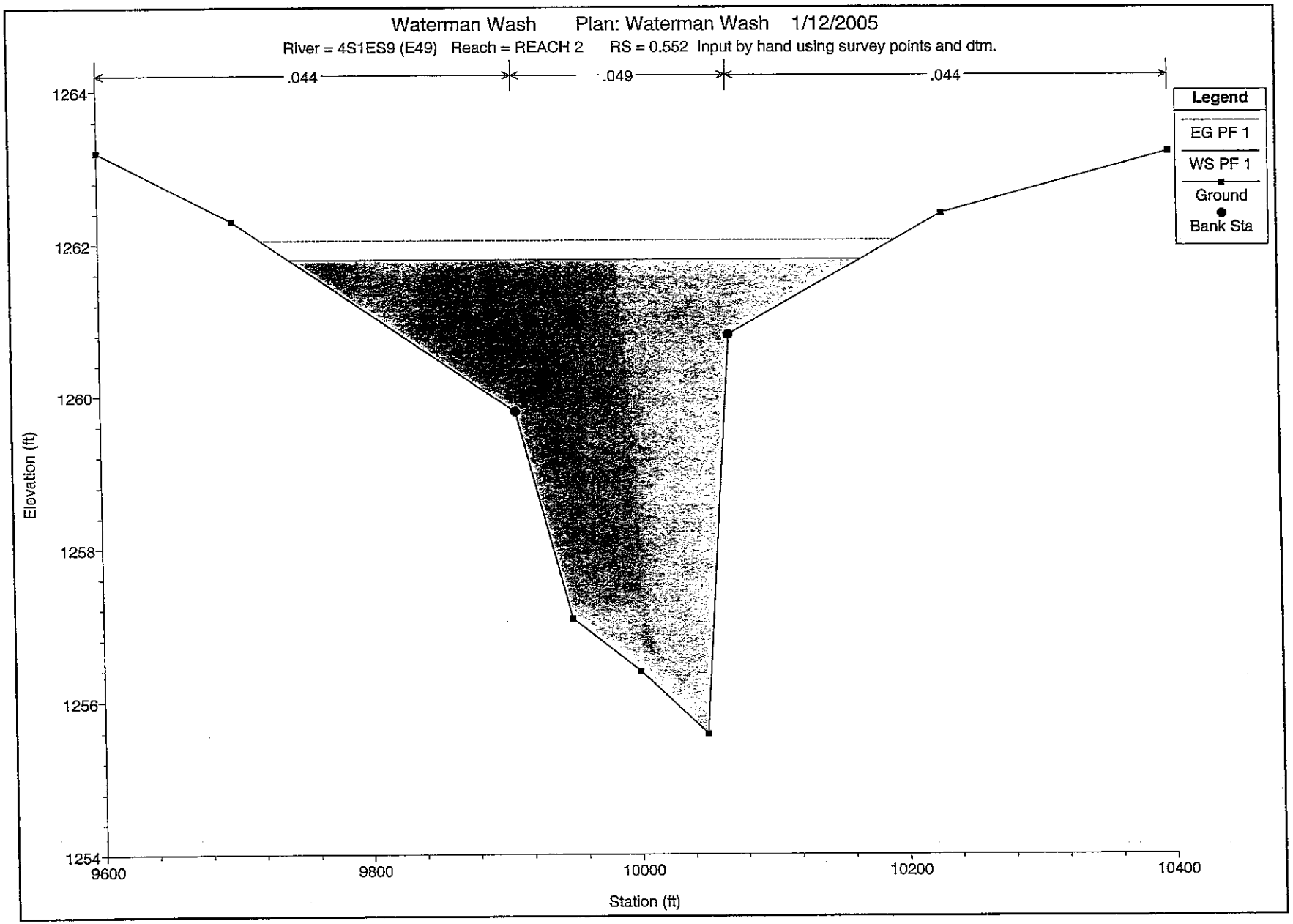
0.594 does not exist. Placed to be in accordance with CP location.

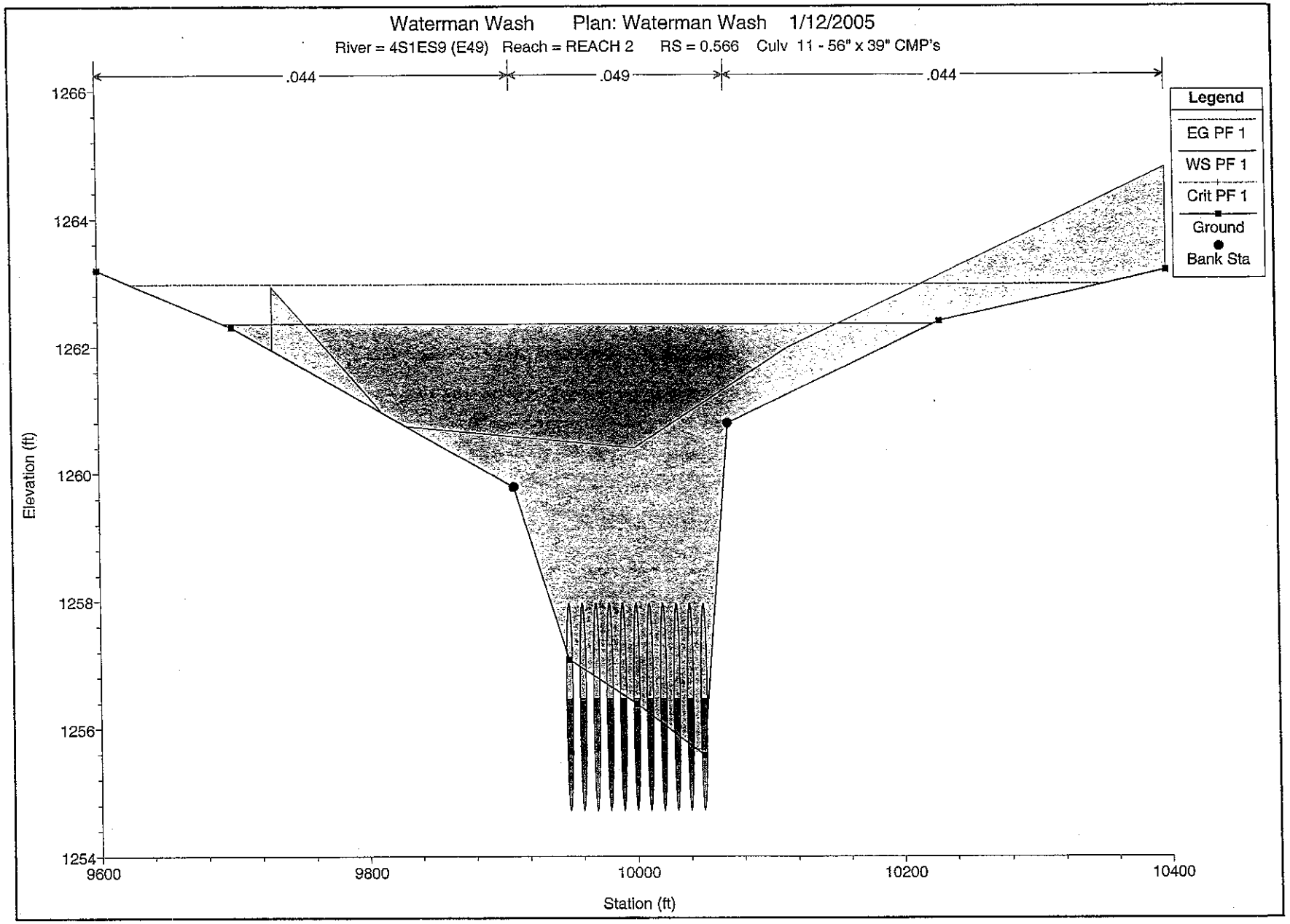

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.125 X-Section within Waterman Wash floodplain.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1259
1258
1257
1256
1255
1254
1253
1252
9000
9200
9400
9600
9800
10000
10200
10400
10600
Station (ft)

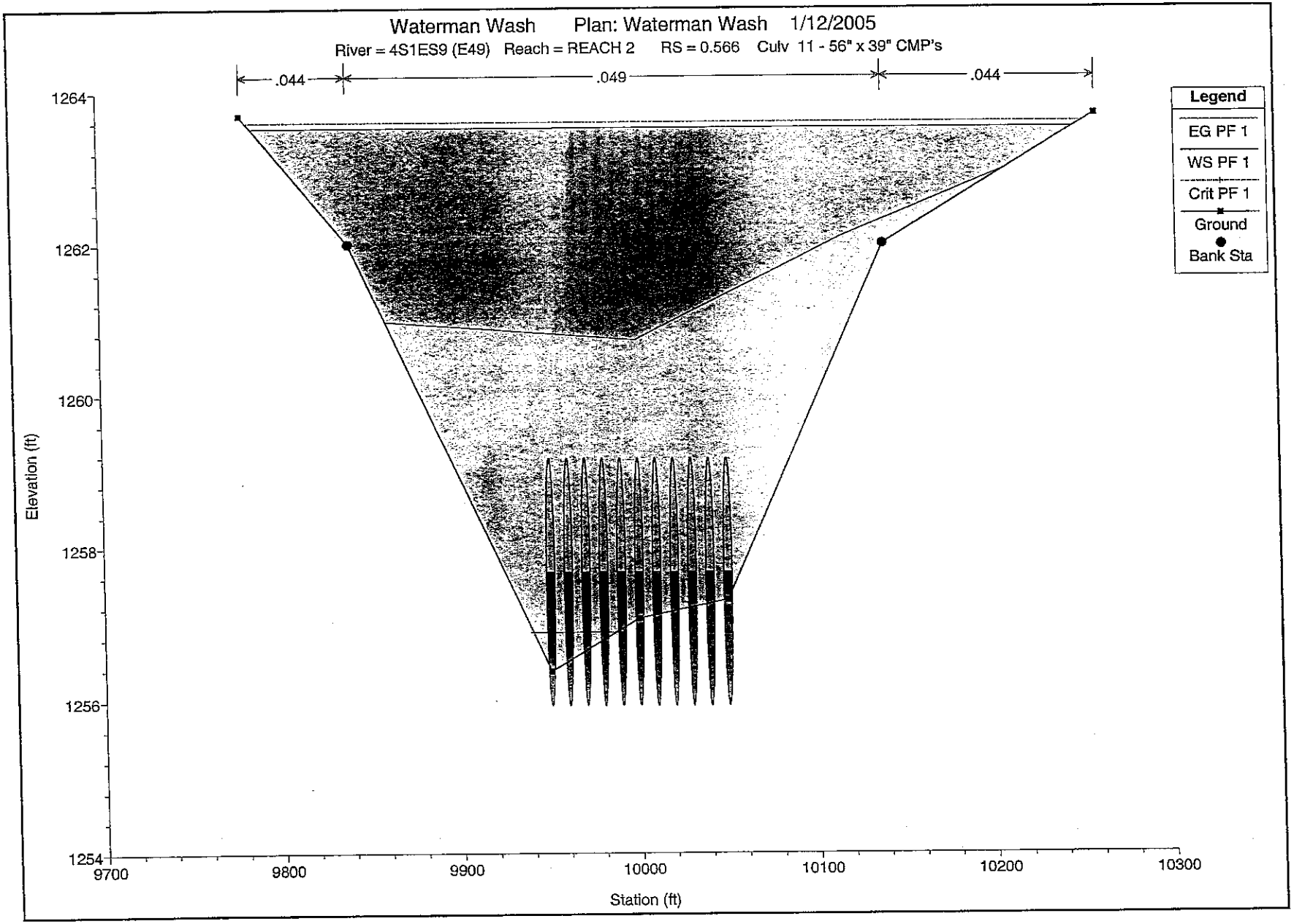

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.289
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1260
1259
1258
1257
1256
1255
1254
1253
9600
9800
10000
10200
10400
10600
Station (ft)

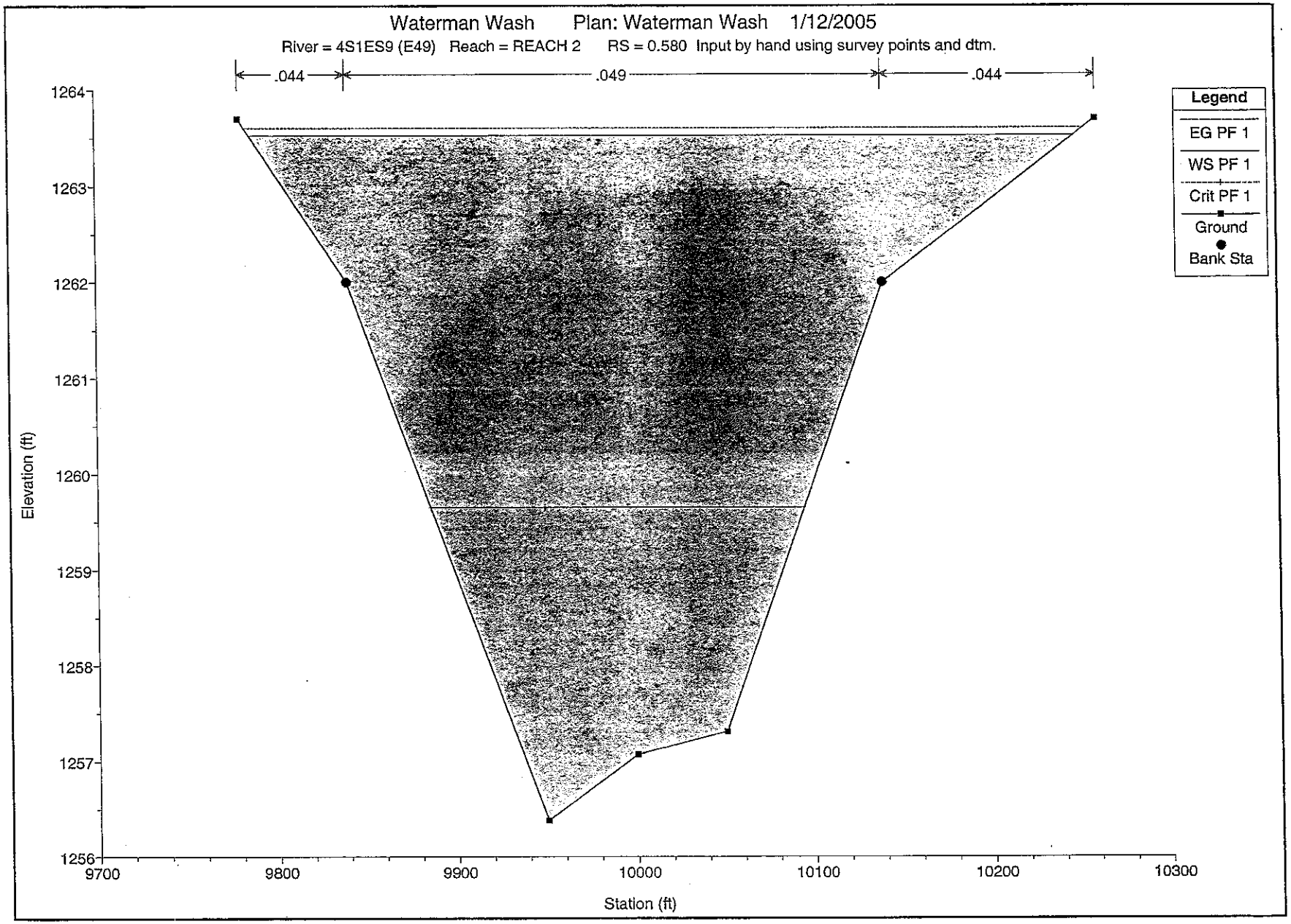

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.409
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1262
1260
1258
1256
1254
1252
9400
9600
9800
10000
10200
10400
10600
Station (ft)

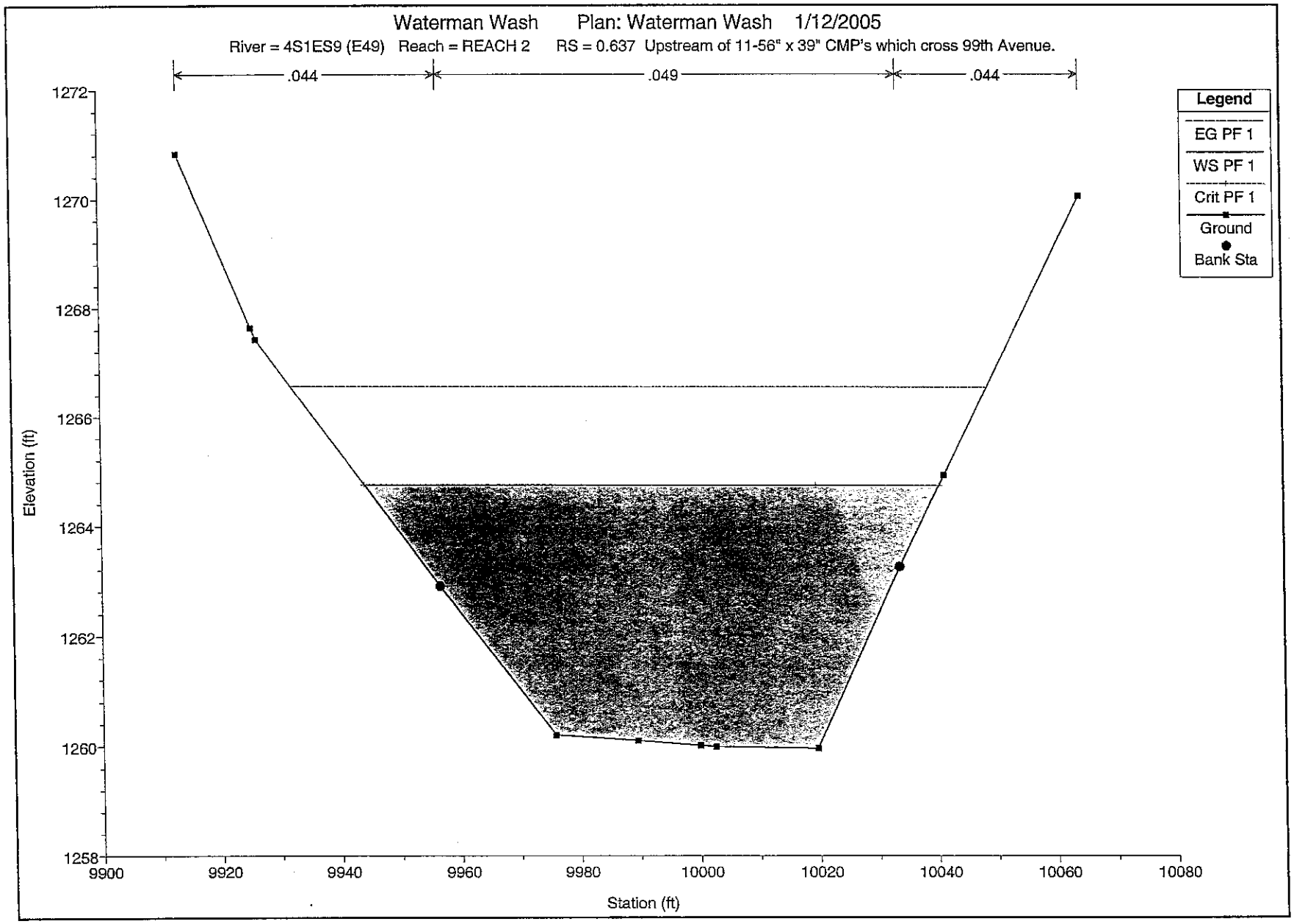

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.495 Downstream of 11-56" x 39" CMP's which cross 99th Avenue.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1264
1262
1260
1258
1256
1254
9800
9900
10000
10100
10200
10300
Station (ft)

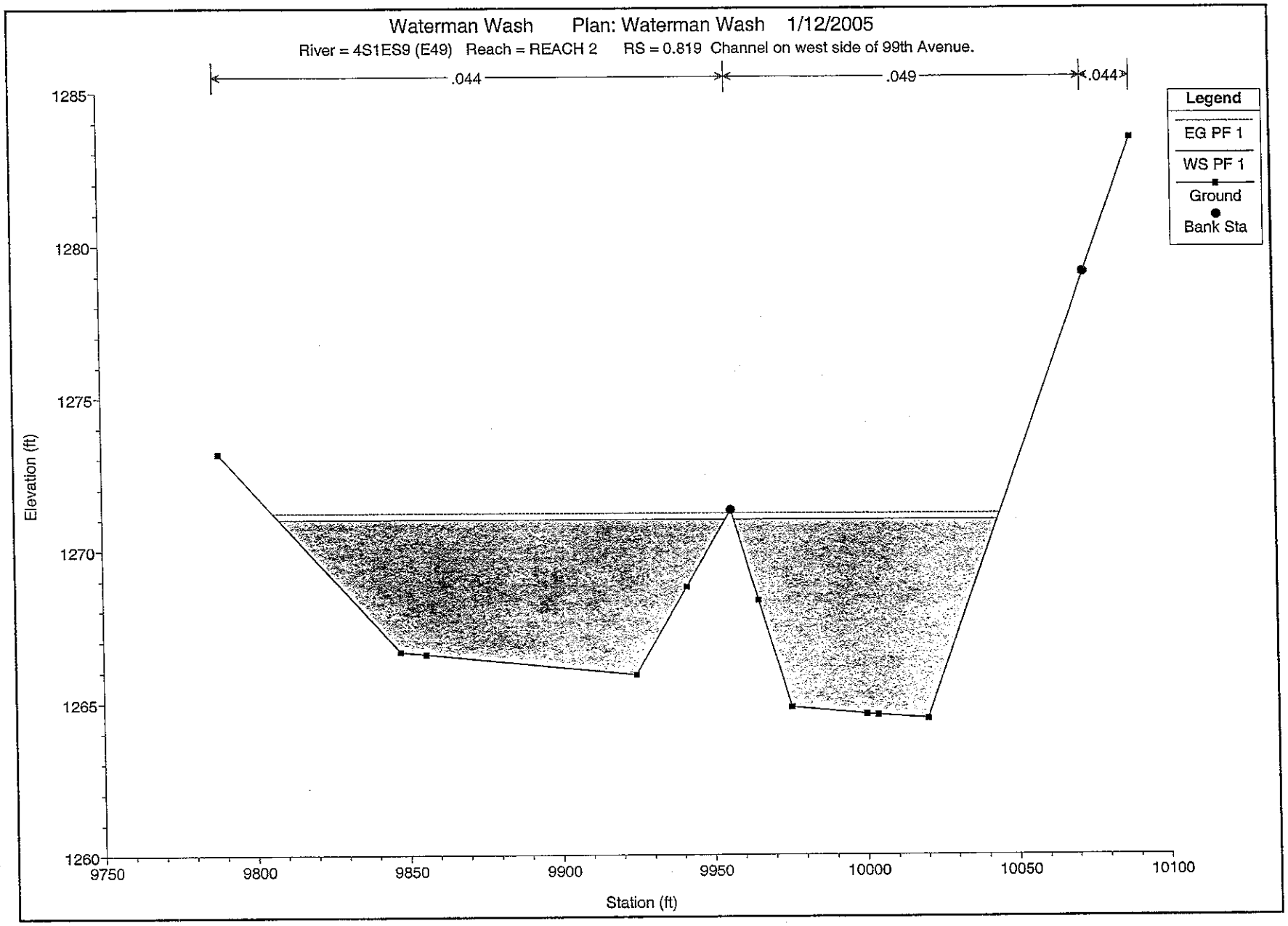

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.552 Input by hand using survey points and dtm.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1264
1262
1260
1258
1256
1254
9600
9800
10000
10200
10400
Station (ft)

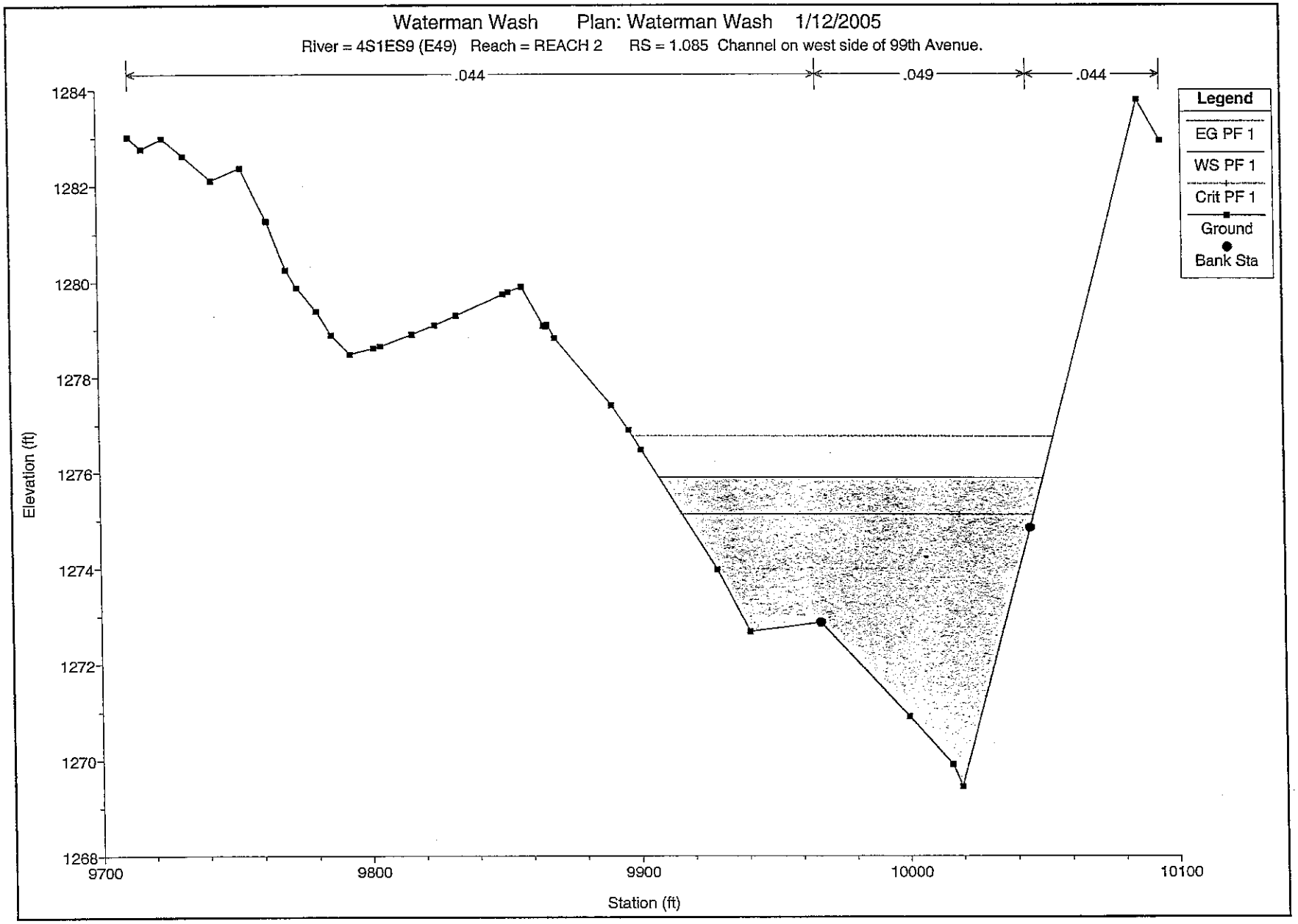

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.566 Culv 11 - 56" x 39" CMP's
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1266
1264
1262
1260
1258
1256
1254
9600
9800
10000
10200
10400
Station (ft)

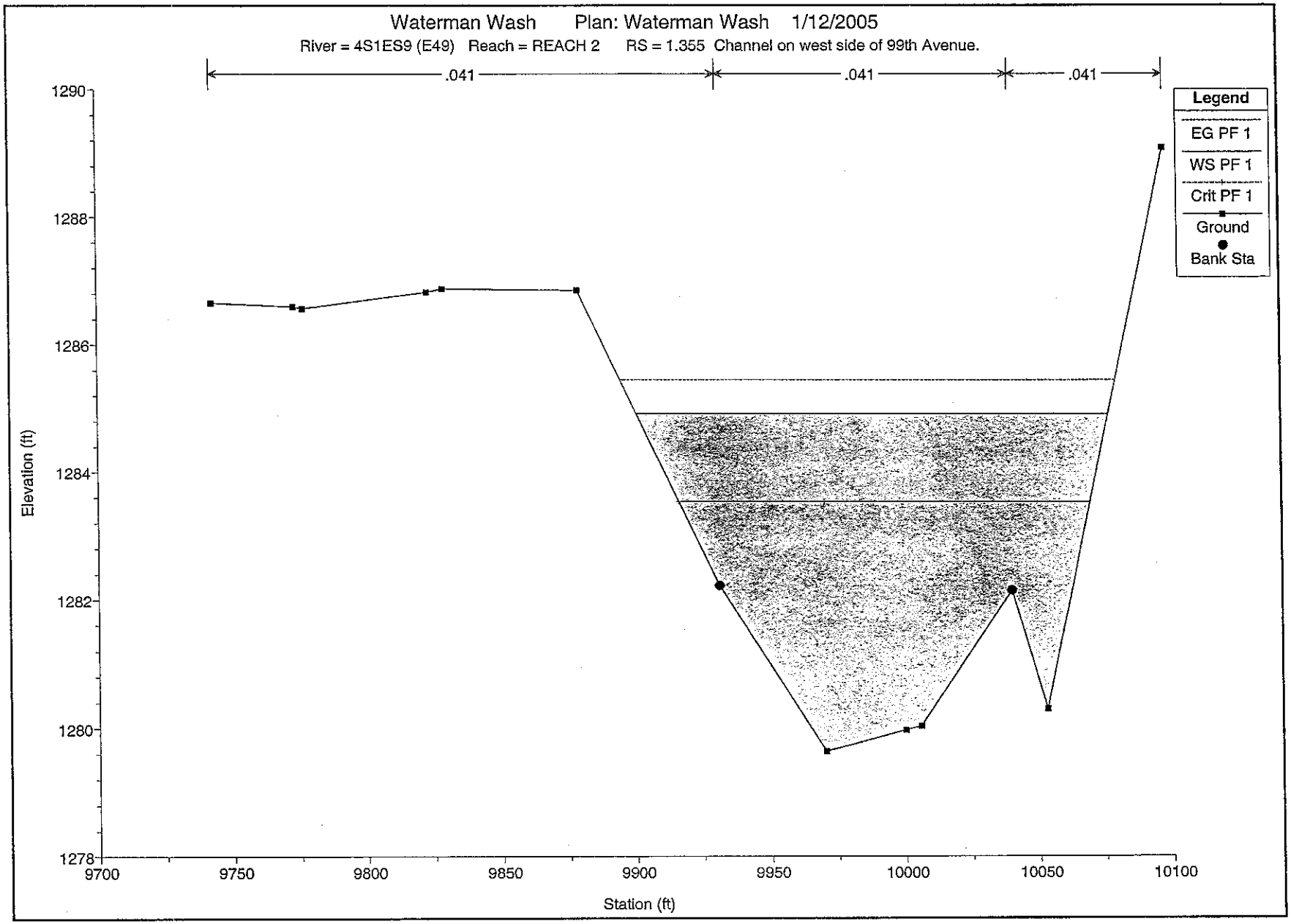

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.566 Culv 11 - 56" x 39" CMP's
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1264
1262
1260
1258
1256
1254
9700
9800
9900
10000
10100
10200
10300
Station (ft)

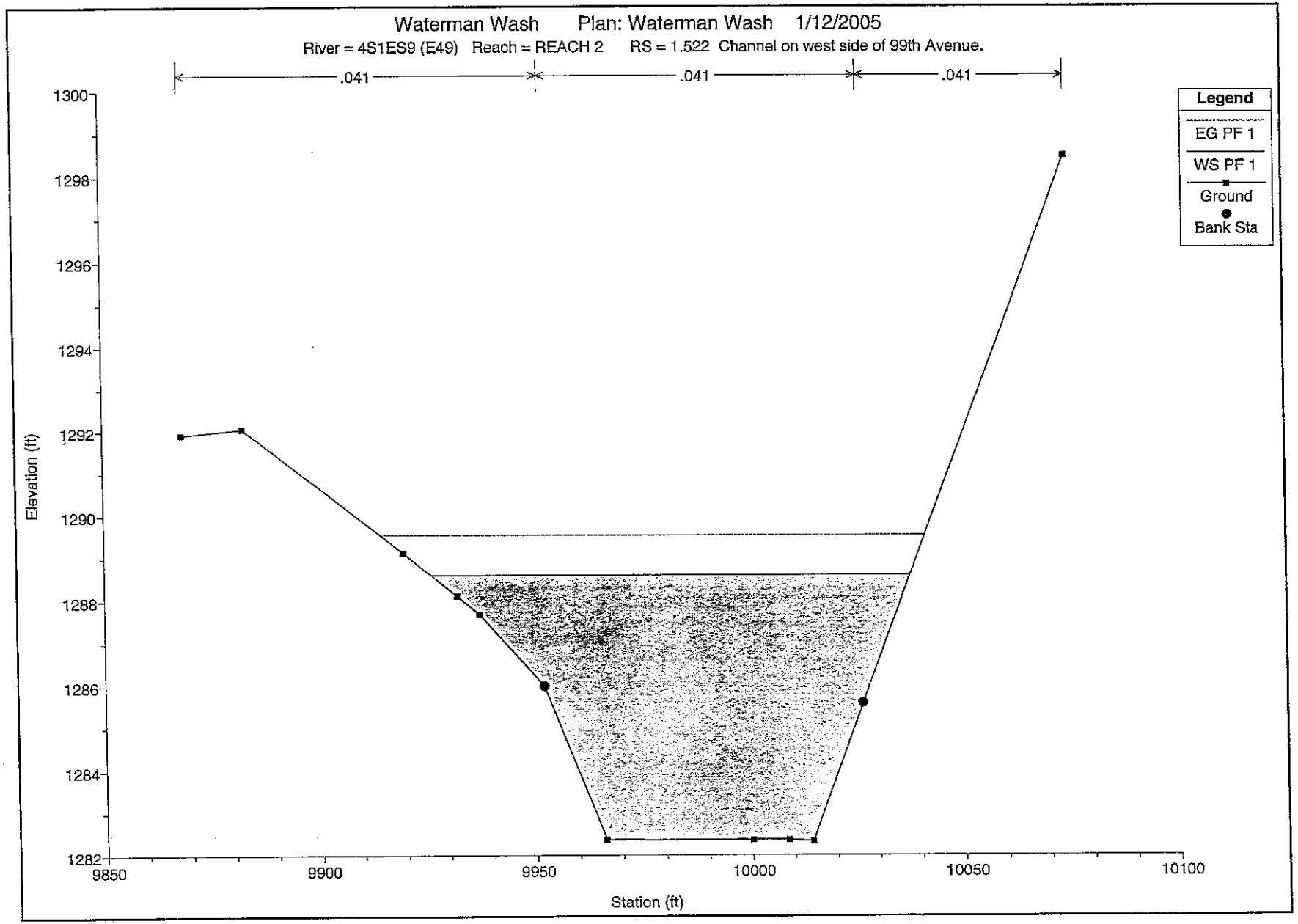

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.580 Input by hand using survey points and dtm.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1264
1263
1262
1261
1260
1259
1258
1257
1256
9700
9800
9900
10000
10100
10200
10300
Station (ft)

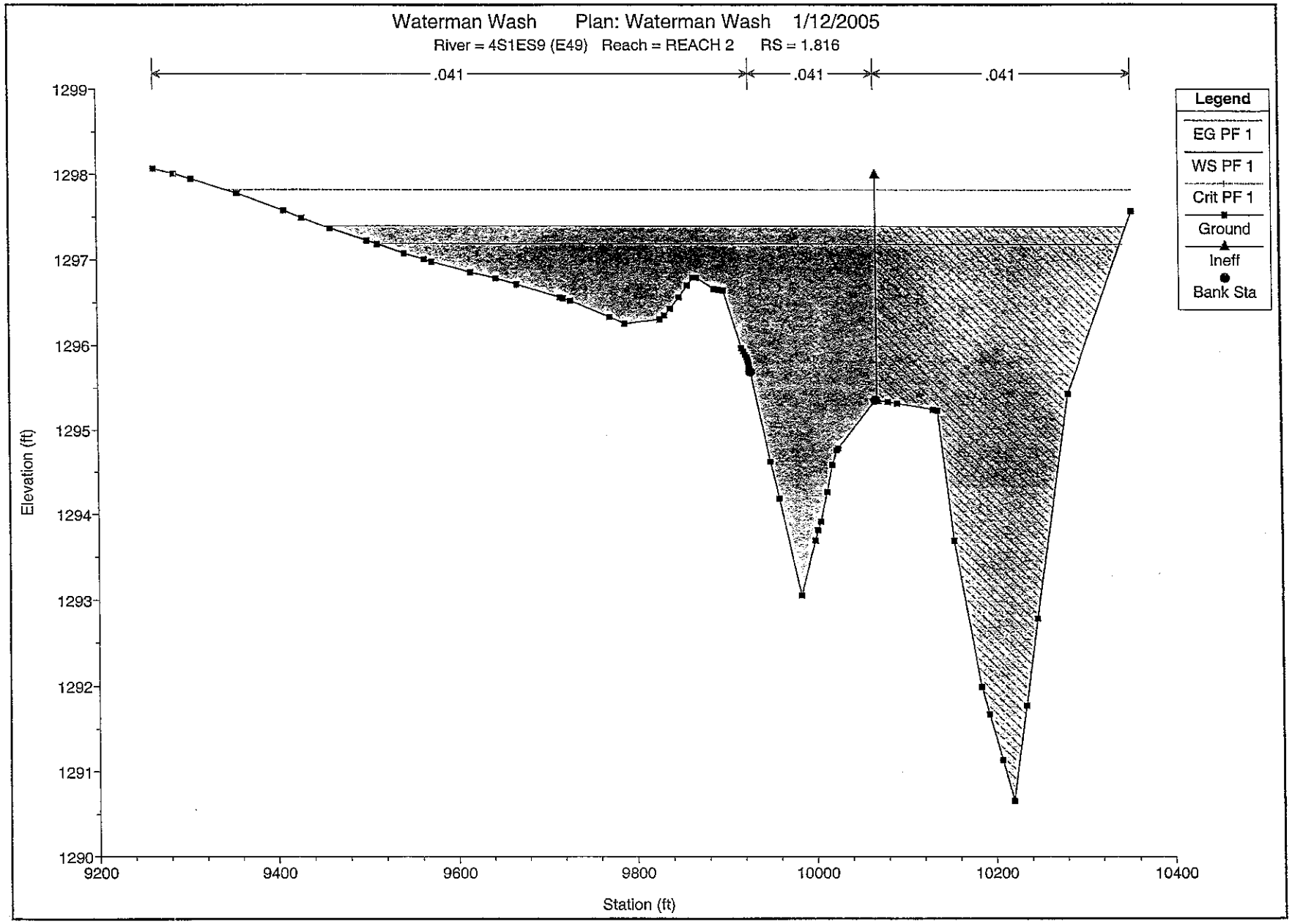

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.637 Upstream of 11-56" x 39" CMP's which cross 99th Avenue.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1272
1270
1268
1266
1264
1262
1260
1258
9900
9920
9940
9960
9980
10000
10020
10040
10060
10080
Station (ft)

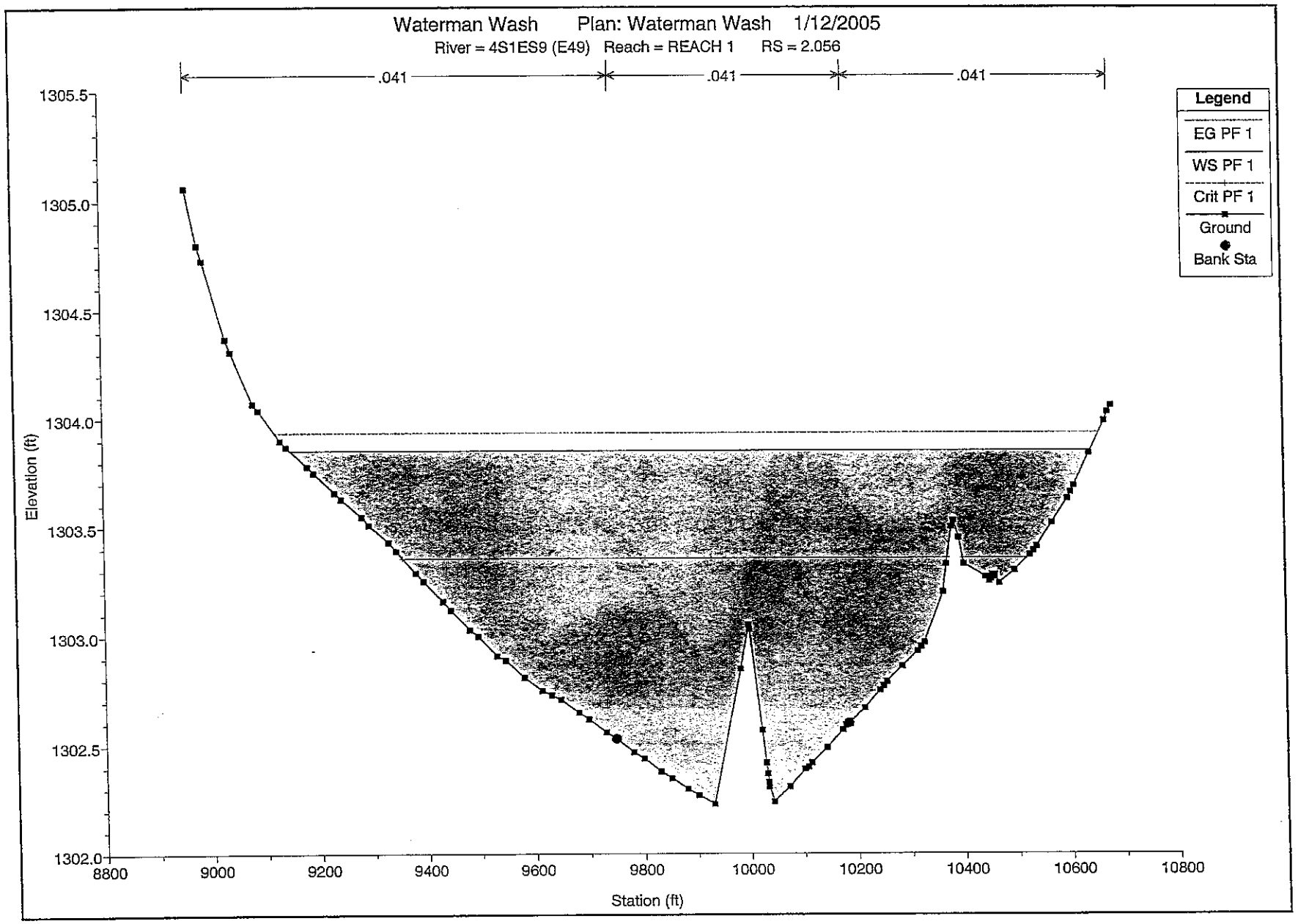

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 0.819 Channel on west side of 99th Avenue.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1285
1280
1275
1270
1265
1260
9750
9800
9850
9900
9950
10000
10050
10100
Station (ft)

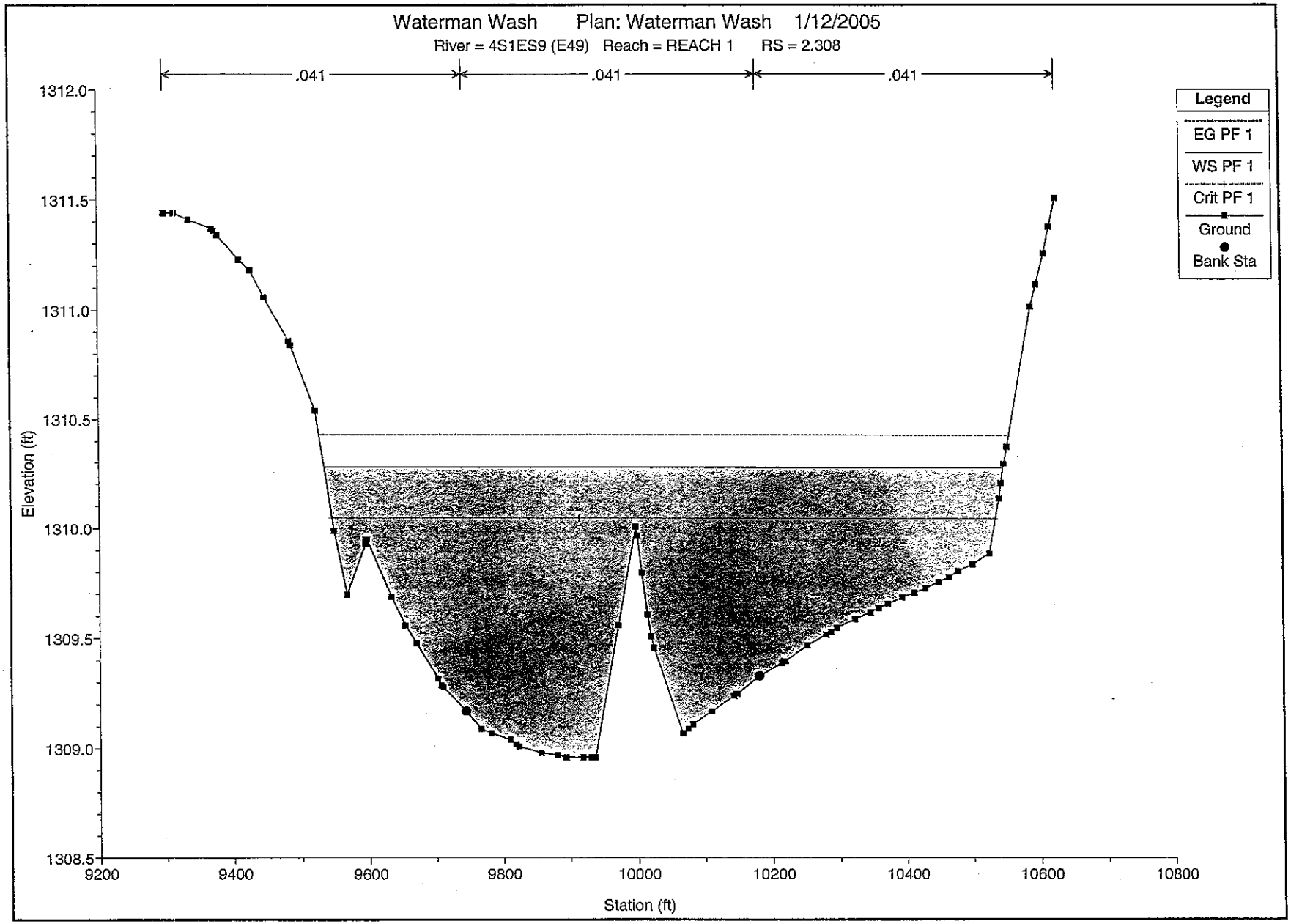

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 1.085 Channel on west side of 99th Avenue.
.044
.049
.044
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1284
1282
1280
1278
1276
1274
1272
1270
1268
9700
9800
9900
10000
10100
Station (ft)

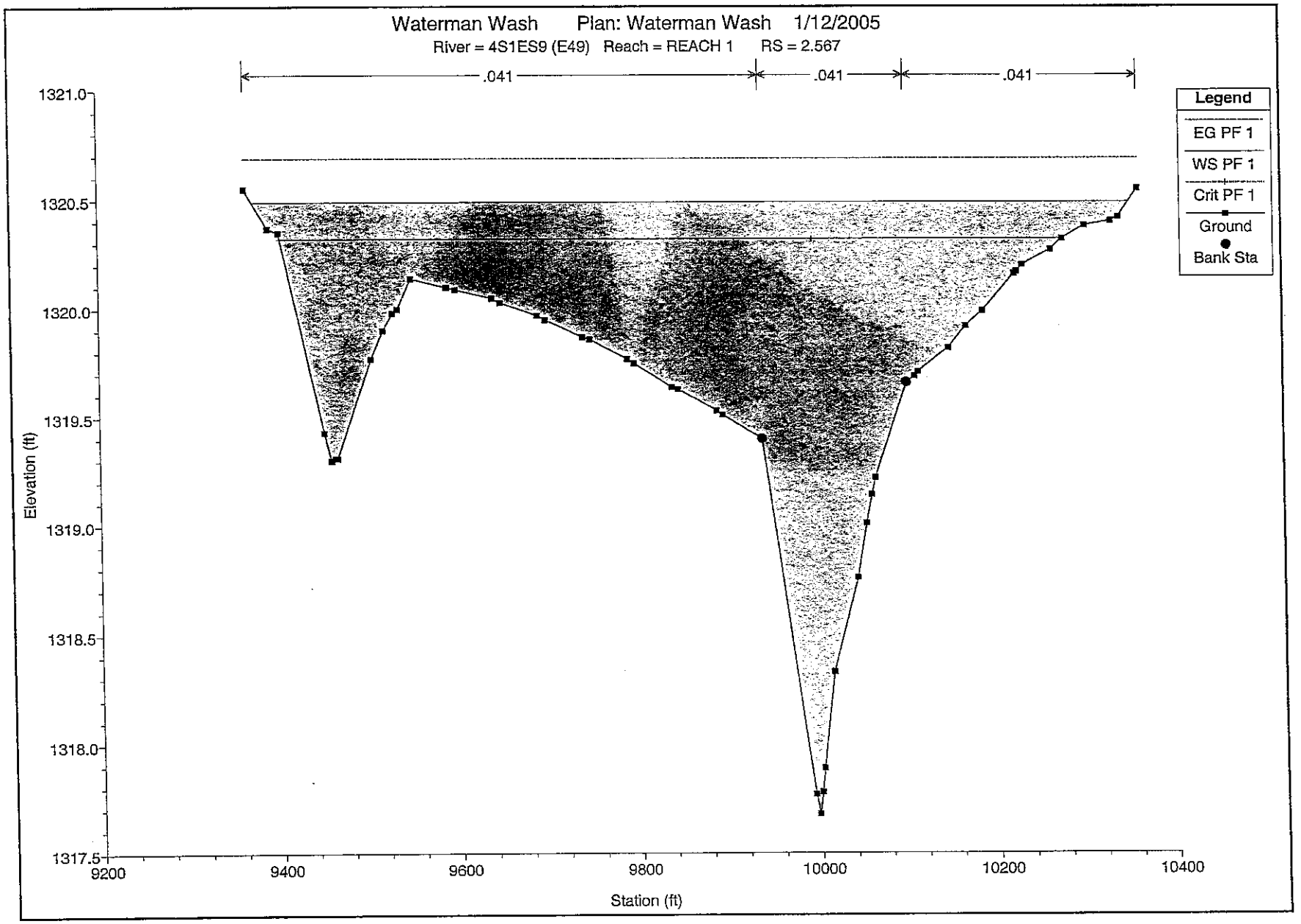

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 1.355 Channel on west side of 99th Avenue.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1290
1288
1286
1284
1282
1280
1278
9700
9750
9800
9850
9900
9950
10000
10050
10100
Station (ft)

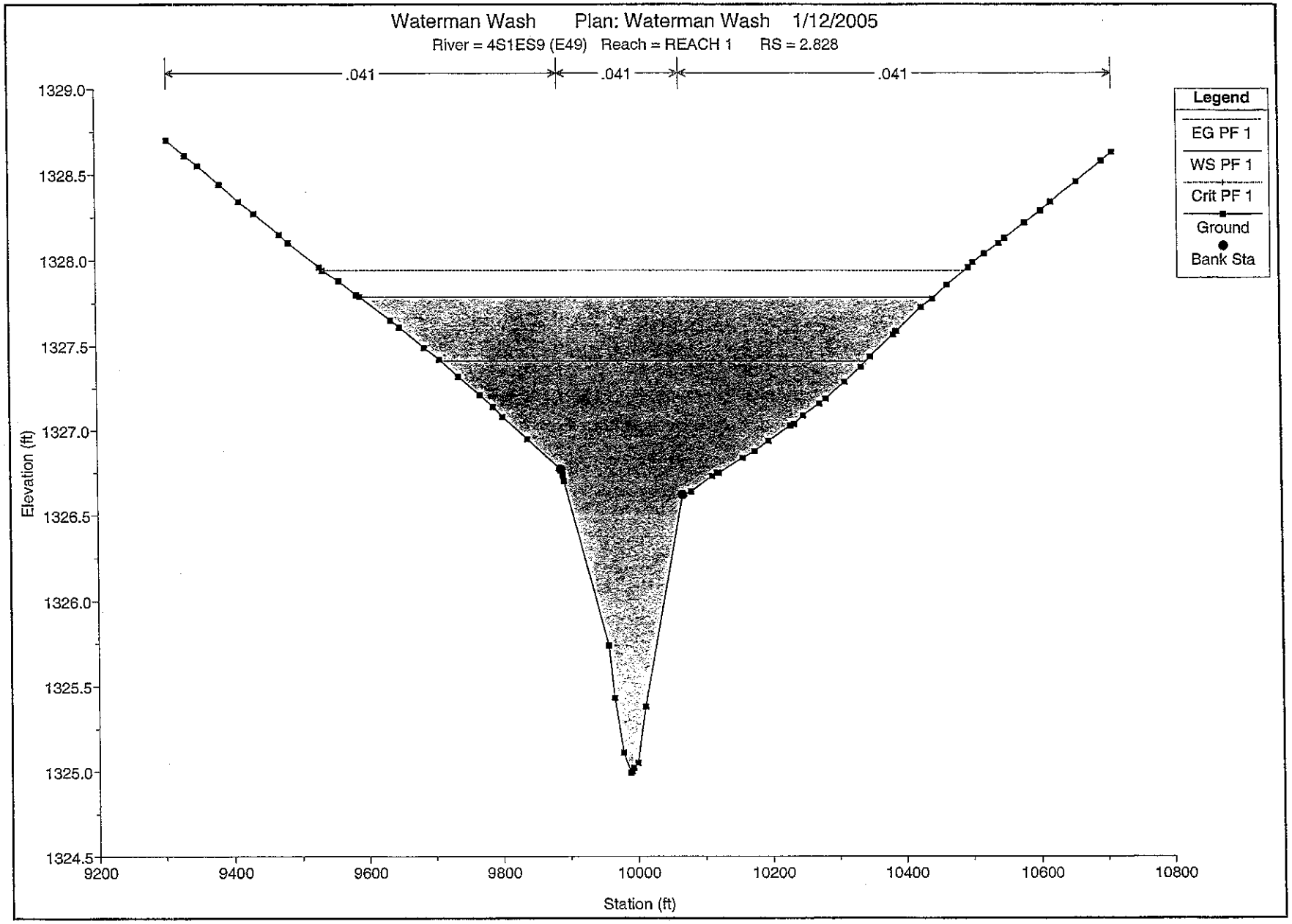

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 1.522 Channel on west side of 99th Avenue.
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1300
1298
1296
1294
1292
1290
1288
1286
1284
1282
9850
9900
9950
10000
10050
10100
Station (ft)

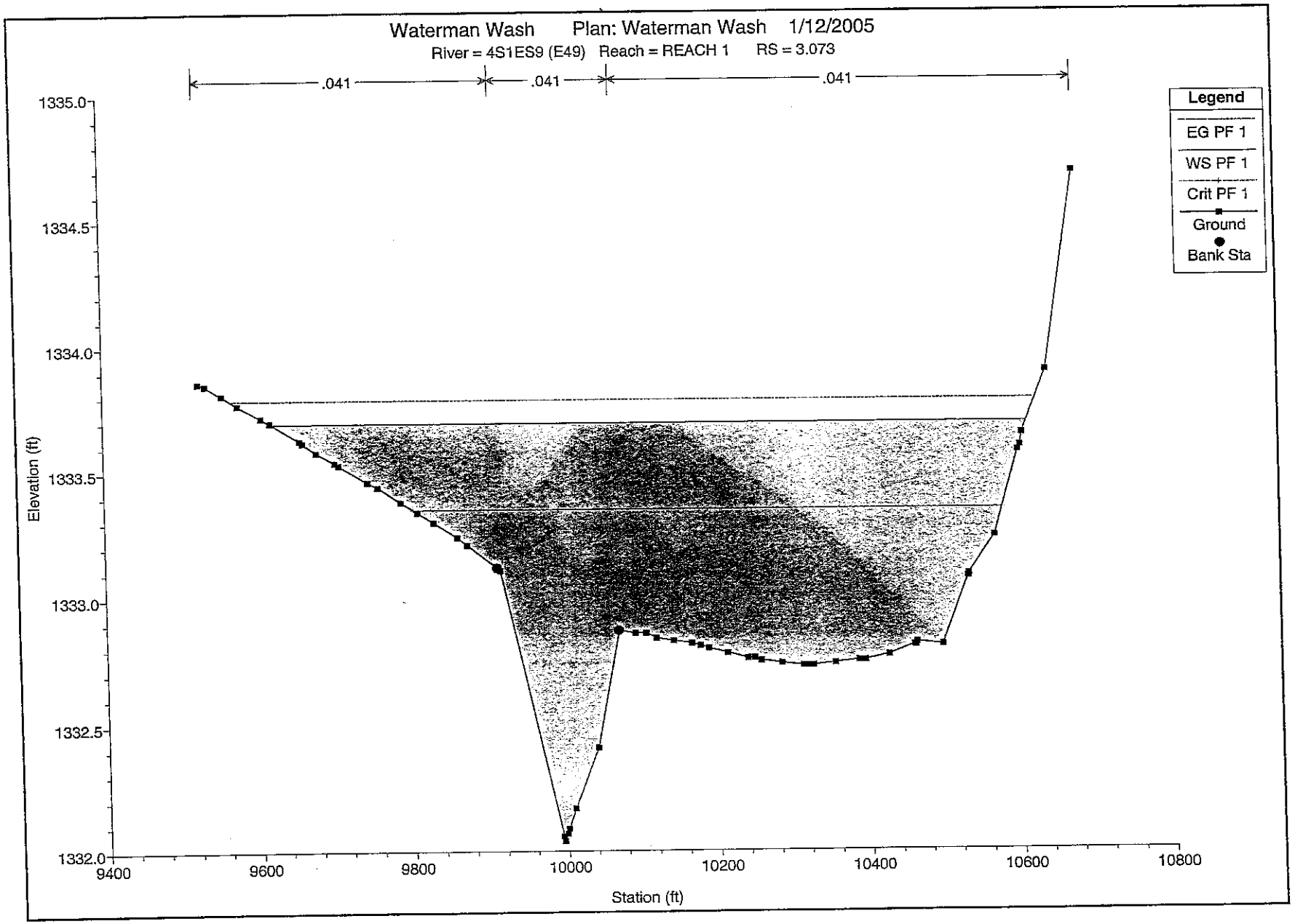

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 2 RS = 1.816
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
1299
1298
1297
1296
1295
1294
1293
1292
1291
1290
9200
9400
9600
9800
10000
10200
10400
Station (ft)

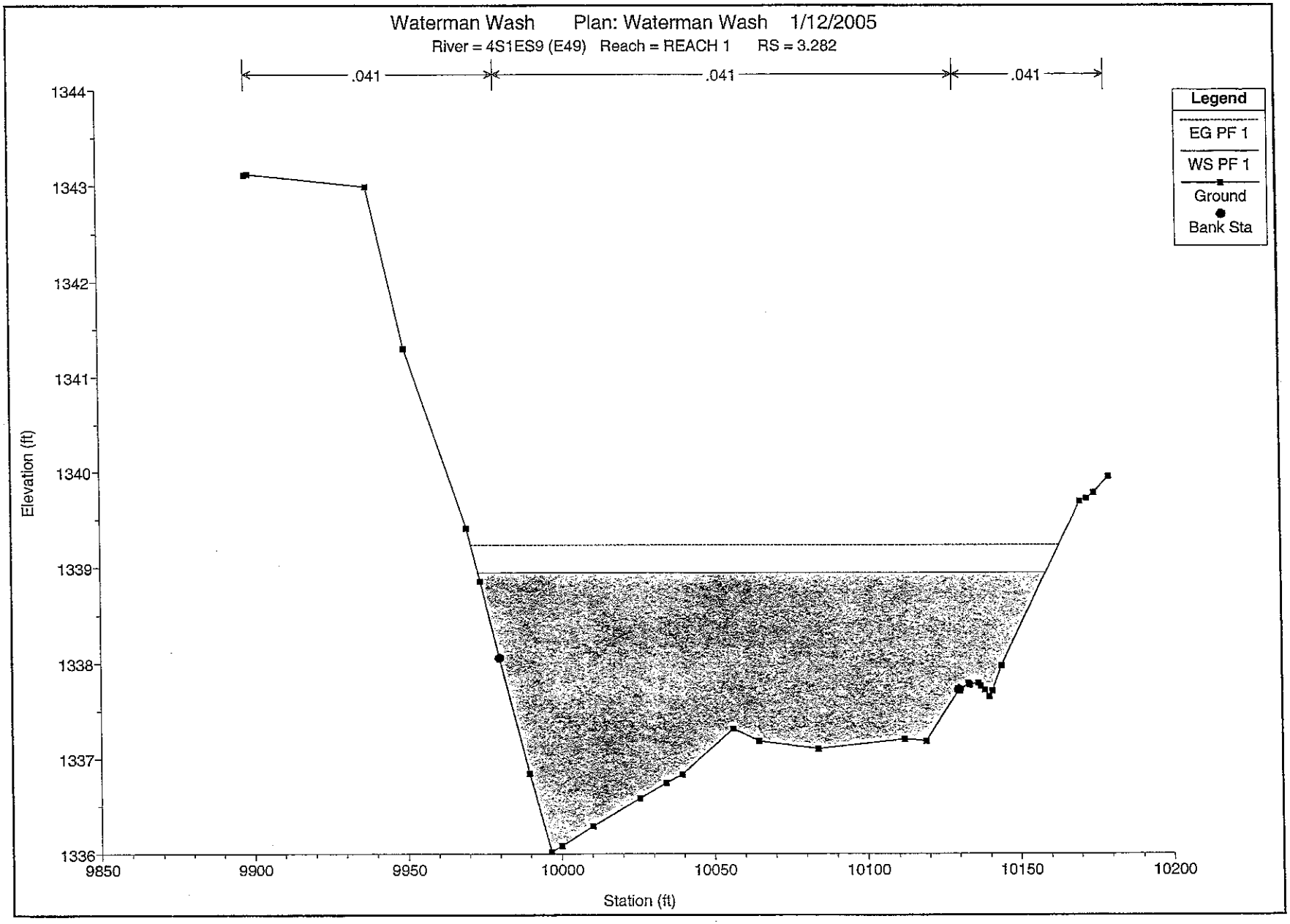

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 1 RS = 2.056
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1305.5
1305.0
1304.5
1304.0
1303.5
1303.0
1302.5
1302.0
8800
9000
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 1 RS = 2.308
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1312.0
1311.5
1311.0
1310.5
1310.0
1309.5
1309.0
1308.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 1 RS = 2.567
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1321.0
1320.5
1320.0
1319.5
1319.0
1318.5
1318.0
1317.5
9200
9400
9600
9800
10000
10200
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 1 RS = 2.828
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1329.0
1328.5
1328.0
1327.5
1327.0
1326.5
1326.0
1325.5
1325.0
1324.5
9200
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 1 RS = 3.073
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1335.0
1334.5
1334.0
1333.5
1333.0
1332.5
1332.0
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES9 (E49) Reach = REACH 1 RS = 3.282
.041
.041
.041
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1344
1343
1342
1341
1340
1339
1338
1337
1336
9850
9900
9950
10000
10050
10100
10150
10200
Station (ft)

MODEL: WATERMAN WASH

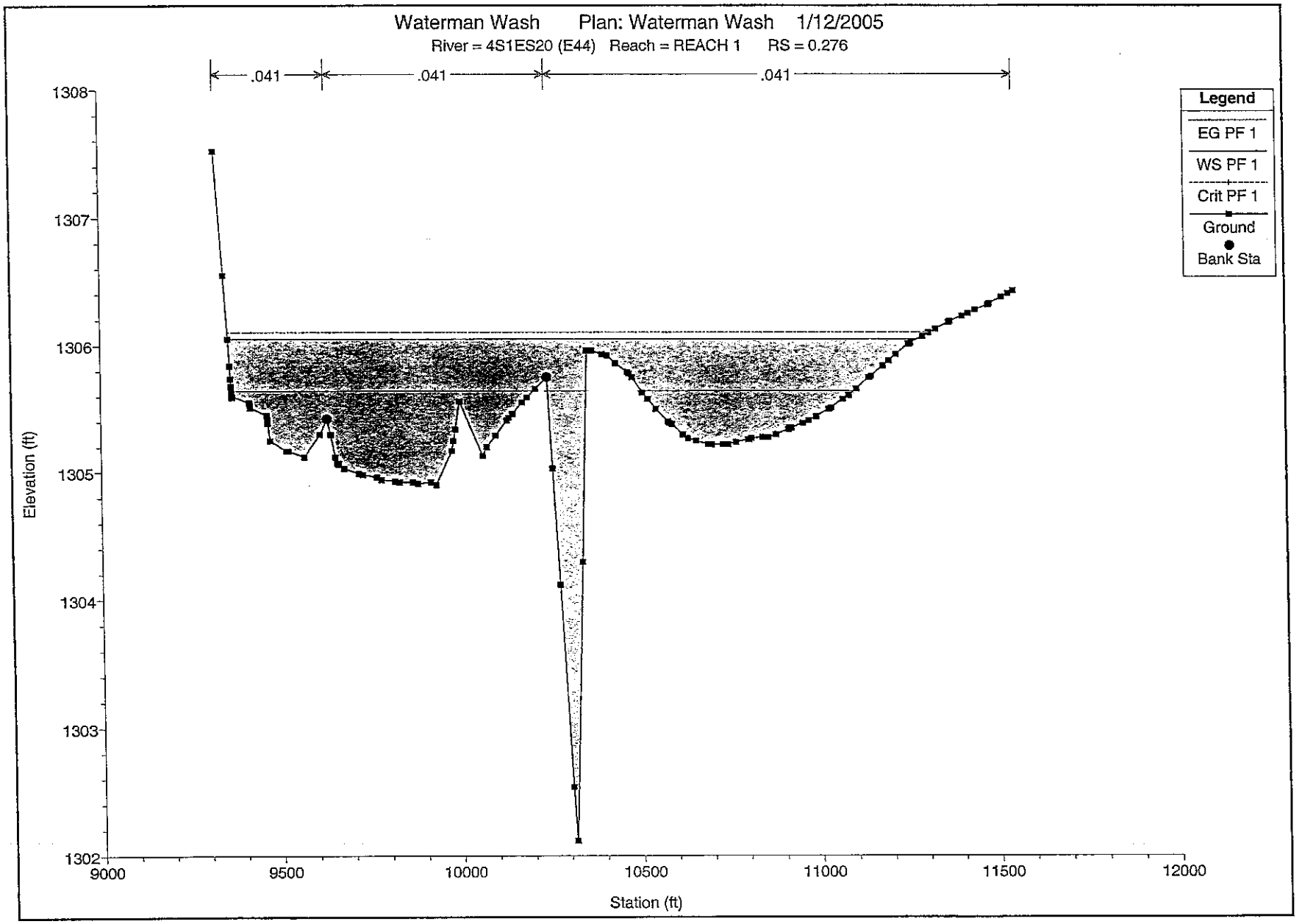
REACH: 4S1ES20 (E44)

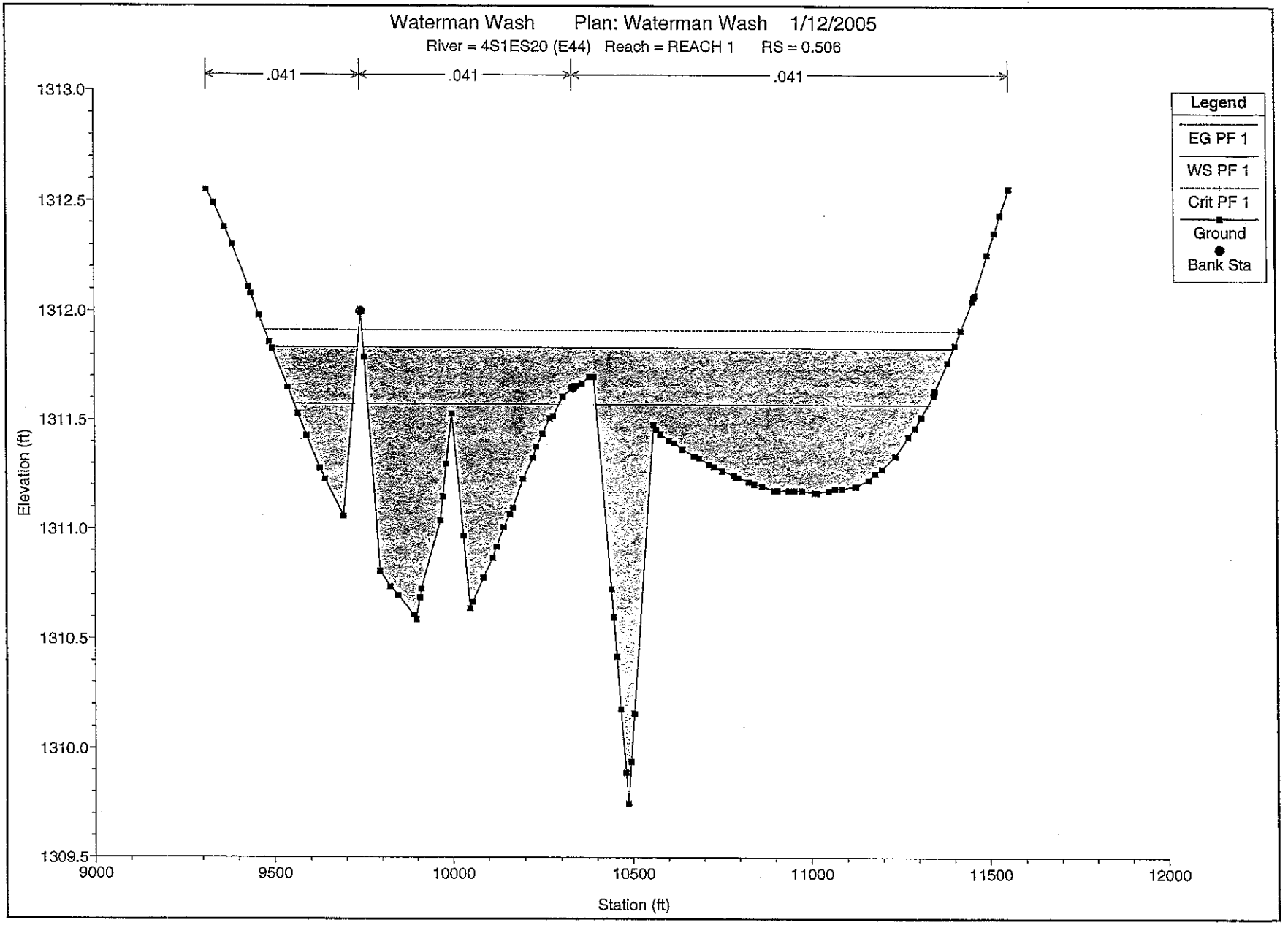
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

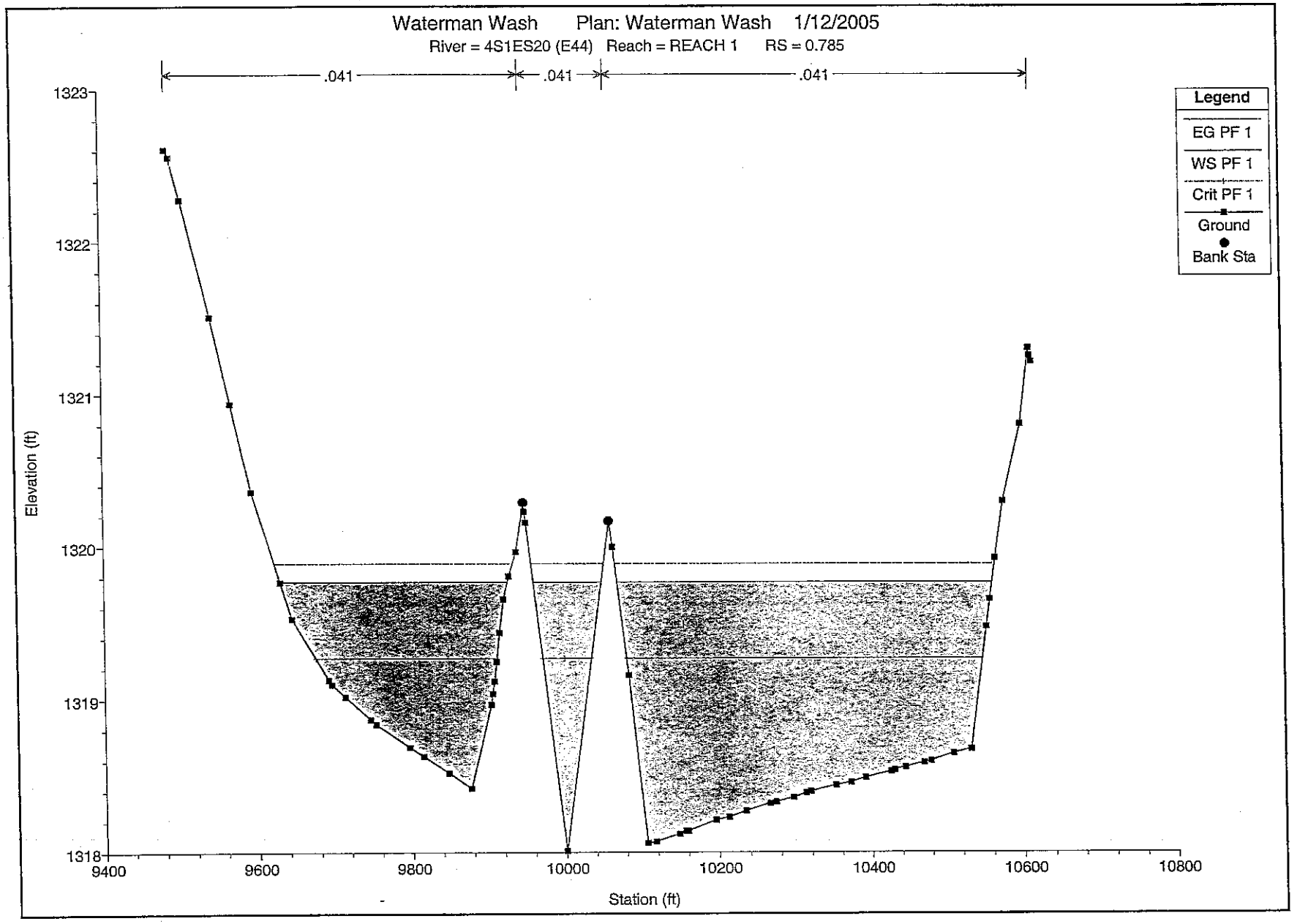
Change in Discharge based on Reach Length

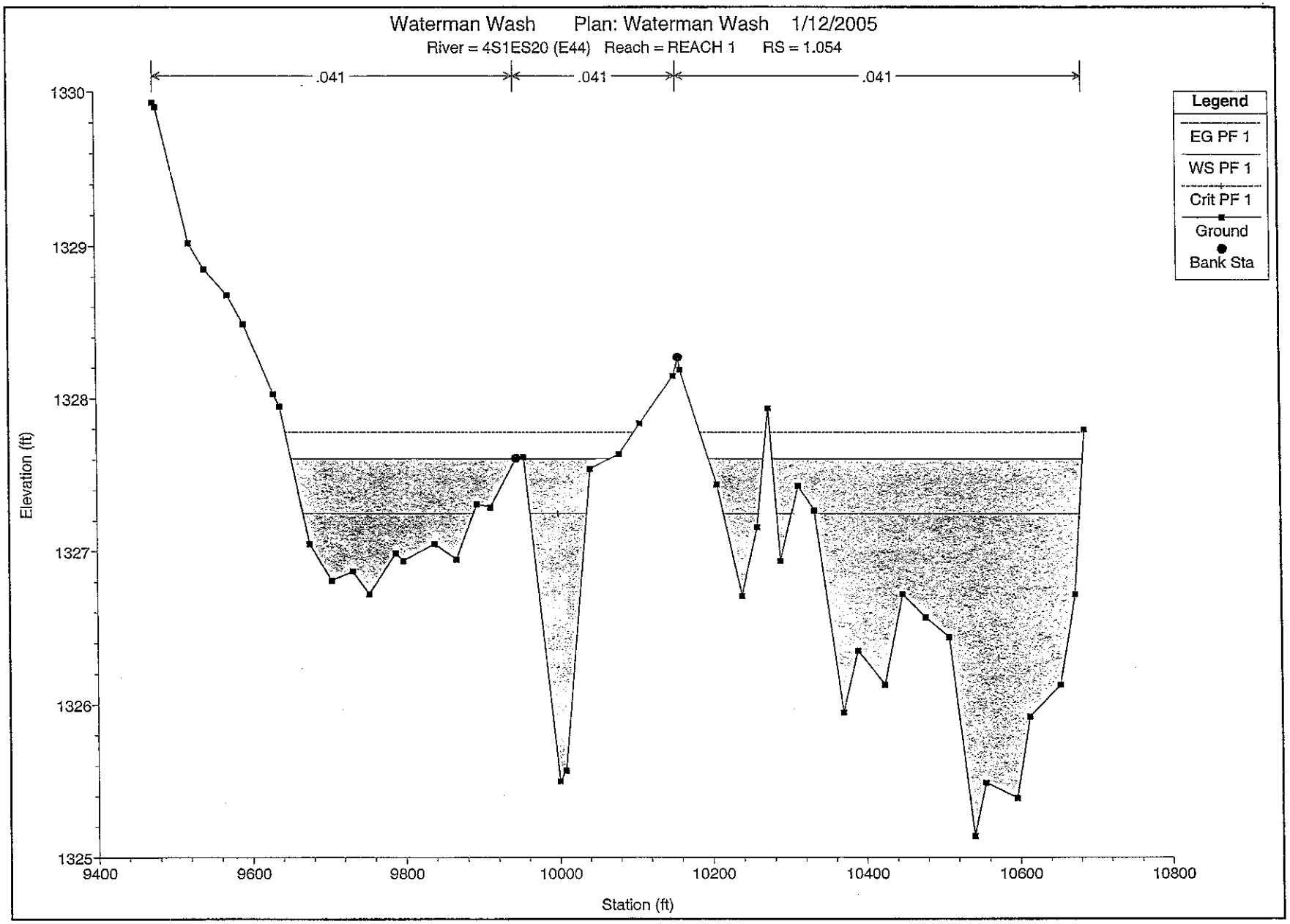
Wash ID: 4S1ES20 (E44)

The discharge used for the cross-sections was CPE38 from the without railroad model.
The discharge used at all cross-sections is 2630 cfs.


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES20 (E44) Reach = REACH 1 RS = 0.276
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1308
1307
1306
1305
1304
1303
1302
9000
9500
10000
10500
11000
11500
12000
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES20 (E44) Reach = REACH 1 RS = 0.506
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1313.0
1312.5
1312.0
1311.5
1311.0
1310.5
1310.0
1309.5
9000
9500
10000
10500
11000
11500
12000
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES20 (E44) Reach = REACH 1 RS = 0.785
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1323
1322
1321
1320
1319
1318
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 4S1ES20 (E44) Reach = REACH 1 RS = 1.054
.041
.041
.041
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1330
1329
1328
1327
1326
1325
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: WATERMAN WASH

REACH: 3S1WS22A (D42)

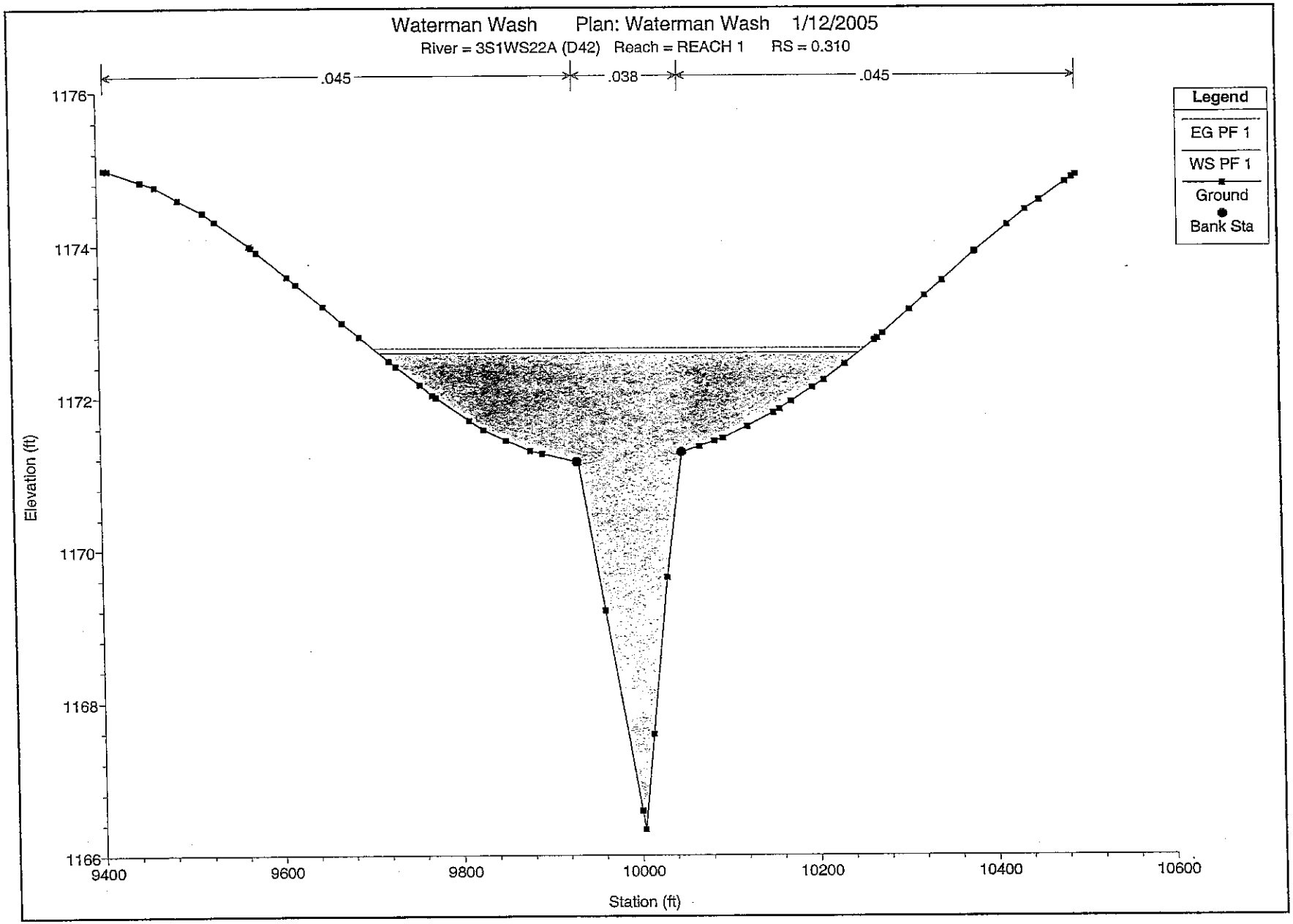
Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

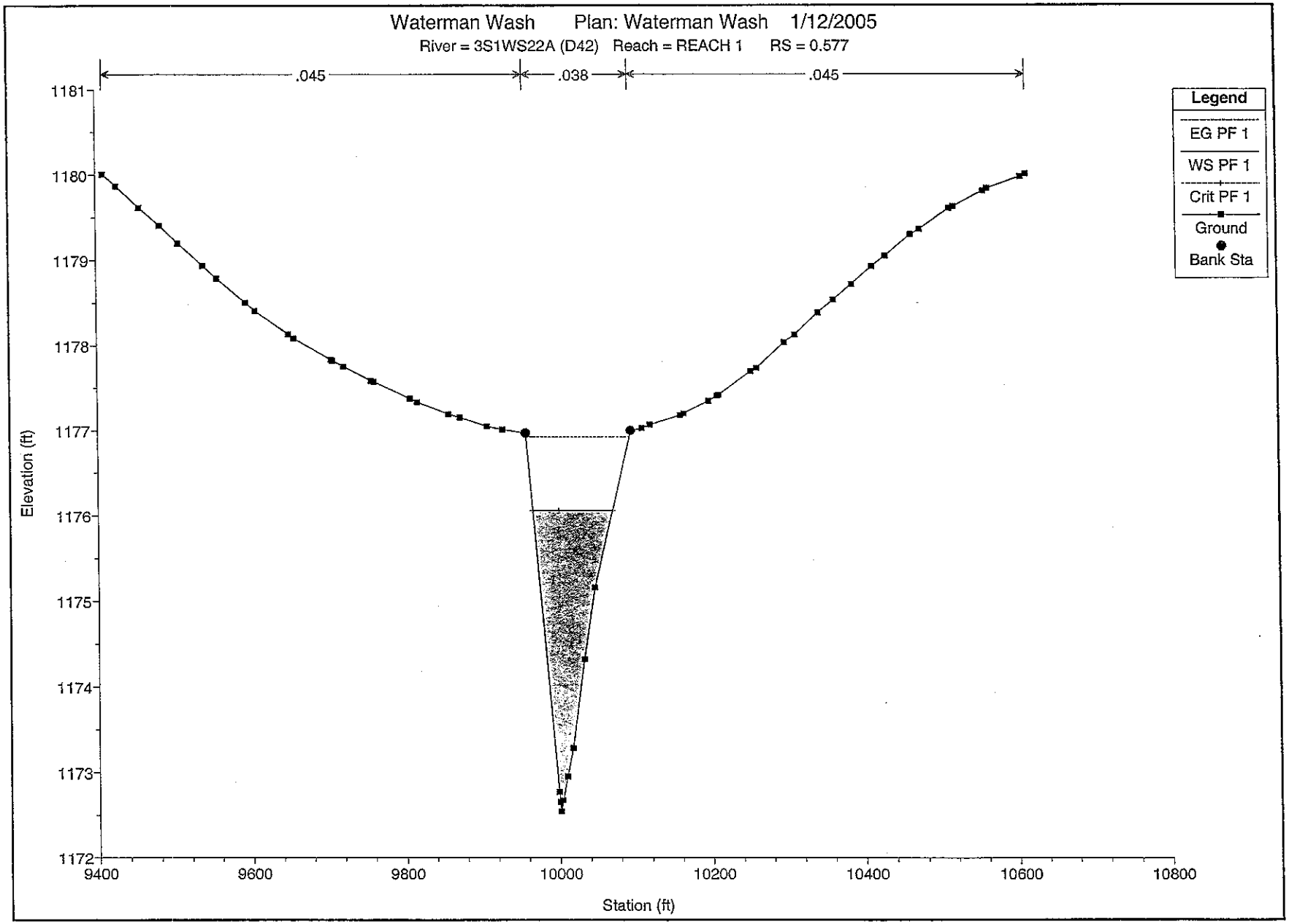
Change in Discharge based on Reach Length

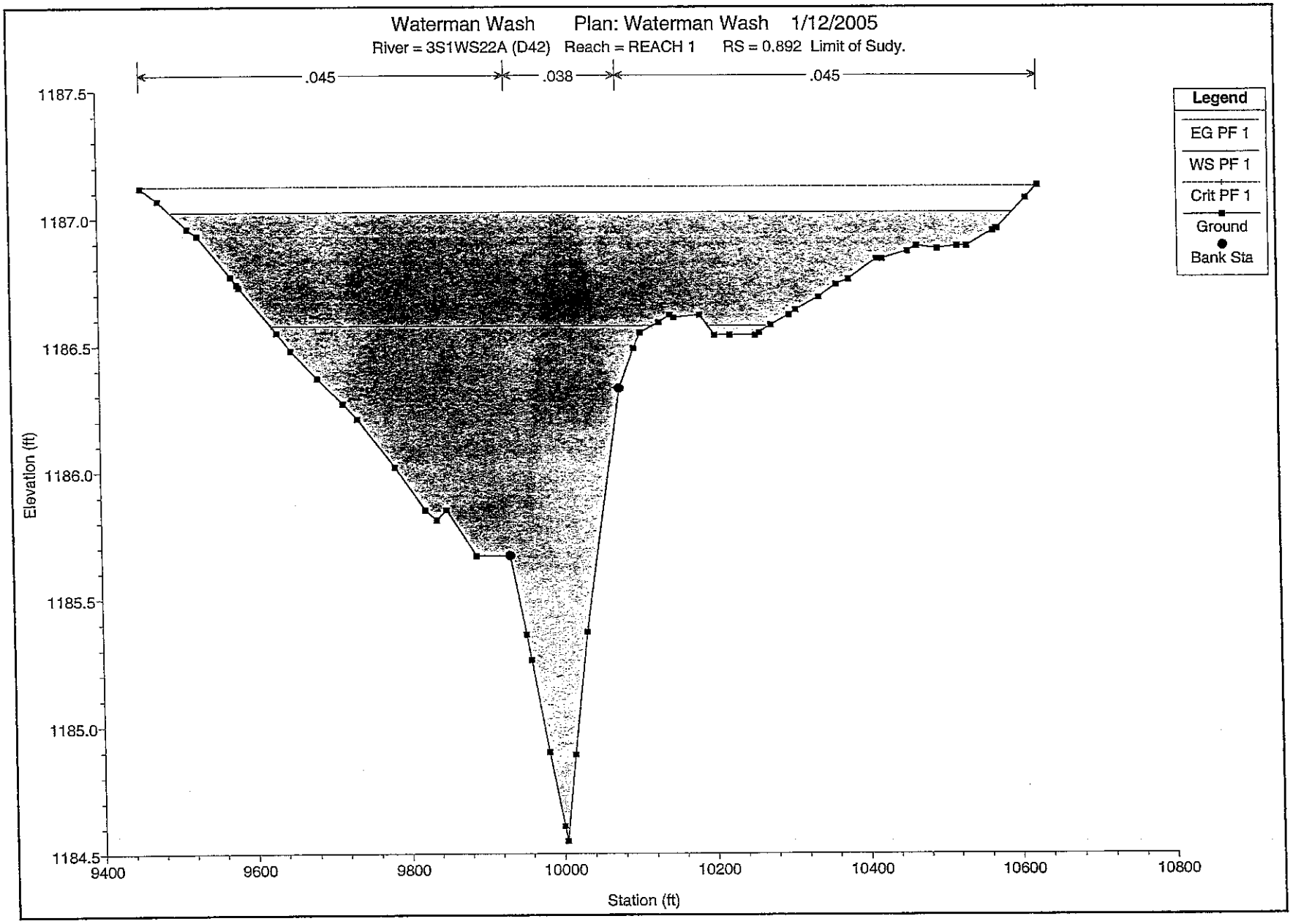
Wash ID: 3S1WS22A (D42)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
D34	0.892	1432	1430	1400
D42	0.577	1307	1310	1300
D42	0.310	1201	1200	1200
CPD42	0.004	1080	1080	1100

Runoff from local Subbasin D34 is 1432 cfs.
X-Section 0.004 deleted from model but left in table for calculation purposes.


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22A (D42) Reach = REACH 1 RS = 0.310
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1176
1174
1172
1170
1168
1166
9400
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22A (D42) Reach = REACH 1 RS = 0.577
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1181
1180
1179
1178
1177
1176
1175
1174
1173
1172
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22A (D42) Reach = REACH 1 RS = 0.892 Limit of Sudy.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1187.5
1187.0
1186.5
1186.0
1185.5
1185.0
1184.5
9400
9600
9800
10000
10200
10400
10600
10800
Station (ft)

MODEL: WATERMAN WASH

REACH: 3S1WS22B (G39)

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Reach Length

Wash ID: 3S1WS22B (G39)

Subbasin	X-section	Discharge	Q (3 sig-figs)	Q (2 sig-figs)
DVG12	1.961	638	640	600
G39	1.713	698	700	700
G39	1.451	761	760	800
G39	1.203	821	820	800
G39	0.955	881	880	900
G39	0.696	944	940	900
CPG39	0.378	1021	1020	1000

Waterman Wash FDS
FCD 2002C024
EEC Job No. 303002

Change in Discharge based on Drainage Area

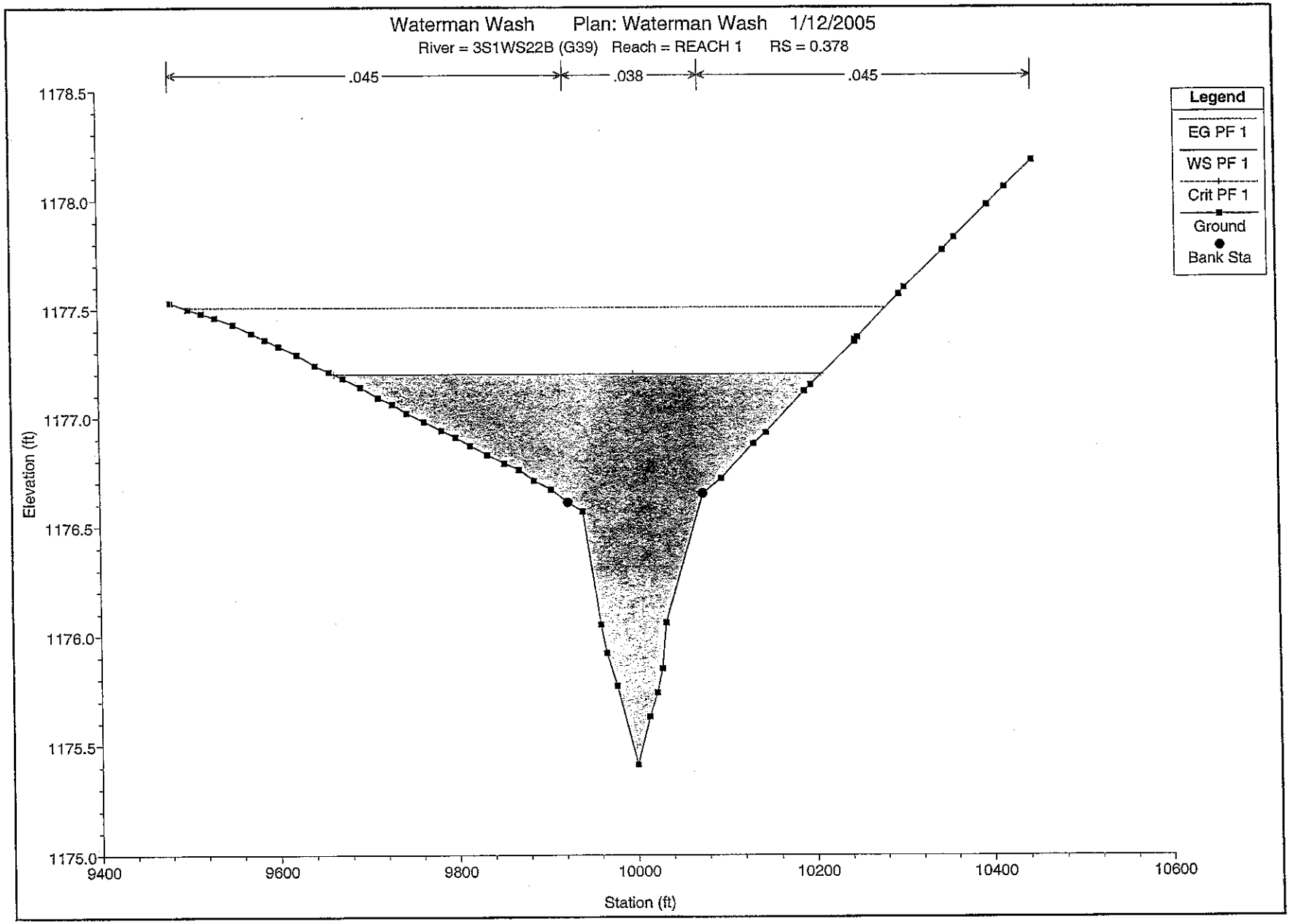
Wash ID: 3S1WS22B (G39)

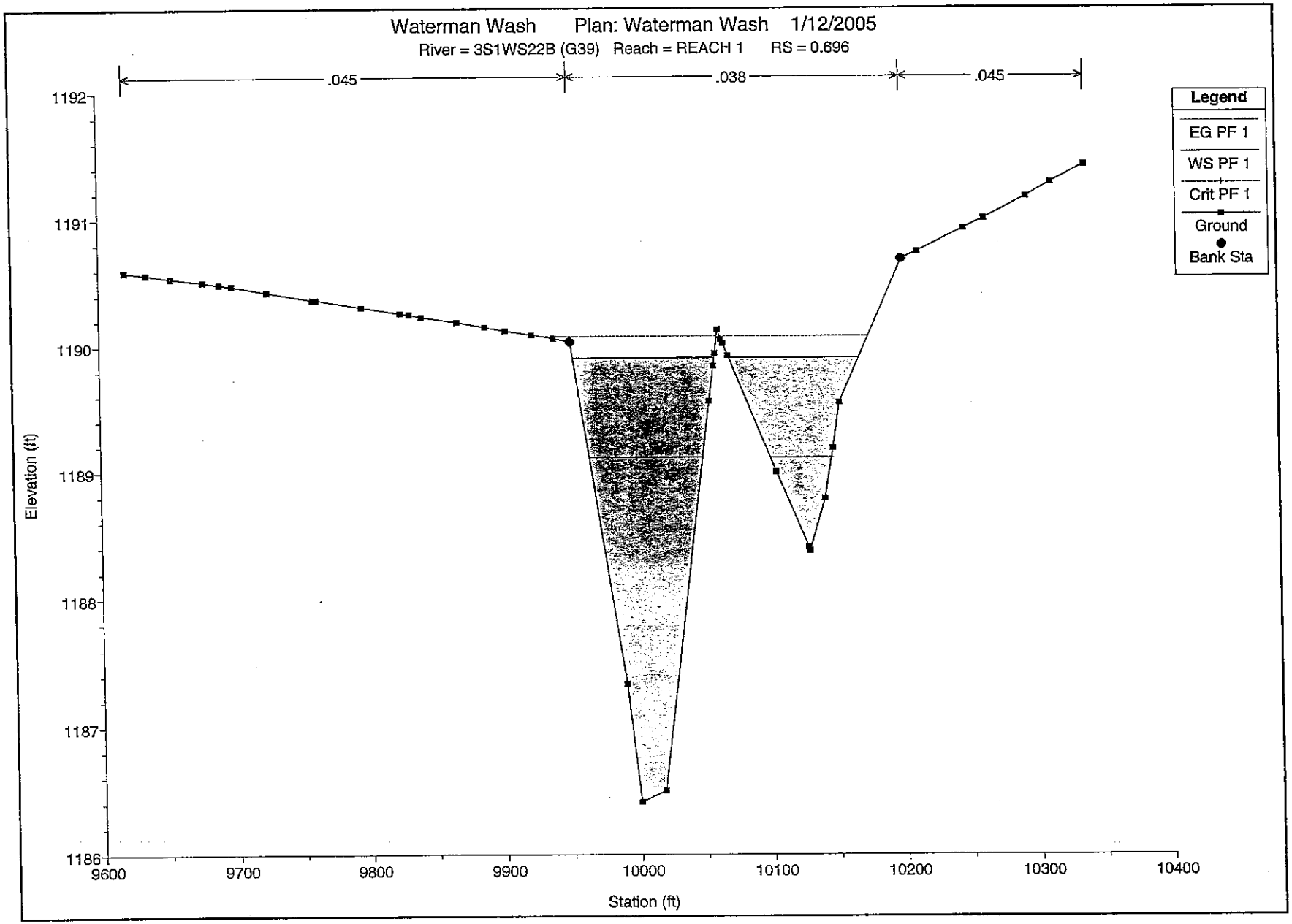
Subbasin: G12

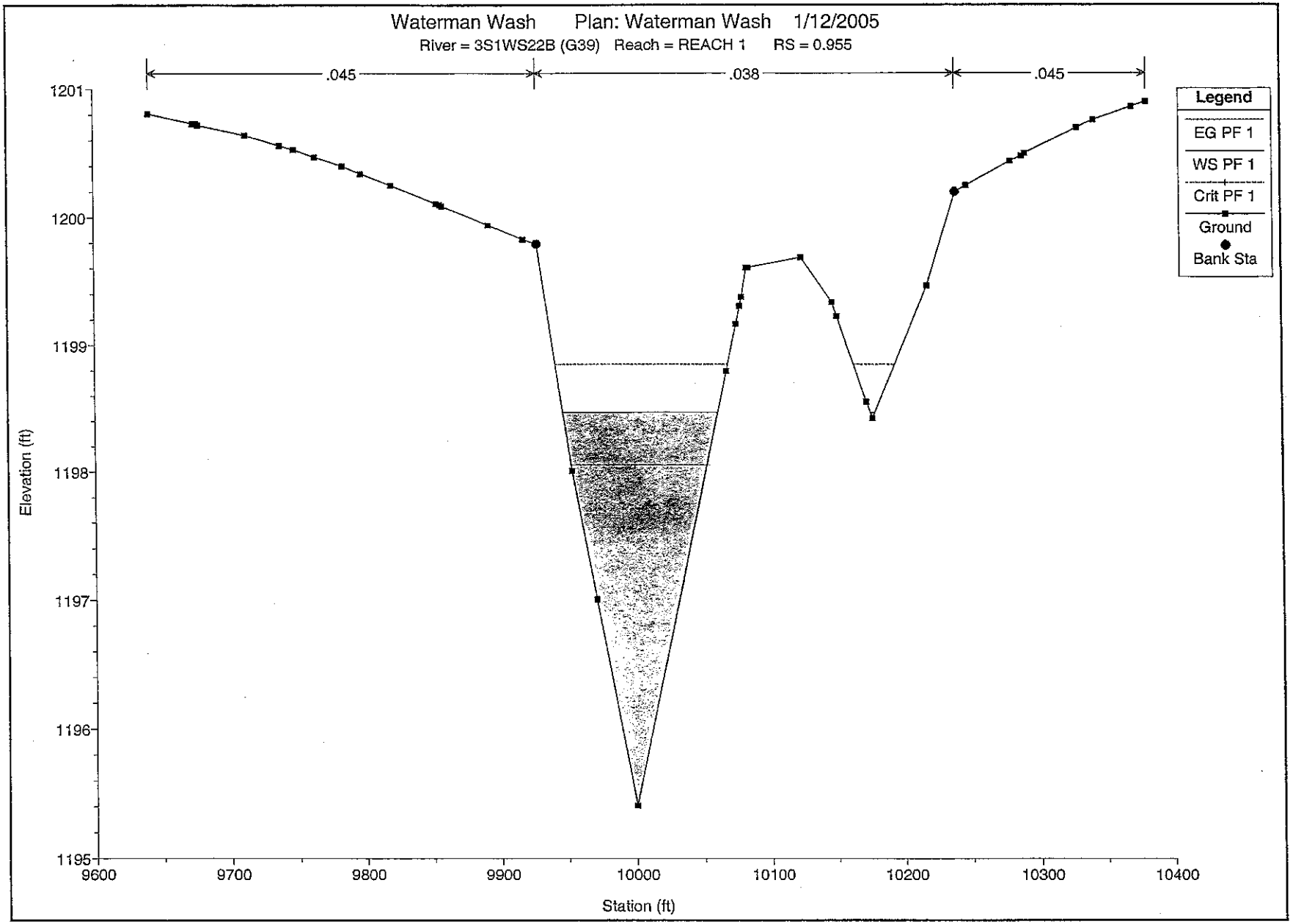
Total Discharge (cfs) = 986

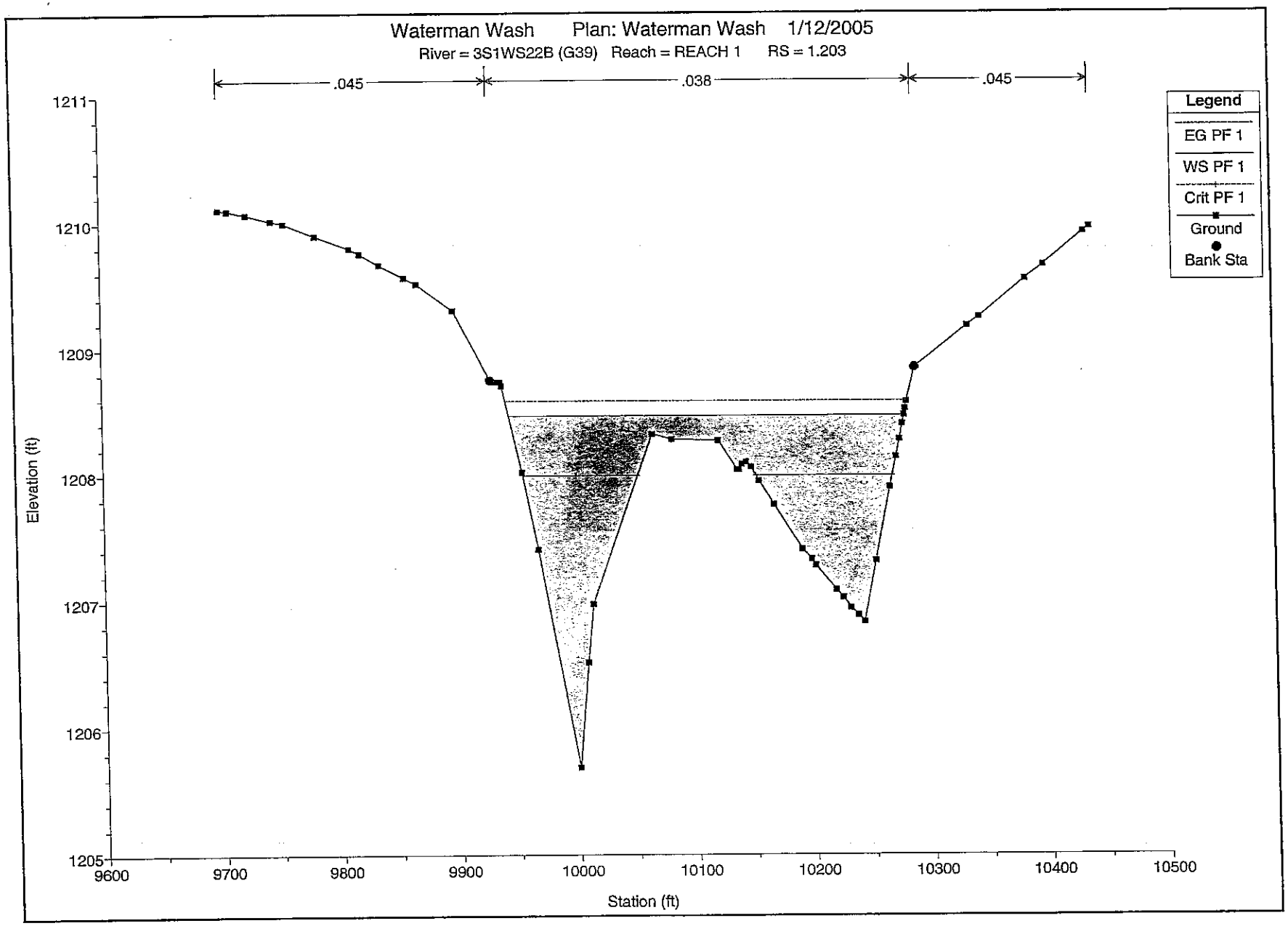
Total Area (acres) = 661

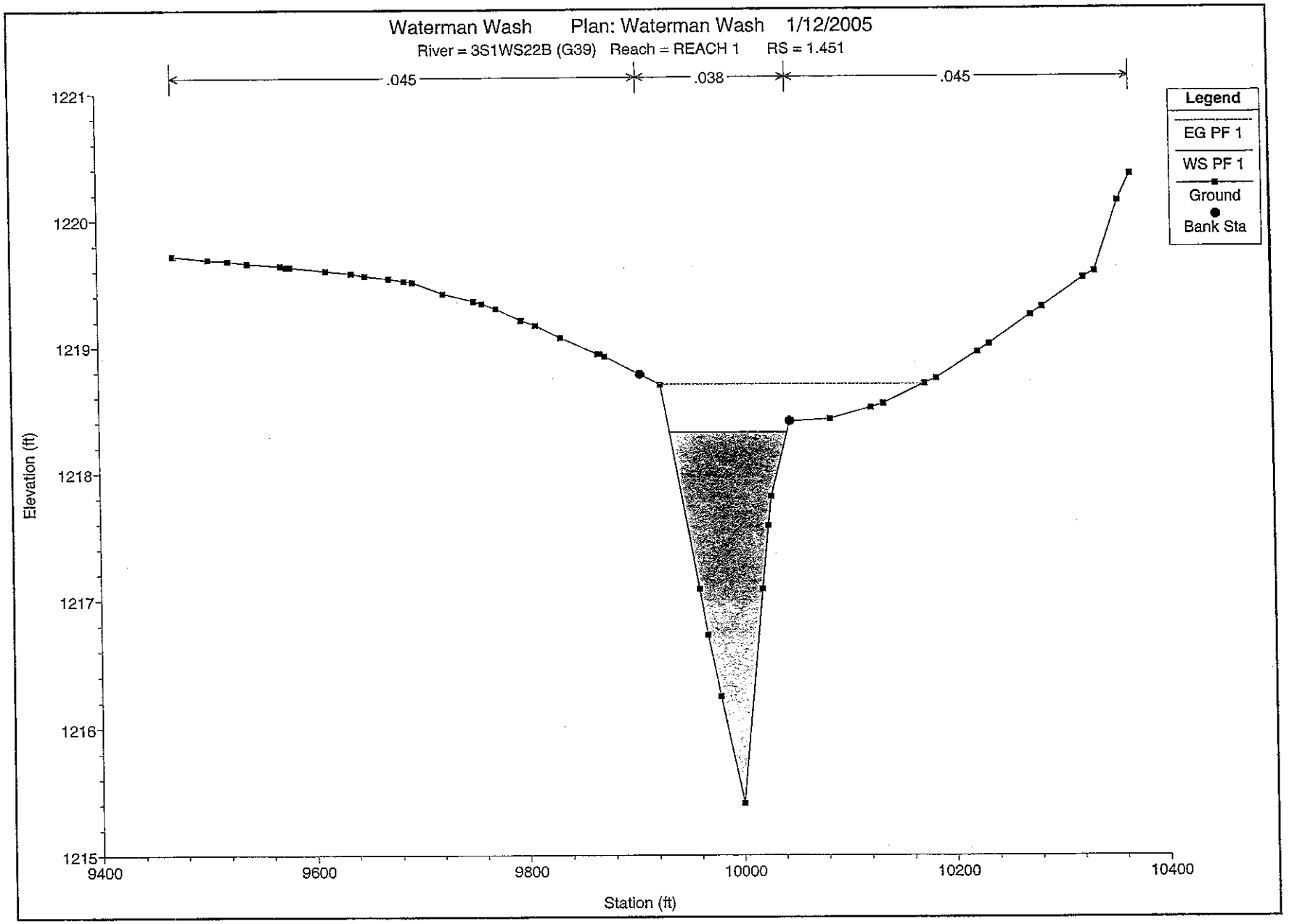
X-Section ID	Contributing Area (acres)	Percent of Total Area	Discharge at X-Section
3.753	164	24.8	240
3.527	190	28.7	280
3.281	225	34.0	340
3.005	452	68.4	670
2.755	486	73.5	720
2.456	583	88.2	870
2.200	639	96.7	950

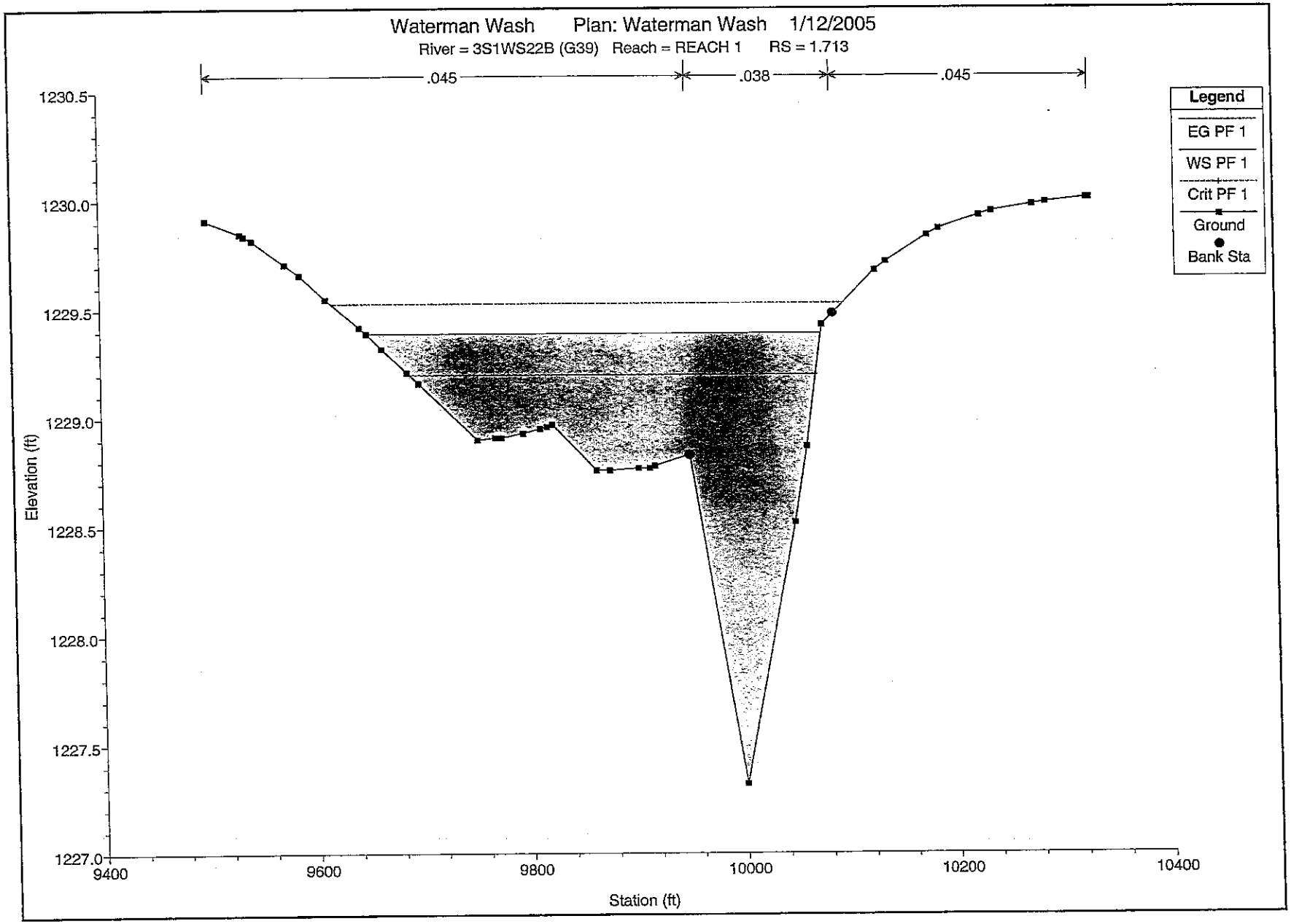

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 0.378
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1178.5
1178.0
1177.5
1177.0
1176.5
1176.0
1175.5
1175.0
9400
9600
9800
10000
10200
10400
10600
Station (ft)

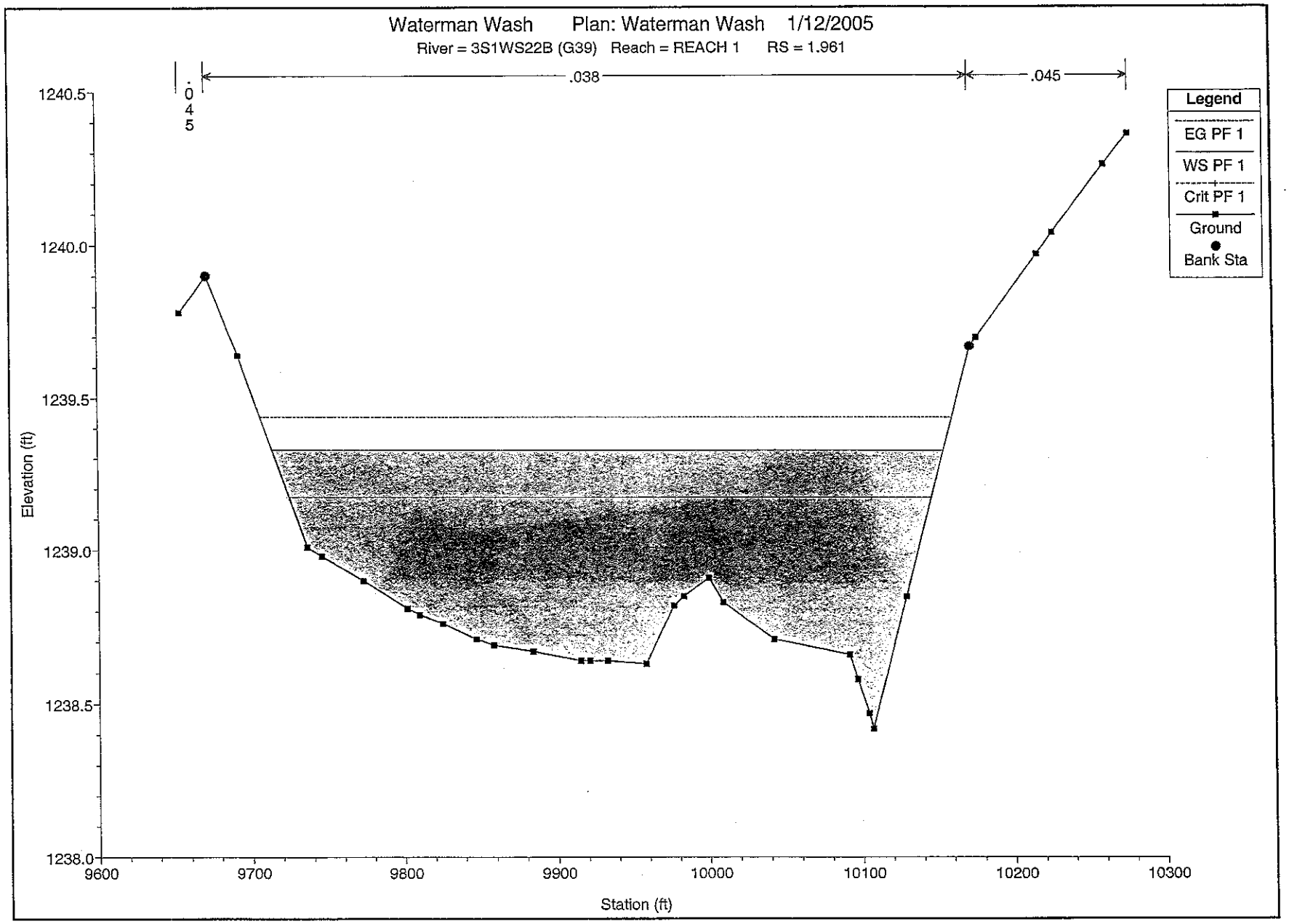

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 0.696
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1192
1191
1190
1189
1188
1187
1186
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

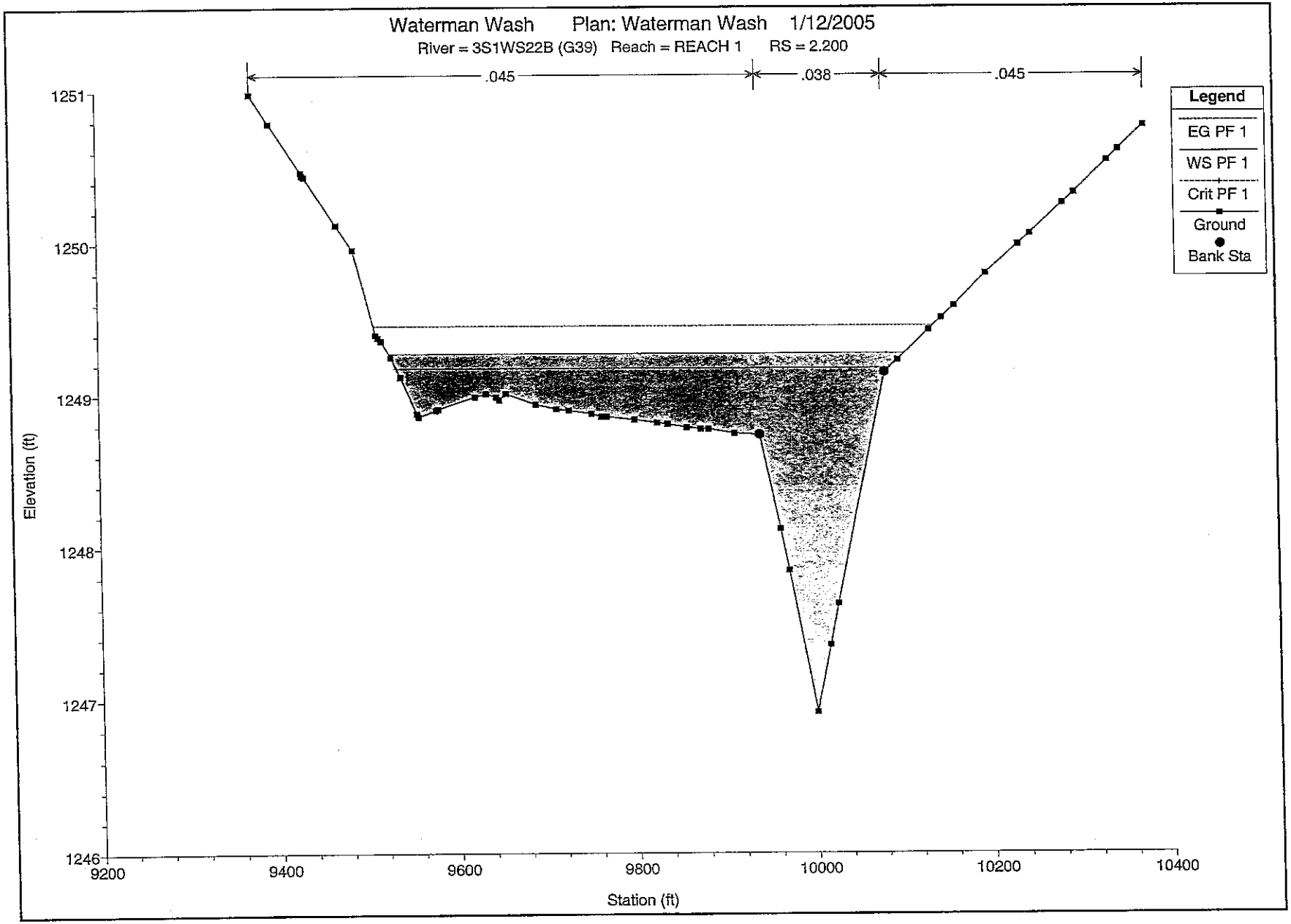

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 0.955
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1201
1200
1199
1198
1197
1196
1195
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

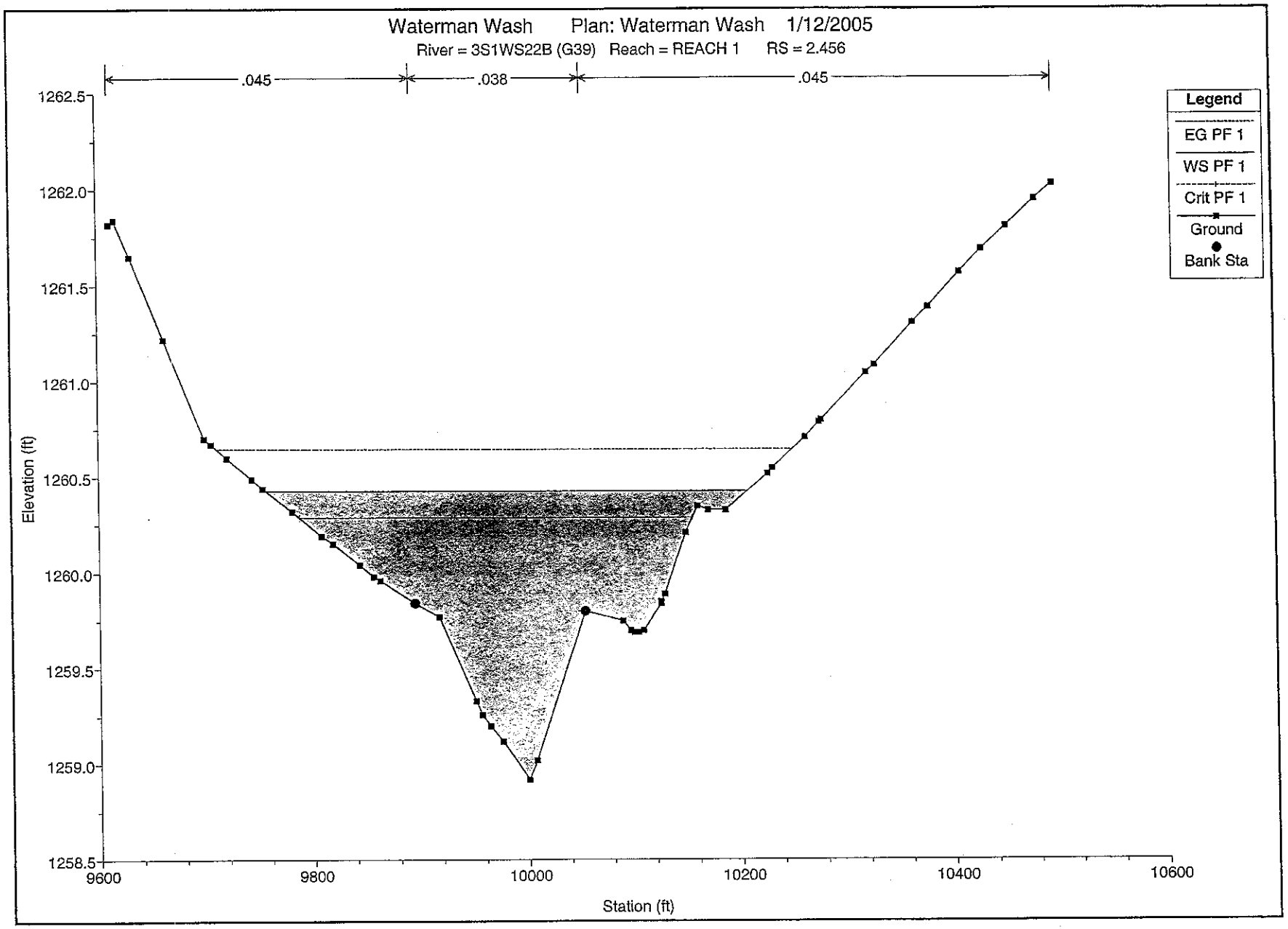

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 1.203
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1211
1210
1209
1208
1207
1206
1205
9600
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)

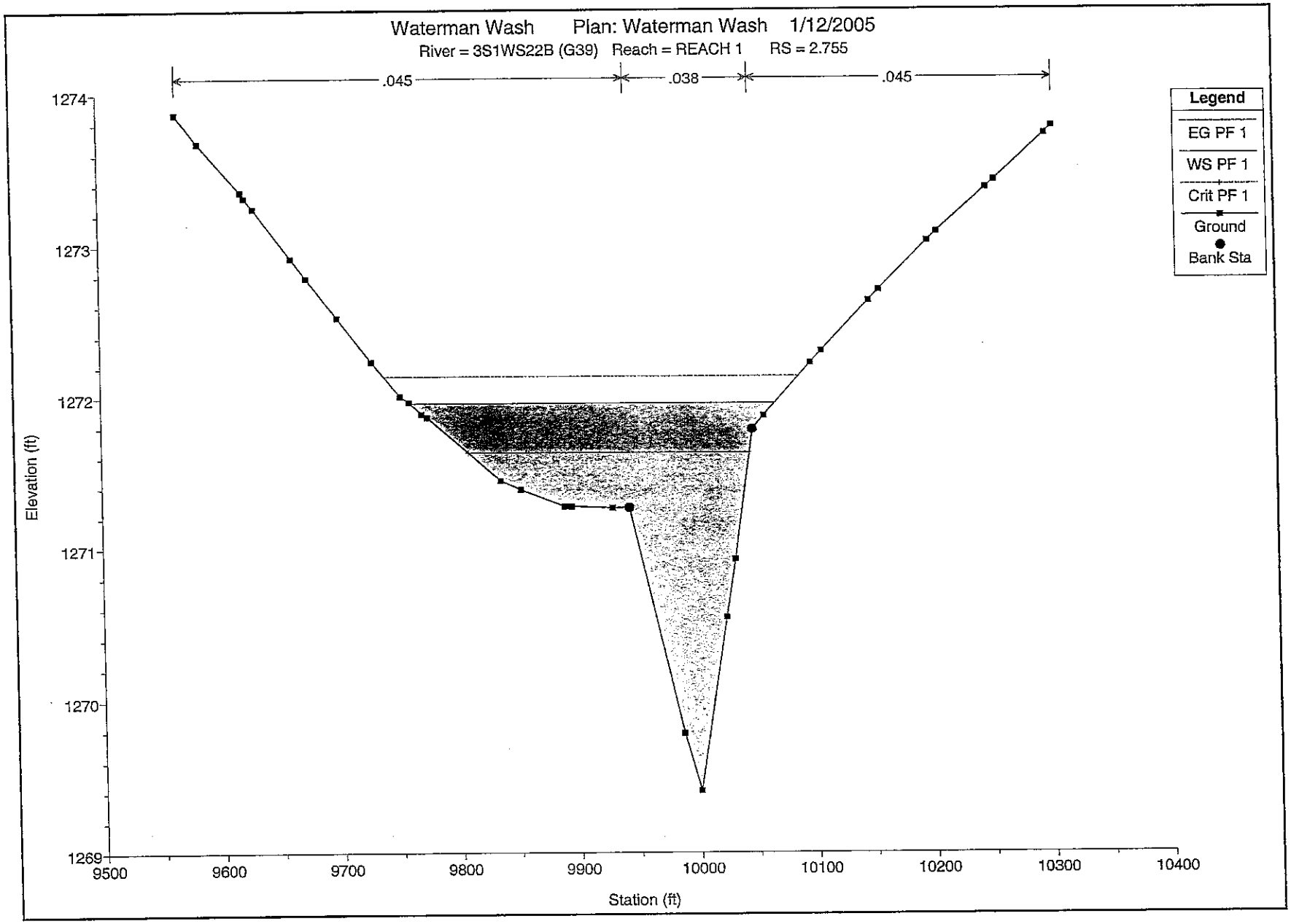

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 1.451
.045
.038
.045
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
1221
1220
1219
1218
1217
1216
1215
9400
9600
9800
10000
10200
10400
Station (ft)

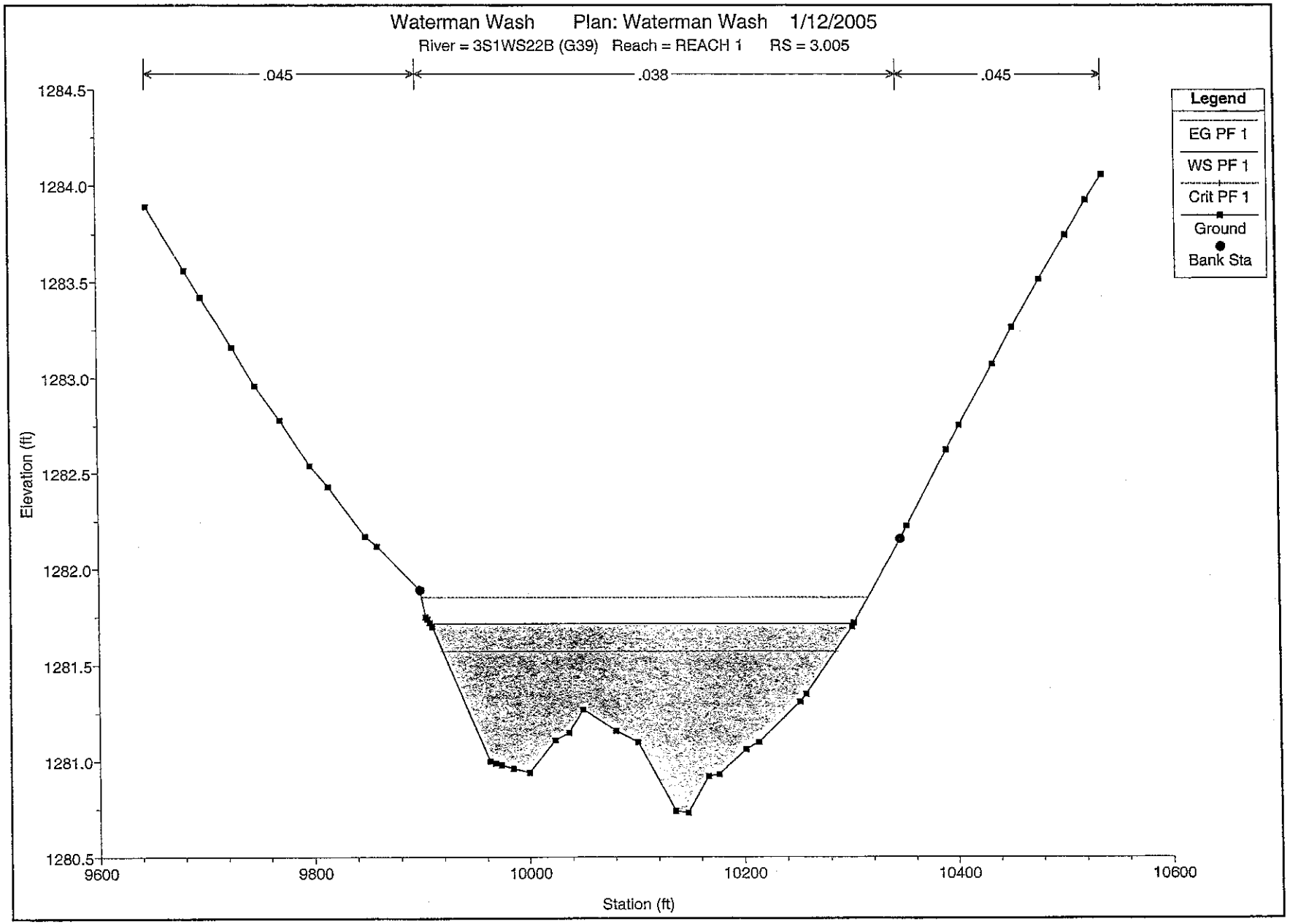

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 1.713
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1230.5
1230.0
1229.5
1229.0
1228.5
1228.0
1227.5
1227.0
9400
9600
9800
10000
10200
10400
Station (ft)

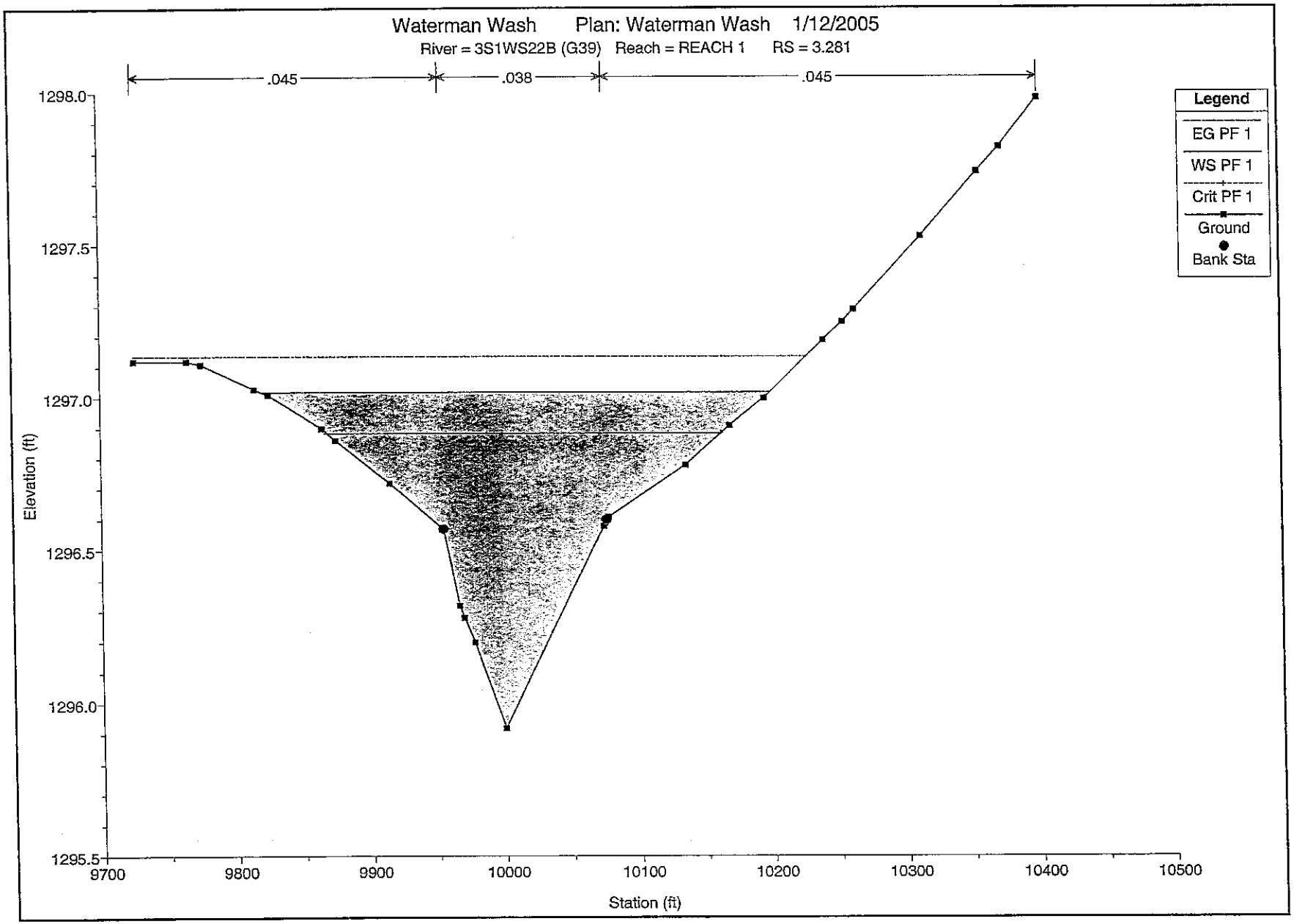

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 1.961
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1240.5
1240.0
1239.5
1239.0
1238.5
1238.0
9600
9700
9800
9900
10000
10100
10200
10300
Station (ft)

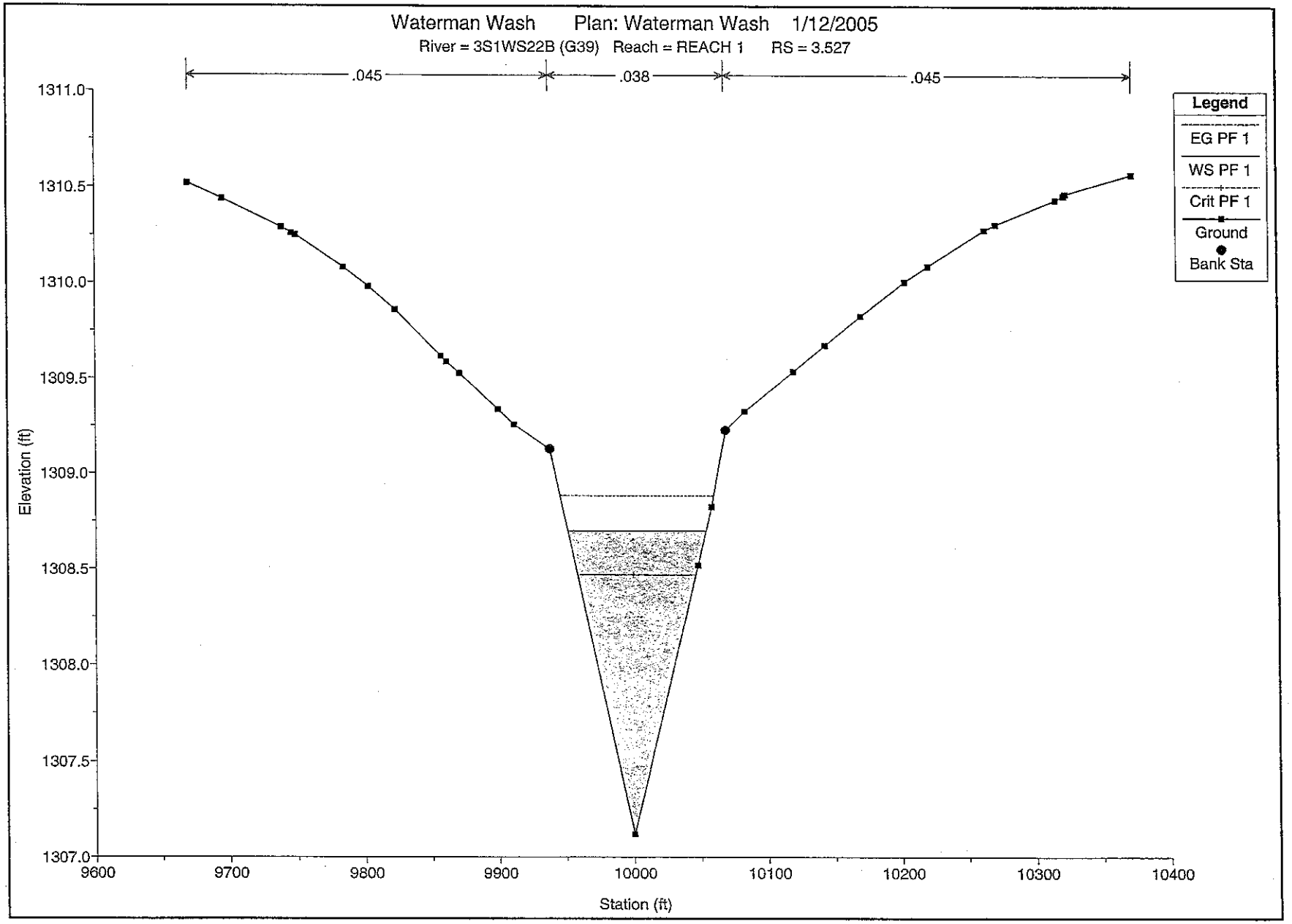

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 2.200
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1251
1250
1249
1248
1247
1246
9200
9400
9600
9800
10000
10200
10400
Station (ft)

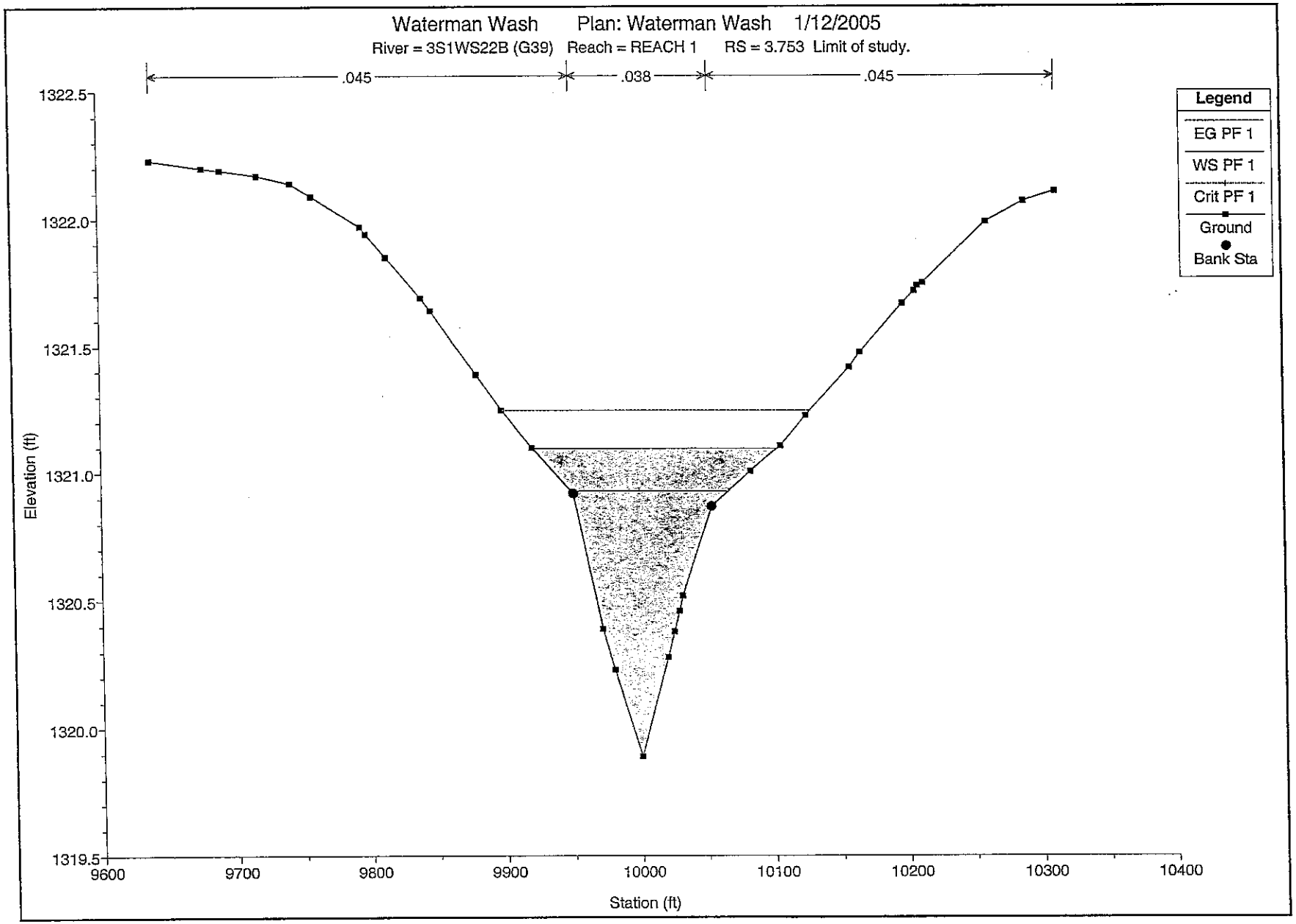

Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 2.456
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1262.5
1262.0
1261.5
1261.0
1260.5
1260.0
1259.5
1259.0
1258.5
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 2.755
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1274
1273
1272
1271
1270
1269
9500
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 3.005
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1284.5
1284.0
1283.5
1283.0
1282.5
1282.0
1281.5
1281.0
1280.5
9600
9800
10000
10200
10400
10600
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 3.281
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1298.0
1297.5
1297.0
1296.5
1296.0
1295.5
9700
9800
9900
10000
10100
10200
10300
10400
10500
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 3.527
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1311.0
1310.5
1310.0
1309.5
1309.0
1308.5
1308.0
1307.5
1307.0
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)


Waterman Wash Plan: Waterman Wash 1/12/2005
River = 3S1WS22B (G39) Reach = REACH 1 RS = 3.753 Limit of study.
.045
.038
.045
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
1322.5
1322.0
1321.5
1321.0
1320.5
1320.0
1319.5
9600
9700
9800
9900
10000
10100
10200
10300
10400
Station (ft)

Appendix E.3

EXPANSION AND CONTRACTION COEFFICIENTS

APPENDIX E.3: EXPANSION AND CONTRACTION COEFFECIENTS

Expansion and contraction coefficients were selected from the U.S. Army Corps of Engineers HEC-RAS User's Manual. The majority of all the washes use coefficients for gradual transitions. However, several washes encounter culverts or bridges requiring higher values. The following table summarizes the coefficients used in the project.

Description of Transition	Contraction Coefficient	Expansion Coefficient
Gradual Transition	0.1	0.3
Bridge Cross Sections	0.3	0.5
Abrupt Transitions (including most culverts)	0.6	0.8

Appendix E.4
ANALYSIS OF STRUCTURES

APPENDIX E.4: ANALYSIS OF STRUCTURES

All of the structures affecting the floodplain delineation are modeled within the HEC-RAS computer models of each wash. No additional hydraulic modeling of the structures was performed.

There were no as-built drawings for the structure. Engineering Alliance surveyed the structures and created record drawings for each structure.

APPENDIX E.5
HYDRAULIC CALCULATIONS

MODEL: 1S2WS14 (J14)
REACHES: 1S2WS14 (J14)
1S2WS23 (J14)
MODEL: 1S2WS17 (J38)
REACH: 1S2WS17 (J38)
MODEL: 1S2WS18B (J37)
REACHES: 1S2WS18B (J37)
1S2WS18A (J27)
MODEL: 1S2WS2A (J46)
REACH: 1S2WS2A (J46)
MODEL: 1S2WS2B (J48)
REACH: 1S2WS2B (J48)
MODEL: 1S2WS2C (J47)
REACH: 1S2WS2C (J47)
MODEL: 1S2WS31 (A56)
REACHES: 1S2WS31 (A56)
2S3WS12A (A30)
2S3WS12B (A27)
2S2WS7C (A32)
2S2WS7A (A52)
2S3WS1 (A54)
2S2WS6 (A55)
2S2WS20 (A19)
2S2WS17B (A63)
2S2WS7B (A51)
MODEL: 1S2WS31B (I70)
REACHES: 1S2WS31B (I70)
1S2WS32A (I67)
1S2WS32B (I68)
1S2WS34 (I65)
1S2WS33 (I66)
1S2WS31A (I71)
MODEL: 1S2WS9A (J39)
REACHES: 1S2WS9A (J39)
1S2WS27 (J16)
1S2WS22 (J20)
MODEL: 1S2WS9B (J40)
REACH: 1S2WS9B (J40)
MODEL: 1S3WS24A (A60)
REACHES: 1S3WS24A (A60)
1S3WS24B (A59)
MODEL: 2S1WS31 (B46)
REACH: 2S1WS31 (B46)
MODEL: 2S2WS15 (A37)
REACH: 2S2WS15 (A37)
MODEL: 2S2WS16A (A35)
REACHES: 2S2WS16A (A35)
2S2WS16B (A15)
2S2WS17A (A17)
MODEL: 2S2WS26 (A41)
REACH: 2S2WS26 (A41)
MODEL: 2S2WS35A (B58)
REACH: 2S2WS35A (B58)
MODEL: 2S2WS35B (B29)
REACH: 2S2WS35B (B29)
MODEL: 3S1WS4A (H71)
REACHES: 3S1WS4A (H71)
3S1WS4B (H73)
3S1WS3 (H29)
MODEL: 3S1WS5 (B45)
REACH: 3S1WS5 (B45)
MODEL: 3S1WS6 (B47)
REACH: 3S1WS6 (B47)
MODEL: 3S1WS9 (B12)
REACH: 3S1WS9 (B12)
MODEL: 3S2WS2A (B33)
REACHES: 3S2WS2A (B33)
3S2WS2E (B33)
3S2WS11 (B37)
3S2WS2D (B35)
MODEL: 3S2WS2B (B65)
REACHES: 3S2WS2B (B65)
3S2WS1 (B54)
3S2WS2C (B38)
MODEL: 4S1ES21 (E45)
REACH: 4S1ES21 (E45)
MODEL: 4S1ES23 (F20)
REACH: 4S1ES23 (F20)
MODEL: WATERMAN WASH
REACHES: WATERMAN WASH
3S1WS15B (D39)
3S1WS15A (G40)
3S1WS26 (D33)
3S1WS25B (D32)
3S1WS25A (D31)
4S1ES15A (F34)
4S1ES9 (E49)
4S1ES20 (E44)
3S1WS22A (D42)
3S1WS22B (G39)

MODEL: 1S2WS14 (J14)

REACHES: 1S2WS14 (J14)
1S2WS23 (J14)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX   XXXX       XXXX      XX     XXXX
X     X  X       X    X     X   X     X  X    X
X     X  X       X          X   X    X    X   X
XXXXXXX  XXXX    X      XXX XXXX     XXXXXX   XXXX
X     X  X       X          X  X     X    X       X
X     X  X       X    X     X   X    X    X       X
X     X  XXXXXX   XXXX      X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS14 (J14)
Project File : 1S2WS14_J14.prj
Run Date and Time: 12/13/2004 2:41:19 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model Name: 1S2WS14 (J14)
Reaches: 1S2WS14 (J14)
1S2WS23
(J14)

****

PLAN DATA

Plan Title: 1S2WS14 (J14)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS14 (J14)\1S2WS14_J14.p01

Geometry Title: 1S2WS14 (J14)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS14 (J14)\1S2WS14_J14.g01

Flow Title : 1S2WS14 (J14)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS14 (J14)\1S2WS14_J14.f01

Plan Summary Information:

Number of:	Cross Sections	= 13	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01

```
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  20
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = False
   Left Offset      =        0
   Right Offset     =        0

River = 1S2WS14 (J14)    Reach = REACH 1
RS      Profile           Method  Value1  Value2
4.853   PF 2                   1    9750   10375
4.589   PF 2                   1    9750   10100
4.354   PF 2                   1    9750   10150
4.078   PF 2                   1    9800   10200
3.846   PF 2                   1    9750   10250
3.575   PF 2                   1    9930   10150

River = 1S2WS14 (J14)    Reach = REACH 2
RS      Profile           Method  Value1  Value2
3.302   PF 2                   1    9800   10150
3.272   PF 2                   1    9890   10110
3.245   PF 2                   1    9955   10055

River = 1S2WS23 (J14)    Reach = REACH 1
RS      Profile           Method  Value1  Value2
1.027   PF 2                   1    9990   10010
0.773   PF 2                   1    9985   10015
0.516   PF 2                   1    9980   10014
0.233   PF 2                   1    9900   10150
0.079   PF 2                   1    9900   10050

*****************************************************************************

FLOW DATA

Flow Title: 1S2WS14 (J14)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS14
(J14)\1S2WS14_J14.f01

Flow Data (cfs)
*************************************************************
* River            Reach           RS      *          PF 1 *
* 1S2WS14 (J14)    REACH 1         4.853   *          8660 *
* 1S2WS14 (J14)    REACH 1         4.589   *          8320 *
* 1S2WS14 (J14)    REACH 1         4.354   *          8030 *
* 1S2WS14 (J14)    REACH 1         4.078   *          7680 *
* 1S2WS14 (J14)    REACH 1         3.846   *          7390 *
* 1S2WS14 (J14)    REACH 1         3.575   *          7050 *
* 1S2WS14 (J14)    REACH 2         3.302   *          7170 *
* 1S2WS14 (J14)    REACH 2         3.245   *          7170 *
* 1S2WS23 (J14)    REACH 1         1.027   *           670 *
* 1S2WS23 (J14)    REACH 1         0.773   *           730 *
* 1S2WS23 (J14)    REACH 1         0.516   *           770 *
* 1S2WS23 (J14)    REACH 1         0.233   *           810 *
* 1S2WS23 (J14)    REACH 1         0.079   *           890 *
*************************************************************

Boundary Conditions
*****************************************************************************************************
* River            Reach           Profile          *          Upstream                Downstream    *
*****************************************************************************************************
* 1S2WS14 (J14)    REACH 1         PF 1             *       Normal S = 0.0085                        *
* 1S2WS14 (J14)    REACH 2         PF 1             *                                Normal S = 0.0085 *
* 1S2WS23 (J14)    REACH 1         PF 1             *        Normal S = 0.027                        *
*****************************************************************************************************

*************************************************************************

GEOMETRY DATA
```

Geometry Title: 1S2WS14 (J14)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS14 (J14)\1S2WS14_J14.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
1S2WS14 (J14)	REACH 1		JUNCTION 1
1S2WS14 (J14)	REACH 2	JUNCTION 1	
1S2WS23 (J14)	REACH 1		JUNCTION 1

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
1S2WS14 (J14)	REACH 1	to 1S2WS14 (J14)	REACH 2	1445	
1S2WS23 (J14)	REACH 1	to 1S2WS14 (J14)	REACH 2	420	

CROSS SECTION

RIVER: 1S2WS14 (J14)
REACH: REACH 1 RS: 4.853

INPUT
Description: Limit of study.
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9329.09	1116.87	9345.47	1117.54	9345.79	1117.53	9360.68	1117.34	9397.16	1116.77
9402.75	1116.64	9406.12	1116.57	9409.54	1116.56	9417.76	1116.49	9456.42	1116.16
9468.4	1116.17	9484.98	1116.04	9525.51	1116.07	9529.25	1115.73	9533.71	1115.42
9539.36	1115.31	9547.61	1115.32	9552.42	1115.33	9561.71	1115.32	9620.33	1114.52
9631.03	1114.16	9634.26	1114.12	9638.73	1114.08	9642.53	1114.04	9647.33	1114
9653.82	1113.94	9674.95	1113.75	9691.77	1113.53	9695.31	1113.56	9699.71	1113.61
9711.38	1113.58	9729.77	1113.49	9739.34	1113.34	9746.36	1113.37	9753.1	1113.23
9762.29	1113.32	9771.89	1113.42	9773.83	1113.4	9779.88	1113.5	9784.02	1113.47
9791.83	1113.43	9802.09	1113.44	9822.91	1113	9847.13	1112.85	9881.17	1112.99
9894.6	1113.3	9897.04	1113.31	9910.7	1112.83	9967.85	1112.63	9974.84	1112.61
9985.77	1112.45	9991.76	1112.37	10000	1112.29	10017.56	1112.09	10027.81	1111.98
10038.58	1112.18	10050.34	1112.5	10079.77	1113.27	10096.58	1113.37	10132.84	1113.6
10143.81	1113.55	10185.91	1113.31	10207.14	1112.69	10226.63	1112.05	10289.24	1113.19
10291.34	1113.22	10292.06	1113.25	10292.96	1113.26	10345.13	1114.35	10373.95	1115.49
10398.2	1116.42	10442.11	1118.22	10451.27	1118.59	10456.33	1118.84	10504.34	1120.92
10538.72	1122.71	10557.41	1123.7	10591.26	1125.11	10610.48	1125.95	10621.1	1126.42
10663.55	1128.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9329.09	.05	9647.33	.04	10345.13	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9647.33	10345.13	1400	1395	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1115.99	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.34	Wt. n-Val.	0.050	0.043	0.050	
W.S. Elev (ft)	1115.65	Reach Len. (ft)	1400.00	1395.00	1300.00	
Crit W.S. (ft)	1114.78	Flow Area (sq ft)	92.24	1787.34	21.49	
E.G. Slope (ft/ft)	0.005347	Area (sq ft)	92.24	1787.34	21.49	
Q Total (cfs)	8660.00	Flow (cfs)	171.05	8453.94	35.01	
Top Width (ft)	847.87	Top Width (ft)	116.98	697.80	33.08	
Vel Total (ft/s)	4.56	Avg. Vel. (ft/s)	1.85	4.73	1.63	
Max Chl Dpth (ft)	3.67	Hydr. Depth (ft)	0.79	2.56	0.65	
Conv. Total (cfs)	118432.5	Conv. (cfs)	2339.2	115614.5	478.8	
Length Wtd. (ft)	1394.71	Wetted Per. (ft)	117.00	697.89	33.11	
Min Ch El (ft)	1111.98	Shear (lb/sq ft)	0.26	0.85	0.22	
Alpha	1.06	Stream Power (lb/ft s)	0.49	4.04	0.35	
Frctn Loss (ft)	12.05	Cum Volume (acre-ft)	30.15	238.14	26.09	
C & E Loss (ft)	0.09	Cum SA (acres)	20.52	72.41	8.93	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS14 (J14)
REACH: REACH 1 RS: 4.589

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9483.48	1104.06	9486.27	1104.05	9496.6	1103.97	9536.97	1103.77	9539.99	1103.74
9599.45	1104.62	9605.97	1105.04	9611.25	1105.38	9614.26	1105.37	9638.39	1103.03
9670.16	1102.71	9689.09	1102.55	9713.55	1102.27	9739.8	1101.98	9756.94	1101.76
9790.5	1101.34	9800.33	1101.21	9841.21	1100.68	9843.72	1100.66	9858.62	1100.49
9887.11	1100.17	9891.92	1100.11	9898.67	1100.05	9954.96	1099.46	9969.82	1099.23
9970.8	1099.2	9993.94	1098.49	10000	1098.37	10028.23	1097.93	10044.69	1098.61
10083.9	1100.67	10114.34	1101.61	10127.48	1102.12	10175.54	1103.66	10214.2	1104.8
10236.73	1105.48	10290.78	1106.91	10297.93	1107.09	10300.91	1107.13	10359.13	1108.3
10387.63	1108.63	10420.33	1109.25	10474.35	1109.96				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9483.48	.05	9790.5	.04	10114.34	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9790.5	10114.34	1225	1240	1240	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1103.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.20	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1102.66	Reach Len. (ft)	1225.00	1240.00	1240.00
Crit W.S. (ft)	1102.65	Flow Area (sq ft)	71.11	908.46	14.85
E.G. Slope (ft/ft)	0.016769	Area (sq ft)	71.11	908.46	14.85
Q Total (cfs)	8320.00	Flow (cfs)	199.96	8084.16	35.88
Top Width (ft)	467.53	Top Width (ft)	113.85	323.84	29.84
Vel Total (ft/s)	8.37	Avg. Vel. (ft/s)	2.81	8.90	2.42
Max Chl Dpth (ft)	4.73	Hydr. Depth (ft)	0.62	2.81	0.50
Conv. Total (cfs)	64250.2	Conv. (cfs)	1544.2	62429.0	277.1
Length Wtd. (ft)	1238.53	Wetted Per. (ft)	113.86	323.95	29.86
Min Ch El (ft)	1097.93	Shear (lb/sq ft)	0.65	2.94	0.52
Alpha	1.10	Stream Power (lb/ft s)	1.84	26.12	1.26
Frctn Loss (ft)	11.81	Cum Volume (acre-ft)	27.53	194.97	25.55
C & E Loss (ft)	0.23	Cum SA (acres)	16.81	56.06	7.99

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS14 (J14)
REACH: REACH 1 RS: 4.354

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9446.85	1092.3	9446.95	1092.31	9451.36	1092.11	9461.32	1091.6	9468.72	1091.27
9519.34	1090.51	9538.78	1090.38	9570.31	1090.22	9581.34	1090.13	9621.28	1089.86
9623.89	1089.84	9637.15	1089.75	9666.45	1089.54	9672.24	1089.49	9709.01	1089.29

```
 9723.21 1089.21 9757.25 1089.32 9770.44 1089.42 9781.92  1089.5 9788.35 1089.47
 9796.49 1089.44 9803.09 1089.42 9808.14 1089.38 9871.42 1088.53 9876.11  1088.5
 9895.13 1088.33 9921.81  1088.1 9927.07 1088.06 9971.32 1087.51 9979.27  1087.3
 9988.24 1087.31 9992.45 1087.34   10000 1087.3510013.28 1087.7210029.82 1088.11
10047.82 1087.9410053.41 1087.83 10061.8 1087.7310068.54 1087.55 10074.3 1087.41
   10077 1087.4810091.35 1087.9410141.83 1089.3610165.88 1089.8610197.04 1090.51
10224.46 1091.0310252.25 1091.5710283.82 1092.0710307.45 1092.4810328.25 1092.83
10362.66 1093.3710401.76 1094.1610417.87  1094.510432.04 1094.8210473.08 1095.75
 10519.7 1096.9110528.28 1097.1110535.83 1097.2910583.49 1098.3310637.64 1099.84
10638.69 1099.8710639.62 1099.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9446.85     .05 9788.35    .04310165.88     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9788.3510165.88             1370    1460    1420            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1091.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.43  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1091.39  * Reach Len. (ft)         * 1370.00  * 1460.00  * 1420.00  *
* Crit W.S. (ft)         * 1090.71  * Flow Area (sq ft)       *  471.68  * 1151.88  *   57.86  *
* E.G. Slope (ft/ft)     *0.006053  * Area (sq ft)            *  471.68  * 1151.88  *   57.86  *
* Q Total (cfs)          * 8030.00  * Flow (cfs)              * 1405.69  * 6513.85  *  110.46  *
* Top Width (ft)         *  776.93  * Top Width (ft)          *  322.31  *  377.53  *   77.09  *
* Vel Total (ft/s)       *    4.78  * Avg. Vel. (ft/s)        *    2.98  *    5.65  *    1.91  *
* Max Chl Dpth (ft)      *    4.09  * Hydr. Depth (ft)        *    1.46  *    3.05  *    0.75  *
* Conv. Total (cfs)      *103212.8  * Conv. (cfs)             * 18067.9  * 83725.1  *  1419.7  *
* Length Wtd. (ft)       * 1447.25  * Wetted Per. (ft)        *  322.33  *  377.59  *   77.11  *
* Min Ch El (ft)         * 1087.30  * Shear (lb/sq ft)        *    0.55  *    1.15  *    0.28  *
* Alpha                  *    1.21  * Stream Power (lb/ft s)  *    1.65  *    6.52  *    0.54  *
* Frctn Loss (ft)        *   14.41  * Cum Volume (acre-ft)    *   19.89  *  165.65  *   24.51  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)          *   10.68  *   46.07  *    6.47  *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS14 (J14)
REACH: REACH 1            RS: 4.078

INPUT
Description:
Station Elevation Data    num=      60
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
**********************************************************************************
 9726.27 1077.17 9729.59 1077.08 9745.88 1076.45 9755.32 1076.01 9761.48  1075.8
 9764.27 1075.76 9766.69 1075.75 9771.32 1075.73  9773.7 1075.73 9775.98 1075.72
 9777.95 1075.71 9779.69  1075.7 9782.73 1075.69 9784.15  1075.7 9785.36 1075.69
 9819.94 1074.99 9840.46 1074.78 9866.12 1074.52 9895.17 1074.23 9923.18 1074.13
 9945.01  1073.8 9954.62 1073.65 9959.33 1073.65 9960.97 1073.63 9961.35 1073.62
    9975  1073.4 9983.38 1073.29 9994.73 1073.17   10000 1073.1210002.97 1073.08
10015.11  1072.910031.34  1073.410045.26 1073.8910055.55 1074.2410065.88 1074.38
10106.79 1074.8210131.97    107510158.04  1075.210198.06 1075.4410209.28  1075.5
10222.72  1075.110225.68 1074.9910230.13 1074.8310239.15 1074.5810261.98 1074.02
10281.94 1073.5410290.64 1074.6710296.55 1075.4310300.03 1075.8810302.39 1076.13
10304.41 1076.2710330.23 1077.6610363.02 1079.1110396.32 1081.1510414.26 1082.11
10462.41 1086.8510465.51  1087.110476.21 1088.4510516.75 1093.16 10528.5 1094.81

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9726.27     .05 9819.94    .04310158.04     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9819.9410158.04             1135    1225    1260            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	1077.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.95	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1076.41	Reach Len. (ft)	1135.00	1225.00	1260.00
Crit W.S. (ft)	1076.41	Flow Area (sq ft)	57.72	747.16	227.35
E.G. Slope (ft/ft)	0.020065	Area (sq ft)	57.72	747.16	227.35
Q Total (cfs)	7680.00	Flow (cfs)	207.57	6204.36	1268.07
Top Width (ft)	560.06	Top Width (ft)	73.09	338.10	148.87
Vel Total (ft/s)	7.44	Avg. Vel. (ft/s)	3.60	8.30	5.58
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	0.79	2.21	1.53
Conv. Total (cfs)	54218.3	Conv. (cfs)	1465.4	43800.8	8952.1
Length Wtd. (ft)	1226.19	Wetted Per. (ft)	73.11	338.14	149.07
Min Ch El (ft)	1072.90	Shear (lb/sq ft)	0.99	2.77	1.91
Alpha	1.11	Stream Power (lb/ft s)	3.56	22.98	10.66
Frctn Loss (ft)	9.99	Cum Volume (acre-ft)	11.57	133.82	19.87
C & E Loss (ft)	0.21	Cum SA (acres)	4.46	34.08	2.79

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS14 (J14)
REACH: REACH 1 RS: 3.846

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9345.27	1065.55	9357.53	1065.43	9369.07	1065.34	9373.11	1065.31	9408.32	1065.36
9426.08	1065.3	9447.57	1065.24	9479.05	1065.15	9486.81	1065.11	9509.02	1065.01
9526.06	1064.94	9532.02	1064.92	9565.3	1064.73	9584.98	1064.62	9604.55	1064.5
9637.95	1064.28	9643.8	1064.24	9660.51	1064.13	9690.92	1063.9	9724.85	1063.31
9739.85	1063.28	9759.02	1063.25	9760.69	1063.26	9774.77	1063.33	9805.88	1063.14
9823.97	1063.12	9832.58	1063.11	9839.43	1062.98	9841.29	1062.91	9842.95	1062.86
9844.21	1062.86	9870.16	1062.75	9902.79	1062.58	9918.52	1062.5	9975.73	1061.62
9984.21	1061.36	10000	1061.46	10002.11	1061.47	10068.18	1061.05	10072.03	1061.04
10079.42	1061.05	10085.08	1061.14	10161.78	1062.1	10165.4	1062.11	10182.45	1061.96
10207.56	1061.8	10212.9	1061.76	10249.71	1061.58	10264.02	1061.48	10291.87	1061.28
10315.13	1061.12	10334.02	1061.02	10366.25	1060.86	10376.17	1060.82	10418.52	1060.13
10425.73	1060.23	10436.66	1060.58	10452.69	1061.01	10462.73	1061.14	10502.64	1062.96
10519.61	1063.8	10544.79	1065.09						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9345.27	.05	9774.77	.043	10519.61	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9774.77	10519.61	1475	1427	1210	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1064.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1064.15	Reach Len. (ft)	1475.00	1427.00	1210.00
Crit W.S. (ft)		Flow Area (sq ft)	65.77	1794.10	1.18
E.G. Slope (ft/ft)	0.004297	Area (sq ft)	65.77	1794.10	1.18
Q Total (cfs)	7390.00	Flow (cfs)	87.23	7302.05	0.72
Top Width (ft)	868.70	Top Width (ft)	117.06	744.84	6.80
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)	1.33	4.07	0.61
Max Chl Dpth (ft)	4.02	Hydr. Depth (ft)	0.56	2.41	0.17
Conv. Total (cfs)	112732.9	Conv. (cfs)	1330.6	111391.3	11.0
Length Wtd. (ft)	1427.21	Wetted Per. (ft)	117.07	744.95	6.81
Min Ch El (ft)	1060.13	Shear (lb/sq ft)	0.15	0.65	0.05

```
* Alpha                  *    1.04  * Stream Power (lb/ft s) *    0.20  *    2.63  *    0.03  *
* Frctn Loss (ft)        *   11.36  * Cum Volume (acre-ft)   *    9.96  *   98.09  *   16.56  *
* C & E Loss (ft)        *    0.08  * Cum SA (acres)         *    1.98  *   18.85  *    0.54  *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS14 (J14)
REACH: REACH 1            RS: 3.575

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9711.78 1059.06 9712.06 1059.07 9741.08 1058.72 9773.39 1058.36 9786.55 1057.57
 9834.73 1055.01 9872.88 1053.44 9896.06 1052.36 9936.82 1049.48 9951.25 1048.32
  9953.9 1048.12  9967.7 1048.41  9976.6 1048.67   10000 1048.6110028.29 1048.58
 10043.3 1048.4310058.45 1048.7110070.43 1048.7610096.07 1049.28 10099.3 1049.25
10140.16 1049.8210140.43 1049.82 10140.7 1049.8210140.95 1049.8210141.71 1049.82
10147.01  1049.910196.84 1050.4610245.77 1051.0310252.64 1051.1110259.63 1051.18
10308.44 1051.6610356.38 1052.0510364.24 1052.1210372.24 1052.1610420.04 1052.33
10466.99 1052.4310475.84 1052.4510484.86 1052.4710531.65 1052.6710553.46  1052.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9711.78     .05 9896.06    .04310308.44     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9896.0610308.44             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1052.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.04  * Wt. n-Val.              *          *    0.043 *    0.050  *
* W.S. Elev (ft)         * 1051.92  * Reach Len. (ft)         * 1445.00  * 1445.00  * 1445.00  *
* Crit W.S. (ft)         * 1051.92  * Flow Area (sq ft)       *          *  860.95  *    4.12  *
* E.G. Slope (ft/ft)     *0.020605  * Area (sq ft)            *          *  860.95  *    4.12  *
* Q Total (cfs)          * 7050.00  * Flow (cfs)              *          * 7045.51  *    4.49  *
* Top Width (ft)         *  437.95  * Top Width (ft)          *          *  406.14  *   31.81  *
* Vel Total (ft/s)       *    8.15  * Avg. Vel. (ft/s)        *          *    8.18  *    1.09  *
* Max Chl Dpth (ft)      *    3.80  * Hydr. Depth (ft)        *          *    2.12  *    0.13  *
* Conv. Total (cfs)      * 49113.5  * Conv. (cfs)             *          * 49082.2  *    31.3  *
* Length Wtd. (ft)       * 1445.00  * Wetted Per. (ft)        *          *  406.31  *   31.81  *
* Min Ch El (ft)         * 1048.12  * Shear (lb/sq ft)        *          *    2.73  *    0.17  *
* Alpha                  *    1.01  * Stream Power (lb/ft s)  *          *   22.31  *    0.18  *
* Frctn Loss (ft)        *    1.18  * Cum Volume (acre-ft)    *    8.85  *   54.60  *   16.49  *
* C & E Loss (ft)        *    0.29  * Cum SA (acres)          *          *          *          *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS14 (J14)
REACH: REACH 2            RS: 3.302

INPUT
```

Description: Directly upstream of Estrella Parkway.

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9399.32	1043.52	9400.58	1043.53	9435.29	1044.26	9450.58	1044.74	9485.29	1045.92
9500.58	1046.57	9535.29	1046.07	9550.58	1046.12	9585.29	1045.75	9600.58	1045.48
9635.29	1043.95	9650.58	1043.58	9685.29	1042.46	9700.58	1042.09	9715.87	1041.7
9744.8	1039.21	9787.01	1036.81	9807.96	1036.35	9824.26	1042.08	9825.11	1042.31
9825.88	1042.31	9897	1040.15	9915	1030.89	10000	1030.98	10058	1031.95
10161	1039.89	10170.8	1039.91	10208.19	1040.16	10227.51	1040.34	10244.28	1040.13
10284.23	1039.67	10330.24	1039.17	10340.94	1039.02	10350.23	1038.99	10397.65	1038.99
10452.29	1039.88	10454.37	1039.91	10456.17	1039.96	10511.08	1041.51	10562.12	1042.41
10567.79	1042.51	10574.33	1042.58	10624.51	1043.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9399.32	.05	9897	.043	10161	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9897	10161	235	235	235	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1042.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1042.52	Reach Len. (ft)	80.00	80.00	80.00
Crit W.S. (ft)	1035.25	Flow Area (sq ft)	533.42	2431.05	989.91
E.G. Slope (ft/ft)	0.000255	Area (sq ft)	533.42	2431.05	989.91
Q Total (cfs)	7170.00	Flow (cfs)	464.45	5857.47	848.09
Top Width (ft)	885.71	Top Width (ft)	213.49	264.00	408.22
Vel Total (ft/s)	1.81	Avg. Vel. (ft/s)	0.87	2.41	0.86
Max Chl Dpth (ft)	11.63	Hydr. Depth (ft)	2.50	9.21	2.42
Conv. Total (cfs)	448882.7	Conv. (cfs)	29077.2	366710.5	53095.0
Length Wtd. (ft)	80.00	Wetted Per. (ft)	214.72	266.56	408.27
Min Ch El (ft)	1030.89	Shear (lb/sq ft)	0.04	0.15	0.04
Alpha	1.48	Stream Power (lb/ft s)	0.03	0.35	0.03
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	0.86	5.07	1.26
C & E Loss (ft)	0.08	Cum SA (acres)	0.57	1.05	0.81

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE

RIVER: 1S2WS14 (J14)
REACH: REACH 2 RS: 3.272

INPUT
Description: 70' Bridge
Structure 10
Crosses Estrella Parkway
Distance from Upstream XS = 80
Deck/Roadway Width = 130
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 12

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9700	1040.4	1030	9900	1040.4	1030	9945	1040.46	1030
9969.49	1040.46	1030	9969.5	1040.46	1037.36	10043	1040.52	1037.36
10043.01	1040.52	1030	10055	1040.52	1030	10100	1040.58	1030
10250	1040.5		10350	1041.75		10600	1042	

Upstream Bridge Cross Section Data
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9399.32	1043.52	9400.58	1043.53	9435.29	1044.26	9450.58	1044.74	9485.29	1045.92
9500.58	1046.57	9535.29	1046.07	9550.58	1046.12	9585.29	1045.75	9600.58	1045.48
9635.29	1043.95	9650.58	1043.58	9685.29	1042.46	9700.58	1042.09	9715.87	1041.7
9744.8	1039.21	9787.01	1036.81	9807.96	1036.35	9824.26	1042.08	9825.11	1042.31
9825.88	1042.31	9897	1040.15	9915	1030.89	10000	1030.98	10058	1031.95
10161	1039.89	10170.8	1039.91	10208.19	1040.16	10227.51	1040.34	10244.28	1040.13
10284.23	1039.67	10330.24	1039.17	10340.94	1039.02	10350.23	1038.99	10397.65	1038.99

```
10452.29 1039.8810454.37 1039.9110456.17 1039.9610511.08  1041.510562.12 1042.41
10567.79  1042.510574.33 1042.5810624.51 1043.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9399.32     .05    9897    .043   10161     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9897   10161             .1       .3

Downstream  Deck/Roadway Coordinates
    num=      12
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*****************************************************************************
    9700 1042.79    1028    9900 1042.79    1028    9945 1042.62    1028
 9969.49 1042.62    1028  9969.5 1042.62 1036.95   10043 1042.45 1036.95
10043.01 1042.45    1028   10055 1042.45    1028   10100 1042.28    1028
   10250 1042.28           10350 1042.28           10600    1042

Downstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9885  1039.6    9886 1039.41    9979 1026.92   10000  1026.7   10037 1026.98
   10045  1029.8   10053  1030.1   10105 1038.76   10110  1039.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
    9885     .05    9885    .043   10110     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9885   10110             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  6

Pier Data
Pier Station     Upstream=    9980    Downstream=    9980
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1029.83      .5  1037.4
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5    1028      .5    1037

Pier Data
Pier Station     Upstream=  9990.5    Downstream=  9990.5
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1029.62      .5  1037.4
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1027.98      .5 1036.98

Pier Data
Pier Station     Upstream=   10001    Downstream=   10001
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5  1029.4      .5  1037.4
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1027.97      .5 1036.97

Pier Data
```

```
Pier Station     Upstream= 10011.5    Downstream= 10011.5
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1029.29      .5  1037.4
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1028.28      .5 1037.28

Pier Data
Pier Station     Upstream=   10022    Downstream=   10022
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1029.28      .5  1037.4
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1028.59      .5 1037.59

Pier Data
Pier Station     Upstream= 10032.5    Downstream= 10032.5
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1029.26      .5  1037.4
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
      .5 1028.91      .5 1037.91

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. US. (ft)          *    1042.59  * Element                 *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1042.52  * E.G. Elev (ft)          *    1042.45  *    1037.30  *
* Q Total (cfs)          *    7170.00  * W.S. Elev (ft)          *    1041.62  *    1033.90  *
* Q Bridge (cfs)         *    3903.81  * Crit W.S. (ft)          *    1041.62  *    1033.90  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)       *      10.67  *       7.20  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)        *       6.96  *      14.81  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)       *    1030.48  *     484.07  *
* Weir Submerg           *             * Froude # Chl            *       0.38  *       1.00  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)    *    5130.57  *    4967.19  *
* Min El Weir Flow (ft)  *    1042.29  * Hydr Depth (ft)         *       1.73  *       6.87  *
* Min El Prs (ft)        *    1037.36  * W.P. Total (ft)         *     824.82  *     166.52  *
* Delta EG (ft)          *       6.95  * Conv. Total (cfs)       *    41291.7  *    34072.0  *
* Delta WS (ft)          *       8.21  * Top Width (ft)          *     597.06  *      70.51  *
* BR Open Area (sq ft)   *     435.42  * Frctn Loss (ft)         *       4.71  *       0.41  *
* BR Open Vel (ft/s)     *       8.97  * C & E Loss (ft)         *       0.26  *       0.62  *
* Coef of Q              *             * Shear Total (lb/sq ft)  *       2.35  *       8.04  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)   *      16.36  *     119.04  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
```

```
is
          not a valid subcritical answer.  The program defaulted to critical depth.
Note:     Multiple critical depths were found at this location.  The critical depth with the lowest,
valid,
          energy was used.
Warning: The energy equation could not be balanced within the specified number of iterations.  The
          program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
          additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
          0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

          This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
          depth, the calculated water surface came back below critical depth.  This indicates that there
is
          not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS14 (J14)
REACH: REACH 2            RS: 3.245

INPUT
Description:
Station Elevation Data    num=      9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
    9885  1039.6    9886 1039.41    9979 1026.92   10000  1026.7   10037 1026.98
   10045  1029.8   10053  1030.1   10105 1038.76   10110  1039.6

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9885     .05    9885    .043   10110     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9885   10110                 1       1       1             .1      .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1035.65  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.34  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          * 1034.31  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          * 1033.15  * Flow Area (sq ft)       *          *  772.92  *          *
* E.G. Slope (ft/ft)      *0.008507  * Area (sq ft)            *          *  772.92  *          *
* Q Total (cfs)           * 7170.00  * Flow (cfs)              *          * 7170.00  *          *
* Top Width (ft)          *  154.33  * Top Width (ft)          *          *  154.33  *          *
* Vel Total (ft/s)        *    9.28  * Avg. Vel. (ft/s)        *          *    9.28  *          *
* Max Chl Dpth (ft)       *    7.61  * Hydr. Depth (ft)        *          *    5.01  *          *
* Conv. Total (cfs)       * 77737.8  * Conv. (cfs)             *          * 77737.8  *          *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *          *  155.66  *          *
* Min Ch El (ft)          * 1026.70  * Shear (lb/sq ft)        *          *    2.64  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *   24.46  *          *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *          *          *          *
* C & E Loss (ft)         *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************

CROSS SECTION


RIVER: 1S2WS23 (J14)
REACH: REACH 1            RS: 1.027

INPUT
Description: Limit of study
Station Elevation Data    num=     35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9780.53 1200.19 9783.85 1199.26 9796.78 1194.51 9821.02 1187.39 9848.45  1180.8
 9862.01 1177.82 9904.16 1169.92 9910.06 1168.66 9924.19 1167.01 9948.76 1161.68
 9949.77 1161.58 9951.06 1161.58 9952.52 1161.61 9953.63 1161.61 9954.71 1161.63
 9989.39 1154.81 9989.99 1154.81 9990.78 1154.83 9993.97 1155.16 9997.57 1155.08
   10000 1155.1110004.69 1155.1710011.76 1156.6410055.12 1163.8210066.97 1163.98
10106.79 1164.9710107.96 1165.0710112.47 1165.3710148.95 1167.8910158.46 1168.64
10189.95 1172.6910210.12 1175.0910230.94 1178.3110261.79 1183.0510271.93 1184.94
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9780.53     .05 9952.52    .04310055.12     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.5210055.12             1250    1344    1245            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1158.83  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.95  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1157.88  * Reach Len. (ft)         * 1250.00  * 1344.00  * 1245.00  *
* Crit W.S. (ft)          * 1157.88  * Flow Area (sq ft)       *          *   85.62  *          *
* E.G. Slope (ft/ft)      *0.022425  * Area (sq ft)            *          *   85.62  *          *
* Q Total (cfs)           *  670.00  * Flow (cfs)              *          *  670.00  *          *
* Top Width (ft)          *   45.48  * Top Width (ft)          *          *   45.48  *          *
* Vel Total (ft/s)        *    7.82  * Avg. Vel. (ft/s)        *          *    7.82  *          *
* Max Chl Dpth (ft)       *    3.07  * Hydr. Depth (ft)        *          *    1.88  *          *
* Conv. Total (cfs)       *  4474.1  * Conv. (cfs)             *          *  4474.1  *          *
* Length Wtd. (ft)        * 1344.00  * Wetted Per. (ft)        *          *   46.05  *          *
* Min Ch El (ft)          * 1154.81  * Shear (lb/sq ft)        *          *    2.60  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   20.37  *          *
* Frctn Loss (ft)         *   30.47  * Cum Volume (acre-ft)    *    2.57  *   25.39  *    7.73  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *   10.65  *    5.37  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS23 (J14)
REACH: REACH 1            RS: 0.773

INPUT
Description:
Station Elevation Data      num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9739.69 1137.09 9743.97 1137.07 9766.38 1136.74  9782.7 1136.41  9819.9 1135.84
 9821.44  1135.8 9825.47 1135.72 9860.17 1134.99 9873.42 1134.81  9898.9 1134.36
 9926.94 1134.11 9959.73 1127.21 9975.36 1123.04   10000 1121.7410000.41 1121.72
10013.84 1121.0510015.62 1121.9310063.62 1135.3910082.13 1135.65 10109.4 1135.44
10132.37 1134.9110155.18 1134.35

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9739.69     .05 9926.94    .04310063.62     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9926.9410063.62             1270    1357    1270            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1125.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.93  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1124.10  * Reach Len. (ft)         * 1270.00  * 1357.00  * 1270.00  *
* Crit W.S. (ft)          * 1124.10  * Flow Area (sq ft)       *          *   94.50  *          *
* E.G. Slope (ft/ft)      *0.022897  * Area (sq ft)            *          *   94.50  *          *
* Q Total (cfs)           *  730.00  * Flow (cfs)              *          *  730.00  *          *
* Top Width (ft)          *   51.94  * Top Width (ft)          *          *   51.94  *          *
* Vel Total (ft/s)        *    7.72  * Avg. Vel. (ft/s)        *          *    7.72  *          *
* Max Chl Dpth (ft)       *    3.05  * Hydr. Depth (ft)        *          *    1.82  *          *
* Conv. Total (cfs)       *  4824.3  * Conv. (cfs)             *          *  4824.3  *          *
* Length Wtd. (ft)        * 1357.00  * Wetted Per. (ft)        *          *   52.63  *          *
* Min Ch El (ft)          * 1121.05  * Shear (lb/sq ft)        *          *    2.57  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   19.83  *          *
* Frctn Loss (ft)         *   30.34  * Cum Volume (acre-ft)    *    2.57  *   22.61  *    7.73  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *    9.15  *    5.37  *
```

```
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS23 (J14)
REACH: REACH 1            RS: 0.516

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9742.63  1103.2 9758.07 1103.27 9763.54 1103.25 9769.29 1103.26 9798.91 1103.46
 9827.12 1103.48 9834.28 1103.45 9841.79 1103.28 9869.64 1102.56 9896.17  1101.9
 9905.01 1101.66 9914.29 1101.34 9940.37 1100.01 9979.17 1091.55 9983.44 1090.51
 9986.79 1090.63   10000 1090.9210006.52 1091.0910023.94 1096.2910047.21 1101.93
10071.73 1102.2110083.14 1102.1610091.06 1102.1210119.07  1102.810151.92 1102.36
10154.99 1102.2910159.43 1102.5210190.92 1103.6310212.77 1104.1710226.85 1103.93
10247.14 1104.3610262.78 1104.4610273.63 1104.9610298.71 1104.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9742.63     .05 9914.29    .04310047.21     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.2910047.21             1440    1492    1470            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1094.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.06  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)         * 1093.55  * Reach Len. (ft)         * 1440.00  * 1492.00  * 1470.00  *
* Crit W.S. (ft)         * 1093.55  * Flow Area (sq ft)       *          *   93.32  *          *
* E.G. Slope (ft/ft)     *0.021862  * Area (sq ft)            *          *   93.32  *          *
* Q Total (cfs)          *  770.00  * Flow (cfs)              *          *  770.00  *          *
* Top Width (ft)         *   44.77  * Top Width (ft)          *          *   44.77  *          *
* Vel Total (ft/s)       *    8.25  * Avg. Vel. (ft/s)        *          *    8.25  *          *
* Max Chl Dpth (ft)      *    3.04  * Hydr. Depth (ft)        *          *    2.08  *          *
* Conv. Total (cfs)      *  5207.7  * Conv. (cfs)             *          *  5207.7  *          *
* Length Wtd. (ft)       * 1488.18  * Wetted Per. (ft)        *          *   45.47  *          *
* Min Ch El (ft)         * 1090.51  * Shear (lb/sq ft)        *          *    2.80  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   23.11  *          *
* Frctn Loss (ft)        *   26.46  * Cum Volume (acre-ft)    *    2.57  *   19.69  *    7.73  *
* C & E Loss (ft)        *    0.26  * Cum SA (acres)          *          *    7.64  *    5.37  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS23 (J14)
REACH: REACH 1            RS: 0.233

INPUT
Description:
```

```
Station Elevation Data     num=      37
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9591.53 1068.32 9622.56 1068.42 9634.32 1068.43  9673.4 1068.44 9677.25 1068.43
 9698.13 1068.36 9720.18 1068.29 9724.25 1068.27 9763.11 1067.97 9775.09 1067.86
 9806.04 1067.68 9825.93 1067.38 9848.97 1067.02 9885.52 1066.31 9904.87 1065.65
 9975.78 1065.33 9978.19  1065.3 9978.49 1065.31  9978.9 1065.31   10000 1064.97
10047.34 1066.4210059.25 1066.6510080.91 1065.7410115.27 1065.5510145.74 1065.69
10161.72 1065.78 10195.9  1065.910208.16 1065.9610246.06 1066.1910254.61 1066.27
10296.21 1066.7710301.06 1066.8310346.37 1067.68 10347.5  1067.710361.64 1067.92
10393.95 1068.4310396.53 1068.49

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9591.53     .05 9848.97    .04310059.25     .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9848.9710059.25               915     814     820              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1066.61  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.               *          *    0.043 *    0.050 *
* W.S. Elev (ft)          * 1066.44  * Reach Len. (ft)          *  915.00  *   814.00 *   820.00 *
* Crit W.S. (ft)          * 1066.29  * Flow Area (sq ft)        *          *   142.58 *   112.58 *
* E.G. Slope (ft/ft)      *0.014874  * Area (sq ft)             *          *   142.58 *   112.58 *
* Q Total (cfs)           *  810.00  * Flow (cfs)               *          *   535.74 *   274.26 *
* Top Width (ft)          *  373.62  * Top Width (ft)           *          *   169.34 *   204.29 *
* Vel Total (ft/s)        *    3.17  * Avg. Vel. (ft/s)          *          *     3.76 *     2.44 *
* Max Chl Dpth (ft)       *    1.47  * Hydr. Depth (ft)          *          *     0.84 *     0.55 *
* Conv. Total (cfs)       *  6641.5  * Conv. (cfs)               *          *   4392.7 *   2248.7 *
* Length Wtd. (ft)        *  814.97  * Wetted Per. (ft)          *          *   169.37 *   204.31 *
* Min Ch El (ft)          * 1064.97  * Shear (lb/sq ft)          *          *     0.78 *     0.51 *
* Alpha                   *    1.13  * Stream Power (lb/ft s)    *          *     2.94 *     1.25 *
* Frctn Loss (ft)         *   17.17  * Cum Volume (acre-ft)      *     2.57 *    15.65 *     5.83 *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)            *          *     3.97 *     1.92 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS23 (J14)
REACH: REACH 1            RS: 0.079

INPUT
Description:
Station Elevation Data     num=      29
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9653.64 1049.97 9657.88 1049.88 9673.41 1049.69 9699.14 1049.45 9709.83 1049.47
 9716.28 1049.49 9746.25 1049.76 9774.69 1049.49 9782.67 1049.39 9795.87 1049.31
 9819.08 1049.16  9833.1 1049.03  9855.5 1048.84  9891.5 1048.52 9892.29 1048.51
 9892.81  1048.5 9895.77 1048.48 9960.71 1047.89 9973.49 1047.84   10000    1048
10010.45 1048.1110020.78 1048.12 10060.7 1048.44 10066.9 1048.4710072.01 1048.57
10075.89 1048.7310107.45 1049.8410142.32 1050.0910142.88  1050.1

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9653.64     .05 9746.25    .04310107.45     .05

Bank Sta: Left   Right     Coeff Contr.    Expan.
       9746.2510107.45              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1049.43  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.37  * Wt. n-Val.               *          *    0.043 *          *
* W.S. Elev (ft)          * 1049.06  * Reach Len. (ft)          *  420.00  *   420.00 *   420.00 *
* Crit W.S. (ft)          * 1049.06  * Flow Area (sq ft)        *          *   183.29 *          *
* E.G. Slope (ft/ft)      *0.030819  * Area (sq ft)             *          *   183.29 *          *
* Q Total (cfs)           *  890.00  * Flow (cfs)               *          *   890.00 *          *
* Top Width (ft)          *  255.93  * Top Width (ft)           *          *   255.93 *          *
```

* Vel Total (ft/s)	*	4.86	* Avg. Vel. (ft/s)	*		*	4.86	*	*
* Max Chl Dpth (ft)	*	1.22	* Hydr. Depth (ft)	*		*	0.72	*	*
* Conv. Total (cfs)	*	5069.7	* Conv. (cfs)	*		*	5069.7	*	*
* Length Wtd. (ft)	*	420.00	* Wetted Per. (ft)	*		*	255.95	*	*
* Min Ch El (ft)	*	1047.84	* Shear (lb/sq ft)	*		*	1.38	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	6.69	*	*
* Frctn Loss (ft)	*	0.13	* Cum Volume (acre-ft)	*	2.57	*	12.60	*	4.77 *
* C & E Loss (ft)	*	0.09	* Cum SA (acres)	*		*		*	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

SUMMARY OF MANNING'S N VALUES

River:1S2WS14 (J14)

Reach	River Sta.	n1	n2	n3
*REACH 1	4.853	.05	.043	.05
*REACH 1	4.589	.05	.043	.05
*REACH 1	4.354	.05	.043	.05
*REACH 1	4.078	.05	.043	.05
*REACH 1	3.846	.05	.043	.05
*REACH 1	3.575	.05	.043	.05
*REACH 2	3.302	.05	.043	.05
*REACH 2	3.272	*Bridge		
*REACH 2	3.245	.05	.043	.05

River:1S2WS23 (J14)

Reach	River Sta.	n1	n2	n3
*REACH 1	1.027	.05	.043	.05
*REACH 1	0.773	.05	.043	.05
*REACH 1	0.516	.05	.043	.05
*REACH 1	0.233	.05	.043	.05
*REACH 1	0.079	.05	.043	.05

SUMMARY OF REACH LENGTHS

River: 1S2WS14 (J14)

Reach	River Sta.	Left	Channel	Right
*REACH 1	4.853	1400	1395	1300
*REACH 1	4.589	1225	1240	1240
*REACH 1	4.354	1370	1460	1420
*REACH 1	4.078	1135	1225	1260
*REACH 1	3.846	1475	1427	1210
*REACH 1	3.575			
*REACH 2	3.302	235	235	235
*REACH 2	3.272	*Bridge		
*REACH 2	3.245	1	1	1

River: 1S2WS23 (J14)

Reach	River Sta.	Left	Channel	Right
*REACH 1	1.027	1250	1344	1245
*REACH 1	0.773	1270	1357	1270
*REACH 1	0.516	1440	1492	1470
*REACH 1	0.233	915	814	820
*REACH 1	0.079			

```
*******************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS14 (J14)

*****************************************************
*     Reach       *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    4.853    *       .1*       .3*
*REACH 1          *    4.589    *       .1*       .3*
*REACH 1          *    4.354    *       .1*       .3*
*REACH 1          *    4.078    *       .1*       .3*
*REACH 1          *    3.846    *       .1*       .3*
*REACH 1          *    3.575    *       .1*       .3*
*REACH 2          *    3.302    *       .1*       .3*
*REACH 2          *    3.272    *Bridge   *         *
*REACH 2          *    3.245    *       .1*       .3*
*****************************************************
River: 1S2WS23 (J14)

*****************************************************
*     Reach       *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    1.027    *       .1*       .3*
*REACH 1          *    0.773    *       .1*       .3*
*REACH 1          *    0.516    *       .1*       .3*
*REACH 1          *    0.233    *       .1*       .3*
*REACH 1          *    0.079    *       .1*       .3*
*****************************************************
```

MODEL: 1S2WS17 (J38)

REACH: 1S2WS17 (J38)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS17 (J38)
Project File : 1S2WS17_J38.prj
Run Date and Time: 12/13/2004 2:36:50 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS17 (J38)
Reaches: 1S2WS17 (J38)

****

PLAN DATA

Plan Title: 1S2WS17 (J38)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS17
(J38)\1S2WS17_J38.p01

Geometry Title: 1S2WS17 (J38)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS17
(J38)\1S2WS17_J38.g01

Flow Title : 1S2WS17 (J38)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS17
(J38)\1S2WS17_J38.f01

Plan Summary Information:

Number of:	Cross Sections =	4	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 1S2WS17 (J38)     Reach = REACH 1
RS      Profile            Method  Value1  Value2
0.920   PF 2                    1    9950   10055
0.718   PF 2                    1    9975   10025
0.495   PF 2                    1    9950   10050
0.298   PF 2                    1    9950   10050

*****************************************************************************

FLOW DATA

Flow Title: 1S2WS17 (J38)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS17
(J38)\1S2WS17_J38.f01

Flow Data (cfs)
*************************************************************
* River            Reach            RS      *            PF 1 *
* 1S2WS17 (J38)    REACH 1          0.920   *            1480 *
* 1S2WS17 (J38)    REACH 1          0.718   *            1630 *
* 1S2WS17 (J38)    REACH 1          0.495   *            1810 *
* 1S2WS17 (J38)    REACH 1          0.298   *            2020 *
*************************************************************

Boundary Conditions
*****************************************************************************************************
* River            Reach            Profile          *            Upstream                Downstream    *
*****************************************************************************************************
* 1S2WS17 (J38)    REACH 1          PF 1             *        Normal S = 0.0091       Normal S = 0.0091 *
*****************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 1S2WS17 (J38)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS17
(J38)\1S2WS17_J38.g01

CROSS SECTION


RIVER: 1S2WS17 (J38)
REACH: REACH 1            RS: 0.920

INPUT
Description: Limit of Study.
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9656.14  910.91 9673.99  910.81 9713.01  910.61  9741.4  910.36 9770.79  910.06
  9811.2  909.47 9828.56  909.23 9841.19  908.99 9886.34  908.08 9906.37  907.76
 9945.56  904.93 9958.08  904.04 9973.59  904.29   10000  904.5110004.41  904.55
10011.42  904.6210019.63   904.710020.24   904.7 10024.3   904.710056.68  907.54
10071.85  909.3910078.12  909.9810082.11  910.6410089.33  910.6410097.05   910.6
10101.95  910.5210105.95  910.4310109.27  910.3910113.16  910.4210116.72  910.49
10119.88  910.5310161.17   910.910162.44   910.910163.55  910.8910164.52  910.89
10165.23  910.8810165.84  910.8710166.38  910.8710180.14  910.9810219.07  911.38
10247.83  911.54 10273.4   911.710308.03  911.8310327.72   911.910342.27  911.95
10382.04  912.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
```

```
 9656.14     .051 9770.79     .05410082.11     .051

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9770.7910082.11              1060    1070    1060             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  908.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *    0.054 *          *
* W.S. Elev (ft)          *  908.09  * Reach Len. (ft)         * 1060.00  * 1070.00  * 1060.00  *
* Crit W.S. (ft)          *  906.52  * Flow Area (sq ft)       *          *   424.34 *          *
* E.G. Slope (ft/ft)      *0.004953  * Area (sq ft)            *          *   424.34 *          *
* Q Total (cfs)           * 1480.00  * Flow (cfs)              *          *  1480.00 *          *
* Top Width (ft)          *  175.28  * Top Width (ft)          *          *   175.28 *          *
* Vel Total (ft/s)        *    3.49  * Avg. Vel. (ft/s)         *          *     3.49 *          *
* Max Chl Dpth (ft)       *    4.05  * Hydr. Depth (ft)         *          *     2.42 *          *
* Conv. Total (cfs)       * 21028.9  * Conv. (cfs)              *          *  21028.9 *          *
* Length Wtd. (ft)        * 1069.99  * Wetted Per. (ft)         *          *   175.57 *          *
* Min Ch El (ft)          *  904.04  * Shear (lb/sq ft)         *          *     0.75 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *          *     2.61 *          *
* Frctn Loss (ft)         *    5.68  * Cum Volume (acre-ft)      *    0.20  *    30.08 *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)            *    2.05  *    12.04 *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS17 (J38)
REACH: REACH 1            RS: 0.718

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9588.77  904.02 9636.02   903.7 9638.16  903.69 9639.97  903.68 9695.01  903.29
 9745.01  902.94 9751.86  902.88 9759.95  902.83 9808.72  902.48 9850.05  902.29
 9865.57  902.22 9883.88  902.23 9922.43  902.21  9933.9  902.23 9963.28  899.44
 9990.34   897.3 9998.79  897.26   10000  897.26 10007.4  897.2110044.02  900.13
10081.45 903.2810092.99  903.3910131.75  903.7110149.84  903.8510165.18  903.96
10194.62  903.710255.69  904.5910263.55  904.6410270.22  904.6810320.41  904.95
10375.26  905.210377.26  905.2110379.62  905.2110434.12  905.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9588.77    .051 9922.43    .05410081.45    .051

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9922.4310081.45              1080    1177    1030             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  902.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.051  *    0.054 *          *
* W.S. Elev (ft)          *  902.34  * Reach Len. (ft)         * 1080.00  * 1177.00  * 1030.00  *
* Crit W.S. (ft)          *  900.65  * Flow Area (sq ft)       *    8.32  *   403.11 *          *
* E.G. Slope (ft/ft)      *0.005664  * Area (sq ft)            *    8.32  *   403.11 *          *
* Q Total (cfs)           * 1630.00  * Flow (cfs)              *    3.93  *  1626.07 *          *
* Top Width (ft)          *  231.10  * Top Width (ft)          *   83.25  *   147.85 *          *
* Vel Total (ft/s)        *    3.96  * Avg. Vel. (ft/s)         *    0.47  *     4.03 *          *
* Max Chl Dpth (ft)       *    5.13  * Hydr. Depth (ft)         *    0.10  *     2.73 *          *
* Conv. Total (cfs)       * 21659.1  * Conv. (cfs)              *    52.2  *  21606.9 *          *
* Length Wtd. (ft)        * 1176.89  * Wetted Per. (ft)         *   83.25  *   148.28 *          *
* Min Ch El (ft)          *  897.21  * Shear (lb/sq ft)         *    0.04  *     0.96 *          *
* Alpha                   *    1.03  * Stream Power (lb/ft s)    *    0.02  *     3.88 *          *
* Frctn Loss (ft)         *    8.51  * Cum Volume (acre-ft)      *    0.10  *    19.91 *          *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)            *    1.03  *     8.07 *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION
```

```
RIVER: 1S2WS17 (J38)
REACH: REACH 1              RS: 0.495

INPUT
Description:
Station Elevation Data     num=      35
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9512.72   899.5  9519.9  899.51 9569.32  899.55 9593.52  899.51 9637.44  899.43
 9667.15  899.36 9705.56  899.13 9740.77   898.9 9773.67  898.56  9814.4  898.16
 9841.79  897.77 9888.02  896.75 9909.91  896.24 9934.77  895.63 9973.11  890.37
 9992.31  887.98   10000  888.3910008.04  888.7910008.71  888.8410012.16  889.15
 10081.2  895.5310092.45  895.5810123.17  895.9710147.57  896.2210175.77  896.53
10202.68  896.8310225.96  897.03 10257.8  897.32 10294.6  897.5710312.91  897.72
10328.76  897.8410368.03  898.1710413.43  898.4910423.15  898.5610431.55   898.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9512.72    .051 9934.77    .054 10081.2    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.77 10081.2             1040    1039     970            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  894.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.47  * Wt. n-Val.              *          *   0.054  *          *
* W.S. Elev (ft)          *  893.59  * Reach Len. (ft)         * 1040.00  * 1039.00  *  970.00  *
* Crit W.S. (ft)          *  892.36  * Flow Area (sq ft)       *          *  330.52  *          *
* E.G. Slope (ft/ft)      *0.009274  * Area (sq ft)            *          *  330.52  *          *
* Q Total (cfs)           * 1810.00  * Flow (cfs)              *          * 1810.00  *          *
* Top Width (ft)          *  110.65  * Top Width (ft)          *          *  110.65  *          *
* Vel Total (ft/s)        *    5.48  * Avg. Vel. (ft/s)        *          *    5.48  *          *
* Max Chl Dpth (ft)       *    5.61  * Hydr. Depth (ft)        *          *    2.99  *          *
* Conv. Total (cfs)       * 18795.0  * Conv. (cfs)             *          * 18795.0  *          *
* Length Wtd. (ft)        * 1039.00  * Wetted Per. (ft)        *          *  111.26  *          *
* Min Ch El (ft)          *  887.98  * Shear (lb/sq ft)        *          *    1.72  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    9.42  *          *
* Frctn Loss (ft)         *    9.55  * Cum Volume (acre-ft)     *          *   10.00  *          *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)           *          *    4.58  *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS17 (J38)
REACH: REACH 1              RS: 0.298

INPUT
Description: Cross Section located at Elliot Road.
Station Elevation Data     num=      38
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
  9754.4   888.7 9771.58  888.12 9800.75   887.2 9819.74  887.46 9848.54  887.66
 9849.61   887.6 9850.75  887.53 9851.69  887.46 9852.69  887.38 9853.77   887.3
 9858.63     887 9900.03  885.37 9910.33  884.85 9938.89  883.65  9952.8  883.05
  9980.5  880.46  9987.2  880.55 9991.88  880.62 9995.39  880.85   10000   880.8
10018.16  880.95 10036.8  881.4910064.37  881.7610078.79  881.8910107.65   882.4
 10136.1   883.110151.04  883.32 10179.4   883.910194.49  884.15 10222.9  884.47
10237.96  884.7210266.42  884.9310281.34  885.1510309.87  885.4410324.69  885.69
10355.02  886.2810381.23  886.8710395.99  887.16

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9754.4    .051 9848.54    .05410237.96    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9848.5410237.96             15      17       15            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

E.G. Elev (ft)	884.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.054	
W.S. Elev (ft)	884.20	Reach Len. (ft)			
Crit W.S. (ft)	883.28	Flow Area (sq ft)		508.25	
E.G. Slope (ft/ft)	0.009117	Area (sq ft)		508.25	
Q Total (cfs)	2020.00	Flow (cfs)		2020.00	
Top Width (ft)	273.00	Top Width (ft)		273.00	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)		3.97	
Max Chl Dpth (ft)	3.74	Hydr. Depth (ft)		1.86	
Conv. Total (cfs)	21155.4	Conv. (cfs)		21155.4	
Length Wtd. (ft)		Wetted Per. (ft)		273.19	
Min Ch El (ft)	880.46	Shear (lb/sq ft)		1.06	
Alpha	1.00	Stream Power (lb/ft s)		4.21	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:1S2WS17 (J38)

Reach	River Sta.	n1	n2	n3
REACH 1	0.920	.051	.054	.051
REACH 1	0.718	.051	.054	.051
REACH 1	0.495	.051	.054	.051
REACH 1	0.298	.051	.054	.051

SUMMARY OF REACH LENGTHS

River: 1S2WS17 (J38)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.920	1060	1070	1060
REACH 1	0.718	1080	1177	1030
REACH 1	0.495	1040	1039	970
REACH 1	0.298	15	17	15

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS17 (J38)

Reach	River Sta.	Contr.	Expan.
REACH 1	0.920	.1	.3
REACH 1	0.718	.1	.3
REACH 1	0.495	.1	.3
REACH 1	0.298	.1	.3

MODEL: 1S2WS18B (J37)

REACHES: 1S2WS18B (J37)
1S2WS18A (J27)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS18B (J37)
Project File : 1S2WS18B_J37.prj
Run Date and Time: 12/14/2004 12:40:58 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS18B (J37)
Reaches: 1S2WS18B (J37)
  1S2WS18A (J27)

****

PLAN DATA

Plan Title: 1S2WS18B (J37)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS18B (J37)\1S2WS18B_J37.p01

Geometry Title: 1S2WS18B (J37)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS18B (J37)\1S2WS18B_J37.g01

Flow Title : 1S2WS18B (J37)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS18B (J37)\1S2WS18B_J37.f01

Plan Summary Information:

Number of:	Cross Sections =	7	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
  Water surface calculation tolerance = 0.01
  Critical depth calculaton tolerance = 0.01

```
    Maximum number of interations        =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 1S2WS18B (J37)   Reach = REACH 1
RS      Profile           Method  Value1  Value2
1.618   PF 2                  1    9950   10030
1.338   PF 2                  1    9959   10047

River = 1S2WS18B (J37)   Reach = REACH 2
RS      Profile           Method  Value1  Value2
1.045   PF 2                  1    9960   10040
0.876   PF 2                  1    9920   10055
0.683   PF 2                  1    9950   10050

River = 1S2WS18A (J27)   Reach = REACH 1
RS      Profile           Method  Value1  Value2
0.460   PF 2                  1    9960   10030
0.257   PF 2                  1    9965   10035

*****************************************************************************

FLOW DATA

Flow Title: 1S2WS18B (J37)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS18B
(J37)\1S2WS18B_J37.f01

Flow Data (cfs)
*************************************************************
* River           Reach           RS      *          PF 1 *
* 1S2WS18B (J37)  REACH 1         1.618   *           970 *
* 1S2WS18B (J37)  REACH 1         1.338   *          1040 *
* 1S2WS18B (J37)  REACH 2         1.045   *          2480 *
* 1S2WS18B (J37)  REACH 2         0.876   *          2800 *
* 1S2WS18B (J37)  REACH 2         0.683   *          3170 *
* 1S2WS18A (J27)  REACH 1         0.460   *           700 *
* 1S2WS18A (J27)  REACH 1         0.257   *           820 *
*************************************************************

Boundary Conditions
*****************************************************************************************************
* River           Reach           Profile         *        Upstream                  Downstream    *
*****************************************************************************************************
* 1S2WS18B (J37)  REACH 1         PF 1            *     Normal S = 0.006                            *
* 1S2WS18B (J37)  REACH 2         PF 1            *                                Normal S = 0.006 *
* 1S2WS18A (J27)  REACH 1         PF 1            *     Normal S = 0.006                            *
*****************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 1S2WS18B (J37)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS18B
(J37)\1S2WS18B_J37.g01

Reach Connection Table
*****************************************************************************
* River           Reach           *  Upstream Boundary  * Downstream Boundary *
*****************************************************************************
* 1S2WS18B (J37)  REACH 1         *                     *   JUNCTION 1        *
* 1S2WS18B (J37)  REACH 2         *   JUNCTION 1        *                     *
* 1S2WS18A (J27)  REACH 1         *                     *   JUNCTION 1        *
*****************************************************************************

JUNCTION INFORMATION
```

Name: JUNCTION 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
1S2WS18B (J37)	REACH 1	to 1S2WS18B (J37)	REACH 2	1547	
1S2WS18A (J27)	REACH 1	to 1S2WS18B (J37)	REACH 2	1356	

CROSS SECTION

RIVER: 1S2WS18B (J37)
REACH: REACH 1 RS: 1.618

INPUT
Description: Directly downstream of Tuthill Road.
Limit of study.
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9392.7	910.61	9399.27	910.62	9441.26	910.68	9484.21	910.73	9503.11	910.75
9553.72	910.85	9564.96	910.87	9569.16	910.87	9626.81	910.89	9654.1	910.88
9688.66	910.84	9739.05	910.73	9750.51	910.7	9781.21	910.56	9812.36	910.41
9823.99	910.32	9874.21	909.92	9908.93	909.55	9936.06	909.3	9995.67	907.42
9995.84	907.41	10000	907.38	10017.16	907.26	10021.89	907.22	10033.23	907.41
10048.96	907.92	10058.86	908.22	10084.57	909.07	10124.55	910.48	10157.01	910.96
10187.89	911.33	10238.46	911.56	10251.23	911.58	10295.95	911.64	10314.58	911.66
10319.9	911.69	10377.92	911.87	10401.34	911.93	10441.26	912.01	10482.78	911.99
10504.6	912	10564.22	911.98	10567.95	911.99	10581	912.01		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9392.7	.051	9936.06	.054	10124.55	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9936.06	10124.55	1380	1475	1435	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	910.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.051	0.054	
W.S. Elev (ft)	910.35	Reach Len. (ft)	1380.00	1475.00	1435.00
Crit W.S. (ft)	909.13	Flow Area (sq ft)	58.18	364.60	
E.G. Slope (ft/ft)	0.003316	Area (sq ft)	58.18	364.60	
Q Total (cfs)	970.00	Flow (cfs)	61.58	908.42	
Top Width (ft)	300.91	Top Width (ft)	116.08	184.83	
Vel Total (ft/s)	2.29	Avg. Vel. (ft/s)	1.06	2.49	
Max Chl Dpth (ft)	3.13	Hydr. Depth (ft)	0.50	1.97	
Conv. Total (cfs)	16844.8	Conv. (cfs)	1069.4	15775.4	
Length Wtd. (ft)	1472.09	Wetted Per. (ft)	116.08	184.91	
Min Ch El (ft)	907.22	Shear (lb/sq ft)	0.10	0.41	
Alpha	1.12	Stream Power (lb/ft s)	0.11	1.02	
Frctn Loss (ft)	9.00	Cum Volume (acre-ft)	0.94	22.72	0.26
C & E Loss (ft)	0.04	Cum SA (acres)	1.84	4.65	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS18B (J37)
REACH: REACH 1 RS: 1.338

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9284.24	904.63	9308.87	904.5	9324.24	903.87	9339.13	903.38	9364.84	902.83
9390.3	901.68	9391.41	901.71	9393	901.73	9430.41	902.62	9435.35	902.8
9457.82	903.77	9492.05	903.63	9501.04	903.6	9548.02	903.47	9595.57	903.33

```
 9603.99  903.31 9612.31  903.29 9659.96  903.25 9708.19  903.29 9715.93  903.29
 9723.57   903.3  9771.9  903.36 9820.81   903.4 9827.87  903.41 9834.84  903.41
 9883.84  903.41 9933.43  903.24 9939.81  903.23 9944.24  902.76 9945.89  902.54
 9950.24  901.98  9989.8  896.86 9992.92  896.46 9996.86  896.87   10000   897.2
 10000.3  897.2210013.43   898.310022.19  899.0310028.42  899.5510036.55  900.22
10078.89  902.9510093.51  903.06 10131.7  903.4110155.21  903.6310164.22  903.72
10216.92   904.110249.55  904.23

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9284.24    .051 9933.43    .05410078.89    .051

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9933.4310078.89            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  901.40  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.45  * Wt. n-Val.              *          *    0.054 *          *
* W.S. Elev (ft)          *  900.95  * Reach Len. (ft)         * 1547.00  * 1547.00  * 1547.00  *
* Crit W.S. (ft)          *  900.23  * Flow Area (sq ft)       *          *  193.55  *          *
* E.G. Slope (ft/ft)      *0.013778  * Area (sq ft)            *          *  193.55  *          *
* Q Total (cfs)           * 1040.00  * Flow (cfs)              *          * 1040.00  *          *
* Top Width (ft)          *   89.73  * Top Width (ft)          *          *   89.73  *          *
* Vel Total (ft/s)        *    5.37  * Avg. Vel. (ft/s)        *          *    5.37  *          *
* Max Chl Dpth (ft)       *    4.49  * Hydr. Depth (ft)        *          *    2.16  *          *
* Conv. Total (cfs)       *  8860.0  * Conv. (cfs)             *          *  8860.0  *          *
* Length Wtd. (ft)        * 1547.00  * Wetted Per. (ft)        *          *   90.20  *          *
* Min Ch El (ft)          *  896.46  * Shear (lb/sq ft)        *          *    1.85  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    9.92  *          *
* Frctn Loss (ft)         *    9.44  * Cum Volume (acre-ft)     *    0.02  *   13.27  *    0.26  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)           *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS18B (J37)
REACH: REACH 2            RS: 1.045

INPUT
Description:
Station Elevation Data      num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9335.49  900.01 9336.37  900.01 9365.26  899.79 9398.84  899.49 9416.11  899.22
 9461.31  898.72 9466.97  898.64 9491.75  898.38 9517.83  898.12 9523.78  898.04
 9568.68  897.45 9586.25  897.16 9619.54  896.62 9648.72  896.07 9670.39  895.68
 9711.19  894.84 9721.25  894.64 9765.32  893.77 9772.11  893.64 9773.66   893.6
 9822.96   892.7 9836.13  892.49 9873.82  891.95  9898.6  891.72 9924.68  891.47
 9958.92  888.29 9975.28   886.7 9994.29  884.85   10000     88510000.27  885.01
10007.33  885.5810024.68  886.9610051.06  888.83 10054.1  889.0110076.34  891.24
 10108.4  891.39 10126.6  891.4510154.01  891.6710176.86  891.8910199.62  892.07
10227.11  892.4310245.23  892.6210277.37  892.8510290.84  892.9310327.63  893.16
10336.45  893.2410377.89  893.7410382.06   893.810422.92  894.3910427.67  894.46
10428.15  894.4710473.28  895.2210478.41   895.310518.89  895.7110528.67  895.79
 10564.5  895.9210578.93  895.9410610.11     896

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9335.49    .051 9924.68    .05410076.34    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9924.6810076.34              845     891     890            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  891.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.31  * Wt. n-Val.              *   0.051  *    0.054 *   0.051  *
* W.S. Elev (ft)          *  891.61  * Reach Len. (ft)         *  845.00  *  891.00  *  890.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    1.02  *  553.81  *   14.48  *
* E.G. Slope (ft/ft)      *0.004694  * Area (sq ft)            *    1.02  *  553.81  *   14.48  *
* Q Total (cfs)           * 2480.00  * Flow (cfs)              *    0.34  * 2469.56  *   10.10  *
```

* Top Width (ft)	*	236.38	* Top Width (ft)	*	14.57	*	151.66	*	70.15	*
* Vel Total (ft/s)	*	4.36	* Avg. Vel. (ft/s)	*	0.34	*	4.46	*	0.70	*
* Max Chl Dpth (ft)	*	6.76	* Hydr. Depth (ft)	*	0.07	*	3.65	*	0.21	*
* Conv. Total (cfs)	*	36198.7	* Conv. (cfs)	*	5.0	*	36046.3	*	147.4	*
* Length Wtd. (ft)	*	890.01	* Wetted Per. (ft)	*	14.57	*	152.24	*	70.15	*
* Min Ch El (ft)	*	884.85	* Shear (lb/sq ft)	*	0.02	*	1.07	*	0.06	*
* Alpha	*	1.04	* Stream Power (lb/ft s)	*	0.01	*	4.75	*	0.04	*
* Frctn Loss (ft)	*	3.55	* Cum Volume (acre-ft)	*	1.88	*	25.06	*	0.49	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	3.04	*	5.80	*	1.49	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS18B (J37)
REACH: REACH 2 RS: 0.876

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9445.12	894.18	9473.99	894.1	9488.25	894.08	9536.08	894.13	9572.6	894.06
9598.16	893.98	9656.94	893.04	9660.25	892.98	9669.48	892.71	9722.34	891.22
9741.28	890.71	9784.42	889.52	9825.63	888.53	9846.51	888.01	9904.75	887.01
9908.59	886.94	9909.97	886.93	9944.94	886.73	9976.68	882.12	9987.12	880.68
9995.13	879.47	10000	879.46	10005.02	879.45	10007.97	879.46	10013.09	880.32
10019.87	881.61	10060.1	888.55	10078.8	888.88	10110.17	889.47	10130.38	889.87
10179.24	890.88	10181.95	890.94	10189.97	891.05	10233.53	891.57	10248.3	891.6
10285.11	891.68	10317.37	891.55	10336.69	891.57	10386.43	891.59	10388.27	891.59
10393.68	891.62	10439.84	891.9	10455.5	892.08	10491.42	892.49	10524.56	892.81

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9445.12	.051	9944.94	.054	10060.1	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9944.94	10060.1	1090	1023	990	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	888.37	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.34	* Wt. n-Val.	*	0.051	*	0.054	*		*
* W.S. Elev (ft)	*	888.03	* Reach Len. (ft)	*	1090.00	*	1023.00	*	990.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	77.73	*	566.35	*		*
* E.G. Slope (ft/ft)	*	0.003481	* Area (sq ft)	*	77.73	*	566.35	*		*
* Q Total (cfs)	*	2800.00	* Flow (cfs)	*	113.55	*	2686.45	*		*
* Top Width (ft)	*	211.34	* Top Width (ft)	*	99.20	*	112.14	*		*
* Vel Total (ft/s)	*	4.35	* Avg. Vel. (ft/s)	*	1.46	*	4.74	*		*
* Max Chl Dpth (ft)	*	8.58	* Hydr. Depth (ft)	*	0.78	*	5.05	*		*
* Conv. Total (cfs)	*	47456.5	* Conv. (cfs)	*	1924.6	*	45531.8	*		*
* Length Wtd. (ft)	*	1024.16	* Wetted Per. (ft)	*	99.21	*	113.41	*		*
* Min Ch El (ft)	*	879.45	* Shear (lb/sq ft)	*	0.17	*	1.09	*		*
* Alpha	*	1.15	* Stream Power (lb/ft s)	*	0.25	*	5.15	*		*
* Frctn Loss (ft)	*	4.67	* Cum Volume (acre-ft)	*	1.12	*	13.60	*	0.34	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	1.93	*	3.10	*	0.77	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS18B (J37)
REACH: REACH 2 RS: 0.683

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9389.58	886.84	9399.23	886.81	9410.78	886.75	9450.14	886.56	9473.7	886.41

9501.04	886.23	9536.62	885.99	9551.94	885.88	9599.54	885.58	9602.85	885.56
9616.87	885.45	9653.75	885.19	9662.46	885.1	9704.66	884.75	9725.38	884.52
9755.56	884.22	9788.3	883.87	9806.46	883.69	9851.22	883.27	9857.37	883.22
9883.43	883.03	9908.27	882.82	9977.59	877.81	9993.37	876.68	9995.95	876.69
10000	876.75	10011.41	876.91	10016.11	877.41	10060.04	882.37	10076.64	882.63
10110.16	882.99	10123.51	883.18	10160.28	883.79	10170.37	883.94	10210.4	884.53
10217.24	884.61	10260.52	885.24	10264.1	885.29	10310.65	886	10310.97	886
10315.63	886.06	10357.83	886.61	10360.77	886.64	10404.7	886.91	10410.89	886.96
10451.57	887.05	10461.01	887.08	10498.43	887.13	10511.13	887.12	10545.3	887.06
10561.25	887.06								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9389.58	.051	9908.27	.05	10060.04	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9908.27	10060.04	90	92	90	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	883.68	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.051	0.054	0.051
W.S. Elev (ft)	883.26	Reach Len. (ft)			
Crit W.S. (ft)	881.49	Flow Area (sq ft)	11.72	592.10	29.97
E.G. Slope (ft/ft)	0.006004	Area (sq ft)	11.72	592.10	29.97
Q Total (cfs)	3170.00	Flow (cfs)	9.41	3121.44	39.16
Top Width (ft)	275.18	Top Width (ft)	55.35	151.77	68.06
Vel Total (ft/s)	5.00	Avg. Vel. (ft/s)	0.80	5.27	1.31
Max Chl Dpth (ft)	6.58	Hydr. Depth (ft)	0.21	3.90	0.44
Conv. Total (cfs)	40909.8	Conv. (cfs)	121.4	40283.1	505.3
Length Wtd. (ft)		Wetted Per. (ft)	55.35	152.30	68.07
Min Ch El (ft)	876.68	Shear (lb/sq ft)	0.08	1.46	0.17
Alpha	1.09	Stream Power (lb/ft s)	0.06	7.68	0.22
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 1S2WS18A (J27)
REACH: REACH 1 RS: 0.460

INPUT
Description: Limit of study.
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9275.39	907.06	9295.51	907.01	9321.71	906.91	9331.02	906.88	9338.72	906.84
9366.53	906.68	9400.16	906.47	9402.05	906.46	9403.61	906.45	9437.56	906.2
9468.49	906.02	9473.07	905.99	9478.61	905.96	9508.59	905.75	9533.38	905.62
9544.1	905.55	9557.06	905.48	9579.62	905.31	9598.27	905.18	9615.13	905.05
9635.51	904.88	9650.64	904.73	9663.15	904.61	9686.15	904.38	9713.96	904.09
9721.67	904	9728.04	903.93	9757.18	903.58	9792.41	903.19	9792.69	903.19
9792.93	903.19	9828.21	902.78	9857.81	902.51	9863.72	902.44	9870.86	902.39
9902.83	900.2	9905.27	900.2	9907.99	900.29	9910.39	900.38	9912.12	900.44
9913.69	900.5	9918.43	900.6	9921.9	900.62	9942.46	899.93	9954.29	899.56
9961.91	899.03	9970.43	898.6	9987.78	897.92	9992.63	897.9	9994.72	897.88
10000	897.87	10000.2	897.87	10008.84	897.49	10063.31	896.53	10066.2	896.86
10083.33	898.58	10100.07	900.41	10105.3	90	10107.66	901.28	10109.06	901.48
10116.33	901.91	0147.99	902.09	10180.65	902.32	10183.54	902.35	10187.11	902.37
10219.09	902.64	10244.96	902.84	10254.64	902.92	10266.6	903	10290.19	903.19

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9275.39	.051	9857.81	.05	10116.33	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9857.81	10116.33	1035	1071	1035	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	899.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.054	
W.S. Elev (ft)	899.81	Reach Len. (ft)	1035.00	1071.00	1035.00
Crit W.S. (ft)		Flow Area (sq ft)		286.84	
E.G. Slope (ft/ft)	0.003271	Area (sq ft)		286.84	

* Q Total (cfs)	* 700.00	* Flow (cfs)	*	* 700.00	*	*
* Top Width (ft)	* 148.30	* Top Width (ft)	*	* 148.30	*	*
* Vel Total (ft/s)	* 2.44	* Avg. Vel. (ft/s)	*	* 2.44	*	*
* Max Chl Dpth (ft)	* 3.28	* Hydr. Depth (ft)	*	* 1.93	*	*
* Conv. Total (cfs)	* 12239.8	* Conv. (cfs)	*	* 12239.8	*	*
* Length Wtd. (ft)	* 1070.99	* Wetted Per. (ft)	*	* 148.54	*	*
* Min Ch El (ft)	* 896.53	* Shear (lb/sq ft)	*	* 0.39	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.96	*	*
* Frctn Loss (ft)	* 2.82	* Cum Volume (acre-ft)	* 0.02	* 21.40	* 0.27	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	*	* 3.38	* 0.32	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS18A (J27)
REACH: REACH 1 RS: 0.257

INPUT
Description:
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9523.57	902.45	9542.22	902.4	9576.93	902.18	9578	902.17	9578.78	902.17
9613.77	901.74	9640.77	901.41	9649.54	901.28	9661.52	901.11	9685.32	900.76
9702.76	900.54	9721.09	900.28	9746.11	899.99	9756.86	899.85	9764.74	899.77
9792.63	899.52	9826.73	899.2	9828.41	899.18	9830.69	899.15	9864.18	898.7
9888.72	898.27	9899.95	898.07	9915.28	897.79	9935.73	897.41	9958.1	895.19
9963.48	894.68	9966.46	894.41	9970.12	894.1	9974.66	893.71	10000	891.73
10000.06	891.72	10007.96	892.51	10023.71	893.93	10066.33	896.88	10078.07	896.92
10091.49	896.98	10113.51	897.08	10132.77	897.16	10148.94	897.25	10167.43	897.29
10184.37	897.36	10199.2	897.45	10219.81	897.64	10243.36	897.72	10255.24	897.79
10265.63	897.86	10290.68	898.15	10319.3	898.36	10326.11	898.43	10332.07	898.46
10361.54	898.72	10395.24	898.96	10396.98	898.98	10398.5	899	10432.41	899.43
10464.93	899.85	10467.85	899.88	10471.18	899.91	10503.28	900.34		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9523.57	.051	9935.73	.054	10066.33	.051

Bank Sta: Left Right Coeff Contr. Expan.
9935.73 10066.33 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 897.08	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.09	* Wt. n-Val.	*	* 0.054	* 0.051	*
* W.S. Elev (ft)	* 896.99	* Reach Len. (ft)	* 1356.00	* 1356.00	* 1356.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 332.24	* 1.52	*
* E.G. Slope (ft/ft)	*0.002225	* Area (sq ft)	*	* 332.24	* 1.52	*
* Q Total (cfs)	* 820.00	* Flow (cfs)	*	* 819.69	* 0.31	*
* Top Width (ft)	* 153.00	* Top Width (ft)	*	* 126.34	* 26.67	*
* Vel Total (ft/s)	* 2.46	* Avg. Vel. (ft/s)	*	* 2.47	* 0.20	*
* Max Chl Dpth (ft)	* 5.27	* Hydr. Depth (ft)	*	* 2.63	* 0.06	*
* Conv. Total (cfs)	* 17384.6	* Conv. (cfs)	*	* 17378.1	* 6.6	*
* Length Wtd. (ft)	* 1356.00	* Wetted Per. (ft)	*	* 126.77	* 26.67	*
* Min Ch El (ft)	* 891.72	* Shear (lb/sq ft)	*	* 0.36	* 0.01	*
* Alpha	* 1.01	* Stream Power (lb/ft s)	*	* 0.90	* 0.00	*
* Frctn Loss (ft)	* 5.14	* Cum Volume (acre-ft)	* 0.02	* 13.79	* 0.25	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	*	*	*	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:1S2WS18B (J37)

Reach	River Sta.	n1	n2	n3

*REACH 1	1.618	.051*	.054*	.051*
*REACH 1	1.338	.051*	.054*	.051*
*REACH 2	1.045	.051*	.054*	.051*
*REACH 2	0.876	.051*	.054*	.051*
*REACH 2	0.683	.051*	.054*	.051*

River:1S2WS18A (J27)

Reach	River Sta.	n1	n2	n3
*REACH 1	0.460	.051*	.054*	.051*
*REACH 1	0.257	.051*	.054*	.051*

SUMMARY OF REACH LENGTHS

River: 1S2WS18B (J37)

Reach	River Sta.	Left	Channel	Right
*REACH 1	1.618	1380*	1475*	1435*
*REACH 1	1.338	*	*	*
*REACH 2	1.045	845*	891*	890*
*REACH 2	0.876	1090*	1023*	990*
*REACH 2	0.683	90*	92*	90*

River: 1S2WS18A (J27)

Reach	River Sta.	Left	Channel	Right
*REACH 1	0.460	1035*	1071*	1035*
*REACH 1	0.257	*	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS18B (J37)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.618	.1*	.3*
*REACH 1	1.338	.1*	.3*
*REACH 2	1.045	.1*	.3*
*REACH 2	0.876	.1*	.3*
*REACH 2	0.683	.1*	.3*

River: 1S2WS18A (J27)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.460	.1*	.3*
*REACH 1	0.257	.1*	.3*

MODEL: 1S2WS2A (J46)

REACH: 1S2WS2A (J46)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X       X
X     X  X        X    X       X   X    X    X       X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS2A (J46)
Project File : 1S2WS2A_J46.prj
Run Date and Time: 12/13/2004 5:04:40 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS2A (J46)

****

PLAN DATA

Plan Title: 1S2WS2A (J46)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2A (J46)\1S2WS2A_J46.p01

Geometry Title: 1S2WS2A (J46)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2A (J46)\1S2WS2A_J46.g01

Flow Title : 1S2WS2A (J46)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2A (J46)\1S2WS2A_J46.f01

Plan Summary Information:

Number of:	Cross Sections =	11	Mulitple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3

Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 1S2WS2A (J46) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.326	PF 2	1	9990	10010
3.080	PF 2	1	9990	10010
2.849	PF 2	1	9980	10010
2.541	PF 2	1	9975	10025
2.532	PF 2	4		
2.459	PF 2	1	9985	10015
2.287	PF 2	1	9990	10015
2.009	PF 2	1	9985	10020
1.785	PF 2	1	9965	10015
1.507	PF 2	1	9975	10015
1.200	PF 2	1	9975	10025
0.869	PF 2	1	9925	10050

****

FLOW DATA

Flow Title: 1S2WS2A (J46)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2A (J46)\1S2WS2A_J46.f01

Flow Data (cfs)

River	Reach	RS	PF 1
1S2WS2A (J46)	REACH 1	3.326	400
1S2WS2A (J46)	REACH 1	3.080	480
1S2WS2A (J46)	REACH 1	2.849	620
1S2WS2A (J46)	REACH 1	2.541	660
1S2WS2A (J46)	REACH 1	2.459	690
1S2WS2A (J46)	REACH 1	2.287	750
1S2WS2A (J46)	REACH 1	2.009	850
1S2WS2A (J46)	REACH 1	1.785	940
1S2WS2A (J46)	REACH 1	1.507	1040
1S2WS2A (J46)	REACH 1	1.200	1150
1S2WS2A (J46)	REACH 1	0.869	1280

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1S2WS2A (J46)	REACH 1	PF 1	Normal S = 0.0205	Normal S = 0.0205

****

GEOMETRY DATA

Geometry Title: 1S2WS2A (J46)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2A (J46)\1S2WS2A_J46.g01

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 3.326

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

****

```
 9813.61 1179.93 9834.11 1178.75 9841.73 1177.57 9877.35 1170.29 9892.48 1166.86
 9920.58 1162.19 9953.82 1152.15 9959.32 1150.96 9964.31    1150 9970.92 1148.77
 9979.71 1147.22 9989.63 1145.53  9997.6 1145.89   10000 1146.1210025.85 1148.69
10034.68 1149.3210041.33 1149.4610047.94 1149.5810056.36  1149.610065.66 1149.55
10074.66 1149.3210076.32 1149.5410083.52 1150.0610090.16 1150.4110096.21 1150.87
10117.35  1156.810126.01  1158.610132.46 1160.0910137.34 1161.3210141.55  1162.5
10144.38  1163.410146.38 1164.0610159.73 1168.8210196.99  1172.4 10223.2 1174.58
10247.74 1176.5710266.43 1178.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9813.61     .05 9970.92    .04310025.85     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.9210025.85             1125    1298    1360            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1148.72  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.70  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)         * 1148.03  * Reach Len. (ft)        * 1125.00  * 1298.00  * 1360.00  *
* Crit W.S. (ft)         * 1148.03  * Flow Area (sq ft)      *          *   59.78  *          *
* E.G. Slope (ft/ft)     *0.025179  * Area (sq ft)           *          *   59.78  *          *
* Q Total (cfs)          *  400.00  * Flow (cfs)              *          *  400.00  *          *
* Top Width (ft)         *   44.03  * Top Width (ft)          *          *   44.03  *          *
* Vel Total (ft/s)       *    6.69  * Avg. Vel. (ft/s)        *          *    6.69  *          *
* Max Chl Dpth (ft)      *    2.50  * Hydr. Depth (ft)        *          *    1.36  *          *
* Conv. Total (cfs)      *  2520.8  * Conv. (cfs)             *          *  2520.8  *          *
* Length Wtd. (ft)       * 1298.00  * Wetted Per. (ft)        *          *   44.35  *          *
* Min Ch El (ft)         * 1145.53  * Shear (lb/sq ft)        *          *    2.12  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   14.18  *          *
* Frctn Loss (ft)        *   32.14  * Cum Volume (acre-ft)    *    0.13  *   48.15  *    0.09  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    0.52  *   23.18  *    0.41  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS2A (J46)
REACH: REACH 1            RS: 3.080

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9657.38 1139.46 9673.82 1136.37 9700.33 1130.76 9715.53 1128.07 9753.54    1121
 9780.66 1116.05 9782.67 1115.85 9784.94 1115.62 9787.48 1115.36 9792.21 1114.89
 9798.02 1114.32 9805.36 1113.55 9813.42 1112.63 9818.32 1112.98 9828.98 1113.77
 9835.28 1114.27 9836.97 1114.41 9838.41 1114.53 9839.63 1114.63 9859.97 1116.58
 9882.96 1116.48 9913.19 1116.34 9927.27  1115.8 9954.63 1110.99  9988.2 1106.79
 9988.84 1106.77 9999.95 1106.05   10000 1106.0610008.38  1106.810042.64 1112.26
10064.82 1115.4910069.33 1116.1710072.01 1116.57 10073.8 1116.83 10075.4 1117.02
10081.83 1118.5410104.52  1123.110141.62 1130.1810161.11 1134.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9657.38     .05 9927.27    .04310064.82     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9927.2710064.82             1170    1217     960            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1109.39  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.76  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)         * 1108.64  * Reach Len. (ft)        * 1170.00  * 1217.00  *  960.00  *
```

```
* Crit W.S. (ft)          * 1108.64  * Flow Area (sq ft)       *          *   68.76  *          *
* E.G. Slope (ft/ft)      *0.024421  * Area (sq ft)            *          *   68.76  *          *
* Q Total (cfs)           *  480.00  * Flow (cfs)              *          *  480.00  *          *
* Top Width (ft)          *   46.46  * Top Width (ft)          *          *   46.46  *          *
* Vel Total (ft/s)        *    6.98  * Avg. Vel. (ft/s)        *          *    6.98  *          *
* Max Chl Dpth (ft)       *    2.59  * Hydr. Depth (ft)        *          *    1.48  *          *
* Conv. Total (cfs)       *  3071.6  * Conv. (cfs)             *          *  3071.6  *          *
* Length Wtd. (ft)        * 1217.00  * Wetted Per. (ft)        *          *   46.78  *          *
* Min Ch El (ft)          * 1106.05  * Shear (lb/sq ft)        *          *    2.24  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   15.64  *          *
* Frctn Loss (ft)         *   28.01  * Cum Volume (acre-ft)    *    0.13  *   46.23  *    0.09  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    0.52  *   21.83  *    0.41  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS2A (J46)
REACH: REACH 1            RS: 2.849

INPUT
Description:
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9769.78 1099.09 9780.31 1099.14  9815.8  1097.1 9832.24 1095.95 9874.34 1091.12
 9884.18  1090.1 9888.02 1089.74 9936.12 1084.75 9964.03 1075.96 9990.68 1068.91
 9993.15 1069.08 9993.59 1069.11 9994.19 1069.15   10000 1069.44 10000.2 1069.45
10012.99 1070.1610020.37 1073.4410026.69 1077.1110038.79 1083.7910083.35 1084.88
10089.17    108510130.42 1086.1510139.55 1086.3910140.84  1086.410189.93 1087.37
10198.34 1087.33

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9769.78     .05 9936.12    .04310038.79     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.1210038.79             1430    1653    1520            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1073.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.01  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1072.01  * Reach Len. (ft)         * 1430.00  * 1653.00  * 1520.00  *
* Crit W.S. (ft)          * 1072.01  * Flow Area (sq ft)       *          *   76.93  *          *
* E.G. Slope (ft/ft)      *0.022003  * Area (sq ft)            *          *   76.93  *          *
* Q Total (cfs)           *  620.00  * Flow (cfs)              *          *  620.00  *          *
* Top Width (ft)          *   38.19  * Top Width (ft)          *          *   38.19  *          *
* Vel Total (ft/s)        *    8.06  * Avg. Vel. (ft/s)        *          *    8.06  *          *
* Max Chl Dpth (ft)       *    3.10  * Hydr. Depth (ft)        *          *    2.01  *          *
* Conv. Total (cfs)       *  4179.7  * Conv. (cfs)             *          *  4179.7  *          *
* Length Wtd. (ft)        * 1653.00  * Wetted Per. (ft)        *          *   39.02  *          *
* Min Ch El (ft)          * 1068.91  * Shear (lb/sq ft)        *          *    2.71  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   21.83  *          *
* Frctn Loss (ft)         *    1.02  * Cum Volume (acre-ft)    *    0.13  *   44.20  *    0.09  *
* C & E Loss (ft)         *    0.29  * Cum SA (acres)          *    0.52  *   20.65  *    0.41  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
```

depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 2.541

INPUT
Description: Upstream of 2-68" CMP's which cross Estrella Parkway.
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9956.71	1045.19	9962	1043.15	9980	1027.72	10021	1028.03	10046	1050.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9956.71	.05	9956.71	.043	10046	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9956.71	10046	430	433	430	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1036.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.		0.043	
W.S. Elev (ft)	1035.97	Reach Len. (ft)	430.00	433.00	430.00
Crit W.S. (ft)	1029.83	Flow Area (sq ft)		405.89	
E.G. Slope (ft/ft)	0.000194	Area (sq ft)		405.89	
Q Total (cfs)	660.00	Flow (cfs)		660.00	
Top Width (ft)	59.31	Top Width (ft)		59.31	
Vel Total (ft/s)	1.63	Avg. Vel. (ft/s)		1.63	
Max Chl Dpth (ft)	8.25	Hydr. Depth (ft)		6.84	
Conv. Total (cfs)	47348.5	Conv. (cfs)		47348.5	
Length Wtd. (ft)	433.00	Wetted Per. (ft)		65.44	
Min Ch El (ft)	1027.72	Shear (lb/sq ft)		0.08	
Alpha	1.00	Stream Power (lb/ft s)		0.12	
Frctn Loss (ft)		Cum Volume (acre-ft)	0.13	35.04	0.09
C & E Loss (ft)		Cum SA (acres)	0.52	18.80	0.41

CULVERT

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 2.532

INPUT
Description: 2 - 68" CMP's
Structure 2
Crosses Estrella Parkway
Distance from Upstream XS = 101
Deck/Roadway Width = 150
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9805	1036.81		10000	1042.01		10102	1044.17	

Upstream Bridge Cross Section Data
Station Elevation Data num= 5

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9956.71	1045.19	9962	1043.15	9980	1027.72	10021	1028.03	10046	1050.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9956.71	.05	9956.71	.043	10046	.05

Bank Sta: Left	Right	Coeff Contr.	Expan.
9956.71	10046	.1	.3

Downstream Deck/Roadway Coordinates
num= 3

```
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
*****************************************************************************
    9928  1033.5            10000 1035.43            10247 1042.03

Downstream Bridge Cross Section Data
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9962.13 1026.79    9967 1027.43    9985 1015.01   10014 1014.22   10037 1030.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9962.13     .05 9962.13    .043   10037     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9962.13   10037             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular    5.67
FHWA Chart # 1 - Concrete Pipe Culvert
FHWA Scale # 1 - Square edge entrance with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 47     355     .024     .024        0                 .5                 1
Number of Barrels =  2
Upstream   Elevation =  1025.5
Centerline Stations
    Sta.    Sta.
    9990   10000
Downstream Elevation =  1014.26
Centerline Stations
    Sta.    Sta.
    9990   10000

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
*************************************************************************
* Q Culv Group (cfs)      *  660.00  * Culv Full Len (ft)      *          *
* # Barrels               *       2  * Culv Vel US (ft/s)      *   13.07  *
* Q Barrel (cfs)          *  330.00  * Culv Vel DS (ft/s)      *   15.80  *
* E.G. US. (ft)           * 1036.01  * Culv Inv El Up (ft)     * 1025.50  *
* W.S. US. (ft)           * 1035.97  * Culv Inv El Dn (ft)     * 1014.26  *
* E.G. DS (ft)            * 1018.45  * Culv Frctn Ls (ft)      *   12.17  *
* W.S. DS (ft)            * 1017.80  * Culv Exit Loss (ft)     *    4.06  *
* Delta EG (ft)           *   17.56  * Culv Entr Loss (ft)     *    1.33  *
* Delta WS (ft)           *   18.17  * Q Weir (cfs)            *          *
* E.G. IC (ft)            * 1036.01  * Weir Sta Lft (ft)       *          *
* E.G. OC (ft)            * 1035.09  * Weir Sta Rgt (ft)       *          *
* Culvert Control         *   Inlet  * Weir Submerg            *          *
* Culv WS Inlet (ft)      * 1031.17  * Weir Max Depth (ft)     *          *
* Culv WS Outlet (ft)     * 1018.63  * Weir Avg Depth (ft)     *          *
* Culv Nml Depth (ft)     *    4.37  * Weir Flow Area (sq ft)  *          *
* Culv Crt Depth (ft)     *    4.95  * Min El Weir Flow (ft)   * 1041.07   *
*************************************************************************

CROSS SECTION


RIVER: 1S2WS2A (J46)
REACH: REACH 1            RS: 2.459

INPUT
Description: Downstream of 2-68" CMP's which cross Estrella Parkway.
Station Elevation Data    num=       5
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9962.13 1026.79    9967 1027.43    9985 1015.01   10014 1014.22   10037 1030.56

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9962.13     .05 9962.13    .043   10037     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.13   10037             1050    1076    1070            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1018.45  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.65  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          * 1017.80  * Reach Len. (ft)         * 1050.00  * 1076.00  * 1070.00  *
* Crit W.S. (ft)          * 1017.09  * Flow Area (sq ft)       *          *  107.01  *          *
* E.G. Slope (ft/ft)      *0.009407  * Area (sq ft)            *          *  107.01  *          *
* Q Total (cfs)           *  690.00  * Flow (cfs)              *          *  690.00  *          *
* Top Width (ft)          *   38.08  * Top Width (ft)          *          *   38.08  *          *
* Vel Total (ft/s)        *    6.45  * Avg. Vel. (ft/s)        *          *    6.45  *          *
* Max Chl Dpth (ft)       *    3.58  * Hydr. Depth (ft)        *          *    2.81  *          *
* Conv. Total (cfs)       *  7114.0  * Conv. (cfs)             *          *  7114.0  *          *
* Length Wtd. (ft)        * 1076.00  * Wetted Per. (ft)        *          *   40.10  *          *
* Min Ch El (ft)          * 1014.22  * Shear (lb/sq ft)        *          *    1.57  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   10.10  *          *
* Frctn Loss (ft)         *   12.81  * Cum Volume (acre-ft)    *    0.13  *   32.49  *    0.09  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    0.52  *   18.32  *    0.41  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS2A (J46)
REACH: REACH 1            RS: 2.287

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9603.63 1030.57 9636.46 1026.07 9651.75 1025.62 9693.47 1019.33 9702.09 1018.91
 9750.47 1016.29 9752.43  1016.2 9767.27 1015.28 9802.77 1013.19    9813 1012.76
 9851.07 1011.21 9877.85 1010.62 9903.45 1010.05 9932.24 1010.23 9951.96 1010.52
 9968.78 1009.98 9978.36 1009.68  9984.1  1006.4 9992.94 1001.19 9993.73 1001.15
   10000 1000.8710003.91 1000.7410047.88 1008.1810057.55 1009.7810067.46 1009.99
10110.73 1010.7210135.32 1010.7110163.91 1010.7410214.23 1011.2410217.09 1011.28
10218.72 1011.2910270.27 1011.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9603.63     .05 9978.36    .04310057.55     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.3610057.55            1525    1470    1380            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1005.62  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.89  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          * 1004.73  * Reach Len. (ft)         * 1525.00  * 1470.00  * 1380.00  *
* Crit W.S. (ft)          * 1004.43  * Flow Area (sq ft)       *          *   99.13  *          *
* E.G. Slope (ft/ft)      *0.015186  * Area (sq ft)            *          *   99.13  *          *
* Q Total (cfs)           *  750.00  * Flow (cfs)              *          *  750.00  *          *
* Top Width (ft)          *   40.55  * Top Width (ft)          *          *   40.55  *          *
* Vel Total (ft/s)        *    7.57  * Avg. Vel. (ft/s)        *          *    7.57  *          *
* Max Chl Dpth (ft)       *    3.99  * Hydr. Depth (ft)        *          *    2.44  *          *
* Conv. Total (cfs)       *  6086.0  * Conv. (cfs)             *          *  6086.0  *          *
* Length Wtd. (ft)        * 1470.00  * Wetted Per. (ft)        *          *   41.86  *          *
* Min Ch El (ft)          * 1000.74  * Shear (lb/sq ft)        *          *    2.25  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   16.99  *          *
* Frctn Loss (ft)         *   24.98  * Cum Volume (acre-ft)    *    0.13  *   29.94  *    0.09  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *    0.52  *   17.35  *    0.41  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
```

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 2.009

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880.6	1006.34	9887.37	1005.38	9890.52	1005.36	9893.7	1004.77	9894.68	1004.58
9896.3	1004.25	9899.63	1003.54	9911.91	1000.9	9967.14	988.96	9969.57	988.41
9979.13	982.82	9989.55	976.81	10000	977.191	10009.65	977.541	10014.08	977.65
10033.49	978.351	10093.35	98	310131.46	983.711	0144.06	984.231	0192.49	988.51
10194.77	988.661	0206.01	988.891	0245.48	989.471	0253.51	989.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9880.6	.05	9967.14	.04	310192.49	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.14	10192.49	1080	1181	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	980.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.043	
W.S. Elev (ft)	979.86	Reach Len. (ft)	1080.00	1181.00	1200.00
Crit W.S. (ft)	979.74	Flow Area (sq ft)		122.66	
E.G. Slope (ft/ft)	0.018867	Area (sq ft)		122.66	
Q Total (cfs)	850.00	Flow (cfs)		850.00	
Top Width (ft)	68.63	Top Width (ft)		68.63	
Vel Total (ft/s)	6.93	Avg. Vel. (ft/s)		6.93	
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)		1.79	
Conv. Total (cfs)	6188.3	Conv. (cfs)		6188.3	
Length Wtd. (ft)	1181.00	Wetted Per. (ft)		69.53	
Min Ch El (ft)	976.81	Shear (lb/sq ft)		2.08	
Alpha	1.00	Stream Power (lb/ft s)		14.40	
Frctn Loss (ft)	15.39	Cum Volume (acre-ft)	0.13	26.20	0.09
C & E Loss (ft)	0.11	Cum SA (acres)	0.52	15.50	0.41

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 1.785

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9806.81	993.39	9809.27	992.75	9816.76	990.1	9827.83	987.47	9878.86	976.13
9895.46	972.25	9922.94	966.99	9980.17	962.44	9988.43	962.02	10000	962
10000.41	962	10014.72	961.96	10029.38	962.65	10065.3	965.47	10084.31	967.28
10124.49	970.27	10145.91	970.53						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9806.81	.05	9895.46	.04	310124.49	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9895.46	10124.49	1420	1467	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	965.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.40	Wt. n-Val.		0.043	

* W.S. Elev (ft)	*	964.71	* Reach Len. (ft)	*	1420.00	*	1467.00	*	1320.00 *
* Crit W.S. (ft)	*	964.18	* Flow Area (sq ft)	*		*	186.35	*	*
* E.G. Slope (ft/ft)	*	0.009809	* Area (sq ft)	*		*	186.35	*	*
* Q Total (cfs)	*	940.00	* Flow (cfs)	*		*	940.00	*	*
* Top Width (ft)	*	103.94	* Top Width (ft)	*		*	103.94	*	*
* Vel Total (ft/s)	*	5.04	* Avg. Vel. (ft/s)	*		*	5.04	*	*
* Max Chl Dpth (ft)	*	2.75	* Hydr. Depth (ft)	*		*	1.79	*	*
* Conv. Total (cfs)	*	9491.0	* Conv. (cfs)	*		*	9491.0	*	*
* Length Wtd. (ft)	*	1467.00	* Wetted Per. (ft)	*		*	104.14	*	*
* Min Ch El (ft)	*	961.96	* Shear (lb/sq ft)	*		*	1.10	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	5.53	*	*
* Frctn Loss (ft)	*	21.51	* Cum Volume (acre-ft)	*	0.13	*	22.01	*	0.09 *
* C & E Loss (ft)	*	0.05	* Cum SA (acres)	*	0.52	*	13.16	*	0.41 *

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 1.507

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9596	949.63	9642.29	949.84	9646.95	949.8	9672.98	947.86	9715.49	944.7
9722.23	945.44	9732.04	946.46	9737.74	947.06	9768.14	949.17	9819.31	949.7
9828.74	949.76	9849.2	949.73	9889.33	949.77	9907.82	947.91	9932.82	943.53
9952.15	942.23	9959.76	941.78	9974.8	940.93	9989.33	940.05	10000	939.45
10002.5	939.31	10006.59	939.15	10013.92	940.77	10025.64	943.53	10054.94	947.89
10102.31	947.38	10112.25	947.42	10115.05	947.38	10166.22	949.34	10170.41	949.49
10173.04	949.61	10184.21	950.13	10188.83	950.37	10193.06	950.53	10204.54	950.93
10209.35	951	10213.73	951.01	10222.26	951.39	10226.45	951.76	10261.98	953.81
10284.19	954.23	10324.62	956.51	10341.51	957.28	10363.03	958.06	10398.82	959.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9596	.05	9889.33	.043	10054.94	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.33	10054.94	1370	1623	1530	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	943.54	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.92	* Wt. n-Val.	*		*	0.043	*	*
* W.S. Elev (ft)	*	942.62	* Reach Len. (ft)	*	1370.00	*	1623.00	*	1530.00 *
* Crit W.S. (ft)	*	942.62	* Flow Area (sq ft)	*		*	135.17	*	*
* E.G. Slope (ft/ft)	*	0.022976	* Area (sq ft)	*		*	135.17	*	*
* Q Total (cfs)	*	1040.00	* Flow (cfs)	*		*	1040.00	*	*
* Top Width (ft)	*	75.43	* Top Width (ft)	*		*	75.43	*	*
* Vel Total (ft/s)	*	7.69	* Avg. Vel. (ft/s)	*		*	7.69	*	*
* Max Chl Dpth (ft)	*	3.47	* Hydr. Depth (ft)	*		*	1.79	*	*
* Conv. Total (cfs)	*	6861.2	* Conv. (cfs)	*		*	6861.2	*	*
* Length Wtd. (ft)	*	1623.00	* Wetted Per. (ft)	*		*	75.93	*	*
* Min Ch El (ft)	*	939.15	* Shear (lb/sq ft)	*		*	2.55	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	19.65	*	*
* Frctn Loss (ft)	*	17.78	* Cum Volume (acre-ft)	*	0.13	*	16.60	*	0.09 *
* C & E Loss (ft)	*	0.16	* Cum SA (acres)	*	0.52	*	10.14	*	0.41 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical

depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 1.200

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9730.91	931.21	9737.43	931.4	9785.34	931.43	9792.37	931.36	9798.25	931.25
9847.32	930.16	9899.15	929.93	9902.26	929.92	9905.98	929.51	9941.17	923.2
9969.47	921.09	9985.17	918.7	9988.25	918.25	9994.75	918.48	10000	918.64
10012.15	919.09	10020.32	920.12	10080.6	925.12	10093.48	925.49	10146.61	928.24
10170.06	929.3	10212.62	930.18	10246.64	929.38	10278.63	926.92	10307.02	924.46
10308.66	924.44	10310.38	924.42	10314.02	924.33	10318.48	924.21	10324.31	924.13
10329.02	924.14	10335.1	924.19	10356.43	924.05	10359.52	923.99	10383.05	927.53
10391.67	928.83	10396.29	929.52	10398.66	929.87	10405.63	930.76	10410.65	931.05
10476.39	930.29	10476.66	930.29						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9730.91	.05	9899.15	.04	10212.62	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9899.15	10212.62	1785	1748	1700	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	923.06	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.37	Wt. n-Val.		0.043		
W.S. Elev (ft)	922.69	Reach Len. (ft)	1785.00	1748.00	1700.00	
Crit W.S. (ft)	921.73	Flow Area (sq ft)		235.64		
E.G. Slope (ft/ft)	0.006688	Area (sq ft)		235.64		
Q Total (cfs)	1150.00	Flow (cfs)		1150.00		
Top Width (ft)	103.37	Top Width (ft)		103.37		
Vel Total (ft/s)	4.88	Avg. Vel. (ft/s)		4.88		
Max Chl Dpth (ft)	4.44	Hydr. Depth (ft)		2.28		
Conv. Total (cfs)	14062.4	Conv. (cfs)		14062.4		
Length Wtd. (ft)	1748.02	Wetted Per. (ft)		103.83		
Min Ch El (ft)	918.25	Shear (lb/sq ft)		0.95		
Alpha	1.00	Stream Power (lb/ft s)		4.62		
Frctn Loss (ft)	19.51	Cum Volume (acre-ft)	0.13	9.69	0.09	
C & E Loss (ft)	0.00	Cum SA (acres)	0.52	6.81	0.41	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2A (J46)
REACH: REACH 1 RS: 0.869

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9606.24	906.97	9617.88	906.76	9635.66	906.59	9660.24	905.98	9685.08	905.29
9687.04	905.2	9689.28	905.2	9711.31	905.71	9744.1	905.44	9789.47	905.84
9796.28	905.47	9797.13	905.47	9798.01	905.47	9798.85	905.49	9840.97	902.7
9845.52	902.82	9850.2	902.91	9854.49	902.97	9859.63	903.02	9866.05	902.98
9871.11	902.79	9877.78	902.48	9905.27	901.7	9911.09	901.7	9913.42	901.85
9951.36	901.56	9954.45	901.48	9963.38	901.44	9966.78	901.49	9968.1	901.48
9971.41	901.51	9974.38	901.53	9986.52	901.67	9993.19	901.79	10000	901.82
10003.16	901.81	10006.04	901.82	10023.9	902.21	10026.46	902.26	10028.79	902.35
10030.94	902.41	10054.53	902.58	10054.92	902.59	10055.27	902.59	10057.64	902.6
10084.58	902.77	10095.77	902.81	10103.02	902.83	10156.6	904.11	10165.74	904.24

```
10172.57   904.310216.26  904.7510216.71  904.7610219.83   904.810260.85   905.2
10266.78  905.5210304.99   905.7 10317.3   905.710349.12  906.9410367.82  907.85
10393.26   908.310418.34  908.22 10437.4  908.5710468.86  908.64

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9606.24      .05 9859.63     .04310095.77      .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9859.6310095.77               4500    4586    4500              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  903.56  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.40  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          *  903.16  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          *  903.09  * Flow Area (sq ft)       *    6.54  *  247.23  *    4.72  *
* E.G. Slope (ft/ft)      *0.020509  * Area (sq ft)            *    6.54  *  247.23  *    4.72  *
* Q Total (cfs)           * 1280.00  * Flow (cfs)              *   11.21  * 1261.38  *    7.41  *
* Top Width (ft)          *  282.81  * Top Width (ft)          *   25.58  *  236.14  *   21.09  *
* Vel Total (ft/s)        *    4.95  * Avg. Vel. (ft/s)        *    1.71  *    5.10  *    1.57  *
* Max Chl Dpth (ft)       *    1.72  * Hydr. Depth (ft)        *    0.26  *    1.05  *    0.22  *
* Conv. Total (cfs)       *  8938.0  * Conv. (cfs)             *    78.3  *  8807.9  *    51.7  *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *   25.59  *  236.18  *   21.10  *
* Min Ch El (ft)          *  901.44  * Shear (lb/sq ft)        *    0.33  *    1.34  *    0.29  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)   *    0.56  *    6.84  *    0.45  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *          *          *          *
* C & E Loss (ft)         *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************

*****************************************************************************

SUMMARY OF MANNING'S N VALUES

River:1S2WS2A (J46)
*****************************************************************
*     Reach       *   River Sta.    *    n1     *    n2     *    n3     *
*****************************************************************
*REACH 1          *    3.326        *      .05*      .043*       .05*
*REACH 1          *    3.080        *      .05*      .043*       .05*
*REACH 1          *    2.849        *      .05*      .043*       .05*
*REACH 1          *    2.541        *      .05*      .043*       .05*
*REACH 1          *    2.532        *Culvert  *         *          *
*REACH 1          *    2.459        *      .05*      .043*       .05*
*REACH 1          *    2.287        *      .05*      .043*       .05*
*REACH 1          *    2.009        *      .05*      .043*       .05*
*REACH 1          *    1.785        *      .05*      .043*       .05*
*REACH 1          *    1.507        *      .05*      .043*       .05*
*REACH 1          *    1.200        *      .05*      .043*       .05*
*REACH 1          *    0.869        *      .05*      .043*       .05*
*****************************************************************

*****************************************************************************

SUMMARY OF REACH LENGTHS

River: 1S2WS2A (J46)
*****************************************************************
*     Reach       *   River Sta.    *  Left    * Channel *  Right   *
*****************************************************************
*REACH 1          *    3.326        *     1125*     1298*      1360*
*REACH 1          *    3.080        *     1170*     1217*       960*
*REACH 1          *    2.849        *     1430*     1653*      1520*
*REACH 1          *    2.541        *      430*      433*       430*
*REACH 1          *    2.532        *Culvert  *         *          *
*REACH 1          *    2.459        *     1050*     1076*      1070*
*REACH 1          *    2.287        *     1525*     1470*      1380*
*REACH 1          *    2.009        *     1080*     1181*      1200*
*REACH 1          *    1.785        *     1420*     1467*      1320*
*REACH 1          *    1.507        *     1370*     1623*      1530*
*REACH 1          *    1.200        *     1785*     1748*      1700*
*REACH 1          *    0.869        *     4500*     4586*      4500*
*****************************************************************

*****************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS2A (J46)
```

```
*****************************************************
*     Reach       *   River Sta.    * Contr.   * Expan.   *
*****************************************************
*REACH 1          *    3.326    *       .1*       .3*
*REACH 1          *    3.080    *       .1*       .3*
*REACH 1          *    2.849    *       .1*       .3*
*REACH 1          *    2.541    *       .1*       .3*
*REACH 1          *    2.532    *Culvert  *         *
*REACH 1          *    2.459    *       .1*       .3*
*REACH 1          *    2.287    *       .1*       .3*
*REACH 1          *    2.009    *       .1*       .3*
*REACH 1          *    1.785    *       .1*       .3*
*REACH 1          *    1.507    *       .1*       .3*
*REACH 1          *    1.200    *       .1*       .3*
*REACH 1          *    0.869    *       .1*       .3*
*****************************************************
```

MODEL: 1S2WS2B (J48)

REACH: 1S2WS2B (J48)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS2B (J48)
Project File : 1S2WS2B_J48.prj
Run Date and Time: 12/13/2004 3:12:26 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS2B (J48)
Reaches: 1S2WS2B (J48)

****

PLAN DATA

Plan Title: 1S2WS2B (J48)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2B (J48)\1S2WS2B_J48.p01

Geometry Title: 1S2WS2B (J48)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2B (J48)\1S2WS2B_J48.g01

Flow Title : 1S2WS2B (J48)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2B (J48)\1S2WS2B_J48.f01

Plan Summary Information:

Number of:	Cross Sections =	12	Mulitple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 1S2WS2 (J48) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.397	PF 2	1	9990	10005
3.142	PF 2	1	9975	10010
2.911	PF 2	1	9985	10015
2.644	PF 2	1	9985	10015
2.391	PF 2	1	9975	10020
2.380	PF 2	1		
2.346	PF 2	1	9981	10020
1.990	PF 2	1	9960	10020
1.726	PF 2	1	9975	10050
1.390	PF 2	1	9960	10070
1.136	PF 2	1	9980	10060
0.883	PF 2	1	9900	10035
0.677	PF 2	1	9950	10150

****

FLOW DATA

Flow Title: 1S2WS2B (J48)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2B (J48)\1S2WS2B_J48.f01

Flow Data (cfs)

River	Reach	RS	PF 1
1S2WS2 (J48)	REACH 1	3.397	550
1S2WS2 (J48)	REACH 1	3.142	650
1S2WS2 (J48)	REACH 1	2.911	730
1S2WS2 (J48)	REACH 1	2.644	760
1S2WS2 (J48)	REACH 1	2.391	830
1S2WS2 (J48)	REACH 1	2.346	860
1S2WS2 (J48)	REACH 1	1.990	1120
1S2WS2 (J48)	REACH 1	1.726	1310
1S2WS2 (J48)	REACH 1	1.390	1560
1S2WS2 (J48)	REACH 1	1.136	1740
1S2WS2 (J48)	REACH 1	0.883	1930
1S2WS2 (J48)	REACH 1	0.677	2080

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1S2WS2 (J48)	REACH 1	PF 1	Normal S = 0.0157	Normal S = 0.0157

****

GEOMETRY DATA

Geometry Title: 1S2WS2B (J48)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2B (J48)\1S2WS2B_J48.g01

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 3.397

INPUT
Description: Limit of Sudy.

Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9670.61	1149.68	9672.31	1149.36	9672.5	1149.35	9672.69	1149.34	9672.78	1149.32
9672.88	1149.31	9673.05	1149.27	9673.13	1149.25	9673.23	1149.23	9673.54	1149.16
9674.01	1149.08	9674.81	1148.95	9675.16	1148.9	9675.6	1148.83	9676.17	1148.74
9678.34	1148.41	9684.65	1147.44	9727.61	1140.5	9732.6	1140.07	9732.87	1140.03
9734.39	1139.75	9737.22	1139.55	9742.06	1138.84	9746.61	1138.27	9751.63	1137.98
9758.17	1137.59	9764.2	1137.36	9769.61	1137.13	9773.44	1136.88	9776.76	1136.66
9795.61	1136.33	9800.26	1136.17	9824.47	1135.65	9853.12	1135.4	9875.06	1135.2
9905.95	1134.53	9943.87	1132.85	9944.66	1132.86	9949.41	1132.42	9950.3	1132.44
9956.28	1132.15	9958.15	1131.47	9962.63	1129.97	9969.7	1127.22	9983.45	1122.18
9995.37	1117.23	10000	1118.92	10006.5	1121.29	10014	1123.95	10019.6	1125.66
10019.68	1125.69	10021.98	1126.25	10028.08	1127.11	10028.85	1127.15	10029.58	1127.1
10030.48	1127.01	10031.52	1127.06	10074.02	1129.71	10074.79	1130.02	10075.64	1130.43
10076.55	1130.75	10077.56	1130.82	10078.57	1130.75	10079.51	1130.78	10080.23	1130.95
10080.9	1131.18	10113.97	1134.96	10115.16	1135.22	10116.49	1135.31	10122.18	1135.76
10123.71	1135.97	10125.6	1136.02	10127.59	1135.99	10129.72	1136.05	10131.35	1136
10133.15	1135.99	10134.94	1136.72	10135.3	1137.06	10135.66	1137.44	10136.03	1137.8
10139.18	1138.96	10142.84	1138.57	10160.43	1140.11	10163.61	1139.82	10165.33	1140.24
10167.13	1140.75	10168.98	1141.21	10171.48	1141.55	10174.06	1141.76	10176.65	1141.91
10180.68	1141.99	10184.93	1141.94	10189.34	1141.87	10194.01	1141.73	10198.69	1141.6
10207.6	1142.16	10212.26	1142.42	10215.01	1142.84	10217.77	1143.41	10220.51	1144.11
10222.94	1144.94	10225.26	1145.86	10227.52	1146.62	10230.82	1147.34	10233.97	1147.78
10236.65	1148.11	10248.49	1149.05						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9670.61	.05	9943.87	.043	10113.97	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9943.87	10113.97	1320	1342	1150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1123.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.23	Wt. n-Val.		0.043	
W.S. Elev (ft)	1122.13	Reach Len. (ft)	1320.00	1342.00	1150.00
Crit W.S. (ft)	1122.13	Flow Area (sq ft)		61.89	
E.G. Slope (ft/ft)	0.022039	Area (sq ft)		61.89	
Q Total (cfs)	550.00	Flow (cfs)		550.00	
Top Width (ft)	25.31	Top Width (ft)		25.31	
Vel Total (ft/s)	8.89	Avg. Vel. (ft/s)		8.89	
Max Chl Dpth (ft)	4.90	Hydr. Depth (ft)		2.45	
Conv. Total (cfs)	3704.8	Conv. (cfs)		3704.8	
Length Wtd. (ft)	1342.00	Wetted Per. (ft)		27.15	
Min Ch El (ft)	1117.23	Shear (lb/sq ft)		3.14	
Alpha	1.00	Stream Power (lb/ft s)		27.87	
Frctn Loss (ft)	28.38	Cum Volume (acre-ft)	0.28	70.96	0.23
C & E Loss (ft)	0.13	Cum SA (acres)	0.31	40.47	0.27

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 3.142

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9786.44	1118.54	9813.94	1112.26	9819.41	1110.84	9825.03	1108.87	9825.94	1108.69
9827.03	1108.5	9828.35	1108.25	9830.32	1107.81	9847.81	1103.5	9861.08	1100.14
9887.17	1093.57	9894.33	1094.15	9905.06	1094.93	9911	1095.26	9912.89	1095.32
9914.48	1095.35	9915.8	1095.41	9917.68	1095.61	9934.78	1094.6	9936.43	1094.28
9938.5	1093.87	9940.6	1093.43	9943.29	1092.85	9946.89	1092.11	9948.73	1091.74

```
 9950.85 1091.33  9953.3 1090.84  9977.8 1086.02 9979.38 1086.14 9980.96 1086.26
   10000 1087.8110006.68 1088.3810008.93 1088.5810010.12 1088.69 10023.8 1090.78
10033.46 1092.1710038.49 1092.8110042.45 1093.2810045.69 1093.6510049.58 1094.04
10052.79 1094.3510073.81 1098.2110109.46 1099.3910114.94 1098.4810116.16 1098.12
10118.72 1097.4210127.76 1095.0210137.96 1092.3410140.45 1092.8710147.34 1094.21
10152.47 1095.2710156.54 1096.2110159.79 1097.0110187.17 1102.8210219.21 1104.74
10237.65 1106.2210274.09 1109.2910304.17 1112.5310328.96 1115.2810358.99 1119.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9786.44     .05 9847.81    .04310187.17     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9847.8110187.17             1220    1222    1205            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1090.07  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.78  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1089.29  * Reach Len. (ft)        * 1220.00  * 1222.00  * 1205.00  *
* Crit W.S. (ft)          * 1089.22  * Flow Area (sq ft)      *          *   91.68  *          *
* E.G. Slope (ft/ft)      *0.020429  * Area (sq ft)           *          *   91.68  *          *
* Q Total (cfs)           *  650.00  * Flow (cfs)             *          *  650.00  *          *
* Top Width (ft)          *   52.84  * Top Width (ft)         *          *   52.84  *          *
* Vel Total (ft/s)        *    7.09  * Avg. Vel. (ft/s)       *          *    7.09  *          *
* Max Chl Dpth (ft)       *    3.27  * Hydr. Depth (ft)       *          *    1.74  *          *
* Conv. Total (cfs)       *  4547.6  * Conv. (cfs)            *          *  4547.6  *          *
* Length Wtd. (ft)        * 1222.00  * Wetted Per. (ft)       *          *   53.31  *          *
* Min Ch El (ft)          * 1086.02  * Shear (lb/sq ft)       *          *    2.19  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *   15.55  *          *
* Frctn Loss (ft)         *   27.44  * Cum Volume (acre-ft)   *    0.28  *   68.59  *    0.23  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)         *    0.31  *   39.26  *    0.27  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS2 (J48)
REACH: REACH 1            RS: 2.911

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9719.34 1065.98 9730.61  1066.1 9737.01 1066.18 9766.49  1066.2 9787.24 1066.49
 9823.89 1067.44 9848.38 1067.55 9906.55 1068.31 9909.52 1068.29 9910.77 1068.27
 9964.43  1061.4 9968.77 1061.12 9974.42 1060.78 9981.06 1060.43 9990.22 1059.97
 9990.25 1059.97   10000 1059.1810002.17 1059.09 10008.2 1059.1110009.56 1059.41
10015.26 1060.4210019.71 1060.8210023.42 1061.0110057.71 1063.94 10081.5 1065.49
10134.75 1067.3910135.12 1067.4110135.35  1067.410188.73 1066.0910222.84 1066.49
10242.35 1066.4910273.24 1068.5210289.62 1069.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9719.34     .05 9909.52    .04310134.75     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9909.5210134.75             1390    1409    1275            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1062.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.74  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1061.87  * Reach Len. (ft)        * 1390.00  * 1409.00  * 1275.00  *
* Crit W.S. (ft)          * 1061.87  * Flow Area (sq ft)      *          *  105.51  *          *
* E.G. Slope (ft/ft)      *0.024522  * Area (sq ft)           *          *  105.51  *          *
* Q Total (cfs)           *  730.00  * Flow (cfs)             *          *  730.00  *          *
* Top Width (ft)          *   72.70  * Top Width (ft)         *          *   72.70  *          *
* Vel Total (ft/s)        *    6.92  * Avg. Vel. (ft/s)       *          *    6.92  *          *
* Max Chl Dpth (ft)       *    2.78  * Hydr. Depth (ft)       *          *    1.45  *          *
* Conv. Total (cfs)       *  4661.7  * Conv. (cfs)            *          *  4661.7  *          *
* Length Wtd. (ft)        * 1409.00  * Wetted Per. (ft)       *          *   72.99  *          *
```

```
* Min Ch El (ft)          * 1059.09  * Shear (lb/sq ft)        *          *    2.21  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *   15.31  *          *
* Frctn Loss (ft)         *   33.44  * Cum Volume (acre-ft)    *    0.28  *   65.82  *    0.23  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.31  *   37.50  *    0.27  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS2 (J48)
REACH: REACH 1            RS: 2.644

INPUT
Description:
Station Elevation Data     num=      43
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************************
 9697.75  1030.8 9723.95  1031.6 9762.85 1031.44  9782.7 1032.97 9813.45 1033.78
 9827.62 1034.08 9836.47 1033.75  9863.9 1033.55 9895.43 1033.64 9900.19 1033.63
 9907.79  1033.6 9951.28 1025.34 9956.27 1023.63 9975.52 1017.94 9983.04 1015.83
   10000 1015.3510001.12 1015.3310015.19 1015.1910046.37 1019.1510069.61 1022.11
10108.94 1030.5210115.64 1031.9410116.79 1032.1910117.28 1032.2910117.53 1032.34
10118.64 1032.5510119.29  1032.410119.59 1032.3810169.09 1030.5610173.09 1030.25
10177.83 1029.8210183.77 1029.1110191.61 1028.0810202.57  1026.610203.88 1026.41
10214.38 1028.2610222.77 1029.85 10229.1 1031.01 10233.9 1031.7810237.97 1032.42
10263.55 1038.52 10294.6 1038.6110308.56 1039.27

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9697.75     .05 9907.79    .04310116.79     .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9907.7910116.79              1260    1336    1350              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1018.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.88  * Wt. n-Val.              *          *    0.043  *          *
* W.S. Elev (ft)          * 1017.65  * Reach Len. (ft)         * 1260.00  * 1336.00  * 1350.00  *
* Crit W.S. (ft)          * 1017.65  * Flow Area (sq ft)       *          *   100.77  *          *
* E.G. Slope (ft/ft)      *0.023013  * Area (sq ft)            *          *   100.77  *          *
* Q Total (cfs)           *  760.00  * Flow (cfs)              *          *   760.00  *          *
* Top Width (ft)          *   57.99  * Top Width (ft)          *          *    57.99  *          *
* Vel Total (ft/s)        *    7.54  * Avg. Vel. (ft/s)        *          *     7.54  *          *
* Max Chl Dpth (ft)       *    2.46  * Hydr. Depth (ft)        *          *     1.74  *          *
* Conv. Total (cfs)       *  5009.8  * Conv. (cfs)             *          *   5009.8  *          *
* Length Wtd. (ft)        * 1335.60  * Wetted Per. (ft)        *          *    58.40  *          *
* Min Ch El (ft)          * 1015.19  * Shear (lb/sq ft)        *          *     2.48  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    18.70  *          *
* Frctn Loss (ft)         *    1.68  * Cum Volume (acre-ft)    *    0.28  *   62.49  *    0.23  *
* C & E Loss (ft)         *    0.08  * Cum SA (acres)          *    0.31  *   35.39  *    0.27  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION
```

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 2.391

INPUT
Description: Upstream of 2-10' x 6' Box culvert which cross Estrella Pkwy.
Points added by hand off survey data.
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9950	1000	9990	995.85	9994	992.47	10012	992.11	10016	995.82
10046	1000								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9950	.05	9990	.013	10016	.05

Bank Sta: Left 9990 Right 10016 Lengths: Left 230 Channel 239 Right 230 Coeff Contr. .1 Expan. .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	998.33	Element			
Vel Head (ft)	0.63	Wt. n-Val.	0.050	0.013	0.050
W.S. Elev (ft)	997.71	Reach Len. (ft)	230.00	239.00	230.00
Crit W.S. (ft)	995.99	Flow Area (sq ft)	16.60	126.64	12.76
E.G. Slope (ft/ft)	0.000435	Area (sq ft)	16.60	126.64	12.76
Q Total (cfs)	830.00	Flow (cfs)	9.76	812.68	7.56
Top Width (ft)	57.43	Top Width (ft)	17.89	26.00	13.54
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	0.59	6.42	0.59
Max Chl Dpth (ft)	5.60	Hydr. Depth (ft)	0.93	4.87	0.94
Conv. Total (cfs)	39774.5	Conv. (cfs)	467.8	38944.2	362.5
Length Wtd. (ft)	239.00	Wetted Per. (ft)	17.99	28.70	13.67
Min Ch El (ft)	992.11	Shear (lb/sq ft)	0.03	0.12	0.03
Alpha	1.42	Stream Power (lb/ft s)	0.01	0.77	0.02
Frctn Loss (ft)		Cum Volume (acre-ft)	0.04	59.00	0.03
C & E Loss (ft)		Cum SA (acres)	0.05	34.10	0.06

CULVERT

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 2.380

INPUT
Description: 2 - 10' x 6' Box Culverts
Structure 1
Crosses Estrella Parkway
Distance from Upstream XS = 58
Deck/Roadway Width = 78
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9960	1000.01		10000	1000.09		10069	1000.03	

Upstream Bridge Cross Section Data
Station Elevation Data num= 6

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9950	1000	9990	995.85	9994	992.47	10012	992.11	10016	995.82
10046	1000								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9950	.05	9990	.013	10016	.05

Bank Sta: Left 9990 Right 10016 Coeff Contr. .1 Expan. .3

Downstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9929	998.64		10000	998.77		10043	998.92	

```
Downstream Bridge Cross Section Data
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************
    9976  992.93    9985  987.92   10016   987.4   10034  995.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9976     .05    9976    .043   10034     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9976   10034             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box       6      10
FHWA Chart # 59- Rectangular concrete
FHWA Scale # 1 - Slope tapered; Less favorable edges
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 36     115     .011     .011        0                  .5                 1
Number of Barrels =  2
Upstream   Elevation =  991.74
Centerline Stations
    Sta.    Sta.
    9997   10008
Downstream Elevation =  984.92
Centerline Stations
    Sta.    Sta.
    9997   10008

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
*************************************************************************
* Q Culv Group (cfs)     *  830.00  * Culv Full Len (ft)     *          *
* # Barrels              *       2  * Culv Vel US (ft/s)     *   11.01  *
* Q Barrel (cfs)         *  415.00  * Culv Vel DS (ft/s)     *   24.30  *
* E.G. US. (ft)          *  998.33  * Culv Inv El Up (ft)    *  991.74  *
* W.S. US. (ft)          *  997.71  * Culv Inv El Dn (ft)    *  984.92  *
* E.G. DS (ft)           *  991.55  * Culv Frctn Ls (ft)     *    1.59  *
* W.S. DS (ft)           *  990.36  * Culv Exit Loss (ft)    *    4.25  *
* Delta EG (ft)          *    6.78  * Culv Entr Loss (ft)    *    0.94  *
* Delta WS (ft)          *    7.35  * Q Weir (cfs)           *          *
* E.G. IC (ft)           *  997.74  * Weir Sta Lft (ft)      *          *
* E.G. OC (ft)           *  998.33  * Weir Sta Rgt (ft)      *          *
* Culvert Control        *  Outlet  * Weir Submerg           *          *
* Culv WS Inlet (ft)     *  995.51  * Weir Max Depth (ft)    *          *
* Culv WS Outlet (ft)    *  986.63  * Weir Avg Depth (ft)    *          *
* Culv Nml Depth (ft)    *    1.25  * Weir Flow Area (sq ft) *          *
* Culv Crt Depth (ft)    *    3.77  * Min El Weir Flow (ft)  *  998.97  *
*************************************************************************

CROSS SECTION


RIVER: 1S2WS2 (J48)
REACH: REACH 1            RS: 2.346

INPUT
Description: Downstream of 2-10' x 6' Box culvert which cross Estrella Parkway.
Station Elevation Data    num=       4
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************
    9976  992.93    9985  987.92   10016   987.4   10034  995.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9976     .05    9976    .043   10034     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9976   10034             1720    1878    1680          .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  991.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.19  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          *  990.36  * Reach Len. (ft)         * 1720.00  * 1878.00  * 1680.00  *
* Crit W.S. (ft)          *  990.36  * Flow Area (sq ft)       *          *   98.29  *          *
* E.G. Slope (ft/ft)      *0.021250  * Area (sq ft)            *          *   98.29  *          *
* Q Total (cfs)           *  860.00  * Flow (cfs)              *          *  860.00  *          *
* Top Width (ft)          *   41.63  * Top Width (ft)          *          *   41.63  *          *
* Vel Total (ft/s)        *    8.75  * Avg. Vel. (ft/s)        *          *    8.75  *          *
* Max Chl Dpth (ft)       *    2.96  * Hydr. Depth (ft)        *          *    2.36  *          *
* Conv. Total (cfs)       *  5899.6  * Conv. (cfs)             *          *  5899.6  *          *
* Length Wtd. (ft)        * 1878.00  * Wetted Per. (ft)        *          *   42.93  *          *
* Min Ch El (ft)          *  987.40  * Shear (lb/sq ft)        *          *    3.04  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *   26.57  *          *
* Frctn Loss (ft)         *   22.07  * Cum Volume (acre-ft)     *          *   58.38  *    0.00  *
* C & E Loss (ft)         *    0.20  * Cum SA (acres)           *          *   33.91  *    0.02  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS2 (J48)
REACH: REACH 1            RS: 1.990

INPUT
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9461.42  983.38 9469.98   983.4 9505.54  983.18 9541.53  983.01 9561.37  982.37
 9580.98  981.57 9617.21  980.45 9653.88  978.19 9668.93  976.03 9670.05  975.87
 9671.43  975.69 9673.26  975.48 9675.43  975.27 9678.11  974.97 9682.07  974.45
  9688.3  973.58 9700.19  971.79 9727.24  967.56 9728.27  967.69 9778.57  978.39
 9784.71  978.09 9802.97  977.63 9840.54  976.71 9878.57  977.08  9893.1   976.1
 9894.37  975.91 9895.88  975.71  9897.3  975.54 9898.94  975.36 9900.91  975.13
 9959.05  963.36 9960.49  963.36 9967.16  963.22 9967.22  963.22  9967.3  963.22
 9967.32  963.22 9967.35  963.22 9969.42  963.25   10000  963.8310011.11  964.05
10016.68   965.510067.22  977.4110087.52  977.7110125.97  979.3710182.73  983.92
10184.73  984.0910187.95  984.57

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9461.42     .05 9878.57    .04310067.22     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9878.5710067.22             1370    1393    1400          .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  967.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.51  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          *  966.59  * Reach Len. (ft)         * 1370.00  * 1393.00  * 1400.00  *
* Crit W.S. (ft)          *  965.85  * Flow Area (sq ft)       *          *  195.42  *          *
* E.G. Slope (ft/ft)      *0.008204  * Area (sq ft)            *          *  195.42  *          *
* Q Total (cfs)           * 1120.00  * Flow (cfs)              *          * 1120.00  *          *
* Top Width (ft)          *   78.22  * Top Width (ft)          *          *   78.22  *          *
* Vel Total (ft/s)        *    5.73  * Avg. Vel. (ft/s)        *          *    5.73  *          *
* Max Chl Dpth (ft)       *    3.37  * Hydr. Depth (ft)        *          *    2.50  *          *
* Conv. Total (cfs)       * 12365.4  * Conv. (cfs)             *          * 12365.4  *          *
```

```
* Length Wtd. (ft)        * 1393.00  * Wetted Per. (ft)        *          *   78.86  *          *
* Min Ch El (ft)          *  963.22  * Shear (lb/sq ft)        *          *    1.27  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    7.27  *          *
* Frctn Loss (ft)         *   13.73  * Cum Volume (acre-ft)     *          *   52.05  *    0.00  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *          *   31.33  *    0.02  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 1.726

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9369.36	974.34	9415.18	973.22	9420.69	973.23	9438.86	972.3	9472.02	970.78
9482.07	971.23	9523.36	972.39	9548.96	972.36	9574.69	972.45	9615.85	972.17
9626.03	972.16	9659.6	971.59	9677.36	971.32	9682.74	971.18	9728.7	971.31
9749.63	970.41	9780.03	969.17	9816.52	966.91	9831.36	965.88	9880.34	960.95
9882.7	960.72	9883.41	960.71	9934.03	959.92	9962.34	952.59	9976.48	949.33
10000	949.97	10013.57	950.34	10017.36	950.45	10018.26	950.51	10021.59	950.71
10025.23	950.92	10028.52	951.06	10032.75	951.09	10035.68	951.23	10040.94	951.17
10051.42	952.07	10057.94	952.07	10064.56	952.08	10071.06	952.07	10077.5	952.13
10084.3	952.25	10091.42	952.45	10098.19	952.84	10113.28	955.56	10115.94	955.89
10118.6	956.26	10121.18	956.68	10124.15	957.28	10126.65	957.85	10128.62	958.32
10132.04	959.24	10138.46	960.53	10139.16	960.61	10141.75	960.76	10143.11	960.81
10144.5	960.87	10181.7	962.76	10183.49	962.85	10185.31	962.95	10187.13	963.05
10189.23	963.14	10227.01	968.26	10243.52	968.71	10290.78	971.56	10295.17	971.75
10296.71	971.83	10346.82	973.34	10366.41	973.61	10398.47	974.59	10436.1	975.23
10450.12	975.12	10459.22	974.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9369.36	.05	9934.03	.04	10138.46	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9934.03	10138.46	1630	1777	1585	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          *  953.36  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.46  * Wt. n-Val.              *           *   0.043   *          *
* W.S. Elev (ft)          *  952.90  * Reach Len. (ft)         * 1630.00   * 1777.00   * 1585.00   *
* Crit W.S. (ft)          *  952.50  * Flow Area (sq ft)       *           *  241.37   *          *
* E.G. Slope (ft/ft)      *0.011692  * Area (sq ft)            *           *  241.37   *          *
* Q Total (cfs)           * 1310.00  * Flow (cfs)              *           * 1310.00   *          *
* Top Width (ft)          *  137.37  * Top Width (ft)          *           *  137.37   *          *
* Vel Total (ft/s)        *    5.43  * Avg. Vel. (ft/s)        *           *    5.43   *          *
* Max Chl Dpth (ft)       *    3.57  * Hydr. Depth (ft)        *           *    1.76   *          *
* Conv. Total (cfs)       * 12115.4  * Conv. (cfs)             *           * 12115.4   *          *
* Length Wtd. (ft)        * 1777.00  * Wetted Per. (ft)        *           *  137.87   *          *
* Min Ch El (ft)          *  949.33  * Shear (lb/sq ft)        *           *    1.28   *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *           *    6.94   *          *
* Frctn Loss (ft)         *   13.73  * Cum Volume (acre-ft)     *           *   45.07   *    0.00  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)           *           *   27.88   *    0.02  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 1.390

INPUT
Description:

Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9496.41	959	9513.02	956.95	9521.28	955.99	9567.91	953.77	9586.88	952.89
9590.24	952.67	9623.9	948.93	9664.27	941.74	9670.83	940.54	9671.85	940.65
9700.56	945.01	9710.48	946.44	9715.85	947.25	9730.32	949.91	9744.69	948.32
9783.71	946.65	9821.91	945.42	9849.32	943.41	9899.13	943.9	9914.93	944.29
9964.94	937.26	9969.78	936.39	9992.74	936.85	10000	937.01	10018.44	937.42
10026.32	937.57	10031.71	937.73	10067.64	937.04	10085.9	936.13	10104.76	936.81
10145.45	940.94	10166.26	942.77	10218.79	943.53	10227.76	943.62	10231.32	943.7
10289.26	945.42	10317.19	945.85	10350.76	945.94	10403.06	945.13	10408.42	945.03
10414.63	944.48	10415.97	944.39	10417.92	944.24	10420.96	944.03	10425.5	943.75
10434.74	943.18	10462.57	941.45	10486.92	939.86	10557.61	940.89	10562.2	941.16
10563.55	941.04	10564.63	941.19	10572.23	942.34	10581.85	943.74	10595.47	945.05
10601.27	945.17	10607.14	945.48	10610.93	945.89	10614.31	946.33	10617.33	946.72
10620.24	947.06	10630.53	948.11	10633.26	948.29	10635.75	948.38	10638.41	948.44
10640.94	948.51	10670.98	949.82	10675.73	950.06	10680.46	950.38	10712.69	954.11
10715.77	954.37	10719.02	954.67	10721.79	954.93	10724.12	955.16	10726.44	955.38
10728.46	955.58	10746.54	958.16	10766.78	959.42	10781.27	960.31	10804.59	959.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9496.41	.05	9914.93	.043	10166.26	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914.93	10166.26	1325	1339	1315	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	939.57	Element				
Vel Head (ft)	0.28	Wt. n-Val.			0.043	
W.S. Elev (ft)	939.29	Reach Len. (ft)		1325.00	1339.00	1315.00
Crit W.S. (ft)	938.50	Flow Area (sq ft)			367.80	
E.G. Slope (ft/ft)	0.005772	Area (sq ft)			367.80	
Q Total (cfs)	1560.00	Flow (cfs)			1560.00	
Top Width (ft)	178.71	Top Width (ft)			178.71	
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)			4.24	
Max Chl Dpth (ft)	3.16	Hydr. Depth (ft)			2.06	
Conv. Total (cfs)	20533.1	Conv. (cfs)			20533.1	
Length Wtd. (ft)	1339.00	Wetted Per. (ft)			179.12	
Min Ch El (ft)	936.13	Shear (lb/sq ft)			0.74	
Alpha	1.00	Stream Power (lb/ft s)			3.14	
Frctn Loss (ft)	9.77	Cum Volume (acre-ft)			32.64	0.00
C & E Loss (ft)	0.03	Cum SA (acres)			21.44	0.02

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 1.136

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9793.32	936.17	9800.67	936.72	9803.64	936.9	9806.83	937.09	9859.13	938.69
9907.7	937.71	9914.63	937.67	9921.12	937.27	9924.63	937.06	9951.13	935.52
9955.99	935.24	9956.72	935	9982.9	926.25	10000	926.19	10026.45	926.08
10030.71	926.08	10048.55	926.51	10058.04	926.72	10081.11	927.81	10121.75	931.12
10136.6	932.18	10152.61	932.92	10192.1	933.51	10228.77	933.26		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9793.32	.05	9907.7	.043	10152.61	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9907.7	10152.61	1200	1338	1330	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	929.77	Element				

* Vel Head (ft)	*	0.54	* Wt. n-Val.	*		*	0.043	*	*
* W.S. Elev (ft)	*	929.24	* Reach Len. (ft)	*	1200.00	*	1338.00	* 1330.00	*
* Crit W.S. (ft)	*	928.60	* Flow Area (sq ft)	*		*	295.56	*	*
* E.G. Slope (ft/ft)	*0.009235		* Area (sq ft)	*		*	295.56	*	*
* Q Total (cfs)	*	1740.00	* Flow (cfs)	*		*	1740.00	*	*
* Top Width (ft)	*	124.64	* Top Width (ft)	*		*	124.64	*	*
* Vel Total (ft/s)	*	5.89	* Avg. Vel. (ft/s)	*		*	5.89	*	*
* Max Chl Dpth (ft)	*	3.16	* Hydr. Depth (ft)	*		*	2.37	*	*
* Conv. Total (cfs)	*	18106.5	* Conv. (cfs)	*		*	18106.5	*	*
* Length Wtd. (ft)	*	1338.00	* Wetted Per. (ft)	*		*	125.22	*	*
* Min Ch El (ft)	*	926.08	* Shear (lb/sq ft)	*		*	1.36	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	8.01	*	*
* Frctn Loss (ft)	*	13.46	* Cum Volume (acre-ft)	*		*	22.45	* 0.00	*
* C & E Loss (ft)	*	0.06	* Cum SA (acres)	*		*	16.77	* 0.02	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 0.883

INPUT
Description:
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9665.72	917.21	9672.36	917.26	9715.02	916.92	9743.85	916.81	9766.87	916.4
9815.35	914.73	9818.72	914.69	9827.62	914.67	9870.57	914.6	9901.99	914.08
9934.26	914.01	9942.8	914	9953.4	914.01	9977.89	914	10000	913.99
10012.52	914.09	10020.52	914.15	10035.99	914.25	10060.25	915.81	10071.38	916.51
10091.65	919.03	10110.26	919.29	10142.66	920.24				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9665.72	.05	9766.87	.04	10071.38	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9766.87	10071.38	1115	1088	925	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	916.26	* Element	*	Left OB	*	Channel	* Right OB	*
* Vel Head (ft)	*	0.34	* Wt. n-Val.	*		*	0.043	*	*
* W.S. Elev (ft)	*	915.92	* Reach Len. (ft)	*	1115.00	*	1088.00	* 925.00	*
* Crit W.S. (ft)	*	915.55	* Flow Area (sq ft)	*		*	413.61	*	*
* E.G. Slope (ft/ft)	*0.010906		* Area (sq ft)	*		*	413.61	*	*
* Q Total (cfs)	*	1930.00	* Flow (cfs)	*		*	1930.00	*	*
* Top Width (ft)	*	281.24	* Top Width (ft)	*		*	281.24	*	*
* Vel Total (ft/s)	*	4.67	* Avg. Vel. (ft/s)	*		*	4.67	*	*
* Max Chl Dpth (ft)	*	1.93	* Hydr. Depth (ft)	*		*	1.47	*	*
* Conv. Total (cfs)	*	18480.5	* Conv. (cfs)	*		*	18480.5	*	*
* Length Wtd. (ft)	*	1088.00	* Wetted Per. (ft)	*		*	281.32	*	*
* Min Ch El (ft)	*	913.99	* Shear (lb/sq ft)	*		*	1.00	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	4.67	*	*
* Frctn Loss (ft)	*	14.22	* Cum Volume (acre-ft)	*		*	11.56	* 0.00	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*		*	10.54	* 0.02	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2 (J48)
REACH: REACH 1 RS: 0.677

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9474.86  903.41 9487.49  903.44 9529.01  903.37 9558.39  903.34 9586.96  903.32
 9627.35  903.46  9644.9  903.51 9657.32   903.4 9702.85  902.87 9756.25   902.7
 9760.79   902.7 9767.21   902.8 9818.74  903.15 9855.19   902.5 9876.68  901.88
 9907.07  901.86 9934.63  901.77 9954.12   901.5 9992.57  900.92   10000  900.79
10029.75   900.9   10071  900.8610085.23  900.76 10100.6  900.7210140.71  900.59
10177.85  900.5210196.19   900.510215.98  900.5210251.67  900.5910284.71  900.32
10307.14  900.2710331.37  900.4910362.62   900.910391.56  901.01 10418.1  901.21
10446.76  901.3110473.58  901.4810498.42  901.7110533.53  902.5510546.01  903.14
 10585.8  903.89

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9474.86     .05 9934.63    .04310498.42     .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9934.6310498.42              3300    3537    3300            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  902.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.26  * Wt. n-Val.              *          *   0.043  *   0.050  *
* W.S. Elev (ft)          *  901.76  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          *  901.58  * Flow Area (sq ft)       *          *  511.73  *    0.04  *
* E.G. Slope (ft/ft)      *0.015705  * Area (sq ft)            *          *  511.73  *    0.04  *
* Q Total (cfs)           * 2080.00  * Flow (cfs)              *          * 2079.99  *    0.01  *
* Top Width (ft)          *  564.65  * Top Width (ft)          *          *  562.75  *    1.90  *
* Vel Total (ft/s)        *    4.06  * Avg. Vel. (ft/s)         *          *    4.06  *    0.30  *
* Max Chl Dpth (ft)       *    1.49  * Hydr. Depth (ft)         *          *    0.91  *    0.02  *
* Conv. Total (cfs)       * 16597.6  * Conv. (cfs)              *          * 16597.5  *     0.1  *
* Length Wtd. (ft)        *          * Wetted Per. (ft)         *          *  562.76  *    1.90  *
* Min Ch El (ft)          *  900.27  * Shear (lb/sq ft)         *          *    0.89  *    0.02  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *          *    3.62  *    0.01  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)     *          *          *          *
* C & E Loss (ft)         *          * Cum SA (acres)           *          *          *          *
*****************************************************************************************

*****************************************************************************

SUMMARY OF MANNING'S N VALUES

River:1S2WS2 (J48)
*****************************************************************
*     Reach        *   River Sta.   *   n1    *   n2    *   n3    *
*****************************************************************
*REACH 1          *    3.397       *      .05*     .043*      .05*
*REACH 1          *    3.142       *      .05*     .043*      .05*
*REACH 1          *    2.911       *      .05*     .043*      .05*
*REACH 1          *    2.644       *      .05*     .043*      .05*
*REACH 1          *    2.391       *      .05*     .013*      .05*
*REACH 1          *    2.380       *Culvert  *        *        *
*REACH 1          *    2.346       *      .05*     .043*      .05*
*REACH 1          *    1.990       *      .05*     .043*      .05*
*REACH 1          *    1.726       *      .05*     .043*      .05*
*REACH 1          *    1.390       *      .05*     .043*      .05*
*REACH 1          *    1.136       *      .05*     .043*      .05*
*REACH 1          *    0.883       *      .05*     .043*      .05*
*REACH 1          *    0.677       *      .05*     .043*      .05*
*****************************************************************

*****************************************************************************

SUMMARY OF REACH LENGTHS

River: 1S2WS2 (J48)
*****************************************************************
*     Reach        *   River Sta.   *  Left   * Channel *  Right  *
*****************************************************************
*REACH 1          *    3.397       *     1320*     1342*     1150*
*REACH 1          *    3.142       *     1220*     1222*     1205*
*REACH 1          *    2.911       *     1390*     1409*     1275*
*REACH 1          *    2.644       *     1260*     1336*     1350*
*REACH 1          *    2.391       *      230*      239*      230*
*REACH 1          *    2.380       *Culvert  *        *        *
*REACH 1          *    2.346       *     1720*     1878*     1680*
*REACH 1          *    1.990       *     1370*     1393*     1400*
*REACH 1          *    1.726       *     1630*     1777*     1585*
*REACH 1          *    1.390       *     1325*     1339*     1315*
*REACH 1          *    1.136       *     1200*     1338*     1330*
```

```
*REACH 1          *    0.883       *     1115*     1088*      925*
*REACH 1          *    0.677       *     3300*     3537*     3300*
*************************************************************
```

```
*******************************************************************************
```

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS2 (J48)

Reach	River Sta.	Contr.	Expan.
REACH 1	3.397	.1	.3
REACH 1	3.142	.1	.3
REACH 1	2.911	.1	.3
REACH 1	2.644	.1	.3
REACH 1	2.391	.1	.3
REACH 1	2.380	Culvert	
REACH 1	2.346	.1	.3
REACH 1	1.990	.1	.3
REACH 1	1.726	.1	.3
REACH 1	1.390	.1	.3
REACH 1	1.136	.1	.3
REACH 1	0.883	.1	.3
REACH 1	0.677	.1	.3

MODEL: 1S2WS2C (J47)

REACH: 1S2WS2C (J47)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X       X
X     X  X        X    X       X   X    X    X       X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS2C (J47)
Project File : 1S2WS2C_J47.prj
Run Date and Time: 1/12/2005 4:36:24 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS2C (J47)

****

PLAN DATA

Plan Title: 1S2WS2C (J47)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2C (J47)\1S2WS2C_J47.p01

Geometry Title: 1S2WS2C (J47)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2C (J47)\1S2WS2C_J47.g01

Flow Title : 1S2WS2C (J47)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS2C (J47)\1S2WS2C_J47.f01

Plan Summary Information:

Number of:	Cross Sections =	8	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9798.76     .05 9910.81    .04310065.98     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9910.8110065.98             1300    1370    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1038.09  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.37  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1037.73  * Reach Len. (ft)         * 1300.00  * 1370.00 * 1300.00  *
* Crit W.S. (ft)          * 1037.73  * Flow Area (sq ft)       *          *   24.70 *          *
* E.G. Slope (ft/ft)      *0.031453  * Area (sq ft)            *          *   24.70 *          *
* Q Total (cfs)           *  120.00  * Flow (cfs)              *          *  120.00 *          *
* Top Width (ft)          *   34.87  * Top Width (ft)          *          *   34.87 *          *
* Vel Total (ft/s)        *    4.86  * Avg. Vel. (ft/s)        *          *    4.86 *          *
* Max Chl Dpth (ft)       *    1.50  * Hydr. Depth (ft)        *          *    0.71 *          *
* Conv. Total (cfs)       *   676.6  * Conv. (cfs)             *          *   676.6 *          *
* Length Wtd. (ft)        * 1370.00  * Wetted Per. (ft)        *          *   35.01 *          *
* Min Ch El (ft)          * 1036.23  * Shear (lb/sq ft)        *          *    1.39 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    6.73 *          *
* Frctn Loss (ft)         *   27.64  * Cum Volume (acre-ft)    *    0.09  *   14.43 *    2.30  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    0.26  *   10.07 *    4.09  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS2C (J47)
REACH: REACH 1            RS: 2.201

INPUT
Description:
Station Elevation Data      num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9912.79 1014.89  9934.6 1014.25 9985.06 1008.48   10000 1006.8310079.65 1018.43
10080.04 1018.4910090.61 1020.04

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9912.79     .05  9934.6    .04310080.04     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.610080.04              1100    1178    1100            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1009.62  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.39  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1009.23  * Reach Len. (ft)         * 1100.00  * 1178.00 * 1100.00  *
* Crit W.S. (ft)          * 1009.02  * Flow Area (sq ft)       *          *   45.89 *          *
* E.G. Slope (ft/ft)      *0.016556  * Area (sq ft)            *          *   45.89 *          *
* Q Total (cfs)           *  230.00  * Flow (cfs)              *          *  230.00 *          *
* Top Width (ft)          *   38.03  * Top Width (ft)          *          *   38.03 *          *
* Vel Total (ft/s)        *    5.01  * Avg. Vel. (ft/s)        *          *    5.01 *          *
* Max Chl Dpth (ft)       *    2.40  * Hydr. Depth (ft)        *          *    1.21 *          *
* Conv. Total (cfs)       *  1787.5  * Conv. (cfs)             *          *  1787.5 *          *
* Length Wtd. (ft)        * 1178.00  * Wetted Per. (ft)        *          *   38.34 *          *
* Min Ch El (ft)          * 1006.83  * Shear (lb/sq ft)        *          *    1.24 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    6.20 *          *
* Frctn Loss (ft)         *   20.17  * Cum Volume (acre-ft)    *    0.09  *   13.32 *    2.30  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.26  *    8.92 *    4.09  *
*****************************************************************************************
```

* Crit W.S. (ft)	* 960.76	* Flow Area (sq ft)	*		*	69.51	*		*
* E.G. Slope (ft/ft)	*0.021142	* Area (sq ft)	*		*	69.51	*		*
* Q Total (cfs)	* 430.00	* Flow (cfs)	*		*	430.00	*		*
* Top Width (ft)	* 50.48	* Top Width (ft)	*		*	50.48	*		*
* Vel Total (ft/s)	* 6.19	* Avg. Vel. (ft/s)	*		*	6.19	*		*
* Max Chl Dpth (ft)	* 2.57	* Hydr. Depth (ft)	*		*	1.38	*		*
* Conv. Total (cfs)	* 2957.3	* Conv. (cfs)	*		*	2957.3	*		*
* Length Wtd. (ft)	* 984.00	* Wetted Per. (ft)	*		*	50.88	*		*
* Min Ch El (ft)	* 958.29	* Shear (lb/sq ft)	*		*	1.80	*		*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*		*	11.15	*		*
* Frctn Loss (ft)	* 13.36	* Cum Volume (acre-ft)	*	0.09	*	9.82	*	2.30	*
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	*	0.26	*	6.28	*	4.09	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2C (J47)
REACH: REACH 1 RS: 1.519

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9810.94	959.59	9834.38	957.81	9866.4	954.92	9916.9	951.04	9929.25	950.45
9992.05	944.87	10000	944.04	10007.95	945.61	10013.62	946.66	10022.91	947.99
10055.01	952.05	10081.81	954.49	10117.91	959.18	10124.13	959.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9810.94	.05	9929.25	.043	10055.01	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9929.25	10055.01	1000	1095	1000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 948.03	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	* 0.38	* Wt. n-Val.	*		*	0.043	*		*
* W.S. Elev (ft)	* 947.65	* Reach Len. (ft)	*	1000.00	*	1095.00	*	1000.00	*
* Crit W.S. (ft)	* 947.11	* Flow Area (sq ft)	*		*	103.24	*		*
* E.G. Slope (ft/ft)	*0.009960	* Area (sq ft)	*		*	103.24	*		*
* Q Total (cfs)	* 510.00	* Flow (cfs)	*		*	510.00	*		*
* Top Width (ft)	* 59.74	* Top Width (ft)	*		*	59.74	*		*
* Vel Total (ft/s)	* 4.94	* Avg. Vel. (ft/s)	*		*	4.94	*		*
* Max Chl Dpth (ft)	* 3.61	* Hydr. Depth (ft)	*		*	1.73	*		*
* Conv. Total (cfs)	* 5110.2	* Conv. (cfs)	*		*	5110.2	*		*
* Length Wtd. (ft)	* 1095.00	* Wetted Per. (ft)	*		*	60.22	*		*
* Min Ch El (ft)	* 944.04	* Shear (lb/sq ft)	*		*	1.07	*		*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*		*	5.27	*		*
* Frctn Loss (ft)	* 15.42	* Cum Volume (acre-ft)	*	0.09	*	7.87	*	2.30	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	*	0.26	*	5.04	*	4.09	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2C (J47)
REACH: REACH 1 RS: 1.311

INPUT
Description:
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9878.39	939.96	9896.86	939.27	9923.69	937.55	9943.52	936.43	9968.3	933.51
9973.24	932.8	9982.49	931.58	10000	929.36	10007.22	929.35	10041.56	931.7

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS2C (J47)
REACH: REACH 1 RS: 0.930

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9758.17	914.2	9786.95	914.11	9800.31	913.75	9837.36	912.99	9858.14	912.28
9887.77	910.57	9915.96	909.79	9938.18	909.33	9974.26	908.32	10000	907.92
10004.9	907.91	10011.79	907.88	10012.19	907.88	10018.16	907.91	10023.49	908.07
10027.89	908.07	10036.3	908.27	10043.57	908.41	10057.8	908.35	10094.71	908.07
10100.47	907.98	10103.34	907.94	10112.71	907.97	10161.11	908.21	10176.25	908.28
10180.42	908.29	10239.8	908.42	10261.43	908.43	10303.35	908.54	10342.44	908.68
10366.9	908.79	10423.46	909.09	10430.44	909.11	10433.47	909.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9758.17	.05	9974.26	.043	10043.57	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9974.26	10043.57	550	580	550	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	909.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	908.96	Reach Len. (ft)			
Crit W.S. (ft)	908.81	Flow Area (sq ft)	7.41	61.44	200.39
E.G. Slope (ft/ft)	0.015011	Area (sq ft)	7.41	61.44	200.39
Q Total (cfs)	750.00	Flow (cfs)	12.66	240.01	497.32
Top Width (ft)	448.43	Top Width (ft)	23.00	69.31	356.12
Vel Total (ft/s)	2.79	Avg. Vel. (ft/s)	1.71	3.91	2.48
Max Chl Dpth (ft)	1.08	Hydr. Depth (ft)	0.32	0.89	0.56
Conv. Total (cfs)	6121.4	Conv. (cfs)	103.4	1959.0	4059.1
Length Wtd. (ft)		Wetted Per. (ft)	23.01	69.32	356.12
Min Ch El (ft)	907.88	Shear (lb/sq ft)	0.30	0.83	0.53
Alpha	1.16	Stream Power (lb/ft s)	0.52	3.24	1.31
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:1S2WS2C (J47)

Reach	River Sta.	n1	n2	n3
REACH 1	2.460	.05	.043	.05
REACH 1	2.201	.05	.043	.05
REACH 1	1.977	.05	.043	.05
REACH 1	1.705	.05	.043	.05
REACH 1	1.519	.05	.043	.05
REACH 1	1.311	.05	.043	.05
REACH 1	1.113	.05	.043	.05
REACH 1	0.930	.05	.043	.05

SUMMARY OF REACH LENGTHS

River: 1S2WS2C (J47)

Reach	River Sta.	Left	Channel	Right
REACH 1	2.460	1300	1370	1300
REACH 1	2.201	1100	1178	1100
REACH 1	1.977	1400	1437	1400
REACH 1	1.705	950	984	950

MODEL: 1S2WS31 (A56)

REACHES: 1S2WS31 (A56)
2S3WS12A (A30)
2S3WS12B (A27)
2S2WS7C (A32)
2S2WS7A (A52)
2S3WS1 (A54)
2S2WS6 (A55)
2S2WS20 (A19)
2S2WS17B (A63)
2S2WS7B (A51)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS31 (A56)
Project File : 1S2WS31_A56.prj
Run Date and Time: 12/14/2004 12:49:36 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model Name: 1S2WS31 (A56)
Reaches: 1S2WS31 (A56)
2S2WS12A
(A30)
2S2WS12B (A27)
2S2WS7C (A32)
2S2WS7A (A52)
2S3WS1 (A54)
2S2WS6
(A55)
2S2WS20 (A19)
2S2WS17B (A63)
2S2WS7B (A51)

****

PLAN DATA

Plan Title: 1S2WS31 (A56)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31 (A56)\Current\1S2WS31_A56.p01

Geometry Title: 1S2WS31 (A56)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31 (A56)\Current\1S2WS31_A56.g01

Flow Title : 1S2WS31 (A56)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31

(A56)\Current\1S2WS31_A56.f01

Plan Summary Information:

Number of:	Cross Sections	= 110	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options

Critical depth computed only where necessary	
Conveyance Calculation Method:	At breaks in n values only
Friction Slope Method:	Average Conveyance
Computational Flow Regime:	Subcritical Flow

Encroachment Data

Equal Conveyance	=	True
Left Offset	=	0
Right Offset	=	0

River = 2S2WS7B (A51) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.710	PF 2	1	9990	10170
1.452	PF 2	1	9965	10155
1.187	PF 2	1	9970	10200
0.909	PF 2	1	9990	10110
0.645	PF 2	1	9960	10140
0.373	PF 2	1	9970	10030
0.000	PF 2	1	9920	10030

River = 2S2WS7C (A32) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.475	PF 2	1	9980	10020
1.226	PF 2	1	9980	10020
0.964	PF 2	1	9980	10020
0.726	PF 2	1	9980	10020
0.488	PF 2	1	9980	10020
0.259	PF 2	1	9985	10020

River = 2S2WS7A (A52) Reach = REACH 1

RS	Profile	Method	Value1	Value2
5.079	PF 2	1	9970	10030
4.837	PF 2	1	9985	10020
4.594	PF 2	1	9970	10155
4.407	PF 2	1	9530	10195

River = 2S2WS7A (A52) Reach = REACH 2

RS	Profile	Method	Value1	Value2
0.280	PF 2	1	9965	10025
0.273	PF 2	1	9965	10025

River = 2S2WS7A (A52) Reach = REACH 3

RS	Profile	Method	Value1	Value2
2.494	PF 2	1	9960	10125
2.238	PF 2	1	9930	10010
2.009	PF 2	1	9870	10035
1.714	PF 2	1	9965	10020
1.398	PF 2	1	9965	10080
1.167	PF 2	1	9970	10030
0.871	PF 2	1	9960	10120
0.584	PF 2	1	9950	10030

River = 2S2WS7A (A52) Reach = REACH 4

RS	Profile	Method	Value1	Value2
4.292	PF 2	1	9930	10050
4.127	PF 2	1	9930	10020
3.891	PF 2	1	9860	10120
3.601	PF 2	1	9955	10270
3.334	PF 2	1	9865	10040
3.055	PF 2	1	9905	10025
2.778	PF 2	1	9975	10175

River = 1S2WS31 (A56) Reach = REACH 1

RS	Profile	Method	Value1	Value2

4.185	PF 2	1	9920	10010
3.910	PF 2	1	9985	10080
3.668	PF 2	1	9970	10035

River = 1S2WS31 (A56) Reach = REACH 2

RS	Profile	Method	Value1	Value2
3.374	PF 2	1	9970	10030
3.011	PF 2	1	9970	10030

River = 1S2WS31 (A56) Reach = REACH 3

RS	Profile	Method	Value1	Value2
2.673	PF 2	1	9960	10040
2.388	PF 2	1	9955	10045

River = 1S2WS31 (A56) Reach = REACH 4

RS	Profile	Method	Value1	Value2
2.110	PF 2	1	9960	10040
1.913	PF 2	1	9960	10040

River = 1S2WS31 (A56) Reach = REACH 5

RS	Profile	Method	Value1	Value2
1.595	PF 2	1	9960	10040
1.329	PF 2	1	9950	10045
1.076	PF 2	1	9945	10050
0.811	PF 2	1	9900	10090
0.571	PF 2	1	9935	10065
0.317	PF 2	1	9955	10045

River = 2S3WS1 (A54) Reach = REACH 1

RS	Profile	Method	Value1	Value2
0.461	PF 2	1	9972	10028
0.198	PF 2	1	9975	10025

River = 2S2WS6 (A55) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.720	PF 2	1	9985	10015
1.465	PF 2	1	9980	10020
1.224	PF 2	1	9970	10030
0.971	PF 2	1	9970	10030

River = 2S2WS6 (A55) Reach = REACH 2

RS	Profile	Method	Value1	Value2
0.727	PF 2	1	9970	10030
0.505	PF 2	1	9970	10030
0.255	PF 2	1	9970	10030

River = 2S2WS20 (A19) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.581	PF 2	1	9965.04	10040
1.338	PF 2	1	9975	10035
1.117	PF 2	1	9970	10030
0.842	PF 2	1	9970	10030
0.586	PF 2	1	9975	10025
0.362	PF 2	1	9970	10030

River = 2S2WS17B (A63) Reach = REACH 1

RS	Profile	Method	Value1	Value2
4.381	PF 2	1	9930	10150
4.098	PF 2	1	9930	10115
3.884	PF 2	1	9910	10120
3.592	PF 2	1	9940	10085
3.299	PF 2	1	9960	10100
3.038	PF 2	1	9770	10040
2.771	PF 2	1	9885	10030
2.521	PF 2	1	9940	10020
2.168	PF 2	1	9870	10135
1.898	PF 2	1	9900	10020
1.627	PF 2	1	9970	10040

River = 2S2WS17B (A63) Reach = REACH 2

RS	Profile	Method	Value1	Value2
1.294	PF 2	1	9920	10040
1.137	PF 2	1	9890	10020
0.852	PF 2	1	9830	10040
0.593	PF 2	1	9920	10050
0.298	PF 2	1	9910	10035
0.000	PF 2	1	9980	10165

River = 2S3WS12A (A30) Reach = REACH 1

RS	Profile	Method	Value1	Value2
4.175	PF 2	1	9975	10025
3.908	PF 2	1	9950	10050
3.613	PF 2	1	9960	10040
3.368	PF 2	1	9960	10040
3.116	PF 2	1	9960	10145
2.811	PF 2	1	9910	10040
2.536	PF 2	1	9970	10070
2.254	PF 2	1	9930	10100
2.011	PF 2	1	9850	10045
1.786	PF 2	1	9975	10115
1.605	PF 2	1	9980	10145
1.343	PF 2	1	9975	10025
1.076	PF 2	1	9975	10025
0.802	PF 2	1	9970	10025
0.541	PF 2	1	9965	10020
0.277	PF 2	1	9940	10030

River = 2S3WS12B (A27) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.308	PF 2	1	9975	10090
3.060	PF 2	1	9960	10090
2.796	PF 2	1	9880	10070
2.553	PF 2	1	9930	10080
2.297	PF 2	1	9750	10060
2.036	PF 2	1	9900	10080
1.782	PF 2	1	9940	10060
1.529	PF 2	1	9930	10100
1.284	PF 2	1	9970	10220
0.977	PF 2	1	9960	10190
0.710	PF 2	1	9970	10099
0.415	PF 2	1	9965	10035
0.198	PF 2	1	9975	10025

****

FLOW DATA

Flow Title: 1S2WS31 (A56)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31 (A56)\Current\1S2WS31_A56.f01

Flow Data (cfs)

River	Reach	RS	PF 1
2S3WS12A (A30)	REACH 1	4.175	690
2S3WS12A (A30)	REACH 1	3.908	730
2S3WS12A (A30)	REACH 1	3.613	790
2S3WS12A (A30)	REACH 1	3.368	860
2S3WS12A (A30)	REACH 1	3.116	930
2S3WS12A (A30)	REACH 1	2.811	1010
2S3WS12A (A30)	REACH 1	2.536	1080
2S3WS12A (A30)	REACH 1	2.254	1160
2S3WS12A (A30)	REACH 1	2.011	1220
2S3WS12A (A30)	REACH 1	1.786	1280
2S3WS12A (A30)	REACH 1	1.605	1330
2S3WS12A (A30)	REACH 1	1.343	1310
2S3WS12A (A30)	REACH 1	1.076	1290
2S3WS12A (A30)	REACH 1	0.802	1270
2S3WS12A (A30)	REACH 1	0.541	1260
2S3WS12A (A30)	REACH 1	0.277	1240
2S3WS12B (A27)	REACH 1	3.308	1850
2S3WS12B (A27)	REACH 1	3.060	1760
2S3WS12B (A27)	REACH 1	2.796	1680
2S3WS12B (A27)	REACH 1	2.553	1600
2S3WS12B (A27)	REACH 1	2.297	1510
2S3WS12B (A27)	REACH 1	2.036	1420
2S3WS12B (A27)	REACH 1	1.782	1340
2S3WS12B (A27)	REACH 1	1.529	1250
2S3WS12B (A27)	REACH 1	1.284	1220
2S3WS12B (A27)	REACH 1	0.977	1180
2S3WS12B (A27)	REACH 1	0.710	1150
2S3WS12B (A27)	REACH 1	0.415	1120
2S3WS12B (A27)	REACH 1	0.198	1090
2S2WS7C (A32)	REACH 1	1.475	600
2S2WS7C (A32)	REACH 1	1.226	570
2S2WS7C (A32)	REACH 1	0.964	530
2S2WS7C (A32)	REACH 1	0.726	500

* 2s2ws7C (A32)	REACH 1	0.488	*	460 *
* 2s2ws7C (A32)	REACH 1	0.259	*	430 *
* 2s2ws7A (A52)	REACH 1	5.079	*	600 *
* 2s2ws7A (A52)	REACH 1	4.837	*	630 *
* 2s2ws7A (A52)	REACH 1	4.594	*	660 *
* 2s2ws7A (A52)	REACH 1	4.407	*	1640 *
* 2s2ws7A (A52)	REACH 4	4.292	*	950 *
* 2s2ws7A (A52)	REACH 4	4.127	*	1090 *
* 2s2ws7A (A52)	REACH 4	3.891	*	1280 *
* 2s2ws7A (A52)	REACH 4	3.601	*	1530 *
* 2s2ws7A (A52)	REACH 4	3.334	*	850 *
* 2s2ws7A (A52)	REACH 4	3.055	*	800 *
* 2s2ws7A (A52)	REACH 4	2.778	*	750 *
* 2s2ws7A (A52)	REACH 3	2.494	*	690 *
* 2s2ws7A (A52)	REACH 3	2.238	*	400 *
* 2s2ws7A (A52)	REACH 3	2.009	*	500 *
* 2s2ws7A (A52)	REACH 3	1.714	*	620 *
* 2s2ws7A (A52)	REACH 3	1.398	*	760 *
* 2s2ws7A (A52)	REACH 3	1.167	*	860 *
* 2s2ws7A (A52)	REACH 3	0.871	*	990 *
* 2s2ws7A (A52)	REACH 3	0.584	*	1120 *
* 2s2ws7A (A52)	REACH 2	0.280	*	1250 *
* 2s2ws7A (A52)	REACH 2	0.273	*	1350 *
* 1s2ws31 (A56)	REACH 1	4.185	*	230 *
* 1s2ws31 (A56)	REACH 1	3.910	*	650 *
* 1s2ws31 (A56)	REACH 1	3.668	*	1050 *
* 1s2ws31 (A56)	REACH 2	3.374	*	1450 *
* 1s2ws31 (A56)	REACH 2	3.011	*	1730 *
* 1s2ws31 (A56)	REACH 3	2.673	*	2900 *
* 1s2ws31 (A56)	REACH 3	2.388	*	2840 *
* 1s2ws31 (A56)	REACH 4	2.110	*	3900 *
* 1s2ws31 (A56)	REACH 4	1.913	*	4350 *
* 1s2ws31 (A56)	REACH 5	1.595	*	4550 *
* 1s2ws31 (A56)	REACH 5	1.329	*	4490 *
* 1s2ws31 (A56)	REACH 5	1.076	*	4440 *
* 1s2ws31 (A56)	REACH 5	0.811	*	4380 *
* 1s2ws31 (A56)	REACH 5	0.571	*	4320 *
* 1s2ws31 (A56)	REACH 5	0.317	*	4270 *
* 2s3ws1 (A54)	REACH 1	0.461	*	560 *
* 2s3ws1 (A54)	REACH 1	0.198	*	620 *
* 2s2ws6 (A55)	REACH 1	1.720	*	600 *
* 2s2ws6 (A55)	REACH 1	1.465	*	690 *
* 2s2ws6 (A55)	REACH 1	1.224	*	1060 *
* 2s2ws6 (A55)	REACH 1	0.971	*	1120 *
* 2s2ws6 (A55)	REACH 2	0.727	*	1860 *
* 2s2ws6 (A55)	REACH 2	0.505	*	1920 *
* 2s2ws6 (A55)	REACH 2	0.255	*	1990 *
* 2s2ws20 (A19)	REACH 1	1.581	*	680 *
* 2s2ws20 (A19)	REACH 1	1.338	*	680 *
* 2s2ws20 (A19)	REACH 1	1.117	*	670 *
* 2s2ws20 (A19)	REACH 1	0.842	*	660 *
* 2s2ws20 (A19)	REACH 1	0.586	*	650 *
* 2s2ws20 (A19)	REACH 1	0.362	*	650 *
* 2s2ws17B (A63)	REACH 1	4.381	*	1840 *
* 2s2ws17B (A63)	REACH 1	4.098	*	1790 *
* 2s2ws17B (A63)	REACH 1	3.884	*	1760 *
* 2s2ws17B (A63)	REACH 1	3.592	*	1720 *
* 2s2ws17B (A63)	REACH 1	3.299	*	1670 *
* 2s2ws17B (A63)	REACH 1	3.038	*	1540 *
* 2s2ws17B (A63)	REACH 1	2.771	*	1400 *
* 2s2ws17B (A63)	REACH 1	2.521	*	1270 *
* 2s2ws17B (A63)	REACH 1	2.168	*	1080 *
* 2s2ws17B (A63)	REACH 1	1.898	*	940 *
* 2s2ws17B (A63)	REACH 1	1.627	*	800 *
* 2s2ws17B (A63)	REACH 2	1.294	*	890 *
* 2s2ws17B (A63)	REACH 2	0.593	*	900 *
* 2s2ws17B (A63)	REACH 2	0.000	*	910 *
* 2s2ws7B (A51)	REACH 1	1.710	*	480 *
* 2s2ws7B (A51)	REACH 1	1.452	*	510 *
* 2s2ws7B (A51)	REACH 1	1.187	*	540 *
* 2s2ws7B (A51)	REACH 1	0.909	*	590 *
* 2s2ws7B (A51)	REACH 1	0.645	*	620 *
* 2s2ws7B (A51)	REACH 1	0.373	*	650 *
* 2s2ws7B (A51)	REACH 1	0.000	*	810 *

****

Boundary Conditions

* River	Reach	Profile	*	Upstream	Downstream *

* 2S3WS12A (A30)	REACH 1	PF 1	*	Normal S = 0.0118	*
* 2S3WS12B (A27)	REACH 1	PF 1	*	Normal S = 0.01	*
* 2S2WS7C (A32)	REACH 1	PF 1	*	Normal S = 0.0063	*
* 2S2WS7A (A52)	REACH 1	PF 1	*	Normal S = 0.0083	*
* 1S2WS31 (A56)	REACH 1	PF 1	*	Normal S = 0.0091	*
* 1S2WS31 (A56)	REACH 5	PF 1	*		Normal S = 0.0053 *
* 2S3WS1 (A54)	REACH 1	PF 1	*	Normal S = 0.0077	*
* 2S2WS6 (A55)	REACH 1	PF 1	*	Normal S = 0.0105	*
* 2S2WS17B (A63)	REACH 1	PF 1	*	Normal S = 0.0091	*
* 2S2WS17B (A63)	REACH 2	PF 1	*		Normal S = 0.0059 *
* 2S2WS7B (A51)	REACH 1	PF 1	*		Normal S = 0.0048 *

GEOMETRY DATA

Geometry Title: 1S2WS31 (A56)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31 (A56)\Current\1S2WS31_A56.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
2S3WS12A (A30)	REACH 1		JCT 3
2S3WS12B (A27)	REACH 1		JCT 4
2S2WS7C (A32)	REACH 1		JCT 6
2S2WS7A (A52)	REACH 1		JCT 8
2S2WS7A (A52)	REACH 4	JCT 8	JCT 7
2S2WS7A (A52)	REACH 3	JCT 7	JCT 6
2S2WS7A (A52)	REACH 2	JCT 6	JCT 5
1S2WS31 (A56)	REACH 1		JCT 4
1S2WS31 (A56)	REACH 2	JCT 4	JCT 3
1S2WS31 (A56)	REACH 3	JCT 3	JCT 5
1S2WS31 (A56)	REACH 4	JCT 5	JCT 1
1S2WS31 (A56)	REACH 5	JCT 1	
2S3WS1 (A54)	REACH 1		JCT 2
2S2WS6 (A55)	REACH 1		JCT 2
2S2WS6 (A55)	REACH 2	JCT 2	JCT 1
2S2WS20 (A19)	REACH 1	JCT 8	JCT 9
2S2WS17B (A63)	REACH 1		JCT 9
2S2WS17B (A63)	REACH 2	JCT 9	
2S2WS7B (A51)	REACH 1	JCT 7	

JUNCTION INFORMATION

Name: JCT 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
2S2WS6 (A55)	REACH 1	to 2S2WS6 (A55)	REACH 2	1288	
2S3WS1 (A54)	REACH 1	to 2S2WS6 (A55)	REACH 2	1045	

Name: JCT 6
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
2S2WS7A (A52)	REACH 3	to 2S2WS7A (A52)	REACH 2	1605	
2S2WS7C (A32)	REACH 1	to 2S2WS7A (A52)	REACH 2	1368	

Name: JCT 7
Description: Split from A52 into A51
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
2S2WS7A (A52)	REACH 4	to 2S2WS7A (A52)	REACH 3	1500	
2S2WS7A (A52)	REACH 4	to 2S2WS7B (A51)	REACH 1	1450	

Name: JCT 8
Description:
Energy computation Method

```
    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
2S2WS7A (A52)   REACH 1            to 2S2WS7A (A52)   REACH 4              607
2S2WS7A (A52)   REACH 1            to 2S2WS20 (A19)   REACH 1             1453

Name: JCT 9
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
2S2WS17B (A63)  REACH 1            to 2S2WS17B (A63)  REACH 2             1753
2S2WS20 (A19)   REACH 1            to 2S2WS17B (A63)  REACH 2             1911

Name: JCT 1
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31 (A56)   REACH 4            to 1S2WS31 (A56)   REACH 5             1679
2S2WS6 (A55)    REACH 2            to 1S2WS31 (A56)   REACH 5             1346

Name: JCT 4
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31 (A56)   REACH 1            to 1S2WS31 (A56)   REACH 2             1552
2S3WS12B (A27)  REACH 1            to 1S2WS31 (A56)   REACH 2             1045

Name: JCT 3
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31 (A56)   REACH 2            to 1S2WS31 (A56)   REACH 3             1785
2S3WS12A (A30)  REACH 1            to 1S2WS31 (A56)   REACH 3             1462

Name: JCT 5
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31 (A56)   REACH 3            to 1S2WS31 (A56)   REACH 4             1468
2S2WS7A (A52)   REACH 2            to 1S2WS31 (A56)   REACH 4             1441

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1            RS: 4.175

INPUT
Description: X-Section located at El Paso Natural Gasline Rd.
Limit of Sudy.
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9726.84 1194.35 9750.18 1194.31 9771.69 1194.25 9800.56 1194.21 9816.53 1194.15
 9850.94 1194.09 9861.37 1194.03 9901.32  1193.9 9906.22  1193.9 9945.89 1193.83
 9951.06 1193.82  9951.7 1193.82 9954.98 1193.66 9999.17 1191.28   10000 1191.32
10024.56 1192.4510039.03 1193.1510052.46  1193.910085.59 1193.9810102.84 1194.07
10130.44 1194.1610153.22 1194.2210175.28 1194.29 10203.6 1194.3210220.12 1194.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9726.84    .044 9951.06    .04910052.46    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.0610052.46             1320    1410    1330            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*******************************************************************************
```

* E.G. Elev (ft)	* 1194.43	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.20	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1194.23	* Reach Len. (ft)	* 1320.00	* 1410.00	* 1330.00	*
* Crit W.S. (ft)	* 1193.64	* Flow Area (sq ft)	* 34.72	* 169.48	* 16.89	*
* E.G. Slope (ft/ft)	*0.007781	* Area (sq ft)	* 34.72	* 169.48	* 16.89	*
* Q Total (cfs)	* 690.00	* Flow (cfs)	* 36.96	* 637.95	* 15.09	*
* Top Width (ft)	* 366.71	* Top Width (ft)	* 162.47	* 101.40	* 102.84	*
* Vel Total (ft/s)	* 3.12	* Avg. Vel. (ft/s)	* 1.06	* 3.76	* 0.89	*
* Max Chl Dpth (ft)	* 2.95	* Hydr. Depth (ft)	* 0.21	* 1.67	* 0.16	*
* Conv. Total (cfs)	* 7822.1	* Conv. (cfs)	* 419.0	* 7232.0	* 171.1	*
* Length Wtd. (ft)	* 1399.76	* Wetted Per. (ft)	* 162.47	* 101.53	* 102.84	*
* Min Ch El (ft)	* 1191.28	* Shear (lb/sq ft)	* 0.10	* 0.81	* 0.08	*
* Alpha	* 1.35	* Stream Power (lb/ft s)	* 0.11	* 3.05	* 0.07	*
* Frctn Loss (ft)	* 17.58	* Cum Volume (acre-ft)	* 3.83	* 145.64	* 7.80	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 14.86	* 83.21	* 15.41	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 3.908

INPUT
Description: X-section located 850' upstream of Riggs Road.
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9656.83	1176.84	9670.21	1176.8	9681.9	1176.73	9721.29	1176.61	9747.86	1176.55
9773.95	1176.49	9826.54	1176.33	9826.62	1176.33	9826.77	1176.33	9879.28	1176.2
9905.22	1176.12	9931.94	1176.05	9947.56	1175.99	9963.43	1175.93	10000	1175.72
10002.6	1175.72	10013.77	1175.72	10068.21	1175.91	10093.12	1175.96	10106.2	1176.09
10136.26	1176.21	10144.2	1176.43	10147.65	1176.62	10182.19	1176.74	10202.19	1176.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9656.83	.044	9905.22	.049	10147.65	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9905.22	10147.65	1510	1558	1520	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1176.84	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.18	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1176.66	* Reach Len. (ft)	* 1510.00	* 1558.00	* 1520.00	*
* Crit W.S. (ft)	* 1176.59	* Flow Area (sq ft)	* 52.99	* 171.04	* 0.22	*
* E.G. Slope (ft/ft)	*0.022665	* Area (sq ft)	* 52.99	* 171.04	* 0.22	*
* Q Total (cfs)	* 730.00	* Flow (cfs)	* 111.08	* 618.83	* 0.08	*
* Top Width (ft)	* 453.86	* Top Width (ft)	* 200.12	* 242.43	* 11.31	*
* Vel Total (ft/s)	* 3.26	* Avg. Vel. (ft/s)	* 2.10	* 3.62	* 0.37	*
* Max Chl Dpth (ft)	* 0.94	* Hydr. Depth (ft)	* 0.26	* 0.71	* 0.02	*
* Conv. Total (cfs)	* 4848.9	* Conv. (cfs)	* 737.9	* 4110.5	* 0.5	*
* Length Wtd. (ft)	* 1554.49	* Wetted Per. (ft)	* 200.12	* 242.44	* 11.31	*
* Min Ch El (ft)	* 1175.72	* Shear (lb/sq ft)	* 0.37	* 1.00	* 0.03	*
* Alpha	* 1.11	* Stream Power (lb/ft s)	* 0.79	* 3.61	* 0.01	*
* Frctn Loss (ft)	* 16.07	* Cum Volume (acre-ft)	* 2.50	* 140.13	* 7.54	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 9.37	* 77.64	* 13.67	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 3.613

```
INPUT
Description: Approximately 700' downstream of Riggs Road.
Station Elevation Data     num=       32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9764.34 1162.59 9783.71 1162.58  9814.5 1162.57 9838.16 1162.54 9864.65  1162.5
  9892.6 1162.44 9914.81 1162.36  9955.5 1159.57 9963.59 1159.05 9969.09 1159.03
 9984.12 1159.06 9995.55 1159.04   10000 1159.0610001.25 1159.0710009.79 1159.35
10024.39 1159.0310031.43 1159.01 10054.7 1158.9410073.13 1158.87 10098.5 1158.78
10126.81 1160.41 10166.6 1162.5810178.85 1162.6610217.06 1162.8910223.26 1162.94
10267.52 1163.2110267.67 1163.2110268.77 1163.2210312.08 1163.4810317.98 1163.49
10356.49 1163.6310368.45 1163.69

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9764.34    .044 9914.81    .049 10166.6    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.81 10166.6             1290    1294    1260             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************
* E.G. Elev (ft)          * 1160.75  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *    0.049 *         *
* W.S. Elev (ft)          * 1160.62  * Reach Len. (ft)        * 1290.00  * 1294.00  * 1260.00  *
* Crit W.S. (ft)          * 1159.96  * Flow Area (sq ft)      *          *   266.35 *         *
* E.G. Slope (ft/ft)      *0.006119  * Area (sq ft)           *          *   266.35 *         *
* Q Total (cfs)           *  790.00  * Flow (cfs)              *          *   790.00 *         *
* Top Width (ft)          *  190.38  * Top Width (ft)          *          *   190.38 *         *
* Vel Total (ft/s)        *    2.97  * Avg. Vel. (ft/s)        *          *     2.97 *         *
* Max Chl Dpth (ft)       *    1.84  * Hydr. Depth (ft)        *          *     1.40 *         *
* Conv. Total (cfs)       * 10099.4  * Conv. (cfs)             *          * 10099.4  *         *
* Length Wtd. (ft)        * 1292.64  * Wetted Per. (ft)        *          *   190.49 *         *
* Min Ch El (ft)          * 1158.78  * Shear (lb/sq ft)        *          *     0.53 *         *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     1.58 *         *
* Frctn Loss (ft)         *   11.30  * Cum Volume (acre-ft)    *    1.58  *   132.30 *    7.54 *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    5.90  *    69.90 *   13.47 *
*************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1             RS: 3.368

INPUT
Description:
Station Elevation Data     num=       34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9674.61 1150.09 9699.03 1150.03 9706.83    1150 9745.41 1149.77    9757 1149.68
 9791.78  1149.4 9807.16 1149.25 9838.16 1149.02 9857.33 1148.87 9884.54 1148.71
  9907.5  1148.6 9934.54 1148.59  9966.3 1147.75 9970.59 1147.55 9976.86 1147.37
 9982.28 1147.32 9989.91 1147.31 9996.23 1147.22   10000 1147.3310000.42 1147.35
10002.79 1147.3810005.02 1147.4110007.13 1147.4410012.09 1147.51   10058 1148.66
10070.04 1148.6910108.16 1148.8710116.42 1148.9210158.33 1149.21 10162.8 1149.24
 10208.5 1149.5410209.52  1149.510210.47 1149.4610214.28 1149.38

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9674.61    .044 9934.54    .049   10058    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.54   10058             1320    1330    1310             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************
* E.G. Elev (ft)          * 1149.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.24  * Wt. n-Val.              *   0.044  *    0.049 *   0.044  *
* W.S. Elev (ft)          * 1149.20  * Reach Len. (ft)        * 1320.00  * 1330.00  * 1310.00  *
* Crit W.S. (ft)          * 1149.05  * Flow Area (sq ft)      *   47.51  *   167.26 *   30.85  *
* E.G. Slope (ft/ft)      *0.012988  * Area (sq ft)           *   47.51  *   167.26 *   30.85  *
* Q Total (cfs)           *  860.00  * Flow (cfs)              *   97.99  *   707.57 *   54.44  *
```

* Top Width (ft)	* 343.93	* Top Width (ft)	* 121.09	* 123.46	* 99.38	*
* Vel Total (ft/s)	* 3.50	* Avg. Vel. (ft/s)	* 2.06	* 4.23	* 1.76	*
* Max Chl Dpth (ft)	* 1.98	* Hydr. Depth (ft)	* 0.39	* 1.35	* 0.31	*
* Conv. Total (cfs)	* 7546.2	* Conv. (cfs)	* 859.8	* 6208.7	* 477.7	*
* Length Wtd. (ft)	* 1328.69	* Wetted Per. (ft)	* 121.10	* 123.50	* 99.38	*
* Min Ch El (ft)	* 1147.22	* Shear (lb/sq ft)	* 0.32	* 1.10	* 0.25	*
* Alpha	* 1.26	* Stream Power (lb/ft s)	* 0.66	* 4.65	* 0.44	*
* Frctn Loss (ft)	* 12.19	* Cum Volume (acre-ft)	* 0.88	* 125.86	* 7.09	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 4.11	* 65.24	* 12.03	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 3.116

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9735.59	1137.23	9763.51	1137.33	9785.65	1137.39	9811.23	1137.43	9835.71	1137.41
9858.94	1137.3	9885.77	1137.22	9906.66	1137.15	9935.83	1137.04	9961.48	1135.97
10000	1134.49	10001.74	1134.43	10002.52	1134.47	10019.34	1135.51	10110.08	1135.83
10111.1	1135.82	10157.59	1136.53	10186.13	1136.87	10192.95	1136.89	10236.19	1136.92
10240.67	1136.93	10286.25	1136.99	10288.38	1137.01	10331.8	1137.04	10336.1	1137.07
10336.31	1137.11	10337.18	1137.11	10339.13	1137.13	10365.07	1137.12		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9735.59	.044	9935.83	.049	10186.13	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9935.83	10186.13	1595	1610	1580	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1137.22	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.13	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1137.09	* Reach Len. (ft)	* 1595.00	* 1610.00	* 1580.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 0.30	* 312.43	* 18.94	*
* E.G. Slope (ft/ft)	*0.006966	* Area (sq ft)	* 0.30	* 312.43	* 18.94	*
* Q Total (cfs)	* 930.00	* Flow (cfs)	* 0.07	* 916.50	* 13.43	*
* Top Width (ft)	* 413.09	* Top Width (ft)	* 12.69	* 250.30	* 150.09	*
* Vel Total (ft/s)	* 2.80	* Avg. Vel. (ft/s)	* 0.23	* 2.93	* 0.71	*
* Max Chl Dpth (ft)	* 2.66	* Hydr. Depth (ft)	* 0.02	* 1.25	* 0.13	*
* Conv. Total (cfs)	* 11142.8	* Conv. (cfs)	* 0.9	* 10981.0	* 160.9	*
* Length Wtd. (ft)	* 1609.58	* Wetted Per. (ft)	* 12.69	* 250.39	* 150.10	*
* Min Ch El (ft)	* 1134.43	* Shear (lb/sq ft)	* 0.01	* 0.54	* 0.05	*
* Alpha	* 1.08	* Stream Power (lb/ft s)	* 0.00	* 1.59	* 0.04	*
* Frctn Loss (ft)	* 14.46	* Cum Volume (acre-ft)	* 0.15	* 118.54	* 6.34	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 2.08	* 59.54	* 8.28	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 2.811

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9671.78	1122.68	9698.55	1122.67	9724.66	1122.66	9748.62	1122.63	9777.53	1122.59
9798.69	1122.52	9830.41	1122.43	9848.76	1122.36	9879.33	1121.56	9882.24	1121.5

```
 9900.92 1121.21    9921 1121.47 9923.87 1121.52 9926.27 1121.56 9928.24 1121.59
 9956.06 1121.53 9961.07 1121.38 9964.26 1121.28 9972.84    1121   10000 1119.87
10007.29 1120.0210049.42  1122.210076.22 1122.3310099.72 1122.4410121.57 1122.54
10150.02 1122.6810166.93 1122.7110200.31 1122.8210212.28 1122.8110250.61 1122.88
10257.64 1122.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9671.78    .044 9848.76    .04910049.42    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9848.7610049.42             1450    1452    1440             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1122.76  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1122.53  * Reach Len. (ft)         * 1450.00  * 1452.00  * 1440.00  *
* Crit W.S. (ft)          * 1122.15  * Flow Area (sq ft)       *    4.20  *  256.99  *   11.36  *
* E.G. Slope (ft/ft)      *0.011724  * Area (sq ft)            *    4.20  *  256.99  *   11.36  *
* Q Total (cfs)           * 1010.00  * Flow (cfs)              *    2.84  *  994.79  *   12.37  *
* Top Width (ft)          *  323.41  * Top Width (ft)          *   52.91  *  200.66  *   69.83  *
* Vel Total (ft/s)        *    3.71  * Avg. Vel. (ft/s)        *    0.68  *    3.87  *    1.09  *
* Max Chl Dpth (ft)       *    2.66  * Hydr. Depth (ft)        *    0.08  *    1.28  *    0.16  *
* Conv. Total (cfs)       *  9327.8  * Conv. (cfs)             *    26.2  *  9187.3  *   114.3  *
* Length Wtd. (ft)        * 1451.93  * Wetted Per. (ft)        *   52.91  *  200.77  *   69.83  *
* Min Ch El (ft)          * 1119.87  * Shear (lb/sq ft)        *    0.06  *    0.94  *    0.12  *
* Alpha                   *    1.08  * Stream Power (lb/ft s)  *    0.04  *    3.63  *    0.13  *
* Frctn Loss (ft)         *   12.94  * Cum Volume (acre-ft)    *    0.07  *  108.02  *    5.79  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.88  *   51.20  *    4.29  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1            RS: 2.536

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9751.77 1110.23 9781.88 1110.37 9796.04 1110.41 9832.37 1110.51  9840.3 1110.49
 9882.87 1110.42 9884.57 1110.41 9896.72 1110.36 9928.84 1110.22 9933.36  1110.2
 9968.94 1108.03 9997.45 1106.21   10000 1106.4610004.41 1106.8910014.14 1107.89
10053.26 1108.1910068.13 1107.1610087.36 1107.8410135.33 1109.6910164.68 1107.14
10176.59 1106.0210221.06 1108.95 10231.4 1109.6310236.31    111010238.72    1110
 10255.9 1110.0610282.99 1110.14 10286.8 1110.1610327.26 1110.2110337.29 1110.23
10371.53 1110.2510387.78 1110.25 10415.8 1110.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9751.77    .044 9928.84    .04910135.33    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.8410135.33             1450    1489    1435             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10135.33 10415.8    1110       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1109.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *   0.049  *          *
* W.S. Elev (ft)          * 1109.62  * Reach Len. (ft)         * 1450.00  * 1489.00  * 1435.00  *
* Crit W.S. (ft)          * 1108.89  * Flow Area (sq ft)       *          *  307.48  *          *
* E.G. Slope (ft/ft)      *0.007105  * Area (sq ft)            *          *  307.48  *  169.88  *
* Q Total (cfs)           * 1080.00  * Flow (cfs)              *          * 1080.00  *          *
* Top Width (ft)          *  285.70  * Top Width (ft)          *          *  190.61  *   95.09  *
* Vel Total (ft/s)        *    3.51  * Avg. Vel. (ft/s)        *          *    3.51  *          *
* Max Chl Dpth (ft)       *    3.60  * Hydr. Depth (ft)        *          *    1.61  *          *
* Conv. Total (cfs)       * 12812.8  * Conv. (cfs)             *          * 12812.8  *          *
```

```
* Length Wtd. (ft)       * 1489.00  * Wetted Per. (ft)        *          *  190.88  *          *
* Min Ch El (ft)         * 1106.21  * Shear (lb/sq ft)        *          *    0.71  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    2.51  *          *
* Frctn Loss (ft)        *   13.92  * Cum Volume (acre-ft)    *          *   98.61  *    2.80  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *          *   44.68  *    1.57  *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1            RS: 2.254

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9687.16  1096.8 9695.72 1096.87 9726.34 1097.09 9748.75 1097.25 9765.52 1097.33
 9801.79 1097.46 9804.69 1097.46 9812.91 1097.45 9843.87 1097.43 9854.83 1097.39
 9883.05 1097.26 9913.24 1095.93 9917.52 1095.84 9927.21 1095.32 9932.97 1094.85
 9940.58 1094.29 9943.38 1094.12    9965 1093.99   10000 1093.7510009.51 1093.69
10046.95 1094.0110096.21 1094.4510126.08 1095.5110157.29 1096.9710173.04 1097.03
10196.47  1097.110226.08 1097.1610235.64 1097.2110262.67 1097.2910274.82 1097.34
10279.12 1097.3510288.12 1097.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9687.16    .044 9883.05    .04910157.29    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9883.0510157.29             1275    1283    1300             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1095.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.27  * Wt. n-Val.              *          *    0.049  *          *
* W.S. Elev (ft)         * 1095.60  * Reach Len. (ft)         * 1275.00  * 1283.00  * 1300.00  *
* Crit W.S. (ft)         * 1095.19  * Flow Area (sq ft)       *          *  278.96  *          *
* E.G. Slope (ft/ft)     *0.012559  * Area (sq ft)            *          *  278.96  *          *
* Q Total (cfs)          * 1160.00  * Flow (cfs)              *          * 1160.00  *          *
* Top Width (ft)         *  206.03  * Top Width (ft)           *          *  206.03  *          *
* Vel Total (ft/s)       *    4.16  * Avg. Vel. (ft/s)         *          *    4.16  *          *
* Max Chl Dpth (ft)      *    1.91  * Hydr. Depth (ft)         *          *    1.35  *          *
* Conv. Total (cfs)      * 10350.8  * Conv. (cfs)              *          * 10350.8  *          *
* Length Wtd. (ft)       * 1283.00  * Wetted Per. (ft)         *          *  206.10  *          *
* Min Ch El (ft)         * 1093.69  * Shear (lb/sq ft)         *          *    1.06  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    4.41  *          *
* Frctn Loss (ft)        *   11.15  * Cum Volume (acre-ft)     *          *   88.59  *          *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)           *          *   37.90  *          *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1            RS: 2.011

INPUT
Description:
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9511.88    1087 9523.96 1087.02 9544.94 1087.03 9563.58 1087.05 9597.57 1087.05
```

```
 9603.19 1087.04 9620.32    1087 9642.81 1086.96  9650.2 1086.93 9682.43 1086.67
 9702.82 1086.49 9722.04 1086.33 9772.43 1083.72 9779.07 1083.35 9783.09 1083.09
 9796.39 1083.07 9844.93 1082.97 9847.91 1083.07 9863.95 1083.65  9938.7 1083.34
 9951.94 1082.55 9955.27 1082.51 9980.51 1082.27 9988.46 1082.16 9998.99 1082.01
   10000 1082.0610007.55  1082.410071.21 1085.9410078.59 1086.0210101.06 1086.25
10118.21 1086.4410123.84 1086.4910157.83 1086.8110176.47 1086.9910197.44 1087.11
 10229.1 1087.2510237.06 1087.2610261.31 1087.2810276.68 1087.2910281.72 1087.29
10316.29 1087.2110334.35 1087.1710355.91 1087.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9511.88    .044 9722.04    .04910071.21    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9722.0410071.21             1000    1188    1260            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1084.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1084.55  * Reach Len. (ft)         * 1000.00  * 1188.00  * 1260.00  *
* Crit W.S. (ft)          * 1083.92  * Flow Area (sq ft)       *          *  402.26  *          *
* E.G. Slope (ft/ft)      *0.006459  * Area (sq ft)            *          *  402.26  *          *
* Q Total (cfs)           * 1220.00  * Flow (cfs)              *          * 1220.00  *          *
* Top Width (ft)          *  289.63  * Top Width (ft)          *          *  289.63  *          *
* Vel Total (ft/s)        *    3.03  * Avg. Vel. (ft/s)        *          *    3.03  *          *
* Max Chl Dpth (ft)       *    2.54  * Hydr. Depth (ft)        *          *    1.39  *          *
* Conv. Total (cfs)       * 15180.2  * Conv. (cfs)             *          * 15180.2  *          *
* Length Wtd. (ft)        * 1188.00  * Wetted Per. (ft)        *          *  289.77  *          *
* Min Ch El (ft)          * 1082.01  * Shear (lb/sq ft)        *          *    0.56  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.70  *          *
* Frctn Loss (ft)         *    9.99  * Cum Volume (acre-ft)    *          *   78.55  *          *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *          *   30.60  *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1            RS: 1.786

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    9813 1075.38 9854.84 1075.58 9862.89  1075.6 9904.84 1075.84 9912.78 1075.71
 9954.84 1075.41 9974.38 1073.03 9994.18 1070.48 9997.68 1070.03   10000 1070.13
10061.63 1073.3510077.96 1074.2110081.09 1074.0910100.25 1073.3610147.65 1075.63
 10162.2 1076.6810169.74 1076.7510193.93 1076.9910209.66 1077.1510214.57 1077.19
10249.59 1077.4310266.95 1077.5610289.51 1077.6410319.32  1077.810361.84 1077.97
10369.35    107810374.08 1077.9110375.11 1077.8610377.46 1077.8110385.17 1077.62
10412.92 1076.8910420.97 1077.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9813    .044 9954.84    .049 10162.2    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.84 10162.2             1000     956     995            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1074.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.34  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1074.35  * Reach Len. (ft)         * 1000.00  *  956.00  *  995.00  *
* Crit W.S. (ft)          * 1073.62  * Flow Area (sq ft)       *          *  275.08  *          *
* E.G. Slope (ft/ft)      *0.011211  * Area (sq ft)            *          *  275.08  *          *
* Q Total (cfs)           * 1280.00  * Flow (cfs)              *          * 1280.00  *          *
* Top Width (ft)          *  157.25  * Top Width (ft)          *          *  157.25  *          *
* Vel Total (ft/s)        *    4.65  * Avg. Vel. (ft/s)        *          *    4.65  *          *
* Max Chl Dpth (ft)       *    4.32  * Hydr. Depth (ft)        *          *    1.75  *          *
* Conv. Total (cfs)       * 12088.8  * Conv. (cfs)             *          * 12088.8  *          *
```

```
* Length Wtd. (ft)        *  956.00  * Wetted Per. (ft)        *          *  157.67  *          *
* Min Ch El (ft)          * 1070.03  * Shear (lb/sq ft)        *          *    1.22  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    5.68  *          *
* Frctn Loss (ft)         *    8.96  * Cum Volume (acre-ft)    *          *   69.32  *          *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *          *   24.51  *          *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 1.605

INPUT
Description:
Station Elevation Data num= 40

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9486.22 1071.81 9494.57 1071.79 9496.75 1071.79 9517.84 1071.74 9546.97 1071.67
 9549.97 1071.66 9597.18 1071.57 9605.36 1071.56  9647.4 1071.47 9660.75  1071.5
 9697.62 1071.51 9716.15 1071.59 9747.84 1071.68 9771.54 1071.93 9798.05 1072.06
 9826.94 1071.61 9848.27 1071.35 9882.33 1070.45 9898.49 1069.86 9937.72 1068.64
 9948.71 1068.44  9964.4 1066.38 9967.65 1065.96 9984.31 1063.93 9998.31 1062.27
   10000  1062.310045.51 1063.2610074.59 1063.8310077.11 1063.8710089.63 1064.15
 10105.4 1063.8810126.89 1063.5310142.17 1064.6510199.17 1068.3810232.56 1068.56
10249.23 1068.6310280.25 1068.83 10299.3 1069.0310327.95 1069.1910349.36 1069.17
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9486.22    .044 9948.71    .04910199.17    .044
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9948.7110199.17 1375 1383 1380 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1065.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *          *    0.049  *          *
* W.S. Elev (ft)          * 1065.44  * Reach Len. (ft)         * 1375.00  * 1383.00  * 1380.00  *
* Crit W.S. (ft)          * 1064.74  * Flow Area (sq ft)       *          *  330.24  *          *
* E.G. Slope (ft/ft)      *0.008002  * Area (sq ft)            *          *  330.24  *          *
* Q Total (cfs)           * 1330.00  * Flow (cfs)              *          * 1330.00  *          *
* Top Width (ft)          *  182.27  * Top Width (ft)           *          *  182.27  *          *
* Vel Total (ft/s)        *    4.03  * Avg. Vel. (ft/s)         *          *    4.03  *          *
* Max Chl Dpth (ft)       *    3.17  * Hydr. Depth (ft)         *          *    1.81  *          *
* Conv. Total (cfs)       * 14868.3  * Conv. (cfs)              *          * 14868.3  *          *
* Length Wtd. (ft)        * 1383.00  * Wetted Per. (ft)         *          *  182.55  *          *
* Min Ch El (ft)          * 1062.27  * Shear (lb/sq ft)         *          *    0.90  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.64  *          *
* Frctn Loss (ft)         *   10.55  * Cum Volume (acre-ft)     *          *   62.68  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *          *   20.78  *          *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 1.343

INPUT
Description:
Station Elevation Data num= 32

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9869.46 1058.12 9873.77 1058.19 9921.63 1057.94 9923.81 1057.95 9929.78 1057.33
 9995.14 1050.37 9996.57 1050.32   10001 1050.2210007.87 1050.0810056.81 1054.48
10069.43  1055.610073.97 1056.0510119.13  1056.610124.03 1056.6510166.79 1057.25
 10174.1 1057.3210214.45 1057.9110224.16 1058.0310262.11 1058.5610274.22 1058.72
10309.77 1059.1710324.28 1059.3610357.43 1059.6610374.35 1059.8210405.08 1059.92
10424.41 1059.9810452.74 1059.9610474.48 1059.97 10500.4 1059.9410524.54 1059.93
```

10548.06 1059.91 10574.6 1059.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9869.46	.044	9929.78	.04	10073.97	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9929.78	10073.97	1420	1410	1410	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1055.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.		0.049	
W.S. Elev (ft)	1054.78	Reach Len. (ft)	1420.00	1410.00	1410.00
Crit W.S. (ft)		Flow Area (sq ft)		271.83	
E.G. Slope (ft/ft)	0.007269	Area (sq ft)		271.83	
Q Total (cfs)	1310.00	Flow (cfs)		1310.00	
Top Width (ft)	106.37	Top Width (ft)		106.37	
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82	
Max Chl Dpth (ft)	4.70	Hydr. Depth (ft)		2.56	
Conv. Total (cfs)	15364.7	Conv. (cfs)		15364.7	
Length Wtd. (ft)	1410.00	Wetted Per. (ft)		106.82	
Min Ch El (ft)	1050.08	Shear (lb/sq ft)		1.15	
Alpha	1.00	Stream Power (lb/ft s)		5.57	
Frctn Loss (ft)	8.83	Cum Volume (acre-ft)		53.12	
C & E Loss (ft)	0.03	Cum SA (acres)		16.20	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 1.076

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9566.41	1050.35	9577.99	1050.28	9599.9	1050.16	9635.39	1050	9650.27	1049.93
9692.8	1049.73	9700.64	1049.69	9750.2	1049.32	9751.02	1049.32	9756.87	1049.24
9796.53	1048.74	9801.39	1048.69	9807.6	1048.6	9851.76	1047.91	9865	1047.7
9902.13	1047.15	9922.4	1046.89	9967.36	1044.18	9976.99	1043.05	9993.09	1041.17
10000	1041.23	10005.81	1041.3	10013.27	1041.41	10014.86	1041.43	10033.38	1043.8
10080.16	1046.87	10102.9	1047.11	10128.79	1047.41	10152.92	1047.65	10177.42	1047.88
10202.94	1048.11	10226.06	1048.31	10252.96	1048.52	10274.69	1048.71	10302.98	1048.92
10323.32	1049.07	10353	1049.29	10371.96	1049.41	10403.02	1049.62	10420.59	1049.7
10453.04	1049.85	10469.22	1049.86						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9566.41	.044	9922.4	.04	10080.16	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9922.41	10080.16	1445	1447	1430	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1046.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.049	
W.S. Elev (ft)	1046.03	Reach Len. (ft)	1445.00	1447.00	1430.00
Crit W.S. (ft)		Flow Area (sq ft)		318.82	
E.G. Slope (ft/ft)	0.005441	Area (sq ft)		318.82	
Q Total (cfs)	1290.00	Flow (cfs)		1290.00	
Top Width (ft)	130.60	Top Width (ft)		130.60	
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)		4.05	
Max Chl Dpth (ft)	4.86	Hydr. Depth (ft)		2.44	
Conv. Total (cfs)	17487.7	Conv. (cfs)		17487.7	
Length Wtd. (ft)	1447.00	Wetted Per. (ft)		131.06	
Min Ch El (ft)	1041.17	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		3.34	
Frctn Loss (ft)	9.14	Cum Volume (acre-ft)		43.56	
C & E Loss (ft)	0.01	Cum SA (acres)		12.37	

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 0.802

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9674.2	1040.79	9681.54	1040.79	9701.99	1040.77	9734.91	1040.59	9752.08	1040.47
9788.28	1040.03	9802.18	1039.86	9841.65	1039.32	9852.27	1039.17	9895.02	1038.51
9902.37	1038.39	9910.59	1037.75	9922.31	1037.03	9968.14	1034.51	9982.97	1033.28
9989.7	1033.1	10000	1032.83	10009.89	1032.61	10029.05	1034.71	10056.49	1036.95
10078.37	1037.35	10110.24	1037.71	10116.91	1037.81	10133.85	1038.05	10155.46	1038.38
10163.98	1038.48	10194.01	1038.85	10217.73	1039.11	10232.55	1039.27	10270.14	1039.61
10271.1	1039.62	10271.48	1039.62	10309.65	1039.81	10325.23	1039.88	10348.19	1039.88
10378.97	1039.92	10386.74	1039.9						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9674.2	.044	9895.02	.049	10056.49	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9895.02	10056.49	1380	1378	1395	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1037.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.049	
W.S. Elev (ft)	1036.83	Reach Len. (ft)	1380.00	1378.00	1395.00
Crit W.S. (ft)	1035.81	Flow Area (sq ft)		286.19	
E.G. Slope (ft/ft)	0.007438	Area (sq ft)		286.19	
Q Total (cfs)	1270.00	Flow (cfs)		1270.00	
Top Width (ft)	129.16	Top Width (ft)		129.16	
Vel Total (ft/s)	4.44	Avg. Vel. (ft/s)		4.44	
Max Chl Dpth (ft)	4.23	Hydr. Depth (ft)		2.22	
Conv. Total (cfs)	14726.2	Conv. (cfs)		14726.2	
Length Wtd. (ft)	1378.00	Wetted Per. (ft)		129.48	
Min Ch El (ft)	1032.60	Shear (lb/sq ft)		1.03	
Alpha	1.00	Stream Power (lb/ft s)		4.55	
Frctn Loss (ft)	8.63	Cum Volume (acre-ft)		33.51	
C & E Loss (ft)	0.01	Cum SA (acres)		8.05	

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12A (A30)
REACH: REACH 1 RS: 0.541

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9646.49	1031.75	9685.59	1031.62	9687.57	1031.62	9734.69	1031.34	9737.58	1031.32
9783.79	1030.97	9787.59	1030.94	9832.89	1030.71	9837.6	1030.68	9881.99	1030.51
9887.61	1030.5	9931.09	1030.24	9937.61	1030.09	9944.73	1029.06	9967.03	1026.03
9983.74	1023.82	10000	1024.25	10012.84	1024.59	10025.41	1024.95	10056.76	1027.36
10087.64	1029.61	10127.48	1030.05	10137.65	1030.22	10148.2	1030.31	10187.66	1030.6
10225.68	1030.79	10237.67	1030.85	10274.78	1031.04	10287.67	1031.09	10323.88	1031.25
10337.68	1031.31	10372.98	1031.41	10387.69	1031.44	10422.08	1031.53	10437.7	1031.57

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 9646.49    .044 9931.09    .04910087.64    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9931.0910087.64             1395    1394    1380            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1028.49  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.27  * Wt. n-Val.              *          *   0.049  *          *
* W.S. Elev (ft)         * 1028.23  * Reach Len. (ft)         * 1395.00  * 1394.00  * 1380.00  *
* Crit W.S. (ft)         * 1026.87  * Flow Area (sq ft)       *          *  303.39  *          *
* E.G. Slope (ft/ft)     *0.005340  * Area (sq ft)            *          *  303.39  *          *
* Q Total (cfs)          * 1260.00  * Flow (cfs)              *          * 1260.00  *          *
* Top Width (ft)         *  117.82  * Top Width (ft)          *          *  117.82  *          *
* Vel Total (ft/s)       *    4.15  * Avg. Vel. (ft/s)        *          *    4.15  *          *
* Max Chl Dpth (ft)      *    4.41  * Hydr. Depth (ft)        *          *    2.58  *          *
* Conv. Total (cfs)      * 17242.7  * Conv. (cfs)             *          * 17242.7  *          *
* Length Wtd. (ft)       * 1394.00  * Wetted Per. (ft)        *          *  118.25  *          *
* Min Ch El (ft)         * 1023.82  * Shear (lb/sq ft)        *          *    0.86  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    3.55  *          *
* Frctn Loss (ft)        *    9.21  * Cum Volume (acre-ft)    *          *   24.18  *          *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *          *    4.15  *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12A (A30)
REACH: REACH 1            RS: 0.277

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9578.06 1022.87  9599.3 1022.91 9601.83 1022.91 9649.34 1022.84 9649.91 1022.83
 9663.74  1022.8 9697.99 1022.71 9699.39  1022.7 9746.07 1022.44 9749.43 1022.42
 9794.15 1022.11 9799.47 1022.02 9842.23 1020.91 9849.51 1020.78  9890.3 1019.57
 9899.55 1019.33 9928.05 1017.78 9960.88 1016.37    9969 1015.83 9998.98 1016.07
   10000 1016.0910020.26 1016.3710043.21  1018.7 10067.6 1020.3110105.37 1020.65
10106.94 1020.6710111.49 1020.7310146.28 1021.2510158.25 1021.4110185.62 1021.74
10211.13 1021.9910224.95 1022.1110264.01 1022.4110264.29 1022.4110265.11 1022.41
10303.63 1022.5810316.89 1022.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9578.06    .044  9890.3    .049 10067.6    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9890.3 10067.6             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1019.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.30  * Wt. n-Val.              *          *   0.049  *          *
* W.S. Elev (ft)         * 1018.97  * Reach Len. (ft)         * 1462.00  * 1462.00  * 1462.00  *
* Crit W.S. (ft)         * 1018.15  * Flow Area (sq ft)       *          *  281.52  *          *
* E.G. Slope (ft/ft)     *0.008428  * Area (sq ft)            *          *  281.52  *          *
* Q Total (cfs)          * 1240.00  * Flow (cfs)              *          * 1240.00  *          *
* Top Width (ft)         *  141.25  * Top Width (ft)          *          *  141.25  *          *
* Vel Total (ft/s)       *    4.40  * Avg. Vel. (ft/s)        *          *    4.40  *          *
* Max Chl Dpth (ft)      *    3.14  * Hydr. Depth (ft)        *          *    1.99  *          *
* Conv. Total (cfs)      * 13506.7  * Conv. (cfs)             *          * 13506.7  *          *
* Length Wtd. (ft)       * 1462.00  * Wetted Per. (ft)        *          *  141.46  *          *
* Min Ch El (ft)         * 1015.83  * Shear (lb/sq ft)        *          *    1.05  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    4.61  *          *
* Frctn Loss (ft)        *    8.34  * Cum Volume (acre-ft)    *          *   14.83  *          *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
```

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 3.308

INPUT
Description: X-Section located at Riggs Road.
Limit of Sudy.
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9765.82	1171.21	9781.66	1170.93	9824.68	1170.97	9841.56	1170.99	9862.09	1170.92
9884.92	1170.77	9907.1	1170.83	9933.41	1170.84	9949.54	1170.81	9970.9	1169.49
9974.54	1169.26	9981.83	1169.18	10000	1168.93	10020.84	1168.95	10030.51	1168.42
10068.57	1165.68	10103.64	1169.13	10121.13	1170.52	10143.51	1170.54	10173.57	1169.56
10200.97	1168.61	10205.69	1168.45	10209.07	1168.34	10250.74	1169.06	10262.29	1169.2
10306.46	1169.89	10332.19	1170.12	10359.28	1170.51	10397.61	1170.91	10409.35	1171.05
10449.08	1171.73	10455.73	1171.77	10457.79	1171.78	10495.74	1171.99	10510.1	1172.08
10535.73	1171.99	10562.42	1171.91	10575.73	1171.81	10614.74	1171.48	10615.73	1171.47
10618.97	1171.45	10655.73	1171.21						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9765.82	.05	9949.54	.04	10121.13	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9949.54 10121.13 1275 1309 1355 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10140	10655.73	1172	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1170.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.043	
W.S. Elev (ft)	1170.48	Reach Len. (ft)	1275.00	1309.00	1355.00
Crit W.S. (ft)	1169.87	Flow Area (sq ft)		345.68	
E.G. Slope (ft/ft)	0.009020	Area (sq ft)		345.68	214.53
Q Total (cfs)	1850.00	Flow (cfs)		1850.00	
Top Width (ft)	377.74	Top Width (ft)		165.63	212.10
Vel Total (ft/s)	5.35	Avg. Vel. (ft/s)		5.35	
Max Chl Dpth (ft)	4.80	Hydr. Depth (ft)		2.09	
Conv. Total (cfs)	19478.6	Conv. (cfs)		19478.6	
Length Wtd. (ft)	1309.00	Wetted Per. (ft)		166.01	
Min Ch El (ft)	1165.68	Shear (lb/sq ft)		1.17	
Alpha	1.00	Stream Power (lb/ft s)		6.28	
Frctn Loss (ft)	11.70	Cum Volume (acre-ft)	22.30	109.63	57.33
C & E Loss (ft)	0.03	Cum SA (acres)	34.30	64.39	52.78

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 3.060

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9713.9	1159.71	9763.89	1159.64	9764.6	1159.64	9768.11	1159.63	9815.3	1159.48
9824.78	1159.44	9865.99	1159.28	9885.67	1159.2	9916.69	1159.07	9978.12	1157.49
10000	1157.03	10000.56	1157.01	10025.85	1156.25	10078.5	1155.28	10079.83	1155.39
10102.18	1157.31	10110.48	1158.04	10133.04	1158.85				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
  9713.9     .05 9916.69    .04310133.04     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9916.6910133.04             1375    1394    1345            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1159.20  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.35  * Wt. n-Val.              *          *   0.043  *         *
* W.S. Elev (ft)         * 1158.85  * Reach Len. (ft)         * 1375.00  * 1394.00  * 1345.00  *
* Crit W.S. (ft)         * 1158.20  * Flow Area (sq ft)       *          *  369.06  *         *
* E.G. Slope (ft/ft)     *0.008849  * Area (sq ft)            *          *  369.06  *         *
* Q Total (cfs)          * 1760.00  * Flow (cfs)              *          * 1760.00  *         *
* Top Width (ft)         *  207.52  * Top Width (ft)          *          *  207.52  *         *
* Vel Total (ft/s)       *    4.77  * Avg. Vel. (ft/s)        *          *    4.77  *         *
* Max Chl Dpth (ft)      *    3.57  * Hydr. Depth (ft)        *          *    1.78  *         *
* Conv. Total (cfs)      * 18710.1  * Conv. (cfs)             *          * 18710.1  *         *
* Length Wtd. (ft)       * 1393.09  * Wetted Per. (ft)        *          *  207.70  *         *
* Min Ch El (ft)         * 1155.28  * Shear (lb/sq ft)        *          *    0.98  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    4.68  *         *
* Frctn Loss (ft)        *   12.80  * Cum Volume (acre-ft)     *   22.30  *   98.89  *   53.99  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *   34.30  *   58.78  *   49.49  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12B (A27)
REACH: REACH 1            RS: 2.796

INPUT
Description:
Station Elevation Data     num=      52
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9458.35 1146.82 9464.69 1146.83 9501.55 1146.93 9514.71 1146.97 9553.28 1147.04
 9564.74 1147.06 9605.01 1147.09 9614.77 1147.09 9656.74 1147.02  9664.8 1147.01
 9708.48 1146.83 9714.82 1146.81 9760.21 1146.51 9764.85 1146.48 9811.94 1146.11
 9814.88 1146.09 9863.68  1145.7 9865.52 1145.64  9865.7 1145.63 9865.84 1145.63
 9866.01 1145.62 9866.23 1145.61 9867.09 1145.59 9869.11 1145.53 9880.16 1145.16
 9918.56 1143.83 9949.79 1143.73  9985.2 1144.18   10000 1144.0110001.31 1143.99
 10003.8 1143.9610011.34 1144.1410066.28 1145.4110100.42 1145.5110117.28 1145.56
10142.62 1145.6410178.01 1143.8710178.92 1143.73 10181.5 1143.4210185.21 1143.06
10190.12 1142.5610203.28 1141.1810204.36 1141.2310269.67 1146.1210270.25 1146.16
10270.26 1146.1610270.28 1146.1610312.74 1146.2710321.28 1146.29 10355.2 1146.33
10372.28 1146.3610397.67 1146.36

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9458.35     .05 9863.68    .04310066.28     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9863.6810066.28             1254    1283    1320            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1012010397.67  1146.5       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1146.40  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.34  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1146.06  * Reach Len. (ft)         * 1254.00  * 1283.00  * 1320.00  *
* Crit W.S. (ft)         * 1145.72  * Flow Area (sq ft)       *    8.03  *  338.54  *   30.59  *
* E.G. Slope (ft/ft)     *0.009573  * Area (sq ft)            *    8.03  *  338.54  *  337.87  *
* Q Total (cfs)          * 1680.00  * Flow (cfs)              *    7.42  * 1611.48  *   61.10  *
* Top Width (ft)         *  449.99  * Top Width (ft)          *   44.83  *  202.60  *  202.56  *
* Vel Total (ft/s)       *    4.45  * Avg. Vel. (ft/s)        *    0.92  *    4.76  *    2.00  *
* Max Chl Dpth (ft)      *    4.88  * Hydr. Depth (ft)        *    0.18  *    1.67  *    0.57  *
* Conv. Total (cfs)      * 17170.5  * Conv. (cfs)             *    75.8  * 16470.2  *   624.4  *
* Length Wtd. (ft)       * 1280.56  * Wetted Per. (ft)        *   44.83  *  202.65  *   53.72  *
* Min Ch El (ft)         * 1143.73  * Shear (lb/sq ft)        *    0.11  *    1.00  *    0.34  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)   *    0.10  *    4.75  *    0.68  *
* Frctn Loss (ft)        *   11.55  * Cum Volume (acre-ft)     *   22.17  *   87.56  *   48.77  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *   33.59  *   52.22  *   46.36  *
```

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 2.553

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9395.58	1134.8	9411.88	1134.75	9418.29	1134.73	9466.04	1134.61	9468.43	1134.61
9498.18	1134.67	9518.56	1134.71	9520.2	1134.71	9568.7	1134.84	9617.05	1135.02
9630.8	1135.17	9631.52	1135.16	9651.56	1134.92	9658.16	1134.83	9661.79	1134.46
9682.68	1134.36	9719.11	1134.14	9736.84	1134.06	9769.25	1133.92	9791	1133.83
9819.39	1133.7	9845.16	1133.59	9869.53	1133.49	9899.32	1133.53	9919.67	1133.54
9937.2	1133.58	9986.61	1132.54	10000	1131.95	10002.94	1131.86	10010.14	1132
10040.1	1132.71	10076.18	1134.09	10081.38	1134.11	10093.38	1134.16	10130.68	1134.33
10157.41	1134.33	10185.18	1134.33	10195.42	1134.31	10219.02	1134.28	10233.43	1134.28
10239.69	1134.28	10271.45	1134.34	10294.19	1134.41	10309.46	1134.48	10344.65	1134.7
10347.47	1134.72	10348.69	1134.73						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9395.58	.05	9937.2	.04	10076.18	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9937.2	10076.18	1290	1352	1330	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1134.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1134.56	Reach Len. (ft)	1290.00	1352.00	1330.00
Crit W.S. (ft)	1134.40	Flow Area (sq ft)	197.44	240.15	61.56
E.G. Slope (ft/ft)	0.008494	Area (sq ft)	197.44	240.15	61.56
Q Total (cfs)	1600.00	Flow (cfs)	432.10	1101.04	66.86
Top Width (ft)	661.92	Top Width (ft)	276.42	138.98	246.52
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)	2.19	4.58	1.09
Max Chl Dpth (ft)	2.70	Hydr. Depth (ft)	0.71	1.73	0.25
Conv. Total (cfs)	17360.3	Conv. (cfs)	4688.4	11946.5	725.4
Length Wtd. (ft)	1337.68	Wetted Per. (ft)	276.43	139.04	246.52
Min Ch El (ft)	1131.86	Shear (lb/sq ft)	0.38	0.92	0.13
Alpha	1.54	Stream Power (lb/ft s)	0.83	4.20	0.14
Frctn Loss (ft)	12.67	Cum Volume (acre-ft)	19.22	79.04	42.72
C & E Loss (ft)	0.02	Cum SA (acres)	28.97	47.19	39.55

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 2.297

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9646.82	1121.95	9680.7	1122.11	9709.48	1121.93	9728.6	1121.82	9759.53	1121.61
9776.49	1121.51	9809.58	1121.28	9824.39	1121.22	9859.63	1121.03	9872.28	1121.01
9909.68	1120.92	9920.18	1120.93	9959.73	1120.93	9976.47	1119.97	9983.22	1119.5
10000	1118.31	10000.56	1118.27	10002.13	1118.16	10007.86	1118.46	10042.2	1120.24
10049.4	1120.61	10053.22	1120.81	10059.88	1121.13	10063.1	1121.14	10109.96	1121.26
10110.43	1121.26	10118.39	1121.29	10157.75	1121.41	10160.05	1121.42	10205.07	1121.51

```
10210.13 1121.53 10252.4 1121.5810260.22 1121.6410299.72 1121.73 10310.3 1121.81
10347.04 1121.9810360.25 1122.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9646.82     .05 9959.73    .04310059.88     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.7310059.88             1400    1378    1340             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1122.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.42  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1121.70  * Reach Len. (ft)         * 1400.00  * 1378.00  * 1340.00  *
* Crit W.S. (ft)          * 1121.70  * Flow Area (sq ft)       *  114.87  *  206.51  *   62.59  *
* E.G. Slope (ft/ft)      *0.010706  * Area (sq ft)            *  114.87  *  206.51  *   62.59  *
* Q Total (cfs)           * 1510.00  * Flow (cfs)              *  233.58  * 1194.90  *   81.52  *
* Top Width (ft)          *  540.83  * Top Width (ft)          *  213.60  *  100.15  *  227.08  *
* Vel Total (ft/s)        *    3.93  * Avg. Vel. (ft/s)        *    2.03  *    5.79  *    1.30  *
* Max Chl Dpth (ft)       *    3.54  * Hydr. Depth (ft)        *    0.54  *    2.06  *    0.28  *
* Conv. Total (cfs)       * 14593.4  * Conv. (cfs)             *  2257.4  * 11548.2  *   787.8  *
* Length Wtd. (ft)        * 1377.65  * Wetted Per. (ft)        *  213.60  *  100.32  *  227.08  *
* Min Ch El (ft)          * 1118.16  * Shear (lb/sq ft)        *    0.36  *    1.38  *    0.18  *
* Alpha                   *    1.76  * Stream Power (lb/ft s)   *    0.73  *    7.96  *    0.24  *
* Frctn Loss (ft)         *   11.30  * Cum Volume (acre-ft)    *   14.59  *   72.11  *   40.83  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)          *   21.72  *   43.48  *   32.32  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 2S3WS12B (A27)
REACH: REACH 1            RS: 2.036

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9697.95  1110.5 9723.26 1110.43  9741.9 1110.34 9773.82 1110.28 9785.86 1110.23
 9824.38 1110.16 9833.19 1109.59 9840.79 1109.41 9843.51 1109.41 9847.35 1109.42
  9853.1 1109.42 9866.27 1109.13 9896.33 1109.68 9906.52 1109.55 9911.09 1109.52
 9914.33 1109.59 9916.44 1109.65 9918.04 1109.69 9918.59  1109.7 9921.24 1109.74
  9922.5 1109.75    9923 1109.76  9938.5 1109.51 9942.39 1109.44 9944.88 1109.38
 9948.37 1109.29 9953.55 1109.15   10000 1107.8710003.11 1107.7810007.15 1107.88
10041.37 1108.5810077.19 1109.7810093.56 1109.7510127.75 1109.7310137.52 1109.75
10178.31 1109.8310181.47 1109.84 10202.5 1109.9110225.43 1109.9910228.87 1110.04
10269.38 1110.1610279.43 1110.2510313.34 1110.4110324.27 1110.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9697.95     .05  9922.5    .04310077.19     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9922.510077.19              1285    1341    1305             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1110.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1110.48  * Reach Len. (ft)         * 1285.00  * 1341.00  * 1305.00  *
* Crit W.S. (ft)          * 1110.11  * Flow Area (sq ft)       *  117.87  *  264.49  *  124.21  *
* E.G. Slope (ft/ft)      *0.006393  * Area (sq ft)            *  117.87  *  264.49  *  124.21  *
* Q Total (cfs)           * 1420.00  * Flow (cfs)              *  186.38  * 1044.68  *  188.95  *
* Top Width (ft)          *  614.24  * Top Width (ft)          *  217.09  *  154.69  *  242.46  *
```

```
* Vel Total (ft/s)        *    2.80  * Avg. Vel. (ft/s)        *    1.58  *    3.95  *    1.52  *
* Max Chl Dpth (ft)       *    2.70  * Hydr. Depth (ft)        *    0.54  *    1.71  *    0.51  *
* Conv. Total (cfs)       * 17759.9  * Conv. (cfs)             *  2331.0  * 13065.8  *  2363.2  *
* Length Wtd. (ft)        * 1329.38  * Wetted Per. (ft)        *  217.12  *  154.74  *  242.47  *
* Min Ch El (ft)          * 1107.78  * Shear (lb/sq ft)        *    0.22  *    0.68  *    0.20  *
* Alpha                   *    1.54  * Stream Power (lb/ft s)  *    0.34  *    2.69  *    0.31  *
* Frctn Loss (ft)         *   11.53  * Cum Volume (acre-ft)    *   10.85  *   64.66  *   37.95  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   14.79  *   39.45  *   25.10  *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12B (A27)
REACH: REACH 1            RS: 1.782

INPUT
Description:
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9707.89 1098.75  9729.1 1098.55 9757.89 1098.37 9779.36 1098.28 9807.89 1098.19
 9829.63 1098.14 9857.89 1098.09 9879.89  1098.1 9907.89 1098.08 9935.59 1098.12
 9967.57 1097.38 9970.68 1097.21 9975.47    1097 9982.34 1096.68 9997.43  1095.9
   10000 1095.9810014.57 1096.4310057.89 1098.3210080.95 1098.3810107.89 1098.43
10159.15    109610178.42  1095.210199.07 1096.8910234.02 1098.57 10268.7 1097.17
10276.13 1096.5310293.22 1094.8910293.27 1094.8910357.89 1098.81

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9707.89     .05 9935.59    .04310057.89     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.5910057.89             1310    1336    1315            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
   1010710357.89    1099       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1099.12  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.37  * Wt. n-Val.              *   0.050   *   0.043   *   0.050   *
* W.S. Elev (ft)          * 1098.75  * Reach Len. (ft)         * 1310.00   * 1336.00   * 1315.00   *
* Crit W.S. (ft)          * 1098.72  * Flow Area (sq ft)       *  114.93   *  198.00   *   18.04   *
* E.G. Slope (ft/ft)      *0.012740  * Area (sq ft)            *  114.93   *  198.00   *  467.79   *
* Q Total (cfs)           * 1340.00  * Flow (cfs)              *  244.70   * 1064.27   *   31.03   *
* Top Width (ft)          *  648.52  * Top Width (ft)          *  227.27   *  122.30   *  298.94   *
* Vel Total (ft/s)        *    4.05  * Avg. Vel. (ft/s)        *    2.13   *    5.38   *    1.72   *
* Max Chl Dpth (ft)       *    3.86  * Hydr. Depth (ft)        *    0.51   *    1.62   *    0.37   *
* Conv. Total (cfs)       * 11871.9  * Conv. (cfs)             *  2168.0   *  9429.0   *   274.9   *
* Length Wtd. (ft)        * 1333.29  * Wetted Per. (ft)        *  227.27   *  122.39   *   49.11   *
* Min Ch El (ft)          * 1095.90  * Shear (lb/sq ft)        *    0.40   *    1.29   *    0.29   *
* Alpha                   *    1.45  * Stream Power (lb/ft s)  *    0.86   *    6.92   *    0.50   *
* Frctn Loss (ft)         *   11.79  * Cum Volume (acre-ft)    *    7.42   *   57.54   *   29.08   *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *    8.24   *   35.18   *   16.99   *
*****************************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S3WS12B (A27)
REACH: REACH 1            RS: 1.529

INPUT
Description:
```

```
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9706.32 1088.18 9733.73 1088.06  9758.7 1087.93 9783.78 1087.81 9811.09 1087.68
 9833.83 1087.56 9863.48 1087.39 9883.88 1087.29 9915.87 1087.19 9944.53 1085.77
  9946.4  1085.6 9948.97 1085.38 9954.25 1084.98 9963.21 1084.34 9970.29 1083.82
 9982.36 1084.46   10000  1085.110041.67 1086.1410046.36 1085.7310065.53 1084.62
10082.78 1085.2510119.37 1086.6210136.44 1087.3810144.98  1087.410187.35 1087.49
 10187.7 1087.4910189.47 1087.4910230.41 1087.5810238.27  1087.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9706.32     .05 9915.87    .04310136.44     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.8710136.44             1280    1294    1290             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1087.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1087.07  * Reach Len. (ft)         * 1280.00  * 1294.00 * 1290.00  *
* Crit W.S. (ft)          * 1086.42  * Flow Area (sq ft)       *          *   334.03 *          *
* E.G. Slope (ft/ft)      *0.006366  * Area (sq ft)            *          *   334.03 *          *
* Q Total (cfs)           * 1250.00  * Flow (cfs)              *          *  1250.00 *          *
* Top Width (ft)          *  211.01  * Top Width (ft)          *          *   211.01 *          *
* Vel Total (ft/s)        *    3.74  * Avg. Vel. (ft/s)        *          *     3.74 *          *
* Max Chl Dpth (ft)       *    3.25  * Hydr. Depth (ft)        *          *     1.58 *          *
* Conv. Total (cfs)       * 15666.2  * Conv. (cfs)             *          *  15666.2 *          *
* Length Wtd. (ft)        * 1293.98  * Wetted Per. (ft)        *          *   211.25 *          *
* Min Ch El (ft)          * 1083.82  * Shear (lb/sq ft)        *          *     0.63 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     2.35 *          *
* Frctn Loss (ft)         *   10.14  * Cum Volume (acre-ft)    *    5.69  *    49.38 *    22.02 *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    4.82  *    30.07 *    12.48 *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12B (A27)
REACH: REACH 1            RS: 1.284

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9619.43  1077.1 9626.84 1077.06 9661.55 1076.92 9728.86 1074.76 9739.08 1074.53
 9768.35 1075.59 9811.68 1076.96 9837.64 1076.97 9861.73 1076.98 9887.89 1076.97
 9911.77 1076.95  9940.1 1076.93 9974.39 1075.93 9982.29 1075.51 9999.19 1074.52
   10000 1074.5410009.81 1074.8910062.36 1076.7410082.73 1076.6910112.77 1076.63
10127.39 1076.6310175.09 1074.7110177.32  1074.610179.95 1074.4710181.98 1074.56
10186.89 1074.7810261.35 1076.5810264.02 1076.58   10306 1076.5910314.43  1076.6
10339.88 1074.0610365.77 1071.6410379.45 1073.0910427.07 1075.8310429.84 1075.74
10444.25 1075.2810455.02 1074.9410483.13 1075.8810499.11 1076.4110516.09  1077.1
10529.26 1077.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9619.43     .05  9940.1    .04310261.35     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.110261.35             1475    1621    1470             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev  Permanent
 9619.43    9890    1078       F
   1028010529.26    1078       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1077.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *          *    0.043 *    0.050 *
* W.S. Elev (ft)          * 1076.93  * Reach Len. (ft)         * 1475.00  * 1621.00 * 1470.00  *
```

Crit W.S. (ft)	1076.52	Flow Area (sq ft)		338.93	6.51
E.G. Slope (ft/ft)	0.009951	Area (sq ft)	179.94	338.93	446.64
Q Total (cfs)	1220.00	Flow (cfs)		1210.44	9.56
Top Width (ft)	724.32	Top Width (ft)	152.50	321.25	250.57
Vel Total (ft/s)	3.53	Avg. Vel. (ft/s)		3.57	1.47
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)		1.06	0.35
Conv. Total (cfs)	12229.8	Conv. (cfs)		12134.0	95.9
Length Wtd. (ft)	1570.80	Wetted Per. (ft)		321.42	18.65
Min Ch El (ft)	1074.47	Shear (lb/sq ft)		0.66	0.22
Alpha	1.02	Stream Power (lb/ft s)		2.34	0.32
Frctn Loss (ft)	13.47	Cum Volume (acre-ft)	3.05	39.39	15.41
C & E Loss (ft)	0.00	Cum SA (acres)	2.58	22.16	8.77

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 0.977

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9693.64	1064.87	9713.11	1064.86	9733.81	1064.86	9763.63	1064.84	9783.81	1064.83
9814.15	1064.8	9833.81	1064.76	9864.67	1064.69	9883.82	1064.62	9915.19	1064.46
9933.82	1064.35	9972.25	1062.39	10000	1061.14	10000.77	1061.11	10014.28	1061.75
10026.9	1062.42	10056.32	1063.61	10085.4	1063.53	10121.25	1062.06	10139.6	1061.6
10156.07	1060.98	10157.04	1060.94	10166.83	1060.81	10166.95	1060.81	10167.27	1060.81
10170.79	1060.77	10183.15	1060.64	10214.96	1062.67	10238.23	1064.29	10269.45	1064.53

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9693.64	.05	9933.82	.04	10056.32	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.82	10056.32	1380	1410	1370	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1063.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.		0.043	0.050
W.S. Elev (ft)	1063.46	Reach Len. (ft)	1380.00	1410.00	1370.00
Crit W.S. (ft)	1062.78	Flow Area (sq ft)		118.57	224.20
E.G. Slope (ft/ft)	0.007434	Area (sq ft)		118.57	224.20
Q Total (cfs)	1180.00	Flow (cfs)		391.63	788.37
Top Width (ft)	240.78	Top Width (ft)		101.47	139.31
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)		3.30	3.52
Max Chl Dpth (ft)	2.82	Hydr. Depth (ft)		1.17	1.61
Conv. Total (cfs)	13686.1	Conv. (cfs)		4542.3	9143.8
Length Wtd. (ft)	1396.47	Wetted Per. (ft)		101.58	139.45
Min Ch El (ft)	1061.10	Shear (lb/sq ft)		0.54	0.75
Alpha	1.00	Stream Power (lb/ft s)		1.79	2.62
Frctn Loss (ft)	11.71	Cum Volume (acre-ft)		30.87	4.09
C & E Loss (ft)	0.02	Cum SA (acres)		14.30	2.19

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 0.710

INPUT

Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9445.95	1053.82	9449.11	1053.84	9452.17	1053.85	9452.51	1053.85	9497.45	1053.99
9502.81	1054.01	9542.74	1054.03	9553.12	1054.04	9588.02	1054.02	9603.43	1054.03
9633.31	1054	9653.73	1053.99	9678.59	1053.96	9704.04	1053.92	9723.88	1053.89
9754.35	1053.83	9769.16	1053.78	9804.65	1053.64	9814.45	1053.58	9854.96	1053.29
9859.73	1053.25	9902.81	1052.84	9905.02	1052.81	9905.26	1052.81	9950.3	1052.36
9959.1	1051.83	9968.75	1051.01	9998.34	1048.32	10000	1048.36	10035.12	1049.28
10055.1	1049.87	10081.58	1050.78	10107.1	1051.74	10147.75	1049.69	10169.25	1048.72
10194.53	1051.02	10198.58	1051.42	10200.91	1051.65	10202.36	1051.8	10214.85	1052.51
10257.38	1052.84	10258.67	1052.85	10258.87	1052.85	10302.5	1053.05	10309.47	1053.08
10346.32	1053.15	10360.06	1053.17	10390.15	1053.19	10410.65	1053.22	10433.97	1053.25
10461.24	1053.3	10477.79	1053.32	10511.84	1053.39	10521.62	1053.4	10562.43	1053.44
10565.44	1053.44								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9445.95	.05	9950.3	.04	10214.85	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9950.3	10214.85	1520	1558	1550	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10107.1	10565.44	1052	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1051.91	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.36	Wt. n-Val.		0.043		
W.S. Elev (ft)	1051.55	Reach Len. (ft)	1520.00	1558.00	1550.00	
Crit W.S. (ft)	1051.02	Flow Area (sq ft)		238.35		
E.G. Slope (ft/ft)	0.009573	Area (sq ft)		366.88		
Q Total (cfs)	1150.00	Flow (cfs)		1150.00		
Top Width (ft)	228.62	Top Width (ft)		228.62		
Vel Total (ft/s)	4.82	Avg. Vel. (ft/s)		4.82		
Max Chl Dpth (ft)	3.23	Hydr. Depth (ft)		1.71		
Conv. Total (cfs)	11753.8	Conv. (cfs)		11753.8		
Length Wtd. (ft)	1558.00	Wetted Per. (ft)		139.82		
Min Ch El (ft)	1048.32	Shear (lb/sq ft)		1.02		
Alpha	1.00	Stream Power (lb/ft s)		4.92		
Frctn Loss (ft)	9.43	Cum Volume (acre-ft)		23.02	0.57	
C & E Loss (ft)	0.03	Cum SA (acres)		8.96		

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 2S3WS12B (A27)
REACH: REACH 1 RS: 0.415

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9667.67	1044.5	9682.22	1044.5	9730.52	1044.33	9733.12	1044.32	9744.15	1044.25
9784.01	1043.97	9793.38	1043.9	9834.91	1043.52	9856.23	1043.33	9885.81	1043.06
9919.08	1042.92	9936.7	1042.81	9981.46	1038.45	9990.65	1037.84	10000	1038.15
10006.96	1038.38	10008.4	1038.4	10019.72	1039.19	10076.98	1043.49	10089.39	1043.59
10107.64	1043.73	10140.29	1043.96	10170.5	1044.07	10191.19	1044.16	10233.35	1044.15
10242.08	1044.15								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9667.67	.05	9936.7	.04	10076.98	.05

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9936.710076.98             1150    1146    1110            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1042.45  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.25  * Wt. n-Val.              *          *    0.043 *         *
* W.S. Elev (ft)         * 1042.21  * Reach Len. (ft)         * 1150.00  * 1146.00  * 1110.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  281.53  *         *
* E.G. Slope (ft/ft)     *0.004129  * Area (sq ft)            *          *  281.53  *         *
* Q Total (cfs)          * 1120.00  * Flow (cfs)              *          * 1120.00  *         *
* Top Width (ft)         *  117.05  * Top Width (ft)          *          *  117.05  *         *
* Vel Total (ft/s)       *    3.98  * Avg. Vel. (ft/s)         *          *    3.98  *         *
* Max Chl Dpth (ft)      *    4.37  * Hydr. Depth (ft)         *          *    2.41  *         *
* Conv. Total (cfs)      * 17430.0  * Conv. (cfs)             *          * 17430.0  *         *
* Length Wtd. (ft)       * 1146.00  * Wetted Per. (ft)        *          *  117.40  *         *
* Min Ch El (ft)         * 1037.84  * Shear (lb/sq ft)        *          *    0.62  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    2.46  *         *
* Frctn Loss (ft)        *    8.88  * Cum Volume (acre-ft)     *          *   11.42  *    0.57 *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)           *          *    2.78  *         *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S3WS12B (A27)
REACH: REACH 1            RS: 0.198

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9619.25 1035.03 9628.91 1035.08 9658.49 1035.22 9678.91  1035.3 9708.49 1035.39
 9728.91 1035.41 9758.49 1035.44 9778.91 1035.39 9808.49 1035.31 9828.91 1035.19
 9858.49 1034.94 9878.91 1034.72 9908.49 1034.38 9928.91 1034.22 9976.73 1031.52
 9988.61 1030.22   10000 1030.0910008.73 1030.0210015.74 1029.8910033.66 1031.48
 10054.8 1033.3610067.84 1034.1310110.28 1034.7210110.83 1034.7310113.81 1034.78
10153.81 1035.41 10161.1 1035.5310196.79    103610211.93 1036.1810233.82 1036.33
10262.75 1036.5610282.76 1036.6310313.58 1036.6810325.74 1036.68 10364.4 1036.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9619.25     .05 9928.91    .04310067.84     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9928.9110067.84             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1033.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.74  * Wt. n-Val.              *          *    0.043 *         *
* W.S. Elev (ft)         * 1032.78  * Reach Len. (ft)         * 1045.00  * 1045.00  * 1045.00  *
* Crit W.S. (ft)         * 1032.69  * Flow Area (sq ft)       *          *  157.52  *         *
* E.G. Slope (ft/ft)     *0.020196  * Area (sq ft)            *          *  157.52  *         *
* Q Total (cfs)          * 1090.00  * Flow (cfs)              *          * 1090.00  *         *
* Top Width (ft)         *   93.94  * Top Width (ft)          *          *   93.94  *         *
* Vel Total (ft/s)       *    6.92  * Avg. Vel. (ft/s)         *          *    6.92  *         *
* Max Chl Dpth (ft)      *    2.89  * Hydr. Depth (ft)         *          *    1.68  *         *
* Conv. Total (cfs)      *  7669.9  * Conv. (cfs)             *          *  7669.9  *         *
* Length Wtd. (ft)       * 1045.00  * Wetted Per. (ft)        *          *   94.17  *         *
* Min Ch El (ft)         * 1029.89  * Shear (lb/sq ft)        *          *    2.11  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *   14.59  *         *
* Frctn Loss (ft)        *    7.94  * Cum Volume (acre-ft)     *          *    5.65  *    0.57 *
* C & E Loss (ft)        *    0.12  * Cum SA (acres)           *          *         *         *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
```

CROSS SECTION

RIVER: 2S2WS7C (A32)
REACH: REACH 1 RS: 1.475

INPUT
Description: Approximately 750' upstream of Rainbow Valley Rd.
Limit of Sudy.
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9517.54	1055.23	9523.85	1055.26	9529.27	1055.28	9532.2	1055.28	9582.27	1055.35
9613.94	1055.3	9635.27	1055.26	9674.59	1055.15	9688.27	1055.11	9695.68	1055.09
9741.27	1054.95	9777.42	1054.78	9794.27	1054.69	9825.33	1054.55	9847.27	1054.46
9859.16	1054.43	9900.27	1054.3	9940.9	1054.26	9953.27	1054.25	9967.85	1053.27
9973.78	1052.77	9992.42	1051.22	9998.64	1050.72	10000	1050.78	10002.03	1050.87
10057.88	1054.55	10090.18	1054.59	10109.63	1054.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9517.54	.044	9953.27	.049	10057.88	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.27	10057.88	1280	1318	1245	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1054.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.044	0.049	
W.S. Elev (ft)	1054.54	Reach Len. (ft)	1280.00	1318.00	1245.00
Crit W.S. (ft)		Flow Area (sq ft)	22.69	204.52	
E.G. Slope (ft/ft)	0.003644	Area (sq ft)	22.69	204.52	
Q Total (cfs)	600.00	Flow (cfs)	14.87	585.13	
Top Width (ft)	228.92	Top Width (ft)	124.52	104.40	
Vel Total (ft/s)	2.64	Avg. Vel. (ft/s)	0.66	2.86	
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)	0.18	1.96	
Conv. Total (cfs)	9940.0	Conv. (cfs)	246.3	9693.7	
Length Wtd. (ft)	1317.52	Wetted Per. (ft)	124.52	104.66	
Min Ch El (ft)	1050.72	Shear (lb/sq ft)	0.04	0.44	
Alpha	1.15	Stream Power (lb/ft s)	0.03	1.27	
Frctn Loss (ft)	9.05	Cum Volume (acre-ft)	0.33	30.97	0.00
C & E Loss (ft)	0.02	Cum SA (acres)	1.83	15.18	0.53

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7C (A32)
REACH: REACH 1 RS: 1.226

INPUT
Description: Approximately 600' downstream of Rainbow Valley Rd.
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9752.31	1045.49	9797.31	1045.67	9814.97	1045.71	9849.24	1045.76	9887.09	1045.74
9901.16	1045.72	9937.35	1045.62	9953.08	1045.58	9961.62	1045.04	9966.82	1044.73
9986.14	1043.64	10000	1042.84	10002.54	1042.71	10009.21	1042.96	10054.99	1045.53
10066.73	1045.52	10105.14	1045.55	10113.25	1045.55	10155.29	1045.53	10159.78	1045.54
10205.44	1045.54	10206.3	1045.54	10217.33	1045.57	10252.83	1045.64	10255.59	1045.65
10299.35	1045.78	10305.74	1045.79	10345.87	1045.9	10355.9	1045.92	10392.4	1046.06
10406.05	1046.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9752.31	.044	9953.08	.049	10054.99	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.08	10054.99	1350	1383	1355	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1045.59	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.37	Wt. n-Val.		0.049		
W.S. Elev (ft)	1045.21	Reach Len. (ft)	1350.00	1383.00	1355.00	
Crit W.S. (ft)	1044.94	Flow Area (sq ft)		116.54		
E.G. Slope (ft/ft)	0.018609	Area (sq ft)		116.54		
Q Total (cfs)	570.00	Flow (cfs)		570.00		
Top Width (ft)	90.50	Top Width (ft)		90.50		
Vel Total (ft/s)	4.89	Avg. Vel. (ft/s)		4.89		
Max Chl Dpth (ft)	2.50	Hydr. Depth (ft)		1.29		
Conv. Total (cfs)	4178.4	Conv. (cfs)		4178.4		
Length Wtd. (ft)	1383.00	Wetted Per. (ft)		90.64		
Min Ch El (ft)	1042.71	Shear (lb/sq ft)		1.49		
Alpha	1.00	Stream Power (lb/ft s)		7.31		
Frctn Loss (ft)	9.18	Cum Volume (acre-ft)		26.11	0.00	
C & E Loss (ft)	0.08	Cum SA (acres)		12.24	0.53	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7C (A32)
REACH: REACH 1 RS: 0.964

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9569.19	1037.44	9584.84	1037.53	9585.96	1037.53	9590.78	1037.54	9636.82	1037.56
9647.44	1037.55	9687.69	1037.48	9710.03	1037.37	9738.56	1037.22	9772.63	1036.99
9789.43	1036.88	9835.22	1036.64	9840.3	1036.62	9862.34	1036.53	9891.17	1036.4
9897.82	1036.38	9942.04	1036.28	9979.58	1034.01	10000	1032.85	10003.1	1032.68
10015.75	1033.53	10027.41	1034.34	10073.03	1036.22	10093.27	1036.23	10110.82	1036.27
10143.39	1036.33	10157.63	1036.36	10193.52	1036.45	10204.44	1036.47	10243.64	1036.55
10251.25	1036.57	10293.77	1036.71	10298.06	1036.69	10343.89	1036.66	10344.87	1036.66
10358.58	1036.66	10391.67	1036.66	10394.02	1036.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9569.19	.044	9942.04	.049	10073.03	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9942.04 10073.03 1230 1257 1225 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1036.32	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.09	Wt. n-Val.		0.049	0.044	
W.S. Elev (ft)	1036.23	Reach Len. (ft)	1230.00	1257.00	1225.00	
Crit W.S. (ft)	1034.99	Flow Area (sq ft)		218.15	0.08	
E.G. Slope (ft/ft)	0.003230	Area (sq ft)		218.15	0.08	
Q Total (cfs)	530.00	Flow (cfs)		530.00	0.00	
Top Width (ft)	148.16	Top Width (ft)		130.14	18.02	
Vel Total (ft/s)	2.43	Avg. Vel. (ft/s)		2.43	0.05	
Max Chl Dpth (ft)	3.55	Hydr. Depth (ft)		1.68	0.00	
Conv. Total (cfs)	9325.7	Conv. (cfs)		9325.6	0.1	
Length Wtd. (ft)	1257.00	Wetted Per. (ft)		130.34	18.02	
Min Ch El (ft)	1032.68	Shear (lb/sq ft)		0.34	0.00	
Alpha	1.00	Stream Power (lb/ft s)		0.82	0.00	
Frctn Loss (ft)	8.42	Cum Volume (acre-ft)		20.80	0.00	
C & E Loss (ft)	0.03	Cum SA (acres)		8.73	0.25	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

```
RIVER: 2S2WS7C (A32)
REACH: REACH 1            RS: 0.726

INPUT
Description:
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9857.63 1028.26 9888.23 1028.22 9907.63 1028.17 9937.46 1028.18 9960.26 1027.26
 9962.38 1027.21 9964.77 1027.16 9967.25 1027.12 9978.77  1026.7 9983.03 1026.47
   10000  1025.410003.74 1025.1710030.19 1026.4410058.92 1028.2110072.93 1028.19
10110.04 1028.1510115.11 1028.1410139.02 1028.0910157.28 1028.0410161.15 1028.04
10199.45 1027.9310212.26  1027.910241.62 1027.8510263.37 1027.8210283.79 1027.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9857.63    .044 9937.46    .04910058.92    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.4610058.92             1180    1252    1200             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1027.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.38  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1027.49  * Reach Len. (ft)         * 1180.00  * 1252.00  * 1200.00  *
* Crit W.S. (ft)          * 1027.32  * Flow Area (sq ft)       *          *  101.30  *          *
* E.G. Slope (ft/ft)      *0.023542  * Area (sq ft)            *          *  101.30  *          *
* Q Total (cfs)           *  500.00  * Flow (cfs)              *          *  500.00  *          *
* Top Width (ft)          *   92.59  * Top Width (ft)          *          *   92.59  *          *
* Vel Total (ft/s)        *    4.94  * Avg. Vel. (ft/s)        *          *    4.94  *          *
* Max Chl Dpth (ft)       *    2.32  * Hydr. Depth (ft)        *          *    1.09  *          *
* Conv. Total (cfs)       *  3258.8  * Conv. (cfs)             *          *  3258.8  *          *
* Length Wtd. (ft)        * 1252.00  * Wetted Per. (ft)        *          *   92.72  *          *
* Min Ch El (ft)          * 1025.17  * Shear (lb/sq ft)        *          *    1.61  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    7.93  *          *
* Frctn Loss (ft)         *    9.09  * Cum Volume (acre-ft)    *          *   16.19  *          *
* C & E Loss (ft)         *    0.09  * Cum SA (acres)          *          *    5.52  *          *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7C (A32)
REACH: REACH 1            RS: 0.488

INPUT
Description:
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9821.54 1020.12 9837.17 1020.19 9844.02 1020.19 9887.17 1019.91 9894.93 1019.87
 9937.18 1019.68 9960.39 1018.18 9968.69 1017.63 9987.85 1016.38   10000 1015.59
10003.41 1015.38 10016.6 1015.9910044.25 1017.2610077.46 1019.5210091.24 1019.56
10117.45 1019.6610143.56  1019.810157.45 1019.8710195.88 1020.0210197.45 1020.03
10202.54 1020.0510237.44 1020.24 10248.2 1020.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9821.54    .044 9937.18    .04910077.46    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.1810077.46             1115    1211    1155             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1018.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1018.60  * Reach Len. (ft)         * 1115.00  * 1211.00  * 1155.00  *
```

* Crit W.S. (ft)	* 1017.43	* Flow Area (sq ft)	*	* 186.19	*
* E.G. Slope (ft/ft)	*0.003298	* Area (sq ft)	*	* 186.19	*
* Q Total (cfs)	* 460.00	* Flow (cfs)	*	* 460.00	*
* Top Width (ft)	* 110.01	* Top Width (ft)	*	* 110.01	*
* Vel Total (ft/s)	* 2.47	* Avg. Vel. (ft/s)	*	* 2.47	*
* Max Chl Dpth (ft)	* 3.22	* Hydr. Depth (ft)	*	* 1.69	*
* Conv. Total (cfs)	* 8009.6	* Conv. (cfs)	*	* 8009.6	*
* Length Wtd. (ft)	* 1211.00	* Wetted Per. (ft)	*	* 110.20	*
* Min Ch El (ft)	* 1015.38	* Shear (lb/sq ft)	*	* 0.35	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.86	*
* Frctn Loss (ft)	* 9.06	* Cum Volume (acre-ft)	*	* 12.06	*
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	*	* 2.61	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7C (A32)
REACH: REACH 1 RS: 0.259

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9753.59	1013.75	9783.62	1013.58	9791.93	1013.51	9834.46	1013.03	9841.94	1013.05
9885.29	1012.36	9891.95	1012.21	9936.13	1011.13	9941.96	1010.96	9960.51	1009.79
9994.36	1007.6	10000	1007.63	10015.45	1007.72	10024.72	1007.77	10049.46	1009.13
10077.9	1010.71	10083.71	1011.02	10086.24	1011.15	10091.98	1011.53	10139.47	1012.07
10141.98	1012.11	10190.31	1012.53	10191.99	1012.54	10241.14	1012.84	10241.99	1012.85
10291.98	1012.86	10292	1012.86	10293.39	1012.86	10342.01	1012.71	10342.81	1012.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9753.59	.044	9936.13	.049	10091.98	.044

Bank Sta: Left Right Coeff Contr. Expan.
9936.13 10091.98 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1009.59	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.50	* Wt. n-Val.	*	* 0.049	*
* W.S. Elev (ft)	* 1009.10	* Reach Len. (ft)	* 1368.00	* 1368.00	* 1368.00
* Crit W.S. (ft)	* 1009.10	* Flow Area (sq ft)	*	* 76.14	*
* E.G. Slope (ft/ft)	*0.035627	* Area (sq ft)	*	* 76.14	*
* Q Total (cfs)	* 430.00	* Flow (cfs)	*	* 430.00	*
* Top Width (ft)	* 77.62	* Top Width (ft)	*	* 77.62	*
* Vel Total (ft/s)	* 5.65	* Avg. Vel. (ft/s)	*	* 5.65	*
* Max Chl Dpth (ft)	* 1.50	* Hydr. Depth (ft)	*	* 0.98	*
* Conv. Total (cfs)	* 2278.1	* Conv. (cfs)	*	* 2278.1	*
* Length Wtd. (ft)	* 1368.00	* Wetted Per. (ft)	*	* 77.70	*
* Min Ch El (ft)	* 1007.60	* Shear (lb/sq ft)	*	* 2.18	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 12.31	*
* Frctn Loss (ft)	* 4.72	* Cum Volume (acre-ft)	*	* 8.41	*
* C & E Loss (ft)	* 0.11	* Cum SA (acres)	*	*	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS7A (A52)

REACH: REACH 1 RS: 5.079

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 20

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9745.21	1189.3	9779.99	1189.2	9795.81	1189.16	9839.88	1188.99	9846.4	1188.96
9881.92	1188.79	9897	1188.72	9899.77	1188.71	9947.6	1188.5	9985.64	1186.72
10000	1186.01	10000.22	1186	10009.12	1186.48	10048.23	1188.47	10065.03	1188.53
10098.24	1188.66	10114.05	1188.74	10148.25	1188.91	10163.07	1188.98	10198.26	1189.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9745.21	.044	9947.6	.049	10048.23	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.6	10048.23	1240	1278	1230	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1189.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1189.11	Reach Len. (ft)	1240.00	1278.00	1230.00
Crit W.S. (ft)		Flow Area (sq ft)	40.97	186.12	47.27
E.G. Slope (ft/ft)	0.003683	Area (sq ft)	40.97	186.12	47.27
Q Total (cfs)	600.00	Flow (cfs)	37.47	515.70	46.84
Top Width (ft)	378.75	Top Width (ft)	137.46	100.63	140.66
Vel Total (ft/s)	2.19	Avg. Vel. (ft/s)	0.91	2.77	0.99
Max Chl Dpth (ft)	3.10	Hydr. Depth (ft)	0.30	1.85	0.34
Conv. Total (cfs)	9886.6	Conv. (cfs)	617.3	8497.5	771.8
Length Wtd. (ft)	1275.02	Wetted Per. (ft)	137.46	100.75	140.66
Min Ch El (ft)	1186.00	Shear (lb/sq ft)	0.07	0.42	0.08
Alpha	1.41	Stream Power (lb/ft s)	0.06	1.18	0.08
Frctn Loss (ft)	10.80	Cum Volume (acre-ft)	5.42	24.10	1.16
C & E Loss (ft)	0.06	Cum SA (acres)	12.50	13.29	5.16

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 1 RS: 4.837

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9576.36	1180.06	9597.99	1179.94	9639.35	1179.77	9648.97	1179.72	9687.86	1179.57
9699.94	1179.53	9702.93	1179.52	9750.91	1179.32	9766.51	1179.26	9801.89	1179.1
9830.09	1178.99	9852.86	1178.89	9893.67	1178.75	9903.83	1178.71	9944.94	1178.62
9953.18	1178.61	9955.83	1178.49	9956.65	1178.41	9959.55	1178.15	9995.18	1175
10000	1175.34	10038.18	1177.8	10056.08	1178.84	10059.63	1178.86	10088.85	1178.99
10106.45	1179.08	10149.46	1179.28	10156.81	1179.31	10194.37	1179.48	10207.18	1179.54
10239.29	1179.67	10257.55	1179.73	10284.2	1179.81	10307.91	1179.87	10329.11	1179.91
10358.28	1179.96	10374.03	1179.96	10408.65	1179.98	10418.94	1179.98	10459.02	1179.98
10463.86	1179.98								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9576.36	.044	9944.94	.049	10056.08	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9944.94	10056.08	1265	1286	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1178.36	Element	Left OB	Channel	Right OB

* Vel Head (ft)	*	0.68	* Wt. n-Val.	*		*	0.049	*	*
* W.S. Elev (ft)	*	1177.68	* Reach Len. (ft)	*	1265.00	*	1286.00	*	1250.00 *
* Crit W.S. (ft)	*	1177.68	* Flow Area (sq ft)	*		*	95.01	*	*
* E.G. Slope (ft/ft)	*	0.032775	* Area (sq ft)	*		*	95.01	*	*
* Q Total (cfs)	*	630.00	* Flow (cfs)	*		*	630.00	*	*
* Top Width (ft)	*	71.38	* Top Width (ft)	*		*	71.38	*	*
* Vel Total (ft/s)	*	6.63	* Avg. Vel. (ft/s)	*		*	6.63	*	*
* Max Chl Dpth (ft)	*	2.68	* Hydr. Depth (ft)	*		*	1.33	*	*
* Conv. Total (cfs)	*	3479.9	* Conv. (cfs)	*		*	3479.9	*	*
* Length Wtd. (ft)	*	1285.01	* Wetted Per. (ft)	*		*	71.58	*	*
* Min Ch El (ft)	*	1175.00	* Shear (lb/sq ft)	*		*	2.72	*	*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	18.01	*	*
* Frctn Loss (ft)	*	8.60	* Cum Volume (acre-ft)	*	4.83	*	19.98	*	0.50 *
* C & E Loss (ft)	*	0.19	* Cum SA (acres)	*	10.54	*	10.77	*	3.18 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 1 RS: 4.594

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9403.53	1169.93	9410.71	1169.89	9414.6	1169.88	9417.09	1169.87	9468.26	1169.72
9504.94	1169.66	9521.91	1169.64	9548.55	1169.6	9575.57	1169.57	9592.79	1169.55
9629.22	1169.5	9680.64	1169.43	9682.88	1169.42	9684.13	1169.4	9684.78	1169.4
9686.07	1169.39	9687.35	1169.39	9766.88	1169	9770.12	1169	9774.28	1169
9774.62	1169	9774.97	1169	9795.65	1169.03	9815.54	1169.06	9838.34	1169.04
9843.84	1169.03	9856.35	1168.99	9897.5	1168.84	9944.2	1168.67	9951.15	1168.65
9954.67	1168.57	9957.85	1168.53	9999.44	1168	10000	1168.01	10014.12	1168.17
10045.14	1168.54	10055.49	1168.64	10063.47	1168.34	10073.8	1167.91	10120	1166
10127.12	1166.56	10137.79	1167.36	10142.89	1167.74	10146.15	1167.97	10148.4	1168.36
10177.8	1169.04	10208.28	1169.14	10228.87	1169.21	10259.21	1169.31	10271.53	1169.32
10310.14	1169.41	10314.19	1169.42	10335.05	1169.47	10356.85	1169.52	10361.07	1169.53
10399.51	1169.62	10412	1169.66	10442.17	1169.72	10462.94	1169.76	10484.83	1169.8
10513.87	1169.86	10527.49	1169.88						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9403.53	.044	9944.2	.049	10177.8	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9944.2	10177.8	1040	987	1020	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1169.33	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.05	* Wt. n-Val.	*	0.044	*	0.049	*	0.044 *
* W.S. Elev (ft)	*	1169.27	* Reach Len. (ft)	*	1040.00	*	987.00	*	1020.00 *
* Crit W.S. (ft)	*	1168.47	* Flow Area (sq ft)	*	68.27	*	307.70	*	8.50 *
* E.G. Slope (ft/ft)	*	0.002883	* Area (sq ft)	*	68.27	*	307.70	*	8.50 *
* Q Total (cfs)	*	660.00	* Flow (cfs)	*	54.61	*	601.72	*	3.67 *
* Top Width (ft)	*	539.78	* Top Width (ft)	*	232.98	*	233.60	*	73.20 *
* Vel Total (ft/s)	*	1.72	* Avg. Vel. (ft/s)	*	0.80	*	1.96	*	0.43 *
* Max Chl Dpth (ft)	*	3.27	* Hydr. Depth (ft)	*	0.29	*	1.32	*	0.12 *
* Conv. Total (cfs)	*	12292.0	* Conv. (cfs)	*	1017.1	*	11206.5	*	68.4 *
* Length Wtd. (ft)	*	994.52	* Wetted Per. (ft)	*	232.98	*	233.78	*	73.20 *
* Min Ch El (ft)	*	1166.00	* Shear (lb/sq ft)	*	0.05	*	0.24	*	0.02 *
* Alpha	*	1.20	* Stream Power (lb/ft s)	*	0.04	*	0.46	*	0.01 *

```
* Frctn Loss (ft)        *    7.71  * Cum Volume (acre-ft)   *    3.84  *   14.04  *    0.37  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *    7.16  *    6.27  *    2.13  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 1 RS: 4.407

INPUT
Description:
Station Elevation Data num= 70

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
  9404.1 1161.88 9440.11 1161.79 9442.83 1161.79 9446.37 1161.78 9500.29 1161.68
 9522.04 1160.97 9526.66 1160.86 9532.91  1160.7 9544.62 1160.39 9559.81 1160.01
 9560.04    1160 9568.88 1160.29 9574.97 1160.51  9615.2  1161.5  9643.1 1161.46
 9672.65 1161.41 9711.21 1161.36 9730.11 1161.34  9744.6 1161.33 9787.57 1161.29
 9843.62 1161.22 9845.02 1161.21 9846.09 1161.21 9902.48 1161.13 9947.59 1161.03
 9955.47 1161.01 9961.76  1160.8 9963.17 1160.89 9965.68 1160.82 9974.89 1160.59
 9998.21    1160   10000 1160.0210008.23 1160.0610021.39 1160.14   10069 1161.03
10071.39 1161.0310078.23 1161.0510110.64  1161.110130.24 1160.4710135.42 1160.34
10144.08 1160.1210173.61  1159.710181.67 1159.39 10190.3  1158.5 10201.5 1158.54
10216.39 1159.2310267.62 1161.4110280.88 1161.4310306.86 1161.4510333.85 1161.45
10346.11 1161.4410381.15 1161.4210385.35 1161.4210386.82 1161.42 10424.6 1161.36
10439.79 1161.3510463.84 1161.3510492.76 1161.3610503.08 1161.3810532.61 1161.45
10542.33 1161.4710545.73 1161.4710581.57  1161.6 10598.7 1161.6510620.82 1161.73
10651.67  1161.810660.06 1161.8210684.07 1161.8510699.31 1161.8710704.64 1161.87
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9404.1    .044 9947.59    .04910267.62    .044
```

Bank Sta: Left Right Coeff Contr. Expan.
9947.5910267.62 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1161.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.21  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1161.40  * Reach Len. (ft)         * 1453.00  * 1453.00  * 1453.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  111.86  *  355.29  *    3.70  *
* E.G. Slope (ft/ft)     *0.014057  * Area (sq ft)            *  111.86  *  355.29  *    3.70  *
* Q Total (cfs)          * 1640.00  * Flow (cfs)              *  268.41  * 1370.03  *    1.56  *
* Top Width (ft)         *  794.63  * Top Width (ft)          *  366.52  *  319.71  *  108.40  *
* Vel Total (ft/s)       *    3.48  * Avg. Vel. (ft/s)        *    2.40  *    3.86  *    0.42  *
* Max Chl Dpth (ft)      *    2.90  * Hydr. Depth (ft)        *    0.31  *    1.11  *    0.03  *
* Conv. Total (cfs)      * 13832.3  * Conv. (cfs)             *  2263.9  * 11555.3  *    13.1  *
* Length Wtd. (ft)       * 1453.00  * Wetted Per. (ft)        *  366.56  *  319.87  *  108.40  *
* Min Ch El (ft)         * 1158.50  * Shear (lb/sq ft)        *    0.27  *    0.97  *    0.03  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)  *    0.64  *    3.76  *    0.01  *
* Frctn Loss (ft)        *   12.78  * Cum Volume (acre-ft)    *    1.69  *    6.52  *    0.23  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *          *          *          *
*****************************************************************************************************
```

Warning: Divided flow computed for this cross-section.
Warning: A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 4 RS: 4.292

INPUT
Description: X-section located at Riggs Road.
Station Elevation Data num= 28

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*****************************************************************************
 9689.21 1157.97 9698.37 1157.99 9704.03 1157.87 9735.37 1157.75 9743.94 1157.66
 9753.93 1157.58 9800.72 1157.46 9840.83  1157.3 9858.81  1157.1 9891.66 1156.73
 9941.37 1156.11 9945.16 1156.07 9978.39 1157.03 9984.95 1156.85 9998.42 1154.11
   10000 1154.2710000.39 1154.3110025.78 1156.8610058.92 1156.8310073.32  1156.9
   10107 1157.0110131.28 1157.21 10168.1 1157.4310185.47  1157.610234.32 1157.93
10236.38    115810243.54 1157.9810252.46 1158.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9689.21    .044 9978.39    .04910025.78    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.3910025.78              860     871     835            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1157.75  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.               *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1157.42  * Reach Len. (ft)          *  860.00  *  871.00  *  835.00  *
* Crit W.S. (ft)          * 1157.38  * Flow Area (sq ft)        *  106.04  *   82.20  *   53.95  *
* E.G. Slope (ft/ft)      *0.017518  * Area (sq ft)             *  106.04  *   82.20  *   53.95  *
* Q Total (cfs)           *  950.00  * Flow (cfs)               *  349.16  *  473.54  *  127.29  *
* Top Width (ft)          *  355.74  * Top Width (ft)           *  167.69  *   47.39  *  140.67  *
* Vel Total (ft/s)        *    3.92  * Avg. Vel. (ft/s)         *    3.29  *    5.76  *    2.36  *
* Max Chl Dpth (ft)       *    3.31  * Hydr. Depth (ft)         *    0.63  *    1.73  *    0.38  *
* Conv. Total (cfs)       *  7177.6  * Conv. (cfs)              *  2638.1  *  3577.8  *   961.8  *
* Length Wtd. (ft)        *  866.87  * Wetted Per. (ft)         *  167.71  *   47.81  *  140.67  *
* Min Ch El (ft)          * 1154.11  * Shear (lb/sq ft)         *    0.69  *    1.88  *    0.42  *
* Alpha                   *    1.38  * Stream Power (lb/ft s)   *    2.28  *   10.83  *    0.99  *
* Frctn Loss (ft)         *    7.07  * Cum Volume (acre-ft)     *   20.15  *   50.60  *    5.03  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)           *   22.36  *   25.66  *    9.17  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 4            RS: 4.127

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9630.69 1151.55 9630.87 1151.55 9655.81 1151.72  9689.5 1151.49 9727.77 1151.39
 9739.31 1151.35 9751.57 1150.54 9757.22 1150.12 9774.01 1148.86 9798.83 1147.43
 9829.37 1149.58  9842.6  1150.7 9848.16 1151.15 9849.29 1151.23 9850.03 1151.29
 9853.34 1151.52 9855.13 1151.52 9859.31 1151.16 9863.07 1150.88 9891.25 1148.91
 9904.34    1148 9905.36 1148.11 9908.98    1148 9925.41    1148 9978.16    1148
 9986.75    1148 9989.76    1148   10000    114810000.34    114810021.07 1149.32
10071.09 1151.9910117.62 1152.0810122.75 1152.0910137.37 1152.1210174.41 1152.18
10187.42 1152.2110226.07 1152.2810257.22 1152.3510277.73 1152.3810327.02 1152.47
 10329.4 1152.4710336.15 1152.48

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9630.69    .044 9853.34    .04910071.09    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9853.3410071.09              1220    1247    1220            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 9630.69 9853.34  1152.5       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1150.64  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.               *          *   0.049  *          *
* W.S. Elev (ft)          * 1150.47  * Reach Len. (ft)          *  1220.00 *  1247.00 *  1220.00 *
* Crit W.S. (ft)          * 1149.47  * Flow Area (sq ft)        *          *  331.02  *          *
```

* E.G. Slope (ft/ft)	*0.004999	*	Area (sq ft)	*	139.91	*	331.02	*		*
* Q Total (cfs)	* 1090.00	*	Flow (cfs)	*		*	1090.00	*		*
* Top Width (ft)	* 261.21	*	Top Width (ft)	*	87.44	*	173.77	*		*
* Vel Total (ft/s)	* 3.29	*	Avg. Vel. (ft/s)	*		*	3.29	*		*
* Max Chl Dpth (ft)	* 3.04	*	Hydr. Depth (ft)	*		*	1.90	*		*
* Conv. Total (cfs)	* 15415.7	*	Conv. (cfs)	*		*	15415.7	*		*
* Length Wtd. (ft)	* 1238.09	*	Wetted Per. (ft)	*		*	173.93	*		*
* Min Ch El (ft)	* 1148.00	*	Shear (lb/sq ft)	*		*	0.59	*		*
* Alpha	* 1.00	*	Stream Power (lb/ft s)	*		*	1.96	*		*
* Frctn Loss (ft)	* 8.52	*	Cum Volume (acre-ft)	*	17.72	*	46.47	*	4.51	*
* C & E Loss (ft)	* 0.01	*	Cum SA (acres)	*	19.84	*	23.45	*	7.82	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 4 RS: 3.891

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9421.1	1143.22	9425.8	1143.22	9477.53	1143.24	9479.45	1143.24	9482.47	1143.24
9533.1	1143.22	9565.36	1143.16	9586.75	1143.11	9620.33	1143.01	9640.41	1142.96
9653.19	1142.92	9694.06	1142.8	9741.03	1142.68	9747.71	1142.66	9751.5	1142.54
9752.75	1142.52	9754.77	1142.49	9766.62	1142.01	9826.11	1140	9827.37	1139.96
9853.66	1139	9886.63	1141.17	9898.39	1141.91	9901.93	1142.02	9903.87	1142.15
9908.67	1142.47	9943.76	1142.48	9986.16	1140.25	10000	1139.25	10003.51	1139
10049.82	1141.65	10061.29	1142.38	10065.64	1142.61	10070.93	1142.41	10104.15	1141
10117.31	1141.43	10166.81	1142.87	10182.24	1142.91	10217.39	1143.02	10241.96	1143.07
10267.97	1143.15	10301.68	1143.22	10318.55	1143.26	10361.4	1143.33	10369.13	1143.35
10411.95	1143.39	10419.72	1143.41	10421.12	1143.4	10470.3	1143.42	10480.84	1143.41
10520.88	1143.39	10540.56	1143.37	10571.46	1143.34				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9421.1	.044	9943.76	.049	10065.64	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9943.76	10065.64	1505	1534	1475	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1142.11	*	Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	* 0.24	*	Wt. n-Val.	*	0.044	*	0.049	*	0.044 *
* W.S. Elev (ft)	* 1141.87	*	Reach Len. (ft)	*	1505.00	*	1534.00	*	1475.00 *
* Crit W.S. (ft)	* 1141.37	*	Flow Area (sq ft)	*	179.57	*	135.75	*	20.81 *
* E.G. Slope (ft/ft)	*0.009478	*	Area (sq ft)	*	179.57	*	135.75	*	20.81 *
* Q Total (cfs)	* 1280.00	*	Flow (cfs)	*	743.40	*	497.82	*	38.78 *
* Top Width (ft)	* 273.54	*	Top Width (ft)	*	126.94	*	97.88	*	48.72 *
* Vel Total (ft/s)	* 3.81	*	Avg. Vel. (ft/s)	*	4.14	*	3.67	*	1.86 *
* Max Chl Dpth (ft)	* 2.87	*	Hydr. Depth (ft)	*	1.41	*	1.39	*	0.43 *
* Conv. Total (cfs)	* 13147.7	*	Conv. (cfs)	*	7635.9	*	5113.4	*	398.4 *
* Length Wtd. (ft)	* 1523.94	*	Wetted Per. (ft)	*	127.08	*	98.05	*	48.75 *
* Min Ch El (ft)	* 1139.00	*	Shear (lb/sq ft)	*	0.84	*	0.82	*	0.25 *
* Alpha	* 1.05	*	Stream Power (lb/ft s)	*	3.46	*	3.00	*	0.47 *
* Frctn Loss (ft)	* 10.89	*	Cum Volume (acre-ft)	*	13.25	*	39.78	*	4.22 *
* C & E Loss (ft)	* 0.01	*	Cum SA (acres)	*	16.84	*	19.56	*	7.14 *

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 4 RS: 3.601

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9371.41	1132.74	9373.94	1132.72	9389.51	1132.62	9425.59	1132.36	9428.4	1132.34
9430.53	1132.32	9482.85	1131.96	9526.32	1131.67	9537.31	1131.6	9551.79	1131.52
9591.77	1131.32	9622.11	1131.19	9646.22	1131.09	9677.99	1130.97	9700.68	1130.89
9717.9	1130.83	9755.13	1130.7	9804.19	1130.56	9809.59	1130.55	9846	1130.47
9864.05	1130.45	9909.48	1130.41	9918.5	1130.4	9923.26	1130.2	9928.16	1129.94
9952.36	1128.97	9991.33	1127.32	10000	1127.05	10001.37	1127	10013.45	1127.6
10075.63	1130.63	10093.1	1130.68	10125.93	1130.78	10138.4	1130.81	10176.24	1130.92
10206.5	1129.91	10232.34	1129	10251.36	1129.93	10268.05	1130.75	10271.72	1131.04
10273.91	1131.11	10276.84	1131.21	10319.61	1131.37	10327.15	1131.41	10364.92	1131.57
10377.45	1131.64	10410.22	1131.79	10427.75	1131.89	10455.52	1132.03	10478.06	1132.14
10500.83	1132.24	10528.36	1132.34	10546.13	1132.39	10578.66	1132.43	10591.43	1132.43
10628.97	1132.39	10636.74	1132.37						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9371.41	.044	9909.48	.049	10075.63	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9909.48	10075.63	1430	1410	1340	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10175	10636.74	1132	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1131.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1130.99	Reach Len. (ft)	1430.00	1410.00	1340.00
Crit W.S. (ft)	1130.07	Flow Area (sq ft)	85.34	361.24	21.80
E.G. Slope (ft/ft)	0.005796	Area (sq ft)	85.34	361.24	119.77
Q Total (cfs)	1530.00	Flow (cfs)	110.83	1398.79	20.38
Top Width (ft)	599.34	Top Width (ft)	237.70	166.15	195.50
Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)	1.30	3.87	0.94
Max Chl Dpth (ft)	3.99	Hydr. Depth (ft)	0.36	2.17	0.22
Conv. Total (cfs)	20096.4	Conv. (cfs)	1455.7	18373.0	267.7
Length Wtd. (ft)	1412.11	Wetted Per. (ft)	237.70	166.31	99.37
Min Ch El (ft)	1127.00	Shear (lb/sq ft)	0.13	0.79	0.08
Alpha	1.30	Stream Power (lb/ft s)	0.17	3.04	0.07
Frctn Loss (ft)	10.35	Cum Volume (acre-ft)	8.67	31.03	1.84
C & E Loss (ft)	0.00	Cum SA (acres)	10.54	14.91	3.01

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 4 RS: 3.334

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9571.3	1120.72	9572.61	1120.72	9592.09	1120.73	9622.62	1120.74	9641.41	1120.75
9672.62	1120.77	9690.73	1120.78	9745.84	1118.36	9750.68	1118	9767.68	1118.69
9784.57	1119.35	9795.33	1119.75	9822.64	1120.93	9873.4	1119.37	9884.42	1119
9892.06	1119.43	9922.65	1121.09	9958.13	1119.76	10000	1118.11	10002.64	1118
10043.41	1119.94	10072.66	1121.21	10085.26	1121.21	10122.67	1121.22	10134.58	1121.21
10172.67	1121.18	10183.89	1121.16	10222.68	1121.08	10233.21	1121.05	10272.68	1120.95

```
10282.53 1120.9310322.69 1120.8710331.85 1120.8610372.69 1120.8410381.16 1120.85
 10422.7 1120.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
  9571.3    .044 9922.65    .04910072.66    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9922.6510072.66             1420    1472    1425             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
  9571.3 9822.64  1121.5       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1120.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *   0.044  *    0.049  *         *
* W.S. Elev (ft)          * 1120.63  * Reach Len. (ft)         * 1420.00  * 1472.00  * 1425.00  *
* Crit W.S. (ft)          * 1120.27  * Flow Area (sq ft)       *   65.54  *  160.81  *         *
* E.G. Slope (ft/ft)      *0.012183  * Area (sq ft)            *  222.26  *  160.81  *         *
* Q Total (cfs)           *  850.00  * Flow (cfs)              *  210.99  *  639.01  *         *
* Top Width (ft)          *  327.18  * Top Width (ft)          *  202.98  *  124.21  *         *
* Vel Total (ft/s)        *    3.76  * Avg. Vel. (ft/s)        *    3.22  *    3.97  *         *
* Max Chl Dpth (ft)       *    2.63  * Hydr. Depth (ft)        *    0.80  *    1.29  *         *
* Conv. Total (cfs)       *  7700.9  * Conv. (cfs)             *  1911.6  *  5789.4  *         *
* Length Wtd. (ft)        * 1465.35  * Wetted Per. (ft)        *   81.66  *  124.32  *         *
* Min Ch El (ft)          * 1118.00  * Shear (lb/sq ft)        *    0.61  *    0.98  *         *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    1.97  *    3.91  *         *
* Frctn Loss (ft)         *   11.99  * Cum Volume (acre-ft)    *    3.62  *   22.58  *         *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *    3.31  *   10.21  *         *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 4            RS: 3.055

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9571.89 1110.39 9587.66  1110.5 9614.35  1110.6 9638.35  1110.7 9675.18 1110.69
 9689.04  1110.7 9736.01 1110.46 9739.73 1110.45 9758.35 1110.31 9790.42 1110.08
 9796.83 1110.03 9841.11 1109.66 9857.66 1109.54  9891.8 1109.29 9928.96 1107.16
 9940.32 1106.61 9958.26 1106.44  9973.3 1106.31 9992.52 1106.11   10000 1106.08
10004.24 1106.0610010.48 1106.4910046.41 1108.9610064.15 1108.9710100.04 1109.05
10102.79 1109.0610109.88 1109.0710141.43 1109.1410153.67 1109.1610180.07 1109.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9571.89    .044  9891.8    .04910046.41    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9891.810046.41             1365    1463    1380             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1108.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *          *    0.049  *         *
* W.S. Elev (ft)          * 1108.68  * Reach Len. (ft)         * 1365.00  * 1463.00  * 1380.00  *
* Crit W.S. (ft)          * 1107.79  * Flow Area (sq ft)       *          *  241.63  *         *
* E.G. Slope (ft/ft)      *0.005760  * Area (sq ft)            *          *  241.63  *         *
* Q Total (cfs)           *  800.00  * Flow (cfs)              *          *  800.00  *         *
* Top Width (ft)          *  139.89  * Top Width (ft)          *          *  139.89  *         *
* Vel Total (ft/s)        *    3.31  * Avg. Vel. (ft/s)        *          *    3.31  *         *
* Max Chl Dpth (ft)       *    2.62  * Hydr. Depth (ft)        *          *    1.73  *         *
* Conv. Total (cfs)       * 10540.9  * Conv. (cfs)             *          * 10540.9  *         *
```

```
* Length Wtd. (ft)        * 1463.00  * Wetted Per. (ft)        *          * 140.04  *          *
* Min Ch El (ft)          * 1106.06  * Shear (lb/sq ft)        *          *   0.62  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   2.05  *          *
* Frctn Loss (ft)         *   11.49  * Cum Volume (acre-ft)    *          *  15.78  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *          *   5.75  *          *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 4            RS: 2.778

INPUT
Description:
Station Elevation Data    num=      27
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
 9719.24 1097.88 9722.83  1097.9 9767.85 1098.15 9773.01 1098.18 9822.62 1098.35
 9823.18 1098.35 9829.29 1098.34 9873.36 1098.24  9877.4 1098.23 9923.53 1098.21
 9932.17 1098.18 9995.16 1095.36   10000 1095.0410002.91 1094.8310008.63 1094.38
10038.21 1095.97 10054.7 1096.8610074.04 1097.8610081.74 1097.8710154.67 1095.63
10158.09 1095.5410203.98 1097.2710212.63  1097.610216.12 1097.7310224.54 1097.95
10267.36 1097.91 10274.7 1097.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9719.24    .044 9923.53    .04910224.54    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9923.5310224.54            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10224.54 10274.7    1099       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1097.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1097.17  * Reach Len. (ft)         * 1500.00  * 1500.00 * 1500.00  *
* Crit W.S. (ft)          * 1096.73  * Flow Area (sq ft)       *          *  218.05 *          *
* E.G. Slope (ft/ft)      *0.011658  * Area (sq ft)            *          *  218.05 *          *
* Q Total (cfs)           *  750.00  * Flow (cfs)              *          *  750.00 *          *
* Top Width (ft)          *  202.31  * Top Width (ft)          *          *  202.31 *          *
* Vel Total (ft/s)        *    3.44  * Avg. Vel. (ft/s)        *          *    3.44 *          *
* Max Chl Dpth (ft)       *    2.79  * Hydr. Depth (ft)        *          *    1.08 *          *
* Conv. Total (cfs)       *  6946.3  * Conv. (cfs)             *          *  6946.3 *          *
* Length Wtd. (ft)        * 1500.00  * Wetted Per. (ft)        *          *  202.52 *          *
* Min Ch El (ft)          * 1094.38  * Shear (lb/sq ft)        *          *    0.78 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    2.70 *          *
* Frctn Loss (ft)         *   12.06  * Cum Volume (acre-ft)    *          *    8.06 *          *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *          *         *          *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: A flow split was encountered.  The program first calculated the momentum of both channels
         below the junction.  An energy balance was performed across the junction from the stream with
         the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 3            RS: 2.494

INPUT
```

```
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9576.56 1085.65 9596.86 1085.74 9619.78 1085.85 9647.39    1086 9678.97 1086.17
 9697.93 1086.28 9738.17 1086.38 9748.46 1086.41 9797.36 1086.44 9798.99 1086.44
 9808.48 1086.42 9849.52 1086.32 9856.56 1086.29 9900.06 1086.07 9928.01 1084.94
 9939.63 1084.49 9975.31 1083.25 9983.59 1083.18 9998.57  1082.9   10000 1082.96
10011.18 1083.3610030.92 1084.14   10038 1084.4510055.05 1084.5310071.98 1084.38
 10083.4 1084.0210102.02 1083.4610112.14 1083.8210135.57 1084.3810141.36 1084.41
10145.41 1084.4610168.92 1085.2510204.08 1085.2610211.94 1085.2810254.89 1085.38
10254.96 1085.3810255.34 1085.3810297.98 1085.55 10305.7 1085.58   10341 1085.73
10356.52  1085.810384.02 1085.8710407.33 1085.9410427.04 1085.9410458.15 1085.98
10470.06 1085.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9576.56    .044 9900.06    .04910168.92    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9900.0610168.92             1280    1351    1245            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1085.26  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1085.17  * Reach Len. (ft)        * 1280.00  * 1351.00  * 1245.00  *
* Crit W.S. (ft)          * 1084.61  * Flow Area (sq ft)      *          *   276.54 *          *
* E.G. Slope (ft/ft)      *0.005735  * Area (sq ft)           *          *   276.54 *          *
* Q Total (cfs)           *  690.00  * Flow (cfs)             *          *   690.00 *          *
* Top Width (ft)          *  244.06  * Top Width (ft)         *          *   244.06 *          *
* Vel Total (ft/s)        *    2.50  * Avg. Vel. (ft/s)       *          *     2.50 *          *
* Max Chl Dpth (ft)       *    2.27  * Hydr. Depth (ft)       *          *     1.13 *          *
* Conv. Total (cfs)       *  9111.7  * Conv. (cfs)            *          *   9111.7 *          *
* Length Wtd. (ft)        * 1351.00  * Wetted Per. (ft)       *          *   244.17 *          *
* Min Ch El (ft)          * 1082.90  * Shear (lb/sq ft)       *          *     0.41 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *     1.01 *          *
* Frctn Loss (ft)         *   12.96  * Cum Volume (acre-ft)   *    2.36  *    59.92 *          *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    4.36  *    32.84 *          *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 3            RS: 2.238

INPUT
Description: X-section is approximately 600' upstream of Ocotillo Road.
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9555.61 1074.05 9584.99 1075.55 9593.33 1075.52 9605.08 1075.51 9644.05 1075.47
 9666.21 1075.46 9694.77 1075.44 9727.33 1075.35 9745.49  1075.3 9788.45 1075.08
 9796.21 1075.04    9834 1074.82 9846.92 1074.75 9858.65 1074.12 9914.81 1071.13
  9956.4 1071.07  9977.1 1071.08   10000 1071.09   10002 1071.11 10013.6 1071.87
10051.48 1074.3110061.34 1074.3910092.61  1074.6 10101.2 1074.6610103.91 1074.68
10141.06    107510156.34 1075.1210180.91 1075.3210208.76 1075.5110220.77 1075.59
10258.83  1075.810260.62 1075.8110261.19 1075.8210300.48 1075.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9555.61    .044 9846.92    .04910051.48    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9846.9210051.48             1205    1211    1210            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1072.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.36  * Wt. n-Val.              *          *    0.049 *          *
```

* W.S. Elev (ft)	* 1071.91	* Reach Len. (ft)	* 1205.00	* 1211.00	* 1210.00 *
* Crit W.S. (ft)	* 1071.91	* Flow Area (sq ft)	*	* 82.56	* *
* E.G. Slope (ft/ft)	*0.039359	* Area (sq ft)	*	* 82.56	* *
* Q Total (cfs)	* 400.00	* Flow (cfs)	*	* 400.00	* *
* Top Width (ft)	* 114.20	* Top Width (ft)	*	* 114.20	* *
* Vel Total (ft/s)	* 4.84	* Avg. Vel. (ft/s)	*	* 4.84	* *
* Max Chl Dpth (ft)	* 0.84	* Hydr. Depth (ft)	*	* 0.72	* *
* Conv. Total (cfs)	* 2016.2	* Conv. (cfs)	*	* 2016.2	* *
* Length Wtd. (ft)	* 1211.00	* Wetted Per. (ft)	*	* 114.25	* *
* Min Ch El (ft)	* 1071.07	* Shear (lb/sq ft)	*	* 1.78	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 8.60	* *
* Frctn Loss (ft)	* 7.80	* Cum Volume (acre-ft)	* 2.36	* 54.36	* *
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 4.36	* 27.29	* *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 3 RS: 2.009

INPUT
Description: X-section is approximately 600' downstream of Ocotillo Rd.
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9607.48	1065.93	9611.53	1065.95	9626.12	1065.97	9662.02	1066.04	9684.92	1066
9712.52	1065.97	9743.72	1065.76	9763.01	1065.65	9802.51	1065.27	9813.51	1065.17
9821.79	1065.09	9857.69	1062.53	9886.85	1060.78	9894.87	1061.16	9920.82	1062.38
9932.21	1062.93	9967.65	1063.58	9969.4	1063.39	9972.65	1063.06	9979	1062.4
9995.43	1060.71	9998.38	1060.4	10000	1060.48	10014.35	1061.06	10065.77	1064.32
10074.09	1064.32	10116.1	1064.5	10119.23	1064.5	10146.55	1064.62	10164.38	1064.7
10166.43	1064.71	10209.52	1064.84	10216.75	1064.86	10254.67	1065.03	10267.08	1065.05
10299.81	1065.09								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9607.48	.044	9821.79	.049	10065.77	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9821.79	10065.77	1500	1558	1500	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1063.41	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.06	* Wt. n-Val.	*	* 0.049	* *
* W.S. Elev (ft)	* 1063.35	* Reach Len. (ft)	* 1500.00	* 1558.00	* 1500.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 251.25	* *
* E.G. Slope (ft/ft)	*0.002957	* Area (sq ft)	*	* 251.25	* *
* Q Total (cfs)	* 500.00	* Flow (cfs)	*	* 500.00	* *
* Top Width (ft)	* 189.16	* Top Width (ft)	*	* 189.16	* *
* Vel Total (ft/s)	* 1.99	* Avg. Vel. (ft/s)	*	* 1.99	* *
* Max Chl Dpth (ft)	* 2.95	* Hydr. Depth (ft)	*	* 1.33	* *
* Conv. Total (cfs)	* 9194.4	* Conv. (cfs)	*	* 9194.4	* *
* Length Wtd. (ft)	* 1558.00	* Wetted Per. (ft)	*	* 189.53	* *
* Min Ch El (ft)	* 1060.40	* Shear (lb/sq ft)	*	* 0.24	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.49	* *
* Frctn Loss (ft)	* 12.11	* Cum Volume (acre-ft)	* 2.36	* 49.72	* *
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 4.36	* 23.07	* *

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 3 RS: 1.714

INPUT
Description:
Station Elevation Data num= 22

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9780.38	1053.21	9789.93	1053.22	9815.2	1053.19	9839.98	1053.15	9867.53	1053.01
9890.03	1052.88	9919.86	1052.76	9940.07	1052.69	9987.35	1048.36	9997.63	1047.78
10000	1048.01	10007.48	1048.69	10020.45	1049.87	10027.66	1050.51	10033.44	1051.01
10056.07	1052.41	10090.14	1052.53	10125.14	1052.62	10140.14	1052.68	10175.84	1052.81
10190.15	1052.85	10226.53	1052.94						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9780.38	.044	9940.07	.049	10056.07	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9940.07	10056.07	1600	1668	1600	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1051.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.049	
W.S. Elev (ft)	1050.52	Reach Len. (ft)	1600.00	1668.00	1600.00
Crit W.S. (ft)	1050.52	Flow Area (sq ft)		91.37	
E.G. Slope (ft/ft)	0.031259	Area (sq ft)		91.37	
Q Total (cfs)	620.00	Flow (cfs)		620.00	
Top Width (ft)	63.94	Top Width (ft)		63.94	
Vel Total (ft/s)	6.79	Avg. Vel. (ft/s)		6.79	
Max Chl Dpth (ft)	2.74	Hydr. Depth (ft)		1.43	
Conv. Total (cfs)	3506.8	Conv. (cfs)		3506.8	
Length Wtd. (ft)	1662.72	Wetted Per. (ft)		64.18	
Min Ch El (ft)	1047.78	Shear (lb/sq ft)		2.78	
Alpha	1.00	Stream Power (lb/ft s)		18.85	
Frctn Loss (ft)	10.98	Cum Volume (acre-ft)	2.36	43.59	
C & E Loss (ft)	0.19	Cum SA (acres)	4.36	18.54	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS7A (A52)
REACH: REACH 3 RS: 1.398

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9485.49	1042.5	9510.66	1042.6	9525.75	1042.63	9561.09	1042.67	9583.8	1042.67
9611.52	1042.65	9641.84	1042.53	9661.94	1042.43	9699.89	1042.16	9712.37	1042.07
9757.93	1041.65	9763.28	1041.39	9764.71	1041.33	9765.41	1041.31	9766.25	1041.28
9767.26	1041.26	9772.81	1041.03	9819.7	1039.04	9836.68	1038.23	9846.42	1037.88
9858.47	1038.15	9877.26	1038.66	9885.17	1038.86	9891.42	1039.02	9896.7	1039.14
9900.97	1039.19	9904.2	1039.22	9906.38	1039.3	9941.01	1038.69	9955.88	1037.76

```
 9988.45 1036.82   10000 1036.5210000.76  1036.510005.12 1036.5610008.31 1036.63
10030.38 1037.0510047.71 1037.4310060.57  1037.710067.31 1037.97 10115.8 1040.54
10164.23 1040.7210166.22 1040.7310179.44 1040.7510216.65 1040.8210222.27 1040.83
10267.08 1040.93 10301.5 1041.02

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9485.49    .044 9900.97    .049 10115.8    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9900.97 10115.8             1195    1220    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1039.40  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.044  *    0.049  *         *
* W.S. Elev (ft)          * 1039.33  * Reach Len. (ft)         * 1195.00  * 1220.00  * 1200.00  *
* Crit W.S. (ft)          * 1038.31  * Flow Area (sq ft)       *   67.33  *  290.06  *         *
* E.G. Slope (ft/ft)      *0.003180  * Area (sq ft)            *   67.33  *  290.06  *         *
* Q Total (cfs)           *  760.00  * Flow (cfs)              *  107.15  *  652.85  *         *
* Top Width (ft)          *  280.06  * Top Width (ft)          *   88.08  *  191.98  *         *
* Vel Total (ft/s)        *    2.13  * Avg. Vel. (ft/s)        *    1.59  *    2.25  *         *
* Max Chl Dpth (ft)       *    2.83  * Hydr. Depth (ft)        *    0.76  *    1.51  *         *
* Conv. Total (cfs)       * 13477.1  * Conv. (cfs)             *  1900.1  * 11577.0  *         *
* Length Wtd. (ft)        * 1218.35  * Wetted Per. (ft)        *   88.13  *  192.09  *         *
* Min Ch El (ft)          * 1036.50  * Shear (lb/sq ft)        *    0.15  *    0.30  *         *
* Alpha                   *    1.04  * Stream Power (lb/ft s)   *    0.24  *    0.67  *         *
* Frctn Loss (ft)         *    8.42  * Cum Volume (acre-ft)     *    1.12  *   36.29  *         *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)           *    2.75  *   13.64  *         *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 3            RS: 1.167

INPUT
Description:
Station Elevation Data      num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9839.84 1031.36 9849.96  1031.3 9873.03 1031.76 9902.23 1032.44 9935.47 1032.45
 9970.17 1029.89 9980.84 1028.82   10000 1026.8210001.77 1026.6510002.76 1026.54
 10002.9 1026.5510052.82 1031.8710054.93 1032.0810055.93 1032.19 10059.6 1032.44
10071.31 1032.4910108.29 1032.6810116.68 1032.7110159.13 1032.9610179.08 1033.01
10209.98 1033.1110241.48 1033.1410260.83 1033.1610303.88 1033.1410311.68 1033.14
10346.04 1033.0310362.53 1032.9710366.28 1032.9710413.38 1032.8810428.67 1032.83
10464.23 1032.7210491.07 1032.68

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9839.84    .044 9935.47    .049 10059.6    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.47 10059.6             1500    1562    1510            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1030.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.65  * Wt. n-Val.              *         *    0.049  *         *
* W.S. Elev (ft)          * 1030.27  * Reach Len. (ft)         * 1500.00  * 1562.00  * 1510.00  *
* Crit W.S. (ft)          * 1030.02  * Flow Area (sq ft)       *         *  133.08  *         *
* E.G. Slope (ft/ft)      *0.020461  * Area (sq ft)            *         *  133.08  *         *
* Q Total (cfs)           *  860.00  * Flow (cfs)              *         *  860.00  *         *
* Top Width (ft)          *   72.80  * Top Width (ft)          *         *   72.80  *         *
* Vel Total (ft/s)        *    6.46  * Avg. Vel. (ft/s)        *         *    6.46  *         *
* Max Chl Dpth (ft)       *    3.73  * Hydr. Depth (ft)        *         *    1.83  *         *
* Conv. Total (cfs)       *  6012.3  * Conv. (cfs)             *         *  6012.3  *         *
```

```
* Length Wtd. (ft)       * 1561.91  * Wetted Per. (ft)        *          *   73.19  *          *
* Min Ch El (ft)         * 1026.54  * Shear (lb/sq ft)        *          *    2.32  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   15.01  *          *
* Frctn Loss (ft)        *    8.48  * Cum Volume (acre-ft)    *    0.20  *   30.36  *          *
* C & E Loss (ft)        *    0.17  * Cum SA (acres)          *    1.54  *    9.94  *          *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 3            RS: 0.871

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
  9682.2 1022.87 9691.37 1022.88 9735.91 1022.95 9779.76 1023.08 9789.62 1023.12
 9804.89 1023.05 9843.33 1022.83 9868.15 1022.52 9897.04 1022.17 9941.79 1021.92
 9948.23 1021.88 9952.92 1021.65 9954.72 1021.52 9959.46 1021.19 9999.66 1018.39
   10000 1018.4310012.54  1019.610071.61 1020.4410084.28 1019.1910085.87 1019.03
10131.98 1021.5610155.53 1022.9910204.34 1023.4110205.98 1023.4310216.56  1023.5
10256.42 1023.7810262.59 1023.7810306.87 1023.8810320.83 1023.8910357.32 1023.88
10379.08  1023.910407.76 1023.9310437.32 1023.8210458.21 1023.7210495.57 1023.53
10508.66 1023.6910553.81  1023.5 10559.1 1023.4210593.32 1023.4310609.55 1023.46
10612.06 1023.47   10660 1023.61 10670.3 1023.6710710.44 1024.1410728.55 1024.26

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9682.2    .044 9941.79    .04910155.53    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.7910155.53             1450    1514    1425            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1022.27  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.044  *   0.049  *          *
* W.S. Elev (ft)         * 1022.18  * Reach Len. (ft)         * 1450.00  * 1514.00  * 1425.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *    5.95  *  397.86  *          *
* E.G. Slope (ft/ft)     *0.002689  * Area (sq ft)            *    5.95  *  397.86  *          *
* Q Total (cfs)          *  990.00  * Flow (cfs)              *    2.69  *  987.31  *          *
* Top Width (ft)         *  245.76  * Top Width (ft)          *   45.39  *  200.36  *          *
* Vel Total (ft/s)       *    2.45  * Avg. Vel. (ft/s)        *    0.45  *    2.48  *          *
* Max Chl Dpth (ft)      *    3.79  * Hydr. Depth (ft)        *    0.13  *    1.99  *          *
* Conv. Total (cfs)      * 19090.7  * Conv. (cfs)             *    51.8  * 19038.9  *          *
* Length Wtd. (ft)       * 1513.92  * Wetted Per. (ft)        *   45.40  *  200.70  *          *
* Min Ch El (ft)         * 1018.39  * Shear (lb/sq ft)        *    0.02  *    0.33  *          *
* Alpha                  *    1.02  * Stream Power (lb/ft s)  *    0.01  *    0.83  *          *
* Frctn Loss (ft)        *   10.22  * Cum Volume (acre-ft)    *    0.10  *   20.84  *          *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)          *    0.76  *    5.04  *          *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 3            RS: 0.584

INPUT
Description:
```

```
Station Elevation Data     num=       18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9883.12 1012.47 9901.88 1012.43 9925.71 1012.45 9972.32 1009.64 9987.76 1008.06
 9990.71 1007.78 9998.68 1008.12   10000 1008.1710007.65  1008.510045.37 1011.86
10049.71 1012.2310055.08 1012.5910059.15  1012.610106.33  1012.710125.35  1012.7
10157.59 1012.7110191.54 1012.6610208.85 1012.62

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9883.12    .044 9925.71    .04910055.08    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9925.7110055.08            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1011.97  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.84  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1011.13  * Reach Len. (ft)         * 1605.00  * 1605.00  * 1605.00  *
* Crit W.S. (ft)          * 1011.12  * Flow Area (sq ft)       *          *  152.57  *          *
* E.G. Slope (ft/ft)      *0.028921  * Area (sq ft)            *          *  152.57  *          *
* Q Total (cfs)           * 1120.00  * Flow (cfs)              *          * 1120.00  *          *
* Top Width (ft)          *   89.57  * Top Width (ft)          *          *   89.57  *          *
* Vel Total (ft/s)        *    7.34  * Avg. Vel. (ft/s)        *          *    7.34  *          *
* Max Chl Dpth (ft)       *    3.35  * Hydr. Depth (ft)        *          *    1.70  *          *
* Conv. Total (cfs)       *  6585.9  * Conv. (cfs)             *          *  6585.9  *          *
* Length Wtd. (ft)        * 1605.00  * Wetted Per. (ft)        *          *   89.84  *          *
* Min Ch El (ft)          * 1007.78  * Shear (lb/sq ft)        *          *    3.07  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   22.51  *          *
* Frctn Loss (ft)         *    8.33  * Cum Volume (acre-ft)    *          *   11.28  *          *
* C & E Loss (ft)         *    0.22  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 2            RS: 0.280

INPUT
Description:
Station Elevation Data     num=       39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9689.52 1005.12  9711.9 1005.16 9742.09 1005.19 9789.75 1005.21 9794.66 1005.21
 9804.87 1005.15 9847.23 1004.92 9876.53 1004.63  9899.8 1004.51 9964.45    1000
 9972.66  999.39 9981.53  999.37 9987.69   999.4   10000  999.3810004.97  999.42
 10010.4  999.4510015.75  999.5410017.65  999.5510021.04  999.5410024.11  999.54
10026.02  999.5310028.04  999.5410033.47  999.5410036.31  999.5510080.12 1002.48
10089.33 1002.98 10104.7 1004.0710114.77 1004.1510194.78 1003.94 10204.7 1003.93
10214.59 1003.95 10254.7  1004.6 10264.5 1004.63 10304.7 1004.7510314.41 1004.81
 10354.7 1005.0610364.32 1005.08 10404.7 1005.1410414.23 1005.16

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9689.52    .044  9899.8    .049 10104.7    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9899.8 10104.7                 40      37      40            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1003.42  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1003.30  * Reach Len. (ft)         *   40.00  *   37.00  *   40.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  459.46  *          *
* E.G. Slope (ft/ft)      *0.002257  * Area (sq ft)            *          *  459.46  *          *
* Q Total (cfs)           * 1250.00  * Flow (cfs)              *          * 1250.00  *          *
* Top Width (ft)          *  176.81  * Top Width (ft)          *          *  176.81  *          *
* Vel Total (ft/s)        *    2.72  * Avg. Vel. (ft/s)        *          *    2.72  *          *
```

```
* Max Chl Dpth (ft)      *    3.93  * Hydr. Depth (ft)       *          *    2.60  *          *
* Conv. Total (cfs)      * 26309.2  * Conv. (cfs)            *          * 26309.2  *          *
* Length Wtd. (ft)       *   37.00  * Wetted Per. (ft)       *          *  177.07  *          *
* Min Ch El (ft)         *  999.37  * Shear (lb/sq ft)       *          *    0.37  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    0.99  *          *
* Frctn Loss (ft)        *    0.10  * Cum Volume (acre-ft)   *          *   18.47  *    0.00  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *          *    0.15  *          *
*****************************************************************************************************

CROSS SECTION


RIVER: 2S2WS7A (A52)
REACH: REACH 2            RS: 0.273

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9689.52 1005.12  9711.9 1005.16 9742.09 1005.19 9789.75 1005.21 9794.66 1005.21
 9804.87 1005.15 9847.23 1004.92 9876.53 1004.63  9899.8 1004.51 9964.45    1000
 9972.66  999.39 9981.53  999.37 9987.69   999.4   10000  999.3810004.97  999.42
 10010.4  999.4510015.75  999.5410017.65  999.5510021.04  999.5410024.11  999.54
10026.02  999.5310028.04  999.5410033.47  999.5410036.31  999.5510080.12 1002.48
10089.33 1002.98 10104.7 1004.0710114.77 1004.1510194.78 1003.94 10204.7 1003.93
10214.59 1003.95 10254.7  1004.6 10264.5 1004.63 10304.7 1004.7510314.41 1004.81
 10354.7 1005.0610364.32 1005.08 10404.7 1005.1410414.23 1005.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9689.52    .044  9899.8    .049 10104.7    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9899.8 10104.7            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1003.32  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)         * 1003.17  * Reach Len. (ft)         * 1441.00  * 1441.00  * 1441.00  *
* Crit W.S. (ft)         * 1001.50  * Flow Area (sq ft)       *          *  435.87  *          *
* E.G. Slope (ft/ft)     *0.003048  * Area (sq ft)            *          *  435.87  *          *
* Q Total (cfs)          * 1350.00  * Flow (cfs)              *          * 1350.00  *          *
* Top Width (ft)         *  172.97  * Top Width (ft)          *          *  172.97  *          *
* Vel Total (ft/s)       *    3.10  * Avg. Vel. (ft/s)         *          *    3.10  *          *
* Max Chl Dpth (ft)      *    3.80  * Hydr. Depth (ft)         *          *    2.52  *          *
* Conv. Total (cfs)      * 24451.8  * Conv. (cfs)              *          * 24451.8  *          *
* Length Wtd. (ft)       * 1441.00  * Wetted Per. (ft)         *          *  173.23  *          *
* Min Ch El (ft)         *  999.37  * Shear (lb/sq ft)         *          *    0.48  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    1.48  *          *
* Frctn Loss (ft)        *    6.29  * Cum Volume (acre-ft)     *          *   18.09  *    0.00  *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)           *          *          *          *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

```
CROSS SECTION


RIVER: 1S2WS31 (A56)
REACH: REACH 1            RS: 4.185

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9672.09 1049.07 9681.86 1049.05 9720.95 1048.99 9754.66 1048.88 9772.42  1048.8
 9796.04 1048.69 9823.88 1048.54 9837.42 1048.46 9875.35 1048.24 9885.09 1047.94
 9924.63 1046.61 9932.33 1046.36 9933.43 1046.35 9934.01 1046.35 9935.36 1046.35
 9942.46 1046.36 9983.94  1046.4 9991.59 1046.43   10000 1046.7210008.71 1047.02
10019.04  1047.410023.41 1047.5710041.21 1047.99 10066.6 1048.09 10079.7 1048.14
10084.92 1048.17 10118.2 1048.3610138.73 1048.4810156.69 1048.5710192.55 1048.69
10195.18 1048.6910201.81 1048.6810233.68 1048.6410246.36 1048.6310272.17 1048.54
10300.18 1048.4610310.67 1048.42
```

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9672.09      .05 9875.35     .04310041.21      .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9875.3510041.21               1550    1452    1400            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1047.35  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *           *    0.043  *          *
* W.S. Elev (ft)          * 1047.07  * Reach Len. (ft)         * 1550.00   * 1452.00   * 1400.00  *
* Crit W.S. (ft)          * 1047.07  * Flow Area (sq ft)       *           *   54.66   *          *
* E.G. Slope (ft/ft)      *0.032840  * Area (sq ft)            *           *   54.66   *          *
* Q Total (cfs)           *  230.00  * Flow (cfs)              *           *  230.00   *          *
* Top Width (ft)          *   99.22  * Top Width (ft)          *           *   99.22   *          *
* Vel Total (ft/s)        *    4.21  * Avg. Vel. (ft/s)        *           *    4.21   *          *
* Max Chl Dpth (ft)       *    0.72  * Hydr. Depth (ft)        *           *    0.55   *          *
* Conv. Total (cfs)       *  1269.2  * Conv. (cfs)             *           *  1269.2   *          *
* Length Wtd. (ft)        * 1452.00  * Wetted Per. (ft)        *           *   99.25   *          *
* Min Ch El (ft)          * 1046.35  * Shear (lb/sq ft)        *           *    1.13   *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *           *    4.75   *          *
* Frctn Loss (ft)         *    8.75  * Cum Volume (acre-ft)    *    0.01   *   23.72   *    0.84  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *    0.05   *   10.09   *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS31 (A56)
REACH: REACH 1            RS: 3.910

INPUT
Description:
Station Elevation Data     num=     104
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9073.49 1049.91 9087.65 1049.34 9093.28 1049.23 9098.86  1049.2 9128.64 1049.06
 9158.72 1049.06    9164 1049.05 9169.22 1048.98 9199.35 1048.49 9229.79 1048.58
 9234.71 1048.57 9239.58 1048.45 9270.06 1047.62 9300.85 1046.75 9305.42 1046.62
 9309.94 1046.68 9340.77 1046.65 9371.92 1046.35 9376.13 1046.24  9380.3 1046.25
 9411.49 1045.92 9442.99 1045.58 9446.84  1045.5 9450.65 1045.47  9482.2 1045.14
 9514.06 1044.49 9517.55  1044.4 9521.01 1044.33 9524.44 1044.23 9552.91 1043.41
 9581.96 1042.96 9585.13 1042.91 9588.27  1042.8 9591.37 1042.73 9623.62 1042.16
  9656.2  1041.8 9658.98 1041.77 9661.73 1041.76 9694.33 1041.65 9727.27 1040.75
 9729.69 1040.73 9732.09 1040.69 9765.05 1041.08 9798.33 1040.22  9800.4 1040.21
 9802.45 1040.17 9804.47 1040.17 9835.76 1040.12 9867.67 1039.75  9869.4 1039.73
 9871.11 1039.72 9872.81  1039.7 9874.48 1039.67 9906.47 1039.11  9939.1 1038.97
 9940.47 1038.96 9941.83 1038.95 9945.59 1038.86 9952.47 1038.66   10000 1037.29
 10000.3 1037.2810047.89 1036.7210064.77 1036.5310075.59 1036.3510082.92 1036.32
10114.67 1036.3910124.23 1036.3910128.51 1036.4210156.17 1037.7210171.66 1038.44
10224.58  1040.210224.62  1040.210224.63  1040.210224.72  1040.210260.03 1040.42
10294.99 1040.5910295.38 1040.5910295.78 1040.5910330.74 1040.7710365.36 1040.99
10366.09 1040.9910366.83    104110401.45 1041.2210435.73 1041.47 10436.8 1041.48
10437.89 1041.4910472.16  1041.710506.09 1041.8910507.52  1041.910508.95 1041.91
10542.87 1042.0410576.46 1042.1210578.23 1042.1310580.01 1042.1310613.58  1042.2
10646.83 1042.2410648.94 1042.2410651.07 1042.24 10684.3 1042.32 10717.2 1042.39
10719.65 1042.3910722.13 1042.3910755.01 1042.4710787.56 1042.53

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9073.49      .05 9906.47     .04310224.58      .05
```

```
Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9906.4710224.58                1180    1277    1230            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1038.31  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1038.21  * Reach Len. (ft)         * 1180.00  * 1277.00  * 1230.00  *
* Crit W.S. (ft)          * 1037.52  * Flow Area (sq ft)       *          *   249.89 *          *
* E.G. Slope (ft/ft)      *0.004170  * Area (sq ft)            *          *   249.89 *          *
* Q Total (cfs)           *  650.00  * Flow (cfs)              *          *   650.00 *          *
* Top Width (ft)          *  198.50  * Top Width (ft)          *          *   198.50 *          *
* Vel Total (ft/s)        *    2.60  * Avg. Vel. (ft/s)        *          *     2.60 *          *
* Max Chl Dpth (ft)       *    1.89  * Hydr. Depth (ft)        *          *     1.26 *          *
* Conv. Total (cfs)       * 10065.3  * Conv. (cfs)             *          * 10065.3  *          *
* Length Wtd. (ft)        * 1277.00  * Wetted Per. (ft)        *          *   198.57 *          *
* Min Ch El (ft)          * 1036.32  * Shear (lb/sq ft)        *          *     0.33 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     0.85 *          *
* Frctn Loss (ft)         *    5.69  * Cum Volume (acre-ft)    *    0.01  *    18.65 *    0.84  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.05  *     5.13 *          *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31 (A56)
REACH: REACH 1            RS: 3.668

INPUT
Description:
Station Elevation Data    num=      92
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9022.64 1041.13 9028.48  1041.1 9047.16 1041.07  9064.5  1041.1 9090.25 1040.99
 9100.52 1040.98 9107.44 1040.89 9136.55 1040.81 9167.73 1040.81 9172.57 1040.82
 9179.75 1040.78 9208.59 1040.69 9228.02 1041.17 9244.61 1041.46 9269.25 1041.54
 9280.63  1041.4  9288.3 1041.25 9316.65 1040.67 9345.65 1039.71 9348.59 1039.61
 9352.68 1039.51 9358.75 1039.37 9394.89 1037.98 9399.95 1037.84 9401.92 1037.81
 9404.05 1037.77 9406.35 1037.74 9411.49 1037.64 9417.92 1037.51 9433.77 1037.08
 9444.16 1036.77 9448.34 1036.63 9453.87  1036.8 9461.68 1036.88 9482.53 1036.97
 9487.11 1037.01  9493.2 1037.05 9527.25 1037.88 9529.13 1037.91 9530.46 1037.93
 9531.61 1037.94 9537.74 1038.13 9568.81 1038.32 9589.73 1038.21 9604.83 1038.22
 9627.24 1038.42 9640.85 1038.41 9650.02 1038.32 9676.87 1038.28  9710.3  1038.6
 9712.89 1038.61 9716.73 1038.49 9723.04  1038.3 9748.91 1037.52 9760.27 1037.31
 9770.59 1037.11 9784.93 1037.02 9806.23 1036.16 9820.95 1035.61 9830.87 1035.33
 9881.72 1033.78 9891.16  1033.5    9893 1033.45 9895.73 1033.34 9929.02 1032.28
 9965.49 1030.25 9972.94 1029.82 9983.05 1029.64   10000 1029.1910004.63 1029.07
10012.29 1028.8910017.37 1029.1810055.29 1031.3310062.73 1031.7110066.63 1031.89
10081.89 1032.4510107.16 1032.7710134.12 1033.1210142.54 1033.2310150.43 1033.34
10177.91 1033.7510207.21 1034.1310213.28 1034.2110218.98 1034.2910248.66 1034.66
 10280.3 1035.0110284.03 1035.0510287.53 1035.0910319.41 1035.3710353.39 1035.68
10354.78 1035.6910356.08  1035.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9022.64     .05 9929.02    .04310081.89     .05

Bank Sta: Left   Right     Coeff Contr.   Expan.
      9929.0210081.89              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1032.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *   0.050  *    0.043 *          *
* W.S. Elev (ft)          * 1032.41  * Reach Len. (ft)         * 1552.00  * 1552.00  * 1552.00  *
* Crit W.S. (ft)          * 1031.38  * Flow Area (sq ft)       *    0.25  *   289.68 *          *
* E.G. Slope (ft/ft)      *0.004649  * Area (sq ft)            *    0.25  *   289.68 *          *
* Q Total (cfs)           * 1050.00  * Flow (cfs)              *    0.08  * 1049.92  *          *
* Top Width (ft)          *  155.62  * Top Width (ft)          *    3.95  *   151.67 *          *
* Vel Total (ft/s)        *    3.62  * Avg. Vel. (ft/s)        *    0.32  *     3.62 *          *
* Max Chl Dpth (ft)       *    3.52  * Hydr. Depth (ft)        *    0.06  *     1.91 *          *
* Conv. Total (cfs)       * 15399.2  * Conv. (cfs)             *     1.2  * 15398.0  *          *
```

```
* Length Wtd. (ft)        * 1552.00  * Wetted Per. (ft)        *    3.95  *  151.84  *          *
* Min Ch El (ft)          * 1028.89  * Shear (lb/sq ft)        *    0.02  *    0.55  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.01  *    2.01  *          *
* Frctn Loss (ft)         *    7.14  * Cum Volume (acre-ft)    *    0.00  *   10.74  *    0.84  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *          *          *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 2 RS: 3.374

INPUT
Description:
Station Elevation Data num= 107

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9143.23 1030.55 9153.02 1030.63 9186.59 1030.88 9188.87  1030.9 9192.07 1030.92
 9224.72 1031.04 9248.01  1031.1 9260.57 1031.15 9278.18 1031.23 9296.41 1031.27
 9309.42 1031.32 9332.26 1031.41 9364.29 1031.51 9368.11 1031.52 9370.83 1031.52
 9403.96 1031.55 9426.58 1031.54 9432.24 1031.53  9439.8 1031.53  9450.4 1031.51
 9475.65 1031.48 9493.66 1031.48  9511.5 1031.45 9536.51 1031.44 9547.34 1031.43
 9555.07 1031.44 9583.19 1031.44 9616.48  1031.5 9619.04  1031.5 9622.62 1031.51
 9654.89 1031.54  9677.9 1031.61 9690.73 1031.64 9708.73 1031.65 9726.58  1031.6
 9739.31 1031.73 9762.43 1031.77 9794.85 1031.73 9798.27 1031.66 9800.72 1031.58
 9834.12 1030.48 9862.13 1029.38 9869.97 1028.97 9880.96 1028.68 9905.82 1027.78
 9924.23 1026.06 9942.56 1024.62 9969.56 1022.75 9988.33 1020.91 9993.52 1020.48
   10000 1019.9610007.86 1019.2910037.48  1023.810048.59 1025.2610056.29 1025.32
10083.99 1025.6610109.05 1025.8510119.39 1025.9410129.91 1025.2910131.83  1025.2
10133.78 1025.1110136.39 1025.0110139.78 1024.8710163.66 1023.5710164.36 1023.61
10187.77 1024.7310225.59 1027.0510243.87 1027.2610260.99 1027.4610279.92  1027.7
10296.39 1027.9110311.28 1028.1310331.79 1028.4310354.46 1028.7810367.19 1028.98
 10378.7 1029.1510402.59 1029.5110429.01 1029.9110437.99 1030.0510446.11 1030.14
10453.49 1030.2410473.39  1030.510497.73 1030.7110503.55 1030.7610508.79  1030.8
10513.52 1030.8210544.19 1030.9610578.09 1031.0910579.59  1031.110580.94  1031.1
10614.99  1031.210648.35 1031.3110650.39 1031.3210652.64 1031.3310685.79 1031.51
10715.76 1031.6610721.19 1031.6910727.18 1031.7210756.59  1031.910783.18 1032.04
10791.99 1032.0910801.73 1032.1210827.39 1032.1410850.59  1032.110862.79 1032.09
10876.27 1032.0810898.19    1032
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9143.23     .05 9924.23    .04310048.59     .05
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
       9924.2310048.59            1850    1920    1820            .1       .3
```

Ineffective Flow num= 1

```
   Sta L   Sta R    Elev  Permanent
   1010910898.19    1028       F
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1025.46  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1025.13  * Reach Len. (ft)         * 1850.00  * 1920.00  * 1820.00  *
* Crit W.S. (ft)          * 1023.68  * Flow Area (sq ft)       *          *  313.19  *          *
* E.G. Slope (ft/ft)      *0.004563  * Area (sq ft)            *          *  313.19  *   47.17  *
* Q Total (cfs)           * 1450.00  * Flow (cfs)              *          * 1450.00  *          *
* Top Width (ft)          *  172.24  * Top Width (ft)           *          *  111.45  *   60.79  *
* Vel Total (ft/s)        *    4.63  * Avg. Vel. (ft/s)         *          *    4.63  *          *
* Max Chl Dpth (ft)       *    5.84  * Hydr. Depth (ft)         *          *    2.81  *          *
* Conv. Total (cfs)       * 21465.8  * Conv. (cfs)              *          * 21465.8  *          *
* Length Wtd. (ft)        * 1918.82  * Wetted Per. (ft)         *          *  112.12  *          *
* Min Ch El (ft)          * 1019.29  * Shear (lb/sq ft)         *          *    0.80  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.68  *          *
* Frctn Loss (ft)         *    7.13  * Cum Volume (acre-ft)     *    0.00  *   37.03  *    2.78  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *    0.00  *    5.52  *    3.70  *
*****************************************************************************************************
```

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 2 RS: 3.011

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9797.36	1020.91	9801.61	1020.95	9803.83	1020.88	9838.66	1020.17	9850.75	1019.97
9860.25	1019.82	9875.71	1019.64	9905.27	1018.95	9912.76	1018.75	9920.57	1018.06
9963.28	1015.85	9988.17	1012.64	9989.95	1012.63	10000	1012.63	10005.4	1012.64
10010.55	1012.59	10047.75	1016.13	10059.69	1017.25	10063.42	1017.53	10071.31	1017.53
10101.97	1017.53	10114.06	1017.61	10141.88	1017.82	10167.8	1017.99	10179.07	1018.09
10207.63	1018.35	10217.61	1018.44	10221.55	1018.49	10256.16	1018.91	10275.3	1019.16
10285.53	1019.28	10294.71	1019.41	10329.04	1019.81	10333.26	1019.85	10343.95	1019.96
10371.81	1020.27	10382.79	1020.41	10388.66	1020.46	10410.35	1020.71	10436.53	1020.95
10448.9	1021.08	10480.28	1021.41						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9797.36	.05	9920.57	.04	10059.69	.05

Bank Sta: Left Right Coeff Contr. Expan.
9920.57 10059.69 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1018.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.043	0.050
W.S. Elev (ft)	1018.06	Reach Len. (ft)	1785.00	1785.00	1785.00
Crit W.S. (ft)		Flow Area (sq ft)		418.33	43.46
E.G. Slope (ft/ft)	0.003172	Area (sq ft)	0.00	418.33	43.46
Q Total (cfs)	1730.00	Flow (cfs)		1692.30	37.70
Top Width (ft)	255.67	Top Width (ft)	0.05	139.12	116.50
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)		4.05	0.87
Max Chl Dpth (ft)	5.47	Hydr. Depth (ft)		3.01	0.37
Conv. Total (cfs)	30715.9	Conv. (cfs)		30046.6	669.3
Length Wtd. (ft)	1785.00	Wetted Per. (ft)		139.60	116.51
Min Ch El (ft)	1012.59	Shear (lb/sq ft)		0.59	0.07
Alpha	1.14	Stream Power (lb/ft s)		2.40	0.06
Frctn Loss (ft)	7.37	Cum Volume (acre-ft)	0.00	20.90	0.89
C & E Loss (ft)	0.01	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 3 RS: 2.673

INPUT
Description:
Station Elevation Data num= 106

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9141.29	1022.32	9147.03	1022.26	9177	1021.49	9206.31	1021.33	9213.21	1021.33
9224.04	1021.12	9265.59	1020.29	9285.64	1019.92	9317.12	1020.18	9321.86	1020.13
9324.87	1020.17	9358.07	1019.72	9384.15	1019.3	9394.29	1019.14	9410.19	1018.58
9430.5	1017.91	9443.44	1018.03	9466.72	1018.28	9502.57	1018.61	9502.71	1018.61
9503.27	1018.61	9561.99	1017.29	9575.36	1016.98	9596.34	1016.69	9611.57	1016.61
9621.28	1016.85	9647.79	1017.49	9680.56	1016.69	9684	1016.63	9689.42	1016.61
9720.22	1016.39	9739.84	1016.03	9756.43	1015.64	9782.49	1015.41	9792.65	1015.28
9799.12	1015.19	9828.86	1013.68	9853.77	1011.76	9858.4	1011.41	9865.08	1011.21
9875.57	1011.01	9901.29	1010.29	9932.79	1007.79	9957.33	1006.3	9972.89	1005.14
9999.98	1005.87	10000	1005.87	10023.59	1006.71	10032.32	1007.15	10065.52	1008.81

```
10075.95 1009.3210081.32 1009.5710098.02 1010.2810135.26 1011.6810141.12 1011.76
10173.97 1012.7310184.22 1012.9910186.05 1013.0110227.32 1013.2310236.84 1013.24
10270.42 1012.8310287.63 1012.9610313.52 1013.1310338.42 1013.2210356.62 1013.49
10389.21 1013.6510399.71 1013.72   10440 1013.9110442.81 1013.9310458.59    1014
10485.91 1014.1110490.79 1014.1210529.01 1014.2810541.58 1014.3310546.83 1014.36
10572.11 1014.5110592.37 1014.6610615.21 1014.8510643.16 1015.0610658.31 1015.16
10693.95 1015.9410701.41 1016.04 10743.2 1016.28 10744.5 1016.2910744.74 1016.29
 10787.6 1017.3910795.53 1017.47 10830.7 1017.4410846.32  1017.6 10873.8 1017.93
10897.11 1018.11 10916.9 1018.28 10947.9 1018.52   10960 1018.5110998.69 1018.85
 11003.1 1018.8911027.82  1019.1 11046.2 1019.2411049.48 1019.27 11089.3 1019.57
11100.27 1019.64 11132.4 1019.7811151.06 1019.8811175.49 1020.0111201.85 1020.14
11218.59 1020.19

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9141.29     .05 9799.12    .04310173.97     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9799.1210173.97             1550    1509    1620            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1010.93  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.36  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1010.57  * Reach Len. (ft)        * 1550.00  * 1509.00  * 1620.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *   601.92 *          *
* E.G. Slope (ft/ft)      *0.004925  * Area (sq ft)           *          *   601.92 *          *
* Q Total (cfs)           * 2900.00  * Flow (cfs)             *          *  2900.00 *          *
* Top Width (ft)          *  214.65  * Top Width (ft)          *          *   214.65 *          *
* Vel Total (ft/s)        *    4.82  * Avg. Vel. (ft/s)        *          *     4.82 *          *
* Max Chl Dpth (ft)       *    5.43  * Hydr. Depth (ft)        *          *     2.80 *          *
* Conv. Total (cfs)       * 41323.5  * Conv. (cfs)             *          *  41323.5 *          *
* Length Wtd. (ft)        * 1509.00  * Wetted Per. (ft)        *          *   214.96 *          *
* Min Ch El (ft)          * 1005.14  * Shear (lb/sq ft)        *          *     0.86 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     4.15 *          *
* Frctn Loss (ft)         *    6.99  * Cum Volume (acre-ft)    *          *    41.65 *     0.00 *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *          *     7.04 *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 3 RS: 2.388

INPUT
Description:

```
Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9673.39 1006.39  9679.9 1006.37 9685.58 1006.37 9715.34 1006.29 9749.41 1006.18
 9750.77 1006.19 9751.96 1006.23 9753.01 1006.25 9786.21 1006.75 9818.34 1005.81
 9821.64  1005.8 9825.43  1005.8 9857.08 1006.02 9884.71 1004.81 9892.52 1004.55
  9905.6 1003.62  9942.3 1000.77   10000  999.4610010.84  999.2110043.43  998.51
10052.79  999.3710105.13  1004.310129.52 1005.4610140.57 1005.8610150.22 1005.81
10158.72 1005.7810176.01 1005.7110198.71 1005.3810205.54 1005.28

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9673.39     .05 9857.08    .04310140.57     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9857.0810140.57            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1003.95  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.36  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1003.59  * Reach Len. (ft)        * 1468.00  * 1468.00  * 1468.00  *
* Crit W.S. (ft)          * 1002.16  * Flow Area (sq ft)      *          *   589.30 *          *
* E.G. Slope (ft/ft)      *0.004357  * Area (sq ft)           *          *   589.30 *          *
* Q Total (cfs)           * 2840.00  * Flow (cfs)             *          *  2840.00 *          *
* Top Width (ft)          *  191.51  * Top Width (ft)          *          *   191.51 *          *
```

* Vel Total (ft/s)	* 4.82	* Avg. Vel. (ft/s)	*	* 4.82	*		*
* Max Chl Dpth (ft)	* 5.08	* Hydr. Depth (ft)	*	* 3.08	*		*
* Conv. Total (cfs)	* 43024.9	* Conv. (cfs)	*	* 43024.9	*		*
* Length Wtd. (ft)	* 1468.00	* Wetted Per. (ft)	*	* 191.89	*		*
* Min Ch El (ft)	* 998.51	* Shear (lb/sq ft)	*	* 0.84	*		*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 4.03	*		*
* Frctn Loss (ft)	* 6.93	* Cum Volume (acre-ft)	*	* 21.02	*	0.00	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	*	*	*		*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 4 RS: 2.110

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9734.17	997.77	9767.69	997.74	9779.14	997.64	9815.69	997.16	9818.05	997.13
9824.12	997.11	9868.41	996.89	9869.09	996.88	9874.82	996.85	9914.07	996.65
9918.77	996.62	9929.16	995.3	9982.84	989.11	10000	989.48	10000.46	989.49
10015.54	989.77	10022.78	990.65	10069.83	996.04	10093.97	996.43	10120.19	996.62
10138.94	996.78	10170.55	997.06	10183.92	997.05	10217.8	997.13	10220.91	997.14
10228.89	997.13	10271.26	997.13	10273.87	997.13	10295.65	997.11	10318.84	997.09
10321.62	997.08	10363.82	997.12	10371.98	997.12	10408.8	997.29	10422.33	997.31
10453.77	997.61	10472.69	997.61	10498.75	997.66				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9734.17	.05	9914.07	.04	10093.97	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914.07	10093.97	1015	1040	1045	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 996.99	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.55	* Wt. n-Val.	*	* 0.043	* 0.050	*
* W.S. Elev (ft)	* 996.45	* Reach Len. (ft)	* 1015.00	* 1040.00	* 1045.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 657.87	* 0.02	*
* E.G. Slope (ft/ft)	*0.005021	* Area (sq ft)	*	* 657.87	* 0.02	*
* Q Total (cfs)	* 3900.00	* Flow (cfs)	*	* 3900.00	* 0.00	*
* Top Width (ft)	* 176.21	* Top Width (ft)	*	* 173.84	* 2.37	*
* Vel Total (ft/s)	* 5.93	* Avg. Vel. (ft/s)	*	* 5.93	* 0.09	*
* Max Chl Dpth (ft)	* 7.34	* Hydr. Depth (ft)	*	* 3.78	* 0.01	*
* Conv. Total (cfs)	* 55038.4	* Conv. (cfs)	*	* 55038.4	* 0.0	*
* Length Wtd. (ft)	* 1040.00	* Wetted Per. (ft)	*	* 174.64	* 2.37	*
* Min Ch El (ft)	* 989.11	* Shear (lb/sq ft)	*	* 1.18	* 0.00	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 7.00	* 0.00	*
* Frctn Loss (ft)	* 5.11	* Cum Volume (acre-ft)	* 0.06	* 45.36	* 0.00	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	*	* 3.80	* 0.03	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 4 RS: 1.913

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9816.4	992.51	9834.14	992.47	9866.42	992.11	9885.48	991.77	9909.87	991.47
9916.43	991.4	9971.64	984.98	9981.35	983.77	9989.37	983.77	10000	983.79
10016.17	983.8	10044.11	988.32	10066.77	991.87	10081.02	992.04	10117.01	992.5

```
 10126.8  992.4910167.25  992.5410172.59  992.5410217.48   992.510218.37   992.5
10227.51  992.5410264.15  992.6710267.72  992.6710309.94  992.7210317.95   992.8
10355.72  992.9610368.19  992.9610401.51  993.0410407.51  993.0610418.42  993.11
10447.29  993.1510468.66  993.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9816.4     .05 9916.43    .04310066.77     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9916.4310066.77             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  991.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.67  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          *  991.20  * Reach Len. (ft)         * 1679.00  * 1679.00  * 1679.00  *
* Crit W.S. (ft)          *  989.24  * Flow Area (sq ft)       *          *  661.00  *          *
* E.G. Slope (ft/ft)      *0.004815  * Area (sq ft)            *          *  661.00  *          *
* Q Total (cfs)           * 4350.00  * Flow (cfs)              *          * 4350.00  *          *
* Top Width (ft)          *  144.35  * Top Width (ft)          *          *  144.35  *          *
* Vel Total (ft/s)        *    6.58  * Avg. Vel. (ft/s)        *          *    6.58  *          *
* Max Chl Dpth (ft)       *    7.43  * Hydr. Depth (ft)        *          *    4.58  *          *
* Conv. Total (cfs)       * 62691.0  * Conv. (cfs)             *          * 62691.0  *          *
* Length Wtd. (ft)        * 1679.00  * Wetted Per. (ft)        *          *  145.38  *          *
* Min Ch El (ft)          *  983.77  * Shear (lb/sq ft)        *          *    1.37  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    8.99  *          *
* Frctn Loss (ft)         *    8.01  * Cum Volume (acre-ft)     *    0.06  *   29.62  *          *
* C & E Loss (ft)         *    0.08  * Cum SA (acres)           *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31 (A56)
REACH: REACH 5            RS: 1.595

INPUT
Description:
Station Elevation Data    num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9508.78  984.63 9522.33   984.7 9528.81  984.67 9559.83  984.53 9584.22  984.29
 9597.32  984.15 9624.74  983.89 9634.82  983.81 9639.64  983.77 9672.32  983.62
 9695.05  983.67 9709.81  983.71  9740.7  983.68 9747.31  983.67 9750.47  983.68
 9784.81  983.49 9796.27  983.49 9805.89  983.49 9822.31  983.38 9856.66  983.18
  9859.8  983.15  9861.3  983.14  9897.3  982.46 9916.72  981.88  9934.8  981.29
 9957.68  978.36 9979.43  975.77   10000  976.0610003.59  976.12 10024.9  976.41
10060.04  979.99   10081  982.3710092.23  982.6110116.82  983.1610150.99  983.86
10152.64  983.8910153.83  983.9110188.46  984.3410215.43   984.610224.29  984.67
10236.59  984.6410254.85  984.5710260.11  984.5510262.78  984.5610277.03  984.62
10295.93   984.610322.19  984.7210331.75  984.7410338.63  984.7810367.57  984.87
10400.23  984.97 10403.4  984.9810407.79  984.9910439.22  985.0210461.83  985.04
10475.04  985.0210493.39     98510510.86  984.9610523.43  984.9410546.68  984.86
10578.99  984.7510582.51  984.7410585.03  984.7310618.33  984.5910646.64  984.47
10654.15  984.4410664.59  984.4110689.97  984.3310708.24  984.2810725.79  984.24
10750.19   984.210761.62  984.1810769.84  984.1710797.44  984.1410831.44   984.1
10833.26   984.110835.79  984.0910869.08  984.0410893.04     984 10904.9  983.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9508.78     .05 9856.66    .04310188.46     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9856.6610188.46             1460    1401    1395             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  983.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.42  * Wt. n-Val.              *   0.050  *   0.043  *          *
* W.S. Elev (ft)          *  983.37  * Reach Len. (ft)         * 1460.00  * 1401.00  * 1395.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    2.99  *  875.79  *          *
* E.G. Slope (ft/ft)      *0.004727  * Area (sq ft)            *    2.99  *  875.79  *          *
```

* Q Total (cfs)	*	4550.00	* Flow (cfs)	*	1.26	*	4548.74	*		*
* Top Width (ft)	*	302.32	* Top Width (ft)	*	32.07	*	270.25	*		*
* Vel Total (ft/s)	*	5.18	* Avg. Vel. (ft/s)	*	0.42	*	5.19	*		*
* Max Chl Dpth (ft)	*	7.60	* Hydr. Depth (ft)	*	0.09	*	3.24	*		*
* Conv. Total (cfs)	*	66178.9	* Conv. (cfs)	*	18.3	*	66160.6	*		*
* Length Wtd. (ft)	*	1401.44	* Wetted Per. (ft)	*	32.07	*	270.95	*		*
* Min Ch El (ft)	*	975.77	* Shear (lb/sq ft)	*	0.03	*	0.95	*		*
* Alpha	*	1.01	* Stream Power (lb/ft s)	*	0.01	*	4.95	*		*
* Frctn Loss (ft)	*	5.93	* Cum Volume (acre-ft)	*	22.86	*	103.98	*	41.52	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	34.26	*	28.86	*	63.11	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 5 RS: 1.329

INPUT
Description:
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8990.52	982.07	9002.72	982	9026.58	981.85	9038.2	981.79	9048.01	981.74
9073.69	981.61	9104.1	981.44	9109.17	981.41	9113.44	981.39	9144.65	981.24
9178.87	981.07	9180.13	981.06	9181.63	981.05	9215.61	980.9	9244.3	980.77
9251.09	980.74	9259.15	980.7	9286.58	980.57	9309.73	980.46	9322.06	980.4
9336.67	980.33	9357.54	980.23	9375.16	980.12	9393.02	980.02	9414.19	979.89
9428.5	979.79	9440.59	979.69	9463.99	979.51	9491.71	979.27	9499.47	979.2
9506.01	979.14	9569.23	978.54	9570.43	978.53	9571.44	978.52	9605.91	978.2
9636.87	977.91	9641.39	977.87	9646.75	977.82	9676.87	977.56	9702.3	977.37
9712.36	977.3	9724.27	977.23	9747.84	977.08	9767.73	976.98	9783.32	976.91
9801.79	976.87	9818.8	976.83	9833.16	976.8	9854.28	976.76	9879.32	976.84
9889.77	976.86	9898.59	976.84	9925.25	976.69	9953.42	972.85	9973.21	970.52
10000	970.36	10005.91	970.33	10026.03	970.13	10031.65	970.91	10068.09	976.67
10087.91	976.76	10104.05	976.77	10127.6	976.92	10140.02	976.98	10148.53	977.03
10175.98	977.19	10209.16	977.41	10211.95	977.43	10216.01	977.45	10247.91	977.65
10269.78	977.75	10283.87	977.82	10304.42	977.91	10319.84	977.96	10330.41	977.98
10355.8	978.03	10390.5	978.08	10391.04	978.08	10391.77	978.08	10392.83	978.08

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8990.52	.05	9925.25	.043	10068.09	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9925.25	10068.09	1300	1338	1325	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	977.84	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.58	* Wt. n-Val.	*	0.050	*	0.043	*	0.050	*
* W.S. Elev (ft)	*	977.26	* Reach Len. (ft)	*	1300.00	*	1338.00	*	1325.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	74.75	*	709.66	*	38.95	*
* E.G. Slope (ft/ft)	*	0.003806	* Area (sq ft)	*	74.75	*	709.66	*	38.95	*
* Q Total (cfs)	*	4490.00	* Flow (cfs)	*	69.75	*	4386.29	*	33.96	*
* Top Width (ft)	*	467.50	* Top Width (ft)	*	205.89	*	142.84	*	118.77	*
* Vel Total (ft/s)	*	5.45	* Avg. Vel. (ft/s)	*	0.93	*	6.18	*	0.87	*
* Max Chl Dpth (ft)	*	7.13	* Hydr. Depth (ft)	*	0.36	*	4.97	*	0.33	*
* Conv. Total (cfs)	*	72782.3	* Conv. (cfs)	*	1130.6	*	71101.2	*	550.5	*
* Length Wtd. (ft)	*	1336.62	* Wetted Per. (ft)	*	205.89	*	143.74	*	118.77	*
* Min Ch El (ft)	*	970.13	* Shear (lb/sq ft)	*	0.09	*	1.17	*	0.08	*
* Alpha	*	1.26	* Stream Power (lb/ft s)	*	0.08	*	7.25	*	0.07	*
* Frctn Loss (ft)	*	6.31	* Cum Volume (acre-ft)	*	21.56	*	78.48	*	40.89	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	30.27	*	22.21	*	61.21	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)

REACH: REACH 5 RS: 1.076

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9527.1	971.27	9553.84	971.09	9584.57	970.91	9590.52	970.87	9601	970.82
9627.2	970.69	9642.05	970.61	9663.88	970.53	9699.52	970.4	9700.56	970.39
9702.38	970.39	9737.24	970.29	9757	970.23	9773.92	970.2	9803.76	970.15
9810.6	970.14	9814.48	970.13	9847.28	970.07	9871.96	970.07	9883.96	970.05
9905.14	970.02	9920.64	969.98	9936.42	968.56	9974.22	964.68	9979.5	964.7
10000	964.79	10024.4	964.93	10041.07	967.37	10065.29	970.68	10084.62	970.79
10100.85	970.81	10113.97	970.85	10136.4	970.91	10164.13	970.87	10171.95	970.87
10178.28	970.86	10207.5	970.79	10242.58	970.78	10243.06	970.76	10243.64	970.76
10278.61	970.77	10306.89	970.77	10314.16	970.77	10323.15	970.79	10334.54	970.81
10349.71	970.84	10359.59	970.89	10371.2	970.99	10385.26	971.05	10402.66	971.13
10420.82	971.15	10435.5	971.16	10456.37	971.17	10482.16	971.18	10491.92	971.17
10499.81	971.16								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9527.1	.05	9920.64	.04	10065.29	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9920.64 10065.29 1310 1397 1455 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10136.4	10499.81	972	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	971.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	970.80	Reach Len. (ft)	1310.00	1397.00	1455.00
Crit W.S. (ft)	969.58	Flow Area (sq ft)	163.83	604.66	1.44
E.G. Slope (ft/ft)	0.006025	Area (sq ft)	163.83	604.66	5.12
Q Total (cfs)	4440.00	Flow (cfs)	243.61	4195.96	0.42
Top Width (ft)	622.62	Top Width (ft)	316.55	144.65	161.41
Vel Total (ft/s)	5.77	Avg. Vel. (ft/s)	1.49	6.94	0.30
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)	0.52	4.18	0.05
Conv. Total (cfs)	57198.8	Conv. (cfs)	3138.4	54055.0	5.5
Length Wtd. (ft)	1400.55	Wetted Per. (ft)	316.55	145.32	31.26
Min Ch El (ft)	964.68	Shear (lb/sq ft)	0.19	1.57	0.02
Alpha	1.37	Stream Power (lb/ft s)	0.29	10.86	0.01
Frctn Loss (ft)	6.24	Cum Volume (acre-ft)	18.00	58.30	40.22
C & E Loss (ft)	0.14	Cum SA (acres)	22.48	17.80	56.95

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 5 RS: 0.811

INPUT
Description:
Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9409.76	967.73	9428.52	967.42	9434.94	967.39	9468.63	967.47	9487.18	967.45
9508.73	967.57	9539.42	967.68	9548.84	967.71	9580.02	967.57	9588.95	967.54
9591.65	967.54	9629.06	967.29	9643.89	967.11	9669.17	966.25	9707.48	964.51
9729.99	963.7	9740.26	963.32	9757.63	963.64	9800.6	964.33	9829.6	964.23
9852.83	964.25	9869.71	964.2	9905.07	964.03	9909.81	963.99	9929.14	962.33
9977.84	958.89	10000	959.7	10000.23	959.71	10021.92	960.44	10033.55	961.38
10048.95	962.61	10054.89	963.08	10059.57	963.46	10071.25	964.11	10099.13	964.16
10131.5	964.2	10135.15	964.19	10140.59	964.19	10171.18	964.08	10191.75	964.09
10207.21	963.96	10230.2	963.83	10243.24	963.78	10252.01	963.78	10279.27	963.8
10312.26	963.8	10315.29	963.81	10319.81	963.83	10351.32	963.97	10372.51	963.96

```
10387.35  963.9210409.42  963.8710423.38  963.8410436.82   963.410442.02  963.26
10453.39  962.9310491.53  961.7910506.51  962.4410531.46  963.6910553.26   963.7
10567.49  963.7210588.65  963.6910603.52   963.710613.51  963.9710639.54   964.2
10673.76  964.4410675.57  964.5910678.26  964.6110695.38   964.8 10711.6  964.97
10723.82  964.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9409.76     .05 9905.07    .04310071.25     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9905.0710071.25             1315    1269    1225             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  965.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.24  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          *  964.89  * Reach Len. (ft)         * 1315.00  * 1269.00  * 1225.00  *
* Crit W.S. (ft)          *  964.41  * Flow Area (sq ft)       *  167.82  *  598.84  *  695.15  *
* E.G. Slope (ft/ft)      *0.003418  * Area (sq ft)            *  167.82  *  598.84  *  695.15  *
* Q Total (cfs)           * 4380.00  * Flow (cfs)              *  254.36  * 2839.52  * 1286.11  *
* Top Width (ft)          * 1004.62  * Top Width (ft)          *  205.91  *  166.18  *  632.53  *
* Vel Total (ft/s)        *    3.00  * Avg. Vel. (ft/s)        *    1.52  *    4.74  *    1.85  *
* Max Chl Dpth (ft)       *    6.00  * Hydr. Depth (ft)        *    0.81  *    3.60  *    1.10  *
* Conv. Total (cfs)       * 74919.1  * Conv. (cfs)             *  4350.9  * 48569.5  * 21998.7  *
* Length Wtd. (ft)        * 1266.08  * Wetted Per. (ft)        *  205.95  *  166.54  *  632.62  *
* Min Ch El (ft)          *  958.89  * Shear (lb/sq ft)        *    0.17  *    0.77  *    0.23  *
* Alpha                   *    1.75  * Stream Power (lb/ft s)  *    0.26  *    3.64  *    0.43  *
* Frctn Loss (ft)         *    5.39  * Cum Volume (acre-ft)    *   13.01  *   39.00  *   28.53  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   14.62  *   12.81  *   43.69  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31 (A56)
REACH: REACH 5            RS: 0.571

INPUT
Description:
Station Elevation Data    num=     106
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9252.83     970 9274.31  969.24 9283.39  968.96 9307.92  968.18  9322.3  967.65
 9327.63  967.45 9361.21  966.21 9380.94  965.55 9400.13  964.86 9434.25  963.84
 9439.04  963.68 9451.97   963.3 9477.95  962.52 9487.57  962.31 9516.87  961.65
 9540.88  961.25 9555.78  960.96  9594.2  960.48 9594.69  960.47 9596.02  960.46
  9633.6  959.97 9647.51  959.81 9672.52  959.54 9700.83  959.27 9711.43  959.19
 9740.07  959.02 9750.92  958.73 9752.06  958.73 9753.28  958.72 9754.03  958.71
 9754.84   958.7 9755.73  958.69 9756.19  958.69 9759.32  958.61 9760.86  958.57
 9764.38  958.46 9771.67  958.22 9793.03  957.53 9812.72  956.92 9827.76  956.88
 9843.68  956.79  9875.8  957.81 9890.85  958.26 9897.17  958.45 9914.09  958.96
 9942.15   956.7 9981.93  953.93   10000  954.3210008.55   954.510017.99  954.69
10030.03  955.5410079.05  957.8210086.42  958.1910088.42  958.2810089.53  958.33
10094.11  958.5210126.84   958.610161.87  958.6710162.23  958.6710162.63  958.67
10197.62  958.7410229.64  958.7910233.01  958.79 10236.7   958.8 10268.4  958.82
10297.41  958.84 10303.8  958.8510310.77  958.8510339.19  958.8810365.18   958.9
10374.58  958.9110384.85  958.9210409.97  958.9410432.95  958.9510445.36  958.95
10458.92  958.9610480.75  958.9710500.72  958.9810516.14  958.9810532.99  958.99
10551.53  959.0110568.49  959.0210586.92  959.0410607.06  959.0610622.31  959.08
10636.26   959.1 10657.7  959.1310681.13  959.1510693.09  959.1710704.03  959.18
10728.48  959.2210755.21  959.2410763.87  959.2510771.79  959.2510799.26  959.29
10829.28   959.310834.65  959.3110839.56  959.3110870.04  959.3610903.35  959.46
10905.43  959.4910907.33  959.5210940.82  959.66 10975.1  959.7310976.21  959.75
10977.42  959.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9252.83     .05 9914.09    .04310094.11     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.0910094.11             1150    1342    1300             .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	959.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	959.35	Reach Len. (ft)	1150.00	1342.00	1300.00
Crit W.S. (ft)	958.56	Flow Area (sq ft)	283.21	583.58	285.12
E.G. Slope (ft/ft)	0.005468	Area (sq ft)	283.21	583.58	285.12
Q Total (cfs)	4320.00	Flow (cfs)	733.42	3262.92	323.66
Top Width (ft)	1169.40	Top Width (ft)	221.34	180.02	768.04
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	2.59	5.59	1.14
Max Chl Dpth (ft)	5.42	Hydr. Depth (ft)	1.28	3.24	0.37
Conv. Total (cfs)	58419.0	Conv. (cfs)	9918.0	44124.2	4376.8
Length Wtd. (ft)	1317.98	Wetted Per. (ft)	221.40	180.32	768.04
Min Ch El (ft)	953.93	Shear (lb/sq ft)	0.44	1.10	0.13
Alpha	1.77	Stream Power (lb/ft s)	1.13	6.18	0.14
Frctn Loss (ft)	7.10	Cum Volume (acre-ft)	6.20	21.78	14.74
C & E Loss (ft)	0.02	Cum SA (acres)	8.17	7.77	23.99

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31 (A56)
REACH: REACH 5 RS: 0.317

INPUT
Description: Right side of cross section within existing floodplain.
Right side extended.
Ineffective flow set at limit of expansion.
Station Elevation Data num= 156

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8671.54	960.36	8692.59	960.08	8700.99	959.99	8702.86	959.94	8716.42	959.58
8728.33	959.3	8735.01	959.14	8750.19	958.78	8758.84	958.58	8763.74	958.46
8765.89	958.41	8770.48	958.38	8771.97	958.37	8773.04	958.37	8777.35	958.38
8779.22	958.36	8786.36	958.3	8789.61	958.3	8791.78	958.31	8798.35	958.24
8801.87	958.21	8805.03	958.21	8805.61	958.22	8809.52	958.16	8816.54	958.07
8818.86	958.03	8822.35	957.98	8823.28	957.98	8827.25	958	8829.71	958.01
8836.84	958.03	8852.23	958.06	8853.37	958.06	8854.39	958.05	8857.47	958.03
8873.24	957.89	8878.47	957.84	8888.91	957.75	8896.14	957.74	8902.43	957.73
8906.46	957.72	8953.53	957.12	8953.88	957.11	8954.13	957.11	8954.21	957.11
8954.28	957.11	8957.45	957.06	8998.27	956.61	9004.78	956.53	9041.94	956.12
9055.41	955.96	9085.61	955.64	9106.04	955.4	9129.27	955.17	9156.67	954.95
9172.94	954.8	9207.31	954.47	9216.61	954.38	9257.94	953.89	9260.28	953.87
9274.96	953.71	9303.95	953.4	9308.57	953.35	9347.62	952.95	9359.2	952.84
9391.28	952.6	9409.83	952.49	9461.68	951.1	9466.61	950.94	9496.92	951.47
9504.37	951.71	9522.29	952.22	9561.73	952.19	9565.96	952.19	9592.46	952.25
9609.62	952.29	9612.76	952.25	9613.94	952.23	9659.86	952.18	9663.35	952.13
9668.92	952.06	9676.35	951.93	9691.49	951.68	9730.49	951.01	9734.61	951.09
9748.48	951.36	9756.94	951.54	9762.2	951.66	9784.3	952.03	9814.89	951.9
9827.97	951.82	9865.52	951.48	9871.64	951.41	9909.98	951.09	9915.3	951.04
9916.15	951.03	9918.71	950.81	9924.26	950.39	9975.27	946.45	10000	946.38
10006.38	946.35	10025.16	946.28	10032.74	946.97	10059.06	949.37	10066.09	950.04
10069.39	950.41	10079.85	951.21	10110.75	951.51	10139.26	951.68	10146.94	951.69
10158.9	951.71	10180.13	951.76	10183.12	951.76	10184.3	951.77	10198.67	951.81
10251.47	951.84	10255.5	951.84	10258.08	951.84	10291.68	951.82	10317.49	951.84
10327.87	951.84	10344.05	951.82	10364.06	951.77	10376.9	951.78	10400.25	951.76
10436.31	951.75	10436.62	951.75	10472.62	951.67	10495.73	951.67	10508.81	951.64
10529.19	951.6	10544.99	951.54	10555.14	951.52	10581.18	951.46	10614.55	951.36
10617.37	951.36	10621.77	951.34	10653.56	951.18	10673.96	951.15	10689.74	951.18
10714.34	951.16	10725.93	951.16	10733.37	951.15	10762.12	951.16	10792.78	951.07
10798.3	951.04	10806.91	951.05	10834.49	951.08	10852.19	951.11	10870.68	951.09
10899.48	951.06	10906.87	951.06	10911.6	951.08	10943.05	951.06	10971.02	951.09
10979.24	951.08								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8671.54	.05	9814.89	.043	10139.26	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9814.89	10139.26	1840	1672	1415	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent

10317.4910979.24 952.5 F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	952.61	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	952.29	Reach Len. (ft)			
Crit W.S. (ft)	950.73	Flow Area (sq ft)	186.70	830.02	88.52
E.G. Slope (ft/ft)	0.005307	Area (sq ft)	186.70	830.02	702.86
Q Total (cfs)	4270.00	Flow (cfs)	244.10	3905.72	120.18
Top Width (ft)	1562.12	Top Width (ft)	397.76	324.37	839.98
Vel Total (ft/s)	3.86	Avg. Vel. (ft/s)	1.31	4.71	1.36
Max Chl Dpth (ft)	6.01	Hydr. Depth (ft)	0.47	2.56	0.50
Conv. Total (cfs)	58614.8	Conv. (cfs)	3350.8	53614.2	1649.8
Length Wtd. (ft)		Wetted Per. (ft)	397.82	324.78	178.23
Min Ch El (ft)	946.28	Shear (lb/sq ft)	0.16	0.85	0.16
Alpha	1.37	Stream Power (lb/ft s)	0.20	3.98	0.22
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S3WS1 (A54)
REACH: REACH 1 RS: 0.461

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9626.56	1025.36	9652.4	1025.34	9692.16	1025.33	9729.64	1025.31	9757.76	1025.33
9806.88	1025.41	9823.35	1025.43	9884.13	1025.46	9888.95	1025.46	9922.21	1025.39
9979.8	1021.76	9991.71	1021	10000	102110002.02	102110006.31	1021		
10009.16	1021.1510065.31	1025.0910077.94	1025.1310137.43	1025.410137.57	1025.4				
10137.64	1025.4	10197.2	1025.9910229.41	1026.3510256.82	1026.7110307.69	1027.38			
10316.45	1027.4910321.18	1027.5510376.08	1027.9510412.95	1028.1610435.71	1028.21				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9626.56	.05	9922.21	.04310065.31	.05	

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9922.2	110065.31	1360	1389	1365	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1024.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.043	
W.S. Elev (ft)	1024.16	Reach Len. (ft)	1360.00	1389.00	1365.00
Crit W.S. (ft)		Flow Area (sq ft)		198.02	
E.G. Slope (ft/ft)	0.003076	Area (sq ft)		198.02	
Q Total (cfs)	560.00	Flow (cfs)		560.00	
Top Width (ft)	110.26	Top Width (ft)		110.26	
Vel Total (ft/s)	2.83	Avg. Vel. (ft/s)		2.83	
Max Chl Dpth (ft)	3.16	Hydr. Depth (ft)		1.80	
Conv. Total (cfs)	10097.8	Conv. (cfs)		10097.8	
Length Wtd. (ft)	1389.00	Wetted Per. (ft)		110.47	
Min Ch El (ft)	1021.00	Shear (lb/sq ft)		0.34	
Alpha	1.00	Stream Power (lb/ft s)		0.97	
Frctn Loss (ft)	9.86	Cum Volume (acre-ft)		10.05	
C & E Loss (ft)	0.05	Cum SA (acres)		3.00	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S3WS1 (A54)
REACH: REACH 1 RS: 0.198

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9875.52	1015.49	9895.6	1015.35	9924.36	1015.22	9961.87	1013.52	9971.63	1013.35
9993.69	1012	9994.44	1011.93	10000	1011.51	10007.66	1011	10010.08	1011.23
10027.53	1012.91	10036.08	1013.85	10037.84	1014.12	10076.79	1016.97	10098.2	1017.33
10142.95	1017.68	10158.56	1017.81	10166.04	1017.86	10218.93	1017.94	10255.29	1018.04
10279.29	1018.01	10329.43	1018.07	10339.65	1018.08	10344.54	1018.09	10400.01	1018.29
10433.79	1018.51	10460.37	1018.72	10515.92	1019.37	10520.73	1019.42	10523.04	1019.45
10581.09	1020.17	10612.29	1020.57	10641.46	1020.85				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9875.52	.05	9924.36	.043	10098.2	.05

Bank Sta: Left Right Coeff Contr. Expan.
9924.36 10098.2 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1014.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.		0.043	
W.S. Elev (ft)	1013.74	Reach Len. (ft)	1045.00	1045.00	1045.00
Crit W.S. (ft)	1013.74	Flow Area (sq ft)		97.66	
E.G. Slope (ft/ft)	0.025175	Area (sq ft)		97.66	
Q Total (cfs)	620.00	Flow (cfs)		620.00	
Top Width (ft)	78.17	Top Width (ft)		78.17	
Vel Total (ft/s)	6.35	Avg. Vel. (ft/s)		6.35	
Max Chl Dpth (ft)	2.74	Hydr. Depth (ft)		1.25	
Conv. Total (cfs)	3907.5	Conv. (cfs)		3907.5	
Length Wtd. (ft)	1045.00	Wetted Per. (ft)		78.39	
Min Ch El (ft)	1011.00	Shear (lb/sq ft)		1.96	
Alpha	1.00	Stream Power (lb/ft s)		12.43	
Frctn Loss (ft)	7.25	Cum Volume (acre-ft)		5.33	
C & E Loss (ft)	0.05	Cum SA (acres)			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS6 (A55)
REACH: REACH 1 RS: 1.720

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9400.74	1036.66	9431.06	1036.72	9436.99	1036.73	9476.84	1036.57	9487.23	1036.53
9522.62	1036.13	9537.46	1035.98	9568.39	1035.52	9587.7	1035.25	9614.17	1034.9
9637.94	1034.59	9659.95	1034.41	9688.17	1034.18	9705.73	1034.1	9738.41	1033.95
9778.14	1033.43	9788.65	1033.31	9797.29	1033.29	9838.89	1033.11	9843.07	1033.08
9886	1032.86	9888.85	1032.85	9889.12	1032.85	9934.62	1032.64	9939.36	1032.62
9951.75	1031.95	9964.44	1031.25	10000	1029.29	10002.91	1029.13	10016.01	1030.7
10025.06	1031.81	10034.64	1032.07	10090.07	1033.45	10117.74	1033.9	10140.3	1034.23
10163.51	1034.63	10190.54	1035.13	10209.29	1035.44	10240.78	1035.87	10255.07	1036.02
10291.01	1036.31	10300.85	1036.41	10341.25	1036.67	10346.62	1036.68	10391.48	1036.77
10392.4	1036.78	10401.84	1036.82	10438.18	1036.97	10441.72	1036.98	10483.96	1037.17
10491.96	1037.21	10529.74	1037.35	10542.19	1037.42	10575.52	1037.52	10592.43	1037.57

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9400.74     .05 9939.36    .04310090.07     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.3610090.07             1265    1346    1265            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1032.73  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1032.51  * Reach Len. (ft)         * 1265.00  * 1346.00  * 1265.00  *
* Crit W.S. (ft)          * 1031.76  * Flow Area (sq ft)       *          *  158.54  *          *
* E.G. Slope (ft/ft)      *0.007479  * Area (sq ft)            *          *  158.54  *          *
* Q Total (cfs)           *  600.00  * Flow (cfs)              *          *  600.00  *          *
* Top Width (ft)          *  110.99  * Top Width (ft)          *          *  110.99  *          *
* Vel Total (ft/s)        *    3.78  * Avg. Vel. (ft/s)         *          *    3.78  *          *
* Max Chl Dpth (ft)       *    3.38  * Hydr. Depth (ft)         *          *    1.43  *          *
* Conv. Total (cfs)       *  6937.7  * Conv. (cfs)              *          *  6937.7  *          *
* Length Wtd. (ft)        * 1346.00  * Wetted Per. (ft)         *          *  111.26  *          *
* Min Ch El (ft)          * 1029.13  * Shear (lb/sq ft)         *          *    0.67  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    2.52  *          *
* Frctn Loss (ft)         *    8.15  * Cum Volume (acre-ft)     *          *   28.77  *          *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *          *    9.64  *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS6 (A55)
REACH: REACH 1 RS: 1.465

INPUT
Description:
Station Elevation Data num= 65

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9279.61 1029.94 9280.11 1029.93 9295.55 1029.81 9343.56 1029.46 9351.75  1029.4
 9354.39 1029.38 9359.51 1029.36 9391.52 1029.22 9407.96 1029.22 9428.66 1029.16
 9464.16  1029.1  9465.8  1029.1    9469 1029.09 9502.94 1029.01 9520.36 1028.95
 9540.08 1028.85 9576.57 1028.63 9577.22 1028.63 9578.48 1028.62 9614.35 1028.37
 9632.77 1028.21 9651.49 1028.07 9687.96 1027.75 9688.63 1027.74 9688.98 1027.74
 9725.77  1027.5 9745.18 1027.35 9762.91 1027.25 9797.44 1027.02 9800.05    1027
 9801.38 1026.99 9837.18 1026.77 9857.59 1026.65 9874.32 1026.52 9906.92 1026.33
 9911.46  1026.3 9913.79 1026.29  9948.6  1026.1 9987.37 1021.87   10000 1020.53
10002.37  1020.310023.72 1022.0510049.14 1024.45 10062.8 1025.6810075.26 1026.94
10108.96 1028.0810126.59 1028.6310150.61 1029.4310177.93 1029.9610192.27 1030.03
10229.26 1029.8110253.98 1029.6610280.59 1029.4710317.23 1028.4910331.92 1028.41
10358.88 1028.5210383.26 1029.1810400.53 1029.5610434.59 1030.1910442.18 1030.36
10474.86 1030.2210483.84 1030.1510485.92 1030.1410525.49 1029.7810537.25 1029.92
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9279.61     .05  9948.6    .04310075.26     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.610075.26              1240    1272    1250            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1024.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1024.34  * Reach Len. (ft)         * 1240.00  * 1272.00  * 1250.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  172.36  *          *
* E.G. Slope (ft/ft)      *0.005119  * Area (sq ft)            *          *  172.36  *          *
* Q Total (cfs)           *  690.00  * Flow (cfs)              *          *  690.00  *          *
* Top Width (ft)          *   83.27  * Top Width (ft)          *          *   83.27  *          *
* Vel Total (ft/s)        *    4.00  * Avg. Vel. (ft/s)         *          *    4.00  *          *
* Max Chl Dpth (ft)       *    4.04  * Hydr. Depth (ft)         *          *    2.07  *          *
* Conv. Total (cfs)       *  9643.7  * Conv. (cfs)              *          *  9643.7  *          *
* Length Wtd. (ft)        * 1272.00  * Wetted Per. (ft)         *          *   83.66  *          *
* Min Ch El (ft)          * 1020.30  * Shear (lb/sq ft)         *          *    0.66  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    2.64  *          *
* Frctn Loss (ft)         *    5.76  * Cum Volume (acre-ft)     *          *   23.66  *          *
```

```
* C & E Loss (ft)          *    0.01  * Cum SA (acres)          *          *    6.64  *          *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS6 (A55)
REACH: REACH 1 RS: 1.224

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9307.37	1025.22	9324.2	1025.33	9347.37	1025.44	9361.58	1025.48	9390.63	1025.53
9398.96	1025.55	9403.03	1025.56	9436.34	1025.52	9458.69	1025.49	9473.72	1025.36
9504.45	1025.44	9511.1	1025.44	9514.34	1025.41	9548.47	1024.94	9570	1024.94
9585.85	1024.75	9618.27	1024.37	9623.23	1024.3	9625.66	1024.29	9660.61	1023.84
9681.32	1023.71	9697.99	1023.55	9732.09	1023.06	9735.37	1023.01	9736.98	1022.98
9772.75	1022.42	9792.64	1022.04	9810.13	1021.73	9845.9	1020.95	9847.51	1020.91
9848.29	1020.9	9884.89	1020.12	9903.95	1019.71	9922.27	1019.39	9953.18	1016.86
9986.38	1015	9986.67	1015.01	10000	1015.15	10010.11	1015.26	10018.14	1015.64
10071.3	1018.92	10071.53	1018.92	10072.01	1018.93	10108.78	1019.42	10127.24	1019.74
10146.03	1019.94	10183.19	1020.44	10183.27	1020.44	10183.45	1020.44	10220.52	1020.64
10239.14	1020.82	10257.77	1020.96	10294.89	1021.28	10295.02	1021.28	10295.08	1021.28
10332.27	1021.55	10351.03	1021.76	10369.51	1021.95	10406.33	1022.41	10406.76	1022.41
10406.98	1022.41	10444.01	1023.05	10462.93	1023.23	10481.26	1023.66	10517.77	1024.38
10518.51	1024.39	10518.87	1024.41	10555.75	1025.23	10574.82	1025.47	10593	1025.62
10629.22	1025.61	10630.25	1025.61	10630.77	1025.6	10667.5	1025.44	10686.72	1025.56
10704.74	1025.63	10740.66	1025.88	10741.99	1025.89	10742.66	1025.91	10779.24	1026.33
10798.61	1026.58	10816.49	1026.79	10852.1	1027.31	10853.74	1027.33		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9307.37	.05	9922.27	.043	10071.3	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9922.27	10071.3	1305	1335	1315	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1018.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.043	
W.S. Elev (ft)	1018.60	Reach Len. (ft)	1305.00	1335.00	1315.00
Crit W.S. (ft)	1017.46	Flow Area (sq ft)		286.17	
E.G. Slope (ft/ft)	0.004199	Area (sq ft)		286.17	
Q Total (cfs)	1060.00	Flow (cfs)		1060.00	
Top Width (ft)	134.29	Top Width (ft)		134.29	
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)		3.70	
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)		2.13	
Conv. Total (cfs)	16357.8	Conv. (cfs)		16357.8	
Length Wtd. (ft)	1335.00	Wetted Per. (ft)		134.51	
Min Ch El (ft)	1015.00	Shear (lb/sq ft)		0.56	
Alpha	1.00	Stream Power (lb/ft s)		2.07	
Frctn Loss (ft)	5.87	Cum Volume (acre-ft)		16.96	
C & E Loss (ft)	0.01	Cum SA (acres)		3.46	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS6 (A55)
REACH: REACH 1 RS: 0.971

INPUT
Description:
Station Elevation Data num= 107

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*****************************************************************************
 9120.02 1019.91 9148.64 1019.66 9168.29 1019.45 9184.88 1019.34 9211.12 1019.09
 9221.12 1019.04 9227.45 1018.96 9257.36 1018.79 9286.61 1018.45 9304.65 1018.29
 9329.84  1018.1 9345.77 1017.94 9366.08 1017.81 9398.18 1017.51 9402.32 1017.49
 9404.94 1017.47 9438.56 1017.25  9464.1 1017.03  9474.8 1016.96 9491.71 1016.84
 9511.04 1016.69 9523.26 1016.61 9547.28 1016.49 9582.43 1016.26 9583.52 1016.24
 9585.24 1016.23 9619.76 1015.94 9641.59 1015.68    9656 1015.53 9678.77 1015.36
 9692.24 1015.25 9700.75  1015.2 9728.48 1014.99 9759.92  1014.9 9764.72 1014.86
  9772.3 1014.82 9800.96 1014.55 9819.08 1014.48  9837.2 1014.28 9865.84 1014.14
 9878.24 1014.11 9909.68 1013.96 9937.41  1013.9 9945.92 1013.86 9990.84 1008.16
 9992.79    1008 9997.94    1008   10000    100810008.34    100810018.14 1009.25
10057.55 1013.8410084.93 1013.9110095.73  1013.910121.37 1013.9110133.91 1013.92
10139.19 1013.9210172.08 1013.8410193.44 1013.9510210.26 1014.0310247.69 1014.29
10248.43  1014.310250.19 1014.3110286.61 1014.5610301.95 1014.6810324.79 1014.89
 10356.2 1015.1710362.96  1015.210379.02 1015.1910401.14  1015.210410.45 1015.16
10439.31 1015.0810464.71    101510477.49    101510507.85 1014.9610515.67 1014.95
10518.96 1014.9510553.84 1014.9910573.21 1015.0210592.02 1015.0710627.46 1015.18
10630.19 1015.1910636.68 1015.2210668.37 1015.3310681.72  1015.410706.55 1015.49
10735.97 1015.6710744.72 1015.71 10765.5 1015.87 10782.9    101610790.22 1016.08
10821.08 1016.3910844.48 1016.6610859.25 1016.8510894.33 1017.3110897.43 1017.35
10898.73 1017.37 10935.6  1017.910952.98 1018.1410973.78 1018.4511007.24 1018.89
11011.96 1018.9611023.16 1019.0911050.13 1019.3911061.49  1019.511088.31 1019.74
11115.74 1019.9511126.48 1020.03

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9120.02     .05 9937.41    .04310057.55     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9937.4110057.55             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1012.94  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1012.63  * Reach Len. (ft)         * 1288.00  * 1288.00  * 1288.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  247.40  *          *
* E.G. Slope (ft/ft)      *0.004591  * Area (sq ft)            *          *  247.40  *          *
* Q Total (cfs)           * 1120.00  * Flow (cfs)              *          * 1120.00  *          *
* Top Width (ft)          *   91.46  * Top Width (ft)          *          *   91.46  *          *
* Vel Total (ft/s)        *    4.53  * Avg. Vel. (ft/s)        *          *    4.53  *          *
* Max Chl Dpth (ft)       *    4.62  * Hydr. Depth (ft)        *          *    2.71  *          *
* Conv. Total (cfs)       * 16530.0  * Conv. (cfs)             *          * 16530.0  *          *
* Length Wtd. (ft)        * 1288.00  * Wetted Per. (ft)        *          *   92.02  *          *
* Min Ch El (ft)          * 1008.00  * Shear (lb/sq ft)        *          *    0.77  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.49  *          *
* Frctn Loss (ft)         *    6.36  * Cum Volume (acre-ft)     *          *    8.79  *          *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS6 (A55)
REACH: REACH 2            RS: 0.727

INPUT
Description:
Station Elevation Data     num=      68
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9360.9 1012.65 9373.09 1012.56 9407.59  1012.4 9410.04 1012.39 9411.34 1012.38
 9446.99 1012.11 9468.03 1011.98 9483.93 1011.83 9513.72 1011.63 9520.88 1011.58
 9524.71 1011.55 9557.83 1011.29  9581.4 1011.14 9594.78 1011.05 9619.84 1010.91
 9631.73 1010.83 9638.09 1010.78 9668.68 1010.59 9694.77 1010.45 9725.96 1010.15
 9742.58 1009.96 9751.46  1009.9 9779.53 1009.49 9808.14 1009.23 9816.48 1009.27
 9832.08 1009.27 9853.43 1009.25 9864.83 1009.25 9902.38 1009.89 9924.57 1009.12
 9928.42 1008.66  9938.2  1007.5 9979.29    1002 9983.82 1001.85 9984.28 1001.85
 9991.01 1001.78 9995.56 1001.66   10000 1001.5610017.78 1001.06 10019.8    1001
10036.37 1003.2110080.78 1009.4110103.32 1009.0310130.79 1008.5910154.14 1008.43
 10180.8 1008.1210204.96 1008.11 10230.8 1007.9810255.78 1007.9610280.81  1007.9
  10306.6 1007.9310330.81 1007.9510357.42 1007.9210380.82 1008.0310408.25 1008.23
10430.83 1008.3210459.07 1008.5210480.83 1008.6910509.89 1008.8110530.84 1008.83
10560.71 1008.8410580.85 1008.9210611.53 1009.1810630.85 1009.2410662.35 1009.31
```

10680.86 1009.4410713.17 1009.5610730.87 1009.53

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9360.9	.05	9902.38	.04310080.78		.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9902.3810080.78 1150 1175 1190 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1006.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.		0.043	
W.S. Elev (ft)	1006.13	Reach Len. (ft)	1150.00	1175.00	1190.00
Crit W.S. (ft)		Flow Area (sq ft)		346.97	
E.G. Slope (ft/ft)	0.005168	Area (sq ft)		346.97	
Q Total (cfs)	1860.00	Flow (cfs)		1860.00	
Top Width (ft)	108.83	Top Width (ft)		108.83	
Vel Total (ft/s)	5.36	Avg. Vel. (ft/s)		5.36	
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)		3.19	
Conv. Total (cfs)	25872.2	Conv. (cfs)		25872.2	
Length Wtd. (ft)	1175.00	Wetted Per. (ft)		109.47	
Min Ch El (ft)	1001.00	Shear (lb/sq ft)		1.02	
Alpha	1.00	Stream Power (lb/ft s)		5.48	
Frctn Loss (ft)	4.39	Cum Volume (acre-ft)	0.05	37.86	
C & E Loss (ft)	0.04	Cum SA (acres)		6.43	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS6 (A55)
REACH: REACH 2 RS: 0.505

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9817.14	1001.9	9854.61	1002.1	9858.81	1002.12	9876.95	1002.17	9900.49	1002.23
9905.94	1002.24	9942.16	1002.22	9970.96	999.09	9995.13	995.24	10000	995.14
10013.09	994.87	10013.51	994.86	10013.79	994.92	10059.98	100	10066.95	1002
10096.34	1001.99	10108.49	1001.98	10111.37	1001.98	10150.02	1002.01	10162.76	1002.01
10191.56	1002.04	10214.14	1002.09	10233.09	1002.13	10265.53	1002.29	10274.63	1002.34
10312.99	1002.68	10316.17	1002.71	10316.92	1002.71	10357.7	1003.23	10368.3	1003.39
10399.24	1003.87	10419.69	1004.23	10440.77	1004.58	10471.08	1005.11	10482.31	1005.29
10522.47	100	10523.84	1006.02	10529.65	1006.12	10565.38	1006.71	10573.85	1006.84
10606.91	1007.11	10625.24	1007.26	10648.45	1007.28				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9817.14	.05	9942.16	.04310059.98		.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9942.1610059.98 1290 1321 1330 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1002.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.		0.043	
W.S. Elev (ft)	1001.83	Reach Len. (ft)	1290.00	1321.00	1330.00
Crit W.S. (ft)		Flow Area (sq ft)		429.99	
E.G. Slope (ft/ft)	0.002849	Area (sq ft)		429.99	
Q Total (cfs)	1920.00	Flow (cfs)		1920.00	
Top Width (ft)	113.18	Top Width (ft)		113.18	
Vel Total (ft/s)	4.47	Avg. Vel. (ft/s)		4.47	
Max Chl Dpth (ft)	6.97	Hydr. Depth (ft)		3.80	
Conv. Total (cfs)	35968.7	Conv. (cfs)		35968.7	
Length Wtd. (ft)	1321.00	Wetted Per. (ft)		114.17	
Min Ch El (ft)	994.86	Shear (lb/sq ft)		0.67	
Alpha	1.00	Stream Power (lb/ft s)		2.99	
Frctn Loss (ft)	8.22	Cum Volume (acre-ft)	0.05	27.38	
C & E Loss (ft)	0.08	Cum SA (acres)		3.44	

```
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS6 (A55)
REACH: REACH 2            RS: 0.255

INPUT
Description:
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9325.63  994.73 9328.32  994.74 9347.82  994.82  9363.7  994.88 9378.49  994.95
 9399.08  995.06 9421.19  995.17 9434.46  995.24 9446.81  995.29 9469.83  995.38
 9494.57  995.45 9505.21  995.46 9515.12  995.52 9540.59  995.59 9567.95  995.71
 9575.97  995.73 9583.44   995.8 9611.35  995.92 9641.32  996.18 9646.72  996.22
 9651.75  996.26  9682.1  996.36  9714.7  996.54 9717.48  996.54 9720.07  996.51
 9752.86  996.13 9788.07  996.05 9788.23  996.05 9788.38  996.05 9823.61   995.6
  9856.7  994.69 9858.99  994.65 9861.45  994.61 9894.37  994.26 9925.02  994.03
 9929.75  994.01 9944.41  992.85 9986.66  989.49   10000  989.6710003.89  989.72
10016.01  989.8510027.46  989.9710039.76  990.8910051.66  991.8610074.82  994.71
10106.89  995.0110111.96  995.0410121.88  995.0610149.11  995.0310163.07  995.05
10186.26  994.9410219.25  994.64 10223.4   994.6 10231.5  994.5310260.55  994.31
10275.44  994.29 10297.7  994.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9325.63     .05 9925.02    .04310074.82     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9925.0210074.82             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         *  993.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.07  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)         *  992.77  * Reach Len. (ft)         * 1346.00  * 1346.00  * 1346.00  *
* Crit W.S. (ft)         *  992.77  * Flow Area (sq ft)       *          *  239.45  *          *
* E.G. Slope (ft/ft)     *0.021460  * Area (sq ft)            *          *  239.45  *          *
* Q Total (cfs)          * 1990.00  * Flow (cfs)              *          * 1990.00  *          *
* Top Width (ft)         *  113.57  * Top Width (ft)          *          *  113.57  *          *
* Vel Total (ft/s)       *    8.31  * Avg. Vel. (ft/s)         *          *    8.31  *          *
* Max Chl Dpth (ft)      *    3.28  * Hydr. Depth (ft)         *          *    2.11  *          *
* Conv. Total (cfs)      * 13584.4  * Conv. (cfs)              *          * 13584.4  *          *
* Length Wtd. (ft)       * 1346.00  * Wetted Per. (ft)         *          *  113.83  *          *
* Min Ch El (ft)         *  989.49  * Shear (lb/sq ft)         *          *    2.82  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)    *          *   23.42  *          *
* Frctn Loss (ft)        *    9.05  * Cum Volume (acre-ft)      *    0.05  *   17.23  *          *
* C & E Loss (ft)        *    0.20  * Cum SA (acres)            *          *          *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 2S2WS20 (A19)
REACH: REACH 1            RS: 1.581
```

```
INPUT
Description: X-section is approximately 850' downstream of Riggs Rd.
Limit of
             Sudy.
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9860.41 1151.11 9890.45 1151.07 9907.28 1151.08 9940.57 1151.06 9989.06 1146.35
  9995.9 1145.81   10000 1146.0110002.83 1146.16   10055 1146.6310067.41 1146.82
10074.56 1146.9510084.04 1147.5710117.79  1149.710142.43 1151.4510176.02 1151.41
10193.03 1151.3810219.78 1151.2910243.64  1151.210263.55 1151.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9860.41    .044 9940.57    .04910142.43    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9940.5710142.43             1260    1283    1250            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)          * 1148.80  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.               *          *    0.049 *          *
* W.S. Elev (ft)          * 1148.68  * Reach Len. (ft)          * 1260.00  * 1283.00 * 1250.00  *
* Crit W.S. (ft)          * 1147.63  * Flow Area (sq ft)        *          *  244.33 *          *
* E.G. Slope (ft/ft)      *0.003888  * Area (sq ft)             *          *  244.33 *          *
* Q Total (cfs)           *  680.00  * Flow (cfs)               *          *  680.00 *          *
* Top Width (ft)          *  136.63  * Top Width (ft)           *          *  136.63 *          *
* Vel Total (ft/s)        *    2.78  * Avg. Vel. (ft/s)          *          *    2.78 *          *
* Max Chl Dpth (ft)       *    2.87  * Hydr. Depth (ft)          *          *    1.79 *          *
* Conv. Total (cfs)       * 10905.5  * Conv. (cfs)               *          * 10905.5 *          *
* Length Wtd. (ft)        * 1281.45  * Wetted Per. (ft)          *          *  136.83 *          *
* Min Ch El (ft)          * 1145.81  * Shear (lb/sq ft)          *          *    0.43 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *          *    1.21 *          *
* Frctn Loss (ft)         *    7.64  * Cum Volume (acre-ft)      *    1.86  *   38.92 *    0.05  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *    7.93  *   21.23 *    1.00  *
*************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS20 (A19)
REACH: REACH 1            RS: 1.338

INPUT
Description:
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9605.75 1141.09  9606.8 1141.09 9649.89 1140.95 9657.55 1140.92 9659.16 1140.91
  9708.3 1140.75 9720.57 1140.72 9759.05 1140.64 9781.98 1140.65 9809.79 1140.66
 9843.39 1140.73 9860.54 1140.75 9904.79 1140.85 9911.29 1140.86 9921.15 1140.56
 9925.34 1140.47 9929.29 1140.39 9935.91 1140.25 9987.53 1139.26  9992.1 1139.09
 9997.71 1138.73   10000 1138.7810062.04 1140.8610062.64 1140.8810062.86 1140.89
10062.98 1140.89 10063.4  1140.9 10106.9 1141.0210114.04 1141.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9605.75    .044 9911.29    .049 10063.4    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9911.29 10063.4             1125    1167    1120            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)          * 1141.16  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.               *   0.044  *    0.049 *   0.044  *
* W.S. Elev (ft)          * 1141.00  * Reach Len. (ft)          * 1125.00  * 1167.00  * 1120.00  *
* Crit W.S. (ft)          * 1140.81  * Flow Area (sq ft)        *   67.54  *  174.69  *    1.86  *
* E.G. Slope (ft/ft)      *0.010282  * Area (sq ft)             *   67.54  *  174.69  *    1.86  *
* Q Total (cfs)           *  680.00  * Flow (cfs)               *   90.23  *  588.90  *    0.87  *
```

```
* Top Width (ft)          *  466.06  * Top Width (ft)          *  277.22  *  152.11  *   36.73  *
* Vel Total (ft/s)        *    2.79  * Avg. Vel. (ft/s)        *    1.34  *    3.37  *    0.47  *
* Max Chl Dpth (ft)       *    2.27  * Hydr. Depth (ft)        *    0.24  *    1.15  *    0.05  *
* Conv. Total (cfs)       *  6706.2  * Conv. (cfs)             *   889.8  *  5807.7  *     8.6  *
* Length Wtd. (ft)        * 1164.16  * Wetted Per. (ft)        *  277.22  *  152.18  *   36.73  *
* Min Ch El (ft)          * 1138.73  * Shear (lb/sq ft)        *    0.16  *    0.74  *    0.03  *
* Alpha                   *    1.30  * Stream Power (lb/ft s)  *    0.21  *    2.48  *    0.02  *
* Frctn Loss (ft)         *   11.14  * Cum Volume (acre-ft)    *    0.88  *   32.75  *    0.02  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    3.92  *   16.98  *    0.47  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS20 (A19)
REACH: REACH 1 RS: 1.117

INPUT
Description:
Station Elevation Data num= 33

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9619.65 1134.35 9621.14 1134.35 9661.13 1134.27 9674.47 1134.21 9712.67 1134.06
 9743.21 1133.84 9764.21  1133.7 9811.94 1133.23 9815.75  1133.2 9827.18 1133.06
 9867.29 1132.58 9880.68 1132.43 9918.84 1132.02 9941.72 1131.84 9998.47 1126.25
   10000 1126.1410001.45 1126.2510003.73 1126.4210024.83 1127.9110034.03 1128.54
10040.55 1128.9810072.75 1131.6910096.49 1131.8410123.78 1131.9910138.86 1132.09
10174.81 1132.3210181.23 1132.3510212.63 1132.5210223.61 1132.5810225.85  1132.6
10265.98 1132.7610276.88 1132.8110308.35 1132.92
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9619.65    .044 9941.72    .04910072.75    .044
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.7210072.75             1430    1452    1395            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1130.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.28  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1129.73  * Reach Len. (ft)         * 1430.00  * 1452.00  * 1395.00  *
* Crit W.S. (ft)          * 1128.97  * Flow Area (sq ft)       *          *  157.23  *          *
* E.G. Slope (ft/ft)      *0.008913  * Area (sq ft)            *          *  157.23  *          *
* Q Total (cfs)           *  670.00  * Flow (cfs)              *          *  670.00  *          *
* Top Width (ft)          *   86.28  * Top Width (ft)          *          *   86.28  *          *
* Vel Total (ft/s)        *    4.26  * Avg. Vel. (ft/s)        *          *    4.26  *          *
* Max Chl Dpth (ft)       *    3.59  * Hydr. Depth (ft)        *          *    1.82  *          *
* Conv. Total (cfs)       *  7096.8  * Conv. (cfs)             *          *  7096.8  *          *
* Length Wtd. (ft)        * 1452.00  * Wetted Per. (ft)        *          *   86.59  *          *
* Min Ch El (ft)          * 1126.14  * Shear (lb/sq ft)        *          *    1.01  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    4.31  *          *
* Frctn Loss (ft)         *    9.54  * Cum Volume (acre-ft)    *    0.01  *   28.31  *          *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *    0.34  *   13.79  *          *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS20 (A19)
REACH: REACH 1 RS: 0.842

INPUT
Description:
Station Elevation Data num= 33

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9483.31 1123.02 9513.13 1122.93 9533.47 1122.81 9563.48 1122.63 9590.63  1122.4
 9613.83 1122.22 9647.79 1121.94 9664.19  1121.8 9704.95 1121.48 9714.54 1121.41
 9762.12 1121.27 9764.89 1121.27 9785.44 1121.22 9815.25 1121.12 9819.28 1121.09
```

```
  9865.6 1120.54 9876.44 1120.45 9915.95 1120.25 9976.03 1118.11 9998.76  1117.2
   10000 1117.2610032.98 1118.8210069.43 1120.47 10073.9 1120.5110088.89 1120.65
 10114.1 1120.86 10121.6 1120.9410154.29 1121.2410173.77 1121.4410194.49 1121.61
10225.94 1121.8810234.69 1121.9410264.05 1122.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9483.31    .044 9915.95    .04910069.43    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.9510069.43             1370    1352    1400             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1120.43  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *   0.044  *   0.049  *         *
* W.S. Elev (ft)          * 1120.30  * Reach Len. (ft)        * 1370.00  * 1352.00  * 1400.00  *
* Crit W.S. (ft)          * 1119.37  * Flow Area (sq ft)      *    0.29  *  230.54  *         *
* E.G. Slope (ft/ft)      *0.005021  * Area (sq ft)           *    0.29  *  230.54  *         *
* Q Total (cfs)           *  660.00  * Flow (cfs)             *    0.06  *  659.94  *         *
* Top Width (ft)          *  160.47  * Top Width (ft)         *   10.66  *  149.81  *         *
* Vel Total (ft/s)        *    2.86  * Avg. Vel. (ft/s)       *    0.22  *    2.86  *         *
* Max Chl Dpth (ft)       *    3.10  * Hydr. Depth (ft)       *    0.03  *    1.54  *         *
* Conv. Total (cfs)       *  9314.2  * Conv. (cfs)            *     0.9  *  9313.3  *         *
* Length Wtd. (ft)        * 1352.00  * Wetted Per. (ft)       *   10.66  *  149.94  *         *
* Min Ch El (ft)          * 1117.20  * Shear (lb/sq ft)       *    0.01  *    0.48  *         *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *    0.00  *    1.38  *         *
* Frctn Loss (ft)         *   10.57  * Cum Volume (acre-ft)   *    0.00  *   21.84  *         *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)         *    0.17  *    9.85  *         *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS20 (A19)
REACH: REACH 1            RS: 0.586

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9358.86 1112.05 9377.48 1111.99  9396.1  1111.9 9424.42 1111.76 9446.22 1111.66
 9471.36 1111.53 9496.33  1111.4 9518.31 1111.28 9546.45 1111.13 9565.25 1111.01
 9596.56 1110.83 9612.19 1110.76 9646.67  1110.6 9659.14 1110.57 9696.79 1110.47
 9712.49 1109.99 9724.64 1109.59 9767.32 1108.15 9769.07 1108.24 9840.16 1110.15
 9846.25 1110.32 9847.13 1110.34 9893.85 1110.23 9897.24 1110.22  9940.8 1110.09
 9947.36 1110.07 9964.02 1108.71 9985.36 1106.88 9989.18 1106.56  9990.5 1106.62
   10000 1107.05 10001.4 1107.1110006.73 1107.36 10009.3 1107.4510020.07 1108.08
10027.82 1108.5110032.73 1108.7710036.21 1108.9410082.21  1110.410100.95 1110.49
10111.74 1110.5510151.82 1110.7610152.54 1110.7610152.73 1110.7610193.33 1110.91
10204.51 1110.9610234.13 1111.0310256.29 1111.0910274.93 1111.1210308.07 1111.17
10315.73 1111.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9358.86    .044 9696.79    .04910082.21    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9696.7910082.21             1200    1183    1210             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 9358.86 9846.25    1111       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1109.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *          *   0.049  *         *
* W.S. Elev (ft)          * 1109.53  * Reach Len. (ft)        * 1200.00  * 1183.00  * 1210.00  *
* Crit W.S. (ft)          * 1109.09  * Flow Area (sq ft)      *          *  143.65  *         *
* E.G. Slope (ft/ft)      *0.013953  * Area (sq ft)           *          *  205.53  *         *
```

Q Total (cfs)	650.00	Flow (cfs)		650.00	
Top Width (ft)	191.91	Top Width (ft)		191.91	
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)		4.52	
Max Chl Dpth (ft)	2.97	Hydr. Depth (ft)		1.42	
Conv. Total (cfs)	5502.8	Conv. (cfs)		5502.8	
Length Wtd. (ft)	1183.00	Wetted Per. (ft)		101.19	
Min Ch El (ft)	1106.56	Shear (lb/sq ft)		1.24	
Alpha	1.00	Stream Power (lb/ft s)		5.60	
Frctn Loss (ft)	9.53	Cum Volume (acre-ft)		15.08	
C & E Loss (ft)	0.06	Cum SA (acres)		4.55	

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 2S2WS20 (A19)
REACH: REACH 1 RS: 0.362

INPUT
Description:
Station Elevation Data num= 30

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9672.57	1101.53	9688.02	1101.56	9701.72	1101.6	9728.39	1101.61	9753.78	1101.63
9768.76	1101.62	9805.83	1101.61	9809.13	1101.61	9820.52	1101.59	9849.49	1101.56
9857.88	1101.54	9889.86	1101.42	9909.93	1101.35	9930.23	1101.31	9965.68	1098.81
9976.05	1098.44	9990.88	1097.98	9994.95	1097.91	9995.71	1097.89	10000	1097.65
10016.15	1097.81	10019.71	1097.86	10027.61	1097.97	10047.07	1098.28	10072.3	1099.34
10086.79	1099.97	10119.83	1101.71	10130.36	1101.72	10156.6	1101.72	10187.57	1101.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9672.57	.044	9930.23	.049	10119.83	.044

Bank Sta: Left Right Coeff Contr. Expan.
9930.23 10119.83 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1100.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.		0.049	
W.S. Elev (ft)	1100.13	Reach Len. (ft)	1911.00	1911.00	1911.00
Crit W.S. (ft)		Flow Area (sq ft)		221.41	
E.G. Slope (ft/ft)	0.005236	Area (sq ft)		221.41	
Q Total (cfs)	650.00	Flow (cfs)		650.00	
Top Width (ft)	142.96	Top Width (ft)		142.96	
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)		2.94	
Max Chl Dpth (ft)	2.48	Hydr. Depth (ft)		1.55	
Conv. Total (cfs)	8983.0	Conv. (cfs)		8983.0	
Length Wtd. (ft)	1911.00	Wetted Per. (ft)		143.07	
Min Ch El (ft)	1097.65	Shear (lb/sq ft)		0.51	
Alpha	1.00	Stream Power (lb/ft s)		1.49	
Frctn Loss (ft)	15.53	Cum Volume (acre-ft)		9.28	
C & E Loss (ft)	0.02	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 4.381

INPUT
Description: X-section located at El Paso Natural Gas Road.

```
Limit of Sudy.
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9525.3 1214.83 9530.88 1214.81 9554.04 1214.71 9585.03 1214.58  9628.6 1214.42
 9639.18 1214.39 9646.71 1214.38 9693.33  1214.3 9739.37 1214.28 9747.47 1214.28
 9758.87 1214.27 9801.62 1214.23 9856.38 1212.65 9870.21 1212.15 9889.87 1213.21
 9898.99 1213.73 9909.91 1214.08 9977.71 1212.82 9978.29 1212.81 9978.41 1212.81
 9978.69 1212.81   10000 1212.6710017.69 1212.5310024.28 1212.4810057.13 1212.84
10066.86    121310113.93 1212.36 10116.9 1212.3210166.02 1211.8210166.94 1211.81
 10167.8 1211.8110173.69 1211.7810248.65 1211.43 10302.1 1213.5310317.85 1214.05
10319.26 1214.0310321.86    121410325.13 1213.9510332.52 1213.8410350.22  1213.7
10362.51 1213.61 10370.3 1213.8410371.11 1213.8710371.34 1213.8810377.42 1214.15
10382.41  1214.410382.69 1214.4110393.71 1215.1210405.06 1216.0610415.62 1217.09
10425.51 1218.1210437.57  1219.410450.84 1220.8810454.49 1221.0810466.98 1222.59
10474.34 1222.7910517.22 1223.9510530.63 1223.7710567.25 1223.7710582.72 1223.55
10617.29 1223.1110634.81 1222.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9525.3    .044 9909.91    .04910066.86    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9909.9110066.86             1560 1499.52    1450             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10317.8510634.81    1215       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1213.93  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *   0.044   *   0.049   *   0.044  *
* W.S. Elev (ft)          * 1213.74  * Reach Len. (ft)         * 1560.00   * 1499.52   * 1450.00  *
* Crit W.S. (ft)          * 1213.28  * Flow Area (sq ft)       *   62.42   *  116.75   *  379.02  *
* E.G. Slope (ft/ft)      *0.006863  * Area (sq ft)            *   62.42   *  116.75   *  380.45  *
* Q Total (cfs)           * 1840.00  * Flow (cfs)              *  147.08   *  261.52   * 1431.40  *
* Top Width (ft)          *  482.71  * Top Width (ft)           *   80.70   *  138.66   *  263.35  *
* Vel Total (ft/s)        *    3.30  * Avg. Vel. (ft/s)         *    2.36   *    2.24   *    3.78  *
* Max Chl Dpth (ft)       *    2.31  * Hydr. Depth (ft)         *    0.77   *    0.84   *    1.57  *
* Conv. Total (cfs)       * 22211.2  * Conv. (cfs)              *  1775.4   *  3156.9   * 17278.9  *
* Length Wtd. (ft)        * 1480.79  * Wetted Per. (ft)         *   80.77   *  138.67   *  241.65  *
* Min Ch El (ft)          * 1212.48  * Shear (lb/sq ft)         *    0.33   *    0.36   *    0.67  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)   *    0.78   *    0.81   *    2.54  *
* Frctn Loss (ft)         *   11.58  * Cum Volume (acre-ft)     *   13.52   *  121.10   *   22.40  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   17.32   *   71.25   *   28.81  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS17B (A63)
REACH: REACH 1            RS: 4.098

INPUT
Description:
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9795.92 1203.57 9802.27 1203.63 9811.01 1203.59  9854.4 1203.38 9884.94 1202.84
 9906.53 1202.54 9931.33 1201.97 9955.31 1201.18 9986.68 1200.35 9994.98 1200.02
   10000    120010028.47 1200.2610045.22 1200.4610067.27 1200.5910091.26  1200.7
   10123  1200.9 10128.6 1200.9510139.97 1200.9910165.94 1201.1110178.74 1201.07
10203.29 1201.2710234.47 1201.2410240.63  1201.310253.13 1201.2810277.97 1201.31
10290.21 1201.2910315.32 1201.4310345.94  1201.610352.66  1201.6 10366.3  1201.6
   10390 1201.6110426.18 1201.6110440.54 1201.6410444.97 1201.4410465.07 1201.77
10483.86 1201.8810492.65 1201.92 10497.8 1201.9510513.15 1202.4310539.38 1202.77
10568.88  1203.210576.72 1203.3410592.64 1203.5910614.07  1203.910624.62  1204.1
10651.41 1204.4710680.35 1204.8210688.75 1204.96

Manning's n Values        num=       3
```

Sta	n Val	Sta	n Val	Sta	n Val
9795.92	.044	9955.31	.04	9910345.94	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9955.3110345.94 1100 1124.64 1200 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1202.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1202.17	Reach Len. (ft)	1100.00	1124.64	1200.00
Crit W.S. (ft)		Flow Area (sq ft)	15.21	482.94	78.43
E.G. Slope (ft/ft)	0.009036	Area (sq ft)	15.21	482.94	78.43
Q Total (cfs)	1790.00	Flow (cfs)	29.26	1603.55	157.19
Top Width (ft)	582.38	Top Width (ft)	32.78	390.63	158.97
Vel Total (ft/s)	3.10	Avg. Vel. (ft/s)	1.92	3.32	2.00
Max Chl Dpth (ft)	2.17	Hydr. Depth (ft)	0.46	1.24	0.49
Conv. Total (cfs)	18830.3	Conv. (cfs)	307.8	16868.9	1653.6
Length Wtd. (ft)	1138.98	Wetted Per. (ft)	32.79	390.65	158.98
Min Ch El (ft)	1200.00	Shear (lb/sq ft)	0.26	0.70	0.28
Alpha	1.07	Stream Power (lb/ft s)	0.50	2.32	0.56
Frctn Loss (ft)	9.91	Cum Volume (acre-ft)	12.13	110.78	14.76
C & E Loss (ft)	0.01	Cum SA (acres)	15.29	62.14	21.78

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 3.884

INPUT
Description:
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9413.02	1192.71	9425.37	1192.7	9430.97	1192.74	9475.38	1192.93	9479.87	1192.99
9525.39	1193.21	9528.76	1193.2	9575.41	1193.08	9577.66	1193.06	9625.42	1192.67
9626.56	1192.66	9675.43	1192.18	9675.45	1192.18	9676.34	1192.17	9724.35	1191.72
9725.45	1191.71	9773.25	1191.31	9775.46	1191.29	9822.14	1191.01	9825.47	1190.99
9871.04	1190.9	9875.49	1190.89	9919.94	1190.95	9925.5	1190.96	9937.85	1191.02
10000	119	110000.72	119	110060.52	1191.55	10073.63	1191.68	10078.08	1191.74
10095.67	1191.64	10119.81	1191.67	10150.85	1191.71	10155.44	1191.71	10159.01	1191.7
10191.07	1191.66	10224.44	1191.09	10237.44	1190.97	10241.54	1190.94	10267.66	1191.24
10280.05	1191.38	10289.95	1191.51	10313.74	1191.65	10333.6	1191.71	10349.04	1191.78
10369.23	1191.88	10395.18	1192.08	10404.86	1192.15	10412.39	1192.21	10440.49	1192.37

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9413.02	.044	9724.35	.04	10078.08	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9724.3510078.08 1475 1542 1475 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1192.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1192.28	Reach Len. (ft)	1475.00	1542.00	1475.00
Crit W.S. (ft)	1191.96	Flow Area (sq ft)	16.84	399.47	228.85
E.G. Slope (ft/ft)	0.008379	Area (sq ft)	16.84	399.47	228.85
Q Total (cfs)	1760.00	Flow (cfs)	22.48	1202.52	535.01
Top Width (ft)	761.06	Top Width (ft)	59.36	353.73	347.97
Vel Total (ft/s)	2.73	Avg. Vel. (ft/s)	1.33	3.01	2.34
Max Chl Dpth (ft)	1.39	Hydr. Depth (ft)	0.28	1.13	0.66
Conv. Total (cfs)	19227.0	Conv. (cfs)	245.5	13136.8	5844.7
Length Wtd. (ft)	1531.26	Wetted Per. (ft)	59.36	353.74	347.98
Min Ch El (ft)	1190.89	Shear (lb/sq ft)	0.15	0.59	0.34
Alpha	1.06	Stream Power (lb/ft s)	0.20	1.78	0.80
Frctn Loss (ft)	13.23	Cum Volume (acre-ft)	11.73	99.39	10.53
C & E Loss (ft)	0.01	Cum SA (acres)	14.13	52.53	14.80

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 3.592

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9446.92	1180.81	9468.54	1180.71	9501.33	1180.53	9518.74	1180.44	9556.5	1180.26
9568.95	1180.2	9611.68	1180.04	9619.15	1180.01	9666.86	1179.88	9669.35	1179.87
9694.56	1179.78	9719.56	1179.69	9722.03	1179.68	9769.76	1179.45	9777.21	1179.4
9809.96	1179.13	9820.81	1179.05	9839.79	1178.81	9875.86	1177.74	9895.63	1177.56
9922.16	1177.01	9985.61	1176.09	10000	1175.84	10001.78	1175.72	10002.18	1175.69
10026.92	1176.43	10072.44	1178.73	10082.13	1178.94	10110.39	1179.02	10123.99	1179.05
10143.27	1179.03	10165.85	1179.02						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9446.92	.044	9820.81	.049	10072.44	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9820.81	10072.44	1525	1547	1475	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1179.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.		0.049	0.044
W.S. Elev (ft)	1178.88	Reach Len. (ft)	1525.00	1547.00	1475.00
Crit W.S. (ft)		Flow Area (sq ft)		415.09	0.55
E.G. Slope (ft/ft)	0.008920	Area (sq ft)		415.09	0.55
Q Total (cfs)	1720.00	Flow (cfs)		1719.69	0.32
Top Width (ft)	245.59	Top Width (ft)		238.49	7.10
Vel Total (ft/s)	4.14	Avg. Vel. (ft/s)		4.14	0.58
Max Chl Dpth (ft)	3.19	Hydr. Depth (ft)		1.74	0.08
Conv. Total (cfs)	18211.6	Conv. (cfs)		18208.2	3.3
Length Wtd. (ft)	1546.99	Wetted Per. (ft)		238.60	7.11
Min Ch El (ft)	1175.69	Shear (lb/sq ft)		0.97	0.04
Alpha	1.00	Stream Power (lb/ft s)		4.01	0.02
Frctn Loss (ft)	13.37	Cum Volume (acre-ft)	11.44	84.97	6.64
C & E Loss (ft)	0.00	Cum SA (acres)	13.12	42.05	8.79

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 3.299

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9602.08	1165.51	9620.42	1165.52	9624.26	1165.53	9649.47	1165.59	9668.15	1165.63
9671	1165.64	9712.03	1165.76	9721.58	1165.79	9755.92	1165.88	9772.16	1165.91
9799.8	1165.94	9822.73	1165.95	9843.69	1165.93	9873.31	1165.91	9887.57	1165.89
9923.89	1165.81	9933.89	1165.52	9937.74	1165.36	9966.43	1163.86	9988.97	1162.84
10000	1162.79	10015.35	1162.76	10078.96	1162.71	10109.58	1164.75	10131.27	1166.3
10136.28	1166.33	10151.57	1166.37	10175.91	1166.45	10183.88	1166.47	10215.55	1166.44
10236.49	1166.39	10255.19	1166.32	10289.1	1166.18	10294.83	1166.15	10312.33	1166.04
10334.46	1165.91	10341.71	1165.85						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9602.08	.044	9923.89	.049	10131.27	.044

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9923.8910131.27              1325    1378    1350              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1165.78  * Element                  *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.31  * Wt. n-Val.               *           *    0.049  *           *
* W.S. Elev (ft)          * 1165.48  * Reach Len. (ft)          * 1325.00   * 1378.00  * 1350.00   *
* Crit W.S. (ft)          * 1164.67  * Flow Area (sq ft)        *           *  375.48  *           *
* E.G. Slope (ft/ft)      *0.008365  * Area (sq ft)             *           *  375.48  *           *
* Q Total (cfs)           * 1670.00  * Flow (cfs)               *           * 1670.00  *           *
* Top Width (ft)          *  184.74  * Top Width (ft)            *           *  184.74  *           *
* Vel Total (ft/s)        *    4.45  * Avg. Vel. (ft/s)          *           *    4.45  *           *
* Max Chl Dpth (ft)       *    2.77  * Hydr. Depth (ft)          *           *    2.03  *           *
* Conv. Total (cfs)       * 18259.6  * Conv. (cfs)               *           * 18259.6  *           *
* Length Wtd. (ft)        * 1371.26  * Wetted Per. (ft)          *           *  184.90  *           *
* Min Ch El (ft)          * 1162.70  * Shear (lb/sq ft)          *           *    1.06  *           *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *           *    4.72  *           *
* Frctn Loss (ft)         *   11.51  * Cum Volume (acre-ft)      *   11.44   *   70.93  *    6.63   *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)            *   13.12   *   34.54  *    8.67   *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS17B (A63)
REACH: REACH 1            RS: 3.038

INPUT
Description: X-section located 200' upstream of Riggs Rd.
Station Elevation Data     num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9373.29 1155.78 9376.94 1155.75 9423.64 1155.42 9427.69 1155.39 9428.54 1155.39
 9478.44 1155.02 9489.97 1154.94 9546.99 1152.82 9555.86 1152.38 9572.35 1151.66
 9579.27  1151.4 9593.56 1151.94 9607.32 1152.41 9616.98 1152.67 9630.04 1152.65
 9674.28 1153.87 9681.44 1153.84 9715.46  1153.7 9732.19 1153.63 9735.71 1153.62
 9782.94 1153.47 9812.86 1153.07 9830.26 1152.78 9839.65 1152.92 9884.44 1153.26
 9920.01 1153.23 9935.19 1153.22 9960.37 1152.05 9998.04 1150.05   10000  1150.2
10023.73 1152.4110037.02 1153.3910071.19 1153.5310088.24  1153.610113.11 1153.68
10139.45 1153.7810155.04 1153.8310190.66 1153.9710196.96 1153.9910225.39 1154.08
10238.88 1154.1310241.88 1154.1310280.81 1154.2310293.09 1154.2610322.73  1154.3
 10344.3 1154.3310364.66 1154.3410395.51 1154.3510406.58 1154.3510446.73 1154.34
10448.51 1154.3410456.54 1154.3410490.43 1154.3310497.94 1154.32

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9373.29    .044 9935.19    .04910037.02    .044

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9935.1910037.02              1400    1415    1375              .1        .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
 9373.29 9674.28  1154.5       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1154.26  * Element                  *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.28  * Wt. n-Val.               *   0.044   *   0.049  *   0.044   *
* W.S. Elev (ft)          * 1153.99  * Reach Len. (ft)          * 1400.00   * 1415.00  * 1375.00   *
* Crit W.S. (ft)          * 1153.80  * Flow Area (sq ft)        *  164.41   *  230.26  *   46.46   *
* E.G. Slope (ft/ft)      *0.008419  * Area (sq ft)             *  365.85   *  230.26  *   46.46   *
* Q Total (cfs)           * 1540.00  * Flow (cfs)               *  374.42   * 1102.12  *   63.45   *
* Top Width (ft)          *  680.15  * Top Width (ft)            *  419.57   *  101.83  *  158.75   *
* Vel Total (ft/s)        *    3.49  * Avg. Vel. (ft/s)          *    2.28   *    4.79  *    1.37   *
* Max Chl Dpth (ft)       *    3.94  * Hydr. Depth (ft)          *    0.63   *    2.26  *    0.29   *
* Conv. Total (cfs)       * 16783.8  * Conv. (cfs)               *  4080.7   * 12011.5  *   691.5   *
* Length Wtd. (ft)        * 1412.23  * Wetted Per. (ft)          *  260.92   *  102.05  *  158.75   *
* Min Ch El (ft)          * 1150.05  * Shear (lb/sq ft)          *    0.33   *    1.19  *    0.15   *
* Alpha                   *    1.46  * Stream Power (lb/ft s)    *    0.75   *    5.68  *    0.21   *
* Frctn Loss (ft)         *   11.02  * Cum Volume (acre-ft)      *    5.88   *   61.35  *    5.91   *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)            *    6.74   *   30.00  *    6.21   *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 2.771

INPUT
Description: X-section located 1200' downstream of Riggs Rd.
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9442.8	1146.38	9457.57	1146.46	9465.48	1146.51	9503.36	1146.64	9515.72	1146.72
9549.16	1146.71	9565.95	1146.75	9594.95	1146.68	9616.18	1146.45	9640.74	1146.06
9666.42	1145.63	9686.54	1145.35	9716.65	1144.85	9732.33	1144.69	9766.89	1144.36
9778.12	1144.28	9817.12	1143.96	9823.92	1143.92	9886.71	1141.41	9901.78	1140.84
9908.61	1140.74	9930.64	1140.35	9975.62	1140.4	9995.6	1140.41	10000	1140.63
10013.51	1141.3	10071.45	1143.88	10085.55	1143.87	10124.01	1143.91	10125.25	1143.9
10129.06	1143.91	10164.95	1143.85	10176.57	1143.91	10204.64	1143.98	10229.13	1144.03
10244.34	1144.02	10281.68	1144.11	10284.04	1144.11	10291.32	1144.13	10323.74	1144.19
10334.24	1144.22	10363.44	1144.29	10386.8	1144.36	10403.14	1144.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9442.8	.044	9817.12	.049	10071.45	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9817.12	10071.45	1310	1320	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1143.21	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.23	Wt. n-Val.		0.049		
W.S. Elev (ft)	1142.99	Reach Len. (ft)	1310.00	1320.00	1320.00	
Crit W.S. (ft)	1142.16	Flow Area (sq ft)		367.63		
E.G. Slope (ft/ft)	0.007207	Area (sq ft)		367.63		
Q Total (cfs)	1400.00	Flow (cfs)		1400.00		
Top Width (ft)	204.24	Top Width (ft)		204.24		
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		3.81		
Max Chl Dpth (ft)	2.64	Hydr. Depth (ft)		1.80		
Conv. Total (cfs)	16490.8	Conv. (cfs)		16490.8		
Length Wtd. (ft)	1320.00	Wetted Per. (ft)		204.35		
Min Ch El (ft)	1140.35	Shear (lb/sq ft)		0.81		
Alpha	1.00	Stream Power (lb/ft s)		3.08		
Frctn Loss (ft)	10.08	Cum Volume (acre-ft)		51.64	5.18	
C & E Loss (ft)	0.01	Cum SA (acres)		25.03	3.70	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 2.521

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9712.01	1134.07	9739.71	1133.93	9762.01	1133.84	9789.71	1133.72	9812.01	1133.67
9839.71	1133.58	9862.01	1133.55	9889.71	1133.5	9921.79	1131.07	9936.52	1129.96
9964.3	1129.9	9997.67	1129.97	10000	1130.14	10008.18	1130.72	10039.72	1133.41
10062.49	1133.39	10089.72	1133.36	10128.24	1130.29	10135.47	1129.91	10136.08	1129.94
10137.96	1130.03	10139.78	1130.12	10163.96	1131.41	10170.47	1131.73	10174.06	1131.9
10177.01	1132.04	10179.29	1132.17	10213.64	1133.29	10239.72	1133.31	10264.02	1133.38
10289.72	1133.46	10314.41	1133.56	10339.73	1133.67	10364.79	1133.74	10389.73	1133.85
10415.18	1133.88	10439.73	1133.91						

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9712.01    .044 9889.71    .04910039.72    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9889.7110039.72             1825    1859    1810            .1        .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
   1006210439.73    1134       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1133.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.31  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1132.82  * Reach Len. (ft)        * 1825.00  * 1859.00  * 1810.00  *
* Crit W.S. (ft)          * 1131.98  * Flow Area (sq ft)      *          *   282.58 *          *
* E.G. Slope (ft/ft)      *0.008150  * Area (sq ft)           *          *   282.58 *   144.12 *
* Q Total (cfs)           * 1270.00  * Flow (cfs)             *          *  1270.00 *          *
* Top Width (ft)          *  236.85  * Top Width (ft)          *          *   134.12 *   102.73 *
* Vel Total (ft/s)        *    4.49  * Avg. Vel. (ft/s)        *          *     4.49 *          *
* Max Chl Dpth (ft)       *    2.92  * Hydr. Depth (ft)        *          *     2.11 *          *
* Conv. Total (cfs)       * 14068.0  * Conv. (cfs)             *          *  14068.0 *          *
* Length Wtd. (ft)        * 1859.00  * Wetted Per. (ft)        *          *   134.34 *          *
* Min Ch El (ft)          * 1129.90  * Shear (lb/sq ft)        *          *     1.07 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     4.81 *          *
* Frctn Loss (ft)         *   13.51  * Cum Volume (acre-ft)    *          *    41.79 *     3.00 *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *          *    19.91 *     2.15 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS17B (A63)
REACH: REACH 1            RS: 2.168

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9659.64 1121.94 9672.94    1122 9681.51 1122.03 9699.25 1122.04  9734.1 1122.04
 9750.94 1121.96 9786.69  1121.7 9828.94 1121.29 9839.27 1121.19 9847.85 1120.57
 9853.87 1120.02  9880.1  1117.7 9885.35 1117.92 9905.42  1118.7 9944.44 1120.42
    9995  1116.9   10000 1116.5510002.65  1116.710003.16 1116.7310012.18 1116.69
10057.66 1117.2810077.02  1117.610092.93 1117.83 10118.1 1118.3410119.21 1118.36
10123.72 1118.4710135.62 1119.1610148.67 1119.9110158.15 1120.3910168.99 1120.76
10177.52 1120.9310199.02 1123.2510215.16  1123.510249.46 1123.9110259.68  1123.6
 10299.9 1122.41 10304.2 1122.33

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9659.64    .044 9839.27    .04910158.15    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9839.2710158.15             1400    1429    1420            .1        .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
 9659.64 9944.44    1122       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1119.58  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1119.39  * Reach Len. (ft)        * 1400.00  * 1429.00  * 1420.00  *
* Crit W.S. (ft)          * 1118.60  * Flow Area (sq ft)      *          *   310.18 *          *
* E.G. Slope (ft/ft)      *0.006406  * Area (sq ft)           *          *   361.69 *          *
* Q Total (cfs)           * 1080.00  * Flow (cfs)             *          *  1080.00 *          *
* Top Width (ft)          *  240.46  * Top Width (ft)          *          *   240.46 *          *
* Vel Total (ft/s)        *    3.48  * Avg. Vel. (ft/s)        *          *     3.48 *          *
```

```
* Max Chl Dpth (ft)      *    2.84  * Hydr. Depth (ft)        *          *    1.72  *          *
* Conv. Total (cfs)      * 13493.6  * Conv. (cfs)             *          * 13493.6  *          *
* Length Wtd. (ft)       * 1429.00  * Wetted Per. (ft)        *          *  180.53  *          *
* Min Ch El (ft)         * 1116.55  * Shear (lb/sq ft)        *          *    0.69  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    2.39  *          *
* Frctn Loss (ft)        *   11.23  * Cum Volume (acre-ft)    *          *   28.04  *    0.00  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *          *   11.91  *    0.01  *
*****************************************************************************************************
```

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 1.898

INPUT
Description:
Station Elevation Data num= 36

```
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9540.27 1111.01 9544.43 1111.02 9571.05 1111.04 9594.71 1111.09 9627.29 1111.04
    9645    1111 9683.54 1110.96 9695.28 1110.95 9739.78 1110.79 9745.56 1110.77
 9794.23 1110.48 9795.84 1110.47 9796.03 1110.47 9846.12 1110.16  9875.6 1108.53
 9921.99 1106.11 9951.15 1106.09   10000 1105.9110003.18 1106.1510009.35 1106.58
10048.02 1110.07 10058.5 1110.12 10099.2 1110.3610100.51 1110.37 10106.5  1110.4
10142.52 1110.5910150.38 1110.6510184.52 1110.8410201.55 1110.9410226.53 1111.05
10252.73 1111.1810268.54 1111.2310303.91 1111.3410310.55 1111.3510340.97 1111.43
10352.56 1111.45
```

Manning's n Values num= 3

```
     Sta   n Val      Sta   n Val      Sta   n Val
*****************************************************
 9540.27    .044 9846.12    .04910048.02    .044
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9846.1210048.02             1320    1431    1400            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1108.34  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)          *    0.27  * Wt. n-Val.              *           *    0.049  *          *
* W.S. Elev (ft)         * 1108.07  * Reach Len. (ft)         * 1320.00   * 1431.00   * 1400.00   *
* Crit W.S. (ft)         * 1107.51  * Flow Area (sq ft)       *           *  225.03   *          *
* E.G. Slope (ft/ft)     *0.010237  * Area (sq ft)            *           *  225.03   *          *
* Q Total (cfs)          *  940.00  * Flow (cfs)              *           *  940.00   *          *
* Top Width (ft)         *  141.51  * Top Width (ft)          *           *  141.51   *          *
* Vel Total (ft/s)       *    4.18  * Avg. Vel. (ft/s)         *           *    4.18   *          *
* Max Chl Dpth (ft)      *    2.16  * Hydr. Depth (ft)         *           *    1.59   *          *
* Conv. Total (cfs)      *  9290.6  * Conv. (cfs)              *           *  9290.6   *          *
* Length Wtd. (ft)       * 1431.00  * Wetted Per. (ft)         *           *  141.66   *          *
* Min Ch El (ft)         * 1105.91  * Shear (lb/sq ft)         *           *    1.02   *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *           *    4.24   *          *
* Frctn Loss (ft)        *   10.24  * Cum Volume (acre-ft)     *           *   18.41   *    0.00  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)           *           *    5.65   *    0.01  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 1 RS: 1.627

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9672.35	1100.24	9705.3	1100.22	9749.54	1100.03	9765.54	1099.94	9798.29	1099.66
9825.78	1099.43	9839.2	1099.29	9886.01	1098.79	9928.86	1098.26	9946.25	1098.08
9983.5	1095.94	9993.77	1095.28	9999.27	1094.88	10000	1094.83	10020.87	1095.94
10037.3	1096.81	10055.32	1097.56	10063.13	1097.56	10123.28	1095.78	10131.29	1095.57
10135.29	1096.12	10150.81	1097.86	10190.69	1102.36	10201.44	1103.61	10203.28	1103.81
10205.47	1104.03	10233.02	1103.31	10255.53	1102.61	10256.61	1102.61	10305.58	1101.65
10309.08	1101.62	10355.63	1100.91	10361.54	1100.88	10405.69	1100.79	10414.01	1100.77
10455.74	1101.15	10466.47	1101.13						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9672.35	.044	9946.25	.049	10150.81	.044

Bank Sta: Left	Right	Coeff Contr.	Expan.
9946.25	10150.81	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1098.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.049	0.044
W.S. Elev (ft)	1097.95	Reach Len. (ft)	1753.00	1753.00	1753.00
Crit W.S. (ft)	1097.13	Flow Area (sq ft)		291.74	0.03
E.G. Slope (ft/ft)	0.005029	Area (sq ft)		291.74	0.03
Q Total (cfs)	800.00	Flow (cfs)		799.99	0.01
Top Width (ft)	203.00	Top Width (ft)		202.28	0.72
Vel Total (ft/s)	2.74	Avg. Vel. (ft/s)		2.74	0.28
Max Chl Dpth (ft)	3.12	Hydr. Depth (ft)		1.44	0.04
Conv. Total (cfs)	11281.4	Conv. (cfs)		11281.3	0.1
Length Wtd. (ft)	1753.00	Wetted Per. (ft)		202.61	0.72
Min Ch El (ft)	1094.83	Shear (lb/sq ft)		0.45	0.01
Alpha	1.00	Stream Power (lb/ft s)		1.24	0.00
Frctn Loss (ft)	13.33	Cum Volume (acre-ft)		9.93	0.00
C & E Loss (ft)	0.02	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 2 RS: 1.294

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9126.07	1091.18	9158.63	1090.96	9208.26	1090.57	9213.4	1090.53	9219.76	1090.49
9268.16	1090.2	9307.26	1090.02	9322.93	1089.95	9332.37	1089.56	9334.33	1089.52
9336.78	1089.46	9392.83	1088.39	9396.86	1088.23	9401.5	1088.03	9406.44	1087.8
9414.86	1087.36	9426.98	1086.65	9443.35	1085.69	9450.82	1086.23	9472.53	1087.77
9478.77	1088.23	9481.51	1088.47	9505.28	1089.08	9548.84	1087.85	9551.35	1087.72
9554.4	1087.57	9561.2	1087.2	9566.05	1086.89	9573.34	1086.44	9597.03	1085.1
9600.16	1084.92	9618.45	1085.96	9629.56	1086.42	9634.56	1086.51	9638.85	1086.54
9642.61	1086.53	9645.11	1086.49	9647.49	1086.43	9703.29	1088.17	9706.28	1088.16
9709.98	1088.16	9761.04	1088.2	9802.3	1088.12	9815.81	1088.13	9832.53	1087.87
9870.57	1087.22	9922.72	1083.81	9944.01	1082.44	9944.53	1082.44	9944.78	1082.44
9969.88	1082.28	9977.36	1082.31	9986.13	1082.24	9995.44	1082.3	10000	1082.35
10007.76	1082.44	10017.3	1082.91	10036.41	1083.89	10081.93	1086.53	10105.37	1086.68
10131.99	1086.91	10157.97	1087.05	10182.05	1087.16	10210.57	1087.17	10232.1	1087.23
10263.18	1087.35	10282.16	1087.34	10315.78	1087.43	10332.22	1087.28	10347.14	1087.3
10387.6	1085.32	10391.96	1085.22	10407.55	1084.74	10409.38	1084.74	10411.76	1084.74
10439.9	1085.92	10455.17	1086.57	10462.83	1086.91	10482.4	1087.91	10526.19	1088.22
10532.45	1088.27	10578.79	1088.46	10582.51	1088.49				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9126.07	.044	9870.57	.049	10081.93	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9870.57	10081.93	900	834	790	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1084.72	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.30	Wt. n-Val.		0.049		
W.S. Elev (ft)	1084.42	Reach Len. (ft)	900.00	834.00	790.00	
Crit W.S. (ft)	1083.93	Flow Area (sq ft)		201.57		
E.G. Slope (ft/ft)	0.012070	Area (sq ft)		201.57		
Q Total (cfs)	890.00	Flow (cfs)		890.00		
Top Width (ft)	132.00	Top Width (ft)		132.00		
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)		4.42		
Max Chl Dpth (ft)	2.18	Hydr. Depth (ft)		1.53		
Conv. Total (cfs)	8101.1	Conv. (cfs)		8101.1		
Length Wtd. (ft)	834.00	Wetted Per. (ft)		132.12		
Min Ch El (ft)	1082.24	Shear (lb/sq ft)		1.15		
Alpha	1.00	Stream Power (lb/ft s)		5.08		
Frctn Loss (ft)	5.42	Cum Volume (acre-ft)	1.29	60.42	11.04	
C & E Loss (ft)	0.05	Cum SA (acres)	5.40	33.75	14.46	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17B (A63)
REACH: REACH 2 RS: 1.137

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9683.52	1081.42	9728.2	1081.29	9749.62	1081.23	9779.8	1081.12	9818.86	1080.97
9831.39	1080.91	9847	1080.21	9856.5	1079.77	9918.22	1076.89	9931.19	1076.77
9986.94	1076.46	9998.72	1076.38	10000	1076.38	10002.26	1076.58	10003.24	1076.66
10016.9	1077.63	10024.58	1078.19	10027.64	1078.45	10030.33	1078.69	10032.57	1078.86
10067.44	1080.19	10088.43	1080.27	10102.31	1080.31	10139.45	1080.36	10144.7	1080.36
10170.46	1080.37	10187.09	1080.38	10190.48	1080.41	10229.48	1080.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9683.52	.044	9831.39	.049	10067.44	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9831.39	10067.44	1470	1506	1490	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1079.25	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.13	Wt. n-Val.		0.049		
W.S. Elev (ft)	1079.12	Reach Len. (ft)	1470.00	1506.00	1490.00	
Crit W.S. (ft)	1078.02	Flow Area (sq ft)		308.91		
E.G. Slope (ft/ft)	0.004049	Area (sq ft)		308.91		
Q Total (cfs)	890.00	Flow (cfs)		890.00		
Top Width (ft)	169.15	Top Width (ft)		169.15		
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)		2.88		
Max Chl Dpth (ft)	2.74	Hydr. Depth (ft)		1.83		
Conv. Total (cfs)	13987.6	Conv. (cfs)		13987.6		
Length Wtd. (ft)	1506.00	Wetted Per. (ft)		169.30		
Min Ch El (ft)	1076.38	Shear (lb/sq ft)		0.46		
Alpha	1.00	Stream Power (lb/ft s)		1.33		
Frctn Loss (ft)	8.91	Cum Volume (acre-ft)	1.29	55.54	11.04	
C & E Loss (ft)	0.01	Cum SA (acres)	5.40	30.87	14.46	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

```
RIVER: 2S2WS17B (A63)
REACH: REACH 2            RS: 0.852

INPUT
Description: X-section located at Ocotillo Road.
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9626.27 1071.22 9664.84 1071.31 9666.98 1071.31 9714.91 1071.43 9719.83  1071.4
 9764.97 1071.16 9783.75 1070.11 9795.04 1069.46 9834.93 1067.14 9851.52 1066.16
 9858.21 1066.56 9881.01    1068 9915.18 1069.95 9931.23  1069.9 9989.61 1067.43
   10000 1066.7510000.43 1066.72 10024.7 1067.9610065.53 1070.0710078.59 1070.13
10115.71 1070.3410124.85 1070.3810165.89 1070.6410171.11 1070.6610216.07 1070.89
10217.37 1070.8910232.64 1070.8910263.63  1070.910266.25  1070.910309.89 1070.82
10316.43 1070.7910356.15 1070.6810366.61 1070.6610402.41 1070.6410416.79 1070.64
10448.67 1070.6410466.97 1070.6410494.92 1070.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9626.27    .044 9764.97    .04910065.53    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9764.9710065.53            1350    1363    1350             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 9626.27  9915.2    1071       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1070.32  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.24  * Wt. n-Val.              *          *    0.049 *    0.044 *
* W.S. Elev (ft)         * 1070.09  * Reach Len. (ft)         * 1350.00  * 1363.00 * 1350.00 *
* Crit W.S. (ft)         * 1069.38  * Flow Area (sq ft)       *          *   228.42 *    0.03 *
* E.G. Slope (ft/ft)     *0.009464  * Area (sq ft)            *          *   486.88 *    0.03 *
* Q Total (cfs)          *  890.00  * Flow (cfs)              *          *   890.00 *    0.00 *
* Top Width (ft)         *  284.75  * Top Width (ft)          *          *   281.36 *    3.40 *
* Vel Total (ft/s)       *    3.90  * Avg. Vel. (ft/s)        *          *     3.90 *    0.13 *
* Max Chl Dpth (ft)      *    3.93  * Hydr. Depth (ft)        *          *     1.52 *    0.01 *
* Conv. Total (cfs)      *  9148.4  * Conv. (cfs)             *          *   9148.4 *     0.0 *
* Length Wtd. (ft)       * 1361.94  * Wetted Per. (ft)        *          *   150.49 *    3.40 *
* Min Ch El (ft)         * 1066.16  * Shear (lb/sq ft)        *          *     0.90 *    0.00 *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *     3.49 *    0.00 *
* Frctn Loss (ft)        *   10.35  * Cum Volume (acre-ft)    *    1.29  *    41.78 *   11.03 *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *    5.40  *    23.08 *   14.40 *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS17B (A63)
REACH: REACH 2            RS: 0.593

INPUT
Description:
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9727.34 1059.98 9728.87 1059.97 9757.96 1059.88 9778.88 1059.82 9807.22 1059.76
 9828.88  1059.7 9856.47 1059.61 9878.89 1059.53 9905.73 1059.44 9928.89 1059.37
 9954.99 1059.32 9990.83    1058 9993.43 1057.91 9996.63  1057.8   10000 1057.67
10000.37 1057.6610015.31 1056.7410035.82 1057.4710081.39  1059.210085.85 1059.21
10103.42 1059.21   10127 1059.2510132.97 1059.2510168.15 1059.3510184.55 1059.37
 10209.3 1059.4510236.13 1059.5310252.47  1058.510257.11  1058.310263.72 1058.14
10273.03 1058.0210287.42 1057.7410313.66 1057.0210314.48 1057.0510316.59 1057.12
10341.14 1057.99 10354.6 1058.5210390.87 1060.5210415.06 1060.7510442.45 1060.92
10456.21 1060.9910494.04 1061.2710497.37 1061.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9727.34    .044 9954.99    .04910085.85    .044
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.9910085.85             1580    1563    1550            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10236.1310497.37    1060       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1059.94  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.16  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1059.79  * Reach Len. (ft)         * 1580.00  * 1563.00  * 1550.00  *
* Crit W.S. (ft)         * 1059.23  * Flow Area (sq ft)       *   38.38  *  221.44  *   67.90  *
* E.G. Slope (ft/ft)     *0.006254  * Area (sq ft)            *   38.38  *  221.44  *  301.71  *
* Q Total (cfs)          *  900.00  * Flow (cfs)              *   39.50  *  753.73  *  106.76  *
* Top Width (ft)         *  583.05  * Top Width (ft)          *  160.47  *  130.86  *  291.72  *
* Vel Total (ft/s)       *    2.75  * Avg. Vel. (ft/s)        *    1.03  *    3.40  *    1.57  *
* Max Chl Dpth (ft)      *    3.05  * Hydr. Depth (ft)        *    0.24  *    1.69  *    0.45  *
* Conv. Total (cfs)      * 11380.5  * Conv. (cfs)             *   499.5  *  9530.9  *  1350.0  *
* Length Wtd. (ft)       * 1562.54  * Wetted Per. (ft)        *  160.47  *  130.96  *  150.28  *
* Min Ch El (ft)         * 1056.74  * Shear (lb/sq ft)        *    0.09  *    0.66  *    0.18  *
* Alpha                  *    1.33  * Stream Power (lb/ft s)   *    0.10  *    2.25  *    0.28  *
* Frctn Loss (ft)        *   10.80  * Cum Volume (acre-ft)    *    0.70  *   30.70  *    6.36  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *    2.91  *   16.63  *    9.83  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS17B (A63)
REACH: REACH 2            RS: 0.298

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9662.14 1049.78 9699.86 1049.92 9712.25 1049.94 9723.08 1049.88 9762.36 1049.84
 9812.43 1046.32 9823.18 1046.27 9828.79 1045.81 9837.92 1045.45 9844.89 1045.27
 9846.82 1045.33 9847.08 1045.33 9854.72 1045.55 9862.96 1045.79  9874.3 1046.13
 9884.96 1046.45 9893.23 1046.62  9900.3 1046.77 9948.34 1047.92 9952.41 1048.01
 9954.67 1048.04 9956.34 1048.07 9962.82 1048.42  9972.7  1047.6 9984.41 1046.62
   10000 1045.2810003.56 1044.9810037.18 1047.0710050.32 1047.8810064.34  1048.6
10101.57 1048.7110115.49 1048.7510143.66 1048.7910166.63 1048.86

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9662.14    .044 9762.36    .04910064.34    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9762.3610064.34             1505    1573    1455            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 9662.14 9962.82  1049.5       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1049.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.28  * Wt. n-Val.              *          *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1048.85  * Reach Len. (ft)         * 1505.00  * 1573.00  * 1455.00  *
* Crit W.S. (ft)         * 1048.02  * Flow Area (sq ft)       *          *  208.30  *   11.36  *
* E.G. Slope (ft/ft)     *0.007673  * Area (sq ft)            *          *  587.48  *   11.36  *
* Q Total (cfs)          *  900.00  * Flow (cfs)              *          *  891.99  *    8.01  *
* Top Width (ft)         *  385.48  * Top Width (ft)          *          *  287.84  *   97.64  *
* Vel Total (ft/s)       *    4.10  * Avg. Vel. (ft/s)        *          *    4.28  *    0.71  *
* Max Chl Dpth (ft)      *    3.87  * Hydr. Depth (ft)        *          *    2.05  *    0.12  *
* Conv. Total (cfs)      * 10274.2  * Conv. (cfs)             *          * 10182.7  *    91.5  *
* Length Wtd. (ft)       * 1572.48  * Wetted Per. (ft)        *          *  101.77  *   97.64  *
* Min Ch El (ft)         * 1044.98  * Shear (lb/sq ft)        *          *    0.98  *    0.06  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)   *          *    4.20  *    0.04  *
* Frctn Loss (ft)        *   10.53  * Cum Volume (acre-ft)    *          *   16.19  *    0.79  *
```

```
* C & E Loss (ft)        *    0.04  * Cum SA (acres)        *          *    9.12  *    2.90  *
*****************************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS17B (A63)
REACH: REACH 2            RS: 0.000

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9722.38 1039.17 9728.72  1039.2 9771.28 1039.35 9778.74 1039.38 9820.19 1039.35
 9828.75 1039.37  9869.1 1039.41 9878.76 1039.39 9918.01 1039.37 9928.77 1039.38
 9940.31 1038.63 9943.56 1038.54 9948.11  1038.4 9954.91 1038.16 9991.74 1036.09
 9997.86 1036.03   10000 1035.9910007.32 1035.9310017.57 1035.9410020.77 1035.91
 10045.1    103610046.34 1036.0310065.69 1036.5910078.41 1036.7910111.09 1037.48
10131.24 1037.8810143.43 1038.1410192.65 1038.7610193.54 1038.7710196.62 1038.84
10199.14 1038.8910201.22 1038.9410234.37 1038.5210282.56 1037.5510284.97 1037.46
10289.44 1037.5610344.68 1039.3610372.41 1039.4510381.65  1039.510399.01  1039.6
10418.62  1039.710429.05 1039.7610455.59 1039.8710485.68 1040.0710492.56 1040.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9722.38    .044 9928.77    .04910201.22    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.7710201.22              13      13      13             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10201.2210492.56  1039.5       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1038.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.13  * Wt. n-Val.              *          *   0.049  *          *
* W.S. Elev (ft)         * 1038.41  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)         * 1037.57  * Flow Area (sq ft)       *          *  308.99  *          *
* E.G. Slope (ft/ft)     *0.005906  * Area (sq ft)            *          *  308.99  *   35.88  *
* Q Total (cfs)          *  910.00  * Flow (cfs)              *          *  910.00  *          *
* Top Width (ft)         *  293.34  * Top Width (ft)          *          *  217.41  *   75.93  *
* Vel Total (ft/s)       *    2.95  * Avg. Vel. (ft/s)         *          *    2.95  *          *
* Max Chl Dpth (ft)      *    2.50  * Hydr. Depth (ft)         *          *    1.42  *          *
* Conv. Total (cfs)      * 11841.2  * Conv. (cfs)              *          * 11841.2  *          *
* Length Wtd. (ft)       *          * Wetted Per. (ft)         *          *  217.50  *          *
* Min Ch El (ft)         * 1035.91  * Shear (lb/sq ft)         *          *    0.52  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    1.54  *          *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)     *          *          *          *
* C & E Loss (ft)        *          * Cum SA (acres)           *          *          *          *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS7B (A51)
REACH: REACH 1            RS: 1.710

INPUT
Description: X-section is approximately 500' upstream of Ocotillo Road.
Limit
            of Sudy.
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
```

```
  9690.2 1073.61 9696.67 1073.64 9728.89 1073.78 9745.84 1073.86 9778.89 1074.01
    9795 1074.06  9828.9 1074.16 9863.99 1074.23 9878.91 1074.26 9893.33 1074.27
 9928.92 1074.26 9942.49 1074.24 9988.58 1072.44 9998.16 1071.66   10000 1071.52
10013.27 1070.5210014.36 1070.5210025.32 1070.7510044.92 1070.5110058.31 1070.69
10076.29 1070.8210085.13 1070.9610102.63 1070.9610105.85    1071   10108 1071.02
10118.06 1070.9310129.16 1071.0410141.47 1071.3310147.77 1071.4210148.46 1071.43
10149.48 1071.4710149.85 1071.4810149.98 1071.4910211.57  1073.510228.96 1074.33
10237.47 1074.3610278.97 1074.4210286.63 1074.4310328.97 1074.55 10335.8 1074.56
10378.98 1074.6710384.96 1074.6810428.99 1074.7610434.12 1074.76   10479 1074.77
10483.29 1074.77   10529 1074.7810532.45 1074.7810579.01 1074.8210581.61 1074.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9690.2    .044 9942.49    .04910228.96    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9942.4910228.96             1325    1362    1310            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1072.43  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1072.37  * Reach Len. (ft)        * 1325.00  * 1362.00 * 1310.00  *
* Crit W.S. (ft)          * 1071.57  * Flow Area (sq ft)      *          *  239.44 *          *
* E.G. Slope (ft/ft)      *0.003156  * Area (sq ft)           *          *  239.44 *          *
* Q Total (cfs)           *  480.00  * Flow (cfs)             *          *  480.00 *          *
* Top Width (ft)          *  187.46  * Top Width (ft)         *          *  187.46 *          *
* Vel Total (ft/s)        *    2.00  * Avg. Vel. (ft/s)       *          *    2.00 *          *
* Max Chl Dpth (ft)       *    1.86  * Hydr. Depth (ft)       *          *    1.28 *          *
* Conv. Total (cfs)       *  8544.6  * Conv. (cfs)            *          *  8544.6 *          *
* Length Wtd. (ft)        * 1362.00  * Wetted Per. (ft)       *          *  187.56 *          *
* Min Ch El (ft)          * 1070.51  * Shear (lb/sq ft)       *          *    0.25 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    0.50 *          *
* Frctn Loss (ft)         *    9.39  * Cum Volume (acre-ft)   *    5.55  *   50.64 *    5.30  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)         *    6.54  *   35.66 *    5.65  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7B (A51)
REACH: REACH 1            RS: 1.452

INPUT
Description: X-section is approximately 850' downstream of Ocotillo Rd.
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9825.01 1062.97 9833.19    1063 9874.05 1063.12  9883.2 1063.15 9923.08 1063.25
 9933.21 1063.27 9952.42 1062.52 9986.88 1061.21   10000 1060.71 10001.1 1060.66
10015.05 1061.1610083.24 1063.5110102.64 1062.7110115.61 1062.3210135.51 1061.68
10151.15 1062.3410183.26 1063.7410217.31 1063.8610233.27 1063.8910266.34 1064.02
10283.28 1064.0810315.38 1064.1810333.29 1064.2210364.42 1064.36 10383.3 1064.44
10413.45 1064.4610433.31 1064.5110462.49 1064.5310483.32 1064.5810511.53 1064.62
10533.33 1064.6710560.57 1064.6810583.34 1064.69 10609.6 1064.6510633.35 1064.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9825.01    .044 9933.21    .04910083.24    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.2110083.24             1345    1399    1325            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10083.2410633.35    1064       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1063.01  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1062.68  * Reach Len. (ft)        * 1345.00  * 1399.00 * 1325.00  *
```

```
* Crit W.S. (ft)          * 1062.51  * Flow Area (sq ft)       *          *  111.12  *          *
* E.G. Slope (ft/ft)      *0.022812  * Area (sq ft)            *          *  111.12  *   27.36  *
* Q Total (cfs)           *  510.00  * Flow (cfs)              *          *  510.00  *          *
* Top Width (ft)          *  165.88  * Top Width (ft)          *          *  110.70  *   55.18  *
* Vel Total (ft/s)        *    4.59  * Avg. Vel. (ft/s)        *          *    4.59  *          *
* Max Chl Dpth (ft)       *    2.02  * Hydr. Depth (ft)        *          *    1.00  *          *
* Conv. Total (cfs)       *  3376.7  * Conv. (cfs)             *          *  3376.7  *          *
* Length Wtd. (ft)        * 1377.47  * Wetted Per. (ft)        *          *  110.78  *          *
* Min Ch El (ft)          * 1060.66  * Shear (lb/sq ft)        *          *    1.43  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    6.56  *          *
* Frctn Loss (ft)         *   11.35  * Cum Volume (acre-ft)    *    5.55  *   45.16  *    4.89  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)          *    6.54  *   31.00  *    4.82  *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS7B (A51)
REACH: REACH 1            RS: 1.187

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9572.23 1053.42 9597.21 1053.39 9605.18 1053.36 9647.22 1053.24 9656.15 1053.18
 9697.23 1052.97 9707.12 1052.92 9747.24  1052.7 9758.09 1052.65 9797.24 1052.45
 9809.06 1052.38 9847.25 1052.27 9860.04 1052.25 9897.26 1052.17 9911.01 1052.16
 9947.27  1052.2 9980.81 1050.03 9999.36 1049.16  9999.8 1049.14   10000 1049.15
10020.79 1050.3210030.14 1050.89 10047.3 1052.2310064.82 1052.2510097.33 1052.29
10127.82 1052.3210154.06 1050.8410156.87 1050.59 10161.3  1050.410167.74 1050.24
 10184.3 1049.3510190.14 1048.9210194.82 1049.1710203.34 1049.6210247.41  1052.6
10271.57 1052.6310297.43 1052.6810323.26 1052.6710347.46 1052.67

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9572.23    .044 9947.27    .049 10047.3    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.27 10047.3             1410    1468    1380            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1051.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *          *    0.049 *    0.044 *
* W.S. Elev (ft)          * 1051.50  * Reach Len. (ft)         * 1410.00  * 1468.00  * 1380.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  100.58  *  115.27  *
* E.G. Slope (ft/ft)      *0.004347  * Area (sq ft)            *          *  100.58  *  115.27  *
* Q Total (cfs)           *  540.00  * Flow (cfs)              *          *  234.53  *  305.47  *
* Top Width (ft)          *  168.34  * Top Width (ft)          *          *   79.72  *   88.62  *
* Vel Total (ft/s)        *    2.50  * Avg. Vel. (ft/s)        *          *    2.33  *    2.65  *
* Max Chl Dpth (ft)       *    2.57  * Hydr. Depth (ft)        *          *    1.26  *    1.30  *
* Conv. Total (cfs)       *  8190.1  * Conv. (cfs)             *          *  3557.0  *  4633.1  *
* Length Wtd. (ft)        * 1444.21  * Wetted Per. (ft)        *          *   79.86  *   88.78  *
* Min Ch El (ft)          * 1049.14  * Shear (lb/sq ft)        *          *    0.34  *    0.35  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *          *    0.80  *    0.93  *
* Frctn Loss (ft)         *    9.90  * Cum Volume (acre-ft)    *    5.55  *   41.76  *    2.72  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    6.54  *   27.95  *    2.64  *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION
```

```
RIVER: 2S2WS7B (A51)
REACH: REACH 1            RS: 0.909

INPUT
Description:
Station Elevation Data    num=      24
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
 9861.85 1042.52 9873.54 1042.52 9912.16 1042.53    9943 1042.54 9975.79 1041.58
 9982.05 1041.14  9994.7 1040.32   10000 1040.0510001.33 1039.9810040.41 1040.14
10080.98 1040.13 10098.4 1040.6210118.37 1040.9710162.71 1042.3110190.77 1042.41
10212.72 1042.43 10241.4 1042.6310262.72 1042.7710292.04 1042.8810312.72 1042.97
10342.67 1042.9310362.73 1042.97 10393.3 1042.9210412.73 1042.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9861.85    .044    9943    .04910162.71    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994310162.71              1400    1394    1360            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1041.70  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *           *    0.049  *           *
* W.S. Elev (ft)          * 1041.51  * Reach Len. (ft)         * 1400.00   * 1394.00   * 1360.00   *
* Crit W.S. (ft)          * 1041.14  * Flow Area (sq ft)       *           *   171.59  *           *
* E.G. Slope (ft/ft)      *0.011677  * Area (sq ft)            *           *   171.59  *           *
* Q Total (cfs)           *  590.00  * Flow (cfs)              *           *   590.00  *           *
* Top Width (ft)          *  159.57  * Top Width (ft)          *           *   159.57  *           *
* Vel Total (ft/s)        *    3.44  * Avg. Vel. (ft/s)         *           *     3.44  *           *
* Max Chl Dpth (ft)       *    1.53  * Hydr. Depth (ft)         *           *     1.08  *           *
* Conv. Total (cfs)       *  5459.8  * Conv. (cfs)              *           *   5459.8  *           *
* Length Wtd. (ft)        * 1394.00  * Wetted Per. (ft)         *           *   159.64  *           *
* Min Ch El (ft)          * 1039.98  * Shear (lb/sq ft)         *           *     0.78  *           *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *           *     2.69  *           *
* Frctn Loss (ft)         *    9.00  * Cum Volume (acre-ft)     *    5.55   *    37.17  *    0.89   *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *    6.54   *    23.91  *    1.23   *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS7B (A51)
REACH: REACH 1            RS: 0.645

INPUT
Description:
Station Elevation Data    num=      40
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
 9738.84 1033.19 9739.37 1033.19 9754.94 1033.25  9789.4 1033.36 9790.57 1033.36
 9839.42 1033.32 9842.29 1033.31 9889.45 1033.15 9894.02 1033.13 9939.48 1032.94
 9954.61 1032.28 9961.44 1031.96 9979.18 1031.09   10000 1030.0810010.67 1030.76
10022.16 1031.5110027.05 1031.8510039.53 1032.6310055.59 1031.8710067.11 1031.46
10086.11  1030.910114.29 1030.1110118.01 1030.4110124.89 1030.9310175.79 1032.77
10189.61  1032.810204.37 1032.8510239.64 1032.97 10256.1 1033.0710289.66 1033.25
10307.83 1033.3710339.69 1033.5610359.55 1033.6410389.72 1033.7410411.28 1033.75
10439.75 1033.75   10463  1033.710489.77 1033.6310514.73 1033.46 10539.8 1033.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9738.84    .044 9939.48    .04910175.79    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.4810175.79             1405    1436    1400            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
```

E.G. Elev (ft)	1032.67	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.08	Wt. n-Val.		0.049		
W.S. Elev (ft)	1032.59	Reach Len. (ft)	1405.00	1436.00	1400.00	
Crit W.S. (ft)	1031.75	Flow Area (sq ft)		274.58		
E.G. Slope (ft/ft)	0.004170	Area (sq ft)		274.58		
Q Total (cfs)	620.00	Flow (cfs)		620.00		
Top Width (ft)	221.53	Top Width (ft)		221.53		
Vel Total (ft/s)	2.26	Avg. Vel. (ft/s)		2.26		
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)		1.24		
Conv. Total (cfs)	9600.9	Conv. (cfs)		9600.9		
Length Wtd. (ft)	1436.00	Wetted Per. (ft)		221.77		
Min Ch El (ft)	1030.08	Shear (lb/sq ft)		0.32		
Alpha	1.00	Stream Power (lb/ft s)		0.73		
Frctn Loss (ft)	8.16	Cum Volume (acre-ft)	5.55	30.03	0.89	
C & E Loss (ft)	0.01	Cum SA (acres)	6.54	17.82	1.23	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7B (A51)
REACH: REACH 1 RS: 0.373

INPUT
Description:
Station Elevation Data num= 16

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9785.7	1024.95	9812.41	1024.99	9836.67	1025.05	9862.42	1025.08	9887.65	1025.06
9912.43	1025.07	9938.63	1025.03	9967.59	1023.63	9982.26	1022.6	10000	1021.33
10002.84	1021.13	10011.66	1021.52	10036.36	1022.52	10062.46	1024.71	10091.56	1024.6
10112.47	1024.54								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9785.7	.044	9938.63	.049	10062.46	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9938.63	10062.46	1835	1969	1790	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1024.50	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.22	Wt. n-Val.		0.049		
W.S. Elev (ft)	1024.27	Reach Len. (ft)	1835.00	1969.00	1790.00	
Crit W.S. (ft)	1023.50	Flow Area (sq ft)		170.85		
E.G. Slope (ft/ft)	0.008035	Area (sq ft)		170.85		
Q Total (cfs)	650.00	Flow (cfs)		650.00		
Top Width (ft)	102.97	Top Width (ft)		102.97		
Vel Total (ft/s)	3.80	Avg. Vel. (ft/s)		3.80		
Max Chl Dpth (ft)	3.14	Hydr. Depth (ft)		1.66		
Conv. Total (cfs)	7251.2	Conv. (cfs)		7251.2		
Length Wtd. (ft)	1958.91	Wetted Per. (ft)		103.18		
Min Ch El (ft)	1021.13	Shear (lb/sq ft)		0.83		
Alpha	1.00	Stream Power (lb/ft s)		3.16		
Frctn Loss (ft)	11.65	Cum Volume (acre-ft)	5.55	22.69	0.89	
C & E Loss (ft)	0.03	Cum SA (acres)	6.54	12.47	1.23	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS7B (A51)
REACH: REACH 1 RS: 0.000

INPUT
Description:

Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8921.25	1014.51	8936.43	1014.44	8959.81	1014.32	8993.02	1014.18	9010.12	1014.11
9049.62	1013.76	9060.43	1013.7	9106.22	1013.86	9110.73	1013.86	9146.86	1013.08
9160.45	1012.71	9161.42	1012.7	9208.14	1013.1	9212.5	1013.05	9255.21	1012.55
9259.3	1012.52	9263.36	1012.48	9303.21	1012.72	9309.64	1012.61	9311.46	1012.57
9313.43	1012.53	9317.42	1012.47	9353.29	1012.29	9358.04	1012.25	9362.98	1012.22
9394.8	1011.9	9413.08	1011.82	9441.32	1011.25	9463.03	1011.26	9487.78	1011.26
9538.38	1011.22	9544.02	1011.21	9547.88	1011.2	9561.11	1011.18	9612.75	1010.78
9650.3	1010.76	9662.57	1010.99	9673.13	1010.86	9720.19	1010.72	9726.07	1010.67
9779.68	1010.51	9780.36	1010.51	9788	1010.5	9837.69	1010.79	9840.09	1010.81
9871.47	1011.08	9885.4	1010.71	9914.92	1010.86	9941.64	1010.9	9954.09	1010.87
9966.05	1010.81	9976.27	1010.74	9996.05	1011.51	10000	1011.54	10009.74	1011.63
10021.3	1011.78	10039.31	1011.81	10050.77	1011.96	10101.2	1013.89	10117.1	1013.95
10131.11	1014.51	10167.49	1013.91	10178.52	1013.75	10217.89	1013.21	10225.92	1013.21
10268.28	1013.02	10273.33	1013.08	10318.68	1013.62	10320.74	1013.64	10353.33	1013.8
10367.31	1013.86								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8921.25	.044	9561.11	.049	10009.74	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
9561.11	10009.74	25	27	25	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
8921.25	9871.47	1013	F

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1012.82	Element				
Vel Head (ft)	0.13	Wt. n-Val.			0.049	0.044
W.S. Elev (ft)	1012.69	Reach Len. (ft)				
Crit W.S. (ft)	1012.02	Flow Area (sq ft)			239.76	43.55
E.G. Slope (ft/ft)	0.004809	Area (sq ft)		263.58	833.15	43.55
Q Total (cfs)	810.00	Flow (cfs)			727.68	82.32
Top Width (ft)	819.07	Top Width (ft)		310.40	448.63	60.04
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)			3.03	1.89
Max Chl Dpth (ft)	2.19	Hydr. Depth (ft)			1.73	0.73
Conv. Total (cfs)	11680.2	Conv. (cfs)			10493.2	1187.0
Length Wtd. (ft)		Wetted Per. (ft)			138.29	60.06
Min Ch El (ft)	1010.50	Shear (lb/sq ft)			0.52	0.22
Alpha	1.06	Stream Power (lb/ft s)			1.58	0.41
Frctn Loss (ft)		Cum Volume (acre-ft)				
C & E Loss (ft)		Cum SA (acres)				

Warning: Divided flow computed for this cross-section.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

SUMMARY OF MANNING'S N VALUES

River:2S3WS12A (A30)

Reach	River Sta.	n1	n2	n3
REACH 1	4.175	.044	.049	.044
REACH 1	3.908	.044	.049	.044
REACH 1	3.613	.044	.049	.044
REACH 1	3.368	.044	.049	.044
REACH 1	3.116	.044	.049	.044
REACH 1	2.811	.044	.049	.044
REACH 1	2.536	.044	.049	.044
REACH 1	2.254	.044	.049	.044
REACH 1	2.011	.044	.049	.044
REACH 1	1.786	.044	.049	.044
REACH 1	1.605	.044	.049	.044
REACH 1	1.343	.044	.049	.044
REACH 1	1.076	.044	.049	.044
REACH 1	0.802	.044	.049	.044
REACH 1	0.541	.044	.049	.044
REACH 1	0.277	.044	.049	.044

River:2S3WS12B (A27)

Reach	River Sta.	n1	n2	n3
REACH 1	3.308	.05	.043	.05
REACH 1	3.060	.05	.043	.05
REACH 1	2.796	.05	.043	.05
REACH 1	2.553	.05	.043	.05
REACH 1	2.297	.05	.043	.05
REACH 1	2.036	.05	.043	.05
REACH 1	1.782	.05	.043	.05
REACH 1	1.529	.05	.043	.05
REACH 1	1.284	.05	.043	.05
REACH 1	0.977	.05	.043	.05
REACH 1	0.710	.05	.043	.05
REACH 1	0.415	.05	.043	.05
REACH 1	0.198	.05	.043	.05

River:2S2WS7C (A32)

Reach	River Sta.	n1	n2	n3
REACH 1	1.475	.044	.049	.044
REACH 1	1.226	.044	.049	.044
REACH 1	0.964	.044	.049	.044
REACH 1	0.726	.044	.049	.044
REACH 1	0.488	.044	.049	.044
REACH 1	0.259	.044	.049	.044

River:2S2WS7A (A52)

Reach	River Sta.	n1	n2	n3
REACH 1	5.079	.044	.049	.044
REACH 1	4.837	.044	.049	.044
REACH 1	4.594	.044	.049	.044
REACH 1	4.407	.044	.049	.044
REACH 4	4.292	.044	.049	.044
REACH 4	4.127	.044	.049	.044
REACH 4	3.891	.044	.049	.044
REACH 4	3.601	.044	.049	.044
REACH 4	3.334	.044	.049	.044
REACH 4	3.055	.044	.049	.044
REACH 4	2.778	.044	.049	.044
REACH 3	2.494	.044	.049	.044
REACH 3	2.238	.044	.049	.044
REACH 3	2.009	.044	.049	.044
REACH 3	1.714	.044	.049	.044
REACH 3	1.398	.044	.049	.044
REACH 3	1.167	.044	.049	.044
REACH 3	0.871	.044	.049	.044
REACH 3	0.584	.044	.049	.044
REACH 2	0.280	.044	.049	.044
REACH 2	0.273	.044	.049	.044

River:1S2WS31 (A56)

Reach	River Sta.	n1	n2	n3
REACH 1	4.185	.05	.043	.05
REACH 1	3.910	.05	.043	.05
REACH 1	3.668	.05	.043	.05
REACH 2	3.374	.05	.043	.05
REACH 2	3.011	.05	.043	.05
REACH 3	2.673	.05	.043	.05
REACH 3	2.388	.05	.043	.05
REACH 4	2.110	.05	.043	.05
REACH 4	1.913	.05	.043	.05
REACH 5	1.595	.05	.043	.05
REACH 5	1.329	.05	.043	.05
REACH 5	1.076	.05	.043	.05
REACH 5	0.811	.05	.043	.05
REACH 5	0.571	.05	.043	.05
REACH 5	0.317	.05	.043	.05

River:2S3WS1 (A54)

Reach	River Sta.	n1	n2	n3
REACH 1	0.461	.05	.043	.05
REACH 1	0.198	.05	.043	.05

River:2S2WS6 (A55)

Reach	River Sta.	n1	n2	n3
REACH 1	1.720	.05	.043	.05
REACH 1	1.465	.05	.043	.05
REACH 1	1.224	.05	.043	.05
REACH 1	0.971	.05	.043	.05
REACH 2	0.727	.05	.043	.05
REACH 2	0.505	.05	.043	.05
REACH 2	0.255	.05	.043	.05

River:2S2WS20 (A19)

Reach	River Sta.	n1	n2	n3
REACH 1	1.581	.044	.049	.044
REACH 1	1.338	.044	.049	.044
REACH 1	1.117	.044	.049	.044
REACH 1	0.842	.044	.049	.044
REACH 1	0.586	.044	.049	.044
REACH 1	0.362	.044	.049	.044

River:2S2WS17B (A63)

Reach	River Sta.	n1	n2	n3
REACH 1	4.381	.044	.049	.044
REACH 1	4.098	.044	.049	.044
REACH 1	3.884	.044	.049	.044
REACH 1	3.592	.044	.049	.044
REACH 1	3.299	.044	.049	.044
REACH 1	3.038	.044	.049	.044
REACH 1	2.771	.044	.049	.044
REACH 1	2.521	.044	.049	.044
REACH 1	2.168	.044	.049	.044
REACH 1	1.898	.044	.049	.044
REACH 1	1.627	.044	.049	.044
REACH 2	1.294	.044	.049	.044
REACH 2	1.137	.044	.049	.044
REACH 2	0.852	.044	.049	.044
REACH 2	0.593	.044	.049	.044
REACH 2	0.298	.044	.049	.044
REACH 2	0.000	.044	.049	.044

River:2S2WS7B (A51)

Reach	River Sta.	n1	n2	n3
REACH 1	1.710	.044	.049	.044
REACH 1	1.452	.044	.049	.044
REACH 1	1.187	.044	.049	.044
REACH 1	0.909	.044	.049	.044
REACH 1	0.645	.044	.049	.044
REACH 1	0.373	.044	.049	.044
REACH 1	0.000	.044	.049	.044

SUMMARY OF REACH LENGTHS

River: 2S3WS12A (A30)

Reach	River Sta.	Left	Channel	Right
REACH 1	4.175	1320	1410	1330

*REACH 1	3.908	1510*	1558*	1520*
*REACH 1	3.613	1290*	1294*	1260*
*REACH 1	3.368	1320*	1330*	1310*
*REACH 1	3.116	1595*	1610*	1580*
*REACH 1	2.811	1450*	1452*	1440*
*REACH 1	2.536	1450*	1489*	1435*
*REACH 1	2.254	1275*	1283*	1300*
*REACH 1	2.011	1000*	1188*	1260*
*REACH 1	1.786	1000*	956*	995*
*REACH 1	1.605	1375*	1383*	1380*
*REACH 1	1.343	1420*	1410*	1410*
*REACH 1	1.076	1445*	1447*	1430*
*REACH 1	0.802	1380*	1378*	1395*
*REACH 1	0.541	1395*	1394*	1380*
*REACH 1	0.277	*	*	*

River: 2S3WS12B (A27)

* Reach *	River Sta. *	Left *	Channel *	Right *
*REACH 1	3.308	1275*	1309*	1355*
*REACH 1	3.060	1375*	1394*	1345*
*REACH 1	2.796	1254*	1283*	1320*
*REACH 1	2.553	1290*	1352*	1330*
*REACH 1	2.297	1400*	1378*	1340*
*REACH 1	2.036	1285*	1341*	1305*
*REACH 1	1.782	1310*	1336*	1315*
*REACH 1	1.529	1280*	1294*	1290*
*REACH 1	1.284	1475*	1621*	1470*
*REACH 1	0.977	1380*	1410*	1370*
*REACH 1	0.710	1520*	1558*	1550*
*REACH 1	0.415	1150*	1146*	1110*
*REACH 1	0.198	*	*	*

River: 2S2WS7C (A32)

* Reach *	River Sta. *	Left *	Channel *	Right *
*REACH 1	1.475	1280*	1318*	1245*
*REACH 1	1.226	1350*	1383*	1355*
*REACH 1	0.964	1230*	1257*	1225*
*REACH 1	0.726	1180*	1252*	1200*
*REACH 1	0.488	1115*	1211*	1155*
*REACH 1	0.259	*	*	*

River: 2S2WS7A (A52)

* Reach *	River Sta. *	Left *	Channel *	Right *
*REACH 1	5.079	1240*	1278*	1230*
*REACH 1	4.837	1265*	1286*	1250*
*REACH 1	4.594	1040*	987*	1020*
*REACH 1	4.407	*	*	*
*REACH 4	4.292	860*	871*	835*
*REACH 4	4.127	1220*	1247*	1220*
*REACH 4	3.891	1505*	1534*	1475*
*REACH 4	3.601	1430*	1410*	1340*
*REACH 4	3.334	1420*	1472*	1425*
*REACH 4	3.055	1365*	1463*	1380*
*REACH 4	2.778	*	*	*
*REACH 3	2.494	1280*	1351*	1245*
*REACH 3	2.238	1205*	1211*	1210*
*REACH 3	2.009	1500*	1558*	1500*
*REACH 3	1.714	1600*	1668*	1600*
*REACH 3	1.398	1195*	1220*	1200*
*REACH 3	1.167	1500*	1562*	1510*
*REACH 3	0.871	1450*	1514*	1425*
*REACH 3	0.584	*	*	*
*REACH 2	0.280	40*	37*	40*
*REACH 2	0.273	*	*	*

River: 1S2WS31 (A56)

* Reach *	River Sta. *	Left *	Channel *	Right *

Reach	River Sta.	Left	Channel	Right
REACH 1	4.185	1550	1452	1400
REACH 1	3.910	1180	1277	1230
REACH 1	3.668			
REACH 2	3.374	1850	1920	1820
REACH 2	3.011			
REACH 3	2.673	1550	1509	1620
REACH 3	2.388			
REACH 4	2.110	1015	1040	1045
REACH 4	1.913			
REACH 5	1.595	1460	1401	1395
REACH 5	1.329	1300	1338	1325
REACH 5	1.076	1310	1397	1455
REACH 5	0.811	1315	1269	1225
REACH 5	0.571	1150	1342	1300
REACH 5	0.317	1840	1672	1415

River: 2S3WS1 (A54)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.461	1360	1389	1365
REACH 1	0.198			

River: 2S2WS6 (A55)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.720	1265	1346	1265
REACH 1	1.465	1240	1272	1250
REACH 1	1.224	1305	1335	1315
REACH 1	0.971			
REACH 2	0.727	1150	1175	1190
REACH 2	0.505	1290	1321	1330
REACH 2	0.255			

River: 2S2WS20 (A19)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.581	1260	1283	1250
REACH 1	1.338	1125	1167	1120
REACH 1	1.117	1430	1452	1395
REACH 1	0.842	1370	1352	1400
REACH 1	0.586	1200	1183	1210
REACH 1	0.362			

River: 2S2WS17B (A63)

Reach	River Sta.	Left	Channel	Right
REACH 1	4.381	1560	1499.52	1450
REACH 1	4.098	1100	1124.64	1200
REACH 1	3.884	1475	1542	1475
REACH 1	3.592	1525	1547	1475
REACH 1	3.299	1325	1378	1350
REACH 1	3.038	1400	1415	1375
REACH 1	2.771	1310	1320	1320
REACH 1	2.521	1825	1859	1810
REACH 1	2.168	1400	1429	1420
REACH 1	1.898	1320	1431	1400
REACH 1	1.627			
REACH 2	1.294	900	834	790
REACH 2	1.137	1470	1506	1490
REACH 2	0.852	1350	1363	1350
REACH 2	0.593	1580	1563	1550
REACH 2	0.298	1505	1573	1455
REACH 2	0.000	13	13	13

River: 2S2WS7B (A51)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.710	1325	1362	1310
REACH 1	1.452	1345	1399	1325

*REACH 1	*	1.187	*	1410*	1468*	1380*
*REACH 1	*	0.909	*	1400*	1394*	1360*
*REACH 1	*	0.645	*	1405*	1436*	1400*
*REACH 1	*	0.373	*	1835*	1969*	1790*
*REACH 1	*	0.000	*	25*	27*	25*

****

****

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S3WS12A (A30)

* Reach	*	River Sta.	*	Contr.	*	Expan.	*
*REACH 1	*	4.175	*	.1*		.3*	
*REACH 1	*	3.908	*	.1*		.3*	
*REACH 1	*	3.613	*	.1*		.3*	
*REACH 1	*	3.368	*	.1*		.3*	
*REACH 1	*	3.116	*	.1*		.3*	
*REACH 1	*	2.811	*	.1*		.3*	
*REACH 1	*	2.536	*	.1*		.3*	
*REACH 1	*	2.254	*	.1*		.3*	
*REACH 1	*	2.011	*	.1*		.3*	
*REACH 1	*	1.786	*	.1*		.3*	
*REACH 1	*	1.605	*	.1*		.3*	
*REACH 1	*	1.343	*	.1*		.3*	
*REACH 1	*	1.076	*	.1*		.3*	
*REACH 1	*	0.802	*	.1*		.3*	
*REACH 1	*	0.541	*	.1*		.3*	
*REACH 1	*	0.277	*	.1*		.3*	

River: 2S3WS12B (A27)

* Reach	*	River Sta.	*	Contr.	*	Expan.	*
*REACH 1	*	3.308	*	.1*		.3*	
*REACH 1	*	3.060	*	.1*		.3*	
*REACH 1	*	2.796	*	.1*		.3*	
*REACH 1	*	2.553	*	.1*		.3*	
*REACH 1	*	2.297	*	.1*		.3*	
*REACH 1	*	2.036	*	.1*		.3*	
*REACH 1	*	1.782	*	.1*		.3*	
*REACH 1	*	1.529	*	.1*		.3*	
*REACH 1	*	1.284	*	.1*		.3*	
*REACH 1	*	0.977	*	.1*		.3*	
*REACH 1	*	0.710	*	.1*		.3*	
*REACH 1	*	0.415	*	.1*		.3*	
*REACH 1	*	0.198	*	.1*		.3*	

River: 2S2WS7C (A32)

* Reach	*	River Sta.	*	Contr.	*	Expan.	*
*REACH 1	*	1.475	*	.1*		.3*	
*REACH 1	*	1.226	*	.1*		.3*	
*REACH 1	*	0.964	*	.1*		.3*	
*REACH 1	*	0.726	*	.1*		.3*	
*REACH 1	*	0.488	*	.1*		.3*	
*REACH 1	*	0.259	*	.1*		.3*	

River: 2S2WS7A (A52)

* Reach	*	River Sta.	*	Contr.	*	Expan.	*
*REACH 1	*	5.079	*	.1*		.3*	
*REACH 1	*	4.837	*	.1*		.3*	
*REACH 1	*	4.594	*	.1*		.3*	
*REACH 1	*	4.407	*	.1*		.3*	
*REACH 4	*	4.292	*	.1*		.3*	
*REACH 4	*	4.127	*	.1*		.3*	
*REACH 4	*	3.891	*	.1*		.3*	
*REACH 4	*	3.601	*	.1*		.3*	
*REACH 4	*	3.334	*	.1*		.3*	
*REACH 4	*	3.055	*	.1*		.3*	
*REACH 4	*	2.778	*	.1*		.3*	

*REACH 3	2.494	.1	.3
*REACH 3	2.238	.1	.3
*REACH 3	2.009	.1	.3
*REACH 3	1.714	.1	.3
*REACH 3	1.398	.1	.3
*REACH 3	1.167	.1	.3
*REACH 3	0.871	.1	.3
*REACH 3	0.584	.1	.3
*REACH 2	0.280	.1	.3
*REACH 2	0.273	.1	.3

River: 1S2WS31 (A56)

Reach	River Sta.	Contr.	Expan.
*REACH 1	4.185	.1	.3
*REACH 1	3.910	.1	.3
*REACH 1	3.668	.1	.3
*REACH 2	3.374	.1	.3
*REACH 2	3.011	.1	.3
*REACH 3	2.673	.1	.3
*REACH 3	2.388	.1	.3
*REACH 4	2.110	.1	.3
*REACH 4	1.913	.1	.3
*REACH 5	1.595	.1	.3
*REACH 5	1.329	.1	.3
*REACH 5	1.076	.1	.3
*REACH 5	0.811	.1	.3
*REACH 5	0.571	.1	.3
*REACH 5	0.317	.1	.3

River: 2S3WS1 (A54)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.461	.1	.3
*REACH 1	0.198	.1	.3

River: 2S2WS6 (A55)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.720	.1	.3
*REACH 1	1.465	.1	.3
*REACH 1	1.224	.1	.3
*REACH 1	0.971	.1	.3
*REACH 2	0.727	.1	.3
*REACH 2	0.505	.1	.3
*REACH 2	0.255	.1	.3

River: 2S2WS20 (A19)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.581	.1	.3
*REACH 1	1.338	.1	.3
*REACH 1	1.117	.1	.3
*REACH 1	0.842	.1	.3
*REACH 1	0.586	.1	.3
*REACH 1	0.362	.1	.3

River: 2S2WS17B (A63)

Reach	River Sta.	Contr.	Expan.
*REACH 1	4.381	.1	.3
*REACH 1	4.098	.1	.3
*REACH 1	3.884	.1	.3
*REACH 1	3.592	.1	.3
*REACH 1	3.299	.1	.3
*REACH 1	3.038	.1	.3
*REACH 1	2.771	.1	.3
*REACH 1	2.521	.1	.3
*REACH 1	2.168	.1	.3

```
*REACH 1          *    1.898   *       .1*       .3*
*REACH 1          *    1.627   *       .1*       .3*
*REACH 2          *    1.294   *       .1*       .3*
*REACH 2          *    1.137   *       .1*       .3*
*REACH 2          *    0.852   *       .1*       .3*
*REACH 2          *    0.593   *       .1*       .3*
*REACH 2          *    0.298   *       .1*       .3*
*REACH 2          *    0.000   *       .1*       .3*
*****************************************************
River: 2S2WS7B (A51)

*****************************************************
*     Reach       *   River Sta.   * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    1.710   *       .1*       .3*
*REACH 1          *    1.452   *       .1*       .3*
*REACH 1          *    1.187   *       .1*       .3*
*REACH 1          *    0.909   *       .1*       .3*
*REACH 1          *    0.645   *       .1*       .3*
*REACH 1          *    0.373   *       .1*       .3*
*REACH 1          *    0.000   *       .1*       .3*
*****************************************************
```

MODEL: 1S2WS31B (I70)

REACHES: 1S2WS31B (I70)
1S2WS32A (I67)
1S2WS32B (I68)
1S2WS34 (I65)
1S2WS33 (I66)
1S2WS31A (I71)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX   XXXX       XXXX      XX     XXXX
X     X  X       X    X     X   X    X  X   X
X     X  X       X          X   X   X    X  X
XXXXXXX  XXXX    X      XXX XXXX    XXXXXX   XXXX
X     X  X       X          X  X    X    X       X
X     X  X       X    X     X   X   X    X       X
X     X  XXXXXX   XXXX      X    X  X    X  XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS31B (I70)
Project File : 1S2WS31B_I70.prj
Run Date and Time: 1/12/2005 4:37:17 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS31B (I70)
Reaches: 1S2WS31B (I70)
  1S2WS31A
(I71)
  1S2WS34 (I65)
  1S2WS33 (I66)
  1S2WS32A (I67)
  1S2WS32B (I68)

****

PLAN DATA

Plan Title: 1S2WS31B (I70)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31B (I70)\1S2WS31B_I70.p01

Geometry Title: 1S2WS31B (I70)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31B (I70)\1S2WS31B_I70.g01

Flow Title : 1S2WS31B (I70)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31B (I70)\1S2WS31B_I70.f01

Plan Summary Information:
Number of: Cross Sections = 50 Mulitple Openings = 0
  Culverts = 0 Inline Structures = 0

Bridges = 0 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = False
Left Offset = 0
Right Offset = 0

River = 1S2WS34 (I65) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.033	PF 2	1	9960	10040
2.756	PF 2	1	9960	10205
2.519	PF 2	1	9850	10250
2.295	PF 2	1	9890	10200
2.056	PF 2	1	9875	10175
1.813	PF 2	1	9850	10110
1.557	PF 2	1	9875	10100
1.278	PF 2	1	9925	10150
1.024	PF 2	1	9965	10060
0.674	PF 2	1	9850	10460
0.405	PF 2	1	9850	10335
0.203	PF 2	1	9825	10140
0.033	PF 2	1	9950	10050

River = 1S2WS33 (I66) Reach = REACH 1

RS	Profile	Method	Value1	Value2
0.887	PF 2	1	9975	10025
0.597	PF 2	1	9950	10050
0.308	PF 2	1	9950	10050
0.018	PF 2	1	9900	10040

River = 1S2WS31B (I70) Reach = REACH 1

RS	Profile	Method	Value1	Value2
4.423	PF 2	1	9950	10050
4.171	PF 2	1	9950	10100
3.898	PF 2	1	9950	10050
3.648	PF 2	1	9950	10050
3.378	PF 2	1	9940	10060
3.113	PF 2	1	9950	10050
2.925	PF 2	1	9940	10060
2.792	PF 2	1	9925	10075

River = 1S2WS31B (I70) Reach = REACH 2

RS	Profile	Method	Value1	Value2
2.706	PF 2	1	9950	10200
2.522	PF 2	1	9975	10030

River = 1S2WS31B (I70) Reach = REACH 3

RS	Profile	Method	Value1	Value2
2.277	PF 2	1	9950	10050
2.037	PF 2	1	9950	10050
1.772	PF 2	1	9950	10050
1.482	PF 2	1	9950	10050
1.162	PF 2	1	9950	10115
0.907	PF 2	1	9950	10050
0.648	PF 2	1	9915	10050
0.499	PF 2	1	9950	10050
0.412	PF 2	1	9950	10050

River = 1S2WS31B (I70) Reach = REACH 4

RS	Profile	Method	Value1	Value2
1.483	PF 2	1	9950	10050
1.482	PF 2	1	9950	10050

River = 1S2WS31B (I70) Reach = REACH 5

RS	Profile	Method	Value1	Value2
1.162	PF 2	1	9950	10115

0.907	PF 2	1	9950	10050
0.648	PF 2	1	9915	10050
0.499	PF 2	1	9950	10050
0.412	PF 2	1	9950	10050

River = 1S2WS31B (I70) Reach = REACH 6

RS	Profile	Method	Value1	Value2
0.124	PF 2	1	9950	10050
0.123	PF 2	1	9950	10050

River = 1S2WS31A (I71) Reach = REACH 1

RS	Profile	Method	Value1	Value2
0.868	PF 2	1	9975	10025
0.657	PF 2	1	9925	10075
0.434	PF 2	1	9940	10060
0.281	PF 2	1	9950	10045
0.203	PF 2	1	9989.5	10040

River = 1S2WS32A (I67) Reach = REACH 1

RS	Profile	Method	Value1	Value2
0.824	PF 2	1	9989	10055
0.572	PF 2	1	9865	10100
0.329	PF 2	1	9950	10155

River = 1S2WS32B (I68) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.016	PF 2	1	9960	10023
0.890	PF 2	1	9970	10035
0.745	PF 2	1	9935	10024
0.517	PF 2	1	9925	10022
0.263	PF 2	1	9925	10045

****

FLOW DATA

Flow Title: 1S2WS31B (I70)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31B (I70)\1S2WS31B_I70.f01

Flow Data (cfs)

River	Reach	RS	PF 1
1S2WS32A (I67)	REACH 1	0.824	220
1S2WS32A (I67)	REACH 1	0.572	560
1S2WS32A (I67)	REACH 1	0.329	670
1S2WS32B (I68)	REACH 1	1.016	70
1S2WS32B (I68)	REACH 1	0.890	140
1S2WS32B (I68)	REACH 1	0.745	210
1S2WS32B (I68)	REACH 1	0.517	340
1S2WS32B (I68)	REACH 1	0.263	480
1S2WS34 (I65)	REACH 1	3.033	790
1S2WS34 (I65)	REACH 1	2.756	790
1S2WS34 (I65)	REACH 1	2.519	800
1S2WS34 (I65)	REACH 1	2.295	810
1S2WS34 (I65)	REACH 1	2.056	810
1S2WS34 (I65)	REACH 1	1.813	820
1S2WS34 (I65)	REACH 1	1.557	830
1S2WS34 (I65)	REACH 1	1.278	840
1S2WS34 (I65)	REACH 1	1.024	840
1S2WS34 (I65)	REACH 1	0.674	1910
1S2WS34 (I65)	REACH 1	0.405	1670
1S2WS34 (I65)	REACH 1	0.203	1490
1S2WS34 (I65)	REACH 1	0.033	1330
1S2WS33 (I66)	REACH 1	0.887	170
1S2WS33 (I66)	REACH 1	0.597	450
1S2WS33 (I66)	REACH 1	0.308	930
1S2WS33 (I66)	REACH 1	0.018	1710
1S2WS31B (I70)	REACH 1	4.423	650
1S2WS31B (I70)	REACH 1	4.171	780
1S2WS31B (I70)	REACH 1	3.898	920
1S2WS31B (I70)	REACH 1	3.648	1040
1S2WS31B (I70)	REACH 1	3.378	1180
1S2WS31B (I70)	REACH 1	3.113	1310
1S2WS31B (I70)	REACH 1	2.925	1410
1S2WS31B (I70)	REACH 1	2.792	1470
1S2WS31B (I70)	REACH 2	2.706	2680
1S2WS31B (I70)	REACH 2	2.522	2930

* 1S2WS31B (I70)	REACH 3	2.277	*	3270 *
* 1S2WS31B (I70)	REACH 3	2.037	*	3170 *
* 1S2WS31B (I70)	REACH 3	1.772	*	3050 *
* 1S2WS31B (I70)	REACH 4	1.483	*	2920 *
* 1S2WS31B (I70)	REACH 4	1.482	*	2920 *
* 1S2WS31B (I70)	REACH 5	1.162	*	3070 *
* 1S2WS31B (I70)	REACH 5	0.907	*	2960 *
* 1S2WS31B (I70)	REACH 5	0.648	*	2840 *
* 1S2WS31B (I70)	REACH 5	0.499	*	2770 *
* 1S2WS31B (I70)	REACH 5	0.412	*	2740 *
* 1S2WS31B (I70)	REACH 6	0.124	*	2740 *
* 1S2WS31B (I70)	REACH 6	0.123	*	2740 *
* 1S2WS31A (I71)	REACH 1	0.434	*	330 *
* 1S2WS31A (I71)	REACH 1	0.281	*	490 *
* 1S2WS31A (I71)	REACH 1	0.203	*	520 *

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1S2WS32A (I67)	REACH 1	PF 1	Normal S = 0.005	
1S2WS32B (I68)	REACH 1	PF 1	Normal S = 0.005	
1S2WS34 (I65)	REACH 1	PF 1	Normal S = 0.0061	
1S2WS33 (I66)	REACH 1	PF 1	Normal S = 0.0086	
1S2WS31B (I70)	REACH 1	PF 1	Normal S = 0.0051	
1S2WS31B (I70)	REACH 6	PF 1		Normal S = 0.005
1S2WS31A (I71)	REACH 1	PF 1	Normal S = 0.0076	

GEOMETRY DATA

Geometry Title: 1S2WS31B (I70)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS31B (I70)\1S2WS31B_I70.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
1S2WS32A (I67)	REACH 1		JUNCTION 3
1S2WS32B (I68)	REACH 1		JUNCTION 4
1S2WS34 (I65)	REACH 1		JUNCTION 1
1S2WS33 (I66)	REACH 1		JUNCTION 2
1S2WS31B (I70)	REACH 1		JUNCTION 1
1S2WS31B (I70)	REACH 2	JUNCTION 1	JUNCTION 2
1S2WS31B (I70)	REACH 3	JUNCTION 2	JUNCTION 3
1S2WS31B (I70)	REACH 4	JUNCTION 3	JUNCTION 4
1S2WS31B (I70)	REACH 5	JUNCTION 4	JUNCTION 5
1S2WS31B (I70)	REACH 6	JUNCTION 5	
1S2WS31A (I71)	REACH 1		JUNCTION 5

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
1S2WS31B (I70)	REACH 1	to 1S2WS31B (I70)	REACH 2	454	
1S2WS34 (I65)	REACH 1	to 1S2WS31B (I70)	REACH 2	174	

Name: JUNCTION 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
1S2WS31B (I70)	REACH 2	to 1S2WS31B (I70)	REACH 3	1294	
1S2WS33 (I66)	REACH 1	to 1S2WS31B (I70)	REACH 3	95	

Name: JUNCTION 3
Description:
Energy computation Method

```
    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31B (I70)  REACH 3          to 1S2WS31B (I70)  REACH 4              1532
1S2WS32A (I67)  REACH 1          to 1S2WS31B (I70)  REACH 4              1730

Name: JUNCTION 4
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31B (I70)  REACH 4          to 1S2WS31B (I70)  REACH 5              1690
1S2WS32B (I68)  REACH 1          to 1S2WS31B (I70)  REACH 5              1550

Name: JUNCTION 5
Description:
Energy computation Method

    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
1S2WS31B (I70)  REACH 5          to 1S2WS31B (I70)  REACH 6              1520       0
1S2WS31A (I71)  REACH 1          to 1S2WS31B (I70)  REACH 6                 0       0

CROSS SECTION


RIVER: 1S2WS32A (I67)
REACH: REACH 1            RS: 0.824

INPUT
Description: Limit of Study.
Directly downstream of Rainbow Valley Road.
Station Elevation Data    num=      26
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9755.26 1008.75 9791.32 1008.59 9827.01 1007.73 9843.24 1007.72 9893.69 1007.01
 9929.01 1007.04 9952.27 1007.68 9977.04 1007.73 9978.32 1007.59 9978.73 1007.54
 9979.97 1007.4210000.04 1005.4110117.26 1007.0310150.41  1007.610186.11 1008.29
10201.42 1008.0410267.66 1007.6410270.72 1007.6810273.06 1007.6910290.95 1007.92
10362.65 1009.1510380.08 1009.2710424.66 1009.6110452.06  1009.910467.16 1009.98
10497.97 1010.93

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9755.26    .042 9977.04    .04310186.11    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.0410186.11             1300    1327    1300             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1006.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.29  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)         * 1006.53  * Reach Len. (ft)        * 1300.00  * 1327.00  * 1300.00  *
* Crit W.S. (ft)         * 1006.53  * Flow Area (sq ft)      *          *   51.15  *          *
* E.G. Slope (ft/ft)     *0.033810  * Area (sq ft)           *          *   51.15  *          *
* Q Total (cfs)          *  220.00  * Flow (cfs)              *          *  220.00  *          *
* Top Width (ft)         *   91.78  * Top Width (ft)          *          *   91.78  *          *
* Vel Total (ft/s)       *    4.30  * Avg. Vel. (ft/s)        *          *    4.30  *          *
* Max Chl Dpth (ft)      *    1.11  * Hydr. Depth (ft)        *          *    0.56  *          *
* Conv. Total (cfs)      *  1196.5  * Conv. (cfs)             *          *  1196.5  *          *
* Length Wtd. (ft)       * 1326.48  * Wetted Per. (ft)        *          *   91.84  *          *
* Min Ch El (ft)         * 1005.41  * Shear (lb/sq ft)        *          *    1.18  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    5.06  *          *
* Frctn Loss (ft)        *    9.26  * Cum Volume (acre-ft)   *    0.52  *   24.64  *    6.54  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)         *    2.59  *   12.68  *    2.22  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
```

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS32A (I67)
REACH: REACH 1 RS: 0.572

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9573.18	995.99	9594.06	996.01	9613.79	995.96	9629.46	995.92	9643.63	995.87
9664.86	995.8	9688.31	995.71	9711.07	995.6	9735.66	995.48	9762.82	995.35
9771.05	995.31	9778.5	995.27	9806.45	995.15	9837.34	995.01	9841.85	994.98
9845.94	994.97	9877.25	994.82	9911.86	994.69	9912.65	994.69	9913.37	994.68
9948.05	994.58	10000	994.65	10018.58	994.49	10040.94	994.29	10057.19	994.23
10080.67	993.87	10094.52	993.78	10101.37	993.88	10131.84	993.82	10157.15	994.4
10169.16	994.59	10193.43	995.21	10206.48	995.26	10212.93	995.29	10243.8	995.41
10268.72	995.5	10281.12	995.54	10306.2	995.57	10318.44	995.58		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9573.18	.042	9877.25	.043	10193.43	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9877.25	10193.43	1225	1286	1225	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	995.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	995.23	Reach Len. (ft)	1225.00	1286.00	1225.00
Crit W.S. (ft)	994.84	Flow Area (sq ft)	17.95	260.75	0.05
E.G. Slope (ft/ft)	0.004731	Area (sq ft)	17.95	260.75	0.05
Q Total (cfs)	560.00	Flow (cfs)	14.98	545.01	0.01
Top Width (ft)	410.72	Top Width (ft)	89.38	316.18	5.16
Vel Total (ft/s)	2.01	Avg. Vel. (ft/s)	0.83	2.09	0.11
Max Chl Dpth (ft)	1.45	Hydr. Depth (ft)	0.20	0.82	0.01
Conv. Total (cfs)	8141.3	Conv. (cfs)	217.8	7923.4	0.1
Length Wtd. (ft)	1274.72	Wetted Per. (ft)	89.38	316.20	5.16
Min Ch El (ft)	993.78	Shear (lb/sq ft)	0.06	0.24	0.00
Alpha	1.06	Stream Power (lb/ft s)	0.05	0.51	0.00
Frctn Loss (ft)	10.49	Cum Volume (acre-ft)	0.25	19.89	6.54
C & E Loss (ft)	0.01	Cum SA (acres)	1.26	6.47	2.14

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS32A (I67)
REACH: REACH 1 RS: 0.329

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9645.31	985.38	9659.13	985.3	9680.67	985.13	9703.11	985.07	9716.04	985.01
9728.45	984.98	9751.4	984.95	9775.29	984.91	9786.76	984.88	9797.78	984.85
9822.13	984.82	9847.47	984.77	9857.49	984.75	9867.11	984.72	9892.85	984.7
9919.65	984.64	9930.6	984.43	9932.11	984.4	9934.11	984.39	9936.76	984.35
9940.73	984.23	9946.21	984.02	9976.06	983.38	9984	983.03	9991.15	982.82
10000	982.62	10027.6	983.89	10036.18	984.28	10045.07	984.45	10045.89	984.42
10046.94	984.38	10048.27	984.36	10050.13	984.36	10052.62	984.39	10056.05	984.41
10063.43	984.37	10099.12	983.96	10109.7	983.82	10121.79	983.66	10122.85	983.65
10130.93	983.69	10139.22	983.73	10146.83	983.77	10168.44	984.21	10177.35	984.27
10184.1	984.32	10189.5	984.43	10192.59	984.59	10195.32	984.76	10197.73	984.86
10199.68	984.87	10201.63	984.85	10203.56	984.86	10205.81	984.96	10207.96	985.09
10246.78	985.1	10247.71	985.14	10249.09	985.15	10250.16	985.13	10270.23	985.08
10295.3	985.06	10300.43	985.06	10337.67	985.16	10351.47	985.2	10380.04	985.26

10402.51 985.26 10414.3 985.28

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9645.31	.042	9919.65	.04310045.07		.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9919.6510045.07 1700 1736 1700 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	984.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.043	0.042
W.S. Elev (ft)	984.57	Reach Len. (ft)	1730.00	1730.00	1730.00
Crit W.S. (ft)	984.48	Flow Area (sq ft)		112.78	75.68
E.G. Slope (ft/ft)	0.015301	Area (sq ft)		112.78	75.68
Q Total (cfs)	670.00	Flow (cfs)		457.47	212.53
Top Width (ft)	269.13	Top Width (ft)		121.94	147.19
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)		4.06	2.81
Max Chl Dpth (ft)	1.95	Hydr. Depth (ft)		0.92	0.51
Conv. Total (cfs)	5416.5	Conv. (cfs)		3698.3	1718.2
Length Wtd. (ft)	1730.00	Wetted Per. (ft)		122.00	147.21
Min Ch El (ft)	982.62	Shear (lb/sq ft)		0.88	0.49
Alpha	1.09	Stream Power (lb/ft s)		3.58	1.38
Frctn Loss (ft)	11.92	Cum Volume (acre-ft)		14.38	5.47
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS32B (I68)
REACH: REACH 1 RS: 1.016

INPUT
Description: Limit of Study.
Directly downstream of Rainbow Valley Road.
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9573.4	1028.89	9582.83	1028.82	9629.45	1028.54	9644.32	1028.5	9662.92	1028.31
9693.45	1027.99	9715.47	1027.72	9743.01	1027.27	9757.46	1027.05	9786.62	1026.65
9821.46	1026.28	9822.19	1026.28	9823.11	1026.28	9857.77	1026.29	9885.46	1026.25
9893.34	1026.27	9903.2	1026.2	9928.92	1026.1	9956.1	1025.59	9961.48	1025.46
9974.49	1025.24	10000	1024.89	10035.5	1025.84	10038.23	1025.92	10038.99	1025.94
10039.47	1025.96	10039.8	1025.97	10042.13	1026.03	10049.67	1026.16	10084.18	1026.88
10091.65	1026.95	10126.22	1027.45	10142.81	1027.63	10168.27	1028.08		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9573.4	.042	9928.92	.04310084.18		.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9928.9210084.18 625 664 625 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1025.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.043	
W.S. Elev (ft)	1025.52	Reach Len. (ft)	625.00	664.00	625.00
Crit W.S. (ft)	1025.52	Flow Area (sq ft)		21.43	
E.G. Slope (ft/ft)	0.039001	Area (sq ft)		21.43	
Q Total (cfs)	70.00	Flow (cfs)		70.00	
Top Width (ft)	64.69	Top Width (ft)		64.69	
Vel Total (ft/s)	3.27	Avg. Vel. (ft/s)		3.27	
Max Chl Dpth (ft)	0.63	Hydr. Depth (ft)		0.33	
Conv. Total (cfs)	354.5	Conv. (cfs)		354.5	
Length Wtd. (ft)	664.00	Wetted Per. (ft)		64.71	
Min Ch El (ft)	1024.89	Shear (lb/sq ft)		0.81	
Alpha	1.00	Stream Power (lb/ft s)		2.63	
Frctn Loss (ft)	6.24	Cum Volume (acre-ft)	1.45	21.29	0.22
C & E Loss (ft)	0.02	Cum SA (acres)		8.56	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS32B (I68)
REACH: REACH 1 RS: 0.890

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9775.5	1016.86	9791.15	1016.5	9798.64	1016.34	9841.91	1015.33	9860.21	1014.96
9892.68	1014.24	9921.78	1013.61	9943.44	1013.15	9974.95	1011.34	9994.39	1010.34
10000	1010.06	10000.63	1010.03	10008.23	1010.34	10026.93	1011.17	10044.35	1012.17
10082.31	1012.71	10094.42	1012.91	10129.91	1013.66	10144.49	1014.03	10177.5	1014.89
10194.56	1015.35	10225.09	1015.94	10244.62	1016.38	10262.78	1016.46		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9775.5	.042	9943.44	.043	10044.35	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9943.44	10044.35	725	767	725	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1011.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.		0.043	
W.S. Elev (ft)	1011.68	Reach Len. (ft)	725.00	767.00	725.00
Crit W.S. (ft)	1011.23	Flow Area (sq ft)		57.85	
E.G. Slope (ft/ft)	0.005965	Area (sq ft)		57.85	
Q Total (cfs)	140.00	Flow (cfs)		140.00	
Top Width (ft)	66.92	Top Width (ft)		66.92	
Vel Total (ft/s)	2.42	Avg. Vel. (ft/s)		2.42	
Max Chl Dpth (ft)	1.65	Hydr. Depth (ft)		0.86	
Conv. Total (cfs)	1812.6	Conv. (cfs)		1812.6	
Length Wtd. (ft)	767.00	Wetted Per. (ft)		67.00	
Min Ch El (ft)	1010.03	Shear (lb/sq ft)		0.32	
Alpha	1.00	Stream Power (lb/ft s)		0.78	
Frctn Loss (ft)	10.73	Cum Volume (acre-ft)	1.45	20.69	0.22
C & E Loss (ft)	0.02	Cum SA (acres)		7.56	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS32B (I68)
REACH: REACH 1 RS: 0.745

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9734.01	1005.13	9761.77	1004.4	9780.27	1003.83	9811.95	1002.98	9826.54	1002.63
9862.13	1001.74	9872.8	1001.59	9932.58	1000.73	9942.06	1000.36	9952.17	1000.09
9956.04	1000.09	9957.81	1000.09	9964.73	1000.08	9966.91	1000.05	9973.82	1000.04
9975.27	1000.04	9982.9	1000.03	9984.71	1000.03	9991.56	1000.02	10000	1000
10002.55	1000.08	10021.2	1000.63	10033.27	1001.01	10075.09	1001.78	10081.19	1001.87

```
 10090.4    100210117.27 1002.3310135.06 1002.5310153.35 1002.6810180.98 1002.92
10189.43 1003.0310195.02  1003.110225.51  1003.310254.98 1003.4510261.59 1003.45
10263.95 1003.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9734.01    .042  9872.8    .04310075.09    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9872.810075.09              1150    1201    1150              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
**************************************************************************************************
* E.G. Elev (ft)          * 1001.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1000.75  * Reach Len. (ft)         * 1150.00  * 1201.00  * 1150.00  *
* Crit W.S. (ft)          * 1000.75  * Flow Area (sq ft)       *          *   50.28  *          *
* E.G. Slope (ft/ft)      *0.033530  * Area (sq ft)            *          *   50.28  *          *
* Q Total (cfs)           *  210.00  * Flow (cfs)              *          *  210.00  *          *
* Top Width (ft)          *   93.74  * Top Width (ft)          *          *   93.74  *          *
* Vel Total (ft/s)        *    4.18  * Avg. Vel. (ft/s)        *          *    4.18  *          *
* Max Chl Dpth (ft)       *    0.75  * Hydr. Depth (ft)        *          *    0.54  *          *
* Conv. Total (cfs)       *  1146.8  * Conv. (cfs)             *          *  1146.8  *          *
* Length Wtd. (ft)        * 1201.00  * Wetted Per. (ft)        *          *   93.76  *          *
* Min Ch El (ft)          * 1000.00  * Shear (lb/sq ft)        *          *    1.12  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    4.69  *          *
* Frctn Loss (ft)         *    7.32  * Cum Volume (acre-ft)    *    1.45  *   19.74  *    0.22  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *          *    6.15  *          *
**************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS32B (I68)
REACH: REACH 1            RS: 0.517

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**************************************************************************************
 9646.87  992.34 9690.66  991.55 9697.14  991.55 9736.21  991.09  9747.4  990.93
 9781.76  990.74 9797.67  990.58  9827.3  990.61 9847.94  990.46 9872.85   990.4
 9912.96  989.19 9917.95  988.98 9925.39  988.67 9937.61  988.19 9943.07  988.02
 9952.96  987.71 9962.96  987.41 9969.66  987.14   10000  986.0110042.83  991.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9646.87    .042 9872.85    .04310042.83    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9872.8510042.83              1300    1345    1300              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
**************************************************************************************************
* E.G. Elev (ft)          *  988.88  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          *  988.79  * Reach Len. (ft)         * 1300.00  * 1345.00  * 1300.00  *
* Crit W.S. (ft)          *  987.89  * Flow Area (sq ft)       *          *  137.79  *          *
* E.G. Slope (ft/ft)      *0.003321  * Area (sq ft)            *          *  137.79  *          *
* Q Total (cfs)           *  340.00  * Flow (cfs)              *          *  340.00  *          *
* Top Width (ft)          *   99.69  * Top Width (ft)          *          *   99.69  *          *
* Vel Total (ft/s)        *    2.47  * Avg. Vel. (ft/s)        *          *    2.47  *          *
* Max Chl Dpth (ft)       *    2.78  * Hydr. Depth (ft)        *          *    1.38  *          *
* Conv. Total (cfs)       *  5899.8  * Conv. (cfs)             *          *  5899.8  *          *
```

```
* Length Wtd. (ft)       * 1345.00  * Wetted Per. (ft)        *          *   99.91  *          *
* Min Ch El (ft)         *  986.01  * Shear (lb/sq ft)        *          *    0.29  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    0.71  *          *
* Frctn Loss (ft)        *   12.01  * Cum Volume (acre-ft)    *    1.45  *   17.14  *    0.22  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *          *    3.48  *          *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS32B (I68)
REACH: REACH 1            RS: 0.263

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9832.07  977.09 9833.23  977.09 9834.07  977.09 9868.99  977.02 9896.11  976.91
 9904.76  976.86 9937.91  976.03 9962.77  975.59   10000  975.0110051.18  976.59
10052.13  976.6210052.95  976.6510053.28  976.6510092.55  976.9510105.93  977.07
10132.14  977.3110158.57  977.5610171.74   977.710211.22     97810211.34     978
10211.69     97810246.22  978.17

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*****************************************************
 9832.07    .042 9904.76    .04310052.13    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9904.7610052.13             1325    1387    1325            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         *  976.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.39  * Wt. n-Val.              *          *    0.043  *          *
* W.S. Elev (ft)         *  976.45  * Reach Len. (ft)         * 1550.00  * 1550.00  * 1550.00  *
* Crit W.S. (ft)         *  976.45  * Flow Area (sq ft)       *          *   96.15  *          *
* E.G. Slope (ft/ft)     *0.029841  * Area (sq ft)            *          *   96.15  *          *
* Q Total (cfs)          *  480.00  * Flow (cfs)              *          *  480.00  *          *
* Top Width (ft)         *  125.70  * Top Width (ft)          *          *  125.70  *          *
* Vel Total (ft/s)       *    4.99  * Avg. Vel. (ft/s)        *          *    4.99  *          *
* Max Chl Dpth (ft)      *    1.44  * Hydr. Depth (ft)        *          *    0.76  *          *
* Conv. Total (cfs)      *  2778.7  * Conv. (cfs)             *          *  2778.7  *          *
* Length Wtd. (ft)       * 1550.00  * Wetted Per. (ft)        *          *  125.73  *          *
* Min Ch El (ft)         *  975.01  * Shear (lb/sq ft)        *          *    1.42  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    7.11  *          *
* Frctn Loss (ft)        *    6.22  * Cum Volume (acre-ft)    *    1.45  *   13.53  *    0.22  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *          *          *          *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS34 (I65)
REACH: REACH 1            RS: 3.033

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
  9481.4 1113.94 9500.63 1113.88 9511.68 1113.84 9514.27 1113.84 9553.28  1113.7
```

```
 9565.63 1113.66 9594.89 1113.55 9616.98 1113.48 9636.49 1113.41 9668.34  1113.3
  9678.1 1113.26 9719.69 1113.09 9719.73 1113.09  9761.3 1112.91 9771.05 1112.86
 9802.91 1112.69  9822.4 1112.58 9844.51 1112.43 9873.76 1112.24 9886.11 1112.15
 9925.11 1111.88 9929.96 1111.52 9932.71 1111.34 9936.39 1111.12 9945.54 1110.59
 9993.51 1108.01   10000 1107.4210020.41 1108.4810066.87  1111.710088.41 1111.79
10130.62 1111.9710145.76 1112.0410165.15 1112.14 10203.1 1112.3210232.73 1112.46
10260.45  1112.610295.95 1112.7710317.79 1112.8810334.85 1112.9710375.14 1113.18
10426.75 1113.4610432.48  1113.510436.96 1113.5210438.94 1113.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9481.4    .042 9925.11    .04310066.87    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9925.1110066.87             1400    1462    1400            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1110.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.67  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1110.11  * Reach Len. (ft)         * 1400.00  * 1462.00  * 1400.00  *
* Crit W.S. (ft)          * 1110.11  * Flow Area (sq ft)       *          *   120.14 *          *
* E.G. Slope (ft/ft)      *0.024546  * Area (sq ft)            *          *   120.14 *          *
* Q Total (cfs)           *  790.00  * Flow (cfs)              *          *   790.00 *          *
* Top Width (ft)          *   89.59  * Top Width (ft)          *          *    89.59 *          *
* Vel Total (ft/s)        *    6.58  * Avg. Vel. (ft/s)        *          *     6.58 *          *
* Max Chl Dpth (ft)       *    2.69  * Hydr. Depth (ft)        *          *     1.34 *          *
* Conv. Total (cfs)       *  5042.4  * Conv. (cfs)             *          *   5042.4 *          *
* Length Wtd. (ft)        * 1448.36  * Wetted Per. (ft)        *          *    89.76 *          *
* Min Ch El (ft)          * 1107.42  * Shear (lb/sq ft)        *          *     2.05 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    13.49 *          *
* Frctn Loss (ft)         *   10.61  * Cum Volume (acre-ft)    *   19.16  *    91.67 *   29.16  *
* C & E Loss (ft)         *    0.16  * Cum SA (acres)          *   46.90  *    88.86 *   44.67  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS34 (I65)
REACH: REACH 1            RS: 2.756

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9385.11 1099.01 9387.29 1099.01 9388.52 1099.01 9435.68 1098.98 9438.55 1098.98
 9484.07 1098.97 9488.58 1098.97 9532.47 1098.97 9538.61 1098.97 9580.86 1098.96
 9588.64 1098.96 9629.26  1098.9 9638.67 1098.89 9677.65 1098.81  9688.7  1098.8
 9726.04 1098.69 9738.72 1098.66 9774.44 1098.57 9788.75 1098.54 9822.83 1098.46
 9838.78 1098.42 9871.23 1098.34 9888.81 1098.29 9919.62 1098.22 9938.84 1098.17
   10000 1093.4510021.86 1095.75 10029.1 1096.5310032.95 1096.9510035.25 1097.19
 10048.1 1098.0810069.62  1098.110093.64 1098.1310105.56 1098.1410146.32 1098.19
10178.33  1095.310187.28 1094.3310192.45 1093.7910217.26 1095.7310230.41 1096.83
10235.93 1097.3410251.68 1098.3110263.23 1098.3210304.36 1098.3610342.07  1098.4
10357.04 1098.4110387.19 1098.4510409.72 1098.48 10420.9  1098.5 10462.4 1098.56
10499.73  1098.610515.08 1098.6210545.98 1098.6410567.76 1098.6710578.57 1098.68
10620.44 1098.72 10657.4 1098.7610673.12 1098.78   10681 1098.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9385.11    .042 9938.84    .043 10048.1    .042
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9938.84 10048.1             1200    1250    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1097.20  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *    0.043 *    0.042 *
* W.S. Elev (ft)          * 1097.07  * Reach Len. (ft)         * 1200.00  * 1250.00 * 1200.00 *
* Crit W.S. (ft)          * 1095.99  * Flow Area (sq ft)       *          *   146.71 *   120.87 *
* E.G. Slope (ft/ft)      *0.003465  * Area (sq ft)            *          *   146.71 *   120.87 *
* Q Total (cfs)           *  790.00  * Flow (cfs)              *          *   442.47 *   347.53 *
* Top Width (ft)          *  155.15  * Top Width (ft)          *          *    80.93 *    74.21 *
* Vel Total (ft/s)        *    2.95  * Avg. Vel. (ft/s)         *          *     3.02 *     2.88 *
* Max Chl Dpth (ft)       *    3.62  * Hydr. Depth (ft)         *          *     1.81 *     1.63 *
* Conv. Total (cfs)       * 13420.2  * Conv. (cfs)              *          *   7516.5 *   5903.7 *
* Length Wtd. (ft)        * 1239.07  * Wetted Per. (ft)         *          *    81.26 *    74.50 *
* Min Ch El (ft)          * 1093.45  * Shear (lb/sq ft)         *          *     0.39 *     0.35 *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     1.18 *     1.01 *
* Frctn Loss (ft)         *    8.46  * Cum Volume (acre-ft)     *   19.16  *    87.19 *    27.22 *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *   46.90  *    86.00 *    43.48 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS34 (I65)
REACH: REACH 1            RS: 2.519

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9491.93 1089.28 9513.68 1089.28 9542.08 1089.27 9560.19 1089.24 9592.24 1089.19
 9606.71 1089.15 9642.39 1089.05 9653.23 1089.02 9692.54 1088.89 9699.74 1088.86
 9742.69 1088.71 9746.26 1088.69 9791.92 1088.48 9792.78 1088.48 9792.85 1088.48
  9839.3 1088.26    9843 1088.24 9885.81 1088.03 9893.15    1088 9932.33 1087.85
  9943.3 1087.81   10000 1087.8310034.97 1087.7310051.17  1087.810084.58 1087.91
10110.01    108810125.56 1088.0510168.86 1088.1810205.69 1088.4410224.12 1088.15
10224.35 1088.1510243.62 1088.2710286.55 1088.5710315.21 1088.6810345.39 1088.78
10394.75 1088.9410404.24 1088.9710410.04 1088.9810463.08 1089.1310504.86 1089.22
10521.93 1089.2710549.84 1089.3710580.77 1089.4810599.69 1089.5510639.62 1089.72
10694.52 1089.9210698.46 1089.9410704.92 1089.9510735.75 1090.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9491.93    .042 9692.54    .04310394.75    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9692.5410394.75             1100    1181    1100            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1088.75  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1088.61  * Reach Len. (ft)         * 1100.00  * 1181.00 * 1100.00  *
* Crit W.S. (ft)          * 1088.50  * Flow Area (sq ft)       *          *   267.15 *          *
* E.G. Slope (ft/ft)      *0.018863  * Area (sq ft)            *          *   267.15 *          *
* Q Total (cfs)           *  800.00  * Flow (cfs)              *          *   800.00 *          *
* Top Width (ft)          *  533.03  * Top Width (ft)          *          *   533.03 *          *
* Vel Total (ft/s)        *    2.99  * Avg. Vel. (ft/s)         *          *     2.99 *          *
* Max Chl Dpth (ft)       *    0.88  * Hydr. Depth (ft)         *          *     0.50 *          *
* Conv. Total (cfs)       *  5824.8  * Conv. (cfs)              *          *   5824.8 *          *
* Length Wtd. (ft)        * 1169.23  * Wetted Per. (ft)         *          *   533.04 *          *
* Min Ch El (ft)          * 1087.73  * Shear (lb/sq ft)         *          *     0.59 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     1.77 *          *
* Frctn Loss (ft)         *    8.53  * Cum Volume (acre-ft)     *   19.16  *    81.25 *    25.55 *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   46.90  *    77.19 *    42.45 *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
```

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 2.295

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9747.51	1082.25	9758.45	1082.19	9798.53	1081.43	9805.44	1081.3	9811.28	1081.16
9816.05	1081.06	9834.31	1080.85	9885.75	1080.02	9892.73	1079.92	9926.52	1079.49
9957.18	1078.53	9970.3	1078.27	10000	1078.28	10035.06	1078.71	10047.86	1078.89
10070.52	1079.11	10093.3	1079.16	10116.31	1079.23	10173.46	1079.42	10180.28	1079.44
10207.24	1079.54	10244.25	1079.66	10253.62	1079.69	10283.99	1079.78	10307.87	1079.97
10312.49	1080	10318.41	1079.99	10325.86	1079.98	10336.87	1079.98	10353.51	1079.99
10360.84	1080.01	10365.33	1079.99	10380.08	1080.11	10426.3	1080.38	10436.16	1080.43
10461.87	1080.56	10494.1	1080.71	10500.13	1080.73	10523.92	1080.83	10528.9	1080.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9747.51	.042	9926.52	.043	10070.52	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9926.52	10070.52	1200	1264	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1080.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1080.11	Reach Len. (ft)	1200.00	1264.00	1200.00
Crit W.S. (ft)	1079.65	Flow Area (sq ft)	14.80	209.09	156.56
E.G. Slope (ft/ft)	0.003866	Area (sq ft)	14.80	209.09	156.56
Q Total (cfs)	810.00	Flow (cfs)	15.24	576.01	218.75
Top Width (ft)	499.46	Top Width (ft)	46.19	144.00	309.26
Vel Total (ft/s)	2.13	Avg. Vel. (ft/s)	1.03	2.75	1.40
Max Chl Dpth (ft)	1.84	Hydr. Depth (ft)	0.32	1.45	0.51
Conv. Total (cfs)	13027.1	Conv. (cfs)	245.1	9263.8	3518.2
Length Wtd. (ft)	1250.86	Wetted Per. (ft)	46.20	144.02	309.26
Min Ch El (ft)	1078.27	Shear (lb/sq ft)	0.08	0.35	0.12
Alpha	1.31	Stream Power (lb/ft s)	0.08	0.97	0.17
Frctn Loss (ft)	10.14	Cum Volume (acre-ft)	18.97	74.80	23.57
C & E Loss (ft)	0.02	Cum SA (acres)	46.32	68.01	38.55

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 2.056

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9601.63	1073.8	9641.75	1072.88	9676.95	1072.22	9694.04	1071.88	9732.82	1071.27
9746.33	1071.06	9752.28	1070.99	9798.61	1070.4	9827.6	1070.09	9850.9	1069.84
9902.92	1069.4	9903.18	1069.4	9903.66	1069.4	9944.92	1069.01	9975.77	1068.87
10000	1068.73	10014.96	1068.92	10068.85	1068.91	10087.05	1069.25	10112.52	1069.58
10148.76	1069.35	10162.19	1069.35	10167.72	1069.38	10229.1	1069.61	10236.54	1069.64
10301.87	1069.91	10305.36	1069.91	10366.21	1070.15	10374.18	1070.18	10374.64	1070.18
10431.74	1070.42	10466.7	1070.35	10470.51	1070.35	10490	1070.46	10509.41	1070.58
10513.45	1070.61	10515.05	1070.63	10520.17	1070.62	10580.63	1070.69	10592.94	1070.68
10649.45	1070.69	10665.71	1070.69	10703.82	1071.15	10708.93	1071.25	10731.8	1071.91
10757.07	1072.74	10761.62	1072.58						

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9601.63    .042 9798.61    .04310112.52    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9798.6110112.52             1300    1339    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1070.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.26  * Wt. n-Val.              *          *    0.043 *    0.042 *
* W.S. Elev (ft)          * 1069.79  * Reach Len. (ft)        * 1300.00  * 1339.00  * 1300.00  *
* Crit W.S. (ft)          * 1069.79  * Flow Area (sq ft)      *          *   167.35 *    41.99 *
* E.G. Slope (ft/ft)      *0.026600  * Area (sq ft)           *          *   167.35 *    41.99 *
* Q Total (cfs)           *  810.00  * Flow (cfs)             *          *   711.25 *    98.75 *
* Top Width (ft)          *  416.93  * Top Width (ft)         *          *   255.56 *   161.38 *
* Vel Total (ft/s)        *    3.87  * Avg. Vel. (ft/s)       *          *     4.25 *     2.35 *
* Max Chl Dpth (ft)       *    1.06  * Hydr. Depth (ft)       *          *     0.65 *     0.26 *
* Conv. Total (cfs)       *  4966.4  * Conv. (cfs)            *          *   4361.0 *    605.5 *
* Length Wtd. (ft)        * 1336.06  * Wetted Per. (ft)       *          *   255.57 *   161.38 *
* Min Ch El (ft)          * 1068.73  * Shear (lb/sq ft)       *          *     1.09 *     0.43 *
* Alpha                   *    1.10  * Stream Power (lb/ft s) *          *     4.62 *     1.02 *
* Frctn Loss (ft)         *   10.10  * Cum Volume (acre-ft)   *   18.77  *    69.34 *    20.84 *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)         *   45.68  *    62.21 *    32.07 *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS34 (I65)
REACH: REACH 1            RS: 1.813

INPUT
Description:
Station Elevation Data     num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9511.25 1059.38 9553.46 1059.34    9556 1059.34 9603.48 1059.27 9607.18 1059.26
 9653.49 1059.15 9658.36 1059.13  9703.5 1058.96 9709.54 1058.94 9753.52 1058.76
 9760.72 1058.72 9803.53 1058.53  9811.9 1058.49 9853.54  1058.3 9863.08 1058.25
 9903.55 1058.04 9942.23 1057.82 9956.54 1057.86 9964.88 1057.86 9974.55  1057.8
   10000 1057.61 10037.6 1057.7310047.52 1057.7510064.34 1057.6810082.86 1057.74
10098.51  1057.910123.08 1058.0910131.84 1058.0610170.49 1058.0410202.08 1058.16
10209.37 1058.1810275.65 1058.4610277.54 1058.4710301.43 1058.57 10345.7 1058.76
10349.21 1058.7710413.87 1059.0310422.78 1059.0610482.03 1059.2810496.34 1059.33
 10550.2 1059.5310569.91 1059.5810618.36  1059.710643.47 1059.7610686.53 1059.84
 10701.2 1059.8710727.65 1059.8710737.49 1059.93

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9511.25    .042  9811.9    .04310301.43    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9811.910301.43              1300    1348    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1058.97  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.042  *    0.043 *    0.042 *
* W.S. Elev (ft)          * 1058.92  * Reach Len. (ft)        * 1300.00  * 1348.00  * 1300.00  *
* Crit W.S. (ft)          * 1058.48  * Flow Area (sq ft)      *   20.06  *   425.20 *    14.26 *
* E.G. Slope (ft/ft)      *0.003541  * Area (sq ft)           *   20.06  *   425.20 *    14.26 *
* Q Total (cfs)           *  820.00  * Flow (cfs)             *   14.83  *   795.96 *     9.21 *
* Top Width (ft)          *  669.95  * Top Width (ft)         *   96.42  *   489.53 *    84.00 *
```

* Vel Total (ft/s)	*	1.78	* Avg. Vel. (ft/s)	*	0.74	*	1.87	*	0.65	*
* Max Chl Dpth (ft)	*	1.31	* Hydr. Depth (ft)	*	0.21	*	0.87	*	0.17	*
* Conv. Total (cfs)	*	13780.1	* Conv. (cfs)	*	249.2	*	13376.1	*	154.7	*
* Length Wtd. (ft)	*	1347.30	* Wetted Per. (ft)	*	96.42	*	489.54	*	84.00	*
* Min Ch El (ft)	*	1057.61	* Shear (lb/sq ft)	*	0.05	*	0.19	*	0.04	*
* Alpha	*	1.07	* Stream Power (lb/ft s)	*	0.03	*	0.36	*	0.02	*
* Frctn Loss (ft)	*	11.03	* Cum Volume (acre-ft)	*	18.47	*	60.23	*	20.00	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	44.24	*	50.76	*	28.40	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 1.557

INPUT
Description: Approximately at crossing of Estrella Parkway.
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9469.82	1049.04	9470.22	1049.04	9478.87	1049.03	9521.5	1048.84	9528.89	1048.81
9572.77	1048.54	9578.9	1048.5	9624.05	1048.23	9628.92	1048.2	9675.33	1047.94
9678.93	1047.92	9726.6	1047.68	9728.95	1047.67	9777.88	1047.43	9778.96	1047.42
9821.9	1047.22	9828.98	1047.19	9829.16	1047.19	9878.99	1046.98	9926.44	1046.78
9928.82	1046.8	9929.21	1046.79	9929.52	1046.79	9929.86	1046.79	9930.22	1046.79
9930.41	1046.8	9930.61	1046.8	9930.82	1046.8	9931.48	1046.81	9932.38	1046.82
9933.68	1046.83	9938.49	1046.92	10000	1048.09	10000.34	1048.09	10002.76	1048.03
10053.19	1046.77	10074.26	1046.87	10100.16		10471	0155.65	1047.33	10163.52
10210.51	1047.75	10216.48	1047.75	10223.89	1047.75	10233.38	1047.75	10241.27	1047.76
10251.47	1047.76	10260.76	1047.76	10262.97	1047.75	10268.71	1047.76	10302.01	1047.76
10315.06	1047.76	10338.22	1047.88	10353.62	1047.96	10399.82	1048.16	10416.99	1048.22
10477.33	1048.35	10480.35	1048.36	10481.21	1048.36	10543.72	1048.39	10562.6	1048.39

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9469.82	.042	9726.6	.043	10210.51	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9726.6	10210.51	1415	1471	1435	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1047.92	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.24	* Wt. n-Val.	*		*	0.043	*		*
* W.S. Elev (ft)	*	1047.68	* Reach Len. (ft)	*	1415.00	*	1471.00	*	1435.00	*
* Crit W.S. (ft)	*	1047.68	* Flow Area (sq ft)	*		*	208.96	*		*
* E.G. Slope (ft/ft)	*	0.035248	* Area (sq ft)	*		*	208.96	*		*
* Q Total (cfs)	*	830.00	* Flow (cfs)	*		*	830.00	*		*
* Top Width (ft)	*	436.17	* Top Width (ft)	*		*	436.17	*		*
* Vel Total (ft/s)	*	3.97	* Avg. Vel. (ft/s)	*		*	3.97	*		*
* Max Chl Dpth (ft)	*	0.91	* Hydr. Depth (ft)	*		*	0.48	*		*
* Conv. Total (cfs)	*	4420.9	* Conv. (cfs)	*		*	4420.9	*		*
* Length Wtd. (ft)	*	1469.83	* Wetted Per. (ft)	*		*	436.20	*		*
* Min Ch El (ft)	*	1046.77	* Shear (lb/sq ft)	*		*	1.05	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	4.19	*		*
* Frctn Loss (ft)	*	10.08	* Cum Volume (acre-ft)	*	18.17	*	50.42	*	19.79	*
* C & E Loss (ft)	*	0.05	* Cum SA (acres)	*	42.81	*	36.44	*	27.15	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 1.278

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9708.59	1036.27	9749.67	1036.23	9759.2	1036.22	9793.43	1036.17	9809.81	1036.14
9837.19	1036.07	9860.42	1036	9880.95	1035.94	9911.03	1035.83	9952.27	1035.7
9964.24	1035.49	9967.5	1035.44	9974.79	1035.31	9981.54	1035.18	10000	1034.81
10000.1	1034.81	10000.76	1034.79	10000.96	1034.79	10039.19	1034.61	10053.43	1034.72
10063.55	1034.75	10099.41	1034.88	10108.2	1034.69	10144.03	1033.91	10160.76	1034.56
10185.5	1035.53	10192.43	1035.79	10212.4	1036.49	10251.04	1036.99	10262.47	1037.13
10298.59	1037.72	10312.54	1037.92	10346.14	1038.58	10362.61	1038.86	10393.69	1039.55
10412.68	1039.91	10441.25	1040.54	10462.75	1040.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9708.59	.042	9952.27	.043	10212.4	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9952.27	10212.4	1270	1343	1310	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1036.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.042	0.043	
W.S. Elev (ft)	1036.26	Reach Len. (ft)	1270.00	1343.00	1310.00
Crit W.S. (ft)		Flow Area (sq ft)	50.63	351.29	
E.G. Slope (ft/ft)	0.002846	Area (sq ft)	50.63	351.29	
Q Total (cfs)	840.00	Flow (cfs)	35.05	804.95	
Top Width (ft)	481.31	Top Width (ft)	227.90	253.42	
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)	0.69	2.29	
Max Chl Dpth (ft)	2.34	Hydr. Depth (ft)	0.22	1.39	
Conv. Total (cfs)	15746.5	Conv. (cfs)	657.0	15089.5	
Length Wtd. (ft)	1341.48	Wetted Per. (ft)	227.90	253.48	
Min Ch El (ft)	1033.91	Shear (lb/sq ft)	0.04	0.25	
Alpha	1.16	Stream Power (lb/ft s)	0.03	0.56	
Frctn Loss (ft)	8.71	Cum Volume (acre-ft)	17.35	40.96	19.79
C & E Loss (ft)	0.05	Cum SA (acres)	39.10	24.79	27.15

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 1.024

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9731.31	1028.59	9753.55	1028.52	9784.32	1028.36	9792.75	1028.31	9816.65	1028.15
9831.95	1028.05	9837.34	1028.03	9871.15	1027.77	9890.35	1027.67	9910.34	1027.51
9943.37	1027.36	9949.54	1027.31	9975.33	1026.54	10000	1025.93	10001.61	1025.9
10020.02	1025.37	10020.67	1025.35	10021.37	1025.33	10022.13	1025.31	10036.55	1024.9
10047.69	1025.29	10064.96	1025.91	10099.12	1027.47	10113.12	1027.51	10150.43	1027.65
10154.82	1027.66	10173.86	1027.73	10196.52	1027.81	10201.74	1027.82	10238.22	1027.96
10253.05	1028.02	10279.92	1028.18	10304.36	1028.31	10321.62	1028.45	10355.68	1028.7
10363.31	1028.78	10396.45	1029.08	10405.01	1029.16	10406.99	1029.17		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9731.31	.042	9943.37	.043	10099.12	.042

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.3710099.12             1760    1846    1755             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1027.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.56  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1027.01  * Reach Len. (ft)         * 1760.00  * 1846.00  * 1755.00  *
* Crit W.S. (ft)          * 1027.01  * Flow Area (sq ft)       *          *  140.24  *          *
* E.G. Slope (ft/ft)      *0.027065  * Area (sq ft)            *          *  140.24  *          *
* Q Total (cfs)           *  840.00  * Flow (cfs)              *          *  840.00  *          *
* Top Width (ft)          *  129.60  * Top Width (ft)          *          *  129.60  *          *
* Vel Total (ft/s)        *    5.99  * Avg. Vel. (ft/s)        *          *    5.99  *          *
* Max Chl Dpth (ft)       *    2.11  * Hydr. Depth (ft)        *          *    1.08  *          *
* Conv. Total (cfs)       *  5105.9  * Conv. (cfs)             *          *  5105.9  *          *
* Length Wtd. (ft)        * 1834.43  * Wetted Per. (ft)        *          *  129.67  *          *
* Min Ch El (ft)          * 1024.90  * Shear (lb/sq ft)        *          *    1.83  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   10.95  *          *
* Frctn Loss (ft)         *    8.48  * Cum Volume (acre-ft)    *   16.61  *   33.38  *   19.79  *
* C & E Loss (ft)         *    0.13  * Cum SA (acres)          *   35.78  *   18.89  *   27.15  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS34 (I65)
REACH: REACH 1            RS: 0.674

INPUT
Description:
Station Elevation Data    num=      79
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9466.52 1017.57  9468.6 1017.57 9471.56 1017.57 9511.79 1017.51 9522.32  1017.5
 9554.99 1017.45 9573.08 1017.43 9598.18  1017.4 9623.84 1017.38 9641.37 1017.36
 9674.61 1017.33 9684.56 1017.32 9725.37 1017.27 9727.76 1017.26 9741.37 1017.24
 9770.95 1017.19 9776.13 1017.18 9814.14 1017.13 9826.89 1017.11 9857.33 1017.06
 9877.66 1017.03 9900.53 1016.98 9928.42 1016.93 9943.72 1016.86 9998.83 1016.78
   10000 1016.7710000.83 1016.7710010.83 1016.6410074.18 1015.2610080.48  1015.2
10117.89 1014.74 10131.1 1014.67 10161.6 1014.5110182.66 1014.4810185.97  1014.5
10189.79 1014.5510196.63 1014.7510206.11 1015.1110230.53 1015.3510238.93 1015.76
10241.85 1015.8610245.15 1015.9610248.86  1016.1 10254.2 1016.3310260.22  1016.3
10263.23 1016.3510274.49 1016.3810281.26 1016.3910292.86 1016.5610298.53  1016.6
10317.44    1016   10334 1016.6110341.09 1016.8410360.15 1016.5910362.51  1016.6
10366.08 1016.6510371.57 1016.7410392.51 1016.6610398.04 1016.8710405.64 1017.19
10416.97 1017.5610417.74 1017.5710419.66 1017.62 10427.8 1017.5310434.58 1017.32
 10467.6 1015.9810485.44 1016.2910511.31 1016.8210536.06 1017.1910555.02 1017.63
10586.68 1018.0510598.73 1018.24 10637.3 1018.5810642.45 1018.59   10675 1018.76
10686.16  1018.810687.93 1018.8110729.87 1018.7210738.55 1018.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9466.52    .042 9998.83    .043 10254.2    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9998.83 10254.2             1330    1422    1335             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1017.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1017.32  * Reach Len. (ft)         * 1330.00  * 1422.00  * 1335.00  *
* Crit W.S. (ft)          * 1016.48  * Flow Area (sq ft)       *   79.30  *  519.31  *  189.65  *
* E.G. Slope (ft/ft)      *0.002923  * Area (sq ft)            *   79.30  *  519.31  *  189.65  *
* Q Total (cfs)           * 1910.00  * Flow (cfs)              *   60.41  * 1557.00  *  292.58  *
* Top Width (ft)          *  833.48  * Top Width (ft)          *  315.48  *  255.37  *  262.63  *
```

* Vel Total (ft/s)	* 2.42	* Avg. Vel. (ft/s)	* 0.76	* 3.00	* 1.54	*
* Max Chl Dpth (ft)	* 2.84	* Hydr. Depth (ft)	* 0.25	* 2.03	* 0.72	*
* Conv. Total (cfs)	* 35329.8	* Conv. (cfs)	* 1117.5	* 28800.3	* 5412.0	*
* Length Wtd. (ft)	* 1379.77	* Wetted Per. (ft)	* 315.48	* 255.42	* 262.71	*
* Min Ch El (ft)	* 1014.48	* Shear (lb/sq ft)	* 0.05	* 0.37	* 0.13	*
* Alpha	* 1.31	* Stream Power (lb/ft s)	* 0.03	* 1.11	* 0.20	*
* Frctn Loss (ft)	* 6.78	* Cum Volume (acre-ft)	* 15.01	* 19.41	* 15.97	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 29.41	* 10.73	* 21.86	*

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 0.405

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9585.82	1010.63	9593.76	1010.6	9605.77	1010.56	9629.84	1010.47	9645.75	1010.41
9665.93	1010.33	9696.48	1010.21	9702.02	1010.19	9705.67	1010.18	9738.1	1010.06
9765.59	1009.99	9774.19	1009.97	9787.2	1009.95	9810.28	1009.91	9825.52	1009.89
9846.36	1009.88	9877.92	1009.86	9882.45	1009.86	9885.44	1009.86	9918.53	1009.85
9945.36	1009.86	9964.54	1009.79	9975.06	1009.65	10000	1009.24	10000.91	1009.24
10027.51	1009.66	10043.49	1009.88	10047.88	1009.88	10070.76	1010.02	10108.37	1010.11
10113.85	1010.11	10115.74	1010.12	10119.82	1010.14	10132.83	1010.19	10165.76	1010.34
10178.36	1010.37	10212.16	1010.24	10254.51	1009.84	10264.31	1009.75	10286.77	1009.33
10299.53	1009.64	10327.38	1010.58	10338.5	1010.32	10340.96	1010.27	10344.68	1010.19
10365.04	1009.71	10381.37	1009.37	10418.46	1008.59	10422.72	1008.51	10425.93	1008.46
10427.71	1008.42	10441.35	1008.77	10459.09	1009.31	10473.65	1009.73	10517.44	1011.3
10523.54	1011.34	10558.04	1011.54	10575.43	1011.64	10598.65	1011.76	10627.33	1011.92
10639.26	1011.98	10679.23	1012.22	10679.87	1012.22	10682.17	1012.24		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9585.82	.042	9945.36	.04	10043.49	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.36	10043.49	1015	1067	1020	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1010.66	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.15	* Wt. n-Val.	* 0.042	* 0.043	* 0.042 *
* W.S. Elev (ft)	* 1010.51	* Reach Len. (ft)	* 1015.00	* 1067.00	* 1020.00 *
* Crit W.S. (ft)	* 1010.36	* Flow Area (sq ft)	* 152.79	* 89.55	* 312.34 *
* E.G. Slope (ft/ft)	*0.011241	* Area (sq ft)	* 152.79	* 89.55	* 312.34 *
* Q Total (cfs)	* 1670.00	* Flow (cfs)	* 345.25	* 308.64	* 1016.11 *
* Top Width (ft)	* 871.94	* Top Width (ft)	* 326.76	* 98.13	* 447.05 *
* Vel Total (ft/s)	* 3.01	* Avg. Vel. (ft/s)	* 2.26	* 3.45	* 3.25 *
* Max Chl Dpth (ft)	* 2.09	* Hydr. Depth (ft)	* 0.47	* 0.91	* 0.70 *
* Conv. Total (cfs)	* 15751.2	* Conv. (cfs)	* 3256.4	* 2911.0	* 9583.8 *
* Length Wtd. (ft)	* 1033.75	* Wetted Per. (ft)	* 326.77	* 98.14	* 447.13 *
* Min Ch El (ft)	* 1009.24	* Shear (lb/sq ft)	* 0.33	* 0.64	* 0.49 *
* Alpha	* 1.07	* Stream Power (lb/ft s)	* 0.74	* 2.21	* 1.59 *
* Frctn Loss (ft)	* 5.27	* Cum Volume (acre-ft)	* 11.47	* 9.47	* 8.27 *
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 19.60	* 4.96	* 10.99 *

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 0.203

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9091.62	1006.12	9104.28	1006.06	9123.49	1005.96	9140.02	1005.88	9158.94	1005.8
9180.93	1005.71	9194.39	1005.65	9205.99	1005.61	9229.85	1005.52	9257.57	1005.43
9265.3	1005.4	9271.96	1005.38	9300.76	1005.3	9334.22	1005.22	9336.21	1005.21
9337.93	1005.21	9371.67	1005.13	9403.9	1005.07	9407.12	1005.06	9410.86	1005.05
9442.57	1005	9469.87	1004.96	9478.03	1004.94	9487.51	1004.93	9513.48	1004.88
9535.84	1004.85	9548.94	1004.83	9564.16	1004.8	9584.39	1004.76	9601.81	1004.72
9619.85	1004.69	9640.8	1004.65	9655.3	1004.61	9667.78	1004.59	9690.76	1004.54
9717.45	1004.48	9726.21	1004.46	9733.75	1004.44	9761.67	1004.38	9794.09	1004.31
9797.12	1004.31	9799.72	1004.3	9832.57	1004.22	9865.7	1004.17	9868.03	1004.17
9870.74	1004.16	9903.48	1004.12	9931.67	1004.1	9938.94	1004.09	9956.17	1003.43
9975.32	1002.8	10000	1002.04	10000.92	1002.02	10009.5	1002.64	10015.14	1003.06
10049.96	1004.3	10085.57	1004.04	10108.08	1003.72	10109.28	1003.71	10112.91	1003.77
10153.4	1004.53	10176.01	1004.91	10206.35	1005.11	10229.13	1005.25	10245.44	1005.37
10282.25	1005.65	10284.54	1005.66	10290.92	1005.71	10323.64	1005.94	10335.37	1006.01
10362.73	1006.16	10388.49	1006.28	10401.83	1006.32	10439.03	1006.42	10440.93	1006.42
10441.61	1006.43	10480.02	1006.45	10494.72	1006.46	10519.12	1006.43	10547.84	1006.41
10558.22	1006.4	10587.14	1006.35	10597.31	1006.34	10600.96	1006.34	10636.41	1006.33
10654.08	1006.29								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9091.62	.042	9938.94	.043	10049.96	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9938.94	10049.96	845	899	875	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1005.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1005.29	Reach Len. (ft)	845.00	899.00	875.00
Crit W.S. (ft)	1004.77	Flow Area (sq ft)	398.02	237.16	149.75
E.G. Slope (ft/ft)	0.002731	Area (sq ft)	398.02	237.16	149.75
Q Total (cfs)	1490.00	Flow (cfs)	539.32	709.98	240.70
Top Width (ft)	930.13	Top Width (ft)	634.38	111.02	184.73
Vel Total (ft/s)	1.90	Avg. Vel. (ft/s)	1.36	2.99	1.61
Max Chl Dpth (ft)	3.27	Hydr. Depth (ft)	0.63	2.14	0.81
Conv. Total (cfs)	28511.8	Conv. (cfs)	10320.1	13585.8	4605.9
Length Wtd. (ft)	881.26	Wetted Per. (ft)	634.38	111.11	184.74
Min Ch El (ft)	1002.02	Shear (lb/sq ft)	0.11	0.36	0.14
Alpha	1.49	Stream Power (lb/ft s)	0.14	1.09	0.22
Frctn Loss (ft)	4.41	Cum Volume (acre-ft)	5.05	5.47	2.86
C & E Loss (ft)	0.03	Cum SA (acres)	8.41	2.40	3.59

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS34 (I65)
REACH: REACH 1 RS: 0.033

INPUT
Description: Directly upstream of Rainbow Valley Road.
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9667.9	1000.76	9679.19	1000.71	9692.38	1000.65	9717.27	1000.56	9746.77	1000.44
9755.36	1000.4	9775.46	1000.32	9793.45	1000.26	9801.15	1000.23	9831.54	1000.12
9855.53	1000.05	9869.63	999.98	9902.58	999.89	9907.72	999.87	9909.92	999.87
9945.81	999.75	9977.19	998.98	9981.21	998.88	9986.65	998.74	9994.16	998.54
10000	998.36	10002.43	998.33	10004.91	998.34	10010.74	998.41	10034.31	999.04
10044.77	999.28	10050.63	999.43	10055.32	999.54	10058.14	999.62	10059.98	999.66
10061	999.69	10061.81	999.71	10062.45	999.73	10063.14	999.75	10067.42	999.93
10091.72	1000.04	10110.17	1000.13	10113.69	1000.14	10152.92	1000.29	10164.59	1000.34

```
10195.67 1000.4410215.49  1000.510238.42 1000.5710266.39 1000.6310281.17 1000.68
10317.29 1000.7810323.92 1000.81 10358.7 1000.9310366.67 1000.9510368.19 1000.96

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
  9667.9    .042 9945.81    .04310067.42    .042

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9945.8110067.42              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1000.93  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.36  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1000.57  * Reach Len. (ft)         *  174.00  *  174.00  *  174.00  *
* Crit W.S. (ft)         * 1000.57  * Flow Area (sq ft)       *  100.67  *  185.97  *   50.56  *
* E.G. Slope (ft/ft)     *0.013714  * Area (sq ft)            *  100.67  *  185.97  *   50.56  *
* Q Total (cfs)          * 1330.00  * Flow (cfs)              *  238.89  *  998.70  *   92.41  *
* Top Width (ft)         *  526.46  * Top Width (ft)          *  232.25  *  121.61  *  172.59  *
* Vel Total (ft/s)       *    3.94  * Avg. Vel. (ft/s)        *    2.37  *    5.37  *    1.83  *
* Max Chl Dpth (ft)      *    2.24  * Hydr. Depth (ft)        *    0.43  *    1.53  *    0.29  *
* Conv. Total (cfs)      * 11357.4  * Conv. (cfs)             *  2040.0  *  8528.3  *   789.1  *
* Length Wtd. (ft)       *  174.00  * Wetted Per. (ft)        *  232.25  *  121.65  *  172.60  *
* Min Ch El (ft)         *  998.33  * Shear (lb/sq ft)        *    0.37  *    1.31  *    0.25  *
* Alpha                  *    1.47  * Stream Power (lb/ft s)   *    0.88  *    7.03  *    0.46  *
* Frctn Loss (ft)        *    0.94  * Cum Volume (acre-ft)     *    0.21  *    1.10  *    0.85  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *          *          *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS33 (I66)
REACH: REACH 1            RS: 0.887

INPUT
Description: Limit of Sudy.
Station Elevation Data      num=      35
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************
 9497.72 1029.77 9520.46 1029.64 9524.43 1029.63 9545.21 1029.54 9567.17 1029.46
 9571.37 1029.44  9609.9 1029.29 9622.27 1029.24 9652.63 1029.12 9673.18 1029.03
 9695.37 1028.95 9724.08 1028.84  9738.1 1028.79 9774.99 1028.64 9780.83 1028.62
 9811.38  1028.5 9823.57 1028.45  9825.9 1028.44  9866.3 1028.28  9876.8 1028.24
 9909.03 1028.15 9927.71 1028.11 9978.03 1027.25   10000 1026.9910000.03 1026.99
10014.85 1027.2610067.07 1028.5810097.07 1028.7810102.92 1028.82 10111.1 1028.88
10138.76 1029.0910158.51 1029.2210174.61 1029.3510197.14 1029.5110210.45 1029.61

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9497.72    .042 9927.71    .04310067.07    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9927.7110067.07             1480    1530    1460              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1028.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.24  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)         * 1027.84  * Reach Len. (ft)         * 1480.00  * 1530.00  * 1460.00  *
* Crit W.S. (ft)         * 1027.84  * Flow Area (sq ft)       *          *   43.59  *          *
* E.G. Slope (ft/ft)     *0.035811  * Area (sq ft)            *          *   43.59  *          *
* Q Total (cfs)          *  170.00  * Flow (cfs)              *          *  170.00  *          *
* Top Width (ft)         *   94.61  * Top Width (ft)          *          *   94.61  *          *
* Vel Total (ft/s)       *    3.90  * Avg. Vel. (ft/s)        *          *    3.90  *          *
* Max Chl Dpth (ft)      *    0.85  * Hydr. Depth (ft)        *          *    0.46  *          *
* Conv. Total (cfs)      *   898.3  * Conv. (cfs)             *          *   898.3  *          *
```

```
* Length Wtd. (ft)       * 1530.00  * Wetted Per. (ft)       *          *   94.62  *          *
* Min Ch El (ft)         * 1026.99  * Shear (lb/sq ft)       *          *    1.03  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    4.02  *          *
* Frctn Loss (ft)        *    5.81  * Cum Volume (acre-ft)   *    0.00  *   23.83  *    2.06  *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)         *          *   17.69  *    4.05  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS33 (I66)
REACH: REACH 1            RS: 0.597

INPUT
Description:
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9359.63 1017.84  9363.4 1017.84 9363.81 1017.84 9366.65 1017.83 9407.95 1017.75
 9413.91 1017.74 9452.09 1017.59 9464.43 1017.55 9496.24 1017.39 9514.95 1017.31
 9540.38 1017.17 9565.47 1017.05 9584.53 1016.96 9615.99  1016.8 9628.67 1016.75
 9666.51 1016.59 9672.82 1016.56 9716.51 1016.39 9716.96 1016.39 9717.03 1016.39
 9761.11 1016.24 9767.55 1016.21 9805.25 1016.08 9818.07 1016.03  9849.4 1015.92
 9868.58 1015.85 9893.54 1015.74  9919.1 1015.66 9957.54 1014.35 9972.81 1013.97
  9976.1 1013.98 9976.85 1013.98 9980.16    1014 9980.28    1014 9989.52 1014.01
 9990.95 1014.01   10000 1014.0110024.88 1014.0310066.38 1014.0710071.93 1014.07
10074.79 1014.0710081.04 1014.0810088.76 1014.2710124.16 1015.0610141.06 1015.44
10147.95 1015.5910153.24  1015.710154.53 1015.7210155.45 1015.7310162.23 1016.02
10168.18 1016.0410197.59 1016.17 10227.5 1016.3110232.94 1016.3310238.29 1016.36
 10268.3 1016.5210298.82 1016.7110303.65 1016.7410308.41 1016.7710339.01 1016.98
10370.14 1017.2110374.37 1017.2410378.52 1017.2710409.72 1017.5210441.46 1017.78
10445.08  1017.810448.64 1017.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9359.63    .042  9919.1    .04310153.24    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9919.110153.24              1450    1524    1470              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1015.57  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.            *          *   0.043  *          *
* W.S. Elev (ft)         * 1015.52  * Reach Len. (ft)       * 1450.00  * 1524.00  * 1470.00  *
* Crit W.S. (ft)         * 1014.76  * Flow Area (sq ft)     *          *  246.66  *          *
* E.G. Slope (ft/ft)     *0.002414  * Area (sq ft)          *          *  246.66  *          *
* Q Total (cfs)          *  450.00  * Flow (cfs)            *          *  450.00  *          *
* Top Width (ft)         *  221.39  * Top Width (ft)        *          *  221.39  *          *
* Vel Total (ft/s)       *    1.82  * Avg. Vel. (ft/s)      *          *    1.82  *          *
* Max Chl Dpth (ft)      *    1.55  * Hydr. Depth (ft)      *          *    1.11  *          *
* Conv. Total (cfs)      *  9159.2  * Conv. (cfs)           *          *  9159.2  *          *
* Length Wtd. (ft)       * 1515.64  * Wetted Per. (ft)      *          *  221.43  *          *
* Min Ch El (ft)         * 1013.97  * Shear (lb/sq ft)      *          *    0.17  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    0.31  *          *
* Frctn Loss (ft)        *   12.51  * Cum Volume (acre-ft)   *    0.00  *   18.73  *    2.06  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *          *   12.14  *    4.05  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION
```

```
RIVER: 1S2WS33 (I66)
REACH: REACH 1            RS: 0.308

INPUT
Description: Directly upstream of Rainbow Valley Road.
Station Elevation Data    num=      21
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
  9795.6 1003.62 9809.17 1003.55 9840.07  1003.4 9847.11 1003.36 9850.21 1003.35
 9885.06 1003.17 9904.82 1003.08    9923    1003 9990.63  1001.2 9996.64 1000.93
   10000 1000.9310018.67 1001.1310034.66 1001.1510044.97 1001.5710054.45 1001.98
10058.49 1002.1810079.07 1002.8910137.92 1001.9410171.41 1001.9610196.62 1001.97
10253.37 1003.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9795.6    .042    9923    .04310079.07    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          992310079.07              1450    1620    1450            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1003.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.38  * Wt. n-Val.              *          *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1002.64  * Reach Len. (ft)         * 1450.00  * 1620.00  * 1450.00  *
* Crit W.S. (ft)          * 1002.64  * Flow Area (sq ft)       *          *  134.73  *   61.46  *
* E.G. Slope (ft/ft)      *0.023795  * Area (sq ft)            *          *  134.73  *   61.46  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *          *  716.33  *  213.67  *
* Top Width (ft)          *  256.04  * Top Width (ft)          *          *  135.20  *  120.84  *
* Vel Total (ft/s)        *    4.74  * Avg. Vel. (ft/s)        *          *    5.32  *    3.48  *
* Max Chl Dpth (ft)       *    1.71  * Hydr. Depth (ft)        *          *    1.00  *    0.51  *
* Conv. Total (cfs)       *  6029.0  * Conv. (cfs)             *          *  4643.8  *  1385.2  *
* Length Wtd. (ft)        * 1606.24  * Wetted Per. (ft)        *          *  135.25  *  120.86  *
* Min Ch El (ft)          * 1000.93  * Shear (lb/sq ft)        *          *    1.48  *    0.76  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)   *          *    7.87  *    2.63  *
* Frctn Loss (ft)         *    9.36  * Cum Volume (acre-ft)     *    0.00  *   12.06  *    1.02  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)           *          *    5.91  *    2.01  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS33 (I66)
REACH: REACH 1            RS: 0.018

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
  9758.9  990.12 9769.86  990.08 9779.53  990.04 9812.43  989.91 9830.49  989.82
 9854.99  989.72 9894.42  987.56 9901.54  987.27 9911.51  986.88 9930.68  985.88
 9931.48  985.88 9941.43  985.89 9944.97  985.82 9951.71  985.67 9967.42  985.51
 9983.27  985.14 9987.82  985.07 9996.29  984.83   10000  984.8710000.61  984.89
 10011.8  985.7910027.42  987.0910035.15  987.7310038.99  988.0610041.67  988.29
10056.39  989.4910067.96  989.5610091.78  989.7310113.68  989.8910127.17     990
10141.84  990.1210162.55  990.2810181.59  990.4310197.94  990.5510215.72  990.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9758.9    .042 9854.99    .04310056.39    .042
```

```
Bank Sta: Left   Right     Coeff Contr.   Expan.
       9854.9910056.39            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  989.23  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *           *    0.043  *           *
* W.S. Elev (ft)          *  989.01  * Reach Len. (ft)         *   95.00   *   95.00   *   95.00   *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *           *  451.77   *           *
* E.G. Slope (ft/ft)      *0.003588  * Area (sq ft)            *           *  451.77   *           *
* Q Total (cfs)           * 1710.00  * Flow (cfs)              *           * 1710.00   *           *
* Top Width (ft)          *  182.42  * Top Width (ft)          *           *  182.42   *           *
* Vel Total (ft/s)        *    3.79  * Avg. Vel. (ft/s)         *           *    3.79   *           *
* Max Chl Dpth (ft)       *    4.18  * Hydr. Depth (ft)         *           *    2.48   *           *
* Conv. Total (cfs)       * 28549.4  * Conv. (cfs)              *           * 28549.4   *           *
* Length Wtd. (ft)        *   95.00  * Wetted Per. (ft)         *           *  182.68   *           *
* Min Ch El (ft)          *  984.83  * Shear (lb/sq ft)         *           *    0.55   *           *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *           *    2.10   *           *
* Frctn Loss (ft)         *    0.40  * Cum Volume (acre-ft)      *    0.00   *    1.16   *           *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)            *           *           *           *
*****************************************************************************************

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 1            RS: 4.423

INPUT
Description: Directly downstream of Estrella Parkway.
Limit of Sudy.
Station Elevation Data     num=      51
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9555.26 1060.52 9579.59 1060.42 9613.18  1060.2 9615.53 1060.19 9618.92 1060.17
 9651.46    1060    9674 1059.85  9687.4 1059.77 9706.75 1059.64 9723.33 1059.54
 9734.81 1059.47 9759.27 1059.32 9794.58 1059.09  9795.2 1059.08 9795.63 1059.08
 9831.14 1058.85 9856.45 1058.68 9867.07 1058.61 9882.41 1058.51 9903.01 1058.38
 9917.26 1058.29 9938.94 1058.15 9974.94 1057.45 9989.64 1057.21   10000 1057.14
 10000.7 1057.1310008.68 1057.2410018.38 1057.4710061.09 1058.1110083.25 1058.23
10108.05  1058.410133.36 1058.5410155.02 1058.6910183.47 1058.85 10210.2 1058.87
10217.54 1058.75   10229 1058.9110247.68 1059.1410247.95 1059.1410261.23 1059.19
10269.57 1059.1510323.46 1059.3810333.81  1059.410342.87 1059.4210383.92 1059.43
10389.83 1059.4410434.04 1059.4610436.79 1059.4710477.83 1059.5310483.75 1059.54
10484.15 1059.54

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9555.26    .042 9938.94    .04310061.09    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9938.9410061.09              1285    1330    1275            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1058.93  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *   0.042   *   0.043   *   0.042   *
* W.S. Elev (ft)          * 1058.60  * Reach Len. (ft)         * 1285.00   * 1330.00   * 1275.00   *
* Crit W.S. (ft)          * 1058.60  * Flow Area (sq ft)       *   16.15   *  121.77   *   20.51   *
* E.G. Slope (ft/ft)      *0.019121  * Area (sq ft)            *   16.15   *  121.77   *   20.51   *
* Q Total (cfs)           *  650.00  * Flow (cfs)              *   29.42   *  580.61   *   39.97   *
* Top Width (ft)          *  274.76  * Top Width (ft)          *   71.03   *  122.15   *   81.58   *
* Vel Total (ft/s)        *    4.10  * Avg. Vel. (ft/s)         *    1.82   *    4.77   *    1.95   *
* Max Chl Dpth (ft)       *    1.47  * Hydr. Depth (ft)         *    0.23   *    1.00   *    0.25   *
* Conv. Total (cfs)       *  4700.7  * Conv. (cfs)              *   212.8   *  4198.9   *   289.1   *
* Length Wtd. (ft)        * 1327.47  * Wetted Per. (ft)         *   71.03   *  122.17   *   81.58   *
* Min Ch El (ft)          * 1057.13  * Shear (lb/sq ft)         *    0.27   *    1.19   *    0.30   *
* Alpha                   *    1.23  * Stream Power (lb/ft s)    *    0.49   *    5.67   *    0.58   *
* Frctn Loss (ft)         *   11.06  * Cum Volume (acre-ft)      *   10.51   *   49.21   *   15.90   *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)            *   24.46   *   31.08   *   31.33   *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
```

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 1 RS: 4.171

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9530.56	1048.95	9537.64	1048.91	9556.84	1048.81	9568.37	1048.75	9593.28	1048.64
9626.7	1048.48	9629.72	1048.47	9634.75	1048.45	9666.16	1048.32	9685.02	1048.25
9702.6	1048.18	9731.86	1048.07	9739.04	1048.04	9743.34	1048.02	9775.48	1047.87
9801.67	1047.74	9811.92	1047.68	9828.98	1047.58	9848.36	1047.47	9859.99	1047.4
9906.63	1047.1	9919.88	1046.97	9920.72	1046.96	9921.86	1046.93	9922.81	1046.9
9924.15	1046.85	9926.15	1046.79	9956.88	1045.85	9982.38	1045.5	9999.49	1045.45
10000	1045.45	10027.15	1045.51	10045.39	1045.53	10060.95	1045.53	10071.4	1045.51
10086.07	1046.07	10130.11	1047.73	10148.74	1048.19	10180.16	1048.82	10201.14	1049.12
10230.21	1049.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9530.56	.042	9919.88	.043	10130.11	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9919.88	10130.11	1345	1439	1350	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1047.36	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.14	Wt. n-Val.	0.042	0.043		
W.S. Elev (ft)	1047.23	Reach Len. (ft)	1345.00	1439.00	1350.00	
Crit W.S. (ft)	1046.60	Flow Area (sq ft)	3.73	261.68		
E.G. Slope (ft/ft)	0.005062	Area (sq ft)	3.73	261.68		
Q Total (cfs)	780.00	Flow (cfs)	2.21	777.79		
Top Width (ft)	229.49	Top Width (ft)	32.66	196.83		
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)	0.59	2.97		
Max Chl Dpth (ft)	1.77	Hydr. Depth (ft)	0.11	1.33		
Conv. Total (cfs)	10962.6	Conv. (cfs)	31.0	10931.5		
Length Wtd. (ft)	1435.27	Wetted Per. (ft)	32.66	196.88		
Min Ch El (ft)	1045.45	Shear (lb/sq ft)	0.04	0.42		
Alpha	1.02	Stream Power (lb/ft s)	0.02	1.25		
Frctn Loss (ft)	10.12	Cum Volume (acre-ft)	10.22	43.36	15.60	
C & E Loss (ft)	0.02	Cum SA (acres)	22.93	26.21	30.14	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 1 RS: 3.898

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9668.51	1038.1	9688.45	1037.99	9711.6	1037.86	9723.82	1037.79	9735.4	1037.73
9759.19	1037.6	9784.29	1037.45	9794.56	1037.39	9804.29	1037.33	9829.92	1037.19
9856.98	1037.03	9865.29	1036.98	9873.17	1036.94	9900.66	1036.78	9929.67	1036.62
9938.7	1036.37	9939.54	1036.35	9941.73	1036.3	9945.55	1036.21	9954.82	1035.92
9973.41	1035.26	9995.96	1034.56	9999.94	1034.28	10000	1034.28	10006.86	1034.54
10018.48	1034.96	10030.72	1035.28	10057.43	1036.41	10095.94	1036.52	10113.06	1036.58
10129.36	1036.64	10168.69	1036.78	10210	1036.91	10224.32	1036.95	10237.94	1036.98
10279.95	1037.08	10324.07	1037.14	10335.58	1037.16	10346.53	1037.17	10391.2	1037.22
10438.14	1037.31	10446.83	1037.32	10455.11	1037.34	10502.46	1037.43	10552.21	1037.52

```
10558.09 1037.5310563.69 1037.5410613.72 1037.65

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9668.51    .042 9929.67    .04310057.43    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9929.6710057.43             1295    1323    1275            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
**********************************************************************************************
* E.G. Elev (ft)          * 1037.22  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.29  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1036.93  * Reach Len. (ft)         * 1295.00  * 1323.00  * 1275.00  *
* Crit W.S. (ft)          * 1036.68  * Flow Area (sq ft)       *    8.47  *  190.50  *   41.65  *
* E.G. Slope (ft/ft)      *0.009831  * Area (sq ft)            *    8.47  *  190.50  *   41.65  *
* Q Total (cfs)           *  920.00  * Flow (cfs)              *    8.60  *  851.53  *   59.87  *
* Top Width (ft)          *  340.95  * Top Width (ft)          *   54.36  *  127.76  *  158.83  *
* Vel Total (ft/s)        *    3.82  * Avg. Vel. (ft/s)        *    1.02  *    4.47  *    1.44  *
* Max Chl Dpth (ft)       *    2.65  * Hydr. Depth (ft)        *    0.16  *    1.49  *    0.26  *
* Conv. Total (cfs)       *  9278.9  * Conv. (cfs)             *    86.7  *  8588.4  *   603.8  *
* Length Wtd. (ft)        * 1319.50  * Wetted Per. (ft)        *   54.36  *  127.84  *  158.83  *
* Min Ch El (ft)          * 1034.28  * Shear (lb/sq ft)        *    0.10  *    0.91  *    0.16  *
* Alpha                   *    1.27  * Stream Power (lb/ft s)  *    0.10  *    4.09  *    0.23  *
* Frctn Loss (ft)         *   10.33  * Cum Volume (acre-ft)    *   10.03  *   35.89  *   14.96  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   21.59  *   20.84  *   27.68  *
**********************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 1            RS: 3.648

INPUT
Description:
Station Elevation Data     num=      48
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
**********************************************************************************
 9443.91 1027.81 9455.56 1027.77 9475.88 1027.69 9505.92 1027.57 9520.86 1027.51
 9556.27 1027.38 9565.85 1027.35 9606.62 1027.21 9610.84 1027.19 9646.14 1027.07
 9655.82 1027.04 9656.98 1027.03 9700.81 1026.86 9707.33 1026.84  9745.8 1026.66
 9757.69 1026.62 9790.78 1026.46 9808.04  1026.4 9835.77 1026.28  9858.4 1026.23
 9887.16 1026.16 9916.81 1025.44 9921.35 1025.48 9930.11 1025.45 9949.39 1025.02
 9955.63 1024.99 9959.36 1024.95 9979.33 1024.68 9994.27 1024.46 9997.12 1024.44
   10000  1024.410000.15  1024.410003.98 1024.5510066.86 1026.0410091.31 1026.16
10123.15 1026.3310157.21 1026.5810179.43 1026.74 10200.2 1026.8810235.71  1027.1
10273.71 1027.27   10292 1027.3510309.09 1027.3710334.93  1027.410348.28 1027.42
10390.22 1027.4310404.57 1027.4310417.98 1027.45

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9443.91    .042 9887.16    .04310066.86    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9887.1610066.86             1325    1423    1330            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
**********************************************************************************************
* E.G. Elev (ft)          * 1026.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1026.67  * Reach Len. (ft)         * 1325.00  * 1423.00  * 1330.00  *
* Crit W.S. (ft)          * 1026.27  * Flow Area (sq ft)       *   40.57  *  262.11  *   35.03  *
* E.G. Slope (ft/ft)      *0.006526  * Area (sq ft)            *   40.57  *  262.11  *   35.03  *
* Q Total (cfs)           * 1040.00  * Flow (cfs)              *   50.10  *  940.93  *   48.97  *
* Top Width (ft)          *  424.94  * Top Width (ft)          *  142.82  *  179.70  *  102.42  *
* Vel Total (ft/s)        *    3.08  * Avg. Vel. (ft/s)        *    1.23  *    3.59  *    1.40  *
* Max Chl Dpth (ft)       *    2.27  * Hydr. Depth (ft)        *    0.28  *    1.46  *    0.34  *
* Conv. Total (cfs)       * 12874.1  * Conv. (cfs)             *   620.1  * 11647.8  *   606.2  *
* Length Wtd. (ft)        * 1394.29  * Wetted Per. (ft)        *  142.82  *  179.74  *  102.42  *
* Min Ch El (ft)          * 1024.40  * Shear (lb/sq ft)        *    0.12  *    0.59  *    0.14  *
* Alpha                   *    1.25  * Stream Power (lb/ft s)  *    0.14  *    2.13  *    0.19  *
* Frctn Loss (ft)         *    8.48  * Cum Volume (acre-ft)    *    9.30  *   29.01  *   13.83  *
```

```
* C & E Loss (ft)          *    0.02  * Cum SA (acres)          *   18.66  *   16.17  *   23.85  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 1 RS: 3.378

INPUT
Description:
Station Elevation Data num= 53

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9433.94 1018.78 9443.84 1018.72 9463.83 1018.62 9479.81 1018.55 9503.09 1018.45
 9515.77 1018.39 9524.47 1018.36 9551.73 1018.26 9585.11 1018.17 9587.69 1018.16
 9591.45 1018.15 9623.65 1018.04 9645.75 1017.98 9659.61 1017.94 9679.81 1017.89
 9695.58 1017.84 9706.39 1017.81 9731.54 1017.73 9767.04 1017.65  9767.5 1017.65
 9768.17 1017.65 9803.46 1017.58 9827.68 1017.52 9839.42 1017.51 9856.54 1017.48
 9875.39 1017.45 9888.32 1017.42 9911.35 1017.39  9944.9  1017.3 9947.31  1017.3
 9948.96 1017.29 9995.85 1016.17   10000 1016.1310000.07 1016.1310006.08 1016.18
 10062.2 1017.3410085.55 1017.3910115.89 1017.4610135.39 1017.5210169.58 1017.62
10222.76 1017.7710223.27 1017.77 10223.6 1017.7710276.96 1017.9110311.81 1017.99
10330.66 1018.0410359.97 1018.1110384.35 1018.1710400.02 1018.1910438.04 1018.27
10488.23 1018.3210491.73 1018.3310497.17 1018.33
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9433.94    .042  9944.9    .043 10062.2    .042
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9944.9 10062.2             1415    1402    1300            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1018.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1018.23  * Reach Len. (ft)         * 1415.00  * 1402.00  * 1300.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  194.63  *  177.91  *  153.10  *
* E.G. Slope (ft/ft)      *0.005732  * Area (sq ft)            *  194.63  *  177.91  *  153.10  *
* Q Total (cfs)           * 1180.00  * Flow (cfs)              *  332.47  *  614.32  *  233.21  *
* Top Width (ft)          *  856.46  * Top Width (ft)           *  382.17  *  117.30  *  356.99  *
* Vel Total (ft/s)        *    2.24  * Avg. Vel. (ft/s)         *    1.71  *    3.45  *    1.52  *
* Max Chl Dpth (ft)       *    2.10  * Hydr. Depth (ft)         *    0.51  *    1.52  *    0.43  *
* Conv. Total (cfs)       * 15586.0  * Conv. (cfs)              *  4391.4  *  8114.3  *  3080.4  *
* Length Wtd. (ft)        * 1385.61  * Wetted Per. (ft)         *  382.17  *  117.33  *  356.99  *
* Min Ch El (ft)          * 1016.13  * Shear (lb/sq ft)         *    0.18  *    0.54  *    0.15  *
* Alpha                   *    1.49  * Stream Power (lb/ft s)   *    0.31  *    1.87  *    0.23  *
* Frctn Loss (ft)         *    8.50  * Cum Volume (acre-ft)     *    5.73  *   21.83  *   10.96  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   10.67  *   11.32  *   16.84  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 1 RS: 3.113

INPUT
Description:
Station Elevation Data num= 38

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9646.11 1012.41 9656.96 1012.64 9662.02 1012.56 9686.18  1011.9 9713.19 1011.14
 9723.63 1011.05 9770.16 1010.56 9800.29 1010.22 9836.12  1009.8    9855 1009.57
 9905.87 1008.33 9913.92 1008.15 9916.58 1008.16 9924.53 1007.98 9991.38  1007.6
 9999.97 1007.59   10000 1007.5910016.15 1007.9310072.17 1008.8110076.88 1008.76
10077.34 1008.7610088.19 1008.8810131.44 1009.0510183.68 1009.310185.74 1009.28
10185.94 1009.2810186.14 1009.2810186.35 1009.2810186.44 1009.2810186.52 1009.28
10227.94 1009.0810229.29 1009.0810233.17 1009.0610237.35 1009.0310241.89 1009.01
```

```
10288.87 1009.8710296.11 1009.9110304.86 1009.97

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9646.11    .042    9855    .04310072.17    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          985510072.17              950     993     960            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1009.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1009.66  * Reach Len. (ft)         *  950.00  *  993.00  *  960.00  *
* Crit W.S. (ft)          * 1009.34  * Flow Area (sq ft)       *    0.35  *  310.56  *  110.64  *
* E.G. Slope (ft/ft)      *0.006528  * Area (sq ft)            *    0.35  *  310.56  *  110.64  *
* Q Total (cfs)           * 1310.00  * Flow (cfs)              *    0.13  * 1100.48  *  209.39  *
* Top Width (ft)          *  430.17  * Top Width (ft)           *    7.62  *  217.17  *  205.38  *
* Vel Total (ft/s)        *    3.11  * Avg. Vel. (ft/s)         *    0.37  *    3.54  *    1.89  *
* Max Chl Dpth (ft)       *    2.07  * Hydr. Depth (ft)         *    0.05  *    1.43  *    0.54  *
* Conv. Total (cfs)       * 16213.7  * Conv. (cfs)              *     1.6  * 13620.4  *  2591.6  *
* Length Wtd. (ft)        *  984.61  * Wetted Per. (ft)         *    7.62  *  217.20  *  205.39  *
* Min Ch El (ft)          * 1007.59  * Shear (lb/sq ft)         *    0.02  *    0.58  *    0.22  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)   *    0.01  *    2.06  *    0.42  *
* Frctn Loss (ft)         *    5.24  * Cum Volume (acre-ft)     *    2.56  *   13.97  *    7.03  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    4.34  *    5.94  *    8.45  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 1            RS: 2.925

INPUT
Description:
Station Elevation Data     num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9574.86 1005.59 9587.08 1005.39 9598.65  1005.4 9625.93 1005.19 9640.76 1005.07
 9657.78 1004.93 9697.45 1004.63 9732.02  1004.4 9754.14 1004.26 9779.53 1004.11
 9810.83 1003.93 9838.11 1003.77 9867.52 1003.61 9901.28 1003.47 9924.22 1003.37
 9931.18 1003.34  9998.1 1001.09   10000 1001.0510000.01 1001.0510005.87 1001.36
10030.54 1002.7110040.38 1003.2910051.84 1003.3210095.89 1003.4810129.99 1003.63
10160.94 1003.7910208.15 1004.03   10226 1004.1310286.31 1004.4410291.05 1004.46
 10314.6 1004.5510356.11 1004.7310364.47 1004.7610421.16 1004.9710442.62 1005.06

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9574.86    .042 9924.22    .04310040.38    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9924.2210040.38              625     701     725            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1004.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1004.42  * Reach Len. (ft)         *  625.00  *  701.00  *  725.00  *
* Crit W.S. (ft)          * 1004.01  * Flow Area (sq ft)       *  109.99  *  252.91  *  147.28  *
* E.G. Slope (ft/ft)      *0.004477  * Area (sq ft)            *  109.99  *  252.91  *  147.28  *
* Q Total (cfs)           * 1410.00  * Flow (cfs)              *  177.72  *  981.79  *  250.49  *
* Top Width (ft)          *  553.08  * Top Width (ft)           *  195.06  *  116.16  *  241.86  *
* Vel Total (ft/s)        *    2.76  * Avg. Vel. (ft/s)         *    1.62  *    3.88  *    1.70  *
* Max Chl Dpth (ft)       *    3.37  * Hydr. Depth (ft)         *    0.56  *    2.18  *    0.61  *
* Conv. Total (cfs)       * 21072.6  * Conv. (cfs)              *  2656.1  * 14673.0  *  3743.6  *
* Length Wtd. (ft)        *  697.39  * Wetted Per. (ft)         *  195.07  *  116.26  *  241.86  *
* Min Ch El (ft)          * 1001.05  * Shear (lb/sq ft)         *    0.16  *    0.61  *    0.17  *
* Alpha                   *    1.48  * Stream Power (lb/ft s)   *    0.25  *    2.36  *    0.29  *
* Frctn Loss (ft)         *    4.14  * Cum Volume (acre-ft)     *    1.36  *    7.54  *    4.18  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    2.13  *    2.14  *    3.52  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 1 RS: 2.792

INPUT
Description: Directly upstream of Rainbow Valley Road.
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9735.71	1000.89	9742.83	1000.83	9780.25	1000.49	9863.05	999.74	9863.12	999.74
9863.19	999.74	9919.43	999.36	9947.2	998.16	9958.71	997.88	9983.16	997.7
9991.71	997.55	10000	997.7	10000.89	997.69	10012.56	998.18	10069.47	999.31
10085.55	999.38	10126.36	999.59	10140.07	999.67	10157.9	999.76	10194.58	999.92
10222.78	1000.03	10249.1	1000.15	10283.36	1000.28	10303.62	1000.35		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9735.71	.042	9919.43	.04	10069.47	.042

Bank Sta: Left Right Coeff Contr. Expan.
9919.43 10069.47 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1000.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1000.16	Reach Len. (ft)	454.00	454.00	454.00
Crit W.S. (ft)	999.88	Flow Area (sq ft)	43.64	272.16	73.85
E.G. Slope (ft/ft)	0.008136	Area (sq ft)	43.64	272.16	73.85
Q Total (cfs)	1470.00	Flow (cfs)	78.95	1261.45	129.60
Top Width (ft)	433.37	Top Width (ft)	102.25	150.04	181.08
Vel Total (ft/s)	3.77	Avg. Vel. (ft/s)	1.81	4.63	1.75
Max Chl Dpth (ft)	2.61	Hydr. Depth (ft)	0.43	1.81	0.41
Conv. Total (cfs)	16297.0	Conv. (cfs)	875.3	13984.9	1436.8
Length Wtd. (ft)	454.00	Wetted Per. (ft)	102.26	150.09	181.08
Min Ch El (ft)	997.55	Shear (lb/sq ft)	0.22	0.92	0.21
Alpha	1.33	Stream Power (lb/ft s)	0.39	4.27	0.36
Frctn Loss (ft)	2.21	Cum Volume (acre-ft)	0.25	3.32	2.34
C & E Loss (ft)	0.01	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 2 RS: 2.706

INPUT
Description: Directly downstream of Rainbow Valley Road.
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9603.73	1003.79	9622.11	1003.5	9644	1003.15	9663.3	1002.84	9695.56	1002.32
9704.48	1002.17	9739.85	1001.57	9745.66	1001.47	9747.13	1001.44	9786.85	1000.74
9798.69	1000.51	9828.03	999.93	9850.25	999.46	9869.21	999.08	9901.82	998.39
9910.4	998.26	9944.44	997.67	9951.58	997.55	9953.38	997.52	9961.51	996.52
9996.06	992.18	10000	992.19	10001.1	992.19	10002.56	992.19	10014.59	993.18
10043.4	995.57	10047.5	995.93	10049.88	996.14	10058.98	996.96	10073.71	996.98
10112.79	997.06	10163.13	997.23	10166.61	997.25	10168.11	997.25	10204.51	996.89
10273.09	996.01	10302.4	995.72	10308.04	995.93	10328.69	996.68	10353.98	997.23
10381.72	998.04	10433.32	998.96	10435.69	999.01	10437.55	999.08	10442.21	999.11
10489.51	999.43	10520.8	999.63	10543.33	999.78	10577.38	1000.01	10597.15	1000.13
10610.22	1000.22								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9603.73	.042	9951.58	.04	10058.98	.042

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9951.5810058.98               960     972     970            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  998.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  997.97  * Reach Len. (ft)         *  960.00  *  972.00  *  970.00  *
* Crit W.S. (ft)          *  997.43  * Flow Area (sq ft)       *    5.08  *  364.55  *  376.03  *
* E.G. Slope (ft/ft)      *0.003844  * Area (sq ft)            *    5.08  *  364.55  *  376.03  *
* Q Total (cfs)           * 2680.00  * Flow (cfs)              *    3.93  * 1758.11  *  917.97  *
* Top Width (ft)          *  451.85  * Top Width (ft)          *   24.23  *  107.40  *  320.21  *
* Vel Total (ft/s)        *    3.59  * Avg. Vel. (ft/s)        *    0.77  *    4.82  *    2.44  *
* Max Chl Dpth (ft)       *    5.79  * Hydr. Depth (ft)        *    0.21  *    3.39  *    1.17  *
* Conv. Total (cfs)       * 43227.6  * Conv. (cfs)             *    63.3  * 28357.8  * 14806.6  *
* Length Wtd. (ft)        *  971.53  * Wetted Per. (ft)        *   24.24  *  107.94  *  320.26  *
* Min Ch El (ft)          *  992.18  * Shear (lb/sq ft)        *    0.05  *    0.81  *    0.28  *
* Alpha                   *    1.34  * Stream Power (lb/ft s)   *    0.04  *    3.91  *    0.69  *
* Frctn Loss (ft)         *    3.84  * Cum Volume (acre-ft)     *    1.31  *   30.32  *    4.38  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    1.34  *    3.88  *    3.99  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 2            RS: 2.522

INPUT
Description:
Station Elevation Data     num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9329.99  999.97 9338.71  999.82 9373.71   999.2 9381.58  999.06 9423.73  998.36
 9424.44  998.35 9424.58  998.35 9467.31  997.69 9475.44  997.57 9510.17  997.08
  9526.3  996.85 9553.04  996.51 9577.16  996.19  9595.9  995.96 9628.03  995.56
 9638.76  995.43 9678.89  994.96 9681.63  994.93 9696.31  994.76 9724.49  994.43
 9729.75  994.37 9767.36  993.98 9780.62  993.83 9810.22  993.57 9831.48  993.37
 9853.09  993.25 9882.34  993.09 9895.95  993.07 9933.21  992.99 9942.65  992.16
 9947.88  991.69 9963.05  990.29 9997.17  987.18   10000  987.16   10002  987.16
10004.01   987.110012.44  987.7110029.31  988.9510067.72   993.510093.12  993.71
10131.39   994.110148.33  994.2710163.24  994.4310203.54  994.8510249.32  995.33
10258.75  995.4210267.04  995.5110313.95  995.9910367.25  996.5310369.16  996.54
10370.84  996.56   10429  996.4410431.17  996.4310432.72  996.4310434.25  996.44
10438.08  996.5510440.49  996.6710479.37   997.510479.66  997.5110479.91  997.51
10480.16  997.5110480.42  997.5110480.67  997.5110480.92  997.5110485.18  997.62
10534.78  998.07

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9329.99    .042 9853.09    .04310093.12    .042

Bank Sta: Left   Right    Coeff Contr.   Expan.
      9853.0910093.12              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  994.39  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.28  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  994.10  * Reach Len. (ft)         * 1294.00  * 1294.00  * 1294.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   45.89  *  661.98  *    7.58  *
* E.G. Slope (ft/ft)      *0.004060  * Area (sq ft)            *   45.89  *  661.98  *    7.58  *
* Q Total (cfs)           * 2930.00  * Flow (cfs)              *   62.54  * 2861.68  *    5.78  *
* Top Width (ft)          *  376.21  * Top Width (ft)          *   97.60  *  240.03  *   38.58  *
* Vel Total (ft/s)        *    4.10  * Avg. Vel. (ft/s)        *    1.36  *    4.32  *    0.76  *
* Max Chl Dpth (ft)       *    7.00  * Hydr. Depth (ft)        *    0.47  *    2.76  *    0.20  *
* Conv. Total (cfs)       * 45984.4  * Conv. (cfs)             *   981.5  * 44912.2  *    90.7  *
* Length Wtd. (ft)        * 1294.00  * Wetted Per. (ft)        *   97.61  *  240.63  *   38.58  *
* Min Ch El (ft)          *  987.10  * Shear (lb/sq ft)        *    0.12  *    0.70  *    0.05  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)   *    0.16  *    3.01  *    0.04  *
* Frctn Loss (ft)         *    5.56  * Cum Volume (acre-ft)     *    0.75  *   18.86  *    0.11  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *          *          *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 3 RS: 2.277

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9129.07	999.74	9153.09	998.64	9182.75	997.58	9205.04	996.7	9223.27	996.16
9256.99	995.14	9263.8	994.96	9287.93	994.43	9304.32	994.05	9308.94	993.95
9344.84	993.3	9360.89	993.05	9385.37	992.71	9412.84	992.37	9425.89	992.23
9464.79	991.84	9466.42	991.82	9472.18	991.77	9506.94	991.46	9516.74	991.37
9547.46	991.12	9568.69	990.94	9587.99	990.77	9620.64	990.48	9628.51	990.4
9656.43	990.13	9669.03	990	9672.59	989.97	9709.56	989.59	9724.54	989.46
9750.08	989.21	9776.49	989	9790.6	988.89	9828.44	988.61	9831.13	988.59
9840.68	988.53	9871.65	988.35	9880.38	988.29	9912.17	988.18	9932.33	988.1
9977.06	983.13	9994.34	980.96	9998.27	981	10000	981.03	10003.76	981.09
10006.19	981.28	10026.66	982.95	10032.96	983.51	10092.34	989.13	10109.76	989.37
10146.74	989.87	10174.46	990.23	10201.13	990.57	10236.7	990.98	10255.53	991.19
10269.66	991.34	10309.93	991.75	10363.63	992.32	10364.33	992.33	10364.85	992.34
10418.73	992.92	10460.04	993.36	10473.12	993.51	10490.57	993.67	10527.52	994.03
10555.24	994.27	10581.92	994.5	10617.5	994.79				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9129.07	.042	9912.17	.043	10109.76	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9912.17	10109.76	990	1003	1010	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	988.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.042	0.043	
W.S. Elev (ft)	988.36	Reach Len. (ft)	990.00	1003.00	1010.00
Crit W.S. (ft)		Flow Area (sq ft)	4.41	608.02	
E.G. Slope (ft/ft)	0.004520	Area (sq ft)	4.41	608.02	
Q Total (cfs)	3270.00	Flow (cfs)	2.32	3267.68	
Top Width (ft)	214.65	Top Width (ft)	42.58	172.07	
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)	0.52	5.37	
Max Chl Dpth (ft)	7.40	Hydr. Depth (ft)	0.10	3.53	
Conv. Total (cfs)	48638.3	Conv. (cfs)	34.5	48603.9	
Length Wtd. (ft)	1003.39	Wetted Per. (ft)	42.58	172.81	
Min Ch El (ft)	980.96	Shear (lb/sq ft)	0.03	0.99	
Alpha	1.01	Stream Power (lb/ft s)	0.02	5.34	
Frctn Loss (ft)	3.77	Cum Volume (acre-ft)	0.23	66.86	9.82
C & E Loss (ft)	0.09	Cum SA (acres)	1.05	17.15	7.34

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 3 RS: 2.037

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9241.17	992.96	9255.59	992.54	9267.62	992.23	9300.97	991.42	9317.92	991.06
9346.35	990.52	9368.21	990.06	9391.72	989.67	9418.5	989.21	9437.1	988.98
9468.79	988.55	9482.48	988.42	9519.09	988	9527.86	987.91	9569.38	987.47
9573.23	987.43	9608.81	987.05	9618.61	986.95	9619.67	986.94	9663.99	986.39
9669.96	986.33	9709.36	985.79	9720.26	985.65	9754.74	985.17	9770.55	984.96
9790.2	984.72	9821.83	983.55	9824.19	983.54	9826.71	983.53	9829.57	983.53

```
 9832.42  983.53 9863.15  983.37 9865.72  983.38 9868.93   983.4 9871.78  983.43
 9890.87  983.83 9921.43  983.72 9949.72   981.6 9989.41  978.95 9996.77  978.46
 9998.43  978.33   10000   978.210008.45  977.4710031.15  979.8910072.68  983.85
10094.77  983.9210123.23  983.9810154.17  984.0810173.79  984.1310213.58  984.33
10225.88  983.9310226.99  983.9310228.29  983.9510229.87  983.9410230.96  983.92
10236.38  983.6810238.46  983.5710243.68  983.3910254.22  983.1110276.73  982.43
 10285.1  982.93 10304.2  983.9410311.53   984.310315.48  984.4910320.12  984.71
10322.49  984.8210324.02  984.8810324.88   984.9 10332.4  985.27   10376  985.72
10391.81  985.8810426.55  986.2310451.22  986.45 10477.1  986.6810510.63  986.97
10527.65  987.1110570.04  987.4710578.21  987.53 10624.8  987.9210628.76  987.95
10629.45  987.9610679.31  988.3910688.86  988.4710729.86  988.8310748.27  988.97
10780.42  989.22

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9241.17    .042  9790.2    .04310154.17    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9790.210154.17              1390    1401    1380             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  984.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  984.80  * Reach Len. (ft)         * 1390.00  * 1401.00  * 1380.00  *
* Crit W.S. (ft)          *  982.90  * Flow Area (sq ft)       *    0.24  *  833.85  *  176.47  *
* E.G. Slope (ft/ft)      *0.003150  * Area (sq ft)            *    0.24  *  833.85  *  176.47  *
* Q Total (cfs)           * 3170.00  * Flow (cfs)              *    0.05  * 2807.69  *  362.26  *
* Top Width (ft)          *  538.00  * Top Width (ft)          *    6.23  *  363.97  *  167.80  *
* Vel Total (ft/s)        *    3.14  * Avg. Vel. (ft/s)        *    0.22  *    3.37  *    2.05  *
* Max Chl Dpth (ft)       *    7.33  * Hydr. Depth (ft)        *    0.04  *    2.29  *    1.05  *
* Conv. Total (cfs)       * 56478.9  * Conv. (cfs)             *     0.9  * 50023.7  *  6454.3  *
* Length Wtd. (ft)        * 1399.64  * Wetted Per. (ft)        *    6.23  *  364.54  *  167.90  *
* Min Ch El (ft)          *  977.47  * Shear (lb/sq ft)        *    0.01  *    0.45  *    0.21  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)   *    0.00  *    1.51  *    0.42  *
* Frctn Loss (ft)         *    4.86  * Cum Volume (acre-ft)     *    0.17  *   50.26  *    7.78  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.50  *   10.97  *    5.39  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 3            RS: 1.772

INPUT
Description:
Station Elevation Data      num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9245.25  987.23 9248.32  987.17 9289.59   986.5 9290.36  986.49 9293.91  986.43
  9332.4  985.79 9340.75  985.66 9374.44   985.2 9391.91  984.97 9416.49  984.67
 9443.08  984.37 9458.53  984.19 9494.24  983.83 9500.57  983.76 9529.76  983.45
 9542.61  983.31  9545.4  983.28 9584.65  982.83 9596.56  982.71  9626.7  982.35
 9647.73  982.11 9668.74  981.87 9698.89  981.53 9710.78   981.4 9750.05  980.96
 9752.83  980.93  9765.6  980.77 9794.87  980.39 9801.22   980.3 9836.91  979.71
 9852.38  979.46 9878.95  979.02 9903.54   978.6 9930.19  977.02  9950.2  976.16
 9989.76  974.47 9993.37  974.27   10000  973.7910007.66   973.210028.41  975.66
10061.13  978.2810111.87  978.7610115.97  978.7910120.98  978.8410170.81  979.32
10211.67  979.4810225.65  979.5310242.71  979.5710280.49  979.6810311.47  979.79
10335.33  979.8510364.44  979.9110390.17   979.910411.27   979.910445.01  979.91
10486.17  979.9210499.85  979.9210511.07  979.9310554.69  979.99 10607.9  980.13
10609.53  980.1310610.87  980.1410664.37  980.3510710.67  980.5710719.21  980.61
10722.44  980.62

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9245.25    .042 9852.38    .04310170.81    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9852.3810170.81              1540    1532    1530             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	980.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	979.87	Reach Len. (ft)	1532.00	1532.00	1532.00
Crit W.S. (ft)	978.15	Flow Area (sq ft)	5.09	775.22	43.88
E.G. Slope (ft/ft)	0.003855	Area (sq ft)	5.09	775.22	43.88
Q Total (cfs)	3050.00	Flow (cfs)	3.88	3007.42	38.70
Top Width (ft)	515.88	Top Width (ft)	24.93	318.43	172.52
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)	0.76	3.88	0.88
Max Chl Dpth (ft)	6.67	Hydr. Depth (ft)	0.20	2.43	0.25
Conv. Total (cfs)	49123.5	Conv. (cfs)	62.5	48437.8	623.2
Length Wtd. (ft)	1532.00	Wetted Per. (ft)	24.94	318.84	172.52
Min Ch El (ft)	973.20	Shear (lb/sq ft)	0.05	0.59	0.06
Alpha	1.08	Stream Power (lb/ft s)	0.04	2.27	0.05
Frctn Loss (ft)	7.22	Cum Volume (acre-ft)	0.09	24.38	4.29
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 4 RS: 1.483

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9122.35	979.47	9158.61	978.93	9192	978.42	9210.43	977.82	9213.74	977.78
9215.51	977.77	9217.49	977.76	9219.6	977.7	9252.66	977.17	9254.1	977.04
9255.64	976.89	9257.17	976.76	9260.69	976.68	9286.8	977.13	9309.56	976.85
9327.72	976.74	9359.87	976.55	9372.96	976.45	9410.18	976.17	9418.21	976.06
9460.5	975.57	9463.45	975.52	9489.77	975.18	9508.69	974.92	9511.19	974.84
9511.53	974.83	9511.9	974.83	9559.45	974.11	9560.52	974.1	9561.13	974.1
9561.74	974.1	9570.13	974.16	9611.44	973.65	9644.41	973.26	9661.75	973.07
9683.46	972.85	9712.06	972.55	9734.9	972.36	9762.38	972.14	9780.14	972.04
9812.69	971.85	9825.38	971.8	9863	971.57	9870.62	971.51	9913.32	971.25
9916.28	971.04	9916.78	971.02	9917.39	971	9918.13	970.97	9919.26	970.92
9920.92	970.85	9923.67	970.72	9924.97	970.66	9926.64	970.58	9928.84	970.47
9946.16	969.64	9991.2	967.47	9996.89	967.18	9999.7	967.04	10011.91	966.43
10017.99	967.98	10037.4	972.65	10093.35	971.45	10111.56	971.03	10114.27	971.05
10117.49	971.07	10164.45	971.46	10172.35	971.52	10214.63	971.98	10227.22	972.13
10264.81	972.55	10282.08	972.73	10315	973.08	10336.95	973.27	10365.18	973.51
10391.81	973.71	10415.36	973.88	10446.68	974.11	10465.54	974.23	10501.54	974.48
10515.72	974.58	10556.41	974.86	10565.9	974.92	10611.27	975.21	10616.08	975.24
10666.13	975.5	10666.26	975.5	10667.65	975.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9122.35	.042	9661.75	.043	10037.4	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9661.75	10037.4	5	5	5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	972.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.043	0.042
W.S. Elev (ft)	972.65	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)		Flow Area (sq ft)		611.24	199.87
E.G. Slope (ft/ft)	0.005958	Area (sq ft)		611.24	199.87
Q Total (cfs)	2920.00	Flow (cfs)		2432.23	487.77
Top Width (ft)	571.13	Top Width (ft)		334.57	236.56
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)		3.98	2.44
Max Chl Dpth (ft)	6.22	Hydr. Depth (ft)		1.83	0.84
Conv. Total (cfs)	37831.2	Conv. (cfs)		31511.7	6319.4
Length Wtd. (ft)	5.00	Wetted Per. (ft)		335.44	236.59
Min Ch El (ft)	966.43	Shear (lb/sq ft)		0.68	0.31
Alpha	1.09	Stream Power (lb/ft s)		2.70	0.77
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	1.58	24.53	3.94
C & E Loss (ft)	0.00	Cum SA (acres)		0.04	0.03

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 4 RS: 1.482

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9122.35	979.47	9158.61	978.93	9192	978.42	9210.43	977.82	9213.74	977.78
9215.51	977.77	9217.49	977.76	9219.6	977.7	9252.66	977.17	9254.1	977.04
9255.64	976.89	9257.17	976.76	9260.69	976.68	9286.8	977.13	9309.56	976.85
9327.72	976.74	9359.87	976.55	9372.96	976.45	9410.18	976.17	9418.21	976.06
9460.5	975.57	9463.45	975.52	9489.77	975.18	9508.69	974.92	9511.19	974.84
9511.53	974.83	9511.9	974.83	9559.45	974.11	9560.52	974.1	9561.13	974.1
9561.74	974.1	9570.13	974.16	9611.44	973.65	9644.41	973.26	9661.75	973.07
9683.46	972.85	9712.06	972.55	9734.9	972.36	9762.38	972.14	9780.14	972.04
9812.69	971.85	9825.38	971.8	9863	971.57	9870.62	971.51	9913.32	971.25
9916.28	971.04	9916.78	971.02	9917.39	971	9918.13	970.97	9919.26	970.92
9920.92	970.85	9923.67	970.72	9924.97	970.66	9926.64	970.58	9928.84	970.47
9946.16	969.64	9991.2	967.47	9996.89	967.18	9999.7	967.04	10011.91	966.43
10017.99	967.98	10037.4	972.65	10093.35	971.45	10111.56	971.03	10114.27	971.05
10117.49	971.07	10164.45	971.46	10172.35	971.52	10214.63	971.98	10227.22	972.13
10264.81	972.55	10282.08	972.73	10315	973.08	10336.95	973.27	10365.18	973.51
10391.81	973.71	10415.36	973.88	10446.68	974.11	10465.54	974.23	10501.54	974.48
10515.72	974.58	10556.41	974.86	10565.9	974.92	10611.27	975.21	10616.08	975.24
10666.13	975.5	10666.26	975.5	10667.65	975.5				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9122.35	.042	9661.75	.043	10037.4	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9661.75 10037.4 1650 1690 1700 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	972.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.		0.043	0.042
W.S. Elev (ft)	972.60	Reach Len. (ft)	1690.00	1690.00	1690.00
Crit W.S. (ft)	971.97	Flow Area (sq ft)		596.72	189.67
E.G. Slope (ft/ft)	0.006423	Area (sq ft)		596.72	189.67
Q Total (cfs)	2920.00	Flow (cfs)		2447.54	472.47
Top Width (ft)	560.55	Top Width (ft)		330.22	230.33
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)		4.10	2.49
Max Chl Dpth (ft)	6.17	Hydr. Depth (ft)		1.81	0.82
Conv. Total (cfs)	36433.3	Conv. (cfs)		30538.3	5895.0
Length Wtd. (ft)	1690.00	Wetted Per. (ft)		331.09	230.36
Min Ch El (ft)	966.43	Shear (lb/sq ft)		0.72	0.33
Alpha	1.10	Stream Power (lb/ft s)		2.96	0.82
Frctn Loss (ft)	7.54	Cum Volume (acre-ft)	1.58	24.47	3.92
C & E Loss (ft)	0.01	Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 5 RS: 1.162

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9175.13	968.79	9210.11	968.47	9222.91	968.34	9258.75	967.91	9272.93	967.74
9307.39	967.42	9322.95	967.28	9356.02	967.01	9372.97	966.94	9404.66	966.73
9422.99	966.55	9453.3	966.27	9473.01	966.12	9501.93	965.8	9523.03	965.53
9550.57	965.18	9573.05	964.88	9599.21	964.58	9623.07	964.33	9647.85	964.36

9673.09	964.27	9696.48	964.4	9723.11	964.73	9745.12	965.04	9773.13	965.4
9793.76	965.6	9823.15	965.84	9842.39	965.73	9873.17	965.74	9891.03	965.53
9923.19	965.11	9963.21	962.32	9982.9	960.6	9989.39	960.03	10000	960.15
10001.1	960.17	10010.23	960.49	10023.44	960.47	10070.85	960.41	10075.23	960.71
10100.33	962.48	10123.26	964.5	10141.33	964.71	10173.27	964.95	10192.54	965.23
10223.29	965.65	10243.76	965.95	10273.3	966.41	10294.97	966.64	10323.31	967.15
10346.19	967.43	10373.33	967.72	10397.4	967.98	10423.34	968.24	10448.62	968.43
10473.36	968.71	10499.83	968.98	10523.37	969.16	10551.05	969.38	10573.38	969.57
10602.26	969.87	10623.4	970.07	10653.48	970.42	10673.41	970.62	10704.69	970.92
10723.42	971.13	10755.91	971.45	10773.44	971.63	10807.12	971.98	10823.45	972.15

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9175.13	.042	9873.17	.043	10123.26	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9873.17	10123.26	1320	1346	1335	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	965.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	964.99	Reach Len. (ft)	1320.00	1346.00	1335.00
Crit W.S. (ft)		Flow Area (sq ft)	81.48	664.46	12.19
E.G. Slope (ft/ft)	0.003325	Area (sq ft)	81.48	664.46	12.19
Q Total (cfs)	3070.00	Flow (cfs)	99.38	2961.23	9.40
Top Width (ft)	427.10	Top Width (ft)	176.27	198.30	52.53
Vel Total (ft/s)	4.05	Avg. Vel. (ft/s)	1.22	4.46	0.77
Max Chl Dpth (ft)	4.96	Hydr. Depth (ft)	0.46	3.35	0.23
Conv. Total (cfs)	53239.8	Conv. (cfs)	1723.4	51353.4	163.0
Length Wtd. (ft)	1345.13	Wetted Per. (ft)	176.28	198.66	52.53
Min Ch El (ft)	960.03	Shear (lb/sq ft)	0.10	0.69	0.05
Alpha	1.17	Stream Power (lb/ft s)	0.12	3.09	0.04
Frctn Loss (ft)	6.40	Cum Volume (acre-ft)	4.95	69.60	4.98
C & E Loss (ft)	0.02	Cum SA (acres)	7.87	16.08	8.23

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 5 RS: 0.907

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9275.65	962.99	9277.69	962.97	9319.33	962.53	9320.9	962.52	9329.88	962.45
9364.1	962.17	9370.09	962.12	9407.3	961.85	9420.84	961.74	9450.51	961.49
9471.6	961.36	9493.71	961.18	9522.36	961	9536.92	960.88	9573.12	960.63
9620.15	960.28	9623.32	960.26	9623.88	960.25	9666.53	959.93	9674.64	959.87
9709.73	959.57	9725.4	959.46	9747.7	959.3	9773.31	959.06	9776.62	959.01
9778.6	958.92	9796.14	958.91	9826.91	958.72	9839.34	958.64	9877.67	958.42
9882.55	958.4	9910.43	958.25	9925.75	958.17	9928.43	958.16	9944.86	956.88
9986.89	953.48	9997.95	953.48	10000	953.44	10012.4	953.24	10028.93	954.44
10052.52	956.14	10079.61	958.37	10096.95	957.87	10102.24	957.77	10109.75	957.75
10147.83	957.31	10155.54	957.52	10164.36	957.68	10174	957.65	10176.61	957.68
10184.15	957.52	10184.55	957.53	10192.38	957.57	10199.12	957.56	10206.53	957.51
10208.27	957.53	10215.13	957.53	10218.36	957.58	10226.1	957.86	10230.11	957.89
10231.77	957.95	10237.63	958.15	10245.97	958.43	10248.07	958.5	10250.71	958.57
10255.57	958.68	10259.71	958.77	10264.12	958.87	10323.49	960.2	10325.18	960.24
10326.27	960.26	10327.35	960.29	10329.94	960.37	10331.62	960.39	10380	960.69
10384.42	960.73	10430.07	961.07	10437.21	961.12	10480.14	961.43	10490	961.51
10530.2	961.77	10542.8	961.85	10580.27	962.09	10595.59	962.19	10630.34	962.4
10648.39	962.51								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9275.65	.042	9928.43	.043	10079.61	.042

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9928.4310079.61              1350    1365    1315             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  958.86  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.55  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  958.31  * Reach Len. (ft)         * 1350.00  * 1365.00  * 1315.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    2.37  *  443.83  *  101.87  *
* E.G. Slope (ft/ft)      *0.007509  * Area (sq ft)            *    2.37  *  443.83  *  101.87  *
* Q Total (cfs)           * 2960.00  * Flow (cfs)              *    1.34  * 2728.46  *  230.20  *
* Top Width (ft)          *  341.31  * Top Width (ft)          *   29.86  *  150.50  *  160.95  *
* Vel Total (ft/s)        *    5.40  * Avg. Vel. (ft/s)        *    0.57  *    6.15  *    2.26  *
* Max Chl Dpth (ft)       *    5.07  * Hydr. Depth (ft)        *    0.08  *    2.95  *    0.63  *
* Conv. Total (cfs)       * 34159.6  * Conv. (cfs)             *    15.5  * 31487.6  *  2656.6  *
* Length Wtd. (ft)        * 1362.79  * Wetted Per. (ft)        *   29.86  *  150.88  *  160.98  *
* Min Ch El (ft)          *  953.24  * Shear (lb/sq ft)        *    0.04  *    1.38  *    0.30  *
* Alpha                   *    1.21  * Stream Power (lb/ft s)   *    0.02  *    8.48  *    0.67  *
* Frctn Loss (ft)         *    5.15  * Cum Volume (acre-ft)     *    3.68  *   52.47  *    3.23  *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)           *    4.75  *   10.69  *    4.96  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 5              RS: 0.648

INPUT
Description:
Station Elevation Data     num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9552.25  954.74 9570.78  954.67  9602.9  954.51 9637.42  954.31 9654.21  954.23
 9704.06  953.86 9705.52  953.85 9710.38  953.82 9756.82  953.49  9770.7  953.39
 9808.13  953.12 9837.34  952.84 9859.44  952.66 9873.26  952.55 9919.43  949.39
  9934.4  948.48 9943.23  948.55 9957.96  948.55 9982.18  948.63 9992.94  948.66
 9999.04  948.68   10000  948.6710019.54  948.6810053.98   951.410067.08  952.44
10071.32  952.7610073.91  952.7910084.68  952.8810132.55  953.4310162.79  953.54
10191.19  953.8210236.13   954.110249.83   954.210258.49  954.2910308.47  955.05
10354.18  955.8410367.11  956.0210387.59  956.0210425.76  956.0510449.87  956.19
 10484.4  956.5710539.04  957.0610543.04   957.110545.57  957.1110601.68  957.16

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9552.25    .042 9873.26    .04310071.32    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9873.2610071.32              760     788     780             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  953.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  953.38  * Reach Len. (ft)         *  760.00  *  788.00  *  780.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   41.30  *  722.11  *   18.48  *
* E.G. Slope (ft/ft)      *0.002228  * Area (sq ft)            *   41.30  *  722.11  *   18.48  *
* Q Total (cfs)           * 2840.00  * Flow (cfs)              *   37.85  * 2787.60  *   14.55  *
* Top Width (ft)          *  356.77  * Top Width (ft)          *  101.58  *  198.06  *   57.13  *
* Vel Total (ft/s)        *    3.63  * Avg. Vel. (ft/s)        *    0.92  *    3.86  *    0.79  *
* Max Chl Dpth (ft)       *    4.90  * Hydr. Depth (ft)        *    0.41  *    3.65  *    0.32  *
* Conv. Total (cfs)       * 60161.6  * Conv. (cfs)             *   801.9  * 59051.6  *   308.2  *
* Length Wtd. (ft)        *  787.62  * Wetted Per. (ft)        *  101.58  *  198.36  *   57.14  *
* Min Ch El (ft)          *  948.48  * Shear (lb/sq ft)        *    0.06  *    0.51  *    0.05  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)   *    0.05  *    1.96  *    0.04  *
* Frctn Loss (ft)         *    2.32  * Cum Volume (acre-ft)     *    3.01  *   34.21  *    1.41  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    2.71  *    5.23  *    1.67  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
```

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 5 RS: 0.499

INPUT
Description: Directly upstream of Tuthill Road.
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9528.74	953.84	9531.44	953.81	9552.27	953.47	9569.59	953.33	9587.45	953.06
9601.14	952.85	9629.84	952.66	9641.46	952.53	9682.63	952.12	9686.84	952.07
9710.17	951.83	9737.63	951.58	9747.85	951.51	9789.44	951.11	9813.28	950.88
9841.24	950.72	9890.02	950.46	9893.05	950.44	9901.2	950.4	9939.63	949.09
9942.53	948.98	9945.96	948.82	9951.57	948.43	9962.57	947.56	9985.25	945.66
9988.94	945.71	9999.95	945.66	9999.97	945.66	10000	945.66	10016.18	945.74
10022.65	946.06	10044.76	947.41	10086.86	950.37	10117.91	950.58	10129.78	950.69
10178.83	951.21	10217.31	951.73	10239.75	952.07	10291.12	953.08	10300.67	953.25
10304.84	953.33	10361.58	954.63	10392.37	955.08	10422.5	955.54		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9528.74	.042	9901.2	.043	10086.86	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9901.2 10086.86 465 461 450 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	951.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	950.95	Reach Len. (ft)	465.00	461.00	450.00
Crit W.S. (ft)		Flow Area (sq ft)	27.66	577.72	21.55
E.G. Slope (ft/ft)	0.004094	Area (sq ft)	27.66	577.72	21.55
Q Total (cfs)	2770.00	Flow (cfs)	27.52	2719.64	22.84
Top Width (ft)	347.91	Top Width (ft)	94.98	185.66	67.27
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)	0.99	4.71	1.06
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)	0.29	3.11	0.32
Conv. Total (cfs)	43291.1	Conv. (cfs)	430.1	42504.1	356.9
Length Wtd. (ft)	460.98	Wetted Per. (ft)	94.98	185.97	67.27
Min Ch El (ft)	945.66	Shear (lb/sq ft)	0.07	0.79	0.08
Alpha	1.12	Stream Power (lb/ft s)	0.07	3.74	0.09
Frctn Loss (ft)	1.89	Cum Volume (acre-ft)	2.41	22.45	1.06
C & E Loss (ft)	0.01	Cum SA (acres)	1.00	1.76	0.56

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31B (I70)
REACH: REACH 5 RS: 0.412

INPUT
Description: Directly downstream of Tuthill Road.
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9594.54	950.33	9595.34	950.33	9641.73	950.2	9650.77	950.19	9660.62	950.16
9706.21	949.92	9748.07	949.63	9761.64	949.54	9776.41	949.43	9817.07	949.05
9854.42	948.74	9872.51	948.57	9892.21	948.44	9916.37	948.24	9928.38	947.23
9932.24	947.05	9936.48	946.88	9942.29	946.65	9973.36	945.06	9992.52	943.97
10000	943.17	10004.84	942.65	10008.81	942.28	10039.1	945.65	10062.82	948.36
10083.62	948.69	10110.54	949.11	10161.84	950.24	10176.22	950.28	10190.65	950.29
10225.96	950.37	10247.65	950.38	10253.5	950.73	10281.77	952.33	10288.16	952.45
10292.33	952.53	10317.31	952.95	10352.04	953.41	10366.32	953.61	10373.64	953.68
10376.49	953.7	10396.5	953.82						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 9594.54    .042 9916.37    .04310062.82    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9916.3710062.82             1500    1520    1500            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  949.39  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.40  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  948.99  * Reach Len. (ft)         * 1520.00  * 1520.00  * 1520.00  *
* Crit W.S. (ft)          *  947.51  * Flow Area (sq ft)       *   34.82  *  521.61  *   12.51  *
* E.G. Slope (ft/ft)      *0.004102  * Area (sq ft)            *   34.82  *  521.61  *   12.51  *
* Q Total (cfs)           * 2740.00  * Flow (cfs)              *   41.36  * 2685.64  *   12.99  *
* Top Width (ft)          *  278.49  * Top Width (ft)          *   91.73  *  146.45  *   40.31  *
* Vel Total (ft/s)        *    4.82  * Avg. Vel. (ft/s)        *    1.19  *    5.15  *    1.04  *
* Max Chl Dpth (ft)       *    6.71  * Hydr. Depth (ft)        *    0.38  *    3.56  *    0.31  *
* Conv. Total (cfs)       * 42781.3  * Conv. (cfs)             *   645.8  * 41932.6  *   202.9  *
* Length Wtd. (ft)        * 1520.00  * Wetted Per. (ft)        *   91.73  *  147.01  *   40.31  *
* Min Ch El (ft)          *  942.28  * Shear (lb/sq ft)        *    0.10  *    0.91  *    0.08  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)   *    0.12  *    4.68  *    0.08  *
* Frctn Loss (ft)         *    6.71  * Cum Volume (acre-ft)     *    2.07  *   16.63  *    0.88  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *          *         *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS31B (I70)
REACH: REACH 6            RS: 0.124

INPUT
Description: Copy of x-section 0.123 to make model run.
Station Elevation Data    num=      55
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
 9533.51  946.14 9552.48  946.08  9579.6  946.03 9602.75  945.95 9635.73  946.21
 9653.02  946.18 9691.86  946.11 9703.29  946.14 9747.98  945.17 9753.56  945.11
 9801.43  943.84 9803.83  943.78 9804.11  943.77 9854.11  942.79 9894.65  941.89
 9905.55  941.15 9911.26  940.78 9951.16  940.28 9959.14   939.3 9966.51  938.26
    9985  935.52 9985.29  935.47   10000   936.510009.27  937.1910011.44  937.34
10040.06  939.9110047.28  940.4610051.08  940.7110058.68   941.510058.97  941.57
10059.25  941.6510059.52  941.7110067.42  942.0810069.43   942.110071.98  942.06
10075.33  942.0210080.77  941.9710089.89   941.910109.14  941.7310127.06  941.57
10137.05  941.4710137.24  941.47 10137.6  941.4710143.81  941.6710151.52  941.95
10214.84  943.8110264.01  944.9810267.26  945.0410268.76  945.0510319.69  945.57
10345.33  945.5710372.12   945.6 10421.9  945.4310424.54  945.4210430.28  945.41

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9533.51    .042 9951.16    .04310067.42    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.1610067.42                5       5       5            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  942.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.46  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  942.21  * Reach Len. (ft)         *    5.00  *    5.00  *    5.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   83.93  *  431.68  *   37.92  *
* E.G. Slope (ft/ft)      *0.004763  * Area (sq ft)            *   83.93  *  431.68  *   37.92  *
* Q Total (cfs)           * 2740.00  * Flow (cfs)              *  229.25  * 2459.81  *   50.94  *
* Top Width (ft)          *  280.10  * Top Width (ft)          *   70.90  *  116.26  *   92.93  *
* Vel Total (ft/s)        *    4.95  * Avg. Vel. (ft/s)        *    2.73  *    5.70  *    1.34  *
* Max Chl Dpth (ft)       *    6.74  * Hydr. Depth (ft)        *    1.18  *    3.71  *    0.41  *
* Conv. Total (cfs)       * 39700.6  * Conv. (cfs)             *  3321.6  * 35640.9  *   738.1  *
* Length Wtd. (ft)        *    5.00  * Wetted Per. (ft)        *   70.95  *  116.89  *   92.95  *
* Min Ch El (ft)          *  935.47  * Shear (lb/sq ft)        *    0.35  *    1.10  *    0.12  *
* Alpha                   *    1.22  * Stream Power (lb/ft s)   *    0.96  *    6.26  *    0.16  *
* Frctn Loss (ft)         *    0.02  * Cum Volume (acre-ft)     *    0.01  *    0.05  *    0.00  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    0.01  *    0.01  *    0.01  *
*****************************************************************************************

CROSS SECTION
```

RIVER: 1S2WS31B (I70)
REACH: REACH 6 RS: 0.123

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9533.51	946.14	9552.48	946.08	9579.6	946.03	9602.75	945.95	9635.73	946.21
9653.02	946.18	9691.86	946.11	9703.29	946.14	9747.98	945.17	9753.56	945.11
9801.43	943.84	9803.83	943.78	9804.11	943.77	9854.11	942.79	9894.65	941.89
9905.55	941.15	9911.26	940.78	9951.16	940.28	9959.14	939.3	9966.51	938.26
9985	935.52	9985.29	935.47	10000	936.51	10009.27	937.19	10011.44	937.34
10040.06	939.91	10047.28	940.46	10051.08	940.71	10058.68	941.51	10058.97	941.57
10059.25	941.65	10059.52	941.71	10067.42	942.08	10069.43	942.11	10071.98	942.06
10075.33	942.02	10080.77	941.97	10089.89	941.91	10109.14	941.73	10127.06	941.57
10137.05	941.47	10137.24	941.47	10137.6	941.47	10143.81	941.67	10151.52	941.95
10214.84	943.81	10264.01	944.98	10267.26	945.04	10268.76	945.05	10319.69	945.57
10345.33	945.57	10372.12	945.6	10421.9	945.43	10424.54	945.42	10430.28	945.41

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9533.51	.042	9951.16	.043	10067.42	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9951.16	10067.42	640	649	640	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	942.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	942.17	Reach Len. (ft)			
Crit W.S. (ft)	941.03	Flow Area (sq ft)	80.89	426.61	33.91
E.G. Slope (ft/ft)	0.005000	Area (sq ft)	80.89	426.61	33.91
Q Total (cfs)	2740.00	Flow (cfs)	225.02	2471.21	43.78
Top Width (ft)	276.65	Top Width (ft)	68.94	116.26	91.45
Vel Total (ft/s)	5.06	Avg. Vel. (ft/s)	2.78	5.79	1.29
Max Chl Dpth (ft)	6.70	Hydr. Depth (ft)	1.17	3.67	0.37
Conv. Total (cfs)	38747.6	Conv. (cfs)	3182.1	34946.4	619.0
Length Wtd. (ft)		Wetted Per. (ft)	68.98	116.89	91.47
Min Ch El (ft)	935.47	Shear (lb/sq ft)	0.37	1.14	0.12
Alpha	1.21	Stream Power (lb/ft s)	1.02	6.60	0.15
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 1S2WS31A (I71)
REACH: REACH 1 RS: 0.434

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 50

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9589.05	958.81	9599.16	958.76	9614.56	958.68	9624.91	958.63	9650.58	958.53
9685.17	958.37	9686.61	958.37	9688.74	958.36	9722.63	958.27	9745.44	958.17
9758.66	958.16	9778.32	958.07	9794.69	958.04	9805.7	957.96	9830.71	957.8
9865.96	957.57	9866.74	957.57	9867.89	957.56	9902.76	957.33	9926.22	957.17
9938.79	957.07	9971.79	957.17	9979.56	957.15	9991.39	957.12	9995.85	957.12
10000	957.07	10005.13	957.02	10010.15	956.97	10047.12	957.01	10054.59	957
10060.38	956.98	10064.16	956.97	10079.24	957.01	10094.17	957.07	10131.2	957.22
10166.56	957.32	10183.15	957.35	10225.34	957.43	10235.1	957.46	10238.95	957.47
10287.06	957.63	10311.34	957.66	10339.01	957.68	10383.72	957.83	10390.97	957.85
10409.38	957.99	10442.92	958.24	10456.11	958.37	10494.88	958.71	10528.5	958.94

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9589.05	.042	9830.71	.043	10311.34	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9830.71	10311.34	800	803	770	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	957.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.043	
W.S. Elev (ft)	957.58	Reach Len. (ft)	800.00	803.00	770.00
Crit W.S. (ft)	957.48	Flow Area (sq ft)		142.06	
E.G. Slope (ft/ft)	0.018346	Area (sq ft)		142.06	
Q Total (cfs)	330.00	Flow (cfs)		330.00	
Top Width (ft)	406.30	Top Width (ft)		406.30	
Vel Total (ft/s)	2.32	Avg. Vel. (ft/s)		2.32	
Max Chl Dpth (ft)	0.61	Hydr. Depth (ft)		0.35	
Conv. Total (cfs)	2436.3	Conv. (cfs)		2436.3	
Length Wtd. (ft)	802.98	Wetted Per. (ft)		406.31	
Min Ch El (ft)	956.97	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	6.25	Cum Volume (acre-ft)	0.05	3.92	0.01
C & E Loss (ft)	0.01	Cum SA (acres)	0.33	5.68	0.13

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31A (I71)
REACH: REACH 1 RS: 0.281

INPUT
Description: Upstream of Tuthill Road.
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9695.64	953.92	9705.91	953.92	9735.73	953.94	9744.43	953.87	9786.99	953.57
9810.64	953.19	9838.25	952.74	9876.85	951.89	9889.51	951.65	9932.91	951.04
9940.77	950.95	9952.43	950.48	9984.1	949.24	9996.61	948.75	9999.34	948.86
10000	948.88	10003.19	949.01	10034.16	950.23	10044.25	950.6	10048.4	950.75
10057.25	951.15	10107.72	951.77	10126.49		95210133.16	952.08	10145.81	952.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9695.64	.042	9940.77	.043	10057.25	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9940.77 10057.25 400 412 390 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	951.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	951.27	Reach Len. (ft)	400.00	412.00	390.00
Crit W.S. (ft)		Flow Area (sq ft)	3.93	159.81	0.54
E.G. Slope (ft/ft)	0.005103	Area (sq ft)	3.93	159.81	0.54
Q Total (cfs)	490.00	Flow (cfs)	2.98	486.81	0.20
Top Width (ft)	149.77	Top Width (ft)	23.90	116.48	9.39
Vel Total (ft/s)	2.98	Avg. Vel. (ft/s)	0.76	3.05	0.38
Max Chl Dpth (ft)	2.52	Hydr. Depth (ft)	0.16	1.37	0.06
Conv. Total (cfs)	6859.7	Conv. (cfs)	41.8	6815.0	2.9
Length Wtd. (ft)	411.96	Wetted Per. (ft)	23.90	116.57	9.39
Min Ch El (ft)	948.75	Shear (lb/sq ft)	0.05	0.44	0.02
Alpha	1.04	Stream Power (lb/ft s)	0.04	1.33	0.01
Frctn Loss (ft)	4.12	Cum Volume (acre-ft)	0.02	1.14	0.00
C & E Loss (ft)	0.05	Cum SA (acres)	0.11	0.87	0.04

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS31A (I71)

REACH: REACH 1 RS: 0.203

INPUT
Description: Downstream of Tuthill Road.
Station Elevation Data num= 23

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9716.01	955.26	9747.34	955.3	9787.78	954.57	9799.48	954.35	9827.35	953.59
9851.62	952.87	9861.81	952.6	9903.76	951.38	9935.84	950.58	9955.9	950.02
10000	945.49	10010.03	944.45	10014.25	944.19	10020.6	944.56	10028.66	945.04
10034.13	945.37	10038.62	945.65	10042.21	945.89	10087.53	948.36	10112.32	948.36
10157.93	948.55	10164.46	948.57	10180	948.69				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9716.01	.042	9955.9	.043	10087.53	.042

Bank Sta: Left	Right	Coeff Contr.	Expan.
9955.9	10087.53	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	947.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.63	Wt. n-Val.		0.043	
W.S. Elev (ft)	946.62	Reach Len. (ft)	0.00	0.00	0.00
Crit W.S. (ft)	946.62	Flow Area (sq ft)		81.74	
E.G. Slope (ft/ft)	0.025823	Area (sq ft)		81.74	
Q Total (cfs)	520.00	Flow (cfs)		520.00	
Top Width (ft)	66.47	Top Width (ft)		66.47	
Vel Total (ft/s)	6.36	Avg. Vel. (ft/s)		6.36	
Max Chl Dpth (ft)	2.43	Hydr. Depth (ft)		1.23	
Conv. Total (cfs)	3235.9	Conv. (cfs)		3235.9	
Length Wtd. (ft)	0.00	Wetted Per. (ft)		66.66	
Min Ch El (ft)	944.19	Shear (lb/sq ft)		1.98	
Alpha	1.00	Stream Power (lb/ft s)		12.58	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)			
C & E Loss (ft)	0.05	Cum SA (acres)			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

SUMMARY OF MANNING'S N VALUES

River:1S2WS32A (I67)

Reach	River Sta.	n1	n2	n3
REACH 1	0.824	.042	.043	.042
REACH 1	0.572	.042	.043	.042
REACH 1	0.329	.042	.043	.042

River:1S2WS32B (I68)

Reach	River Sta.	n1	n2	n3
REACH 1	1.016	.042	.043	.042
REACH 1	0.890	.042	.043	.042
REACH 1	0.745	.042	.043	.042
REACH 1	0.517	.042	.043	.042
REACH 1	0.263	.042	.043	.042

River:1S2WS34 (I65)

Reach	River Sta.	n1	n2	n3
REACH 1	3.033	.042	.043	.042

Reach	River Sta.	n1	n2	n3
REACH 1	2.756	.042	.043	.042
REACH 1	2.519	.042	.043	.042
REACH 1	2.295	.042	.043	.042
REACH 1	2.056	.042	.043	.042
REACH 1	1.813	.042	.043	.042
REACH 1	1.557	.042	.043	.042
REACH 1	1.278	.042	.043	.042
REACH 1	1.024	.042	.043	.042
REACH 1	0.674	.042	.043	.042
REACH 1	0.405	.042	.043	.042
REACH 1	0.203	.042	.043	.042
REACH 1	0.033	.042	.043	.042

River:1S2WS33 (I66)

Reach	River Sta.	n1	n2	n3
REACH 1	0.887	.042	.043	.042
REACH 1	0.597	.042	.043	.042
REACH 1	0.308	.042	.043	.042
REACH 1	0.018	.042	.043	.042

River:1S2WS31B (I70)

Reach	River Sta.	n1	n2	n3
REACH 1	4.423	.042	.043	.042
REACH 1	4.171	.042	.043	.042
REACH 1	3.898	.042	.043	.042
REACH 1	3.648	.042	.043	.042
REACH 1	3.378	.042	.043	.042
REACH 1	3.113	.042	.043	.042
REACH 1	2.925	.042	.043	.042
REACH 1	2.792	.042	.043	.042
REACH 2	2.706	.042	.043	.042
REACH 2	2.522	.042	.043	.042
REACH 3	2.277	.042	.043	.042
REACH 3	2.037	.042	.043	.042
REACH 3	1.772	.042	.043	.042
REACH 4	1.483	.042	.043	.042
REACH 4	1.482	.042	.043	.042
REACH 5	1.162	.042	.043	.042
REACH 5	0.907	.042	.043	.042
REACH 5	0.648	.042	.043	.042
REACH 5	0.499	.042	.043	.042
REACH 5	0.412	.042	.043	.042
REACH 6	0.124	.042	.043	.042
REACH 6	0.123	.042	.043	.042

River:1S2WS31A (I71)

Reach	River Sta.	n1	n2	n3
REACH 1	0.434	.042	.043	.042
REACH 1	0.281	.042	.043	.042
REACH 1	0.203	.042	.043	.042

SUMMARY OF REACH LENGTHS

River: 1S2WS32A (I67)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.824	1300	1327	1300
REACH 1	0.572	1225	1286	1225
REACH 1	0.329	1700	1736	1700

River: 1S2WS32B (I68)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.016	625	664	625

*REACH 1	0.890	725*	767*	725*
*REACH 1	0.745	1150*	1201*	1150*
*REACH 1	0.517	1300*	1345*	1300*
*REACH 1	0.263	1325*	1387*	1325*

River: 1S2WS34 (I65)

Reach	River Sta.	Left	Channel	Right
*REACH 1	3.033	1400*	1462*	1400*
*REACH 1	2.756	1200*	1250*	1200*
*REACH 1	2.519	1100*	1181*	1100*
*REACH 1	2.295	1200*	1264*	1200*
*REACH 1	2.056	1300*	1339*	1300*
*REACH 1	1.813	1300*	1348*	1300*
*REACH 1	1.557	1415*	1471*	1435*
*REACH 1	1.278	1270*	1343*	1310*
*REACH 1	1.024	1760*	1846*	1755*
*REACH 1	0.674	1330*	1422*	1335*
*REACH 1	0.405	1015*	1067*	1020*
*REACH 1	0.203	845*	899*	875*
*REACH 1	0.033	*	*	*

River: 1S2WS33 (I66)

Reach	River Sta.	Left	Channel	Right
*REACH 1	0.887	1480*	1530*	1460*
*REACH 1	0.597	1450*	1524*	1470*
*REACH 1	0.308	1450*	1620*	1450*
*REACH 1	0.018	*	*	*

River: 1S2WS31B (I70)

Reach	River Sta.	Left	Channel	Right
*REACH 1	4.423	1285*	1330*	1275*
*REACH 1	4.171	1345*	1439*	1350*
*REACH 1	3.898	1295*	1323*	1275*
*REACH 1	3.648	1325*	1423*	1330*
*REACH 1	3.378	1415*	1402*	1300*
*REACH 1	3.113	950*	993*	960*
*REACH 1	2.925	625*	701*	725*
*REACH 1	2.792	*	*	*
*REACH 2	2.706	960*	972*	970*
*REACH 2	2.522	*	*	*
*REACH 3	2.277	990*	1003*	1010*
*REACH 3	2.037	1390*	1401*	1380*
*REACH 3	1.772	1540*	1532*	1530*
*REACH 4	1.483	5*	5*	5*
*REACH 4	1.482	1650*	1690*	1700*
*REACH 5	1.162	1320*	1346*	1335*
*REACH 5	0.907	1350*	1365*	1315*
*REACH 5	0.648	760*	788*	780*
*REACH 5	0.499	465*	461*	450*
*REACH 5	0.412	1500*	1520*	1500*
*REACH 6	0.124	5*	5*	5*
*REACH 6	0.123	640*	649*	640*

River: 1S2WS31A (I71)

Reach	River Sta.	Left	Channel	Right
*REACH 1	0.434	800*	803*	770*
*REACH 1	0.281	400*	412*	390*
*REACH 1	0.203	*	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS32A (I67)

Reach	River Sta.	Contr.	Expan.

*REACH 1	0.824	.1	.3
*REACH 1	0.572	.1	.3
*REACH 1	0.329	.1	.3

River: 1S2WS32B (I68)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.016	.1	.3
*REACH 1	0.890	.1	.3
*REACH 1	0.745	.1	.3
*REACH 1	0.517	.1	.3
*REACH 1	0.263	.1	.3

River: 1S2WS34 (I65)

Reach	River Sta.	Contr.	Expan.
*REACH 1	3.033	.1	.3
*REACH 1	2.756	.1	.3
*REACH 1	2.519	.1	.3
*REACH 1	2.295	.1	.3
*REACH 1	2.056	.1	.3
*REACH 1	1.813	.1	.3
*REACH 1	1.557	.1	.3
*REACH 1	1.278	.1	.3
*REACH 1	1.024	.1	.3
*REACH 1	0.674	.1	.3
*REACH 1	0.405	.1	.3
*REACH 1	0.203	.1	.3
*REACH 1	0.033	.1	.3

River: 1S2WS33 (I66)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.887	.1	.3
*REACH 1	0.597	.1	.3
*REACH 1	0.308	.1	.3
*REACH 1	0.018	.1	.3

River: 1S2WS31B (I70)

Reach	River Sta.	Contr.	Expan.
*REACH 1	4.423	.1	.3
*REACH 1	4.171	.1	.3
*REACH 1	3.898	.1	.3
*REACH 1	3.648	.1	.3
*REACH 1	3.378	.1	.3
*REACH 1	3.113	.1	.3
*REACH 1	2.925	.1	.3
*REACH 1	2.792	.1	.3
*REACH 2	2.706	.1	.3
*REACH 2	2.522	.1	.3
*REACH 3	2.277	.1	.3
*REACH 3	2.037	.1	.3
*REACH 3	1.772	.1	.3
*REACH 4	1.483	.1	.3
*REACH 4	1.482	.1	.3
*REACH 5	1.162	.1	.3
*REACH 5	0.907	.1	.3
*REACH 5	0.648	.1	.3
*REACH 5	0.499	.1	.3
*REACH 5	0.412	.1	.3
*REACH 6	0.124	.1	.3
*REACH 6	0.123	.1	.3

River: 1S2WS31A (I71)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.434	.1	.3

```
*REACH 1          *    0.281   *        .1*        .3*
*REACH 1          *    0.203   *        .1*        .3*
*****************************************************
```

MODEL: 1S2WS9A (J39)

REACHES: 1S2WS9A (J39)
1S2WS27 (J16)
1S2WS22 (J20)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X       X
X     X  X        X    X       X   X    X    X       X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS9A (J39)
Project File : 1S2WS9A_J39.prj
Run Date and Time: 12/14/2004 1:01:46 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS9A (J39)
Reaches: 1S2WS9A (J39)
  1S2WS27
(J16)
  1S2WS22 (J20)

****

PLAN DATA

Plan Title: 1S2WS9A (J39)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9A
(J39)\1S2WS9A_J39.p01

Geometry Title: 1S2WS9A (J39)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9A
(J39)\1S2WS9A_J39.g01

Flow Title : 1S2WS9A (J39)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9A
(J39)\1S2WS9A_J39.f01

Plan Summary Information:

Number of:	Cross Sections	= 32	Mulitple Openings	=	0
	Culverts	= 1	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information

```
    Water surface calculation tolerance =  0.01
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  20
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 1S2WS22 (J20)    Reach = REACH 1
RS      Profile           Method  Value1  Value2
1.136   PF 2                   1    9960   10020
0.836   PF 2                   1    9975   10025
0.582   PF 2                   1    9975   10025

River = 1S2WS22 (J20)    Reach = REACH 2
RS      Profile           Method  Value1  Value2
0.366   PF 2                   1    9970   10030
0.154   PF 2                   1    9970   10030

River = 1S2WS9A (J39)    Reach = REACH 1
RS      Profile           Method  Value1  Value2
6.679   PF 2                   1    9980   10020
6.374   PF 2                   1    9985   10015
6.086   PF 2                   1    9960   10005
5.752   PF 2                   1    9980   10020
5.455   PF 2                   1    9970   10020
5.222   PF 2                   1    9940   10060
4.901   PF 2                   1    9940   10060
4.636   PF 2                   1    9930   10070
4.349   PF 2                   1    9970   10030

River = 1S2WS9A (J39)    Reach = REACH 2
RS      Profile           Method  Value1  Value2
4.055   PF 2                   1    9955   10045
3.881   PF 2                   1    9950   10050
3.516   PF 2                   1    9945   10055
3.313   PF 2                   1    9940   10060
3.065   PF 2                   1    9930   10070
2.751   PF 2                   1    9950   10060
2.508   PF 2                   1    9960   10100
2.214   PF 2                   1    9960   10040
1.959   PF 2                   1    9955   10045
1.725   PF 2                   1    9950   10050
1.367   PF 2                   1    9955   10045
1.157   PF 2                   1    9950   10050
1.149   PF 2                   1    9945   10055
1.117   PF 2                   1    9935   10065
0.913   PF 2                   1    9960   10060
0.747   PF 2                   1    9970   10030

River = 1S2WS27 (J16)    Reach = REACH 1
RS      Profile           Method  Value1  Value2
0.550   PF 2                   1    9960 10037.79
0.367   PF 2                   1    9980   10020
0.152   PF 2                   1    9985   10015

*******************************************************************************

FLOW DATA

Flow Title: 1S2WS9A (J39)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9A
(J39)\1S2WS9A_J39.f01

Flow Data (cfs)
*************************************************************
* River           Reach          RS       *            PF 1 *
* 1S2WS27 (J16)   REACH 1        0.550    *             650 *
* 1S2WS27 (J16)   REACH 1        0.367    *             590 *
```

* 1S2WS27 (J16)	REACH 1	0.152	*	520 *
* 1S2WS9A (J39)	REACH 1	6.679	*	350 *
* 1S2WS9A (J39)	REACH 1	6.374	*	570 *
* 1S2WS9A (J39)	REACH 1	6.086	*	780 *
* 1S2WS9A (J39)	REACH 1	5.752	*	1010 *
* 1S2WS9A (J39)	REACH 1	5.455	*	1210 *
* 1S2WS9A (J39)	REACH 1	5.222	*	1370 *
* 1S2WS9A (J39)	REACH 1	4.901	*	1300 *
* 1S2WS9A (J39)	REACH 1	4.636	*	1250 *
* 1S2WS9A (J39)	REACH 1	4.349	*	1190 *
* 1S2WS9A (J39)	REACH 2	4.055	*	1130 *
* 1S2WS9A (J39)	REACH 2	3.881	*	3500 *
* 1S2WS9A (J39)	REACH 2	3.516	*	3780 *
* 1S2WS9A (J39)	REACH 2	3.313	*	3940 *
* 1S2WS9A (J39)	REACH 2	3.065	*	4140 *
* 1S2WS9A (J39)	REACH 2	2.751	*	4390 *
* 1S2WS9A (J39)	REACH 2	2.508	*	4330 *
* 1S2WS9A (J39)	REACH 2	2.214	*	4270 *
* 1S2WS9A (J39)	REACH 2	1.959	*	4210 *
* 1S2WS9A (J39)	REACH 2	1.725	*	4160 *
* 1S2WS9A (J39)	REACH 2	1.367	*	4080 *
* 1S2WS9A (J39)	REACH 2	1.157	*	4040 *
* 1S2WS9A (J39)	REACH 2	0.913	*	3980 *
* 1S2WS9A (J39)	REACH 2	0.747	*	3950 *
* 1S2WS22 (J20)	REACH 1	1.136	*	700 *
* 1S2WS22 (J20)	REACH 1	0.836	*	860 *
* 1S2WS22 (J20)	REACH 1	0.582	*	990 *
* 1S2WS22 (J20)	REACH 2	0.366	*	1390 *
* 1S2WS22 (J20)	REACH 2	0.154	*	1970 *

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1S2WS27 (J16)	REACH 1	PF 1	Normal S = 0.0103	
1S2WS9A (J39)	REACH 1	PF 1	Normal S = 0.0073	
1S2WS9A (J39)	REACH 2	PF 1		Normal S = 0.0073
1S2WS22 (J20)	REACH 1	PF 1	Normal S = 0.0058	

GEOMETRY DATA

Geometry Title: 1S2WS9A (J39)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9A (J39)\1S2WS9A_J39.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
1S2WS27 (J16)	REACH 1		JCT 2
1S2WS9A (J39)	REACH 1		JCT 1
1S2WS9A (J39)	REACH 2	JCT 1	
1S2WS22 (J20)	REACH 1		JCT 2
1S2WS22 (J20)	REACH 2	JCT 2	JCT 1

JUNCTION INFORMATION

Name: JCT 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
1S2WS9A (J39)	REACH 1	to 1S2WS9A (J39)	REACH 2	1552	
1S2WS22 (J20)	REACH 2	to 1S2WS9A (J39)	REACH 2	813	

Name: JCT 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
1S2WS22 (J20)	REACH 1	to 1S2WS22 (J20)	REACH 2	1140	
1S2WS27 (J16)	REACH 1	to 1S2WS22 (J20)	REACH 2	803	

CROSS SECTION

RIVER: 1S2WS27 (J16)
REACH: REACH 1 RS: 0.550

INPUT
Description: Downstream of Rainbow Valley Road.
Limit of Sudy.
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9734.08	1039.17	9743.3	1039.01	9774.26	1037.9	9783.11	1037.58	9784.68	1037.56
9785.98	1037.53	9787.05	1037.53	9788.13	1037.56	9790.46	1037.61	9790.77	1037.6
9797.9	1037.43	9810.91	1037.44	9852.29	1037.46	9906.03	1037.55	9906.68	1037.55
9906.94	1037.55	9961.07	1037.6	9965.82	1037.62	9979.73	1037.68	9980.72	1037.68
9981.43	1037.69	9986.24	1037.73	9990.74	1037.76	9994.91	1037.79	9997.76	1037.81
10000	1037.82	10000.5	1037.82	10009.44	1037.84	10015.47	1037.85	10021.5	1037.88
10023.16	1037.91	10059.28	1038.77	10069.85	1038.92	10096.26	1039.29	10124.24	1039.69
10161.62	1040.02	10178.63	1040.18	10191.37	1040.27	10233.02	1040.5	10286.49	1040.6
10287.41	1040.6	10288.65	1040.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9734.08	.045	9743.3	.038	10096.26	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9743.3	10096.26	940	964	940	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1038.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.038	
W.S. Elev (ft)	1038.25	Reach Len. (ft)	940.00	964.00	940.00
Crit W.S. (ft)	1038.18	Flow Area (sq ft)		171.61	
E.G. Slope (ft/ft)	0.017455	Area (sq ft)		171.61	
Q Total (cfs)	650.00	Flow (cfs)		650.00	
Top Width (ft)	273.35	Top Width (ft)		273.35	
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)		3.79	
Max Chl Dpth (ft)	0.82	Hydr. Depth (ft)		0.63	
Conv. Total (cfs)	4919.9	Conv. (cfs)		4919.9	
Length Wtd. (ft)	964.00	Wetted Per. (ft)		273.37	
Min Ch El (ft)	1037.43	Shear (lb/sq ft)		0.68	
Alpha	1.00	Stream Power (lb/ft s)		2.59	
Frctn Loss (ft)	8.76	Cum Volume (acre-ft)	0.07	11.52	0.54
C & E Loss (ft)	0.02	Cum SA (acres)		7.66	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS27 (J16)
REACH: REACH 1 RS: 0.367

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9693.26	1030.85	9718.99	1030.87	9740.75	1030.87	9766.1	1031	9795.83	1031.1
9821.36	1030.95	9850.91	1030.86	9885.33	1030.37	9899.46	1030.14	9905.86	1029.93
9908.71	1029.83	9912.38	1029.63	9922.47	1029.14	9943.66	1028.2	9996.44	1027.56
10000	1027.52	10000.43	1027.51	10001.34	1027.54	10021.25	1028.13	10071.22	1029.71
10123.78	1030.35	10126.3	1030.38	10128.46	1030.41	10181.38	1030.93	10230.82	1031.32
10236.45	1031.37	10243.01	1031.41	10291.53	1031.61				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9693.26	.045	9850.91	.038	10071.22	.045

```
Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9850.9110071.22              1090    1138    1130            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1029.70  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.               *           *    0.038  *          *
* W.S. Elev (ft)          * 1029.54  * Reach Len. (ft)          * 1090.00   * 1138.00  * 1130.00   *
* Crit W.S. (ft)          * 1029.01  * Flow Area (sq ft)        *           *   182.71  *          *
* E.G. Slope (ft/ft)      *0.005318  * Area (sq ft)             *           *   182.71  *          *
* Q Total (cfs)           *  590.00  * Flow (cfs)               *           *   590.00  *          *
* Top Width (ft)          *  151.54  * Top Width (ft)           *           *   151.54  *          *
* Vel Total (ft/s)        *    3.23  * Avg. Vel. (ft/s)          *           *     3.23  *          *
* Max Chl Dpth (ft)       *    2.03  * Hydr. Depth (ft)          *           *     1.21  *          *
* Conv. Total (cfs)       *  8090.8  * Conv. (cfs)               *           *   8090.8  *          *
* Length Wtd. (ft)        * 1138.00  * Wetted Per. (ft)          *           *   151.61  *          *
* Min Ch El (ft)          * 1027.51  * Shear (lb/sq ft)          *           *     0.40  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *           *     1.29  *          *
* Frctn Loss (ft)         *   10.24  * Cum Volume (acre-ft)      *    0.07   *     7.60  *    0.54  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)            *           *     2.95  *          *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS27 (J16)
REACH: REACH 1            RS: 0.152

INPUT
Description:
Station Elevation Data     num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9814.65 1023.46 9827.95 1023.41 9848.07 1023.05 9877.97 1022.59 9899.82    1022
    9928 1021.23 9984.46 1017.57 9989.49 1017.24 9998.84 1016.61   10000 1016.66
10015.33  1017.410078.08  1021.110106.79 1021.6910128.11 1022.2410158.53 1022.88
10178.14 1023.4210210.27 1024.0610228.17 1024.3910262.02 1024.7810278.19  1024.9
10313.76 1024.8710328.22 1024.83 10365.5 1024.4710378.25 1024.33

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9814.65    .045    9928    .03810078.08    .045

Bank Sta: Left   Right     Coeff Contr.   Expan.
         992810078.08              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1019.42  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.58  * Wt. n-Val.               *           *    0.038  *          *
* W.S. Elev (ft)          * 1018.83  * Reach Len. (ft)          *  803.00   *  803.00   *  803.00   *
* Crit W.S. (ft)          * 1018.83  * Flow Area (sq ft)        *           *   84.83   *          *
* E.G. Slope (ft/ft)      *0.020760  * Area (sq ft)             *           *   84.83   *          *
* Q Total (cfs)           *  520.00  * Flow (cfs)               *           *  520.00   *          *
* Top Width (ft)          *   74.61  * Top Width (ft)           *           *   74.61   *          *
* Vel Total (ft/s)        *    6.13  * Avg. Vel. (ft/s)          *           *    6.13   *          *
* Max Chl Dpth (ft)       *    2.22  * Hydr. Depth (ft)          *           *    1.14   *          *
* Conv. Total (cfs)       *  3609.0  * Conv. (cfs)               *           *  3609.0   *          *
* Length Wtd. (ft)        *  803.00  * Wetted Per. (ft)          *           *   74.75   *          *
* Min Ch El (ft)          * 1016.61  * Shear (lb/sq ft)          *           *    1.47   *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *           *    9.02   *          *
* Frctn Loss (ft)         *    2.47  * Cum Volume (acre-ft)      *    0.07   *    4.10   *    0.54  *
* C & E Loss (ft)         *    0.12  * Cum SA (acres)            *           *           *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
```

is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 1 RS: 6.679

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9462.4	1120	9503.99	1119.81	9546.1	1119.05	9556.32	1119.04	9557.12	1119.03
9558.41	1119.05	9560.18	1119.09	9562.59	1119.12	9566.05	1119.16	9571.39	1119.22
9585.57	1119.4	9586.5	1119.4	9592.02	1119.4	9646.72	1118.45	9654	1118.41
9661.18	1118.37	9704	1118.29	9710.88	1118.27	9754	1117.96	9760.57	1117.94
9804	1117.81	9847.96	1117.81	9854.04	1117.81	9856.54	1117.86	9857.84	1117.86
9860.1	1117.83	9866.31	1117.81	9879.39	1117.89	9920.04	1118	9948.58	1118.11
9954	1118.13	9964.9	1117.76	10000	1115.91	10000.02	1115.91	10039.67	1117.77
10054.12	1118.41	10063.45	1118.42	10104.23	1118.54	10117.11	1118.59	10154.34	1118.71
10170.78	1118.77	10204.45	1118.91	10224.45	1118.98	10254.56	1119.08		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9462.4	.045	9954	.038	10063.45	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9954 10063.45 1530 1607 1530 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9462.4	9953.21	1119	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1118.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.045	0.038	
W.S. Elev (ft)	1118.28	Reach Len. (ft)	1530.00	1607.00	1530.00
Crit W.S. (ft)	1117.71	Flow Area (sq ft)	0.12	114.69	
E.G. Slope (ft/ft)	0.004905	Area (sq ft)	82.92	114.69	
Q Total (cfs)	350.00	Flow (cfs)	0.08	349.92	
Top Width (ft)	344.64	Top Width (ft)	247.23	97.41	
Vel Total (ft/s)	3.05	Avg. Vel. (ft/s)	0.66	3.05	
Max Chl Dpth (ft)	2.37	Hydr. Depth (ft)	0.15	1.18	
Conv. Total (cfs)	4997.7	Conv. (cfs)	1.1	4996.5	
Length Wtd. (ft)	1606.99	Wetted Per. (ft)	0.79	97.52	
Min Ch El (ft)	1115.91	Shear (lb/sq ft)	0.05	0.36	
Alpha	1.00	Stream Power (lb/ft s)	0.03	1.10	
Frctn Loss (ft)	15.95	Cum Volume (acre-ft)	3.75	83.88	0.21
C & E Loss (ft)	0.04	Cum SA (acres)	7.98	69.10	1.88

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 1 RS: 6.374

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9264.39	1104	9283.02	1103.92	9308.97	1103.8	9334.83	1103.68	9359	1103.56
9414.79	1103.22	9428.28	1103.04	9435.38	1103.17	9459.06	1103.27	9490.28	1103.32
9509.09	1103.33	9542.1	1103.5	9559.12	1103.56	9593.91	1103.75	9609.15	1103.86
9645.73	1104.03	9659.18	1104.02	9697.55	1104.05	9709.21	1104.01	9749.36	1103.65
9759.24	1103.61	9801.18	1103.36	9809.27	1103.35	9853	1103.06	9859.3	1103.02
9904.81	1102.26	9909.33	1102.25	9956.63	1101.91	9959.36	1101.89	9964.42	1101.64
9966.35	1101.52	9971.36	1101.23	9997.83	1099.64	10000	1099.74	10028.74	1101.11

```
10043.39 1101.8110059.91 1102.6510067.74 1102.7810110.36 1103.3610125.99 1103.56
10160.81 1103.9710184.24 1104.1610211.25 1104.3810242.49 1104.31 10261.7 1104.37
10300.74 1104.3810312.14 1104.3910358.99  1104.510362.59 1104.51 10385.9 1104.58
10413.04 1104.6510417.23 1104.6610463.48 1104.7710475.48 1104.81

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9264.39    .045 9956.63    .03810059.91    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9956.6310059.91               1450    1524    1490             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1102.45  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.50  * Wt. n-Val.               *   0.045  *   0.038  *         *
* W.S. Elev (ft)          * 1101.95  * Reach Len. (ft)          * 1450.00  * 1524.00  * 1490.00  *
* Crit W.S. (ft)          * 1101.88  * Flow Area (sq ft)        *    0.08  *  100.40  *         *
* E.G. Slope (ft/ft)      *0.018092  * Area (sq ft)             *    0.08  *  100.40  *         *
* Q Total (cfs)           *  570.00  * Flow (cfs)               *    0.02  *  569.98  *         *
* Top Width (ft)          *   94.23  * Top Width (ft)            *    4.82  *   89.41  *         *
* Vel Total (ft/s)        *    5.67  * Avg. Vel. (ft/s)          *    0.30  *    5.68  *         *
* Max Chl Dpth (ft)       *    2.30  * Hydr. Depth (ft)          *    0.02  *    1.12  *         *
* Conv. Total (cfs)       *  4237.8  * Conv. (cfs)               *     0.2  *  4237.6  *         *
* Length Wtd. (ft)        * 1524.00  * Wetted Per. (ft)          *    4.82  *   89.53  *         *
* Min Ch El (ft)          * 1099.64  * Shear (lb/sq ft)          *    0.02  *    1.27  *         *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *    0.01  *    7.19  *         *
* Frctn Loss (ft)         *   14.62  * Cum Volume (acre-ft)      *    2.29  *   79.92  *    0.21  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)            *    3.55  *   65.65  *    1.88  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS9A (J39)
REACH: REACH 1              RS: 6.086

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9656.09 1093.33 9665.11  1093.4 9667.01  1093.4 9709.22 1093.36 9717.54 1093.35
 9753.33 1093.09 9768.07 1093.08 9797.44 1092.33 9818.59 1092.05 9841.55 1091.29
 9869.12 1090.21 9885.66 1089.63 9919.65 1088.77 9932.61 1087.69 9933.78 1087.56
 9935.48 1087.32 9937.72 1086.97 9940.57 1086.54 9950.45 1085.19 9965.17 1085.12
 9991.61 1084.47   10000 1085.4310012.05  1086.810016.87 1087.32 10020.7 1087.61
 10062.1 1087.6910071.22 1087.7710106.21 1088.0910121.75    108810150.32 1087.95
10172.28 1088.0510194.43 1088.12 10222.8 1088.2510238.54 1088.3310273.33 1088.54
10282.65 1088.5910323.85 1088.8510326.76 1088.8710346.74 1088.9810370.87 1089.12
10374.38 1089.1410414.98 1089.3210424.91 1089.3610459.09 1089.4810475.43 1089.53
 10503.2 1089.6210525.96 1089.6910547.31 1089.7710576.48 1089.8610591.42 1089.91

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9656.09    .045 9932.61    .038 10020.7    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9932.61 10020.7               1745    1762    1710             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1087.80  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.37  * Wt. n-Val.               *          *   0.038  *         *
* W.S. Elev (ft)          * 1087.42  * Reach Len. (ft)          * 1745.00  * 1762.00  * 1710.00  *
* Crit W.S. (ft)          * 1086.80  * Flow Area (sq ft)        *          *  159.18  *         *
* E.G. Slope (ft/ft)      *0.006677  * Area (sq ft)             *          *  159.18  *         *
* Q Total (cfs)           *  780.00  * Flow (cfs)               *          *  780.00  *         *
* Top Width (ft)          *   83.49  * Top Width (ft)            *          *   83.49  *         *
* Vel Total (ft/s)        *    4.90  * Avg. Vel. (ft/s)          *          *    4.90  *         *
* Max Chl Dpth (ft)       *    2.95  * Hydr. Depth (ft)          *          *    1.91  *         *
```

```
* Conv. Total (cfs)       *  9546.0  * Conv. (cfs)              *          *  9546.0  *          *
* Length Wtd. (ft)        * 1762.00  * Wetted Per. (ft)         *          *   83.82  *          *
* Min Ch El (ft)          * 1084.47  * Shear (lb/sq ft)         *          *    0.79  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.88  *          *
* Frctn Loss (ft)         *   14.90  * Cum Volume (acre-ft)     *    2.29  *   75.38  *    0.21  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *    3.47  *   62.63  *    1.88  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 1 RS: 5.752

INPUT
Description:
Station Elevation Data num= 46

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9585.72 1073.31 9589.98 1073.31 9599.16 1073.31  9617.8 1073.32  9636.5 1073.33
 9645.71 1073.33 9673.85 1073.33 9701.44 1073.34  9711.2 1073.33 9731.02 1073.32
 9748.54 1073.31 9757.16 1073.31 9785.89 1073.25 9812.89 1073.22 9823.24 1073.16
 9844.25 1073.07 9860.58 1072.99 9868.62 1072.94 9897.93 1072.57 9924.35 1072.31
 9938.48 1071.39 9947.26 1071.12 9968.67 1070.32 9991.76 1069.31 9999.37 1069.64
   10000 1069.6910002.75 1069.8910030.06 1071.6710035.44 1072.0110044.44 1072.08
10090.61 1072.4310130.94 1072.7510145.78 1072.8610162.77 1072.9610200.95 1073.18
 10234.3  1073.310256.11 1073.3710281.09  1073.410301.68 1073.4210311.28 1073.44
10337.65 1073.4510366.45 1073.4610399.41 1073.4610421.62 1073.4710441.01 1073.49
10476.78 1073.51
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9585.72    .045 9868.62    .03810162.77    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9868.6210162.77             1520    1566    1520            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1072.86  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.28  * Wt. n-Val.              *          *    0.038  *          *
* W.S. Elev (ft)          * 1072.58  * Reach Len. (ft)         * 1520.00  * 1566.00  * 1520.00  *
* Crit W.S. (ft)          * 1072.03  * Flow Area (sq ft)       *          *  235.92  *          *
* E.G. Slope (ft/ft)      *0.010372  * Area (sq ft)            *          *  235.92  *          *
* Q Total (cfs)           * 1010.00  * Flow (cfs)              *          * 1010.00  *          *
* Top Width (ft)          *  211.49  * Top Width (ft)          *          *  211.49  *          *
* Vel Total (ft/s)        *    4.28  * Avg. Vel. (ft/s)        *          *    4.28  *          *
* Max Chl Dpth (ft)       *    3.27  * Hydr. Depth (ft)        *          *    1.12  *          *
* Conv. Total (cfs)       *  9917.3  * Conv. (cfs)             *          *  9917.3  *          *
* Length Wtd. (ft)        * 1565.91  * Wetted Per. (ft)        *          *  211.65  *          *
* Min Ch El (ft)          * 1069.31  * Shear (lb/sq ft)        *          *    0.72  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.09  *          *
* Frctn Loss (ft)         *   15.25  * Cum Volume (acre-ft)     *    2.29  *   67.38  *    0.21  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *    3.47  *   56.66  *    1.88  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 1 RS: 5.455

INPUT
Description:
Station Elevation Data num= 74

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
  9230.4  1062.4  9257.7 1062.16 9275.13 1062.02 9309.74 1061.61 9325.17 1061.48
 9361.77 1060.98 9375.21 1060.88 9413.81 1060.25 9425.24 1060.21 9465.84 1059.73
 9475.28 1059.68 9517.88 1059.29 9525.31 1059.24  9532.2 1059.13 9588.73 1058.33
```

```
9592.25 1058.27 9596.28 1058.21 9600.87 1058.14 9607.05 1058.06 9614.25 1057.97
9622.28 1057.79 9625.18 1057.79 9626.21 1057.79 9647.48 1057.96 9663.54 1058.08
9668.15 1058.12 9672.27 1058.15 9673.39 1058.16 9674.11 1058.17 9674.25 1058.17
9674.37 1058.17 9674.64 1058.17 9674.86 1058.17 9676.76 1058.19 9711.48 1059.28
9725.46 1059.72 9726.02 1059.72  9775.5  1060.3 9778.06 1060.25 9825.54  1059.8
9830.09 1059.67 9875.57 1058.65 9886.15  1058.2 9894.01  1057.8 9925.49 1056.24
9953.55 1054.98 9956.97 1054.72 9978.25 1054.48 9984.09 1054.44 9994.13 1054.37
9999.99 1054.3210009.32 1055.0910015.28 1055.57 10016.9 1055.7110019.29 1055.94
10021.01 1056.0610030.33 1056.6610039.51 1057.25 10045.2  1057.210058.67 1057.03
10075.79 1056.9710092.32 1057.0710125.91 1057.2310146.14 1057.3110176.03 1057.39
10199.95 1057.4210226.15 1057.4310253.77 1057.4310276.27 1057.4210307.59 1057.42
10326.38 1057.41 10361.4 1057.42 10376.5 1057.4110415.22 1057.41

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
  9230.4    .045  9775.5    .03810039.51    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9775.510039.51              1235    1234    1185            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1057.60  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.45  * Wt. n-Val.               *          *    0.038 *    0.045 *
* W.S. Elev (ft)          * 1057.15  * Reach Len. (ft)          * 1235.00  * 1234.00 * 1185.00 *
* Crit W.S. (ft)          * 1056.74  * Flow Area (sq ft)        *          *  224.16 *     6.09 *
* E.G. Slope (ft/ft)      *0.009253  * Area (sq ft)             *          *  224.16 *     6.09 *
* Q Total (cfs)           * 1210.00  * Flow (cfs)               *          * 1205.82 *     4.18 *
* Top Width (ft)          *  191.47  * Top Width (ft)            *          *  130.90 *    60.57 *
* Vel Total (ft/s)        *    5.26  * Avg. Vel. (ft/s)          *          *    5.38 *     0.69 *
* Max Chl Dpth (ft)       *    2.83  * Hydr. Depth (ft)          *          *    1.71 *     0.10 *
* Conv. Total (cfs)       * 12579.0  * Conv. (cfs)               *          * 12535.5 *     43.4 *
* Length Wtd. (ft)        * 1233.92  * Wetted Per. (ft)          *          *  131.07 *    60.57 *
* Min Ch El (ft)          * 1054.32  * Shear (lb/sq ft)          *          *    0.99 *     0.06 *
* Alpha                   *    1.04  * Stream Power (lb/ft s)    *          *    5.31 *     0.04 *
* Frctn Loss (ft)         *    8.56  * Cum Volume (acre-ft)      *    2.29  *   59.11 *     0.10 *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)            *    3.47  *   50.51 *     0.82 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS9A (J39)
REACH: REACH 1            RS: 5.222

INPUT
Description: Upstream of Rainbow Valley Road.
Station Elevation Data     num=      41
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 9636.91 1049.82 9670.07 1049.97 9724.85 1049.81  9726.7 1049.81 9728.32 1049.79
 9783.32 1048.94 9834.83 1048.13 9839.95 1048.06 9845.76 1048.02 9896.58 1047.55
 9941.35 1047.33 9949.09  1047.3 9968.68 1047.51 9992.65 1047.62 9997.62 1047.61
   10000 1047.5510003.51 1047.4710036.96 1047.4610051.16 1047.4210053.45 1047.41
10055.27 1047.3910068.33 1047.37 10104.5 1047.5910126.54 1047.7210141.46  1047.8
10184.76 1048.0510239.07 1048.3810242.98  1048.410248.77 1048.44 10301.2  1048.8
10336.67 1049.0510359.42  1049.210393.05 1049.4310417.64 1049.5910434.28  1049.7
10475.86 1049.9810531.88 1050.3710534.08 1050.3810537.32  1050.4 10592.3 1050.73
10629.49 1050.87

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9636.91    .045 9724.85    .03810531.88    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9724.8510531.88             1630    1694    1630            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1048.95  * Element                  *  Left OB *  Channel * Right OB *
```

* Vel Head (ft)	* 0.12	* Wt. n-Val.	*	* 0.038	*	*
* W.S. Elev (ft)	* 1048.82	* Reach Len. (ft)	* 1630.00	* 1694.00	* 1630.00	*
* Crit W.S. (ft)	* 1048.40	* Flow Area (sq ft)	*	* 487.34	*	*
* E.G. Slope (ft/ft)	*0.005542	* Area (sq ft)	*	* 487.34	*	*
* Q Total (cfs)	* 1370.00	* Flow (cfs)	*	* 1370.00	*	*
* Top Width (ft)	* 513.47	* Top Width (ft)	*	* 513.47	*	*
* Vel Total (ft/s)	* 2.81	* Avg. Vel. (ft/s)	*	* 2.81	*	*
* Max Chl Dpth (ft)	* 1.52	* Hydr. Depth (ft)	*	* 0.95	*	*
* Conv. Total (cfs)	* 18403.6	* Conv. (cfs)	*	* 18403.6	*	*
* Length Wtd. (ft)	* 1694.00	* Wetted Per. (ft)	*	* 513.49	*	*
* Min Ch El (ft)	* 1047.30	* Shear (lb/sq ft)	*	* 0.33	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.92	*	*
* Frctn Loss (ft)	* 13.37	* Cum Volume (acre-ft)	* 2.29	* 49.04	* 0.02	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 3.47	* 41.38	*	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 1 RS: 4.901

INPUT
Description: Downstream of Rainbow Valley Road.
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9851.24	1036	9861.53	1035.95	9903.44	1035.88	9926.01	1035.76	9976.97	1033.77
9994.07	1032.89	10000	1032.69	10001.45	1032.65	10002.6	1032.61	10025.56	1033.38
10064.38	1034.55	10112.06	1034.53	10120.35	1034.54	10128.74	1034.57	10176.32	1034.76
10223.33	1034.94	10232.29	1034.96	10241.35	1034.97	10288.26	1035.01	10334.6	1035.08
10344.22	1035.11	10353.97	1035.15	10400.19	1035.34	10445.87	1035.54	10452.72	1035.57
10460.37	1035.56	10495.19	1035.53	10556.95	1036.07	10564.43	1036.18	10568.1	1036.2
10579.2	1036.27	10624.07	1036.55	10668.41	1036.71	10680.04	1036.76		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9851.24	.045	9926.01	.038	10445.87	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9926.01	10445.87	1370	1396	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1035.57	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.21	* Wt. n-Val.	*	* 0.038	*	*
* W.S. Elev (ft)	* 1035.36	* Reach Len. (ft)	* 1370.00	* 1396.00	* 1320.00	*
* Crit W.S. (ft)	* 1035.18	* Flow Area (sq ft)	*	* 357.06	*	*
* E.G. Slope (ft/ft)	*0.012455	* Area (sq ft)	*	* 357.06	*	*
* Q Total (cfs)	* 1300.00	* Flow (cfs)	*	* 1300.00	*	*
* Top Width (ft)	* 468.48	* Top Width (ft)	*	* 468.48	*	*
* Vel Total (ft/s)	* 3.64	* Avg. Vel. (ft/s)	*	* 3.64	*	*
* Max Chl Dpth (ft)	* 2.76	* Hydr. Depth (ft)	*	* 0.76	*	*
* Conv. Total (cfs)	* 11648.6	* Conv. (cfs)	*	* 11648.6	*	*
* Length Wtd. (ft)	* 1394.78	* Wetted Per. (ft)	*	* 468.57	*	*
* Min Ch El (ft)	* 1032.60	* Shear (lb/sq ft)	*	* 0.59	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 2.16	*	*
* Frctn Loss (ft)	* 10.52	* Cum Volume (acre-ft)	* 2.29	* 32.62	* 0.02	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 3.47	* 22.29	*	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 1 RS: 4.636

```
INPUT
Description:
Station Elevation Data     num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9246.83 1027.63 9257.36 1027.54 9309.65 1027.33 9312.16 1027.32 9315.23 1027.33
 9366.95  1027.5 9409.01 1027.43 9421.75 1027.46 9437.42  1027.3 9476.55 1026.73
 9508.37 1026.19 9531.35 1025.82  9559.6 1025.41 9577.93 1025.13 9589.46 1024.75
 9590.87 1024.72 9592.86 1024.68 9597.03  1024.6 9603.84 1024.48 9616.12 1024.24
 9631.28 1023.87 9657.29 1024.12 9691.42 1024.43 9695.74 1024.42 9707.09 1024.38
 9750.54 1024.23 9803.97 1024.07 9805.34 1024.06 9806.45 1024.06 9860.14 1023.92
 9905.81  1023.9 9914.93  1023.9 9918.41  1023.9 9948.63 1023.53 9984.38 1023.11
 9993.07 1022.77   10000 1022.4810003.34 1022.3410012.81 1022.6910065.17 1024.84
10098.74  1025.110102.31 1025.1210169.49 1025.4910172.98 1025.5110240.25 1025.77
10243.65 1025.78   10311 1025.9910314.32    102610355.74 1026.01 10360.1 1026.16
10365.09 1026.3310393.72 1026.4910401.48 1026.5110401.49 1026.51 10401.5 1026.51
10402.33 1026.5110402.47 1026.51 10442.3 1026.5610447.49 1026.5610450.97 1026.57
10451.98 1026.5710454.08 1026.5810455.66 1026.5910523.25 1027.1710526.33 1027.21
   10594 1028.24   10597 1028.2910664.75 1029.0210667.67 1029.03

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9246.83    .045 9691.42    .03810240.25    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9691.4210240.25             1470    1516    1510            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************
* E.G. Elev (ft)         * 1025.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *   0.045  *   0.038  *         *
* W.S. Elev (ft)         * 1024.90  * Reach Len. (ft)         * 1470.00  * 1516.00  * 1510.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   68.86  *  398.21  *         *
* E.G. Slope (ft/ft)     *0.004977  * Area (sq ft)            *   68.86  *  398.21  *         *
* Q Total (cfs)          * 1250.00  * Flow (cfs)              *  119.92  * 1130.08  *         *
* Top Width (ft)         *  488.08  * Top Width (ft)          *  106.52  *  381.55  *         *
* Vel Total (ft/s)       *    2.68  * Avg. Vel. (ft/s)        *    1.74  *    2.84  *         *
* Max Chl Dpth (ft)      *    2.56  * Hydr. Depth (ft)        *    0.65  *    1.04  *         *
* Conv. Total (cfs)      * 17718.7  * Conv. (cfs)             *  1699.8  * 16018.9  *         *
* Length Wtd. (ft)       * 1513.74  * Wetted Per. (ft)        *  106.54  *  381.62  *         *
* Min Ch El (ft)         * 1022.34  * Shear (lb/sq ft)        *    0.20  *    0.32  *         *
* Alpha                  *    1.06  * Stream Power (lb/ft s)   *    0.35  *    0.92  *         *
* Frctn Loss (ft)        *   12.93  * Cum Volume (acre-ft)    *    1.21  *   20.52  *    0.02 *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)           *    1.80  *    8.67  *         *
*************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS9A (J39)
REACH: REACH 1             RS: 4.349

INPUT
Description:
Station Elevation Data     num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9625.85 1017.37 9631.63 1017.46 9664.71 1017.84 9689.92 1017.77 9716.45 1017.14
 9724.03 1017.04  9729.2 1017.05 9735.79 1017.07 9743.55 1017.06 9751.84 1016.97
 9755.53 1016.93 9764.62 1016.74 9772.91 1016.52 9780.91 1016.26 9788.77 1015.96
 9797.18 1015.75 9805.26 1015.41  9809.7 1015.14  9814.1 1014.87 9818.53 1014.69
 9820.43 1014.67 9822.34 1014.68 9824.25 1014.64 9826.77 1014.35 9829.26 1013.98
 9831.71 1013.91 9833.16 1014.13  9834.6 1014.45 9844.71 1014.17 9846.28 1014.38
  9847.5 1014.42 9848.72  1014.4 9849.88 1014.39 9853.02 1014.41 9912.16 1013.09
 9916.98 1012.92 9928.04 1012.15 9981.92 1008.98   10000 1008.7610004.55 1008.71
10005.05 1008.7210005.31  1008.710011.04 1008.9710071.74 1011.8610101.48 1012.04
 10124.7 1012.1810137.16 1012.3310177.66  1012.810218.54  1013.510230.62  1013.7
10253.16  1014.110283.58 1014.5410299.91 1014.6810336.54 1015.08
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val      Sta   n Val
*********************************************
 9625.85    .045 9916.98    .03810071.74    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9916.9810071.74            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1012.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.75  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)          * 1011.28  * Reach Len. (ft)         * 1552.00  * 1552.00 * 1552.00  *
* Crit W.S. (ft)          * 1011.28  * Flow Area (sq ft)       *          *   171.64 *          *
* E.G. Slope (ft/ft)      *0.018796  * Area (sq ft)            *          *   171.64 *          *
* Q Total (cfs)           * 1190.00  * Flow (cfs)              *          *  1190.00 *          *
* Top Width (ft)          *  116.58  * Top Width (ft)          *          *   116.58 *          *
* Vel Total (ft/s)        *    6.93  * Avg. Vel. (ft/s)         *          *     6.93 *          *
* Max Chl Dpth (ft)       *    2.58  * Hydr. Depth (ft)         *          *     1.47 *          *
* Conv. Total (cfs)       *  8679.9  * Conv. (cfs)              *          *   8679.9 *          *
* Length Wtd. (ft)        * 1552.00  * Wetted Per. (ft)         *          *   116.71 *          *
* Min Ch El (ft)          * 1008.70  * Shear (lb/sq ft)         *          *     1.73 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    11.96 *          *
* Frctn Loss (ft)         *    6.95  * Cum Volume (acre-ft)     *    0.05  *    10.60 *    0.02  *
* C & E Loss (ft)         *    0.19  * Cum SA (acres)           *          *          *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS9A (J39)
REACH: REACH 2            RS: 4.055

INPUT
Description:
Station Elevation Data      num=       40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9501.68 1006.93 9506.49 1006.84 9556.44 1006.57 9569.25 1006.42 9609.48 1005.81
    9632 1005.48 9639.17 1005.33 9694.76 1003.86  9721.9 1003.02 9757.52 1001.95
 9777.84 1001.54 9804.63 1000.79 9820.28 1000.44 9869.48  999.41 9883.72  999.11
 9883.88  999.11 9884.07  999.11 9884.27   999.1    9885  999.08 9967.37  995.95
 9969.64  995.85 9976.31  995.73 9997.58  995.73   10000  995.7310009.65  995.73
10011.59  995.7310013.13  995.8410025.45   996.710062.86   999.210085.49  999.82
10109.64 1000.5410160.72 1001.8110176.56 1002.0910235.95 1002.6710243.48 1002.69
10304.11 1002.78 10310.4 1002.7810311.18 1002.7910377.32 1002.9510386.41 1002.99

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val      Sta   n Val
*********************************************
 9501.68    .042 9883.72    .04310062.86    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9883.7210062.86              910     915     910            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  999.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          *  999.44  * Reach Len. (ft)         *  910.00  *  915.00  *  910.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    2.64  *  423.36  *    1.08  *
* E.G. Slope (ft/ft)      *0.001892  * Area (sq ft)            *    2.64  *  423.36  *    1.08  *
* Q Total (cfs)           * 1130.00  * Flow (cfs)              *    1.23  * 1128.36  *    0.41  *
* Top Width (ft)          *  203.89  * Top Width (ft)          *   15.85  *  179.14  *    8.90  *
* Vel Total (ft/s)        *    2.65  * Avg. Vel. (ft/s)         *    0.47  *    2.67  *    0.38  *
* Max Chl Dpth (ft)       *    3.71  * Hydr. Depth (ft)         *    0.17  *    2.36  *    0.12  *
* Conv. Total (cfs)       * 25977.0  * Conv. (cfs)              *    28.3  * 25939.3  *     9.4  *
```

* Length Wtd. (ft)	*	915.00	* Wetted Per. (ft)	*	15.86	*	179.32	*	8.90	*
* Min Ch El (ft)	*	995.73	* Shear (lb/sq ft)	*	0.02	*	0.28	*	0.01	*
* Alpha	*	1.01	* Stream Power (lb/ft s)	*	0.01	*	0.74	*	0.01	*
* Frctn Loss (ft)	*	2.03	* Cum Volume (acre-ft)	*	5.05	*	327.92	*	22.87	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	8.88	*	96.38	*	23.99	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 3.881

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9439.39	1006.32	9443.03	1006.75	9471.71	1007.72	9483.99	1007.81	9511.59	1007.55
9544.8	1007.16	9559.57	1006.82	9605.6	1005.39	9647.44	1003.77	9666.41	1003.3
9709.02	1001.83	9727.21	1001.24	9735.31	1001	9788.02	998.67	9823.17	997.09
9848.82	996.09	9906.45	994.6	9909.63	994.51	9910.2	994.5	9913.27	994.34
9985.77	990.74	9992.79	990.73	10000	990.73	10014.73	990.72	10016.16	990.86
10031.45	992.27	10040.48	993.18	10049.37	993.94	10055.13	994.41	10073.92	996.77
10074.18	996.75	10097.29	995.34	10108.6	994.59	10158.85	992.53	10166.14	992.32
10173.09	992.26	10182.22	992.25	10194.41	992.16	10200.71	992.19	10209.5	992.18
10212.72	992.18	10218.04	991.49	10218.81	991.38	10219.85	991.25	10225.81	990.75
10227.33	990.62	10234.52	990.7	10237.09	990.78	10239.27	991.05	10249.6	992.17
10250.45	992.28	10251.13	992.37	10253.79	992.78	10259.32	992.82	10272.67	992.95
10279.22	992.95	10280.88	992.95	10287.19	992.95	10289.45	992.95	10320.87	994.47
10328.51	994.74	10331.31	994.86	10333.22	994.94	10334.43	995.01	10341.44	995.53
10350.37	996.04	10396.06	998.6	10438.24	1000.21	10456.87	1000.83	10498.73	1001.43
10517.67	1001.72	10526.1	1001.77	10578.48	1002	10613.97	1002.08	10639.28	1002.1

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9439.39	.042	9788.02	.043	10396.06	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9788.02	10396.06	1735	1931	1785	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10073.92	10639.28	998	F

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	997.52	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.23	* Wt. n-Val.	*		*	0.043	*		*
* W.S. Elev (ft)	*	997.28	* Reach Len. (ft)	*	1735.00	*	1931.00	*	1785.00	*
* Crit W.S. (ft)	*	994.96	* Flow Area (sq ft)	*		*	903.05	*		*
* E.G. Slope (ft/ft)	*	0.002336	* Area (sq ft)	*		*	2004.94	*		*
* Q Total (cfs)	*	3500.00	* Flow (cfs)	*		*	3500.00	*		*
* Top Width (ft)	*	553.64	* Top Width (ft)	*		*	553.64	*		*
* Vel Total (ft/s)	*	3.88	* Avg. Vel. (ft/s)	*		*	3.88	*		*
* Max Chl Dpth (ft)	*	6.66	* Hydr. Depth (ft)	*		*	3.54	*		*
* Conv. Total (cfs)	*	72411.8	* Conv. (cfs)	*		*	72411.8	*		*
* Length Wtd. (ft)	*	1930.38	* Wetted Per. (ft)	*		*	255.48	*		*
* Min Ch El (ft)	*	990.62	* Shear (lb/sq ft)	*		*	0.52	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	2.00	*		*
* Frctn Loss (ft)	*	7.50	* Cum Volume (acre-ft)	*	5.02	*	302.42	*	22.86	*
* C & E Loss (ft)	*	0.04	* Cum SA (acres)	*	8.71	*	88.68	*	23.90	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 3.516

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9218.67	997.4	9240.32	997.15	9240.79	997.15	9244.82	997.1	9307.88	996.42
9315.31	996.35	9374.97	995.78	9390.3	995.64	9442.06	995.18	9465.29	994.94
9509.15	994.46	9540.28	994.09	9576.24	993.66	9615.27	993.2	9643.33	992.89
9690.26	992.32	9710.41	992.08	9765.25	991.37	9777.5	991.24	9840.24	990.5
9844.59	990.45	9881.58	989.88	9912.25	989.35	9912.63	989.35	9912.98	989.35
9913.34	989.35	9913.69	989.35	9913.9	989.34	9914.1	989.33	9914.31	989.32
9914.57	989.31	9915.88	989.21	9916.65	989.13	9917.83	989.01	9922.37	988.55
9973.19	984.37	9983.28	982.93	10000	983.83	10012.64	984.51	10013.5	984.55
10018.24	984.76	10034.49	985.76	10084.26	988.51	10094.85	988.72	10134.3	989.29
10170.52	990.52	10190.51	990.54	10210.99	990.29	10222.16	990.11	10246.82	1000.92
10248.74	1001.65	10261.82	1000.1						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9218.67	.042	9912.25	.043	10084.26	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9912.25	10084.26	1000	1069	1000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	989.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.		0.043	0.042
W.S. Elev (ft)	989.31	Reach Len. (ft)	1000.00	1069.00	1000.00
Crit W.S. (ft)		Flow Area (sq ft)		569.65	19.52
E.G. Slope (ft/ft)	0.007244	Area (sq ft)		569.65	19.52
Q Total (cfs)	3780.00	Flow (cfs)		3748.88	31.12
Top Width (ft)	220.40	Top Width (ft)		169.73	50.67
Vel Total (ft/s)	6.42	Avg. Vel. (ft/s)		6.58	1.59
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)		3.36	0.39
Conv. Total (cfs)	44412.8	Conv. (cfs)		44047.1	365.7
Length Wtd. (ft)	1067.52	Wetted Per. (ft)		170.19	50.68
Min Ch El (ft)	982.93	Shear (lb/sq ft)		1.51	0.17
Alpha	1.04	Stream Power (lb/ft s)		9.96	0.28
Frctn Loss (ft)	5.82	Cum Volume (acre-ft)	5.02	245.35	22.46
C & E Loss (ft)	0.09	Cum SA (acres)	8.71	72.65	22.86

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 3.313

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9662.02	984.24	9688.95	984.19	9725.28	984.13	9735.83	984.08	9788.53	983.79
9817.47	983.57	9851.78	983.33	9874.82	981.95	9900.81	981.09	9938.79	980.43
9976.66	978.72	9987.31	978.8	10000	978.73	10020.04	978.81	10049.64	980.64
10095.41	982.66	10106	982.69	10124.52	982.79	10142.64	982.85	10153	982.94
10179.29	983.48	10210.59	984.4	10231.61	984.66	10264.82	985.04	10275.78	984.97
10285.74	987.86	10297.81	990.92	10302.32	992.03				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9662.02	.042	9851.78	.043	10095.41	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9851.78	10095.41	1200	1313	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	984.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.36	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	983.71	Reach Len. (ft)	1200.00	1313.00	1300.00
Crit W.S. (ft)	982.45	Flow Area (sq ft)	10.08	776.31	67.31
E.G. Slope (ft/ft)	0.004296	Area (sq ft)	10.08	776.31	67.31
Q Total (cfs)	3940.00	Flow (cfs)	7.79	3805.14	127.08
Top Width (ft)	387.65	Top Width (ft)	52.40	243.63	91.62
Vel Total (ft/s)	4.62	Avg. Vel. (ft/s)	0.77	4.90	1.89
Max Chl Dpth (ft)	4.99	Hydr. Depth (ft)	0.19	3.19	0.73
Conv. Total (cfs)	60115.2	Conv. (cfs)	118.8	58057.4	1938.9
Length Wtd. (ft)	1310.07	Wetted Per. (ft)	52.40	243.83	91.63
Min Ch El (ft)	978.72	Shear (lb/sq ft)	0.05	0.85	0.20
Alpha	1.09	Stream Power (lb/ft s)	0.04	4.19	0.37
Frctn Loss (ft)	6.11	Cum Volume (acre-ft)	4.90	228.84	21.46
C & E Loss (ft)	0.01	Cum SA (acres)	8.11	67.58	21.23

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 3.065

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9491.45	979.97	9498.67	979.96	9536.34	979.84	9563.54	979.7	9590.55	979.57
9627.96	979.31	9644.77	979.16	9656.92	979.04	9698.99	978.63	9750.29	978.07
9753.21	978.04	9757.25	977.99	9807.43	977.4	9843.67	976.94	9861.65	976.7
9886.54	976.39	9915.87	976.05	9975.78	972.43	9982.11	971.78	9990.25	971.9
10000	971.9	10015.46	972.03	10019.5	972.16	10029.74	972.51	10042.24	973.59
10045.62	973.76	10052.17	974.31	10057.95	974.49	10062.77	974.85	10068.68	975.14
10070.9	975.18	10086.41	975.7	10086.73	975.7	10088.44	975.78	10090.9	975.84
10092.01	975.86	10103.25	976.12	10109.48	976.28	10144.19	977.01	10153.91	977.22
10161.44	977.25	10169.67	977.24	10176.24	977.4	10177.1	977.3	10178.25	977.26
10178.39	977.27	10178.53	977.28	10186.59	977.34	10188.04	977.45	10193.11	977.62
10196.61	977.75	10200.09	977.89	10203.18	978.11	10208.69	978.46	10225.51	978.16
10229.2	978.29	10236.84	977.84	10238.93	977.87	10245.54	977.71	10246.24	977.71
10249.93	977.68	10252.96	977.82	10253.44	977.82	10260.63	978.03	10269.94	978.07
10287.17	979.06	10297.98	979.26	10306.83	979.44	10316.8	979.7	10324.18	979.91
10329.85	980.06	10333.38	980.12	10382.54	982.47	10382.57	982.47	10382.59	982.47
10382.61	982.47	10382.63	982.48	10382.84	982.48	10441.94	983.78	10475.71	984.29
10501.27	984.55	10546.5	984.99	10561.16	984.93	10561.99	984.95	10562.77	984.96
10568.58	985.23								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9491.45	.042	9915.87	.043	10144.19	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9915.87	10144.19	1620	1657	1715	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	977.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.43	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	977.53	Reach Len. (ft)	1620.00	1657.00	1715.00
Crit W.S. (ft)	976.35	Flow Area (sq ft)	89.40	735.84	12.53
E.G. Slope (ft/ft)	0.005055	Area (sq ft)	89.40	735.84	12.53
Q Total (cfs)	4140.00	Flow (cfs)	185.36	3941.43	13.20
Top Width (ft)	393.98	Top Width (ft)	119.45	228.32	46.22
Vel Total (ft/s)	4.94	Avg. Vel. (ft/s)	2.07	5.36	1.05
Max Chl Dpth (ft)	5.75	Hydr. Depth (ft)	0.75	3.22	0.27
Conv. Total (cfs)	58229.1	Conv. (cfs)	2607.2	55436.3	185.7
Length Wtd. (ft)	1656.49	Wetted Per. (ft)	119.46	228.59	46.23
Min Ch El (ft)	971.78	Shear (lb/sq ft)	0.24	1.02	0.09
Alpha	1.13	Stream Power (lb/ft s)	0.49	5.44	0.09
Frctn Loss (ft)	9.14	Cum Volume (acre-ft)	3.53	206.05	20.27
C & E Loss (ft)	0.01	Cum SA (acres)	5.74	60.46	19.17

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 2.751

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9421.75	973.81	9421.99	973.81	9441.42	973.64	9462.94	973.42	9468.58	973.38
9503.9	972.97	9520.27	972.79	9544.85	972.42	9571.96	972.05	9585.81	971.76
9623.65	971.08	9626.76	970.99	9638.65	970.7	9667.72	969.98	9675.34	969.81
9708.68	968.86	9727.03	968.35	9749.63	967.94	9778.71	967.21	9828.46	966.7
9831.27	966.67	9832.33	966.65	9867.06	966.03	9868.25	966.01	9884.92	966.29
9894.63	966.47	9900.23	966.55	9940.39	965.74	9951.27	965.23	9981.1	963.7
9983.42	963.72	10000	963.71	10017.94	963.69	10027.23	964.32	10057.14	965.76
10086	967.69	10098.06	967.77	10136.04	967.95	10150.04	968.04	10186.07	968.25
10202.01	968.37	10236.11	968.63	10253.98	968.71	10286.14	968.91		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9421.75	.042	9778.71	.043	10086	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9778.71	10086	1350	1282	1070	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	968.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	968.41	Reach Len. (ft)	1350.00	1282.00	1070.00
Crit W.S. (ft)	967.57	Flow Area (sq ft)	30.14	824.98	45.71
E.G. Slope (ft/ft)	0.006012	Area (sq ft)	30.14	824.98	45.71
Q Total (cfs)	4390.00	Flow (cfs)	56.25	4268.13	65.61
Top Width (ft)	481.79	Top Width (ft)	53.71	307.29	120.79
Vel Total (ft/s)	4.87	Avg. Vel. (ft/s)	1.87	5.17	1.44
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)	0.56	2.68	0.38
Conv. Total (cfs)	56617.2	Conv. (cfs)	725.5	55045.5	846.2
Length Wtd. (ft)	1253.73	Wetted Per. (ft)	53.72	307.48	120.79
Min Ch El (ft)	963.69	Shear (lb/sq ft)	0.21	1.01	0.14
Alpha	1.10	Stream Power (lb/ft s)	0.39	5.21	0.20
Frctn Loss (ft)	5.92	Cum Volume (acre-ft)	1.31	176.36	19.13
C & E Loss (ft)	0.01	Cum SA (acres)	2.52	50.28	15.88

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 2.508

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9389.05	963.74	9425.3	963.78	9425.82	963.78	9427.37	963.78	9488.32	963.86
9508.63	963.88	9550.82	963.92	9591.97	963.97	9613.32	963.99	9675.3	964.05
9675.82	964.05	9677.37	964.05	9738.32	964.08	9758.63	964.1	9800.82	964.11
9841.97	964.11	9863.32	964.1	9925.3	963.41	9925.6	963.41	9926.44	963.32
9980.19	956.74	10000	956.73	10011.1	956.71	10018.19	956.71	10022.93	956.97
10072.99	960.01	10098.63	959.87	10140.07	960.17	10153.03	960.32	10162.75	960.44
10207.43	960.95	10257.96	961.57	10261.83	961.62	10266.99	961.68	10316.23	962.17
10353.17	962.42	10370.63	962.56	10393.9	962.68	10425.03	962.84	10448.37	962.99
10479.43	963.17	10520.82	963.54	10533.83	963.68	10543.58	963.82		

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9389.05    .042 9863.32    .04310072.99    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9863.3210072.99             1430    1553    1600            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  962.89  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.38  * Wt. n-Val.              *          *    0.043 *    0.042 *
* W.S. Elev (ft)          *  962.51  * Reach Len. (ft)         * 1430.00  * 1553.00  * 1600.00  *
* Crit W.S. (ft)          *  961.40  * Flow Area (sq ft)       *          *  583.74  *  408.31  *
* E.G. Slope (ft/ft)      *0.003798  * Area (sq ft)            *          *  583.74  *  408.31  *
* Q Total (cfs)           * 4330.00  * Flow (cfs)              *          * 3214.88  * 1115.12  *
* Top Width (ft)          *  431.19  * Top Width (ft)          *          *  139.92  *  291.27  *
* Vel Total (ft/s)        *    4.36  * Avg. Vel. (ft/s)        *          *    5.51  *    2.73  *
* Max Chl Dpth (ft)       *    5.80  * Hydr. Depth (ft)        *          *    4.17  *    1.40  *
* Conv. Total (cfs)       * 70256.3  * Conv. (cfs)             *          * 52163.0  * 18093.3  *
* Length Wtd. (ft)        * 1558.71  * Wetted Per. (ft)        *          *  140.38  *  291.28  *
* Min Ch El (ft)          *  956.71  * Shear (lb/sq ft)        *          *    0.99  *    0.33  *
* Alpha                   *    1.28  * Stream Power (lb/ft s)   *          *    5.43  *    0.91  *
* Frctn Loss (ft)         *    8.53  * Cum Volume (acre-ft)     *    0.84  *  155.63  *   13.55  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)           *    1.69  *   43.70  *   10.82  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS9A (J39)
REACH: REACH 2            RS: 2.214

INPUT
Description:
Station Elevation Data      num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9502.97  959.91 9511.95  959.86 9531.03  959.68 9562.13  959.45  9585.8  959.18
  9612.3  958.92 9640.58  958.49 9662.48  958.22 9695.35  957.58 9712.65  957.33
 9750.13  956.63 9762.83  956.35 9804.91   955.5 9813.01  955.33 9859.68  953.86
 9863.18  953.78 9901.38  952.97 9913.36  952.73 9914.88  952.61 9936.71  950.88
 9976.82  947.71   10000  948.0610004.98  948.1510013.52  948.2910029.08  949.47
10064.82   952.410090.65  953.6410115.74  954.8510153.67  956.9510166.65  957.58
 10216.7  959.2110217.57  959.2410221.23   959.310268.48  960.08

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9502.97    .042 9913.36    .04310090.65    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9913.3610090.65             1370    1345    1310            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  954.32  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.80  * Wt. n-Val.              *   0.042  *   0.043  *         *
* W.S. Elev (ft)          *  953.52  * Reach Len. (ft)         * 1370.00  * 1345.00  * 1310.00  *
* Crit W.S. (ft)          *  952.64  * Flow Area (sq ft)       *   15.03  *  589.40  *         *
* E.G. Slope (ft/ft)      *0.008605  * Area (sq ft)            *   15.03  *  589.40  *         *
* Q Total (cfs)           * 4270.00  * Flow (cfs)              *   26.69  * 4243.31  *         *
* Top Width (ft)          *  212.47  * Top Width (ft)          *   37.75  *  174.72  *         *
* Vel Total (ft/s)        *    7.06  * Avg. Vel. (ft/s)        *    1.78  *    7.20  *         *
* Max Chl Dpth (ft)       *    5.81  * Hydr. Depth (ft)        *    0.40  *    3.37  *         *
* Conv. Total (cfs)       * 46031.5  * Conv. (cfs)             *   287.7  * 45743.8  *         *
* Length Wtd. (ft)        * 1345.08  * Wetted Per. (ft)        *   37.76  *  175.11  *         *
* Min Ch El (ft)          *  947.71  * Shear (lb/sq ft)        *    0.21  *    1.81  *         *
* Alpha                   *    1.03  * Stream Power (lb/ft s)   *    0.38  *   13.02  *         *
* Frctn Loss (ft)         *    8.67  * Cum Volume (acre-ft)     *    0.60  *  134.72  *    6.05 *
* C & E Loss (ft)         *    0.09  * Cum SA (acres)           *    1.07  *   38.09  *    5.47 *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 1.959

INPUT
Description:
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9634.28	950.43	9646.67	950.43	9700.53	950.4	9716.35	950.46	9772.32	950.31
9786.03	950.1	9844.11	947.7	9855.7	947.14	9915.9	943.45	9920.71	943.06
9931.67	942.06	9972.37	938.58	10000	938.49	10013.9	938.45	10017.69	938.46
10056.53	943.25	10058.4	943.49	10068.37	944.23	10121.25	946.01	10150.88	947.32
10184.11	948.21	10233.39	948.39	10246.96	948.45	10290.36	948.52	10309.82	948.53
10314.6	948.48	10315.81	948.45	10318.35	948.36	10328.03	948.09	10368.61	947.11
10378.68	947.76	10395.45	948.86	10403.54	949.4				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9634.28	.042	9786.03	.043	10184.11	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9786.03	10184.11	1260	1235	1190	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	945.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.		0.043	
W.S. Elev (ft)	945.05	Reach Len. (ft)	1260.00	1235.00	1190.00
Crit W.S. (ft)		Flow Area (sq ft)		733.44	
E.G. Slope (ft/ft)	0.004993	Area (sq ft)		733.44	
Q Total (cfs)	4210.00	Flow (cfs)		4210.00	
Top Width (ft)	202.87	Top Width (ft)		202.87	
Vel Total (ft/s)	5.74	Avg. Vel. (ft/s)		5.74	
Max Chl Dpth (ft)	6.60	Hydr. Depth (ft)		3.62	
Conv. Total (cfs)	59582.2	Conv. (cfs)		59582.2	
Length Wtd. (ft)	1235.00	Wetted Per. (ft)		203.48	
Min Ch El (ft)	938.45	Shear (lb/sq ft)		1.12	
Alpha	1.00	Stream Power (lb/ft s)		6.45	
Frctn Loss (ft)	5.62	Cum Volume (acre-ft)	0.36	114.29	6.05
C & E Loss (ft)	0.04	Cum SA (acres)	0.48	32.26	5.47

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 1.725

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9686.23	941.15	9691.76	941.2	9735.82	941.55	9747.07	941.64	9759.61	941.64
9802.38	941.45	9840.77	940.58	9857.69	940.25	9876.55	939.69	9913	938.62
9944.3	935.55	9969.62	933.66	9983.99	933.85	10000	934.07	10043.91	934.72
10059.57	935.47	10121.86	938.45	10137.12	939.08	10172.06	940.45	10192.35	941.1
10222.27	942.12	10247.58	942.7	10272.47	943.31	10302.81	943.6	10322.68	943.89
10358.04	943.87	10372.89	943.92						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9686.23	.042	9802.38	.043	10272.47	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9802.38	10272.47	1710	1889	1800	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	939.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.043	
W.S. Elev (ft)	939.53	Reach Len. (ft)	1710.00	1889.00	1800.00
Crit W.S. (ft)	937.73	Flow Area (sq ft)		857.37	
E.G. Slope (ft/ft)	0.004163	Area (sq ft)		857.37	
Q Total (cfs)	4160.00	Flow (cfs)		4160.00	
Top Width (ft)	266.73	Top Width (ft)		266.73	
Vel Total (ft/s)	4.85	Avg. Vel. (ft/s)		4.85	
Max Chl Dpth (ft)	5.87	Hydr. Depth (ft)		3.21	
Conv. Total (cfs)	64472.6	Conv. (cfs)		64472.6	
Length Wtd. (ft)	1889.00	Wetted Per. (ft)		267.08	
Min Ch El (ft)	933.66	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		4.05	
Frctn Loss (ft)	14.48	Cum Volume (acre-ft)	0.36	91.74	6.05
C & E Loss (ft)	0.11	Cum SA (acres)	0.48	25.60	5.47

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 1.367

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9614.74	933.16	9614.92	933.16	9639.75	932.86	9667.07	932.55	9713.86	931.74
9719.22	931.65	9731.94	931.39	9771.36	930.58	9787.96	930.16	9823.51	929.16
9862.07	927.93	9875.66	927.46	9907.94	926.24	9923.27	925.64	9930.57	924.67
9934.73	923.92	9961.54	919.78	9975.82	919.96	10000	920.09	10040.77	920.29
10084.06	924.31	10084.25	924.33	10084.39	924.33	10136.4	924.93		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9614.74	.042	9907.94	.043	10084.06	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9907.94	10084.06	1060	1015	960	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	925.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.46	Wt. n-Val.		0.043	
W.S. Elev (ft)	923.85	Reach Len. (ft)	1060.00	1015.00	960.00
Crit W.S. (ft)	923.85	Flow Area (sq ft)		420.58	
E.G. Slope (ft/ft)	0.018951	Area (sq ft)		420.58	
Q Total (cfs)	4080.00	Flow (cfs)		4080.00	
Top Width (ft)	143.94	Top Width (ft)		143.94	
Vel Total (ft/s)	9.70	Avg. Vel. (ft/s)		9.70	
Max Chl Dpth (ft)	4.07	Hydr. Depth (ft)		2.92	
Conv. Total (cfs)	29637.9	Conv. (cfs)		29637.9	
Length Wtd. (ft)	1013.32	Wetted Per. (ft)		144.42	
Min Ch El (ft)	919.78	Shear (lb/sq ft)		3.45	
Alpha	1.00	Stream Power (lb/ft s)		33.42	
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	0.36	64.03	6.05
C & E Loss (ft)	0.43	Cum SA (acres)	0.48	16.70	5.47

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 1.157

INPUT
Description: Upstream of 3-10' x 7' box culverts which cross Elliot Rd.
Last 2 points added by hand.
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9690.5	923.25	9694.23	923.19	9705.46	922.91	9744.35	921.82	9759.27	921.24
9794.46	919.59	9813.07	918.76	9844.58	917.17	9866.88	916.29	9894.7	915.31
9937.72	913.06	9954.88	911.99	9993.88	911.83	10000	911.81	10046.61	911.68
10062.17	912.37	10095.07	913.59	10120.25	914.91	10145.14	916.15	10167.86	916.9
10195.2	917.95	10215.47	918.08	10245.27	918.31	10500	919.5	10750	921

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9690.5	.042	9813.07	.043	10215.47	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9813.07	10215.47	200	214	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	920.30	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	920.26	Reach Len. (ft)	200.00	214.00	200.00
Crit W.S. (ft)	914.89	Flow Area (sq ft)	24.95	2287.85	454.46
E.G. Slope (ft/ft)	0.000224	Area (sq ft)	24.95	2287.85	454.46
Q Total (cfs)	4040.00	Flow (cfs)	10.99	3771.44	257.57
Top Width (ft)	846.33	Top Width (ft)	32.88	402.40	411.05
Vel Total (ft/s)	1.46	Avg. Vel. (ft/s)	0.44	1.65	0.57
Max Chl Dpth (ft)	8.58	Hydr. Depth (ft)	0.76	5.69	1.11
Conv. Total (cfs)	269643.0	Conv. (cfs)	733.8	251718.1	17191.1
Length Wtd. (ft)	214.00	Wetted Per. (ft)	32.91	402.70	411.05
Min Ch El (ft)	911.68	Shear (lb/sq ft)	0.01	0.08	0.02
Alpha	1.20	Stream Power (lb/ft s)	0.00	0.13	0.01
Frctn Loss (ft)		Cum Volume (acre-ft)	0.06	32.48	1.04
C & E Loss (ft)		Cum SA (acres)	0.08	10.33	0.94

CULVERT

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 1.149

INPUT
Description: 3 - 10' x 7' Box Culverts
Structure 3
Crosses Elliot Rd.
Distance from Upstream XS = 63
Deck/Roadway Width = 28
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9750	920		9843	919.95		10000	918.9	
10065	919.04		10325	919.75		10750	921	

Upstream Bridge Cross Section Data
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9690.5	923.25	9694.23	923.19	9705.46	922.91	9744.35	921.82	9759.27	921.24
9794.46	919.59	9813.07	918.76	9844.58	917.17	9866.88	916.29	9894.7	915.31

```
 9937.72  913.06 9954.88  911.99 9993.88  911.83   10000  911.8110046.61  911.68
10062.17  912.3710095.07  913.5910120.25   914.910145.14  916.1510167.86   916.9
 10195.2  917.9510215.47  918.0810245.27  918.31   10500   919.5   10750     921

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
  9690.5    .042 9813.07    .04310215.47    .042

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9813.0710215.47             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       6
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*********************************************************************
    9750  919.75            9843  919.44           10000  918.36
   10065  918.44           10325  919.65           10750   920.9

Downstream Bridge Cross Section Data
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************************
 9594.01  922.55 9621.27  922.43 9630.78  922.33  9671.5  921.92  9686.3  921.63
 9721.73  920.85 9741.83  920.17 9771.96  919.13 9797.35  917.96 9822.18  917.03
 9852.87  915.76 9872.41  915.06 9915.29   911.8 9955.75  909.27 9957.04  909.28
 9957.84  909.28   10000  909.0610001.33  909.05 10025.2  908.8510053.27   908.9
10076.85  909.3610100.13  908.8910101.24  908.9510124.05  909.9410162.28  911.63
10173.08  911.7310210.72  912.2610223.11  912.4210259.16  912.9210273.13   913.1
 10307.6  913.4210323.16  913.48

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9594.01    .042 9872.41    .043 10307.6    .042

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9872.41 10307.6             .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1          Box       7      10
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 40      70     .011     .011        0                  .5                 1
Number of Barrels =  3
Upstream   Elevation =  908.42
Centerline Stations
    Sta.    Sta.    Sta.
    9989   10000   10011
Downstream Elevation =  907.33
Centerline Stations
    Sta.    Sta.    Sta.
    9989   10000   10011

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
*********************************************************************
* Q Culv Group (cfs)     * 2741.43  * Culv Full Len (ft)     *          *
* # Barrels              *       3  * Culv Vel US (ft/s)     *   13.05  *
* Q Barrel (cfs)         *  913.81  * Culv Vel DS (ft/s)     *   20.94  *
* E.G. US. (ft)          *  920.30  * Culv Inv El Up (ft)    *  908.42  *
* W.S. US. (ft)          *  920.26  * Culv Inv El Dn (ft)    *  907.33  *
* E.G. DS (ft)           *  913.21  * Culv Frctn Ls (ft)     *    0.47  *
* W.S. DS (ft)           *  912.89  * Culv Exit Loss (ft)    *    5.29  *
* Delta EG (ft)          *    7.08  * Culv Entr Loss (ft)    *    1.32  *
* Delta WS (ft)          *    7.37  * Q Weir (cfs)           * 1298.57  *
* E.G. IC (ft)           *  920.30  * Weir Sta Lft (ft)      * 9779.10  *
* E.G. OC (ft)           *  919.58  * Weir Sta Rgt (ft)      *10515.46  *
```

```
* Culvert Control          *   Inlet  * Weir Submerg            *    0.00  *
* Culv WS Inlet (ft)       *  915.42  * Weir Max Depth (ft)     *    1.41  *
* Culv WS Outlet (ft)      *  911.69  * Weir Avg Depth (ft)     *    0.73  *
* Culv Nml Depth (ft)      *    3.39  * Weir Flow Area (sq ft) *  538.15  *
* Culv Crt Depth (ft)      *    6.38  * Min El Weir Flow (ft)  *  918.91  *
*********************************************************************
```

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 1.117

INPUT
Description: Downstream of 3-10' x 7' box culverts which cross Elliot Rd.
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9594.01	922.55	9621.27	922.43	9630.78	922.33	9671.5	921.92	9686.3	921.63
9721.73	920.85	9741.83	920.17	9771.96	919.13	9797.35	917.96	9822.18	917.03
9852.87	915.76	9872.41	915.06	9915.29	911.8	9955.75	909.27	9957.04	909.28
9957.84	909.28	10000	909.06	10001.33	909.05	10025.2	908.85	10053.27	908.9
10076.85	909.36	10100.13	908.89	10101.24	908.95	10124.05	909.94	10162.28	911.63
10173.08	911.73	10210.72	912.26	10223.11	912.42	10259.16	912.92	10273.13	913.1
10307.6	913.42	10323.16	913.48						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9594.01	.042	9872.41	.043	10307.6	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9872.41	10307.6	900	1077	960	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	913.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.043	
W.S. Elev (ft)	912.89	Reach Len. (ft)	900.00	1077.00	960.00
Crit W.S. (ft)	911.62	Flow Area (sq ft)		879.45	
E.G. Slope (ft/ft)	0.005291	Area (sq ft)		879.45	
Q Total (cfs)	4040.00	Flow (cfs)		4040.00	
Top Width (ft)	355.76	Top Width (ft)		355.76	
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)		4.59	
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)		2.47	
Conv. Total (cfs)	55540.5	Conv. (cfs)		55540.5	
Length Wtd. (ft)	1077.00	Wetted Per. (ft)		355.96	
Min Ch El (ft)	908.85	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)		3.75	
Frctn Loss (ft)	9.75	Cum Volume (acre-ft)		24.70	
C & E Loss (ft)	0.11	Cum SA (acres)		8.47	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9A (J39)
REACH: REACH 2 RS: 0.913

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9589.14	918.41	9611.72	918.1	9631.55	917.93	9687.82	917.77	9697.88	917.76
9763.91	917.78	9764.2	917.78	9766.17	917.73	9830.53	916.21	9840.01	915.69
9896.86	911.37	9905.82	910.57	9924.32	906.48	9951.76	899.07	9956.21	897.93
9998.12	898.24	10000	898.25	10046.67	898.89	10051.36	898.94	10053.55	898.98
10055.68	899.21	10078.33	901.68	10110.53	903.78	10115.54	903.83	10120.86	904.08
10161.91	918.85	10168.55	921.14	10180.42	920.91				

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9589.14    .042 9763.91    .04310161.91    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9763.9110161.91              870     876     810            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  903.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.47  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          *  901.88  * Reach Len. (ft)         *  870.00  *  876.00  *  810.00  *
* Crit W.S. (ft)          *  901.88  * Flow Area (sq ft)       *          *  408.79  *          *
* E.G. Slope (ft/ft)      *0.019144  * Area (sq ft)            *          *  408.79  *          *
* Q Total (cfs)           * 3980.00  * Flow (cfs)              *          * 3980.00  *          *
* Top Width (ft)          *  140.01  * Top Width (ft)          *          *  140.01  *          *
* Vel Total (ft/s)        *    9.74  * Avg. Vel. (ft/s)        *          *    9.74  *          *
* Max Chl Dpth (ft)       *    3.95  * Hydr. Depth (ft)        *          *    2.92  *          *
* Conv. Total (cfs)       * 28765.4  * Conv. (cfs)             *          * 28765.4  *          *
* Length Wtd. (ft)        *  876.00  * Wetted Per. (ft)        *          *  140.68  *          *
* Min Ch El (ft)          *  897.93  * Shear (lb/sq ft)        *          *    3.47  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *   33.81  *          *
* Frctn Loss (ft)         *    9.80  * Cum Volume (acre-ft)     *          *    8.77  *          *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)           *          *    2.34  *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S2WS9A (J39)
REACH: REACH 2            RS: 0.747

INPUT
Description:
Station Elevation Data      num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9546.69  909.89 9597.91  909.56 9599.47  909.55 9603.04  909.52 9660.37  909.09
 9685.49  908.92 9721.27  908.58 9773.07  907.87 9782.17  907.72 9802.95  907.35
 9843.07  906.66 9850.28  906.49 9866.52     907 9902.47  908.19 9920.65  902.15
 9955.28  890.79 9962.68   888.4 9973.73  884.91 9983.46  885.07   10000  885.37
10016.95  885.68 10045.1  892.3710065.81  897.6810086.67  898.7810123.39  901.29
10147.57  903.1610202.77  907.3310208.47  907.7510210.97  907.87

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9546.69    .042 9902.47    .04310065.81    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9902.4710065.81              3940    3946    3940            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  893.24  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.13  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          *  892.11  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          *  890.71  * Flow Area (sq ft)       *          *  463.74  *          *
* E.G. Slope (ft/ft)      *0.007303  * Area (sq ft)            *          *  463.74  *          *
* Q Total (cfs)           * 3950.00  * Flow (cfs)              *          * 3950.00  *          *
* Top Width (ft)          *   92.78  * Top Width (ft)          *          *   92.78  *          *
* Vel Total (ft/s)        *    8.52  * Avg. Vel. (ft/s)        *          *    8.52  *          *
* Max Chl Dpth (ft)       *    7.20  * Hydr. Depth (ft)        *          *    5.00  *          *
* Conv. Total (cfs)       * 46223.3  * Conv. (cfs)             *          * 46223.3  *          *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *          *   94.66  *          *
```

```
* Min Ch El (ft)          *  884.91  * Shear (lb/sq ft)        *          *    2.23  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *   19.02  *          *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *          *          *          *
* C & E Loss (ft)         *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************************
```

CROSS SECTION

RIVER: 1S2WS22 (J20)
REACH: REACH 1 RS: 1.136

INPUT
Description: Downstream of Rainbow Valley Road.
Limit of Sudy.
Station Elevation Data num= 52

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9583.13 1036.84 9598.02 1036.85  9623.5 1036.84 9648.95 1036.83 9686.72 1036.71
 9699.89 1036.69 9749.94 1036.38 9750.82 1036.38 9754.48 1036.34 9801.76 1035.79
 9813.17 1035.63  9852.7  1035.1 9876.39 1034.77 9903.63 1034.38 9966.47 1030.81
 9967.46 1030.75 9968.52 1030.75 9999.91 1031.19   10000 1031.1910036.84  1032.7
10040.94 1032.8610043.68 1032.9710047.75 1033.1510049.44 1033.2310050.82 1033.31
10051.57 1033.3510052.25  1033.410052.87 1033.4410054.33 1033.4710066.06 1033.64
10107.37 1033.9710129.28  1034.210158.31 1034.54 10192.5 1034.9210209.24 1035.11
10255.73 1035.5510260.18 1035.5910278.62 1035.6710311.11 1035.8310318.95 1035.83
10362.05  1035.810382.18 1035.7410412.99 1035.62 10445.4 1035.5210463.92 1035.46
10486.82 1035.6510501.63 1035.5610527.58 1035.3910551.27 1035.3210580.37 1035.49
10584.45 1035.5910599.35 1035.67
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9583.13    .045 9903.63    .03810066.06    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9903.6310066.06             1540    1583    1480            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1033.25  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.57  * Wt. n-Val.              *          *    0.038  *          *
* W.S. Elev (ft)          * 1032.68  * Reach Len. (ft)         * 1540.00  * 1583.00  * 1480.00  *
* Crit W.S. (ft)          * 1032.68  * Flow Area (sq ft)       *          *  115.10  *          *
* E.G. Slope (ft/ft)      *0.020773  * Area (sq ft)            *          *  115.10  *          *
* Q Total (cfs)           *  700.00  * Flow (cfs)              *          *  700.00  *          *
* Top Width (ft)          *  102.60  * Top Width (ft)          *          *  102.60  *          *
* Vel Total (ft/s)        *    6.08  * Avg. Vel. (ft/s)         *          *    6.08  *          *
* Max Chl Dpth (ft)       *    1.93  * Hydr. Depth (ft)         *          *    1.12  *          *
* Conv. Total (cfs)       *  4856.8  * Conv. (cfs)              *          *  4856.8  *          *
* Length Wtd. (ft)        * 1582.16  * Wetted Per. (ft)         *          *  102.68  *          *
* Min Ch El (ft)          * 1030.75  * Shear (lb/sq ft)         *          *    1.45  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    8.84  *          *
* Frctn Loss (ft)         *    7.01  * Cum Volume (acre-ft)     *    1.06  *   21.01  *    0.77  *
* C & E Loss (ft)         *    0.14  * Cum SA (acres)           *    1.76  *    8.76  *          *
*****************************************************************************************************
```

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS22 (J20)
REACH: REACH 1 RS: 0.836

INPUT
Description:
Station Elevation Data num= 72

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*****************************************************************************
 9488.86 1033.49 9535.09  1032.5  9547.7 1032.23  9612.1 1031.42 9613.44  1031.4
 9621.28 1031.31 9679.18 1030.62 9689.11 1030.45 9744.92 1029.15 9766.12 1028.64
 9807.34  1025.8 9814.43 1025.44 9825.66 1024.76 9835.22 1024.02 9849.39 1023.05
 9855.96 1022.42 9861.99 1021.93  9863.2 1021.89  9864.4 1021.86 9867.02 1021.78
 9902.12 1021.25 9905.86 1021.19  9908.7 1021.19 9911.52 1021.18 9911.62 1021.18
  9912.5  1021.3 9913.21 1021.24 9915.72 1021.33  9940.7 1020.65 9964.14 1019.32
 9969.75 1019.22 9976.88 1018.98 9979.84 1018.94 9994.11 1018.44 9994.17 1018.44
 9994.22 1018.44 9994.42 1018.43 9995.21 1018.49   10000 1018.8510003.32  1019.1
 10004.8 1019.1510073.62 1022.0810074.16 1022.0810139.36 1023.7210151.17 1023.98
 10205.1 1025.4310228.18 1025.8910270.84 1026.6110305.19 1026.9710336.58 1027.23
10367.86 1027.12 10374.3 1027.0510389.43 1026.7110422.33 1025.9310427.63 1025.85
 10431.8 1025.8810458.05 1027.3910461.42 1027.7110464.55 1028.0110467.46 1028.24
10470.42 1028.3310473.19 1028.3510475.79 1028.3710478.74  1028.410481.53 1028.42
10484.16 1028.4810488.43 1028.7110508.73 1029.5710511.53 1029.5710514.47 1029.57
10517.54 1029.5710528.82 1029.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9488.86    .045 9915.72    .03810073.62    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9915.7210073.62             1250    1345    1230            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1022.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.045  *   0.038  *          *
* W.S. Elev (ft)          * 1022.03  * Reach Len. (ft)         * 1250.00  * 1345.00  * 1230.00  *
* Crit W.S. (ft)          * 1020.87  * Flow Area (sq ft)       *   29.85  *  298.48  *          *
* E.G. Slope (ft/ft)      *0.002142  * Area (sq ft)            *   29.85  *  298.48  *          *
* Q Total (cfs)           *  860.00  * Flow (cfs)              *   30.38  *  829.62  *          *
* Top Width (ft)          *  211.59  * Top Width (ft)          *   54.93  *  156.66  *          *
* Vel Total (ft/s)        *    2.62  * Avg. Vel. (ft/s)        *    1.02  *    2.78  *          *
* Max Chl Dpth (ft)       *    3.60  * Hydr. Depth (ft)        *    0.54  *    1.91  *          *
* Conv. Total (cfs)       * 18582.7  * Conv. (cfs)             *   656.4  * 17926.3  *          *
* Length Wtd. (ft)        * 1343.44  * Wetted Per. (ft)        *   54.95  *  156.81  *          *
* Min Ch El (ft)          * 1018.43  * Shear (lb/sq ft)        *    0.07  *    0.25  *          *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *    0.07  *    0.71  *          *
* Frctn Loss (ft)         *    6.96  * Cum Volume (acre-ft)    *    0.53  *   13.50  *    0.77  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)          *    0.79  *    4.05  *          *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS22 (J20)
REACH: REACH 1            RS: 0.582

INPUT
Description:
Station Elevation Data    num=      33
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************
 9584.89 1019.89 9604.74 1019.56 9623.54 1018.99 9631.01 1018.75 9666.37  1017.7
 9669.53  1017.6 9691.94 1017.86 9721.07 1018.29    9753 1017.84 9759.63 1017.74
 9827.13 1017.32 9827.35 1017.32 9829.75 1017.29 9895.08 1016.59 9901.26 1016.49
 9950.22 1014.15 9957.04 1013.86 9967.06 1013.37 9983.24 1012.48    9992 1011.94
   10000 1011.9210001.01 1011.9210006.11 1012.0410010.26 1012.1710011.74 1012.23
10016.84 1012.4110043.17 1013.9510047.92 1014.2410075.81 1015.9910103.28 1017.07
10122.97 1017.81 10165.2 1019.2110207.74 1020.19

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9584.89    .045 9901.26    .03810103.28    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9901.2610103.28            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1015.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.		0.038	
W.S. Elev (ft)	1014.40	Reach Len. (ft)	1140.00	1140.00	1140.00
Crit W.S. (ft)	1014.40	Flow Area (sq ft)		146.47	
E.G. Slope (ft/ft)	0.019356	Area (sq ft)		146.47	
Q Total (cfs)	990.00	Flow (cfs)		990.00	
Top Width (ft)	105.63	Top Width (ft)		105.63	
Vel Total (ft/s)	6.76	Avg. Vel. (ft/s)		6.76	
Max Chl Dpth (ft)	2.48	Hydr. Depth (ft)		1.39	
Conv. Total (cfs)	7115.9	Conv. (cfs)		7115.9	
Length Wtd. (ft)	1140.00	Wetted Per. (ft)		105.76	
Min Ch El (ft)	1011.92	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)		11.31	
Frctn Loss (ft)	4.48	Cum Volume (acre-ft)	0.11	6.63	0.77
C & E Loss (ft)	0.15	Cum SA (acres)			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S2WS22 (J20)
REACH: REACH 2 RS: 0.366

INPUT
Description:
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9301.77	1023.24	9346.84	1022	9371.36	1021.28	9413.06	1020.21	9447.61	1019.3
9479.29	1018.59	9523.85	1017.82	9545.52	1017.67	9600.1	1017.88	9611.75	1017.96
9676.35	1018.15	9677.98	1018.14	9688.77	1017.96	9744.21	1017.03	9752.59	1016.79
9810.44	1014.49	9828.84	1013.62	9876.66	1011.4	9905.09	1010.28	9942.89	1009.04
9967.51	1006.92	9972.4	1006.43	9980.79	1005.61	9990.16	1004.75	9995.45	1005.01
10000	1005.22	10002.3	1005.34	10007.89	1005.63	10021.75	1006.46	10062.82	1008.5
10089.02	1008.86	10118.03	1009.25	10143.58	1009.61	10173.24	1010.02	10206.91	1010.43
10225.67	1010.56	10227.3	1010.59	10229.21	1010.63	10231.49	1010.65	10234.14	1010.65
10237.95	1010.63	10278.75	1010.79	10284.83	1010.69	10287.69	1010.65	10300.13	1010.39
10303.78	1010.31	10308.18	1010.27	10308.77	1010.31	10321.27	1010.72	10333.39	1011.17
10342.18	1011.48	10374.57	1012.01	10384.24	1012.23	10390.77	1012.38	10409.59	1012.75
10442.69	1013.14	10449.3	1013.21	10455.12	1013.29	10504.51	1013.91	10558.97	1014.59
10559.72	1014.61	10560.58	1014.61	10614.93	1015.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9301.77	.045	9942.89	.038	10062.82	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.89	10062.82	1130	1124	1110	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1009.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1009.77	Reach Len. (ft)	1130.00	1124.00	1110.00
Crit W.S. (ft)		Flow Area (sq ft)	8.03	360.19	58.75
E.G. Slope (ft/ft)	0.002031	Area (sq ft)	8.03	360.19	58.75
Q Total (cfs)	1390.00	Flow (cfs)	6.08	1319.30	64.62
Top Width (ft)	234.53	Top Width (ft)	22.13	119.93	92.47
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)	0.76	3.66	1.10
Max Chl Dpth (ft)	5.02	Hydr. Depth (ft)	0.36	3.00	0.64
Conv. Total (cfs)	30839.5	Conv. (cfs)	134.9	29270.9	1433.7
Length Wtd. (ft)	1123.74	Wetted Per. (ft)	22.14	120.22	92.48
Min Ch El (ft)	1004.75	Shear (lb/sq ft)	0.05	0.38	0.08
Alpha	1.21	Stream Power (lb/ft s)	0.03	1.39	0.09

```
* Frctn Loss (ft)        *    5.73  * Cum Volume (acre-ft)   *    0.13  *   14.51  *    1.83  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)         *    0.29  *    3.31  *    2.28  *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS22 (J20)
REACH: REACH 2            RS: 0.154

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9463.96 1013.97 9472.37 1013.83 9505.05 1013.15 9556.93  1012.2 9563.71 1012.06
 9567.99 1011.98 9622.37 1010.71 9663.61 1009.88 9681.03 1009.46 9708.67  1008.8
 9739.69 1008.04 9759.23 1007.61 9798.34 1006.76 9854.85 1005.53    9857 1005.49
 9860.42 1005.42 9915.66  1004.2  9928.9 1003.93 9983.93  1000.3 9992.78  999.67
 9996.16  999.73   10000  999.7510004.61  999.7710043.77 1001.7310078.72 1003.52
10084.04 1003.5610096.35 1003.6410137.83 1003.9510185.55 1004.1410191.63 1004.17
10200.85 1004.2110232.76 1004.3210244.97 1003.8110247.47 1003.78 10250.3 1003.73
10287.27 1003.4610291.59 1003.3610296.75 1003.2410302.67 1003.0910309.54 1002.95
10317.97 1002.8210329.54 1002.6910345.33 1002.5310354.53 1002.3910362.21 1002.29
10374.03 1002.9910390.98 1003.9910400.65 1004.4510407.52  1004.610412.39 1004.61
10457.64 1006.2410459.14 1006.2710459.55 1006.2910459.93  1006.310460.28 1006.31
10461.03 1006.3510461.69  1006.410462.27 1006.4110471.91  1006.8 10514.4 1007.63
10542.36 1008.2510568.19  1008.810607.43 1009.4910621.98 1009.7310631.56 1009.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9463.96    .045  9928.9    .03810078.72    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9928.910078.72            .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
10224.1410631.56    1006       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1004.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.85  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)         * 1003.32  * Reach Len. (ft)        *  813.00  *  813.00  *  813.00  *
* Crit W.S. (ft)         * 1003.21  * Flow Area (sq ft)      *          *  265.91  *          *
* E.G. Slope (ft/ft)     *0.014793  * Area (sq ft)           *          *  265.91  *   48.64  *
* Q Total (cfs)          * 1970.00  * Flow (cfs)             *          * 1970.00  *          *
* Top Width (ft)         *  222.67  * Top Width (ft)          *          *  136.55  *   86.11  *
* Vel Total (ft/s)       *    7.41  * Avg. Vel. (ft/s)        *          *    7.41  *          *
* Max Chl Dpth (ft)      *    3.65  * Hydr. Depth (ft)        *          *    1.95  *          *
* Conv. Total (cfs)      * 16197.4  * Conv. (cfs)             *          * 16197.4  *          *
* Length Wtd. (ft)       *  813.00  * Wetted Per. (ft)        *          *  136.76  *          *
* Min Ch El (ft)         *  999.67  * Shear (lb/sq ft)        *          *    1.80  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *   13.30  *          *
* Frctn Loss (ft)        *    4.39  * Cum Volume (acre-ft)     *    0.02  *    6.43  *    0.46  *
* C & E Loss (ft)        *    0.22  * Cum SA (acres)           *          *          *          *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

*****************************************************************************
```

SUMMARY OF MANNING'S N VALUES

River:1S2WS27 (J16)

Reach	River Sta.	n1	n2	n3
REACH 1	0.550	.045	.038	.045
REACH 1	0.367	.045	.038	.045
REACH 1	0.152	.045	.038	.045

River:1S2WS9A (J39)

Reach	River Sta.	n1	n2	n3
REACH 1	6.679	.045	.038	.045
REACH 1	6.374	.045	.038	.045
REACH 1	6.086	.045	.038	.045
REACH 1	5.752	.045	.038	.045
REACH 1	5.455	.045	.038	.045
REACH 1	5.222	.045	.038	.045
REACH 1	4.901	.045	.038	.045
REACH 1	4.636	.045	.038	.045
REACH 1	4.349	.045	.038	.045
REACH 2	4.055	.042	.043	.042
REACH 2	3.881	.042	.043	.042
REACH 2	3.516	.042	.043	.042
REACH 2	3.313	.042	.043	.042
REACH 2	3.065	.042	.043	.042
REACH 2	2.751	.042	.043	.042
REACH 2	2.508	.042	.043	.042
REACH 2	2.214	.042	.043	.042
REACH 2	1.959	.042	.043	.042
REACH 2	1.725	.042	.043	.042
REACH 2	1.367	.042	.043	.042
REACH 2	1.157	.042	.043	.042
REACH 2	1.149	Culvert		
REACH 2	1.117	.042	.043	.042
REACH 2	0.913	.042	.043	.042
REACH 2	0.747	.042	.043	.042

River:1S2WS22 (J20)

Reach	River Sta.	n1	n2	n3
REACH 1	1.136	.045	.038	.045
REACH 1	0.836	.045	.038	.045
REACH 1	0.582	.045	.038	.045
REACH 2	0.366	.045	.038	.045
REACH 2	0.154	.045	.038	.045

SUMMARY OF REACH LENGTHS

River: 1S2WS27 (J16)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.550	940	964	940
REACH 1	0.367	1090	1138	1130
REACH 1	0.152			

River: 1S2WS9A (J39)

Reach	River Sta.	Left	Channel	Right
REACH 1	6.679	1530	1607	1530
REACH 1	6.374	1450	1524	1490
REACH 1	6.086	1745	1762	1710
REACH 1	5.752	1520	1566	1520
REACH 1	5.455	1235	1234	1185
REACH 1	5.222	1630	1694	1630
REACH 1	4.901	1370	1396	1320
REACH 1	4.636	1470	1516	1510
REACH 1	4.349			

*REACH 2	4.055	910*	915*	910*
*REACH 2	3.881	1735*	1931*	1785*
*REACH 2	3.516	1000*	1069*	1000*
*REACH 2	3.313	1200*	1313*	1300*
*REACH 2	3.065	1620*	1657*	1715*
*REACH 2	2.751	1350*	1282*	1070*
*REACH 2	2.508	1430*	1553*	1600*
*REACH 2	2.214	1370*	1345*	1310*
*REACH 2	1.959	1260*	1235*	1190*
*REACH 2	1.725	1710*	1889*	1800*
*REACH 2	1.367	1060*	1015*	960*
*REACH 2	1.157	200*	214*	200*
*REACH 2	1.149	*Culvert *	*	*
*REACH 2	1.117	900*	1077*	960*
*REACH 2	0.913	870*	876*	810*
*REACH 2	0.747	3940*	3946*	3940*

River: 1S2WS22 (J20)

Reach	River Sta.	Left	Channel	Right
*REACH 1	1.136	1540*	1583*	1480*
*REACH 1	0.836	1250*	1345*	1230*
*REACH 1	0.582	*	*	*
*REACH 2	0.366	1130*	1124*	1110*
*REACH 2	0.154	*	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: 1S2WS27 (J16)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.550	.1*	.3*
*REACH 1	0.367	.1*	.3*
*REACH 1	0.152	.1*	.3*

River: 1S2WS9A (J39)

Reach	River Sta.	Contr.	Expan.
*REACH 1	6.679	.1*	.3*
*REACH 1	6.374	.1*	.3*
*REACH 1	6.086	.1*	.3*
*REACH 1	5.752	.1*	.3*
*REACH 1	5.455	.1*	.3*
*REACH 1	5.222	.1*	.3*
*REACH 1	4.901	.1*	.3*
*REACH 1	4.636	.1*	.3*
*REACH 1	4.349	.1*	.3*
*REACH 2	4.055	.1*	.3*
*REACH 2	3.881	.1*	.3*
*REACH 2	3.516	.1*	.3*
*REACH 2	3.313	.1*	.3*
*REACH 2	3.065	.1*	.3*
*REACH 2	2.751	.1*	.3*
*REACH 2	2.508	.1*	.3*
*REACH 2	2.214	.1*	.3*
*REACH 2	1.959	.1*	.3*
*REACH 2	1.725	.1*	.3*
*REACH 2	1.367	.1*	.3*
*REACH 2	1.157	.1*	.3*
*REACH 2	1.149	*Culvert *	*
*REACH 2	1.117	.1*	.3*
*REACH 2	0.913	.1*	.3*
*REACH 2	0.747	.1*	.3*

River: 1S2WS22 (J20)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.136	.1*	.3*
*REACH 1	0.836	.1*	.3*

```
*REACH 1          *    0.582   *       .1*       .3*
*REACH 2          *    0.366   *       .1*       .3*
*REACH 2          *    0.154   *       .1*       .3*
*****************************************************
```

MODEL: 1S2WS9B (J40)

REACH: 1S2WS9B (J40)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S2WS9B (J40)
Project File : 1S2WS9B_J40.prj
Run Date and Time: 12/13/2004 3:13:29 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S2WS9B (J40)
Reaches: 1S2WS9B (J40)

****

PLAN DATA

Plan Title: 1S2WS9B (J40)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9B (J40)\1S2WS9B_J40.p02

Geometry Title: 1S2WS9B (J40)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9B (J40)\1S2WS9B_J40.g01

Flow Title : 1S2WS9B (J40)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9B (J40)\1S2WS9B_J40.f01

Plan Summary Information:

Number of:	Cross Sections =	8	Mulitple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 1S2WS9B (J40) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.702	PF 2	1	9990	10010
1.448	PF 2	1	9975	10025
1.405	PF 2	1	9970	10035
1.381	PF 2	1	9975	10030
1.365	PF 2	1	9975	10015
1.333	PF 2	1	9975	10025
1.178	PF 2	1	9990	10010
0.914	PF 2	1	9975	10025
0.716	PF 2	1	9980	10025

****

FLOW DATA

Flow Title: 1S2WS9B (J40)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9B (J40)\1S2WS9B_J40.f01

Flow Data (cfs)

River	Reach	RS	PF 1
1S2WS9B (J40)	REACH 1	1.702	320
1S2WS9B (J40)	REACH 1	1.448	360
1S2WS9B (J40)	REACH 1	1.405	660
1S2WS9B (J40)	REACH 1	1.365	660
1S2WS9B (J40)	REACH 1	1.333	690
1S2WS9B (J40)	REACH 1	1.178	730
1S2WS9B (J40)	REACH 1	0.914	1510
1S2WS9B (J40)	REACH 1	0.716	1570

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
1S2WS9B (J40)	REACH 1	PF 1	Normal S = 0.0091	Normal S = 0.0091

****

GEOMETRY DATA

Geometry Title: 1S2WS9B (J40)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S2WS9B (J40)\1S2WS9B_J40.g01

CROSS SECTION

RIVER: 1S2WS9B (J40)
REACH: REACH 1 RS: 1.702

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9653.72	952.54	9666.36	952.59	9694.72	952.72	9745.4	952.77	9747.84	952.77
9749.21	952.77	9800.96	952.62	9832.06	952.45	9854.09	952.34	9893.44	952.09
9903.57	952.02	9907.62	951.46	9909.07	951.35	9911.27	951.15	9958.55	948.6
9965.06	947.63	9968.96	946.93	9974.55	945.86	9983.65	944.06	9992.01	942.29
10000	942.61	10005.64	942.84	10005.82	942.85	10005.9	942.84	10008.86	942.63

10015.5	942.1510016.02	942.1110024.82	942.9310027.67	943.17 10040.2	945.74
10078.25	951.9210106.87	952.1610140.69	952.4210190.34	952.8310203.13	952.92
10241.08	953.2210265.57	953.4210273.82	953.4910328.01	953.94 10357.3	954.2

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9653.72	.051	9903.57	.05410078.25		.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9903.57	10078.25	1240	1341	960	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	944.66	Element			0.054	
Vel Head (ft)	0.25	Wt. n-Val.			0.054	
W.S. Elev (ft)	944.42	Reach Len. (ft)		1240.00	1341.00	960.00
Crit W.S. (ft)	943.85	Flow Area (sq ft)			80.35	
E.G. Slope (ft/ft)	0.011822	Area (sq ft)			80.35	
Q Total (cfs)	320.00	Flow (cfs)			320.00	
Top Width (ft)	51.88	Top Width (ft)			51.88	
Vel Total (ft/s)	3.98	Avg. Vel. (ft/s)			3.98	
Max Chl Dpth (ft)	2.31	Hydr. Depth (ft)			1.55	
Conv. Total (cfs)	2943.1	Conv. (cfs)			2943.1	
Length Wtd. (ft)	1341.00	Wetted Per. (ft)			52.32	
Min Ch El (ft)	942.11	Shear (lb/sq ft)			1.13	
Alpha	1.00	Stream Power (lb/ft s)			4.51	
Frctn Loss (ft)	13.78	Cum Volume (acre-ft)		2.11	21.91	
C & E Loss (ft)	0.02	Cum SA (acres)		0.78	8.02	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9B (J40)
REACH: REACH 1 RS: 1.448

INPUT
Description:
Station Elevation Data num= 24

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9736.94	934.52	9761.97	934.76	9780.75	934.97	9842.66	935.49	9843.77	935.5
9844.11	935.5	9906.8	935.3	9915.24	935.21	9924.89	934.01	9940.16	932.58
9975.47	929.66	9992.43	927.63	10000	928.12	10002.13	928.28	10008.82	928.76
10024.3	930.03	10086.15	935.66	10117.31	936.33	10142.79	936.89	10171.78	937.52
10199.43	938.12	10223.74	938.69	10256.07	939.21	10292.84	939.75		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9736.94	.051	9915.24	.05410086.15		.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9915.24	10086.15	220	224	220	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	930.86	Element			0.054	
Vel Head (ft)	0.19	Wt. n-Val.			0.054	
W.S. Elev (ft)	930.68	Reach Len. (ft)		220.00	224.00	220.00
Crit W.S. (ft)		Flow Area (sq ft)			103.78	
E.G. Slope (ft/ft)	0.009138	Area (sq ft)			103.78	
Q Total (cfs)	360.00	Flow (cfs)			360.00	
Top Width (ft)	68.23	Top Width (ft)			68.23	
Vel Total (ft/s)	3.47	Avg. Vel. (ft/s)			3.47	
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)			1.52	
Conv. Total (cfs)	3766.1	Conv. (cfs)			3766.1	
Length Wtd. (ft)	224.00	Wetted Per. (ft)			68.52	
Min Ch El (ft)	927.63	Shear (lb/sq ft)			0.86	
Alpha	1.00	Stream Power (lb/ft s)			3.00	
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)		2.11	19.07	
C & E Loss (ft)	0.04	Cum SA (acres)		0.78	6.17	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9B (J40)
REACH: REACH 1 RS: 1.405

INPUT
Description: Upstream of 2-48" CMP's which cross Elliot Road.
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9914.41	933.64	9934.96	933.33	9992.41	924.53	9993.38	924.34	9994.57	924.41
10000	924.83	10008.76	925.51	10020.94	926.88	10075.25	931.11	10079.03	931.32
10107.05	933.03								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9914.41	.051	9934.96	.054	10107.05	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9934.96	10107.05	200	211	200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	930.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.		0.054	
W.S. Elev (ft)	930.26	Reach Len. (ft)	200.00	211.00	200.00
Crit W.S. (ft)	927.52	Flow Area (sq ft)		317.59	
E.G. Slope (ft/ft)	0.001388	Area (sq ft)		317.59	
Q Total (cfs)	660.00	Flow (cfs)		660.00	
Top Width (ft)	109.35	Top Width (ft)		109.35	
Vel Total (ft/s)	2.08	Avg. Vel. (ft/s)		2.08	
Max Chl Dpth (ft)	5.92	Hydr. Depth (ft)		2.90	
Conv. Total (cfs)	17713.3	Conv. (cfs)		17713.3	
Length Wtd. (ft)	211.00	Wetted Per. (ft)		110.06	
Min Ch El (ft)	924.34	Shear (lb/sq ft)		0.25	
Alpha	1.00	Stream Power (lb/ft s)		0.52	
Frctn Loss (ft)		Cum Volume (acre-ft)	2.11	17.99	
C & E Loss (ft)		Cum SA (acres)	0.78	5.72	

CULVERT

RIVER: 1S2WS9B (J40)
REACH: REACH 1 RS: 1.381

INPUT
Description: 2 - 48" CMP's
Structure 9
Crosses Elliot Road
Distance from Upstream XS = 75
Deck/Roadway Width = 28
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 3

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9950	928.52		10000	928.73		10055	929.1	

Upstream Bridge Cross Section Data
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9914.41	933.64	9934.96	933.33	9992.41	924.53	9993.38	924.34	9994.57	924.41
10000	924.83	10008.76	925.51	10020.94	926.88	10075.25	931.11	10079.03	931.32
10107.05	933.03								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9914.41	.051	9934.96	.054	10107.05	.051

Bank Sta: Left	Right	Coeff Contr.	Expan.
9934.96	10107.05	.1	.3

```
Downstream  Deck/Roadway Coordinates
    num=        3
     Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord      Sta Hi Cord Lo Cord
*********************************************************************
    9950     928            10000     928            10055  928.58

Downstream Bridge Cross Section Data
Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************
 9920.17  929.62 9951.68  929.31  9961.2  927.67 9963.18  927.24 9967.49  926.45
 9976.92  924.71    9980  924.38    9995  921.27   10005  920.74   10020  926.92
10034.46  926.2310040.59  927.1910044.72  927.7410047.46  928.0410049.34  928.25
10055.17  929.52 10099.9  930.24

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9920.17    .051 9951.68    .05410055.17    .051

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9951.6810055.17             .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular      4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 70      40     .024     .024     1.25                   .5                   1
Number of Barrels =  2
Upstream   Elevation =  921.06
Centerline Stations
    Sta.    Sta.
  9996.5 10003.5
Downstream Elevation =  920.5
Centerline Stations
    Sta.    Sta.
  9996.5 10003.5

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
*********************************************************************
* Q Culv Group (cfs)      *  205.78  * Culv Full Len (ft)      *   40.00  *
* # Barrels               *       2  * Culv Vel US (ft/s)      *   11.17  *
* Q Barrel (cfs)          *  102.89  * Culv Vel DS (ft/s)      *   11.17  *
* E.G. US. (ft)           *  930.32  * Culv Inv El Up (ft)     *  921.06  *
* W.S. US. (ft)           *  930.26  * Culv Inv El Dn (ft)     *  920.50  *
* E.G. DS (ft)            *  926.10  * Culv Frctn Ls (ft)      *    1.76  *
* W.S. DS (ft)            *  925.66  * Culv Exit Loss (ft)     *    1.50  *
* Delta EG (ft)           *    4.22  * Culv Entr Loss (ft)     *    0.97  *
* Delta WS (ft)           *    4.59  * Q Weir (cfs)            *  453.05  *
* E.G. IC (ft)            *  930.26  * Weir Sta Lft (ft)       * 9954.59  *
* E.G. OC (ft)            *  930.32  * Weir Sta Rgt (ft)       *10065.26  *
* Culvert Control         *  Outlet  * Weir Submerg            *    0.00  *
* Culv WS Inlet (ft)      *  925.06  * Weir Max Depth (ft)     *    1.74  *
* Culv WS Outlet (ft)     *  924.50  * Weir Avg Depth (ft)     *    1.33  *
* Culv Nml Depth (ft)     *          * Weir Flow Area (sq ft)  *  146.87  *
* Culv Crt Depth (ft)     *    2.45  * Min El Weir Flow (ft)   *  928.60  *
*********************************************************************

CROSS SECTION


RIVER: 1S2WS9B (J40)
REACH: REACH 1            RS: 1.365

INPUT
Description: Downstream of 2-48" CMP's which cross Elliot Road.
```

```
Station Elevation Data     num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9920.17  929.62 9951.68  929.31  9961.2  927.67 9963.18  927.24 9967.49  926.45
 9976.92  924.71    9980  924.38    9995  921.27   10005  920.74   10020  926.92
10034.46  926.2310040.59  927.1910044.72  927.7410047.46  928.0410049.34  928.25
10055.17  929.52 10099.9  930.24

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9920.17    .051 9951.68    .05410055.17    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.6810055.17              165     169     165             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  926.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.44  * Wt. n-Val.              *          *    0.054 *          *
* W.S. Elev (ft)          *  925.66  * Reach Len. (ft)         *  165.00  *   169.00 *   165.00 *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *   124.41 *          *
* E.G. Slope (ft/ft)      *0.010035  * Area (sq ft)            *          *   124.41 *          *
* Q Total (cfs)           *  660.00  * Flow (cfs)              *          *   660.00 *          *
* Top Width (ft)          *   45.18  * Top Width (ft)          *          *    45.18 *          *
* Vel Total (ft/s)        *    5.31  * Avg. Vel. (ft/s)        *          *     5.31 *          *
* Max Chl Dpth (ft)       *    4.92  * Hydr. Depth (ft)        *          *     2.75 *          *
* Conv. Total (cfs)       *  6588.4  * Conv. (cfs)             *          *   6588.4 *          *
* Length Wtd. (ft)        *  169.00  * Wetted Per. (ft)        *          *    46.60 *          *
* Min Ch El (ft)          *  920.74  * Shear (lb/sq ft)        *          *     1.67 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     8.87 *          *
* Frctn Loss (ft)         *    1.27  * Cum Volume (acre-ft)     *    2.11  *    16.92 *          *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)           *    0.78  *     5.34 *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS9B (J40)
REACH: REACH 1             RS: 1.333

INPUT
Description:
Station Elevation Data     num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9691.71  930.03 9710.83  929.33 9716.77   929.1 9718.19  929.11 9719.22  929.09
 9781.11  928.94 9814.92  928.43 9830.23  926.38 9833.09  925.71 9838.49  924.37
 9852.97  920.96 9860.94  919.18 9889.59  922.61 9905.93  924.59 9914.21  925.59
 9931.92  928.36 9954.81  925.28 9967.09   923.8 9993.99  920.43   10000  920.42
10005.27  920.41 10007.5  920.3710036.33  924.6910059.15  928.1110064.67  928.91
10067.37  929.2610073.78  930.1910077.01  930.2710117.67  931.1910142.73  931.76
10147.05  931.8510208.45  932.39 10224.1  932.44

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9691.71    .051 9931.92    .05410073.78    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9931.9210073.78              840     820     800             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
 9691.71 9931.92     930       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  924.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *          *    0.054 *          *
* W.S. Elev (ft)          *  924.55  * Reach Len. (ft)         *  840.00  *   820.00 *   800.00 *
* Crit W.S. (ft)          *  923.15  * Flow Area (sq ft)       *          *   181.66 *          *
* E.G. Slope (ft/ft)      *0.005860  * Area (sq ft)            *  183.01  *   181.66 *          *
* Q Total (cfs)           *  690.00  * Flow (cfs)              *          *   690.00 *          *
* Top Width (ft)          *  142.24  * Top Width (ft)          *   67.78  *    74.46 *          *
* Vel Total (ft/s)        *    3.80  * Avg. Vel. (ft/s)        *          *     3.80 *          *
```

```
* Max Chl Dpth (ft)      *    5.37  * Hydr. Depth (ft)        *          *    2.44  *          *
* Conv. Total (cfs)      *  9013.6  * Conv. (cfs)             *          *  9013.6  *          *
* Length Wtd. (ft)       *  820.00  * Wetted Per. (ft)        *          *   75.03  *          *
* Min Ch El (ft)         *  920.37  * Shear (lb/sq ft)        *          *    0.89  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    3.36  *          *
* Frctn Loss (ft)        *    6.44  * Cum Volume (acre-ft)     *    1.76  *   16.32  *          *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *    0.65  *    5.11  *          *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 1S2WS9B (J40)
REACH: REACH 1            RS: 1.178

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9616.46  924.32 9634.15  924.38 9645.26  924.42 9693.69  924.21 9695.82   924.2
 9707.81  924.09 9746.39  923.73 9753.23  923.66 9796.95  923.21 9812.77  923.11
 9847.52  922.81 9872.32  922.67 9898.08  922.48 9927.12  922.25 9969.85  922.02
    9981  917.14  9989.9  913.35 9998.84  913.35   10000  913.3410005.72  913.33
10022.79  918.7410036.07  922.2110067.11   922.710099.22  923.2510142.18  923.57
10149.22  923.6510191.97  924.2410199.22  924.3110241.77  924.8410249.22  924.93
10291.56  925.2510299.22  925.2810341.35  925.4610349.22  925.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9616.46    .051 9969.85    .05410036.07    .051

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.8510036.07             1300    1393    1385            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         *  918.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.54  * Wt. n-Val.              *          *    0.054  *          *
* W.S. Elev (ft)         *  917.75  * Reach Len. (ft)         * 1300.00  * 1393.00  * 1385.00  *
* Crit W.S. (ft)         *  916.64  * Flow Area (sq ft)       *          *  123.43  *          *
* E.G. Slope (ft/ft)     *0.010861  * Area (sq ft)            *          *  123.43  *          *
* Q Total (cfs)          *  730.00  * Flow (cfs)              *          *  730.00  *          *
* Top Width (ft)         *   40.08  * Top Width (ft)          *          *   40.08  *          *
* Vel Total (ft/s)       *    5.91  * Avg. Vel. (ft/s)        *          *    5.91  *          *
* Max Chl Dpth (ft)      *    4.42  * Hydr. Depth (ft)        *          *    3.08  *          *
* Conv. Total (cfs)      *  7004.8  * Conv. (cfs)             *          *  7004.8  *          *
* Length Wtd. (ft)       * 1393.00  * Wetted Per. (ft)        *          *   41.67  *          *
* Min Ch El (ft)         *  913.33  * Shear (lb/sq ft)        *          *    2.01  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *   11.88  *          *
* Frctn Loss (ft)        *   10.97  * Cum Volume (acre-ft)     *          *   13.45  *          *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)           *          *    4.03  *          *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S2WS9B (J40)
REACH: REACH 1            RS: 0.914

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

9517.02	921.14	9533.78	921.1	9549.69	921	9585.22	920.88	9617.53	920.64
9636.66	920.53	9685.36	919.8	9688.1	919.77	9696.71	919.55	9739.54	918.25
9753.19	917.69	9790.98	916.48	9821.02	915.57	9842.42	914.94	9888.85	913.43
9893.86	913.27	9909.56	912.53	9941.19	909.83	9944.75	909.77	9953.23	908.52
9983.98	901.63	9984.9	901.64	10000	901.49	10010.42	901.51	10034.45	905.45
10049.13	907.79	10051.62	908.21	10055.96	908.98	10061.72	909.39	10109.43	913.05
10162.47	922.39	10165.93	922.96	10169.05	923.55				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9517.02	.051	9909.56	.054	10109.43	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9909.56	10109.43	1030	1045	1035	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	907.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.		0.054	
W.S. Elev (ft)	906.87	Reach Len. (ft)	1030.00	1045.00	1035.00
Crit W.S. (ft)		Flow Area (sq ft)		289.75	
E.G. Slope (ft/ft)	0.006855	Area (sq ft)		289.75	
Q Total (cfs)	1510.00	Flow (cfs)		1510.00	
Top Width (ft)	82.74	Top Width (ft)		82.74	
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)		5.21	
Max Chl Dpth (ft)	5.38	Hydr. Depth (ft)		3.50	
Conv. Total (cfs)	18237.8	Conv. (cfs)		18237.8	
Length Wtd. (ft)	1045.00	Wetted Per. (ft)		83.75	
Min Ch El (ft)	901.49	Shear (lb/sq ft)		1.48	
Alpha	1.00	Stream Power (lb/ft s)		7.72	
Frctn Loss (ft)	8.24	Cum Volume (acre-ft)		6.85	
C & E Loss (ft)	0.01	Cum SA (acres)		2.07	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S2WS9B (J40)
REACH: REACH 1 RS: 0.716

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9725.15	909.91	9739.33	909.79	9741.36	909.8	9748.91	909.68	9792.46	908.79
9804.13	908.45	9843.56	907	9868.92	906.07	9894.67	905.07	9933.71	903.56
9945.77	903.09	9968.86	898.3	9989.87	893.11	10000	893.24	10000.93	893.25
10008.87	893.55	10027.35	895.52	10069.4	899.82	10094.63	901.07	10112.57	902.08
10138.4	904	10170.63	906.41	10193	907.94	10228.69	910.08	10280.07	910.95
10286.74	911.09	10291.38	911.08						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9725.15	.051	9945.77	.054	10069.4	.051

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.77	10069.4	3300	3358	3300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	899.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.48	Wt. n-Val.		0.054	
W.S. Elev (ft)	898.57	Reach Len. (ft)			
Crit W.S. (ft)	897.25	Flow Area (sq ft)		281.05	
E.G. Slope (ft/ft)	0.009102	Area (sq ft)		281.05	
Q Total (cfs)	1570.00	Flow (cfs)		1570.00	
Top Width (ft)	89.61	Top Width (ft)		89.61	
Vel Total (ft/s)	5.59	Avg. Vel. (ft/s)		5.59	
Max Chl Dpth (ft)	5.46	Hydr. Depth (ft)		3.14	
Conv. Total (cfs)	16456.7	Conv. (cfs)		16456.7	
Length Wtd. (ft)		Wetted Per. (ft)		90.54	

* Min Ch El (ft)	* 893.11	* Shear (lb/sq ft)	*	* 1.76	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 9.85	*
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	*	*	*
* C & E Loss (ft)	*	* Cum SA (acres)	*	*	*

SUMMARY OF MANNING'S N VALUES

River:1S2WS9B (J40)

Reach	River Sta.	n1	n2	n3
REACH 1	1.702	.051	.054	.051
REACH 1	1.448	.051	.054	.051
REACH 1	1.405	.051	.054	.051
REACH 1	1.381	Culvert		
REACH 1	1.365	.051	.054	.051
REACH 1	1.333	.051	.054	.051
REACH 1	1.178	.051	.054	.051
REACH 1	0.914	.051	.054	.051
REACH 1	0.716	.051	.054	.051

SUMMARY OF REACH LENGTHS

River: 1S2WS9B (J40)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.702	1240	1341	960
REACH 1	1.448	220	224	220
REACH 1	1.405	200	211	200
REACH 1	1.381	Culvert		
REACH 1	1.365	165	169	165
REACH 1	1.333	840	820	800
REACH 1	1.178	1300	1393	1385
REACH 1	0.914	1030	1045	1035
REACH 1	0.716	3300	3358	3300

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S2WS9B (J40)

Reach	River Sta.	Contr.	Expan.
REACH 1	1.702	.1	.3
REACH 1	1.448	.1	.3
REACH 1	1.405	.1	.3
REACH 1	1.381	Culvert	
REACH 1	1.365	.1	.3
REACH 1	1.333	.1	.3
REACH 1	1.178	.1	.3
REACH 1	0.914	.1	.3
REACH 1	0.716	.1	.3

MODEL: 1S3WS24A (A60)

REACHES: 1S3WS24A (A60)
1S3WS24B (A59)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X       X    X       X   X     X  X    X
X     X  X       X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX    XXXXXX    XXXX
X     X  X       X            X  X     X    X        X
X     X  X       X    X       X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 1S3WS24A (A60)
Project File : 1S3WS24A_A60.prj
Run Date and Time: 1/13/2005 7:12:14 AM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 1S3WS24A (A60)
Reaches: 1S3WS24A (A60)
  1S3WS24B (A59)

****

PLAN DATA

Plan Title: 1S3WS24A (A60)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S3WS24A (A60)\1S3WS24A_A60.p01

Geometry Title: 1S3WS24A (A60)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S3WS24A (A60)\1S3WS24A_A60.g01

Flow Title : 1S3WS24A (A60)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S3WS24A (A60)\1S3WS24A_A60.f01

Plan Summary Information:
Number of: Cross Sections = 23 Mulitple Openings = 0
  Culverts = 0 Inline Structures = 0
  Bridges = 0 Lateral Structures = 0

Computational Information
  Water surface calculation tolerance = 0.01
  Critical depth calculaton tolerance = 0.01

Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 1S3WS24B (A59) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.901	PF 2	1	9960	10040
1.672	PF 2	1	9800	10025
1.465	PF 2	1	9965	10035
1.234	PF 2	1	9925	10100
0.988	PF 2	1	9990	10010
0.695	PF 2	1	9960	10050
0.515	PF 2	1	9975	10030
0.255	PF 2	1	9940	10025

River = 1S3WS24A (A60) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.653	PF 2	1	9980	10020
3.416	PF 2	1	9950	10025
3.186	PF 2	1	9975	10020
2.944	PF 2	1	9965	10035
2.672	PF 2	1	9975	10025
2.425	PF 2	1	9950	10050
2.224	PF 2	1	9960	10050
1.825	PF 2	1	9960	10040
1.503	PF 2	1	9960	10040

River = 1S3WS24A (A60) Reach = REACH 2

RS	Profile	Method	Value1	Value2
1.202	PF 2	1	9950	10050
0.958	PF 2	1	9875	10140
0.724	PF 2	1	9750	10030
0.572	PF 2	1	9970	10060
0.294	PF 2	1	9970	10030
0.130	PF 2	1	9900	10100

****

FLOW DATA

Flow Title: 1S3WS24A (A60)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S3WS24A (A60)\1S3WS24A_A60.f01

Flow Data (cfs)

River	Reach	RS	PF 1
1S3WS24B (A59)	REACH 1	1.901	450
1S3WS24B (A59)	REACH 1	1.672	580
1S3WS24B (A59)	REACH 1	1.465	670
1S3WS24B (A59)	REACH 1	1.234	840
1S3WS24B (A59)	REACH 1	0.988	1300
1S3WS24B (A59)	REACH 1	0.695	1370
1S3WS24B (A59)	REACH 1	0.515	1390
1S3WS24B (A59)	REACH 1	0.255	1620
1S3WS24A (A60)	REACH 1	3.653	700
1S3WS24A (A60)	REACH 1	3.416	930
1S3WS24A (A60)	REACH 1	3.186	1350
1S3WS24A (A60)	REACH 1	2.944	1620
1S3WS24A (A60)	REACH 1	2.672	1780
1S3WS24A (A60)	REACH 1	2.425	1900
1S3WS24A (A60)	REACH 1	2.224	2000
1S3WS24A (A60)	REACH 1	1.825	2190
1S3WS24A (A60)	REACH 1	1.503	2210
1S3WS24A (A60)	REACH 2	1.202	3640
1S3WS24A (A60)	REACH 2	0.958	3910
1S3WS24A (A60)	REACH 2	0.724	4160

```
* 1S3WS24A (A60)  REACH 2          0.572   *            4320 *
* 1S3WS24A (A60)  REACH 2          0.294   *            4620 *
* 1S3WS24A (A60)  REACH 2          0.130   *            4800 *
*************************************************************
```

Boundary Conditions

```
*****************************************************************************************************
* River            Reach            Profile          *          Upstream                Downstream    *
*****************************************************************************************************
* 1S3WS24B (A59)  REACH 1          PF 1             *       Normal S = 0.0095                        *
* 1S3WS24A (A60)  REACH 1          PF 1             *       Normal S = 0.0083                        *
* 1S3WS24A (A60)  REACH 2          PF 1             *                                 Normal S = 0.0083 *
*****************************************************************************************************
```

```
*****************************************************************************
```

GEOMETRY DATA

Geometry Title: 1S3WS24A (A60)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\1S3WS24A (A60)\1S3WS24A_A60.g01

Reach Connection Table

```
*****************************************************************************
* River            Reach            *  Upstream Boundary  * Downstream Boundary *
*****************************************************************************
* 1S3WS24B (A59)   REACH 1          *                     *   JUNCTION 1        *
* 1S3WS24A (A60)   REACH 1          *                     *   JUNCTION 1        *
* 1S3WS24A (A60)   REACH 2          *   JUNCTION 1        *                     *
*****************************************************************************
```

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

```
    Length across Junction              Tributary
     River            Reach              River            Reach        Length   Angle
1S3WS24A (A60)  REACH 1          to 1S3WS24A (A60)  REACH 2           1589
1S3WS24B (A59)  REACH 1          to 1S3WS24A (A60)  REACH 2           1347
```

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 1.901

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 69

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9323.04 1059.82  9334.8 1058.95 9338.66 1058.76 9351.87 1058.06 9378.96  1056.7
  9386.9  1056.2 9419.26 1054.94    9439 1054.05 9459.56 1053.51  9491.1 1052.28
 9499.85 1051.99 9529.75 1051.36 9540.15 1051.16  9543.2 1051.05 9580.45 1049.85
  9595.3 1049.38 9620.75 1047.86  9647.4 1046.72 9661.04    1046  9699.5 1044.83
 9701.34 1044.78 9707.64  1044.7 9741.64 1044.21  9751.6 1044.21 9781.94 1044.29
  9803.7 1044.51 9822.23 1044.48  9855.8 1044.38 9862.53 1044.34 9885.53 1044.24
 9902.83 1044.18 9910.32 1043.93 9911.91 1043.86 9914.85 1043.74 9920.82  1043.5
 9936.53 1042.87 9958.44    1042 9972.61 1042.47 9986.88  1043.5   10000 1043.76
10000.63 1043.7710019.33 1043.6310022.63 1043.5110027.83 1043.3310038.41 1042.93
10060.27 1041.4610084.98 1042.9210099.79 1044.1310115.66 1045.36 10146.2 1046.29
10167.48 1046.9510186.94  1047.710219.29 1048.9710227.68 1049.2910258.55 1050.35
10268.42 1050.6710271.11 1050.8110309.16 1052.7110322.92 1053.23 10349.9 1054.51
10374.74 1055.7410390.64 1056.6210426.55 1058.7710431.38 1059.1110449.16 1060.65
10472.12 1062.5610478.36 1063.0810512.86 1066.1910530.18 1068.34
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9323.04     .05 9902.83    .04310115.66     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9902.8310115.66             1145    1210    1130            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1043.96  * Element                 *  Left OB *  Channel * Right OB *
```

* Vel Head (ft)	*	0.10	* Wt. n-Val.	*		*	0.043	*		*
* W.S. Elev (ft)	*	1043.87	* Reach Len. (ft)	*	1145.00	*	1210.00	*	1130.00	*
* Crit W.S. (ft)	*	1043.25	* Flow Area (sq ft)	*		*	180.52	*		*
* E.G. Slope (ft/ft)	*	0.005380	* Area (sq ft)	*		*	180.52	*		*
* Q Total (cfs)	*	450.00	* Flow (cfs)	*		*	450.00	*		*
* Top Width (ft)	*	184.85	* Top Width (ft)	*		*	184.85	*		*
* Vel Total (ft/s)	*	2.49	* Avg. Vel. (ft/s)	*		*	2.49	*		*
* Max Chl Dpth (ft)	*	2.41	* Hydr. Depth (ft)	*		*	0.98	*		*
* Conv. Total (cfs)	*	6135.1	* Conv. (cfs)	*		*	6135.1	*		*
* Length Wtd. (ft)	*	1210.00	* Wetted Per. (ft)	*		*	185.08	*		*
* Min Ch El (ft)	*	1041.46	* Shear (lb/sq ft)	*		*	0.33	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	0.82	*		*
* Frctn Loss (ft)	*	13.88	* Cum Volume (acre-ft)	*	1.55	*	56.83	*	10.12	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	2.80	*	34.53	*	13.01	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 1.672

INPUT
Description:
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9253.28	1051.24	9262.67	1050.14	9287.27	1047.97	9321.9	1043.91	9361.44	1042.65
9366.19	1042.33	9368.93	1042.16	9379.18	1041.76	9409.76	1040.63	9417.95	1040.33
9450.59	1039.32	9469.71	1038.51	9491.42	1037.83	9521.47	1036.63	9532.25	1036.24
9572.56	1034.65	9573.09	1034.62	9573.23	1034.62	9613.92	1032.96	9624.99	1032.55
9654.75	1031.82	9676.75	1031.34	9695.58	1031.13	9728.51	1030.84	9741.28	1030.19
9750.66	1029.85	9783.57	1028.66	9801.82	1028	9813.24	1028.39	9827.17	1028.86
9835.96	1029.16	9883.79	1030.92	9899.73	1030.73	9948.77	1029.55	9960.78	1029.29
9974.26	1029.74	9979.37	1029.88	9982.25	1029.81	9989.61	1029.64	10000	1029.41
10004.89	1029.31	10017.12	102	910018.39	1029.05	10024.86	1029.31	10071.25	1031.81
10088.08	103	210117.39	1032.24	10138.27	1032.58	10163.53	1033.32	10188.46	1034.13
10209.66	1034.79	10238.65	1036.2	10255.8	1037.18	10288.85	1039.22	10301.94	1040.08
10339.04	1042.47	10348.08	1043.32	10389.23	1046.85	10397.16	1048.38	10400.79	1049.08
10412.71	1051.94	10431.39	1056.36	10446.27	1061.1				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9253.28	.05	9728.51	.04	310071.25	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9728.51	10071.25	1080	1095	1065	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1030.15	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.30	* Wt. n-Val.	*		*	0.043	*		*
* W.S. Elev (ft)	*	1029.85	* Reach Len. (ft)	*	1080.00	*	1095.00	*	1065.00	*
* Crit W.S. (ft)	*	1029.81	* Flow Area (sq ft)	*		*	132.56	*		*
* E.G. Slope (ft/ft)	*	0.027880	* Area (sq ft)	*		*	132.56	*		*
* Q Total (cfs)	*	580.00	* Flow (cfs)	*		*	580.00	*		*
* Top Width (ft)	*	200.62	* Top Width (ft)	*		*	200.62	*		*
* Vel Total (ft/s)	*	4.38	* Avg. Vel. (ft/s)	*		*	4.38	*		*
* Max Chl Dpth (ft)	*	1.85	* Hydr. Depth (ft)	*		*	0.66	*		*
* Conv. Total (cfs)	*	3473.6	* Conv. (cfs)	*		*	3473.6	*		*
* Length Wtd. (ft)	*	1090.69	* Wetted Per. (ft)	*		*	200.73	*		*
* Min Ch El (ft)	*	1028.00	* Shear (lb/sq ft)	*		*	1.15	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	5.03	*		*
* Frctn Loss (ft)	*	10.45	* Cum Volume (acre-ft)	*	1.55	*	52.49	*	10.12	*
* C & E Loss (ft)	*	0.06	* Cum SA (acres)	*	2.80	*	29.18	*	13.01	*

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 1.465

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9354.47	1039.91	9379.84	1037.4	9387.48	1036.81	9430.12	1035.46	9432.97	1035.33
9460.02	1034.46	9478.45	1033.82	9480.39	1033.78	9523.94	1031.9	9530.67	1031.65
9569.43	1029.47	9580.95	1028.94	9614.92	1027.22	9631.22	1026.58	9660.41	1025.03
9681.5	1024.16	9705.89	1023.02	9731.77	1022.01	9751.38	1021.39	9782.05	1020.33
9796.87	1020.02	9832.33	1019.44	9842.36	1019.25	9882.6	1018.93	9887.85	1018.89
9932.88	1018.71	9933.66	1018.69	9934.42	1018.68	9935.82	1018.67	9976.48	1018.23
9997.29	1018	9998.56	1018	10000	101810004.04		101810036.41		1018.45
10063.86	1018.8310070.94		1018.9310083.35		1019.07 10133.4		1019.110133.54		1019.1
10183.47	1019.0510186.04		1019.0510233.53		1019.0410238.67		1019.0510283.59		1019.11
10291.31	1019.1510333.65		1019.3510343.94		1019.4310383.71		1019.710396.58		1019.81
10433.77	1020.1410449.21		1020.3210483.82		1020.6510501.85		1020.8310533.88		1021.23
10554.48	1021.5810583.94		1022.0310607.12		1022.37	10634	1022.8410659.75		1023.25
10684.06	1023.66								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9354.47	.05	9932.88	.04	10083.35	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9932.88	10083.35	1190	1220	1180	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1019.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1019.55	Reach Len. (ft)	1190.00	1220.00	1180.00
Crit W.S. (ft)	1019.29	Flow Area (sq ft)	58.50	167.64	115.80
E.G. Slope (ft/ft)	0.005191	Area (sq ft)	58.50	167.64	115.80
Q Total (cfs)	670.00	Flow (cfs)	83.47	448.52	138.01
Top Width (ft)	536.85	Top Width (ft)	107.52	150.47	278.86
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)	1.43	2.68	1.19
Max Chl Dpth (ft)	1.55	Hydr. Depth (ft)	0.54	1.11	0.42
Conv. Total (cfs)	9299.6	Conv. (cfs)	1158.6	6225.4	1915.6
Length Wtd. (ft)	1214.69	Wetted Per. (ft)	107.53	150.48	278.86
Min Ch El (ft)	1018.00	Shear (lb/sq ft)	0.18	0.36	0.13
Alpha	1.39	Stream Power (lb/ft s)	0.25	0.97	0.16
Frctn Loss (ft)	14.12	Cum Volume (acre-ft)	0.83	48.71	8.70
C & E Loss (ft)	0.03	Cum SA (acres)	1.47	24.76	9.60

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 1.234

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9570.77	1010.75	9597.67	1010.7	9600.87	1010.62	9602.28	1010.59	9605.92	1010.53
9654.51	1009.83	9679.55	1009.43	9708.15	1008.83	9718.18	1008.58	9744.01	1008.05
9756.82	1007.8	9761.79	1007.72	9795.45	1007.1	9815.43	1006.84	9834.08	1006.55
9869.07	1005.93	9882.11	1005.71	9911.35	1005.21	9922.71	1005.06	9958.18	1004.32
9965.33	1004.25	9973.17	1004.16	9984.36	1004.99	9991.08	1005	9997.24	1004.61
10000	1004.2110001.62		100410005.55		100410011.63		1004.0810016.65		1004.14
10061.4	1004.2510079.02		1004.2710103.68		1004.3910129.71		1004.5110164.48		1004.85
10180.4	1004.9910225.28		1005.6310231.09		1005.710260.19		1006.1710281.77		1006.52

```
10286.08 1006.5710332.46 1006.9710346.87 1007.03   10389 1007.1510393.68 1007.49
10398.06 1007.4710403.01 1007.4510432.02 1007.7110435.37 1008.0610439.94 1007.66
 10445.1 1007.63 10450.9 1007.5910454.71 1007.0510459.79 1006.9310465.18 1007.43
10476.07 1007.3410493.33 1007.56   10503 1007.3810514.09 1008.0910517.72    1008
10527.05 1008.0110535.98 1008.0310575.95 1009.2210580.35 1009.3210582.81 1009.36
10584.46 1009.3910585.56 1009.4910586.12 1009.4210626.37 1009.3210628.45 1009.34
10630.22 1009.5610631.16 1009.5610650.86 1009.9210687.26 1010.1610711.66 1010.32
10737.95 1010.5110772.46 1010.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9570.77     .05 9911.35    .04310225.28     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9911.3510225.28             1290    1294    1280            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1005.50  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *           *    0.043  *          *
* W.S. Elev (ft)          * 1005.16  * Reach Len. (ft)         * 1290.00   * 1294.00  * 1280.00  *
* Crit W.S. (ft)          * 1005.16  * Flow Area (sq ft)       *           *  181.08  *          *
* E.G. Slope (ft/ft)      *0.031844  * Area (sq ft)            *           *  181.08  *          *
* Q Total (cfs)           *  840.00  * Flow (cfs)              *           *  840.00  *          *
* Top Width (ft)          *  277.46  * Top Width (ft)          *           *  277.46  *          *
* Vel Total (ft/s)        *    4.64  * Avg. Vel. (ft/s)        *           *    4.64  *          *
* Max Chl Dpth (ft)       *    1.16  * Hydr. Depth (ft)        *           *    0.65  *          *
* Conv. Total (cfs)       *  4707.2  * Conv. (cfs)             *           *  4707.2  *          *
* Length Wtd. (ft)        * 1292.05  * Wetted Per. (ft)        *           *  277.56  *          *
* Min Ch El (ft)          * 1004.00  * Shear (lb/sq ft)        *           *    1.30  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *           *    6.02  *          *
* Frctn Loss (ft)         *   11.00  * Cum Volume (acre-ft)    *    0.03   *   43.83  *    7.13  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)           *           *   18.77  *    5.82  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S3WS24B (A59)
REACH: REACH 1            RS: 0.988

INPUT
Description:
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9486.65 1009.38 9534.77 1005.36 9546.59 1004.28 9581.17 1002.11 9596.76 1000.95
 9627.56  999.24 9646.92  998.33 9673.96  997.29 9697.09  996.17 9720.35  995.59
 9747.25  994.53 9766.75   994.3 9797.42  993.63 9813.14  993.51 9847.58  993.35
 9859.54  993.29 9897.75  993.21 9905.93   993.2 9947.91  993.15 9956.73  992.03
 9981.71  988.99 9998.08     987   10000  987.2110016.65  989.0610033.83     991
10034.23     99110094.07  992.6610097.25  992.7510097.65  992.7610097.85  992.76
10097.94  992.7610097.99  992.7610098.03  992.7610098.06  992.7610098.24  992.77
10148.09  992.8210150.28   992.710154.98   992.410209.19  989.4510239.33  992.05
10245.15  992.6510246.39  992.7610246.96  992.8210247.41  992.8610249.31  992.95
10298.09  993.2210346.18  993.5710348.09   993.610378.38  993.8810395.96  994.04
10398.09  994.0610445.96   994.510448.09  994.5310495.96  994.9910498.09  995.01
10545.96  995.5110548.09  995.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9486.65     .05 9947.91    .04310094.07     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.9110094.07             1460    1551    1590            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	992.43	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.21	Wt. n-Val.		0.043	0.050	
W.S. Elev (ft)	992.22	Reach Len. (ft)	1460.00	1551.00	1590.00	
Crit W.S. (ft)	991.21	Flow Area (sq ft)		254.52	114.76	
E.G. Slope (ft/ft)	0.004944	Area (sq ft)		254.52	114.76	
Q Total (cfs)	1300.00	Flow (cfs)		1001.94	298.06	
Top Width (ft)	205.51	Top Width (ft)		122.88	82.63	
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)		3.94	2.60	
Max Chl Dpth (ft)	5.22	Hydr. Depth (ft)		2.07	1.39	
Conv. Total (cfs)	18487.7	Conv. (cfs)		14248.9	4238.8	
Length Wtd. (ft)	1555.35	Wetted Per. (ft)		123.43	82.82	
Min Ch El (ft)	987.00	Shear (lb/sq ft)		0.64	0.43	
Alpha	1.09	Stream Power (lb/ft s)		2.51	1.11	
Frctn Loss (ft)	11.48	Cum Volume (acre-ft)	0.03	37.36	5.45	
C & E Loss (ft)	0.04	Cum SA (acres)		12.83	4.61	

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 0.695

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9638.83	990.25	9683.1	984.04	9711.2	981.74	9724.85	983.01	9763.33	984.22
9778.39	985.14	9785.52	985.25	9814.15	985.72	9835.25	984.91	9849.91	984.93
9869.81	984.37	9885.67	984.17	9897.36	983.73	9921.43	983.17	9977.67	978.61
9986.13	978	10000	977.03	10001.62	976.92	10014.99	975.97	10016.32	976.13
10063.81	981.11	10098.34	981.09	10099.2	981.09	10100.16	981.09	10134.6	981.18
10165.9	981.56	10170	981.61	10174.5	981.63	10205.39	981.75	10233.47	981.9
10240.79	981.94	10248.84	981.97	10276.18	982.02	10301.03	982.09	10311.58	982.13
10323.18	982.14	10346.97	982.17						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9638.83	.05	9921.43	.043	10063.81	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9921.43	10063.81	900	950	1015	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	980.90	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.62	Wt. n-Val.		0.043		
W.S. Elev (ft)	980.28	Reach Len. (ft)	900.00	950.00	1015.00	
Crit W.S. (ft)	979.81	Flow Area (sq ft)		216.43		
E.G. Slope (ft/ft)	0.011852	Area (sq ft)		216.43		
Q Total (cfs)	1370.00	Flow (cfs)		1370.00		
Top Width (ft)	98.78	Top Width (ft)		98.78		
Vel Total (ft/s)	6.33	Avg. Vel. (ft/s)		6.33		
Max Chl Dpth (ft)	4.31	Hydr. Depth (ft)		2.19		
Conv. Total (cfs)	12584.0	Conv. (cfs)		12584.0		
Length Wtd. (ft)	950.49	Wetted Per. (ft)		99.16		
Min Ch El (ft)	975.97	Shear (lb/sq ft)		1.61		
Alpha	1.00	Stream Power (lb/ft s)		10.22		
Frctn Loss (ft)	8.84	Cum Volume (acre-ft)	0.03	28.97	3.35	
C & E Loss (ft)	0.11	Cum SA (acres)		8.88	3.10	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 0.515

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9796.55	975.83	9823.43	976	9842.23	975.81	9869.85	975.23	9892.4	974.26
9972.94	969.15	9974.17	969.08	9976.15	969.08	10000	969.08	10017.81	969.07
10018.59	969.09	10049.94	969.75	10063.74	970.03	10072.62	970.17	10100.28	971.02
10122.43	971.17	10154.35	971.31	10160.73	971.33	10176.25	971.38	10199.04	971.47
10208.42	971.51	10237.35	971.59	10262.48	971.68	10275.65	971.79	10307.68	971.86
10316.55	971.88	10352.27	971.88	10370.61	971.96				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9796.55	.05	9892.4	.043	10154.35	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9892.4 10154.35 1370 1371 1405 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	971.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.043	0.050
W.S. Elev (ft)	971.71	Reach Len. (ft)	1370.00	1371.00	1405.00
Crit W.S. (ft)	971.11	Flow Area (sq ft)		342.29	23.01
E.G. Slope (ft/ft)	0.007517	Area (sq ft)		342.29	23.01
Q Total (cfs)	1390.00	Flow (cfs)		1369.31	20.69
Top Width (ft)	333.30	Top Width (ft)		221.74	111.57
Vel Total (ft/s)	3.81	Avg. Vel. (ft/s)		4.00	0.90
Max Chl Dpth (ft)	2.64	Hydr. Depth (ft)		1.54	0.21
Conv. Total (cfs)	16032.1	Conv. (cfs)		15793.4	238.7
Length Wtd. (ft)	1371.23	Wetted Per. (ft)		221.85	111.57
Min Ch El (ft)	969.07	Shear (lb/sq ft)		0.72	0.10
Alpha	1.09	Stream Power (lb/ft s)		2.90	0.09
Frctn Loss (ft)	15.46	Cum Volume (acre-ft)	0.03	22.88	3.09
C & E Loss (ft)	0.05	Cum SA (acres)		5.38	1.80

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24B (A59)
REACH: REACH 1 RS: 0.255

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9644.86	977.34	9670.26	976.46	9690.79	975.25	9711.94	974.36	9742.11	972.65
9753.61	971.87	9793.44	969.72	9795.29	969.54	9803.3	968.86	9836.96	965.79
9844.76	965.25	9878.64	962.05	9904.76	959.23	9912.73	958.11	9928.76	955.65
9942.68	953.64	9966.08	953.55	9986.08	953.34	10000	953.13	10011.18	952.98
10016.43	952.91	10019.18	953.11	10083.78	958.69	10103.15	959.31	10123.91	959.73
10155.37	960.25	10164.03	960.34	10192.78	960.71	10204.16	960.83	10207.59	960.88
10244.29	961.21	10259.82	961.36	10284.41	961.44	10312.04	961.61		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9644.86	.05	9904.76	.043	10123.91	.05

Bank Sta: Left Right Coeff Contr. Expan.
9904.76 10123.91 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	956.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.		0.043	
W.S. Elev (ft)	955.68	Reach Len. (ft)	1347.00	1347.00	1347.00
Crit W.S. (ft)	955.51	Flow Area (sq ft)		231.11	
E.G. Slope (ft/ft)	0.017295	Area (sq ft)		231.11	
Q Total (cfs)	1620.00	Flow (cfs)		1620.00	
Top Width (ft)	120.38	Top Width (ft)		120.38	
Vel Total (ft/s)	7.01	Avg. Vel. (ft/s)		7.01	
Max Chl Dpth (ft)	2.77	Hydr. Depth (ft)		1.92	
Conv. Total (cfs)	12318.3	Conv. (cfs)		12318.3	
Length Wtd. (ft)	1347.00	Wetted Per. (ft)		120.65	
Min Ch El (ft)	952.91	Shear (lb/sq ft)		2.07	
Alpha	1.00	Stream Power (lb/ft s)		14.50	
Frctn Loss (ft)	10.12	Cum Volume (acre-ft)	0.03	13.86	2.71
C & E Loss (ft)	0.13	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 1 RS: 3.653

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9538.28	1059.95	9570.88	1059.35	9575.36	1059.25	9593.57	1058.82	9616.69	1058.3
9622.38	1058.17	9658.01	1057.46	9673.87	1057.08	9699.33	1056.62	9725.36	1056.04
9740.65	1055.77	9776.85	1055.22	9781.97	1055.14	9802.76	1054.83	9823.29	1054.53
9828.35	1054.48	9864.61	1053.87	9879.84	1053.69	9905.93	1053.32	9931.33	1052.93
9966.26	1051.32	9987.8	1050.12	9989.87	1050	9991.99	1050	10000	1050
10009.02	105	010023.83	1052.04	10069.23	1058.15	10086.98	1058.91	0119.89	1065.8
10139.98	1070.98	10153.67	1071.71	0202.33	1068.51	0207.55	1069.29		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9538.28	.05	9931.33	.04	310069.23	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9931.33	10069.23	1240	1253	1230	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1052.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.		0.043	
W.S. Elev (ft)	1052.21	Reach Len. (ft)	1240.00	1253.00	1230.00
Crit W.S. (ft)	1052.21	Flow Area (sq ft)		105.21	
E.G. Slope (ft/ft)	0.025028	Area (sq ft)		105.21	
Q Total (cfs)	700.00	Flow (cfs)		700.00	
Top Width (ft)	78.15	Top Width (ft)		78.15	
Vel Total (ft/s)	6.65	Avg. Vel. (ft/s)		6.65	
Max Chl Dpth (ft)	2.21	Hydr. Depth (ft)		1.35	
Conv. Total (cfs)	4424.7	Conv. (cfs)		4424.7	
Length Wtd. (ft)	1253.00	Wetted Per. (ft)		78.36	
Min Ch El (ft)	1050.00	Shear (lb/sq ft)		2.10	
Alpha	1.00	Stream Power (lb/ft s)		13.96	
Frctn Loss (ft)	7.14	Cum Volume (acre-ft)	3.31	104.45	5.01
C & E Loss (ft)	0.17	Cum SA (acres)	10.16	41.32	5.43

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 1 RS: 3.416

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9221.32	1053.29	9223.36	1053.28	9231.82	1053.29	9242.95	1053.06	9252.27	1053.07
9260.27	1053.08	9295.02	1052.62	9300.35	1052.59	9304.4	1052.56	9307.8	1052.54
9310.22	1052.53	9312.38	1052.53	9314.38	1052.52	9315.28	1052.51	9333.87	1052.1
9369.58	1051.22	9396.03	1050.86	9420.13	1050.38	9440.02	1050.11	9470.68	1049.6
9484.02	1049.42	9521.24	1048.83	9528.01	1048.73	9571.79	1048.04	9572.01	1048.04
9573.48	1048.02	9616	1047.4	9622.34	1047.3	9660	1046.7	9672.89	1046.5
9703.99	1045.97	9731.42	1045.05	9733.61	1044.97	9736.57	1044.9	9761.13	1044.4
9763.25	1044.4	9765.58	1044.4	9767.87	1044.4	9770.79	1044.42	9773.48	1044.44
9779.35	1044.47	9783.28	1044.47	9807.64	1044.01	9811.97	1044.01	9814.07	1044.01
9816.74	1044.01	9818.92	1044	9822.88	1044.01	9826.77	1044.01	9836.12	1043.46
9857.79	1043.09	9860.82	1043.09	9865.8	1042.52	9877.48	1042.5	9883.32	1042.46
9888.12	1042.43	9892.25	1042.42	9897.55	1042.4	9907.82	1042.32	9921.01	1042.17
9925.65	1042.16	9944.23	1042	9954.49	1042	9954.6	1042	9954.86	1042
9955.5	1041.98	9956.26	1041.96	9979.05	1041.33	9991.45	1041	9994.68	1041
10000	104110007.55		104110028.94		1043.6410055.15		1046.9310063.99		1047.97
10081.92	1050.8110091.84		1051.8910117.98		1054.38 10151.9		1058.5310154.05		1058.76
10157.27	1059.2410190.11		1064.1410211.96		1066.9810226.17		1068.62		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9221.32	.05	9807.64	.04310055.15		.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9807.6	10055.15	1150	1213	1180	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1044.06	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.11	Wt. n-Val.		0.043		
W.S. Elev (ft)	1043.95	Reach Len. (ft)	1150.00	1213.00	1180.00	
Crit W.S. (ft)		Flow Area (sq ft)		347.92		
E.G. Slope (ft/ft)	0.002936	Area (sq ft)		347.92		
Q Total (cfs)	930.00	Flow (cfs)		930.00		
Top Width (ft)	203.71	Top Width (ft)		203.71		
Vel Total (ft/s)	2.67	Avg. Vel. (ft/s)		2.67		
Max Chl Dpth (ft)	2.95	Hydr. Depth (ft)		1.71		
Conv. Total (cfs)	17164.6	Conv. (cfs)		17164.6		
Length Wtd. (ft)	1213.00	Wetted Per. (ft)		203.95		
Min Ch El (ft)	1041.00	Shear (lb/sq ft)		0.31		
Alpha	1.00	Stream Power (lb/ft s)		0.84		
Frctn Loss (ft)	9.30	Cum Volume (acre-ft)	3.31	97.93	5.01	
C & E Loss (ft)	0.08	Cum SA (acres)	10.16	37.27	5.43	

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 1 RS: 3.186

INPUT
Description:
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9066.16	1049.89	9074.16	1049.33	9095.85	1048.31	9124.42	1046.94	9151.93	1046.01
9174.69	1045.2	9208	1044.32	9224.96	1043.86	9264.08	1043.02	9275.23	1042.76

```
 9284.28 1042.58 9325.49 1041.76 9371.68 1040.82 9375.76 1040.74 9376.23 1040.73
 9426.03 1040.05 9432.31 1039.95  9476.3 1039.25 9488.38 1039.26 9526.56 1039.18
 9544.46 1039.13 9576.83 1039.06 9600.54 1039.06  9627.1 1039.03 9656.61 1039.11
 9677.36 1039.12 9712.69 1039.29 9727.63 1039.32 9768.76 1039.62  9777.9 1039.64
 9824.84 1038.14 9828.17 1038.05 9856.95 1036.74 9878.43 1035.77 9880.92 1035.64
  9928.7 1033.38 9947.06 1032.62 9964.45 1031.98 9990.98    1031   10000    1031
10002.57    103110008.89    103110029.67 1034.54 10079.3 1042.6210087.59 1043.21
10129.43 1046.1610134.27 1046.5310179.57 1049.4710180.95 1049.6110199.51 1051.15
10227.63  1053.510229.71  1053.710274.31 1058.9710279.85 1059.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9066.16     .05 9768.76    .043 10079.3     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9768.76 10079.3             1290    1280    1255             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1034.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.87  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)         * 1033.84  * Reach Len. (ft)        * 1290.00  * 1280.00  * 1255.00  *
* Crit W.S. (ft)         * 1033.84  * Flow Area (sq ft)      *          *  180.84  *          *
* E.G. Slope (ft/ft)     *0.023113  * Area (sq ft)           *          *  180.84  *          *
* Q Total (cfs)          * 1350.00  * Flow (cfs)             *          * 1350.00  *          *
* Top Width (ft)         *  106.46  * Top Width (ft)         *          *  106.46  *          *
* Vel Total (ft/s)       *    7.47  * Avg. Vel. (ft/s)       *          *    7.47  *          *
* Max Chl Dpth (ft)      *    2.84  * Hydr. Depth (ft)       *          *    1.70  *          *
* Conv. Total (cfs)      *  8879.8  * Conv. (cfs)            *          *  8879.8  *          *
* Length Wtd. (ft)       * 1279.94  * Wetted Per. (ft)       *          *  106.76  *          *
* Min Ch El (ft)         * 1031.00  * Shear (lb/sq ft)       *          *    2.44  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *   18.25  *          *
* Frctn Loss (ft)        *    9.98  * Cum Volume (acre-ft)   *    3.31  *   90.57  *    5.01  *
* C & E Loss (ft)        *    0.20  * Cum SA (acres)         *   10.16  *   32.95  *    5.43  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 1            RS: 2.944

INPUT
Description:
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9226.38 1037.46 9255.21 1036.87 9269.93 1036.58 9293.67 1036.05 9323.78 1035.44
 9332.14 1035.24 9353.02 1034.76  9370.6 1034.37 9377.64 1034.21 9409.07 1033.37
 9431.49 1032.78 9447.54  1032.3 9485.34 1031.24    9486 1031.22 9487.65 1031.18
 9524.47 1030.06 9539.19 1029.61 9562.93 1028.95 9593.04 1028.11  9601.4 1027.91
 9622.28  1027.4 9639.86 1026.96 9646.89  1026.8 9678.33 1026.17 9700.75 1025.65
 9716.79 1025.32  9754.6 1024.59 9755.26 1024.58 9756.91 1024.55 9793.72 1023.97
 9808.45 1023.78 9832.19 1023.46  9862.3 1022.85 9870.66  1022.7 9891.54 1022.43
 9909.12 1022.25 9916.15 1022.16 9961.39 1020.83 9990.38    1020 9998.38    1020
   10000    102010008.63    102010020.38  1020.510037.72 1021.2210047.23 1021.62
10082.09  1023.310097.26 1023.37 10125.2  1023.410134.13  1023.410138.98  1023.4
10171.01 1023.2110195.87  1023.110207.89 1023.0910225.35 1023.1210232.48 1023.09
10243.55 1023.0410252.73  1023.410253.27    102310268.47 1023.8110283.53 1024.61
 10291.8 1025.06 10295.9 1025.2710303.09 1025.3710305.44  1025.510318.51 1026.29
10334.86 1027.2810356.19 1028.2510357.58 1028.4410358.93 1028.6110360.91 1028.78
10363.14 1028.79 10365.7 1028.9810404.12 1033.2510423.42 1035.0910429.14 1035.67
10458.03 1039.14
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9226.38     .05 9832.19    .04310082.09     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9832.1910082.09             1445    1437    1345            .1        .3
Ineffective Flow      num=        1
   Sta L   Sta R    Elev  Permanent
   1013410458.03    1025       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1023.76  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.               *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1023.58  * Reach Len. (ft)          * 1445.00  * 1437.00  * 1345.00  *
* Crit W.S. (ft)          * 1022.61  * Flow Area (sq ft)        *    0.51  *  468.84  *   10.62  *
* E.G. Slope (ft/ft)      *0.004285  * Area (sq ft)             *    0.51  *  468.84  *   60.43  *
* Q Total (cfs)           * 1620.00  * Flow (cfs)               *    0.15  * 1612.68  *    7.17  *
* Top Width (ft)          *  440.63  * Top Width (ft)            *    8.71  *  249.90  *  182.02  *
* Vel Total (ft/s)        *    3.38  * Avg. Vel. (ft/s)         *    0.29  *    3.44  *    0.68  *
* Max Chl Dpth (ft)       *    3.58  * Hydr. Depth (ft)         *    0.06  *    1.88  *    0.20  *
* Conv. Total (cfs)       * 24749.0  * Conv. (cfs)              *     2.3  * 24637.1  *   109.5  *
* Length Wtd. (ft)        * 1436.81  * Wetted Per. (ft)         *    8.71  *  250.02  *   51.91  *
* Min Ch El (ft)          * 1020.00  * Shear (lb/sq ft)         *    0.02  *    0.50  *    0.05  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)    *    0.00  *    1.73  *    0.04  *
* Frctn Loss (ft)         *   11.58  * Cum Volume (acre-ft)     *    3.30  *   81.02  *    4.14  *
* C & E Loss (ft)         *    0.09  * Cum SA (acres)            *   10.03  *   27.71  *    2.81  *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 1            RS: 2.672

INPUT
Description:
Station Elevation Data      num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9295.69 1019.86 9324.84 1019.76 9325.11 1019.76  9325.6 1019.75 9361.97 1019.33
 9381.78 1019.13 9398.82 1018.97 9430.12  1018.6 9437.16 1018.53 9437.62 1018.54
 9438.12 1018.54 9438.59 1018.54 9439.64 1018.54  9441.8 1018.55 9443.56 1018.56
 9446.86 1018.44 9495.65 1017.88 9501.78 1017.91 9512.64 1017.09 9519.79  1016.3
 9523.18 1016.04 9533.39 1016.13 9541.82 1016.22 9545.65 1016.26 9549.77  1016.3
 9583.12 1016.55 9609.53 1016.28 9639.15 1015.92 9656.83 1015.71 9666.47 1015.63
 9693.69 1015.31 9723.41 1014.98 9730.55 1014.92 9743.67 1014.82 9767.41 1014.69
 9780.34 1014.54 9804.27 1014.34 9837.28 1014.08 9841.13 1014.06 9848.18 1014.01
 9877.99  1014.1 9894.22 1013.96 9914.84 1013.94 9969.99 1008.34 9984.18    1007
   10000 1007.5610003.29 1007.6810012.06 1008.2610034.34 1010.7310060.86 1013.51
10093.31 1014.5310098.75 1014.5110154.32 1016.0310191.59 1017.8310213.92 1018.45
10240.95 1019.4810278.94 1023.9210279.81 1023.9910334.53 1023.6410358.04 1025.48
10406.65 1024.28

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9295.69     .05 9914.84    .04310093.31     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.8410093.31             1295    1304    1330            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1012.09  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.04  * Wt. n-Val.               *          *   0.043  *          *
* W.S. Elev (ft)          * 1011.06  * Reach Len. (ft)          * 1295.00  * 1304.00  * 1330.00  *
```

* Crit W.S. (ft)	* 1010.96	* Flow Area (sq ft)	*	*	217.83	*	*
* E.G. Slope (ft/ft)	*0.018391	* Area (sq ft)	*	*	217.83	*	*
* Q Total (cfs)	* 1780.00	* Flow (cfs)	*	*	1780.00	*	*
* Top Width (ft)	* 94.22	* Top Width (ft)	*	*	94.22	*	*
* Vel Total (ft/s)	* 8.17	* Avg. Vel. (ft/s)	*	*	8.17	*	*
* Max Chl Dpth (ft)	* 4.06	* Hydr. Depth (ft)	*	*	2.31	*	*
* Conv. Total (cfs)	* 13125.4	* Conv. (cfs)	*	*	13125.4	*	*
* Length Wtd. (ft)	* 1303.75	* Wetted Per. (ft)	*	*	94.61	*	*
* Min Ch El (ft)	* 1007.00	* Shear (lb/sq ft)	*	*	2.64	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	*	21.60	*	*
* Frctn Loss (ft)	* 8.72	* Cum Volume (acre-ft)	* 3.30	*	69.69	* 3.20	*
* C & E Loss (ft)	* 0.24	* Cum SA (acres)	* 9.89	*	22.03	*	*

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 1 RS: 2.425

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9067.11	1007.44	9067.78	1007.44	9088.07	1007.29	9105.1	1007.16	9139.54	1006.9
9142.42	1006.88	9143.84	1006.87	9179.74	1006.59	9199.62	1006.43	9217.07	1006.28
9252.34	1005.97	9254.39	1005.95	9255.4	1005.94	9291.71	1005.59	9311.18	1005.39
9329.04	1005.21	9365.14	1004.81	9366.36	1004.79	9366.96	1004.79	9403.68	1004.43
9422.74	1004.23	9441	1004.08	9477.94	1003.8	9478.33	1003.79	9478.52	1003.79
9515.65	1003.53	9534.3	1003.41	9552.97	1003.33	9590.08	1003.17	9590.3	1003.17
9590.74	1003.17	9627.62	1003.03	9645.86	1002.97	9664.94	1002.91	9701.64	1002.79
9702.27	1002.78	9703.54	1002.78	9739.59	1002.68	9757.42	1002.61	9776.91	1002.56
9813.2	1002.43	9814.23	1002.43	9816.33	1002.42	9851.56	1002.32	9868.98	1002.27
9888.88	1002.22	9924.75	1002.18	9926.2	1002.17	9930.42	1001.82	9987.99	997.75
9996.97	998.39	10000	998.52	10010.55	999	10019.52	999.34	10053.66	1001.05
10061.21	1001.13	10101.82	1002.97	10108.25	1003.02	10117.16	1003.11	10163.49	1003.67
10179.88	1003.86	10202.57	1004.14	10215.69	1004.33	10225.16	1004.46	10251.5	1004.83
10286.83	1005.33	10287.32	1005.33	10287.99	1005.34	10323.13	1005.87	10348.5	1006.24
10358.94	1006.4	10373.4	1006.61	10394.76	1006.94	10410.18	1007.16	10430.57	1007.49
10458.81	1007.95	10466.38	1008.08	10471.85	1008.17	10502.19	1008.67	10533.52	1009.21
10538.01	1009.29	10544.22	1009.38	10573.82	1009.86				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9067.11	.05	9924.75	.04	10101.82	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9924.75	10101.82	1040	1059	1045	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1003.13	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.23	* Wt. n-Val.	* 0.050	* 0.043	*	*
* W.S. Elev (ft)	* 1002.91	* Reach Len. (ft)	* 1040.00	* 1059.00	* 1045.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 104.56	* 460.21	*	*
* E.G. Slope (ft/ft)	*0.003552	* Area (sq ft)	* 104.56	* 460.21	*	*
* Q Total (cfs)	* 1900.00	* Flow (cfs)	* 101.07	* 1798.93	*	*
* Top Width (ft)	* 435.00	* Top Width (ft)	* 259.29	* 175.71	*	*
* Vel Total (ft/s)	* 3.36	* Avg. Vel. (ft/s)	* 0.97	* 3.91	*	*
* Max Chl Dpth (ft)	* 5.16	* Hydr. Depth (ft)	* 0.40	* 2.62	*	*
* Conv. Total (cfs)	* 31881.5	* Conv. (cfs)	* 1696.0	* 30185.5	*	*
* Length Wtd. (ft)	* 1058.51	* Wetted Per. (ft)	* 259.29	* 175.99	*	*
* Min Ch El (ft)	* 997.75	* Shear (lb/sq ft)	* 0.09	* 0.58	*	*
* Alpha	* 1.28	* Stream Power (lb/ft s)	* 0.09	* 2.27	*	*
* Frctn Loss (ft)	* 7.85	* Cum Volume (acre-ft)	* 1.74	* 59.55	* 3.20	*
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 6.03	* 17.99	*	*

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

```
        additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 1            RS: 2.224

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9905.37  995.12 9908.35  995.11 9944.19  994.95 9954.99  993.78 9962.09  993.08
 9985.06     991 9987.93  991.22 9994.13  991.65   10000  992.0510008.84  992.75
10011.97     99310026.07  992.78 10077.3     99210105.62  995.7110126.98  998.85
10139.22 1001.0910168.97 1005.0410226.98 1009.28 10231.3 1009.7210234.85 1010.06
10243.19 1009.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9905.37     .05 9944.19    .04310105.62     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.1910105.62             2060    2107    2125             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  995.22  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.91  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          *  994.31  * Reach Len. (ft)         * 2060.00  * 2107.00  * 2125.00  *
* Crit W.S. (ft)          *  994.31  * Flow Area (sq ft)       *          *  261.91  *          *
* E.G. Slope (ft/ft)      *0.022261  * Area (sq ft)            *          *  261.91  *          *
* Q Total (cfs)           * 2000.00  * Flow (cfs)              *          * 2000.00  *          *
* Top Width (ft)          *  144.91  * Top Width (ft)          *          *  144.91  *          *
* Vel Total (ft/s)        *    7.64  * Avg. Vel. (ft/s)         *          *    7.64  *          *
* Max Chl Dpth (ft)       *    3.31  * Hydr. Depth (ft)         *          *    1.81  *          *
* Conv. Total (cfs)       * 13404.7  * Conv. (cfs)              *          * 13404.7  *          *
* Length Wtd. (ft)        * 2106.94  * Wetted Per. (ft)         *          *  145.30  *          *
* Min Ch El (ft)          *  991.00  * Shear (lb/sq ft)         *          *    2.51  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *          *   19.13  *          *
* Frctn Loss (ft)         *   15.87  * Cum Volume (acre-ft)     *    0.49  *   50.77  *    3.20  *
* C & E Loss (ft)         *    0.19  * Cum SA (acres)            *    2.94  *   14.10  *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 1            RS: 1.825

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9663.68   975.7 9699.07  975.66 9703.86  975.66 9719.89  975.61 9744.04  975.55
 9751.26  975.52 9784.22  975.39 9803.44   975.3  9824.4  975.18 9855.63  975.03
 9864.58  974.95 9894.55  974.93 9904.76   974.9 9907.81  974.89 9914.87  974.52
```

```
 9921.67  974.07 9936.94   973.3 9982.36     971   10000     97110001.57     971
 10040.6     971 10055.5   972.110102.55  976.2710118.86  976.5410141.55  977.61
10172.09  978.3110180.54  978.7410203.73  979.3510219.54     98010225.31  980.08
10258.54  981.3110278.53   981.710297.54  982.1910331.75  983.4410336.53  983.51
10349.64  984.0910375.53  985.2510384.98  985.7910414.53  986.74 10438.2  988.03
10453.53  988.2410491.42   989.410492.53  989.4110495.56  989.4710531.52  989.82
10544.64   989.910570.52  990.0210597.86  990.1810609.52  990.3310641.47  990.25
10648.52  990.1810651.09  990.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9663.68     .05 9894.55    .04310102.55     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9894.5510102.55             1665    1698    1675             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  975.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *   0.050  *   0.043  *          *
* W.S. Elev (ft)          *  975.17  * Reach Len. (ft)         * 1665.00  * 1698.00  * 1675.00  *
* Crit W.S. (ft)          *  973.71  * Flow Area (sq ft)       *   10.74  *  523.05  *          *
* E.G. Slope (ft/ft)      *0.003942  * Area (sq ft)            *   10.74  *  523.05  *          *
* Q Total (cfs)           * 2190.00  * Flow (cfs)              *    5.82  * 2184.18  *          *
* Top Width (ft)          *  264.28  * Top Width (ft)          *   68.66  *  195.62  *          *
* Vel Total (ft/s)        *    4.10  * Avg. Vel. (ft/s)        *    0.54  *    4.18  *          *
* Max Chl Dpth (ft)       *    4.17  * Hydr. Depth (ft)        *    0.16  *    2.67  *          *
* Conv. Total (cfs)       * 34878.6  * Conv. (cfs)             *    92.6  * 34786.0  *          *
* Length Wtd. (ft)        * 1697.96  * Wetted Per. (ft)        *   68.66  *  195.90  *          *
* Min Ch El (ft)          *  971.00  * Shear (lb/sq ft)        *    0.04  *    0.66  *          *
* Alpha                   *    1.03  * Stream Power (lb/ft s)   *    0.02  *    2.74  *          *
* Frctn Loss (ft)         *   12.99  * Cum Volume (acre-ft)    *    0.24  *   31.78  *    3.20  *
* C & E Loss (ft)         *    0.09  * Cum SA (acres)           *    1.31  *    5.86  *          *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 1            RS: 1.503

INPUT
Description:
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9868.84  963.12 9874.42  963.11 9918.86   963.1 9946.98  960.91 9991.22  957.05
 9998.21  957.07   10000  957.0710009.28  957.0710046.15  960.8710071.49   963.3
10103.73  963.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9868.84     .05 9918.86    .04310071.49     .05

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9918.8610071.49             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  962.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    1.21  * Wt. n-Val.              *          *   0.043  *          *
* W.S. Elev (ft)          *  961.15  * Reach Len. (ft)         * 1589.00  * 1589.00  * 1589.00  *
* Crit W.S. (ft)          *  961.15  * Flow Area (sq ft)       *          *  250.66  *          *
* E.G. Slope (ft/ft)      *0.020534  * Area (sq ft)            *          *  250.66  *          *
* Q Total (cfs)           * 2210.00  * Flow (cfs)              *          * 2210.00  *          *
* Top Width (ft)          *  105.12  * Top Width (ft)          *          *  105.12  *          *
* Vel Total (ft/s)        *    8.82  * Avg. Vel. (ft/s)        *          *    8.82  *          *
* Max Chl Dpth (ft)       *    4.10  * Hydr. Depth (ft)        *          *    2.38  *          *
* Conv. Total (cfs)       * 15422.6  * Conv. (cfs)             *          * 15422.6  *          *
```

* Length Wtd. (ft)	* 1589.00	* Wetted Per. (ft)	*		*	105.50	*		*
* Min Ch El (ft)	* 957.05	* Shear (lb/sq ft)	*		*	3.05	*		*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*		*	26.85	*		*
* Frctn Loss (ft)	* 13.37	* Cum Volume (acre-ft)	*	0.03	*	16.70	*	3.20	*
* C & E Loss (ft)	* 0.26	* Cum SA (acres)	*		*		*		*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 2 RS: 1.202

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9798.43	947.67	9838.79	946.71	9845.88	946.59	9888.87	945.55	9893.33	945.46
9962.81	941.51	9968.53	941.07	9996.39	941.07	10000	941.08	10022.62	941.11
10033.08	941.75	10094.29	945.18	10108.06	945.32	10147.24	945.68	10147.32	945.68
10147.53	945.68	10186.58	945.66	10200.2	945.71	10225.84	945.71	10253.15	945.75
10265.11	945.78	10299.41	945.86	10304.37	945.87	10306.1	945.88	10368.81	944.28
10383.46	943.85	10393.26	943.53	10429.82	945.16	10448.83	946.02	10454.31	946.28
10461.42	946.78	10464.96	946.81	10500.68	947.03	10517.91	947.15	10539.95	947.27
10570.86	947.44	10579.21	947.47	10603.16	947.57	10618.47	947.63	10623.81	947.65
10657.73	947.73	10676.76	947.77	10697	947.77				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9798.43	.05	9888.87	.04	10147.24	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9888.87	10147.24	1325	1289	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 946.19	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.34	* Wt. n-Val.	* 0.050	* 0.043	* 0.050
* W.S. Elev (ft)	* 945.85	* Reach Len. (ft)	* 1325.00	* 1289.00	* 1250.00
* Crit W.S. (ft)	* 944.77	* Flow Area (sq ft)	* 1.91	* 665.18	* 175.56
* E.G. Slope (ft/ft)	*0.005664	* Area (sq ft)	* 1.91	* 665.18	* 175.56
* Q Total (cfs)	* 3640.00	* Flow (cfs)	* 1.22	* 3247.63	* 391.16
* Top Width (ft)	* 558.68	* Top Width (ft)	* 12.57	* 258.37	* 287.74
* Vel Total (ft/s)	* 4.32	* Avg. Vel. (ft/s)	* 0.64	* 4.88	* 2.23
* Max Chl Dpth (ft)	* 4.78	* Hydr. Depth (ft)	* 0.15	* 2.57	* 0.61
* Conv. Total (cfs)	* 48364.4	* Conv. (cfs)	* 16.2	* 43151.0	* 5197.3
* Length Wtd. (ft)	* 1286.67	* Wetted Per. (ft)	* 12.58	* 258.62	* 287.82
* Min Ch El (ft)	* 941.07	* Shear (lb/sq ft)	* 0.05	* 0.91	* 0.22
* Alpha	* 1.17	* Stream Power (lb/ft s)	* 0.03	* 4.44	* 0.48
* Frctn Loss (ft)	* 10.68	* Cum Volume (acre-ft)	* 9.68	* 74.46	* 5.14
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 7.66	* 25.18	* 9.46

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 2 RS: 0.958

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9608.24	938.71	9610.56	938.74	9611.28	938.74	9612.23	938.74	9646.98	938.7
9673.15	938.23	9682.69	937.99	9695.34	937.73	9718.39	937.21	9735.75	936.58
9754.09	935.82	9784.73	934.79	9810.02	933.92	9810.05	934.3	9810.06	934.45
9860.08	934.22	9861.21	934.22	9861.56	934.21	9896.91	933.64	9923.54	933.3
9932.62	933.18	9949.2	932.15	9966.36	931.09	9978.34	930.33	9978.34	930.38
9978.37	930.87	9982.39	930.76	10000	930.42	10006.28	930.31	10016.81	930.08
10019.92	930.06	10019.95	930.57	10019.95	930.61	10052.39	932.48	10075.18	933.67
10107.19	934.28	10110.76	934.35	10113.61	934.41	10167.05	935.2	10183.5	935.2
10186.69	935.24	10186.73	935.68	10186.73	935.78	10198.2	935.94	10207.23	936.11
10213.26	936.18	10241.37	935.98	10253.1	936.03	10267.85	935.97	10288.68	935.89
10318.8	935.86	10343.69	935.69	10343.72	936.18	10343.72	936.23	10346.36	936.22
10395.44	936.96	10428.52	938.05	10431.02	938.13	10433.02	938.18	10466.61	939.55
10496.9	940.54	10502.19	940.75	10508.85	940.96	10537.78	942.01	10560.78	942.59
10573.36	942.93	10589.18	943.37	10608.95	944.2	10624.66	944.54	10644.53	944.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9608.24	.05	9810.02	.04	10075.18	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9810.02	10075.18	1180	1235	1280	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	935.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	934.83	Reach Len. (ft)	1180.00	1235.00	1280.00
Crit W.S. (ft)	934.57	Flow Area (sq ft)	12.15	579.35	36.75
E.G. Slope (ft/ft)	0.012836	Area (sq ft)	12.15	579.35	36.75
Q Total (cfs)	3910.00	Flow (cfs)	24.25	3802.96	82.79
Top Width (ft)	358.91	Top Width (ft)	26.61	265.16	67.14
Vel Total (ft/s)	6.22	Avg. Vel. (ft/s)	2.00	6.56	2.25
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)	0.46	2.18	0.55
Conv. Total (cfs)	34511.3	Conv. (cfs)	214.1	33566.5	730.7
Length Wtd. (ft)	1226.77	Wetted Per. (ft)	26.63	266.86	67.15
Min Ch El (ft)	930.06	Shear (lb/sq ft)	0.37	1.74	0.44
Alpha	1.09	Stream Power (lb/ft s)	0.73	11.42	0.99
Frctn Loss (ft)	11.08	Cum Volume (acre-ft)	9.46	56.04	2.09
C & E Loss (ft)	0.05	Cum SA (acres)	7.06	17.43	4.37

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 2 RS: 0.724

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9336.43	929.92	9360.33	929.47	9369.41	929.44	9410.33	928.89	9419.07	928.74
9460.33	928.32	9468.73	928.19	9510.33	927.14	9518.4	926.94	9560.34	925.59
9568.06	925.35	9610.34	924	9617.72	923.71	9660.34	922.83	9667.38	922.67
9710.34	922.45	9719.92	922.09	9726.17	921.94	9750.47	921.28	9750.47	921.3
9750.49	921.81	9772.69	920.46	9777.78	920.2	9777.79	920.28	9777.8	920.73
9780.08	920.78	9854.58	923.44	9860.34	923.5	9866.02	923.49	9910.34	923.34
9917.33	922.94	9983.11	918.21	10000	918.55	10005.74	918.67	10005.77	919.03
10005.78	919.2	10016.56	919.34	10047.53	924.86	10060.35	927.05	10064.32	927.25
10110.35	929.33	10113.71	929.5	10160.36	931.26	10163.11	931.37	10210.36	933.35
10212.51	933.44	10260.36	935.37	10261.9	935.4	10310.37	936.21	10311.3	936.19
10360.37	935.12	10360.69	935.1	10386.66	934.04				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
************************************************
 9336.43     .05 9910.34    .04310060.35     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9910.3410060.35              790     801     795            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  924.36  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.49  * Wt. n-Val.               *   0.050   *   0.043   *         *
* W.S. Elev (ft)          *  923.86  * Reach Len. (ft)          *  790.00   *  801.00   *  795.00 *
* Crit W.S. (ft)          *  923.25  * Flow Area (sq ft)        *  411.14   *  451.04   *         *
* E.G. Slope (ft/ft)      *0.006814  * Area (sq ft)             *  411.14   *  451.04   *         *
* Q Total (cfs)           * 4160.00  * Flow (cfs)               * 1251.01   * 2908.99   *         *
* Top Width (ft)          *  428.07  * Top Width (ft)           *  296.48   *  131.59   *         *
* Vel Total (ft/s)        *    4.82  * Avg. Vel. (ft/s)          *    3.04   *    6.45   *         *
* Max Chl Dpth (ft)       *    5.65  * Hydr. Depth (ft)          *    1.39   *    3.43   *         *
* Conv. Total (cfs)       * 50395.4  * Conv. (cfs)               * 15155.1   * 35240.3   *         *
* Length Wtd. (ft)        *  799.38  * Wetted Per. (ft)          *  297.63   *  132.67   *         *
* Min Ch El (ft)          *  918.21  * Shear (lb/sq ft)          *    0.59   *    1.45   *         *
* Alpha                   *    1.37  * Stream Power (lb/ft s)    *    1.79   *    9.33   *         *
* Frctn Loss (ft)         *    5.21  * Cum Volume (acre-ft)      *    3.73   *   41.44   *    1.55 *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)            *    2.69   *   11.81   *    3.38 *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 1S3WS24A (A60)
REACH: REACH 2 RS: 0.572

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9038.6	928.93	9057.52	927.71	9065.2	927.39	9108.63	924.81	9147.86	923.62
9170.89	923.16	9170.91	923.52	9170.93	923.69	9179.22	923.63	9193.08	923.52
9259.74	923.44	9261.96	923.45	9270.2	923.44	9313.07	923.42	9324.59	923.43
9364.17	923.38	9389.43	923.28	9415.28	923.08	9454.27	922.51	9466.39	922.35
9511.48	921.65	9517.5	921.56	9519.12	921.55	9568.61	921.19	9583.96	921.22
9619.72	921.3	9648.81	921.42	9670.83	921.49	9713.65	921.65	9721.94	921.67
9752.77	921.71	9773.05	921.73	9778.5	921.7	9824.16	921.37	9843.34	920.93
9875.27	920.22	9903.05	921.36	9929.09	921.52	9936.63	921.54	9936.63	921.62
9936.66	922.07	9970.41	914.09	9983.75	910.89	9983.79	911.41	9984.5	911.42
9985.57	911.41	10000	911.33	10016.5	911.27	10016.52	911.55	10016.53	911.8
10065.59	915.75	10075.62	916.38	10076.11	916.41	10076.58	916.44	10076.99	916.46
10076.99	916.49	10082.65	917.03	10128.28	919.92	10167.99	922.8	10178.4	923.5
10214.86	925.25	10228.52	926.01	10261.73	926.52	10278.64	926.61	10299.82	925.71
10321.84	924.71	10321.86	924.94	10346.47	926.18	10378.88	927.26	10402.34	927.55
10429	927.41	10449.21	926.98	10479.12	926.21	10496.08	925.55		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9038.6	.05	9936.66	.04	10167.99	.05

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.6610167.99              1650    1468    1350            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          *  919.12  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.75  * Wt. n-Val.               *           *   0.043   *         *
* W.S. Elev (ft)          *  918.37  * Reach Len. (ft)          * 1650.00   * 1468.00   * 1350.00  *
* Crit W.S. (ft)          *  916.83  * Flow Area (sq ft)        *           *  622.19   *         *
* E.G. Slope (ft/ft)      *0.006254  * Area (sq ft)             *           *  622.19   *         *
* Q Total (cfs)           * 4320.00  * Flow (cfs)               *           * 4320.00   *         *
* Top Width (ft)          *  151.50  * Top Width (ft)           *           *  151.50   *         *
* Vel Total (ft/s)        *    6.94  * Avg. Vel. (ft/s)          *           *    6.94   *         *
* Max Chl Dpth (ft)       *    7.48  * Hydr. Depth (ft)          *           *    4.11   *         *
* Conv. Total (cfs)       * 54627.4  * Conv. (cfs)               *           * 54627.4   *         *
* Length Wtd. (ft)        * 1466.34  * Wetted Per. (ft)          *           *  153.63   *         *
* Min Ch El (ft)          *  910.89  * Shear (lb/sq ft)          *           *    1.58   *         *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *           *   10.98   *         *
```

```
* Frctn Loss (ft)        *   12.99  * Cum Volume (acre-ft)   *          *   31.57  *    1.55  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *          *    9.20  *    3.38  *
*****************************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 2            RS: 0.294

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9499.15  909.71 9550.42  910.61 9587.65  910.29 9587.66  910.38 9603.35  910.15
 9632.86  910.57 9663.55  911.05  9668.9  911.08 9676.88  911.08 9704.94     911
 9723.74  911.07 9740.97  910.95 9766.68  910.81 9777.01  910.73 9783.93  910.77
 9813.05   910.5 9844.13  910.53 9850.06  909.89 9850.75  909.85 9851.51  909.81
 9853.93  909.64 9914.48   906.9 9914.49  907.05  9919.5  906.35 9926.78  905.51
  9926.8  905.73 9961.26  901.35  9968.1  900.46 9968.13  900.95  9973.2  900.32
   10000   899.4 10001.3  899.3610018.08  899.0610018.08  899.0910018.09  899.59
10019.79  899.7110071.34     90410079.56  904.0710121.91  904.3410123.46  904.35
10133.68  904.3510167.36  904.3610172.48   904.410211.27  904.8610223.06  905.11
10255.17  905.9510273.63  906.6510299.07  907.6210324.21  908.4510342.97  909.07
10385.84  909.8110396.54  909.6910406.43  909.6610406.44  909.8910406.46   910.2
10411.47  910.2510474.68  912.1910475.93  912.2110518.58   913.3 10526.5  913.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9499.15     .05 9844.13    .04310071.34     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9844.1310071.34              800     870     820             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         *  906.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.27  * Wt. n-Val.              *          *   0.043  *   0.050  *
* W.S. Elev (ft)         *  904.81  * Reach Len. (ft)         *  800.00  *  870.00  *  820.00  *
* Crit W.S. (ft)         *  904.81  * Flow Area (sq ft)       *          *  490.11  *   62.19  *
* E.G. Slope (ft/ft)     *0.013098  * Area (sq ft)            *          *  490.11  *   62.19  *
* Q Total (cfs)          * 4620.00  * Flow (cfs)              *          * 4494.33  *  125.67  *
* Top Width (ft)         *  273.13  * Top Width (ft)          *          *  137.31  *  135.82  *
* Vel Total (ft/s)       *    8.37  * Avg. Vel. (ft/s)        *          *    9.17  *    2.02  *
* Max Chl Dpth (ft)      *    5.75  * Hydr. Depth (ft)        *          *    3.57  *    0.46  *
* Conv. Total (cfs)      * 40368.2  * Conv. (cfs)             *          * 39270.2  *  1098.0  *
* Length Wtd. (ft)       *  869.33  * Wetted Per. (ft)        *          *  138.81  *  135.82  *
* Min Ch El (ft)         *  899.06  * Shear (lb/sq ft)        *          *    2.89  *    0.37  *
* Alpha                  *    1.17  * Stream Power (lb/ft s)   *          *   26.48  *    0.76  *
* Frctn Loss (ft)        *    8.92  * Cum Volume (acre-ft)     *          *   12.83  *    0.59  *
* C & E Loss (ft)        *    0.21  * Cum SA (acres)           *          *    4.34  *    1.28  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 1S3WS24A (A60)
REACH: REACH 2            RS: 0.130
```

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9547.89	903.66	9590.47	903.32	9598.81	903.32	9619.2	903.38	9637.15	903.38
9644.49	903.37	9675.49	902.38	9698.51	901.97	9713.83	901.44	9751.27	899.72
9752.17	899.68	9752.53	899.66	9790.5	897.67	9806.55	896.67	9857.86	891.98
9865.85	891.21	9865.88	891.62	9865.89	891.74	9893.46	892.22	9914.6	892.37
9943.86	892.26	9968.62	892.24	9986.74	892.09	9986.76	892.33	10000	892.33
10009.11	892.37	10009.12	892.61	10042.94	892.06	10053.84	892.14	10084.3	892.72
10099.94	892.31	10102.87	892.24	10102.88	892.31	10102.93	892.78	10117.17	894.49
10120.46	895.28	10124.43	896.17	10137.59	898.14	10153.79	901.36	10158	902.02
10161.12	902.49	10173.49	904.92	10173.52	905.21	10173.54	905.45	10178.95	905.35
10188.12	906.06	10200.05	906.65	10224.25	908.68	10229.15	909.13	10258.57	910.49
10258.59	910.54	10258.68	911.02	10261.73	910.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9547.89	.05	9751.27	.043	10137.59	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9751.27	10137.59	650	685	650	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	895.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.043	
W.S. Elev (ft)	895.18	Reach Len. (ft)			
Crit W.S. (ft)	894.47	Flow Area (sq ft)		794.26	
E.G. Slope (ft/ft)	0.008311	Area (sq ft)		794.26	
Q Total (cfs)	4800.00	Flow (cfs)		4800.00	
Top Width (ft)	297.13	Top Width (ft)		297.13	
Vel Total (ft/s)	6.04	Avg. Vel. (ft/s)		6.04	
Max Chl Dpth (ft)	3.97	Hydr. Depth (ft)		2.67	
Conv. Total (cfs)	52650.7	Conv. (cfs)		52650.7	
Length Wtd. (ft)		Wetted Per. (ft)		298.94	
Min Ch El (ft)	891.21	Shear (lb/sq ft)		1.38	
Alpha	1.00	Stream Power (lb/ft s)		8.33	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:1S3WS24B (A59)

Reach	River Sta.	n1	n2	n3
REACH 1	1.901	.05	.043	.05
REACH 1	1.672	.05	.043	.05
REACH 1	1.465	.05	.043	.05
REACH 1	1.234	.05	.043	.05
REACH 1	0.988	.05	.043	.05
REACH 1	0.695	.05	.043	.05
REACH 1	0.515	.05	.043	.05
REACH 1	0.255	.05	.043	.05

River:1S3WS24A (A60)

Reach	River Sta.	n1	n2	n3
REACH 1	3.653	.05	.043	.05
REACH 1	3.416	.05	.043	.05
REACH 1	3.186	.05	.043	.05
REACH 1	2.944	.05	.043	.05
REACH 1	2.672	.05	.043	.05
REACH 1	2.425	.05	.043	.05
REACH 1	2.224	.05	.043	.05
REACH 1	1.825	.05	.043	.05
REACH 1	1.503	.05	.043	.05
REACH 2	1.202	.05	.043	.05
REACH 2	0.958	.05	.043	.05
REACH 2	0.724	.05	.043	.05
REACH 2	0.572	.05	.043	.05

*REACH 2	0.294	.05	.043	.05
*REACH 2	0.130	.05	.043	.05

SUMMARY OF REACH LENGTHS

River: 1S3WS24B (A59)

Reach	River Sta.	Left	Channel	Right
*REACH 1	1.901	1145	1210	1130
*REACH 1	1.672	1080	1095	1065
*REACH 1	1.465	1190	1220	1180
*REACH 1	1.234	1290	1294	1280
*REACH 1	0.988	1460	1551	1590
*REACH 1	0.695	900	950	1015
*REACH 1	0.515	1370	1371	1405
*REACH 1	0.255			

River: 1S3WS24A (A60)

Reach	River Sta.	Left	Channel	Right
*REACH 1	3.653	1240	1253	1230
*REACH 1	3.416	1150	1213	1180
*REACH 1	3.186	1290	1280	1255
*REACH 1	2.944	1445	1437	1345
*REACH 1	2.672	1295	1304	1330
*REACH 1	2.425	1040	1059	1045
*REACH 1	2.224	2060	2107	2125
*REACH 1	1.825	1665	1698	1675
*REACH 1	1.503			
*REACH 2	1.202	1325	1289	1250
*REACH 2	0.958	1180	1235	1280
*REACH 2	0.724	790	801	795
*REACH 2	0.572	1650	1468	1350
*REACH 2	0.294	800	870	820
*REACH 2	0.130	650	685	650

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 1S3WS24B (A59)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.901	.1	.3
*REACH 1	1.672	.1	.3
*REACH 1	1.465	.1	.3
*REACH 1	1.234	.1	.3
*REACH 1	0.988	.1	.3
*REACH 1	0.695	.1	.3
*REACH 1	0.515	.1	.3
*REACH 1	0.255	.1	.3

River: 1S3WS24A (A60)

Reach	River Sta.	Contr.	Expan.
*REACH 1	3.653	.1	.3
*REACH 1	3.416	.1	.3
*REACH 1	3.186	.1	.3
*REACH 1	2.944	.1	.3
*REACH 1	2.672	.1	.3
*REACH 1	2.425	.1	.3
*REACH 1	2.224	.1	.3
*REACH 1	1.825	.1	.3
*REACH 1	1.503	.1	.3
*REACH 2	1.202	.1	.3
*REACH 2	0.958	.1	.3
*REACH 2	0.724	.1	.3
*REACH 2	0.572	.1	.3
*REACH 2	0.294	.1	.3

```
*REACH 2          *    0.130    *        .1*        .3*
*****************************************************
```

MODEL: 2S1WS31 (B46)

REACH: 2S1WS31 (B46)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 2S1WS31 (B46)
Project File : 2S1WS31_B46.prj
Run Date and Time: 1/20/2005 12:45:37 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 2S1WS32 (B46)
Reaches: 2S1WS32 (B46)

****

PLAN DATA

Plan Title: 2S1WS31 (B46)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S1WS31 (B46)\2S1WS31_B46.p01

Geometry Title: 2S1WS31 (B46)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S1WS31 (B46)\2S1WS31_B46.g01

Flow Title : 2S1WS31 (B46)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S1WS31 (B46)\2S1WS31_B46.f01

Plan Summary Information:

Number of:	Cross Sections =	4	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance          =  0.3
    Flow tolerance factor                 =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 2S1WS32 (B46)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
1.117    PF 2                   1    9930   10100
0.858    PF 2                   1    9945   10125
0.601    PF 2                   1    9900   10100
0.326    PF 2                   1    9900   10100

*****************************************************************************

FLOW DATA

Flow Title: 2S1WS31 (B46)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S1WS31
(B46)\2S1WS31_B46.f01

Flow Data (cfs)
*************************************************************
* River            Reach            RS       *          PF 1 *
* 2S1WS32 (B46)    REACH 1          1.117    *           690 *
* 2S1WS32 (B46)    REACH 1          0.858    *           980 *
* 2S1WS32 (B46)    REACH 1          0.601    *          1270 *
* 2S1WS32 (B46)    REACH 1          0.326    *          1570 *
*************************************************************

Boundary Conditions
*****************************************************************************************************************
* River            Reach            Profile          *          Upstream                    Downstream     *
*****************************************************************************************************************
* 2S1WS32 (B46)    REACH 1          PF 1             *       Normal S = 0.0051          Known WS = 1108 *
*****************************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 2S1WS31 (B46)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S1WS31
(B46)\2S1WS31_B46.g01

CROSS SECTION


RIVER: 2S1WS32 (B46)
REACH: REACH 1            RS: 1.117

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      41
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*****************************************************************************************
 9530.98     1130 9566.17 1129.89 9568.86 1129.88  9616.2 1129.74 9617.25 1129.73
 9648.14 1129.63 9665.63 1129.56 9666.23 1129.56 9714.02 1129.39 9716.25 1129.38
  9762.4 1129.22 9766.28  1129.2 9810.79 1129.06 9816.31 1129.04 9859.17 1128.93
 9869.19 1128.66 9870.77  1128.6 9873.62 1128.51 9876.08 1128.46 9879.29  1128.4
 9883.44 1128.32 9915.98  1127.5 9920.93 1127.47 9926.32 1127.45 9940.35 1127.06
 9940.45 1127.06 9941.19 1127.07 9950.64 1127.13  9957.1 1127.24   10000 1128.64
10003.25 1128.7910019.26 1128.8410055.79 1127.1110088.89 1125.7410101.69 1125.17
10111.52 1124.8710164.37 1127.8510176.531128.51310178.86 1128.6410195.23 1129.43
10221.39 1129.47

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
*********************************************************
 9530.98     .044 9859.17     .04910195.23     .044
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9859.1710195.23             1360    1368    1370            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1127.75  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.36  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)         * 1127.39  * Reach Len. (ft)         * 1360.00  * 1368.00  * 1370.00  *
* Crit W.S. (ft)         * 1127.21  * Flow Area (sq ft)       *          *   143.72 *          *
* E.G. Slope (ft/ft)     *0.024118  * Area (sq ft)            *          *   143.72 *          *
* Q Total (cfs)          *  690.00  * Flow (cfs)              *          *   690.00 *          *
* Top Width (ft)         *  139.50  * Top Width (ft)          *          *   139.50 *          *
* Vel Total (ft/s)       *    4.80  * Avg. Vel. (ft/s)        *          *     4.80 *          *
* Max Chl Dpth (ft)      *    2.52  * Hydr. Depth (ft)        *          *     1.03 *          *
* Conv. Total (cfs)      *  4443.0  * Conv. (cfs)             *          *   4443.0 *          *
* Length Wtd. (ft)       * 1368.25  * Wetted Per. (ft)        *          *   139.64 *          *
* Min Ch El (ft)         * 1124.87  * Shear (lb/sq ft)        *          *     1.55 *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *     7.44 *          *
* Frctn Loss (ft)        *    6.10  * Cum Volume (acre-ft)    *    5.08  *    32.06 *    15.59 *
* C & E Loss (ft)        *    0.09  * Cum SA (acres)          *   13.24  *    20.87 *    32.51 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S1WS32 (B46)
REACH: REACH 1            RS: 0.858

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9742.61 1122.16 9759.65 1122.09 9782.98 1121.99 9809.78 1121.86 9837.15 1121.73
 9859.92 1121.63 9891.33 1121.49 9910.06 1121.42  9945.5 1121.26  9960.2  1121.2
 9993.89 1119.11 9999.37 1118.78   10000  1118.810003.42 1118.8910066.67 1120.77
10074.92 1120.7510092.44 1120.6810112.49 1120.6110121.93 1120.5710161.24 1119.64
10184.42 1119.2410214.78 1120.0910232.47 1120.4710262.78 1120.5310287.74 1120.66
10300.35 1120.6910327.14 1120.7110337.92 1120.71   10343 1120.72 10375.5 1120.78
10398.27 1120.8310413.07 1120.8810444.49 1120.9710450.64 1120.9910453.54    1121
10488.21 1121.12 10508.8 1121.1910525.79 1121.2510561.84 1121.3710563.36 1121.37
10564.07 1121.3810600.93 1121.5110619.34 1121.57 10638.5 1121.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9742.61    .044  9960.2    .04910232.47    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.210232.47              1360    1359    1300            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1121.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.044  *    0.049 *    0.044 *
* W.S. Elev (ft)         * 1121.50  * Reach Len. (ft)         * 1360.00  * 1359.00  * 1300.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   10.42  *   400.94 *   205.65 *
* E.G. Slope (ft/ft)     *0.002271  * Area (sq ft)            *   10.42  *   400.94 *   205.65 *
* Q Total (cfs)          *  980.00  * Flow (cfs)              *    4.67  *   749.70 *   225.63 *
* Top Width (ft)         *  708.51  * Top Width (ft)          *   70.90  *   272.27 *   365.34 *
* Vel Total (ft/s)       *    1.59  * Avg. Vel. (ft/s)        *    0.45  *     1.87 *     1.10 *
* Max Chl Dpth (ft)      *    2.72  * Hydr. Depth (ft)        *    0.15  *     1.47 *     0.56 *
* Conv. Total (cfs)      * 20564.7  * Conv. (cfs)             *    98.1  * 15731.9  *  4734.7  *
* Length Wtd. (ft)       * 1349.28  * Wetted Per. (ft)        *   70.90  *   272.40 *   365.35 *
* Min Ch El (ft)         * 1118.78  * Shear (lb/sq ft)        *    0.02  *     0.21 *     0.08 *
* Alpha                  *    1.17  * Stream Power (lb/ft s)  *    0.01  *     0.39 *     0.09 *
* Frctn Loss (ft)        *    7.29  * Cum Volume (acre-ft)    *    4.92  *    23.51 *    12.36 *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   12.13  *    14.41 *    26.76 *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
```

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S1WS32 (B46)
REACH: REACH 1 RS: 0.601

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9248.33	1115.8	9260.61	1115.75	9292.85	1115.58	9310.95	1115.47	9337.92	1115.32
9361.29	1115.18	9382.98	1115.05	9411.64	1114.88	9428.05	1114.79	9461.98	1114.6
9473.12	1114.55	9512.32	1114.38	9518.19	1114.36	9562.66	1114.22	9563.26	1114.22
9568.39	1114.21	9608.33	1114.13	9613	1114.12	9653.4	1114.06	9663.34	1114.04
9698.46	1114	9713.68	1113.98	9743.53	1113.94	9764.02	1113.91	9788.6	1113.88
9814.36	1113.84	9846.95	1113.78	9864.7	1113.74	9878.74	1113.71	9915.04	1113.63
9923.81	1113.61	9998.34	1111.68	10000	1111.56	10000.59	1111.55	10002.65	1111.63
10018.46	1112.02	10035.41	1112.29	10051.5	1112.48	10060.87	1112.62	10083.27	1113.54
10118.34	1113.61	10119.33	1113.61	10119.99	1113.61	10155.39	1113.64	10180.07	1113.67
10191.44	1113.67	10208.51	1113.68	10227.5	1113.68	10240.15	1113.68	10263.56	1113.68
10298.69	1113.67	10299.62	1113.67	10300.23	1113.67	10335.67	1113.69	10360.31	1113.7
10371.73	1113.71	10388.86	1113.73	10407.79	1113.77	10420.4	1113.81	10443.84	1113.86
10479.04	1113.96	10479.9	1113.97	10480.48	1113.97	10515.96	1114.13	10540.56	1114.23
10552.01	1114.29	10569.21	1114.37	10588.07	1114.48	10600.64	1114.55	10624.13	1114.7

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9248.33	.044	9923.81	.049	10118.34	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.81	10118.34	1385	1452	1465	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1114.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1113.96	Reach Len. (ft)	1385.00	1452.00	1465.00
Crit W.S. (ft)	1113.96	Flow Area (sq ft)	29.81	243.82	87.57
E.G. Slope (ft/ft)	0.016014	Area (sq ft)	29.81	243.82	87.57
Q Total (cfs)	1270.00	Flow (cfs)	36.62	1087.52	145.87
Top Width (ft)	747.76	Top Width (ft)	193.38	194.53	359.84
Vel Total (ft/s)	3.52	Avg. Vel. (ft/s)	1.23	4.46	1.67
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)	0.15	1.25	0.24
Conv. Total (cfs)	10035.7	Conv. (cfs)	289.4	8593.7	1152.7
Length Wtd. (ft)	1447.97	Wetted Per. (ft)	193.39	194.59	359.84
Min Ch El (ft)	1111.55	Shear (lb/sq ft)	0.15	1.25	0.24
Alpha	1.41	Stream Power (lb/ft s)	0.19	5.59	0.41
Frctn Loss (ft)	3.53	Cum Volume (acre-ft)	4.29	13.45	7.99
C & E Loss (ft)	0.07	Cum SA (acres)	8.01	7.13	15.94

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S1WS32 (B46)
REACH: REACH 1 RS: 0.326

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9147.36	1110.67	9149.41	1110.67	9197.67	1110.47	9207.06	1110.43	9219.73	1110.37
9264.72	1110.12	9298.09	1109.93	9322.37	1109.78	9355.11	1109.6	9380.03	1109.45
9398.51	1109.35	9437.68	1109.14	9490.5	1108.84	9495.34	1108.81	9498.93	1108.79
9552.99	1108.46	9599.35	1108.16	9610.65	1108.1	9625.88	1108	9668.3	1107.74
9699.77	1107.56	9725.96	1107.43	9761.27	1107.26	9783.61	1107.16	9800.19	1107.09
9841.27	1106.93	9896.66	1106.76	9898.92	1106.75	9900.6	1106.75	9936.16	1106.69
9961.43	1105.88	10000	1104.74	10007.02	1104.66	10007.35	1104.67	10008.29	1104.65
10048.27	1104.95	10065.22	1105.24	10097.89	1105.61	10120.21	1105.85	10169.19	1107.02
10169.9	1107.03	10171.21	1107.06	10222.31	1107.15	10249.22	1107.16	10274.65	1107.17
10289.18	1107.17	10327	1107.15	10329.15	1107.15	10336.07	1107.15	10369.11	1107.15
10379.35	1107.14	10409.07	1107.16	10431.69	1107.17	10449.03	1107.19	10484.04	1107.22
10488.99	1107.23	10504.96	1107.26	10528.95	1107.31	10536.39	1107.31	10568.91	1107.39
10588.73	1107.44	10608.87	1107.49	10641.08	1107.58	10648.83	1107.61	10673.85	1107.7
10688.79	1107.75	10693.43	1107.77	10728.76	1107.91	10745.77	1107.96	10768.72	1108.04
10798.12	1108.15	10808.68	1108.19						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9147.36	.044	9936.16	.049	10169.19	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9936.16	10169.19	2000	1721	2000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1108.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1108.00	Reach Len. (ft)			
Crit W.S. (ft)	1106.65	Flow Area (sq ft)	240.11	563.40	387.29
E.G. Slope (ft/ft)	0.001092	Area (sq ft)	240.11	563.40	387.29
Q Total (cfs)	1570.00	Flow (cfs)	225.87	1016.94	327.19
Top Width (ft)	1131.36	Top Width (ft)	310.28	233.03	588.05
Vel Total (ft/s)	1.32	Avg. Vel. (ft/s)	0.94	1.81	0.84
Max Chl Dpth (ft)	3.35	Hydr. Depth (ft)	0.77	2.42	0.66
Conv. Total (cfs)	47506.8	Conv. (cfs)	6834.7	30771.6	9900.4
Length Wtd. (ft)		Wetted Per. (ft)	310.28	233.08	588.06
Min Ch El (ft)	1104.65	Shear (lb/sq ft)	0.05	0.16	0.04
Alpha	1.37	Stream Power (lb/ft s)	0.05	0.30	0.04
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:2S1WS32 (B46)

Reach	River Sta.	n1	n2	n3
REACH 1	1.117	.044	.049	.044
REACH 1	0.858	.044	.049	.044
REACH 1	0.601	.044	.049	.044
REACH 1	0.326	.044	.049	.044

SUMMARY OF REACH LENGTHS

River: 2S1WS32 (B46)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.117	1360	1368	1370
REACH 1	0.858	1360	1359	1300
REACH 1	0.601	1385	1452	1465
REACH 1	0.326	2000	1721	2000

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S1WS32 (B46)

Reach	River Sta.	Contr.	Expan.
REACH 1	1.117	.1	.3
REACH 1	0.858	.1	.3
REACH 1	0.601	.1	.3
REACH 1	0.326	.1	.3

MODEL: 2S2WS15 (A37)

REACH: 2S2WS15 (A37)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 2S2WS15 (A37)
Project File : 2S2WS15_A37.prj
Run Date and Time: 12/14/2004 3:41:31 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 2S2WS15 (A37)
Reaches: 2S2WS15 (A37)

****

PLAN DATA

Plan Title: 2S2WS15 (A37)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS15 (A37)\2S2WS15_A37.p01

Geometry Title: 2S2WS15 (A37)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS15 (A37)\2S2WS15_A37.g01

Flow Title : 2S2WS15 (A37)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS15 (A37)\2S2WS15_A37.f01

Plan Summary Information:

Number of:	Cross Sections =	20	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 2S2WS15 (A37) Reach = REACH 1

RS	Profile	Method	Value1	Value2
5.019	PF 2	1	9950	10050
4.775	PF 2	1	9980	10120
4.444	PF 2	1	9970	10035
4.151	PF 2	1	9890	10025
3.934	PF 2	1	9940	10045
3.680	PF 2	1	9940	10060
3.418	PF 2	1	9815	10090
3.145	PF 2	1	9870	10060
2.877	PF 2	1	9750	10100
2.616	PF 2	1	9935	10050
2.322	PF 2	1	9975	10040
2.097	PF 2	1	9955	10035
1.867	PF 2	1	9850	10030
1.617	PF 2	1	9950	10050
1.379	PF 2	1	9975	10095
1.054	PF 2	1	9965	10045
0.799	PF 2	1	9975	10065
0.560	PF 2	1	9685	10070
0.286	PF 2	1	9575	10080
0.000	PF 2	1	9850	10075

****

FLOW DATA

Flow Title: 2S2WS15 (A37)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS15 (A37)\2S2WS15_A37.f01

Flow Data (cfs)

River	Reach	RS	PF 1
2S2WS15 (A37)	REACH 1	5.019	980
2S2WS15 (A37)	REACH 1	4.775	1030
2S2WS15 (A37)	REACH 1	4.444	1100
2S2WS15 (A37)	REACH 1	4.151	1160
2S2WS15 (A37)	REACH 1	3.934	1200
2S2WS15 (A37)	REACH 1	3.680	1250
2S2WS15 (A37)	REACH 1	3.418	1300
2S2WS15 (A37)	REACH 1	3.145	1360
2S2WS15 (A37)	REACH 1	2.877	1290
2S2WS15 (A37)	REACH 1	2.616	1230
2S2WS15 (A37)	REACH 1	2.322	1160
2S2WS15 (A37)	REACH 1	2.097	1100
2S2WS15 (A37)	REACH 1	1.867	1050
2S2WS15 (A37)	REACH 1	1.617	1100
2S2WS15 (A37)	REACH 1	1.379	1160
2S2WS15 (A37)	REACH 1	1.054	1230
2S2WS15 (A37)	REACH 1	0.799	1280
2S2WS15 (A37)	REACH 1	0.560	1330
2S2WS15 (A37)	REACH 1	0.286	1390
2S2WS15 (A37)	REACH 1	0.000	1460

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
2S2WS15 (A37)	REACH 1	PF 1	Normal S = 0.0074	Normal S = 0.0074

****

GEOMETRY DATA

Geometry Title: 2S2WS15 (A37)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS15 (A37)\2S2WS15_A37.g01

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 5.019

INPUT
Description: Directly downstream of El Paso Natural Gas Rd.
Limit of Sudy.
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9583.59	1224.74	9586.58	1224.74	9592	1224.73	9623.39	1224.67	9640.67	1224.61
9660.2	1224.54	9695.63	1224.36	9697	1224.35	9697.76	1224.34	9733.81	1224.13
9754.84	1223.98	9770.62	1223.87	9799.26	1223.66	9807.43	1223.6	9811.93	1223.56
9844.24	1223.34	9869.01	1223.16	9881.05	1223.09	9902.89	1222.96	9917.85	1222.88
9927.27	1222.84	9938.36	1222.48	9973.59	1222	9985.62	1221.57	9993.78	1221.26
10000	1221.01	10024.37	1220	10031.6	1220.51	10043.76	1221.43	10095.01	1222.98
10099.7	1223.02	10102.87	1223.07	10135.72	1223.66	10163.19	1224.37	10171.73	1224.55
10184.4	1224.86	10207.75	1225.41	10223.51	1225.72				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9583.59	.044	9973.59	.049	10043.76	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9973.59	10043.76	1240	1287	1285	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1223.32	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1222.73	Reach Len. (ft)	1240.00	1287.00	1285.00
Crit W.S. (ft)	1222.73	Flow Area (sq ft)	18.38	125.88	28.09
E.G. Slope (ft/ft)	0.021421	Area (sq ft)	18.38	125.88	28.09
Q Total (cfs)	980.00	Flow (cfs)	51.50	824.17	104.34
Top Width (ft)	156.31	Top Width (ft)	43.04	70.17	43.10
Vel Total (ft/s)	5.69	Avg. Vel. (ft/s)	2.80	6.55	3.71
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	0.43	1.79	0.65
Conv. Total (cfs)	6695.8	Conv. (cfs)	351.9	5631.1	712.9
Length Wtd. (ft)	1285.69	Wetted Per. (ft)	43.05	70.26	43.12
Min Ch El (ft)	1220.00	Shear (lb/sq ft)	0.57	2.40	0.87
Alpha	1.17	Stream Power (lb/ft s)	1.60	15.69	3.24
Frctn Loss (ft)	5.24	Cum Volume (acre-ft)	54.18	160.28	6.57
C & E Loss (ft)	0.15	Cum SA (acres)	77.13	87.63	20.66

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 4.775

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*******************************************************************************
 9207.21 1217.39 9211.14 1217.37 9233.08 1217.17 9262.18  1216.9 9275.43 1216.74
 9313.23 1216.34 9317.77 1216.29 9339.92 1216.05 9360.12 1215.82 9364.27 1215.78
 9402.47 1215.39 9415.31 1215.27 9444.81 1215.02 9475.33 1214.39 9478.56 1214.35
 9482.79  1214.3 9488.78 1214.23 9496.96 1214.13 9508.46    1214 9521.65 1214.11
 9550.49 1214.36 9558.36 1214.43 9562.42 1214.47 9564.42 1214.39 9565.52 1214.42
 9566.27 1214.43 9566.82 1214.45 9571.85 1214.49 9588.42 1214.45 9614.19 1214.38
 9619.49 1214.36 9656.54 1214.23 9670.53 1214.16 9698.89 1214.03 9721.58 1213.88
 9741.23 1213.78 9772.62  1213.6 9783.58 1213.54 9823.66 1213.32 9825.92 1213.31
 9836.93 1213.26 9868.27 1213.12 9874.71 1213.09 9910.61 1212.96 9925.75 1212.91
 9971.51 1211.12 9974.82    1211 9993.76 1209.91   10000 1209.5310010.25 1208.89
10024.33    1208 10024.5    120810034.75 1208.2210049.68 1208.5310083.43 1208.62
10105.05 1208.8510118.84    120910157.17 1211.2810186.74 1213.2110193.45 1213.23
10213.71 1213.2710233.02 1213.3110239.41 1213.3210272.58 1213.28

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9207.21    .044 9925.75    .04910186.74    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9925.7510186.74             1390    1748    1680            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*******************************************************************************************
* E.G. Elev (ft)          * 1211.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1211.71  * Reach Len. (ft)         * 1390.00  * 1748.00 * 1680.00  *
* Crit W.S. (ft)          * 1209.94  * Flow Area (sq ft)       *          *   472.38 *          *
* E.G. Slope (ft/ft)      *0.001728  * Area (sq ft)            *          *   472.38 *          *
* Q Total (cfs)           * 1030.00  * Flow (cfs)              *          *  1030.00 *          *
* Top Width (ft)          *  207.44  * Top Width (ft)           *          *   207.44 *          *
* Vel Total (ft/s)        *    2.18  * Avg. Vel. (ft/s)         *          *     2.18 *          *
* Max Chl Dpth (ft)       *    3.71  * Hydr. Depth (ft)         *          *     2.28 *          *
* Conv. Total (cfs)       * 24779.1  * Conv. (cfs)              *          *  24779.1 *          *
* Length Wtd. (ft)        * 1748.00  * Wetted Per. (ft)         *          *   207.63 *          *
* Min Ch El (ft)          * 1208.00  * Shear (lb/sq ft)         *          *     0.25 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     0.54 *          *
* Frctn Loss (ft)         *    8.32  * Cum Volume (acre-ft)     *   53.92  *   151.45 *    6.16  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)           *   76.51  *    83.53 *   20.02  *
*******************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS15 (A37)
REACH: REACH 1            RS: 4.444

INPUT
Description:
Station Elevation Data    num=       39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9702.94 1205.39 9727.77 1204.99 9776.23 1204.43  9781.8 1204.37 9785.65 1204.38
 9835.82 1204.35 9877.09 1204.13 9889.84 1204.06 9908.25 1203.68 9943.87 1202.93
 9984.95 1200.59 9996.53 1200.07    9998    1200   10000 1200.0810001.19 1200.12
10020.47 1200.8810042.58 1201.7510049.44 1202.0110052.76 1202.1410054.95 1202.34
10056.32 1202.3610057.46 1202.3810063.22 1202.5910094.19 1203.0910129.01 1203.74
10129.65 1203.75 10130.4 1203.7510165.11 1204.12 10194.8 1204.4610200.58 1204.49
10207.34 1204.5110236.04 1204.6610260.59 1204.62 10271.5  1204.610284.27 1204.52
10306.97 1204.3610326.38 1204.1610342.43 1204.04 10361.2 1203.89

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9702.94    .044 9835.82    .049 10194.8    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9835.82 10194.8             1490    1550    1510            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	1203.41	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.68	Wt. n-Val.		0.049		
W.S. Elev (ft)	1202.72	Reach Len. (ft)	1490.00	1550.00	1510.00	
Crit W.S. (ft)	1202.72	Flow Area (sq ft)		165.81		
E.G. Slope (ft/ft)	0.032496	Area (sq ft)		165.81		
Q Total (cfs)	1100.00	Flow (cfs)		1100.00		
Top Width (ft)	123.90	Top Width (ft)		123.90		
Vel Total (ft/s)	6.63	Avg. Vel. (ft/s)		6.63		
Max Chl Dpth (ft)	2.72	Hydr. Depth (ft)		1.34		
Conv. Total (cfs)	6102.1	Conv. (cfs)		6102.1		
Length Wtd. (ft)	1550.00	Wetted Per. (ft)		124.03		
Min Ch El (ft)	1200.00	Shear (lb/sq ft)		2.71		
Alpha	1.00	Stream Power (lb/ft s)		17.99		
Frctn Loss (ft)	11.99	Cum Volume (acre-ft)	53.92	138.64	6.16	
C & E Loss (ft)	0.16	Cum SA (acres)	76.51	76.88	20.02	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 4.151

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9253.77	1193.94	9286.32	1193.93	9296.83	1193.92	9330.59	1193.87	9347.32	1193.84
9374.87	1193.78	9397.81	1193.72	9419.14	1193.66	9448.3	1193.57	9463.41	1193.52
9498.79	1193.38	9507.68	1193.34	9549.28	1193.16	9551.96	1193.15	9570.99	1193.05
9596.23	1192.92	9599.77	1192.89	9640.5	1192.65	9650.26	1192.58	9684.77	1192.35
9700.75	1192.23	9725.81	1191.15	9765.36	1190	9765.46	1190	9789.68	1190.78
9796.03	1190.62	9817.59	1191.32	9852.23	1191.02	9861.86	1190.94	9917.31	1185.2
9918.69	1185	9939.72	1185.28	9955.77	1185.5	9970.03	1185.69	9992.46	1186
10000	1186.5	110004.23	1186.8	110057.73	1190.99	10072.4	1191.17	10109.4	1191.61
10110.91	1191.63	10111.52	1191.64	10149.43	1192.08	10165.31	1192.27	10187.94	1192.48
10219.1	1192.77	10226.46	1192.8	10245.02	1192.88	10264.97	1192.96	10272.89	1192.97
10303.48	1192.8	10326.67	1192.65	10342	1192.59	10380.46	1192.42	10380.64	1192.42
10419.03	1192.56	10434.25	1192.62	10457.54	1192.7				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9253.77	.044	9817.59	.049	10057.73	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9817.59	10057.73	1130	1143	1170	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1188.91	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.16	Wt. n-Val.		0.049		
W.S. Elev (ft)	1188.74	Reach Len. (ft)	1130.00	1143.00	1170.00	
Crit W.S. (ft)	1187.27	Flow Area (sq ft)		356.58		
E.G. Slope (ft/ft)	0.003505	Area (sq ft)		356.58		
Q Total (cfs)	1160.00	Flow (cfs)		1160.00		
Top Width (ft)	145.88	Top Width (ft)		145.88		
Vel Total (ft/s)	3.25	Avg. Vel. (ft/s)		3.25		
Max Chl Dpth (ft)	3.74	Hydr. Depth (ft)		2.44		
Conv. Total (cfs)	19593.6	Conv. (cfs)		19593.6		
Length Wtd. (ft)	1143.05	Wetted Per. (ft)		146.19		
Min Ch El (ft)	1185.00	Shear (lb/sq ft)		0.53		
Alpha	1.00	Stream Power (lb/ft s)		1.74		

```
* Frctn Loss (ft)        *    4.83  * Cum Volume (acre-ft)   *   53.92  *  129.35  *    6.16  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)         *   76.51  *   72.08  *   20.02  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 3.934

INPUT
Description:
Station Elevation Data num= 33

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9637.17 1183.94 9670.92 1183.85 9687.24 1183.78 9718.43 1183.77 9737.32 1183.76
 9765.93 1183.75 9787.39 1183.72 9813.44 1183.71 9837.46 1183.66 9860.94 1183.63
 9887.54 1183.57 9908.45 1183.53 9937.61 1183.47 9986.71 1181.04 9987.81 1180.97
 9990.15 1180.91   10000  1180.510013.99    118010028.15 1180.5110073.32 1183.52
10096.16 1183.5610108.69 1183.59 10120.5 1183.6210144.06 1183.6510169.07 1183.71
10179.43 1183.73 10189.2 1183.77 10214.8 1183.8310241.97 1183.9210250.17 1183.94
 10257.9 1183.9710285.55 1184.0510314.88 1184.14
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9637.17    .044 9937.61    .04910073.32    .044
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.6110073.32             1325    1342    1340            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1184.07  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.21  * Wt. n-Val.              *   0.044   *   0.049   *   0.044   *
* W.S. Elev (ft)          * 1183.86  * Reach Len. (ft)         * 1325.00   * 1342.00   * 1340.00   *
* Crit W.S. (ft)          * 1182.81  * Flow Area (sq ft)       *   48.50   *  305.09   *   28.28   *
* E.G. Slope (ft/ft)      *0.005167  * Area (sq ft)            *   48.50   *  305.09   *   28.28   *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *   37.35   * 1140.21   *   22.44   *
* Top Width (ft)          *  558.43  * Top Width (ft)          *  271.41   *  135.71   *  151.31   *
* Vel Total (ft/s)        *    3.14  * Avg. Vel. (ft/s)        *    0.77   *    3.74   *    0.79   *
* Max Chl Dpth (ft)       *    3.86  * Hydr. Depth (ft)        *    0.18   *    2.25   *    0.19   *
* Conv. Total (cfs)       * 16694.1  * Conv. (cfs)             *   519.7   * 15862.3   *   312.1   *
* Length Wtd. (ft)        * 1341.66  * Wetted Per. (ft)        *  271.41   *  135.90   *  151.31   *
* Min Ch El (ft)          * 1180.00  * Shear (lb/sq ft)        *    0.06   *    0.72   *    0.06   *
* Alpha                   *    1.35  * Stream Power (lb/ft s)  *    0.04   *    2.71   *    0.05   *
* Frctn Loss (ft)         *   11.30  * Cum Volume (acre-ft)    *   53.29   *  120.67   *    5.78   *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   72.99   *   68.38   *   17.99   *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 3.680

INPUT
Description:
Station Elevation Data num= 39

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9563.93  1173.2  9577.9 1173.15 9592.12 1173.09 9627.99 1172.95  9639.4  1172.9
 9678.07 1172.74 9686.68 1172.71 9728.16 1172.55 9733.97 1172.53 9787.25 1170.36
 9796.87 1170.04 9798.17    1170 9808.61 1170.39 9817.26 1170.72 9875.82 1172.16
 9878.43 1172.16  9923.1 1172.15 9928.51 1172.15 9939.33 1171.52 9960.83 1170.32
 9966.42 1169.92 9969.82    1170   10000    117010010.21    117010010.35    1170
10010.48    117010025.13 1170.4110085.51 1172.3510090.43 1172.3510101.96 1172.37
10128.53 1172.4110139.88 1172.4310168.14 1172.4610194.25 1172.4810204.73 1172.48
10229.28 1172.4610242.83 1172.4510248.61 1172.4310280.93 1172.35
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9563.93    .044 9928.51    .04910085.51    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.5110085.51             1360    1385    1360            .1        .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
 9563.93    9900    1173       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1172.76  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.40  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1172.36  * Reach Len. (ft)         * 1360.00  * 1385.00  * 1360.00  *
* Crit W.S. (ft)          * 1172.00  * Flow Area (sq ft)       *    5.95  *  244.13  *    0.11  *
* E.G. Slope (ft/ft)      *0.015615  * Area (sq ft)            *  175.97  *  244.13  *    0.11  *
* Q Total (cfs)           * 1250.00  * Flow (cfs)              *    8.83  * 1241.15  *    0.02  *
* Top Width (ft)          *  362.83  * Top Width (ft)          *  190.38  *  157.00  *   15.44  *
* Vel Total (ft/s)        *    5.00  * Avg. Vel. (ft/s)        *    1.48  *    5.08  *    0.16  *
* Max Chl Dpth (ft)       *    2.44  * Hydr. Depth (ft)        *    0.21  *    1.55  *    0.01  *
* Conv. Total (cfs)       * 10003.3  * Conv. (cfs)             *    70.7  *  9932.5  *     0.1  *
* Length Wtd. (ft)        * 1375.87  * Wetted Per. (ft)        *   28.51  *  157.10  *   15.45  *
* Min Ch El (ft)          * 1169.92  * Shear (lb/sq ft)        *    0.20  *    1.51  *    0.01  *
* Alpha                   *    1.03  * Stream Power (lb/ft s)   *    0.30  *    7.70  *    0.00  *
* Frctn Loss (ft)         *   12.66  * Cum Volume (acre-ft)    *   49.87  *  112.21  *    5.34  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)           *   65.97  *   63.87  *   15.42  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 2S2WS15 (A37)
REACH: REACH 1            RS: 3.418

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9513.66 1161.88  9549.4 1161.82 9552.29 1161.82 9597.84  1161.7 9602.31 1161.69
 9646.28 1161.54 9652.34 1161.51 9694.72 1161.33 9702.37 1161.29 9743.16 1161.08
 9752.39 1161.03 9780.42 1159.31  9816.4 1157.12 9818.38 1157.02 9819.72 1157.02
 9822.84 1157.08 9862.88 1157.79 9874.81    1158 9897.46 1158.65 9913.64 1159.12
  9952.5 1160.41  9993.7 1158.11 9995.52    1158   10000 1158.0610063.18 1158.83
10075.69    115910121.55    116010150.92 1160.8110157.92 1160.8210191.73  1160.8
10209.69 1160.7710232.55 1160.71

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9513.66    .044  9952.5    .04910150.92    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9952.510150.92              1350    1440    1320            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1160.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.044  *   0.049  *          *
* W.S. Elev (ft)          * 1159.85  * Reach Len. (ft)         * 1350.00  * 1440.00  * 1320.00  *
* Crit W.S. (ft)          * 1159.26  * Flow Area (sq ft)       *  257.99  *  156.09  *          *
* E.G. Slope (ft/ft)      *0.006148  * Area (sq ft)            *  257.99  *  156.09  *          *
* Q Total (cfs)           * 1300.00  * Flow (cfs)              *  922.95  *  377.05  *          *
* Top Width (ft)          *  316.52  * Top Width (ft)          *  164.17  *  152.36  *          *
* Vel Total (ft/s)        *    3.14  * Avg. Vel. (ft/s)        *    3.58  *    2.42  *          *
```

```
* Max Chl Dpth (ft)      *    2.83  * Hydr. Depth (ft)        *    1.57  *    1.02  *          *
* Conv. Total (cfs)      * 16579.7  * Conv. (cfs)             * 11770.9  *  4808.8  *          *
* Length Wtd. (ft)       * 1404.85  * Wetted Per. (ft)        *  164.29  *  152.42  *          *
* Min Ch El (ft)         * 1158.00  * Shear (lb/sq ft)        *    0.60  *    0.39  *          *
* Alpha                  *    1.09  * Stream Power (lb/ft s)   *    2.16  *    0.95  *          *
* Frctn Loss (ft)        *   11.44  * Cum Volume (acre-ft)    *   43.10  *  105.84  *    5.34  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   60.43  *   58.96  *   15.18  *
*****************************************************************************************************
```

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 3.145

INPUT
Description: Xsect just d/s of Riggs Road.
Station Elevation Data num= 27

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9553.38 1148.94 9594.51 1149.29 9615.96 1149.13 9630.52 1149.11  9637.9 1149.09
 9660.43 1148.75 9693.86 1148.45 9735.37 1148.07 9741.91 1148.01 9742.92 1148.01
 9744.31 1148.01 9746.32 1148.01 9845.05 1148.11 9868.91 1148.04 9876.17 1147.14
 9879.91 1147.09 9895.15 1147.46 9903.83 1147.68 9927.17 1148.21  9978.7 1146.08
   10000 1145.3410010.17    114510036.59 1145.9210055.52 1147.0710063.54 1147.27
10068.43 1147.3810108.72  1148.8
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9553.38    .044 9927.17    .04910108.72    .044
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9927.1710108.72 1480 1417 1460 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1148.56  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)          *    0.29  * Wt. n-Val.              *   0.044   *   0.049   *          *
* W.S. Elev (ft)         * 1148.27  * Reach Len. (ft)         * 1480.00   * 1417.00   * 1460.00   *
* Crit W.S. (ft)         * 1147.82  * Flow Area (sq ft)       *   69.14   *  277.20   *          *
* E.G. Slope (ft/ft)     *0.011123  * Area (sq ft)            *   69.14   *  277.20   *          *
* Q Total (cfs)          * 1360.00  * Flow (cfs)              *  115.90   * 1244.10   *          *
* Top Width (ft)         *  380.70  * Top Width (ft)          *  214.08   *  166.62   *          *
* Vel Total (ft/s)       *    3.93  * Avg. Vel. (ft/s)        *    1.68   *    4.49   *          *
* Max Chl Dpth (ft)      *    3.27  * Hydr. Depth (ft)        *    0.32   *    1.66   *          *
* Conv. Total (cfs)      * 12895.2  * Conv. (cfs)             *  1099.0   * 11796.2   *          *
* Length Wtd. (ft)       * 1437.40  * Wetted Per. (ft)        *  214.15   *  166.76   *          *
* Min Ch El (ft)         * 1145.00  * Shear (lb/sq ft)        *    0.22   *    1.15   *          *
* Alpha                  *    1.21  * Stream Power (lb/ft s)   *    0.38   *    5.18   *          *
* Frctn Loss (ft)        *    9.38  * Cum Volume (acre-ft)    *   38.03   *   98.68   *    5.34  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)          *   54.57   *   53.68   *   15.18  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 2.877

INPUT
Description:
Station Elevation Data num= 51

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9436.13 1139.63 9462.81 1139.55 9474.27 1139.43 9508.45  1138.7 9551.83    1138
 9571.04 1138.03    9595 1138.05 9624.89 1138.05 9646.86 1138.05  9675.1 1138.16
 9692.87 1138.23 9725.31 1138.37 9738.88  1138.4 9775.51 1138.51 9784.89 1138.51
```

```
 9825.72 1138.52 9847.32 1138.27 9865.33    1138 9911.05  1138.2 9926.14 1138.29
 9968.94 1138.14 9979.07 1137.88  9988.6 1137.65   10000 1137.3710014.58    1137
10025.27 1137.1410058.55 1137.5710082.22 1138.2210106.19 1138.2810117.58 1138.31
10129.39 1138.3410152.94  1138.410175.65 1138.47 10188.3  1138.510201.42 1138.54
10223.66  1138.610245.11 1138.6610259.02  1138.710273.45 1138.7410294.38  1138.8
10314.56 1138.8510329.74  1138.910345.49 1138.9510365.11 1139.0110384.02 1139.07
10400.47 1139.1210417.52 1139.1710435.83 1139.2310453.48 1139.2610471.19 1139.31
10489.55 1139.34

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9436.13    .044 9926.14    .04910082.22    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9926.1410082.22             1295    1379    1310            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1139.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1139.05  * Reach Len. (ft)         * 1295.00  * 1379.00  * 1310.00  *
* Crit W.S. (ft)          * 1138.67  * Flow Area (sq ft)       *  340.56  *  208.63  *  127.51  *
* E.G. Slope (ft/ft)      *0.004198  * Area (sq ft)            *  340.56  *  208.63  *  127.51  *
* Q Total (cfs)           * 1290.00  * Flow (cfs)              *  633.70  *  497.32  *  158.98  *
* Top Width (ft)          *  886.70  * Top Width (ft)           *  434.21  *  156.08  *  296.41  *
* Vel Total (ft/s)        *    1.91  * Avg. Vel. (ft/s)         *    1.86  *    2.38  *    1.25  *
* Max Chl Dpth (ft)       *    2.05  * Hydr. Depth (ft)         *    0.78  *    1.34  *    0.43  *
* Conv. Total (cfs)       * 19910.9  * Conv. (cfs)              *  9781.0  *  7676.0  *  2453.9  *
* Length Wtd. (ft)        * 1353.01  * Wetted Per. (ft)         *  434.23  *  156.11  *  296.41  *
* Min Ch El (ft)          * 1137.00  * Shear (lb/sq ft)         *    0.21  *    0.35  *    0.11  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)   *    0.38  *    0.83  *    0.14  *
* Frctn Loss (ft)         *   10.52  * Cum Volume (acre-ft)     *   31.07  *   90.78  *    3.20  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)           *   43.56  *   48.44  *   10.22  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS15 (A37)
REACH: REACH 1            RS: 2.616

INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9526.04 1128.84  9536.7 1128.82 9549.86 1128.79 9586.77 1128.71 9597.51 1128.69
 9659.65 1128.85 9669.92    1129 9730.98 1128.46 9736.96 1128.36 9740.43 1128.35
 9787.02 1128.22 9788.07 1128.22  9808.7 1128.15 9835.72 1128.07 9837.09 1128.06
 9883.36  1127.9 9887.15 1127.88    9931 1127.73 9938.54  1127.3 9940.21 1127.36
 9943.85 1127.25  9947.2 1127.17 9951.77 1127.08 9980.66 1126.18 9987.28 1126.15
 9991.65 1125.26   10000 1124.71 10000.2  1124.710002.77 1124.5310004.92 1124.65
 10008.5    112510008.93    112510029.85 1126.2910047.46 1127.3510051.24 1127.67
10052.45 1127.7110053.16 1127.7310053.73 1127.7510054.24 1127.7710057.79 1127.89
10090.54 1128.0910118.21 1128.2410126.02 1128.2910135.25 1128.34 10161.5 1128.49
10183.67 1128.5910196.98 1128.6610212.71 1128.7210232.46  1128.810249.14 1128.85
10267.93 1128.9110290.18 1128.97

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9526.04    .044    9931    .04910057.79    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
         993110057.79              1380    1549    1320            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1128.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.54  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1128.01  * Reach Len. (ft)         * 1380.00  * 1549.00  * 1320.00  *
* Crit W.S. (ft)          * 1127.85  * Flow Area (sq ft)       *   11.31  *  205.03  *    1.21  *
```

* E.G. Slope (ft/ft)	*0.020153	* Area (sq ft)	*	11.31	*	205.03	*	1.21	*
* Q Total (cfs)	* 1230.00	* Flow (cfs)	*	14.73	*	1214.37	*	0.89	*
* Top Width (ft)	* 226.55	* Top Width (ft)	*	79.86	*	126.79	*	19.89	*
* Vel Total (ft/s)	* 5.65	* Avg. Vel. (ft/s)	*	1.30	*	5.92	*	0.74	*
* Max Chl Dpth (ft)	* 3.48	* Hydr. Depth (ft)	*	0.14	*	1.62	*	0.06	*
* Conv. Total (cfs)	* 8664.4	* Conv. (cfs)	*	103.8	*	8554.3	*	6.3	*
* Length Wtd. (ft)	* 1547.18	* Wetted Per. (ft)	*	79.86	*	127.04	*	19.89	*
* Min Ch El (ft)	* 1124.53	* Shear (lb/sq ft)	*	0.18	*	2.03	*	0.08	*
* Alpha	* 1.08	* Stream Power (lb/ft s)	*	0.23	*	12.03	*	0.06	*
* Frctn Loss (ft)	* 14.34	* Cum Volume (acre-ft)	*	25.84	*	84.23	*	1.27	*
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	*	35.92	*	43.96	*	5.46	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 2.322

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9672.68	1115.61	9709.63	1115.5	9712.77	1115.48	9755.12	1115.32	9762.89	1115.29
9763.47	1115.28	9813.01	1114.99	9817.31	1114.95	9863.13	1114.55	9871.14	1114.47
9913.25	1114.04	9924.98	1113.94	9963.37	1113.57	9997.71	1109.77	10000	1109.49
10003.97	1109	10030.4	1110.75	10043.86	1111.67	10075.12	1113.59	10094.44	1113.7
10124.93	1113.88	10130.68	1113.91	10134.32	1113.93	10166.91	1114.08	10193.51	1114.17
10203.14	1114.19	10218.34	1114.22	10239.37	1114.24	10252.7	1114.24	10311.75	1114.36
10311.84	1114.36	10311.96	1114.36	10312.03	1114.36	10312.37	1114.35		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9672.68	.044	9963.37	.049	10075.12	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9963.37	10075.12	1395	1190	1365	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1114.13	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	* 0.25	* Wt. n-Val.	*	0.044	*	0.049	*	0.044	*
* W.S. Elev (ft)	* 1113.88	* Reach Len. (ft)	*	1395.00	*	1190.00	*	1365.00	*
* Crit W.S. (ft)	* 1112.59	* Flow Area (sq ft)	*	4.87	*	284.48	*	7.10	*
* E.G. Slope (ft/ft)	*0.005154	* Area (sq ft)	*	4.87	*	284.48	*	7.10	*
* Q Total (cfs)	* 1160.00	* Flow (cfs)	*	3.38	*	1151.88	*	4.74	*
* Top Width (ft)	* 192.73	* Top Width (ft)	*	31.79	*	111.75	*	49.19	*
* Vel Total (ft/s)	* 3.91	* Avg. Vel. (ft/s)	*	0.69	*	4.05	*	0.67	*
* Max Chl Dpth (ft)	* 4.88	* Hydr. Depth (ft)	*	0.15	*	2.55	*	0.14	*
* Conv. Total (cfs)	* 16158.4	* Conv. (cfs)	*	47.1	*	16045.2	*	66.0	*
* Length Wtd. (ft)	* 1190.67	* Wetted Per. (ft)	*	31.79	*	112.16	*	49.19	*
* Min Ch El (ft)	* 1109.00	* Shear (lb/sq ft)	*	0.05	*	0.82	*	0.05	*
* Alpha	* 1.06	* Stream Power (lb/ft s)	*	0.03	*	3.30	*	0.03	*
* Frctn Loss (ft)	* 9.76	* Cum Volume (acre-ft)	*	25.58	*	75.53	*	1.14	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	*	34.15	*	39.72	*	4.41	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 2.097

INPUT
Description:

```
Station Elevation Data     num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9587.18 1105.51  9595.2 1105.49 9630.85 1105.41 9637.16 1105.39 9665.81  1105.3
 9679.12 1105.26 9682.05 1105.25 9689.54 1105.01 9728.39    1104 9749.45 1104.27
 9784.44 1104.88 9817.94 1104.74 9835.64 1104.66 9846.95 1104.61 9886.84 1104.45
 9888.91 1104.44 9898.33 1104.41 9930.87 1104.28 9938.04 1104.26 9957.14 1103.18
 9985.14  1101.4   10000 1100.6110009.73 1100.0410010.46 1100.0110045.57 1103.93
10046.89 1104.0410047.49 1104.0810049.41 1104.1810057.27 1104.2210111.97 1104.45
10119.71 1104.4710130.01  1104.510155.42 1104.5510174.53  1104.610191.13 1104.62
 10213.2 1104.6610226.83 1104.6810237.09  1104.710262.54 1104.7110296.39 1104.75
10298.25 1104.7610299.65 1104.7610333.96 1104.7810362.21 1104.84

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9587.18    .044 9938.04    .04910049.41    .044

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9938.0410049.41              1140    1211    1165              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1104.33  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.53  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1103.80  * Reach Len. (ft)        * 1140.00  * 1211.00  * 1165.00  *
* Crit W.S. (ft)          * 1103.37  * Flow Area (sq ft)      *          *   188.43 *          *
* E.G. Slope (ft/ft)      *0.015634  * Area (sq ft)           *          *   188.43 *          *
* Q Total (cfs)           * 1100.00  * Flow (cfs)             *          *  1100.00 *          *
* Top Width (ft)          *   98.32  * Top Width (ft)         *          *    98.32 *          *
* Vel Total (ft/s)        *    5.84  * Avg. Vel. (ft/s)       *          *     5.84 *          *
* Max Chl Dpth (ft)       *    3.79  * Hydr. Depth (ft)       *          *     1.92 *          *
* Conv. Total (cfs)       *  8797.5  * Conv. (cfs)            *          *   8797.5 *          *
* Length Wtd. (ft)        * 1193.04  * Wetted Per. (ft)       *          *    98.64 *          *
* Min Ch El (ft)          * 1100.01  * Shear (lb/sq ft)       *          *     1.86 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    10.88 *          *
* Frctn Loss (ft)         *   10.92  * Cum Volume (acre-ft)   *   25.51  *    69.07 *     1.03 *
* C & E Loss (ft)         *    0.11  * Cum SA (acres)         *   33.64  *    36.85 *     3.64 *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS15 (A37)
REACH: REACH 1             RS: 1.867

INPUT
Description: Approximately 700' upstream of Perryville Road.
Station Elevation Data     num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9491.67 1095.85 9493.83 1095.85 9532.79 1095.87 9538.52 1095.86 9583.19  1095.8
 9583.22  1095.8 9583.42  1095.8 9627.91 1095.64  9633.6 1095.61 9672.61 1095.37
 9684.01 1095.28  9717.3 1094.97 9734.41 1094.81    9762 1094.55 9784.82 1094.45
 9806.69 1094.23 9838.14 1091.44 9842.45 1091.06 9846.83 1090.77 9852.59 1090.43
 9853.97 1090.35 9858.81 1090.52 9867.76 1090.93 9911.37 1092.28 9920.94 1092.61
 9925.85 1092.74 9928.45 1092.76 9930.34 1092.76 9931.77 1092.77 9933.56 1092.85
 9940.77 1093.21 9974.04 1091.43 9999.09 1090.11   10000 1090.1710005.26 1090.52
10016.67 1091.2310027.07 1091.7810064.16 1093.3910093.59 1093.5210102.47 1093.58
10124.06 1093.7610140.78 1093.8810147.65 1093.94

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9491.67    .044 9940.77    .04910064.16    .044

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9940.7710064.16              1370    1321    1260              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1093.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.044  *    0.049 *          *
```

* W.S. Elev (ft)	* 1093.15	* Reach Len. (ft)	* 1370.00	* 1321.00	* 1260.00	*
* Crit W.S. (ft)	* 1092.37	* Flow Area (sq ft)	* 168.30	* 169.65	*	*
* E.G. Slope (ft/ft)	*0.005894	* Area (sq ft)	* 168.30	* 169.65	*	*
* Q Total (cfs)	* 1050.00	* Flow (cfs)	* 543.95	* 506.05	*	*
* Top Width (ft)	* 237.57	* Top Width (ft)	* 120.76	* 116.81	*	*
* Vel Total (ft/s)	* 3.11	* Avg. Vel. (ft/s)	* 3.23	* 2.98	*	*
* Max Chl Dpth (ft)	* 3.04	* Hydr. Depth (ft)	* 1.39	* 1.45	*	*
* Conv. Total (cfs)	* 13676.6	* Conv. (cfs)	* 7085.2	* 6591.5	*	*
* Length Wtd. (ft)	* 1334.33	* Wetted Per. (ft)	* 120.92	* 116.97	*	*
* Min Ch El (ft)	* 1090.11	* Shear (lb/sq ft)	* 0.51	* 0.53	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	* 1.66	* 1.59	*	*
* Frctn Loss (ft)	* 9.00	* Cum Volume (acre-ft)	* 23.30	* 64.09	* 1.03	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 32.06	* 33.86	* 3.64	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 1.617

INPUT
Description: Approximately 650' downstream of Perryville Road.
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9835.61	1084.32	9846.19	1084.42	9860.61	1084.45	9890.43	1083.64	9911.11	1083.24
9934.66	1083.88	9973.78	1082.11	9997.11	1079.72	9998.32	1079.81	10000	1079.91
10056.35	1083.77	10070.1	1083.94	10093.35	1084.31	10126.65	1084.75		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9835.61	.044	9934.66	.049	10056.35	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9934.66	10056.35	1200	1257	1240	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10126.65	10126.65	1085	F

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1084.29	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.27	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1084.02	* Reach Len. (ft)	* 1200.00	* 1257.00	* 1240.00	*
* Crit W.S. (ft)	* 1083.19	* Flow Area (sq ft)	* 25.27	* 247.06	* 2.41	*
* E.G. Slope (ft/ft)	*0.007740	* Area (sq ft)	* 25.27	* 247.06	* 2.41	*
* Q Total (cfs)	* 1100.00	* Flow (cfs)	* 43.09	* 1055.09	* 1.82	*
* Top Width (ft)	* 198.45	* Top Width (ft)	* 58.08	* 121.69	* 18.68	*
* Vel Total (ft/s)	* 4.00	* Avg. Vel. (ft/s)	* 1.71	* 4.27	* 0.76	*
* Max Chl Dpth (ft)	* 4.30	* Hydr. Depth (ft)	* 0.44	* 2.03	* 0.13	*
* Conv. Total (cfs)	* 12503.1	* Conv. (cfs)	* 489.8	* 11992.6	* 20.7	*
* Length Wtd. (ft)	* 1255.89	* Wetted Per. (ft)	* 58.10	* 121.99	* 18.68	*
* Min Ch El (ft)	* 1079.72	* Shear (lb/sq ft)	* 0.21	* 0.98	* 0.06	*
* Alpha	* 1.10	* Stream Power (lb/ft s)	* 0.36	* 4.18	* 0.05	*
* Frctn Loss (ft)	* 9.35	* Cum Volume (acre-ft)	* 20.26	* 57.77	* 0.99	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 29.25	* 30.24	* 3.37	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 1.379

INPUT

```
Description:
Station Elevation Data     num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9902.02 1075.25 9905.08 1075.23 9947.63 1074.78 9959.14 1074.23 9962.45 1074.01
 9969.16 1073.42   10000 1070.4710004.28 1070.0910008.19 1070.3310060.11 1073.73
 10070.9 1073.9310097.04 1074.3410109.19 1074.56 10114.2 1074.5310147.48 1074.72
10168.29 1075.0810185.77 1075.1810222.38 1075.2710224.06 1075.2710228.14 1075.26
10262.35  1075.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9902.02    .044 9902.02    .04910109.19    .044

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9902.0210109.19               1630    1716    1625              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1074.93  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.               *          *    0.049 *    0.044 *
* W.S. Elev (ft)          * 1074.70  * Reach Len. (ft)          * 1630.00  * 1716.00 * 1625.00 *
* Crit W.S. (ft)          * 1073.54  * Flow Area (sq ft)        *          *   297.92 *     3.27 *
* E.G. Slope (ft/ft)      *0.007184  * Area (sq ft)             *          *   297.92 *     3.27 *
* Q Total (cfs)           * 1160.00  * Flow (cfs)               *          *  1158.06 *     1.94 *
* Top Width (ft)          *  194.45  * Top Width (ft)            *          *   159.86 *    34.59 *
* Vel Total (ft/s)        *    3.85  * Avg. Vel. (ft/s)          *          *     3.89 *     0.59 *
* Max Chl Dpth (ft)       *    4.61  * Hydr. Depth (ft)          *          *     1.86 *     0.09 *
* Conv. Total (cfs)       * 13685.6  * Conv. (cfs)               *          *  13662.7 *     22.9 *
* Length Wtd. (ft)        * 1715.69  * Wetted Per. (ft)          *          *   160.19 *    34.59 *
* Min Ch El (ft)          * 1070.09  * Shear (lb/sq ft)          *          *     0.83 *     0.04 *
* Alpha                   *    1.02  * Stream Power (lb/ft s)    *          *     3.24 *     0.03 *
* Frctn Loss (ft)         *   11.01  * Cum Volume (acre-ft)      *   19.91  *    49.91 *     0.91 *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *   28.45  *    26.18 *     2.61 *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS15 (A37)
REACH: REACH 1             RS: 1.054

INPUT
Description:
Station Elevation Data     num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9658.6 1064.52 9663.96 1064.51 9679.45 1064.46 9714.47 1064.29 9738.47 1064.23
 9764.99 1064.13 9797.49 1064.02  9815.5 1063.92 9856.52 1063.75 9866.02 1063.71
 9915.54 1063.52 9916.54 1063.52 9922.46  1063.5 9961.44  1063.4 9973.54 1062.44
 9984.03  1061.1   10000 1059.06 10003.1 1058.7810020.39 1059.7610039.15 1060.91
   10045 1061.31 10078.6 1064.0210093.62 1064.1410118.63 1064.2810130.06 1064.33
10136.92 1064.37 10166.5 1064.3710195.24 1064.3310202.94 1064.3210215.76 1064.27

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9658.6    .044 9961.44    .049 10078.6    .044

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9961.44 10078.6               1325    1347    1310              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1063.92  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.28  * Wt. n-Val.               *   0.044  *    0.049 *          *
* W.S. Elev (ft)          * 1063.64  * Reach Len. (ft)          * 1325.00  * 1347.00 * 1310.00  *
* Crit W.S. (ft)          * 1062.33  * Flow Area (sq ft)        *    9.83  *   285.32 *          *
* E.G. Slope (ft/ft)      *0.005804  * Area (sq ft)             *    9.83  *   285.32 *          *
* Q Total (cfs)           * 1230.00  * Flow (cfs)               *    6.46  *  1223.54 *          *
* Top Width (ft)          *  188.40  * Top Width (ft)            *   76.01  *   112.39 *          *
* Vel Total (ft/s)        *    4.17  * Avg. Vel. (ft/s)          *    0.66  *     4.29 *          *
* Max Chl Dpth (ft)       *    4.86  * Hydr. Depth (ft)          *    0.13  *     2.54 *          *
* Conv. Total (cfs)       * 16144.6  * Conv. (cfs)               *    84.9  *  16059.8 *          *
```

```
* Length Wtd. (ft)        * 1346.94  * Wetted Per. (ft)        *   76.01  *  112.83  *          *
* Min Ch El (ft)          * 1058.78  * Shear (lb/sq ft)        *    0.05  *    0.92  *          *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.03  *    3.93  *          *
* Frctn Loss (ft)         *    9.58  * Cum Volume (acre-ft)    *   19.73  *   38.42  *    0.85  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   27.03  *   20.82  *    1.97  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 0.799

INPUT
Description:
Station Elevation Data num= 32

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9748.85 1054.83    9751 1054.84 9755.18 1054.84 9771.45  1054.8 9806.22 1054.73
 9815.18  1054.7 9857.26 1054.51 9879.36  1054.4  9908.3 1054.25 9943.54 1054.08
 9959.33 1054.01 9974.16 1052.56 9982.24 1051.85   10000 1050.2910007.66 1049.76
10013.68 1050.06   10024  1050.610048.22 1051.9610059.27 1052.5910065.06 1052.93
 10068.5 1053.1710088.09 1054.1710110.38 1054.2710131.22 1054.4110145.75  1054.5
 10161.3 1054.5910181.13  1054.710199.67 1054.78 10216.5 1054.8610234.51 1054.89
10251.88 1054.8910268.12  1054.9
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9748.85    .044 9959.33    .04910088.09    .044
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
       9959.3310088.09             1200    1262    1200             .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)          * 1054.33  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.35  * Wt. n-Val.              *           *    0.049  *           *
* W.S. Elev (ft)          * 1053.98  * Reach Len. (ft)         * 1200.00   * 1262.00   * 1200.00   *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *           *  269.14   *           *
* E.G. Slope (ft/ft)      *0.008837  * Area (sq ft)            *           *  269.14   *           *
* Q Total (cfs)           * 1280.00  * Flow (cfs)              *           * 1280.00   *           *
* Top Width (ft)          *  124.59  * Top Width (ft)          *           *  124.59   *           *
* Vel Total (ft/s)        *    4.76  * Avg. Vel. (ft/s)        *           *    4.76   *           *
* Max Chl Dpth (ft)       *    4.22  * Hydr. Depth (ft)        *           *    2.16   *           *
* Conv. Total (cfs)       * 13616.6  * Conv. (cfs)             *           * 13616.6   *           *
* Length Wtd. (ft)        * 1250.47  * Wetted Per. (ft)        *           *  124.89   *           *
* Min Ch El (ft)          * 1049.76  * Shear (lb/sq ft)        *           *    1.19   *           *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *           *    5.65   *           *
* Frctn Loss (ft)         *    9.94  * Cum Volume (acre-ft)    *   19.58   *   29.85   *    0.85   *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *   25.87   *   17.15   *    1.97   *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 0.560

INPUT
Description:
Station Elevation Data num= 37

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9442.9 1044.27 9498.86 1040.36 9499.45 1040.32 9499.82 1040.33 9547.44 1042.93
 9574.15 1042.87  9599.7 1042.97 9614.22 1042.97 9651.97 1043.47 9654.28 1043.48
 9661.86 1043.48 9694.35 1043.52 9704.24 1043.53 9734.41 1043.58 9756.51 1043.57
 9774.47 1043.47 9808.78 1043.38 9814.54 1043.37 9833.46 1043.32  9854.6 1043.25
 9861.04 1043.25 9894.67 1043.17 9913.31 1043.15 9934.73 1043.13 9984.47  1042.1
   10000 1041.5710000.25 1041.5610019.55 1042.1210065.29 1043.1910073.45 1043.38
10077.01 1043.4610084.01 1043.8110089.23 1043.9610119.44 1044.2510153.86  1044.2
```

10154.87 1044.1810155.75 1044.17

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9442.9	.044	9934.73	.04910065.29		.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9934.7310065.29 1375 1437 1375 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9442.9	9700	1045	F

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1044.33	Element			
Vel Head (ft)	0.17	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1044.16	Reach Len. (ft)	1375.00	1437.00	1375.00
Crit W.S. (ft)	1043.84	Flow Area (sq ft)	186.75	226.91	16.86
E.G. Slope (ft/ft)	0.007216	Area (sq ft)	563.50	226.91	16.86
Q Total (cfs)	1330.00	Flow (cfs)	459.96	844.73	25.31
Top Width (ft)	665.31	Top Width (ft)	490.22	130.56	44.53
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)	2.46	3.72	1.50
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	0.80	1.74	0.38
Conv. Total (cfs)	15657.3	Conv. (cfs)	5414.8	9944.4	298.0
Length Wtd. (ft)	1423.04	Wetted Per. (ft)	234.73	130.60	44.54
Min Ch El (ft)	1041.56	Shear (lb/sq ft)	0.36	0.78	0.17
Alpha	1.15	Stream Power (lb/ft s)	0.88	2.91	0.26
Frctn Loss (ft)	9.87	Cum Volume (acre-ft)	11.82	22.66	0.62
C & E Loss (ft)	0.00	Cum SA (acres)	19.12	13.46	1.36

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 0.286

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9386.85	1034.62	9410.43	1034.57	9430.3	1034.56	9461.12	1034.58	9473.75	1034.56
9511.81	1034.49	9517.2	1034.48	9591.39	1033.57	9593.63	1033.52	9600.74	1033.61
9663.88	1034.27	9691.02	1034.21	9714.56	1034.13	9734.47	1034.11	9765.25	1034.1
9777.92	1034.08	9815.94	1034.01	9821.37	1034	9853.99	1033.93	9864.83	1033.9
9866.63	1033.9	9908.28	1033.87	9921.77	1033.41	9924.67	1033.3	9930.08	1033.13
9932.83	1033.06	9936.24	1032.98	9940.41	1032.86	9968.81	1032.03	9978.84	1031.48
9985.38	1031.38	9987.25	1031.44	9992.97	1030.66	9996.82	1030.13	9997.34	1031.17
9998.38	1031.3	10000	1031.48	10003.7	1031.82	10003.81	1031.82	10004.4	1031.82
10004.52	1030.05	10013.8	1031.81	10015.26	1031.82	10022.17	1031.81	10038.8	1032.17
10064.65	1032.96	10076.09	1033.16	10106.18	1034.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9386.85	.044	9908.28	.04910076.09		.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9908.2810076.09 1400 1510 1400 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1034.45	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1034.24	Reach Len. (ft)	1400.00	1510.00	1400.00
Crit W.S. (ft)	1033.54	Flow Area (sq ft)	91.78	328.74	11.11
E.G. Slope (ft/ft)	0.006686	Area (sq ft)	91.78	328.74	11.11
Q Total (cfs)	1390.00	Flow (cfs)	106.62	1263.01	20.37
Top Width (ft)	545.61	Top Width (ft)	357.30	167.81	20.50
Vel Total (ft/s)	3.22	Avg. Vel. (ft/s)	1.16	3.84	1.83

* Max Chl Dpth (ft)	*	4.19	* Hydr. Depth (ft)	*	0.26	*	1.96	*	0.54	*
* Conv. Total (cfs)	*	16999.0	* Conv. (cfs)	*	1304.0	*	15446.0	*	249.1	*
* Length Wtd. (ft)	*	1505.10	* Wetted Per. (ft)	*	357.31	*	170.46	*	20.53	*
* Min Ch El (ft)	*	1030.05	* Shear (lb/sq ft)	*	0.11	*	0.81	*	0.23	*
* Alpha	*	1.31	* Stream Power (lb/ft s)	*	0.12	*	3.09	*	0.41	*
* Frctn Loss (ft)	*	10.60	* Cum Volume (acre-ft)	*	1.47	*	13.50	*	0.18	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	5.74	*	8.53	*	0.33	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS15 (A37)
REACH: REACH 1 RS: 0.000

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9630.59	1027.45	9645.02	1027.04	9685.67	1025.66	9695.21	1025.59	9740.75	1025.49
9745.41	1025.4	9793.31	1022.08	9795.5	1021.92	9795.6	1021.92	9795.72	1021.92
9845.02	1022.7	9847.6	1022.69	9892.99	1022.56	9897.94	1022.53	9903.66	1022.49
9951.96	1021.93	9956.82	1021.89	9961.79	1021.84	9975.22	1021.75	9979.91	1021.72
9984.62	1021.71	9999.93	1021.59	10000	1021.59	10004.64	1021.61	10009.59	1021.61
10019.08	1021.68	10023.93	1021.74	10029.55	1021.81	10036.13	1021.87	10051.05	1021.95
10051.74	1021.99	10061.81	1022.58	10094.03	1023.66	10104.34	1024.07	10109.1	1024.26
10112.21	1024.41	10114.13	1024.49	10128.53	1024.87	10155.72	1025.17	10172.75	1025.37
10192	1025.59	10222.74	1026.05	10228.28	1026.07	10231.75	1026.07		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9630.59	.044	9740.75	.049	10128.53	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9740.75	10128.53	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1023.85	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.16	* Wt. n-Val.	*		*	0.049	*		*
* W.S. Elev (ft)	*	1023.69	* Reach Len. (ft)	*		*		*		*
* Crit W.S. (ft)	*	1023.10	* Flow Area (sq ft)	*		*	450.00	*		*
* E.G. Slope (ft/ft)	*	0.007408	* Area (sq ft)	*		*	450.00	*		*
* Q Total (cfs)	*	1460.00	* Flow (cfs)	*		*	1460.00	*		*
* Top Width (ft)	*	324.59	* Top Width (ft)	*		*	324.59	*		*
* Vel Total (ft/s)	*	3.24	* Avg. Vel. (ft/s)	*		*	3.24	*		*
* Max Chl Dpth (ft)	*	2.10	* Hydr. Depth (ft)	*		*	1.39	*		*
* Conv. Total (cfs)	*	16963.0	* Conv. (cfs)	*		*	16963.0	*		*
* Length Wtd. (ft)	*		* Wetted Per. (ft)	*		*	324.70	*		*
* Min Ch El (ft)	*	1021.59	* Shear (lb/sq ft)	*		*	0.64	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	2.08	*		*
* Frctn Loss (ft)	*		* Cum Volume (acre-ft)	*		*		*		*
* C & E Loss (ft)	*		* Cum SA (acres)	*		*		*		*

SUMMARY OF MANNING'S N VALUES

River:2S2WS15 (A37)

Reach	River Sta.	n1	n2	n3
REACH 1	5.019	.044	.049	.044
REACH 1	4.775	.044	.049	.044
REACH 1	4.444	.044	.049	.044
REACH 1	4.151	.044	.049	.044
REACH 1	3.934	.044	.049	.044
REACH 1	3.680	.044	.049	.044
REACH 1	3.418	.044	.049	.044
REACH 1	3.145	.044	.049	.044
REACH 1	2.877	.044	.049	.044

*REACH 1	2.616	.044	.049	.044
*REACH 1	2.322	.044	.049	.044
*REACH 1	2.097	.044	.049	.044
*REACH 1	1.867	.044	.049	.044
*REACH 1	1.617	.044	.049	.044
*REACH 1	1.379	.044	.049	.044
*REACH 1	1.054	.044	.049	.044
*REACH 1	0.799	.044	.049	.044
*REACH 1	0.560	.044	.049	.044
*REACH 1	0.286	.044	.049	.044
*REACH 1	0.000	.044	.049	.044

SUMMARY OF REACH LENGTHS

River: 2S2WS15 (A37)

Reach	River Sta.	Left	Channel	Right
*REACH 1	5.019	1240	1287	1285
*REACH 1	4.775	1390	1748	1680
*REACH 1	4.444	1490	1550	1510
*REACH 1	4.151	1130	1143	1170
*REACH 1	3.934	1325	1342	1340
*REACH 1	3.680	1360	1385	1360
*REACH 1	3.418	1350	1440	1320
*REACH 1	3.145	1480	1417	1460
*REACH 1	2.877	1295	1379	1310
*REACH 1	2.616	1380	1549	1320
*REACH 1	2.322	1395	1190	1365
*REACH 1	2.097	1140	1211	1165
*REACH 1	1.867	1370	1321	1260
*REACH 1	1.617	1200	1257	1240
*REACH 1	1.379	1630	1716	1625
*REACH 1	1.054	1325	1347	1310
*REACH 1	0.799	1200	1262	1200
*REACH 1	0.560	1375	1437	1375
*REACH 1	0.286	1400	1510	1400
*REACH 1	0.000	1	1	1

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S2WS15 (A37)

Reach	River Sta.	Contr.	Expan.
*REACH 1	5.019	.1	.3
*REACH 1	4.775	.1	.3
*REACH 1	4.444	.1	.3
*REACH 1	4.151	.1	.3
*REACH 1	3.934	.1	.3
*REACH 1	3.680	.1	.3
*REACH 1	3.418	.1	.3
*REACH 1	3.145	.1	.3
*REACH 1	2.877	.1	.3
*REACH 1	2.616	.1	.3
*REACH 1	2.322	.1	.3
*REACH 1	2.097	.1	.3
*REACH 1	1.867	.1	.3
*REACH 1	1.617	.1	.3
*REACH 1	1.379	.1	.3
*REACH 1	1.054	.1	.3
*REACH 1	0.799	.1	.3
*REACH 1	0.560	.1	.3
*REACH 1	0.286	.1	.3
*REACH 1	0.000	.1	.3

MODEL: 2S2WS16A (A35)

REACHES: 2S2WS16A (A35)
2S2WS16B (A15)
2S2WS17A (A17)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 2S2WS16A (A35)
Project File : 2S2WS16A_A35.prj
Run Date and Time: 12/14/2004 3:52:03 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 2S2WS16A (A35)
Reaches: 2S2WS16A (A35)
  2S2WS16B
(A15)
  2S2WS17A (A17)

****

PLAN DATA

Plan Title: 2S2WS16A (A35)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS16A (A35)\2S2WS16A_A35.p01

Geometry Title: 2S2WS16A (A35)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS16A (A35)\2S2WS16A_A35.g01

Flow Title : 2S2WS16A (A35)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS16A (A35)\2S2WS16A_A35.f01

Plan Summary Information:

Number of:	Cross Sections =	36	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

```
    Water surface calculation tolerance =  0.01
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  20
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 2S2WS16A (A35)   Reach = REACH 2
RS      Profile           Method  Value1  Value2
1.888   PF 2                   1    9895   10050
1.632   PF 2                   1    9950   10050
1.364   PF 2                   1    9950   10050
1.114   PF 2                   1 9953.52   10050
0.859   PF 2                   1    9950   10050
0.588   PF 2                   1    9955   10035

River = 2S2WS16A (A35)   Reach = REACH 3
RS      Profile           Method  Value1  Value2
0.351   PF 2                   1    9800   10040
0.213   PF 2                   1    9900   10410
0.000   PF 2                   1    9900   10100

River = 2S2WS16A (A35)   Reach = REACH 1
RS      Profile           Method  Value1  Value2
4.711   PF 2                   1    9950   10190
4.426   PF 2                   1    9950   10050
4.194   PF 2                   1    9950   10050
3.954   PF 2                   1    9950   10050
3.708   PF 2                   1    9945   10055
3.458   PF 2                   1    9950   10050
3.199   PF 2                   1    9960   10040
2.957   PF 2                   1    9900   10050
2.701   PF 2                   1    9900   10100
2.377   PF 2                   1    9840   10100
2.157   PF 2                   1    9670   10100

River = 2S2WS16B (A15)   Reach = REACH 1
RS      Profile           Method  Value1  Value2
2.077   PF 2                   1    9980   10020
1.815   PF 2                   1    9875   10050
1.550   PF 2                   1    9940   10030
1.308   PF 2                   1    9950   10240
1.047   PF 2                   1    982510042.04
0.781   PF 2                   1    995010048.75
0.524   PF 2                   1    995010038.88
0.268   PF 2                   1    9900   10040
0.053   PF 2                   1    9950   10050

River = 2S2WS17A (A17)   Reach = REACH 1
RS      Profile           Method  Value1  Value2
1.473   PF 2                   1    9965   10035
1.217   PF 2                   1    9900   10035
0.931   PF 2                   1    9945   10020
0.684   PF 2                   1 9945.17   10185
0.435   PF 2                   1    9875 10025.8
0.248   PF 2                   1    987510038.64
0.000   PF 2                   1    9950   10050

*******************************************************************************

FLOW DATA

Flow Title: 2S2WS16A (A35)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS16A
(A35)\2S2WS16A_A35.f01

Flow Data (cfs)
*************************************************************
```

River	Reach	RS	PF 1
2S2WS16A (A35)	REACH 1	4.711	840
2S2WS16A (A35)	REACH 1	4.426	920
2S2WS16A (A35)	REACH 1	4.194	1010
2S2WS16A (A35)	REACH 1	3.954	1090
2S2WS16A (A35)	REACH 1	3.708	1180
2S2WS16A (A35)	REACH 1	3.458	1260
2S2WS16A (A35)	REACH 1	3.199	1350
2S2WS16A (A35)	REACH 1	2.957	1430
2S2WS16A (A35)	REACH 1	2.701	1520
2S2WS16A (A35)	REACH 1	2.377	1630
2S2WS16A (A35)	REACH 1	2.157	1700
2S2WS16A (A35)	REACH 2	1.888	890
2S2WS16A (A35)	REACH 2	1.632	880
2S2WS16A (A35)	REACH 2	1.364	870
2S2WS16A (A35)	REACH 2	1.114	860
2S2WS16A (A35)	REACH 2	0.859	840
2S2WS16A (A35)	REACH 2	0.588	830
2S2WS16A (A35)	REACH 3	0.351	1180
2S2WS16A (A35)	REACH 3	0.213	1430
2S2WS16A (A35)	REACH 3	0.000	1730
2S2WS16B (A15)	REACH 1	2.077	680
2S2WS16B (A15)	REACH 1	1.815	720
2S2WS16B (A15)	REACH 1	1.550	760
2S2WS16B (A15)	REACH 1	1.308	790
2S2WS16B (A15)	REACH 1	1.047	830
2S2WS16B (A15)	REACH 1	0.781	870
2S2WS16B (A15)	REACH 1	0.524	1210
2S2WS16B (A15)	REACH 1	0.268	1210
2S2WS16B (A15)	REACH 1	0.053	1210
2S2WS17A (A17)	REACH 1	1.473	810
2S2WS17A (A17)	REACH 1	1.217	800
2S2WS17A (A17)	REACH 1	0.931	780
2S2WS17A (A17)	REACH 1	0.684	770
2S2WS17A (A17)	REACH 1	0.435	760
2S2WS17A (A17)	REACH 1	0.248	750
2S2WS17A (A17)	REACH 1	0.000	740

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
2S2WS16A (A35)	REACH 1	PF 1	Normal S = 0.0077	
2S2WS16A (A35)	REACH 3	PF 1		Normal S = 0.0077
2S2WS16B (A15)	REACH 1	PF 1	Normal S = 0.0073	
2S2WS17A (A17)	REACH 1	PF 1		Normal S = 0.009

GEOMETRY DATA

Geometry Title: 2S2WS16A (A35)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS16A (A35)\2S2WS16A_A35.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
2S2WS16A (A35)	REACH 1		JUNCTION 1
2S2WS16A (A35)	REACH 2	JUNCTION 1	2
2S2WS16A (A35)	REACH 3	2	
2S2WS16B (A15)	REACH 1		2
2S2WS17A (A17)	REACH 1	JUNCTION 1	

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
2S2WS16A (A35)	REACH 1	to 2S2WS16A (A35)	REACH 2	1426	
2S2WS16A (A35)	REACH 1	to 2S2WS17A (A17)	REACH 1	1430	

Name: 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
2S2WS16A (A35)	REACH 2	to 2S2WS16A (A35)	REACH 3	1251	
2S2WS16B (A15)	REACH 1	to 2S2WS16A (A35)	REACH 3	280	

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 1 RS: 4.711

INPUT
Description: Directly downstream of El Paso Natural Gas Road.
Limit of Sudy.
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9702.56	1227.4	9714.53	1226.97	9741.83	1226.2	9751.52	1225.89	9769.83	1225.42
9788.51	1224.91	9798.41	1224.72	9825.51	1224.11	9854.98	1223.6	9862.5	1223.45
9876.7	1223.3	9899.49	1223.04	9911.55	1223	9936.48	1222.92	9984.07	1222.44
9992.35	1222.34	10000	1221.87	10006.2	1221.48	10011.3	1221.19	10015.77	1221.34
10080.33	1223.32	10085.06	1223.34	10103.84	1222.87	10155.71	1221.64	10163.78	1221.58
10168.91	1221.54	10179.61	1221.84	10200.66	1222.55	10234.11	1223.68	10248.08	1223.69
10271.37	1223.7	10304	1223.71	10308.63	1223.71	10317.89	1223.71	10345.89	1223.72
10359.91	1223.72	10383.15	1223.73	10415.83	1223.74	10420.42	1223.75	10429.58	1223.75
10457.68	1223.77	10471.74	1223.78	10494.94	1223.81	10527.66	1223.85	10535.24	1223.54
10536.96	1223.45	10542.77	1223.21	10580.78	1221.61	10582.19	1221.54	10583.77	1221.61
10639.49	1223.99	10643.98	1224	10652.96	1224.01	10681.25	1224.07	10695.41	1224.09
10718.51	1224.13	10751.32	1224.21	10755.77	1224.21	10764.65	1224.21		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9702.56	.044	9854.98	.049	10234.11	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9854.98	10234.11	1400	1504	1450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1223.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.000	0.049	0.044
W.S. Elev (ft)	1223.61	Reach Len. (ft)	1400.00	1504.00	1450.00
Crit W.S. (ft)	1222.81	Flow Area (sq ft)	0.00	394.76	100.86
E.G. Slope (ft/ft)	0.002815	Area (sq ft)	0.00	394.76	100.86
Q Total (cfs)	840.00	Flow (cfs)	0.00	654.74	185.26
Top Width (ft)	474.75	Top Width (ft)	0.60	377.07	97.08
Vel Total (ft/s)	1.69	Avg. Vel. (ft/s)	0.05	1.66	1.84
Max Chl Dpth (ft)	2.42	Hydr. Depth (ft)	0.01	1.05	1.04
Conv. Total (cfs)	15831.4	Conv. (cfs)	0.0	12339.8	3491.7
Length Wtd. (ft)	1498.09	Wetted Per. (ft)	0.60	377.20	97.17
Min Ch El (ft)	1221.19	Shear (lb/sq ft)		0.18	0.18
Alpha	1.01	Stream Power (lb/ft s)		0.31	0.34
Frctn Loss (ft)	10.74	Cum Volume (acre-ft)	25.73	81.55	29.71
C & E Loss (ft)	0.04	Cum SA (acres)	34.92	55.69	36.76

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 1 RS: 4.426

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
  9710.8 1216.24  9735.4 1215.51 9758.01 1214.94 9785.91 1214.24 9816.98 1213.65
 9836.43 1213.29 9875.96 1212.76 9886.94 1212.62 9934.93 1212.17 9937.45 1212.15
 9940.74 1212.03 9942.24 1211.98 9945.13  1211.9    9956 1211.59 9995.18 1210.45
 9999.89  1210.7   10000 1210.7110000.91 1210.75 10007.9 1211.0310008.53 1211.06
10009.34 1211.0910022.69 1211.2210034.15 1211.2610053.23 1211.5110065.47  1211.6
10074.41 1211.6710081.29 1211.7210102.71 1212.3810135.46 1212.5510138.18 1212.56
 10140.5 1212.5710173.64 1212.7210206.31 1212.86 10209.1 1212.8710212.36 1212.88
10244.56 1213.01

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9710.8    .044 9934.93    .04910102.71    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.9310102.71             1200    1225    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1212.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.48  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1212.39  * Reach Len. (ft)         * 1200.00  * 1225.00  * 1200.00  *
* Crit W.S. (ft)         * 1212.39  * Flow Area (sq ft)       *    2.60  *  164.80  *    0.01  *
* E.G. Slope (ft/ft)     *0.034442  * Area (sq ft)            *    2.60  *  164.80  *    0.01  *
* Q Total (cfs)          *  920.00  * Flow (cfs)              *    3.75  *  916.25  *    0.00  *
* Top Width (ft)         *  193.42  * Top Width (ft)          *   23.55  *  167.78  *    2.09  *
* Vel Total (ft/s)       *    5.50  * Avg. Vel. (ft/s)        *    1.44  *    5.56  *    0.19  *
* Max Chl Dpth (ft)      *    1.94  * Hydr. Depth (ft)        *    0.11  *    0.98  *    0.01  *
* Conv. Total (cfs)      *  4957.3  * Conv. (cfs)             *    20.2  *  4937.1  *     0.0  *
* Length Wtd. (ft)       * 1217.52  * Wetted Per. (ft)        *   23.55  *  167.83  *    2.09  *
* Min Ch El (ft)         * 1210.45  * Shear (lb/sq ft)        *    0.24  *    2.11  *    0.01  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)  *    0.34  *   11.74  *    0.00  *
* Frctn Loss (ft)        *   10.50  * Cum Volume (acre-ft)    *   25.69  *   71.89  *   28.03  *
* C & E Loss (ft)        *    0.12  * Cum SA (acres)          *   34.53  *   46.29  *   35.11  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 2S2WS16A (A35)
REACH: REACH 1            RS: 4.194

INPUT
Description:
Station Elevation Data     num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9300.99 1207.65 9323.68 1207.31 9351.78 1206.99 9366.51 1206.89 9404.66 1206.49
 9447.07 1206.06 9457.53 1205.97 9477.49 1205.71  9510.4 1205.21 9527.64 1205.07
 9563.27 1204.51 9608.21 1203.99 9616.14 1203.91  9631.3 1203.69 9669.01 1203.11
  9708.8 1200.77 9716.27 1200.54  9733.3  1199.3 9735.45 1199.33 9738.79 1199.46
 9739.98  1199.5  9741.4 1199.57 9767.38 1200.16 9816.75 1201.79 9827.63 1201.73
 9849.91 1201.62  9880.5 1201.47 9895.45 1201.42 9933.37 1201.29 9934.79 1201.29
 9943.89 1201.13 9995.16 1200.07 9996.91 1199.89   10000 1199.6110002.74 1199.44
10004.99 1199.3310006.37 1199.2710019.18 1199.7310030.35 1200.1510068.13 1200.85
 10076.9 1201.0610080.47 1201.1110083.17 1201.1410085.28 1201.1810087.56 1201.25
10089.39 1201.3210105.53 1201.5410144.26 1201.6410163.77 1201.6810196.92 1201.77
10203.35 1201.7910222.86 1201.8310242.94 1201.8710249.57 1201.8910282.53 1201.95
10302.22    120210322.11 1202.0510379.65 1200.46 10392.2 1199.8310393.35 1199.88
10440.87 1202.3310460.18 1202.3710480.46 1202.4210512.83 1202.4810520.05  1202.5
 10541.9 1202.5410559.64 1202.5710565.49 1202.5810599.22 1202.6310618.14 1202.65

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9300.99    .044 9933.37    .04910105.53    .044
```

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9933.3710105.53              1265    1268    1230            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1201.81  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.044   *   0.049   *   0.044   *
* W.S. Elev (ft)          * 1201.74  * Reach Len. (ft)         * 1265.00   * 1268.00   * 1230.00   *
* Crit W.S. (ft)          * 1201.06  * Flow Area (sq ft)       *  178.55   *  202.39   *   93.13   *
* E.G. Slope (ft/ft)      *0.004073  * Area (sq ft)            *  178.55   *  202.39   *   93.13   *
* Q Total (cfs)           * 1010.00  * Flow (cfs)              *  400.64   *  436.15   *  173.21   *
* Top Width (ft)          *  578.03  * Top Width (ft)          *  230.12   *  172.16   *  175.75   *
* Vel Total (ft/s)        *    2.13  * Avg. Vel. (ft/s)        *    2.24   *    2.16   *    1.86   *
* Max Chl Dpth (ft)       *    2.47  * Hydr. Depth (ft)        *    0.78   *    1.18   *    0.53   *
* Conv. Total (cfs)       * 15826.4  * Conv. (cfs)             *  6277.9   *  6834.3   *  2714.2   *
* Length Wtd. (ft)        * 1262.15  * Wetted Per. (ft)        *  230.24   *  172.23   *  175.83   *
* Min Ch El (ft)          * 1199.27  * Shear (lb/sq ft)        *    0.20   *    0.30   *    0.13   *
* Alpha                   *    1.01  * Stream Power (lb/ft s)  *    0.44   *    0.64   *    0.25   *
* Frctn Loss (ft)         *   11.03  * Cum Volume (acre-ft)    *   23.19   *   66.73   *   26.74   *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   31.04   *   41.51   *   32.66   *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16A (A35)
REACH: REACH 1              RS: 3.954

INPUT
Description:
Station Elevation Data     num=      47
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************
 9586.76 1191.04  9608.1 1191.02 9636.83 1191.02 9661.15 1190.95 9686.91  1190.9
  9714.2 1190.77 9736.99 1190.67 9767.25 1190.49 9787.07 1190.37  9820.3 1190.18
 9837.15 1190.08 9873.35 1189.92 9887.23 1189.86  9926.4  1189.8  9937.3 1189.77
 9962.08 1189.21 9979.69 1188.85   10000 1188.3410000.16 1188.3410007.87 1188.65
10018.11 1189.0110031.35 1189.51   10034 1189.5910036.14 1189.6310097.47 1190.45
10097.52 1190.4510134.82 1190.5910153.31 1190.6710172.14 1190.71 10209.1 1190.84
10209.46 1190.8410210.19 1190.8410246.78 1190.9310264.88    119110301.95 1190.08
 10308.8    119010327.85 1189.4810328.93 1189.4510343.33 1190.0410376.46 1191.46
10396.05 1191.5410432.24 1191.7310433.37 1191.7410435.65 1191.7510470.69 1191.88
10488.03 1191.9410508.01 1192.02

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9586.76    .044  9937.3    .04910097.47    .044

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9937.310097.47               1275    1297    1275            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1190.75  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *   0.044   *   0.049   *   0.044   *
* W.S. Elev (ft)          * 1190.42  * Reach Len. (ft)         * 1275.00   * 1297.00   * 1275.00   *
* Crit W.S. (ft)          * 1190.42  * Flow Area (sq ft)       *   63.07   *  159.35   *   30.55   *
* E.G. Slope (ft/ft)      *0.027003  * Area (sq ft)            *   63.07   *  159.35   *   30.55   *
* Q Total (cfs)           * 1090.00  * Flow (cfs)              *  188.89   *  797.77   *  103.34   *
* Top Width (ft)          *  381.45  * Top Width (ft)          *  159.08   *  158.20   *   64.17   *
* Vel Total (ft/s)        *    4.31  * Avg. Vel. (ft/s)        *    2.99   *    5.01   *    3.38   *
* Max Chl Dpth (ft)       *    2.08  * Hydr. Depth (ft)        *    0.40   *    1.01   *    0.48   *
* Conv. Total (cfs)       *  6633.1  * Conv. (cfs)             *  1149.5   *  4854.8   *   628.9   *
* Length Wtd. (ft)        * 1287.43  * Wetted Per. (ft)        *  159.08   *  158.24   *   64.21   *
* Min Ch El (ft)          * 1188.34  * Shear (lb/sq ft)        *    0.67   *    1.70   *    0.80   *
* Alpha                   *    1.13  * Stream Power (lb/ft s)  *    2.00   *    8.50   *    2.71   *
* Frctn Loss (ft)         *   12.27  * Cum Volume (acre-ft)    *   19.68   *   61.46   *   25.00   *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)          *   25.38   *   36.70   *   29.27   *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
```

```
         program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 2S2WS16A (A35)
REACH: REACH 1            RS: 3.708

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9544.04 1178.26 9561.96 1178.25 9594.19 1178.23 9596.85 1178.23 9644.33 1178.14
 9685.08 1178.13 9694.48 1178.12 9705.43 1178.15 9744.62 1178.16 9759.72 1178.14
 9794.77  1178.1 9814.01 1178.04 9844.92 1177.91  9868.3 1177.74 9895.06 1177.56
 9922.59 1177.35 9945.21 1177.16 9971.57 1176.46   10000 1175.7910002.53 1175.74
10020.13 1176.1310050.64 1176.8610075.06 1176.9210096.04 1176.9910106.44 1177.02
10143.79 1175.2610146.94 1175.1510184.82  1176.510197.97    117710202.07 1177.18
10218.06 1177.6610245.28 1177.8310273.87    117810282.59 1178.0510300.19 1178.15
 10319.9 1178.2810329.68 1178.3410357.21 1178.4810385.48 1178.6210394.52 1178.65
10412.75 1178.7110431.83 1178.7810441.29 1178.8110469.14 1178.88 10497.1 1178.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9544.04    .044 9945.21    .04910050.64    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.2110050.64             1300    1321    1295            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1178.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.11  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1177.94  * Reach Len. (ft)         * 1300.00  * 1321.00  * 1295.00  *
* Crit W.S. (ft)         * 1177.26  * Flow Area (sq ft)       *   39.29  *  166.16  *  245.54  *
* E.G. Slope (ft/ft)     *0.005043  * Area (sq ft)            *   39.29  *  166.16  *  245.54  *
* Q Total (cfs)          * 1180.00  * Flow (cfs)              *   48.26  *  484.46  *  647.27  *
* Top Width (ft)         *  425.57  * Top Width (ft)           *  107.17  *  105.43  *  212.97  *
* Vel Total (ft/s)       *    2.62  * Avg. Vel. (ft/s)         *    1.23  *    2.92  *    2.64  *
* Max Chl Dpth (ft)      *    2.79  * Hydr. Depth (ft)         *    0.37  *    1.58  *    1.15  *
* Conv. Total (cfs)      * 16617.0  * Conv. (cfs)              *   679.7  *  6822.3  *  9115.0  *
* Length Wtd. (ft)       * 1308.82  * Wetted Per. (ft)         *  107.17  *  105.46  *  213.06  *
* Min Ch El (ft)         * 1175.74  * Shear (lb/sq ft)         *    0.12  *    0.50  *    0.36  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)   *    0.14  *    1.45  *    0.96  *
* Frctn Loss (ft)        *   11.98  * Cum Volume (acre-ft)     *   18.18  *   56.62  *   20.96  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)           *   21.49  *   32.77  *   25.21  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16A (A35)
REACH: REACH 1            RS: 3.458

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9579.42 1166.63 9582.81 1166.62 9619.78 1166.52 9673.29 1166.36 9673.79 1166.36
 9675.73  1166.3 9756.23 1163.89 9787.77 1164.71 9812.12 1165.29 9818.01 1165.38
```

```
 9835.84 1165.78 9856.82 1165.71 9889.85 1165.59 9937.65 1165.47 9943.86 1165.45
 9999.12 1163.92   10000  1163.910003.87 1163.8310015.43 1163.65 10018.6 1163.55
10030.36 1164.1610038.95  1164.610044.26 1164.8710047.31 1165.0210060.58 1165.69
10086.73  1165.810120.75 1165.9310123.64 1165.9410158.04 1166.02 10186.7 1166.11
 10193.7 1166.1110202.81 1166.1310229.36 1166.16

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9579.42    .044 9943.86    .04910060.58    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.8610060.58             1325    1367    1320            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1166.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *   0.044  *    0.049 *    0.044 *
* W.S. Elev (ft)          * 1165.72  * Reach Len. (ft)         * 1325.00  * 1367.00  * 1320.00  *
* Crit W.S. (ft)          * 1165.64  * Flow Area (sq ft)       *  136.89  *  141.85  *    0.13  *
* E.G. Slope (ft/ft)      *0.020082  * Area (sq ft)            *  136.89  *  141.85  *    0.13  *
* Q Total (cfs)           * 1260.00  * Flow (cfs)              *  566.06  *  693.90  *    0.04  *
* Top Width (ft)          *  354.05  * Top Width (ft)          *  229.38  *  116.72  *    7.94  *
* Vel Total (ft/s)        *    4.52  * Avg. Vel. (ft/s)        *    4.14  *    4.89  *    0.31  *
* Max Chl Dpth (ft)       *    2.17  * Hydr. Depth (ft)        *    0.60  *    1.22  *    0.02  *
* Conv. Total (cfs)       *  8891.3  * Conv. (cfs)             *  3994.4  *  4896.6  *     0.3  *
* Length Wtd. (ft)        * 1356.06  * Wetted Per. (ft)        *  229.43  *  116.80  *    7.94  *
* Min Ch El (ft)          * 1163.55  * Shear (lb/sq ft)        *    0.75  *    1.52  *    0.02  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    3.09  *    7.45  *    0.01  *
* Frctn Loss (ft)         *   13.74  * Cum Volume (acre-ft)    *   15.56  *   51.95  *   17.30  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *   16.47  *   29.40  *   21.93  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16A (A35)
REACH: REACH 1            RS: 3.199

INPUT
Description: Approximately 200' upstream of Riggs Road.
Station Elevation Data     num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9407.94 1154.13 9420.64 1154.12 9420.95 1154.12 9464.35 1154.04 9470.95 1154.03
    9471 1154.03 9520.95 1153.63 9521.35 1153.62 9570.95 1152.82 9571.71 1152.82
 9620.95 1152.42 9622.06 1152.42 9670.95 1152.32 9672.42 1152.33 9720.96 1152.71
 9722.78 1152.71 9770.96 1152.52 9773.13  1152.5 9820.96 1152.19 9823.49 1152.16
 9870.96 1151.88 9873.84 1151.86 9920.96 1151.61 9926.75 1151.37 9928.96 1151.28
 9933.27 1151.09 9983.18 1149.07 9999.53 1148.41   10000 1148.4310057.61  1150.8
10063.97 1151.0510071.35 1151.3310113.56 1151.4610121.62  1151.510159.08  1151.7
10171.89 1151.77 10204.6 1151.9510222.16 1152.0310250.12 1152.1710272.43 1152.26
10295.64 1152.36 10322.7 1152.4610341.16 1152.5110372.98 1152.5810386.68 1152.58

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9407.94    .044 9920.96    .04910071.35    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9920.9610071.35             1250    1280    1230            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1152.27  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *   0.044  *    0.049 *    0.044 *
* W.S. Elev (ft)          * 1152.05  * Reach Len. (ft)         * 1250.00  * 1280.00  * 1230.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   17.69  *  316.27  *   60.21  *
* E.G. Slope (ft/ft)      *0.006276  * Area (sq ft)            *   17.69  *  316.27  *   60.21  *
* Q Total (cfs)           * 1350.00  * Flow (cfs)              *   17.52  * 1246.54  *   85.95  *
* Top Width (ft)          *  383.44  * Top Width (ft)          *   78.56  *  150.39  *  154.49  *
* Vel Total (ft/s)        *    3.42  * Avg. Vel. (ft/s)        *    0.99  *    3.94  *    1.43  *
```

* Max Chl Dpth (ft)	*	3.64	* Hydr. Depth (ft)	*	0.23	*	2.10	*	0.39	*
* Conv. Total (cfs)	*	17040.2	* Conv. (cfs)	*	221.1	*	15734.3	*	1084.8	*
* Length Wtd. (ft)	*	1278.27	* Wetted Per. (ft)	*	78.56	*	150.51	*	154.49	*
* Min Ch El (ft)	*	1148.41	* Shear (lb/sq ft)	*	0.09	*	0.82	*	0.15	*
* Alpha	*	1.23	* Stream Power (lb/ft s)	*	0.09	*	3.25	*	0.22	*
* Frctn Loss (ft)	*	10.80	* Cum Volume (acre-ft)	*	13.20	*	44.76	*	16.39	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*	11.78	*	25.21	*	19.47	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 1 RS: 2.957

INPUT
Description: Approximately 1100' downstream of Riggs Road.
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9592.25	1143.27	9630.72	1143.2	9641.34	1143.19	9679.74	1143.08	9691.35	1143.05
9728.76	1142.84	9741.36	1142.77	9777.78	1142.51	9791.37	1142.4	9826.8	1142.16
9841.38	1142.06	9885.76	1140.84	9920.53	1140.31	9936.61	1139.99	10000	1138.5
10024.24	1137.93	10035.81	1138.58	10093.47	1142.01	10103.94	1142.05	10144.6	1142.24
10146.07	1142.24	10153	1142.26	10188.21	1142.36	10195.72	1142.39	10230.34	1142.42
10246.85	1142.45	10272.48	1142.46	10297.97	1142.49	10314.61	1142.51	10349.1	1142.57
10356.75	1142.59	10392.59	1142.69	10398.88	1142.71	10400.22	1142.72	10441.01	1142.85
10451.35	1142.88	10483.15	1143.01	10502.47	1143.07				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9592.25	.044	9841.38	.049	10093.47	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9841.38	10093.47	1310	1353	1335	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1141.47	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.31	* Wt. n-Val.	*		*	0.049	*		*
* W.S. Elev (ft)	*	1141.17	* Reach Len. (ft)	*	1310.00	*	1353.00	*	1335.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*		*	322.62	*		*
* E.G. Slope (ft/ft)	*	0.011722	* Area (sq ft)	*		*	322.62	*		*
* Q Total (cfs)	*	1430.00	* Flow (cfs)	*		*	1430.00	*		*
* Top Width (ft)	*	205.54	* Top Width (ft)	*		*	205.54	*		*
* Vel Total (ft/s)	*	4.43	* Avg. Vel. (ft/s)	*		*	4.43	*		*
* Max Chl Dpth (ft)	*	3.24	* Hydr. Depth (ft)	*		*	1.57	*		*
* Conv. Total (cfs)	*	13207.8	* Conv. (cfs)	*		*	13207.8	*		*
* Length Wtd. (ft)	*	1344.98	* Wetted Per. (ft)	*		*	205.67	*		*
* Min Ch El (ft)	*	1137.93	* Shear (lb/sq ft)	*		*	1.15	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	5.09	*		*
* Frctn Loss (ft)	*	9.45	* Cum Volume (acre-ft)	*	12.95	*	35.37	*	15.54	*
* C & E Loss (ft)	*	0.07	* Cum SA (acres)	*	10.66	*	19.98	*	17.29	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 1 RS: 2.701

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9666.44	1132.58	9672.87	1132.51	9687.7	1132.36	9720.14	1132.03	9737.79	1131.85
9767.42	1131.64	9787.87	1131.48	9814.69	1131.35	9837.96	1131.23	9861.97	1131.14

```
 9888.05 1131.04 9909.24 1130.97 9938.14  1130.9 9995.92 1130.18   10000 1129.98
 10001.8  1129.910007.15 1129.8910015.75 1129.8110021.11  1129.810029.02 1130.04
10033.26  1130.310035.68 1130.4710049.71 1130.8710088.61 1130.8810095.73 1130.89
10138.82  1130.910174.01  1130.910187.77  1130.910189.02  1130.910214.91 1130.01
10238.49 1129.1910244.52 1129.3810274.49  1130.5 10281.8 1130.8210284.98 1130.94
10300.98 1131.1410339.64 1131.2810371.86 1131.4310389.85 1131.5110417.88 1131.67
10440.05 1131.79 10463.9 1131.9710490.26 1132.1610527.28 1132.3510550.43 1132.36
10556.62 1132.3610566.31 1132.4410569.62 1132.4710632.35 1133.3910640.88 1133.46
10647.99  1133.510691.09 1133.7810694.01 1133.79

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9666.44    .044 9938.14    .04910049.71    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9938.1410049.71             1625    1708    1660            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1131.95  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.               *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1131.86  * Reach Len. (ft)          * 1625.00  * 1708.00  * 1660.00  *
* Crit W.S. (ft)          * 1131.35  * Flow Area (sq ft)        *  116.03  *  168.65  *  382.25  *
* E.G. Slope (ft/ft)      *0.004784  * Area (sq ft)             *  116.03  *  168.65  *  382.25  *
* Q Total (cfs)           * 1520.00  * Flow (cfs)               *  187.64  *  465.82  *  866.54  *
* Top Width (ft)          *  712.68  * Top Width (ft)            *  201.40  *  111.57  *  399.71  *
* Vel Total (ft/s)        *    2.28  * Avg. Vel. (ft/s)          *    1.62  *    2.76  *    2.27  *
* Max Chl Dpth (ft)       *    2.67  * Hydr. Depth (ft)          *    0.58  *    1.51  *    0.96  *
* Conv. Total (cfs)       * 21976.8  * Conv. (cfs)               *  2712.9  *  6735.0  * 12528.8  *
* Length Wtd. (ft)        * 1689.63  * Wetted Per. (ft)          *  201.41  *  111.61  *  399.77  *
* Min Ch El (ft)          * 1129.80  * Shear (lb/sq ft)          *    0.17  *    0.45  *    0.29  *
* Alpha                   *    1.08  * Stream Power (lb/ft s)    *    0.28  *    1.25  *    0.65  *
* Frctn Loss (ft)         *   11.53  * Cum Volume (acre-ft)      *   11.21  *   27.74  *    9.68  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)            *    7.63  *   15.06  *   11.16  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16A (A35)
REACH: REACH 1            RS: 2.377

INPUT
Description:
Station Elevation Data      num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9694.95 1121.55 9697.01 1121.52 9722.65 1121.22 9757.97 1120.83 9810.05 1120.22
 9815.28 1120.16 9826.54 1119.75 9856.54 1118.35 9888.23 1118.68 9923.02 1119.09
 9940.85 1118.97 9965.89  1118.5 9980.94 1118.24   10000  1117.710001.62  1117.7
10021.72 1118.3110036.16 1118.5910059.24 1119.0610080.76 1119.2110116.78 1119.48
10117.42 1119.4910118.54  1119.510154.08  1119.910174.32 1119.9810190.74 1120.07
10219.58 1120.1710227.41  1120.210231.86 1120.1810264.07 1120.23 10289.4 1120.37
10300.73 1120.4210320.62 1120.4910337.39 1120.5410346.94 1120.5710374.05 1120.61
10404.48 1120.77

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9694.95    .044 9826.54    .04910154.08    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9826.5410154.08             1115    1162    1130            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1120.40  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.21  * Wt. n-Val.               *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1120.19  * Reach Len. (ft)          * 1115.00  * 1162.00  * 1130.00  *
* Crit W.S. (ft)          * 1119.75  * Flow Area (sq ft)        *    2.71  *  436.53  *   10.05  *
* E.G. Slope (ft/ft)      *0.010185  * Area (sq ft)             *    2.71  *  436.53  *   10.05  *
* Q Total (cfs)           * 1630.00  * Flow (cfs)               *    3.09  * 1617.73  *    9.19  *
* Top Width (ft)          *  423.24  * Top Width (ft)            *   14.05  *  327.54  *   81.65  *
* Vel Total (ft/s)        *    3.63  * Avg. Vel. (ft/s)          *    1.14  *    3.71  *    0.91  *
```

* Max Chl Dpth (ft)	*	2.49	* Hydr. Depth (ft)	*	0.19	*	1.33	*	0.12	*
* Conv. Total (cfs)	*	16151.0	* Conv. (cfs)	*	30.6	*	16029.4	*	91.0	*
* Length Wtd. (ft)	*	1149.63	* Wetted Per. (ft)	*	14.06	*	327.61	*	81.65	*
* Min Ch El (ft)	*	1117.70	* Shear (lb/sq ft)	*	0.12	*	0.85	*	0.08	*
* Alpha	*	1.04	* Stream Power (lb/ft s)	*	0.14	*	3.14	*	0.07	*
* Frctn Loss (ft)	*	9.83	* Cum Volume (acre-ft)	*	8.99	*	15.88	*	2.21	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	3.61	*	6.45	*	1.99	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 1 RS: 2.157

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9516.35	1111.67	9523.89	1111.63	9551.84	1111.44	9573.92	1111.27	9600.22	1111.04
9623.95	1110.86	9648.59	1110.67	9684.11	1109.38	9688.53	1109.22	9694.84	1108.98
9706.11	1108.49	9706.2	1108.49	9740.67	1108.35	9759.03	1108.09	9777.88	1108.55
9824.07	1110.04	9842.09	1110.01	9874.1	1109.98	9890.47	1109.96	9924.13	1109.91
9938.84	1109.89	9993.56	1108.17	10000	1108.01	10015.07	1107.53	10044.83	1108.7
10080.17	1110.05	10104.85	1110.15	10134.2	1110.29	10143.18	1110.34	10165.06	1110.47
10181.5	1110.57	10188.24	1110.61	10219.83	1110.81	10242.28	1110.94	10258.15	1111
10296.32	1111.18	10296.48	1111.18	10296.88	1111.18	10334.81	1111.18	10350.36	1111.17
10373.13	1111.16	10404.39	1111.11	10411.46	1111.09	10428.7	1111.08	10449.79	1111.06
10458.43	1111.07	10488.11	1111.11	10512.47	1111.18	10526.44	1111.21		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9516.35	.044	9924.13	.049	10080.17	.044

Bank Sta: Left	Right	Coeff Contr.	Expan.
9924.13	10080.17	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1110.55	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.16	* Wt. n-Val.	*	0.044	*	0.049	*	0.044	*
* W.S. Elev (ft)	*	1110.39	* Reach Len. (ft)	*	1430.00	*	1430.00	*	1430.00	*
* Crit W.S. (ft)	*	1109.75	* Flow Area (sq ft)	*	285.14	*	239.82	*	13.18	*
* E.G. Slope (ft/ft)	*	0.007325	* Area (sq ft)	*	285.14	*	239.82	*	13.18	*
* Q Total (cfs)	*	1700.00	* Flow (cfs)	*	859.04	*	828.66	*	12.30	*
* Top Width (ft)	*	495.71	* Top Width (ft)	*	267.89	*	156.04	*	71.78	*
* Vel Total (ft/s)	*	3.16	* Avg. Vel. (ft/s)	*	3.01	*	3.46	*	0.93	*
* Max Chl Dpth (ft)	*	2.86	* Hydr. Depth (ft)	*	1.06	*	1.54	*	0.18	*
* Conv. Total (cfs)	*	19862.6	* Conv. (cfs)	*	10036.9	*	9681.9	*	143.8	*
* Length Wtd. (ft)	*	1430.00	* Wetted Per. (ft)	*	267.96	*	156.13	*	71.78	*
* Min Ch El (ft)	*	1107.53	* Shear (lb/sq ft)	*	0.49	*	0.70	*	0.08	*
* Alpha	*	1.04	* Stream Power (lb/ft s)	*	1.47	*	2.43	*	0.08	*
* Frctn Loss (ft)	*	10.92	* Cum Volume (acre-ft)	*	5.31	*	6.85	*	1.91	*
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*		*		*		*

Warning: A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 2 RS: 1.888

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9636.76	1101.02	9638.45	1101.02	9652.44	1101.02	9682.75	1100.97	9704.88	1100.93
9715.08	1100.9	9757.31	1100.76	9791.72	1100.58	9809.74	1100.48	9848.8	1100.25
9862.18	1100.16	9868.35	1100.13	9920.04	1099.68	9925	1099.68	9930.74	1099.68
9937.03	1099.68	9942.05	1099.7	9948.07	1099.73	9955.48	1099.68	9965.43	1099.42
9979.7	1098.93	9997.11	1098.45	9998.41	1098.41	10000	1098.42	10047.27	1099.36
10078.04	1099.37	10084.14	1099.38	10095.37	1099.42	10121.01	1099.51	10134.94	1099.54
10157.88	1099.62	10191.85	1099.76	10194.75	1099.77	10200.1	1099.79	10231.62	1099.96
10248.75	1100.06	10268.49	1100.18	10304.84	1100.37	10305.36	1100.37	10305.65	1100.37
10342.24	1100.58	10362.56	1100.71	10379.11	1100.78	10409.57	1100.95	10415.98	1100.98
10419.46	1100.99	10452.85	1101.17						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9636.76	.044	9955.48	.049	10047.27	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9955.48	10047.27	1285	1348	1330	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1100.62	Element			
Vel Head (ft)	0.08	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1100.54	Reach Len. (ft)	1285.00	1348.00	1330.00
Crit W.S. (ft)	1100.09	Flow Area (sq ft)	77.36	145.90	206.58
E.G. Slope (ft/ft)	0.004520	Area (sq ft)	77.36	145.90	206.58
Q Total (cfs)	890.00	Flow (cfs)	109.55	405.06	375.40
Top Width (ft)	537.32	Top Width (ft)	157.05	91.79	288.48
Vel Total (ft/s)	2.07	Avg. Vel. (ft/s)	1.42	2.78	1.82
Max Chl Dpth (ft)	2.13	Hydr. Depth (ft)	0.49	1.59	0.72
Conv. Total (cfs)	13238.1	Conv. (cfs)	1629.5	6024.9	5583.7
Length Wtd. (ft)	1340.28	Wetted Per. (ft)	157.05	91.82	288.49
Min Ch El (ft)	1098.41	Shear (lb/sq ft)	0.14	0.45	0.20
Alpha	1.20	Stream Power (lb/ft s)	0.20	1.24	0.37
Frctn Loss (ft)	10.94	Cum Volume (acre-ft)	12.77	31.55	14.05
C & E Loss (ft)	0.02	Cum SA (acres)	11.68	20.69	24.02

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 2 RS: 1.632

INPUT
Description:
Station Elevation Data num= 29

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9673.81	1089.98	9707.43	1089.94	9723.92	1089.93	9762.23	1089.9	9774.1	1089.88
9817.03	1089.77	9824.28	1089.75	9871.83	1089.54	9874.46	1089.53	9903.02	1089.46
9924.63	1089.41	9930.44	1089.31	9935.65	1089.21	10000	1087.96	10005.9	1087.85
10007.92	1087.88	10029.83	1088.25	10041.73	1088.51	10118.06	1088.21	10119.45	1088.21
10120.7	1088.23	10121.57	1088.25	10168.02	1089.42	10182.91	1089.75	10189.44	1089.83
10193.7	1089.85	10196.74	1089.87	10199.75	1089.89	10212.25	1090.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9673.81	.044	9924.63	.049	10168.02	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9924.63	10168.02	1345	1413	1355	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1089.67	Element			
Vel Head (ft)	0.24	Wt. n-Val.	0.044	0.049	0.000
W.S. Elev (ft)	1089.42	Reach Len. (ft)	1345.00	1413.00	1355.00
Crit W.S. (ft)	1089.22	Flow Area (sq ft)	0.04	222.55	0.00
E.G. Slope (ft/ft)	0.019160	Area (sq ft)	0.04	222.55	0.00

* Q Total (cfs)	*	880.00	* Flow (cfs)	*	0.01	*	879.99	*	0.00	*
* Top Width (ft)	*	249.30	* Top Width (ft)	*	5.76	*	243.39	*	0.15	*
* Vel Total (ft/s)	*	3.95	* Avg. Vel. (ft/s)	*	0.17	*	3.95	*	0.07	*
* Max Chl Dpth (ft)	*	1.57	* Hydr. Depth (ft)	*	0.01	*	0.91	*	0.00	*
* Conv. Total (cfs)	*	6357.4	* Conv. (cfs)	*	0.0	*	6357.4	*	0.0	*
* Length Wtd. (ft)	*	1395.11	* Wetted Per. (ft)	*	5.76	*	243.43	*	0.15	*
* Min Ch El (ft)	*	1087.85	* Shear (lb/sq ft)	*	0.01	*	1.09	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*	0.00	*	4.32	*		*
* Frctn Loss (ft)	*	10.80	* Cum Volume (acre-ft)	*	11.63	*	25.85	*	10.90	*
* C & E Loss (ft)	*	0.05	* Cum SA (acres)	*	9.28	*	15.51	*	19.61	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 2 RS: 1.364

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9444.8	1079.94	9445.73	1079.94	9481.49	1079.76	9506.06	1079.64	9532.13	1079.53
9566.39	1079.42	9582.77	1079.35	9626.72	1079.23	9633.41	1079.21	9668.42	1079.05
9684.06	1078.98	9687.05	1078.97	9734.7	1078.75	9777.75	1076.42	9785.72	1076.14
9798.71	1076.62	9812.39	1077.14	9820.18	1077.48	9868.03	1078.46	9886.62	1078.43
9928.36	1078.39	9937.26	1078.4	9946.14	1077.97	9948.77	1077.88	9954.26	1077.69
9967.32	1077.23	10000	1076.05	10000.09	1076.05	10017.04	1077.08	10025.1	1077.6
10040.33	1078.52	10071.08	1078.61	10093.33	1078.68	10110.29	1078.73	10146.33	1078.85
10158.53	1078.89	10188.72	1078.98	10199.33	1079.01	10230.65	1078.11	10241.67	1077.76
10247.74	1077.86	10305.33	1079.31	10306.36	1079.31	10309.31	1079.32		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9444.8	.044	9937.26	.049	10040.33	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9937.26	10040.33	1290	1325	1280	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1078.82	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.08	* Wt. n-Val.	*	0.044	*	0.049	*	0.044	*
* W.S. Elev (ft)	*	1078.74	* Reach Len. (ft)	*	1290.00	*	1325.00	*	1280.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	195.39	*	156.23	*	44.85	*
* E.G. Slope (ft/ft)	*	0.004131	* Area (sq ft)	*	195.39	*	156.23	*	44.85	*
* Q Total (cfs)	*	870.00	* Flow (cfs)	*	414.21	*	401.50	*	54.29	*
* Top Width (ft)	*	451.81	* Top Width (ft)	*	202.34	*	103.07	*	146.39	*
* Vel Total (ft/s)	*	2.19	* Avg. Vel. (ft/s)	*	2.12	*	2.57	*	1.21	*
* Max Chl Dpth (ft)	*	2.69	* Hydr. Depth (ft)	*	0.97	*	1.52	*	0.31	*
* Conv. Total (cfs)	*	13535.9	* Conv. (cfs)	*	6444.5	*	6246.7	*	844.7	*
* Length Wtd. (ft)	*	1308.54	* Wetted Per. (ft)	*	202.45	*	103.19	*	146.42	*
* Min Ch El (ft)	*	1076.05	* Shear (lb/sq ft)	*	0.25	*	0.39	*	0.08	*
* Alpha	*	1.10	* Stream Power (lb/ft s)	*	0.53	*	1.00	*	0.10	*
* Frctn Loss (ft)	*	10.18	* Cum Volume (acre-ft)	*	8.62	*	19.71	*	10.20	*
* C & E Loss (ft)	*	0.03	* Cum SA (acres)	*	6.06	*	9.89	*	17.33	*

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 2 RS: 1.114

INPUT
Description: Approximately 400' upstream of Ocotillo Road.
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9591.28	1069.96	9596.53	1069.95	9625.98	1069.89	9646.68	1069.84	9680.3	1069.74
9696.82	1069.68	9734.63	1069.54	9746.97	1069.49	9788.96	1069.31	9797.12	1069.28
9843.28	1069.07	9847.27	1069.05	9895.07	1068.83	9897.41	1068.82	9897.61	1068.82
9947.56	1068.61	9957.73	1067.98	9990.24	1066.05	9998.99	1065.57	10000	1065.62
10021.28	1067.01	10030.64	1067.65	10035.57	1067.94	10038.99	1068.07	10041.27	1068.12
10050.46	1068.49	10083.23	1068.54	10126.58	1067.21	10136.72	1066.81	10136.78	1066.81
10137.06	1066.82	10168.93	1067.71	10183.3	1068.11	10189.82	1068.29	10209.06	1068.86
10240.63	1068.89	10261.93	1068.94	10279.97	1068.98	10314.8	1069.06	10319.32	1069.08
10332.47	1069.15	10358.67	1069.29	10367.67	1069.34	10398.02	1069.52	10420.54	1069.65
10437.37	1069.73	10473.41	1069.91	10476.71	1069.91	10486.32	1069.92	10516.06	1069.97
10526.28	1069.98								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9591.28	.044	9947.56	.049	10050.46	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.56	10050.46	1305	1347	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1068.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.		0.049	0.044
W.S. Elev (ft)	1068.25	Reach Len. (ft)	1305.00	1347.00	1300.00
Crit W.S. (ft)	1068.13	Flow Area (sq ft)		118.28	67.66
E.G. Slope (ft/ft)	0.020052	Area (sq ft)		118.28	67.66
Q Total (cfs)	860.00	Flow (cfs)		603.49	256.51
Top Width (ft)	186.98	Top Width (ft)		91.16	95.82
Vel Total (ft/s)	4.63	Avg. Vel. (ft/s)		5.10	3.79
Max Chl Dpth (ft)	2.68	Hydr. Depth (ft)		1.30	0.71
Conv. Total (cfs)	6073.2	Conv. (cfs)		4261.8	1811.5
Length Wtd. (ft)	1329.58	Wetted Per. (ft)		91.32	95.86
Min Ch El (ft)	1065.57	Shear (lb/sq ft)		1.62	0.88
Alpha	1.05	Stream Power (lb/ft s)		8.27	3.35
Frctn Loss (ft)	9.65	Cum Volume (acre-ft)	5.72	15.53	8.55
C & E Loss (ft)	0.09	Cum SA (acres)	3.07	6.93	13.77

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 2 RS: 0.859

INPUT
Description: Approximately 900' downstream of Ocotillo Road.
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9775.9	1058.92	9791.77	1058.9	9825.94	1058.84	9839.92	1058.79	9875.98	1058.63
9888.07	1058.58	9926.02	1058.38	9936.21	1058.33	9985.62	1057.08	9998.81	1056.28
9999.17	1056.26	10000	1056.25	10013.73	1056.44	10060.95	1058.12	10089.07	1058.17
10097.33	1058.18	10110.89	1058.23	10133.72	1058.31	10147.62	1058.36	10170.1	1058.41
10206.16	1058.51	10206.48	1058.51	10207.01	1058.51	10242.87	1058.56	10264.71	1058.59
10279.25	1058.59	10303.13	1058.61	10323.25	1058.61	10352.02	1058.61	10395.59	1056.44
10399.9	1056.29	10405.06	1056.51	10423.33	1057.36	10461.17	1058.85	10495.36	1059.07
10497.55	1059.08	10498.89	1059.09	10533.94	1059.34	10557.43	1059.54	10570.32	1059.62
10591.48	1059.76	10606.71	1059.88	10615.98	1059.97	10643.09	1060.13		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9775.9	.044	9936.21	.049	10060.95	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9936.21	10060.95	1375	1427	1395	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1058.87	Element				
Vel Head (ft)	0.07	Wt. n-Val.		0.044	0.049	0.044
W.S. Elev (ft)	1058.80	Reach Len. (ft)		1375.00	1427.00	1395.00
Crit W.S. (ft)	1058.00	Flow Area (sq ft)		22.51	190.84	243.63
E.G. Slope (ft/ft)	0.003661	Area (sq ft)		22.51	190.84	243.63
Q Total (cfs)	840.00	Flow (cfs)		17.05	464.73	358.22
Top Width (ft)	623.42	Top Width (ft)		99.67	124.74	399.00
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)		0.76	2.44	1.47
Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)		0.23	1.53	0.61
Conv. Total (cfs)	13883.3	Conv. (cfs)		281.8	7681.0	5920.5
Length Wtd. (ft)	1419.61	Wetted Per. (ft)		99.67	124.81	399.11
Min Ch El (ft)	1056.25	Shear (lb/sq ft)		0.05	0.35	0.14
Alpha	1.25	Stream Power (lb/ft s)		0.04	0.85	0.21
Frctn Loss (ft)	11.13	Cum Volume (acre-ft)		5.39	10.75	3.90
C & E Loss (ft)	0.06	Cum SA (acres)		1.57	3.60	6.39

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 2 RS: 0.588

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9405.85	1049.13	9449.56	1048.96	9451.65	1048.96	9499.57	1048.75	9502.69	1048.74
9549.58	1048.55	9553.73	1048.54	9599.59	1048.35	9604.76	1048.34	9649.6	1048.28
9655.8	1048.26	9699.61	1048.17	9706.84	1048.15	9749.62	1048	9757.88	1047.98
9799.63	1047.86	9808.92	1047.83	9849.64	1047.64	9859.95	1047.59	9899.65	1047.39
9910.99	1047.36	9949.66	1047.23	9993.86	1044.51	9997.9	1044.32	10000	1044.42
10047.67	1047.11	10049.89	1047.22	10052.39	1047.37	10058.53	1047.39	10094.09	1047.5
10102.28	1047.52	10135.8	1047.56	10153.58	1047.58	10177.51	1047.61	10204.89	1047.67
10219.22	1047.67	10256.2	1047.73	10260.93	1047.73	10281.48	1047.74		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9405.85	.044	9949.66	.049	10052.39	.044

Bank Sta: Left	Right	Coeff Contr.	Expan.
9949.66	10052.39	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1047.68	Element				
Vel Head (ft)	0.62	Wt. n-Val.			0.049	
W.S. Elev (ft)	1047.07	Reach Len. (ft)		1251.00	1251.00	1251.00
Crit W.S. (ft)	1046.99	Flow Area (sq ft)			131.80	
E.G. Slope (ft/ft)	0.027840	Area (sq ft)			131.80	
Q Total (cfs)	830.00	Flow (cfs)			830.00	
Top Width (ft)	94.77	Top Width (ft)			94.77	
Vel Total (ft/s)	6.30	Avg. Vel. (ft/s)			6.30	
Max Chl Dpth (ft)	2.75	Hydr. Depth (ft)			1.39	
Conv. Total (cfs)	4974.4	Conv. (cfs)			4974.4	
Length Wtd. (ft)	1251.00	Wetted Per. (ft)			94.93	
Min Ch El (ft)	1044.32	Shear (lb/sq ft)			2.41	
Alpha	1.00	Stream Power (lb/ft s)			15.20	
Frctn Loss (ft)	7.84	Cum Volume (acre-ft)		5.03	5.47	
C & E Loss (ft)	0.16	Cum SA (acres)				

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 3 RS: 0.351

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9141.63	1040.13	9155.25	1040.1	9188.53	1040.03	9205.34	1040.05	9241.88	1039.99
9255.43	1039.94	9295.22	1039.85	9305.53	1039.86	9348.57	1039.77	9355.62	1039.74
9401.92	1039.62	9405.71	1039.61	9455.27	1039.5	9455.81	1039.5	9464.08	1039.48
9505.9	1039.37	9508.62	1039.36	9555.99	1039.19	9564.2	1038.89	9567.25	1038.77
9573.02	1038.55	9587.58	1038.04	9617.78	1037.13	9623.43	1037.4	9632.49	1037.93
9638.71	1038.23	9692.34	1038.89	9706.27	1038.88	9722.01	1038.88	9756.36	1038.9
9775.36	1038.91	9806.46	1038.96	9828.71	1039.02	9856.55	1039.05	9882.06	1039.15
9906.64	1039.21	9954.15	1037.3	9963.07	1036.94	9972.07	1036.94	10000	1036.95
10000.92	1036.95	10026.96	1038.43	10041.81	1039.29	10063.26	1040.66	10080.63	1040.86
10098.61	1041.04	10116.47	1041.26	10133.97	1041.45	10151.59	1041.65	10169.33	1041.7
10186.94	1041.82	10204.68	1041.89	10222.55	1042.3	10240.04	1042.52	10257.4	1042.95
10275.39	1043.08	10293.5	1042.89	10310.75	1042.52				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9141.63	.044	9906.64	.049	10063.26	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9906.64 10063.26 700 728 750 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1039.68	Element			
Vel Head (ft)	0.07	Wt. n-Val.	0.044	0.049	
W.S. Elev (ft)	1039.61	Reach Len. (ft)	700.00	728.00	750.00
Crit W.S. (ft)	1038.79	Flow Area (sq ft)	350.33	249.06	
E.G. Slope (ft/ft)	0.003342	Area (sq ft)	350.33	249.06	
Q Total (cfs)	1180.00	Flow (cfs)	539.73	640.27	
Top Width (ft)	639.86	Top Width (ft)	499.72	140.14	
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)	1.54	2.57	
Max Chl Dpth (ft)	2.67	Hydr. Depth (ft)	0.70	1.78	
Conv. Total (cfs)	20410.5	Conv. (cfs)	9335.6	11074.8	
Length Wtd. (ft)	728.91	Wetted Per. (ft)	499.79	140.26	
Min Ch El (ft)	1036.94	Shear (lb/sq ft)	0.15	0.37	
Alpha	1.21	Stream Power (lb/ft s)	0.23	0.95	
Frctn Loss (ft)	2.65	Cum Volume (acre-ft)	5.22	9.55	10.39
C & E Loss (ft)	0.00	Cum SA (acres)	8.55	5.16	11.02

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 3 RS: 0.213

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9755.08	1037.22	9778.61	1037.21	9784.68	1037.21	9799.38	1037.17	9836.77	1037.05
9852.22	1036.96	9888.86	1036.64	9925.82	1036.48	9940.96	1036.43	9952.3	1036.09
9958.42	1035.83	9976.64	1035.02	10000	1034.09	10005.34	1033.88	10028.86	1035.01
10032.91	1035.22	10035.47	1035.36	10037.27	1035.45	10038.95	1035.52	10040.23	1035.57
10041.14	1035.62	10050.87	1035.88	10093.36	1035.82	10102.14	1035.81	10143.37	1035.83
10153.4	1035.86	10193.39	1035.83	10204.67	1035.85	10243.4	1036.01	10270.07	1035.33
10276.93	1035.15	10288.4	1034.85	10290.98	1034.78	10293	1034.85	10302.69	1035.17
10343.43	1036.32	10358.46	1036.42	10393.45	1036.53	10409.72	1036.57	10443.46	1036.68
10460.99	1037.11	10493.48	1037.69	10512.25	1037.25				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9755.08	.044	9940.96	.04	10050.87	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9940.96 10050.87 1100 1127 1100 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1037.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1036.94	Reach Len. (ft)	1100.00	1127.00	1100.00
Crit W.S. (ft)	1036.33	Flow Area (sq ft)	26.47	202.81	396.52
E.G. Slope (ft/ft)	0.003903	Area (sq ft)	26.47	202.81	396.52
Q Total (cfs)	1430.00	Flow (cfs)	25.39	577.69	826.92
Top Width (ft)	599.68	Top Width (ft)	86.36	109.91	403.41
Vel Total (ft/s)	2.29	Avg. Vel. (ft/s)	0.96	2.85	2.09
Max Chl Dpth (ft)	3.06	Hydr. Depth (ft)	0.31	1.85	0.98
Conv. Total (cfs)	22890.5	Conv. (cfs)	406.4	9247.2	13236.8
Length Wtd. (ft)	1113.46	Wetted Per. (ft)	86.37	110.01	403.45
Min Ch El (ft)	1033.88	Shear (lb/sq ft)	0.07	0.45	0.24
Alpha	1.11	Stream Power (lb/ft s)	0.07	1.28	0.50
Frctn Loss (ft)	6.13	Cum Volume (acre-ft)	2.19	5.77	6.97
C & E Loss (ft)	0.01	Cum SA (acres)	3.84	3.07	7.55

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16A (A35)
REACH: REACH 3 RS: 0.000

INPUT
Description: Approximately 500' upstream of Queen Creek Road.
Station Elevation Data num= 54

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9385.8	1031.61	9386.65	1031.61	9402.31	1031.6	9446.64	1031.59	9469.18	1031.54
9506.62	1031.49	9559.68	1031.3	9566.61	1031.3	9580.23	1031.26	9626.6	1031.11
9650.18	1031.08	9686.58	1030.86	9740.68	1030.45	9746.57	1030.4	9758.15	1030.33
9806.56	1030.03	9831.18	1029.9	9866.54	1029.7	9921.68	1029.59	9926.53	1029.58
9977.45	1028.37	9994.49	1028.31	9997.44	1028.28	10000	1028.33	10003.23	1028.39
10014.18	1028.5	10053.79	1029.34	10058.02	1029.35	10062.41	1029.35	10093.38	1029.48
10123.18	1029.61	10128.74	1029.64	10134.52	1029.68	10164.1	1029.93	10192.57	1030.19
10199.47	1030.25	10206.63	1030.33	10234.83	1030.57	10261.96	1030.82	10270.19	1030.88
10278.75	1030.98	10305.55	1031.24	10331.35	1031.48	10340.91	1031.54	10350.86	1031.59
10376.28	1031.71	10400.73	1031.85	10411.64	1031.91	10422.97	1031.91	10447	1031.93
10470.12	1031.88	10482.36	1031.87	10495.08	1031.85	10517.72	1031.87		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9385.8	.044	9926.53	.04	10053.79	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9926.53 10053.79 460 511 460 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1030.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1030.69	Reach Len. (ft)			
Crit W.S. (ft)	1030.35	Flow Area (sq ft)	147.04	243.30	155.65
E.G. Slope (ft/ft)	0.007703	Area (sq ft)	147.04	243.30	155.65
Q Total (cfs)	1730.00	Flow (cfs)	335.09	997.32	397.59
Top Width (ft)	539.86	Top Width (ft)	218.08	127.26	194.53
Vel Total (ft/s)	3.17	Avg. Vel. (ft/s)	2.28	4.10	2.55
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)	0.67	1.91	0.80
Conv. Total (cfs)	19711.7	Conv. (cfs)	3818.0	11363.5	4530.2
Length Wtd. (ft)		Wetted Per. (ft)	218.08	127.28	194.53
Min Ch El (ft)	1028.28	Shear (lb/sq ft)	0.32	0.92	0.38
Alpha	1.21	Stream Power (lb/ft s)	0.74	3.77	0.98
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 2S2WS16B (A15)
REACH: REACH 1 RS: 2.077

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 33

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9621.93	1121.68	9641.03	1121.49	9669.88	1121.27	9684.63	1121.13	9720.53	1120.92
9728.24	1120.92	9771.17	1121.02	9771.84	1121.03	9776	1121.05	9815.45	1121.24
9821.82	1121.24	9859.06	1121.03	9872.47	1120.87	9902.66	1120.65	9923.12	1120.48
9991.67	1117.47	10000	1117.08	10001.63	111	710048.49	1119.61	10062.72	1120.4
10067.28	1120.64	10070.72	1120.83	10075.06	1121.07	10077.09	1121.08	10089.62	1121.14
10120.69	1121.28	10125.71	1121.3	10164.3	1121.41	10176.36	1121.43	10207.9	1121.47
10227	1121.49	10251.51	1121.51	10277.65	1121.51				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9621.93	.044	9923.12	.049	10075.06	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.12	10075.06	1310	1383	1305	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1120.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.049	
W.S. Elev (ft)	1119.92	Reach Len. (ft)	1310.00	1383.00	1305.00
Crit W.S. (ft)	1119.34	Flow Area (sq ft)		171.18	
E.G. Slope (ft/ft)	0.010472	Area (sq ft)		171.18	
Q Total (cfs)	680.00	Flow (cfs)		680.00	
Top Width (ft)	118.05	Top Width (ft)		118.05	
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)		3.97	
Max Chl Dpth (ft)	2.92	Hydr. Depth (ft)		1.45	
Conv. Total (cfs)	6645.1	Conv. (cfs)		6645.1	
Length Wtd. (ft)	1382.05	Wetted Per. (ft)		118.19	
Min Ch El (ft)	1117.00	Shear (lb/sq ft)		0.95	
Alpha	1.00	Stream Power (lb/ft s)		3.76	
Frctn Loss (ft)	9.94	Cum Volume (acre-ft)	9.11	54.44	6.00
C & E Loss (ft)	0.03	Cum SA (acres)	11.64	32.41	10.71

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16B (A15)
REACH: REACH 1 RS: 1.815

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9469.58	1112.01	9500.82	1112.2	9514.26	1112.28	9527.34	1112.29	9534.37	1112.3
9577.36	1112.45	9582.87	1112.43	9627.39	1112.27	9631.37	1112.25	9677.41	1111.89
9679.86	1111.87	9727.44	1111.37	9728.36	1111.36	9757.68	1111.03	9776.86	1110.81
9777.46	1110.8	9825.36	1110.3	9827.49	1110.28	9873.85	1109.89	9877.51	1109.87
9922.35	1109.62	9927.54	1109.6	9950.56	1108.75	9999.57	1107.57	10000	1107.58
10030.54	1108.05	10078.21	1109.8	10107.17	1110.01	10128.62	1110.16	10151.85	1110.36
10179.03	1110.59	10196.52	1110.73	10229.44	1111	10241.2	1111.08	10279.85	1111.36
10285.87	1111.39	10330.26	1111.63	10330.55	1111.63	10332.77	1111.63	10375.22	1111.72
10380.67	1111.74	10419.9	1111.75	10431.08	1111.75				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9469.58	.044	9922.35	.049	10078.21	.044

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9922.3510078.21             1370    1399    1365            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1110.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.13  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1110.06  * Reach Len. (ft)         * 1370.00  * 1399.00  * 1365.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   16.13  *  238.72  *    4.47  *
* E.G. Slope (ft/ft)     *0.005329  * Area (sq ft)            *   16.13  *  238.72  *    4.47  *
* Q Total (cfs)          *  720.00  * Flow (cfs)              *   15.23  *  701.99  *    2.78  *
* Top Width (ft)         *  259.25  * Top Width (ft)          *   68.06  *  155.86  *   35.33  *
* Vel Total (ft/s)       *    2.78  * Avg. Vel. (ft/s)        *    0.94  *    2.94  *    0.62  *
* Max Chl Dpth (ft)      *    2.48  * Hydr. Depth (ft)        *    0.24  *    1.53  *    0.13  *
* Conv. Total (cfs)      *  9862.6  * Conv. (cfs)             *   208.6  *  9615.9  *    38.1  *
* Length Wtd. (ft)       * 1391.48  * Wetted Per. (ft)        *   68.06  *  155.93  *   35.33  *
* Min Ch El (ft)         * 1107.57  * Shear (lb/sq ft)        *    0.08  *    0.51  *    0.04  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)   *    0.07  *    1.50  *    0.03  *
* Frctn Loss (ft)        *   11.60  * Cum Volume (acre-ft)    *    8.87  *   47.93  *    5.93  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)           *   10.62  *   28.06  *   10.18  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16B (A15)
REACH: REACH 1            RS: 1.550

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9679.79 1099.94 9687.12 1099.91 9712.44 1099.84  9737.2 1099.78 9765.53  1099.7
 9787.28 1099.65 9821.54 1096.89 9834.39 1095.79 9851.66 1097.07 9887.44 1099.44
 9924.78 1099.37 9937.52 1099.35 9976.62 1097.08  9997.7 1095.78   10000 1095.96
10012.47 1096.8110024.86 1097.6710030.48 1098.0710058.97 1099.32 10089.4 1099.26
10109.58 1099.4410140.42  1099.710152.01 1099.7310191.43 1099.8910194.43 1099.91
10209.23 1099.9710236.85 1100.0910242.45 1100.1110279.27 1100.2310293.46 1100.29
 10321.7 1100.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9679.79    .044 9937.52    .04910058.97    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.5210058.97             1215    1279    1250            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1098.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.29  * Wt. n-Val.              *   0.044  *   0.049  *          *
* W.S. Elev (ft)         * 1098.27  * Reach Len. (ft)         * 1215.00  * 1279.00  * 1250.00  *
* Crit W.S. (ft)         * 1097.93  * Flow Area (sq ft)       *   79.50  *   95.76  *          *
* E.G. Slope (ft/ft)     *0.014347  * Area (sq ft)            *   79.50  *   95.76  *          *
* Q Total (cfs)          *  760.00  * Flow (cfs)              *  365.33  *  394.67  *          *
* Top Width (ft)         *  144.53  * Top Width (ft)          *   65.46  *   79.06  *          *
* Vel Total (ft/s)       *    4.34  * Avg. Vel. (ft/s)        *    4.60  *    4.12  *          *
* Max Chl Dpth (ft)      *    2.49  * Hydr. Depth (ft)        *    1.21  *    1.21  *          *
* Conv. Total (cfs)      *  6345.1  * Conv. (cfs)             *  3050.1  *  3295.0  *          *
* Length Wtd. (ft)       * 1256.80  * Wetted Per. (ft)        *   65.65  *   79.22  *          *
* Min Ch El (ft)         * 1095.78  * Shear (lb/sq ft)        *    1.08  *    1.08  *          *
* Alpha                  *    1.01  * Stream Power (lb/ft s)   *    4.98  *    4.46  *          *
* Frctn Loss (ft)        *    9.15  * Cum Volume (acre-ft)    *    7.36  *   42.56  *    5.86  *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)           *    8.52  *   24.29  *    9.63  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
```

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16B (A15)
REACH: REACH 1 RS: 1.308

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9732.56	1089.8	9738.91	1089.79	9747.23	1089.79	9790.09	1089.76	9812.75	1089.73
9841.27	1089.64	9878.26	1089.53	9892.46	1089.45	9943.16	1089.19	9943.64	1089.19
9943.99	1089.17	9944.46	1089.15	10000	1086.61	10001.36	1086.55	10036.5	1088.27
10043.56	1088.62	10045.02	1088.69	10045.6	1088.73	10045.99	1088.76	10046.26	1088.78
10048.95	1088.81	10099.13	1088.78	10126.13	1088.88	10151.34	1088.96	10166.27	1089.01
10203.55	1089.18	10206.42	1089.19	10215.96	1089.23	10246.56	1089.33	10255.76	1089.37
10286.71	1089.43	10307.97	1089.48	10344.46	1088.42	10370.18	1087.63	10379.55	1087.31
10415.32	1088.17	10432.34	1088.56	10464.59	1089.56	10496.76	1089.63		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9732.56	.044	9943.16	.049	10048.95	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9943.16	10048.95	1330	1376	1310	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1089.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1089.28	Reach Len. (ft)	1330.00	1376.00	1310.00
Crit W.S. (ft)		Flow Area (sq ft)	0.80	156.12	199.33
E.G. Slope (ft/ft)	0.004464	Area (sq ft)	0.80	156.12	199.33
Q Total (cfs)	790.00	Flow (cfs)	0.23	409.68	380.09
Top Width (ft)	446.67	Top Width (ft)	17.66	105.79	323.21
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	0.29	2.62	1.91
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	0.05	1.48	0.62
Conv. Total (cfs)	11824.4	Conv. (cfs)	3.4	6132.0	5689.0
Length Wtd. (ft)	1351.99	Wetted Per. (ft)	17.66	105.91	323.27
Min Ch El (ft)	1086.55	Shear (lb/sq ft)	0.01	0.41	0.17
Alpha	1.08	Stream Power (lb/ft s)	0.00	1.08	0.33
Frctn Loss (ft)	11.10	Cum Volume (acre-ft)	6.24	38.87	3.00
C & E Loss (ft)	0.03	Cum SA (acres)	7.36	21.58	4.99

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16B (A15)
REACH: REACH 1 RS: 1.047

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9588.69	1079.18	9598.2	1079.21	9606.84	1079.25	9646.09	1079.4	9656.89	1079.42
9693.99	1079.43	9706.94	1079.4	9741.89	1079.23	9756.99	1079.15	9789.78	1078.85
9807.04	1078.73	9834.12	1077.17	9844.12	1076.69	9858.21	1076.05	9861.09	1076.17
9907.14	1078.47	9933.47	1078.53	9957.19	1078.96	9986.81	1076.34	9998.24	1075.58
10000	1075.46	10002.01	1075.36	10010.38	1075.69	10019.67	1076.06	10059.25	1079.24
10065.78	1079.26	10090.16	1079.29	10111.01	1079.32	10147.44	1079.78	10162.77	1079.8
10188.27	1079.34	10214.53	1079.34	10229.1	1079.31	10266.29	1080.17	10269.94	1080.19
10283.55	1080.07								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 9588.69    .044 9957.19    .04910059.25    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.1910059.25             1320    1404    1380            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1078.24  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.38  * Wt. n-Val.              *   0.044  *   0.049  *         *
* W.S. Elev (ft)          * 1077.86  * Reach Len. (ft)         * 1320.00  * 1404.00  * 1380.00  *
* Crit W.S. (ft)          * 1077.66  * Flow Area (sq ft)       *   67.84  *  101.76  *         *
* E.G. Slope (ft/ft)      *0.018805  * Area (sq ft)            *   67.84  *  101.76  *         *
* Q Total (cfs)           *  830.00  * Flow (cfs)              *  299.86  *  530.14  *         *
* Top Width (ft)          *  145.05  * Top Width (ft)          *   72.67  *   72.38  *         *
* Vel Total (ft/s)        *    4.89  * Avg. Vel. (ft/s)        *    4.42  *    5.21  *         *
* Max Chl Dpth (ft)       *    2.50  * Hydr. Depth (ft)        *    0.93  *    1.41  *         *
* Conv. Total (cfs)       *  6052.5  * Conv. (cfs)             *  2186.6  *  3865.9  *         *
* Length Wtd. (ft)        * 1382.45  * Wetted Per. (ft)        *   72.77  *   72.56  *         *
* Min Ch El (ft)          * 1075.36  * Shear (lb/sq ft)        *    1.09  *    1.65  *         *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    4.84  *    8.58  *         *
* Frctn Loss (ft)         *    8.50  * Cum Volume (acre-ft)    *    5.19  *   34.79  *    0.00 *
* C & E Loss (ft)         *    0.08  * Cum SA (acres)          *    5.98  *   18.76  *    0.13 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16B (A15)
REACH: REACH 1            RS: 0.781

INPUT
Description: Approximately 700' upstream of Ocotillo Road.
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9501.62  1070.8 9515.08 1070.82 9521.82 1070.83 9524.95 1070.82 9574.27 1070.62
 9601.79 1070.52 9626.73 1070.41 9678.64 1070.09 9679.19 1070.08 9680.37 1070.08
 9731.65 1069.78 9755.48 1069.68  9784.1 1069.53 9832.33 1069.46 9837.78 1069.35
  9838.6 1069.33 9840.24 1069.29  9841.9 1069.25 9844.75 1069.18 9851.44 1069.02
  9894.7 1067.89 9903.21 1068.16 9941.48 1069.27  9992.5 1065.33 9997.64 1064.81
   10000 1065.0810012.49 1066.5110046.39 1069.5310062.87 1069.6110098.85 1069.77
10139.71 1069.8510151.31 1069.8910176.25 1069.8710203.77 1069.8110216.56 1069.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9501.62    .044 9941.48    .04910046.39    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.4810046.39             1345    1357    1330            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1069.66  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.044  *   0.049  *   0.044 *
* W.S. Elev (ft)          * 1069.54  * Reach Len. (ft)         * 1345.00  * 1357.00  * 1330.00 *
* Crit W.S. (ft)          * 1068.23  * Flow Area (sq ft)       *   99.42  *  246.56  *    0.01 *
* E.G. Slope (ft/ft)      *0.003098  * Area (sq ft)            *   99.42  *  246.56  *    0.01 *
* Q Total (cfs)           *  870.00  * Flow (cfs)              *  136.28  *  733.72  *    0.00 *
* Top Width (ft)          *  266.84  * Top Width (ft)          *  159.57  *  104.91  *    2.37 *
* Vel Total (ft/s)        *    2.51  * Avg. Vel. (ft/s)        *    1.37  *    2.98  *    0.06 *
* Max Chl Dpth (ft)       *    4.73  * Hydr. Depth (ft)        *    0.62  *    2.35  *    0.01 *
* Conv. Total (cfs)       * 15631.6  * Conv. (cfs)             *  2448.6  * 13183.0  *     0.0 *
* Length Wtd. (ft)        * 1356.21  * Wetted Per. (ft)        *  159.61  *  105.32  *    2.37 *
* Min Ch El (ft)          * 1064.81  * Shear (lb/sq ft)        *    0.12  *    0.45  *    0.00 *
* Alpha                   *    1.23  * Stream Power (lb/ft s)  *    0.17  *    1.35  *    0.00 *
* Frctn Loss (ft)         *   11.73  * Cum Volume (acre-ft)    *    2.66  *   29.18  *    0.00 *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)          *    2.46  *   15.91  *    0.09 *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS16B (A15)
REACH: REACH 1 RS: 0.524

INPUT
Description: Apporximately 600' downstream of Ocotillo Road.
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9752.28	1058.46	9779.62	1058.34	9788.68	1058.31	9835.03	1058.06	9838.9	1058.04
9876.24	1057.9	9889.12	1057.85	9897.29	1057.54	9968.14	1054.67	9989.61	1055.49
10000	1055.42	10002.93	1055.46	10020.77	1056.18	10031.02	1056.65	10034.72	1056.88
10036.82	1057.04	10038.01	1057.14	10045.23	1057.52	10081.93	1057.86	10089.43	1057.93
10090.5	1057.93	10133.64	1058.42	10141.01	1058.46	10177.85	1058.59	10191.51	1058.66
10222.06	1058.58	10242.02	1058.6	10266.27	1058.64	10292.52	1058.77	10344.06	1060.5
10361.2	1061.34								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9752.28	.044	9889.12	.049	10045.23	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.12	10045.23	1270	1351	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1057.88	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.70	Wt. n-Val.		0.049		
W.S. Elev (ft)	1057.19	Reach Len. (ft)	1270.00	1351.00	1320.00	
Crit W.S. (ft)	1057.19	Flow Area (sq ft)		180.83		
E.G. Slope (ft/ft)	0.032309	Area (sq ft)		180.83		
Q Total (cfs)	1210.00	Flow (cfs)		1210.00		
Top Width (ft)	132.83	Top Width (ft)		132.83		
Vel Total (ft/s)	6.69	Avg. Vel. (ft/s)		6.69		
Max Chl Dpth (ft)	2.52	Hydr. Depth (ft)		1.36		
Conv. Total (cfs)	6731.7	Conv. (cfs)		6731.7		
Length Wtd. (ft)	1351.00	Wetted Per. (ft)		132.95		
Min Ch El (ft)	1054.67	Shear (lb/sq ft)		2.74		
Alpha	1.00	Stream Power (lb/ft s)		18.36		
Frctn Loss (ft)	7.18	Cum Volume (acre-ft)	1.13	22.52	0.00	
C & E Loss (ft)	0.19	Cum SA (acres)		12.20	0.06	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS16B (A15)
REACH: REACH 1 RS: 0.268

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9542.3	1049.98	9572.57	1049.93	9588.08	1049.88	9623.09	1049.76	9647.18	1049.65
9673.62	1049.56	9706.27	1049.34	9724.14	1049.22	9765.37	1048.91	9777.16	1048.4

```
 9778.84 1048.33 9781.21 1048.27  9784.4 1048.19 9788.88 1048.07 9834.78 1046.45
 9848.18 1046.13 9868.21 1045.59  9870.3 1045.55 9900.52 1046.09 9922.35 1046.88
 9966.11 1045.67 9996.98 1045.25   10000 1045.5110003.91 1045.8410017.35    1047
10023.75 1047.4710046.34 1048.54 10077.8  1048.810119.95 1049.0810128.33 1049.12
10177.68 1049.4410178.85 1049.4510179.05 1049.4510229.37 1049.7510238.15 1049.78
 10279.9 1049.9810297.24 1049.9610330.42 1049.9610356.34 1049.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
  9542.3    .044 9765.37    .04910046.34    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9765.3710046.34             1100    1136    1100            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1048.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *          *    0.049 *    0.044 *
* W.S. Elev (ft)          * 1048.56  * Reach Len. (ft)         * 1100.00  * 1136.00  * 1100.00  *
* Crit W.S. (ft)          * 1047.12  * Flow Area (sq ft)       *          *   548.27 *     0.02 *
* E.G. Slope (ft/ft)      *0.002090  * Area (sq ft)            *          *   548.27 *     0.02 *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *          *  1210.00 *     0.00 *
* Top Width (ft)          *  274.86  * Top Width (ft)          *          *   272.81 *     2.05 *
* Vel Total (ft/s)        *    2.21  * Avg. Vel. (ft/s)        *          *     2.21 *     0.06 *
* Max Chl Dpth (ft)       *    3.31  * Hydr. Depth (ft)        *          *     2.01 *     0.01 *
* Conv. Total (cfs)       * 26465.0  * Conv. (cfs)             *          *  26464.9 *      0.0 *
* Length Wtd. (ft)        * 1136.00  * Wetted Per. (ft)        *          *   273.01 *     2.05 *
* Min Ch El (ft)          * 1045.25  * Shear (lb/sq ft)        *          *     0.26 *     0.00 *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     0.58 *     0.00 *
* Frctn Loss (ft)         *    6.11  * Cum Volume (acre-ft)    *     1.13 *    11.22 *     0.00 *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *          *     5.91 *     0.03 *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS16B (A15)
REACH: REACH 1            RS: 0.053

INPUT
Description:
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9819.03 1042.37 9835.57 1042.24 9866.39 1042.12 9894.59 1041.64 9916.91 1041.13
  9933.6    1041 9971.08 1040.24   10000 1039.6510000.15 1039.6410054.92 1041.74
10063.26 1042.0610064.54 1042.1210068.46 1042.2910071.65 1042.3210118.97 1042.49
10130.67 1042.5310169.49 1042.6210189.68 1042.71   10220 1042.85 10248.7 1042.76
10270.52 1042.7410307.72 1042.6910321.04 1042.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9819.03    .044 9866.39    .04910068.46    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9866.3910068.46             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1042.47  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.56  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1041.91  * Reach Len. (ft)         *  280.00  *  280.00  *  280.00  *
* Crit W.S. (ft)          * 1041.91  * Flow Area (sq ft)       *          *   200.92 *          *
* E.G. Slope (ft/ft)      *0.034262  * Area (sq ft)            *          *   200.92 *          *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *          *  1210.00 *          *
* Top Width (ft)          *  180.74  * Top Width (ft)          *          *   180.74 *          *
* Vel Total (ft/s)        *    6.02  * Avg. Vel. (ft/s)        *          *     6.02 *          *
* Max Chl Dpth (ft)       *    2.27  * Hydr. Depth (ft)        *          *     1.11 *          *
* Conv. Total (cfs)       *  6537.0  * Conv. (cfs)             *          *   6537.0 *          *
* Length Wtd. (ft)        *  280.00  * Wetted Per. (ft)        *          *   180.81 *          *
* Min Ch El (ft)          * 1039.64  * Shear (lb/sq ft)        *          *     2.38 *          *
```

```
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *   14.31  *          *
* Frctn Loss (ft)        *    2.20  * Cum Volume (acre-ft)   *    1.13  *    1.45  *          *
* C & E Loss (ft)        *    0.15  * Cum SA (acres)         *          *          *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. *The program defaulted to critical depth.*

CROSS SECTION

RIVER: 2S2WS17A (A17)
REACH: REACH 1 RS: 1.473

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 35

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9660.67 1100.72 9672.75 1101.17 9703.89 1101.11 9753.06 1100.97 9755.14 1100.97
 9762.31 1100.94 9806.38 1100.78 9819.14 1100.73 9857.63 1100.64 9885.21  1100.5
 9908.87 1100.34 9931.56 1099.24 9937.74 1098.84 9944.41 1098.44 9953.41 1098.03
    9968 1097.36 9993.08 1096.18 9995.52  1096.3   10000 1096.5210021.39 1097.61
10033.38 1098.2310039.68 1098.5610061.43 1099.5810071.04 1099.5910111.71 1099.62
 10127.3 1099.6710161.99 1099.7610183.56 1099.8310212.27 1099.9310239.82    1100
10262.55 1100.0510296.08 1100.0510312.84 1100.0410328.59 1100.02 10347.2 1100.02
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9660.67    .044 9908.87    .04910061.43    .044
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9908.8710061.43 1360 1350 1340 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1099.62  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)          *    0.23  * Wt. n-Val.              *           *    0.049  *          *
* W.S. Elev (ft)         * 1099.39  * Reach Len. (ft)         * 1360.00   * 1350.00   * 1340.00  *
* Crit W.S. (ft)         * 1098.66  * Flow Area (sq ft)       *           *  210.76   *          *
* E.G. Slope (ft/ft)     *0.008368  * Area (sq ft)            *           *  210.76   *          *
* Q Total (cfs)          *  810.00  * Flow (cfs)              *           *  810.00   *          *
* Top Width (ft)         *  129.08  * Top Width (ft)          *           *  129.08   *          *
* Vel Total (ft/s)       *    3.84  * Avg. Vel. (ft/s)         *           *    3.84   *          *
* Max Chl Dpth (ft)      *    3.21  * Hydr. Depth (ft)         *           *    1.63   *          *
* Conv. Total (cfs)      *  8854.6  * Conv. (cfs)              *           *  8854.6   *          *
* Length Wtd. (ft)       * 1350.04  * Wetted Per. (ft)         *           *  129.24   *          *
* Min Ch El (ft)         * 1096.18  * Shear (lb/sq ft)         *           *    0.85   *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *           *    3.27   *          *
* Frctn Loss (ft)        *    9.53  * Cum Volume (acre-ft)     *    6.68   *   32.70   *    2.88  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)           *    9.18   *   21.73   *    4.13  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17A (A17)
REACH: REACH 1 RS: 1.217

INPUT
Description:
Station Elevation Data num= 30

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9707.99 1090.67 9728.25 1090.85 9734.44 1090.77 9778.32 1090.59 9787.11 1090.58
 9828.38 1089.82 9839.78 1089.77 9878.44 1089.81 9892.45  1089.8  9928.5 1089.82
 9966.26 1088.28 9999.14 1086.96   10000 1086.9810008.07 1087.1910020.54 1087.61
10047.86 1088.3210060.18 1088.7710089.83 1089.9310108.81 1089.9810143.09 1090.05
10145.59 1090.0510146.98 1090.0510182.38  1090.110204.13 1090.1510219.16 1090.19
```

```
10246.31 1090.2910255.95 1090.3210261.28 1090.3410292.73 1090.4510318.44 1090.53

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9707.99    .044  9928.5    .04910108.81    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9928.510108.81             1490    1510    1480            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1090.06  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.044  *   0.049  *         *
* W.S. Elev (ft)          * 1089.91  * Reach Len. (ft)        * 1490.00  * 1510.00  * 1480.00  *
* Crit W.S. (ft)          * 1089.08  * Flow Area (sq ft)      *   11.13  *  250.79  *         *
* E.G. Slope (ft/ft)      *0.006023  * Area (sq ft)           *   11.13  *  250.79  *         *
* Q Total (cfs)           *  800.00  * Flow (cfs)              *    6.54  *  793.46  *         *
* Top Width (ft)          *  265.74  * Top Width (ft)          *  104.95  *  160.79  *         *
* Vel Total (ft/s)        *    3.05  * Avg. Vel. (ft/s)        *    0.59  *    3.16  *         *
* Max Chl Dpth (ft)       *    2.95  * Hydr. Depth (ft)        *    0.11  *    1.56  *         *
* Conv. Total (cfs)       * 10308.1  * Conv. (cfs)             *    84.2  * 10223.8  *         *
* Length Wtd. (ft)        * 1509.92  * Wetted Per. (ft)        *  104.95  *  160.90  *         *
* Min Ch El (ft)          * 1086.96  * Shear (lb/sq ft)        *    0.04  *    0.59  *         *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.02  *    1.85  *         *
* Frctn Loss (ft)         *   11.27  * Cum Volume (acre-ft)    *    6.51  *   25.54  *    2.88  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    7.54  *   17.24  *    4.13  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS17A (A17)
REACH: REACH 1            RS: 0.931

INPUT
Description:
Station Elevation Data     num=       36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9606.06 1080.48 9626.86 1080.37 9650.98 1080.23 9683.73 1080.14 9701.31  1080.1
  9740.6 1080.16 9751.64 1080.11 9797.48 1080.19 9801.96 1080.16 9836.49  1079.7
 9852.29 1079.48 9854.35 1079.47 9902.62 1078.88 9913.02 1077.93 9916.86 1077.83
 9923.41 1077.58  9937.2 1076.86 9964.78  1075.3 9968.01  1075.5 9976.47    1076
 9983.58 1076.43   10000  1077.210039.99 1078.77 10053.7 1078.7710064.29 1078.88
10104.11 1079.0110108.97 1079.0510146.86 1079.5310153.65 1079.6110154.52 1079.61
10198.32 1079.6810204.93 1079.76   10243 1080.1910255.34 1080.2110287.68 1079.99
10305.75 1080.01

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9606.06    .044 9902.62    .04910039.99    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9902.6210039.99            1250    1306    1280            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1078.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.24  * Wt. n-Val.              *          *   0.049  *         *
* W.S. Elev (ft)          * 1078.54  * Reach Len. (ft)        * 1250.00  * 1306.00  * 1280.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *  197.11  *         *
* E.G. Slope (ft/ft)      *0.009559  * Area (sq ft)           *          *  197.11  *         *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *          *  780.00  *         *
* Top Width (ft)          *  127.66  * Top Width (ft)          *          *  127.66  *         *
* Vel Total (ft/s)        *    3.96  * Avg. Vel. (ft/s)        *          *    3.96  *         *
* Max Chl Dpth (ft)       *    3.24  * Hydr. Depth (ft)        *          *    1.54  *         *
* Conv. Total (cfs)       *  7977.8  * Conv. (cfs)             *          *  7977.8  *         *
* Length Wtd. (ft)        * 1302.59  * Wetted Per. (ft)        *          *  127.84  *         *
* Min Ch El (ft)          * 1075.30  * Shear (lb/sq ft)        *          *    0.92  *         *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    3.64  *         *
* Frctn Loss (ft)         *    9.86  * Cum Volume (acre-ft)    *    6.32  *   17.78  *    2.88  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    5.74  *   12.24  *    4.13  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17A (A17)
REACH: REACH 1 RS: 0.684

INPUT
Description: Approximately 450' upstream of Ocotillo Road.
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9738.42	1070.9	9752.41	1070.84	9759.04	1070.83	9803.56	1070.65	9824.28	1070.46
9854.72	1070.2	9889.52	1069.7	9905.87	1069.5	9954.76	1068.57	9957.02	1068.52
9958.69	1068.4	9959.79	1068.33	9964.54	1068.02	9999.88	1065.71	10000	1065.72
10025.02	1066.88	10037.63	1067.46	10058.1	1068.24	10095.01	1068.41	10114.38	1068.24
10121.18	1068.13	10143.08	1067.63	10160.14	1067.21	10169.09	1067.66	10208.38	1069.15
10229.83	1069.24	10258.48	1069.35	10283.19	1069.42	10308.57	1069.51	10336.56	1069.58
10358.66	1069.65	10389.93	1069.75	10408.76	1069.8	10443.3	1069.84	10458.85	1069.85
10496.66	1069.82	10508.95	1069.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9738.42	.044	9954.76	.049	10058.1	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9954.76	10058.1	1310	1414	1295	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1068.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1068.75	Reach Len. (ft)	1310.00	1414.00	1295.00
Crit W.S. (ft)		Flow Area (sq ft)	0.87	170.97	97.39
E.G. Slope (ft/ft)	0.006129	Area (sq ft)	0.87	170.97	97.39
Q Total (cfs)	770.00	Flow (cfs)	0.47	567.23	202.31
Top Width (ft)	252.72	Top Width (ft)	9.59	103.34	139.79
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	0.54	3.32	2.08
Max Chl Dpth (ft)	3.04	Hydr. Depth (ft)	0.09	1.65	0.70
Conv. Total (cfs)	9835.6	Conv. (cfs)	6.0	7245.5	2584.2
Length Wtd. (ft)	1362.74	Wetted Per. (ft)	9.59	103.49	139.84
Min Ch El (ft)	1065.71	Shear (lb/sq ft)	0.03	0.63	0.27
Alpha	1.13	Stream Power (lb/ft s)	0.02	2.10	0.55
Frctn Loss (ft)	10.10	Cum Volume (acre-ft)	6.31	12.26	1.45
C & E Loss (ft)	0.00	Cum SA (acres)	5.61	8.78	2.08

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17A (A17)
REACH: REACH 1 RS: 0.435

INPUT
Description: Approximately 950' downstream of Ocotillo Road.
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9366.75	1061.37	9381.17	1061.3	9409.55	1061.14	9431.4	1061	9465.05	1060.76
9481.62	1060.64	9520.54	1060.39	9531.85	1060.32	9576.04	1060.2	9582.07	1060.19
9631.53	1060.12	9632.3	1060.12	9639.56	1060.05	9682.52	1059.66	9687.03	1059.63
9732.75	1059.33	9742.53	1059.27	9810.99	1056.67	9818.42	1056.2	9818.99	1056.17
9844.61	1057.11	9883.42	1058.59	9909.01	1058.7	9933.65	1058.76	9981.88	1057.23
9998.95	1056.69	10000	1056.76	10012.5	1057.7	10024.43	1058.56	10048.41	1059.65
10083.98	1059.89	10121.81	1060.13	10134.01	1060.21	10173.41	1060.32	10184.03	1060.35
10225.01	1060.34	10234.05	1060.34	10276.62	1060.27	10284.08	1060.25		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 9366.75    .044 9933.65    .04910048.41    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.6510048.41              970     988     980            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1058.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.044  *   0.049  *         *
* W.S. Elev (ft)          * 1058.62  * Reach Len. (ft)         *  970.00  *  988.00  *  980.00 *
* Crit W.S. (ft)          * 1058.16  * Flow Area (sq ft)       *  148.70  *   84.24  *         *
* E.G. Slope (ft/ft)      *0.009174  * Area (sq ft)            *  148.70  *   84.24  *         *
* Q Total (cfs)           *  760.00  * Flow (cfs)              *  522.17  *  237.83  *         *
* Top Width (ft)          *  219.17  * Top Width (ft)          *  131.36  *   87.81  *         *
* Vel Total (ft/s)        *    3.26  * Avg. Vel. (ft/s)        *    3.51  *    2.82  *         *
* Max Chl Dpth (ft)       *    2.45  * Hydr. Depth (ft)        *    1.13  *    0.96  *         *
* Conv. Total (cfs)       *  7934.9  * Conv. (cfs)             *  5451.8  *  2483.1  *         *
* Length Wtd. (ft)        *  978.70  * Wetted Per. (ft)        *  131.46  *   87.91  *         *
* Min Ch El (ft)          * 1056.69  * Shear (lb/sq ft)        *    0.65  *    0.55  *         *
* Alpha                   *    1.03  * Stream Power (lb/ft s)  *    2.27  *    1.55  *         *
* Frctn Loss (ft)         *    6.88  * Cum Volume (acre-ft)    *    4.06  *    8.12  *         *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    3.49  *    5.67  *         *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS17A (A17)
REACH: REACH 1            RS: 0.248

INPUT
Description:
Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9507.82 1053.16  9543.2  1053.3 9564.01 1053.39 9593.49  1053.5 9620.39 1053.55
 9643.78 1053.56 9676.76 1053.51 9694.07 1053.47 9733.13 1053.29 9744.36 1053.22
 9789.51 1052.91 9794.65 1052.88 9837.19 1052.64 9844.94 1052.59 9846.84 1052.47
 9848.77 1052.37 9900.75 1049.41 9923.05 1050.83 9945.53 1052.36 9994.57 1048.77
   10000 1048.3910001.65 1048.2710008.62 1048.8810045.88 1052.46 10066.2 1052.51
10095.93 1052.5810118.49 1052.6210145.97 1052.6610170.77 1052.7110196.02 1052.75
10223.06  1052.810246.06 1052.8310275.34 1052.8710296.11 1052.8910327.63  1052.9
10346.16  1052.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9507.82    .044 9945.53    .04910045.88    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.5310045.88              1310    1309    1310            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1051.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.044  *   0.049  *         *
* W.S. Elev (ft)          * 1051.77  * Reach Len. (ft)         * 1310.00  * 1309.00  * 1310.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *   91.77  *  149.75  *         *
* E.G. Slope (ft/ft)      *0.005538  * Area (sq ft)            *   91.77  *  149.75  *         *
* Q Total (cfs)           *  750.00  * Flow (cfs)              *  258.11  *  491.89  *         *
* Top Width (ft)          *  162.36  * Top Width (ft)          *   77.38  *   84.98  *         *
* Vel Total (ft/s)        *    3.11  * Avg. Vel. (ft/s)        *    2.81  *    3.28  *         *
* Max Chl Dpth (ft)       *    3.49  * Hydr. Depth (ft)        *    1.19  *    1.76  *         *
* Conv. Total (cfs)       * 10078.0  * Conv. (cfs)             *  3468.3  *  6609.7  *         *
* Length Wtd. (ft)        * 1309.17  * Wetted Per. (ft)        *   77.53  *   85.27  *         *
* Min Ch El (ft)          * 1048.27  * Shear (lb/sq ft)        *    0.41  *    0.61  *         *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *    1.15  *    1.99  *         *
* Frctn Loss (ft)         *    9.09  * Cum Volume (acre-ft)    *    1.38  *    5.47  *         *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    1.16  *    3.71  *         *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
```

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS17A (A17)
REACH: REACH 1 RS: 0.000

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9274.31	1047.15	9281.73	1047.14	9303.14	1047.11	9341.67	1047.03	9353.74	1047.01
9401.61	1046.84	9404.35	1046.83	9419.16	1046.74	9454.95	1046.54	9493.91	1046.22
9505.55	1046.14	9521.49	1046	9556.16	1045.7	9581.43	1045.5	9606.76	1045.32
9641.37	1045.08	9657.36	1044.99	9701.32	1044.69	9707.96	1044.64	9744	1044.44
9758.57	1044.37	9761.26	1044.35	9809.17	1044.18	9844.17	1044.07	9864.2	1043.23
9879.55	1042.67	9926.24	1041.1	9937.2	1041.66	9959.49	1042.91	9995.21	1040.29
10000	1039.86	10008.25	1039.12	10014	1039.36	10061.65	1043.58	10110.15	1043.55
10111.81	1043.55	10130.62	1043.56	10161.98	1043.57	10206.01	1043.53	10212.14	1043.52

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9274.31	.044	9844.17	.049	10061.65	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9844.17	10061.65	10	11	10	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1042.83	Element				
Vel Head (ft)	0.19	Wt. n-Val.			0.049	
W.S. Elev (ft)	1042.64	Reach Len. (ft)				
Crit W.S. (ft)	1042.00	Flow Area (sq ft)			214.09	
E.G. Slope (ft/ft)	0.009000	Area (sq ft)			214.09	
Q Total (cfs)	740.00	Flow (cfs)			740.00	
Top Width (ft)	162.20	Top Width (ft)			162.20	
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)			3.46	
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)			1.32	
Conv. Total (cfs)	7800.1	Conv. (cfs)			7800.1	
Length Wtd. (ft)		Wetted Per. (ft)			162.56	
Min Ch El (ft)	1039.12	Shear (lb/sq ft)			0.74	
Alpha	1.00	Stream Power (lb/ft s)			2.56	
Frctn Loss (ft)		Cum Volume (acre-ft)				
C & E Loss (ft)		Cum SA (acres)				

Warning: Divided flow computed for this cross-section.

SUMMARY OF MANNING'S N VALUES

River:2S2WS16A (A35)

Reach	River Sta.	n1	n2	n3
REACH 1	4.711	.044	.049	.044
REACH 1	4.426	.044	.049	.044
REACH 1	4.194	.044	.049	.044
REACH 1	3.954	.044	.049	.044
REACH 1	3.708	.044	.049	.044
REACH 1	3.458	.044	.049	.044
REACH 1	3.199	.044	.049	.044
REACH 1	2.957	.044	.049	.044
REACH 1	2.701	.044	.049	.044
REACH 1	2.377	.044	.049	.044
REACH 1	2.157	.044	.049	.044
REACH 2	1.888	.044	.049	.044
REACH 2	1.632	.044	.049	.044
REACH 2	1.364	.044	.049	.044
REACH 2	1.114	.044	.049	.044
REACH 2	0.859	.044	.049	.044
REACH 2	0.588	.044	.049	.044
REACH 3	0.351	.044	.049	.044
REACH 3	0.213	.044	.049	.044
REACH 3	0.000	.044	.049	.044

River:2S2WS16B (A15)

Reach	River Sta.	n1	n2	n3
REACH 1	2.077	.044	.049	.044
REACH 1	1.815	.044	.049	.044
REACH 1	1.550	.044	.049	.044
REACH 1	1.308	.044	.049	.044
REACH 1	1.047	.044	.049	.044
REACH 1	0.781	.044	.049	.044
REACH 1	0.524	.044	.049	.044
REACH 1	0.268	.044	.049	.044
REACH 1	0.053	.044	.049	.044

River:2S2WS17A (A17)

Reach	River Sta.	n1	n2	n3
REACH 1	1.473	.044	.049	.044
REACH 1	1.217	.044	.049	.044
REACH 1	0.931	.044	.049	.044
REACH 1	0.684	.044	.049	.044
REACH 1	0.435	.044	.049	.044
REACH 1	0.248	.044	.049	.044
REACH 1	0.000	.044	.049	.044

SUMMARY OF REACH LENGTHS

River: 2S2WS16A (A35)

Reach	River Sta.	Left	Channel	Right
REACH 1	4.711	1400	1504	1450
REACH 1	4.426	1200	1225	1200
REACH 1	4.194	1265	1268	1230
REACH 1	3.954	1275	1297	1275
REACH 1	3.708	1300	1321	1295
REACH 1	3.458	1325	1367	1320
REACH 1	3.199	1250	1280	1230
REACH 1	2.957	1310	1353	1335
REACH 1	2.701	1625	1708	1660
REACH 1	2.377	1115	1162	1130
REACH 1	2.157			
REACH 2	1.888	1285	1348	1330
REACH 2	1.632	1345	1413	1355
REACH 2	1.364	1290	1325	1280
REACH 2	1.114	1305	1347	1300
REACH 2	0.859	1375	1427	1395
REACH 2	0.588			
REACH 3	0.351	700	728	750
REACH 3	0.213	1100	1127	1100
REACH 3	0.000	460	511	460

River: 2S2WS16B (A15)

Reach	River Sta.	Left	Channel	Right
REACH 1	2.077	1310	1383	1305
REACH 1	1.815	1370	1399	1365
REACH 1	1.550	1215	1279	1250
REACH 1	1.308	1330	1376	1310
REACH 1	1.047	1320	1404	1380
REACH 1	0.781	1345	1357	1330
REACH 1	0.524	1270	1351	1320
REACH 1	0.268	1100	1136	1100
REACH 1	0.053			

River: 2S2WS17A (A17)

Reach	River Sta.	Left	Channel	Right

*REACH 1	*	1.473	* 1360*	1350*	1340*
*REACH 1	*	1.217	* 1490*	1510*	1480*
*REACH 1	*	0.931	* 1250*	1306*	1280*
*REACH 1	*	0.684	* 1310*	1414*	1295*
*REACH 1	*	0.435	* 970*	988*	980*
*REACH 1	*	0.248	* 1310*	1309*	1310*
*REACH 1	*	0.000	* 10*	11*	10*

****

****

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S2WS16A (A35)

Reach	River Sta.	Contr.	Expan.
*REACH 1	* 4.711	* .1*	.3*
*REACH 1	* 4.426	* .1*	.3*
*REACH 1	* 4.194	* .1*	.3*
*REACH 1	* 3.954	* .1*	.3*
*REACH 1	* 3.708	* .1*	.3*
*REACH 1	* 3.458	* .1*	.3*
*REACH 1	* 3.199	* .1*	.3*
*REACH 1	* 2.957	* .1*	.3*
*REACH 1	* 2.701	* .1*	.3*
*REACH 1	* 2.377	* .1*	.3*
*REACH 1	* 2.157	* .1*	.3*
*REACH 2	* 1.888	* .1*	.3*
*REACH 2	* 1.632	* .1*	.3*
*REACH 2	* 1.364	* .1*	.3*
*REACH 2	* 1.114	* .1*	.3*
*REACH 2	* 0.859	* .1*	.3*
*REACH 2	* 0.588	* .1*	.3*
*REACH 3	* 0.351	* .1*	.3*
*REACH 3	* 0.213	* .1*	.3*
*REACH 3	* 0.000	* .1*	.3*

River: 2S2WS16B (A15)

Reach	River Sta.	Contr.	Expan.
*REACH 1	* 2.077	* .1*	.3*
*REACH 1	* 1.815	* .1*	.3*
*REACH 1	* 1.550	* .1*	.3*
*REACH 1	* 1.308	* .1*	.3*
*REACH 1	* 1.047	* .1*	.3*
*REACH 1	* 0.781	* .1*	.3*
*REACH 1	* 0.524	* .1*	.3*
*REACH 1	* 0.268	* .1*	.3*
*REACH 1	* 0.053	* .1*	.3*

River: 2S2WS17A (A17)

Reach	River Sta.	Contr.	Expan.
*REACH 1	* 1.473	* .1*	.3*
*REACH 1	* 1.217	* .1*	.3*
*REACH 1	* 0.931	* .1*	.3*
*REACH 1	* 0.684	* .1*	.3*
*REACH 1	* 0.435	* .1*	.3*
*REACH 1	* 0.248	* .1*	.3*
*REACH 1	* 0.000	* .1*	.3*

MODEL: 2S2WS26 (A41)

REACH: 2S2WS26 (A41)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 2S2WS26 (A41)
Project File : 2S2WS26_A41.prj
Run Date and Time: 12/14/2004 4:09:06 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 2S2WS26 (A41)
Reaches: 2S2WS26 (A41)

****

PLAN DATA

Plan Title: 2S2WS26 (A41)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS26 (A41)\2S2WS26_A41.p01

Geometry Title: 2S2WS26 (A41)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS26 (A41)\2S2WS26_A41.g01

Flow Title : 2S2WS26 (A41)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS26 (A41)\2S2WS26_A41.f01

Plan Summary Information:

Number of:	Cross Sections =	10	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 2S2WS26 (A41)     Reach = REACH 1
RS      Profile            Method  Value1  Value2
2.531   PF 2                    1    9981   10060
2.274   PF 2                    1    9975   10025
2.020   PF 2                    1    9975   10025
1.771   PF 2                    1    9980   10075
1.513   PF 2                    1    9975   10025
1.250   PF 2                    1    9960   10040
0.988   PF 2                    1    9975   10025
0.640   PF 2                    1    9975   10050
0.330   PF 2                    1    9800   10070
0.000   PF 2                    1    9540   10100

*****************************************************************************

FLOW DATA

Flow Title: 2S2WS26 (A41)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS26
(A41)\2S2WS26_A41.f01

Flow Data (cfs)
*************************************************************
* River           Reach           RS        *          PF 1 *
* 2S2WS26 (A41)   REACH 1         2.531     *           200 *
* 2S2WS26 (A41)   REACH 1         2.274     *           260 *
* 2S2WS26 (A41)   REACH 1         2.020     *           310 *
* 2S2WS26 (A41)   REACH 1         1.771     *           350 *
* 2S2WS26 (A41)   REACH 1         1.513     *           390 *
* 2S2WS26 (A41)   REACH 1         1.250     *           430 *
* 2S2WS26 (A41)   REACH 1         0.988     *           490 *
* 2S2WS26 (A41)   REACH 1         0.640     *          1210 *
* 2S2WS26 (A41)   REACH 1         0.330     *          1120 *
* 2S2WS26 (A41)   REACH 1         0.000     *          1020 *
*************************************************************

Boundary Conditions
*************************************************************************************************
* River           Reach           Profile          *          Upstream                Downstream    *
*************************************************************************************************
* 2S2WS26 (A41)   REACH 1         PF 1             *       Normal S = 0.0067       Normal S = 0.0067 *
*************************************************************************************************

*************************************************************************

GEOMETRY DATA

Geometry Title: 2S2WS26 (A41)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS26
(A41)\2S2WS26_A41.g01

CROSS SECTION


RIVER: 2S2WS26 (A41)
REACH: REACH 1            RS: 2.531

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************
 9604.47 1164.23 9614.84 1164.22 9638.74  1164.2 9650.55 1164.19 9666.21 1164.17
 9686.25 1164.14 9701.35 1164.11 9721.95 1164.08  9749.3 1164.02 9757.65 1163.99
```

```
 9763.95 1163.96 9793.36 1163.87 9826.55 1163.73 9829.06 1163.73 9832.39 1163.71
 9864.76 1163.55 9889.15 1163.35 9900.47 1163.29 9915.48 1163.15 9942.71  1162.8
 9946.17    1163  9950.5 1162.57 9963.52 1161.96 9973.42 1161.63 9997.94 1158.47
 9999.65 1157.25   10000 1157.0710000.23 1156.9610000.26  1157.810002.24 1160.39
10002.49 1160.4110002.73 1160.4410014.59 1160.8810039.37  1159.510048.49 1160.04
10053.09 1160.2410056.76 1160.3810059.73  1160.510061.87 1160.5910078.56 1161.84
10096.39 1161.7910114.07 1161.7310128.71  1161.710155.44 1161.94 10156.1 1161.96
10157.61 1161.9710189.08 1162.5510190.58 1162.5510190.98 1162.5510192.49 1162.59
10192.68 1162.5610193.35 1162.4510193.87 1162.3810246.44 1161.93 10251.4 1161.89
10252.84 1161.9110253.73 1161.9210256.12 1161.9210258.54 1161.9310291.63 1162.14
10323.45 1162.3610327.14 1162.39 10331.6 1162.4210362.65 1162.6510388.36 1162.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9604.47    .042 9946.17    .04310078.56    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.1710078.56             1255    1358    1245            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1160.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *          *    0.043 *          *
* W.S. Elev (ft)          * 1160.71  * Reach Len. (ft)        * 1255.00  * 1358.00  * 1245.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *   58.25  *          *
* E.G. Slope (ft/ft)      *0.014658  * Area (sq ft)           *          *   58.25  *          *
* Q Total (cfs)           *  200.00  * Flow (cfs)             *          *  200.00  *          *
* Top Width (ft)          *   75.57  * Top Width (ft)         *          *   75.57  *          *
* Vel Total (ft/s)        *    3.43  * Avg. Vel. (ft/s)       *          *    3.43  *          *
* Max Chl Dpth (ft)       *    3.75  * Hydr. Depth (ft)       *          *    0.77  *          *
* Conv. Total (cfs)       *  1651.9  * Conv. (cfs)            *          *  1651.9  *          *
* Length Wtd. (ft)        * 1358.00  * Wetted Per. (ft)       *          *   78.34  *          *
* Min Ch El (ft)          * 1156.96  * Shear (lb/sq ft)       *          *    0.68  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    2.34  *          *
* Frctn Loss (ft)         *   11.15  * Cum Volume (acre-ft)   *   12.64  *   45.02  *    5.32  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   25.79  *   36.35  *   10.15  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS26 (A41)
REACH: REACH 1            RS: 2.274

INPUT
Description:
Station Elevation Data    num=      49
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9733.59  1154.1 9761.81 1153.69  9765.9 1153.63 9830.75 1151.28 9839.75 1151.05
 9845.43 1151.18 9852.71 1151.31 9858.28 1151.41  9862.7 1151.49 9865.66 1151.54
 9892.39 1151.41 9896.58 1151.44 9900.04 1151.46 9904.85 1151.47 9908.95 1151.47
 9912.58 1151.47  9914.9 1151.49 9917.13  1151.5 9919.24 1151.52 9921.86 1151.53
 9924.14 1151.53 9998.61 1148.01   10000 1147.9410000.52 1147.9210000.96 1147.92
10002.93 1147.92 10017.4 1148.2610021.57 1148.3110027.47 1148.4110039.62 1148.64
10046.54 1148.7710052.58  1148.910056.98    114910093.87  1151.110113.77 1151.17
10132.23 1151.2510167.77  1151.410174.04  1151.510177.35 1151.5710192.94 1151.93
10213.85 1152.4610228.95 1152.3210275.76 1151.8910285.66 1151.9410309.96 1152.07
10324.02 1152.1410329.75 1152.1710362.38 1152.3510383.75 1152.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9733.59    .042 9921.86    .04310093.87    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9921.8610093.87             1330    1342    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1149.73  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.10	Wt. n-Val.		0.043		
W.S. Elev (ft)	1149.62	Reach Len. (ft)	1330.00	1342.00	1300.00	
Crit W.S. (ft)	1149.15	Flow Area (sq ft)		100.82		
E.G. Slope (ft/ft)	*0.005767	Area (sq ft)		100.82		
Q Total (cfs)	260.00	Flow (cfs)		260.00		
Top Width (ft)	103.44	Top Width (ft)		103.44		
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)		2.58		
Max Chl Dpth (ft)	1.70	Hydr. Depth (ft)		0.97		
Conv. Total (cfs)	3423.7	Conv. (cfs)		3423.7		
Length Wtd. (ft)	1342.00	Wetted Per. (ft)		103.50		
Min Ch El (ft)	1147.92	Shear (lb/sq ft)		0.35		
Alpha	1.00	Stream Power (lb/ft s)		0.90		
Frctn Loss (ft)	10.95	Cum Volume (acre-ft)	12.64	42.54	5.32	
C & E Loss (ft)	0.02	Cum SA (acres)	25.79	33.56	10.15	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS26 (A41)
REACH: REACH 1 RS: 2.020

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9551.09	1142.91	9559.42	1142.96	9565.74	1142.99	9595.42	1143.11	9626.16	1143.17
9631.41	1143.18	9639.15	1143.19	9667.41	1143.17	9686.58	1143.19	9703.41	1143.16
9728.22	1143.1	9747.01	1143.02	9775.41	1142.77	9807.43	1142.48	9811.41	1142.44
9817.28	1142.36	9847.41	1141.95	9867.85	1141.73	9883.4	1141.54	9906.34	1141.26
9919.4	1141.1	9928.27	1141	9971.64	1138.07	9974.55	1137.9	9977.82	1137.7
9983.8	1137.27	9991.61	1136.67	10000	1136.02	10001.2	1135.92	10002.59	1136.09
10012.59	1137.26	10046.71	1140.24	10064.59	1140.29	10096.12	1140.56	10101.27	1140.59
10104.19	1140.62	10137.95	1140.93	10161.67	1141.14	10174.63	1141.22	10197.49	1141.32
10211.31	1141.38	10219.15	1141.41						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9551.09	.042	9928.27	.043	10046.71	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9928.27	10046.71	1270	1313	1245	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1138.76	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.27	Wt. n-Val.		0.043		
W.S. Elev (ft)	1138.48	Reach Len. (ft)	1270.00	1313.00	1245.00	
Crit W.S. (ft)	1138.11	Flow Area (sq ft)		73.84		
E.G. Slope (ft/ft)	*0.011522	Area (sq ft)		73.84		
Q Total (cfs)	310.00	Flow (cfs)		310.00		
Top Width (ft)	61.10	Top Width (ft)		61.10		
Vel Total (ft/s)	4.20	Avg. Vel. (ft/s)		4.20		
Max Chl Dpth (ft)	2.56	Hydr. Depth (ft)		1.21		
Conv. Total (cfs)	2888.0	Conv. (cfs)		2888.0		
Length Wtd. (ft)	1313.00	Wetted Per. (ft)		61.32		
Min Ch El (ft)	1135.92	Shear (lb/sq ft)		0.87		
Alpha	1.00	Stream Power (lb/ft s)		3.64		
Frctn Loss (ft)	8.64	Cum Volume (acre-ft)	12.64	39.85	5.32	
C & E Loss (ft)	0.05	Cum SA (acres)	25.79	31.03	10.15	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS26 (A41)
REACH: REACH 1 RS: 1.771

```
INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9620.62 1134.15 9632.55 1134.18 9651.55 1134.25 9664.17 1134.22 9687.62 1134.13
 9722.94 1133.94 9723.69 1133.94 9724.18 1133.93 9759.76 1133.65  9784.2 1133.44
 9795.82 1133.34 9813.33 1133.16 9831.89 1132.97 9844.22 1132.83 9867.96 1132.59
 9903.72 1132.23 9904.03 1132.23 9904.24 1132.23  9940.1  1131.9 9981.83  1128.2
 9996.26 1126.59   10000 1126.9710007.03 1127.6710018.58 1128.8510025.41 1129.52
10029.79 1129.98 10059.5 1129.1410066.15 1128.9510101.28 1130.8410111.81 1131.39
10117.34 1131.64 10120.1 1131.7510127.76 1132.2810130.16 1132.3210166.02 1132.73
10184.29 1132.9410204.28 1133.0810238.42 1133.2510242.54 1133.2610252.48 1133.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9620.62    .042  9940.1    .04310127.76    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9940.110127.76             1325    1367    1325             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1130.07  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *          *   0.043  *         *
* W.S. Elev (ft)         * 1129.97  * Reach Len. (ft)         * 1325.00  * 1367.00  * 1325.00  *
* Crit W.S. (ft)         * 1129.07  * Flow Area (sq ft)       *          *  139.70  *         *
* E.G. Slope (ft/ft)     *0.004451  * Area (sq ft)            *          *  139.70  *         *
* Q Total (cfs)          *  350.00  * Flow (cfs)              *          *  350.00  *         *
* Top Width (ft)         *  122.94  * Top Width (ft)          *          *  122.94  *         *
* Vel Total (ft/s)       *    2.51  * Avg. Vel. (ft/s)         *          *    2.51  *         *
* Max Chl Dpth (ft)      *    3.38  * Hydr. Depth (ft)         *          *    1.14  *         *
* Conv. Total (cfs)      *  5246.3  * Conv. (cfs)              *          *  5246.3  *         *
* Length Wtd. (ft)       * 1367.00  * Wetted Per. (ft)         *          *  123.32  *         *
* Min Ch El (ft)         * 1126.59  * Shear (lb/sq ft)         *          *    0.31  *         *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    0.79  *         *
* Frctn Loss (ft)        *   10.27  * Cum Volume (acre-ft)     *   12.64  *   36.63  *    5.32  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *   25.79  *   28.25  *   10.15  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS26 (A41)
REACH: REACH 1            RS: 1.513

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9671.56 1123.54 9684.86 1123.52 9704.51  1123.5 9726.02 1123.39  9739.9 1123.34
 9752.57 1123.25 9775.29 1123.09 9800.18 1122.84 9810.68 1122.76 9820.28 1122.67
 9846.07 1122.39 9874.33 1122.04 9881.47 1121.97 9887.98 1121.89 9916.86 1121.54
 9948.48 1121.15 9952.25  1121.1 9956.59 1120.74 9957.22 1120.69 9958.72 1120.57
 9961.39 1120.36 9967.31 1119.87   10000 1117.0510001.64 1116.9110013.74 1117.75
10058.43 1120.81 10091.1 1120.9710093.82 1120.9810096.79    112110129.21 1121.24
10158.81 1121.44 10164.6 1121.4810170.95 1121.5110199.99 1121.6910226.51 1121.79
10235.38 1121.83 10245.1 1121.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9671.56    .042 9948.48    .04310058.43    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9948.4810058.43            1340    1384    1330             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

* E.G. Elev (ft)	* 1119.77	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.35	* Wt. n-Val.	*	* 0.043	*	*
* W.S. Elev (ft)	* 1119.42	* Reach Len. (ft)	* 1340.00	* 1384.00	* 1330.00	*
* Crit W.S. (ft)	* 1119.13	* Flow Area (sq ft)	*	* 82.13	*	*
* E.G. Slope (ft/ft)	*0.014039	* Area (sq ft)	*	* 82.13	*	*
* Q Total (cfs)	* 390.00	* Flow (cfs)	*	* 390.00	*	*
* Top Width (ft)	* 65.57	* Top Width (ft)	*	* 65.57	*	*
* Vel Total (ft/s)	* 4.75	* Avg. Vel. (ft/s)	*	* 4.75	*	*
* Max Chl Dpth (ft)	* 2.51	* Hydr. Depth (ft)	*	* 1.25	*	*
* Conv. Total (cfs)	* 3291.5	* Conv. (cfs)	*	* 3291.5	*	*
* Length Wtd. (ft)	* 1383.58	* Wetted Per. (ft)	*	* 65.77	*	*
* Min Ch El (ft)	* 1116.91	* Shear (lb/sq ft)	*	* 1.09	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 5.20	*	*
* Frctn Loss (ft)	* 7.83	* Cum Volume (acre-ft)	* 12.64	* 33.15	* 5.32	*
* C & E Loss (ft)	* 0.09	* Cum SA (acres)	* 25.79	* 25.30	* 10.15	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS26 (A41)
REACH: REACH 1 RS: 1.250

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9708.55	1112.9	9725	1112.85	9736.32	1112.83	9767.54	1112.7	9775.35	1112.65
9778.18	1112.63	9814.38	1112.34	9831.37	1112.2	9853.41	1112.01	9884.56	1111.73
9914.15	1111.56	9933.82	1111.39	9935.05	1111.4	9936.37	1111.36	9936.91	1111.31
9937.46	1111.25	9937.9	1111.21	9939.09	1111.16	9940.32	1111.15	9941.76	1111.13
9943.37	1111.09	9945.54	1111.03	9948.61	1110.94	9953.27	1110.82	9960.59	1110.63
9972.17	1110.36	9988.77	1109.9	9996.47	1109.83	9996.55	1109.83	9997.1	1109.84
9997.13	1109.84	10000	1109.85	10026.15	1110.26	10037.61	1110.47	10049.09	1110.66
10060.49	1110.88	10060.82	1110.88	10061.3	1110.89	10061.33	1110.89	10061.95	1110.89
10062.73	1110.89	10063.43	1110.89	10081.85	1111.19	10084.71	1111.23	10118.3	1111.62
10140.57	1111.81	10154.77	1111.94	10178.58	1112.21	10191.24	1112.33	10198.79	1112.4
10227.7	1112.71	10257.01	1113.01	10264.17	1113.08	10276.19	1113.21	10300.64	1113.4
10315.23	1113.56	10337.11	1113.71	10373.44	1113.99	10373.57	1113.99	10373.79	1113.99
10410.04	1114.06								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9708.55	.042	9933.82	.043	10118.3	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.82	10118.3	1330	1383	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1111.85	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.07	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1111.79	* Reach Len. (ft)	* 1330.00	* 1383.00	* 1320.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 10.54	* 202.96	* 1.73	*
* E.G. Slope (ft/ft)	*0.003194	* Area (sq ft)	* 10.54	* 202.96	* 1.73	*
* Q Total (cfs)	* 430.00	* Flow (cfs)	* 6.95	* 422.39	* 0.66	*
* Top Width (ft)	* 260.82	* Top Width (ft)	* 55.64	* 184.48	* 20.70	*
* Vel Total (ft/s)	* 2.00	* Avg. Vel. (ft/s)	* 0.66	* 2.08	* 0.38	*
* Max Chl Dpth (ft)	* 1.96	* Hydr. Depth (ft)	* 0.19	* 1.10	* 0.08	*
* Conv. Total (cfs)	* 7608.1	* Conv. (cfs)	* 123.0	* 7473.5	* 11.7	*
* Length Wtd. (ft)	* 1382.55	* Wetted Per. (ft)	* 55.64	* 184.52	* 20.70	*
* Min Ch El (ft)	* 1109.83	* Shear (lb/sq ft)	* 0.04	* 0.22	* 0.02	*
* Alpha	* 1.07	* Stream Power (lb/ft s)	* 0.02	* 0.46	* 0.01	*
* Frctn Loss (ft)	* 10.62	* Cum Volume (acre-ft)	* 12.48	* 28.62	* 5.29	*
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 24.94	* 21.32	* 9.83	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS26 (A41)
REACH: REACH 1 RS: 0.988

INPUT
Description:
Station Elevation Data num= 27

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9909.7 1102.63 9913.39 1102.37 9925.28 1101.49 9936.74 1100.93 9939.63 1100.86
 9954.74 1100.41 9957.33 1100.34 9976.84 1099.67  9992.3 1099.16   10000    1099
 10002.6 1098.9410019.07 1099.6110028.81 1100.2110044.99 1100.8410063.45 1100.93
10080.36 1101.0410096.11 1101.1210115.74 1101.2310136.83 1101.3310151.12  1101.4
10164.43 1101.45 10186.5 1101.5610210.21 1101.6810221.88 1101.7410232.74 1101.79
10257.25  1101.910283.58 1102.02
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9909.7    .042 9913.39    .04310044.99    .042
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9913.3910044.99 1760 1838 1810 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1101.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.		0.043	
W.S. Elev (ft)	1100.72	Reach Len. (ft)	1760.00	1838.00	1810.00
Crit W.S. (ft)	1100.72	Flow Area (sq ft)		89.05	
E.G. Slope (ft/ft)	0.028721	Area (sq ft)		89.05	
Q Total (cfs)	490.00	Flow (cfs)		490.00	
Top Width (ft)	97.71	Top Width (ft)		97.71	
Vel Total (ft/s)	5.50	Avg. Vel. (ft/s)		5.50	
Max Chl Dpth (ft)	1.78	Hydr. Depth (ft)		0.91	
Conv. Total (cfs)	2891.3	Conv. (cfs)		2891.3	
Length Wtd. (ft)	1836.56	Wetted Per. (ft)		97.78	
Min Ch El (ft)	1098.94	Shear (lb/sq ft)		1.63	
Alpha	1.00	Stream Power (lb/ft s)		8.99	
Frctn Loss (ft)	9.49	Cum Volume (acre-ft)	12.32	23.99	5.26
C & E Loss (ft)	0.10	Cum SA (acres)	24.09	16.84	9.52

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 2S2WS26 (A41)
REACH: REACH 1 RS: 0.640

INPUT
Description: Cross section at Riggs Road.
Station Elevation Data num= 36

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9933.92 1088.79 9968.42 1088.33 9982.66 1087.44    9986  1086.8   10000  1084.1
10010.53 1082.4410018.28 1083.7210037.21 1085.4210039.97 1085.4410049.98 1085.48
10060.28 1085.4910061.63 1085.51 10080.1 1086.7610088.12 1087.2610143.86  1087.6
10153.97 1087.5610159.01 1087.5610174.03 1087.54 10198.5 1087.5110206.71 1087.52
   10238 1087.6110259.44 1087.6910277.49 1087.7810312.18 1087.9510316.99 1087.97
10331.35 1088.0210356.49  1088.110364.91 1088.1210395.98 1088.1810417.65  1088.2
10435.48 1088.2310470.38 1088.2610474.97 1088.2710488.68  1088.310514.47 1088.37
10523.11 1088.39
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9933.92    .042 9968.42    .04310143.86    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.4210143.86             1540    1638    1605            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1088.26  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *          *    0.043 *    0.042 *
* W.S. Elev (ft)          * 1088.11  * Reach Len. (ft)         * 1540.00  * 1638.00  * 1605.00  *
* Crit W.S. (ft)          * 1086.69  * Flow Area (sq ft)       *          *   348.74 *   81.52  *
* E.G. Slope (ft/ft)      *0.003397  * Area (sq ft)            *          *   348.74 *   81.52  *
* Q Total (cfs)           * 1210.00  * Flow (cfs)              *          *  1122.42 *   87.58  *
* Top Width (ft)          *  388.65  * Top Width (ft)          *          *   171.92 *  216.74  *
* Vel Total (ft/s)        *    2.81  * Avg. Vel. (ft/s)         *          *     3.22 *    1.07  *
* Max Chl Dpth (ft)       *    5.67  * Hydr. Depth (ft)         *          *     2.03 *    0.38  *
* Conv. Total (cfs)       * 20761.6  * Conv. (cfs)              *          *  19258.8 *  1502.8  *
* Length Wtd. (ft)        * 1615.49  * Wetted Per. (ft)         *          *   172.63 *  216.74  *
* Min Ch El (ft)          * 1082.44  * Shear (lb/sq ft)         *          *     0.43 *    0.08  *
* Alpha                   *    1.23  * Stream Power (lb/ft s)   *          *     1.38 *    0.09  *
* Frctn Loss (ft)         *    8.23  * Cum Volume (acre-ft)     *   12.32  *    14.75 *    3.57  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *   24.09  *    11.16 *    5.01  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS26 (A41)
REACH: REACH 1            RS: 0.330

INPUT
Description:
Station Elevation Data     num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9369.42 1080.07 9384.49 1080.06 9413.28 1080.01 9420.87    1080 9433.31 1079.97
 9457.25 1079.91 9471.85 1079.86 9493.63  1079.8 9529.34 1079.71 9530.01  1079.7
 9530.41  1079.7 9566.39 1079.61 9586.07 1078.66 9592.54 1078.47 9603.85 1078.16
 9609.39    1078 9621.83 1078.27 9636.49 1078.62 9675.52 1079.44 9706.11 1079.43
  9711.9 1079.43 9721.41 1079.43 9748.28 1079.43 9764.67 1079.44 9784.66 1079.45
 9817.44 1079.47 9821.04 1079.47 9823.23 1079.48 9857.42 1079.52  9881.8 1079.55
  9893.8 1079.58 9913.47 1079.61 9930.18 1079.64 9940.36 1079.65 9985.46 1078.22
   10000 1077.3310001.03 1077.2710016.12 1078.0510048.24 1078.9110064.52 1079.46
 10075.2 1079.9810090.11 1080.0310111.35 1080.0910125.14 1080.1210147.49 1080.19
10181.91 1080.2610183.64 1080.2610184.76 1080.2610219.78 1080.3310244.38 1080.34
10255.93 1080.36 10273.7 1080.3810292.07 1080.39   10304 1080.3910328.22 1080.42
10363.63 1080.4710364.36 1080.4710365.49 1080.4710423.25 1080.5710436.65  1080.6

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9369.42    .042 9930.18    .043 10075.2    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9930.18 10075.2             1715    1743    1725            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1080.02  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.042  *    0.043 *          *
* W.S. Elev (ft)          * 1079.87  * Reach Len. (ft)         * 1715.00  * 1743.00  * 1725.00  *
* Crit W.S. (ft)          * 1079.68  * Flow Area (sq ft)       *  236.75  *   168.74 *          *
* E.G. Slope (ft/ft)      *0.008891  * Area (sq ft)            *  236.75  *   168.74 *          *
* Q Total (cfs)           * 1120.00  * Flow (cfs)              *  505.81  *   614.19 *          *
* Top Width (ft)          *  604.66  * Top Width (ft)          *  461.86  *   142.80 *          *
* Vel Total (ft/s)        *    2.76  * Avg. Vel. (ft/s)         *    2.14  *     3.64 *          *
* Max Chl Dpth (ft)       *    2.60  * Hydr. Depth (ft)         *    0.51  *     1.18 *          *
* Conv. Total (cfs)       * 11878.2  * Conv. (cfs)              *  5364.4  *  6513.8  *          *
* Length Wtd. (ft)        * 1727.63  * Wetted Per. (ft)         *  461.90  *   142.91 *          *
* Min Ch El (ft)          * 1077.27  * Shear (lb/sq ft)         *    0.28  *     0.66 *          *
```

* Alpha	*	1.22	* Stream Power (lb/ft s)	*	0.61	*	2.39	*		*
* Frctn Loss (ft)	*	13.36	* Cum Volume (acre-ft)	*	8.13	*	5.02	*	2.07	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	15.92	*	5.24	*	1.02	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS26 (A41)
REACH: REACH 1 RS: 0.000

INPUT
Description:
Station Elevation Data num= 191

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9018.61	1072.32	9019.89	1072.31	9028.52	1072.29	9035.81	1072.27	9043.71	1072.23
9072.54	1072.05	9080.56	1071.99	9091.8	1071.82	9104.72	1071.58	9140.51	1070.86
9147.15	1070.62	9147.93	1070.62	9172.48	1071.21	9172.8	1071.21	9189.52	1071.64
9196.89	1071.77	9197.66	1071.76	9219.44	1071.8	9222.54	1071.74	9243.12	1071.23
9253.82	1070.89	9273.41	1070.1	9289.44	1069.58	9307.17	1068.92	9325.6	1068.61
9347	1067.98	9363.61	1067.82	9379.72	1067.53	9393.71	1067.39	9412.11	1067.15
9425.94	1066.95	9446.31	1066.75	9456.63	1066.61	9472.74	1066.49	9489.78	1066.4
9497.73	1066.31	9515.17	1066.22	9536.36	1066.18	9540.83	1066.16	9562.54	1066.15
9577.27	1066.61	9580.68	1066.4	9581.85	1066.35	9586.8	1066.46	9586.9	1066.46
9592.54	1066.49	9592.82	1066.49	9598.5	1066.48	9598.81	1066.48	9610.1	1066.25
9610.33	1066.25	9610.45	1066.25	9610.58	1066.25	9610.7	1066.25	9610.83	1066.25
9620.93	1065.86	9622.25	1065.85	9622.48	1065.85	9634.6	1065.73	9649.42	1065.51
9649.97	1065.5	9664.78	1065.74	9665.01	1065.76	9665.29	1065.77	9665.61	1065.78
9679.43	1065.98	9679.84	1065.99	9680.29	1066	9680.76	1066.01	9681.26	1066.02
9681.78	1066.02	9704.65	1066	9705.28	1066	9706.08	1066.01	9706.76	1066.03
9707.27	1066.01	9707.64	1065.96	9712.11	1065.96	9736.36	1065.73	9737.18	1065.77
9738.1	1065.82	9739.1	1065.85	9762.23	1065.67	9763.18	1065.67	9764.16	1065.66
9765.1	1065.65	9766.1	1065.64	9767.09	1065.63	9768.07	1065.63	9811.35	1065.52
9814.49	1065.59	9817.67	1065.73	9821.13	1065.87	9823.84	1065.95	9846.76	1070.37
9853.79	1070.38	9866.73	1066.07	9869.63	1066.17	9878.19	1066.34	9894.43	1070.59
9913.95	1066.43	9923.81	1066.47	9935.3	1066.33	9951.72	1066.23	9953.33	1066.23
9955.22	1066.22	9957.02	1066.09	9970.88	1066.01	9972.31	1065.86	9973.75	1065.7
9974.99	1065.55	9976.58	1065.32	9977.83	1065.13	9978.89	1064.98	9979.97	1064.88
9980.98	1064.8	9986.6	1065.08	9988.1	1065.23	9989.45	1065.21	10000	1065.34
10006.41	1065.93	10007.76	1065.91	10010.92	1066.27	10012.94	1066.77	10015.28	1067.12
10015.87	1067.21	10017.44	1067.18	10019.07	1067.06	10023.67	1066.36	10026.13	1066.02
10029.75	1065.41	10030.2	1065.29	10030.71	1065.15	10031.31	1065	10036.44	1063.59
10038.87	1064.51	10041.43	1065.49	10044.43	1066.65	10046.81	1067.49	10048.78	1067.49
10051.94	1067.49	10054.61	1067.49	10056.04	1067.49	10087.71	1068.88	10089	1068.93
10090.1	1068.98	10091.04	1069	10091.86	1068.99	10092.55	1068.96	10093.09	1068.96
10140.24	1067.67	10151.74	1067.98	10154.91	1068.07	10157.78	1068.19	10169.54	1068.46
10171.62	1068.52	10174.42	1068.5	10187.51	1068.78	10188.85	1068.75	10199.13	1068.99
10202.9	1068	10208.23	1066.47	10215.66	1064.23	10221.65	1062.45	10225.07	1063.48
10225.92	1063.48	10226.12	1063.48	10241.18	1064.81	10241.39	1064.8	10241.6	1064.8
10246.35	1064.1	10246.72	1064.05	10252.74	1065.16	10257.91	1066.09	10263.37	1067.19
10270.6	1068.42	10272.06	1068.47	10272.16	1068.46	10277.21	1068.66	10277.55	1068.68
10284.6	1068.86	10293.6	1069.11	10320.14	1069.34	10334.16	1069.48	10342.43	1069.51
10347.7	1069.53	10350.91	1069.55	10366.09	1069.77	10393.28	1069.85	10421.35	1069.98
10430.86	1070.02								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9018.61	.042	9894.43	.043	10087.71	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9894.43	10087.71	5	6	5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1066.66	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.19	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1066.47	* Reach Len. (ft)	*	*	*	*
* Crit W.S. (ft)	* 1066.29	* Flow Area (sq ft)	* 176.30	* 82.20	* 104.46	*
* E.G. Slope (ft/ft)	*0.006705	* Area (sq ft)	* 176.30	* 82.20	* 104.46	*
* Q Total (cfs)	* 1020.00	* Flow (cfs)	* 361.51	* 180.70	* 477.79	*
* Top Width (ft)	* 517.62	* Top Width (ft)	* 347.01	* 119.02	* 51.58	*
* Vel Total (ft/s)	* 2.81	* Avg. Vel. (ft/s)	* 2.05	* 2.20	* 4.57	*
* Max Chl Dpth (ft)	* 4.02	* Hydr. Depth (ft)	* 0.51	* 0.69	* 2.03	*

Conv. Total (cfs)	12456.3	Conv. (cfs)	4414.8	2206.7	5834.8
Length Wtd. (ft)		Wetted Per. (ft)	347.19	120.06	52.66
Min Ch El (ft)	1063.59	Shear (lb/sq ft)	0.21	0.29	0.83
Alpha	1.54	Stream Power (lb/ft s)	0.44	0.63	3.80
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.

SUMMARY OF MANNING'S N VALUES

River:2S2WS26 (A41)

Reach	River Sta.	n1	n2	n3
REACH 1	2.531	.042	.043	.042
REACH 1	2.274	.042	.043	.042
REACH 1	2.020	.042	.043	.042
REACH 1	1.771	.042	.043	.042
REACH 1	1.513	.042	.043	.042
REACH 1	1.250	.042	.043	.042
REACH 1	0.988	.042	.043	.042
REACH 1	0.640	.042	.043	.042
REACH 1	0.330	.042	.043	.042
REACH 1	0.000	.042	.043	.042

SUMMARY OF REACH LENGTHS

River: 2S2WS26 (A41)

Reach	River Sta.	Left	Channel	Right
REACH 1	2.531	1255	1358	1245
REACH 1	2.274	1330	1342	1300
REACH 1	2.020	1270	1313	1245
REACH 1	1.771	1325	1367	1325
REACH 1	1.513	1340	1384	1330
REACH 1	1.250	1330	1383	1320
REACH 1	0.988	1760	1838	1810
REACH 1	0.640	1540	1638	1605
REACH 1	0.330	1715	1743	1725
REACH 1	0.000	5	6	5

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S2WS26 (A41)

Reach	River Sta.	Contr.	Expan.
REACH 1	2.531	.1	.3
REACH 1	2.274	.1	.3
REACH 1	2.020	.1	.3
REACH 1	1.771	.1	.3
REACH 1	1.513	.1	.3
REACH 1	1.250	.1	.3
REACH 1	0.988	.1	.3
REACH 1	0.640	.1	.3
REACH 1	0.330	.1	.3
REACH 1	0.000	.1	.3

MODEL: 2S2WS35A (B58)

REACH: 2S2WS35A (B58)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 2S2WS35A (B58)
Project File : 2S2WS35A_B58.prj
Run Date and Time: 12/14/2004 4:14:30 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 2S2WS35A (B58)
Reaches: 2S2WS35A (B58)

****

PLAN DATA

Plan Title: 2S2WS35A (B58)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35A (B58)\2S2WS35A_B58.p01

Geometry Title: 2S2WS35A (B58)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35A (B58)\2S2WS35A_B58.g01

Flow Title : 2S2WS35A (B58)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35A (B58)\2S2WS35A_B58.f01

Plan Summary Information:

Number of:	Cross Sections =	3	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 2S2WS35A (B58)   Reach = REACH 1
RS      Profile           Method  Value1  Value2
0.536   PF 2                 1     9950   10050
0.257   PF 2                 1     9900   10050
0.000   PF 2                 1     9980   10045

*****************************************************************************

FLOW DATA

Flow Title: 2S2WS35A (B58)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35A
(B58)\2S2WS35A_B58.f01

Flow Data (cfs)
*************************************************************
* River            Reach          RS      *          PF 1 *
* 2S2WS35A (B58)   REACH 1        0.536   *           510 *
* 2S2WS35A (B58)   REACH 1        0.257   *           510 *
* 2S2WS35A (B58)   REACH 1        0.000   *           740 *
*************************************************************

Boundary Conditions
*****************************************************************************************************************
* River            Reach          Profile          *          Upstream                    Downstream    *
*****************************************************************************************************************
* 2S2WS35A (B58)   REACH 1        PF 1             *       Normal S = 0.0067        Normal S = 0.0067 *
*****************************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 2S2WS35A (B58)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35A
(B58)\2S2WS35A_B58.g01

CROSS SECTION


RIVER: 2S2WS35A (B58)
REACH: REACH 1            RS: 0.536

INPUT
Description: Directly downstream of Rainbow Valley Road.
Limit of Sudy.
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9614.31 1122.57 9616.72  1122.6 9621.27  1122.6 9625.45 1122.61 9662.66 1122.43
 9664.82 1122.42 9667.18 1122.43 9669.01 1122.43  9670.4 1122.41 9681.28 1122.32
 9710.91 1122.31 9742.97  1122.3 9746.72  1122.3 9751.91 1122.29 9782.53 1122.24
 9804.66 1122.19 9818.34 1122.15 9837.26 1122.09  9859.6 1122.19 9885.12 1122.27
  9970.4 1121.34 9979.67 1121.23 9991.44  1121.1   10000  1121.110002.97 1121.15
10026.22  1121.110059.08  1121.410059.88 1121.4210061.32 1121.5210063.41 1121.69
10066.46 1121.8810069.66 1122.0210074.36 1122.18   10082 1122.4410090.18 1122.79
10095.65 1122.8510162.35 1121.7110166.07 1121.8210170.73 1121.8210174.02 1121.92
10177.04 1122.0510178.64 1122.16 10180.2 1122.2810181.69 1122.3510186.54 1122.32
10187.49 1122.3210192.52  1122.310193.43 1122.27 10194.3 1122.2610198.23 1122.24
 10199.9 1122.2210203.89 1122.2110205.45  1122.210209.52 1122.1910233.58 1122.63
10234.51 1122.6310242.03 1122.8610242.67 1122.8610250.44  1122.910250.72  1122.9
10256.54 1122.85 10258.9  1122.810266.47 1122.6510291.73 1122.7710305.87 1122.91
10368.55 1122.8410374.03  1122.7 10389.1 1122.8510392.26 1122.8110402.68 1123.05
10406.43 1123.32 10410.5 1123.6510418.28 1124.0510422.14 1124.1310426.31 1124.22
```

10428.1 1124.25 10442.1 1123.86

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9614.31	.042	9885.12	.043	10095.65	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9885.1210095.65 1385 1473 1420 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1122.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1122.50	Reach Len. (ft)	1385.00	1473.00	1420.00
Crit W.S. (ft)	1122.10	Flow Area (sq ft)	56.64	187.24	38.55
E.G. Slope (ft/ft)	0.004418	Area (sq ft)	56.64	187.24	38.55
Q Total (cfs)	510.00	Flow (cfs)	51.26	413.83	44.91
Top Width (ft)	546.14	Top Width (ft)	237.28	198.32	110.54
Vel Total (ft/s)	1.81	Avg. Vel. (ft/s)	0.90	2.21	1.16
Max Chl Dpth (ft)	1.40	Hydr. Depth (ft)	0.24	0.94	0.35
Conv. Total (cfs)	7672.9	Conv. (cfs)	771.2	6226.0	675.7
Length Wtd. (ft)	1465.36	Wetted Per. (ft)	237.28	198.36	110.57
Min Ch El (ft)	1121.10	Shear (lb/sq ft)	0.07	0.26	0.10
Alpha	1.28	Stream Power (lb/ft s)	0.06	0.58	0.11
Frctn Loss (ft)	10.51	Cum Volume (acre-ft)	0.90	10.88	1.17
C & E Loss (ft)	0.01	Cum SA (acres)	4.05	11.60	6.58

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS35A (B58)
REACH: REACH 1 RS: 0.257

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9730.2	1112.47	9750.71	1112.38	9772.14	1112.29	9786.07	1112.22	9799.41	1112.17
9821.44	1112.07	9844.46	1111.96	9856.8	1111.89	9868.61	1111.85	9905.55	1111.22
9914	1111.11	9920.96	1111.03	9930.62	1110.93	9942.73	1110.81	9943.33	1110.82
9952.74	1110.91	9961.09	1110.97	9976.24	1110.85	9979.56	1110.86	9984.91	1110.87
9993.4	1110.89	10000	1110.9	10001	1110.9	10008.33	1110.9	10015.02	1110.99
10030.15	1111.15	10044.47	1111.3	10048.58	1111.33	10051.66	1111.36	10053.96	1111.38
10055.84	1111.4	10057.41	1111.41	10059.52	1111.43	10061.18	1111.44	10071.49	1111.63
10085.57	1111.65	10108.13	1111.69	10121.02	1111.71	10144.78	1111.77	10178.61	1111.83
10181.43	1111.83	10186.35	1111.84	10218.07	1111.87	10236.2	1111.89	10254.72	1111.89
10287.13	1111.9	10291.37	1111.9	10293.79	1111.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9730.2	.042	9868.61	.043	10071.49	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9868.6110071.49 1450 1359 1275 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1112.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1111.88	Reach Len. (ft)	1450.00	1359.00	1275.00
Crit W.S. (ft)	1111.73	Flow Area (sq ft)	0.12	149.72	17.48
E.G. Slope (ft/ft)	0.013621	Area (sq ft)	0.12	149.72	17.48
Q Total (cfs)	510.00	Flow (cfs)	0.03	493.08	16.89
Top Width (ft)	365.92	Top Width (ft)	8.50	202.88	154.54
Vel Total (ft/s)	3.05	Avg. Vel. (ft/s)	0.24	3.29	0.97
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)	0.01	0.74	0.11
Conv. Total (cfs)	4369.8	Conv. (cfs)	0.3	4224.9	144.7
Length Wtd. (ft)	1357.87	Wetted Per. (ft)	8.50	202.89	154.54

```
* Min Ch El (ft)          * 1110.81  * Shear (lb/sq ft)        *    0.01  *    0.63  *    0.10  *
* Alpha                   *    1.13  * Stream Power (lb/ft s) *    0.00  *    2.07  *    0.09  *
* Frctn Loss (ft)         *   11.81  * Cum Volume (acre-ft)    *    0.00  *    5.18  *    0.26  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    0.14  *    4.82  *    2.26  *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS35A (B58)
REACH: REACH 1            RS: 0.000

INPUT
Description: Directly upstream of 175th Avenue.
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9845.01 1100.92    9863  1100.8 9892.87 1100.56 9898.43 1100.52 9903.33 1100.49
 9933.85 1100.22 9968.41 1100.01 9969.27    1100 9970.41 1099.93 9970.99 1099.89
 9973.27 1099.71   10000 1097.5410001.71 1097.4310013.22 1096.6810013.36 1096.69
10026.22  1097.210035.74 1097.7310079.82  1100.210088.03 1100.25 10131.3 1100.51
 10145.3 1100.6410182.77 1100.9910213.43 1101.4210234.24  1101.710281.56  1102.5
10285.72 1102.5610298.54 1102.7110337.19 1103.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9845.01    .042 9968.41    .04310079.82    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9968.4110079.82              150     156     150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1100.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.26  * Wt. n-Val.              *          *    0.043  *          *
* W.S. Elev (ft)          * 1099.97  * Reach Len. (ft)         *          *           *          *
* Crit W.S. (ft)          * 1099.22  * Flow Area (sq ft)       *          *  182.36   *          *
* E.G. Slope (ft/ft)      *0.006709  * Area (sq ft)            *          *  182.36   *          *
* Q Total (cfs)           *  740.00  * Flow (cfs)              *          *  740.00   *          *
* Top Width (ft)          *  106.02  * Top Width (ft)          *          *  106.02   *          *
* Vel Total (ft/s)        *    4.06  * Avg. Vel. (ft/s)        *          *    4.06   *          *
* Max Chl Dpth (ft)       *    3.29  * Hydr. Depth (ft)        *          *    1.72   *          *
* Conv. Total (cfs)       *  9034.8  * Conv. (cfs)             *          *  9034.8   *          *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *          *  106.23   *          *
* Min Ch El (ft)          * 1096.68  * Shear (lb/sq ft)        *          *    0.72   *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    2.92   *          *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *          *           *          *
* C & E Loss (ft)         *          * Cum SA (acres)          *          *           *          *
*****************************************************************************************************

*************************************************************************

SUMMARY OF MANNING'S N VALUES

River:2S2WS35A (B58)
*************************************************************
*     Reach       *   River Sta.   *   n1    *   n2    *   n3    *
*************************************************************
*REACH 1          *    0.536       *    .042*    .043*    .042*
*REACH 1          *    0.257       *    .042*    .043*    .042*
*REACH 1          *    0.000       *    .042*    .043*    .042*
*************************************************************

*****************************************************************************

SUMMARY OF REACH LENGTHS

River: 2S2WS35A (B58)
*************************************************************
*     Reach       *   River Sta.   *  Left   * Channel *  Right  *
*************************************************************
*REACH 1          *    0.536       *    1385*    1473*    1420*
```

```
*REACH 1          *    0.257       *     1450*     1359*     1275*
*REACH 1          *    0.000       *      150*      156*      150*
*****************************************************************

*******************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S2WS35A (B58)

*****************************************************
*     Reach       *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    0.536   *       .1*       .3*
*REACH 1          *    0.257   *       .1*       .3*
*REACH 1          *    0.000   *       .1*       .3*
*****************************************************
```

MODEL: 2S2WS35B (B29)

REACH: 2S2WS35B (B29)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX   XXXX       XXXX      XX     XXXX
X     X  X       X    X     X   X    X  X    X
X     X  X       X          X   X    X    X   X
XXXXXXX  XXXX    X      XXX XXXX     XXXXXX   XXXX
X     X  X       X          X  X     X    X       X
X     X  X       X    X     X   X    X    X       X
X     X  XXXXXX   XXXX      X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 2S2WS35B (B29)
Project File : 2S2WS35B_B29.prj
Run Date and Time: 12/21/2004 7:26:58 AM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 2S2WS35B (B29)
Reaches: 2S2WS35B (B29)

****

PLAN DATA

Plan Title: 2S2WS35B (B29)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35B (B29)\2S2WS35B_B29.p01

Geometry Title: 2S2WS35B (B29)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35B (B29)\2S2WS35B_B29.g01

Flow Title : 2S2WS35B (B29)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35B (B29)\2S2WS35B_B29.f01

Plan Summary Information:

Number of:	Cross Sections =	5	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 2S2WS35 (B29)    Reach = REACH 1
RS      Profile           Method  Value1  Value2
0.871   PF 2                  1    9950   10050
0.662   PF 2                  1    9985   10015
0.409   PF 2                  1    9950   10090
0.223   PF 2                  1    9950   10035
0.000   PF 2                  1    9950   10070

*****************************************************************************

FLOW DATA

Flow Title: 2S2WS35B (B29)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35B
(B29)\2S2WS35B_B29.f01

Flow Data (cfs)
*************************************************************
* River            Reach          RS      *            PF 1 *
* 2S2WS35 (B29)    REACH 1        0.871   *              970 *
* 2S2WS35 (B29)    REACH 1        0.662   *              970 *
* 2S2WS35 (B29)    REACH 1        0.409   *              970 *
* 2S2WS35 (B29)    REACH 1        0.223   *              970 *
* 2S2WS35 (B29)    REACH 1        0.000   *              970 *
* 2S2WS35B (B29)   REACH 1        0.871   *              970 *
* 2S2WS35B (B29)   REACH 1        0.662   *              970 *
* 2S2WS35B (B29)   REACH 1        0.409   *              970 *
* 2S2WS35B (B29)   REACH 1        0.223   *              970 *
* 2S2WS35B (B29)   REACH 1        0.000   *              970 *
*************************************************************

Boundary Conditions
*****************************************************************************************************************
* River            Reach          Profile         *          Upstream                  Downstream     *
*****************************************************************************************************************
* 2S2WS35B (B29)   REACH 1        PF 1            *       Normal S = 0.0083        Normal S = 0.0083 *
*****************************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 2S2WS35B (B29)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\2S2WS35B
(B29)\2S2WS35B_B29.g01

CROSS SECTION


RIVER: 2S2WS35B (B29)
REACH: REACH 1            RS: 0.871

INPUT
Description: Approximately 800' upstream of Rainbow Valley Road.
Limit of Sudy.
Station Elevation Data     num=      56
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************
 9539.35   1145.3 9566.27 1145.29 9593.58 1145.25 9601.92 1145.24 9612.76 1145.22
 9637.57 1145.17 9656.66 1145.11 9673.23 1145.06 9694.76 1144.98 9708.88 1144.91
 9719.75 1144.84 9744.54  1144.7 9776.77 1144.48 9780.19 1144.45 9782.83 1144.43
 9815.85 1144.15 9845.91 1143.89  9851.5 1143.84 9858.78 1143.78 9887.16 1143.54
 9908.99 1143.39 9922.81 1143.29 9947.08 1142.64  9956.6 1142.37 9971.57 1141.88
 9999.41  1142.8   10000 1142.8210000.38 1142.8310001.47 1142.8610003.13 1142.91
```

```
10035.06 1143.0110047.84 1143.0610052.47 1143.0710055.92 1143.0910058.61  1143.1
10060.72 1143.11 10062.5 1143.1110064.02 1143.1210066.63 1143.1210075.51 1143.27
10113.35 1143.4910116.66 1143.51 10117.5 1143.5210157.81 1143.7710169.08 1143.84
10198.96 1144.0310220.67 1144.16 10240.1 1144.2710272.25 1144.4410281.25 1144.49
10316.73 1144.66 10322.4 1144.6810323.83 1144.6910363.54 1144.8410375.42 1144.87
10404.69 1144.96

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9539.35    .042 9922.81    .04310001.47    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9922.8110001.47               1070    1105    1050            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1144.36  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.16  * Wt. n-Val.               *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1144.20  * Reach Len. (ft)          * 1070.00  * 1105.00  * 1050.00  *
* Crit W.S. (ft)          * 1143.90  * Flow Area (sq ft)        *   53.54  *  131.79  *  157.53  *
* E.G. Slope (ft/ft)      *0.006587  * Area (sq ft)             *   53.54  *  131.79  *  157.53  *
* Q Total (cfs)           *  970.00  * Flow (cfs)               *   93.51  *  521.23  *  355.26  *
* Top Width (ft)          *  417.83  * Top Width (ft)            *  112.88  *   78.66  *  226.29  *
* Vel Total (ft/s)        *    2.83  * Avg. Vel. (ft/s)          *    1.75  *    3.96  *    2.26  *
* Max Chl Dpth (ft)       *    2.32  * Hydr. Depth (ft)          *    0.47  *    1.68  *    0.70  *
* Conv. Total (cfs)       * 11951.7  * Conv. (cfs)               *  1152.2  *  6422.2  *  4377.3  *
* Length Wtd. (ft)        * 1093.24  * Wetted Per. (ft)          *  112.88  *   78.70  *  226.30  *
* Min Ch El (ft)          * 1141.88  * Shear (lb/sq ft)          *    0.20  *    0.69  *    0.29  *
* Alpha                   *    1.32  * Stream Power (lb/ft s)    *    0.34  *    2.72  *    0.65  *
* Frctn Loss (ft)         *   10.75  * Cum Volume (acre-ft)      *    0.66  *   21.33  *    5.66  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)            *    1.39  *   14.46  *    8.79  *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 2S2WS35B (B29)
REACH: REACH 1            RS: 0.662

INPUT
Description: Approximately 300' downstream of Rainbow Valley Road.
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9685.61 1135.36 9716.45 1135.28 9726.45 1135.25 9814.07 1135.75  9824.9 1135.64
 9852.19 1135.37 9903.96 1134.79 9918.37 1134.73 9931.86  1134.7 9953.75 1134.61
 9983.96 1131.06   10000 1129.1710004.87  1128.610017.65 1130.4710042.14 1133.58
10047.53 1134.2710055.73  1134.110060.41 1134.1110064.43 1134.1710096.13 1134.39
10125.52 1134.3510131.83 1134.34 10140.2 1134.3310188.13 1134.1210203.23 1134.06
10223.27 1133.9910250.74 1133.7810274.64 1133.5910306.34 1133.3210310.34 1133.28
10313.35 1133.25

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9685.61    .042 9953.75    .04310047.53    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9953.7510047.53               1280    1334    1310            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1133.56  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.78  * Wt. n-Val.               *          *   0.043  *          *
* W.S. Elev (ft)          * 1132.78  * Reach Len. (ft)          * 1280.00  * 1334.00  * 1310.00  *
* Crit W.S. (ft)          * 1132.54  * Flow Area (sq ft)        *          *  136.89  *          *
* E.G. Slope (ft/ft)      *0.016241  * Area (sq ft)             *          *  136.89  *          *
* Q Total (cfs)           *  970.00  * Flow (cfs)               *          *  970.00  *          *
* Top Width (ft)          *   66.54  * Top Width (ft)            *          *   66.54  *          *
* Vel Total (ft/s)        *    7.09  * Avg. Vel. (ft/s)          *          *    7.09  *          *
```

* Max Chl Dpth (ft)	*	4.18	* Hydr. Depth (ft)	*	*	2.06	*		*
* Conv. Total (cfs)	*	7611.4	* Conv. (cfs)	*	*	7611.4	*		*
* Length Wtd. (ft)	*	1330.78	* Wetted Per. (ft)	*	*	67.07	*		*
* Min Ch El (ft)	*	1128.60	* Shear (lb/sq ft)	*	*	2.07	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*	*	14.66	*		*
* Frctn Loss (ft)	*	10.61	* Cum Volume (acre-ft)	*	*	17.93	*	3.76	*
* C & E Loss (ft)	*	0.20	* Cum SA (acres)	*	*	12.62	*	6.06	*

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS35B (B29)
REACH: REACH 1 RS: 0.409

INPUT
Description:
Station Elevation Data num= 71

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9487.45	1123.85	9489.04	1123.85	9524.32	1123.82	9559.25	1123.66	9584.62	1123.7
9628.5	1124.82	9635.75	1124.71	9643.73	1124.51	9652.27	1124.36	9660.77	1124.35
9713.96	1124.33	9718.34	1124.39	9723.22	1124.44	9731.11	1124.47	9759.27	1124.85
9761.06	1124.89	9761.56	1124.89	9769.9	1124.89	9773.03	1124.89	9786.89	1124.73
9791.21	1124.76	9795.87	1124.76	9800.51	1124.76	9804.4	1124.72	9806.4	1124.68
9817.57	1124.75	9845.89	1124.62	9851.57	1124.6	9856.53	1124.56	9884.86	1123.4
9891.16	1123.27	9896.27	1123.12	9900.6	1123.02	9906.15	1122.86	9909.89	1122.78
9944.27	1121.5	9944.66	1121.49	9947.12	1121.39	9978.56	1120.76	10000	1120.35
10005.61	1120.25	10008.46	1120.34	10018.22	1120.54	10033.07	1120.88	10041.5	1121.07
10046.67	1121.2	10050.15	1121.31	10052.67	1121.36	10065.44	1121.91	10078.02	1121.84
10081.22	1121.85	10086.03	1121.87	10093.6	1121.91	10107.55	1121.97	10128.35	1122.06
10134.39	1122.02	10146.7	1121.94	10152.51	1121.93	10186.57	1121.75	10207.17	1121.87
10230.72	1121.96	10242.61	1122.06	10253.01	1122.15	10278.04	1122.42	10306.64	1122.68
10313.47	1122.74	10319.46	1122.79	10348.91	1123.11	10382.56	1123.43	10384.34	1123.44
10385.9	1123.45								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9487.45	.042	9909.89	.043	10065.44	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9909.89	10065.44	970	980	915	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1122.77	* Element	*	Left OB	*	Channel	*	Right OB *
* Vel Head (ft)	*	0.12	* Wt. n-Val.	*		*	0.043	*	0.042 *
* W.S. Elev (ft)	*	1122.64	* Reach Len. (ft)	*	970.00	*	980.00	*	915.00 *
* Crit W.S. (ft)	*	1122.25	* Flow Area (sq ft)	*		*	228.09	*	147.15 *
* E.G. Slope (ft/ft)	*	0.004720	* Area (sq ft)	*		*	228.09	*	147.15 *
* Q Total (cfs)	*	970.00	* Flow (cfs)	*		*	709.86	*	260.14 *
* Top Width (ft)	*	389.12	* Top Width (ft)	*		*	151.90	*	237.22 *
* Vel Total (ft/s)	*	2.59	* Avg. Vel. (ft/s)	*		*	3.11	*	1.77 *
* Max Chl Dpth (ft)	*	2.39	* Hydr. Depth (ft)	*		*	1.50	*	0.62 *
* Conv. Total (cfs)	*	14119.4	* Conv. (cfs)	*		*	10332.7	*	3786.7 *
* Length Wtd. (ft)	*	971.28	* Wetted Per. (ft)	*		*	151.96	*	237.23 *
* Min Ch El (ft)	*	1120.25	* Shear (lb/sq ft)	*		*	0.44	*	0.18 *
* Alpha	*	1.19	* Stream Power (lb/ft s)	*		*	1.38	*	0.32 *
* Frctn Loss (ft)	*	6.11	* Cum Volume (acre-ft)	*		*	12.34	*	1.55 *
* C & E Loss (ft)	*	0.01	* Cum SA (acres)	*		*	9.27	*	2.49 *

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS35B (B29)

REACH: REACH 1 RS: 0.223

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9708.44	1117.55	9716.87	1117.54	9732.86	1117.52	9752.46	1117.49	9777.16	1117.45
9788.05	1117.43	9796.67	1117.41	9823.64	1117.36	9877.29	1114.47	9884.73	1114.08
9893.12	1114.39	9904.83	1114.95	9927.34	1115.93	9944.08	1116.89	9977.09	1114.83
9991.4	1113.96	10000	1113.47	10002.57	1113.33	10020.28	1114.99	10028.29	1115.68
10051.91	1117.08	10072.77	1117.07	10099.08	1117.06	10108.36	1117.05	10115.72	1117.05
10143.95	1117.01	10179.53	1116.95	10179.54	1116.95	10179.56	1116.95	10215.13	1116.85
10243.33	1116.78	10250.72	1116.76	10260.04	1116.73	10286.31	1116.64		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9708.44	.042	9823.64	.043	10051.91	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9823.64	10051.91	1080	1180	1075	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1116.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.043	
W.S. Elev (ft)	1116.41	Reach Len. (ft)	1080.00	1180.00	1075.00
Crit W.S. (ft)	1115.90	Flow Area (sq ft)		246.24	
E.G. Slope (ft/ft)	0.008792	Area (sq ft)		246.24	
Q Total (cfs)	970.00	Flow (cfs)		970.00	
Top Width (ft)	183.36	Top Width (ft)		183.36	
Vel Total (ft/s)	3.94	Avg. Vel. (ft/s)		3.94	
Max Chl Dpth (ft)	3.08	Hydr. Depth (ft)		1.34	
Conv. Total (cfs)	10344.8	Conv. (cfs)		10344.8	
Length Wtd. (ft)	1180.00	Wetted Per. (ft)		183.70	
Min Ch El (ft)	1113.33	Shear (lb/sq ft)		0.74	
Alpha	1.00	Stream Power (lb/ft s)		2.90	
Frctn Loss (ft)	10.08	Cum Volume (acre-ft)		7.00	
C & E Loss (ft)	0.01	Cum SA (acres)		5.50	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 2S2WS35B (B29)
REACH: REACH 1 RS: 0.000

INPUT
Description: Directly upstream of 175th Avenue.
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9667.57	1106.64	9705.41	1108.01	9707.7	1108	9709.75	1107.99	9743.11	1107.84
9776.83	1107.69	9778.52	1107.68	9780.41	1107.67	9813.93	1107.55	9843.92	1107.39
9849.34	1107.37	9855.4	1107.35	9884.75	1107.27	9911	1107.17	9924.5	1106.8
9932.49	1106.57	9962.38	1105.71	9992.61	1104.54	10000	1104.52	10023.5	1104.54
10026.33	1104.65	10042.29	1104.68	10055.94	1104.71	10058.45	1104.69	10060.62	1104.67
10062.63	1104.66	10064.76	1104.65	10079.28	1104.74	10081.92	1104.73	10084.52	1104.74
10089.31	1104.83	10105.2	1105.11	10110.96	1105.27	10125.44	1105.61	10131.94	1105.72
10145.32	1105.96	10148.57	1105.97	10151.79	1105.96	10196.47	1107.64	10203.47	1107.71
10209.47	1107.74	10214.69	1107.78	10261.15	1108.53	10261.64	1108.54	10262.05	1108.55
10266.86	1108.63	10313.43	1108.99	10329.51	1109.12	10365.05	1109.39	10398.95	1109.62
10416.67	1109.73								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9667.57	.042	9911	.043	10196.47	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9911	10196.47	0	0	0	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1106.57	Element				
Vel Head (ft)	0.20	Wt. n-Val.			0.043	
W.S. Elev (ft)	1106.37	Reach Len. (ft)				
Crit W.S. (ft)	1105.91	Flow Area (sq ft)			270.75	
E.G. Slope (ft/ft)	0.008299	Area (sq ft)			270.75	
Q Total (cfs)	970.00	Flow (cfs)			970.00	
Top Width (ft)	222.96	Top Width (ft)			222.96	
Vel Total (ft/s)	3.58	Avg. Vel. (ft/s)			3.58	
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)			1.21	
Conv. Total (cfs)	10647.6	Conv. (cfs)			10647.6	
Length Wtd. (ft)		Wetted Per. (ft)			223.02	
Min Ch El (ft)	1104.52	Shear (lb/sq ft)			0.63	
Alpha	1.00	Stream Power (lb/ft s)			2.25	
Frctn Loss (ft)		Cum Volume (acre-ft)				
C & E Loss (ft)		Cum SA (acres)				

SUMMARY OF MANNING'S N VALUES

River:2S2WS35B (B29)

Reach	River Sta.	n1	n2	n3
REACH 1	0.871	.042	.043	.042
REACH 1	0.662	.042	.043	.042
REACH 1	0.409	.042	.043	.042
REACH 1	0.223	.042	.043	.042
REACH 1	0.000	.042	.043	.042

SUMMARY OF REACH LENGTHS

River: 2S2WS35B (B29)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.871	1070	1105	1050
REACH 1	0.662	1280	1334	1310
REACH 1	0.409	970	980	915
REACH 1	0.223	1080	1180	1075
REACH 1	0.000	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 2S2WS35B (B29)

Reach	River Sta.	Contr.	Expan.
REACH 1	0.871	.1	.3
REACH 1	0.662	.1	.3
REACH 1	0.409	.1	.3
REACH 1	0.223	.1	.3
REACH 1	0.000	.1	.3

MODEL: 3S1WS4A (H71)

REACHES: 3S1WS4A (H71)
3S1WS4B (H73)
3S1WS3 (H29)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 3S1WS4A (H71)
Project File : 3S1WS4A_H71.prj
Run Date and Time: 1/12/2005 4:38:48 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 3S1WS4A (H71)
Reaches: 3S1WS4A (H71)
3S1WS4B
(H73)
3S1WS3 (H29)

****

PLAN DATA

Plan Title: 3S1WS4A (H71)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS4A
(H71)\3S1WS4A_H71.p01

Geometry Title: 3S1WS4A (H71)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS4A
(H71)\3S1WS4A_H71.g01

Flow Title : 3S1WS4A (H71)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS4A
(H71)\3S1WS4A_H71.f01

Plan Summary Information:

Number of:	Cross Sections =	38	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

```
    Water surface calculation tolerance =  0.01
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  20
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 3S1WS4A (H71)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
5.920    PF 2                   1    9945   10100
5.678    PF 2                   1    9825   10075
5.438    PF 2                   1    9900   10375
5.167    PF 2                   1    9825   10075
4.938    PF 2                   1    9825   10100
4.717    PF 2                   1    9825   10065
4.487    PF 2                   1    9770   10185
4.230    PF 2                   1    9510   10250
3.967    PF 2                   1    9870   10275
3.687    PF 2                   1    9790   10100
3.423    PF 2                   1    9700   10150
3.221    PF 2                   1    9720   10110
2.979    PF 2                   1    9825   10220
2.812    PF 2                   1    9700   10200

River = 3S1WS4A (H71)     Reach = REACH 2
RS       Profile           Method  Value1  Value2
2.579    PF 2                   1    9800   10500
2.303    PF 2                   1    9800   10375
2.069    PF 2                   1    9700   10275
1.814    PF 2                   1    9625   10175
1.570    PF 2                   1    9700   10275
1.291    PF 2                   1    9200   10465
1.050    PF 2                   1    9505   10565
0.818    PF 2                   1    9200   10550
0.541    PF 2                   1    9610   10465
0.285    PF 2                   1    9650   10425
0.000    PF 2                   1    9700   10110

River = 3S1WS4B (H73)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
2.316    PF 2                   1    9900   10400
2.076    PF 2                   1    9780   10200
1.836    PF 2                   1    9640   10150
1.589    PF 2                   1    9635   10175

River = 3S1WS4B (H73)     Reach = REACH 2
RS       Profile           Method  Value1  Value2
1.378    PF 2                   1    9675   10300
1.125    PF 2                   1    9700   10140
0.874    PF 2                   1    9650   10150
0.577    PF 2                   1    9700   10200
0.292    PF 2                   1    9725   10400
0.000    PF 2                   1    9530   10300

River = 3S1WS3 (H29)      Reach = REACH 1
RS       Profile           Method  Value1  Value2
1.096    PF 2                   1    9950   10050
0.745    PF 2                   1    9950   10250
0.376    PF 2                   1    9875   10150

*******************************************************************************

FLOW DATA

Flow Title: 3S1WS4A (H71)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS4A
(H71)\3S1WS4A_H71.f01
```

Flow Data (cfs)

River	Reach	RS	PF 1
3S1WS4A (H71)	REACH 1	5.920	2280
3S1WS4A (H71)	REACH 1	5.678	2760
3S1WS4A (H71)	REACH 1	5.438	3230
3S1WS4A (H71)	REACH 1	5.167	3770
3S1WS4A (H71)	REACH 1	4.938	4220
3S1WS4A (H71)	REACH 1	4.717	4650
3S1WS4A (H71)	REACH 1	4.487	4530
3S1WS4A (H71)	REACH 1	4.230	4390
3S1WS4A (H71)	REACH 1	3.967	4250
3S1WS4A (H71)	REACH 1	3.687	4100
3S1WS4A (H71)	REACH 1	3.423	4140
3S1WS4A (H71)	REACH 1	3.221	4170
3S1WS4A (H71)	REACH 1	2.979	4200
3S1WS4A (H71)	REACH 1	2.812	4230
3S1WS4A (H71)	REACH 2	2.579	4230
3S1WS4A (H71)	REACH 2	2.303	2560
3S1WS4A (H71)	REACH 2	2.069	2510
3S1WS4A (H71)	REACH 2	1.814	2450
3S1WS4A (H71)	REACH 2	1.570	2400
3S1WS4A (H71)	REACH 2	1.291	2340
3S1WS4A (H71)	REACH 2	1.050	2310
3S1WS4A (H71)	REACH 2	0.818	2280
3S1WS4A (H71)	REACH 2	0.541	2240
3S1WS4A (H71)	REACH 2	0.285	2210
3S1WS4A (H71)	REACH 2	0.000	2170
3S1WS4B (H73)	REACH 1	2.316	4230
3S1WS4B (H73)	REACH 1	2.076	1560
3S1WS4B (H73)	REACH 1	1.836	1510
3S1WS4B (H73)	REACH 1	1.589	1460
3S1WS4B (H73)	REACH 2	1.378	2320
3S1WS4B (H73)	REACH 2	1.125	2290
3S1WS4B (H73)	REACH 2	0.874	2270
3S1WS4B (H73)	REACH 2	0.577	2240
3S1WS4B (H73)	REACH 2	0.292	2710
3S1WS4B (H73)	REACH 2	0.000	3190
3S1WS3 (H29)	REACH 1	1.096	700
3S1WS3 (H29)	REACH 1	0.745	690
3S1WS3 (H29)	REACH 1	0.376	670

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
3S1WS4A (H71)	REACH 1	PF 1	Normal S = 0.01	
3S1WS4A (H71)	REACH 2	PF 1		Normal S = 0.007
3S1WS4B (H73)	REACH 2	PF 1		Normal S = 0.007
3S1WS3 (H29)	REACH 1	PF 1	Normal S = 0.01	

GEOMETRY DATA

Geometry Title: 3S1WS4A (H71)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS4A (H71)\3S1WS4A_H71.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
3S1WS4A (H71)	REACH 1		JUNCTION 1
3S1WS4A (H71)	REACH 2	JUNCTION 1	
3S1WS4B (H73)	REACH 1	JUNCTION 1	JUNCTION 2
3S1WS4B (H73)	REACH 2	JUNCTION 2	
3S1WS3 (H29)	REACH 1		JUNCTION 2

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

Length across Junction Tributary

River	Reach		River	Reach	Length	Angle
3S1WS4A (H71)	REACH 1	to	3S1WS4A (H71)	REACH 2	1233	
3S1WS4A (H71)	REACH 1	to	3S1WS4B (H73)	REACH 1	1200	

Name: JUNCTION 2
Description:
Energy computation Method

Length across Junction

River	Reach		Tributary River	Reach	Length	Angle
3S1WS4B (H73)	REACH 1	to	3S1WS4B (H73)	REACH 2	1113	
3S1WS3 (H29)	REACH 1	to	3S1WS4B (H73)	REACH 2	2000	

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 5.920

INPUT
Description: Limit of study.
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9674.05	1370.73	9697.3	1370.46	9728.4	1370.13	9732.69	1370.09	9737.4	1370.05
9796.07	1369.51	9803.48	1369.46	9811.59	1369.4	9838.87	1369.19	9863.75	1369.02
9875.79	1368.26	9885.31	1367.86	9916.35	1366.21	9948.42	1365.6	9970.07	1364.87
9973.47	1364.87	9980.59	1364.88	9985.19	1364.91	10000	136510019.25		1365.09
10024.45	1365.0110024.63		1365.0110034.05		1365.1810061.67		1365.6410073.16		1365.82
10116.02	1366.310122.55		1366.2410127.84		1366.21 10158.1		1366.0710192.19		1365.9
10193.65	1365.910195.45		1365.9110256.54		1366.3410264.75		1366.4310274.87		1366.54
10300.3	1366.8510320.89		1367.110335.84		1367.29 10354.3		1367.510358.52		1367.62

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9674.05	.042	9916.35	.04310116.02		.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9916.3	10116.02	1250	1277	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1367.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1367.62	Reach Len. (ft)	1250.00	1277.00	1250.00
Crit W.S. (ft)	1366.91	Flow Area (sq ft)	18.63	423.83	282.21
E.G. Slope (ft/ft)	0.004066	Area (sq ft)	18.63	423.83	282.21
Q Total (cfs)	2280.00	Flow (cfs)	33.22	1542.26	704.52
Top Width (ft)	468.56	Top Width (ft)	26.48	199.67	242.41
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)	1.78	3.64	2.50
Max Chl Dpth (ft)	2.75	Hydr. Depth (ft)	0.70	2.12	1.16
Conv. Total (cfs)	35757.7	Conv. (cfs)	521.1	24187.5	11049.1
Length Wtd. (ft)	1270.50	Wetted Per. (ft)	26.51	199.70	242.42
Min Ch El (ft)	1364.87	Shear (lb/sq ft)	0.18	0.54	0.30
Alpha	1.10	Stream Power (lb/ft s)	0.32	1.96	0.74
Frctn Loss (ft)	8.48	Cum Volume (acre-ft)	52.45	260.26	63.47
C & E Loss (ft)	0.05	Cum SA (acres)	76.37	136.93	61.94

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 5.678

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9613.02	1358.88	9632.61	1358.88	9667.24	1358.8	9669.3	1358.8	9670.47	1358.8
9705.99	1358.67	9727.91	1358.6	9742.68	1358.52	9768.79	1358.42	9779.37	1358.37
9785.36	1358.35	9804.24	1358.13	9846.91	1357.51	9874.86	1357.73	9878.93	1357.76
9881.83	1357.78	9900.25	1357.8	9939.23	1357.65	9960.95	1357.25	9964.28	1357.05

```
10000.01  1354.5 10023.6 1354.5210039.22 1355.8610064.43  1357.810084.46 1357.92
10115.41 1358.1210126.97 1358.2110166.39 1358.5310169.48 1358.5610184.96 1358.72
10211.99 1358.9910217.38 1359.05 10254.5 1359.4610268.36  1359.610297.01 1359.91
10319.34 1360.1410336.44 1360.31

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9613.02    .042 9939.23    .04310064.43    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9939.2310064.43               1250    1271    1250              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1359.26  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.64  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1358.62  * Reach Len. (ft)         * 1250.00  * 1271.00  * 1250.00  *
* Crit W.S. (ft)          * 1358.60  * Flow Area (sq ft)       *  134.39  *  327.69  *   49.38  *
* E.G. Slope (ft/ft)      *0.011317  * Area (sq ft)            *  134.39  *  327.69  *   49.38  *
* Q Total (cfs)           * 2760.00  * Flow (cfs)              *  366.63  * 2285.01  *  108.36  *
* Top Width (ft)          *  453.89  * Top Width (ft)           *  217.77  *  125.20  *  110.91  *
* Vel Total (ft/s)        *    5.40  * Avg. Vel. (ft/s)         *    2.73  *    6.97  *    2.19  *
* Max Chl Dpth (ft)       *    4.12  * Hydr. Depth (ft)         *    0.62  *    2.62  *    0.45  *
* Conv. Total (cfs)       * 25944.5  * Conv. (cfs)              *  3446.4  * 21479.5  *  1018.6  *
* Length Wtd. (ft)        * 1263.54  * Wetted Per. (ft)         *  217.78  *  125.43  *  110.92  *
* Min Ch El (ft)          * 1354.50  * Shear (lb/sq ft)         *    0.44  *    1.85  *    0.31  *
* Alpha                   *    1.42  * Stream Power (lb/ft s)    *    1.19  *   12.87  *    0.69  *
* Frctn Loss (ft)         *   10.46  * Cum Volume (acre-ft)     *   50.26  *  249.25  *   58.71  *
* C & E Loss (ft)         *    0.12  * Cum SA (acres)            *   72.87  *  132.17  *   56.87  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4A (H71)
REACH: REACH 1              RS: 5.438

INPUT
Description:
Station Elevation Data     num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9330.27 1348.54 9338.95 1348.53 9367.02 1348.48 9374.78 1348.47 9385.58 1348.47
  9410.6 1348.47 9428.59 1348.47 9446.43 1348.48 9471.25 1348.47 9482.26 1348.47
 9490.17 1348.47 9518.08 1348.46 9551.74 1348.42 9553.91 1348.41 9556.92 1348.41
 9589.73 1348.34 9613.32 1348.27 9625.56 1348.23 9642.59 1348.19 9661.38 1348.14
 9674.89 1348.11 9697.21 1348.05 9728.26 1348.01 9733.03    1348 9736.47 1347.99
 9768.86 1347.94 9798.04 1347.91 9804.69 1347.89 9813.92 1347.85 9840.51 1347.77
 9859.62 1347.73 9876.34 1347.62 9899.59  1347.5 9912.16 1347.44  9921.2  1347.4
   10000 1345.5110078.56  1346.810086.02 1346.7910129.31 1346.8510136.02 1346.86
10152.53 1346.9510175.46    134710211.83 1347.1710229.09 1347.2610230.83 1347.28
10231.97 1347.26 10235.9 1347.16 10237.3 1347.14 10239.2 1347.1110284.99 1347.39
10286.48 1347.37 10288.2 1347.3710291.43 1347.3910300.67 1347.3710339.79 1347.06
10352.06 1347.2210371.03 1347.3210433.79 1348.8510436.06 1348.8710484.53 1349.38
10486.06  1349.410532.82 1349.91

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9330.27    .042 9912.16    .04310078.56    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9912.1610078.56               1350    1430    1350              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1348.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1348.45  * Reach Len. (ft)         * 1350.00  * 1430.00  * 1350.00  *
* Crit W.S. (ft)          * 1348.10  * Flow Area (sq ft)       *  162.75  *  346.21  *  420.00  *
* E.G. Slope (ft/ft)      *0.006552  * Area (sq ft)            *  162.75  *  346.21  *  420.00  *
* Q Total (cfs)           * 3230.00  * Flow (cfs)              *  263.60  * 1578.09  * 1388.31  *
```

* Top Width (ft)	* 887.73	* Top Width (ft)	* 382.65	* 166.40	* 338.68	*
* Vel Total (ft/s)	* 3.48	* Avg. Vel. (ft/s)	* 1.62	* 4.56	* 3.31	*
* Max Chl Dpth (ft)	* 2.94	* Hydr. Depth (ft)	* 0.43	* 2.08	* 1.24	*
* Conv. Total (cfs)	* 39902.9	* Conv. (cfs)	* 3256.5	* 19495.5	* 17150.9	*
* Length Wtd. (ft)	* 1409.16	* Wetted Per. (ft)	* 382.66	* 166.43	* 338.70	*
* Min Ch El (ft)	* 1345.51	* Shear (lb/sq ft)	* 0.17	* 0.85	* 0.51	*
* Alpha	* 1.25	* Stream Power (lb/ft s)	* 0.28	* 3.88	* 1.68	*
* Frctn Loss (ft)	* 12.50	* Cum Volume (acre-ft)	* 45.99	* 239.42	* 51.98	*
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 64.25	* 127.92	* 50.42	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 5.167

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9639.84	1335.55	9647.24	1335.52	9662.71	1335.51	9684.73	1335.5	9695.27	1335.49
9722.22	1335.43	9750.69	1335.35	9759.72	1335.3	9778.59	1335.2	9797.21	1335.1
9806.12	1335.05	9834.7	1334.82	9861.54	1334.61	9872.19	1334.53	9886.04	1334.03
9932.17	1332.54	10000	1331.54	10070.65	1334.61	10075.79	1334.64	10115.06	1334.96
10126.25	1335.09	10159.46	1335.51	10176.72	1335.74	10203.87	1336.16	10227.18	1336.6
10248.28	1336.97	10277.64	1337.67	10292.68	1337.93	10328.11	1338.71	10337.09	1338.81
10378.57	1339.16	10381.49	1339.18	10402.93	1339.29	10425.9	1339.42	10429.03	1339.42
10470.3	1339.66	10479.49	1339.71	10514.71	1339.96	10529.96	1339.95	10559.12	1340.02
10563.74	1340.03								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9639.84	.042	9861.54	.043	10070.65	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9861.54	10070.65	1125	1210	1125	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1336.14	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.72	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1335.42	* Reach Len. (ft)	* 1125.00	* 1210.00	* 1125.00	*
* Crit W.S. (ft)	* 1335.23	* Flow Area (sq ft)	* 45.95	* 518.81	* 37.26	*
* E.G. Slope (ft/ft)	*0.012001	* Area (sq ft)	* 45.95	* 518.81	* 37.26	*
* Q Total (cfs)	* 3770.00	* Flow (cfs)	* 86.35	* 3598.14	* 85.51	*
* Top Width (ft)	* 426.94	* Top Width (ft)	* 136.07	* 209.11	* 81.76	*
* Vel Total (ft/s)	* 6.26	* Avg. Vel. (ft/s)	* 1.88	* 6.94	* 2.30	*
* Max Chl Dpth (ft)	* 3.88	* Hydr. Depth (ft)	* 0.34	* 2.48	* 0.46	*
* Conv. Total (cfs)	* 34413.8	* Conv. (cfs)	* 788.2	* 32845.0	* 780.6	*
* Length Wtd. (ft)	* 1206.92	* Wetted Per. (ft)	* 136.07	* 209.22	* 81.77	*
* Min Ch El (ft)	* 1331.54	* Shear (lb/sq ft)	* 0.25	* 1.86	* 0.34	*
* Alpha	* 1.18	* Stream Power (lb/ft s)	* 0.48	* 12.89	* 0.78	*
* Frctn Loss (ft)	* 11.32	* Cum Volume (acre-ft)	* 42.76	* 225.22	* 44.89	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 56.22	* 121.75	* 43.90	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 4.938

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9564.94	1324.48	9570.25	1324.48	9589.22	1324.53	9623.33	1324.6	9625.99	1324.6

```
 9627.47  1324.6 9662.75 1324.64 9684.68 1324.66 9699.52 1324.65 9726.21  1324.6
 9736.28 1324.59 9741.89 1324.57 9773.05 1324.38  9799.1  1324.2 9809.82 1324.11
 9829.09 1323.92 9846.58 1323.76 9856.31 1323.67 9883.35 1323.51 9913.52 1323.28
 9922.54 1322.55 9956.27  1318.6  9962.7 1318.73   10000    132010077.96 1322.18
10109.57 1323.2210127.88 1323.7310158.93 1323.9410179.27 1324.0810200.45 1324.23
10230.66 1324.4510241.98 1324.5410282.06 1324.8210283.51 1324.8310289.61 1324.88
10325.03 1325.1210333.45 1325.1810366.56 1325.4210386.66 1325.1110388.84 1325.26
10391.32  1325.410404.62 1325.5810438.73 1325.1710454.34 1325.4610483.09 1325.98
10484.34 1326.0110485.31 1326.0310486.07 1326.0510486.64 1326.0610487.12 1326.07
10488.28 1326.1210489.03 1326.1710489.71 1326.2110505.93 1326.3510538.49 1326.35
10539.14 1326.3210540.01 1326.2910541.11 1326.2610544.26 1326.1410548.88 1325.99
10555.91 1325.94   10561 1326.0410567.85 1326.23 10578.7 1326.4210608.98 1326.46
10612.28 1326.5310625.23 1326.58 10632.6 1326.6310636.12  1326.710655.62 1327.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9564.94    .042 9913.52    .04310127.88    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9913.5210127.88             1100    1162    1100            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1324.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.61  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1324.18  * Reach Len. (ft)         * 1100.00  * 1162.00  * 1100.00  *
* Crit W.S. (ft)          * 1323.39  * Flow Area (sq ft)       *   53.13  *  647.80  *   14.62  *
* E.G. Slope (ft/ft)      *0.007704  * Area (sq ft)            *   53.13  *  647.80  *   14.62  *
* Q Total (cfs)           * 4220.00  * Flow (cfs)              *  100.61  * 4102.59  *   16.80  *
* Top Width (ft)          *  390.88  * Top Width (ft)          *  111.57  *  214.36  *   64.95  *
* Vel Total (ft/s)        *    5.90  * Avg. Vel. (ft/s)        *    1.89  *    6.33  *    1.15  *
* Max Chl Dpth (ft)       *    5.58  * Hydr. Depth (ft)        *    0.48  *    3.02  *    0.23  *
* Conv. Total (cfs)       * 48080.3  * Conv. (cfs)             *  1146.3  * 46742.6  *   191.4  *
* Length Wtd. (ft)        * 1158.57  * Wetted Per. (ft)        *  111.57  *  214.70  *   64.95  *
* Min Ch El (ft)          * 1318.60  * Shear (lb/sq ft)        *    0.23  *    1.45  *    0.11  *
* Alpha                   *    1.12  * Stream Power (lb/ft s)  *    0.43  *    9.19  *    0.12  *
* Frctn Loss (ft)         *   11.53  * Cum Volume (acre-ft)    *   41.48  *  209.01  *   44.22  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   53.02  *  115.87  *   42.01  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4A (H71)
REACH: REACH 1            RS: 4.717

INPUT
Description:
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9427.86 1313.29 9445.03 1313.29 9453.96 1313.29 9469.55 1313.27  9490.6 1313.28
 9502.65 1313.27 9527.23 1313.27 9560.27 1313.24 9563.87 1313.24 9570.15 1313.23
 9600.51 1313.21 9617.89 1313.19 9637.14 1313.15 9670.75 1313.09 9673.78 1313.09
 9675.52 1313.08 9710.42    1313 9733.14 1312.95 9747.05 1312.91 9771.35 1312.83
 9783.69 1312.79 9793.84 1312.68 9812.99 1312.13 9824.72 1311.81  9827.6 1311.87
 9839.07 1311.62 9905.62 1310.93 9916.45 1310.53   10000    1308 10069.5 1311.47
10090.36 1311.6810120.29 1311.9510133.48 1312.0710171.07 1312.42 10176.6 1312.46
10207.66 1312.7110219.71 1312.8110222.41 1312.7710223.09 1312.7510224.21 1312.72
10225.82 1312.6610230.13  1312.510261.23  1311.410262.21 1311.3910263.69 1311.38
10283.37 1311.3310300.85  1311.410301.06 1311.4110310.45  1312.110317.21 1312.69
 10322.3  1313.110335.39 1313.6610364.95 1313.8710375.75 1313.9710415.68 1314.25
10422.29 1314.2710423.93 1314.2710425.44 1314.27 10435.3 1314.3910475.78  1314.7
10478.41 1314.7210493.22 1314.8410521.53 1315.0910526.56 1315.1310551.79 1315.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9427.86    .042 9783.69    .04310120.29    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9783.6910120.29             1150    1216    1150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	1313.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.59	Wt. n-Val.		0.043	0.042
W.S. Elev (ft)	1312.65	Reach Len. (ft)	1150.00	1216.00	1150.00
Crit W.S. (ft)	1312.43	Flow Area (sq ft)		671.24	110.97
E.G. Slope (ft/ft)	0.012961	Area (sq ft)		671.24	110.97
Q Total (cfs)	4650.00	Flow (cfs)		4277.15	372.85
Top Width (ft)	496.42	Top Width (ft)		325.48	170.94
Vel Total (ft/s)	5.94	Avg. Vel. (ft/s)		6.37	3.36
Max Chl Dpth (ft)	4.65	Hydr. Depth (ft)		2.06	0.65
Conv. Total (cfs)	40844.7	Conv. (cfs)		37569.7	3275.0
Length Wtd. (ft)	1209.26	Wetted Per. (ft)		325.63	171.02
Min Ch El (ft)	1308.00	Shear (lb/sq ft)		1.67	0.53
Alpha	1.08	Stream Power (lb/ft s)		10.63	1.76
Frctn Loss (ft)	9.85	Cum Volume (acre-ft)	40.81	191.42	42.63
C & E Loss (ft)	0.10	Cum SA (acres)	51.61	108.67	39.03

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 4.487

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9325.46	1303.99	9337.38	1304	9368.23	1303.99	9373.43	1303.99	9381.22	1303.99
9409.48	1303.98	9428.36	1303.97	9445.53	1303.95	9471.21	1303.93	9481.57	1303.92
9488.5	1303.91	9517.62	1303.89	9548.63	1303.84	9553.67	1303.84	9561.21	1303.82
9589.72	1303.79	9608.77	1303.75	9625.77	1303.71	9651.2	1303.62	9661.81	1303.59
9668.91	1303.56	9697.86	1303.43	9729.04	1303.26	9733.91	1303.23	9741.19	1303.19
9769.96	1303.02	9789.18	1302.89	9806	1302.77	9851.06	1302.22	9862.25	1301.99
9907.93	1301.84	9914.15	1301.83	9922.21	1301.56	9931.01	1301.32	9977.73	1300.12
10000	1299.46	10064.8	1300.53	10074.77	1300.71	10077.89	1300.71	10124.81	1300.75
10126.02	1300.76	10156.67	1300.87	10174.85	1300.93	10222.28	1301.19	10224.89	1301.21
10270.41	1301.45	10274.93	1301.47	10318.54	1301.68	10324.97	1301.72	10366.67	1301.91
10375	1301.95	10384.02	1302.01	10425.04	1302.24	10455.71	1302.36	10493.03	1302.61
10500.65	1302.66	10501.55	1302.68	10501.86	1302.69	10561.17	1303.59	10568.43	1303.63
10574.82	1303.64	10607.32	1303.63	10625.2	1303.77	10655.45	1304.01	10675.24	1304.17
10703.58	1304.39	10725.28	1304.55	10751.71	1304.74	10757.28	1304.78		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9325.46	.042	9907.93	.043	10318.54	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9907.93 10318.54 1250 1359 1250 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1303.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1303.04	Reach Len. (ft)	1250.00	1359.00	1250.00
Crit W.S. (ft)		Flow Area (sq ft)	91.86	908.45	167.38
E.G. Slope (ft/ft)	0.005537	Area (sq ft)	91.86	908.45	167.38
Q Total (cfs)	4530.00	Flow (cfs)	181.16	3965.81	383.03
Top Width (ft)	758.76	Top Width (ft)	141.65	410.61	206.50
Vel Total (ft/s)	3.88	Avg. Vel. (ft/s)	1.97	4.37	2.29
Max Chl Dpth (ft)	3.58	Hydr. Depth (ft)	0.65	2.21	0.81
Conv. Total (cfs)	60880.6	Conv. (cfs)	2434.7	53298.2	5147.7
Length Wtd. (ft)	1350.81	Wetted Per. (ft)	141.66	410.66	206.51
Min Ch El (ft)	1299.46	Shear (lb/sq ft)	0.22	0.76	0.28
Alpha	1.15	Stream Power (lb/ft s)	0.44	3.34	0.64
Frctn Loss (ft)	11.84	Cum Volume (acre-ft)	39.60	169.37	38.96
C & E Loss (ft)	0.01	Cum SA (acres)	49.74	98.40	34.05

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 4.230

INPUT
Description:
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9239.32	1291.46	9243.04	1291.47	9266.52	1291.49	9299.7	1291.52	9302.39	1291.52
9304.29	1291.52	9338.26	1291.56	9365.54	1291.59	9374.13	1291.59	9386.26	1291.6
9410	1291.58	9426.8	1291.57	9445.87	1291.64	9472.82	1291.72	9481.74	1291.74
9501.48	1291.06	9524.95	1290.06	9532.96	1290.32	9547.52	1290.62	9589.35	1291.86
9626.92	1291.82	9643.98	1291.85	9655.52	1291.87	9664.06	1291.81	9711.75	1290.1
9730.59	1289.47	9743.77	1289.96	9762.02	1290.64	9794.31	1291.07	9804.57	1290.98
9819.07	1290.87	9840.44	1290.71	9855.56	1290.61	9876.31	1290.46	9905.63	1290.24
9912.18	1290.21	9916.81	1290.18	9971.57	1289.24	9982.61	1289.01	10000	1288.63
10067.5	1290.11	10083.2	1290.17	10111	1290.17	10144.43	1289.21	10158.45	1288.53
10176.37	1287.68	10213.87	1289.46	10228.06	1290.14	10231.82	1290.33	10241.5	1290.73
10279.53	1290.91	10285	1290.93	10285.9	1290.93	10328.5	1290.97	10336.58	1290.99
10372	1291.07	10387.25	1291.11	10415.5	1291.17	10437.93	1291.27	10482	1289.69
10497.83	1289.06	10515.36	1288.41	10520.74	1288.54	10579.66	1291.34	10587.19	1291.69
10588.33	1291.75	10589.96	1291.83	10633.01	1291.89	10640.63	1291.91	10676.51	1291.91
10691.31	1291.94	10714.04	1292.02						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9239.32	.042	9655.52	.043	10589.96	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9655.52	10589.96	1300	1388	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1291.47	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.33	Wt. n-Val.	0.042	0.043		
W.S. Elev (ft)	1291.14	Reach Len. (ft)	1300.00	1388.00	1300.00	
Crit W.S. (ft)	1290.91	Flow Area (sq ft)	35.42	921.60		
E.G. Slope (ft/ft)	0.016275	Area (sq ft)	35.42	921.60		
Q Total (cfs)	4390.00	Flow (cfs)	105.86	4284.14		
Top Width (ft)	916.49	Top Width (ft)	65.70	850.79		
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)	2.99	4.65		
Max Chl Dpth (ft)	3.46	Hydr. Depth (ft)	0.54	1.08		
Conv. Total (cfs)	34411.4	Conv. (cfs)	829.8	33581.7		
Length Wtd. (ft)	1386.39	Wetted Per. (ft)	65.74	851.11		
Min Ch El (ft)	1287.68	Shear (lb/sq ft)	0.55	1.10		
Alpha	1.01	Stream Power (lb/ft s)	1.64	5.11		
Frctn Loss (ft)	11.96	Cum Volume (acre-ft)	37.77	140.82	36.56	
C & E Loss (ft)	0.03	Cum SA (acres)	46.77	78.72	31.08	

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 3.967

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9496.89	1280.73	9510.94	1280.72	9529.44	1280.71	9537.18	1280.7	9567.65	1280.63
9591.38	1280.58	9605.86	1280.52	9640.45	1280.41	9644.07	1280.39	9645.58	1280.39

```
 9682.28 1280.21 9699.78 1280.14 9720.49 1280.01 9753.99 1279.83  9758.7  1279.8
 9769.96 1279.72 9796.91 1279.53 9808.19 1279.45 9835.12 1279.23 9862.39 1279.03
 9873.33 1278.95 9899.47 1278.76 9911.54 1278.67 9916.59 1278.63 9943.34  1277.1
 9968.61  1275.7 9979.49 1276.32   10000 1277.1710073.06    127810083.77 1277.98
10123.06 1277.9510133.48 1277.9510173.06 1277.95 10183.2 1277.9610223.06 1278.01
10232.91 1278.0310273.06 1278.1310289.27  1277.410295.36 1277.2110306.81  1276.9
10343.39 1275.6610344.81  1275.710400.33 1276.2410431.32 1276.5510445.87 1277.33
10460.17 1278.1510473.07  1278.810481.48 1278.8310523.07 1279.0210531.19 1279.05
10573.07 1279.2510580.91 1279.2910623.07 1279.5110630.62 1279.5610673.07 1279.81
10680.34 1279.8510723.07 1280.1210726.45 1280.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9496.89    .042 9916.59    .04310473.07    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9916.5910473.07             1400    1479    1400            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1279.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.23  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1279.25  * Reach Len. (ft)         * 1400.00  * 1479.00  * 1400.00  *
* Crit W.S. (ft)         * 1278.52  * Flow Area (sq ft)       *   25.73  * 1078.03  *   22.84  *
* E.G. Slope (ft/ft)     *0.005261  * Area (sq ft)            *   25.73  * 1078.03  *   22.84  *
* Q Total (cfs)          * 4250.00  * Flow (cfs)              *   30.10  * 4197.92  *   21.98  *
* Top Width (ft)         *  739.51  * Top Width (ft)          *   83.59  *  556.48  *   99.44  *
* Vel Total (ft/s)       *    3.77  * Avg. Vel. (ft/s)        *    1.17  *    3.89  *    0.96  *
* Max Chl Dpth (ft)      *    3.59  * Hydr. Depth (ft)        *    0.31  *    1.94  *    0.23  *
* Conv. Total (cfs)      * 58592.5  * Conv. (cfs)             *   415.0  * 57874.5  *   303.1  *
* Length Wtd. (ft)       * 1475.42  * Wetted Per. (ft)        *   83.59  *  556.71  *   99.44  *
* Min Ch El (ft)         * 1275.66  * Shear (lb/sq ft)        *    0.10  *    0.64  *    0.08  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)   *    0.12  *    2.48  *    0.07  *
* Frctn Loss (ft)        *   12.70  * Cum Volume (acre-ft)    *   36.86  *  108.97  *   36.22  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *   44.54  *   56.30  *   29.60  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4A (H71)
REACH: REACH 1            RS: 3.687

INPUT
Description:
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9301.28 1266.71 9328.31 1266.62 9344.16 1266.57 9379.98 1266.47 9385.15 1266.46
 9405.03 1266.41 9426.14 1266.35 9431.65 1266.34 9467.13 1266.25 9483.32 1266.22
 9508.12 1266.19 9534.98 1266.15 9549.11 1266.13 9586.65 1266.08  9590.1 1266.07
 9603.35 1266.06 9631.09 1266.02 9638.32 1266.01 9672.08 1265.95 9689.99 1265.91
 9713.07 1265.84 9741.66 1265.74 9754.06 1265.69 9793.33  1265.5 9795.69 1265.51
 9796.73 1265.51 9801.21 1265.52 9865.11 1265.69 9874.49  1265.6 9902.07 1265.31
 9948.34 1264.66 9959.01 1264.61   10000  1264.410053.17  1264.510101.33 1264.63
10107.16  1264.710123.43 1264.7210140.08 1264.6510149.63  1264.610153.37 1264.59
10169.64 1264.5410178.05 1264.52 10184.7 1264.53 10188.2 1264.5510208.49 1264.44
10208.76 1264.4410210.97 1264.4310227.38 1264.5110240.43 1264.6910245.87 1264.86
10296.24 1265.6410301.58 1265.7610305.07 1265.8310307.77 1265.8710318.98 1266.11
10332.92 1266.2210372.14 1266.5210416.14 1266.87 10425.3 1266.94 10441.5 1267.07
10478.47 1267.3610499.37 1267.5210531.63 1267.7610543.66 1267.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9301.28    .042 9865.11    .04310296.24    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9865.1110296.24             1300    1394    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

E.G. Elev (ft)	1266.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1266.25	Reach Len. (ft)	1300.00	1394.00	1300.00
Crit W.S. (ft)	1266.25	Flow Area (sq ft)	136.36	641.55	9.68
E.G. Slope (ft/ft)	0.017056	Area (sq ft)	136.36	641.55	9.68
Q Total (cfs)	4100.00	Flow (cfs)	309.04	3773.68	17.28
Top Width (ft)	868.41	Top Width (ft)	396.93	431.13	40.35
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	2.27	5.88	1.78
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)	0.34	1.49	0.24
Conv. Total (cfs)	31393.6	Conv. (cfs)	2366.3	28895.0	132.3
Length Wtd. (ft)	1383.59	Wetted Per. (ft)	396.93	431.15	40.36
Min Ch El (ft)	1264.40	Shear (lb/sq ft)	0.37	1.58	0.26
Alpha	1.19	Stream Power (lb/ft s)	0.83	9.32	0.46
Frctn Loss (ft)	12.48	Cum Volume (acre-ft)	34.25	79.77	35.69
C & E Loss (ft)	0.10	Cum SA (acres)	36.82	39.53	27.35

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 3.423

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9089.65	1255.07	9115.26	1254.98	9123.19	1254.95	9170.1	1254.41	9193.27	1254.17
9203.99	1254.06	9222.06	1254.12	9278.4	1254.43	9278.72	1254.43	9279.94	1254.43
9319.59	1254.26	9330.14	1254.21	9403.75	1253.02	9409.55	1252.9	9464.82	1253.35
9475.1	1253.44	9479.43	1253.47	9485.36	1253.53	9523.93	1253.43	9537.1	1253.39
9564.79	1253.33	9588.84	1253.27	9605.66	1253.24	9640.58	1253.18	9646.53	1253.17
9668.89	1253.13	9687.39	1253.09	9692.32	1253.08	9728.26	1253.02	9744.06	1252.99
9779.52	1252.34	9803.59	1252.02	9805.88	1251.99	9833.57	1252.38	9883.38	1252.45
9899.27	1252.55	9932.59	1252.42	9951.01	1252.35	10000	1251.71	10028.12	1252.05
10052.76	1252.31	10072.21	1252.34	10102.86	1252.42	10125.67	1252.47	10152.96	1252.55
10179.13	1252.62	10203.06	1252.71	10232.59	1252.81	10253.16	1252.88	10316.33	1251.95
10333.55	1251.71	10358.47	1252.36	10403.46	1253.59	10446.44	1253.81	10453.55	1253.85
10499.9	1254.11								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9089.65	.042	9744.06	.043	10403.46	.042

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9744.06 10403.46 1000 1067 1000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1254.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1253.96	Reach Len. (ft)	1000.00	1067.00	1000.00
Crit W.S. (ft)	1253.51	Flow Area (sq ft)	276.84	1024.89	13.17
E.G. Slope (ft/ft)	0.005593	Area (sq ft)	276.84	1024.89	13.17
Q Total (cfs)	4140.00	Flow (cfs)	574.63	3553.90	11.47
Top Width (ft)	1127.52	Top Width (ft)	398.45	659.40	69.67
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)	2.08	3.47	0.87
Max Chl Dpth (ft)	2.26	Hydr. Depth (ft)	0.69	1.55	0.19
Conv. Total (cfs)	55355.5	Conv. (cfs)	7683.3	47518.8	153.4
Length Wtd. (ft)	1050.71	Wetted Per. (ft)	398.46	659.45	69.68
Min Ch El (ft)	1251.70	Shear (lb/sq ft)	0.24	0.54	0.07
Alpha	1.10	Stream Power (lb/ft s)	0.50	1.88	0.06
Frctn Loss (ft)	7.19	Cum Volume (acre-ft)	28.09	53.11	35.35
C & E Loss (ft)	0.03	Cum SA (acres)	24.95	22.08	25.71

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 3.221

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9338.98	1246.75	9352.14	1246.7	9373.73	1246.64	9404.93	1246.53	9413.16	1246.5
9437.47	1246.42	9452.59	1246.37	9457.72	1246.36	9492.03	1246.25	9510.51	1246.19
9531.46	1246.12	9563.3	1246.03	9570.89	1246	9593.28	1245.94	9610.32	1245.88
9616.09	1245.86	9649.75	1245.75	9668.89	1245.69	9689.19	1245.65	9721.68	1245.56
9728.62	1245.56	9749.1	1245.55	9768.05	1245.52	9774.47	1245.5	9807.48	1245.51
9827.26	1245.5	9846.91	1245.51	9880.05	1245.44	9886.35	1245.4	9904.92	1245.27
9925.78	1245.09	9932.67	1244.64	9933.5	1244.62	9953.81	1243.03	9973.52	1241.22
9976.68	1240.94	10000	1241.7	10037.14	1246.32	10054.36	1246.36	10086.53	1245.07
10112.25	1245.17	10136.6	1245.28	10165.26	1245.39	10186.68	1245.45	10218.27	1245.56
10236.76	1245.62	10271.28	1245.75	10286.83	1245.81	10324.28	1245.95	10336.91	1246
10377.29	1246.17	10386.99	1246.2	10430.3	1246.36	10437.06	1246.38	10483.31	1246.56
10487.14	1246.57	10536.31	1246.76	10537.22	1246.76	10538.02	1246.77	10552.64	1246.83
10575.66	1246.93								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9338.98	.042	9880.05	.043	10037.14	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9880.05	10037.14	1200	1273	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1246.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1246.47	Reach Len. (ft)	1200.00	1273.00	1200.00
Crit W.S. (ft)	1246.43	Flow Area (sq ft)	291.77	434.94	287.50
E.G. Slope (ft/ft)	0.008554	Area (sq ft)	291.77	434.94	287.50
Q Total (cfs)	4170.00	Flow (cfs)	707.25	2735.43	727.32
Top Width (ft)	1037.54	Top Width (ft)	457.57	157.09	422.87
Vel Total (ft/s)	4.11	Avg. Vel. (ft/s)	2.42	6.29	2.53
Max Chl Dpth (ft)	5.53	Hydr. Depth (ft)	0.64	2.77	0.68
Conv. Total (cfs)	45087.9	Conv. (cfs)	7647.1	29576.6	7864.1
Length Wtd. (ft)	1247.47	Wetted Per. (ft)	457.58	157.56	422.90
Min Ch El (ft)	1240.94	Shear (lb/sq ft)	0.34	1.47	0.36
Alpha	1.66	Stream Power (lb/ft s)	0.83	9.27	0.92
Frctn Loss (ft)	9.70	Cum Volume (acre-ft)	21.56	35.23	31.90
C & E Loss (ft)	0.06	Cum SA (acres)	15.12	12.08	20.06

****

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 2.979

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9707.57	1236.91	9709.86	1236.86	9722.38	1236.81	9761.11	1236.61	9764.22	1236.59
9778.04	1236.46	9806.06	1236.2	9812.36	1236.14	9847.9	1235.77	9863.61	1235.6
9889.74	1235.36	9914.85	1235.15	9931.58	1235.03	10000	1234.34	10030.39	1234.53
10042.66	1234.62	10049.3	1234.67	10067.69	1234.61	10081.34	1234.63	10135.61	1235.43
10139.54	1235.62	10143.8	1235.72	10149.32	1235.78	10156.52	1235.88	10159.58	1235.93
10169.02	1235.75	10219.4	1235.08	10260.13	1235.26	10269.97	1235.31	10319.73	1235.53

```
10320.54 1235.5310325.13 1235.5510371.11 1235.7510379.32 1235.7810421.68 1235.98
10438.92 1236.0610472.25 1236.2110498.52 1236.3410522.82 1236.4510558.11 1236.64
 10573.4 1236.7210617.71 1236.9410623.97 1236.97   10659 1237.1210674.54 1237.19
10677.31  1237.210707.41 1237.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9707.57    .042  9847.9    .04310156.52    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9847.910156.52              800     884     800            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1237.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1236.91  * Reach Len. (ft)         *  800.00  *  884.00  *  800.00  *
* Crit W.S. (ft)          * 1236.47  * Flow Area (sq ft)       *   69.12  *  598.16  *  456.09  *
* E.G. Slope (ft/ft)      *0.007101  * Area (sq ft)            *   69.12  *  598.16  *  456.09  *
* Q Total (cfs)           * 4200.00  * Flow (cfs)              *  128.66  * 2707.58  * 1363.76  *
* Top Width (ft)          *  902.76  * Top Width (ft)           *  140.08  *  308.62  *  454.06  *
* Vel Total (ft/s)        *    3.74  * Avg. Vel. (ft/s)        *    1.86  *    4.53  *    2.99  *
* Max Chl Dpth (ft)       *    2.56  * Hydr. Depth (ft)        *    0.49  *    1.94  *    1.00  *
* Conv. Total (cfs)       * 49841.9  * Conv. (cfs)             *  1526.8  * 32131.2  * 16183.9  *
* Length Wtd. (ft)        *  846.41  * Wetted Per. (ft)        *  140.08  *  308.64  *  454.07  *
* Min Ch El (ft)          * 1234.34  * Shear (lb/sq ft)        *    0.22  *    0.86  *    0.45  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)  *    0.41  *    3.89  *    1.33  *
* Frctn Loss (ft)         *    6.77  * Cum Volume (acre-ft)    *   16.59  *   20.13  *   21.66  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    6.89  *    5.28  *    7.98  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 1 RS: 2.812

INPUT
Description:
Station Elevation Data num= 80

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9286.05  1230.7 9291.44 1230.51 9308.96 1229.93 9346.88  1228.8 9356.93 1228.57
 9364.38 1228.74 9384.32 1229.24 9395.98 1229.46 9401.07 1229.48 9436.58 1230.24
 9457.85 1230.13 9492.77 1229.98 9494.99 1229.97 9499.31 1229.95 9532.13  1229.8
 9548.96 1229.74 9569.28 1229.66 9605.15 1229.52 9606.42 1229.52  9608.9 1229.51
 9643.57  1229.4 9661.34 1229.35 9680.71  1229.3 9717.53  1229.2 9717.86  1229.2
 9718.49  1229.2    9755 1229.11 9773.72 1229.05 9792.14    1229 9828.07 1228.91
 9829.29  1228.9 9829.91  1228.9 9866.43 1228.81  9886.1 1228.79 9903.58 1228.75
 9937.66 1228.73 9940.72 1228.72 9942.29 1228.72 9949.57 1228.52   10000 1227.48
10017.35 1227.9610025.71  1228.110031.35 1228.1710035.24 1228.2110090.13 1228.49
10097.68 1228.3910105.25 1228.4910149.22 1228.8210187.28 1228.8510199.41 1228.87
 10242.3 1228.95 10249.6 1228.9710297.32 1229.1410299.79 1229.1410325.51 1229.27
10349.98 1229.3910352.34  1229.410400.18 1229.6210407.35 1229.6410450.37 1229.81
10462.37 1229.8510500.56 1229.9610517.39 1230.0110550.75  1230.110572.41 1230.16
10600.94 1230.2310627.42  1230.310651.14 1230.3510682.44 1230.4310701.33 1230.47
10737.46 1230.5410751.52 1230.5710792.47  1230.610801.71 1230.6110847.49 1230.62
 10851.9 1230.62 10897.8 1230.6210902.09 1230.6210902.51 1230.6210904.11 1230.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9286.05    .042 9937.66    .04310149.22    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9937.6610149.22             1150    1233    1150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1230.38  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1230.14  * Reach Len. (ft)         * 1200.00  * 1200.00  * 1200.00  *
* Crit W.S. (ft)          * 1229.90  * Flow Area (sq ft)       *  502.46  *  392.63  *  295.15  *
* E.G. Slope (ft/ft)      *0.009063  * Area (sq ft)            *  502.46  *  392.63  *  295.15  *
```

* Q Total (cfs)	* 4230.00	* Flow (cfs)	* 1487.25	* 1950.42	* 792.32	*
* Top Width (ft)	* 1236.49	* Top Width (ft)	* 610.15	* 211.56	* 414.78	*
* Vel Total (ft/s)	* 3.55	* Avg. Vel. (ft/s)	* 2.96	* 4.97	* 2.68	*
* Max Chl Dpth (ft)	* 2.66	* Hydr. Depth (ft)	* 0.82	* 1.86	* 0.71	*
* Conv. Total (cfs)	* 44433.9	* Conv. (cfs)	* 15622.8	* 20488.2	* 8322.9	*
* Length Wtd. (ft)	* 1200.00	* Wetted Per. (ft)	* 610.19	* 211.58	* 414.78	*
* Min Ch El (ft)	* 1227.48	* Shear (lb/sq ft)	* 0.47	* 1.05	* 0.40	*
* Alpha	* 1.25	* Stream Power (lb/ft s)	* 1.38	* 5.22	* 1.08	*
* Frctn Loss (ft)	* 9.21	* Cum Volume (acre-ft)	* 11.34	* 10.08	* 14.76	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	*	*	*	*

Warning: Divided flow computed for this cross-section.
Warning: A flow split was encountered. The program first calculated the momentum of both channels below the junction. An energy balance was performed across the junction from the stream with the highest momentum downstream to the section upstream.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 2.579

INPUT
Description:
Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9120.69	1223.47	9129.63	1223.43	9144.86	1223.37	9171.02	1223.25	9196.32	1223.15
9212.4	1223.07	9247.78	1222.91	9253.78	1222.88	9278.43	1222.75	9295.16	1222.67
9299.24	1222.65	9336.55	1222.47	9350.7	1222.4	9377.93	1222.28	9402.16	1222.16
9419.31	1222.09	9453.63	1221.94	9460.69	1221.91	9489.71	1221.8	9502.08	1221.76
9505.09	1221.74	9543.46	1221.62	9556.55	1221.57	9584.84	1221.49	9608.01	1221.42
9626.22	1221.37	9659.47	1221.27	9667.61	1221.25	9701	1221.17	9708.99	1221.15
9710.93	1221.14	9750.37	1221.06	9762.4	1221.03	9791.75	1220.96	9813.86	1220.92
9833.14	1220.88	9865.32	1220.8	9888.41	1220.54	9904.31	1220.39	9914.04	1220.3
9934.34	1220.42	9943.42	1220.46	9968.24	1220.47	9983.86	1220.41	9999.45	1220.36
10019.14	1220.3	10043.04	1220.23	10069.79	1220.15	10086.63	1220.11	10120.45	1220.01
10130.22	1220	10171.1	1219.93	10176.09	1219.86	10177.57	1219.85	10180.24	1219.83
10215.15	1219.24	10217.62	1219.19	10217.96	1219.2	10272.4	1219.83	10304.57	1219.79
10323.06	1219.77	10348.16	1219.74	10373.71	1219.72	10391.75	1219.71	10424.36	1219.68
10435.33	1219.67	10475.01	1219.63	10484.12	1219.47	10488.89	1219.42	10494.91	1219.35
10551.83	1218.69	10557.92	1218.62	10565.98	1218.52	10600.47	1219.11	10609.84	1219.27
10614.28	1219.34	10628.4	1219.61	10637.54	1219.61	10680.24	1219.63	10708.91	1219.64
10732.08	1219.64	10780.28	1219.67	10783.91	1219.67	10793.56	1219.69	10835.75	1219.76
10851.65	1219.81	10887.59	1219.91	10923.01	1220.04	10939.43	1220.09	10983	1220.26
10991.27	1220.29	10994.38	1220.3	11043.1	1220.51	1065.75	1220.59	11094.94	1220.71
11137.12	1220.89	11146.78	1220.92	11172.43	1221.02	11198.62	1221.12	11208.48	1221.15
11250.46	1221.29	11279.85	1221.39	11302.3	1221.46	11346.38	1221.62		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9120.69	.042	9865.32	.043	10272.4	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9865.32	10272.4	1400	1453	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1221.13	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.14	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1220.98	* Reach Len. (ft)	* 1400.00	* 1453.00	* 1400.00	*
* Crit W.S. (ft)	* 1220.58	* Flow Area (sq ft)	* 7.13	* 363.10	* 1034.96	*
* E.G. Slope (ft/ft)	*0.006576	* Area (sq ft)	* 7.13	* 363.10	* 1034.96	*
* Q Total (cfs)	* 4230.00	* Flow (cfs)	* 4.00	* 942.83	* 3283.17	*
* Top Width (ft)	* 1379.78	* Top Width (ft)	* 82.57	* 407.08	* 890.13	*
* Vel Total (ft/s)	* 3.01	* Avg. Vel. (ft/s)	* 0.56	* 2.60	* 3.17	*
* Max Chl Dpth (ft)	* 2.46	* Hydr. Depth (ft)	* 0.09	* 0.89	* 1.16	*
* Conv. Total (cfs)	* 52162.4	* Conv. (cfs)	* 49.3	* 11626.5	* 40486.5	*
* Length Wtd. (ft)	* 1418.87	* Wetted Per. (ft)	* 82.57	* 407.09	* 890.15	*
* Min Ch El (ft)	* 1219.19	* Shear (lb/sq ft)	* 0.04	* 0.37	* 0.48	*
* Alpha	* 1.03	* Stream Power (lb/ft s)	* 0.02	* 0.95	* 1.51	*
* Frctn Loss (ft)	* 9.79	* Cum Volume (acre-ft)	* 66.32	* 129.00	* 64.37	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 112.89	* 98.43	* 90.95	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 2.303

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9063.71	1213.13	9093.61	1213.05	9097.54	1213.04	9098.89	1213.04	9136.88	1212.96
9151.77	1212.93	9176.21	1212.92	9204.65	1212.89	9215.55	1212.89	9247.19	1212.89
9257.54	1212.88	9262.97	1212.88	9310.42	1212.89	9343.62	1212.88	9363.3	1212.88
9372.89	1212.86	9400.77	1212.83	9416.18	1212.81	9451.57	1212.72	9469.06	1212.67
9490.9	1212.59	9521.94	1212.46	9530.24	1212.42	9554.35	1212.29	9569.58	1212.21
9574.82	1212.18	9608.91	1211.97	9627.7	1211.85	9648.25	1211.7	9680.58	1211.48
9687.59	1211.42	9707.93	1211.28	9726.92	1211.14	9733.46	1211.09	9766.26	1210.83
9786.34	1210.69	9805.6	1210.53	9839.23	1210.3	9844.93	1210.26	9861.51	1210.14
9884.27	1209.97	9892.11	1209.92	9923.61	1209.72	9944.99	1209.59	9975.53	1208.95
9985.13	1208.82	10000	1208.66	10001.95	1208.67	10003.22	1208.68	10006.04	1208.68
10007.8	1208.69	10029.16	1209.08	10036.3	1209.16	10068.91	1209.52	10096.8	1209.61
10110.73	1209.65	10126.21	1209.71	10167.24	1209.85	10204.15	1209.99	10223.74	1210.07
10245.52	1210.16	10280.24	1210.31	10311.49	1210.46	10336.75	1210.57	10364.83	1210.72
10393.25	1210.88	10418.83	1211.03	10449.76	1211.22	10484.13	1211.44	10506.26	1211.58
10526.17	1211.71	0562.77	1211.92	10569.21	1211.94				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9063.71	.042	9923.61	.043	10096.8	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.61	10096.8	1150	1239	1150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1211.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.23	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1211.11	Reach Len. (ft)	1150.00	1239.00	1150.00
Crit W.S. (ft)		Flow Area (sq ft)	137.54	324.50	277.02
E.G. Slope (ft/ft)	0.007487	Area (sq ft)	137.54	324.50	277.02
Q Total (cfs)	2560.00	Flow (cfs)	337.03	1474.59	748.38
Top Width (ft)	699.43	Top Width (ft)	192.06	173.19	334.18
Vel Total (ft/s)	3.46	Avg. Vel. (ft/s)	2.45	4.54	2.70
Max Chl Dpth (ft)	2.44	Hydr. Depth (ft)	0.72	1.87	0.83
Conv. Total (cfs)	29585.1	Conv. (cfs)	3894.9	17041.4	8648.8
Length Wtd. (ft)	1194.48	Wetted Per. (ft)	192.07	173.20	334.18
Min Ch El (ft)	1208.66	Shear (lb/sq ft)	0.33	0.88	0.39
Alpha	1.24	Stream Power (lb/ft s)	0.82	3.98	1.05
Frctn Loss (ft)	9.95	Cum Volume (acre-ft)	64.00	117.54	43.29
C & E Loss (ft)	0.00	Cum SA (acres)	108.47	88.75	71.27

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 2.069

INPUT
Description:
Station Elevation Data num= 67

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9196.93	1201.82	9197.61	1201.82	9200.17	1201.82	9237.57	1201.79	9252.52	1201.79
9277.53	1201.76	9304.86	1201.74	9317.49	1201.72	9357.21	1201.66	9357.46	1201.66
9358.25	1201.66	9397.42	1201.59	9409.55	1201.56	9437.38	1201.49	9461.9	1201.44

```
 9477.34 1201.39 9514.25 1201.29  9517.3 1201.28 9527.15 1201.24 9557.26 1201.13
 9566.59  1201.1 9597.22 1200.96 9618.94 1200.88 9637.18 1200.79 9671.29 1200.64
 9677.15 1200.61 9696.05 1200.53 9717.11 1200.44 9723.63 1200.42 9757.07 1200.29
 9775.98 1200.23 9797.03 1200.16 9828.33 1200.07 9836.99 1200.05 9864.95 1199.99
 9876.95 1199.96 9880.67 1199.95 9916.91 1199.89 9933.02 1199.85 9974.92 1199.01
 9984.06  1198.9   10000 1198.6910010.31 1198.9410039.13 1199.8210086.83 1199.97
10093.43 1199.9910102.41 1200.0210147.74 1200.1710181.12  1200.310202.05 1200.39
10230.49  1200.510256.36  1200.610275.42 1200.6910310.67 1200.8310358.56 1201.03
10364.98 1201.0610369.71 1201.0810419.29 1201.27   10464 1201.43 10473.6 1201.47
10486.64 1201.5110527.91 1201.62 10558.3 1201.6810582.22 1201.7210614.71 1201.78
10636.53 1201.8210649.63 1201.85

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9196.93    .042 9933.02    .04310039.13    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.0210039.13             1250    1347    1250            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1201.39  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.24  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1201.15  * Reach Len. (ft)         * 1250.00  * 1347.00  * 1250.00  *
* Crit W.S. (ft)          * 1200.97  * Flow Area (sq ft)       *  282.84  *  204.70  *  244.05  *
* E.G. Slope (ft/ft)      *0.009342  * Area (sq ft)            *  282.84  *  204.70  *  244.05  *
* Q Total (cfs)           * 2510.00  * Flow (cfs)              *  792.85  * 1059.29  *  657.86  *
* Top Width (ft)          *  835.88  * Top Width (ft)          *  381.07  *  106.11  *  348.70  *
* Vel Total (ft/s)        *    3.43  * Avg. Vel. (ft/s)        *    2.80  *    5.17  *    2.70  *
* Max Chl Dpth (ft)       *    2.46  * Hydr. Depth (ft)        *    0.74  *    1.93  *    0.70  *
* Conv. Total (cfs)       * 25968.8  * Conv. (cfs)             *  8202.9  * 10959.6  *  6806.4  *
* Length Wtd. (ft)        * 1294.20  * Wetted Per. (ft)        *  381.08  *  106.14  *  348.70  *
* Min Ch El (ft)          * 1198.69  * Shear (lb/sq ft)        *    0.43  *    1.12  *    0.41  *
* Alpha                   *    1.33  * Stream Power (lb/ft s)  *    1.21  *    5.82  *    1.10  *
* Frctn Loss (ft)         *    9.62  * Cum Volume (acre-ft)    *   58.45  *  110.01  *   36.41  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *  100.91  *   84.78  *   62.26  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4A (H71)
REACH: REACH 2              RS: 1.814

INPUT
Description:
Station Elevation Data      num=      70
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************
 9302.42 1192.25 9310.22 1192.23 9331.79 1192.15 9348.14 1192.09 9385.25 1191.93
 9386.07 1191.93 9386.43 1191.93    9424 1191.78 9441.07 1191.69 9461.92 1191.61
 9495.71 1191.46 9499.85 1191.44 9509.23 1191.41 9537.77  1191.3 9550.35 1191.24
  9575.7 1191.15    9605 1191.04 9613.62 1191.01  9633.2 1190.94 9651.55 1190.88
 9659.64 1190.85 9689.48 1190.76 9733.22 1190.44 9745.57 1190.22 9757.38 1190.04
 9757.48 1190.04 9759.31 1190.05 9779.31 1190.09 9823.56 1190.43 9841.18 1190.39
  9878.2 1190.31  9879.1 1190.31 9881.16  1190.3 9917.03 1190.24 9932.84 1190.21
 9986.03    1189   10000 1188.6110014.59  1189.110022.59 1189.3410027.16  1189.5
10029.62 1189.63 10070.4 1190.39 10094.8 1190.49 10134.2 1190.6710148.33 1190.74
10157.07 1190.7910201.86 1191.0410243.74 1191.2810255.39 1191.34 10274.2 1191.43
10308.92 1191.5910330.41 1191.6610362.45 1191.77 10414.2 1191.8610415.98 1191.86
10417.08 1191.8610469.51  1191.910503.75 1191.9310523.04 1191.9410554.19 1191.97
10576.57 1191.9810590.42 1191.98 10630.1 1191.99 10677.1 1191.9910683.63 1191.99
10694.19 1191.9810737.16 1191.9810763.77 1191.9910790.69    119210791.86    1192

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9302.42    .042 9932.84    .043 10070.4    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9932.84 10070.4             1200    1283    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

* E.G. Elev (ft)	* 1191.75	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.19	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1191.57	* Reach Len. (ft)	* 1200.00	* 1283.00	* 1200.00	*
* Crit W.S. (ft)	* 1191.22	* Flow Area (sq ft)	* 394.27	* 279.29	* 139.88	*
* E.G. Slope (ft/ft)	*0.006026	* Area (sq ft)	* 394.27	* 279.29	* 139.88	*
* Q Total (cfs)	* 2450.00	* Flow (cfs)	* 975.80	* 1200.95	* 273.24	*
* Top Width (ft)	* 831.58	* Top Width (ft)	* 460.86	* 137.56	* 233.17	*
* Vel Total (ft/s)	* 3.01	* Avg. Vel. (ft/s)	* 2.47	* 4.30	* 1.95	*
* Max Chl Dpth (ft)	* 2.96	* Hydr. Depth (ft)	* 0.86	* 2.03	* 0.60	*
* Conv. Total (cfs)	* 31562.1	* Conv. (cfs)	* 12570.8	* 15471.3	* 3520.0	*
* Length Wtd. (ft)	* 1239.91	* Wetted Per. (ft)	* 460.87	* 137.60	* 233.17	*
* Min Ch El (ft)	* 1188.61	* Shear (lb/sq ft)	* 0.32	* 0.76	* 0.23	*
* Alpha	* 1.31	* Stream Power (lb/ft s)	* 0.80	* 3.28	* 0.44	*
* Frctn Loss (ft)	* 8.06	* Cum Volume (acre-ft)	* 48.74	* 102.53	* 30.90	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 88.83	* 81.01	* 53.91	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 1.570

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9401.82	1183.92	9419.07	1183.89	9449.88	1183.83	9456.69	1183.81	9471.3	1183.79
9494.31	1183.74	9505.05	1183.72	9534.53	1183.67	9560.21	1183.62	9589.61	1183.57
9615.38	1183.53	9644.81	1183.47	9670.55	1183.43	9707.91	1183.34	9720.06	1183.31
9725.72	1183.3	9772.94	1181.02	9782.75	1180.56	9796.64	1181.22	9826.71	1182.67
9829.38	1182.82	9836.06	1183.04	9870.55	1182.99	9891.23	1182.96	9908.18	1182.93
9944.52	1182.88	9945.8	1182.88	9946.4	1182.88	10000	1179.68	10051.43	1182.8
10079.17	1182.81	10101.44	1182.81	10176.3	1181.22	10176.75	1181.21	10177.3	1181.22
10202.04	1181.84	10251.45	1183.04	10282.25	1183.11	10301.46	1183.14	10333.02	1183.2
10351.46	1183.21	10383.79	1183.26	10401.47	1183.27	10434.56	1183.34	10451.48	1183.36
10485.33	1183.45	10501.48	1183.48	10536.1	1183.55	10551.49	1183.58	10586.87	1183.62
10601.49	1183.63	10637.64	1183.64	10651.5	1183.65	10664.95	1183.65	10701.5	1183.64
10739.18	1183.62	10751.51	1183.62	10789.95	1183.58	10801.51	1183.56	10818	1183.54

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9401.82	.042	9944.52	.043	10051.43	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9944.52	10051.43	1400	1478	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1183.68	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.22	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1183.46	* Reach Len. (ft)	* 1400.00	* 1478.00	* 1400.00	*
* Crit W.S. (ft)	* 1182.96	* Flow Area (sq ft)	* 235.26	* 232.51	* 294.86	*
* E.G. Slope (ft/ft)	*0.007048	* Area (sq ft)	* 235.26	* 232.51	* 294.86	*
* Q Total (cfs)	* 2400.00	* Flow (cfs)	* 599.82	* 1130.91	* 669.27	*
* Top Width (ft)	* 843.92	* Top Width (ft)	* 295.70	* 106.91	* 441.32	*
* Vel Total (ft/s)	* 3.15	* Avg. Vel. (ft/s)	* 2.55	* 4.86	* 2.27	*
* Max Chl Dpth (ft)	* 3.78	* Hydr. Depth (ft)	* 0.80	* 2.17	* 0.67	*
* Conv. Total (cfs)	* 28587.7	* Conv. (cfs)	* 7144.7	* 13470.9	* 7972.1	*
* Length Wtd. (ft)	* 1441.72	* Wetted Per. (ft)	* 295.82	* 107.10	* 441.36	*
* Min Ch El (ft)	* 1179.68	* Shear (lb/sq ft)	* 0.35	* 0.96	* 0.29	*
* Alpha	* 1.43	* Stream Power (lb/ft s)	* 0.89	* 4.65	* 0.67	*
* Frctn Loss (ft)	* 9.95	* Cum Volume (acre-ft)	* 40.06	* 94.99	* 24.91	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 78.41	* 77.41	* 44.62	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 1.291

INPUT
Description:
Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8813.53	1174.15	8834.45	1174.09	8842.33	1174.05	8872.82	1173.92	8883.37	1173.87
8886.09	1173.86	8924.41	1173.71	8937.73	1173.66	8960.32	1173.59	8989.37	1173.49
9029.92	1173.27	9041.01	1173.21	9072.87	1173.1	9092.65	1173.07	9129.63	1173.12
9144.29	1173.09	9169.14	1173.05	9195.93	1173.07	9211.72	1173.08	9247.57	1172.85
9252.77	1172.83	9272.91	1172.85	9293.81	1172.87	9299.21	1172.86	9334.85	1172.84
9350.84	1172.89	9375.9	1172.97	9402.48	1173.04	9416.94	1173.09	9454.12	1173.2
9457.99	1173.21	9472.96	1173.25	9499.03	1173.31	9505.76	1173.32	9540.08	1173.36
9557.4	1173.37	9581.12	1173.37	9609.04	1173.38	9634.28	1171.84	9651.78	1170.81
9684.94	1172.28	9698.44	1172.85	9712.32	1173.29	9745.3	1173.27	9763.96	1173.25
9786.34	1173.23	9815.6	1173.21	9827.38	1173.2	9867.23	1173.17	9873.05	1173.16
9909.47	1173.1	9918.87	1173.1	9953.57	1171.68	9995.08	1169.94	9997.36	1169.94
9998.52	1169.94	10000	1169.93	10018.33	1170.69	10074.08	1173.33	10120.04	1173.54
10125.93	1173.56	10128.15	1173.57	10177.77	1173.76	10199.56	1173.82	10229.61	1173.91
10270.98	1173.87	10281.46	1173.91	10309.21	1173.94	10333.3	1173.95	10342.4	1173.98
10385.15	1174.07	10438.94	1172.51	10441.07	1172.46	10457.38	1173.04	10482	1173.93
10488.83	1174.23	10498.38	1174.25	10540.68	1174.38	10556.65	1174.46	10592.52	1174.65
10628.06	1174.79	10644.36	1174.86	10687.54	1175.13	10696.21	1175.18	10699.48	1175.2
10748.05	1175.49	10770.9	1175.6	10799.9	1175.69	10840.39	1175.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8813.53	.042	9909.47	.043	10074.08	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9909.47	10074.08	1200	1270	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1173.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1173.53	Reach Len. (ft)	1200.00	1270.00	1200.00
Crit W.S. (ft)	1173.43	Flow Area (sq ft)	468.74	318.53	41.23
E.G. Slope (ft/ft)	0.006759	Area (sq ft)	468.74	318.53	41.23
Q Total (cfs)	2340.00	Flow (cfs)	861.68	1404.38	73.93
Top Width (ft)	1209.42	Top Width (ft)	932.76	164.61	112.05
Vel Total (ft/s)	2.82	Avg. Vel. (ft/s)	1.84	4.41	1.79
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)	0.50	1.94	0.37
Conv. Total (cfs)	28463.2	Conv. (cfs)	10481.3	17082.6	899.3
Length Wtd. (ft)	1255.78	Wetted Per. (ft)	932.89	164.75	112.08
Min Ch El (ft)	1169.93	Shear (lb/sq ft)	0.21	0.82	0.16
Alpha	1.63	Stream Power (lb/ft s)	0.39	3.60	0.28
Frctn Loss (ft)	8.76	Cum Volume (acre-ft)	28.75	85.64	19.51
C & E Loss (ft)	0.02	Cum SA (acres)	58.66	72.80	35.73

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 1.050

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9108.17	1165.9	9110.58	1165.89	9122.83	1165.85	9162.47	1165.71	9163.45	1165.71
9166.97	1165.7	9204.06	1165.59	9214.36	1165.57	9244.68	1165.51	9266.25	1165.47
9285.29	1165.44	9318.14	1165.38	9325.91	1165.36	9353.86	1165.31	9366.52	1165.29
9370.03	1165.28	9407.14	1165.23	9421.93	1165.21	9447.75	1165.18	9473.82	1165.16
9488.37	1165.15	9527.9	1163.7	9557.06	1162.84	9581.95	1163.52	9601.25	1164.03
9607.3	1164.18	9629.49	1165.09	9650.82	1165.07	9681.38	1165.06	9691.44	1165.05
9727.65	1165.03	9732.05	1165.02	9733.28	1165.02	9772.67	1164.97	9785.17	1164.95
9813.28	1164.9	9837.06	1164.84	9853.9	1164.79	9888.95	1164.69	9914.55	1164.61
9935.13	1164.56	9940.84	1164.54	9975.48	1162.99	10000	1162.16	10027.31	1163.26

```
10035.48 1163.59 10060.8 1164.2910093.35 1164.2710132.13 1164.2410143.54 1164.23
10187.11 1164.2210193.73 1164.21 10242.1  1164.210243.92  1164.210262.92 1164.19
10294.11 1164.1810297.09 1164.18 10344.3 1164.1510352.08 1164.1510394.49 1164.14
10407.07 1164.1610444.68 1164.2110467.02 1162.3810480.42 1161.4710488.87 1160.95
10502.69 1161.7210545.06 1164.5510572.04 1164.6510595.25 1164.7310627.03 1164.83
10645.44 1164.8810682.02 1164.9910695.63 1165.0310737.01 1165.1610745.82 1165.19
   10792 1165.3510796.01 1165.3610837.99  1165.5 10846.2 1165.5310846.99 1165.53
10896.39  1165.610901.98  1165.610946.58 1165.5910956.97 1165.5710996.77 1165.52
11009.69  1165.5

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9108.17    .042 9488.37    .04310545.06    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9488.3710545.06               1150    1228    1150              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1164.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.13  * Wt. n-Val.              *          *    0.043 *    0.042 *
* W.S. Elev (ft)          * 1164.84  * Reach Len. (ft)         * 1150.00  * 1228.00  * 1150.00  *
* Crit W.S. (ft)          * 1164.42  * Flow Area (sq ft)       *          *   803.88 *    11.63 *
* E.G. Slope (ft/ft)      *0.007202  * Area (sq ft)            *          *   803.88 *    11.63 *
* Q Total (cfs)           * 2310.00  * Flow (cfs)              *          * 2300.70  *     9.30 *
* Top Width (ft)          *  918.01  * Top Width (ft)          *          *   833.43 *    84.58 *
* Vel Total (ft/s)        *    2.83  * Avg. Vel. (ft/s)        *          *     2.86 *     0.80 *
* Max Chl Dpth (ft)       *    3.89  * Hydr. Depth (ft)        *          *     0.96 *     0.14 *
* Conv. Total (cfs)       * 27219.6  * Conv. (cfs)             *          * 27110.0  *   109.6  *
* Length Wtd. (ft)        * 1209.77  * Wetted Per. (ft)        *          *   833.82 *    84.58 *
* Min Ch El (ft)          * 1160.95  * Shear (lb/sq ft)        *          *     0.43 *     0.06 *
* Alpha                   *    1.02  * Stream Power (lb/ft s)  *          *     1.24 *     0.05 *
* Frctn Loss (ft)         *    7.10  * Cum Volume (acre-ft)    *   22.29  *    69.28 *    18.79 *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   45.82  *    58.25 *    33.02 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4A (H71)
REACH: REACH 2              RS: 0.818

INPUT
Description: Approximately at crossing of 139th Avenue.
Station Elevation Data     num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8768.27 1158.63 8784.03  1158.6 8800.51 1158.56 8822.03 1158.52 8855.03 1158.44
 8860.03 1158.43 8871.53  1158.4 8898.03 1158.34 8909.55 1158.31 8936.03 1158.27
 8964.07 1158.22 8974.03 1158.21 8996.91  1158.2 9012.03 1158.19  9018.6 1158.19
 9050.03 1158.19 9073.12  1158.2 9088.02  1158.2  9122.3 1158.18 9126.02 1158.18
 9127.64 1158.18 9164.02 1158.13 9182.16 1158.09 9218.47 1157.12 9235.66 1156.71
 9246.16 1156.36 9260.82 1156.88 9291.21 1157.83 9316.02 1157.78 9345.73 1157.71
 9354.02  1157.7 9373.07 1157.66 9392.02 1157.61 9400.25  1157.6 9430.02 1157.56
 9454.78 1157.51 9468.02 1157.49 9498.46 1157.43 9506.01 1157.41  9509.3 1157.41
 9544.01 1157.33 9563.82 1157.28 9582.01 1157.23 9618.35 1157.12 9620.01 1157.12
 9623.84  1157.1 9658.01 1157.01 9672.87 1156.96 9696.01 1156.89 9727.39  1156.8
 9734.01 1156.78 9749.23 1156.74 9772.01 1156.69 9781.91 1156.67 9810.01  1156.6
 9836.44 1156.54 9848.01 1156.52 9874.62 1156.47 9886.01 1156.45 9890.96 1156.44
    9924 1156.42 9945.48 1156.41    9962 1156.41   10000 1156.4510051.05 1156.73
10064.24 1156.7810102.09 1156.9210128.48 1156.9810153.13 1157.0310181.52 1155.61
10190.29 1155.04 10191.9 1154.9410244.25 1156.7710251.13 1157.0110252.08 1157.04
10252.64 1157.0610255.22 1157.1610256.96 1157.1610306.27 1157.18 10321.2 1157.19
10357.31 1157.2210385.44 1157.2410408.35 1157.2710449.68 1157.33 10459.4 1157.34
10496.99 1157.4210510.44 1157.4510513.92 1157.4510561.49 1157.5510578.16 1157.58
10612.53 1157.65 10642.4 1157.6910663.57 1157.7310706.64 1157.7710714.62 1157.78
10745.48 1157.7910765.66 1157.7910770.88 1157.82

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8768.27    .042 9727.39    .04310102.09    .042
```

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9727.3910102.09              1400    1461    1400             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*********************************************************************************************
* E.G. Elev (ft)          * 1157.86  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.               *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1157.78  * Reach Len. (ft)          * 1400.00  * 1461.00  * 1400.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *  246.54  *  448.11  *  378.73  *
* E.G. Slope (ft/ft)      *0.004860  * Area (sq ft)             *  246.54  *  448.11  *  378.73  *
* Q Total (cfs)           * 2280.00  * Flow (cfs)               *  384.49  * 1216.22  *  679.29  *
* Top Width (ft)          * 1491.30  * Top Width (ft)           *  506.02  *  374.70  *  610.58  *
* Vel Total (ft/s)        *    2.12  * Avg. Vel. (ft/s)         *    1.56  *    2.71  *    1.79  *
* Max Chl Dpth (ft)       *    2.84  * Hydr. Depth (ft)         *    0.49  *    1.20  *    0.62  *
* Conv. Total (cfs)       * 32705.8  * Conv. (cfs)              *  5515.4  * 17446.3  *  9744.1  *
* Length Wtd. (ft)        * 1428.90  * Wetted Per. (ft)         *  506.06  *  374.70  *  610.68  *
* Min Ch El (ft)          * 1156.41  * Shear (lb/sq ft)         *    0.15  *    0.36  *    0.19  *
* Alpha                   *    1.17  * Stream Power (lb/ft s)    *    0.23  *    0.98  *    0.34  *
* Frctn Loss (ft)         *   11.09  * Cum Volume (acre-ft)     *   19.04  *   51.63  *   13.63  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)            *   39.14  *   41.22  *   23.84  *
*********************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4A (H71)
REACH: REACH 2            RS: 0.541

INPUT
Description:
Station Elevation Data     num=      88
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
  9076.3 1147.63 9082.67  1147.6    9097 1147.56 9120.55 1147.48 9131.01 1147.45
 9158.18 1147.32 9185.72  1147.2 9196.32 1147.18 9220.18 1147.13  9234.2  1147.1
 9240.43 1147.09 9272.08 1147.05 9295.14 1147.01 9309.97 1146.98 9343.35 1146.92
 9347.85 1146.92 9349.85 1146.91 9385.73 1146.85 9404.56 1146.82 9423.62 1146.78
 9459.27 1146.71  9461.5 1146.71 9466.52 1146.69 9499.39 1146.62 9513.98 1146.58
 9537.27 1146.54 9568.69 1146.47 9575.15 1146.46 9589.69 1146.44 9613.04 1146.41
 9628.74 1145.58 9645.94  1144.9 9668.92 1144.06 9680.67 1144.48 9726.69 1146.32
 9732.83 1146.31 9764.57  1146.3 9787.54 1146.28 9802.45 1146.27 9836.03 1146.24
 9840.34 1146.23 9842.25 1146.23 9878.22 1146.18 9896.96 1146.15  9916.1 1146.11
 9951.67 1146.06 9953.99 1146.06 9961.08 1145.73   10000 1144.0410037.62 1145.01
10049.44 1145.33 10055.2 1145.5310058.94 1145.6710070.39 1146.0110104.07 1146.02
10109.81 1146.0310111.76 1146.0310149.23 1146.0310164.56 1146.0410188.66 1146.05
10217.36 1146.0710228.08 1146.0710259.68 1146.09 10267.5  1146.110270.16  1146.1
10306.92 1146.1410322.96 1146.1510346.35 1146.1810391.44 1145.2210399.45 1144.94
10413.64 1144.4210417.34 1144.5710464.62 1146.4310481.35 1146.4810504.04 1146.57
10534.15  1146.710543.46 1146.74 10570.9 1146.8710582.89 1146.9310586.95 1146.94
10622.31  1147.110639.75 1147.1910661.73 1147.2810692.55 1147.4110701.16 1147.43
10726.51 1147.4910740.58 1147.5310745.35 1147.54

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9076.3    .042 9951.67    .04310070.39    .042

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9951.6710070.39              1300    1353    1300             .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*********************************************************************************************
* E.G. Elev (ft)          * 1146.74  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.26  * Wt. n-Val.               *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1146.48  * Reach Len. (ft)          * 1300.00  * 1353.00  * 1300.00  *
* Crit W.S. (ft)          * 1146.41  * Flow Area (sq ft)        *  212.40  *  173.01  *  238.82  *
* E.G. Slope (ft/ft)      *0.014517  * Area (sq ft)             *  212.40  *  173.01  *  238.82  *
* Q Total (cfs)           * 2240.00  * Flow (cfs)               *  605.89  *  925.54  *  708.57  *
* Top Width (ft)          *  917.83  * Top Width (ft)           *  387.91  *  118.72  *  411.21  *
* Vel Total (ft/s)        *    3.59  * Avg. Vel. (ft/s)         *    2.85  *    5.35  *    2.97  *
* Max Chl Dpth (ft)       *    2.44  * Hydr. Depth (ft)         *    0.55  *    1.46  *    0.58  *
* Conv. Total (cfs)       * 18591.1  * Conv. (cfs)              *  5028.6  *  7681.6  *  5880.8  *
```

* Length Wtd. (ft)	* 1335.00	* Wetted Per. (ft)	* 388.00	* 118.79	* 411.27	*
* Min Ch El (ft)	* 1144.04	* Shear (lb/sq ft)	* 0.50	* 1.32	* 0.53	*
* Alpha	* 1.31	* Stream Power (lb/ft s)	* 1.42	* 7.06	* 1.56	*
* Frctn Loss (ft)	* 7.83	* Cum Volume (acre-ft)	* 11.66	* 41.22	* 3.71	*
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 24.77	* 32.95	* 7.42	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 0.285

INPUT
Description:
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9026.4	1139.99	9045.18	1139.95	9047	1139.94	9047.76	1139.94	9085.28	1139.86
9101.87	1139.83	9123.56	1139.77	9155.98	1139.68	9161.83	1139.66	9175.98	1139.6
9200.11	1139.52	9210.09	1139.48	9238.38	1139.35	9264.2	1139.23	9276.66	1139.17
9306.78	1139.03	9314.93	1138.99	9318.31	1138.98	9353.21	1138.81	9372.42	1138.72
9391.48	1138.64	9426.53	1138.48	9429.76	1138.47	9437.58	1138.44	9468.04	1138.33
9480.64	1138.29	9506.31	1138.22	9534.75	1138.15	9544.59	1138.13	9568.38	1138.09
9582.86	1138.07	9588.86	1138.06	9621.14	1138.02	9642.97	1137.99	9659.41	1137.97
9693.41	1137.08	9709.14	1136.53	9721.62	1136.97	9731.91	1137.26	9736.55	1137.32
9774.24	1137.84	9805.29	1137.81	9812.52	1137.8	9829.97	1137.77	9850.79	1137.75
9859.4	1137.73	9889.07	1137.7	9913.51	1137.68	9927.34	1137.66	9960.77	1137.61
9965.62	1137.61	9967.62	1137.6	10000	1137.55	10005.33	1137.55	10020.1	1137.57
10057.76	1137.6	10070.15	1137.62	10110.19	1137.7	10120.2	1137.72	10162.62	1137.82
10170.25	1137.84	10215.04	1137.97	10220.31	1137.98	10267.47	1138.12	10270.36	1138.13
10319.9	1138.29	10320.74	1138.26	10320.85	1138.26	10321.07	1138.24	10321.45	1138.23
10322.13	1138.2	10354.16	1136.64	10362.84	1136.53	10379.72	1136.22	10379.96	1136.22
10381.44	1136.25	10388.29	1136.42	10393.67	1136.58	10440	1137.79	10448.84	1138.02
10462.94	1138.47	10464.09	1138.48	10465.16	1138.48	10466.18	1138.5	10467.07	1138.51
10467.83	1138.52	10468.31	1138.53	10468.74	1138.54	10477.18	1138.76	10520.61	1138.91
10529.61	1138.94	10570.67	1139.08	10582.04	1139.12	10620.72	1139.25	10634.47	1139.29
10670.77	1139.4	10686.89	1139.44	10720.82	1139.54	10739.32	1139.6	10770.87	1139.7
10791.75	1139.78	10820.92	1139.89	10824.16	1139.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9026.4	.042	9659.41	.043	10477.18	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9659.41	10477.18	1500	1500	1500	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1138.85	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.07	* Wt. n-Val.	* 0.042	* 0.043	* 0.042 *
* W.S. Elev (ft)	* 1138.79	* Reach Len. (ft)	* 1500.00	* 1500.00	* 1500.00 *
* Crit W.S. (ft)	* 1138.24	* Flow Area (sq ft)	* 154.90	* 945.45	* 0.11 *
* E.G. Slope (ft/ft)	*0.003130	* Area (sq ft)	* 154.90	* 945.45	* 0.11 *
* Q Total (cfs)	* 2210.00	* Flow (cfs)	* 196.67	* 2013.31	* 0.01 *
* Top Width (ft)	* 1127.35	* Top Width (ft)	* 301.49	* 817.77	* 8.09 *
* Vel Total (ft/s)	* 2.01	* Avg. Vel. (ft/s)	* 1.27	* 2.13	* 0.11 *
* Max Chl Dpth (ft)	* 2.57	* Hydr. Depth (ft)	* 0.51	* 1.16	* 0.01 *
* Conv. Total (cfs)	* 39501.4	* Conv. (cfs)	* 3515.3	* 35985.8	* 0.2 *
* Length Wtd. (ft)	* 1500.00	* Wetted Per. (ft)	* 301.49	* 817.89	* 8.09 *
* Min Ch El (ft)	* 1136.22	* Shear (lb/sq ft)	* 0.10	* 0.23	* 0.00 *
* Alpha	* 1.06	* Stream Power (lb/ft s)	* 0.13	* 0.48	* 0.00 *
* Frctn Loss (ft)	* 6.73	* Cum Volume (acre-ft)	* 6.18	* 23.85	* 0.14 *
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 14.48	* 18.40	* 1.17 *

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4A (H71)
REACH: REACH 2 RS: 0.000

INPUT
Description: Limit of Study.
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9025.74	1132	9026.31	1132	9063.82	1131.99	9079.08	1131.98	9102.19	1131.97
9133.06	1131.96	9140.56	1131.96	9158.97	1131.95	9178.92	1131.94	9187.04	1131.93
9217.29	1131.91	9241.03	1131.9	9255.66	1131.88	9291.62	1131.85	9294.03	1131.84
9295.01	1131.84	9332.4	1131.79	9348.99	1131.79	9370.77	1131.74	9402.97	1131.71
9409.13	1131.7	9424.28	1131.68	9447.5	1131.63	9456.95	1131.62	9485.87	1131.6
9510.93	1131.58	9524.24	1131.54	9556.94	1131.47	9562.61	1131.45	9564.91	1131.45
9570.39	1131.44	9618.89	1131.35	9639.34	1131.33	9672.88	1131.29	9677.71	1131.28
9689.59	1131.27	9716.08	1131.23	9726.86	1131.22	9754.45	1131.19	9782.1	1131.01
9804.65	1131	9860.45	1129.84	9892.26	1130.23	9920.99	1129.59	9935.5	1129.31
9947.79	1129	9981.8	1129.72	9984.44	1129.91	10000	113	10044.79	1131.48
10046.68	1131.5	10047.76	1131.51	10048.5	1131.52	10049.2	1131.53	10049.63	1131.53
10055.8	1131.59	10105.11	1131.83	10148.79	1132.01	10159.29	1132.06	10173.95	1132.12
10213.47	1132.27	10241.78	1132.41	10267.65	1132.52	10303.77	1132.72	10321.83	1132.82
10334.77	1132.91	10376.01	1133.18	10427.76	1133.53	10430.19	1133.54	10433.58	1133.57
10484.37	1133.91	10520.76	1134.13	10538.55	1134.24	10563.4	1134.39	10592.73	1134.56
10613.75	1134.67	10646.91	1134.82	10693.21	1135.01	10698.77	1135.03	10701.09	1135.04
10706.74	1135.06	10755.27	1135.22	10799.73	1135.35	10809.45	1135.38	10823.03	1135.42
10863.63	1135.53	10892.72	1135.61	10917.81	1135.68	10952.84	1135.77	10971.99	1135.82
10985.71	1135.85	11026.17	1135.95	11078.7	1136.09	11080.35	1136.09	11082.66	1136.1
11134.53	1136.24	11171.7	1136.33	11188.71	1136.37	11211.18	1136.42		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9025.74	.042	9804.65	.043	10055.8	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9804.65	10055.8	5	5	5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1132.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1131.87	Reach Len. (ft)			
Crit W.S. (ft)	1131.55	Flow Area (sq ft)	204.26	439.53	8.22
E.G. Slope (ft/ft)	0.007013	Area (sq ft)	204.26	439.53	8.22
Q Total (cfs)	2170.00	Flow (cfs)	316.62	1846.87	6.51
Top Width (ft)	850.52	Top Width (ft)	539.78	251.15	59.59
Vel Total (ft/s)	3.33	Avg. Vel. (ft/s)	1.55	4.20	0.79
Max Chl Dpth (ft)	2.87	Hydr. Depth (ft)	0.38	1.75	0.14
Conv. Total (cfs)	25912.1	Conv. (cfs)	3780.8	22053.6	77.7
Length Wtd. (ft)		Wetted Per. (ft)	539.78	251.22	59.59
Min Ch El (ft)	1129.00	Shear (lb/sq ft)	0.17	0.77	0.06
Alpha	1.39	Stream Power (lb/ft s)	0.26	3.22	0.05
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 1 RS: 2.316

INPUT
Description: Limit of Study.
Station Elevation Data num= 104

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8554.72	1223.47	8563.66	1223.43	8578.89	1223.37	8605.05	1223.25	8630.35	1223.15
8646.43	1223.07	8681.81	1222.91	8687.81	1222.88	8712.46	1222.75	8729.19	1222.67
8733.27	1222.65	8770.58	1222.47	8784.73	1222.4	8811.96	1222.28	8836.19	1222.16
8853.34	1222.09	8887.66	1221.94	8894.72	1221.91	8923.74	1221.8	8936.11	1221.76
8939.12	1221.74	8977.49	1221.62	8990.58	1221.57	9018.87	1221.49	9042.04	1221.42
9060.25	1221.37	9093.5	1221.27	9101.64	1221.25	9135.03	1221.17	9143.02	1221.15
9144.96	1221.14	9184.4	1221.06	9196.43	1221.03	9225.78	1220.96	9247.89	1220.92
9267.17	1220.88	9299.35	1220.8	9322.44	1220.54	9338.34	1220.39	9348.07	1220.3
9368.37	1220.42	9377.45	1220.46	9402.27	1220.47	9417.89	1220.41	9433.48	1220.36

```
 9453.17  1220.3 9477.07 1220.23 9503.82 1220.15 9520.66  1220.1 9554.48 1220.01
 9564.25    1220 9605.13 1219.93 9610.12 1219.86  9611.6 1219.85 9614.27 1219.83
 9649.18 1219.24 9651.65 1219.19 9651.99  1219.2 9706.43 1219.83  9738.6 1219.79
 9757.09 1219.77 9782.19 1219.74 9807.74 1219.72 9825.78 1219.71 9858.39 1219.68
 9869.36 1219.67 9909.04 1219.63 9918.15 1219.47 9922.92 1219.42 9928.94 1219.35
 9985.86 1218.69 9991.95 1218.6210000.01 1218.52 10034.5 1219.1110043.87 1219.27
10048.31 1219.3410062.43  1219.610071.57  1219.610114.27 1219.6310142.94 1219.64
10166.11 1219.6410214.31 1219.6710217.94 1219.6710227.59 1219.6910269.78 1219.76
10285.68 1219.8110321.62 1219.9110357.04 1220.0410373.46 1220.0910417.03 1220.26
 10425.3 1220.2910428.41  1220.310477.13  1220.510499.78 1220.5910528.97 1220.71
10571.15 1220.8910580.81 1220.9210606.46 1221.0210632.65 1221.1210642.51 1221.15
10684.49 1221.2910713.88 1221.3910736.33 1221.4610780.41 1221.62

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 8554.72    .042 9909.04    .04310062.43    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9909.0410062.43             1200    1265    1200             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1221.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1220.98  * Reach Len. (ft)         * 1200.00  * 1265.00  * 1200.00  *
* Crit W.S. (ft)          * 1220.62  * Flow Area (sq ft)       *  620.64  *  294.59  *  481.57  *
* E.G. Slope (ft/ft)      *0.006586  * Area (sq ft)            *  620.64  *  294.59  *  481.57  *
* Q Total (cfs)           * 4230.00  * Flow (cfs)              * 1660.84  * 1276.30  * 1292.86  *
* Top Width (ft)          * 1375.66  * Top Width (ft)          *  689.70  *  153.39  *  532.57  *
* Vel Total (ft/s)        *    3.03  * Avg. Vel. (ft/s)        *    2.68  *    4.33  *    2.68  *
* Max Chl Dpth (ft)       *    2.46  * Hydr. Depth (ft)        *    0.90  *    1.92  *    0.90  *
* Conv. Total (cfs)       * 52124.6  * Conv. (cfs)             * 20465.9  * 15727.3  * 15931.4  *
* Length Wtd. (ft)        * 1225.23  * Wetted Per. (ft)        *  689.72  *  153.41  *  532.57  *
* Min Ch El (ft)          * 1218.52  * Shear (lb/sq ft)        *    0.37  *    0.79  *    0.37  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)  *    0.99  *    3.42  *    1.00  *
* Frctn Loss (ft)         *    9.43  * Cum Volume (acre-ft)    *   19.50  *   36.31  *   15.16  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   25.80  *   23.44  *   19.11  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4B (H73)
REACH: REACH 1            RS: 2.076

INPUT
Description:
Station Elevation Data      num=      52
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
**********************************************************************************
 9480.42 1212.15 9482.67 1212.15 9490.95 1212.15 9523.51 1212.06 9542.71 1212.02
 9564.35 1211.95 9594.47 1211.84 9605.18  1211.8 9645.27 1211.63 9646.02 1211.63
 9646.22 1211.63    9723 1211.06 9728.61 1211.05 9731.16 1211.06 9738.98 1211.07
  9745.2 1211.09 9801.49 1210.92 9809.37 1210.88 9838.81 1210.75  9850.2 1210.69
 9853.25 1210.68 9891.04 1210.54 9905.01 1210.48 9931.88 1210.41 9972.54 1209.94
 9975.31 1209.88 9981.15 1209.77 9989.24 1209.62 9998.57  1209.4   10000  1209.4
10019.55 1209.6410062.14 1210.5110113.23 1210.7410115.49 1210.7510119.31 1210.77
10168.85 1210.9810198.25 1211.12 10222.2 1211.2210262.58  1211.410275.56 1211.46
10283.26 1211.4910328.91 1211.6810368.28 1211.8310382.27 1211.8810405.84 1211.95
10435.62 1212.04 10453.3 1212.0710488.98 1212.1310538.31 1212.1810542.33 1212.19
10549.11  1212.210585.24 1212.24

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9480.42    .042 9931.88    .04310062.14    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9931.8810062.14             1200    1272    1200             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

* E.G. Elev (ft)	* 1211.70	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.28	* Wt. n-Val.	* 0.042	* 0.043	* 0.042 *
* W.S. Elev (ft)	* 1211.42	* Reach Len. (ft)	* 1200.00	* 1272.00	* 1200.00 *
* Crit W.S. (ft)	* 1211.35	* Flow Area (sq ft)	* 140.51	* 192.66	* 92.15 *
* E.G. Slope (ft/ft)	*0.012618	* Area (sq ft)	* 140.51	* 192.66	* 92.15 *
* Q Total (cfs)	* 1560.00	* Flow (cfs)	* 373.56	* 970.73	* 215.71 *
* Top Width (ft)	* 590.91	* Top Width (ft)	* 256.80	* 130.26	* 203.85 *
* Vel Total (ft/s)	* 3.67	* Avg. Vel. (ft/s)	* 2.66	* 5.04	* 2.34 *
* Max Chl Dpth (ft)	* 2.02	* Hydr. Depth (ft)	* 0.55	* 1.48	* 0.45 *
* Conv. Total (cfs)	* 13887.5	* Conv. (cfs)	* 3325.6	* 8641.7	* 1920.3 *
* Length Wtd. (ft)	* 1255.79	* Wetted Per. (ft)	* 256.80	* 130.28	* 203.85 *
* Min Ch El (ft)	* 1209.40	* Shear (lb/sq ft)	* 0.43	* 1.16	* 0.36 *
* Alpha	* 1.36	* Stream Power (lb/ft s)	* 1.15	* 5.87	* 0.83 *
* Frctn Loss (ft)	* 9.91	* Cum Volume (acre-ft)	* 9.02	* 29.23	* 7.25 *
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 12.76	* 19.32	* 8.97 *

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 1 RS: 1.836

INPUT
Description:
Station Elevation Data num= 38

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9510.77	1201.89	9514.07	1201.92	9520.03	1201.86	9527.79	1201.78	9576.21	1201.34
9599.4	1201.31	9620.19	1201.26	9649.48	1201.2	9676.75	1201.23	9691.85	1201.1
9707.22	1201.08	9712.7	1201.07	9723.46	1201.12	9729.78	1201.14	9788.1	1200.84
9799.7	1200.8	9810.1	1200.77	9849.78	1200.64	9857.57	1200.61	9899.85	1200.46
9905.05	1200.44	9949.93	1200.29	9952.53	1200.28	10000	1200.15	10064.44	1200.35
10079.27	1200.41	10128.88	1200.61	10158.53	1200.74	10193.31	1200.9	10237.8	1201.06
10257.75	1201.12	10289.49	1201.52	10297.46	1201.55	10308.69	1201.59	10319.33	1201.62
10333.43	1201.66	10335.07	1201.67	10337.23	1201.67				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9510.77	.042	9723.46	.043	10257.75	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9723.46	10257.75	1250	1302	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1201.74	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.10	* Wt. n-Val.	* 0.042	* 0.043	* 0.042 *
* W.S. Elev (ft)	* 1201.64	* Reach Len. (ft)	* 1250.00	* 1302.00	* 1250.00 *
* Crit W.S. (ft)	* 1201.25	* Flow Area (sq ft)	* 68.03	* 548.22	* 12.30 *
* E.G. Slope (ft/ft)	*0.005339	* Area (sq ft)	* 68.03	* 548.22	* 12.30 *
* Q Total (cfs)	* 1510.00	* Flow (cfs)	* 91.79	* 1408.15	* 10.07 *
* Top Width (ft)	* 783.69	* Top Width (ft)	* 180.38	* 534.29	* 69.02 *
* Vel Total (ft/s)	* 2.40	* Avg. Vel. (ft/s)	* 1.35	* 2.57	* 0.82 *
* Max Chl Dpth (ft)	* 1.49	* Hydr. Depth (ft)	* 0.38	* 1.03	* 0.18 *
* Conv. Total (cfs)	* 20666.0	* Conv. (cfs)	* 1256.2	* 19272.0	* 137.8 *
* Length Wtd. (ft)	* 1291.65	* Wetted Per. (ft)	* 180.39	* 534.29	* 69.02 *
* Min Ch El (ft)	* 1200.15	* Shear (lb/sq ft)	* 0.13	* 0.34	* 0.06 *
* Alpha	* 1.09	* Stream Power (lb/ft s)	* 0.17	* 0.88	* 0.05 *
* Frctn Loss (ft)	* 9.73	* Cum Volume (acre-ft)	* 6.15	* 18.41	* 5.81 *
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 6.74	* 9.62	* 5.21 *

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 1 RS: 1.589

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9432.76	1192.29	9468.8	1192.17	9483.47	1192.11	9512.06	1192.01	9534.22	1191.93
9555.31	1191.86	9584.96	1191.75	9598.57	1191.71	9635.71	1191.59	9641.83	1191.58
9677.17	1191.47	9685.08	1191.44	9686.45	1191.44	9711.86	1191.55	9761.2	1191.82
9769.39	1191.69	9787.27	1191.35	9838.68	1191.04	9858.1	1190.99	9889.42	1190.93
9933.86	1190.87	9940.17	1190.85	9946.79	1190.69	9950.17	1190.62	9954.23	1190.48
9963.21	1190.15	10000.01	1188.85	10020.63	1189.97	10027.71	1190.38	10031.21	1190.56
10043.35	1190.93	10057.55	1190.97	10096.16	1191.08	10115.18	1191.12	10148.97	1191.21
10171.17	1191.26	10201.77	1191.33	10217.52	1191.37	10254.58	1191.46	10297.51	1191.57
10307.39	1191.61	10326.58	1191.65	10360.2	1191.73	10377.5	1191.78	10413	1191.89
10457.49	1192.06	10465.81	1192.09	10481.98	1192.16	10484.92	1192.18		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9432.76	.042	9933.86	.04	10043.35	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.86	10043.35	1100	1113	1100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1191.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1191.68	Reach Len. (ft)	1113.00	1113.00	1113.00
Crit W.S. (ft)	1191.68	Flow Area (sq ft)	112.30	184.29	108.72
E.G. Slope (ft/ft)	0.011614	Area (sq ft)	112.30	184.29	108.72
Q Total (cfs)	1460.00	Flow (cfs)	275.79	970.62	213.59
Top Width (ft)	692.74	Top Width (ft)	289.29	109.49	293.96
Vel Total (ft/s)	3.60	Avg. Vel. (ft/s)	2.46	5.27	1.96
Max Chl Dpth (ft)	2.83	Hydr. Depth (ft)	0.39	1.68	0.37
Conv. Total (cfs)	13547.7	Conv. (cfs)	2559.1	9006.6	1982.0
Length Wtd. (ft)	1113.00	Wetted Per. (ft)	289.29	109.58	293.96
Min Ch El (ft)	1188.85	Shear (lb/sq ft)	0.28	1.22	0.27
Alpha	1.55	Stream Power (lb/ft s)	0.69	6.42	0.53
Frctn Loss (ft)	6.60	Cum Volume (acre-ft)	3.56	7.47	4.08
C & E Loss (ft)	0.03	Cum SA (acres)			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 2 RS: 1.378

INPUT
Description:
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9411.39	1185.23	9434.38	1185.16	9435.69	1185.15	9484.4	1184.98	9487.02	1184.97
9534.42	1184.81	9538.36	1184.8	9584.43	1184.64	9589.69	1184.62	9634.45	1184.51
9641.02	1184.49	9684.47	1184.38	9692.36	1184.36	9734.48	1184.26	9743.69	1184.24
9784.5	1184.15	9795.02	1184.13	9834.52	1184.06	9846.35	1184.04	9884.53	1183.99
9897.68	1183.97	9934.55	1183.93	9974.38	1181.83	10000	1180.52	10026.56	1181.55
10040.65	1182.09	10080.06	1183.2	10082.6	1183.17	10085.21	1183.19	10088.28	1183.25
10091.91	1183.26	10093.96	1183.21	10096.42	1183.12	10099.41	1183.03	10112.07	1182.81
10124.27	1182.75	10130.54	1182.62	10136.23	1182.74	10151.46	1182.91	10155.87	1182.99
10159.96	1183.07	10163.43	1183.14	10168.59	1183.25	10172.38	1183.35	10175.3	1183.42
10212.65	1184.29	10234.94	1184.35	10265.72	1184.44	10285.02	1184.5	10318.8	1184.58
10335.1	1184.63	10371.87	1184.74	10385.18	1184.79	10424.94	1184.94	10435.26	1184.99

```
10478.01 1185.1810485.34 1185.2210531.08 1185.4510535.42 1185.4710584.16 1185.73
 10585.5 1185.7410607.95 1185.8610635.58    118610637.23 1186.0110685.66 1186.23
 10690.3 1186.2510735.74 1186.4410743.37 1186.47 10765.1 1186.56

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9411.39    .042 9934.55    .04310091.91    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.5510091.91             1300    1335    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1184.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.21  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1184.71  * Reach Len. (ft)         * 1300.00  * 1335.00  * 1300.00  *
* Crit W.S. (ft)          * 1183.89  * Flow Area (sq ft)       *  166.43  *  400.23  *  210.46  *
* E.G. Slope (ft/ft)      *0.004260  * Area (sq ft)            *  166.43  *  400.23  *  210.46  *
* Q Total (cfs)           * 2320.00  * Flow (cfs)              *  225.99  * 1680.94  *  413.07  *
* Top Width (ft)          *  794.95  * Top Width (ft)          *  369.06  *  157.36  *  268.53  *
* Vel Total (ft/s)        *    2.99  * Avg. Vel. (ft/s)        *    1.36  *    4.20  *    1.96  *
* Max Chl Dpth (ft)       *    4.19  * Hydr. Depth (ft)        *    0.45  *    2.54  *    0.78  *
* Conv. Total (cfs)       * 35546.7  * Conv. (cfs)             * 3462.6  * 25755.1  *  6329.0  *
* Length Wtd. (ft)        * 1323.71  * Wetted Per. (ft)        *  369.06  *  157.50  *  268.56  *
* Min Ch El (ft)          * 1180.52  * Shear (lb/sq ft)        *    0.12  *    0.68  *    0.21  *
* Alpha                   *    1.53  * Stream Power (lb/ft s)   *    0.16  *    2.84  *    0.41  *
* Frctn Loss (ft)         *    7.29  * Cum Volume (acre-ft)    *   43.32  *   66.11  *   23.53  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   80.87  *   32.32  *   47.31  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS4B (H73)
REACH: REACH 2            RS: 1.125

INPUT
Description:
Station Elevation Data     num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9283.76 1177.33 9292.85 1177.31 9294.76  1177.3 9302.49 1177.27 9336.06 1177.14
 9344.35 1177.11 9377.37    1177 9395.85 1176.94 9418.67  1176.9 9447.35 1176.85
 9459.98 1176.84 9498.85 1176.81 9501.28 1176.81 9511.15 1176.81 9542.59 1176.78
 9550.35 1176.78 9583.89 1176.74 9601.85 1176.73  9625.2  1176.7 9653.35 1176.67
 9666.51 1176.65 9704.85  1176.6 9707.81 1176.59 9719.81 1176.58 9749.12 1176.55
 9756.35 1176.54 9790.42 1176.53 9807.85 1176.52 9831.73 1176.53 9859.35 1176.52
 9873.03 1176.52 9910.85 1176.51 9928.47 1176.51 9955.64 1176.49 9962.35 1176.47
   10000 1173.0210036.03 1174.9310047.49 1175.5210053.02 1175.8210068.82 1176.75
 10086.6 1176.8310123.05 1176.9810173.38 1177.1710177.28 1177.18 10180.1 1177.18
10231.51 1177.24 10273.6 1177.1410285.74 1177.1110302.51 1177.1510339.97  1177.3
 10367.1 1177.44 10394.2 1177.4910431.63 1177.6210448.43 1177.66 10460.6 1177.71
10502.66 1177.85 10554.1 1178.23 10556.9 1178.2510560.75 1178.2910603.54 1178.57

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9283.76    .042 9962.35    .04310068.82    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.3510068.82             1300    1328    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1177.61  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.31  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1177.30  * Reach Len. (ft)         * 1300.00  * 1328.00  * 1300.00  *
* Crit W.S. (ft)          * 1177.30  * Flow Area (sq ft)       *  379.82  *  264.45  *   51.71  *
* E.G. Slope (ft/ft)      *0.007425  * Area (sq ft)            *  379.82  *  264.45  *   51.71  *
* Q Total (cfs)           * 2290.00  * Flow (cfs)              *  795.76  * 1441.90  *   52.34  *
* Top Width (ft)          * 1043.42  * Top Width (ft)          *  666.68  *  106.47  *  270.27  *
* Vel Total (ft/s)        *    3.29  * Avg. Vel. (ft/s)        *    2.10  *    5.45  *    1.01  *
* Max Chl Dpth (ft)       *    4.28  * Hydr. Depth (ft)        *    0.57  *    2.48  *    0.19  *
* Conv. Total (cfs)       * 26576.0  * Conv. (cfs)             *  9235.0  * 16733.6  *   607.4  *
```

* Length Wtd. (ft)	* 1319.29	* Wetted Per. (ft)	* 666.68	* 106.73	* 270.27	*
* Min Ch El (ft)	* 1173.02	* Shear (lb/sq ft)	* 0.26	* 1.15	* 0.09	*
* Alpha	* 1.87	* Stream Power (lb/ft s)	* 0.55	* 6.26	* 0.09	*
* Frctn Loss (ft)	* 7.84	* Cum Volume (acre-ft)	* 35.17	* 55.93	* 19.61	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 65.41	* 28.28	* 39.27	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 2 RS: 0.874

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9340.5	1168.83	9354.76	1168.82	9361.9	1168.81	9400.48	1168.74	9404.81	1168.73
9405.61	1168.73	9447.71	1168.65	9456.46	1168.63	9490.62	1168.57	9507.3	1168.54
9533.53	1168.5	9558.15	1168.46	9576.44	1168.42	9609	1168.36	9619.35	1168.33
9659.85	1168.23	9662.26	1168.22	9675.28	1168.18	9705.17	1168.08	9710.7	1168.06
9748.08	1167.94	9761.55	1167.89	9790.99	1167.8	9812.4	1167.73	9833.9	1167.66
9863.25	1167.57	9876.81	1167.53	9914.09	1167.43	9925.48	1167.04	9931.64	1166.81
10000	1164.43	10053.77	1166.76	10065.6	1167.33	10112.01	1167.44	10115.66	1167.44
10164.62	1167.58	10165.72	1167.58	10187.3	1167.66	10215.78	1167.75	10217.23	1167.76
10265.84	1167.95	10269.85	1167.97	10315.9	1168.16	10322.46	1168.19	10365.96	1168.37
10375.07	1168.41	10416.02	1168.58	10427.68	1168.63	10466.08	1168.77	10480.3	1168.82
10516.13	1168.95	10532.91	1169.01	10566.19	1169.12	10585.52	1169.18	10606.59	1169.23

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9340.5	.042	9914.09	.043	10065.6	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914.09	10065.6	1500	1567	1500	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1168.66	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.24	* Wt. n-Val.	* 0.042	* 0.043	* 0.042	*
* W.S. Elev (ft)	* 1168.42	* Reach Len. (ft)	* 1500.00	* 1567.00	* 1500.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 159.24	* 381.54	* 187.82	*
* E.G. Slope (ft/ft)	*0.004856	* Area (sq ft)	* 159.24	* 381.54	* 187.82	*
* Q Total (cfs)	* 2270.00	* Flow (cfs)	* 239.12	* 1699.82	* 331.06	*
* Top Width (ft)	* 797.22	* Top Width (ft)	* 335.00	* 151.51	* 310.71	*
* Vel Total (ft/s)	* 3.12	* Avg. Vel. (ft/s)	* 1.50	* 4.46	* 1.76	*
* Max Chl Dpth (ft)	* 3.99	* Hydr. Depth (ft)	* 0.48	* 2.52	* 0.60	*
* Conv. Total (cfs)	* 32573.9	* Conv. (cfs)	* 3431.4	* 24391.9	* 4750.6	*
* Length Wtd. (ft)	* 1553.41	* Wetted Per. (ft)	* 335.00	* 151.63	* 310.71	*
* Min Ch El (ft)	* 1164.43	* Shear (lb/sq ft)	* 0.14	* 0.76	* 0.18	*
* Alpha	* 1.60	* Stream Power (lb/ft s)	* 0.22	* 3.40	* 0.32	*
* Frctn Loss (ft)	* 9.01	* Cum Volume (acre-ft)	* 27.13	* 46.08	* 16.04	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 50.47	* 24.34	* 30.60	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 2 RS: 0.577

INPUT
Description: Approximately at crossing of 139th Avenue.

Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9166.26	1159.99	9172.85	1159.99	9202.47	1159.95	9227.63	1159.94	9240.31	1159.92
9268.68	1159.9	9278.16	1159.9	9282.4	1159.89	9316	1159.87	9337.17	1159.86
9353.85	1159.84	9391.13	1159.79	9391.7	1159.79	9391.95	1159.79	9429.54	1159.73
9446.72	1159.71	9467.39	1159.68	9501.5	1159.63	9505.23	1159.63	9513.58	1159.61
9543.08	1159.57	9556.27	1159.55	9580.92	1159.49	9611.05	1159.43	9618.77	1159.41
9636.03	1159.36	9656.61	1159.32	9665.82	1159.3	9694.46	1159.23	9720.6	1159.17
9732.3	1159.14	9758.48	1159.08	9770.15	1159.06	9775.37	1159.05	9807.99	1158.98
9830.14	1158.93	9845.84	1158.89	9880.93	1158.8	9883.69	1158.79	9884.92	1158.79
9921.53	1158.68	9939.69	1158.63	9972.09	1157.47	9990.73	1156.83	10000	1156.52
10033.64	1157.94	10042.4	1158.31	10043.69	1158.35	10046.58	1158.43	10094.95	1158.42
10096.86	1158.42	10144.95	1158.44	10147.13	1158.45	10194.95	1158.5	10219.46	1157.99
10256.51	1157.21	10279.46	1158.05	10289.52	1158.42	10292.09	1158.52	10293.66	1158.58
10294.54	1158.62	10297.96	1158.71	10344.95	1158.85	10348.23	1158.86	10394.96	1159.02
10398.5	1159.03	10444.96	1159.21	10448.78	1159.22	10494.96	1159.42	10499.05	1159.44
10544.96	1159.66	10549.33	1159.68	10594.96	1159.9	10599.6	1159.92	10638.21	1160.06

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9166.26	.042	9939.69	.043	10297.96	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9939.69	10297.96	1450	1504	1450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1159.63	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1159.45	Reach Len. (ft)	1450.00	1504.00	1450.00
Crit W.S. (ft)	1159.14	Flow Area (sq ft)	133.47	513.33	81.17
E.G. Slope (ft/ft)	0.007071	Area (sq ft)	133.47	513.33	81.17
Q Total (cfs)	2240.00	Flow (cfs)	213.63	1895.31	131.05
Top Width (ft)	899.48	Top Width (ft)	338.21	358.27	203.00
Vel Total (ft/s)	3.08	Avg. Vel. (ft/s)	1.60	3.69	1.61
Max Chl Dpth (ft)	2.93	Hydr. Depth (ft)	0.39	1.43	0.40
Conv. Total (cfs)	26638.8	Conv. (cfs)	2540.6	22539.7	1558.5
Length Wtd. (ft)	1490.12	Wetted Per. (ft)	338.21	358.39	203.00
Min Ch El (ft)	1156.52	Shear (lb/sq ft)	0.17	0.63	0.18
Alpha	1.26	Stream Power (lb/ft s)	0.28	2.33	0.28
Frctn Loss (ft)	8.35	Cum Volume (acre-ft)	22.09	29.99	11.41
C & E Loss (ft)	0.00	Cum SA (acres)	38.87	15.18	21.76

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 2 RS: 0.292

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8813.21	1151.5	8825.62	1151.48	8851.89	1151.44	8864.22	1151.44	8895.77	1151.4
8902.82	1151.4	8905.57	1151.39	8941.42	1151.38	8959.25	1151.37	8980.02	1151.36
9012.93	1151.34	9018.62	1151.34	9033.19	1151.33	9057.22	1151.31	9066.61	1151.31
9095.82	1151.28	9120.29	1151.28	9134.42	1151.27	9170.61	1151.27	9173.02	1151.27
9173.97	1151.27	9211.62	1151.29	9227.64	1151.29	9250.23	1151.28	9281.32	1151.25
9288.83	1151.24	9308.03	1151.2	9327.43	1151.16	9335	1151.14	9366.03	1151.05
9388.68	1150.96	9404.63	1150.91	9442.36	1150.79	9443.23	1150.79	9445.46	1150.78
9481.83	1150.7	9496.04	1150.67	9520.43	1150.64	9549.72	1150.61	9559.03	1150.59
9582.88	1150.56	9597.63	1150.54	9603.4	1150.54	9636.24	1150.48	9657.08	1150.45
9674.84	1150.41	9710.76	1150.35	9713.44	1150.35	9720.3	1150.33	9752.04	1150.28
9764.44	1150.25	9790.64	1150.21	9818.12	1150.16	9829.24	1150.14	9857.72	1150.09
9867.84	1150.07	9871.8	1150.07	9906.44	1150.02	9925.47	1149.99	9957.56	1148.87
9974.85	1148.21	10000	1147.31	10011.66	1147.37	10020.61	1147.45	10033.99	1148
10051.85	1148.7	10062.07	1149.09	10086.2	1150.11	10135.98	1150.2	10139.69	1150.21
10145.75	1150.21	10193.18	1150.29	10222.25	1150.35	10246.67	1150.39	10286.52	1150.49
10300.16	1150.53	10308.52	1150.55	10353.64	1150.68	10394.78	1150.8	10407.13	1150.84

```
10412.68 1150.8510427.28  1150.910460.62 1151.0210481.05 1151.1110514.11 1151.26
10567.32  1151.5 10567.6  1151.510568.04  1151.510621.08 1151.7310653.59 1151.86
10674.57 1151.9510708.81  1152.110728.06 1152.1810739.86 1152.2410756.11 1152.32

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 8813.21    .042 9925.47    .043 10086.2    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9925.47 10086.2             1500    1542    1500              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1151.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.21  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1151.06  * Reach Len. (ft)         * 1500.00  * 1542.00  * 1500.00  *
* Crit W.S. (ft)          * 1150.83  * Flow Area (sq ft)       *  337.83  *  405.64  *  211.14  *
* E.G. Slope (ft/ft)      *0.004711  * Area (sq ft)            *  337.83  *  405.64  *  211.14  *
* Q Total (cfs)           * 2710.00  * Flow (cfs)              *  583.19  * 1782.68  *  344.13  *
* Top Width (ft)          * 1108.32  * Top Width (ft)          *  563.61  *  160.73  *  383.98  *
* Vel Total (ft/s)        *    2.84  * Avg. Vel. (ft/s)        *    1.73  *    4.39  *    1.63  *
* Max Chl Dpth (ft)       *    3.75  * Hydr. Depth (ft)        *    0.60  *    2.52  *    0.55  *
* Conv. Total (cfs)       * 39482.8  * Conv. (cfs)             *  8496.7  * 25972.4  *  5013.7  *
* Length Wtd. (ft)        * 1525.74  * Wetted Per. (ft)        *  563.61  *  160.83  *  383.98  *
* Min Ch El (ft)          * 1147.31  * Shear (lb/sq ft)        *    0.18  *    0.74  *    0.16  *
* Alpha                   *    1.70  * Stream Power (lb/ft s)   *    0.30  *    3.26  *    0.26  *
* Frctn Loss (ft)         *    8.82  * Cum Volume (acre-ft)     *   14.24  *   14.12  *    6.54  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *   23.87  *    6.22  *   11.99  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS4B (H73)
REACH: REACH 2 RS: 0.000

INPUT
Description: Limit of Study.

```
Station Elevation Data     num=      103
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************
  8906.6 1142.52 8931.46 1142.46 8947.87 1142.43 8969.32 1142.39 9002.61 1142.33
 9007.19 1142.32 9017.45 1142.31 9045.05 1142.26 9057.35 1142.23 9082.92  1142.2
  9112.1 1142.16 9120.78 1142.15 9140.27 1142.11 9158.65 1142.08 9166.84 1142.07
 9196.51    1142 9221.58 1141.94 9234.38  1141.9 9263.09 1141.82 9272.24 1141.79
 9276.32 1141.78 9310.11  1141.7 9331.06 1141.67 9347.97 1141.65  9385.8 1141.63
 9385.84 1141.63 9385.91 1141.63  9423.7 1141.64 9440.55 1141.65 9461.57 1141.65
 9495.29 1141.66 9499.43 1141.66 9508.73 1141.65  9537.3 1141.63 9550.03 1141.62
 9575.16  1141.6 9604.77 1141.55 9613.03 1141.54 9631.55 1141.52 9650.89 1141.49
 9659.51 1141.47 9688.76 1141.42 9714.25 1141.38 9726.62 1141.35 9754.37 1141.29
 9764.49 1141.27 9768.99 1141.26 9802.35 1141.18 9823.74 1141.13 9877.19    1141
 9878.08    1141 9878.48    1141 9879.52 1140.99 9941.98 1140.13 9946.41 1140.05
 9952.52 1139.94 9965.65 1139.81 9986.69 1139.61   10000    113910000.23  1139.4
10000.45 1139.4110016.96  1139.6 10026.3 1139.9710067.64 1141.1710097.06 1141.29
10125.37  1141.410151.58 1141.4910171.76 1141.5410206.11 1141.6310250.73 1141.76
10260.63 1141.7910268.26 1141.8210315.16 1141.9810333.63 1142.0510369.68 1142.19
10376.09 1142.2210424.21 1142.4310461.24 1142.5710478.73 1142.6410485.62 1142.67
10501.45 1142.7310523.61 1142.8110533.26 1142.8510561.61 1142.9510587.78 1143.05
10599.61  1143.110626.81  1143.210637.61 1143.24 10642.3 1143.2610675.61 1143.38
10696.83 1143.4610750.73 1143.6810751.35 1143.68 10751.6 1143.6810752.17 1143.68
 10789.6 1143.8410805.88 1143.9110847.22 1144.11 10860.4 1144.1710877.53 1144.25
10914.93 1144.4410943.71 1144.5910960.68 1144.68

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
  8906.6    .042 9877.19    .04310067.64    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9877.1910067.64                 5       5       5              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1142.46  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.22	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1142.24	Reach Len. (ft)			
Crit W.S. (ft)	1142.06	Flow Area (sq ft)	489.34	392.18	168.85
E.G. Slope (ft/ft)	0.007001	Area (sq ft)	489.34	392.18	168.85
Q Total (cfs)	3190.00	Flow (cfs)	1024.66	1833.59	331.76
Top Width (ft)	1325.17	Top Width (ft)	822.49	190.45	312.22
Vel Total (ft/s)	3.04	Avg. Vel. (ft/s)	2.09	4.68	1.96
Max Chl Dpth (ft)	3.24	Hydr. Depth (ft)	0.59	2.06	0.54
Conv. Total (cfs)	38126.0	Conv. (cfs)	12246.5	21914.5	3965.0
Length Wtd. (ft)		Wetted Per. (ft)	822.49	190.73	312.23
Min Ch El (ft)	1139.00	Shear (lb/sq ft)	0.26	0.90	0.24
Alpha	1.56	Stream Power (lb/ft s)	0.54	4.20	0.46
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 3S1WS3 (H29)
REACH: REACH 1 RS: 1.096

INPUT
Description: Limit of Study.
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9565.44	1229.96	9576.21	1229.93	9585.47	1229.9	9595.22	1229.86	9620.84	1229.77
9645.17	1229.67	9656.21	1229.62	9667.82	1229.57	9691.57	1229.46	9714.13	1229.35
9726.94	1229.29	9740.43	1229.22	9762.31	1229.11	9783.09	1229.01	9797.67	1228.94
9813.03	1228.86	9833.04	1228.77	9852.05	1228.67	9868.41	1228.59	9885.63	1228.51
9903.78	1228.44	9921.01	1228.36	9939.14	1228.3	9958.73	1227.33	9962.72	1227.2
10000	1226.18	10030.76	1227.47	10033.5	1227.57	10035.53	1227.65	10037.07	1227.7
10053.89	1228.26	10094.82	1228.41	10096.02	1228.41	10101.66	1228.43	10138.15	1228.59
10145.95	1228.62	10180.28	1228.82	10197.07	1228.93	10222.41	1229.09	10248.2	1229.28
10264.54	1229.41	10299.33	1229.68	10306.66	1229.73	10340.99	1229.99	10343.39	1230.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9565.44	.042	9939.14	.043	10053.89	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9939.14	10053.89	1800	1849	1800	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1228.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.		0.043	
W.S. Elev (ft)	1228.22	Reach Len. (ft)	1800.00	1849.00	1800.00
Crit W.S. (ft)	1228.21	Flow Area (sq ft)		119.43	
E.G. Slope (ft/ft)	0.026357	Area (sq ft)		119.43	
Q Total (cfs)	700.00	Flow (cfs)		700.00	
Top Width (ft)	111.76	Top Width (ft)		111.76	
Vel Total (ft/s)	5.86	Avg. Vel. (ft/s)		5.86	
Max Chl Dpth (ft)	2.04	Hydr. Depth (ft)		1.07	
Conv. Total (cfs)	4311.7	Conv. (cfs)		4311.7	
Length Wtd. (ft)	1838.41	Wetted Per. (ft)		111.84	
Min Ch El (ft)	1226.18	Shear (lb/sq ft)		1.76	
Alpha	1.00	Stream Power (lb/ft s)		10.30	
Frctn Loss (ft)	15.91	Cum Volume (acre-ft)	8.46	22.95	15.22
C & E Loss (ft)	0.14	Cum SA (acres)	9.77	10.14	24.96

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS3 (H29)
REACH: REACH 1 RS: 0.745

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9351.89	1214.04	9371.64	1213.98	9389.7	1213.94	9408.34	1213.89	9441.43	1213.79
9445.05	1213.78	9447.09	1213.77	9481.76	1213.68	9504.48	1213.61	9543.29	1213.52
9555.18	1213.48	9561.87	1213.47	9591.88	1213.4	9619.26	1213.34	9628.59	1213.32
9645.15	1213.28	9665.3	1213.22	9676.65	1213.2	9702.01	1213.13	9734.04	1213.05
9738.71	1213.04	9747.01	1213.02	9775.42	1212.94	9791.43	1212.89	9812.13	1212.82
9848.82	1212.72	9848.84	1212.72	9848.86	1212.72	9885.55	1212.57	9906.21	1212.5
9922.25	1212.44	9950.72	1212.33	9958.96	1212.3	9968.12	1212.02	9970.6	1211.93
9976.02	1211.67	10000	1210.45	10060.05	1211.74	10064	1211.85	10066.3	1211.9
10071.67	1212.02	10074.9	1212.02	10085.03	1212.01	10114.7	1211.98	10124.15	1211.97
10154.49	1211.97	10176.63	1211.96	10194.29	1211.96	10229.1	1211.98	10234.09	1211.98
10249.74	1212	10273.88	1212.04	10281.58	1212.06	10313.68	1212.12	10334.05	1212.15
10353.48	1212.19	10386.53	1212.24	10393.28	1212.25	10414.45	1212.28	10433.07	1212.32
10439.01	1212.33	10472.87	1212.39	10491.48	1212.41	10512.67	1212.44	10543.96	1212.48
10552.47	1212.5	10579.16	1212.54	10592.26	1212.57	10596.44	1212.58	10632.06	1212.68
10648.91	1212.73	10671.86	1212.81	10701.39	1212.92	10711.65	1212.96	10743.54	1213.09

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9351.89	.042	9950.72	.043	10071.67	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9950.72	10071.67	1900	1950	1900	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1212.69	Element			
Vel Head (ft)	0.07	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1212.62	Reach Len. (ft)	1900.00	1950.00	1900.00
Crit W.S. (ft)	1212.35	Flow Area (sq ft)	11.18	150.30	227.19
E.G. Slope (ft/ft)	0.004215	Area (sq ft)	11.18	150.30	227.19
Q Total (cfs)	690.00	Flow (cfs)	7.06	389.63	293.31
Top Width (ft)	737.53	Top Width (ft)	77.47	120.95	539.11
Vel Total (ft/s)	1.78	Avg. Vel. (ft/s)	0.63	2.59	1.29
Max Chl Dpth (ft)	2.17	Hydr. Depth (ft)	0.14	1.24	0.42
Conv. Total (cfs)	10628.1	Conv. (cfs)	108.8	6001.4	4517.8
Length Wtd. (ft)	1930.69	Wetted Per. (ft)	77.47	121.01	539.11
Min Ch El (ft)	1210.45	Shear (lb/sq ft)	0.04	0.33	0.11
Alpha	1.43	Stream Power (lb/ft s)	0.02	0.85	0.14
Frctn Loss (ft)	14.47	Cum Volume (acre-ft)	8.23	17.22	10.53
C & E Loss (ft)	0.01	Cum SA (acres)	8.17	5.21	13.82

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS3 (H29)
REACH: REACH 1 RS: 0.376

INPUT
Description:
Station Elevation Data num= 53

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9653.48	1198	9667.11	1197.94	9683.05	1197.89	9702.71	1197.77	9727.64	1197.71
9738.31	1197.67	9746.72	1197.67	9773.91	1197.61	9808.39	1197.65	9809.52	1197.65
9810.4	1197.65	9845.12	1197.62	9874.07	1197.64	9880.72	1197.64	9889.14	1197.64
9916.32	1197.6	9937.75	1197.58	9951.92	1197.56	9982.44	1196.98	10000	1196.44
10029	1197.08	10040.05	1197.25	10045.85	1197.31	10049.3	1197.35	10063.54	1197.65
10085.14	1197.72	10102.06	1197.78	10108.77	1197.81	10140.58	1197.93	10162.55	1198.01
10179.1	1198.06	10216.33	1198.18	10217.62	1198.18	10220.88	1198.19	10256.14	1198.26
10270.11	1198.28	10294.66	1198.31	10323.89	1198.34	10333.18	1198.35	10356.63	1198.38
10371.7	1198.39	10377.67	1198.41	10410.22	1198.43	10431.45	1198.45	10448.74	1198.47
10485.23	1198.53	10487.26	1198.53	10492.37	1198.54	10525.78	1198.58	10539.02	1198.59
10564.3	1198.62	10592.8	1198.64	10602.82	1198.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9653.48	.042	9951.92	.043	10063.54	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9951.9	210063.54	1900	1985	1900	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1198.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1197.99	Reach Len. (ft)	2000.00	2000.00	2000.00
Crit W.S. (ft)	1197.99	Flow Area (sq ft)	93.12	103.05	16.63
E.G. Slope (ft/ft)	0.017391	Area (sq ft)	93.12	103.05	16.63
Q Total (cfs)	670.00	Flow (cfs)	200.49	445.16	24.36
Top Width (ft)	503.26	Top Width (ft)	297.05	111.62	94.58
Vel Total (ft/s)	3.15	Avg. Vel. (ft/s)	2.15	4.32	1.46
Max Chl Dpth (ft)	1.55	Hydr. Depth (ft)	0.31	0.92	0.18
Conv. Total (cfs)	5080.6	Conv. (cfs)	1520.3	3375.6	184.7
Length Wtd. (ft)	2000.00	Wetted Per. (ft)	297.06	111.65	94.58
Min Ch El (ft)	1196.44	Shear (lb/sq ft)	0.34	1.00	0.19
Alpha	1.40	Stream Power (lb/ft s)	0.73	4.33	0.28
Frctn Loss (ft)	10.83	Cum Volume (acre-ft)	5.96	11.55	5.21
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

SUMMARY OF MANNING'S N VALUES

River:3S1WS4A (H71)

Reach	River Sta.	n1	n2	n3
REACH 1	5.920	.042	.043	.042
REACH 1	5.678	.042	.043	.042
REACH 1	5.438	.042	.043	.042
REACH 1	5.167	.042	.043	.042
REACH 1	4.938	.042	.043	.042
REACH 1	4.717	.042	.043	.042
REACH 1	4.487	.042	.043	.042
REACH 1	4.230	.042	.043	.042
REACH 1	3.967	.042	.043	.042
REACH 1	3.687	.042	.043	.042
REACH 1	3.423	.042	.043	.042
REACH 1	3.221	.042	.043	.042
REACH 1	2.979	.042	.043	.042
REACH 1	2.812	.042	.043	.042
REACH 2	2.579	.042	.043	.042
REACH 2	2.303	.042	.043	.042
REACH 2	2.069	.042	.043	.042
REACH 2	1.814	.042	.043	.042
REACH 2	1.570	.042	.043	.042
REACH 2	1.291	.042	.043	.042
REACH 2	1.050	.042	.043	.042
REACH 2	0.818	.042	.043	.042
REACH 2	0.541	.042	.043	.042
REACH 2	0.285	.042	.043	.042
REACH 2	0.000	.042	.043	.042

River:3S1WS4B (H73)

Reach	River Sta.	n1	n2	n3
REACH 1	2.316	.042	.043	.042
REACH 1	2.076	.042	.043	.042
REACH 1	1.836	.042	.043	.042
REACH 1	1.589	.042	.043	.042
REACH 2	1.378	.042	.043	.042
REACH 2	1.125	.042	.043	.042
REACH 2	0.874	.042	.043	.042
REACH 2	0.577	.042	.043	.042

*REACH 2	0.292	.042*	.043*	.042*
*REACH 2	0.000	.042*	.043*	.042*

River:3S1WS3 (H29)

Reach	River Sta.	n1	n2	n3
*REACH 1	1.096	.042*	.043*	.042*
*REACH 1	0.745	.042*	.043*	.042*
*REACH 1	0.376	.042*	.043*	.042*

SUMMARY OF REACH LENGTHS

River: 3S1WS4A (H71)

Reach	River Sta.	Left	Channel	Right
*REACH 1	5.920	1250*	1277*	1250*
*REACH 1	5.678	1250*	1271*	1250*
*REACH 1	5.438	1350*	1430*	1350*
*REACH 1	5.167	1125*	1210*	1125*
*REACH 1	4.938	1100*	1162*	1100*
*REACH 1	4.717	1150*	1216*	1150*
*REACH 1	4.487	1250*	1359*	1250*
*REACH 1	4.230	1300*	1388*	1300*
*REACH 1	3.967	1400*	1479*	1400*
*REACH 1	3.687	1300*	1394*	1300*
*REACH 1	3.423	1000*	1067*	1000*
*REACH 1	3.221	1200*	1273*	1200*
*REACH 1	2.979	800*	884*	800*
*REACH 1	2.812	1150*	1233*	1150*
*REACH 2	2.579	1400*	1453*	1400*
*REACH 2	2.303	1150*	1239*	1150*
*REACH 2	2.069	1250*	1347*	1250*
*REACH 2	1.814	1200*	1283*	1200*
*REACH 2	1.570	1400*	1478*	1400*
*REACH 2	1.291	1200*	1270*	1200*
*REACH 2	1.050	1150*	1228*	1150*
*REACH 2	0.818	1400*	1461*	1400*
*REACH 2	0.541	1300*	1353*	1300*
*REACH 2	0.285	1500*	1500*	1500*
*REACH 2	0.000	5*	5*	5*

River: 3S1WS4B (H73)

Reach	River Sta.	Left	Channel	Right
*REACH 1	2.316	1200*	1265*	1200*
*REACH 1	2.076	1200*	1272*	1200*
*REACH 1	1.836	1250*	1302*	1250*
*REACH 1	1.589	1100*	1113*	1100*
*REACH 2	1.378	1300*	1335*	1300*
*REACH 2	1.125	1300*	1328*	1300*
*REACH 2	0.874	1500*	1567*	1500*
*REACH 2	0.577	1450*	1504*	1450*
*REACH 2	0.292	1500*	1542*	1500*
*REACH 2	0.000	5*	5*	5*

River: 3S1WS3 (H29)

Reach	River Sta.	Left	Channel	Right
*REACH 1	1.096	1800*	1849*	1800*
*REACH 1	0.745	1900*	1950*	1900*
*REACH 1	0.376	1900*	1985*	1900*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 3S1WS4A (H71)

Reach	River Sta.	Contr.	Expan.
REACH 1	5.920	.1	.3
REACH 1	5.678	.1	.3
REACH 1	5.438	.1	.3
REACH 1	5.167	.1	.3
REACH 1	4.938	.1	.3
REACH 1	4.717	.1	.3
REACH 1	4.487	.1	.3
REACH 1	4.230	.1	.3
REACH 1	3.967	.1	.3
REACH 1	3.687	.1	.3
REACH 1	3.423	.1	.3
REACH 1	3.221	.1	.3
REACH 1	2.979	.1	.3
REACH 1	2.812	.1	.3
REACH 2	2.579	.1	.3
REACH 2	2.303	.1	.3
REACH 2	2.069	.1	.3
REACH 2	1.814	.1	.3
REACH 2	1.570	.1	.3
REACH 2	1.291	.1	.3
REACH 2	1.050	.1	.3
REACH 2	0.818	.1	.3
REACH 2	0.541	.1	.3
REACH 2	0.285	.1	.3
REACH 2	0.000	.1	.3

River: 3S1WS4B (H73)

Reach	River Sta.	Contr.	Expan.
REACH 1	2.316	.1	.3
REACH 1	2.076	.1	.3
REACH 1	1.836	.1	.3
REACH 1	1.589	.1	.3
REACH 2	1.378	.1	.3
REACH 2	1.125	.1	.3
REACH 2	0.874	.1	.3
REACH 2	0.577	.1	.3
REACH 2	0.292	.1	.3
REACH 2	0.000	.1	.3

River: 3S1WS3 (H29)

Reach	River Sta.	Contr.	Expan.
REACH 1	1.096	.1	.3
REACH 1	0.745	.1	.3
REACH 1	0.376	.1	.3

MODEL: 3S1WS5 (B45)

REACH: 3S1WS5 (B45)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 3S1WS5 (B45)
Project File : 3S1WS5_B45.prj
Run Date and Time: 1/20/2005 1:13:21 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 3S1WS5 (B45)
Reaches: 3S1WS5 (B45)

****

PLAN DATA

Plan Title: 3S1WS5 (B45)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS5 (B45)\3S1WS5_B45.p01

Geometry Title: 3S1WS5 (B45)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS5 (B45)\3S1WS5_B45.g01

Flow Title : 3S1WS5 (B45)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS5 (B45)\3S1WS5_B45.f01

Plan Summary Information:

Number of:	Cross Sections =	15	Mulitple Openings =	0
	Culverts =	1	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 3S1WS52 (B45) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.093	PF 2	1	9775	10150
2.790	PF 2	1	9850	10150
2.540	PF 2	1	9940	10140
2.317	PF 2	1	9800	10140
2.095	PF 2	1	9875	10265
1.860	PF 2	1	9900	10125
1.617	PF 2	1	9890	10110
1.360	PF 2	1	9900	10100
1.110	PF 2	1	9900	10160
0.857	PF 2	1	9875	10125
0.643	PF 2	1	9715	10125
0.382	PF 2	1	9875	10075
0.265	PF 2	1	9900	10150
0.228	PF 2	1	9920	10140
0.005	PF 2	1	9990	10069

****

FLOW DATA

Flow Title: 3S1WS5 (B45)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS5 (B45)\3S1WS5_B45.f01

Flow Data (cfs)

River	Reach	RS	PF 1
3S1WS52 (B45)	REACH 1	3.093	3060
3S1WS52 (B45)	REACH 1	2.790	2980
3S1WS52 (B45)	REACH 1	2.540	2920
3S1WS52 (B45)	REACH 1	2.317	2860
3S1WS52 (B45)	REACH 1	2.095	2810
3S1WS52 (B45)	REACH 1	1.860	2750
3S1WS52 (B45)	REACH 1	1.617	2730
3S1WS52 (B45)	REACH 1	1.360	2700
3S1WS52 (B45)	REACH 1	1.110	2680
3S1WS52 (B45)	REACH 1	0.857	2660
3S1WS52 (B45)	REACH 1	0.643	2640
3S1WS52 (B45)	REACH 1	0.382	2620
3S1WS52 (B45)	REACH 1	0.265	2610
3S1WS52 (B45)	REACH 1	0.228	2600
3S1WS52 (B45)	REACH 1	0.005	2580

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
3S1WS52 (B45)	REACH 1	PF 1	Normal S = 0.0055	Known WS = 1119

****

GEOMETRY DATA

Geometry Title: 3S1WS5 (B45)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS5 (B45)\3S1WS5_B45.g01

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 3.093

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 76

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9367.8	1216.15	9386.42	1216.2	9387.82	1216.2	9389.43	1216.2	9423.26	1216.32
9452.69	1216.43	9458.7	1216.45	9465.62	1216.47	9494.14	1216.56	9518.95	1216.62
9529.58	1216.64	9541.81	1216.66	9565.03	1216.68	9585.21	1216.67	9600.47	1216.65
9618	1216.62	9635.91	1216.56	9651.48	1216.49	9671.35	1216.41	9694.2	1216.29
9706.79	1216.2	9718.02	1215.12	9723.11	1214.81	9732.65	1214.24	9768.75	1212.32
9784.56	1211.19	9792.89	1210.6	9834.42	1214.14	9848.56	1215.27	9850.27	1215.26
9884	1215.1	9916.54	1214.99	9919.44	1214.98	9922.77	1214.97	9974.04	1212.79
9981.15	1212.34	9995.34	1211.5	10000	1211.24	10001.28	1211.15	10008.85	1211.62
10051.85	1214.91	10068.54	1214.94	10116.25	1211.61	10125.37	1210.94	10134.34	1211.5
10148.19	1212.32	10154.81	1212.71	10187.61	1215.35	10209.54	1215.46	10227.3	1215.56
10262.11	1215.75	10266.99	1215.77	10282.04	1215.86	10306.68		12161	0314.67 1216.04
10346.37	1216.21	10367.23	1216.31	10386.06	1216.39	10419.8	1216.53	10425.75	1216.55
10467.49	1213.98	10491.11	1212.59	10498.38	1213.17	10511.44	1214.26	10518.32	1214.87
10544.82	1216.83	10577.49	1216.87	10584.51	1216.87	10606.13	1216.87	10624.2	1216.86
10630.06	1216.87	10663.89	1216.86	10682.62	1216.87	10703.58	1216.87	10735.18	1216.9
10743.27	1216.91								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9367.8	.045	9706.79	.038	10187.61	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9706.79	10187.61	1400	1600	1600	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

*		*		*		*		*	
* E.G. Elev (ft)	* 1215.00	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.30	* Wt. n-Val.	*	* 0.038	* 0.045	*
* W.S. Elev (ft)	* 1214.70	* Reach Len. (ft)	* 1400.00	* 1600.00	* 1600.00	*
* Crit W.S. (ft)	* 1214.03	* Flow Area (sq ft)	*	* 645.00	* 65.05	*
* E.G. Slope (ft/ft)	*0.005709	* Area (sq ft)	*	* 645.00	* 65.05	*
* Q Total (cfs)	* 3060.00	* Flow (cfs)	*	* 2890.33	* 169.67	*
* Top Width (ft)	* 405.22	* Top Width (ft)	*	* 344.51	* 60.71	*
* Vel Total (ft/s)	* 4.31	* Avg. Vel. (ft/s)	*	* 4.48	* 2.61	*
* Max Chl Dpth (ft)	* 4.10	* Hydr. Depth (ft)	*	* 1.87	* 1.07	*
* Conv. Total (cfs)	* 40499.9	* Conv. (cfs)	*	* 38254.3	* 2245.6	*
* Length Wtd. (ft)	* 1600.00	* Wetted Per. (ft)	*	* 345.30	* 60.86	*
* Min Ch El (ft)	* 1210.60	* Shear (lb/sq ft)	*	* 0.67	* 0.38	*
* Alpha	* 1.04	* Stream Power (lb/ft s)	*	* 2.98	* 0.99	*
* Frctn Loss (ft)	* 9.46	* Cum Volume (acre-ft)	* 34.97	* 166.29	* 78.99	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 44.33	* 98.99	* 78.79	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 2.790

INPUT
Description:
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9302.95	1208.22	9329.62	1208.21	9344.73	1208.19	9380.33	1208.1	9388.08	1208.08
9431.05	1207.93	9431.44	1207.93	9433.76	1207.92	9474.8	1207.75	9481.76	1207.72
9518.16	1207.58	9532.48	1207.52	9561.51	1207.42	9583.19	1207.34	9604.87	1207.27
9633.91	1207.16	9648.23	1207.1	9684.62	1206.94	9691.59	1206.91	9732.61	1206.7
9734.94	1206.69	9735.34	1206.68	9778.3	1206.43	9786.05	1206.38	9820.53	1204.72
9845.29	1203.45	9865.23	1202.39	9883.93	1203.07	9899.29	1203.68	9907.98	1204.09
9938.2	1205.44	9962.33	1203.58	9966.11	1203.28	9973.4	1202.7	9986.83	1201.63
10000	1200.59	10002.2	1200.49	10004.08	1200.62	10017.42	1201.78	10026.08	1202.58
10032.17	1203.09	10035.75	1203.31	10068.53	1203.21	10074.78	1203.38	10102.54	1205.79
10136.34	1205.82	10138.06	1205.82	10140.15	1205.82	10173.58	1205.8	10201.1	1205.77
10209.1	1205.76	10218.82	1205.76	10244.62	1205.73	10265.86	1205.71	10280.15	1205.71

```
 10297.5 1205.7110315.67  1205.710330.62 1205.7110351.19 1205.7310376.17 1205.74
10386.71 1205.7510395.38 1205.7510422.23 1205.7910454.85 1205.8210457.75 1205.82
10460.14 1205.8210493.27 1205.8810524.91  1205.9 10528.8 1205.9110534.14 1205.39
10538.33 1205.0610548.84 1204.2410577.22 1202.0210588.07 1202.7510602.04 1203.71
10635.36 1206.0810654.43 1206.1110670.88 1206.1410690.87 1206.17 10706.4  1206.2
10719.19 1206.2210741.92 1206.2710769.54 1206.3110777.44 1206.3310783.95 1206.34
10812.97 1206.3910848.22 1206.4410848.49 1206.4410848.71 1206.4410884.01 1206.48
10913.47  1206.510919.53  1206.510926.89  1206.510955.05  1206.510978.23 1206.48
10990.57 1206.4711005.57 1206.45

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9302.95    .045  9778.3    .03810102.54    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9778.310102.54             1340    1319    1280            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1205.54  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *          *    0.038 *    0.045 *
* W.S. Elev (ft)          * 1205.22  * Reach Len. (ft)         * 1340.00  * 1319.00 * 1280.00 *
* Crit W.S. (ft)          * 1204.53  * Flow Area (sq ft)       *          *   528.70 *   139.74 *
* E.G. Slope (ft/ft)      *0.006139  * Area (sq ft)            *          *   528.70 *   139.74 *
* Q Total (cfs)           * 2980.00  * Flow (cfs)              *          *  2484.57 *   495.43 *
* Top Width (ft)          *  364.68  * Top Width (ft)           *          *   277.80 *    86.87 *
* Vel Total (ft/s)        *    4.46  * Avg. Vel. (ft/s)         *          *     4.70 *     3.55 *
* Max Chl Dpth (ft)       *    4.73  * Hydr. Depth (ft)         *          *     1.90 *     1.61 *
* Conv. Total (cfs)       * 38032.8  * Conv. (cfs)              *          *  31709.8 *  6323.0 *
* Length Wtd. (ft)        * 1306.61  * Wetted Per. (ft)         *          *   278.32 *    87.11 *
* Min Ch El (ft)          * 1200.49  * Shear (lb/sq ft)         *          *     0.73 *     0.61 *
* Alpha                   *    1.03  * Stream Power (lb/ft s)   *          *     3.42 *     2.18 *
* Frctn Loss (ft)         *    8.18  * Cum Volume (acre-ft)     *   34.97  *   144.74 *    75.23 *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *   44.33  *    87.56 *    76.08 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 2.540

INPUT
Description:
Station Elevation Data      num=       60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9571.56 1197.65 9580.72 1197.63  9590.3 1197.62 9630.16 1197.59 9631.76 1197.58
 9632.14 1197.58 9673.22 1197.58 9683.57 1197.58 9714.68 1197.56 9734.99 1197.55
 9756.14 1197.53 9786.42 1197.49  9797.6 1197.49 9837.84 1197.45 9839.05 1197.45
 9844.09 1197.46 9880.51 1197.48 9889.27 1197.48 9921.97 1197.62 9945.47 1195.32
 9949.13 1194.92 9954.39 1194.34 9962.43 1193.41  9967.8 1192.72 9986.26 1192.54
 9991.52 1192.53   10000 1193.4510020.26  1195.610033.18 1196.9410037.44 1197.38
10039.73 1197.64 10046.5 1198.2510079.97 1198.1810101.42  1198.210117.73 1198.07
10153.61 1198.0310155.49 1198.0210156.35 1198.0210193.25 1197.8410211.27 1197.83
10231.01 1197.7710266.19 1197.7610274.45 1197.7610306.53 1197.7110325.29 1195.75
10330.49 1195.15 10339.7 1194.0310359.45 1191.4610360.08 1191.3810361.23 1191.49
10389.89 1194.3210419.81 1197.4610430.96 1197.4410457.57 1197.3710485.88 1197.31
10495.33 1197.2910516.14 1197.2510533.09 1197.22 10540.8 1197.2110570.85 1197.15

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9571.56    .045 9921.97    .038 10046.5    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9921.97 10046.5            1115    1177    1175            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1197.34  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.47  * Wt. n-Val.              *          *    0.038 *    0.045 *
* W.S. Elev (ft)          * 1196.87  * Reach Len. (ft)         * 1115.00  * 1177.00 * 1175.00 *
```

* Crit W.S. (ft)	* 1195.87	* Flow Area (sq ft)	*	* 263.88	* 269.81	*
* E.G. Slope (ft/ft)	*0.006387	* Area (sq ft)	*	* 263.88	* 269.81	*
* Q Total (cfs)	* 2920.00	* Flow (cfs)	*	* 1541.47	* 1378.53	*
* Top Width (ft)	* 202.36	* Top Width (ft)	*	* 102.80	* 99.55	*
* Vel Total (ft/s)	* 5.47	* Avg. Vel. (ft/s)	*	* 5.84	* 5.11	*
* Max Chl Dpth (ft)	* 5.49	* Hydr. Depth (ft)	*	* 2.57	* 2.71	*
* Conv. Total (cfs)	* 36536.0	* Conv. (cfs)	*	* 19287.4	* 17248.6	*
* Length Wtd. (ft)	* 1170.58	* Wetted Per. (ft)	*	* 103.26	* 100.16	*
* Min Ch El (ft)	* 1192.53	* Shear (lb/sq ft)	*	* 1.02	* 1.07	*
* Alpha	* 1.01	* Stream Power (lb/ft s)	*	* 5.95	* 5.49	*
* Frctn Loss (ft)	* 7.30	* Cum Volume (acre-ft)	* 34.97	* 132.74	* 69.21	*
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 44.33	* 81.80	* 73.34	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 2.317

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9636.84	1190.75	9642.25	1190.72	9675.57	1190.53	9694.69	1190.44	9725.62	1190.26
9747.12	1190.17	9775.68	1190.02	9815.78	1187.39	9833.34	1186.17	9845.83	1187.11
9875.78	1189.61	9904.43	1189.53	9925.83	1189.48	9963.02	1187.81	9989.64	1186.54
10000	1186.05	10000.36	1186.03	10001.86	1186.03	10002.31	1186.03	10007.03	1186.06
10067	1188.81	10073.87	1189.09	10081.07	1189.48	10084.99	1189.49	10118.3	1189.56
10140.97	1189.61	10155.53	1189.64	10184.46	1189.67	10192.77	1189.69	10196.95	1189.69
10230	1189.76	10252.93	1189.77	10276.06	1188.42	10307.56	1185.66	10312.5	1186.13
10364.89	1189.91	10378.93	1189.92	10406.8	1189.93	10416.16	1189.94	10420.88	1189.94
10453.39	1189.96	10476.86	1189.97	10490.63	1189.97	10517.97	1189.98	10527.86	1189.98
10532.84	1189.99	10565.09	1190.01	10588.82	1190.03	10602.32	1190.03		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9636.84	.045	9925.83	.038	10081.07	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9925.83	10081.07	1070	1172	1140	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1189.99	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.28	* Wt. n-Val.	* 0.045	* 0.038	* 0.045 *
* W.S. Elev (ft)	* 1189.70	* Reach Len. (ft)	* 1070.00	* 1172.00	* 1140.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 178.78	* 312.04	* 217.99 *
* E.G. Slope (ft/ft)	*0.006079	* Area (sq ft)	* 178.78	* 312.04	* 217.99 *
* Q Total (cfs)	* 2860.00	* Flow (cfs)	* 527.83	* 1514.20	* 817.97 *
* Top Width (ft)	* 531.18	* Top Width (ft)	* 145.33	* 155.24	* 230.60 *
* Vel Total (ft/s)	* 4.03	* Avg. Vel. (ft/s)	* 2.95	* 4.85	* 3.75 *
* Max Chl Dpth (ft)	* 4.04	* Hydr. Depth (ft)	* 1.23	* 2.01	* 0.95 *
* Conv. Total (cfs)	* 36681.0	* Conv. (cfs)	* 6769.8	* 19420.4	* 10490.8 *
* Length Wtd. (ft)	* 1150.10	* Wetted Per. (ft)	* 145.59	* 155.40	* 230.91 *
* Min Ch El (ft)	* 1186.03	* Shear (lb/sq ft)	* 0.47	* 0.76	* 0.36 *
* Alpha	* 1.11	* Stream Power (lb/ft s)	* 1.38	* 3.70	* 1.34 *
* Frctn Loss (ft)	* 8.11	* Cum Volume (acre-ft)	* 32.68	* 124.96	* 62.63 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 42.47	* 78.31	* 68.89 *

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 2.095

```
INPUT
Description:
Station Elevation Data    num=      66
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9554.14  1183.7 9581.69 1184.12 9606.95 1184.02 9626.48 1183.95 9664.35 1183.79
 9713.29 1183.58 9721.75 1183.55 9728.29 1183.52 9779.15 1183.29 9830.09 1183.03
 9836.55    1183 9882.71 1180.51 9892.54 1180.23 9896.52 1180.21 9897.16 1180.21
 9914.37 1180.02  9918.3 1179.98 9930.09 1179.75 9939.29 1179.53 9947.67 1179.49
 9955.09 1179.37 9967.42 1179.34 9971.79 1179.31 9999.81 1179.25   10000 1179.24
10000.86 1179.2410008.28 1179.4910062.52 1182.1910069.54 1182.18 10086.2 1182.17
10107.71 1182.1510116.77 1182.1410145.89  1182.110171.02 1182.0710187.21 1181.45
10192.21 1181.3210196.18 1181.2110201.42 1181.0510208.75 1180.8210217.21 1180.51
10231.11 1179.9810240.43 1179.6310244.82 1179.8510251.88 1180.23 10298.6 1181.68
10333.77 1181.5210338.78  1181.310342.06  1181.210356.23 1180.6610417.84 1178.11
10430.17 1178.73 10464.8 1180.4910489.49 1181.9710496.53 1182.0110527.67 1182.22
10550.78 1182.3310565.84  1182.410601.62 1182.5410604.02 1182.5510605.03 1182.55
 10642.2 1182.6410659.28 1182.6710680.37 1182.6810713.53 1182.6810718.55 1182.68
10730.47 1182.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9554.14    .045 9830.09    .03810062.52    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9830.0910062.52             1495    1241    1150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1181.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.29  * Wt. n-Val.              *          *    0.038 *    0.045 *
* W.S. Elev (ft)         * 1181.58  * Reach Len. (ft)         * 1495.00  * 1241.00  * 1150.00  *
* Crit W.S. (ft)         * 1181.06  * Flow Area (sq ft)       *          *  296.10  *  364.57  *
* E.G. Slope (ft/ft)     *0.008302  * Area (sq ft)            *          *  296.10  *  364.57  *
* Q Total (cfs)          * 2810.00  * Flow (cfs)              *          * 1430.69  * 1379.31  *
* Top Width (ft)         *  461.38  * Top Width (ft)           *          *  187.39  *  273.98  *
* Vel Total (ft/s)       *    4.25  * Avg. Vel. (ft/s)         *          *    4.83  *    3.78  *
* Max Chl Dpth (ft)      *    3.47  * Hydr. Depth (ft)         *          *    1.58  *    1.33  *
* Conv. Total (cfs)      * 30840.3  * Conv. (cfs)              *          * 15702.2  * 15138.2  *
* Length Wtd. (ft)       * 1226.23  * Wetted Per. (ft)         *          *  187.49  *  274.22  *
* Min Ch El (ft)         * 1179.24  * Shear (lb/sq ft)         *          *    0.82  *    0.69  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)   *          *    3.95  *    2.61  *
* Frctn Loss (ft)        *    6.19  * Cum Volume (acre-ft)     *   30.49  *  116.78  *   55.01  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *   40.69  *   73.70  *   62.28  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 1.860

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9717.92  1175.9 9729.76 1175.81 9748.63 1175.64 9781.39 1175.31 9789.69 1175.23
  9821.9 1174.91 9830.75 1174.82 9833.02  1174.8  9871.8 1174.52 9884.66 1174.44
 9912.86 1174.34 9936.29 1174.29 9989.65 1171.69   10000 1170.9910001.69 1170.87
10027.83 1172.4510071.33 1174.0110078.67 1173.5710087.95 1172.9610107.51 1171.66
10113.66 1171.93 10131.6 1172.71 10140.5 1173.1110172.51 1175.1310200.97 1175.27
10207.88  1175.310214.43 1175.3310243.24 1175.4710273.62 1175.5910278.61 1175.61
10283.35 1175.6310313.98 1175.7410346.28 1175.8310349.35 1175.8410352.26 1175.84
10384.72 1175.9410418.93    117610420.08 1176.0110421.18 1176.0110455.45 1176.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9717.92    .045 9936.29    .03810172.51    .045
```

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9936.2910172.51              1245    1281    1255              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1175.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.26  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1175.41  * Reach Len. (ft)         * 1245.00  * 1281.00  * 1255.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  114.65  *  605.88  *    8.26  *
* E.G. Slope (ft/ft)      *0.003367  * Area (sq ft)            *  114.65  *  605.88  *    8.26  *
* Q Total (cfs)           * 2750.00  * Flow (cfs)              *  172.28  * 2573.45  *    4.27  *
* Top Width (ft)          *  460.15  * Top Width (ft)          *  165.06  *  236.22  *   58.88  *
* Vel Total (ft/s)        *    3.77  * Avg. Vel. (ft/s)        *    1.50  *    4.25  *    0.52  *
* Max Chl Dpth (ft)       *    4.54  * Hydr. Depth (ft)        *    0.69  *    2.56  *    0.14  *
* Conv. Total (cfs)       * 47393.4  * Conv. (cfs)             *  2969.1  * 44350.6  *   73.6  *
* Length Wtd. (ft)        * 1271.73  * Wetted Per. (ft)        *  165.06  *  236.56  *   58.88  *
* Min Ch El (ft)          * 1170.87  * Shear (lb/sq ft)        *    0.15  *    0.54  *    0.03  *
* Alpha                   *    1.20  * Stream Power (lb/ft s)   *    0.22  *    2.29  *    0.02  *
* Frctn Loss (ft)         *    8.34  * Cum Volume (acre-ft)     *   28.52  *  103.93  *   50.09  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *   37.85  *   67.67  *   57.89  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 1.617

INPUT
Description:
Station Elevation Data     num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9633.82 1168.04 9657.79 1167.89 9683.65 1167.05  9685.6 1166.87 9689.11  1166.6
 9694.05 1166.25 9701.11 1165.85 9707.77 1165.59 9742.88 1163.85 9747.33 1163.87
 9747.89 1163.87 9748.47 1163.87 9750.64 1164.03 9826.24 1166.89 9827.78 1166.89
    9841 1166.85 9878.05 1166.74 9882.38 1166.73 9928.32 1166.66 9938.53 1166.65
  9978.6 1166.61   10000 1165.9610011.29 1165.8810014.97 1165.7910019.66 1165.68
10026.57 1165.5610035.28 1165.4210052.78 1165.2410061.06  1165.110071.73 1164.93
10084.45 1164.7510091.65 1164.6410097.23 1164.7310100.47 1164.8210115.11 1165.11
10126.31 1165.3410134.78 1165.5610139.91 1165.7210172.25 1166.5910176.19 1166.71
10178.96 1166.8110182.58 1166.9810206.07  1167.510226.05 1167.5710234.31  1167.6
10264.33 1167.6910288.41 1167.7510302.61 1167.7910336.97 1167.8710340.89 1167.88
10342.51 1167.8810379.17 1167.92

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9633.82    .045  9978.6    .03810172.25    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9978.610172.25               1290    1356    1350              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1167.32  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.54  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1166.78  * Reach Len. (ft)         * 1290.00  * 1356.00  * 1350.00  *
* Crit W.S. (ft)          * 1166.78  * Flow Area (sq ft)       *  219.20  *  243.60  *    0.55  *
* E.G. Slope (ft/ft)      *0.018108  * Area (sq ft)            *  219.20  *  243.60  *    0.55  *
* Q Total (cfs)           * 2730.00  * Flow (cfs)              * 1236.01  * 1493.48  *    0.51  *
* Top Width (ft)          *  447.91  * Top Width (ft)          *  248.53  *  193.65  *    5.73  *
* Vel Total (ft/s)        *    5.89  * Avg. Vel. (ft/s)        *    5.64  *    6.13  *    0.93  *
* Max Chl Dpth (ft)       *    2.92  * Hydr. Depth (ft)        *    0.88  *    1.26  *    0.10  *
* Conv. Total (cfs)       * 20287.6  * Conv. (cfs)             *  9185.2  * 11098.6  *     3.8  *
* Length Wtd. (ft)        * 1336.74  * Wetted Per. (ft)        *  248.67  *  193.69  *    5.73  *
* Min Ch El (ft)          * 1164.64  * Shear (lb/sq ft)        *    1.00  *    1.42  *    0.11  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)   *    5.62  *    8.72  *    0.10  *
* Frctn Loss (ft)         *    8.86  * Cum Volume (acre-ft)     *   23.75  *   91.44  *   49.96  *
* C & E Loss (ft)         *    0.11  * Cum SA (acres)           *   31.94  *   61.35  *   56.96  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
```

program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 1.360

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9657.64	1157.51	9694.91	1157.3	9700.09	1157.26	9746.12	1157.07	9750.1	1157.06
9797.33	1156.9	9800.12	1156.89	9848.54	1156.69	9850.13	1156.69	9899.75	1156.42
9900.14	1156.42	9916.6	1156.33	9950.16	1156.14	9960.96	1155.64	10000	1153.74
10002.2	1153.62	10006.41	1153.81	10014.16	1154.21	10068.44	1155.97	10072.26	1155.97
10076.36	1155.98	10107.64	1156.03	10136.66	1156.09	10143.02	1156.11	10149.87	1156.12
10178.4	1156.18	10204.87	1156.23	10213.78	1156.25	10223.37	1156.27	10249.16	1156.31
10295.78	1155.26	10307.44	1155.08	10313.6	1155.15	10327.03	1155.31	10348.83	1155.66
10362.55	1155.84	10374.35	1156	10381.68	1156.09	10409.51	1156.64	10426.06	1156.7
10443.89	1156.78	10461.44	1156.85	10477.72	1156.92	10496.82	1157	10517.39	1157.1
10532.2	1157.17	10545.93	1157.23	10567.58	1157.31	10590.9	1157.41	10602.96	1157.44
10614.14	1157.48	10638.34	1157.53	10664.4	1157.59	10673.72	1157.62	10682.36	1157.64

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9657.64	.045	9950.16	.038	10068.44	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9950.16	10068.44	1245	1320	1230	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1157.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1157.43	Reach Len. (ft)	1245.00	1320.00	1230.00
Crit W.S. (ft)	1156.88	Flow Area (sq ft)	172.95	301.68	579.45
E.G. Slope (ft/ft)	0.003385	Area (sq ft)	172.95	301.68	579.45
Q Total (cfs)	2700.00	Flow (cfs)	241.66	1280.50	1177.85
Top Width (ft)	929.54	Top Width (ft)	278.85	118.28	532.42
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)	1.40	4.24	2.03
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	0.62	2.55	1.09
Conv. Total (cfs)	46405.9	Conv. (cfs)	4153.4	22008.4	20244.1
Length Wtd. (ft)	1294.44	Wetted Per. (ft)	278.85	118.38	532.44
Min Ch El (ft)	1153.62	Shear (lb/sq ft)	0.13	0.54	0.23
Alpha	1.60	Stream Power (lb/ft s)	0.18	2.29	0.47
Frctn Loss (ft)	8.73	Cum Volume (acre-ft)	17.94	82.95	40.97
C & E Loss (ft)	0.02	Cum SA (acres)	24.13	56.49	48.62

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 1.110

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9499.46  1148.9 9505.42 1148.91  9513.4 1148.88 9520.79 1148.88 9550.73 1148.89
 9565.52 1148.88 9588.06 1148.86 9621.29 1148.78 9625.39 1148.76 9633.67 1148.73
 9662.71 1148.61 9677.07 1148.54 9700.04 1148.43 9732.84 1148.23 9737.37 1148.21
 9746.55 1148.15  9774.7 1147.99  9788.6  1147.9 9812.02 1147.76 9844.37 1147.57
 9849.35 1147.54 9859.42 1147.49 9886.68 1147.34 9900.14 1147.28 9924.01 1147.18
 9957.94 1147.55 9967.58 1147.58 9981.52 1147.62 9988.15 1147.62  9990.3 1147.64
 9996.73 1147.57   10000 1147.5310009.87 1147.4610019.92  1147.410043.49 1147.31
10051.74 1147.2710055.47 1147.2510058.58 1147.2310061.16 1147.2110064.96 1147.18
10094.05 1147.2610103.87 1147.3710112.59 1147.46 10133.2  1147.510147.55 1147.52
10175.54 1147.4610191.46 1147.52 10210.9  1147.610231.02 1147.6910246.26 1147.76
10260.97 1147.8110281.62 1147.91   10303    114810316.98 1148.0610347.46 1147.92
10368.88 1147.9410384.58 1147.9510423.06 1148.5110446.96 1148.6110458.42 1148.65
10469.49 1148.6810493.78 1148.7610518.94 1148.8210529.14 1148.8310538.99 1148.85
 10564.5 1148.8610590.92 1148.8610599.86 1148.86 10608.5 1148.8510635.22 1148.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9499.46    .045  9788.6    .03810316.98    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9788.610316.98             1310    1337    1465             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1148.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.40  * Wt. n-Val.              *   0.045  *    0.038  *   0.045  *
* W.S. Elev (ft)         * 1148.45  * Reach Len. (ft)         * 1310.00  * 1337.00  * 1465.00  *
* Crit W.S. (ft)         * 1148.45  * Flow Area (sq ft)       *   25.45  *   486.38  *   41.93  *
* E.G. Slope (ft/ft)     *0.019656  * Area (sq ft)            *   25.45  *   486.38  *   41.93  *
* Q Total (cfs)          * 2680.00  * Flow (cfs)              *   49.56  * 2523.20  *  107.24  *
* Top Width (ft)         *  723.76  * Top Width (ft)          *   93.25  *   528.38  *  102.13  *
* Vel Total (ft/s)       *    4.84  * Avg. Vel. (ft/s)        *    1.95  *     5.19  *    2.56  *
* Max Chl Dpth (ft)      *    1.27  * Hydr. Depth (ft)        *    0.27  *     0.92  *    0.41  *
* Conv. Total (cfs)      * 19115.7  * Conv. (cfs)             *   353.5  * 17997.3  *  764.9  *
* Length Wtd. (ft)       * 1362.48  * Wetted Per. (ft)        *   93.25  *   528.39  *  102.13  *
* Min Ch El (ft)         * 1147.18  * Shear (lb/sq ft)        *    0.33  *     1.13  *    0.50  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)   *    0.65  *     5.86  *    1.29  *
* Frctn Loss (ft)        *    7.88  * Cum Volume (acre-ft)     *   15.11  *    71.01  *   32.20  *
* C & E Loss (ft)        *    0.08  * Cum SA (acres)           *   18.82  *    46.70  *   39.66  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 0.857

INPUT
Description:
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9441.54  1140.7 9443.33  1140.7 9457.46 1140.68 9494.95 1140.62 9498.55 1140.61
 9512.59 1140.58 9539.63 1140.53 9546.56 1140.52 9580.72 1140.44 9598.18  1140.4
  9621.8 1140.34  9649.8 1140.26 9662.89 1140.23 9701.41 1140.11 9703.98 1140.11
 9713.98 1140.08 9745.06 1139.98 9753.03 1139.96 9786.15 1139.86 9804.64  1139.8
 9827.23 1139.73 9856.26 1139.65 9868.32 1139.61 9939.35 1136.52 9939.72 1136.49
 9941.04 1136.54   10000 1138.8710011.15  1139.310032.42 1139.2810074.69 1138.77
10088.13 1138.6710092.15 1138.6410105.04 1138.7510154.76 1139.3210166.52 1139.34
10186.97 1139.3810230.09 1139.5810237.47 1139.5310249.35 1139.4910257.76 1139.46
10295.18 1139.5610309.46  1139.610314.02 1139.6110316.22 1139.6210321.89 1139.68
10358.66 1139.7610373.68 1139.7910399.44 1139.8410425.47 1139.8910440.22 1139.92
10477.26 1139.99   10481    114010494.85 1140.0410521.78  1140.110529.05 1140.12
10562.56 1140.2210580.84 1140.2710603.34 1140.3610632.63 1140.4610644.12  1140.5
10684.42 1140.67 10684.9 1140.6710686.67 1140.6810725.68 1140.8310736.21 1140.87
```

```
10766.46 1140.98   10788 1141.0610807.24 1141.13 10839.8 1141.2410848.02 1141.27
10878.49 1141.36 10888.8 1141.3910891.59  1141.410929.58  1141.510943.38 1141.53
10970.36 1141.5710995.17 1141.6211011.14 1141.6411046.96 1141.6811051.92 1141.68
11070.31 1141.68 11092.7 1141.6911098.75 1141.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9441.54    .045 9868.32    .03810011.15    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9868.3210011.15             1090    1132    1155            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1140.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1140.63  * Reach Len. (ft)         * 1090.00  * 1132.00  * 1155.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  176.73  *  378.21  *  614.76  *
* E.G. Slope (ft/ft)      *0.002708  * Area (sq ft)            *  176.73  *  378.21  *  614.76  *
* Q Total (cfs)           * 2660.00  * Flow (cfs)              *  183.28  * 1472.06  * 1004.65  *
* Top Width (ft)          * 1182.44  * Top Width (ft)          *  376.88  *  142.83  *  662.74  *
* Vel Total (ft/s)        *    2.27  * Avg. Vel. (ft/s)        *    1.04  *    3.89  *    1.63  *
* Max Chl Dpth (ft)       *    4.14  * Hydr. Depth (ft)        *    0.47  *    2.65  *    0.93  *
* Conv. Total (cfs)       * 51119.4  * Conv. (cfs)             *  3522.3  * 28289.8  * 19307.3  *
* Length Wtd. (ft)        * 1134.91  * Wetted Per. (ft)        *  376.88  *  142.95  *  662.75  *
* Min Ch El (ft)          * 1136.49  * Shear (lb/sq ft)        *    0.08  *    0.45  *    0.16  *
* Alpha                   *    1.83  * Stream Power (lb/ft s)   *    0.08  *    1.74  *    0.26  *
* Frctn Loss (ft)         *    6.47  * Cum Volume (acre-ft)    *   12.07  *   57.74  *   21.16  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   11.75  *   36.39  *   26.80  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 0.643

INPUT
Description:
Station Elevation Data    num=      87
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9339.13 1136.05 9364.08 1136.24 9373.21 1136.33 9376.91 1136.33 9415.75  1135.8
  9442.6  1135.5    9448 1135.48  9452.9 1135.48 9457.39 1135.47 9461.74 1135.46
 9465.89 1135.45 9495.01 1135.41 9500.61  1135.4  9505.8 1135.39 9510.46 1135.38
 9549.68 1134.66 9563.35 1134.58 9613.59 1134.29 9614.36 1134.28 9614.87 1134.28
 9617.39 1134.27 9665.37 1134.01 9732.62 1131.78 9742.48 1131.48 9769.78 1132.17
 9818.39 1133.42 9869.25  1133.3  9869.4  1133.3 9870.02  1133.3 9920.41 1133.18
 9964.88 1133.43 9974.65 1133.51  9987.8  1133.6 9992.76 1133.64 9999.48 1133.57
   10000 1133.5710010.25 1133.4210015.87 1133.3510019.09  1133.310034.47 1133.08
10047.01  1133.110070.59 1133.1310086.01 1133.1510106.71 1133.1710138.38 1133.19
10142.83  1133.210145.75  1133.210178.95 1133.2210205.49 1133.2510215.08 1133.26
10229.74 1133.28 10251.2 1133.3210265.23 1133.3510287.32  1133.4 10321.1 1133.49
10323.44  1133.510324.97 1133.5110359.56 1133.6210384.71 1133.7210395.68 1133.76
10412.47 1133.83 10431.8  1133.910444.45 1133.9510467.92 1134.0510503.83 1134.18
10504.05 1134.1810504.19 1134.1810540.17 1134.3110563.93 1134.3910576.29 1134.43
 10595.2 1134.4810612.41 1134.5410623.66 1134.5710648.53 1134.64 10683.4 1134.73
10684.65 1134.7310686.56 1134.7410720.77 1134.8210743.15 1134.86 10756.9 1134.89
10777.93 1134.9410793.02 1134.9710802.89    113510829.14 1135.0610862.63 1135.14
10865.26 1135.1410869.29 1135.15

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9339.13    .045 9665.37    .03810503.83    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9665.3710503.83             1315    1375    1385            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1134.29  * Element                 *  Left OB *  Channel * Right OB *
```

* Vel Head (ft)	* 0.31	* Wt. n-Val.	*	* 0.038	*	*
* W.S. Elev (ft)	* 1133.98	* Reach Len. (ft)	* 1315.00	* 1375.00	* 1385.00	*
* Crit W.S. (ft)	* 1133.92	* Flow Area (sq ft)	*	* 589.57	*	*
* E.G. Slope (ft/ft)	*0.019183	* Area (sq ft)	*	* 589.57	*	*
* Q Total (cfs)	* 2640.00	* Flow (cfs)	*	* 2640.00	*	*
* Top Width (ft)	* 784.15	* Top Width (ft)	*	* 784.15	*	*
* Vel Total (ft/s)	* 4.48	* Avg. Vel. (ft/s)	*	* 4.48	*	*
* Max Chl Dpth (ft)	* 2.50	* Hydr. Depth (ft)	*	* 0.75	*	*
* Conv. Total (cfs)	* 19061.0	* Conv. (cfs)	*	* 19061.0	*	*
* Length Wtd. (ft)	* 1375.26	* Wetted Per. (ft)	*	* 784.22	*	*
* Min Ch El (ft)	* 1131.48	* Shear (lb/sq ft)	*	* 0.90	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 4.03	*	*
* Frctn Loss (ft)	* 7.64	* Cum Volume (acre-ft)	* 9.86	* 45.17	* 13.01	*
* C & E Loss (ft)	* 0.05	* Cum SA (acres)	* 7.03	* 24.35	* 18.01	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 0.382

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9702.81	1126.94	9732.72	1126.81	9751.99	1126.71	9793.34	1126.48	9812.51	1126.37
9818.21	1126.1	9819.61	1126.05	9823.38	1125.89	9885.76	1124.66	9895.15	1123.94
9919.03	1122.08	9925.69	1121.57	9957.45	1122.26	9960.85	1122.36	9984	1122.87
9984.63	1122.89	9985.11	1122.89	10000	1123.29	10009.81	1123.83	10019.9	1124.22
10022.62	1124.29	10025.19	1124.33	10027.57	1124.36	10031.95	1124.39	10036.12	1124.41
10040.14	1124.44	10048.11	1124.61	10092.76	1125.06	10099.29	1125.23	10105.03	1125.37
10109.98	1125.41	10169.46	1125.93	10172.21	1125.94	10174.41	1125.98	10181.58	1126.23
10224.38	1125.28	10241.57	1124.91	10242.89	1124.93	10274.93	1125.75	10289.8	1126.13
10335.73	1126.47	10347.46	1126.67	10369.28	1127.05	10389.73	1127.13	10416.92	1127.24
10425.43	1127.27	10431.84	1127.31	10461.14	1127.41	10494.41	1127.51	10496.85	1127.52
10500.1	1127.53	10532.56	1127.63	10556.97	1127.71	10568.26	1127.73	10583.28	1127.76

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9702.81	.045	9818.21	.038	10181.58	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9818.2 10181.58 600 622 630 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1126.60	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.16	* Wt. n-Val.	* 0.045	* 0.038	* 0.045	*
* W.S. Elev (ft)	* 1126.45	* Reach Len. (ft)	* 600.00	* 622.00	* 630.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1.68	* 761.98	* 104.41	*
* E.G. Slope (ft/ft)	*0.002587	* Area (sq ft)	* 1.68	* 761.98	* 104.41	*
* Q Total (cfs)	* 2620.00	* Flow (cfs)	* 0.57	* 2482.16	* 137.28	*
* Top Width (ft)	* 532.83	* Top Width (ft)	* 18.72	* 363.37	* 150.74	*
* Vel Total (ft/s)	* 3.02	* Avg. Vel. (ft/s)	* 0.34	* 3.26	* 1.31	*
* Max Chl Dpth (ft)	* 4.87	* Hydr. Depth (ft)	* 0.09	* 2.10	* 0.69	*
* Conv. Total (cfs)	* 51507.1	* Conv. (cfs)	* 11.1	* 48797.2	* 2698.8	*
* Length Wtd. (ft)	* 622.99	* Wetted Per. (ft)	* 18.73	* 363.57	* 150.77	*
* Min Ch El (ft)	* 1121.57	* Shear (lb/sq ft)	* 0.01	* 0.34	* 0.11	*
* Alpha	* 1.11	* Stream Power (lb/ft s)	* 0.00	* 1.10	* 0.15	*
* Frctn Loss (ft)	* 2.06	* Cum Volume (acre-ft)	* 9.83	* 23.84	* 11.35	*
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 6.75	* 6.24	* 15.62	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

```
RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 0.265

INPUT
Description: Upstream of 3-48" CMP's which cross Patterson Road.
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9752.23 1124.09  9802.3 1123.76 9815.51  1123.7 9836.49 1123.61 9869.11 1123.47
 9889.64 1123.37 9922.71 1123.21 9947.13 1123.11 9955.12 1123.11 9976.27 1123.11
 9980.74 1123.11    9981 1121.26    9999  1114.7   10000 1114.73   10016  1121.8
10016.31 1123.1110018.09 1123.1110020.29 1123.1110025.52 1123.11 10030.5 1123.11
10041.93 1123.1110043.26 1123.1110052.97 1123.1110055.49 1122.9210056.14 1122.87
10065.05  1122.210068.38 1122.2510073.84 1121.9810088.27 1120.84 10094.4 1121.08
10101.92 1121.3510107.61 1121.5510111.67 1121.7210117.53 1121.9910120.25 1122.16
10149.79 1122.8510181.13 1122.93 10202.4 1122.9910232.03 1123.0710245.14 1123.11
10282.94 1123.2110287.87 1123.2210313.66 1123.29 10330.6 1123.3310333.85 1123.34
10373.34 1123.4210384.75 1123.4510401.56 1123.4810441.78 1123.9310464.05 1124.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9752.23    .045 9980.74    .03810016.31    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.7410016.31              195     195     195            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1124.50  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.58  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1123.92  * Reach Len. (ft)         *  195.00  *  195.00  *  195.00  *
* Crit W.S. (ft)          * 1123.92  * Flow Area (sq ft)       *   99.90  *  207.62  *  413.40  *
* E.G. Slope (ft/ft)      *0.004377  * Area (sq ft)            *   99.90  *  207.62  *  413.40  *
* Q Total (cfs)           * 2610.00  * Flow (cfs)              *  135.96  * 1587.36  *  886.69  *
* Top Width (ft)          *  663.58  * Top Width (ft)          *  203.17  *   35.57  *  424.84  *
* Vel Total (ft/s)        *    3.62  * Avg. Vel. (ft/s)        *    1.36  *    7.65  *    2.14  *
* Max Chl Dpth (ft)       *    9.22  * Hydr. Depth (ft)        *    0.49  *    5.84  *    0.97  *
* Conv. Total (cfs)       * 39449.4  * Conv. (cfs)             *  2054.9  * 23992.4  * 13402.0  *
* Length Wtd. (ft)        *  195.00  * Wetted Per. (ft)        *  203.17  *   40.87  *  424.96  *
* Min Ch El (ft)          * 1114.70  * Shear (lb/sq ft)        *    0.13  *    1.39  *    0.27  *
* Alpha                   *    2.84  * Stream Power (lb/ft s)   *    0.18  *   10.61  *    0.57  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *    9.13  *   16.91  *    7.60  *
* C & E Loss (ft)         *          * Cum SA (acres)          *    5.22  *    3.39  *   11.45  *
*****************************************************************************************

Warning: The program could not calculate a water surface from the given energy within 100 trials.  The
         program used the water surface at minimum error.
Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.

CULVERT


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 0.257

INPUT
Description: 3 - 48" CMP's
Structure 7
Crosses Patterson Rd.
Distance from Upstream XS =       40
Deck/Roadway Width        =       34
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*************************************************************************
    9000    1124          9946.13 1121.08           10000 1121.29
 10099.5  1119.8           11000    1116

Upstream Bridge Cross Section Data
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9752.23 1124.09  9802.3 1123.76 9815.51  1123.7 9836.49 1123.61 9869.11 1123.47
 9889.64 1123.37 9922.71 1123.21 9947.13 1123.11 9955.12 1123.11 9976.27 1123.11
 9980.74 1123.11    9981 1121.26    9999  1114.7   10000 1114.73   10016  1121.8
10016.31 1123.1110018.09 1123.1110020.29 1123.1110025.52 1123.11 10030.5 1123.11
10041.93 1123.1110043.26 1123.1110052.97 1123.1110055.49 1122.9210056.14 1122.87
```

```
10065.05  1122.210068.38 1122.2510073.84 1121.9810088.27 1120.84 10094.4 1121.08
10101.92 1121.3510107.61 1121.5510111.67 1121.7210117.53 1121.9910120.25 1122.16
10149.79 1122.8510181.13 1122.93 10202.4 1122.9910232.03 1123.0710245.14 1123.11
10282.94 1123.2110287.87 1123.2210313.66 1123.29 10330.6 1123.3310333.85 1123.34
10373.34 1123.4210384.75 1123.4510401.56 1123.4810441.78 1123.9310464.05 1124.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9752.23    .045 9980.74    .03810016.31    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9980.7410016.31              .1       .3

Downstream  Deck/Roadway Coordinates
    num=        5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*******************************************************************
    9000    1123         9946.13 1120.12           10000 1121.18
 10099.5 1119.77           11000    1116

Downstream Bridge Cross Section Data
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9232 1124.13 9270.05 1124.02 9275.97    1124 9320.11 1123.85 9328.46 1123.82
 9370.16 1123.69 9380.95 1123.66 9420.21 1123.54 9433.44 1123.51 9470.27 1123.41
 9485.93 1123.38 9520.32  1123.3 9538.42 1123.28 9570.37 1123.23 9590.91 1123.21
 9620.43 1123.16  9643.4 1123.14 9670.48 1123.09 9695.88 1123.06 9716.43 1121.46
 9719.32  1121.3 9722.29 1121.17 9727.46 1121.15 9761.07  1121.2 9766.14  1121.3
 9770.72 1121.35 9774.97 1121.31 9779.68 1121.23 9785.07 1121.08 9817.67 1121.13
 9822.54 1120.89 9828.34 1120.55 9835.64 1120.03 9846.51 1119.13 9866.76  1117.3
 9881.15 1115.96 9888.77 1118.63 9896.86  1122.1  9899.4 1122.12  9909.3  1122.2
 9943.65 1122.27 9979.58  1121.4 9984.99 1121.19 9985.55  1121.2 9986.88 1121.11
    9994 1120.28   10000 1113.22   10011 1112.92   10019 1120.4910044.89 1122.06
10071.11 1122.0710101.86 1122.1110121.29 1122.1410148.03 1122.1910171.48 1122.24
10194.19 1122.2710221.67 1122.3310240.36 1122.3510271.86 1122.4110286.53 1122.43
10322.05 1122.4810364.35 1122.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
    9232    .045 9943.65    .03810044.89    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9943.6510044.89              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
    9232    9920    1126       F

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1      Circular      4
FHWA Chart # 2 - Corrugated Metal Pipe Culvert
FHWA Scale # 1 - Headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 40    61.6     .024     .024        0                  .5                 1
Number of Barrels =  3
Upstream   Elevation =  1114.64
Centerline Stations
    Sta.    Sta.    Sta.
    9995   10000   10005
Downstream Elevation =  1114.39
Centerline Stations
    Sta.    Sta.    Sta.
    9995   10000   10005

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
**********************************************************************
```

Q Culv Group (cfs)	190.37	Culv Full Len (ft)	61.60
# Barrels	3	Culv Vel US (ft/s)	5.05
Q Barrel (cfs)	63.46	Culv Vel DS (ft/s)	5.05
E.G. US. (ft)	1124.16	Culv Inv El Up (ft)	1114.64
W.S. US. (ft)	1123.92	Culv Inv El Dn (ft)	1114.39
E.G. DS (ft)	1123.55	Culv Frctn Ls (ft)	0.41
W.S. DS (ft)	1122.96	Culv Exit Loss (ft)	
Delta EG (ft)	0.61	Culv Entr Loss (ft)	0.20
Delta WS (ft)	0.97	Q Weir (cfs)	2419.63
E.G. IC (ft)	1124.04	Weir Sta Lft (ft)	9752.23
E.G. OC (ft)	1124.16	Weir Sta Rgt (ft)	10464.05
Culvert Control	Outlet	Weir Submerg	0.27
Culv WS Inlet (ft)	1118.64	Weir Max Depth (ft)	3.32
Culv WS Outlet (ft)	1118.39	Weir Avg Depth (ft)	1.09
Culv Nml Depth (ft)		Weir Flow Area (sq ft)	774.03
Culv Crt Depth (ft)	2.40	Min El Weir Flow (ft)	1120.85

Warning: During subcritical analysis, the water surface upstream of culvert went to critical depth.

CROSS SECTION

RIVER: 3S1WS52 (B45)
REACH: REACH 1 RS: 0.228

INPUT
Description: Downstream of 3-48" CMP's which cross Patterson Road.
Right end
extended.
X-section within Waterman Wash floodplain.
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9232	1124.13	9270.05	1124.02	9275.97	1124	9320.11	1123.85	9328.46	1123.82
9370.16	1123.69	9380.95	1123.66	9420.21	1123.54	9433.44	1123.51	9470.27	1123.41
9485.93	1123.38	9520.32	1123.3	9538.42	1123.28	9570.37	1123.23	9590.91	1123.21
9620.43	1123.16	9643.4	1123.14	9670.48	1123.09	9695.88	1123.06	9716.43	1121.46
9719.32	1121.3	9722.29	1121.17	9727.46	1121.15	9761.07	1121.2	9766.14	1121.3
9770.72	1121.35	9774.97	1121.31	9779.68	1121.23	9785.07	1121.08	9817.67	1121.13
9822.54	1120.89	9828.34	1120.55	9835.64	1120.03	9846.51	1119.13	9866.76	1117.3
9881.15	1115.96	9888.77	1118.63	9896.86	1122.1	9899.4	1122.12	9909.3	1122.2
9943.65	1122.27	9979.58	1121.4	9984.99	1121.19	9985.55	1121.2	9986.88	1121.11
9994	1120.28	10000	1113.22	10011	1112.92	10019	1120.49	10044.89	1122.06
10071.11	1122.07	10101.86	1122.11	10121.29	1122.14	10148.03	1122.19	10171.48	1122.24
10194.19	1122.27	10221.67	1122.33	10240.36	1122.35	10271.86	1122.41	10286.53	1122.43
10322.05	1122.48	10364.35	1122.55						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9232	.045	9943.65	.038	10044.89	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9943.65	10044.89	1100	1178	1170	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9232	9920	1126	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1123.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.60	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1122.96	Reach Len. (ft)	1100.00	1178.00	1170.00
Crit W.S. (ft)	1122.96	Flow Area (sq ft)	16.81	308.33	212.84
E.G. Slope (ft/ft)	0.007453	Area (sq ft)	558.93	308.33	212.84
Q Total (cfs)	2600.00	Flow (cfs)	38.17	2099.41	462.42
Top Width (ft)	667.14	Top Width (ft)	246.44	101.24	319.46
Vel Total (ft/s)	4.83	Avg. Vel. (ft/s)	2.27	6.81	2.17
Max Chl Dpth (ft)	10.04	Hydr. Depth (ft)	0.71	3.05	0.67
Conv. Total (cfs)	30117.1	Conv. (cfs)	442.2	24318.5	5356.4
Length Wtd. (ft)	1176.20	Wetted Per. (ft)	23.65	107.64	319.87
Min Ch El (ft)	1112.92	Shear (lb/sq ft)	0.33	1.33	0.31
Alpha	1.64	Stream Power (lb/ft s)	0.75	9.08	0.67
Frctn Loss (ft)	1.31	Cum Volume (acre-ft)	7.66	15.76	6.20
C & E Loss (ft)	0.14	Cum SA (acres)	4.21	3.08	9.79

Warning: The energy equation could not be balanced within the specified number of iterations. The

```
          program used critical depth for the water surface and continued on with the calculations.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
          0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

          This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
          depth, the calculated water surface came back below critical depth.  This indicates that there
is
          not a valid subcritical answer.  The program defaulted to critical depth.
Note:     Multiple critical depths were found at this location.  The critical depth with the lowest,
valid,
          energy was used.

CROSS SECTION


RIVER: 3S1WS52 (B45)
REACH: REACH 1            RS: 0.005

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
    9635 1119.62 9663.91  1119.6 9665.49  1119.6 9666.14  1119.6 9717.56 1119.64
 9739.55 1119.66 9769.63  1119.7 9812.96  1119.6  9821.7 1119.59 9843.03 1119.25
 9873.77 1118.78 9907.19 1118.01 9940.25 1118.53 9947.18 1119.03 9959.27 1119.88
 9963.25 1120.13 9967.61 1118.73   10000 1110.66 10002.3 1110.0310010.15 1110.09
 10011.7 1110.0910014.53 1110.0910041.21  1110.1   10050  1110.110067.02  1110.1
10075.02 1112.57 10093.9  1119.110112.94 1118.8510172.28 1118.61 10180.9 1118.48
10219.59  1117.110227.58 1116.7910230.08 1116.7310234.35 1116.9110279.61 1118.41
10296.16 1118.4310329.76  1118.410350.48 1118.4610379.91  1118.5 10404.8  1118.6
10430.05 1118.6810459.12  1118.8 10480.2 1118.8810513.44 1119.0110530.35 1119.08

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
    9635    .045 9963.25    .038 10093.9    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.25 10093.9                25      24      25              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1119.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)         * 1119.00  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)         * 1113.51  * Flow Area (sq ft)       *   47.46  *  857.05  *  249.02  *
* E.G. Slope (ft/ft)     *0.000425  * Area (sq ft)            *   47.46  *  857.05  *  249.02  *
* Q Total (cfs)          * 2580.00  * Flow (cfs)              *   21.51  * 2436.79  *  121.70  *
* Top Width (ft)         *  623.59  * Top Width (ft)          *   87.38  *  126.84  *  409.37  *
* Vel Total (ft/s)       *    2.24  * Avg. Vel. (ft/s)        *    0.45  *    2.84  *    0.49  *
* Max Chl Dpth (ft)      *    8.97  * Hydr. Depth (ft)        *    0.54  *    6.76  *    0.61  *
* Conv. Total (cfs)      *125132.7  * Conv. (cfs)             *  1043.2  *118186.8  *  5902.7  *
* Length Wtd. (ft)       *          * Wetted Per. (ft)        *   87.41  *  129.41  *  409.43  *
* Min Ch El (ft)         * 1110.03  * Shear (lb/sq ft)        *    0.01  *    0.18  *    0.02  *
* Alpha                  *    1.53  * Stream Power (lb/ft s)   *    0.01  *    0.50  *    0.01  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)    *          *          *          *
* C & E Loss (ft)        *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.

*******************************************************************************

SUMMARY OF MANNING'S N VALUES

River:3S1WS52 (B45)
*****************************************************************
*     Reach       *   River Sta.   *   n1    *   n2    *   n3    *
*****************************************************************
*REACH 1          *    3.093       *    .045*    .038*    .045*
*REACH 1          *    2.790       *    .045*    .038*    .045*
*REACH 1          *    2.540       *    .045*    .038*    .045*
*REACH 1          *    2.317       *    .045*    .038*    .045*
*REACH 1          *    2.095       *    .045*    .038*    .045*
*REACH 1          *    1.860       *    .045*    .038*    .045*
```

*REACH 1	*	1.617	* .045*	.038*	.045*
*REACH 1	*	1.360	* .045*	.038*	.045*
*REACH 1	*	1.110	* .045*	.038*	.045*
*REACH 1	*	0.857	* .045*	.038*	.045*
*REACH 1	*	0.643	* .045*	.038*	.045*
*REACH 1	*	0.382	* .045*	.038*	.045*
*REACH 1	*	0.265	* .045*	.038*	.045*
*REACH 1	*	0.257	*Culvert *	*	*
*REACH 1	*	0.228	* .045*	.038*	.045*
*REACH 1	*	0.005	* .045*	.038*	.045*

SUMMARY OF REACH LENGTHS

River: 3S1WS52 (B45)

* Reach	*	River Sta.	* Left	* Channel	* Right *
*REACH 1	*	3.093	* 1400*	1600*	1600*
*REACH 1	*	2.790	* 1340*	1319*	1280*
*REACH 1	*	2.540	* 1115*	1177*	1175*
*REACH 1	*	2.317	* 1070*	1172*	1140*
*REACH 1	*	2.095	* 1495*	1241*	1150*
*REACH 1	*	1.860	* 1245*	1281*	1255*
*REACH 1	*	1.617	* 1290*	1356*	1350*
*REACH 1	*	1.360	* 1245*	1320*	1230*
*REACH 1	*	1.110	* 1310*	1337*	1465*
*REACH 1	*	0.857	* 1090*	1132*	1155*
*REACH 1	*	0.643	* 1315*	1375*	1385*
*REACH 1	*	0.382	* 600*	622*	630*
*REACH 1	*	0.265	* 195*	195*	195*
*REACH 1	*	0.257	*Culvert *	*	*
*REACH 1	*	0.228	* 1100*	1178*	1170*
*REACH 1	*	0.005	* 25*	24*	25*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 3S1WS52 (B45)

* Reach	*	River Sta.	* Contr.	* Expan. *
*REACH 1	*	3.093	* .1*	.3*
*REACH 1	*	2.790	* .1*	.3*
*REACH 1	*	2.540	* .1*	.3*
*REACH 1	*	2.317	* .1*	.3*
*REACH 1	*	2.095	* .1*	.3*
*REACH 1	*	1.860	* .1*	.3*
*REACH 1	*	1.617	* .1*	.3*
*REACH 1	*	1.360	* .1*	.3*
*REACH 1	*	1.110	* .1*	.3*
*REACH 1	*	0.857	* .1*	.3*
*REACH 1	*	0.643	* .1*	.3*
*REACH 1	*	0.382	* .1*	.3*
*REACH 1	*	0.265	* .1*	.3*
*REACH 1	*	0.257	*Culvert *	*
*REACH 1	*	0.228	* .1*	.3*
*REACH 1	*	0.005	* .1*	.3*

MODEL: 3S1WS6 (B47)

REACH: 3S1WS6 (B47)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX   XXXX       XXXX      XX     XXXX
X     X  X       X    X     X   X    X  X   X
X     X  X       X          X   X   X    X  X
XXXXXXX  XXXX    X      XXX XXXX    XXXXXX   XXXX
X     X  X       X          X  X    X    X       X
X     X  X       X    X     X   X   X    X       X
X     X  XXXXXX   XXXX      X    X  X    X  XXXXX
```

****

PROJECT DATA
Project Title: 3S1WS6 (B47)
Project File : 3S1WS6_B47.prj
Run Date and Time: 12/14/2004 4:38:12 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 3S1WS6 (B47)
Reaches: 3S1WS6 (B47)

****

PLAN DATA

Plan Title: 3S1WS6 (B47)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS6 (B47)\3S1WS6_B47.p01

Geometry Title: 3S1WS6 (B47)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS6 (B47)\3S1WS6_B47.g01

Flow Title : 3S1WS6 (B47)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS6 (B47)\3S1WS6_B47.f01

Plan Summary Information:

Number of:	Cross Sections	= 5	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 3S1WS6 (B47)      Reach = REACH 1
RS      Profile            Method  Value1  Value2
1.151   PF 2                    1    9920   10040
0.895   PF 2                    1    9960   10050
0.664   PF 2                    1    9952   10038
0.318   PF 2                    1    9955   10045
0.000   PF 2                    1    9965   10100

*****************************************************************************

FLOW DATA

Flow Title: 3S1WS6 (B47)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS6
(B47)\3S1WS6_B47.f01

Flow Data (cfs)
*************************************************************
* River            Reach            RS       *            PF 1 *
* 3S1WS6 (B47)     REACH 1          1.151    *             540 *
* 3S1WS6 (B47)     REACH 1          0.895    *             590 *
* 3S1WS6 (B47)     REACH 1          0.664    *             640 *
* 3S1WS6 (B47)     REACH 1          0.318    *             710 *
* 3S1WS6 (B47)     REACH 1          0.000    *             780 *
*************************************************************

Boundary Conditions
*****************************************************************************************************************
* River            Reach            Profile          *          Upstream                    Downstream    *
*****************************************************************************************************************
* 3S1WS6 (B47)     REACH 1          PF 1             *       Normal S = 0.0046        Normal S = 0.0046 *
*****************************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 3S1WS6 (B47)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS6
(B47)\3S1WS6_B47.g01

CROSS SECTION


RIVER: 3S1WS6 (B47)
REACH: REACH 1            RS: 1.151

INPUT
Description: Approximately 650' upstream of Patterson Road.
Limit of Sudy.
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9414.15 1147.84 9431.56 1147.86 9453.67 1147.84 9481.57  1147.8 9502.73 1147.71
 9531.58 1147.59  9551.8 1147.46 9581.59 1147.26 9600.86 1147.09  9631.6 1146.82
 9649.93 1146.63 9681.61 1146.33 9698.99 1146.14 9731.62  1145.8 9748.06 1145.63
 9781.62 1145.27 9797.13 1145.12 9831.63 1144.79 9846.19 1144.67 9881.64 1144.37
 9915.53 1140.81 9930.05 1139.76 9942.89  1140.6  9963.9 1141.92 9972.03 1142.49
 9988.58 1142.39 9991.59 1142.12 9996.13 1141.82   10000 1141.43   10008 1140.79
10019.31 1139.5210021.96 1139.22 10042.5  1140.710056.87 1141.7110063.95 1142.22
10085.37 1143.8710114.81 1143.9210137.63 1143.9710154.88 1143.99 10189.9 1144.05
10194.95 1144.0510211.54 1144.0710235.02 1144.0910242.16  1144.110275.08  1144.1
10294.42 1144.0910315.15 1144.07
```

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9414.15	.044	9881.64	.04	9910085.37	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9881.6 9910085.37 1285 1354 1330 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1142.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.		0.049	
W.S. Elev (ft)	1142.27	Reach Len. (ft)	1285.00	1354.00	1330.00
Crit W.S. (ft)		Flow Area (sq ft)		197.21	
E.G. Slope (ft/ft)	0.005273	Area (sq ft)		197.21	
Q Total (cfs)	540.00	Flow (cfs)		540.00	
Top Width (ft)	141.78	Top Width (ft)		141.78	
Vel Total (ft/s)	2.74	Avg. Vel. (ft/s)		2.74	
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)		1.39	
Conv. Total (cfs)	7436.2	Conv. (cfs)		7436.2	
Length Wtd. (ft)	1354.00	Wetted Per. (ft)		142.23	
Min Ch El (ft)	1139.22	Shear (lb/sq ft)		0.46	
Alpha	1.00	Stream Power (lb/ft s)		1.25	
Frctn Loss (ft)	7.74	Cum Volume (acre-ft)	3.19	34.05	1.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.04	21.62	8.95

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS6 (B47)
REACH: REACH 1 RS: 0.895

INPUT
Description: Approximately 650' downstream of Patterson Road.
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9642.45	1135.9	9655.28	1135.87	9681.31	1135.83	9715.62	1135.76	9731.95	1135.73
9775.97	1135.63	9782.6	1135.61	9817.16	1135.5	9833.24	1135.45	9836.32	1135.44
9883.88	1135.27	9896.67	1135.22	9934.52	1135.06	9987.58	1132.32	10000	1131.74
10001.26	1131.69	10016.89	1132.19	10086.42	1134.72	10099.96	1134.71	10137.05	1134.66
10143.66	1134.65								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9642.45	.044	9934.52	.04	910086.42	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9934.5 10086.42 1140 1217 1165 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1134.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.		0.049	
W.S. Elev (ft)	1134.51	Reach Len. (ft)	1140.00	1217.00	1165.00
Crit W.S. (ft)	1133.71	Flow Area (sq ft)		194.63	
E.G. Slope (ft/ft)	0.006166	Area (sq ft)		194.63	
Q Total (cfs)	590.00	Flow (cfs)		590.00	
Top Width (ft)	135.39	Top Width (ft)		135.39	
Vel Total (ft/s)	3.03	Avg. Vel. (ft/s)		3.03	
Max Chl Dpth (ft)	2.82	Hydr. Depth (ft)		1.44	
Conv. Total (cfs)	7513.5	Conv. (cfs)		7513.5	
Length Wtd. (ft)	1215.49	Wetted Per. (ft)		135.51	
Min Ch El (ft)	1131.69	Shear (lb/sq ft)		0.55	
Alpha	1.00	Stream Power (lb/ft s)		1.68	
Frctn Loss (ft)	6.43	Cum Volume (acre-ft)	3.19	27.96	1.78
C & E Loss (ft)	0.00	Cum SA (acres)	5.04	17.31	8.95

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS6 (B47)
REACH: REACH 1 RS: 0.664

INPUT
Description:
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9579.85	1130.02	9591.1	1129.87	9595.12	1129.82	9595.7	1129.81	9645.51	1129.16
9653.29	1129.07	9695.9	1128.53	9710.87	1128.37	9746.29	1127.93	9768.46	1127.75
9796.68	1127.51	9826.05	1127.39	9851.28	1126.68	9856.16	1126.53	9864.48	1126.29
9881.51	1125.72	9881.77	1125.71	9883.05	1125.74	9947.85	1127.29	9953.76	1126.96
9955.63	1126.89	9958.69	1126.78	9964.1	1126.58	9990.19	1125.55	10000	1125.15
10002.96	1125.03	10005.47	1125.16	10027.38	1126.29	10049.75	1127.54	10081.56	1127.66
10101.3	1127.73	10122.76	1127.81	10152.86	1127.92	10163.97	1127.95	10204.41	1128.05
10205.17	1128.06	10208.22	1128.06	10246.38	1128.12	10255.96	1128.14	10287.58	1128.16
10307.51	1128.18	10328.79	1128.21	10359.07	1128.23	10369.99	1128.24	10410.62	1128.3
10411.2	1128.3	10413.51	1128.3	10452.4	1128.36	10462.17	1128.37	10493.61	1128.4
10513.72	1128.43	10534.81	1128.45	10565.28	1128.48	10576.02	1128.49	10616.83	1128.53
10617.22	1128.53	10618.79	1128.53	10658.43	1128.56	10668.38	1128.56		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9579.85	.044	9826.05	.04	10049.75	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9826.05	10049.75	1750	1827	1730	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9579.85	9947.85	1129	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1128.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.		0.049	0.044
W.S. Elev (ft)	1128.08	Reach Len. (ft)	1750.00	1827.00	1730.00
Crit W.S. (ft)	1127.24	Flow Area (sq ft)		192.04	40.21
E.G. Slope (ft/ft)	0.004634	Area (sq ft)	36.98	379.27	40.21
Q Total (cfs)	640.00	Flow (cfs)		604.38	35.62
Top Width (ft)	483.17	Top Width (ft)	91.44	223.70	168.03
Vel Total (ft/s)	2.76	Avg. Vel. (ft/s)		3.15	0.89
Max Chl Dpth (ft)	3.05	Hydr. Depth (ft)		1.88	0.24
Conv. Total (cfs)	9401.7	Conv. (cfs)		8878.4	523.3
Length Wtd. (ft)	1823.85	Wetted Per. (ft)		102.01	168.03
Min Ch El (ft)	1125.03	Shear (lb/sq ft)		0.54	0.07
Alpha	1.24	Stream Power (lb/ft s)		1.71	0.06
Frctn Loss (ft)	10.08	Cum Volume (acre-ft)	2.71	19.94	1.24
C & E Loss (ft)	0.01	Cum SA (acres)	3.85	12.30	6.70

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 3S1WS6 (B47)
REACH: REACH 1 RS: 0.318

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9676.27	1119.96	9677.39	1119.95	9706.16	1119.8	9731	1119.68	9744.81	1119.6
9780.49	1119.39	9783.46	1119.37	9784.62	1119.37	9822.12	1119.11	9838.23	1119.01
9860.77	1118.86	9891.85	1118.64	9899.42	1118.58	9919	1118.43	9938.08	1118.26
9950.41	1117.53	9954.94	1117.24	9966.96	1116.51	10000	1114.51	10000.77	1114.46
10030.15	1116.32	10040.2	1116.94	10050.77	1117.73	10057.8	1117.73	10087.09	1117.76
10116.61	1117.84	10123.41	1117.87	10134.38	1117.91	10159.73	1118.01	10175.43	1118.1

```
10196.05 1118.2110229.34 1118.4110232.37 1118.4310234.24 1118.4410268.68 1118.67
10293.05 1118.84   10305 1118.92 10324.3 1119.0610341.32 1119.1810351.87 1119.26
10377.64 1119.4510410.68  1119.710413.96 1119.7210419.26 1119.7510450.28 1119.93

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9676.27    .044 9938.08    .04910050.77    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9938.0810050.77              1540    1681    1580              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1118.13  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *          *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1117.93  * Reach Len. (ft)         * 1540.00  * 1681.00  * 1580.00  *
* Crit W.S. (ft)          * 1117.06  * Flow Area (sq ft)       *          *  193.05  *   11.62  *
* E.G. Slope (ft/ft)      *0.006569  * Area (sq ft)            *          *  193.05  *   11.62  *
* Q Total (cfs)           *  710.00  * Flow (cfs)              *          *  701.78  *    8.22  *
* Top Width (ft)          *  195.67  * Top Width (ft)          *          *  107.11  *   88.56  *
* Vel Total (ft/s)        *    3.47  * Avg. Vel. (ft/s)        *          *    3.64  *    0.71  *
* Max Chl Dpth (ft)       *    3.47  * Hydr. Depth (ft)        *          *    1.80  *    0.13  *
* Conv. Total (cfs)       *  8759.8  * Conv. (cfs)             *          *  8658.4  *   101.4  *
* Length Wtd. (ft)        * 1656.73  * Wetted Per. (ft)        *          *  107.32  *   88.56  *
* Min Ch El (ft)          * 1114.46  * Shear (lb/sq ft)        *          *    0.74  *    0.05  *
* Alpha                   *    1.09  * Stream Power (lb/ft s)  *          *    2.68  *    0.04  *
* Frctn Loss (ft)         *    8.96  * Cum Volume (acre-ft)    *    1.96  *    7.94  *    0.21  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)          *    2.01  *    5.36  *    1.61  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS6 (B47)
REACH: REACH 1            RS: 0.000

INPUT
Description:
Station Elevation Data     num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**************************************************************************************
 9628.85 1109.97 9629.04 1109.97 9632.77 1109.97 9669.12 1109.96 9685.03 1109.94
  9725.4 1107.97 9739.34 1107.28 9746.15 1106.95 9751.01 1107.15 9757.89 1107.41
 9763.52 1107.68 9767.75 1107.96  9809.4 1108.74 9814.36 1108.96 9818.22  1109.1
  9841.8  1109.8 9869.52 1109.75 9894.05 1109.68  9909.6 1109.66 9946.31 1109.59
 9955.08 1109.37 9959.81 1109.21   10000 1107.7810001.99 1107.7110010.37 1107.59
10014.12 1107.5610020.02 1107.5210079.61 1106.9810080.08 1106.9910087.73 1107.25
 10109.4 1108.0310121.17 1108.4910128.12  1108.810162.61 1110.0910179.76 1110.15
10217.31 1110.2810217.65 1110.28 10218.4 1110.2810255.54 1110.3610272.02  1110.4
10293.42 1110.4210326.72 1110.4710331.31 1110.4710341.65 1110.47

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9628.85    .044 9946.31    .04910162.61    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.3110162.61              420     415     420              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1109.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.044  *   0.049  *          *
* W.S. Elev (ft)          * 1109.05  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          * 1108.35  * Flow Area (sq ft)       *  111.14  *  218.40  *          *
* E.G. Slope (ft/ft)      *0.004601  * Area (sq ft)            *  111.14  *  218.40  *          *
* Q Total (cfs)           *  780.00  * Flow (cfs)              *  250.59  *  529.41  *          *
* Top Width (ft)          *  284.35  * Top Width (ft)          *  113.71  *  170.65  *          *
* Vel Total (ft/s)        *    2.37  * Avg. Vel. (ft/s)        *    2.25  *    2.42  *          *
* Max Chl Dpth (ft)       *    2.10  * Hydr. Depth (ft)        *    0.98  *    1.28  *          *
* Conv. Total (cfs)       * 11499.6  * Conv. (cfs)             *  3694.5  *  7805.1  *          *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *  113.80  *  170.72  *          *
* Min Ch El (ft)          * 1106.98  * Shear (lb/sq ft)        *    0.28  *    0.37  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.63  *    0.89  *          *
```

```
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)   *          *          *          *
* C & E Loss (ft)        *          * Cum SA (acres)         *          *          *          *
*****************************************************************************************************
```

Warning: Divided flow computed for this cross-section.

```
*****************************************************************************
```

SUMMARY OF MANNING'S N VALUES

River:3S1WS6 (B47)

Reach	River Sta.	n1	n2	n3
REACH 1	1.151	.044	.049	.044
REACH 1	0.895	.044	.049	.044
REACH 1	0.664	.044	.049	.044
REACH 1	0.318	.044	.049	.044
REACH 1	0.000	.044	.049	.044

```
*****************************************************************************
```

SUMMARY OF REACH LENGTHS

River: 3S1WS6 (B47)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.151	1285	1354	1330
REACH 1	0.895	1140	1217	1165
REACH 1	0.664	1750	1827	1730
REACH 1	0.318	1540	1681	1580
REACH 1	0.000	420	415	420

```
*****************************************************************************
```

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 3S1WS6 (B47)

Reach	River Sta.	Contr.	Expan.
REACH 1	1.151	.1	.3
REACH 1	0.895	.1	.3
REACH 1	0.664	.1	.3
REACH 1	0.318	.1	.3
REACH 1	0.000	.1	.3

MODEL: 3S1WS9 (B12)

REACH: 3S1WS9 (B12)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X       X    X       X   X     X  X    X
X     X  X       X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X       X            X  X     X    X        X
X     X  X       X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X  X    X   XXXXX
```

****

PROJECT DATA
Project Title: 3S1WS9 (B12)
Project File : 3S1WS9_B12.prj
Run Date and Time: 12/14/2004 4:41:07 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 3S1WS9 (B12)
Reaches: 3S1WS9 (B12)

****

PLAN DATA

Plan Title: 3S1WS9 (B12)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS9 (B12)\3S1WS9_B12.p01

Geometry Title: 3S1WS9 (B12)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS9 (B12)\3S1WS9_B12.g01

Flow Title : 3S1WS9 (B12)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS9 (B12)\3S1WS9_B12.f01

Plan Summary Information:

Number of:	Cross Sections =	9	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20

```
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 3S1WS9 (B12)      Reach = REACH 1
RS      Profile            Method  Value1  Value2
2.238   PF 2                    1    9930   10070
1.977   PF 2                    1    9930   10070
1.684   PF 2                    1    9930   10070
1.443   PF 2                    1    9930   10070
1.196   PF 2                    1    9930   10070
0.913   PF 2                    1    9930   10070
0.671   PF 2                    1    9930   10125
0.402   PF 2                    1    9970   10030
0.225   PF 2                    1    9980   10020

*****************************************************************************

FLOW DATA

Flow Title: 3S1WS9 (B12)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS9
(B12)\3S1WS9_B12.f01

Flow Data (cfs)
*************************************************************
* River            Reach            RS       *            PF 1 *
* 3S1WS9 (B12)     REACH 1          2.238    *             750 *
* 3S1WS9 (B12)     REACH 1          1.977    *             850 *
* 3S1WS9 (B12)     REACH 1          1.684    *             950 *
* 3S1WS9 (B12)     REACH 1          1.443    *            1040 *
* 3S1WS9 (B12)     REACH 1          1.196    *            1130 *
* 3S1WS9 (B12)     REACH 1          0.913    *            1230 *
* 3S1WS9 (B12)     REACH 1          0.671    *            1180 *
* 3S1WS9 (B12)     REACH 1          0.402    *            1130 *
* 3S1WS9 (B12)     REACH 1          0.225    *            1090 *
*************************************************************

Boundary Conditions
*****************************************************************************************************************
* River            Reach            Profile          *            Upstream                    Downstream     *
*****************************************************************************************************************
* 3S1WS9 (B12)     REACH 1          PF 1             *        Normal S = 0.0042         Normal S = 0.0042 *
*****************************************************************************************************************

*************************************************************************

GEOMETRY DATA

Geometry Title: 3S1WS9 (B12)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S1WS9
(B12)\3S1WS9_B12.g01

CROSS SECTION


RIVER: 3S1WS9 (B12)
REACH: REACH 1            RS: 2.238

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*************************************************************************
 9362.86 1190.75 9363.88 1190.75 9397.06 1190.71 9399.27 1190.71 9401.71  1190.7
 9434.67 1190.66 9464.62 1190.62 9470.06 1190.62 9476.05 1190.61 9505.46 1190.56
 9532.19 1190.52 9550.39  1190.5 9576.25 1190.45 9599.75 1190.41 9611.65 1190.39
 9624.73 1190.37 9647.04 1190.32 9667.32 1190.29 9682.44 1190.27 9699.07 1190.24
```

```
 9717.83  1190.2 9734.89 1190.18 9766.26 1189.98 9774.29 1189.86 9784.64 1189.76
 9786.64 1189.74 9816.06 1189.87 9830.39 1189.92 9841.87 1189.95 9859.42 1190.01
 9870.02    1190 9894.81 1189.96 9922.09 1189.91 9930.21 1189.89 9943.33 1189.63
 9949.43 1189.53 9965.43 1189.23 9991.71 1188.81 9997.17  1188.6   10000 1188.65
10029.69 1189.3310049.43 1189.7110082.26 1189.6610101.36 1189.6410122.82 1189.62
10153.29 1189.6110163.38 1189.6210199.39 1189.6510203.94 1189.6510205.21 1189.66
 10244.5 1189.6410257.14 1189.6510285.06 1189.8810309.07 1190.0810325.61 1190.21
10360.99 1190.3610366.17 1190.3810384.65 1190.4410406.73 1190.5310412.92 1190.54
10447.29 1190.5810464.85  1190.610487.85 1190.5610516.78 1190.6510528.41 1190.67

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9362.86    .041 9922.09    .04110049.43    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9922.0910049.43             1340    1381    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1190.44  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1190.38  * Reach Len. (ft)         * 1340.00  * 1381.00  * 1300.00  *
* Crit W.S. (ft)          * 1190.09  * Flow Area (sq ft)       *   94.20  *  140.90  *  186.73  *
* E.G. Slope (ft/ft)      *0.004048  * Area (sq ft)            *   94.20  *  140.90  *  186.73  *
* Q Total (cfs)           *  750.00  * Flow (cfs)              *   99.61  *  347.53  *  302.86  *
* Top Width (ft)          *  747.20  * Top Width (ft)          *  303.34  *  127.34  *  316.52  *
* Vel Total (ft/s)        *    1.78  * Avg. Vel. (ft/s)        *    1.06  *    2.47  *    1.62  *
* Max Chl Dpth (ft)       *    1.78  * Hydr. Depth (ft)        *    0.31  *    1.11  *    0.59  *
* Conv. Total (cfs)       * 11788.2  * Conv. (cfs)             *  1565.6  *  5462.3  *  4760.3  *
* Length Wtd. (ft)        * 1358.42  * Wetted Per. (ft)        *  303.34  *  127.37  *  316.52  *
* Min Ch El (ft)          * 1188.60  * Shear (lb/sq ft)        *    0.08  *    0.28  *    0.15  *
* Alpha                   *    1.27  * Stream Power (lb/ft s)  *    0.08  *    0.69  *    0.24  *
* Frctn Loss (ft)         *    6.77  * Cum Volume (acre-ft)    *   17.70  *   58.96  *   29.24  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   35.48  *   53.92  *   57.53  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 1.977

INPUT
Description:

```
Station Elevation Data     num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9601.67 1183.65 9603.79 1183.66 9616.73 1183.65 9624.76 1183.64 9651.13 1183.44
 9684.68  1183.4 9687.92  1183.4  9693.8 1183.39 9724.71 1183.33 9741.81  1183.3
  9761.5 1183.27 9797.11 1183.21 9798.29 1183.21 9798.95  1183.2 9835.08 1183.12
 9856.09 1183.07 9871.87 1183.03 9900.42 1182.95 9908.66 1182.92 9913.23 1182.91
 9945.45 1182.81 9976.82 1182.66  9985.7 1182.66 9999.61 1182.67   10000 1182.67
10000.48 1182.6710000.79 1182.6710017.92 1182.6510027.88 1182.6410036.15 1182.63
10041.81 1182.6210074.46 1182.7910101.82 1182.8410123.53 1182.8810151.83 1182.93
10172.61 1182.9810201.84 1183.0310221.68 1183.0810251.85 1183.1410270.75 1183.18
10303.58 1182.6310320.05 1182.7710322.59 1182.83 10341.2 1183.5110364.52 1183.52
10383.84 1183.7110388.98 1183.6910392.93 1183.6510395.99 1183.6110398.96 1183.58
10417.97 1183.5510451.89 1183.6510467.04  1183.7 10501.9  1183.810516.12 1183.85
10551.91 1183.9610565.19 1183.9910601.92  1184.110614.26 1184.1310651.92 1184.23
10663.33 1184.2510701.93 1184.3310712.41 1184.3410751.94 1184.3710761.48 1184.36
10801.95 1184.3510833.21 1185.06

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9601.67    .041 9651.13    .04110270.75    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9651.1310270.75             1470    1545    1550            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1183.68  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
```

W.S. Elev (ft)	1183.62	Reach Len. (ft)	1470.00	1545.00	1550.00	
Crit W.S. (ft)	1183.34	Flow Area (sq ft)	2.02	374.18	53.26	
E.G. Slope (ft/ft)	0.006099	Area (sq ft)	2.02	374.18	53.26	
Q Total (cfs)	850.00	Flow (cfs)	1.13	756.66	92.21	
Top Width (ft)	790.60	Top Width (ft)	23.09	619.62	147.89	
Vel Total (ft/s)	1.98	Avg. Vel. (ft/s)	0.56	2.02	1.73	
Max Chl Dpth (ft)	1.00	Hydr. Depth (ft)	0.09	0.60	0.36	
Conv. Total (cfs)	10883.8	Conv. (cfs)	14.5	9688.6	1180.7	
Length Wtd. (ft)	1546.90	Wetted Per. (ft)	23.09	619.62	147.91	
Min Ch El (ft)	1182.62	Shear (lb/sq ft)	0.03	0.23	0.14	
Alpha	1.01	Stream Power (lb/ft s)	0.02	0.46	0.24	
Frctn Loss (ft)	9.30	Cum Volume (acre-ft)	16.22	50.80	25.66	
C & E Loss (ft)	0.00	Cum SA (acres)	30.46	42.08	50.60	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 1.684

INPUT
Description: Cross section at Bullard Avenue.
Station Elevation Data num= 85

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9564.02	1174.88	9588.18	1174.81	9613.24	1174.75	9623.97	1174.73	9638.75	1174.69
9659.77	1174.64	9675.04	1174.6	9695.57	1174.55	9723.82	1174.47	9731.36	1174.44
9736.84	1174.43	9767.16	1174.31	9798.64	1174.19	9802.96	1174.17	9808.9	1174.14
9849.63	1174.18	9853.19	1174.22	9857.47	1174.24	9865.7	1174.15	9877.86	1173.93
9892.01	1173.88	9902.84	1173.66	9909.28	1173.65	9909.32	1173.65	9917.55	1173.67
9924.16	1173.68	9929.63	1173.69	9934.51	1173.69	9938.96	1173.69	9943.49	1173.69
9947.65	1173.7	9951.24	1173.7	9972.22	1173.67	9975.92	1173.68	9986.74	1173.67
9989.05	1173.68	9995.75	1173.67	9996.82	1173.67	10000	1173.67	10002.37	1173.67
10006.04	1173.71	10011.93	1173.78	10062.39		117	410093.89	1174.05	10104.74	1174.53
10141.65	1174.12	10150.3	1174.11	10175.17	1174.14	10219.73	1174.09	10236.16	1174.01
10241.28		117	410251.08	1173.98	10316.91	1173.74	10350.59	1173.7	10369.9	1173.66
10402.63	1173.62	10409.74	1173.62	10413.03	1173.56	10418.3	1173.39	10450.2	1172.33
10494.45	1173.13	10518.67	1173.67	10526.86	1173.67	10549.49	1173.7	10565.9	1173.72
10571.85	1173.73	10604.94	1173.77	10625.03	1173.81	10643.99	1173.83	10678.2	1173.9
10683.03	1173.91	10696.34	1173.94	10722.07		117	410731.38	1174.02	10761.11	1174.11
10784.56	1174.19	10800.15	1174.24	10837.74	1174.37	10839.19	1174.38	10843.2	1174.39
10878.23	1174.51	10890.91	1174.56	10917.27	1174.65	10944.09	1174.75	10956.31	1174.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9564.02	.041	9857.47	.041	10104.74	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9857.47	10104.74	1130	1272	1260	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1174.38	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.05	Wt. n-Val.	0.041	0.041	0.041	
W.S. Elev (ft)	1174.33	Reach Len. (ft)	1130.00	1272.00	1260.00	
Crit W.S. (ft)	1174.07	Flow Area (sq ft)	11.82	119.40	389.46	
E.G. Slope (ft/ft)	0.005937	Area (sq ft)	11.82	119.40	389.46	
Q Total (cfs)	950.00	Flow (cfs)	8.25	207.80	733.96	
Top Width (ft)	1039.82	Top Width (ft)	94.69	242.69	702.44	
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	0.70	1.74	1.88	
Max Chl Dpth (ft)	2.00	Hydr. Depth (ft)	0.12	0.49	0.55	
Conv. Total (cfs)	12329.3	Conv. (cfs)	107.0	2696.8	9525.5	
Length Wtd. (ft)	1252.36	Wetted Per. (ft)	94.69	242.70	702.48	
Min Ch El (ft)	1173.65	Shear (lb/sq ft)	0.05	0.18	0.21	
Alpha	1.02	Stream Power (lb/ft s)	0.03	0.32	0.39	
Frctn Loss (ft)	5.33	Cum Volume (acre-ft)	15.99	42.05	17.78	
C & E Loss (ft)	0.01	Cum SA (acres)	28.47	26.79	35.47	

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 1.443

INPUT
Description:
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9415.39	1169.99	9428.26	1169.96	9434.39	1169.95	9477.7	1169.82	9484.4	1169.8
9527.14	1169.63	9534.4	1169.6	9576.58	1169.41	9584.4	1169.37	9626.02	1169.17
9634.41	1169.12	9675.47	1168.9	9684.41	1168.86	9724.91	1168.64	9734.42	1168.6
9744.14	1168.55	9784.42	1168.34	9823.79	1168.19	9834.42	1168.15	9873.23	1168.07
9884.43	1168.05	9922.68	1168.04	9934.43	1168.04	9950.83	1167.34	10000	1165.36
10000.14	1165.36	10008.25	1165.94	10052	1168.51	10069.55	1168.61	10088.22	1168.73
10100.11	1168.81	10124.43	1168.93	10159.39	1169.09	10160.65	1169.09	10162.62	1169.1
10196.86	1169.19	10218.68	1169.22	10233.08	1169.21	10255.68	1169.19	10269.29	1169.18
10277.96	1169.16	10305.5	1169.05						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9415.39	.041	9934.43	.041	10052	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9934.43	10052	1240	1304	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1169.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1168.90	Reach Len. (ft)	1240.00	1304.00	1320.00
Crit W.S. (ft)		Flow Area (sq ft)	144.69	244.75	12.45
E.G. Slope (ft/ft)	0.003278	Area (sq ft)	144.69	244.75	12.45
Q Total (cfs)	1040.00	Flow (cfs)	204.27	827.22	8.52
Top Width (ft)	441.19	Top Width (ft)	257.79	117.57	65.83
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	1.41	3.38	0.68
Max Chl Dpth (ft)	3.53	Hydr. Depth (ft)	0.56	2.08	0.19
Conv. Total (cfs)	18166.1	Conv. (cfs)	3568.0	14449.3	148.8
Length Wtd. (ft)	1295.72	Wetted Per. (ft)	257.79	117.72	65.83
Min Ch El (ft)	1165.36	Shear (lb/sq ft)	0.11	0.43	0.04
Alpha	1.42	Stream Power (lb/ft s)	0.16	1.44	0.03
Frctn Loss (ft)	5.29	Cum Volume (acre-ft)	13.96	36.73	11.97
C & E Loss (ft)	0.01	Cum SA (acres)	23.90	21.53	24.36

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 1.196

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9631.96	1164.54	9642.51	1164.48	9645.39	1164.46	9645.77	1164.46	9695.73	1164.12
9702.87	1164.07	9746.08	1163.77	9759.96	1163.68	9796.43	1163.43	9817.06	1163.3
9846.78	1163.11	9874.16	1162.97	9897.13	1162.85	9931.25	1162.72	9947.47	1162.65
9999.22	1161.73	10000	1161.72	10003.53	1161.69	10006.62	1161.64		
10056.64	1162.45	10062.58	1162.55	10069.82	1162.69	10098.9	1162.79	10126.26	1162.87
10134.27	1162.91	10142.79	1162.93	10177.21	1162.59	10205.12	1162.42	10211.35	1162.39
10263.1	1163.34	10288.73	1163.51	10311.13	1163.58	10332.2	1163.65	10346.5	1163.71
10361.7	1163.77	10381.87	1163.83	10400.85	1163.88	10417.25	1163.94	10434.67	1163.99
10452.62	1164.03	10469.5	1164.06	10487.99	1164.09	10507.64	1164.13	10523.36	1164.12
10538.15	1164.08	10558.73	1164.04						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9631.96	.041	9947.47	.04	110069.82	.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9947.4 710069.82 1430 1496 1460 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1163.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1163.63	Reach Len. (ft)	1430.00	1496.00	1460.00
Crit W.S. (ft)	1163.28	Flow Area (sq ft)	96.88	181.50	174.52
E.G. Slope (ft/ft)	0.005115	Area (sq ft)	96.88	181.50	174.52
Q Total (cfs)	1130.00	Flow (cfs)	166.52	611.90	351.58
Top Width (ft)	556.47	Top Width (ft)	179.41	122.35	254.71
Vel Total (ft/s)	2.49	Avg. Vel. (ft/s)	1.72	3.37	2.01
Max Chl Dpth (ft)	1.98	Hydr. Depth (ft)	0.54	1.48	0.69
Conv. Total (cfs)	15799.6	Conv. (cfs)	2328.3	8555.5	4915.8
Length Wtd. (ft)	1476.12	Wetted Per. (ft)	179.41	122.37	254.72
Min Ch El (ft)	1161.64	Shear (lb/sq ft)	0.17	0.47	0.22
Alpha	1.26	Stream Power (lb/ft s)	0.30	1.60	0.44
Frctn Loss (ft)	5.76	Cum Volume (acre-ft)	10.52	30.35	9.13
C & E Loss (ft)	0.01	Cum SA (acres)	17.68	17.94	19.50

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 0.913

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9399.62	1159.98	9408.19	1159.92	9413.22	1159.88	9459.07	1159.54	9475.92	1159.41
9509.95	1159.15	9538.63	1158.94	9560.84	1158.77	9601.33	1158.47	9611.72	1158.4
9656.4	1158.09	9662.6	1158.05	9664.04	1158.04	9713.48	1157.72	9726.75	1157.64
9764.36	1157.43	9789.45	1157.29	9815.24	1157.16	9841.35	1156.83	9874.97	1156.38
9913.87	1156.73	9917	1156.75	9921.2	1156.68	9943.73	1156.36	9996.58	1155.65
9999.66	1155.58	10000	1155.59	10008.94	1155.72	10039.57	1156.18	10082.06	1156.85
10095.34	1156.91	10115.4	1157	10131.42	1157.06	10142.01	1157.11	10167.5	1157.23
10201.96	1157.39	10203.58	1157.4	10206.03	1157.41	10239.66	1157.56	10261.91	1157.66
10275.74	1157.72	10296.66	1157.81	10311.83	1157.87	10321.86	1157.91		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9399.62	.041	9913.87	.04	110082.06	.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9913.8 710082.06 1330 1275 1230 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1157.97	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1157.88	Reach Len. (ft)	1330.00	1275.00	1230.00
Crit W.S. (ft)	1157.30	Flow Area (sq ft)	163.99	282.16	117.40
E.G. Slope (ft/ft)	0.003135	Area (sq ft)	163.99	282.16	117.40
Q Total (cfs)	1230.00	Flow (cfs)	270.00	808.32	151.68
Top Width (ft)	623.65	Top Width (ft)	224.37	168.19	231.09
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	1.65	2.86	1.29
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)	0.73	1.68	0.51
Conv. Total (cfs)	21967.8	Conv. (cfs)	4822.3	14436.6	2709.0
Length Wtd. (ft)	1280.89	Wetted Per. (ft)	224.38	168.21	231.09
Min Ch El (ft)	1155.58	Shear (lb/sq ft)	0.14	0.33	0.10
Alpha	1.30	Stream Power (lb/ft s)	0.24	0.94	0.13
Frctn Loss (ft)	5.06	Cum Volume (acre-ft)	6.24	22.39	4.24
C & E Loss (ft)	0.00	Cum SA (acres)	11.05	12.95	11.36

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 0.671

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9744.31	1152.88	9747.47	1152.86	9758.38	1152.78	9816.37	1152.15	9819.43	1152.08
9834.73	1152.12	9858.57	1152.13	9900.84	1152.11	9926.92	1152.14	9951.97	1152.09
9997.52	1151.72	10000	1151.7	10006.94	1151.64	10013.25	1151.43	10025.67	1151.19
10046.54	1150.69	10053.38	1150.52	10068.31	1150.52	10086.33	1151.31	10123.08	1151.68
10139.55	1151.97	10143.91	1152	10146.58	1152	10160.57	1152.08	10186.9	1152.15
10208.94	1152.22	10222.4	1152.27	10238.49	1152.32	10257.89	1152.39	10274.13	1152.44
10293.39	1152.52	10316.41	1152.6	10328.88	1152.64	10339.32	1152.66	10364.38	1152.75
10394.34	1152.82	10399.87	1152.83	10404.51	1152.83	10435.37	1152.89		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9744.31	.041	9951.97	.041	10160.57	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9951.97	10160.57	1395	1420	1395	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1152.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1152.79	Reach Len. (ft)	1395.00	1420.00	1395.00
Crit W.S. (ft)	1152.47	Flow Area (sq ft)	110.15	278.43	78.54
E.G. Slope (ft/ft)	0.005187	Area (sq ft)	110.15	278.43	78.54
Q Total (cfs)	1180.00	Flow (cfs)	196.38	880.93	102.70
Top Width (ft)	625.21	Top Width (ft)	195.12	208.60	221.48
Vel Total (ft/s)	2.53	Avg. Vel. (ft/s)	1.78	3.16	1.31
Max Chl Dpth (ft)	2.27	Hydr. Depth (ft)	0.56	1.33	0.35
Conv. Total (cfs)	16384.0	Conv. (cfs)	2726.6	12231.4	1425.9
Length Wtd. (ft)	1416.60	Wetted Per. (ft)	195.13	208.64	221.48
Min Ch El (ft)	1150.52	Shear (lb/sq ft)	0.18	0.43	0.11
Alpha	1.28	Stream Power (lb/ft s)	0.33	1.37	0.15
Frctn Loss (ft)	6.87	Cum Volume (acre-ft)	2.05	14.18	1.48
C & E Loss (ft)	0.01	Cum SA (acres)	4.64	7.43	4.97

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS9 (B12)
REACH: REACH 1 RS: 0.402

INPUT
Description: Floodplain was extended to east so that there was not an island between existing and proposed floodplains.
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9575.49	1148.11	9592.13	1148	9614.56	1147.86	9643.5	1147.66	9680.66	1147.56
9703.56	1147.48	9729.49	1147.14	9746.25	1146.94	9780.84	1146.66	9797.62	1146.52
9822.41	1146.32	9848.99	1146.09	9863.98	1145.96	9900.36	1145.68	9905.55	1145.64
9927.57	1145.52	9947.12	1145.4	9952.33	1144.97	9952.95	1144.93	9953.75	1144.87
9954.81	1144.79	9957.5	1144.64	9962.26	1144.41	9972.69	1143.9	10000	1142.12
10009.98	1141.51	10033.75	1143.26	10034.83	1143.34	10047.55	1144.35	10059.53	1145.2
10066.74	1145.46	10097.3	1145.62	10129.68	1145.8	10132.97	1145.82	10137.28	1145.84
10168.64	1146.04	10192.62	1146.18	10204.31	1146.25	10219.6	1146.33	10239.98	1146.45
10255.56	1146.52	10275.65	1146.6	10301.92	1146.65				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 9575.49    .041 9947.12    .04110066.74    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.1210066.74              910     937     810            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1146.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1145.76  * Reach Len. (ft)         *  910.00  *  937.00  *  810.00  *
* Crit W.S. (ft)          * 1144.78  * Flow Area (sq ft)       *   10.90  *  267.51  *    8.62  *
* E.G. Slope (ft/ft)      *0.004538  * Area (sq ft)            *   10.90  *  267.51  *    8.62  *
* Q Total (cfs)           * 1130.00  * Flow (cfs)              *    8.79  * 1115.18  *    6.04  *
* Top Width (ft)          *  233.27  * Top Width (ft)          *   57.47  *  119.62  *   56.18  *
* Vel Total (ft/s)        *    3.94  * Avg. Vel. (ft/s)        *    0.81  *    4.17  *    0.70  *
* Max Chl Dpth (ft)       *    4.25  * Hydr. Depth (ft)        *    0.19  *    2.24  *    0.15  *
* Conv. Total (cfs)       * 16775.1  * Conv. (cfs)             *   130.5  * 16555.0  *    89.6  *
* Length Wtd. (ft)        *  936.55  * Wetted Per. (ft)        *   57.47  *  119.89  *   56.18  *
* Min Ch El (ft)          * 1141.51  * Shear (lb/sq ft)        *    0.05  *    0.63  *    0.04  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)   *    0.04  *    2.64  *    0.03  *
* Frctn Loss (ft)         *    4.09  * Cum Volume (acre-ft)     *    0.11  *    5.28  *    0.08  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *    0.60  *    2.08  *    0.52  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS9 (B12)
REACH: REACH 1            RS: 0.225

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9682.95 1142.86 9707.77 1142.82 9713.75 1142.81 9726.44  1142.8 9751.32 1142.78
 9763.04 1142.76 9788.89 1142.76 9818.32 1142.75 9826.46 1142.75 9843.73 1142.74
 9864.03 1142.74 9873.59 1142.75  9901.6 1142.73  9952.8 1142.98 9964.38 1143.11
 9984.78 1138.53 9997.07 1135.73   10000 1136.1310020.06 1138.1810033.54 1139.82
10054.38 1142.87 10088.1 1143.0510093.77 1143.0710110.37 1143.1410133.16 1143.21
10140.94 1143.2410172.55 1143.3210193.77 1143.3810211.93 1143.41 10246.6 1143.48
10251.32 1143.4910265.14 1143.5110290.71 1143.5210299.44 1143.52 10330.1 1143.53
10352.27 1143.5310369.48 1143.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9682.95    .041 9964.38    .04110054.38    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.3810054.38             1160    1187     530            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1141.92  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.37  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)          * 1141.55  * Reach Len. (ft)         *          *          *          *
* Crit W.S. (ft)          * 1140.10  * Flow Area (sq ft)       *          *  223.77  *          *
* E.G. Slope (ft/ft)      *0.004207  * Area (sq ft)            *          *  223.77  *          *
* Q Total (cfs)           * 1090.00  * Flow (cfs)              *          * 1090.00  *          *
* Top Width (ft)          *   74.02  * Top Width (ft)          *          *   74.02  *          *
* Vel Total (ft/s)        *    4.87  * Avg. Vel. (ft/s)        *          *    4.87  *          *
* Max Chl Dpth (ft)       *    5.82  * Hydr. Depth (ft)        *          *    3.02  *          *
* Conv. Total (cfs)       * 16804.4  * Conv. (cfs)             *          * 16804.4  *          *
* Length Wtd. (ft)        *          * Wetted Per. (ft)        *          *   75.03  *          *
* Min Ch El (ft)          * 1135.73  * Shear (lb/sq ft)        *          *    0.78  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    3.82  *          *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)     *          *          *          *
* C & E Loss (ft)         *          * Cum SA (acres)           *          *          *          *
*****************************************************************************************

*****************************************************************************

SUMMARY OF MANNING'S N VALUES
```

River:3S1WS9 (B12)

Reach	River Sta.	n1	n2	n3
REACH 1	2.238	.041	.041	.041
REACH 1	1.977	.041	.041	.041
REACH 1	1.684	.041	.041	.041
REACH 1	1.443	.041	.041	.041
REACH 1	1.196	.041	.041	.041
REACH 1	0.913	.041	.041	.041
REACH 1	0.671	.041	.041	.041
REACH 1	0.402	.041	.041	.041
REACH 1	0.225	.041	.041	.041

SUMMARY OF REACH LENGTHS

River: 3S1WS9 (B12)

Reach	River Sta.	Left	Channel	Right
REACH 1	2.238	1340	1381	1300
REACH 1	1.977	1470	1545	1550
REACH 1	1.684	1130	1272	1260
REACH 1	1.443	1240	1304	1320
REACH 1	1.196	1430	1496	1460
REACH 1	0.913	1330	1275	1230
REACH 1	0.671	1395	1420	1395
REACH 1	0.402	910	937	810
REACH 1	0.225	1160	1187	530

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 3S1WS9 (B12)

Reach	River Sta.	Contr.	Expan.
REACH 1	2.238	.1	.3
REACH 1	1.977	.1	.3
REACH 1	1.684	.1	.3
REACH 1	1.443	.1	.3
REACH 1	1.196	.1	.3
REACH 1	0.913	.1	.3
REACH 1	0.671	.1	.3
REACH 1	0.402	.1	.3
REACH 1	0.225	.1	.3

MODEL: 3S2WS2A (B33)

REACHES: 3S2WS2A (B33)
3S2WS2E (B33)
3S2WS11 (B37)
3S2WS2D (B35)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X       X   X     X  X    X
X     X  X        X            X   X    X    X   X
XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
X     X  X        X            X  X     X    X        X
X     X  X        X    X       X   X    X    X        X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 3S2WS2A (B33)
Project File : 3S2WS2A_B33.prj
Run Date and Time: 1/12/2005 4:42:20 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model Name: 3S2WS2A (B33)
Reaches: 3S2WS2A (B33)
3S2WS2D
(B35)
3S2WS11 (B37)

****

PLAN DATA

Plan Title: 3S2WS2A (B33)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2A
(B33)\3S2WS2A_B33.p01

Geometry Title: 3S2WS2A (B33)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2A
(B33)\3S2WS2A_B33.g01

Flow Title : 3S2WS2A (B33)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2A
(B33)\3S2WS2A_B33.f01

Plan Summary Information:

Number of:	Cross Sections =	19	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

```
    Water surface calculation tolerance =  0.01
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  20
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 3S2WS11 (B37)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
0.163    PF 2                   1    9955   10260
0.162    PF 2                   1    9955   10260

River = 3S2WS2A (B33)     Reach = REACH 3
RS       Profile           Method  Value1  Value2
0.386    PF 2                   1    9950   10040
0.040    PF 2                   1    9685   10075

River = 3S2WS2A (B33)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
2.220    PF 2                   1    9950   10040
2.003    PF 2                   1    9978   10150
1.659    PF 2                   1    9925   10100
1.419    PF 2                   1    9875   10200

River = 3S2WS2A (B33)     Reach = REACH 2
RS       Profile           Method  Value1  Value2
1.252    PF 2                   1    9955   10050
1.040    PF 2                   1    9855   10050
0.807    PF 2                   1    9976   10048
0.561    PF 2                   1    9605   10040

River = 3S2WS2A (B33)     Reach = REACH 4
RS       Profile           Method  Value1  Value2
0.001    PF 2                   1    9825   10125
0.000    PF 2                   1    9825   10125

River = 3S2WS2D (B35)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
0.557    PF 2                   1    9790   10025
0.275    PF 2                   1    9960   10115

River = 3S2WS2E (B33)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
0.713    PF 2                   1    9975   10025
0.439    PF 2                   1    9962   10040
0.217    PF 2                   1    9900   10245

*******************************************************************************

FLOW DATA

Flow Title: 3S2WS2A (B33)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2A
(B33)\3S2WS2A_B33.f01

Flow Data (cfs)
*************************************************************
* River           Reach          RS      *          PF 1 *
* 3S2WS2D (B35)   REACH 1        0.557   *          1090 *
* 3S2WS2D (B35)   REACH 1        0.275   *          1090 *
* 3S2WS11 (B37)   REACH 1        0.163   *           740 *
* 3S2WS11 (B37)   REACH 1        0.162   *           740 *
* 3S2WS2A (B33)   REACH 1        2.220   *           790 *
* 3S2WS2A (B33)   REACH 1        2.003   *           820 *
* 3S2WS2A (B33)   REACH 1        1.659   *           930 *
* 3S2WS2A (B33)   REACH 1        1.419   *          1000 *
* 3S2WS2A (B33)   REACH 2        1.252   *          1050 *
* 3S2WS2A (B33)   REACH 2        1.040   *          1110 *
```

* 3S2WS2A (B33)	REACH 2	0.807	*	1150 *
* 3S2WS2A (B33)	REACH 2	0.561	*	1200 *
* 3S2WS2A (B33)	REACH 3	0.386	*	1840 *
* 3S2WS2A (B33)	REACH 3	0.040	*	2220 *
* 3S2WS2A (B33)	REACH 4	0.001	*	2220 *
* 3S2WS2A (B33)	REACH 4	0.000	*	2220 *
* 3S2WS2E (B33)	REACH 1	0.713	*	600 *
* 3S2WS2E (B33)	REACH 1	0.439	*	630 *
* 3S2WS2E (B33)	REACH 1	0.217	*	660 *

Boundary Conditions

* River	Reach	Profile	*	Upstream	Downstream *
* 3S2WS2D (B35)	REACH 1	PF 1	*	Normal S = 0.0077	*
* 3S2WS11 (B37)	REACH 1	PF 1	*	Normal S = 0.0061	*
* 3S2WS2A (B33)	REACH 1	PF 1	*	Normal S = 0.006	*
* 3S2WS2A (B33)	REACH 4	PF 1	*		Normal S = 0.006 *
* 3S2WS2E (B33)	REACH 1	PF 1	*	Normal S = 0.0065	*

GEOMETRY DATA

Geometry Title: 3S2WS2A (B33)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2A (B33)\3S2WS2A_B33.g01

Reach Connection Table

* River	Reach	* Upstream Boundary	* Downstream Boundary *
* 3S2WS2D (B35)	REACH 1	*	* JUNCTION 2 *
* 3S2WS11 (B37)	REACH 1	*	* JUNCTION 1 *
* 3S2WS2A (B33)	REACH 1	*	* JUNCTION 1 *
* 3S2WS2A (B33)	REACH 2	* JUNCTION 1	* JUNCTION 2 *
* 3S2WS2A (B33)	REACH 3	* JUNCTION 2	* JUNCTION 3 *
* 3S2WS2A (B33)	REACH 4	* JUNCTION 3	* *
* 3S2WS2E (B33)	REACH 1	*	* JUNCTION 3 *

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
3S2WS2A (B33)	REACH 1	to 3S2WS2A (B33)	REACH 2	882	
3S2WS11 (B37)	REACH 1	to 3S2WS2A (B33)	REACH 2	818	

Name: JUNCTION 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
3S2WS2A (B33)	REACH 2	to 3S2WS2A (B33)	REACH 3	845	
3S2WS2D (B35)	REACH 1	to 3S2WS2A (B33)	REACH 3	1452	

Name: JUNCTION 3
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
3S2WS2A (B33)	REACH 3	to 3S2WS2A (B33)	REACH 4	210	
3S2WS2E (B33)	REACH 1	to 3S2WS2A (B33)	REACH 4	1150	

CROSS SECTION

RIVER: 3S2WS2D (B35)
REACH: REACH 1 RS: 0.557

INPUT

Description: Approximately 300' downstream of Patterson Road.

Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9615.38	1140	9630.75	1139.87	9636.57	1139.86	9646.22	1139.8	9672.99	1139.66
9689.14	1139.48	9709.41	1139.42	9743.02	1139.19	9745.83	1139.17	9747.26	1139.08
9747.47	1139.07	9747.65	1139.07	9748.42	1139.05	9748.65	1139.04	9749.74	1138.98
9752.08	1138.84	9800.73	1137.11	9808.58	1136.24	9818.31	1135.47	9822.27	1135.63
9839.62	1136.35	9851.07	1136.81	9857.05	1137.03	9861.98	1137.21	9866.16	1137.35
9870.47	1137.47	9891.52	1138.85	9922.7	1138.81	9927.95	1138.8	9936.64	1138.79
9964.37	1138.76	9989.04	1137.67	10000	1136.97	10001.71	1136.86	10030.36	1138.32
10032.94	1138.49	10034.23	1138.57	10035.56	1138.62	10035.98	1138.63	10040.1	1138.7
10101.87	1139.03	10108.05	1139.24	10116.14	1139.23				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9615.38	.041	9747.47	.041	10040.1	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9747.47	10040.1	1420	1492	1420	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1138.85	Element		0.041	
Vel Head (ft)	0.36	Wt. n-Val.			
W.S. Elev (ft)	1138.49	Reach Len. (ft)	1420.00	1492.00	1420.00
Crit W.S. (ft)	1138.23	Flow Area (sq ft)		226.40	
E.G. Slope (ft/ft)	0.013656	Area (sq ft)		226.40	
Q Total (cfs)	1090.00	Flow (cfs)		1090.00	
Top Width (ft)	186.53	Top Width (ft)		186.53	
Vel Total (ft/s)	4.81	Avg. Vel. (ft/s)		4.81	
Max Chl Dpth (ft)	3.02	Hydr. Depth (ft)		1.21	
Conv. Total (cfs)	9327.5	Conv. (cfs)		9327.5	
Length Wtd. (ft)	1491.31	Wetted Per. (ft)		186.80	
Min Ch El (ft)	1135.47	Shear (lb/sq ft)		1.03	
Alpha	1.00	Stream Power (lb/ft s)		4.97	
Frctn Loss (ft)	11.10	Cum Volume (acre-ft)	0.01	23.57	0.81
C & E Loss (ft)	0.07	Cum SA (acres)	0.01	7.56	2.01

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2D (B35)
REACH: REACH 1 RS: 0.275

INPUT
Description:

Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9803.35	1128.36	9827.61	1128.17	9862.76	1127.97	9876.92	1127.89	9884.77	1127.82
9913.7	1127.69	9941.93	1127.54	9950.49	1127.49	9965.74	1126.88	9971.64	1126.66
9985.21	1126.18	10000	1125.65	10001.33	1125.62	10004.98	1125.63	10006.18	1125.62
10020.61	1125.62	10024.07	1125.62	10033.85	1125.63	10039.33	1125.63	10046.55	1125.62
10052.36	1125.62	10055.86	1125.62	10065.51	1125.62	10067.34	1125.62	10078.01	1125.62
10078.7	1125.62	10086.28	1125.62	10089.57	1125.64	10100.7	1125.73	10109.94	1125.81
10120.92	1125.91	10131.3	1126.02	10179.85	1127.07	10196.8	1127.13	10218.5	1127.24
10250.42	1127.32	10257.14	1127.35	10274.49	1127.38	10304.04	1127.47	10334.44	1127.61
10357.67	1127.67	10373.08	1127.78	10411.29	1128.01	10411.73	1128.02	10412.85	1128.03
10450.37	1128.41	10464.92	1128.55	10489.02	1128.8	10518.54	1129.07		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9803.35	.041	9941.93	.041	10196.8	.041

Bank Sta: Left	Right	Coeff Contr.	Expan.
9941.93	10196.8	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1127.69	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.000	0.041	0.041
W.S. Elev (ft)	1127.54	Reach Len. (ft)	1452.00	1452.00	1452.00
Crit W.S. (ft)	1126.88	Flow Area (sq ft)	0.00	349.48	24.71
E.G. Slope (ft/ft)	0.004677	Area (sq ft)	0.00	349.48	24.71
Q Total (cfs)	1090.00	Flow (cfs)	0.00	1069.00	21.00
Top Width (ft)	378.51	Top Width (ft)	0.55	254.87	123.09
Vel Total (ft/s)	2.91	Avg. Vel. (ft/s)	0.03	3.06	0.85
Max Chl Dpth (ft)	1.92	Hydr. Depth (ft)	0.00	1.37	0.20
Conv. Total (cfs)	15937.7	Conv. (cfs)	0.0	15630.6	307.1
Length Wtd. (ft)	1452.00	Wetted Per. (ft)	0.55	254.92	123.09
Min Ch El (ft)	1125.62	Shear (lb/sq ft)		0.40	0.06
Alpha	1.08	Stream Power (lb/ft s)		1.22	0.05
Frctn Loss (ft)	7.93	Cum Volume (acre-ft)	0.01	13.71	0.41
C & E Loss (ft)	0.01	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS11 (B37)
REACH: REACH 1 RS: 0.163

INPUT
Description: X-section 0.162 copied since HecRas has a minumum of
2 x-sections
per reach.
Limit of Sudy.
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9767.19	1150.03	9781.04	1150.04	9797.07	1150.04	9831.9	1150.05	9859.55	1150.04
9882.76	1150.06	9922.04	1150.02	9933.62	1150.01	9941.31	1148.8	9944.3	1148.51
9947.82	1148.21	9953.06	1147.81	9959.7	1147.38	9986.89	1145.45	9993.38	1145.32
10000	1145.32	10001.1	1145.25	10011.5	1144.64	10016.09	1144.97	10025.81	1145.59
10033.27	1146.04	10038.83	1146.47	10042.79	1146.96	10062.74	1149.63	10090.1	1149.55
10098.54	1149.53	10104.65	1149.51	10134.34	1149.48	10166.4	1149.43	10172.06	1149.18
10173.71	1149.12	10176.25	1149.01	10182.79	1148.64	10233.39	1145.66	10238.49	1146.07
10260.54	1147.96	10289.91	1149.74	10313.35	1149.87	10345.71	1150.05	10349.16	1150.07
10351.66	1150.09	10358.29	1150.12						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9767.19	.044	9933.62	.049	10062.74	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9933.62	10062.74	5	5	5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1148.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.		0.049	0.044
W.S. Elev (ft)	1148.59	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)		Flow Area (sq ft)		253.93	124.57
E.G. Slope (ft/ft)	0.001577	Area (sq ft)		253.93	124.57
Q Total (cfs)	740.00	Flow (cfs)		528.43	211.57
Top Width (ft)	198.66	Top Width (ft)		111.45	87.21
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)		2.08	1.70
Max Chl Dpth (ft)	3.95	Hydr. Depth (ft)		2.28	1.43
Conv. Total (cfs)	18633.5	Conv. (cfs)		13306.1	5327.3
Length Wtd. (ft)	5.00	Wetted Per. (ft)		111.79	87.42
Min Ch El (ft)	1144.64	Shear (lb/sq ft)		0.22	0.14
Alpha	1.02	Stream Power (lb/ft s)		0.47	0.24
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)		4.03	1.18
C & E Loss (ft)	0.00	Cum SA (acres)		0.01	0.01

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: 3S2WS11 (B37)

```
REACH: REACH 1            RS: 0.162

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9767.19 1150.03 9781.04 1150.04 9797.07 1150.04  9831.9 1150.05 9859.55 1150.04
 9882.76 1150.06 9922.04 1150.02 9933.62 1150.01 9941.31  1148.8  9944.3 1148.51
 9947.82 1148.21 9953.06 1147.81  9959.7 1147.38 9986.89 1145.45 9993.38 1145.32
   10000 1145.32 10001.1 1145.25 10011.5 1144.6410016.09 1144.9710025.81 1145.59
10033.27 1146.0410038.83 1146.4710042.79 1146.9610062.74 1149.63 10090.1 1149.55
10098.54 1149.5310104.65 1149.5110134.34 1149.48 10166.4 1149.4310172.06 1149.18
10173.71 1149.1210176.25 1149.0110182.79 1148.6410233.39 1145.6610238.49 1146.07
10260.54 1147.9610289.91 1149.7410313.35 1149.8710345.71 1150.0510349.16 1150.07
10351.66 1150.0910358.29 1150.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9767.19    .044 9933.62    .04910062.74    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9933.6210062.74             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1148.64  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *    0.049 *    0.044 *
* W.S. Elev (ft)          * 1148.58  * Reach Len. (ft)         *  818.00  *   818.00 *   818.00 *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *   252.93 *   123.79 *
* E.G. Slope (ft/ft)      *0.001597  * Area (sq ft)            *          *   252.93 *   123.79 *
* Q Total (cfs)           *  740.00  * Flow (cfs)              *          *   528.82 *   211.18 *
* Top Width (ft)          *  198.21  * Top Width (ft)          *          *   111.29 *    86.92 *
* Vel Total (ft/s)        *    1.96  * Avg. Vel. (ft/s)         *          *     2.09 *     1.71 *
* Max Chl Dpth (ft)       *    3.94  * Hydr. Depth (ft)         *          *     2.27 *     1.42 *
* Conv. Total (cfs)       * 18516.3  * Conv. (cfs)              *          * 13232.2  *  5284.2 *
* Length Wtd. (ft)        *  818.00  * Wetted Per. (ft)         *          *   111.63 *    87.12 *
* Min Ch El (ft)          * 1144.64  * Shear (lb/sq ft)         *          *     0.23 *     0.14 *
* Alpha                   *    1.02  * Stream Power (lb/ft s)   *          *     0.47 *     0.24 *
* Frctn Loss (ft)         *    4.00  * Cum Volume (acre-ft)     *          *     4.00 *     1.16 *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)           *          *          *          *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S2WS2A (B33)
REACH: REACH 1            RS: 2.220

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9819.92 1177.17 9851.09 1177.07 9869.95 1177.02 9894.49  1176.3  9902.5 1175.94
 9915.09 1175.31 9934.68 1174.37 9935.73 1174.38 9949.73    1175 9974.33 1174.02
   10000 1173.8610003.81 1173.8410040.13 1175.3510070.03 1176.6710108.19 1176.78
10120.04 1176.8210155.43 1173.8310160.81 1173.5510205.17 1176.1910220.06 1177.37
10261.31  1177.610270.07 1177.6410283.89 1177.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9819.92    .044 9869.95    .04910070.03    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9869.9510070.03             1020    1147    1170             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1175.78  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.27	Wt. n-Val.		0.049	0.044	
W.S. Elev (ft)	1175.51	Reach Len. (ft)	1020.00	1147.00	1170.00	
Crit W.S. (ft)	1175.29	Flow Area (sq ft)		131.21	58.88	
E.G. Slope (ft/ft)	0.017653	Area (sq ft)		131.21	58.88	
Q Total (cfs)	790.00	Flow (cfs)		524.30	265.70	
Top Width (ft)	191.00	Top Width (ft)		132.74	58.26	
Vel Total (ft/s)	4.16	Avg. Vel. (ft/s)		4.00	4.51	
Max Chl Dpth (ft)	1.96	Hydr. Depth (ft)		0.99	1.01	
Conv. Total (cfs)	5945.9	Conv. (cfs)		3946.1	1999.8	
Length Wtd. (ft)	1158.36	Wetted Per. (ft)		132.84	58.39	
Min Ch El (ft)	1173.84	Shear (lb/sq ft)		1.09	1.11	
Alpha	1.01	Stream Power (lb/ft s)		4.35	5.01	
Frctn Loss (ft)	6.95	Cum Volume (acre-ft)	5.38	19.89	17.30	
C & E Loss (ft)	0.07	Cum SA (acres)	12.93	10.52	27.99	

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 1 RS: 2.003

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9803.38	1170.41	9836.01	1170.35	9883.58	1170.27	9899.82	1170.23	9961.98	1170.14
9963.63	1170.14	9963.82	1170.14	9964.3	1170.1	9964.93	1170.04	10000	1166.35
10001.8	1166.3	10009.59	1166.8	10019.51	1167.5	10026.27	1166.98	10041.99	1167.24
10049.82	1167.33	10083.39	1168.11	10155.29	1168.11	10216.31	1168.03	10223.18	1168.01
10227.86	1167.93	10232.6	1167.83	10237.48	1167.75	10243.91	1167.73	10250.68	1167.74
10257.96	1167.76	10269.08	1167.76	10334.23	1167.43	10397.25	1168.2	10402.82	1168.19
10409.38	1168.17	10420.3	1168.14	10443.47	1168.34	10448.52	1168.32	10455.69	1168.29
10464.7	1168.24	10478.78	1168.18	10504.57	1168.05	10538.59	1167.88	10541	1167.92
10556.79	1168.17	10570.6	1168.36	10579.15	1168.47	10587.82	1168.48	10597.24	1168.57
10606.11	1168.64	10618.97	1168.72	10631.31	1168.78	10644.29	1168.8	10656.92	1168.86
10681.4	1169.4								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9803.38	.044	9964.93	.049	10083.39	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9964.93 10083.39 1700 1812 1700 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1168.76	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.04	Wt. n-Val.		0.049	0.044	
W.S. Elev (ft)	1168.71	Reach Len. (ft)	1700.00	1812.00	1700.00	
Crit W.S. (ft)	1168.27	Flow Area (sq ft)		142.49	365.36	
E.G. Slope (ft/ft)	0.003054	Area (sq ft)		142.49	365.36	
Q Total (cfs)	820.00	Flow (cfs)		290.78	529.22	
Top Width (ft)	640.12	Top Width (ft)		105.84	534.28	
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)		2.04	1.45	
Max Chl Dpth (ft)	2.41	Hydr. Depth (ft)		1.35	0.68	
Conv. Total (cfs)	14838.6	Conv. (cfs)		5261.8	9576.7	
Length Wtd. (ft)	1762.46	Wetted Per. (ft)		106.04	534.30	
Min Ch El (ft)	1166.30	Shear (lb/sq ft)		0.26	0.13	
Alpha	1.09	Stream Power (lb/ft s)		0.52	0.19	
Frctn Loss (ft)	10.42	Cum Volume (acre-ft)	5.38	16.29	11.60	
C & E Loss (ft)	0.02	Cum SA (acres)	12.93	7.38	20.03	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 1 RS: 1.659

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9624.74	1158.11	9637.15	1158.06	9652.9	1157.99	9655.09	1157.99	9703.27	1157.8
9712.48	1157.79	9753.65	1157.68	9769.87	1157.68	9804.02	1157.63	9827.25	1157.66
9854.39	1157.66	9884.64	1157.67	9904.76	1157.67	9942.02	1157.62	9955.13	1157.61
9970.73	1156.92	9983.1	1156.34	10000	1155.51	10000.64	1155.49	10013.91	1156.06
10028.04	1156.61	10057.65	1157.65	10080.57	1157.69	10109.62	1157.79	10121.07	1157.81
10161.49	1157.92	10161.56	1157.92	10161.58	1157.92	10202.06	1157.98	10213.55	1157.99
10242.55	1158.07								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9624.74	.044	9955.13	.049	10057.65	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9955.13	10057.65	1250	1270	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1158.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1158.06	Reach Len. (ft)	1250.00	1270.00	1250.00
Crit W.S. (ft)	1158.06	Flow Area (sq ft)	104.94	149.69	34.68
E.G. Slope (ft/ft)	0.013773	Area (sq ft)	104.94	149.69	34.68
Q Total (cfs)	930.00	Flow (cfs)	198.96	685.20	45.84
Top Width (ft)	599.73	Top Width (ft)	317.18	102.52	180.03
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)	1.90	4.58	1.32
Max Chl Dpth (ft)	2.57	Hydr. Depth (ft)	0.33	1.46	0.19
Conv. Total (cfs)	7924.6	Conv. (cfs)	1695.3	5838.6	390.6
Length Wtd. (ft)	1264.86	Wetted Per. (ft)	317.18	102.61	180.03
Min Ch El (ft)	1155.49	Shear (lb/sq ft)	0.28	1.25	0.17
Alpha	1.58	Stream Power (lb/ft s)	0.54	5.74	0.22
Frctn Loss (ft)	6.81	Cum Volume (acre-ft)	3.34	10.21	3.79
C & E Loss (ft)	0.04	Cum SA (acres)	6.75	3.05	6.09

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 1 RS: 1.419

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9640.49	1151.3	9661.46	1151.15	9705.57	1150.81	9716.44	1150.73	9725.61	1150.67
9771.42	1150.33	9825.77	1149.96	9826.41	1149.96	9826.94	1149.95	9881.39	1149.61
9928.27	1149.37	9936.37	1149.33	9941.7	1149.11	9942.96	1149.07	9945.05	1148.98
9947.14	1148.9	9950.78	1148.75	9958.67	1148.41	10000	1146.51	10002.28	1146.44
10010.14	1146.86	10042.75	1149.26	10055.94	1149.32	10093.48	1149.37	10099.24	1149.4
10132.73	1149.51	10142.53	1149.54	10144.22	1149.54	10185.83	1149.77	10194.95	1149.8
10207.85	1149.88	10245.68	1150.09	10272.42	1150.15	10296.41	1150.31	10315.72	1150.28
10332.5	1150.37								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9640.49	.044	9936.37	.04	9910042.75	.044

Bank Sta: Left Right Coeff Contr. Expan.
9936.3710042.75 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1150.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1150.25	Reach Len. (ft)	882.00	882.00	882.00
Crit W.S. (ft)		Flow Area (sq ft)	74.75	254.05	134.64
E.G. Slope (ft/ft)	0.002963	Area (sq ft)	74.75	254.05	134.64
Q Total (cfs)	1000.00	Flow (cfs)	85.26	748.42	166.32
Top Width (ft)	503.70	Top Width (ft)	152.94	106.38	244.38
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)	1.14	2.95	1.24
Max Chl Dpth (ft)	3.81	Hydr. Depth (ft)	0.49	2.39	0.55
Conv. Total (cfs)	18372.2	Conv. (cfs)	1566.4	13750.1	3055.6
Length Wtd. (ft)	882.00	Wetted Per. (ft)	152.94	106.54	244.39
Min Ch El (ft)	1146.44	Shear (lb/sq ft)	0.09	0.44	0.10
Alpha	1.47	Stream Power (lb/ft s)	0.10	1.30	0.13
Frctn Loss (ft)	5.72	Cum Volume (acre-ft)	0.76	4.33	1.36
C & E Loss (ft)	0.05	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 2 RS: 1.252

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9698.02	1145.18	9711.02	1145.17	9716.93	1145.16	9757.75	1145.04	9767.07	1145.02
9804.49	1144.87	9817.2	1144.83	9851.22	1144.68	9867.33	1144.64	9897.95	1144.53
9917.46	1144.49	9940.03	1144.47	9985.42	1141.55	9993.15	1140.42	9996.07	1141.65
10000	1140.71	10000.56	1140.56	10001.34	1141.24	10022.07	1142.24	10068.28	1144.63
10080.81	1144.69	10118.73	1144.84	10125.3	1144.88	10169.17	1145.06	10169.8	1145.06
10174.45	1145.07	10214.29	1145.18	10219.62	1145.19				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9698.02	.044	9940.03	.04	10068.28	.044

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9940.3310068.28 1080 1121 1115 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1144.59	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.57	Wt. n-Val.		0.049	
W.S. Elev (ft)	1144.02	Reach Len. (ft)	1080.00	1121.00	1115.00
Crit W.S. (ft)	1143.82	Flow Area (sq ft)		173.18	
E.G. Slope (ft/ft)	0.021928	Area (sq ft)		173.18	
Q Total (cfs)	1050.00	Flow (cfs)		1050.00	
Top Width (ft)	109.52	Top Width (ft)		109.52	
Vel Total (ft/s)	6.06	Avg. Vel. (ft/s)		6.06	
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)		1.58	
Conv. Total (cfs)	7090.6	Conv. (cfs)		7090.6	
Length Wtd. (ft)	1121.00	Wetted Per. (ft)		110.38	
Min Ch El (ft)	1140.42	Shear (lb/sq ft)		2.15	
Alpha	1.00	Stream Power (lb/ft s)		13.02	
Frctn Loss (ft)	7.80	Cum Volume (acre-ft)	6.48	30.63	0.38
C & E Loss (ft)	0.14	Cum SA (acres)	5.37	11.47	1.35

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 2 RS: 1.040

INPUT
Description: Approximately 400' upstream of Patterson Road.
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9634.91	1138.06	9664.55	1137.91	9667.64	1137.89	9693.66	1137.8	9717.92	1137.72
9720.8	1137.71	9768.2	1137.58	9777.04	1137.56	9818.48	1137.44	9854.44	1135.33
9877.23	1134	9893.33	1133.08	9900.78	1133.51	9916.3	1134.37	9926.86	1134.93
9983.36	1134.98	9986.11	1134.69	9989.86	1134.3	9995.16	1133.78	9999.96	1133.3
10000	1133.31	10006.94	1133.67	10023.99	1134.58	10034.17	1135.12	10069.51	1137.35
10099.59	1137.46	10119.52	1137.55	10148.5	1137.64	10169.54	1137.71	10197.42	1137.77
10219.55	1137.82	10246.33	1137.84	10269.56	1137.88	10295.25	1137.87	10319.57	1137.87
10344.16	1137.82								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9634.91	.044	9818.48	.049	10069.51	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9818.48	10069.51	1195	1231	1165	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1136.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.049	
W.S. Elev (ft)	1136.53	Reach Len. (ft)	1195.00	1231.00	1165.00
Crit W.S. (ft)	1135.46	Flow Area (sq ft)		411.89	
E.G. Slope (ft/ft)	0.003485	Area (sq ft)		411.89	
Q Total (cfs)	1110.00	Flow (cfs)		1110.00	
Top Width (ft)	222.66	Top Width (ft)		222.66	
Vel Total (ft/s)	2.69	Avg. Vel. (ft/s)		2.69	
Max Chl Dpth (ft)	3.45	Hydr. Depth (ft)		1.85	
Conv. Total (cfs)	18804.0	Conv. (cfs)		18804.0	
Length Wtd. (ft)	1231.00	Wetted Per. (ft)		222.99	
Min Ch El (ft)	1133.08	Shear (lb/sq ft)		0.40	
Alpha	1.00	Stream Power (lb/ft s)		1.08	
Frctn Loss (ft)	6.62	Cum Volume (acre-ft)	6.48	23.10	0.38
C & E Loss (ft)	0.03	Cum SA (acres)	5.37	7.20	1.35

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 2 RS: 0.807

INPUT
Description: Approximately 800' downstream of Patterson Road.
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9425.37	1134.06	9434.51	1134.02	9454.93	1133.93	9493.22	1133.75	9505.42	1133.7
9551.93	1133.48	9555.91	1133.46	9580.31	1133.33	9606.4	1133.2	9610.65	1133.18
9656.89	1132.96	9669.36	1132.9	9707.38	1132.73	9728.08	1132.63	9757.86	1132.47
9786.79	1132.31	9808.35	1132.17	9845.5	1131.92	9858.84	1131.81	9904.22	1131.5
9909.33	1131.45	9940.69	1131.23	9959.82	1131.09	9969.96	1129.75	10000	1125.21
10005.48	1124.24	10034.85	1127.62	10062.27	1130.35	10096.92	1130.19	10113.98	1130.15
10137.83	1130.14	10165.69	1130.18	10178.75	1130.23	10217.4	1130.43	10219.67	1130.44
10228.27	1130.5	10260.58	1130.71	10269.11	1130.76	10301.5	1130.92	10320.82	1131.01
10342.41	1131.08								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
 9425.37    .044 9959.82    .04910062.27    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.8210062.27             1300    1306    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1129.99  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.46  * Wt. n-Val.              *          *   0.049  *          *
* W.S. Elev (ft)          * 1129.53  * Reach Len. (ft)         * 1300.00  * 1306.00  * 1300.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  212.33  *          *
* E.G. Slope (ft/ft)      *0.009170  * Area (sq ft)            *          *  212.33  *          *
* Q Total (cfs)           * 1150.00  * Flow (cfs)              *          * 1150.00  *          *
* Top Width (ft)          *   82.66  * Top Width (ft)          *          *   82.66  *          *
* Vel Total (ft/s)        *    5.42  * Avg. Vel. (ft/s)        *          *    5.42  *          *
* Max Chl Dpth (ft)       *    5.29  * Hydr. Depth (ft)        *          *    2.57  *          *
* Conv. Total (cfs)       * 12009.4  * Conv. (cfs)             *          * 12009.4  *          *
* Length Wtd. (ft)        * 1304.96  * Wetted Per. (ft)        *          *   83.36  *          *
* Min Ch El (ft)          * 1124.24  * Shear (lb/sq ft)        *          *    1.46  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    7.90  *          *
* Frctn Loss (ft)         *    6.34  * Cum Volume (acre-ft)     *    6.48  *   14.28  *    0.38  *
* C & E Loss (ft)         *    0.11  * Cum SA (acres)           *    5.37  *    2.88  *    1.35  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S2WS2A (B33)
REACH: REACH 2            RS: 0.561

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9449.29 1125.23 9468.14 1125.05 9495.23 1124.77 9509.71 1124.63  9546.6 1124.31
 9551.28 1124.27 9571.17 1124.09 9592.86 1123.91 9598.86 1123.32 9599.56 1123.19
 9600.26 1123.12 9601.19 1123.04 9602.37 1122.95 9604.21 1122.83 9606.46 1122.72
 9615.82 1122.11 9631.14 1120.98 9642.87 1120.12 9653.89  1120.6 9668.87 1121.24
 9678.16 1121.65 9684.39 1121.93 9688.85 1122.14 9692.09  1122.3 9717.57 1123.22
 9752.08 1123.27 9759.15 1123.29 9789.14 1123.31 9800.72 1123.33 9803.45 1123.33
 9842.29 1123.24 9854.82 1123.19 9883.86 1123.13 9906.19 1123.04 9925.44 1123.03
 9957.56 1122.97 9978.44 1121.31 9988.42 1120.33   10000 1119.1710002.76  1118.9
10004.05 1118.7710013.61 1119.5510020.85 1120.1310067.11 1123.1510081.15 1123.17
10106.46 1123.2510117.93 1123.2710124.28 1123.29 10154.7  1123.410172.67  1123.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9449.29    .044 9957.56    .04910067.11    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9957.5610067.11            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1123.54  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1123.43  * Reach Len. (ft)         *  845.00  *  845.00  *  845.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  262.92  *  263.76  *   15.29  *
* E.G. Slope (ft/ft)      *0.003059  * Area (sq ft)            *  262.92  *  263.76  *   15.29  *
* Q Total (cfs)           * 1200.00  * Flow (cfs)              *  398.24  *  793.04  *    8.71  *
* Top Width (ft)          *  560.10  * Top Width (ft)          *  359.86  *  109.55  *   90.68  *
* Vel Total (ft/s)        *    2.21  * Avg. Vel. (ft/s)        *    1.51  *    3.01  *    0.57  *
* Max Chl Dpth (ft)       *    4.66  * Hydr. Depth (ft)        *    0.73  *    2.41  *    0.17  *
* Conv. Total (cfs)       * 21695.8  * Conv. (cfs)             *  7200.2  * 14338.1  *   157.6  *
* Length Wtd. (ft)        *  845.00  * Wetted Per. (ft)        *  360.06  *  109.90  *   90.68  *
* Min Ch El (ft)          * 1118.77  * Shear (lb/sq ft)        *    0.14  *    0.46  *    0.03  *
* Alpha                   *    1.37  * Stream Power (lb/ft s)   *    0.21  *    1.38  *    0.02  *
* Frctn Loss (ft)         *    3.79  * Cum Volume (acre-ft)     *    2.56  *    7.14  *    0.15  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *          *          *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 3 RS: 0.386

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9650.28	1120.21	9658.23	1120.17	9688.98	1120.14	9711.69	1120.06	9727.77	1120.05
9765.14	1119.93	9766.56	1119.92	9770.31	1119.9	9805.35	1119.7	9818.6	1119.63
9844.14	1119.39	9877.65	1117.9	9881.44	1117.85	9885.94	1117.8	9895.87	1117.26
9901.61	1116.72	9908.64	1116.15	9916.11	1115.74	9918.28	1115.88	9923.18	1116.4
9927.1	1116.79	9987.99	1117.04	10000	1116.59	10006.7	1116.46	10017.09	1116.83
10025.83	1117.09	10070.97	1119.78	10084.8	1119.83	10106.79	1119.9	10137.27	1119.97
10142.6	1119.99	10146.45	1120	10178.42	1120.04	10208.11	1120.09	10214.23	1120.09
10222.71	1120.11	10250.05	1120.11	10269.77	1120.13	10285.86	1120.13	10308.16	1120.17
10321.68	1120.18	10331.43	1120.2	10347.25	1120.19				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9650.28	.044	9844.14	.049	10070.97	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9844.14	10070.97	1800	1827	1800	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1119.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.044	0.049	
W.S. Elev (ft)	1119.51	Reach Len. (ft)	1800.00	1827.00	1800.00
Crit W.S. (ft)	1118.52	Flow Area (sq ft)	0.78	472.84	
E.G. Slope (ft/ft)	0.006027	Area (sq ft)	0.78	472.84	
Q Total (cfs)	1840.00	Flow (cfs)	0.31	1839.69	
Top Width (ft)	235.16	Top Width (ft)	12.85	222.31	
Vel Total (ft/s)	3.89	Avg. Vel. (ft/s)	0.40	3.89	
Max Chl Dpth (ft)	3.77	Hydr. Depth (ft)	0.06	2.13	
Conv. Total (cfs)	23700.5	Conv. (cfs)	4.0	23696.4	
Length Wtd. (ft)	1820.95	Wetted Per. (ft)	12.85	222.56	
Min Ch El (ft)	1115.74	Shear (lb/sq ft)	0.02	0.80	
Alpha	1.00	Stream Power (lb/ft s)	0.01	3.11	
Frctn Loss (ft)	7.21	Cum Volume (acre-ft)	8.90	21.24	1.85
C & E Loss (ft)	0.04	Cum SA (acres)	6.26	8.32	2.24

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 3 RS: 0.040

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9498.43	1112.71	9540.27	1112.53	9552.58	1112.5	9591.46	1112.38	9618.09	1112.31
9642.64	1112.25	9683.6	1112.1	9695.75	1111.82	9696.83	1111.73	9698.27	1111.6
9700.13	1111.47	9703.67	1111.34	9707.98	1111.28	9741.14	1110.12	9748.59	1110.1
9756.47	1109.98	9765.64	1109.84	9774.75	1109.68	9776.4	1109.71	9778.56	1109.73
9803.39	1110.08	9818.69	1110.32	9828.58	1110.47	9834.78	1110.58	9839.3	1110.66
9880.13	1110.9	9898.55	1110.81	9945.64	1110.71	9949.05	1110.63	9949.2	1110.62
9949.37	1110.6	9949.51	1110.58	9952.86	1110.57	9953.75	1110.51	9955.42	1110.4
9959.05	1110.18	10000	1107.79	10003.33	1107.63	10030.35	1109.55	10037.79	1110.2
10054.42	1111.27	10084.17	1111.56	10107.88	1111.81	10122.95	1111.94	10161.34	1112.17
10162.75	1112.4								

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9498.43    .044 9880.13    .04910054.42    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9880.1310054.42               210     210     210            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1112.50  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.               *   0.044   *   0.049   *   0.044  *
* W.S. Elev (ft)          * 1112.39  * Reach Len. (ft)          *  210.00   *  210.00   *  210.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *  376.60   *  433.33   *   65.94  *
* E.G. Slope (ft/ft)      *0.002957  * Area (sq ft)             *  376.60   *  433.33   *   65.94  *
* Q Total (cfs)           * 2220.00  * Flow (cfs)               *  822.64   * 1310.36   *   87.01  *
* Top Width (ft)          *  572.78  * Top Width (ft)           *  290.25   *  174.29   *  108.24  *
* Vel Total (ft/s)        *    2.53  * Avg. Vel. (ft/s)         *    2.18   *    3.02   *    1.32  *
* Max Chl Dpth (ft)       *    4.75  * Hydr. Depth (ft)         *    1.30   *    2.49   *    0.61  *
* Conv. Total (cfs)       * 40823.9  * Conv. (cfs)              * 15127.6   * 24096.4   *  1600.0  *
* Length Wtd. (ft)        *  210.00  * Wetted Per. (ft)         *  290.30   *  174.51   *  108.26  *
* Min Ch El (ft)          * 1107.63  * Shear (lb/sq ft)         *    0.24   *    0.46   *    0.11  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)   *    0.52   *    1.39   *    0.15  *
* Frctn Loss (ft)         *    0.85  * Cum Volume (acre-ft)     *    1.11   *    2.24   *    0.49  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *           *           *          *
*****************************************************************************************

CROSS SECTION


RIVER: 3S2WS2A (B33)
REACH: REACH 4            RS: 0.001

INPUT
Description: Copy of x-section 0.000 because Hec-Ras needs 2 x-sections per
             reach.
Station Elevation Data      num=      56
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 9558.42 1112.18 9598.05 1111.97 9614.16 1111.88  9648.3 1111.73 9669.89  1111.6
 9698.54 1111.49 9725.63 1111.36 9748.78 1111.26 9781.37 1111.11 9799.02 1111.03
 9837.11 1110.83 9849.27 1110.76 9892.84 1110.51 9899.51 1110.46 9910.95 1110.06
 9913.23 1109.99  9916.7 1109.88 9924.35 1109.66 9941.68 1109.19 9960.76 1108.68
 9963.12 1108.59 9969.05 1109.35 9981.27 1110.56 9987.19 1110.82 9998.07 1111.96
   10000 1112.0710000.02 1112.0710004.54 1112.7410011.08 1112.4210011.33 1112.44
10020.57 1112.1110021.12 1112.1310049.21 1110.8910063.45 1110.4510076.41 1108.91
10081.13 1108.7510083.01 1108.3710086.39 1107.7510090.36 1107.7510097.51 1107.76
10103.75 1107.7610110.57 1107.7710136.95 1108.9810148.64 1109.1510183.05 1110.27
10203.06 1110.3810224.75 1110.4710254.37 1110.6310266.45 1110.6810305.68 1110.94
10308.16 1110.9610318.89 1111.0110349.86 1111.1510356.99 1111.1810391.56 1111.26
 10408.3  1111.5

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9558.42    .044 9892.84    .04910183.05    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9892.8410183.05                 1       1       1            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1111.64  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.               *   0.044   *   0.049   *   0.044  *
* W.S. Elev (ft)          * 1111.45  * Reach Len. (ft)          *    1.00   *    1.00   *    1.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *   83.04   *  495.93   *  135.44  *
* E.G. Slope (ft/ft)      *0.005926  * Area (sq ft)             *   83.04   *  495.93   *  135.44  *
* Q Total (cfs)           * 2220.00  * Flow (cfs)               *  125.95   * 1840.69   *  253.35  *
* Top Width (ft)          *  655.17  * Top Width (ft)           *  186.34   *  246.95   *  221.89  *
* Vel Total (ft/s)        *    3.11  * Avg. Vel. (ft/s)         *    1.52   *    3.71   *    1.87  *
* Max Chl Dpth (ft)       *    3.70  * Hydr. Depth (ft)         *    0.45   *    2.01   *    0.61  *
* Conv. Total (cfs)       * 28838.4  * Conv. (cfs)              *  1636.2   * 23911.1   *  3291.1  *
* Length Wtd. (ft)        *    1.00  * Wetted Per. (ft)         *  186.34   *  247.38   *  221.89  *
* Min Ch El (ft)          * 1107.75  * Shear (lb/sq ft)         *    0.16   *    0.74   *    0.23  *
* Alpha                   *    1.24  * Stream Power (lb/ft s)   *    0.25   *    2.75   *    0.42  *
* Frctn Loss (ft)         *    0.01  * Cum Volume (acre-ft)     *    0.00   *    0.01   *    0.00  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    0.00   *    0.01   *    0.01  *
*****************************************************************************************
```

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: 3S2WS2A (B33)
REACH: REACH 4 RS: 0.000

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9558.42	1112.18	9598.05	1111.97	9614.16	1111.88	9648.3	1111.73	9669.89	1111.6
9698.54	1111.49	9725.63	1111.36	9748.78	1111.26	9781.37	1111.11	9799.02	1111.03
9837.11	1110.83	9849.27	1110.76	9892.84	1110.51	9899.51	1110.46	9910.95	1110.06
9913.23	1109.99	9916.7	1109.88	9924.35	1109.66	9941.68	1109.19	9960.76	1108.68
9963.12	1108.59	9969.05	1109.35	9981.27	1110.56	9987.19	1110.82	9998.07	1111.96
10000	1112.07	10000.02	1112.07	10004.54	1112.74	10011.08	1112.42	10011.33	1112.44
10020.57	1112.11	10021.12	1112.13	10049.21	1110.89	10063.45	1110.45	10076.41	1108.91
10081.13	1108.75	10083.01	1108.37	10086.39	1107.75	10090.36	1107.75	10097.51	1107.76
10103.75	1107.76	10110.57	1107.77	10136.95	1108.98	10148.64	1109.15	10183.05	1110.27
10203.06	1110.38	10224.75	1110.47	10254.37	1110.63	10266.45	1110.68	10305.68	1110.94
10308.16	1110.96	10318.89	1111.01	10349.86	1111.15	10356.99	1111.18	10391.56	1111.26
10408.3	1111.5								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9558.42	.044	9892.84	.049	10183.05	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9892.84	10183.05	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1111.63	Element				
Vel Head (ft)	0.19	Wt. n-Val.		0.044	0.049	0.044
W.S. Elev (ft)	1111.45	Reach Len. (ft)				
Crit W.S. (ft)	1110.82	Flow Area (sq ft)		81.93	494.46	134.11
E.G. Slope (ft/ft)	0.006003	Area (sq ft)		81.93	494.46	134.11
Q Total (cfs)	2220.00	Flow (cfs)		124.51	1844.34	251.15
Top Width (ft)	653.32	Top Width (ft)		185.09	246.75	221.47
Vel Total (ft/s)	3.12	Avg. Vel. (ft/s)		1.52	3.73	1.87
Max Chl Dpth (ft)	3.70	Hydr. Depth (ft)		0.44	2.00	0.61
Conv. Total (cfs)	28653.6	Conv. (cfs)		1607.0	23804.9	3241.7
Length Wtd. (ft)		Wetted Per. (ft)		185.09	247.18	221.47
Min Ch El (ft)	1107.75	Shear (lb/sq ft)		0.17	0.75	0.23
Alpha	1.24	Stream Power (lb/ft s)		0.25	2.80	0.42
Frctn Loss (ft)		Cum Volume (acre-ft)				
C & E Loss (ft)		Cum SA (acres)				

Warning: Divided flow computed for this cross-section.

CROSS SECTION

RIVER: 3S2WS2E (B33)
REACH: REACH 1 RS: 0.713

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9608.39	1137.33	9617.17	1137.3	9640.79	1137.22	9656.82	1137.14	9676.78	1137.05
9706.17	1136.89	9712.78	1136.85	9717.26	1136.83	9748.77	1136.64	9777.7	1136.45
9784.77	1136.41	9795.17	1136.34	9820.76	1136.18	9838.14	1136.08	9856.76	1135.97
9884.17	1135.81	9892.75	1135.77	9898.58	1135.74	9928.75	1135.59	9968.81	1134.59
9972.57	1134.48	9976.43	1134.23	10000	1133.16	10001.34	1133.15	10002.46	1132.94
10007.56	1133.33	10010.12	1133.53	10020.74	1133.89	10033.2	1134.63	10045.39	1135.06
10049.88	1135.08	10054.67	1135.11	10059.68	1135.09	10064.55	1135.07	10070.67	1135.07
10076.35	1135.07	10104.1	1135.41	10109.89	1135.43	10113.93	1135.46	10117.44	1135.48
10120.46	1135.51	10123.06	1135.52	10125.25	1135.54	10127.12	1135.56	10128.87	1135.57
10130.44	1135.58	10131.86	1135.59	10133.14	1135.59	10134.37	1135.6	10150	1135.92
10184.93	1136.05	10199.66	1136.11	10234.93	1136.24	10249.32	1136.29	10284.93	1136.45
10298.98	1136.48	10334.93	1136.61	10348.64	1136.63	10384.93	1136.72	10398.3	1136.73

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9608.39    .041 9928.75    .04110045.39    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.7510045.39             1345    1444    1405            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1135.95  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.13  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1135.82  * Reach Len. (ft)         * 1345.00  * 1444.00  * 1405.00  *
* Crit W.S. (ft)         * 1135.30  * Flow Area (sq ft)       *    5.50  *  170.49  *   50.47  *
* E.G. Slope (ft/ft)     *0.004290  * Area (sq ft)            *    5.50  *  170.49  *   50.47  *
* Q Total (cfs)          *  600.00  * Flow (cfs)              *    3.13  *  520.89  *   75.99  *
* Top Width (ft)         *  263.50  * Top Width (ft)          *   46.94  *  116.64  *   99.91  *
* Vel Total (ft/s)       *    2.65  * Avg. Vel. (ft/s)        *    0.57  *    3.06  *    1.51  *
* Max Chl Dpth (ft)      *    2.88  * Hydr. Depth (ft)        *    0.12  *    1.46  *    0.51  *
* Conv. Total (cfs)      *  9160.3  * Conv. (cfs)             *    47.7  *  7952.4  *  1160.1  *
* Length Wtd. (ft)       * 1441.34  * Wetted Per. (ft)        *   46.94  *  116.76  *   99.92  *
* Min Ch El (ft)         * 1132.94  * Shear (lb/sq ft)        *    0.03  *    0.39  *    0.14  *
* Alpha                  *    1.20  * Stream Power (lb/ft s)  *    0.02  *    1.19  *    0.20  *
* Frctn Loss (ft)        *   12.52  * Cum Volume (acre-ft)    *    1.18  *   19.37  *    6.57  *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)          *    0.72  *    7.10  *    4.73  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S2WS2E (B33)
REACH: REACH 1             RS: 0.439

INPUT
Description:
Station Elevation Data     num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9661.85 1124.69 9670.39 1124.65 9679.11 1124.62 9694.76 1124.55 9715.87 1124.49
 9727.63 1124.46 9752.62 1124.43 9784.87 1124.42 9789.38 1124.42 9797.46 1124.42
 9826.13 1124.44 9842.12 1124.46 9862.89 1124.43 9899.36 1124.37 9899.64 1124.37
 9900.16 1124.36  9936.4 1124.26 9978.89 1121.86 9988.23  1121.4   10000 1120.84
10002.84  1120.710038.11 1122.0910065.38 1123.0810070.94 1123.2410074.06 1123.37
10080.24 1123.8310087.52 1123.81 10115.6 1123.7710143.86 1123.7410150.96 1123.74
   10158 1123.7410186.31 1123.7510214.81 1123.7510221.67 1123.7510228.48 1123.75
10257.02 1123.7810285.75  1123.810298.96 1123.79

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9661.85    .041  9936.4    .04110080.24    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9936.410080.24              1120    1177    1130            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1123.40  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.55  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)         * 1122.85  * Reach Len. (ft)         * 1120.00  * 1177.00  * 1130.00  *
* Crit W.S. (ft)         * 1122.85  * Flow Area (sq ft)       *          *  105.78  *          *
* E.G. Slope (ft/ft)     *0.024342  * Area (sq ft)            *          *  105.78  *          *
* Q Total (cfs)          *  630.00  * Flow (cfs)              *          *  630.00  *          *
* Top Width (ft)         *   97.76  * Top Width (ft)          *          *   97.76  *          *
* Vel Total (ft/s)       *    5.96  * Avg. Vel. (ft/s)        *          *    5.96  *          *
* Max Chl Dpth (ft)      *    2.15  * Hydr. Depth (ft)        *          *    1.08  *          *
* Conv. Total (cfs)      *  4038.0  * Conv. (cfs)             *          *  4038.0  *          *
* Length Wtd. (ft)       * 1171.08  * Wetted Per. (ft)        *          *   97.86  *          *
* Min Ch El (ft)         * 1120.70  * Shear (lb/sq ft)        *          *    1.64  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    9.78  *          *
* Frctn Loss (ft)        *    4.66  * Cum Volume (acre-ft)    *    1.10  *   14.79  *    5.76  *
* C & E Loss (ft)        *    0.15  * Cum SA (acres)          *          *    3.54  *    3.12  *
```

```
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S2WS2E (B33)
REACH: REACH 1            RS: 0.217

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9724.91 1118.28 9741.34 1118.19  9774.6 1117.96 9779.46 1117.93 9790.88 1117.84
 9817.58 1117.66 9828.94 1117.56  9855.7 1117.37 9898.58 1115.32 9907.99  1114.8
 9913.84 1114.48 9931.06  1114.4 9958.52 1114.24 9978.27 1114.14 9983.51 1114.11
   10000 1114.0410002.05 1114.0310016.47 1114.7710030.88 1115.5210043.56 1116.19
10052.21 1116.1810079.42 1116.15   10111 1115.6810115.99 1115.6110132.95 1115.32
10134.57 1115.3210135.14 1115.3210137.24 1115.32 10137.4 1115.3210137.62 1115.32
10141.26  1115.410150.81 1115.6410194.44 1115.5910197.26 1115.3910202.04 1115.12
10212.01  1114.810219.55 1114.6110225.48    111510266.28 1115.8310281.31  1116.2
10285.81 1116.2910288.18 1116.3210289.58 1116.34 10294.6 1116.4710297.39 1116.47

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9724.91    .041  9855.7    .04110043.56    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9855.710043.56             1030    1143    1130            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1116.31  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.               *          *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1116.26  * Reach Len. (ft)          * 1150.00  * 1150.00  * 1150.00  *
* Crit W.S. (ft)         * 1115.34  * Flow Area (sq ft)        *          *  254.99  *  151.63  *
* E.G. Slope (ft/ft)     *0.001619  * Area (sq ft)             *          *  254.99  *  151.63  *
* Q Total (cfs)          *  660.00  * Flow (cfs)               *          *  497.55  *  162.45  *
* Top Width (ft)         *  405.25  * Top Width (ft)           *          *  164.60  *  240.65  *
* Vel Total (ft/s)       *    1.62  * Avg. Vel. (ft/s)          *          *    1.95  *    1.07  *
* Max Chl Dpth (ft)      *    2.23  * Hydr. Depth (ft)          *          *    1.55  *    0.63  *
* Conv. Total (cfs)      * 16405.3  * Conv. (cfs)               *          * 12367.3  *  4038.0  *
* Length Wtd. (ft)       * 1150.00  * Wetted Per. (ft)          *          *  164.70  *  240.71  *
* Min Ch El (ft)         * 1114.03  * Shear (lb/sq ft)          *          *    0.16  *    0.06  *
* Alpha                  *    1.20  * Stream Power (lb/ft s)    *          *    0.31  *    0.07  *
* Frctn Loss (ft)        *    4.66  * Cum Volume (acre-ft)      *    1.10  *    9.91  *    3.79  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)            *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

*****************************************************************************

SUMMARY OF MANNING'S N VALUES

River:3S2WS2D (B35)
*************************************************************
*     Reach       *   River Sta.   *   n1    *   n2    *   n3    *
*************************************************************
*REACH 1          *    0.557       *     .041*     .041*     .041*
*REACH 1          *    0.275       *     .041*     .041*     .041*
*************************************************************
```

River:3S2WS11 (B37)

Reach	River Sta.	n1	n2	n3
REACH 1	0.163	.044	.049	.044
REACH 1	0.162	.044	.049	.044

River:3S2WS2A (B33)

Reach	River Sta.	n1	n2	n3
REACH 1	2.220	.044	.049	.044
REACH 1	2.003	.044	.049	.044
REACH 1	1.659	.044	.049	.044
REACH 1	1.419	.044	.049	.044
REACH 2	1.252	.044	.049	.044
REACH 2	1.040	.044	.049	.044
REACH 2	0.807	.044	.049	.044
REACH 2	0.561	.044	.049	.044
REACH 3	0.386	.044	.049	.044
REACH 3	0.040	.044	.049	.044
REACH 4	0.001	.044	.049	.044
REACH 4	0.000	.044	.049	.044

River:3S2WS2E (B33)

Reach	River Sta.	n1	n2	n3
REACH 1	0.713	.041	.041	.041
REACH 1	0.439	.041	.041	.041
REACH 1	0.217	.041	.041	.041

SUMMARY OF REACH LENGTHS

River: 3S2WS2D (B35)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.557	1420	1492	1420
REACH 1	0.275			

River: 3S2WS11 (B37)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.163	5	5	5
REACH 1	0.162			

River: 3S2WS2A (B33)

Reach	River Sta.	Left	Channel	Right
REACH 1	2.220	1020	1147	1170
REACH 1	2.003	1700	1812	1700
REACH 1	1.659	1250	1270	1250
REACH 1	1.419			
REACH 2	1.252	1080	1121	1115
REACH 2	1.040	1195	1231	1165
REACH 2	0.807	1300	1306	1300
REACH 2	0.561			
REACH 3	0.386	1800	1827	1800
REACH 3	0.040	210	210	210
REACH 4	0.001	1	1	1
REACH 4	0.000	1	1	1

River: 3S2WS2E (B33)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.713	1345	1444	1405

```
*REACH 1          *    0.439        *     1120*      1177*      1130*
*REACH 1          *    0.217        *     1030*      1143*      1130*
*************************************************************

*****************************************************************************

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 3S2WS2D (B35)

*****************************************************
*     Reach        *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    0.557    *       .1*       .3*
*REACH 1          *    0.275    *       .1*       .3*
*****************************************************
River: 3S2WS11 (B37)

*****************************************************
*     Reach        *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    0.163    *       .1*       .3*
*REACH 1          *    0.162    *       .1*       .3*
*****************************************************
River: 3S2WS2A (B33)

*****************************************************
*     Reach        *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    2.220    *       .1*       .3*
*REACH 1          *    2.003    *       .1*       .3*
*REACH 1          *    1.659    *       .1*       .3*
*REACH 1          *    1.419    *       .1*       .3*
*REACH 2          *    1.252    *       .1*       .3*
*REACH 2          *    1.040    *       .1*       .3*
*REACH 2          *    0.807    *       .1*       .3*
*REACH 2          *    0.561    *       .1*       .3*
*REACH 3          *    0.386    *       .1*       .3*
*REACH 3          *    0.040    *       .1*       .3*
*REACH 4          *    0.001    *       .1*       .3*
*REACH 4          *    0.000    *       .1*       .3*
*****************************************************
River: 3S2WS2E (B33)

*****************************************************
*     Reach        *   River Sta.    * Contr.  * Expan.  *
*****************************************************
*REACH 1          *    0.713    *       .1*       .3*
*REACH 1          *    0.439    *       .1*       .3*
*REACH 1          *    0.217    *       .1*       .3*
*****************************************************
```

MODEL: 3S2WS2B (B65)

REACHES: 3S2WS2B (B65)
3S2WS1 (B54)
3S2WS2C (B38)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 3S2WS2B (B65)
Project File : 3S2WS2B_B65.prj
Run Date and Time: 1/12/2005 4:44:02 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model Name: 3S2WS2B (B65)
Reaches: 3S2WS2B (B65)
3S2WS2C
(B38)
3S2WS1 (B54)

****

PLAN DATA

Plan Title: 3S2WS2B (B65)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2B
(B65)\3S2WS2B_B65.p01

Geometry Title: 3S2WS2B (B65)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2B
(B65)\3S2WS2B_B65.g01

Flow Title : 3S2WS2B (B65)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2B
(B65)\3S2WS2B_B65.f01

Plan Summary Information:

Number of:	Cross Sections =	22	Mulitple Openings =	0
	Culverts =	0	Inline Structures =	0
	Bridges =	0	Lateral Structures =	0

Computational Information

```
    Water surface calculation tolerance =  0.01
    Critical depth calculaton tolerance =  0.01
    Maximum number of interations       =  20
    Maximum difference tolerance        =  0.3
    Flow tolerance factor               =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 3S2WS2C (B38)     Reach = REACH 1
RS      Profile            Method  Value1  Value2
0.718   PF 2                    1    9980   10030
0.467   PF 2                    1    9960   10030
0.287   PF 2                    1    9860   10060

River = 3S2WS2B (B65)     Reach = REACH 1
RS      Profile            Method  Value1  Value2
2.297   PF 2                    1    9880   10160
2.042   PF 2                    1    9830   10140
1.785   PF 2                    1    9955   10370
1.530   PF 2                    1    9880   10115
1.303   PF 2                    1    9910   10165
1.085   PF 2                    1    9965   10145
0.823   PF 2                    1    9840   10090
0.630   PF 2                    1    9800   10140
0.432   PF 2                    1    9775   10100

River = 3S2WS2B (B65)     Reach = REACH 2
RS      Profile            Method  Value1  Value2
0.823   PF 2                    1    9840   10090
0.630   PF 2                    1    9800   10140
0.432   PF 2                    1    9775   10100
0.315   PF 2                    1    9900   10100

River = 3S2WS2B (B65)     Reach = REACH 3
RS      Profile            Method  Value1  Value2
0.315   PF 2                    1    9900   10100
0.093   PF 2                    1    9875   10125
0.000   PF 2                    1    9850   10100

River = 3S2WS1 (B54)      Reach = REACH 1
RS      Profile            Method  Value1  Value2
1.702   PF 2                    1    9950   10050
1.453   PF 2                    1    9875   10225
1.132   PF 2                    1    9885   10100
0.950   PF 2                    1    9850   10215
0.724   PF 2                    1    9840   10065
0.468   PF 2                    1    9915   10190
0.224   PF 2                    1    9915   10065

*******************************************************************************

FLOW DATA

Flow Title: 3S2WS2B (B65)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2B
(B65)\3S2WS2B_B65.f01

Flow Data (cfs)
*************************************************************
* River            Reach          RS      *          PF 1 *
* 3S2WS1 (B54)     REACH 1        1.702   *           530 *
* 3S2WS1 (B54)     REACH 1        1.453   *           530 *
* 3S2WS1 (B54)     REACH 1        1.132   *           530 *
* 3S2WS1 (B54)     REACH 1        0.950   *           530 *
* 3S2WS1 (B54)     REACH 1        0.724   *           530 *
* 3S2WS1 (B54)     REACH 1        0.468   *           530 *
* 3S2WS1 (B54)     REACH 1        0.224   *           520 *
* 3S2WS2B (B65)    REACH 1        2.297   *          2540 *
* 3S2WS2B (B65)    REACH 1        2.042   *          2460 *
```

```
* 3S2WS2B (B65)    REACH 1          1.785   *            2370 *
* 3S2WS2B (B65)    REACH 1          1.530   *            2280 *
* 3S2WS2B (B65)    REACH 1          1.303   *            2210 *
* 3S2WS2B (B65)    REACH 1          1.085   *            2330 *
* 3S2WS2B (B65)    REACH 2          0.823   *            2290 *
* 3S2WS2B (B65)    REACH 2          0.630   *            2260 *
* 3S2WS2B (B65)    REACH 2          0.432   *            2230 *
* 3S2WS2B (B65)    REACH 3          0.315   *            2210 *
* 3S2WS2B (B65)    REACH 3          0.093   *            2180 *
* 3S2WS2B (B65)    REACH 3          0.000   *            2190 *
* 3S2WS2C (B38)    REACH 1          0.718   *             280 *
* 3S2WS2C (B38)    REACH 1          0.467   *             360 *
* 3S2WS2C (B38)    REACH 1          0.287   *             420 *
*************************************************************
```

Boundary Conditions

```
*****************************************************************************************************
* River            Reach            Profile          *            Upstream                Downstream    *
*****************************************************************************************************
* 3S2WS1 (B54)     REACH 1          PF 1             *        Normal S = 0.0063                      *
* 3S2WS2B (B65)    REACH 1          PF 1             *        Normal S = 0.0063                      *
* 3S2WS2B (B65)    REACH 3          PF 1             *                                 Normal S = 0.0063 *
* 3S2WS2C (B38)    REACH 1          PF 1             *        Normal S = 0.0063                      *
*****************************************************************************************************
```

****

GEOMETRY DATA

Geometry Title: 3S2WS2B (B65)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\3S2WS2B (B65)\3S2WS2B_B65.g01

Reach Connection Table

```
*****************************************************************************
* River            Reach            *  Upstream Boundary  * Downstream Boundary *
*****************************************************************************
* 3S2WS1 (B54)     REACH 1          *                     *   JUNCTION 1        *
* 3S2WS2B (B65)    REACH 1          *                     *   JUNCTION 1        *
* 3S2WS2B (B65)    REACH 2          *   JUNCTION 1        *   JUNCTION 2        *
* 3S2WS2B (B65)    REACH 3          *   JUNCTION 2        *                     *
* 3S2WS2C (B38)    REACH 1          *                     *   JUNCTION 2        *
*****************************************************************************
```

JUNCTION INFORMATION

Name: JUNCTION 1
Description:
Energy computation Method

```
    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
3S2WS2B (B65)    REACH 1            to 3S2WS2B (B65)   REACH 2            1382
3S2WS1 (B54)     REACH 1            to 3S2WS2B (B65)   REACH 2            2100
```

Name: JUNCTION 2
Description:
Energy computation Method

```
    Length across Junction                Tributary
     River            Reach                 River            Reach          Length   Angle
3S2WS2B (B65)    REACH 2            to 3S2WS2B (B65)   REACH 3             618
3S2WS2C (B38)    REACH 1            to 3S2WS2B (B65)   REACH 3            1515
```

CROSS SECTION

RIVER: 3S2WS1 (B54)
REACH: REACH 1 RS: 1.702

INPUT
Description:
Station Elevation Data num= 44

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9615.91 1196.25 9629.14 1196.25 9664.55 1196.25 9677.79 1196.24 9714.56  1196.2
 9726.44 1196.19 9764.58 1196.15  9775.1 1196.13  9814.6 1196.06 9823.75 1196.03
 9864.62 1195.91  9872.4 1195.87 9914.64  1195.7 9927.71 1194.72 9939.66 1193.82
 9956.41  1192.6 9957.06  1192.6 9958.63  1192.6 9960.42  1192.6 9962.56  1192.6
```

```
 9975.94 1192.29  9983.2 1192.21 9991.14 1192.14 9994.01 1192.08   10000 1192.03
10002.05 1192.0110105.98 1195.48 10107.9 1195.5210108.94 1195.53 10111.2 1195.59
10111.52 1195.6110114.68 1195.5410119.58 1195.7810165.12 1196.1210204.42 1196.46
10215.26 1196.5610251.12 1196.8510265.39 1196.9810297.81 1197.1810315.53 1197.32
10344.51 1197.4410365.66 1197.4210391.21 1197.47 10415.8  1197.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9615.91    .044 9914.64    .04910119.58    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9914.6410119.58             1300    1312    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1194.20  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1194.01  * Reach Len. (ft)        * 1300.00  * 1312.00  * 1300.00  *
* Crit W.S. (ft)          * 1193.52  * Flow Area (sq ft)      *          *  151.24  *          *
* E.G. Slope (ft/ft)      *0.010328  * Area (sq ft)           *          *  151.24  *          *
* Q Total (cfs)           *  530.00  * Flow (cfs)             *          *  530.00  *          *
* Top Width (ft)          *  124.64  * Top Width (ft)         *          *  124.64  *          *
* Vel Total (ft/s)        *    3.50  * Avg. Vel. (ft/s)       *          *    3.50  *          *
* Max Chl Dpth (ft)       *    2.00  * Hydr. Depth (ft)       *          *    1.21  *          *
* Conv. Total (cfs)       *  5215.2  * Conv. (cfs)            *          *  5215.2  *          *
* Length Wtd. (ft)        * 1310.79  * Wetted Per. (ft)       *          *  124.73  *          *
* Min Ch El (ft)          * 1192.01  * Shear (lb/sq ft)       *          *    0.78  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    2.74  *          *
* Frctn Loss (ft)         *    6.55  * Cum Volume (acre-ft)   *   16.65  *   46.30  *    7.72  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)         *   17.05  *   44.60  *   14.26  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S2WS1 (B54)
REACH: REACH 1            RS: 1.453

INPUT
Description:
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9676.04  1187.9 9681.57 1187.88 9716.58 1187.81 9756.71  1187.6 9773.26 1187.52
 9787.71 1187.42 9829.95  1187.1 9878.35 1186.79 9886.63 1186.73 9889.14 1186.71
   10000 1186.4310050.16 1186.5410092.73  1186.610100.33 1186.61 10139.1 1186.71
 10150.5 1186.7410185.47 1186.9310200.67 1187.0310231.84 1187.3110250.83 1187.48
10278.21 1187.78   10301 1187.9910324.58 1188.1410351.17 1188.3210370.95 1188.39
10397.17 1188.42

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9676.04    .044 9886.63    .049 10150.5    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9886.63 10150.5             1625    1699    1625            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1187.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.04  * Wt. n-Val.              *   0.044  *    0.049 *   0.044  *
* W.S. Elev (ft)          * 1187.56  * Reach Len. (ft)        * 1625.00  * 1699.00  * 1625.00  *
* Crit W.S. (ft)          * 1187.07  * Flow Area (sq ft)      *   50.74  *  260.06  *   49.94  *
* E.G. Slope (ft/ft)      *0.002940  * Area (sq ft)           *   50.74  *  260.06  *   49.94  *
* Q Total (cfs)           *  530.00  * Flow (cfs)             *   51.77  *  423.48  *   54.75  *
* Top Width (ft)          *  493.67  * Top Width (ft)         *  122.01  *  263.87  *  107.79  *
* Vel Total (ft/s)        *    1.47  * Avg. Vel. (ft/s)       *    1.02  *    1.63  *    1.10  *
* Max Chl Dpth (ft)       *    1.13  * Hydr. Depth (ft)       *    0.42  *    0.99  *    0.46  *
* Conv. Total (cfs)       *  9774.6  * Conv. (cfs)            *   954.7  *  7810.2  *  1009.7  *
* Length Wtd. (ft)        * 1676.92  * Wetted Per. (ft)       *  122.01  *  263.87  *  107.80  *
* Min Ch El (ft)          * 1186.43  * Shear (lb/sq ft)       *    0.08  *    0.18  *    0.09  *
```

```
* Alpha                  *    1.09  * Stream Power (lb/ft s) *    0.08  *    0.29  *    0.09  *
* Frctn Loss (ft)        *   11.72  * Cum Volume (acre-ft)   *   15.89  *   40.10  *    6.97  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *   15.23  *   38.75  *   12.65  *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S2WS1 (B54)
REACH: REACH 1            RS: 1.132

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9670.29 1176.28 9685.79 1176.21 9697.83 1176.15 9754.29 1175.91 9770.98 1175.83
 9822.79 1175.64 9844.13 1175.57 9891.29 1175.41 9917.28 1175.33 9959.79 1175.19
 9990.43 1175.09   10000 1175.0510014.91 1175.1210020.33 1175.1410022.98 1175.15
10075.31 1175.3510128.92 1175.4310134.25 1175.4410169.89 1175.4710189.88 1175.48
10207.28 1175.4710242.93 1175.4410244.67 1175.4510245.52 1175.4510282.06 1175.46
10301.16 1175.4810319.45  1175.510356.79 1175.5810356.84 1175.5810356.94 1175.58
10394.23 1175.7510412.43 1175.8810431.62 1176.0110457.76 1176.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9670.29    .044 9891.29    .04910075.31    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9891.2910075.31              925     956     925            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1175.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1175.72  * Reach Len. (ft)         *  925.00  *  956.00  *  925.00  *
* Crit W.S. (ft)         * 1175.72  * Flow Area (sq ft)       *   14.42  *   91.92  *   76.37  *
* E.G. Slope (ft/ft)     *0.033300  * Area (sq ft)            *   14.42  *   91.92  *   76.37  *
* Q Total (cfs)          *  530.00  * Flow (cfs)              *   26.00  *  320.22  *  183.78  *
* Top Width (ft)         *  587.99  * Top Width (ft)          *   91.04  *  184.02  *  312.92  *
* Vel Total (ft/s)       *    2.90  * Avg. Vel. (ft/s)        *    1.80  *    3.48  *    2.41  *
* Max Chl Dpth (ft)      *    0.67  * Hydr. Depth (ft)        *    0.16  *    0.50  *    0.24  *
* Conv. Total (cfs)      *  2904.4  * Conv. (cfs)             *   142.5  *  1754.8  *  1007.1  *
* Length Wtd. (ft)       *  949.59  * Wetted Per. (ft)        *   91.04  *  184.02  *  312.93  *
* Min Ch El (ft)         * 1175.05  * Shear (lb/sq ft)        *    0.33  *    1.04  *    0.51  *
* Alpha                  *    1.13  * Stream Power (lb/ft s)  *    0.59  *    3.62  *    1.22  *
* Frctn Loss (ft)        *    6.94  * Cum Volume (acre-ft)    *   14.67  *   33.24  *    4.62  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *   11.25  *   30.02  *    4.80  *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S2WS1 (B54)
REACH: REACH 1            RS: 0.950

INPUT
Description:
Station Elevation Data    num=      22
```

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9672.6	1168.92	9707.17	1168.78	9711.95	1168.76	9765.73	1168.54	9807.96	1168.34
9824.3	1168.26	9849.85	1168.15	9882.87	1168.02	9903.98	1167.96	9941.43	1167.83
10000	1167.63	10048.05	1167.73	10050.04	1167.74	10096.1	1167.91	10100.09	1167.92
10184.85	1168.53	10196.11	1168.61	10208.83	1168.77	10250.22	1169.13	10288.31	1169.35
10300.26	1169.42	10336.36	1169.47						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9672.6	.044	9765.73	.049	10184.85	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9765.73	10184.85	1150	1196	1150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1168.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1168.85	Reach Len. (ft)	1150.00	1196.00	1150.00
Crit W.S. (ft)	1168.34	Flow Area (sq ft)	11.41	348.06	5.53
E.G. Slope (ft/ft)	0.003117	Area (sq ft)	11.41	348.06	5.53
Q Total (cfs)	530.00	Flow (cfs)	6.14	520.67	3.19
Top Width (ft)	526.53	Top Width (ft)	74.75	419.12	32.67
Vel Total (ft/s)	1.45	Avg. Vel. (ft/s)	0.54	1.50	0.58
Max Chl Dpth (ft)	1.22	Hydr. Depth (ft)	0.15	0.83	0.17
Conv. Total (cfs)	9492.4	Conv. (cfs)	110.0	9325.2	57.2
Length Wtd. (ft)	1187.63	Wetted Per. (ft)	74.75	419.12	32.67
Min Ch El (ft)	1167.63	Shear (lb/sq ft)	0.03	0.16	0.03
Alpha	1.05	Stream Power (lb/ft s)	0.02	0.24	0.02
Frctn Loss (ft)	9.02	Cum Volume (acre-ft)	14.40	28.41	3.75
C & E Loss (ft)	0.01	Cum SA (acres)	9.49	23.40	1.13

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS1 (B54)
REACH: REACH 1 RS: 0.724

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9546.72	1159.89	9583.72	1159.7	9595.64	1159.64	9597.08	1159.63	9598.92	1159.63
9647.45	1159.43	9656.22	1159.43	9697.81	1159.38	9713.52	1159.39	9748.18	1159.42
9770.81	1159.43	9798.54	1159.48	9828.11	1159.48	9848.91	1159.51	9885.41	1159.48
9905.02	1159.42	9918.9	1159.37	10000	1159.17	10045.65	1159.18	10050.25	1159.17
10091.31	1159.29	10100.51	1159.31	10136.96	1159.57	10150.76	1159.63	10182.61	1159.84
10201.01	1159.93	10228.26	1160.02	10251.27	1160.09	10273.92	1160.11	10301.52	1160.19
10319.57	1160.21	10351.77	1160.34	10365.22	1160.36	10402.03	1160.51	10410.87	1160.52
10452.28	1160.65	10456.53	1160.65	10498.65	1160.71	10502.18	1160.71	10502.53	1160.7
10508.47	1160.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9546.72	.044	9885.41	.049	10136.96	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9885.41	10136.96	1300	1352	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1159.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1159.70	Reach Len. (ft)	1300.00	1352.00	1300.00
Crit W.S. (ft)	1159.70	Flow Area (sq ft)	71.11	103.84	1.85
E.G. Slope (ft/ft)	0.039360	Area (sq ft)	71.11	103.84	1.85
Q Total (cfs)	530.00	Flow (cfs)	181.47	346.35	2.18
Top Width (ft)	579.05	Top Width (ft)	302.47	251.55	25.02

* Vel Total (ft/s)	* 3.00	* Avg. Vel. (ft/s)	* 2.55	* 3.34	* 1.18	*
* Max Chl Dpth (ft)	* 0.53	* Hydr. Depth (ft)	* 0.24	* 0.41	* 0.07	*
* Conv. Total (cfs)	* 2671.4	* Conv. (cfs)	* 914.7	* 1745.8	* 11.0	*
* Length Wtd. (ft)	* 1342.99	* Wetted Per. (ft)	* 302.48	* 251.55	* 25.02	*
* Min Ch El (ft)	* 1159.17	* Shear (lb/sq ft)	* 0.58	* 1.01	* 0.18	*
* Alpha	* 1.06	* Stream Power (lb/ft s)	* 1.47	* 3.38	* 0.21	*
* Frctn Loss (ft)	* 8.45	* Cum Volume (acre-ft)	* 13.31	* 22.21	* 3.65	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 4.51	* 14.19	* 0.37	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S2WS1 (B54)
REACH: REACH 1 RS: 0.468

INPUT
Description:
Station Elevation Data num= 34

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9688.7	1150.85	9712.97	1150.77	9740.59	1150.66	9784.72	1150.5	9792.47	1150.47
9812.68	1150.37	9844.35	1150.22	9856.48	1150.09	9896.23	1149.8	10000	1148.56
10051.27	1148.47	10083.59	1148.76	10110.47	1148.12	10114.69	1148	10120.16	1147.85
10128.08	1147.61	10139.15	1147.29	10162.08	1146.79	10162.83	1146.74	10181.92	1148.58
10192.6	1149.65	10196.96	1150.06	10200.27	1150.3	10202.3	1150.42	10203.6	1150.5
10204.4	1150.57	10208.98	1151	10226.23	1151.31	10256.34	1151.85	10265.16	1151.95
10307.6	1152.49	10331.45	1152.65	10358.87	1152.87	10393.84	1152.97		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9688.7	.044	9896.23	.049	10196.96	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9896.23	10196.96	1225	1288	1225	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1149.64	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.04	* Wt. n-Val.	*	* 0.049	*	*
* W.S. Elev (ft)	* 1149.60	* Reach Len. (ft)	* 1225.00	* 1288.00	* 1225.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*	* 321.28	*	*
* E.G. Slope (ft/ft)	*0.002456	* Area (sq ft)	*	* 321.28	*	*
* Q Total (cfs)	* 530.00	* Flow (cfs)	*	* 530.00	*	*
* Top Width (ft)	* 279.15	* Top Width (ft)	*	* 279.15	*	*
* Vel Total (ft/s)	* 1.65	* Avg. Vel. (ft/s)	*	* 1.65	*	*
* Max Chl Dpth (ft)	* 2.86	* Hydr. Depth (ft)	*	* 1.15	*	*
* Conv. Total (cfs)	* 10695.6	* Conv. (cfs)	*	* 10695.6	*	*
* Length Wtd. (ft)	* 1288.00	* Wetted Per. (ft)	*	* 279.32	*	*
* Min Ch El (ft)	* 1146.74	* Shear (lb/sq ft)	*	* 0.18	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.29	*	*
* Frctn Loss (ft)	* 7.99	* Cum Volume (acre-ft)	* 12.25	* 15.61	* 3.62	*
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	*	* 5.96	*	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS1 (B54)
REACH: REACH 1 RS: 0.224

```
INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9569.79 1144.38 9624.36 1143.92 9633.05 1143.86 9695.25 1143.38 9703.59 1143.33
 9766.14 1143.09 9774.12 1143.07 9822.56 1141.42 9833.43 1140.97 9843.16 1140.65
 9850.38 1141.04 9887.79 1142.05 9902.42 1142.49 9907.04 1142.61 9911.56 1142.77
 9915.19 1142.79 9946.92 1142.81   10000 1139.14   10015 1139.8210028.37  1140.2
 10039.6 1140.4110076.77 1141.5410088.58 1141.8210098.84 1142.0510135.43 1143.81
10157.49 1143.8910185.58 1143.9410211.73    114410235.72 1144.0810265.98 1144.11
10285.86 1144.1810320.22  1144.2   10336 1144.2510374.46 1144.3610386.15  1144.4
10428.71 1144.5710436.29  1144.610482.95 1144.6910486.43  1144.710512.48 1144.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9569.79    .044 9774.12    .04910135.43    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9774.1210135.43             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1141.62  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)          *    0.42  * Wt. n-Val.              *           *    0.049  *          *
* W.S. Elev (ft)         * 1141.20  * Reach Len. (ft)        * 2100.00   * 2100.00   * 2100.00  *
* Crit W.S. (ft)         * 1141.20  * Flow Area (sq ft)      *           *  100.12   *          *
* E.G. Slope (ft/ft)     *0.038969  * Area (sq ft)           *           *  100.12   *          *
* Q Total (cfs)          *  520.00  * Flow (cfs)              *           *  520.00   *          *
* Top Width (ft)         *  123.75  * Top Width (ft)          *           *  123.75   *          *
* Vel Total (ft/s)       *    5.19  * Avg. Vel. (ft/s)        *           *    5.19   *          *
* Max Chl Dpth (ft)      *    2.06  * Hydr. Depth (ft)        *           *    0.81   *          *
* Conv. Total (cfs)      *  2634.2  * Conv. (cfs)             *           *  2634.2   *          *
* Length Wtd. (ft)       * 2100.00  * Wetted Per. (ft)        *           *  123.88   *          *
* Min Ch El (ft)         * 1139.14  * Shear (lb/sq ft)        *           *    1.97   *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *           *   10.21   *          *
* Frctn Loss (ft)        *    9.02  * Cum Volume (acre-ft)    *   12.25   *    9.38   *    3.62  *
* C & E Loss (ft)        *    0.09  * Cum SA (acres)          *           *           *          *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S2WS2B (B65)
REACH: REACH 1            RS: 2.297

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9789.67 1180.81  9792.4 1180.81  9839.7 1180.77 9844.44 1180.75 9889.74 1180.78
 9897.21 1180.09 9913.15 1178.82 9931.75 1177.27 9949.26 1177.22 9999.82 1177.02
   10000 1177.0210029.46 1177.14 10054.4 1177.3110071.29 1179.2810089.86 1181.36
10097.78 1181.3810139.88  1181.510146.41 1181.49 10189.9 1181.6110195.04 1181.61
10239.92 1181.6710287.44 1181.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9789.67    .044 9889.74    .04910089.86    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9889.7410089.86             1320    1348    1325             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	1180.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.		0.049	
W.S. Elev (ft)	1180.28	Reach Len. (ft)	1320.00	1348.00	1325.00
Crit W.S. (ft)	1179.39	Flow Area (sq ft)		477.24	
E.G. Slope (ft/ft)	0.008732	Area (sq ft)		477.24	
Q Total (cfs)	2540.00	Flow (cfs)		2540.00	
Top Width (ft)	185.10	Top Width (ft)		185.10	
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)		5.32	
Max Chl Dpth (ft)	3.26	Hydr. Depth (ft)		2.58	
Conv. Total (cfs)	27182.1	Conv. (cfs)		27182.1	
Length Wtd. (ft)	1338.43	Wetted Per. (ft)		185.40	
Min Ch El (ft)	1177.02	Shear (lb/sq ft)		1.40	
Alpha	1.00	Stream Power (lb/ft s)		7.47	
Frctn Loss (ft)	8.31	Cum Volume (acre-ft)	22.56	61.00	26.05
C & E Loss (ft)	0.09	Cum SA (acres)	10.54	22.61	14.23

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 1 RS: 2.042

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9564.61	1172.99	9565.64	1172.99	9566.05	1172.99	9615.67	1172.88	9617.99	1172.88
9665.7	1172.7	9671.51	1172.21	9680.87	1171.64	9725.95	1168.97	9746.65	1170.64
9765.77	1171.95	9773.83	1171.89	9815.81	1171.65	9844.06	1169.73	9861.49	1168.59
9876.87	1169.49	9895.79	1170.52	9915.87	1171.53	9929.67	1171.54	9965.91	1171.58
9995.84	1169.04	10000	1168.74	10000.77	1168.68	10008.37	1169.05	10065.93	1171.84
10095.03	1169.31	10102.58	1168.55	10104.36	1168.56	10118.76	1169.46	10142.54	1170.75
10165.93	1172.47	10182.4	1172.58	10215.93	1172.87	10232.42	1172.96	10265.93	1173.19
10282.45	1173.22	10315.93	1173.29	10332.47	1173.28	10365.93	1173.25	10382.5	1173.24
10415.93	1173.18								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9564.61	.044	9965.91	.049	10065.93	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965.91	10065.93	1310	1360	1275	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1172.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1172.17	Reach Len. (ft)	1310.00	1360.00	1275.00
Crit W.S. (ft)	1171.18	Flow Area (sq ft)	408.88	196.65	185.88
E.G. Slope (ft/ft)	0.004597	Area (sq ft)	408.88	196.65	185.88
Q Total (cfs)	2460.00	Flow (cfs)	1166.05	633.74	660.21
Top Width (ft)	489.76	Top Width (ft)	293.79	100.02	95.96
Vel Total (ft/s)	3.11	Avg. Vel. (ft/s)	2.85	3.22	3.55
Max Chl Dpth (ft)	3.62	Hydr. Depth (ft)	1.39	1.97	1.94
Conv. Total (cfs)	36280.7	Conv. (cfs)	17197.2	9346.6	9737.0
Length Wtd. (ft)	1311.01	Wetted Per. (ft)	294.18	100.22	96.22
Min Ch El (ft)	1168.68	Shear (lb/sq ft)	0.40	0.56	0.55
Alpha	1.03	Stream Power (lb/ft s)	1.14	1.82	1.97
Frctn Loss (ft)	8.14	Cum Volume (acre-ft)	16.37	50.58	23.22
C & E Loss (ft)	0.01	Cum SA (acres)	6.09	18.20	12.77

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 1 RS: 1.785

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9700.42	1165.27	9706.2	1165.27	9712.26	1165.27	9721.3	1165.25	9770.54	1165.16
9803.52	1165	9828.82	1164.87	9866.59	1164.56	9887.1	1164.4	9900.84	1164.27
9945.38	1163.91	9971.7	1162.03	9992.51	1161.02	10000	1160.64	10002.8	1160.45
10027.52	1161.87	10045.85	1162.92	10053.4	1163.33	10095.16	1163.29	10103.64	1163.29
10140.87	1163.41	10155.62	1162.72	10158.6	1162.41	10165.07	1161.78	10179.2	1160.52
10181.6	1160.71	10191.43	1161.45	10197.57	1161.96	10232.3	1164.06	10254.38	1164.29
10281.32	1164.49	10314.49	1162.67	10324.26	1161.72	10338.8	1160.56	10341.08	1160.68
10359.4	1161.65	10405.12	1164.93	10415.15	1164.96	10455.36	1165	10460.86	1165.01
10505.61	1165.04	10506.57	1165.04	10516.34	1165.02				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9700.42	.044	9945.38	.049	10053.4	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.38	10053.4	1315	1345	1355	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1164.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.27	Wt. n-Val.	0.000	0.049	0.044
W.S. Elev (ft)	1163.92	Reach Len. (ft)	1315.00	1345.00	1355.00
Crit W.S. (ft)		Flow Area (sq ft)	0.00	209.18	365.50
E.G. Slope (ft/ft)	0.008974	Area (sq ft)	0.00	209.18	365.50
Q Total (cfs)	2370.00	Flow (cfs)	0.00	932.45	1437.55
Top Width (ft)	384.46	Top Width (ft)	0.72	108.02	275.72
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)	0.07	4.46	3.93
Max Chl Dpth (ft)	3.47	Hydr. Depth (ft)	0.00	1.94	1.33
Conv. Total (cfs)	25018.5	Conv. (cfs)	0.0	9843.2	15175.2
Length Wtd. (ft)	1349.11	Wetted Per. (ft)	0.72	108.21	276.19
Min Ch El (ft)	1160.45	Shear (lb/sq ft)		1.08	0.74
Alpha	1.01	Stream Power (lb/ft s)		4.83	2.92
Frctn Loss (ft)	11.00	Cum Volume (acre-ft)	10.22	44.24	15.15
C & E Loss (ft)	0.01	Cum SA (acres)	1.66	14.95	7.33

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 1 RS: 1.530

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9710.04	1154.15	9713.24	1154.15	9734.29	1154.14	9770.57	1154.12	9784.66	1154.11
9827.91	1154.13	9835.03	1154.14	9840.6	1154.15	9896.83	1151.22	9911.86	1150.48
9913.25	1150.63	9923.29	1151.69	9985.29	1150.4	9993.62	1150.38	10000	1150.33
10005.26	1150.3	10013.82	1151.09	10020.08	1151.63	10071.87	1149.73	10098.9	1149.64
10101.33	1149.47	10105.08	1149.99	10108.93	1150.53	10127.99	1153.16	10132.04	1153.71
10134.63	1154.03	10135.84	1154.16	10141.61	1154.53	10187.74	1154.51	10223.43	1154.48
10238.15	1154.5	10268.13	1154.41	10288.55	1154.39	10312.83	1154.27	10338.96	1154.18
10357.53	1154.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9710.04	.044	9923.29	.049	10020.08	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9923.29	10020.08	1190	1199	1155	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1153.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1152.84	Reach Len. (ft)	1190.00	1199.00	1155.00
Crit W.S. (ft)	1152.21	Flow Area (sq ft)	75.04	188.29	245.88
E.G. Slope (ft/ft)	0.007415	Area (sq ft)	75.04	188.29	245.88
Q Total (cfs)	2280.00	Flow (cfs)	260.15	765.81	1254.04
Top Width (ft)	259.88	Top Width (ft)	57.52	96.79	105.58
Vel Total (ft/s)	4.48	Avg. Vel. (ft/s)	3.47	4.07	5.10
Max Chl Dpth (ft)	3.37	Hydr. Depth (ft)	1.30	1.95	2.33
Conv. Total (cfs)	26478.5	Conv. (cfs)	3021.2	8893.7	14563.7
Length Wtd. (ft)	1186.19	Wetted Per. (ft)	57.64	96.86	105.85
Min Ch El (ft)	1150.30	Shear (lb/sq ft)	0.60	0.90	1.08
Alpha	1.06	Stream Power (lb/ft s)	2.09	3.66	5.48
Frctn Loss (ft)	8.35	Cum Volume (acre-ft)	9.09	38.11	5.64
C & E Loss (ft)	0.03	Cum SA (acres)	0.79	11.79	1.40

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 1 RS: 1.303

INPUT
Description:
Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9662.66	1146.17	9698.86	1146.25	9710.27	1146.27	9748.86	1146.35	9760.67	1146.34
9798.86	1146.35	9811.07	1146.3	9848.86	1146.19	9861.47	1146.11	9898.86	1145.9
9922.01	1143.06	9929.79	1142.12	9964.75	1142.46	10000	1142.75	10000.72	1142.76
10004.13	1142.95	10024.27	1142.61	10051.99	1142.38	10089.07	1142.06	10098.91	1142.01
10106.04	1142.02	10121.6	1141.99	10133.98	1141.99	10145.72	1141.99	10189.03	1144.46
10199.2	1145.04	10206.79	1145.67	10212.47	1145.71	10232.39	1145.76	10252.93	1145.82
10258.78	1145.83								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9662.66	.044	9898.86	.049	10206.79	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9898.86	10206.79	1128	1152	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1144.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.		0.049	
W.S. Elev (ft)	1144.56	Reach Len. (ft)	1128.00	1152.00	1200.00
Crit W.S. (ft)	1143.73	Flow Area (sq ft)		561.89	
E.G. Slope (ft/ft)	0.006684	Area (sq ft)		561.89	
Q Total (cfs)	2210.00	Flow (cfs)		2210.00	
Top Width (ft)	280.96	Top Width (ft)		280.96	
Vel Total (ft/s)	3.93	Avg. Vel. (ft/s)		3.93	
Max Chl Dpth (ft)	2.57	Hydr. Depth (ft)		2.00	
Conv. Total (cfs)	27032.2	Conv. (cfs)		27032.2	
Length Wtd. (ft)	1152.00	Wetted Per. (ft)		281.19	
Min Ch El (ft)	1141.99	Shear (lb/sq ft)		0.83	
Alpha	1.00	Stream Power (lb/ft s)		3.28	
Frctn Loss (ft)	7.25	Cum Volume (acre-ft)	8.06	27.78	2.38
C & E Loss (ft)	0.00	Cum SA (acres)		6.59	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 1 RS: 1.085

INPUT

Description: Approximately 200' upstream of Patterson Road.

Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9567.03	1139.37	9587.48	1139.32	9632.97	1139.24	9639.24	1139.23	9656.42	1139.22
9691	1139.2	9703.63	1139.2	9742.75	1139.2	9774.29	1139.18	9794.51	1139.17
9844.95	1139.1	9846.27	1139.1	9849.89	1139.09	9898.03	1138.92	9915.61	1138.84
9961.94	1136.88	9964.7	1136.66	9967.44	1136.43	9970.94	1136.14	9975.6	1135.73
9981.53	1135.18	9987.73	1134.59	9995.2	1134.5	10000	1134.44	10018.06	1134.2
10023.44	1134.09	10026.12	1134.09	10028.29	1134.06	10043.26	1133.88	10070.02	1133.56
10075.81	1133.48	10090.3	1133.8	10101.3	1134.06	10111.49	1134.28	10123.93	1134.59
10190.76	1138.42	10198.34	1138.85	10200.06	1138.95	10200.69	1138.98	10201.77	1139.06
10213.52	1139.14	10251.84	1139.41	10253.97	1139.41	10301.91	1139.66	10306.81	1139.68
10351.98	1139.83	10359.66	1139.83						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9567.03	.044	9915.61	.049	10201.77	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9915.61	10201.77	1320	1382	1360	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1137.55	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.29	Wt. n-Val.		0.049		
W.S. Elev (ft)	1137.26	Reach Len. (ft)	1382.00	1382.00	1382.00	
Crit W.S. (ft)	1136.07	Flow Area (sq ft)		542.04		
E.G. Slope (ft/ft)	0.005953	Area (sq ft)		542.04		
Q Total (cfs)	2330.00	Flow (cfs)		2330.00		
Top Width (ft)	217.47	Top Width (ft)		217.47		
Vel Total (ft/s)	4.30	Avg. Vel. (ft/s)		4.30		
Max Chl Dpth (ft)	3.78	Hydr. Depth (ft)		2.49		
Conv. Total (cfs)	30197.6	Conv. (cfs)		30197.6		
Length Wtd. (ft)	1382.00	Wetted Per. (ft)		217.68		
Min Ch El (ft)	1133.48	Shear (lb/sq ft)		0.93		
Alpha	1.00	Stream Power (lb/ft s)		3.98		
Frctn Loss (ft)	5.94	Cum Volume (acre-ft)	8.06	13.18	2.38	
C & E Loss (ft)	0.05	Cum SA (acres)				

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 2 RS: 0.823

INPUT

Description: Approximately 1150' downstream of Patterson Road.

Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9492.39	1132.27	9498.7	1132.25	9536.28	1132.15	9537.68	1132.14	9605.73	1132.02
9609.72	1132.02	9675.18	1130.69	9681.76	1130.55	9713.77	1130.48	9744.63	1130.42
9753.8	1130.4	9814.08	1130.25	9824.44	1129.9	9828.19	1129.76	9833.59	1129.53
9851.45	1128.75	9876.02	1127.77	9880.36	1127.51	9891.87	1128.06	9905.16	1128.61
9913.37	1128.92	9952.99	1129.97	9966.4	1129.64	9971.76	1129.48	9994.08	1128.78
9999.24	1128.62	10000	1128.63	10001.96	1128.64	10019.85	1128.86	10043.83	1129.48
10056.02	1129.73	10062.02	1129.84	10067.26	1129.92	10070.51	1129.95	10097.7	1130.37
10129.09	1130.52	10139.98	1130.57	10162.43	1130.68	10177.4	1130.75	10184.66	1130.78
10214.82	1130.91	10240.23	1131.01	10252.24	1131.04	10277.03	1131.12	10289.67	1131.16
10295.79	1131.17	10327.09	1131.22	10351.36	1131.28	10364.51	1131.28	10391.62	1131.32
10401.93	1131.34	10406.93	1131.35	10439.35	1131.38	10462.5	1131.43	10476.78	1131.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9492.39	.044	9952.99	.049	10097.7	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9952.99	10097.7	1000	1020	1020	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1131.55	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.10	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1131.45	* Reach Len. (ft)	* 1000.00	* 1020.00	* 1020.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 508.18	* 289.08	* 150.25	*
* E.G. Slope (ft/ft)	*0.003237	* Area (sq ft)	* 508.18	* 289.08	* 150.25	*
* Q Total (cfs)	* 2290.00	* Flow (cfs)	* 1342.63	* 791.02	* 156.35	*
* Top Width (ft)	* 836.76	* Top Width (ft)	* 315.07	* 144.71	* 376.98	*
* Vel Total (ft/s)	* 2.42	* Avg. Vel. (ft/s)	* 2.64	* 2.74	* 1.04	*
* Max Chl Dpth (ft)	* 3.94	* Hydr. Depth (ft)	* 1.61	* 2.00	* 0.40	*
* Conv. Total (cfs)	* 40247.6	* Conv. (cfs)	* 23597.3	* 13902.4	* 2747.9	*
* Length Wtd. (ft)	* 1010.93	* Wetted Per. (ft)	* 315.18	* 144.75	* 376.98	*
* Min Ch El (ft)	* 1128.62	* Shear (lb/sq ft)	* 0.33	* 0.40	* 0.08	*
* Alpha	* 1.16	* Stream Power (lb/ft s)	* 0.86	* 1.10	* 0.08	*
* Frctn Loss (ft)	* 5.61	* Cum Volume (acre-ft)	* 36.56	* 17.45	* 11.75	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 25.87	* 8.27	* 15.21	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 2 RS: 0.630

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9123.1	1126.11	9149.42	1126.02	9174.85	1125.93	9229.77	1125.72	9238.72	1125.68
9273.39	1125.53	9302.59	1125.39	9310.13	1125.35	9366.46	1125.08	9390.49	1124.95
9430.33	1124.77	9470.84	1124.55	9494.2	1124.44	9551.2	1124.18	9558.07	1124.15
9613.42	1122.75	9619.33	1122.6	9626.79	1122.42	9638.4	1122.11	9640.23	1122.06
9643.64	1122.19	9659.5	1122.81	9697.37	1124.03	9711.92	1124.07	9749.68	1124.19
9792.27	1124.35	9813.55	1124.43	9872.63	1124.61	9877.42	1124.62	9895.99	1124.64
9941.29	1124.7	9946.47	1124.71	9956.19	1124.35	9998.87	1123.07	10000	1123.1
10027.02	1123.51	10041.97	1123.81	10103.65	1124.92	10107.38	1124.93	10109.59	1124.94
10118.25	1124.96	10150.7	1125.05	10158.99	1125.07	10191.81	1125.13	10210.59	1125.16
10232.91	1125.19	10262.19	1125.21	10274.02	1125.22	10313.8	1125.27	10315.13	1125.27
10320.35	1125.28	10356.24	1125.34	10365.4	1125.35	10397.35	1125.44	10417.01	1125.48
10438.45	1125.56	10468.61	1125.63	10479.56	1125.67	10520.22	1125.77	10520.67	1125.77
10522.45	1125.77	10571.82	1125.91	10602.89	1125.98	10623.42	1126.02		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9123.1	.044	9941.29	.049	10103.65	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9941.29	10103.65	1045	1042	1040	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
9123.1	9775	1127	F

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1125.92	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.27	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1125.64	* Reach Len. (ft)	* 1045.00	* 1042.00	* 1040.00	*
* Crit W.S. (ft)	* 1125.50	* Flow Area (sq ft)	* 183.83	* 272.82	* 140.25	*
* E.G. Slope (ft/ft)	*0.011789	* Area (sq ft)	* 886.18	* 272.82	* 140.25	*
* Q Total (cfs)	* 2260.00	* Flow (cfs)	* 720.62	* 1269.41	* 269.97	*
* Top Width (ft)	* 1225.22	* Top Width (ft)	* 694.16	* 162.36	* 368.70	*
* Vel Total (ft/s)	* 3.79	* Avg. Vel. (ft/s)	* 3.92	* 4.65	* 1.92	*
* Max Chl Dpth (ft)	* 3.58	* Hydr. Depth (ft)	* 1.11	* 1.68	* 0.38	*
* Conv. Total (cfs)	* 20815.0	* Conv. (cfs)	* 6637.1	* 11691.5	* 2486.5	*
* Length Wtd. (ft)	* 1042.53	* Wetted Per. (ft)	* 166.29	* 162.40	* 368.70	*
* Min Ch El (ft)	* 1123.07	* Shear (lb/sq ft)	* 0.81	* 1.24	* 0.28	*
* Alpha	* 1.22	* Stream Power (lb/ft s)	* 3.19	* 5.75	* 0.54	*
* Frctn Loss (ft)	* 5.23	* Cum Volume (acre-ft)	* 20.56	* 10.87	* 8.35	*
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 14.29	* 4.68	* 6.48	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 2 RS: 0.432

INPUT
Description:
Station Elevation Data num= 61

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9171.41	1121.47	9202.77	1121.35	9209.35	1121.33	9211.68	1121.32	9271.54	1121.08
9295.77	1120.98	9333.73	1120.81	9379.86	1120.59	9395.91	1120.51	9424.84	1120.37
9458.1	1120.22	9463.96	1120.19	9520.28	1119.94	9548.05	1119.84	9582.47	1119.7
9632.14	1119.52	9644.66	1119.48	9680.18	1119.38	9706.84	1119.31	9716.23	1119.28
9769.03	1119.18	9800.33	1119.12	9831.22	1119.11	9884.42	1119.16	9892.5	1119.11
9893.39	1119.11	9894.72	1119.11	9896.68	1119.08	9898.64	1119	9901.39	1118.87
9905.64	1118.69	9915.23	1118.44	9944.43	1117.8	9950.19	1117.65	9950.26	1117.66
9957.19	1117.87	9963.89	1117.88	9987.19	1118.38	9997.38	1118.48	10000	1118.52
10007.08	1118.84	10017.41	1119.32	10032.68	1119.91	10049.28	1120.09	10084.93	1120.44
10100.43	1120.49	10137.17	1120.67	10167.13	1119.23	10185.34	1118.55	10209.43	1117.64
10223.93	1117.64	10228.09	1117.64	10235.12	1117.65	10249.59	1117.65	10255.35	1117.65
10258.5	1117.65	10268.51	1118.54	10275.36	1119.19	10279.38	1119.56	10325.29	1120.89
10346.15	1120.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9171.41	.044	9884.42	.049	10137.17	.044

Bank Sta: Left	Right	Coeff Contr.	Expan.
9884.42	10137.17	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1120.62	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1120.55	Reach Len. (ft)	618.00	618.00	618.00
Crit W.S. (ft)		Flow Area (sq ft)	464.04	323.62	308.14
E.G. Slope (ft/ft)	0.002745	Area (sq ft)	464.04	323.62	308.14
Q Total (cfs)	2230.00	Flow (cfs)	784.42	648.00	797.58
Top Width (ft)	899.66	Top Width (ft)	496.96	228.69	174.00
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)	1.69	2.00	2.59
Max Chl Dpth (ft)	2.91	Hydr. Depth (ft)	0.93	1.42	1.77
Conv. Total (cfs)	42561.2	Conv. (cfs)	14971.2	12367.5	15222.5
Length Wtd. (ft)	618.00	Wetted Per. (ft)	496.97	228.75	174.17
Min Ch El (ft)	1117.65	Shear (lb/sq ft)	0.16	0.24	0.30
Alpha	1.10	Stream Power (lb/ft s)	0.27	0.49	0.78
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	4.36	3.74	2.99
C & E Loss (ft)	0.04	Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S2WS2B (B65)
REACH: REACH 3 RS: 0.315

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9342.45	1118.14	9381.93	1118.03	9434.92	1117.82	9437.52	1117.81	9440.27	1117.79
9493.11	1117.54	9543.05	1117.26	9548.7	1117.23	9554.67	1117.2	9604.29	1116.93
9651.19	1116.68	9659.88	1116.63	9669.07	1116.58	9715.47	1116.34	9759.33	1116.14

```
 9771.06 1116.09 9783.48 1116.04 9826.65 1115.86 9867.46 1115.72 9882.24 1115.67
 9897.88 1115.62 9937.83  1115.5 9982.85 1114.39 9997.98 1114.07   10000 1114.13
10010.08 1114.3810023.38  1114.710032.83 1114.9610036.66 1115.0710038.67 1115.13
10040.12 1115.16 10051.3 1115.3910094.14 1115.5210134.05 1115.7710144.17 1115.83
10182.36 1116.24 10194.2 1116.3810230.68 1116.7210244.24 1116.87   10279 1117.12
10294.27 1117.2310327.32 1117.49 10344.3 1117.6310375.63 1117.8310394.33 1117.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9342.45    .044 9937.83    .049 10051.3    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.83 10051.3             1170    1186    1160            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1116.98  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.44  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1116.55  * Reach Len. (ft)         * 1170.00  * 1186.00  * 1160.00  *
* Crit W.S. (ft)         * 1116.55  * Flow Area (sq ft)       *  150.88  *  202.92  *  113.84  *
* E.G. Slope (ft/ft)     *0.019945  * Area (sq ft)            *  150.88  *  202.92  *  113.84  *
* Q Total (cfs)          * 2210.00  * Flow (cfs)              *  498.15  * 1280.17  *  431.67  *
* Top Width (ft)         *  536.02  * Top Width (ft)           *  261.96  *  113.47  *  160.58  *
* Vel Total (ft/s)       *    4.73  * Avg. Vel. (ft/s)        *    3.30  *    6.31  *    3.79  *
* Max Chl Dpth (ft)      *    2.47  * Hydr. Depth (ft)        *    0.58  *    1.79  *    0.71  *
* Conv. Total (cfs)      * 15648.5  * Conv. (cfs)             *  3527.3  *  9064.6  *  3056.6  *
* Length Wtd. (ft)       * 1176.67  * Wetted Per. (ft)        *  261.97  *  113.50  *  160.59  *
* Min Ch El (ft)         * 1114.07  * Shear (lb/sq ft)        *    0.72  *    2.23  *    0.88  *
* Alpha                  *    1.27  * Stream Power (lb/ft s)  *    2.37  *   14.04  *    3.35  *
* Frctn Loss (ft)        *    4.57  * Cum Volume (acre-ft)    *   22.63  *   16.18  *    8.86  *
* C & E Loss (ft)        *    0.11  * Cum SA (acres)          *   21.94  *    6.78  *   15.44  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S2WS2B (B65)
REACH: REACH 3            RS: 0.093

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9205.15  1112.3 9225.25 1112.23 9241.23 1112.17 9276.64 1112.02 9308.67 1111.92
 9328.04 1111.84 9376.12 1111.67 9379.43 1111.65 9390.06 1111.61 9430.83 1111.44
 9443.56 1111.36 9482.22 1111.16    9511 1110.97 9533.62 1110.84 9578.44 1110.61
 9585.02 1110.57 9606.08 1110.49 9636.41 1110.37 9645.88 1110.35 9687.81 1110.27
 9713.32 1110.25 9740.95 1109.92  9758.6 1109.69 9787.13  1109.3 9836.39    1110
  9841.5 1110.04  9848.2 1110.07 9893.39 1109.99 9915.64 1109.97 9944.78 1109.93
 9964.31 1108.97 9975.76 1108.43   10000  1107.510003.16 1107.3810059.46 1110.14
 10060.9 1110.2210061.35 1110.2410062.54 1110.2710097.31 1110.5610130.11 1110.88
10132.71  1110.910135.57 1110.94 10168.1 1111.3110197.67 1111.71 10203.5 1111.75
10209.91 1111.8110238.89 1112.0110265.24 1112.1910274.29 1112.1510284.25 1112.09
10309.68 1111.96 10332.8  1111.810345.08 1111.7110358.59 1111.5910380.48 1111.37
10400.37 1111.1610415.87 1111.0610432.93 1111.0310451.27 1110.9810467.93 1111.02
10486.66  1111.110507.27 1111.2410522.06 1111.34 10535.5 1111.4510557.46 1111.63
10581.61 1111.8310592.85 1111.9310603.07 1112.0210628.25 1112.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9205.15    .044 9944.78    .04910061.35    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9944.7810061.35             1040     966     950            .1        .3
```

```
Ineffective Flow      num=       1
   Sta L    Sta R    Elev  Permanent
   1026510628.25     1113       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1111.80  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.               *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1111.74  * Reach Len. (ft)          * 1040.00  *  966.00  *  950.00  *
* Crit W.S. (ft)          * 1110.70  * Flow Area (sq ft)        *  736.06  *  355.19  *  112.56  *
* E.G. Slope (ft/ft)      *0.001584  * Area (sq ft)             *  736.06  *  355.19  *  217.06  *
* Q Total (cfs)           * 2180.00  * Flow (cfs)               * 1149.03  *  900.47  *  130.50  *
* Top Width (ft)          * 1074.72  * Top Width (ft)           *  588.14  *  116.57  *  370.01  *
* Vel Total (ft/s)        *    1.81  * Avg. Vel. (ft/s)         *    1.56  *    2.54  *    1.16  *
* Max Chl Dpth (ft)       *    4.36  * Hydr. Depth (ft)         *    1.25  *    3.05  *    0.80  *
* Conv. Total (cfs)       * 54767.9  * Conv. (cfs)              * 28867.0  * 22622.4  *  3278.4  *
* Length Wtd. (ft)        *  988.75  * Wetted Per. (ft)         *  588.16  *  116.70  *  140.54  *
* Min Ch El (ft)          * 1107.38  * Shear (lb/sq ft)         *    0.12  *    0.30  *    0.08  *
* Alpha                   *    1.23  * Stream Power (lb/ft s)    *    0.19  *    0.76  *    0.09  *
* Frctn Loss (ft)         *    2.78  * Cum Volume (acre-ft)      *   10.72  *    8.58  *    4.45  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)            *   10.52  *    3.64  *    8.37  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 3S2WS2B (B65)
REACH: REACH 3            RS: 0.000

INPUT
Description:
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9318.3    1110 9329.33 1109.95 9338.57 1109.91 9380.36 1109.71 9402.75 1109.59
  9431.4 1109.44 9466.93 1109.25 9482.44 1109.18 9531.11 1108.96 9533.48 1108.95
 9542.67 1108.91 9584.51  1108.7 9595.29 1108.66 9635.55 1108.48 9659.47  1108.4
 9686.59 1108.28 9723.65 1108.17 9737.63 1108.11 9787.83    1108 9788.66 1107.99
 9791.89 1107.99  9839.7 1107.98 9852.01 1108.02 9902.82 1107.57 9916.43 1107.09
 9933.82 1106.39 9971.48 1105.92 9989.51  1105.7   10000 1105.5910005.36 1105.56
10033.77 1107.1610064.15 1108.3510101.78 1108.2910102.02 1108.2910102.55 1108.29
10139.88  1108.210156.52 1108.1710177.75 1108.1310211.26 1108.0810215.61 1108.09
10225.37  1108.110253.48 1108.14   10266 1108.1610291.34 1108.2610320.75 1108.37
 10329.2  1108.410348.18 1108.4810367.07 1108.5510375.49 1108.5810404.93 1108.65
10430.23 1108.74 10442.8 1108.7710470.99 1108.8610480.66 1108.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9318.3    .044 9852.01    .04910064.15    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9852.0110064.15               490     490     490            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1109.00  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.               *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1108.83  * Reach Len. (ft)          *          *          *          *
* Crit W.S. (ft)          * 1108.52  * Flow Area (sq ft)        *  161.55  *  418.35  *  191.47  *
* E.G. Slope (ft/ft)      *0.006305  * Area (sq ft)             *  161.55  *  418.35  *  191.47  *
* Q Total (cfs)           * 2190.00  * Flow (cfs)               *  290.93  * 1583.63  *  315.44  *
* Top Width (ft)          *  903.27  * Top Width (ft)           *  293.51  *  212.14  *  397.62  *
* Vel Total (ft/s)        *    2.84  * Avg. Vel. (ft/s)         *    1.80  *    3.79  *    1.65  *
* Max Chl Dpth (ft)       *    3.27  * Hydr. Depth (ft)         *    0.55  *    1.97  *    0.48  *
* Conv. Total (cfs)       * 27580.5  * Conv. (cfs)              *  3664.0  * 19944.0  *  3972.6  *
* Length Wtd. (ft)        *          * Wetted Per. (ft)         *  293.51  *  212.24  *  397.62  *
* Min Ch El (ft)          * 1105.56  * Shear (lb/sq ft)         *    0.22  *    0.78  *    0.19  *
* Alpha                   *    1.39  * Stream Power (lb/ft s)    *    0.39  *    2.94  *    0.31  *
```

```
* Frctn Loss (ft)          *          * Cum Volume (acre-ft)   *          *          *          *
* C & E Loss (ft)          *          * Cum SA (acres)         *          *          *          *
*****************************************************************************************************

CROSS SECTION


RIVER: 3S2WS2C (B38)
REACH: REACH 1              RS: 0.718

INPUT
Description: Approximately 300' upstream of Patterson Road.
Limit of Sudy.
Station Elevation Data     num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9502.24 1137.95 9503.11 1137.95  9550.1  1137.8 9555.47 1137.79 9567.37 1137.79
 9607.84 1137.79 9626.15 1137.86 9660.21 1137.95  9702.2 1138.08 9712.58 1138.11
 9735.52  1138.1 9764.95 1138.11 9778.26 1138.06 9817.32 1137.91 9854.31 1137.72
 9869.69 1137.63 9903.68 1137.45 9922.06 1137.35 9957.62  1137.2 9995.65 1133.09
   10000 1132.2710002.95 1131.7110005.56  1131.9 10021.8 1133.03 10076.2 1137.21
10093.12 1137.2910126.61 1137.49 10137.8 1137.5610177.02 1137.8410182.47 1137.88
 10224.9 1138.1810227.14  1138.210227.43  1138.210271.82 1138.4810277.84 1138.52
10316.49  1138.710328.25 1138.7710361.17 1138.8910378.66 1138.9610405.84 1139.03
10429.07 1139.0910450.51 1139.13

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9502.24    .044 9957.62    .049 10076.2    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.62 10076.2             1310    1327    1280            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1135.54  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1135.49  * Reach Len. (ft)         * 1310.00  * 1327.00  * 1280.00  *
* Crit W.S. (ft)          * 1133.90  * Flow Area (sq ft)       *          *  146.89  *          *
* E.G. Slope (ft/ft)      *0.001777  * Area (sq ft)            *          *  146.89  *          *
* Q Total (cfs)           *  280.00  * Flow (cfs)              *          *  280.00  *          *
* Top Width (ft)          *   80.25  * Top Width (ft)           *          *   80.25  *          *
* Vel Total (ft/s)        *    1.91  * Avg. Vel. (ft/s)         *          *    1.91  *          *
* Max Chl Dpth (ft)       *    3.77  * Hydr. Depth (ft)         *          *    1.83  *          *
* Conv. Total (cfs)       *  6642.9  * Conv. (cfs)              *          *  6642.9  *          *
* Length Wtd. (ft)        * 1327.00  * Wetted Per. (ft)         *          *   80.65  *          *
* Min Ch El (ft)          * 1131.71  * Shear (lb/sq ft)         *          *    0.20  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    0.39  *          *
* Frctn Loss (ft)         *    7.72  * Cum Volume (acre-ft)     *    6.75  *   18.04  *    6.11  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *    2.99  *    6.30  *    2.77  *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S2WS2C (B38)
REACH: REACH 1              RS: 0.467

INPUT
Description: Approximately 1000' downstream of Patterson Road.
Station Elevation Data     num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9745.12 1130.11 9789.66 1129.26 9842.25 1128.23 9844.66 1128.22  9846.7 1128.22
 9899.66 1128.09 9927.52 1127.26 9937.87 1127.12 9943.76 1127.05 9975.74 1126.68
 9980.84 1126.62  9986.4 1126.55 9989.51  1126.5 9992.84 1126.45 9996.31 1126.39
   10000 1126.3110004.06 1126.19 10032.8 1127.1210039.96 1127.36 10044.1  1127.5
10046.75  1127.610057.99 1128.05 10062.7 1128.06 10096.9 1128.1510116.02 1128.17
 10135.8 1128.2210169.35 1128.2810174.71 1128.2910189.16  1128.310213.61 1128.72
10222.67 1128.9310252.52 1129.46   10276 1130.0110291.42 1130.31

Manning's n Values         num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9745.12    .044 9899.66    .04910057.99    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9899.6610057.99              950     951     930             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1127.80  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *          *    0.049 *          *
* W.S. Elev (ft)          * 1127.47  * Reach Len. (ft)         *  950.00  *   951.00 *   930.00 *
* Crit W.S. (ft)          * 1127.47  * Flow Area (sq ft)       *          *    77.98 *          *
* E.G. Slope (ft/ft)      *0.042300  * Area (sq ft)            *          *    77.98 *          *
* Q Total (cfs)           *  360.00  * Flow (cfs)              *          *   360.00 *          *
* Top Width (ft)          *  122.43  * Top Width (ft)          *          *   122.43 *          *
* Vel Total (ft/s)        *    4.62  * Avg. Vel. (ft/s)         *          *     4.62 *          *
* Max Chl Dpth (ft)       *    1.28  * Hydr. Depth (ft)         *          *     0.64 *          *
* Conv. Total (cfs)       *  1750.4  * Conv. (cfs)              *          *   1750.4 *          *
* Length Wtd. (ft)        *  949.37  * Wetted Per. (ft)         *          *   122.46 *          *
* Min Ch El (ft)          * 1126.19  * Shear (lb/sq ft)         *          *     1.68 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *     7.76 *          *
* Frctn Loss (ft)         *    0.83  * Cum Volume (acre-ft)     *    6.75  *    14.61 *     6.11 *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)           *    2.99  *     3.21 *     2.77 *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S2WS2C (B38)
REACH: REACH 1            RS: 0.287

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9543.93 1123.83 9581.96 1123.67 9595.64 1123.62 9628.89 1123.47 9656.92 1123.35
 9668.45  1123.3 9718.19  1123.1 9754.95 1122.96 9779.47 1122.86 9839.04 1122.67
 9840.74 1122.66 9841.44 1122.66 9902.02 1122.51 9921.16 1122.09    9923 1122.05
  9925.3    1122 9928.22 1121.95 9934.79 1121.89 9945.37 1121.81 9977.08  1121.3
 9988.68 1120.86 9993.33 1120.48 9998.42 1119.99   10000 1119.8610001.95 1119.84
10002.14 1119.87 10003.1    112010003.93 1120.1110005.04 1120.2210005.73 1120.33
10044.51 1121.0410073.48 1122.5110088.98 1122.5410125.93 1122.6410128.81 1122.65
10137.91 1122.6710168.64 1122.7410178.38 1122.7710208.47 1122.8810230.82 1122.96
 10248.3 1123.0510283.27 1123.2110288.13 1123.2310303.44 1123.3110327.96 1123.45
10335.72 1123.4910367.79 1123.6710388.17 1123.7810407.62 1123.8710440.62 1124.02
10447.45 1124.0410468.98 1124.1110487.28 1124.1710493.07 1124.1910527.11 1124.25
10545.52 1124.2910566.94 1124.3210597.97 1124.3810606.77 1124.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9543.93    .044 9902.02    .04910073.48    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9902.0210073.48             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1123.48  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.01  * Wt. n-Val.              *   0.044  *    0.049 *   0.044  *
* W.S. Elev (ft)          * 1123.48  * Reach Len. (ft)         * 1515.00  * 1515.00  * 1515.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  145.76  *   361.43 *  147.07  *
* E.G. Slope (ft/ft)      *0.000291  * Area (sq ft)            *  145.76  *   361.43 *  147.07  *
* Q Total (cfs)           *  420.00  * Flow (cfs)              *   55.04  *   306.98 *   57.99  *
* Top Width (ft)          *  705.28  * Top Width (ft)          *  274.37  *   171.46 *  259.45  *
```

* Vel Total (ft/s)	*	0.64	* Avg. Vel. (ft/s)	*	0.38	*	0.85	*	0.39	*
* Max Chl Dpth (ft)	*	3.64	* Hydr. Depth (ft)	*	0.53	*	2.11	*	0.57	*
* Conv. Total (cfs)	*	24639.6	* Conv. (cfs)	*	3228.9	*	18009.0	*	3401.7	*
* Length Wtd. (ft)	*	1515.00	* Wetted Per. (ft)	*	274.38	*	171.60	*	259.45	*
* Min Ch El (ft)	*	1119.84	* Shear (lb/sq ft)	*	0.01	*	0.04	*	0.01	*
* Alpha	*	1.38	* Stream Power (lb/ft s)	*	0.00	*	0.03	*	0.00	*
* Frctn Loss (ft)	*	6.46	* Cum Volume (acre-ft)	*	5.16	*	9.81	*	4.54	*
* C & E Loss (ft)	*	0.04	* Cum SA (acres)	*		*		*		*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

SUMMARY OF MANNING'S N VALUES

River:3S2WS1 (B54)

Reach	River Sta.	n1	n2	n3
REACH 1	1.702	.044	.049	.044
REACH 1	1.453	.044	.049	.044
REACH 1	1.132	.044	.049	.044
REACH 1	0.950	.044	.049	.044
REACH 1	0.724	.044	.049	.044
REACH 1	0.468	.044	.049	.044
REACH 1	0.224	.044	.049	.044

River:3S2WS2B (B65)

Reach	River Sta.	n1	n2	n3
REACH 1	2.297	.044	.049	.044
REACH 1	2.042	.044	.049	.044
REACH 1	1.785	.044	.049	.044
REACH 1	1.530	.044	.049	.044
REACH 1	1.303	.044	.049	.044
REACH 1	1.085	.044	.049	.044
REACH 2	0.823	.044	.049	.044
REACH 2	0.630	.044	.049	.044
REACH 2	0.432	.044	.049	.044
REACH 3	0.315	.044	.049	.044
REACH 3	0.093	.044	.049	.044
REACH 3	0.000	.044	.049	.044

River:3S2WS2C (B38)

Reach	River Sta.	n1	n2	n3
REACH 1	0.718	.044	.049	.044
REACH 1	0.467	.044	.049	.044
REACH 1	0.287	.044	.049	.044

SUMMARY OF REACH LENGTHS

River: 3S2WS1 (B54)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.702	1300	1312	1300
REACH 1	1.453	1625	1699	1625
REACH 1	1.132	925	956	925
REACH 1	0.950	1150	1196	1150
REACH 1	0.724	1300	1352	1300
REACH 1	0.468	1225	1288	1225
REACH 1	0.224			

River: 3S2WS2B (B65)

Reach	River Sta.	Left	Channel	Right

*REACH 1	2.297	1320*	1348*	1325*
*REACH 1	2.042	1310*	1360*	1275*
*REACH 1	1.785	1315*	1345*	1355*
*REACH 1	1.530	1190*	1199*	1155*
*REACH 1	1.303	1128*	1152*	1200*
*REACH 1	1.085	1320*	1382*	1360*
*REACH 2	0.823	1000*	1020*	1020*
*REACH 2	0.630	1045*	1042*	1040*
*REACH 2	0.432	*	*	*
*REACH 3	0.315	1170*	1186*	1160*
*REACH 3	0.093	1040*	966*	950*
*REACH 3	0.000	490*	490*	490*

River: 3S2WS2C (B38)

Reach	River Sta.	Left	Channel	Right
*REACH 1	0.718	1310*	1327*	1280*
*REACH 1	0.467	950*	951*	930*
*REACH 1	0.287	*	*	*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: 3S2WS1 (B54)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.702	.1*	.3*
*REACH 1	1.453	.1*	.3*
*REACH 1	1.132	.1*	.3*
*REACH 1	0.950	.1*	.3*
*REACH 1	0.724	.1*	.3*
*REACH 1	0.468	.1*	.3*
*REACH 1	0.224	.1*	.3*

River: 3S2WS2B (B65)

Reach	River Sta.	Contr.	Expan.
*REACH 1	2.297	.1*	.3*
*REACH 1	2.042	.1*	.3*
*REACH 1	1.785	.1*	.3*
*REACH 1	1.530	.1*	.3*
*REACH 1	1.303	.1*	.3*
*REACH 1	1.085	.1*	.3*
*REACH 2	0.823	.1*	.3*
*REACH 2	0.630	.1*	.3*
*REACH 2	0.432	.1*	.3*
*REACH 3	0.315	.1*	.3*
*REACH 3	0.093	.1*	.3*
*REACH 3	0.000	.1*	.3*

River: 3S2WS2C (B38)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.718	.1*	.3*
*REACH 1	0.467	.1*	.3*
*REACH 1	0.287	.1*	.3*

MODEL: 4S1ES21 (E45)

REACH: 4S1ES21 (E45)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X       X
X     X  X        X    X      X   X    X    X       X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 4S1ES21 (E45)
Project File : 4S1WS21_E45.prj
Run Date and Time: 1/12/2005 4:44:29 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 4S1ES21 (E45)

****

PLAN DATA

Plan Title: 4S1ES21 (E45)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES21 (E45)\4S1WS21_E45.p01

Geometry Title: 4S1ES21 (E45)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES21 (E45)\4S1WS21_E45.g01

Flow Title : 4S1ES21 (E45)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES21 (E45)\4S1WS21_E45.f01

Plan Summary Information:

Number of:	Cross Sections	= 3	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3

```
    Flow tolerance factor                  =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = 4S1ES21 (E45)     Reach = REACH 1
RS       Profile           Method  Value1  Value2
0.657    PF 2                   1    9940   10160
0.382    PF 2                   1    9870   10250
0.000    PF 2                   1    9830   10100

*****************************************************************************

FLOW DATA

Flow Title: 4S1ES21 (E45)
Flow File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES21
(E45)\4S1WS21_E45.f01

Flow Data (cfs)
*************************************************************
* River            Reach            RS       *            PF 1 *
* 4S1ES21 (E45)    REACH 1          0.657    *            1370 *
* 4S1ES21 (E45)    REACH 1          0.382    *            1370 *
* 4S1ES21 (E45)    REACH 1          0.000    *            1370 *
*************************************************************

Boundary Conditions
*****************************************************************************************************************
* River            Reach            Profile          *            Upstream                    Downstream     *
*****************************************************************************************************************
* 4S1ES21 (E45)    REACH 1          PF 1             *         Normal S = 0.003          Normal S = 0.003 *
*****************************************************************************************************************

*****************************************************************************

GEOMETRY DATA

Geometry Title: 4S1ES21 (E45)
Geometry File : q:\303002     Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES21
(E45)\4S1WS21_E45.g01

CROSS SECTION


RIVER: 4S1ES21 (E45)
REACH: REACH 1            RS: 0.657

INPUT
Description: Extended cross section by hand 500' on east side.
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9843.41 1320.05 9872.75 1319.89 9886.61 1319.29 9925.26 1317.45 9945.12 1317.45
 9999.95 1312.74 9999.97 1312.74   10000 1312.74 10000.4 1312.7710072.72 1317.39
10079.42 1317.3910087.98 1317.3910129.79 1317.4410145.34 1317.4510180.16 1317.45
 10202.7 1317.5110230.53 1317.5110260.07 1317.52   10750 1319.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9843.41    .041 9945.12    .04110072.72    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9945.1210072.72             1700    1749    1700            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************************
* E.G. Elev (ft)          * 1318.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
```

* W.S. Elev (ft)	* 1318.04	* Reach Len. (ft)	* 1700.00	* 1749.00	* 1700.00	*
* Crit W.S. (ft)	* 1316.35	* Flow Area (sq ft)	* 15.34	* 377.80	* 143.29	*
* E.G. Slope (ft/ft)	*0.001885	* Area (sq ft)	* 15.34	* 377.80	* 143.29	*
* Q Total (cfs)	* 1370.00	* Flow (cfs)	* 14.72	* 1223.63	* 131.65	*
* Top Width (ft)	* 481.02	* Top Width (ft)	* 32.23	* 127.60	* 321.19	*
* Vel Total (ft/s)	* 2.55	* Avg. Vel. (ft/s)	* 0.96	* 3.24	* 0.92	*
* Max Chl Dpth (ft)	* 5.30	* Hydr. Depth (ft)	* 0.48	* 2.96	* 0.45	*
* Conv. Total (cfs)	* 31551.8	* Conv. (cfs)	* 339.0	* 28180.9	* 3032.0	*
* Length Wtd. (ft)	* 1734.00	* Wetted Per. (ft)	* 32.25	* 127.95	* 321.19	*
* Min Ch El (ft)	* 1312.74	* Shear (lb/sq ft)	* 0.06	* 0.35	* 0.05	*
* Alpha	* 1.45	* Stream Power (lb/ft s)	* 0.05	* 1.13	* 0.05	*
* Frctn Loss (ft)	* 6.89	* Cum Volume (acre-ft)	* 1.38	* 32.09	* 13.70	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 6.02	* 29.69	* 28.98	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES21 (E45)
REACH: REACH 1 RS: 0.382

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9523.82	1312.24	9531.85	1312.21	9566.79	1311.79	9582.72	1311.59	9586.38	1311.59
9633.58	1311.47	9648.94	1311.43	9684.45	1311.35	9711.49	1311.28	9735.31	1311.22
9774.05	1311.11	9786.18	1311.07	9836.61	1310.91	9837.05	1310.91	9838.94	1310.91
9887.91	1310.73	9899.17	1310.69	9938.78	1310.55	10000	1309.98	10034.2	1310.28
10038.26	1310.29	10052.28	1310.33	10070.38	1310.34	10089.93	1310.35	10098.99	1310.35
10127.59	1310.37	10154.1	1310.39	10165.25	1310.41	10189.3	1310.43	10202.91	1310.44
10209.21	1310.45	10240.56	1310.48	10264.32	1310.51	10278.22	1310.52	10308.23	1310.55
10315.88	1310.56	10319.42	1310.56	10353.54	1310.61	0374.53	1310.62	10391.19	1310.64
10427.15	1310.68	10428.85	1310.68	10429.64	1310.69	10466.51	1310.72	10484.74	1310.75
10504.17	1310.77	10539.85	1310.84	10541.82	1310.84	10546.08	1310.85	10579.48	1310.9
10594.96	1310.93	10617.14	1310.97	10650.07	1311.05	10654.8	1311.05	10666.3	1311.2
10680.36	1311.32	10729.04	1311.74						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9523.82	.041	9887.91	.041	10127.59	.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9887.9 10127.59 2000 2018 2000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1311.29	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.15	* Wt. n-Val.	* 0.041	* 0.041	* 0.041	*
* W.S. Elev (ft)	* 1311.15	* Reach Len. (ft)	* 2000.00	* 2018.00	* 2000.00	*
* Crit W.S. (ft)	* 1311.05	* Flow Area (sq ft)	* 25.46	* 189.99	* 256.77	*
* E.G. Slope (ft/ft)	*0.013209	* Area (sq ft)	* 25.46	* 189.99	* 256.77	*
* Q Total (cfs)	* 1370.00	* Flow (cfs)	* 36.32	* 677.82	* 655.86	*
* Top Width (ft)	* 901.37	* Top Width (ft)	* 127.02	* 239.68	* 534.67	*
* Vel Total (ft/s)	* 2.90	* Avg. Vel. (ft/s)	* 1.43	* 3.57	* 2.55	*
* Max Chl Dpth (ft)	* 1.17	* Hydr. Depth (ft)	* 0.20	* 0.79	* 0.48	*
* Conv. Total (cfs)	* 11920.5	* Conv. (cfs)	* 316.0	* 5897.8	* 5706.7	*
* Length Wtd. (ft)	* 2013.45	* Wetted Per. (ft)	* 127.02	* 239.68	* 534.68	*
* Min Ch El (ft)	* 1309.98	* Shear (lb/sq ft)	* 0.17	* 0.65	* 0.40	*
* Alpha	* 1.13	* Stream Power (lb/ft s)	* 0.24	* 2.33	* 1.01	*
* Frctn Loss (ft)	* 11.09	* Cum Volume (acre-ft)	* 0.58	* 20.69	* 5.89	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 2.92	* 22.32	* 12.27	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES21 (E45)
REACH: REACH 1 RS: 0.000

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9126.96	1301.51	9164.99	1301.35	9183.03	1301.23	9219.35	1301.09	9242.21	1300.94
9276.68	1300.79	9308.17	1300.66	9336.61	1300.48	9366.18	1300.35	9399.29	1300.13
9426.75	1300.02	9451.84	1299.93	9488.03	1299.64	9511.01	1299.56	9551.63	1299.22
9572.33	1299.14	9591.26	1299.09	9635.92	1298.83	9652.42	1298.78	9678.97	1298.78
9700.91	1298.77	9714.44	1298.74	9768.87	1298.89	9778.92	1298.86	9788.08	1298.83
9846.13	1298.96	9852.01	1298.94	9921.65	1298.89	9924.52	1298.88	9927.14	1298.87
10000	1298.72	10064.31	1299.44	10084.17	1299.66	10097.11	1299.82	10132.62	1300.2
10140.03	1300.29	10145.51	1300.34	10180.52	1300.72	10190.77	1300.74		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9126.96	.041	9242.21	.041	10180.52	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9242.21	10180.52	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1300.18	Element			
Vel Head (ft)	0.06	Wt. n-Val.		0.041	
W.S. Elev (ft)	1300.12	Reach Len. (ft)			
Crit W.S. (ft)	1299.51	Flow Area (sq ft)		703.19	
E.G. Slope (ft/ft)	0.003004	Area (sq ft)		703.19	
Q Total (cfs)	1370.00	Flow (cfs)		1370.00	
Top Width (ft)	723.95	Top Width (ft)		723.95	
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)		1.95	
Max Chl Dpth (ft)	1.40	Hydr. Depth (ft)		0.97	
Conv. Total (cfs)	24995.4	Conv. (cfs)		24995.4	
Length Wtd. (ft)		Wetted Per. (ft)		723.96	
Min Ch El (ft)	1298.72	Shear (lb/sq ft)		0.18	
Alpha	1.00	Stream Power (lb/ft s)		0.35	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:4S1ES21 (E45)

Reach	River Sta.	n1	n2	n3
REACH 1	0.657	.041	.041	.041
REACH 1	0.382	.041	.041	.041
REACH 1	0.000	.041	.041	.041

SUMMARY OF REACH LENGTHS

River: 4S1ES21 (E45)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.657	1700	1749	1700
REACH 1	0.382	2000	2018	2000
REACH 1	0.000	1	1	1

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 4S1ES21 (E45)

Reach	River Sta.	Contr.	Expan.

```
*****************************************************
*REACH 1          *    0.657    *        .1*        .3*
*REACH 1          *    0.382    *        .1*        .3*
*REACH 1          *    0.000    *        .1*        .3*
*****************************************************
```

MODEL: 4S1ES23 (F20)

REACH: 4S1ES23 (F20)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX   XXXX       XXXX       XX      XXXX
X     X  X       X    X     X   X     X  X    X
X     X  X       X          X   X    X    X   X
XXXXXXX  XXXX    X      XXX XXXX     XXXXXX    XXXX
X     X  X       X          X  X     X    X       X
X     X  X       X    X     X   X    X    X       X
X     X  XXXXXX   XXXX      X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: 4S1ES23 (F20)
Project File : 4S1ES23_F20.prj
Run Date and Time: 1/12/2005 4:45:41 PM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants, Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: 4S1ES23 (F20)

****

PLAN DATA

Plan Title: 4S1ES23 (F20)
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES23 (F20)\4S1ES23_F20.p01

Geometry Title: 4S1ES23 (F20)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES23 (F20)\4S1ES23_F20.g01

Flow Title : 4S1ES23 (F20)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES23 (F20)\4S1ES23_F20.f01

Plan Summary Information:

Number of:	Cross Sections	= 21	Mulitple Openings	=	0
	Culverts	= 0	Inline Structures	=	0
	Bridges	= 0	Lateral Structures	=	0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3

Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 4S1ES23 (F20) Reach = REACH 1

RS	Profile	Method	Value1	Value2
4.645	PF 2	1	9995	10070
4.447	PF 2	1	9987	10100
4.099	PF 2	1	9988	10100
3.890	PF 2	1	9986	10030
3.640	PF 2	1	9850	10150
3.357	PF 2	1	9986	10150
3.086	PF 2	1	9914	10150
2.950	PF 2	1	9941	10195
2.833	PF 2	1	9981	10200
2.611	PF 2	1	9913	10200
2.352	PF 2	1	9917	10050
2.033	PF 2	1	9907	10300
1.752	PF 2	1	9907	10300
1.524	PF 2	1	9920	10300
1.358	PF 2	1	9945	10200
1.132	PF 2	1	9947	10050
0.775	PF 2	1	9901	10150
0.545	PF 2	1	9901	10300
0.417	PF 2	1	9883	10300
0.156	PF 2	1	9953	10300
0.000	PF 2	1	9885	10300

****

FLOW DATA

Flow Title: 4S1ES23 (F20)
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES23 (F20)\4S1ES23_F20.f01

Flow Data (cfs)

River	Reach	RS	PF 1
4S1ES23 (F20)	REACH 1	4.645	450
4S1ES23 (F20)	REACH 1	4.447	240
4S1ES23 (F20)	REACH 1	4.099	220
4S1ES23 (F20)	REACH 1	3.890	230
4S1ES23 (F20)	REACH 1	3.640	980
4S1ES23 (F20)	REACH 1	3.357	1820
4S1ES23 (F20)	REACH 1	3.086	1820
4S1ES23 (F20)	REACH 1	2.950	1800
4S1ES23 (F20)	REACH 1	2.833	1050
4S1ES23 (F20)	REACH 1	2.611	970
4S1ES23 (F20)	REACH 1	2.352	740
4S1ES23 (F20)	REACH 1	2.033	570
4S1ES23 (F20)	REACH 1	1.752	1950
4S1ES23 (F20)	REACH 1	1.524	480
4S1ES23 (F20)	REACH 1	1.358	120
4S1ES23 (F20)	REACH 1	1.132	1
4S1ES23 (F20)	REACH 1	0.775	170
4S1ES23 (F20)	REACH 1	0.545	1100
4S1ES23 (F20)	REACH 1	0.417	550
4S1ES23 (F20)	REACH 1	0.156	990
4S1ES23 (F20)	REACH 1	0.000	1260

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
4S1ES23 (F20)	REACH 1	PF 1	Normal S = 0.0045	Normal S = 0.0015

****

GEOMETRY DATA

Geometry Title: 4S1ES23 (F20)
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\4S1ES23 (F20)\4S1ES23_F20.g01

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 4.645

INPUT
Description: Limit of Study.
Directly downstream of 3-58" x 36" CMP's.
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880	1359.61	9890	1359.59	9900	1357.87	9935	1358.99	9980	1360.75
9990	1358.07	10000	1354.08	10033.84	1353.12	10037.31	1353.02	10050.62	1354.72
10092.02	1357.83	10126.69	1358.1	10131.3	1358.13	10144.58	1358.22	10170.58	1358.4
10179.62	1358.44	10209.87	1358.63	10232.55	1358.75	10249.15	1358.86	10285.48	1359.08
10288.43	1359.11	10296.92	1359.16	10327.72	1359.39	10338.42	1359.46	10367	1359.69
10391.35	1359.91	10406.28	1360.02	10444.28	1360.36	10445.57	1360.37	10449.27	1360.4
10484.85	1360.67	10497.21	1360.77	10524.13	1360.96	10550.14	1361.13	10563.42	1361.2
10601.62	1361.38	10602.7	1361.39	10603.07	1361.39	10641.98	1361.48	10656.01	1361.5
10681.27	1361.51	10708.94	1361.51	10720.55	1361.52	10753.96	1361.54	10759.83	1361.54
10761.87	1361.54	10799.12	1361.62						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9880	.04	9980	.05	510092.02	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9980	10092.02	1050	1048	1050	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1356.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.055	
W.S. Elev (ft)	1356.44	Reach Len. (ft)	1050.00	1048.00	1050.00
Crit W.S. (ft)		Flow Area (sq ft)		168.40	
E.G. Slope (ft/ft)	0.003627	Area (sq ft)		168.40	
Q Total (cfs)	450.00	Flow (cfs)		450.00	
Top Width (ft)	79.38	Top Width (ft)		79.38	
Vel Total (ft/s)	2.67	Avg. Vel. (ft/s)		2.67	
Max Chl Dpth (ft)	3.42	Hydr. Depth (ft)		2.12	
Conv. Total (cfs)	7471.8	Conv. (cfs)		7471.8	
Length Wtd. (ft)	1048.00	Wetted Per. (ft)		80.02	
Min Ch El (ft)	1353.02	Shear (lb/sq ft)		0.48	
Alpha	1.00	Stream Power (lb/ft s)		1.27	
Frctn Loss (ft)	4.78	Cum Volume (acre-ft)	16.78	206.10	49.05
C & E Loss (ft)	0.02	Cum SA (acres)	11.22	106.56	77.90

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 4.447

INPUT
Description: Directly downstream of 12' bridge.
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880	1354.26	9890	1354.24	9900	1352.45	9935	1352.57	9980	1354.42
9990	1350.44	10000	1350.46	10021.2	1350.57	10049.15	1350.52	10049.59	1350.52
10079.94	1350.93	10089.3	1351.06	10094.59	1351.13	10098.02	1351.18	10101.35	1351.23
10103.4	1351.26	10104.74	1351.28	10105.73	1351.31	10112.51	1351.42	10123.32	1351.47

```
10152.12 1351.6210161.58 1351.6810191.73 1351.8510214.22 1351.9810231.34 1352.07
10266.85 1352.2810270.95 1352.31

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9880     .04    9980    .05510214.22    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998010214.22              1800    1836    1800            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1351.76  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *    0.055 *          *
* W.S. Elev (ft)          * 1351.70  * Reach Len. (ft)         * 1800.00  * 1836.00  * 1800.00  *
* Crit W.S. (ft)          * 1351.20  * Flow Area (sq ft)       *          *  127.33  *          *
* E.G. Slope (ft/ft)      *0.007642  * Area (sq ft)            *          *  127.33  *          *
* Q Total (cfs)           *  240.00  * Flow (cfs)              *          *  240.00  *          *
* Top Width (ft)          *  178.34  * Top Width (ft)          *          *  178.34  *          *
* Vel Total (ft/s)        *    1.88  * Avg. Vel. (ft/s)         *          *    1.88  *          *
* Max Chl Dpth (ft)       *    1.26  * Hydr. Depth (ft)         *          *    0.71  *          *
* Conv. Total (cfs)       *  2745.5  * Conv. (cfs)              *          *  2745.5  *          *
* Length Wtd. (ft)        * 1836.00  * Wetted Per. (ft)         *          *  178.59  *          *
* Min Ch El (ft)          * 1350.44  * Shear (lb/sq ft)         *          *    0.34  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)   *          *    0.64  *          *
* Frctn Loss (ft)         *    7.50  * Cum Volume (acre-ft)     *   16.78  *  202.55  *   49.05  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *   11.22  *  103.46  *   77.90  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 4.099

INPUT
Description: Directly downstream of 10' bridge.
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    9880 1345.86    9890 1345.84    9900 1344.83    9935 1345.43    9980 1347.29
    9990 1343.24   10000 1341.72 10000.9 1341.7210001.45 1341.7210002.86 1341.72
10003.61 1341.7210004.54 1341.7210014.35 1341.91 10020.1    134210068.18 1343.61
10075.46 1343.7110097.87 1343.9610115.14 1344.1510120.76  1344.210154.81 1344.59
10173.34 1344.7410194.48 1344.9510225.92 1345.1710234.15 1345.2310259.47 1345.37
10273.82 1345.44 10278.5 1345.47 10313.5 1345.6310331.07 1345.7210353.17 1345.83
10383.65 1345.9710392.84 1346.0210421.08 1346.1710432.51 1346.2210436.36 1346.13
10436.69 1346.1210437.05 1346.1210437.97  1346.110439.12 1346.0910440.62 1346.06
10442.79 1346.0110446.53 1345.9310454.38 1345.7710502.22 1344.9310508.28 1344.82
 10526.4 1345.9810532.47 1346.3410551.53 1346.8210582.68 1346.97 10591.2    1347
10593.97 1347.0110630.87 1347.1510646.55 1347.2110670.55 1347.3110699.13 1347.42
10710.22 1347.4610744.28 1347.6110749.89 1347.6310751.71 1347.6310789.56 1347.79
10804.29 1347.8510829.23 1347.9410856.87 1348.05

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9880     .04    9900    .05510115.14    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990010115.14              1100    1104    1100            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1344.24  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *          *    0.055 *   0.045  *
* W.S. Elev (ft)          * 1344.21  * Reach Len. (ft)         * 1100.00  * 1104.00  * 1100.00  *
* Crit W.S. (ft)          * 1343.01  * Flow Area (sq ft)       *          *  148.88  *    0.20  *
* E.G. Slope (ft/ft)      *0.002442  * Area (sq ft)            *          *  148.88  *    0.20  *
* Q Total (cfs)           *  220.00  * Flow (cfs)              *          *  219.97  *    0.03  *
* Top Width (ft)          *  134.04  * Top Width (ft)          *          *  127.54  *    6.50  *
* Vel Total (ft/s)        *    1.48  * Avg. Vel. (ft/s)         *          *    1.48  *    0.16  *
```

```
* Max Chl Dpth (ft)      *    2.49  * Hydr. Depth (ft)       *          *    1.17  *    0.03  *
* Conv. Total (cfs)      *  4452.0  * Conv. (cfs)            *          *  4451.4  *     0.7  *
* Length Wtd. (ft)       * 1104.00  * Wetted Per. (ft)       *          *  127.87  *    6.51  *
* Min Ch El (ft)         * 1341.72  * Shear (lb/sq ft)       *          *    0.18  *    0.00  *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    0.26  *    0.00  *
* Frctn Loss (ft)        *    4.08  * Cum Volume (acre-ft)   *   16.78   *  196.73  *   49.05  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *   11.22   *   97.02  *   77.77  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 3.890

INPUT
Description: Directly downstream of 30' bridge.
North of structure is wash
4S1ES9 (E49).

```
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9880 1341.18    9890 1341.16    9900 1340.05    9935 1340.74    9980 1341.27
    9990 1339.06   10000 1336.8110059.91 1342.2810065.87 1342.8410067.79 1343.04
10072.91 1343.5810110.28 1343.3110125.58 1343.2210149.85 1343.0710178.25 1342.93
10189.42 1342.9310223.11 1342.8610228.98 1342.8510230.92 1342.8410268.55 1342.58
 10283.6 1342.5210308.11 1342.7310336.27 1342.4510347.68 1342.4810382.12 1342.56
10387.24 1342.5710388.94 1342.5710426.81 1342.6110441.61 1342.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9880     .04    9900    .05510072.91    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990010072.91              1300    1320    1300            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1340.16  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.13  * Wt. n-Val.              *          *    0.055 *          *
* W.S. Elev (ft)         * 1340.03  * Reach Len. (ft)         * 1300.00  * 1320.00  * 1300.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *   80.06  *          *
* E.G. Slope (ft/ft)     *0.006071  * Area (sq ft)            *          *   80.06  *          *
* Q Total (cfs)          *  230.00  * Flow (cfs)              *          *  230.00  *          *
* Top Width (ft)         *   49.72  * Top Width (ft)          *          *   49.72  *          *
* Vel Total (ft/s)       *    2.87  * Avg. Vel. (ft/s)        *          *    2.87  *          *
* Max Chl Dpth (ft)      *    3.22  * Hydr. Depth (ft)        *          *    1.61  *          *
* Conv. Total (cfs)      *  2951.8  * Conv. (cfs)             *          *  2951.8  *          *
* Length Wtd. (ft)       * 1317.12  * Wetted Per. (ft)        *          *   50.22  *          *
* Min Ch El (ft)         * 1336.81  * Shear (lb/sq ft)        *          *    0.60  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *    1.74  *          *
* Frctn Loss (ft)        *    2.78  * Cum Volume (acre-ft)   *   16.78   *  193.82  *   49.05  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)         *   11.22   *   94.77  *   77.69  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 3.640

INPUT
Description:

```
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
```

```
    9850 1335.57    9860 1335.55 9875.92 1333.82 9898.19 1333.46  9898.9 1333.47
 9899.15 1333.46 9899.42 1333.46 9899.72 1333.51 9957.22  1336.6 9964.28 1338.94
   10000 1332.0210029.07 1333.9310042.58 1334.6610073.97 1335.3510095.48  1335.8
10113.29 1335.9610148.38 1336.15 10152.6 1336.1710164.83 1336.2410191.92 1336.39
10201.28 1336.4410231.24  1336.610254.18 1336.7210270.55 1336.8110307.08 1337.02
10309.87 1337.0310317.94 1337.0710349.18 1337.2310359.98 1337.29 10388.5 1337.43
10412.88 1337.5410427.82 1337.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
    9850     .04 9964.28    .05510113.29    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.2810113.29             1475    1494    1475            .1       .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
    9850 9964.28    1339       F

CROSS SECTION OUTPUT  Profile #PF 1
**************************************************************************************************
* E.G. Elev (ft)          * 1337.36  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.               *          *    0.055 *    0.045 *
* W.S. Elev (ft)          * 1337.30  * Reach Len. (ft)          * 1475.00  * 1494.00  * 1475.00  *
* Crit W.S. (ft)          * 1335.59  * Flow Area (sq ft)        *          *   372.53 *   165.32 *
* E.G. Slope (ft/ft)      *0.001757  * Area (sq ft)             *  276.09  *   372.53 *   165.32 *
* Q Total (cfs)           *  980.00  * Flow (cfs)               *          *   805.62 *   174.38 *
* Top Width (ft)          *  498.32  * Top Width (ft)           *  109.33  *   140.54 *   248.46 *
* Vel Total (ft/s)        *    1.82  * Avg. Vel. (ft/s)         *          *     2.16 *     1.05 *
* Max Chl Dpth (ft)       *    5.28  * Hydr. Depth (ft)         *          *     2.65 *     0.67 *
* Conv. Total (cfs)       * 23382.7  * Conv. (cfs)              *          * 19222.0  *  4160.7  *
* Length Wtd. (ft)        * 1487.36  * Wetted Per. (ft)         *          *   141.14 *   248.46 *
* Min Ch El (ft)          * 1332.02  * Shear (lb/sq ft)         *          *     0.29 *     0.07 *
* Alpha                   *    1.22  * Stream Power (lb/ft s)    *          *     0.63 *     0.08 *
* Frctn Loss (ft)         *    8.08  * Cum Volume (acre-ft)      *   12.66  *   186.97 *    46.58 *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)            *    9.59  *    91.89 *    73.98 *
**************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 3.357

INPUT
Description: Directly downstream of 18' bridge.
North of structure is wash
             4S1ES20 (E44).
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
    9880 1331.12    9890  1331.1    9900 1329.64    9925 1330.36    9950 1331.12
    9980 1331.24    9990 1326.71   10000 1326.4610079.86 1327.3310080.24 1327.33
10080.39 1327.3410080.63 1327.3410080.76 1327.3410120.36 1327.5510133.29 1327.62
10160.09 1327.7710185.81 1327.9110199.83 1327.9910238.34 1328.2110239.56 1328.22
10243.35 1328.24 10279.3 1328.4410290.87 1328.5110319.03 1328.68 10343.4 1328.81
10358.76  1328.910395.93 1329.13 10398.5 1329.1510406.47  1329.210438.23  1329.4
10448.46 1329.4710477.96 1329.6610500.98 1329.79 10517.7  1329.910553.51 1330.13
10557.43 1330.16 10569.6 1330.2510597.16 1330.4410606.04 1330.51 10636.9 1330.85
10658.57 1331.1410676.63  1331.4 10711.1  1332.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
    9880     .04    9900    .05510079.86    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990010079.86             1400    1427    1400            .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1329.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.		0.055	0.045
W.S. Elev (ft)	1328.92	Reach Len. (ft)	1400.00	1427.00	1400.00
Crit W.S. (ft)	1328.70	Flow Area (sq ft)		190.27	226.23
E.G. Slope (ft/ft)	0.015523	Area (sq ft)		190.27	226.23
Q Total (cfs)	1820.00	Flow (cfs)		1016.06	803.94
Top Width (ft)	376.53	Top Width (ft)		94.73	281.80
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)		5.34	3.55
Max Chl Dpth (ft)	2.46	Hydr. Depth (ft)		2.01	0.80
Conv. Total (cfs)	14607.7	Conv. (cfs)		8155.1	6452.6
Length Wtd. (ft)	1419.72	Wetted Per. (ft)		95.22	281.80
Min Ch El (ft)	1326.46	Shear (lb/sq ft)		1.94	0.78
Alpha	1.13	Stream Power (lb/ft s)		10.34	2.76
Frctn Loss (ft)	5.18	Cum Volume (acre-ft)	7.99	177.32	39.95
C & E Loss (ft)	0.08	Cum SA (acres)	7.74	87.85	65.00

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 3.086

INPUT
Description:
Station Elevation Data num= 27

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9895	1326.87	9905	1326.85	9925	1320	9935	1320	9950	1326
9960	1321	10000	1316.85	10045.57	1316.64	10009	1316.44	10013.28	1316.55
10017.35	1317.14	10021.22	1317.99	10024.93	1318.74	10030.92	1318.91	10041.15	1319.99
10050.21	1320.64	10058.17	1321.16	10069.3	1321.91	10079.18	1322.44	10099.87	1322.28
10109.13	1322.55	10114.75	1322.6	10141.2	1322.41	10164.03	1322.16	10181.9	1322.67
10215.87	1323.61	10222.61	1323.98						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9895	.04	9905	.058	10109.13	.052

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9905	10109.13	700	721	700	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1324.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.		0.058	0.052
W.S. Elev (ft)	1323.92	Reach Len. (ft)	700.00	721.00	700.00
Crit W.S. (ft)		Flow Area (sq ft)		683.11	136.55
E.G. Slope (ft/ft)	0.001587	Area (sq ft)		683.11	136.55
Q Total (cfs)	1820.00	Flow (cfs)		1642.96	177.04
Top Width (ft)	298.54	Top Width (ft)		186.20	112.34
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)		2.41	1.30
Max Chl Dpth (ft)	7.48	Hydr. Depth (ft)		3.67	1.22
Conv. Total (cfs)	45679.4	Conv. (cfs)		41235.9	4443.5
Length Wtd. (ft)	717.20	Wetted Per. (ft)		188.87	112.37
Min Ch El (ft)	1316.44	Shear (lb/sq ft)		0.36	0.12
Alpha	1.09	Stream Power (lb/ft s)		0.86	0.16
Frctn Loss (ft)	1.90	Cum Volume (acre-ft)	7.99	163.01	34.12
C & E Loss (ft)	0.01	Cum SA (acres)	7.74	83.25	58.67

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 2.950

INPUT
Description: Directly downstream of 11' bridge.
North of structure is wash
4S1ES21 (E45).
Station Elevation Data num= 42

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9890	1325.03	9900	1325.01	9915	1323.24	9935	1324.1	9950	1318.24
9965	1323.68	9980	1317.29	9990	1317.61	9995	1314.61	10000	1316.81
10027.97	1318.41	10029.17	1318.41	10030.33	1318.41	10031.44	1318.43	10035.37	1318.87
10080.05	1322	10081.1	1322.15	10081.83	1322.23	10082.13	1322.24	10082.4	1322.26
10082.65	1322.27	10083.11	1322.32	10083.33	1322.35	10083.51	1322.37	10083.87	1322.41
10084.11	1322.42	10084.34	1322.43	10119.51	1320.94	10159.64	1318.99	10164.56	1319.45
10183.92	1321.15	10190.86	1321.7	10241.46	1322.89	10241.64	1322.89	10241.71	1322.89
10280.92	1323.13	10294.65	1323.22	10320.19	1323.39	10347.59	1323.51	10359.46	1323.59
10393.58	1323.71	10398.74	1323.73						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9890	.04	9965	.058	10081.1	.052

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9965	10081.1	600	617	600	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1322.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.040	0.058	0.052
W.S. Elev (ft)	1321.89	Reach Len. (ft)	600.00	617.00	600.00
Crit W.S. (ft)		Flow Area (sq ft)	35.34	338.36	135.40
E.G. Slope (ft/ft)	0.005306	Area (sq ft)	35.34	338.36	135.40
Q Total (cfs)	1800.00	Flow (cfs)	136.53	1322.55	340.92
Top Width (ft)	230.17	Top Width (ft)	19.38	109.21	101.58
Vel Total (ft/s)	3.54	Avg. Vel. (ft/s)	3.86	3.91	2.52
Max Chl Dpth (ft)	7.28	Hydr. Depth (ft)	1.82	3.10	1.33
Conv. Total (cfs)	24710.8	Conv. (cfs)	1874.3	18156.3	4680.2
Length Wtd. (ft)	612.48	Wetted Per. (ft)	20.71	111.62	101.77
Min Ch El (ft)	1314.61	Shear (lb/sq ft)	0.57	1.00	0.44
Alpha	1.08	Stream Power (lb/ft s)	2.18	3.92	1.11
Frctn Loss (ft)	2.38	Cum Volume (acre-ft)	7.71	154.56	31.94
C & E Loss (ft)	0.03	Cum SA (acres)	7.58	80.81	56.95

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 2.833

INPUT
Description: Directly downstream of 57' bridge.
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9880	1323.08	9890	1323.06	9900	1320.79	9980	1320.74	9990	1313.96
10000	1314.82	10000.12	1314.82	10006.83	1315.18	10012.7	1315.51	10017.34	1315.79
10021.14	1316.01	10057.45	131	810073.86	1318.01	10109.97	1318.23	10113.59	1318.25
10124.83	1318.34	10153.33	1318.57	10162.5	1318.66	10193.06	1318.91	10215.03	1319.09
10232.79	1319.21	10267.56	1319.44	10272.53	1319.47	10287.95	1319.56	10312.26	1319.7
10320.09	1319.75	10351.99	1319.91	10372.62	1320.01	10391.73	1320.09	10425.15	1320.24
10431.46	1320.26	10451.06	1320.34	10471.19	1320.43	10477.67	1320.45	10510.93	1320.58
10530.2	1320.66	10550.66	1320.73	10582.73	1320.84	10590.39	1320.87	10614.18	1320.95
10630.12	132	10635.26	1321.02	10669.86	1321.14	10687.79	1321.2	10709.59	1321.29
10740.32	1321.41	10749.32	1321.44	10777.29	1321.56	10789.06	1321.61	10792.85	1321.63
10828.79	1321.8	10845.38	1321.88	10868.52	1322.01	10897.9	1322.16	10908.26	1322.22
10940.41	1322.41	10947.99	1322.46	10950.34	1322.48	10952.26	1322.5	10954.01	1322.51
10957.54	1322.53	10968.49	1322.59	11013.99	1322.89	11023.76	1322.88	11035.85	1322.9
11049.88	1322.91	11055.87	1322.92	11103.53	1323.19	11106.92	1323.2	11108.02	1323.21

```
11146.66 1323.3511160.55 1323.4111186.39 1323.51

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
    9880     .04    9980    .05510057.45    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
          998010057.45               1150    1171    1150            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1319.68  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.               *          *    0.055 *    0.045 *
* W.S. Elev (ft)          * 1319.57  * Reach Len. (ft)          * 1150.00  * 1171.00 * 1150.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *          *  256.51 *  192.23  *
* E.G. Slope (ft/ft)      *0.002507  * Area (sq ft)             *          *  256.51 *  192.23  *
* Q Total (cfs)           * 1050.00  * Flow (cfs)               *          *  770.16 *  279.84  *
* Top Width (ft)          *  308.39  * Top Width (ft)           *          *   75.73 *  232.66  *
* Vel Total (ft/s)        *    2.34  * Avg. Vel. (ft/s)         *          *    3.00 *    1.46  *
* Max Chl Dpth (ft)       *    5.61  * Hydr. Depth (ft)         *          *    3.39 *    0.83  *
* Conv. Total (cfs)       * 20969.3  * Conv. (cfs)              *          * 15380.6 *  5588.7  *
* Length Wtd. (ft)        * 1166.98  * Wetted Per. (ft)         *          *   77.58 *  232.67  *
* Min Ch El (ft)          * 1313.96  * Shear (lb/sq ft)         *          *    0.52 *    0.13  *
* Alpha                   *    1.31  * Stream Power (lb/ft s)    *          *    1.55 *    0.19  *
* Frctn Loss (ft)         *    2.46  * Cum Volume (acre-ft)      *    7.46  *  150.34 *   29.68  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *    7.45  *   79.50 *   54.65  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 2.611

INPUT
Description: Directly downstream of 10' bridge.
Station Elevation Data      num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    9890 1318.36    9900 1318.34    9915 1316.81    9945 1318.11    9970 1312.26
    9980 1309.76    9985 1309.74    9995 1312.68   10000 1312.81 10013.5 1314.11
 10019.9 1314.7210037.79 1316.4510043.85 1316.4510067.13 1316.4510084.84 1316.44
10089.45 1316.4410125.84 1316.4610141.12 1316.4810166.83 1316.5510192.79 1316.63
10207.83  1316.710244.45 1316.8410248.82 1316.8610265.62 1316.9410289.82 1317.05
10296.12 1317.0810330.81 1317.2310347.78 1317.3110371.81 1317.4210399.45 1317.55
10412.81 1317.6110451.12 1317.77 10453.8 1317.7910464.11 1317.83 10494.8 1317.97
10502.78 1318.0110535.79 1318.1510554.45 1318.2310576.79 1318.3310606.12 1318.46
10617.78 1318.5210657.78 1318.6910658.78  1318.7 10662.6 1318.7110699.77 1318.88

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
    9890     .04    9945    .05510037.79    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
          994510037.79               1350    1370    1350            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1317.22  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.               *   0.040  *    0.055 *    0.045 *
* W.S. Elev (ft)          * 1317.12  * Reach Len. (ft)          * 1350.00  * 1370.00  * 1350.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *    1.55  *  323.31  *  125.66  *
* E.G. Slope (ft/ft)      *0.001777  * Area (sq ft)             *    1.55  *  323.31  *  125.66  *
* Q Total (cfs)           *  970.00  * Flow (cfs)               *    0.69  *  863.46  *  105.84  *
* Top Width (ft)          *  365.52  * Top Width (ft)           *   10.09  *   88.55  *  266.88  *
* Vel Total (ft/s)        *    2.15  * Avg. Vel. (ft/s)         *    0.45  *    2.67  *    0.84  *
* Max Chl Dpth (ft)       *    7.38  * Hydr. Depth (ft)         *    0.15  *    3.65  *    0.47  *
* Conv. Total (cfs)       * 23013.4  * Conv. (cfs)              *    16.5  * 20485.7  *  2511.2  *
* Length Wtd. (ft)        * 1368.65  * Wetted Per. (ft)         *   10.11  *   90.01  *  266.88  *
* Min Ch El (ft)          * 1309.74  * Shear (lb/sq ft)         *    0.02  *    0.40  *    0.05  *
* Alpha                   *    1.39  * Stream Power (lb/ft s)    *    0.01  *    1.06  *    0.04  *
* Frctn Loss (ft)         *    4.92  * Cum Volume (acre-ft)      *    7.44  *  142.55  *   25.48  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)            *    7.32  *   77.29  *   48.05  *
```

```
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 2.352

INPUT
Description: Directly downstream of 12' bridge.
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
    9900 1313.17    9910 1313.15    9920 1311.34    9940 1312.19    9960 1313.01
    9980 1307.98   10000 1309.8110067.21  1312.4 10082.1 1312.3510107.56 1312.43
10134.17 1312.5310147.92 1312.5810186.23 1312.7810188.27 1312.7910195.29 1312.83
10228.62 1313.0210239.55 1313.0410241.89 1313.0210247.25 1312.9910257.93 1312.93
10285.51 1312.7610289.79 1312.74 10313.4 1313.0610325.38 1313.2310331.83 1313.32
10336.46 1313.38 10339.4 1313.4210341.45 1313.4510343.21 1313.4710344.55 1313.49
10345.57 1313.5110391.52 1312.7410411.74 1313.1210430.77  1313.210445.64 1313.35
 10455.6 1313.5610468.67 1313.7310492.81 1314.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9900     .04    9960    .05510067.21    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996010067.21              1650    1685    1650            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1312.27  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.38  * Wt. n-Val.              *   0.040  *   0.055  *         *
* W.S. Elev (ft)         * 1311.89  * Reach Len. (ft)         * 1650.00  * 1685.00  * 1650.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *    4.34  *  146.11  *         *
* E.G. Slope (ft/ft)     *0.017975  * Area (sq ft)            *    4.34  *  146.11  *         *
* Q Total (cfs)          *  740.00  * Flow (cfs)              *    9.08  *  730.92  *         *
* Top Width (ft)         *  105.29  * Top Width (ft)          *   15.88  *   89.42  *         *
* Vel Total (ft/s)       *    4.92  * Avg. Vel. (ft/s)         *    2.09  *    5.00  *         *
* Max Chl Dpth (ft)      *    3.91  * Hydr. Depth (ft)         *    0.27  *    1.63  *         *
* Conv. Total (cfs)      *  5519.4  * Conv. (cfs)              *    67.7  *  5451.7  *         *
* Length Wtd. (ft)       * 1683.56  * Wetted Per. (ft)         *   15.94  *   90.02  *         *
* Min Ch El (ft)         * 1307.98  * Shear (lb/sq ft)         *    0.31  *    1.82  *         *
* Alpha                  *    1.02  * Stream Power (lb/ft s)   *    0.64  *    9.11  *         *
* Frctn Loss (ft)        *    3.97  * Cum Volume (acre-ft)     *    7.35  *  135.17  *   23.54 *
* C & E Loss (ft)        *    0.11  * Cum SA (acres)           *    6.91  *   74.49  *   43.92 *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 2.033

INPUT
Description: Directly downstream of 12' bridge.
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
    9895 1308.43    9905 1308.41    9915 1306.92    9950 1308.27    9965 1304.38
   10040  1304.2 10053.8  1307.610077.34 1307.5610093.77 1307.58 10153.1 1306.98
10163.49 1306.7410182.26 1307.1410234.35 1307.7510253.65 1307.7410286.69 1307.77
10293.62 1307.7710316.02  1307.810333.59 1307.8110339.03 1307.8210373.56 1307.88
10391.37 1307.9110413.54 1307.9810443.71 1308.0710453.51 1308.1110485.16 1308.22
```

```
10493.48 1308.2610496.05 1308.2710533.45  1308.410548.39 1308.4510573.42  1308.5
10600.73 1308.5610613.39 1308.5610653.07  1308.610653.36  1308.610654.29  1308.6
10693.33 1308.6310705.41 1308.64 10733.3 1308.6610757.75 1308.6810773.27  1308.7
10810.09 1308.7110813.24 1308.7110823.43 1308.7210853.21 1308.7710861.51 1308.97
10867.35 1309.0110870.39 1309.0310910.33  1309.310914.66 1309.3310920.24 1309.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
    9895     .04    9950    .05510234.35    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          995010234.35              1450    1479    1450              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1308.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.02  * Wt. n-Val.              *   0.040  *   0.055  *   0.045  *
* W.S. Elev (ft)         * 1308.17  * Reach Len. (ft)        * 1450.00  * 1479.00  * 1450.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *   25.58  *  501.64  *   68.77  *
* E.G. Slope (ft/ft)     *0.000706  * Area (sq ft)           *   25.58  *  501.64  *   68.77  *
* Q Total (cfs)          *  570.00  * Flow (cfs)              *   18.44  *  525.11  *   26.44  *
* Top Width (ft)         *  561.88  * Top Width (ft)          *   40.87  *  283.97  *  237.04  *
* Vel Total (ft/s)       *    0.96  * Avg. Vel. (ft/s)        *    0.72  *    1.05  *    0.38  *
* Max Chl Dpth (ft)      *    3.97  * Hydr. Depth (ft)        *    0.63  *    1.77  *    0.29  *
* Conv. Total (cfs)      * 21451.7  * Conv. (cfs)             *   694.2  * 19762.4  *   995.1  *
* Length Wtd. (ft)       * 1476.89  * Wetted Per. (ft)        *   40.98  *  284.88  *  237.04  *
* Min Ch El (ft)         * 1304.20  * Shear (lb/sq ft)        *    0.03  *    0.08  *    0.01  *
* Alpha                  *    1.13  * Stream Power (lb/ft s)   *    0.02  *    0.08  *    0.00  *
* Frctn Loss (ft)        *    2.97  * Cum Volume (acre-ft)     *    6.78  *  122.64  *   22.23  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)           *    5.84  *   67.27  *   39.43  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 1.752

INPUT
Description: Directly downstream of 10' bridge.
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
    9890 1305.73    9900 1305.71    9910 1304.75    9945 1304.81    9970 1300.81
   10000 1301.8110073.19  1303.610076.89 1303.61 10112.8 1303.7110129.53 1303.75
10175.96 1303.04 10215.6 1302.5210253.63 1303.5310287.43 1304.2610310.84 1304.33
10340.07 1304.4210350.44 1304.4510381.99 1304.5510390.05 1304.57 10392.7 1304.58
10429.66 1304.7110445.34 1304.7610469.27 1304.8610497.98 1304.9810508.87 1305.03
   10542 1305.1610548.48 1305.1910550.61  1305.210588.09 1305.3610603.25 1305.42
10627.69 1305.5310655.88 1305.65 10667.3  1305.710702.02 1305.8410706.91 1305.86
10708.52 1305.8710746.52 1306.0310761.15 1306.0910786.12 1306.1910813.79  1306.3
10825.73 1306.3510862.03  1306.510865.34 1306.5210866.42 1306.5210904.94 1306.67
10919.06 1306.73

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
    9890     .04    9945    .05510287.43    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994510287.43              1200    1207    1200              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1305.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.040  *   0.055  *   0.045  *
* W.S. Elev (ft)         * 1305.12  * Reach Len. (ft)        * 1200.00  * 1207.00  * 1200.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      *   12.70  *  724.81  *  113.32  *
* E.G. Slope (ft/ft)     *0.003155  * Area (sq ft)           *   12.70  *  724.81  *  113.32  *
* Q Total (cfs)          * 1950.00  * Flow (cfs)              *   12.57  * 1811.73  *  125.70  *
* Top Width (ft)         *  626.27  * Top Width (ft)          *   38.88  *  342.43  *  244.96  *
```

* Vel Total (ft/s)	*	2.29	* Avg. Vel. (ft/s)	*	0.99	*	2.50	*	1.11	*
* Max Chl Dpth (ft)	*	4.31	* Hydr. Depth (ft)	*	0.33	*	2.12	*	0.46	*
* Conv. Total (cfs)	*	34719.1	* Conv. (cfs)	*	223.8	*	32257.2	*	2238.1	*
* Length Wtd. (ft)	*	1206.48	* Wetted Per. (ft)	*	38.90	*	342.82	*	244.96	*
* Min Ch El (ft)	*	1300.81	* Shear (lb/sq ft)	*	0.06	*	0.42	*	0.09	*
* Alpha	*	1.12	* Stream Power (lb/ft s)	*	0.06	*	1.04	*	0.10	*
* Frctn Loss (ft)	*	2.36	* Cum Volume (acre-ft)	*	6.15	*	101.82	*	19.20	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	4.51	*	56.64	*	31.40	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 1.524

INPUT
Description: Directly downstream of 35' bridge.
North of structure is wash
4S1ES15A (F34).
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9890	1304.45	9900	1304.43	9910	1303.28	9935	1301.96	9960	1298
10000	1299.75	10044.5	1301.11	10056.35	1301.5	10061.5	1301.68	10076.26	1302.01
10115.68	1301.91	10116.69	1301.91	10117.82	1301.91	10118.91	1301.91	10121.8	1301.92
10123.6	1301.92	10125.4	1301.92	10128.38	1301.92	10166.77	1302.11	10167.9	1302.11
10169.11	1302.11	10170.31	1302.11	10193.19	1302.24	10213.29	1302.29	10219.89	1302.31
10252.91	1302.43	10272.51	1302.48	10302.2	1302.38	10304.73	1302.37	10307.23	1302.37
10337.23	1302.38	10340.2	1302.36	10343.65	1302.36	10361.6	1302.48	10365.09	1302.51
10369.64	1302.65	10395.42	1302.95	10400.68	1302.95	10426.47	1303.08	10429.25	1303.08
10432.17	1303.08	10435.13	1303.08	10439.89	1303.06	10445.3	1303.04	10451.58	1303.06
10458.77	1303.18	10466.12	1303.35	10490.22	1303.46	10499.28	1303.62	10507.84	1303.66
10521.64	1303.71	10529.63	1303.69	10537.58	1303.67	10541.63	1303.67	10545.62	1303.67
10549.52	1303.67	10553.59	1303.67	10557.6	1303.67	10577.81	1303.75	10581.48	1303.75
10583.4	1303.75	10585.24	1303.76	10586.93	1303.76	10590.48	1303.76	10630.03	1303.94
10632.88	1303.95	10635.09	1303.95	10636.96	1303.96	10638.56	1303.96	10639.95	1303.96
10640.86	1303.96	10641.73	1303.97	10642.55	1303.97	10643.93	1303.96	10645.27	1303.96
10674.16	1304.12	10688.73	1304.18	10693.51	1304.19	10728.35	1304.34	10746.13	1304.4
10781.3	1304.55	10800.26	1304.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9890	.04	9910	.05	10166.77	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9910	10166.77	850	877	850	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1302.83	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.01	* Wt. n-Val.	*		*	0.055	*	0.045	*
* W.S. Elev (ft)	*	1302.82	* Reach Len. (ft)	*	850.00	*	877.00	*	850.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*		*	456.08	*	93.47	*
* E.G. Slope (ft/ft)	*	0.000563	* Area (sq ft)	*		*	456.08	*	93.47	*
* Q Total (cfs)	*	480.00	* Flow (cfs)	*		*	438.25	*	41.75	*
* Top Width (ft)	*	464.98	* Top Width (ft)	*		*	247.96	*	217.02	*
* Vel Total (ft/s)	*	0.87	* Avg. Vel. (ft/s)	*		*	0.96	*	0.45	*
* Max Chl Dpth (ft)	*	4.81	* Hydr. Depth (ft)	*		*	1.84	*	0.43	*
* Conv. Total (cfs)	*	20237.9	* Conv. (cfs)	*		*	18477.7	*	1760.2	*
* Length Wtd. (ft)	*	875.12	* Wetted Per. (ft)	*		*	248.36	*	217.03	*
* Min Ch El (ft)	*	1298.00	* Shear (lb/sq ft)	*		*	0.06	*	0.02	*
* Alpha	*	1.13	* Stream Power (lb/ft s)	*		*	0.06	*	0.01	*
* Frctn Loss (ft)	*	0.50	* Cum Volume (acre-ft)	*	5.97	*	85.46	*	16.36	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	3.98	*	48.46	*	25.04	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

```
RIVER: 4S1ES23 (F20)
REACH: REACH 1              RS: 1.358

INPUT
Description: Directly downstream of 17' bridge.
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9890 1304.68    9900 1304.66    9910 1303.35    9935 1304.73    9955 1299.65
   10000 1301.6210027.24 1301.4810069.88 1301.4410069.93 1301.4410069.95 1301.44
   10070 1301.4410122.62 1301.7210149.09  1301.910175.28 1302.0310188.67 1302.12
10227.95 1302.3410228.24 1302.3410229.14 1302.3510267.82 1302.5610280.61 1302.62
10307.39 1302.7410333.27 1302.8510346.97  1302.910385.93 1303.0410386.54 1303.04
10388.39 1303.0510426.12 1303.18 10438.6 1303.23 10465.7 1303.3410491.26 1303.44
10505.27  1303.510543.92 1303.6710544.85 1303.6710547.64 1303.6910584.42 1303.85
10596.59  1303.9   10624 1304.0210649.25 1304.1410663.58  1304.210701.91 1304.37
10703.15 1304.37 10706.9 1304.3910742.73 1304.5610754.58 1304.62 10782.3 1304.75
10807.24 1304.8610821.88 1304.93 10859.9 1305.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9890     .04    9935    .05510227.95    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          993510227.95             1175    1194    1175            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1302.32  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.00  * Wt. n-Val.              *           *   0.055   *          *
* W.S. Elev (ft)          * 1302.31  * Reach Len. (ft)        * 1175.00   * 1194.00   * 1175.00   *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *           *  213.94   *          *
* E.G. Slope (ft/ft)      *0.000614  * Area (sq ft)            *           *  213.94   *          *
* Q Total (cfs)           *  120.00  * Flow (cfs)              *           *  120.00   *          *
* Top Width (ft)          *  278.42  * Top Width (ft)          *           *  278.42   *          *
* Vel Total (ft/s)        *    0.56  * Avg. Vel. (ft/s)        *           *    0.56   *          *
* Max Chl Dpth (ft)       *    2.66  * Hydr. Depth (ft)        *           *    0.77   *          *
* Conv. Total (cfs)       *  4844.5  * Conv. (cfs)             *           *  4844.5   *          *
* Length Wtd. (ft)        * 1194.00  * Wetted Per. (ft)        *           *  278.79   *          *
* Min Ch El (ft)          * 1299.65  * Shear (lb/sq ft)        *           *    0.03   *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *           *    0.02   *          *
* Frctn Loss (ft)         *    0.13  * Cum Volume (acre-ft)    *    5.97   *   78.71   *   15.44  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    3.98   *   43.16   *   22.92  *
*****************************************************************************************

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1              RS: 1.132

INPUT
Description: Directly downstream of 4-38" steel pipes.
Approximately 450'
             upstream of 83rd Avenue.
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9895 1304.57    9905 1304.55    9930 1303.95    9955 1301.07    9965 1299.67
    9970 1299.82    9975 1300.93   10000 1299.67   10035 1300.6510076.87 1303.82
10083.55 1303.8410104.17 1303.8810123.25 1303.9210129.42 1303.9310162.95 1303.98
10181.98 1304.0110202.65 1304.0510234.54 1304.0910242.35  1304.110266.47 1304.14
10282.05 1304.1710287.09 1304.1810321.75 1304.2710339.65 1304.3210361.45 1304.41
 10392.2 1304.5210401.15 1304.5610428.77 1304.6810440.85 1304.7310444.76 1304.74
10480.55  1304.910497.32 1304.9610520.25 1305.0410549.87 1305.1410559.95 1305.17
10591.08 1305.2610599.65 1305.2910602.43  1305.310639.35 1305.4110654.98 1305.45
10679.05 1305.5310707.54  1305.610718.75 1305.6410753.38 1305.7510758.45 1305.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9895     .04    9930    .05510104.17    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          993010104.17             1850    1883    1850            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	1302.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.		0.055	
W.S. Elev (ft)	1302.18	Reach Len. (ft)	1850.00	1883.00	1850.00
Crit W.S. (ft)		Flow Area (sq ft)		178.05	
E.G. Slope (ft/ft)	0.000000	Area (sq ft)		178.05	
Q Total (cfs)	1.00	Flow (cfs)		1.00	
Top Width (ft)	109.89	Top Width (ft)		109.89	
Vel Total (ft/s)	0.01	Avg. Vel. (ft/s)		0.01	
Max Chl Dpth (ft)	2.51	Hydr. Depth (ft)		1.62	
Conv. Total (cfs)	6620.3	Conv. (cfs)		6620.3	
Length Wtd. (ft)	1874.65	Wetted Per. (ft)		110.28	
Min Ch El (ft)	1299.67	Shear (lb/sq ft)		0.00	
Alpha	1.00	Stream Power (lb/ft s)		0.00	
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	5.97	73.34	15.44
C & E Loss (ft)	0.00	Cum SA (acres)	3.98	37.84	22.92

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 0.775

INPUT
Description: Directly downstream of 2-54" x 38" CMP's.
Approximately 1450'
downstream of 83rd Avenue.

Station Elevation Data num= 31

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9890	1302.01	9900	1301.99	9915	1299.57	9945	1299.69	9955	1297.28
9985	1297.34	10000	1300.11	10034.87	1300.67	10080.26	1301.31	10088.71	1301.45
10102.3	1301.63	10144.37	1301.71	10178.89	1301.86	10196.8	1301.93	10206.11	1301.98
10235.65	1302.14	10245.97	1302.21	10249.22	1302.21	10285.83	1302.44	10301.65	1302.54
10325.68	1302.68	10354.08	1302.86	10365.54	1302.93	10401.86	1303.13	10405.4	1303.16
10406.51	1303.16	10445.25	1303.39	10458.94	1303.46	10485.11	1303.61	10511.37	1303.76
10524.96	1303.83								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9890	.04	9945	.055	10102.3	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945	10102.3	1200	1212	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1302.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.040	0.055	0.045
W.S. Elev (ft)	1302.11	Reach Len. (ft)	1200.00	1212.00	1200.00
Crit W.S. (ft)		Flow Area (sq ft)	95.67	356.38	37.10
E.G. Slope (ft/ft)	0.000058	Area (sq ft)	95.67	356.38	37.10
Q Total (cfs)	170.00	Flow (cfs)	39.17	126.73	4.09
Top Width (ft)	340.85	Top Width (ft)	55.00	157.30	128.55
Vel Total (ft/s)	0.35	Avg. Vel. (ft/s)	0.41	0.36	0.11
Max Chl Dpth (ft)	4.83	Hydr. Depth (ft)	1.74	2.27	0.29
Conv. Total (cfs)	22227.2	Conv. (cfs)	5122.0	16570.2	535.0
Length Wtd. (ft)	1210.72	Wetted Per. (ft)	55.30	157.85	128.55
Min Ch El (ft)	1297.28	Shear (lb/sq ft)	0.01	0.01	0.00
Alpha	1.10	Stream Power (lb/ft s)	0.00	0.00	0.00
Frctn Loss (ft)	0.31	Cum Volume (acre-ft)	3.94	61.79	14.66
C & E Loss (ft)	0.00	Cum SA (acres)	2.81	32.06	20.19

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 0.545

```
INPUT
Description: Directly downstream of 3' x 3' wood box.
Station Elevation Data     num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9890 1301.58    9900 1301.56    9915 1298.42    9945 1297.65    9970 1298.14
   10000 1298.6910039.01 1298.44 10053.2  1298.410078.03 1298.3910106.41 1298.57
10117.04  1298.810146.28 1299.2110156.06 1299.3710160.93 1299.4810167.23 1299.54
10216.99 1300.6310234.09  1300.710266.02 1300.82 10273.1 1300.8410292.57  1300.9
10312.12 1300.9610319.23 1300.9810351.13 1301.0710372.43 1301.1310390.15 1301.19
10425.63 1301.2910429.16  1301.310438.85 1301.3310468.17 1301.4410478.84 1301.48
10507.19  1301.610532.04 1301.69 10546.2 1301.7510585.14 1301.9110585.22 1301.91
10585.25 1301.9110624.23 1302.0610638.45 1302.1110663.25 1302.2110691.66 1302.32
10702.26 1302.3610731.42 1302.4610741.28  1302.510744.86 1302.5110780.29 1302.64
10798.07  1302.710819.31 1302.7810851.27  1302.9

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
    9890     .04    9900    .05510216.99    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          990010216.99              650     680     650          .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1301.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.              *   0.040  *   0.055  *   0.045  *
* W.S. Elev (ft)          * 1301.79  * Reach Len. (ft)         *  650.00  *  680.00  *  650.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    2.18  *  939.18  *  202.28  *
* E.G. Slope (ft/ft)      *0.000372  * Area (sq ft)            *    2.18  *  939.18  *  202.28  *
* Q Total (cfs)           * 1100.00  * Flow (cfs)              *    0.56  * 1008.11  *   91.34  *
* Top Width (ft)          *  665.50  * Top Width (ft)          *   10.00  *  316.99  *  338.51  *
* Vel Total (ft/s)        *    0.96  * Avg. Vel. (ft/s)        *    0.26  *    1.07  *    0.45  *
* Max Chl Dpth (ft)       *    4.14  * Hydr. Depth (ft)        *    0.22  *    2.96  *    0.60  *
* Conv. Total (cfs)       * 57069.6  * Conv. (cfs)             *    29.0  * 52301.9  *  4738.7  *
* Length Wtd. (ft)        *  677.48  * Wetted Per. (ft)        *   10.21  *  317.36  *  338.51  *
* Min Ch El (ft)          * 1297.65  * Shear (lb/sq ft)        *    0.00  *    0.07  *    0.01  *
* Alpha                   *    1.16  * Stream Power (lb/ft s)   *    0.00  *    0.07  *    0.01  *
* Frctn Loss (ft)         *    0.19  * Cum Volume (acre-ft)     *    2.59  *   43.77  *   11.36  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *    1.91  *   25.46  *   13.76  *
*****************************************************************************************

Warning: The cross-section end points had to be extended vertically for the computed water surface.

CROSS SECTION


RIVER: 4S1ES23 (F20)
REACH: REACH 1            RS: 0.417

INPUT
Description: Directly downstream of 2-4' x 2.5' wood boxes.
North of structure
            is Waterman Wash.
Station Elevation Data     num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9870 1301.61    9880 1301.59    9900  1299.1    9920 1299.19    9940 1296.55
    9960 1297.48    9985 1298.24   10000 1299.0410039.19 1299.2310053.02 1299.29
10078.39 1299.4110106.04 1299.5210117.58 1299.5710150.32 1299.6910156.78 1299.71
10159.06 1299.7210195.97 1299.8610212.08 1299.9310235.17 1300.0410265.09 1300.17
10274.36 1300.2110300.64 1300.3410313.56  1300.410318.11 1300.4310352.75  1300.6
10371.13 1300.6910391.95 1300.7910424.15 1300.9410431.14 1300.9710450.96 1301.05
10470.34 1301.1410477.17 1301.1710509.53 1301.3110530.19 1301.4110548.73  1301.5
10583.21 1301.6610587.92 1301.6910601.28 1301.7610627.12  1301.910636.23 1301.94
10666.31 1302.0910689.25 1302.2210705.51  1302.310742.26  1302.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
    9870     .04    9920    .05510583.21    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          992010583.21              1350    1378    1350          .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1301.62  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.00	Wt. n-Val.	0.040	0.055		
W.S. Elev (ft)	1301.61	Reach Len. (ft)	1350.00	1378.00	1350.00	
Crit W.S. (ft)		Flow Area (sq ft)	74.75	1052.79		
E.G. Slope (ft/ft)	0.000166	Area (sq ft)	74.75	1052.79		
Q Total (cfs)	550.00	Flow (cfs)	46.63	503.37		
Top Width (ft)	702.64	Top Width (ft)	50.00	652.64		
Vel Total (ft/s)	0.49	Avg. Vel. (ft/s)	0.62	0.48		
Max Chl Dpth (ft)	5.06	Hydr. Depth (ft)	1.49	1.61		
Conv. Total (cfs)	42735.3	Conv. (cfs)	3623.0	39112.3		
Length Wtd. (ft)	1369.85	Wetted Per. (ft)	50.16	652.87		
Min Ch El (ft)	1296.55	Shear (lb/sq ft)	0.02	0.02		
Alpha	1.02	Stream Power (lb/ft s)	0.01	0.01		
Frctn Loss (ft)	0.88	Cum Volume (acre-ft)	2.02	28.22	9.85	
C & E Loss (ft)	0.00	Cum SA (acres)	1.47	17.89	11.24	

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 0.156

INPUT
Description: Directly downstream of 2-4' x 2.5' wood boxes. Not in survey.
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9890	1302.22	9900	1302.2	10000	1298.78	10012.16	1298.84	10040.01	1298.96
10087.09	1299.16	10091.29	1299.18	10092.68	1299.18	10130.86	1299.31	10145.35	1299.35
10170.43	1299.43	10223.6	1299.03	10240.18	1298.92	10241.43	1298.97	10255.19	1299.3
10258.77	1299.41	10262.1	1299.49	10284.07	1299.61	10290.38	1299.65	10295.87	1299.63
10300.86	1299.65	10305.28	1299.77	10309.38	1299.91	10313	1300	10348.63	1300.13
10350.61	1300.14	10352.39	1300.13	10353.95	1300.13	10368.27	1300.17	10405.25	1300.37
10407.84	1300.39	10408.7	1300.39	10447.41	1300.61	10461.37	1300.69	10486.98	1300.83
10514.04	1300.98	10526.55	1301.04	10564.33	1301.24	10566.12	1301.25	10566.71	1301.25
10605.69	1301.38	10619.38	1301.42	10645.25	1301.48	10672.05	1301.54	10684.82	1301.56
10723.41	1301.63	10724.39	1301.63	10724.71	1301.63	10763.96	1301.72	10777.38	1301.74
10803.53	1301.83	10830.05	1301.91	10843.1	1301.96	10882.5	1302.11	10882.67	1302.11
10882.72	1302.11	10922.23	1302.26	10935.39	1302.31	10961.8	1302.41	10988.06	1302.5

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9890	.04	9900	.055	10170.43	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9900 10170.43 800 822 800 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1300.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.055	0.045
W.S. Elev (ft)	1300.68	Reach Len. (ft)	800.00	822.00	800.00
Crit W.S. (ft)		Flow Area (sq ft)		316.90	246,52
E.G. Slope (ft/ft)	0.003011	Area (sq ft)		316.90	246.52
Q Total (cfs)	990.00	Flow (cfs)		588.53	401.47
Top Width (ft)	515.33	Top Width (ft)		226.00	289.32
Vel Total (ft/s)	1.76	Avg. Vel. (ft/s)		1.86	1.63
Max Chl Dpth (ft)	1.90	Hydr. Depth (ft)		1.40	0.85
Conv. Total (cfs)	18040.5	Conv. (cfs)		10724.6	7315.9
Length Wtd. (ft)	811.71	Wetted Per. (ft)		226.04	289.34
Min Ch El (ft)	1298.78	Shear (lb/sq ft)		0.26	0.16
Alpha	1.01	Stream Power (lb/ft s)		0.49	0.26
Frctn Loss (ft)	1.61	Cum Volume (acre-ft)	0.86	6.55	6.03
C & E Loss (ft)	0.00	Cum SA (acres)	0.69	4.00	6.75

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES23 (F20)
REACH: REACH 1 RS: 0.000

INPUT
Description: Limit of Study.
Directly downstream of 3-58" x 36" CMP's.
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9870	1299.63	9880	1299.61	9900	1297.37	9960	1298.12	10000	1296.84
10039.78	1296.97	10052.49	1297.01	10079.55	1297.11	10104.98	1297.18	10119.33	1297.23
10157.48	1297.35	10159.11	1297.36	10164.21	1297.38	10198.89	1297.51	10209.97	1297.53
10238.66	1297.64	10262.46	1297.72	10278.44	1297.78	10314.95	1297.92	10318.22	1297.93
10328.42	1297.97	10357.99	1298.07	10367.45	1298.11	10397.77	1298.21	10419.94	1298.29
10437.55	1298.35	10472.43	1298.49	10477.33	1298.51	10492.63	1298.57	10517.1	1298.67
10524.93	1298.71	10556.88	1298.85	10577.42	1298.95	10596.66	1299.05	10629.91	1299.23
10636.43	1299.27	10656.85	1299.38	10676.21	1299.49	10682.4	1299.53	10715.99	1299.71
10734.9	1299.81	10755.77	1299.91	10787.39	1300.06				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9870	.04	9960	.055	10157.48	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9960	10157.48	1	1	1	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1299.12	Element			
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.055	0.045
W.S. Elev (ft)	1299.09	Reach Len. (ft)			
Crit W.S. (ft)	1298.11	Flow Area (sq ft)	93.66	377.73	410.12
E.G. Slope (ft/ft)	0.001498	Area (sq ft)	93.66	377.73	410.12
Q Total (cfs)	1260.00	Flow (cfs)	155.58	608.66	495.76
Top Width (ft)	718.75	Top Width (ft)	75.33	197.48	445.95
Vel Total (ft/s)	1.43	Avg. Vel. (ft/s)	1.66	1.61	1.21
Max Chl Dpth (ft)	2.25	Hydr. Depth (ft)	1.24	1.91	0.92
Conv. Total (cfs)	32550.1	Conv. (cfs)	4019.2	15723.8	12807.0
Length Wtd. (ft)		Wetted Per. (ft)	75.43	197.50	445.95
Min Ch El (ft)	1296.84	Shear (lb/sq ft)	0.12	0.18	0.09
Alpha	1.06	Stream Power (lb/ft s)	0.19	0.29	0.10
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

SUMMARY OF MANNING'S N VALUES

River:4S1ES23 (F20)

Reach	River Sta.	n1	n2	n3
REACH 1	4.645	.04	.055	.045
REACH 1	4.447	.04	.055	.045
REACH 1	4.099	.04	.055	.045
REACH 1	3.890	.04	.055	.045
REACH 1	3.640	.04	.055	.045
REACH 1	3.357	.04	.055	.045
REACH 1	3.086	.04	.058	.052
REACH 1	2.950	.04	.058	.052
REACH 1	2.833	.04	.055	.045
REACH 1	2.611	.04	.055	.045
REACH 1	2.352	.04	.055	.045
REACH 1	2.033	.04	.055	.045
REACH 1	1.752	.04	.055	.045
REACH 1	1.524	.04	.055	.045
REACH 1	1.358	.04	.055	.045
REACH 1	1.132	.04	.055	.045
REACH 1	0.775	.04	.055	.045
REACH 1	0.545	.04	.055	.045
REACH 1	0.417	.04	.055	.045
REACH 1	0.156	.04	.055	.045
REACH 1	0.000	.04	.055	.045

SUMMARY OF REACH LENGTHS

River: 4S1ES23 (F20)

Reach	River Sta.	Left	Channel	Right
REACH 1	4.645	1050	1048	1050
REACH 1	4.447	1800	1836	1800
REACH 1	4.099	1100	1104	1100
REACH 1	3.890	1300	1320	1300
REACH 1	3.640	1475	1494	1475
REACH 1	3.357	1400	1427	1400
REACH 1	3.086	700	721	700
REACH 1	2.950	600	617	600
REACH 1	2.833	1150	1171	1150
REACH 1	2.611	1350	1370	1350
REACH 1	2.352	1650	1685	1650
REACH 1	2.033	1450	1479	1450
REACH 1	1.752	1200	1207	1200
REACH 1	1.524	850	877	850
REACH 1	1.358	1175	1194	1175
REACH 1	1.132	1850	1883	1850
REACH 1	0.775	1200	1212	1200
REACH 1	0.545	650	680	650
REACH 1	0.417	1350	1378	1350
REACH 1	0.156	800	822	800
REACH 1	0.000	1	1	1

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: 4S1ES23 (F20)

Reach	River Sta.	Contr.	Expan.
REACH 1	4.645	.1	.3
REACH 1	4.447	.1	.3
REACH 1	4.099	.1	.3
REACH 1	3.890	.1	.3
REACH 1	3.640	.1	.3
REACH 1	3.357	.1	.3
REACH 1	3.086	.1	.3
REACH 1	2.950	.1	.3
REACH 1	2.833	.1	.3
REACH 1	2.611	.1	.3
REACH 1	2.352	.1	.3
REACH 1	2.033	.1	.3
REACH 1	1.752	.1	.3
REACH 1	1.524	.1	.3
REACH 1	1.358	.1	.3
REACH 1	1.132	.1	.3
REACH 1	0.775	.1	.3
REACH 1	0.545	.1	.3
REACH 1	0.417	.1	.3
REACH 1	0.156	.1	.3
REACH 1	0.000	.1	.3

MODEL: WATERMAN WASH

REACHES: WATERMAN WASH

3S1WS15B (D39)
3S1WS15A (G40)
3S1WS26 (D33)
3S1WS25B (D32)
3S1WS25A (D31)
4S1ES15A (F34)
4S1ES9 (E49)
4S1ES20 (E44)
3S1WS22A (D42)
3S1WS22B (G39)

HEC-RAS Version 3.1 November 2002
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X        X           X   X    X    X   X
XXXXXXX  XXXX     X       XXX XXXX     XXXXXX    XXXX
X     X  X        X           X  X     X    X        X
X     X  X        X    X      X   X    X    X        X
X     X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

****

PROJECT DATA
Project Title: Waterman Wash
Project File : WatermanWash.prj
Run Date and Time: 2/28/2005 8:47:20 AM

Project in English units

Project Description:
Waterman Wash FDS
Prepared by:
Engineering and Environmental Consultants,
Inc.
3003 N. Central Avenue, Suite 600
Phoenix, Arizona 85012
Phone:
602-248-7702 FAX: 602-248-7851
For:
Flood Control District of Maricopa
County
Waterman Wash - Contract # 2002C024
Topographic Mapping Source:

Stewart Geotechnology Dec. 2000
10' Contour Interval
Discharge information
obtained from hydrology report
Study Limits:
Waterman Wash
Final Model Run
Date: July 2004
Model: Waterman Wash
Discharge information obtained from
hydrology report
Study Limits:
Waterman Wash
Final Model Run Date: July
2004
Reaches: Waterman Wash
  3S1WS15 (D39)
  3S1WS22 (D42)
  3S1WS25A
(D31)
  3S1WS25B (D32)
  3S1WS26 (D33)
  4S1ES9 (E49)
  4S1ES15B
(F32)
  3S1WS22 (G39)
  3S1WS15A (G40)
  4S1ES20 (E44)

****

PLAN DATA

Plan Title: Waterman Wash
Plan File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\Waterman Wash\WatermanWash.p01

Geometry Title: Waterman Wash
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\Waterman Wash\WatermanWash.g01

Flow Title : Waterman Wash
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\Waterman Wash\WatermanWash.f01

Plan Summary Information:

Number of:	Cross Sections	= 224	Mulitple Openings	=	0
	Culverts	= 2	Inline Structures	=	0
	Bridges	= 1	Lateral Structures	=	0

Computational Information

Water surface calculation tolerance	=	0.01
Critical depth calculaton tolerance	=	0.01
Maximum number of interations	=	20
Maximum difference tolerance	=	0.3
Flow tolerance factor	=	0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = 4S1ES9 (E49) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.282	PF 2	1	9980	10120
3.073	PF 2	1	9860	10150
2.828	PF 2	1	9870	10120
2.567	PF 2	1	9900	10100
2.308	PF 2	1	9800	10200
2.056	PF 2	1	9800	10200

River = 4S1ES9 (E49) Reach = REACH 2

RS	Profile	Method	Value1	Value2
1.816	PF 2	1	9945	10260
1.522	PF 2	1	9953	10035
1.355	PF 2	1	9950	10040
1.085	PF 2	1	9925	10045
0.819	PF 2	1	9900	10030
0.637	PF 2	1	9945	10040
0.580	PF 2	1	9840	10150
0.566	PF 2	1		
0.552	PF 2	1	9890	10150
0.495	PF 2	1	9942	10050
0.409	PF 2	1	9925	10080
0.289	PF 2	1	9810	10140
0.125	PF 2	1	9600	10200

River = 3S1WS15B (D39) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.202	PF 2	1	9900	10100
2.941	PF 2	1	9900	10100
2.582	PF 2	1	9970	10120
2.341	PF 2	1	9985	10040
2.074	PF 2	1	9986.15	10110
1.817	PF 2	1	9990.65	10080
1.534	PF 2	1	9950	10030
1.334	PF 2	1	9935	10040
1.109	PF 2	1	9920	10045
0.865	PF 2	1	9970	10025
0.632	PF 2	1	9975	10075
0.292	PF 2	1	9860	10025

River = Waterman Wash Reach = REACH 2

RS	Profile	Method	Value1	Value2
25.296	PF 2	1	9700	10300
25.005	PF 2	1	9750	10250
24.668	PF 2	1	9700	10200
24.518	PF 2	1	9650	10300

River = Waterman Wash Reach = REACH 3

RS	Profile	Method	Value1	Value2
24.268	PF 2	1	9700	10300
23.877	PF 2	1	9700	10300
23.597	PF 2	1	9750	10250
23.330	PF 2	1	9725	10275
23.143	PF 2	1	9750	10250
22.828	PF 2	1	9725	10275
22.542	PF 2	1	9700	10300
22.283	PF 2	1	9700	10300
21.997	PF 2	1	9700	10300
21.733	PF 2	1	9700	10300
21.566	PF 2	1	9700	10300
21.285	PF 2	1	9700	10300
21.008	PF 2	1	9700	10300
20.752	PF 2	1	9700	10300
20.461	PF 2	1	9725	10300
20.245	PF 2	1	9650	10350

River = Waterman Wash Reach = REACH 4

RS	Profile	Method	Value1	Value2
19.845	PF 2	1	9600	10400
19.844	PF 2	1	9600	10400

River = Waterman Wash Reach = REACH 5

RS	Profile	Method	Value1	Value2
19.551	PF 2	1	9700	10350
19.344	PF 2	1	9700	10250
19.134	PF 2	1	9700	10250

River = Waterman Wash Reach = REACH 6

RS	Profile	Method	Value1	Value2
18.961	PF 2	1	9700	10300
18.798	PF 2	1	9750	10250
18.567	PF 2	1	9750	10250
18.319	PF 2	1	9750	10250
18.159	PF 2	1	9650	10250
17.913	PF 2	1	9750	10250

River = Waterman Wash Reach = REACH 7

RS	Profile	Method	Value1	Value2
17.647	PF 2	1	9840	10300
17.646	PF 2	1	9840	10300

River = Waterman Wash Reach = REACH 8

RS	Profile	Method	Value1	Value2
17.414	PF 2	1	9820	10365
17.195	PF 2	1	9700	10650

River = Waterman Wash Reach = REACH 9

RS	Profile	Method	Value1	Value2
16.974	PF 2	1	9550	10450
16.710	PF 2	1	9550	10450
16.451	PF 2	1	9500	10500

River = Waterman Wash Reach = REACH 10

RS	Profile	Method	Value1	Value2
16.242	PF 2	1	9500	10500
16.012	PF 2	1	9350	10650
15.600	PF 2	1	9800	10435

River = Waterman Wash Reach = REACH 1

RS	Profile	Method	Value1	Value2
36.434	PF 2	1	9860	10250
36.218	PF 2	1	9705	10175
35.983	PF 2	1	9745	10335
35.793	PF 2	1	9580	10435
35.505	PF 2	1	9655	10820
35.269	PF 2	1	9620	11020
35.038	PF 2	1	9775	10850
34.810	PF 2	1	9200	10600
34.577	PF 2	1	9335	10450
34.373	PF 2	1	9385	10670
34.182	PF 2	1	9385	10475
33.940	PF 2	1	9525	10450
33.690	PF 2	1	9600	10220
33.427	PF 2	1	9405	10080
33.189	PF 2	1	9370	10030
32.903	PF 2	1	9200	10200

32.659	PF 2	1	9425	10300
32.449	PF 2	1	9825	10595
32.215	PF 2	1	9820	10435
31.976	PF 2	1	9800	10300
31.763	PF 2	1	9805	10345
31.513	PF 2	1	9735	10285
31.252	PF 2	1	9735	10375
30.971	PF 2	1	9370	10480
30.734	PF 2	1	9465	10305
30.488	PF 2	1	9500	10380
30.248	PF 2	1	9595	10545
30.018	PF 2	1	9495	10490
29.780	PF 2	1	9595	10430
29.515	PF 2	1	9595	10555
29.273	PF 2	1	9730	10270
29.034	PF 2	1	9770	10220
28.777	PF 2	1	9680	10330
28.556	PF 2	1	9660	10390
28.305	PF 2	1	9725	10415
28.019	PF 2	1	9810	10470
27.788	PF 2	1	9580	10275
27.570	PF 2	1	9175	10425
27.530	PF 2	1	9650	10300
27.454	PF 2	1	9700	10300
27.258	PF 2	1	9650	10350
27.052	PF 2	1	9880	10350
26.756	PF 2	1	9850	10300
26.604	PF 2	1	9800	10225
26.307	PF 2	1	9750	10200
26.055	PF 2	1	9850	10100
25.765	PF 2	1	9600	10085
25.571	PF 2	1	9660	10150

River = 3S1WS25A (D31) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.547	PF 2	1	9910	10050
1.300	PF 2	1	9930	10070
1.053	PF 2	1	9830	10080
0.830	PF 2	1	9950	10075
0.580	PF 2	1	9805	10100
0.305	PF 2	1	9925	10075
0.014	PF 2	1	9750	10250

River = 3S1WS25B (D32) Reach = REACH 1

RS	Profile	Method	Value1	Value2
0.551	PF 2	1	9830	10120
0.289	PF 2	1	9900	10100
0.004	PF 2	1	9900	10120

River = 3S1WS26 (D33) Reach = REACH 1

RS	Profile	Method	Value1	Value2
2.227	PF 2	1	9600	10250
1.965	PF 2	1	9825	10150
1.704	PF 2	1	9825	10175
1.457	PF 2	1	9850	10150
1.217	PF 2	1	9880	10190
0.969	PF 2	1	9850	10150
0.718	PF 2	1	9875	10175
0.405	PF 2	1	9850	10150
0.201	PF 2	1	9875	10125
0.006	PF 2	1	9800	10200

River = 4S1ES15A (F34) Reach = REACH 1

RS	Profile	Method	Value1	Value2
6.207	PF 2	1	9980	10029
5.913	PF 2	1	9825	10099
5.656	PF 2	1	9790	10275
5.427	PF 2	1	9675	10425
5.193	PF 2	1	9550	10160
4.859	PF 2	1	9720	10410
4.621	PF 2	1	9690	10550
4.363	PF 2	1	9780	10665
4.125	PF 2	1	9680	10530
3.888	PF 2	1	9625	10460
3.646	PF 2	1	9685	10315
3.406	PF 2	1	9555	10275
3.118	PF 2	1	9825	10420
2.888	PF 2	1	9670	10290
2.642	PF 2	1	9555	10100

2.400	PF 2	1	9350	10140
2.104	PF 2	1	9830	10465
1.926	PF 2	1	9800	10400
1.904	PF 2	1	9500	10500
1.892	PF 2	1	9770	10230
1.824	PF 2	1	9800	10150
1.554	PF 2	1	9675	10325
1.294	PF 2	1	9675	10200
1.019	PF 2	1	9530	10250
0.752	PF 2	1	9550	10250
0.548	PF 2	1	9800	10275
0.278	PF 2	1	9700	10300

River = 3S1WS15A (G40) Reach = REACH 1

RS	Profile	Method	Value1	Value2
8.704	PF 2	1	9950	10024
8.502	PF 2	1	9950	10022
8.303	PF 2	1	9970	10017
8.111	PF 2	1	9980	10045
7.905	PF 2	1	9935	10025
7.708	PF 2	1	9885	10075
7.487	PF 2	1	9965	10050
7.299	PF 2	1	9950	10013
7.076	PF 2	1	9800	10011
6.909	PF 2	1	9815	10035
6.708	PF 2	1	9983	10170
6.495	PF 2	1	9970	10460
6.248	PF 2	1	9850	10105
6.003	PF 2	1	9910	10190
5.800	PF 2	1	9870	10130
5.567	PF 2	1	9830	10180
5.332	PF 2	1	9885	10180
5.075	PF 2	1	9785	10090
4.821	PF 2	1	9860	10205
4.587	PF 2	1	9890	10340
4.355	PF 2	1	9840	10150
4.113	PF 2	1	9765	10250
3.930	PF 2	1	9610	10465
3.667	PF 2	1	9810	10285
3.438	PF 2	1	9765	10220
3.198	PF 2	1	9815	10205
2.986	PF 2	1	9690	10280
2.762	PF 2	1	9705	10250
2.519	PF 2	1	9590	10305
2.227	PF 2	1	9650	10385
1.993	PF 2	1	9780	10400
1.752	PF 2	1	9830	10355
1.533	PF 2	1	9725	10340
1.285	PF 2	1	9790	10285
1.042	PF 2	1	9830	10340
0.801	PF 2	1	9755	10275
0.575	PF 2	1	9735	10355
0.378	PF 2	1	9200	10190

River = 4S1ES20 (E44) Reach = REACH 1

RS	Profile	Method	Value1	Value2
1.054	PF 2	1	9750	10250
0.785	PF 2	1	9800	10500
0.506	PF 2	1	9600	10650
0.276	PF 2	1	9550	10400

River = 3S1WS22B (G39) Reach = REACH 1

RS	Profile	Method	Value1	Value2
3.753	PF 2	1	9950	10050
3.527	PF 2	1	9955	10050
3.281	PF 2	1	9925	10075
3.005	PF 2	1	9925	10075
2.755	PF 2	1	9800	10050
2.456	PF 2	1	9855	10135
2.200	PF 2	1	9550	10075
1.961	PF 2	1	9800	10125
1.713	PF 2	1	9725	10050
1.451	PF 2	1	9950	10043
1.203	PF 2	1	9950	10270
0.955	PF 2	1	9950	10175
0.696	PF 2	1	9955	10150
0.378	PF 2	1	9680	10185

River = 3S1WS22A (D42) Reach = REACH 1

RS	Profile	Method	Value1	Value2
0.892	PF 2	1	9925	10055
0.577	PF 2	1	9970	10070
0.310	PF 2	1	9950	10050

****

FLOW DATA

Flow Title: Waterman Wash
Flow File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\Waterman Wash\WatermanWash.f01

Flow Data (cfs)
****

River	Reach	RS	PF 1
3S1WS22B (G39)	REACH 1	3.753	240
3S1WS22B (G39)	REACH 1	3.527	280
3S1WS22B (G39)	REACH 1	3.281	340
3S1WS22B (G39)	REACH 1	3.005	670
3S1WS22B (G39)	REACH 1	2.755	720
3S1WS22B (G39)	REACH 1	2.456	870
3S1WS22B (G39)	REACH 1	2.200	950
3S1WS22B (G39)	REACH 1	1.961	640
3S1WS22B (G39)	REACH 1	1.713	700
3S1WS22B (G39)	REACH 1	1.451	760
3S1WS22B (G39)	REACH 1	1.203	820
3S1WS22B (G39)	REACH 1	0.955	880
3S1WS22B (G39)	REACH 1	0.696	940
3S1WS22B (G39)	REACH 1	0.378	1020
3S1WS22A (D42)	REACH 1	0.892	1430
3S1WS22A (D42)	REACH 1	0.577	1310
3S1WS22A (D42)	REACH 1	0.310	1200
4S1ES20 (E44)	REACH 1	1.054	2630
4S1ES20 (E44)	REACH 1	0.785	2630
4S1ES20 (E44)	REACH 1	0.506	2630
4S1ES20 (E44)	REACH 1	0.276	2630
4S1ES9 (E49)	REACH 1	3.282	1380
4S1ES9 (E49)	REACH 1	3.073	1630
4S1ES9 (E49)	REACH 1	2.828	1920
4S1ES9 (E49)	REACH 1	2.567	2220
4S1ES9 (E49)	REACH 1	2.308	2530
4S1ES9 (E49)	REACH 1	2.056	2820
4S1ES9 (E49)	REACH 2	1.816	3100
4S1ES9 (E49)	REACH 2	1.522	3450
4S1ES9 (E49)	REACH 2	1.355	3450
4S1ES9 (E49)	REACH 2	1.085	3460
4S1ES9 (E49)	REACH 2	0.819	3470
4S1ES9 (E49)	REACH 2	0.637	3470
4S1ES9 (E49)	REACH 2	0.580	3470
4S1ES9 (E49)	REACH 2	0.552	3470
4S1ES9 (E49)	REACH 2	0.495	3470
4S1ES9 (E49)	REACH 2	0.409	3470
4S1ES9 (E49)	REACH 2	0.289	3460
4S1ES9 (E49)	REACH 2	0.125	3460
4S1ES15A (F34)	REACH 1	6.207	80
4S1ES15A (F34)	REACH 1	5.913	200
4S1ES15A (F34)	REACH 1	5.656	860
4S1ES15A (F34)	REACH 1	5.427	990
4S1ES15A (F34)	REACH 1	5.193	1110
4S1ES15A (F34)	REACH 1	4.859	1200
4S1ES15A (F34)	REACH 1	4.621	1190
4S1ES15A (F34)	REACH 1	4.363	1170
4S1ES15A (F34)	REACH 1	4.125	1150
4S1ES15A (F34)	REACH 1	3.888	1140
4S1ES15A (F34)	REACH 1	3.646	1120
4S1ES15A (F34)	REACH 1	3.406	1100
4S1ES15A (F34)	REACH 1	3.118	1090
4S1ES15A (F34)	REACH 1	2.888	1120
4S1ES15A (F34)	REACH 1	2.642	1160
4S1ES15A (F34)	REACH 1	2.400	1200
4S1ES15A (F34)	REACH 1	2.104	1250
4S1ES15A (F34)	REACH 1	1.926	1280
4S1ES15A (F34)	REACH 1	1.904	1280
4S1ES15A (F34)	REACH 1	1.892	1280
4S1ES15A (F34)	REACH 1	1.824	1780
4S1ES15A (F34)	REACH 1	1.554	1800
4S1ES15A (F34)	REACH 1	1.294	1820

*	4S1ES15A (F34)	REACH 1	1.019	*	1840 *
*	4S1ES15A (F34)	REACH 1	0.752	*	1860 *
*	4S1ES15A (F34)	REACH 1	0.548	*	1880 *
*	4S1ES15A (F34)	REACH 1	0.278	*	3470 *
*	3S1WS25A (D31)	REACH 1	1.547	*	230 *
*	3S1WS25A (D31)	REACH 1	1.300	*	280 *
*	3S1WS25A (D31)	REACH 1	1.053	*	370 *
*	3S1WS25A (D31)	REACH 1	0.830	*	400 *
*	3S1WS25A (D31)	REACH 1	0.580	*	490 *
*	3S1WS25A (D31)	REACH 1	0.305	*	540 *
*	3S1WS25A (D31)	REACH 1	0.014	*	610 *
*	3S1WS25B (D32)	REACH 1	0.551	*	270 *
*	3S1WS25B (D32)	REACH 1	0.289	*	370 *
*	3S1WS25B (D32)	REACH 1	0.004	*	420 *
*	3S1WS26 (D33)	REACH 1	2.227	*	4200 *
*	3S1WS26 (D33)	REACH 1	1.965	*	4120 *
*	3S1WS26 (D33)	REACH 1	1.704	*	4050 *
*	3S1WS26 (D33)	REACH 1	1.457	*	3970 *
*	3S1WS26 (D33)	REACH 1	1.217	*	3910 *
*	3S1WS26 (D33)	REACH 1	0.969	*	3830 *
*	3S1WS26 (D33)	REACH 1	0.718	*	3760 *
*	3S1WS26 (D33)	REACH 1	0.405	*	3670 *
*	3S1WS26 (D33)	REACH 1	0.201	*	3610 *
*	3S1WS26 (D33)	REACH 1	0.006	*	3560 *
*	3S1WS15A (G40)	REACH 1	8.704	*	1920 *
*	3S1WS15A (G40)	REACH 1	8.502	*	2060 *
*	3S1WS15A (G40)	REACH 1	8.303	*	2160 *
*	3S1WS15A (G40)	REACH 1	8.111	*	2250 *
*	3S1WS15A (G40)	REACH 1	7.905	*	2380 *
*	3S1WS15A (G40)	REACH 1	7.708	*	2420 *
*	3S1WS15A (G40)	REACH 1	7.487	*	2720 *
*	3S1WS15A (G40)	REACH 1	7.299	*	2740 *
*	3S1WS15A (G40)	REACH 1	7.076	*	2750 *
*	3S1WS15A (G40)	REACH 1	6.909	*	2770 *
*	3S1WS15A (G40)	REACH 1	6.708	*	2780 *
*	3S1WS15A (G40)	REACH 1	6.495	*	2800 *
*	3S1WS15A (G40)	REACH 1	6.248	*	2810 *
*	3S1WS15A (G40)	REACH 1	6.003	*	2830 *
*	3S1WS15A (G40)	REACH 1	5.800	*	2850 *
*	3S1WS15A (G40)	REACH 1	5.567	*	2860 *
*	3S1WS15A (G40)	REACH 1	5.332	*	2880 *
*	3S1WS15A (G40)	REACH 1	5.075	*	2900 *
*	3S1WS15A (G40)	REACH 1	4.821	*	2920 *
*	3S1WS15A (G40)	REACH 1	4.587	*	2940 *
*	3S1WS15A (G40)	REACH 1	4.355	*	2950 *
*	3S1WS15A (G40)	REACH 1	4.113	*	2970 *
*	3S1WS15A (G40)	REACH 1	3.930	*	2980 *
*	3S1WS15A (G40)	REACH 1	3.667	*	3000 *
*	3S1WS15A (G40)	REACH 1	3.438	*	3580 *
*	3S1WS15A (G40)	REACH 1	3.198	*	4180 *
*	3S1WS15A (G40)	REACH 1	2.986	*	4720 *
*	3S1WS15A (G40)	REACH 1	2.762	*	5280 *
*	3S1WS15A (G40)	REACH 1	2.519	*	5890 *
*	3S1WS15A (G40)	REACH 1	2.227	*	6630 *
*	3S1WS15A (G40)	REACH 1	1.993	*	3630 *
*	3S1WS15A (G40)	REACH 1	1.752	*	3540 *
*	3S1WS15A (G40)	REACH 1	1.533	*	3470 *
*	3S1WS15A (G40)	REACH 1	1.285	*	3380 *
*	3S1WS15A (G40)	REACH 1	1.042	*	3290 *
*	3S1WS15A (G40)	REACH 1	0.801	*	3200 *
*	3S1WS15A (G40)	REACH 1	0.575	*	3120 *
*	3S1WS15A (G40)	REACH 1	0.378	*	3050 *
*	Waterman Wash	REACH 1	36.434	*	2320 *
*	Waterman Wash	REACH 1	36.218	*	2320 *
*	Waterman Wash	REACH 1	35.983	*	2320 *
*	Waterman Wash	REACH 1	35.793	*	2420 *
*	Waterman Wash	REACH 1	35.505	*	2570 *
*	Waterman Wash	REACH 1	35.269	*	2700 *
*	Waterman Wash	REACH 1	35.038	*	2820 *
*	Waterman Wash	REACH 1	34.810	*	2940 *
*	Waterman Wash	REACH 1	34.577	*	3060 *
*	Waterman Wash	REACH 1	34.373	*	3170 *
*	Waterman Wash	REACH 1	34.182	*	3270 *
*	Waterman Wash	REACH 1	33.940	*	3170 *
*	Waterman Wash	REACH 1	33.690	*	3060 *
*	Waterman Wash	REACH 1	33.427	*	2940 *
*	Waterman Wash	REACH 1	33.189	*	2840 *
*	Waterman Wash	REACH 1	32.903	*	2710 *
*	Waterman Wash	REACH 1	32.659	*	2600 *

* Waterman Wash	REACH 1	32.449	*	2510	*
* Waterman Wash	REACH 1	32.215	*	2410	*
* Waterman Wash	REACH 1	31.976	*	2300	*
* Waterman Wash	REACH 1	31.763	*	2210	*
* Waterman Wash	REACH 1	31.513	*	2100	*
* Waterman Wash	REACH 1	31.252	*	2070	*
* Waterman Wash	REACH 1	30.971	*	2040	*
* Waterman Wash	REACH 1	30.734	*	2020	*
* Waterman Wash	REACH 1	30.488	*	1990	*
* Waterman Wash	REACH 1	30.248	*	1970	*
* Waterman Wash	REACH 1	30.018	*	1950	*
* Waterman Wash	REACH 1	29.780	*	1920	*
* Waterman Wash	REACH 1	29.515	*	1890	*
* Waterman Wash	REACH 1	29.273	*	1010	*
* Waterman Wash	REACH 1	29.034	*	1070	*
* Waterman Wash	REACH 1	28.777	*	1140	*
* Waterman Wash	REACH 1	28.556	*	1180	*
* Waterman Wash	REACH 1	28.305	*	1220	*
* Waterman Wash	REACH 1	28.019	*	1270	*
* Waterman Wash	REACH 1	27.788	*	1310	*
* Waterman Wash	REACH 1	27.570	*	1350	*
* Waterman Wash	REACH 1	27.454	*	1350	*
* Waterman Wash	REACH 1	27.258	*	1410	*
* Waterman Wash	REACH 1	27.052	*	1480	*
* Waterman Wash	REACH 1	26.756	*	1580	*
* Waterman Wash	REACH 1	26.604	*	1640	*
* Waterman Wash	REACH 1	26.307	*	1740	*
* Waterman Wash	REACH 1	26.055	*	2140	*
* Waterman Wash	REACH 1	25.765	*	2940	*
* Waterman Wash	REACH 1	25.571	*	3470	*
* Waterman Wash	REACH 2	25.296	*	3650	*
* Waterman Wash	REACH 2	25.005	*	3650	*
* Waterman Wash	REACH 2	24.668	*	4230	*
* Waterman Wash	REACH 2	24.518	*	4230	*
* Waterman Wash	REACH 3	24.268	*	6060	*
* Waterman Wash	REACH 3	23.877	*	6060	*
* Waterman Wash	REACH 3	23.597	*	6060	*
* Waterman Wash	REACH 3	23.330	*	6020	*
* Waterman Wash	REACH 3	23.143	*	6020	*
* Waterman Wash	REACH 3	22.828	*	6110	*
* Waterman Wash	REACH 3	22.542	*	6110	*
* Waterman Wash	REACH 3	22.283	*	6080	*
* Waterman Wash	REACH 3	21.997	*	6080	*
* Waterman Wash	REACH 3	21.733	*	7400	*
* Waterman Wash	REACH 3	21.566	*	7400	*
* Waterman Wash	REACH 3	21.285	*	8250	*
* Waterman Wash	REACH 3	21.008	*	8250	*
* Waterman Wash	REACH 3	20.752	*	8250	*
* Waterman Wash	REACH 3	20.461	*	9470	*
* Waterman Wash	REACH 3	20.245	*	9470	*
* Waterman Wash	REACH 4	19.845	*	9540	*
* Waterman Wash	REACH 4	19.844	*	9540	*
* Waterman Wash	REACH 5	19.551	*	9510	*
* Waterman Wash	REACH 5	19.344	*	9510	*
* Waterman Wash	REACH 5	19.134	*	9770	*
* Waterman Wash	REACH 6	18.961	*	11490	*
* Waterman Wash	REACH 6	18.798	*	11490	*
* Waterman Wash	REACH 6	18.567	*	11320	*
* Waterman Wash	REACH 6	18.319	*	11320	*
* Waterman Wash	REACH 6	18.159	*	11270	*
* Waterman Wash	REACH 6	17.913	*	11150	*
* Waterman Wash	REACH 7	17.647	*	11150	*
* Waterman Wash	REACH 7	17.646	*	11070	*
* Waterman Wash	REACH 8	17.414	*	11070	*
* Waterman Wash	REACH 8	17.195	*	13290	*
* Waterman Wash	REACH 9	16.974	*	13380	*
* Waterman Wash	REACH 9	16.710	*	13260	*
* Waterman Wash	REACH 9	16.451	*	13430	*
* Waterman Wash	REACH 10	16.242	*	15070	*
* Waterman Wash	REACH 10	16.012	*	15070	*
* Waterman Wash	REACH 10	15.600	*	22850	*
* 3S1WS15B (D39)	REACH 1	3.202	*	670	*
* 3S1WS15B (D39)	REACH 1	2.941	*	880	*
* 3S1WS15B (D39)	REACH 1	2.582	*	980	*
* 3S1WS15B (D39)	REACH 1	2.341	*	1070	*
* 3S1WS15B (D39)	REACH 1	2.074	*	1030	*
* 3S1WS15B (D39)	REACH 1	1.817	*	1000	*
* 3S1WS15B (D39)	REACH 1	1.534	*	960	*
* 3S1WS15B (D39)	REACH 1	1.334	*	930	*

```
* 3S1WS15B (D39)  REACH 1        1.109   *            900 *
* 3S1WS15B (D39)  REACH 1        0.865   *            890 *
* 3S1WS15B (D39)  REACH 1        0.632   *            870 *
* 3S1WS15B (D39)  REACH 1        0.292   *            850 *
*************************************************************
```

Boundary Conditions

```
*****************************************************************************************************
* River            Reach          Profile          *          Upstream                Downstream    *
*****************************************************************************************************
* 3S1WS22B (G39)   REACH 1        PF 1             *          Normal S = 0.04                       *
* 3S1WS22A (D42)   REACH 1        PF 1             *         Normal S = 0.0053                      *
* 4S1ES20 (E44)    REACH 1        PF 1             *          Normal S = 0.005                      *
* 4S1ES9 (E49)     REACH 1        PF 1             *         Normal S = 0.0052                      *
* 4S1ES15A (F34)   REACH 1        PF 1             *          Normal S = 0.006                      *
* 3S1WS25A (D31)   REACH 1        PF 1             *         Normal S = 0.0055                      *
* 3S1WS25B (D32)   REACH 1        PF 1             *         Normal S = 0.0051                      *
* 3S1WS26 (D33)    REACH 1        PF 1             *         Normal S = 0.0051                      *
* 3S1WS15A (G40)   REACH 1        PF 1             *          Normal S = 0.04                       *
* Waterman Wash    REACH 1        PF 1             *          Normal S = 0.005                      *
* Waterman Wash    REACH 10       PF 1             *                                  Known WS = 1141 *
* 3S1WS15B (D39)   REACH 1        PF 1             *         Normal S = 0.0047                      *
*****************************************************************************************************
```

****

GEOMETRY DATA

Geometry Title: Waterman Wash
Geometry File : q:\303002 Waterman Wash\HEC-RAS\Completed Models\Printable Version\Waterman Wash\WatermanWash.g01

Reach Connection Table

```
*****************************************************************************
* River            Reach          *  Upstream Boundary  * Downstream Boundary *
*****************************************************************************
* 3S1WS22B (G39)   REACH 1        *                     *   JUNC 8            *
* 3S1WS22A (D42)   REACH 1        *                     *   JUNC 7            *
* 4S1ES20 (E44)    REACH 1        *                     *   JUNC 3            *
* 4S1ES9 (E49)     REACH 1        *                     *   JUNC 3            *
* 4S1ES9 (E49)     REACH 2        *   JUNC 3            *   JUNC 2            *
* 4S1ES15A (F34)   REACH 1        *                     *   JUNC 1            *
* 3S1WS25A (D31)   REACH 1        *                     *   JUNC 4            *
* 3S1WS25B (D32)   REACH 1        *                     *   JUNC 5            *
* 3S1WS26 (D33)    REACH 1        *                     *   JUNC 6            *
* 3S1WS15A (G40)   REACH 1        *                     *   JUNC 9            *
* Waterman Wash    REACH 1        *                     *   JUNC 1            *
* Waterman Wash    REACH 2        *   JUNC 1            *   JUNC 2            *
* Waterman Wash    REACH 3        *   JUNC 2            *   JUNC 4            *
* Waterman Wash    REACH 4        *   JUNC 4            *   JUNC 5            *
* Waterman Wash    REACH 5        *   JUNC 5            *   JUNC 6            *
* Waterman Wash    REACH 6        *   JUNC 6            *   JUNC 7            *
* Waterman Wash    REACH 7        *   JUNC 7            *   JUNC 8            *
* Waterman Wash    REACH 8        *   JUNC 8            *   JUNC 9            *
* Waterman Wash    REACH 9        *   JUNC 9            *   JUNC 10           *
* Waterman Wash    REACH 10       *   JUNC 10           *                     *
* 3S1WS15B (D39)   REACH 1        *                     *   JUNC 10           *
*****************************************************************************
```

JUNCTION INFORMATION

Name: JUNC 1
Description:
Energy computation Method

```
    Length across Junction              Tributary
     River            Reach                River            Reach        Length   Angle
Waterman Wash   REACH 1          to Waterman Wash   REACH 2             1410
4S1ES15A (F34)  REACH 1          to Waterman Wash   REACH 2             1515
```

Name: JUNC 2
Description:
Momentum computation Method
Add Friction
Do Not Add Weight

```
    Length across Junction              Tributary
     River            Reach                River            Reach        Length   Angle
Waterman Wash   REACH 2          to Waterman Wash   REACH 3             1321
```

4S1ES9 (E49)	REACH 2	to Waterman Wash	REACH 3	660	80

Name: JUNC 3
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
4S1ES9 (E49)	REACH 1	to 4S1ES9 (E49)	REACH 2	1330	
4S1ES20 (E44)	REACH 1	to 4S1ES9 (E49)	REACH 2	1700	

Name: JUNC 4
Description:
Momentum computation Method
Add Friction
Do Not Add Weight

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Waterman Wash	REACH 3	to Waterman Wash	REACH 4	2109	
3S1WS25A (D31)	REACH 1	to Waterman Wash	REACH 4	74	70

Name: JUNC 5
Description:
Momentum computation Method
Add Friction
Do Not Add Weight

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Waterman Wash	REACH 4	to Waterman Wash	REACH 5	1555	
3S1WS25B (D32)	REACH 1	to Waterman Wash	REACH 5	21	70

Name: JUNC 6
Description:
Momentum computation Method
Add Friction
Do Not Add Weight

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Waterman Wash	REACH 5	to Waterman Wash	REACH 6	916	
3S1WS26 (D33)	REACH 1	to Waterman Wash	REACH 6	32	60

Name: JUNC 7
Description:
Momentum computation Method
Add Friction
Do Not Add Weight

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Waterman Wash	REACH 6	to Waterman Wash	REACH 7	1408	
3S1WS22A (D42)	REACH 1	to Waterman Wash	REACH 7	1637	50

Name: JUNC 8
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Waterman Wash	REACH 7	to Waterman Wash	REACH 8	1225	
3S1WS22B (G39)	REACH 1	to Waterman Wash	REACH 8	3000	

Name: JUNC 9
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Waterman Wash	REACH 8	to Waterman Wash	REACH 9	1170	
3S1WS15A (G40)	REACH 1	to Waterman Wash	REACH 9	2300	

Name: JUNC 10
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle

```
Waterman Wash    REACH 9          to Waterman Wash    REACH 10          1103
3S1WS15B (D39)   REACH 1          to Waterman Wash    REACH 10          1550       0
```

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 3.753

INPUT
Description: Limit of study.
Station Elevation Data num= 35

```
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*******************************************************************************
 9639.01 1322.23 9677.62  1322.2 9690.97 1322.19 9718.12 1322.17 9742.94 1322.14
 9758.62 1322.09  9794.9 1321.97 9799.12 1321.94 9814.05 1321.85 9839.63 1321.69
 9846.86 1321.64 9880.13 1321.39 9898.83 1321.25 9920.63  1321.1 9950.79 1320.92
 9971.69 1320.39  9980.3 1320.23   10000 1319.8910020.34 1320.2810025.38 1320.38
10029.12 1320.4610031.81 1320.5210054.37 1320.8710083.78 1321.01   10106 1321.11
10124.84 1321.2310157.63 1321.42 10165.9 1321.4810198.06 1321.6710206.96 1321.72
10209.26 1321.7410213.13 1321.7510260.88 1321.9910289.09 1322.0710312.51 1322.11
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9639.01    .045 9950.79    .03810054.37    .045
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9950.7910054.37 1150 1194 1150 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************
* E.G. Elev (ft)          * 1321.25  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1321.10  * Reach Len. (ft)         * 1150.00  * 1194.00  * 1150.00  *
* Crit W.S. (ft)          * 1320.93  * Flow Area (sq ft)       *    2.66  *   74.26  *    5.52  *
* E.G. Slope (ft/ft)      *0.010121  * Area (sq ft)            *    2.66  *   74.26  *    5.52  *
* Q Total (cfs)           *  240.00  * Flow (cfs)              *    1.76  *  233.96  *    4.28  *
* Top Width (ft)          *  182.48  * Top Width (ft)          *   29.87  *  103.58  *   49.03  *
* Vel Total (ft/s)        *    2.91  * Avg. Vel. (ft/s)        *    0.66  *    3.15  *    0.77  *
* Max Chl Dpth (ft)       *    1.21  * Hydr. Depth (ft)        *    0.09  *    0.72  *    0.11  *
* Conv. Total (cfs)       *  2385.6  * Conv. (cfs)             *    17.5  *  2325.6  *    42.5  *
* Length Wtd. (ft)        * 1193.49  * Wetted Per. (ft)        *   29.87  *  103.60  *   49.03  *
* Min Ch El (ft)          * 1319.89  * Shear (lb/sq ft)        *    0.06  *    0.45  *    0.07  *
* Alpha                   *    1.14  * Stream Power (lb/ft s)  *    0.04  *    1.43  *    0.06  *
* Frctn Loss (ft)         *   12.36  * Cum Volume (acre-ft)    *   32.58  *  158.06  *   13.17  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   40.32  *   77.81  *   13.03  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 3.527

INPUT
Description:
Station Elevation Data num= 30

```
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*******************************************************************************
 9670.05 1310.52 9695.75 1310.44 9739.31 1310.29 9746.74 1310.26 9749.77 1310.25
 9785.08 1310.08 9803.79 1309.98 9823.42 1309.86  9857.8 1309.62 9861.76 1309.59
 9871.45 1309.53 9900.11 1309.34 9911.82 1309.26 9938.45 1309.13   10000 1307.12
10048.24 1308.5210058.55 1308.83 10069.2 1309.2310083.59 1309.33 10119.8 1309.54
10143.53 1309.6810170.41 1309.8310203.46 1310.0110221.01 1310.09 10263.4 1310.28
10271.61 1310.3110316.14 1310.4410322.21 1310.4610323.33 1310.4710372.82 1310.57
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9670.05    .045 9938.45    .038 10069.2    .045
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9938.45 10069.2 1250 1301 1250 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1308.89	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.18	Wt. n-Val.		0.038		
W.S. Elev (ft)	1308.70	Reach Len. (ft)	1250.00	1301.00	1250.00	
Crit W.S. (ft)	1308.47	Flow Area (sq ft)		81.38		
E.G. Slope (ft/ft)	0.010566	Area (sq ft)		81.38		
Q Total (cfs)	280.00	Flow (cfs)		280.00		
Top Width (ft)	102.72	Top Width (ft)		102.72		
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)		3.44		
Max Chl Dpth (ft)	1.58	Hydr. Depth (ft)		0.79		
Conv. Total (cfs)	2724.0	Conv. (cfs)		2724.0		
Length Wtd. (ft)	1296.18	Wetted Per. (ft)		102.76		
Min Ch El (ft)	1307.12	Shear (lb/sq ft)		0.52		
Alpha	1.00	Stream Power (lb/ft s)		1.80		
Frctn Loss (ft)	11.74	Cum Volume (acre-ft)	32.55	155.93	13.10	
C & E Loss (ft)	0.02	Cum SA (acres)	39.92	74.98	12.38	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 3.281

INPUT
Description:
Station Elevation Data num= 28

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9725.27	1297.12	9764.52	1297.12	9775.05	1297.11	9814.52	1297.03	9824.83	1297.01
9864.52	1296.9	9874.62	1296.86	9914.52	1296.72	9954.78	1296.57	9966.26	1296.32
9969.77	1296.28	9977.42	1296.2	10000	1295.92	10074.22	1296.58	10075.28	1296.59
10076.08	1296.61	10076.39	1296.61	10077.79	1296.61	10135.59	1296.78	10168.98	1296.91
10194.79	1297	10239.45	1297.19	10253.98	1297.25	10262.38	1297.29	10313.18	1297.53
10355.78	1297.74	10372.38	1297.82	10401.11	1297.98				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9725.27	.045	9954.78	.03	10076.08	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9954.78	10076.08	1400	1456	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1297.14	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.12	Wt. n-Val.	0.045	0.038	0.045	
W.S. Elev (ft)	1297.02	Reach Len. (ft)	1400.00	1456.00	1400.00	
Crit W.S. (ft)	1296.88	Flow Area (sq ft)	28.25	94.68	27.02	
E.G. Slope (ft/ft)	0.008041	Area (sq ft)	28.25	94.68	27.02	
Q Total (cfs)	340.00	Flow (cfs)	29.49	281.43	29.07	
Top Width (ft)	379.55	Top Width (ft)	134.92	121.30	123.33	
Vel Total (ft/s)	2.27	Avg. Vel. (ft/s)	1.04	2.97	1.08	
Max Chl Dpth (ft)	1.10	Hydr. Depth (ft)	0.21	0.78	0.22	
Conv. Total (cfs)	3791.7	Conv. (cfs)	328.9	3138.5	324.2	
Length Wtd. (ft)	1452.75	Wetted Per. (ft)	134.92	121.31	123.33	
Min Ch El (ft)	1295.92	Shear (lb/sq ft)	0.11	0.39	0.11	
Alpha	1.46	Stream Power (lb/ft s)	0.11	1.16	0.12	
Frctn Loss (ft)	15.28	Cum Volume (acre-ft)	32.14	153.30	12.71	
C & E Loss (ft)	0.00	Cum SA (acres)	37.99	71.64	10.61	

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 3.005

```
INPUT
Description:
Station Elevation Data     num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9646.78 1283.89  9682.2 1283.56 9697.27 1283.42 9726.49 1283.16 9747.75 1282.96
 9770.78 1282.78 9798.24 1282.54 9815.08 1282.43 9848.73 1282.17 9859.37 1282.12
 9899.21 1281.89 9904.24 1281.75 9905.75 1281.74 9907.87 1281.72 9910.05  1281.7
 9963.16    1281 9968.17 1280.99 9973.76 1280.98 9984.83 1280.9610000.01 1280.94
10024.19 1281.1110037.29 1281.1510050.66 1281.2710080.97 1281.1610101.13  1281.1
10135.75 1280.7410147.36 1280.7310167.05 1280.9210176.73 1280.9310202.07 1281.06
10214.07  1281.110252.54 1281.3110258.43 1281.3510301.25  1281.7 10302.8 1281.72
10303.01 1281.7210347.17 1282.1610353.48 1282.2310391.53 1282.6310403.96 1282.76
 10435.9 1283.0810454.43 1283.2710480.27 1283.52 10504.9 1283.7510524.63 1283.93
10539.77 1284.06

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9646.78    .045 9899.21    .03810347.17    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9899.2110347.17             1250    1320    1250              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1281.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)          * 1281.72  * Reach Len. (ft)         * 1250.00  * 1320.00  * 1250.00  *
* Crit W.S. (ft)          * 1281.57  * Flow Area (sq ft)       *          *  225.00  *          *
* E.G. Slope (ft/ft)      *0.012242  * Area (sq ft)            *          *  225.00  *          *
* Q Total (cfs)           *  670.00  * Flow (cfs)              *          *  670.00  *          *
* Top Width (ft)          *  394.02  * Top Width (ft)          *          *  394.02  *          *
* Vel Total (ft/s)        *    2.98  * Avg. Vel. (ft/s)        *          *    2.98  *          *
* Max Chl Dpth (ft)       *    0.99  * Hydr. Depth (ft)        *          *    0.57  *          *
* Conv. Total (cfs)       *  6055.6  * Conv. (cfs)             *          *  6055.6  *          *
* Length Wtd. (ft)        * 1313.50  * Wetted Per. (ft)        *          *  394.03  *          *
* Min Ch El (ft)          * 1280.73  * Shear (lb/sq ft)        *          *    0.44  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    1.30  *          *
* Frctn Loss (ft)         *    9.71  * Cum Volume (acre-ft)    *   31.69  *  147.95  *   12.28  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   35.82  *   63.02  *    8.63  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS22B (G39)
REACH: REACH 1            RS: 2.755

INPUT
Description:
Station Elevation Data     num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9565.97 1273.87  9584.5 1273.68 9619.94 1273.36 9622.87 1273.32 9630.08 1273.25
 9661.25 1272.92 9673.91 1272.79 9699.62 1272.53 9727.89 1272.24 9751.88 1272.01
  9759.1 1271.97  9769.7 1271.89 9774.35 1271.87 9835.83 1271.45 9853.12 1271.39
  9889.8 1271.28  9891.5 1271.28 9895.66 1271.28 9929.87 1271.27 9943.78 1271.27
 9986.67 1269.79   10000 1269.4110023.85 1270.5510032.02 1270.9310047.92 1271.79
10057.86 1271.8810097.92 1272.23 10107.2 1272.3110147.93 1272.6410156.54 1272.71
10197.93 1273.0310205.89 1273.0910247.94 1273.3810255.23 1273.4310297.94 1273.73
10304.58 1273.78

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9565.97    .045 9943.78    .03810047.92    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.7810047.92             1500    1579    1500              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
```

E.G. Elev (ft)	1272.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1271.96	Reach Len. (ft)	1500.00	1579.00	1500.00
Crit W.S. (ft)	1271.64	Flow Area (sq ft)	88.66	159.65	1.63
E.G. Slope (ft/ft)	0.005074	Area (sq ft)	88.66	159.65	1.63
Q Total (cfs)	720.00	Flow (cfs)	128.38	590.88	0.74
Top Width (ft)	306.92	Top Width (ft)	183.53	104.14	19.25
Vel Total (ft/s)	2.88	Avg. Vel. (ft/s)	1.45	3.70	0.45
Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)	0.48	1.53	0.08
Conv. Total (cfs)	10108.3	Conv. (cfs)	1802.3	8295.5	10.4
Length Wtd. (ft)	1563.54	Wetted Per. (ft)	183.53	104.23	19.25
Min Ch El (ft)	1269.41	Shear (lb/sq ft)	0.15	0.49	0.03
Alpha	1.40	Stream Power (lb/ft s)	0.22	1.80	0.01
Frctn Loss (ft)	11.49	Cum Volume (acre-ft)	30.42	142.13	12.25
C & E Loss (ft)	0.00	Cum SA (acres)	33.19	55.48	8.35

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 2.456

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9611.59	1261.82	9616.48	1261.84	9630.96	1261.65	9661.83	1261.22	9698.82	1260.7
9705.24	1260.67	9719.8	1260.6	9743.16	1260.49	9753.46	1260.44	9781.09	1260.32
9808.09	1260.19	9819.02	1260.15	9843.82	1260.04	9856.95	1259.98	9862.73	1259.96
9894.88	1259.84	9917.37	1259.77	9950.93	1259.33	9956.38	1259.26	9964.06	1259.2
9975.45	1259.12	10000	1258.92	10007.1	1259.02	10054.28	1259.81	10089.67	1259.75
10096.85	1259.71	10100.15	1259.69	10104.11	1259.69	10108.77	1259.71	10125.45	1259.84
10125.54	1259.85	10125.61	1259.85	10129.11	1259.89	10149.28	1260.21	10160.62	1260.35
10170.49	1260.33	10186.86	1260.33	10226.66	1260.52	10231.05	1260.55	10261.76	1260.71
10275.24	1260.79	10277.17	1260.81	10319.44	1261.05	10327.68	1261.09	10363.63	1261.31
10378.19	1261.39	10407.82	1261.57	10428.69	1261.69	10452.01	1261.81	10479.2	1261.95
10496.21	1262.03								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9611.59	.045	9894.88	.03	10054.28	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9894.88	10054.28	1300	1354	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1260.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1260.43	Reach Len. (ft)	1300.00	1354.00	1300.00
Crit W.S. (ft)	1260.29	Flow Area (sq ft)	42.05	166.06	62.55
E.G. Slope (ft/ft)	0.010629	Area (sq ft)	42.05	166.06	62.55
Q Total (cfs)	870.00	Flow (cfs)	64.69	687.95	117.35
Top Width (ft)	450.69	Top Width (ft)	138.41	159.40	152.88
Vel Total (ft/s)	3.21	Avg. Vel. (ft/s)	1.54	4.14	1.88
Max Chl Dpth (ft)	1.51	Hydr. Depth (ft)	0.30	1.04	0.41
Conv. Total (cfs)	8438.7	Conv. (cfs)	627.5	6673.0	1138.3
Length Wtd. (ft)	1341.78	Wetted Per. (ft)	138.41	159.41	152.88
Min Ch El (ft)	1258.92	Shear (lb/sq ft)	0.20	0.69	0.27
Alpha	1.38	Stream Power (lb/ft s)	0.31	2.86	0.51
Frctn Loss (ft)	11.19	Cum Volume (acre-ft)	28.16	136.22	11.15
C & E Loss (ft)	0.01	Cum SA (acres)	27.64	50.70	5.39

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 2.200

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9373.37	1250.98	9394.28	1250.79	9430.02	1250.47	9431.25	1250.45	9433.57	1250.44
9468.22	1250.12	9486.66	1249.96	9511.25	1249.4	9514.02	1249.38	9517.29	1249.36
9528.07	1249.25	9538.81	1249.12	9556.94	1248.88	9558.64	1248.86	9578.35	1248.9
9578.53	1248.9	9580.2	1248.91	9581.15	1248.91	9621.88	1248.99	9634.31	1249.01
9645.46	1248.99	9648.92	1248.97	9656.59	1249.01	9690.01	1248.94	9713.23	1248.91
9726.98	1248.9	9752.8	1248.88	9763.94	1248.86	9769.87	1248.86	9800.91	1248.84
9826.51	1248.82	9837.87	1248.81	9859.21	1248.79	9874.84	1248.78	9883.15	1248.78
9911.8	1248.75	9939.8	1248.74	9961.58	1248.12	9970.5	1247.85	10000	1246.92
10015.93	1247.36	10025.43	1247.63	10081.6	1249.15	10096.86	1249.23	10132.16	1249.43
10146.87	1249.51	10161.26	1249.59	10196.87	1249.8	10233.27	1249.99	10246.87	1250.06
10283.82	1250.26	10296.87	1250.33	10334.37	1250.54	10346.88	1250.61	10375.61	1250.77

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9373.37	.045	9939.8	.038	10081.6	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9939.8	10081.6	1200	1263	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1249.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1249.27	Reach Len. (ft)	1200.00	1263.00	1200.00
Crit W.S. (ft)	1249.18	Flow Area (sq ft)	158.94	186.02	1.43
E.G. Slope (ft/ft)	0.006831	Area (sq ft)	158.94	186.02	1.43
Q Total (cfs)	950.00	Flow (cfs)	229.13	720.25	0.62
Top Width (ft)	578.65	Top Width (ft)	413.99	141.80	22.86
Vel Total (ft/s)	2.74	Avg. Vel. (ft/s)	1.44	3.87	0.43
Max Chl Dpth (ft)	2.35	Hydr. Depth (ft)	0.38	1.31	0.06
Conv. Total (cfs)	11494.5	Conv. (cfs)	2772.4	8714.6	7.5
Length Wtd. (ft)	1253.90	Wetted Per. (ft)	413.99	141.86	22.86
Min Ch El (ft)	1246.92	Shear (lb/sq ft)	0.16	0.56	0.03
Alpha	1.58	Stream Power (lb/ft s)	0.24	2.17	0.01
Frctn Loss (ft)	10.00	Cum Volume (acre-ft)	25.17	130.75	10.19
C & E Loss (ft)	0.02	Cum SA (acres)	19.40	46.02	2.77

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 1.961

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9654.38	1239.78	9671.8	1239.9	9692.06	1239.64	9736.16	1239.01	9745.67	1238.98
9773.18	1238.9	9802.17	1238.81	9810.2	1238.79	9825.45	1238.76	9847.22	1238.71
9858.67	1238.69	9884.24	1238.67	9915.17	1238.64	9921.26	1238.64	9932.81	1238.64
9958.28	1238.63	9976.82	1238.82	9983.38	1238.85	10000	1238.91	10009.36	1238.83
10042.45	1238.71	10091.55	1238.66	10096.89	1238.58	10104.1	1238.47	10106.89	1238.42
10129.28	1238.85	10172.2	1239.67	10176.51	1239.71	10216.66	1239.97	10226.97	1240.04
10261.13	1240.26	10277.42	1240.36						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9654.38	.045	9671.8	.038	10172.2	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9671.8	10172.2	1250	1309	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1239.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.		0.038	
W.S. Elev (ft)	1239.33	Reach Len. (ft)	1250.00	1309.00	1250.00
Crit W.S. (ft)	1239.17	Flow Area (sq ft)		241.18	
E.G. Slope (ft/ft)	0.010282	Area (sq ft)		241.18	
Q Total (cfs)	640.00	Flow (cfs)		640.00	
Top Width (ft)	440.52	Top Width (ft)		440.52	
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)		2.65	
Max Chl Dpth (ft)	0.91	Hydr. Depth (ft)		0.55	
Conv. Total (cfs)	6311.5	Conv. (cfs)		6311.5	
Length Wtd. (ft)	1300.36	Wetted Per. (ft)		440.53	
Min Ch El (ft)	1238.42	Shear (lb/sq ft)		0.35	
Alpha	1.00	Stream Power (lb/ft s)		0.93	
Frctn Loss (ft)	9.91	Cum Volume (acre-ft)	22.98	124.56	10.17
C & E Loss (ft)	0.00	Cum SA (acres)	13.70	37.58	2.45

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 1.713

INPUT
Description:
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500.13	1229.91	9532.82	1229.85	9536.3	1229.84	9543.86	1229.82	9573.99	1229.71
9587.85	1229.66	9611.69	1229.55	9642.89	1229.42	9649.39	1229.39	9663.51	1229.32
9687.08	1229.21	9697.92	1229.16	9752.35	1228.9	9769.22	1228.91	9775.03	1228.91
9795.23	1228.93	9811.03	1228.95	9817.41	1228.96	9822.58	1228.97	9863.03	1228.76
9875.57	1228.76	9902.82	1228.77	9913.26	1228.77	9918.07	1228.78	9950.96	1228.83
10000	1227.32	10048.44	1228.52	10060.31	1228.87	10075.57	1229.43	10085.78	1229.48
10125.57	1229.68	10136.28	1229.72	10175.57	1229.84	10186.77	1229.87	10225.57	1229.93
10237.25	1229.95	10275.58	1229.98	10287.75	1229.99	10325.58	1230.01	10327.62	1230.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9500.13	.045	9950.96	.03	10085.78	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9950.96	10085.78	1325	1382	1325	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1229.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.045	0.038	
W.S. Elev (ft)	1229.39	Reach Len. (ft)	1325.00	1382.00	1325.00
Crit W.S. (ft)	1229.20	Flow Area (sq ft)	132.68	147.65	
E.G. Slope (ft/ft)	0.006002	Area (sq ft)	132.68	147.65	
Q Total (cfs)	700.00	Flow (cfs)	196.35	503.65	
Top Width (ft)	425.12	Top Width (ft)	301.60	123.52	
Vel Total (ft/s)	2.50	Avg. Vel. (ft/s)	1.48	3.41	
Max Chl Dpth (ft)	2.07	Hydr. Depth (ft)	0.44	1.20	
Conv. Total (cfs)	9035.2	Conv. (cfs)	2534.3	6500.9	
Length Wtd. (ft)	1374.33	Wetted Per. (ft)	301.60	123.58	
Min Ch El (ft)	1227.32	Shear (lb/sq ft)	0.16	0.45	
Alpha	1.44	Stream Power (lb/ft s)	0.24	1.53	
Frctn Loss (ft)	10.80	Cum Volume (acre-ft)	21.07	118.72	10.17
C & E Loss (ft)	0.02	Cum SA (acres)	9.37	29.10	2.45

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

```
RIVER: 3S1WS22B (G39)
REACH: REACH 1            RS: 1.451

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9471.02 1219.72 9503.83 1219.69 9522.55 1219.68 9540.48 1219.66  9571.9 1219.64
 9577.14 1219.63 9580.12 1219.63 9613.79  1219.6 9637.69 1219.58 9650.44 1219.56
 9672.79 1219.54 9687.09 1219.52 9695.26 1219.51 9723.75 1219.42 9752.83 1219.36
  9760.4 1219.34 9773.67  1219.3 9797.05 1219.21  9810.4 1219.17  9833.7 1219.07
 9867.96 1218.94 9870.36 1218.94 9874.55 1218.92 9907.01 1218.78 9925.53  1218.7
 9959.67 1217.09 9967.07 1216.73 9978.91 1216.25   10000 1215.4110019.63 1217.09
10025.61 1217.5910028.82 1217.8210047.28 1218.4110085.32 1218.4310123.73 1218.52
10135.32 1218.5510173.96 1218.7110185.33 1218.75 10224.2 1218.9610235.33 1219.02
10274.44 1219.2510285.33 1219.3110324.67 1219.5410335.33 1219.5910357.74 1220.14
10369.74 1220.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9471.02    .045 9907.01    .03810047.28    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9907.0110047.28             1250    1308    1250            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1218.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.38  * Wt. n-Val.              *          *   0.038  *          *
* W.S. Elev (ft)         * 1218.32  * Reach Len. (ft)         * 1250.00  * 1308.00  * 1250.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  153.40  *          *
* E.G. Slope (ft/ft)     *0.010457  * Area (sq ft)            *          *  153.40  *          *
* Q Total (cfs)          *  760.00  * Flow (cfs)              *          *  760.00  *          *
* Top Width (ft)         *  111.05  * Top Width (ft)          *          *  111.05  *          *
* Vel Total (ft/s)       *    4.95  * Avg. Vel. (ft/s)         *          *    4.95  *          *
* Max Chl Dpth (ft)      *    2.91  * Hydr. Depth (ft)         *          *    1.38  *          *
* Conv. Total (cfs)      *  7432.2  * Conv. (cfs)              *          *  7432.2  *          *
* Length Wtd. (ft)       * 1308.00  * Wetted Per. (ft)         *          *  111.22  *          *
* Min Ch El (ft)         * 1215.41  * Shear (lb/sq ft)         *          *    0.90  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    4.46  *          *
* Frctn Loss (ft)        *   10.04  * Cum Volume (acre-ft)     *   19.05  *  113.94  *   10.17  *
* C & E Loss (ft)        *    0.08  * Cum SA (acres)           *    4.78  *   25.38  *    2.45  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS22B (G39)
REACH: REACH 1            RS: 1.203

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9699.73 1210.11 9707.57  1210.1 9723.42 1210.07 9744.89 1210.02 9755.52    1210
 9782.21  1209.9 9811.31  1209.8 9819.53 1209.76 9836.13 1209.67 9856.84 1209.57
  9867.1 1209.52 9897.46 1209.31 9928.46 1208.75 9929.23 1208.75 9930.11 1208.74
    9931 1208.74 9932.06 1208.74 9933.08 1208.74 9936.43 1208.74 9937.75 1208.71
 9954.22 1208.02 9966.97 1207.41   10000 1205.6910008.09 1206.5210013.09 1206.98
10064.75 1208.3210081.27 1208.2810120.39 1208.2710136.13 1208.04 10137.7 1208.04
10140.23 1208.0810143.79  1208.110147.99 1208.0610154.67 1207.9510167.06 1207.76
10190.49 1207.4110198.47 1207.3310201.86 1207.28 10218.9 1207.0910224.58 1207.03
10230.81 1206.9510237.16 1206.8910242.17 1206.8410252.54 1207.3210265.38  1207.9
10270.86 1208.1410273.98 1208.2810276.51  1208.410278.01 1208.4710279.01 1208.52
10280.13 1208.58 10287.3 1208.8510332.45 1209.1810342.93 1209.2510382.68 1209.55
10398.57 1209.6610432.92 1209.9210438.12 1209.96

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9699.73    .045 9928.46    .038 10287.3    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.46 10287.3             1250    1311    1250            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1208.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)         * 1208.47  * Reach Len. (ft)         * 1250.00  * 1311.00  * 1250.00  *
* Crit W.S. (ft)         * 1207.99  * Flow Area (sq ft)       *          *  294.98  *          *
* E.G. Slope (ft/ft)     *0.005979  * Area (sq ft)            *          *  294.98  *          *
* Q Total (cfs)          *  820.00  * Flow (cfs)              *          *  820.00  *          *
* Top Width (ft)         *  334.40  * Top Width (ft)          *          *  334.40  *          *
* Vel Total (ft/s)       *    2.78  * Avg. Vel. (ft/s)         *          *    2.78  *          *
* Max Chl Dpth (ft)      *    2.78  * Hydr. Depth (ft)         *          *    0.88  *          *
* Conv. Total (cfs)      * 10605.1  * Conv. (cfs)              *          * 10605.1  *          *
* Length Wtd. (ft)       * 1311.00  * Wetted Per. (ft)         *          *  334.60  *          *
* Min Ch El (ft)         * 1205.69  * Shear (lb/sq ft)         *          *    0.33  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    0.91  *          *
* Frctn Loss (ft)        *    9.70  * Cum Volume (acre-ft)     *   19.05  *  107.21  *   10.17  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *    4.78  *   18.69  *    2.45  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS22B (G39)
REACH: REACH 1            RS: 0.955

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9641.11 1200.81 9673.86 1200.73 9676.26 1200.73 9677.87 1200.72 9712.31 1200.64
 9737.98 1200.56 9748.37 1200.53 9763.94 1200.47 9784.42  1200.4 9798.09 1200.34
 9820.47 1200.25 9854.02 1200.11 9856.52  1200.1  9858.2 1200.09 9892.58 1199.94
 9918.31 1199.83 9928.63 1199.79 9953.43 1198.01  9971.2 1197.01   10000 1195.41
10067.95  1198.810075.25 1199.1710078.07 1199.3110079.59 1199.3810083.12 1199.61
10084.65 1199.6110124.26 1199.6910147.19 1199.3410150.65 1199.2310172.26 1198.56
 10176.9 1198.4310218.02 1199.4710239.41  1200.210247.69 1200.25 10280.3 1200.44
10288.83 1200.4810290.99  1200.510329.97  1200.710342.58 1200.7610371.11 1200.86
 10381.8  1200.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9641.11    .045 9928.63    .03810239.41    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.6310239.41             1300    1369    1300            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1198.85  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.38  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)         * 1198.47  * Reach Len. (ft)         * 1300.00  * 1369.00  * 1300.00  *
* Crit W.S. (ft)         * 1198.06  * Flow Area (sq ft)       *          *  178.02  *          *
* E.G. Slope (ft/ft)     *0.009231  * Area (sq ft)            *          *  178.02  *          *
* Q Total (cfs)          *  880.00  * Flow (cfs)              *          *  880.00  *          *
* Top Width (ft)         *  117.78  * Top Width (ft)          *          *  117.78  *          *
* Vel Total (ft/s)       *    4.94  * Avg. Vel. (ft/s)         *          *    4.94  *          *
* Max Chl Dpth (ft)      *    3.06  * Hydr. Depth (ft)         *          *    1.51  *          *
* Conv. Total (cfs)      *  9159.4  * Conv. (cfs)              *          *  9159.4  *          *
* Length Wtd. (ft)       * 1369.00  * Wetted Per. (ft)         *          *  117.95  *          *
* Min Ch El (ft)         * 1195.41  * Shear (lb/sq ft)         *          *    0.87  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *    4.30  *          *
* Frctn Loss (ft)        *    8.72  * Cum Volume (acre-ft)     *   19.05  *  100.09  *   10.17  *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)           *    4.78  *   11.89  *    2.45  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
```

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 0.696

INPUT
Description:
Station Elevation Data num= 43

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9619.48	1190.59	9635.38	1190.57	9653.61	1190.54	9677.22	1190.51	9689.26	1190.49
9698.55	1190.48	9724.9	1190.43	9759.03	1190.37	9760.55	1190.37	9761.72	1190.37
9796.2	1190.31	9824.89	1190.26	9831.84	1190.25	9840.84	1190.23	9867.49	1190.19
9888.06	1190.15	9903.14	1190.12	9922.66	1190.09	9938.78	1190.06	9951.23	1190.03
9990.22	1187.34	10000	1186.41	10018.16	1186.51	10054.93	1189.56	10058.39	1189.84
10059.49	1189.94	10061.57	1190.13	10063.87	1190.05	10065.4	1190.02	10069.33	1189.92
10104.44	1189	10127.95	1188.41	10128.94	1188.38	10140.65	1188.79	10147.15	1189.19
10152.46	1189.55	10200.08	1190.68	10211.97	1190.74	10246.8	1190.92	10262.1	1191
10293.52	1191.17	10312.23	1191.28	10337.44	1191.42				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9619.48	.045	9951.23	.038	10200.08	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9951.23	10200.08	1600	1679	1600	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1190.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.		0.038	
W.S. Elev (ft)	1189.90	Reach Len. (ft)	1600.00	1679.00	1600.00
Crit W.S. (ft)	1189.11	Flow Area (sq ft)		281.24	
E.G. Slope (ft/ft)	0.004749	Area (sq ft)		281.24	
Q Total (cfs)	940.00	Flow (cfs)		940.00	
Top Width (ft)	203.24	Top Width (ft)		203.24	
Vel Total (ft/s)	3.34	Avg. Vel. (ft/s)		3.34	
Max Chl Dpth (ft)	3.49	Hydr. Depth (ft)		1.38	
Conv. Total (cfs)	13641.1	Conv. (cfs)		13641.1	
Length Wtd. (ft)	1671.77	Wetted Per. (ft)		203.57	
Min Ch El (ft)	1186.41	Shear (lb/sq ft)		0.41	
Alpha	1.00	Stream Power (lb/ft s)		1.37	
Frctn Loss (ft)	12.56	Cum Volume (acre-ft)	19.05	92.87	10.17
C & E Loss (ft)	0.01	Cum SA (acres)	4.78	6.84	2.45

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22B (G39)
REACH: REACH 1 RS: 0.378

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9482.12	1177.53	9502.27	1177.5	9517.02	1177.48	9531.9	1177.46	9552.37	1177.43
9572.66	1177.39	9587.73	1177.36	9602.93	1177.33	9623.09	1177.29	9643.06	1177.24
9658.44	1177.21	9673.96	1177.18	9693.8	1177.14	9713.45	1177.09	9729.15	1177.06
9745	1177.02	9764.51	1176.98	9783.84	1176.94	9799.86	1176.91	9816.03	1176.87
9835.22	1176.83	9854.24	1176.79	9870.58	1176.76	9887.06	1176.71	9905.93	1176.67
9924.63	1176.61	9941.29	1176.57	9960.15	1176.05	9966.55	1175.92	9977.55	1175.77
10000	1175.41	10014.01	1175.63	10022.79	1175.74	10028.81	1175.85	10033.76	1176.06
10076.48	1176.65	10097.14	1176.72	10133.58	1176.88	10147.49	1176.93	10190.68	1177.12
10197.84	1177.15	10247.78	1177.35	10248.19	1177.36	10251.21	1177.37	10298.53	1177.57
10304.88	1177.6	10348.88	1177.77	10361.98	1177.83	10399.23	1177.98	10419.08	1178.06

10449.58 1178.18

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9482.12	.045	9924.63	.03810076.48		.045

Bank Sta: Left Right Coeff Contr. Expan.
9924.6310076.48 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1177.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1177.20	Reach Len. (ft)	3000.00	3000.00	3000.00
Crit W.S. (ft)	1177.20	Flow Area (sq ft)	73.59	173.17	37.52
E.G. Slope (ft/ft)	0.012935	Area (sq ft)	73.59	173.17	37.52
Q Total (cfs)	1020.00	Flow (cfs)	119.00	840.58	60.42
Top Width (ft)	545.92	Top Width (ft)	260.49	151.85	133.59
Vel Total (ft/s)	3.59	Avg. Vel. (ft/s)	1.62	4.85	1.61
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)	0.28	1.14	0.28
Conv. Total (cfs)	8968.3	Conv. (cfs)	1046.3	7390.7	531.3
Length Wtd. (ft)	3000.00	Wetted Per. (ft)	260.49	151.88	133.59
Min Ch El (ft)	1175.41	Shear (lb/sq ft)	0.23	0.92	0.23
Alpha	1.54	Stream Power (lb/ft s)	0.37	4.47	0.37
Frctn Loss (ft)	5.92	Cum Volume (acre-ft)	17.70	84.12	9.49
C & E Loss (ft)	0.00	Cum SA (acres)			

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS22A (D42)
REACH: REACH 1 RS: 0.892

INPUT
Description: Limit of Sudy.
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9457.13	1187.12	9479.43	1187.07	9517.89	1186.96	9530.72	1186.93	9573.93	1186.77
9582.01	1186.74	9584.41	1186.73	9633.31	1186.55	9650.94	1186.48	9684.6	1186.37
9717.46	1186.27	9735.9	1186.21	9783.99	1186.02	9823.32	1185.85	9838.48	1185.81
9851.5	1185.85	9889.78	1185.67	9934.38	1185.67	9953.97	1185.36	9960.33	1185.26
9981.72	1184.9	10000	1184.61	10003.68	1184.55	10015.54	1184.89	10033.14	1185.37
10079.29	1186.33	10098.47	1186.49	10107.43	1186.55	10132.1	1186.59	10146.45	1186.62
10151.66	1186.61	10185.48	1186.62	10204.86	1186.54	10224.5	1186.54	10258.05	1186.54
10263.52	1186.55	10278.59	1186.58	10302.55	1186.62	10311.24	1186.64	10341.57	1186.69
10364.44	1186.74	10380.59	1186.76	10417.63	1186.84	10419.62	1186.84	10425.08	1186.84
10458.64	1186.87	10470.83	1186.89	10497.66	1186.88	10524.02	1186.89	10536.69	1186.89
10571.57	1186.95	10575.71	1186.96	10577.22	1186.96	10614.74	1187.08	10630.41	1187.13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9457.13	.045	9934.38	.03810079.29		.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9934.3810079.29 1560 1661 1530 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1187.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1187.02	Reach Len. (ft)	1560.00	1661.00	1530.00
Crit W.S. (ft)	1186.58	Flow Area (sq ft)	326.71	247.40	160.31
E.G. Slope (ft/ft)	0.003246	Area (sq ft)	326.71	247.40	160.31
Q Total (cfs)	1430.00	Flow (cfs)	504.79	787.23	137.98
Top Width (ft)	1101.94	Top Width (ft)	438.99	144.91	518.04

* Vel Total (ft/s)	*	1.95	* Avg. Vel. (ft/s)	*	1.55	*	3.18	*	0.86	*
* Max Chl Dpth (ft)	*	2.47	* Hydr. Depth (ft)	*	0.74	*	1.71	*	0.31	*
* Conv. Total (cfs)	*	25098.3	* Conv. (cfs)	*	8859.6	*	13816.9	*	2421.7	*
* Length Wtd. (ft)	*	1635.80	* Wetted Per. (ft)	*	438.99	*	144.94	*	518.05	*
* Min Ch El (ft)	*	1184.55	* Shear (lb/sq ft)	*	0.15	*	0.35	*	0.06	*
* Alpha	*	1.71	* Stream Power (lb/ft s)	*	0.23	*	1.10	*	0.05	*
* Frctn Loss (ft)	*	10.11	* Cum Volume (acre-ft)	*	22.30	*	56.46	*	16.57	*
* C & E Loss (ft)	*	0.08	* Cum SA (acres)	*	11.40	*	8.33	*	12.13	*

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS22A (D42)
REACH: REACH 1 RS: 0.577

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9409.11	1180.01	9426.82	1179.87	9455.92	1179.62	9482.56	1179.41	9506.16	1179.2
9538.3	1178.94	9556.4	1178.79	9594.04	1178.51	9606.64	1178.41	9649.78	1178.14
9656.89	1178.09	9705.52	1177.84	9707.13	1177.83	9721.83	1177.76	9757.37	1177.59
9761.26	1177.58	9807.61	1177.38	9817	1177.34	9857.86	1177.2	9872.74	1177.16
9908.1	1177.06	9928.48	1177.02	9958.34	1176.98	9998.81	1172.78	10000	1172.66
10001.07	1172.55	10003.91	1172.68	10010.03	1172.96	10017.32	1173.29	10032.99	1174.33
10046.95	1175.17	10095.37	1177.01	10109.6	1177.04	10120.33	1177.08	10160.08	1177.19
10164.62	1177.21	10197.06	1177.36	10208.91	1177.42	10210.57	1177.43	10253.2	1177.71
10261.06	1177.75	10297.49	1178.05	10311.54	1178.14	10341.79	1178.41	10362.03	1178.55
10386.08	1178.73	10412.52	1178.94	10430.37	1179.06	10463.01	1179.31	10474.66	1179.37
10513.49	1179.62	10518.95	1179.64	10557.95	1179.82	10563.24	1179.85	10563.98	1179.85
10607.53	1179.99	10614.47	1180.02						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9409.11	.045	9958.34	.038	10095.37	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9958.34	10095.37	1410	1411	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1176.94	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.86	* Wt. n-Val.	*		*	0.038	*		*
* W.S. Elev (ft)	*	1176.07	* Reach Len. (ft)	*	1410.00	*	1411.00	*	1320.00	*
* Crit W.S. (ft)	*	1176.07	* Flow Area (sq ft)	*		*	175.81	*		*
* E.G. Slope (ft/ft)	*	0.018008	* Area (sq ft)	*		*	175.81	*		*
* Q Total (cfs)	*	1310.00	* Flow (cfs)	*		*	1310.00	*		*
* Top Width (ft)	*	103.63	* Top Width (ft)	*		*	103.63	*		*
* Vel Total (ft/s)	*	7.45	* Avg. Vel. (ft/s)	*		*	7.45	*		*
* Max Chl Dpth (ft)	*	3.52	* Hydr. Depth (ft)	*		*	1.70	*		*
* Conv. Total (cfs)	*	9762.0	* Conv. (cfs)	*		*	9762.0	*		*
* Length Wtd. (ft)	*	1407.46	* Wetted Per. (ft)	*		*	103.90	*		*
* Min Ch El (ft)	*	1172.55	* Shear (lb/sq ft)	*		*	1.90	*		*
* Alpha	*	1.00	* Stream Power (lb/ft s)	*		*	14.17	*		*
* Frctn Loss (ft)	*	2.38	* Cum Volume (acre-ft)	*	16.45	*	48.39	*	13.75	*
* C & E Loss (ft)	*	0.24	* Cum SA (acres)	*	3.54	*	3.60	*	3.03	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical

depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS22A (D42)
REACH: REACH 1 RS: 0.310

INPUT
Description:
Station Elevation Data num= 58

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9408.24	1174.99	9412.04	1174.98	9448.4	1174.83	9464.03	1174.77	9488.86	1174.6
9516.02	1174.43	9529.32	1174.31	9568.01	1173.99	9569.78	1173.97	9575.99	1173.91
9610.24	1173.59	9620	1173.49	9650.71	1173.2	9671.99	1172.98	9691.17	1172.8
9723.98	1172.48	9731.63	1172.41	9758.46	1172.17	9772.09	1172.03	9775.98	1172
9812.55	1171.7	9827.97	1171.58	9853.02	1171.44	9879.96	1171.3	9893.48	1171.26
9931.94	1171.15	9933.94	1171.14	9961.73	1169.2	10000	1166.58	10003.56	1166.34
10014.4	1167.58	10031.9	1169.64	10050.32	1171.28	10070.04	1171.36	10087.13	1171.43
10096.55	1171.47	10123.93	1171.62	10153.65	1171.8	10160.73	1171.85	10173.59	1171.95
10197.54	1172.13	10210.75	1172.23	10234.34	1172.44	10267.84	1172.75	10271.15	1172.78
10277.14	1172.84	10307.95	1173.15	10324.94	1173.33	10344.75	1173.53	10380.69	1173.9
10381.56	1173.91	10382.04	1173.91	10418.36	1174.25	10439.13	1174.45	10455.17	1174.57
10484.24	1174.81	10491.97	1174.87	10496.23	1174.9				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9408.24	.045	9931.94	.03	10050.32	.045

Bank Sta: Left	Right	Coeff Contr.	Expan.
9931.94	10050.32	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1172.65	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1172.59	Reach Len. (ft)	660.00	660.00	660.00
Crit W.S. (ft)		Flow Area (sq ft)	190.66	441.40	150.49
E.G. Slope (ft/ft)	0.000548	Area (sq ft)	190.66	441.40	150.49
Q Total (cfs)	1200.00	Flow (cfs)	134.41	969.32	96.27
Top Width (ft)	537.23	Top Width (ft)	218.93	118.38	199.91
Vel Total (ft/s)	1.53	Avg. Vel. (ft/s)	0.70	2.20	0.64
Max Chl Dpth (ft)	6.25	Hydr. Depth (ft)	0.87	3.73	0.75
Conv. Total (cfs)	51255.7	Conv. (cfs)	5740.9	41402.8	4112.1
Length Wtd. (ft)	660.00	Wetted Per. (ft)	218.94	118.81	199.92
Min Ch El (ft)	1166.34	Shear (lb/sq ft)	0.03	0.13	0.03
Alpha	1.69	Stream Power (lb/ft s)	0.02	0.28	0.02
Frctn Loss (ft)		Cum Volume (acre-ft)	13.36	38.40	11.47
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 4S1ES20 (E44)
REACH: REACH 1 RS: 1.054

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9476.37	1329.93	9479.81	1329.9	9521.56	1329.02	9541.15	1328.85	9570.78	1328.68
9591.87	1328.49	9630.39	1328.03	9638.3	1327.95	9676.43	1327.05	9705.23	1326.81
9733.04	1326.87	9754.12	1326.72	9789.07	1326.99	9798.79	1326.94	9839.79	1327.05
9867.63	1326.95	9894.45	1327.31	9912.01	1327.29	9946.23	1327.61	9955.64	1327.62
10000	1325.5	10008.2	1325.57	10043.18	1327.54	10081.05	1327.64	10108.81	1327.84
10152.56	1328.15	10158.92	1328.27	10161.52	1328.19	10208.1	1327.44	10239.41	1326.71
10259.57	1327.16	10275	1327.94	10289.44	1326.94	10313.34	1327.43	10334.24	1327.27
10370.1	1325.95	10389.83	1326.35	10424.53	1326.13	10448.74	1326.72	10478.34	1326.57
10508.94	1326.44	10540.31	1325.14	10555.23	1325.49	10595.61	1325.39	10613.11	1325.92
10653.53	1326.13	10673.84	1326.72	10687.93	1327.8				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
*********************************************
 9476.37    .041 9946.23    .04110158.92    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.2310158.92             1350    1420    1350            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1327.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1327.61  * Reach Len. (ft)         * 1350.00  * 1420.00  * 1350.00  *
* Crit W.S. (ft)          * 1327.25  * Flow Area (sq ft)       *  163.32  *  101.37  *  561.60  *
* E.G. Slope (ft/ft)      *0.007213  * Area (sq ft)            *  163.32  *  101.37  *  561.60  *
* Q Total (cfs)           * 2630.00  * Flow (cfs)              *  340.12  *  288.97  * 2000.92  *
* Top Width (ft)          *  883.65  * Top Width (ft)          *  293.45  *  113.63  *  476.57  *
* Vel Total (ft/s)        *    3.18  * Avg. Vel. (ft/s)        *    2.08  *    2.85  *    3.56  *
* Max Chl Dpth (ft)       *    2.47  * Hydr. Depth (ft)        *    0.56  *    0.89  *    1.18  *
* Conv. Total (cfs)       * 30966.2  * Conv. (cfs)             *  4004.6  *  3402.4  * 23559.2  *
* Length Wtd. (ft)        * 1356.25  * Wetted Per. (ft)        *  293.47  *  113.74  *  476.74  *
* Min Ch El (ft)          * 1325.50  * Shear (lb/sq ft)        *    0.25  *    0.40  *    0.53  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)  *    0.52  *    1.14  *    1.89  *
* Frctn Loss (ft)         *    7.88  * Cum Volume (acre-ft)    *   25.73  *   43.94  *   87.84  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   24.56  *   31.45  *   67.65  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES20 (E44)
REACH: REACH 1            RS: 0.785

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9487.46 1322.61 9492.22 1322.56 9506.37 1322.28    9543 1321.51 9568.07 1320.94
 9593.77 1320.36 9629.78 1319.77 9644.55 1319.53 9691.48 1319.13 9695.33  1319.1
 9713.23 1319.02 9746.11 1318.87 9753.18 1318.84 9796.89 1318.69 9814.89 1318.63
 9847.66 1318.52 9876.59 1318.42 9903.75 1318.97  9905.9 1319.04 9908.43 1319.12
  9911.5 1319.25 9915.58 1319.44 9921.43 1319.66 9928.31 1319.81 9938.13 1319.97
 9948.68 1320.29 9949.57 1320.23 9951.48 1320.16   10000 1318.0110060.72 1320.17
 10064.8    1320 10084.2 1319.1610106.23 1318.0610117.29 1318.07 10148.1 1318.12
10156.38 1318.1410159.35 1318.1410195.48 1318.2110212.47 1318.2310234.58 1318.27
10265.59 1318.3210273.67 1318.3310296.21 1318.3610312.77 1318.3910318.71  1318.4
10351.86 1318.4410371.83 1318.4610390.96 1318.4910424.95 1318.5310430.06 1318.54
10444.31 1318.5610469.15 1318.5910478.06  1318.610508.25 1318.6510531.18 1318.68
10552.38 1319.4810557.39 1319.66 10564.7 1319.9310575.63  1320.310599.67 1320.81
10611.19 1321.3110612.45 1321.2610614.88 1321.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9487.46    .041 9948.68    .04110060.72    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.6810060.72             1400    1475    1400            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1319.89  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1319.77  * Reach Len. (ft)         * 1400.00  * 1475.00  * 1400.00  *
* Crit W.S. (ft)          * 1319.27  * Flow Area (sq ft)       *  249.72  *   78.52  *  635.56  *
* E.G. Slope (ft/ft)      *0.004775  * Area (sq ft)            *  249.72  *   78.52  *  635.56  *
* Q Total (cfs)           * 2630.00  * Flow (cfs)              *  557.40  *  180.51  * 1892.09  *
* Top Width (ft)          *  876.22  * Top Width (ft)          *  296.73  *   89.21  *  490.27  *
* Vel Total (ft/s)        *    2.73  * Avg. Vel. (ft/s)        *    2.23  *    2.30  *    2.98  *
* Max Chl Dpth (ft)       *    1.76  * Hydr. Depth (ft)        *    0.84  *    0.88  *    1.30  *
* Conv. Total (cfs)       * 38061.9  * Conv. (cfs)             *  8066.8  *  2612.4  * 27382.7  *
* Length Wtd. (ft)        * 1418.47  * Wetted Per. (ft)        *  296.76  *   89.28  *  490.33  *
* Min Ch El (ft)          * 1318.01  * Shear (lb/sq ft)        *    0.25  *    0.26  *    0.39  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.56  *    0.60  *    1.15  *
* Frctn Loss (ft)         *    7.97  * Cum Volume (acre-ft)    *   19.33  *   41.00  *   69.29  *
```

```
* C & E Loss (ft)        *    0.01  * Cum SA (acres)        *   15.42  *   28.15  *   52.67  *
*****************************************************************************************
```

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES20 (E44)
REACH: REACH 1 RS: 0.506

INPUT
Description:
Station Elevation Data num= 115

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9314.71	1312.55	9335.22	1312.49	9365.57	1312.38	9386.41	1312.3	9431.18	1312.11
9437.61	1312.08	9460.43	1311.98	9488.8	1311.86	9496.79	1311.83	9539.99	1311.65
9567.63	1311.53	9591.18	1311.43	9628	1311.28	9642.38	1311.23	9693.43	1311.06
9693.57	1311.06	9693.65	1311.06	9693.85	1311.06	9744.14	1312	9754.12	1311.79
9795.95	1310.81	9824.83	1310.74	9847.15	1310.7	9890.43	1310.61	9898.34	1310.59
9908.55	1310.69	9912.41	1310.73	9967.29	1311.04	9974.46	1311.15	9983.97	1311.3
10000	1311.5	310031.34	1310.97	10049.38	1310.64	10057.02	1310.67	10086.51	1310.78
10113.24	1310.87	10123.64	1310.92	10143.86	1311.01	10160.77	1311.07	10169.47	1311.1
10197.9	1311.23	10225.69	1311.33	10235.03	1311.38	10253.2	1311.44	10272.16	1311.51
10281.91	1311.52	10309.29	1311.61	10338.14	1311.65	10346.42	1311.66	10362.54	1311.67
10383.55	1311.7	10394.36	1311.7	10441.03	1310.73	10447.25	1310.6	10455.37	1310.42
10466.31	1310.18	10480.47	1309.89	10486.98	1309.75	10494.85	1309.94	10504.07	1310.16
10563.03	1311.48	10569.2	1311.46	10581.21	1311.44	10606.33	1311.41	10619.25	1311.4
10643.46	1311.37	10675.48	1311.34	10680.59	1311.34	10690.55	1311.33	10717.72	1311.3
10731.7	1311.29	10754.86	1311.27	10787.92	1311.25	10791.99	1311.24	10799.89	1311.24
10829.12	1311.22	10844.15	1311.21	10866.25	1311.2	10900.37	1311.18	10903.38	1311.18
10909.22	1311.18	10940.51	1311.18	10956.59	1311.18	10977.64	1311.18	11012.82	1311.17
11014.77	1311.17	11018.56	1311.17	11051.9	1311.18	11069.04	1311.19	11089.03	1311.19
11125.26	1311.2	11126.16	1311.2	11127.9	1311.2	11163.29	1311.23	11181.49	1311.26
11200.42	1311.28	11237.23	1311.34	11237.55	1311.34	11237.71	1311.34	11274.68	1311.43
11293.93	1311.47	11311.81	1311.52	11346.57	1311.62	11348.94	1311.63	11350.16	1311.64
11386.07	1311.77	11406.38	1311.85	11423.2	1311.92	11455.91	1312.05	11460.33	1312.07
11462.6	1312.08	11497.46	1312.26	11518.83	1312.36	11534.59	1312.44	11559.21	1312.56

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9314.71	.041	9744.14	.041	10338.14	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9744.14	10338.14	1150	1214	1150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1311.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1311.84	Reach Len. (ft)	1150.00	1214.00	1150.00
Crit W.S. (ft)	1311.58	Flow Area (sq ft)	97.18	448.97	641.41
E.G. Slope (ft/ft)	0.006702	Area (sq ft)	97.18	448.97	641.41
Q Total (cfs)	2630.00	Flow (cfs)	157.67	1115.02	1357.31
Top Width (ft)	1891.27	Top Width (ft)	240.28	586.22	1064.77
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)	1.62	2.48	2.12
Max Chl Dpth (ft)	2.09	Hydr. Depth (ft)	0.40	0.77	0.60
Conv. Total (cfs)	32127.0	Conv. (cfs)	1926.0	13620.6	16580.4
Length Wtd. (ft)	1176.71	Wetted Per. (ft)	240.29	586.25	1064.81
Min Ch El (ft)	1310.59	Shear (lb/sq ft)	0.17	0.32	0.25
Alpha	1.04	Stream Power (lb/ft s)	0.27	0.80	0.53
Frctn Loss (ft)	5.81	Cum Volume (acre-ft)	13.76	32.07	48.77
C & E Loss (ft)	0.01	Cum SA (acres)	6.79	16.71	27.68

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES20 (E44)

REACH: REACH 1 RS: 0.276

INPUT
Description:
Station Elevation Data num= 129

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9321.72	1307.52	9345.08	1306.55	9356.74	1306.05	9361.56	1305.84	9363.76	1305.74
9364.98	1305.68	9365.63	1305.65	9366.1	1305.62	9366.79	1305.6	9367.08	1305.6
9367.7	1305.59	9368.09	1305.6	9368.48	1305.6	9414.85	1305.55	9415.64	1305.55
9416.41	1305.54	9417.09	1305.53	9417.91	1305.51	9464.06	1305.45	9465.25	1305.42
9466.21	1305.4	9466.86	1305.39	9472.73	1305.25	9517.6	1305.17	9523.86	1305.17
9567.62	1305.12	9610.63	1305.3	9630.85	1305.42	9640.89	1305.3	9652.98	1305.12
9658.05	1305.07	9661.19	1305.06	9663.23	1305.07	9677.25	1305.03	9717.65	1304.99
9728.39	1304.98	9767.66	1304.96	9779.52	1304.94	9817.68	1304.93	9830.65	1304.92
9867.69	1304.92	9881.78	1304.91	9917.7	1304.92	9932.91	1304.9	9977.48	1305.17
9982.14	1305.25	9988.03	1305.34	10000	1305.56	10062.82	1305.13	10075.86	1305.2
10100.04	1305.29	10131.87	1305.41	10137.26	1305.43	10147.94	1305.46	10174.48	1305.55
10187.89	1305.59	10211.7	1305.66	10243.9	1305.75	10257.2	1305.03	10274.65	1304.12
10304.18	1302.54	10313.43	1302.12	10337.74	1304.31	10355.92	1305.96	10360.58	1305.96
10369.8	1305.96	10397.8	1305.93	10411.94	1305.92	10435.02	1305.86	10467.95	1305.79
10472.24	1305.78	10480.73	1305.75	10509.46	1305.63	10523.96	1305.58	10546.68	1305.5
10579.97	1305.41	10583.89	1305.39	10591.66	1305.38	10621.11	1305.31	10635.98	1305.27
10658.33	1305.25	10692	1305.22	10695.55	1305.22	10702.6	1305.22	10732.77	1305.22
10748.01	1305.22	10769.99	1305.24	10804.02	1305.26	10807.21	1305.26	10813.53	1305.27
10844.43	1305.28	10860.03	1305.28	10881.65	1305.31	10916.05	1305.34	10918.87	1305.35
10924.46	1305.35	10956.09	1305.39	10972.06	1305.41	10993.31	1305.44	11028.07	1305.5
11030.53	1305.51	11035.39	1305.51	11067.75	1305.58	11084.08	1305.61	11104.96	1305.66
11140.09	1305.75	11142.18	1305.75	11146.32	1305.76	11179.4	1305.84	11196.11	1305.88
11216.62	1305.93	11252.12	1306.01	11253.84	1306.01	11257.25	1306.02	11291.06	1306.07
11308.13	1306.11	11328.28	1306.13	11364.14	1306.18	11365.5	1306.18	11368.19	1306.19
11402.72	1306.23	11420.16	1306.25	11439.94	1306.28	11476.17	1306.32	11477.16	1306.32
11479.12	1306.33	11514.38	1306.38	11532.18	1306.41	11546.37	1306.43		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9321.72	.041	9630.85	.041	10243.9	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9630.85	10243.9	1400	1458	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1306.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1306.05	Reach Len. (ft)	1700.00	1700.00	1700.00
Crit W.S. (ft)	1305.64	Flow Area (sq ft)	191.29	532.15	703.12
E.G. Slope (ft/ft)	0.003789	Area (sq ft)	191.29	532.15	703.12
Q Total (cfs)	2630.00	Flow (cfs)	335.76	1080.21	1214.03
Top Width (ft)	1919.39	Top Width (ft)	274.06	613.05	1032.28
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)	1.76	2.03	1.73
Max Chl Dpth (ft)	3.93	Hydr. Depth (ft)	0.70	0.87	0.68
Conv. Total (cfs)	42727.6	Conv. (cfs)	5454.8	17549.4	19723.4
Length Wtd. (ft)	1700.00	Wetted Per. (ft)	274.08	613.06	1032.55
Min Ch El (ft)	1304.90	Shear (lb/sq ft)	0.17	0.21	0.16
Alpha	1.02	Stream Power (lb/ft s)	0.29	0.42	0.28
Frctn Loss (ft)	8.24	Cum Volume (acre-ft)	9.95	18.40	31.02
C & E Loss (ft)	0.04	Cum SA (acres)			

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 1 RS: 3.282

INPUT
Description:
Station Elevation Data num= 35

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9898.6	1343.11	9898.64	1343.11	9899.6	1343.12	9938.18	1342.99	9949.97	1341.3
9969.76	1339.41	9974.03	1338.85	9980.16	1338.05	9989.78	1336.84	9996.69	1336.02
10000	1336.08	10010.24	1336.29	10025.59	1336.58	10034.15	1336.74	10039.43	1336.83

```
10056.31 1337.3110064.67 1337.1810083.97  1337.110112.02  1337.210119.11 1337.18
   10130 1337.7210130.29 1337.7110133.03 1337.7910133.25 1337.7810133.48 1337.77
10136.32 1337.7910137.14 1337.76 10138.4 1337.7210139.85 1337.6510140.87 1337.71
   10144 1337.9710170.28 1339.6910172.55 1339.7210174.95 1339.7810179.75 1339.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
  9898.6    .041 9980.16    .041   10130    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.16   10130             1060    1106     800            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1339.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.29  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1338.94  * Reach Len. (ft)         * 1060.00  * 1106.00  *  800.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    3.04  *  298.36  *   23.67  *
* E.G. Slope (ft/ft)      *0.005932  * Area (sq ft)            *    3.04  *  298.36  *   23.67  *
* Q Total (cfs)           * 1380.00  * Flow (cfs)              *    4.93  * 1317.21  *   57.86  *
* Top Width (ft)          *  185.51  * Top Width (ft)          *    6.83  *  149.84  *   28.84  *
* Vel Total (ft/s)        *    4.25  * Avg. Vel. (ft/s)        *    1.62  *    4.41  *    2.44  *
* Max Chl Dpth (ft)       *    2.92  * Hydr. Depth (ft)        *    0.45  *    1.99  *    0.82  *
* Conv. Total (cfs)       * 17918.1  * Conv. (cfs)             *    64.0  * 17102.8  *   751.3  *
* Length Wtd. (ft)        *  997.89  * Wetted Per. (ft)        *    6.88  *  149.99  *   28.89  *
* Min Ch El (ft)          * 1336.02  * Shear (lb/sq ft)        *    0.16  *    0.74  *    0.30  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)   *    0.27  *    3.25  *    0.74  *
* Frctn Loss (ft)         *    5.39  * Cum Volume (acre-ft)     *   38.89  *   68.21  *   49.55  *
* C & E Loss (ft)         *    0.06  * Cum SA (acres)           *   48.12  *   37.09  *   48.79  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES9 (E49)
REACH: REACH 1            RS: 3.073

INPUT
Description:
Station Elevation Data    num=      60
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9524.23 1333.86 9533.11 1333.85 9555.17 1333.81 9575.65 1333.77 9606.14 1333.72
  9618.2  1333.7 9657.12 1333.63 9660.74 1333.62 9679.04 1333.58 9703.28 1333.54
 9708.09 1333.53 9745.83 1333.46 9759.06 1333.44 9788.37 1333.38 9810.03 1333.34
 9830.91  1333.3    9861 1333.24 9873.46 1333.21 9911.97 1333.12    9916 1333.11
 9993.21 1332.06 9994.69 1332.04  9998.2 1332.07   10000 1332.0910009.67 1332.17
10041.25 1332.4110071.65 1332.8710093.14 1332.8610107.03 1332.8610120.02 1332.84
 10142.4 1332.8310166.31 1332.8210177.78 1332.8110188.51  1332.810213.15 1332.78
10239.48 1332.7610248.53 1332.7610256.99 1332.75 10283.9 1332.7410312.65 1332.73
10319.28 1332.7310325.48 1332.7310354.65 1332.7410385.81 1332.7510390.03 1332.75
10393.97 1332.75 10425.4 1332.7710458.98 1332.8110460.77 1332.8110462.45 1332.82
10496.15 1332.8110530.94 1333.0810531.52 1333.0810532.15 1333.09 10566.9 1333.24
10599.42 1333.5810602.27  1333.610605.32 1333.6510637.65  1333.910677.79 1334.69

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9524.23    .041 9911.97    .04110071.65    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9911.9710071.65             1250    1293    1230            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1333.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1333.70  * Reach Len. (ft)         * 1250.00  * 1293.00  * 1230.00  *
* Crit W.S. (ft)          * 1333.35  * Flow Area (sq ft)       *   80.66  *  190.80  *  441.99  *
* E.G. Slope (ft/ft)      *0.005000  * Area (sq ft)            *   80.66  *  190.80  *  441.99  *
* Q Total (cfs)           * 1630.00  * Flow (cfs)              *   87.80  *  550.55  *  991.65  *
* Top Width (ft)          *  990.56  * Top Width (ft)          *  291.32  *  159.68  *  539.56  *
* Vel Total (ft/s)        *    2.28  * Avg. Vel. (ft/s)        *    1.09  *    2.89  *    2.24  *
* Max Chl Dpth (ft)       *    1.66  * Hydr. Depth (ft)        *    0.28  *    1.19  *    0.82  *
```

* Conv. Total (cfs)	* 23052.0	* Conv. (cfs)	* 1241.7	* 7786.1	* 14024.2	*
* Length Wtd. (ft)	* 1264.23	* Wetted Per. (ft)	* 291.32	* 159.69	* 539.56	*
* Min Ch El (ft)	* 1332.04	* Shear (lb/sq ft)	* 0.09	* 0.37	* 0.26	*
* Alpha	* 1.14	* Stream Power (lb/ft s)	* 0.09	* 1.08	* 0.57	*
* Frctn Loss (ft)	* 5.83	* Cum Volume (acre-ft)	* 37.87	* 62.00	* 45.28	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 44.49	* 33.16	* 43.57	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 1 RS: 2.828

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9307.67	1328.7	9334.25	1328.61	9353.63	1328.55	9384.81	1328.44	9413.14	1328.34
9435.38	1328.27	9472.64	1328.15	9485.94	1328.1	9532.15	1327.96	9536.5	1327.94
9561.12	1327.88	9587.06	1327.8	9591.65	1327.79	9637.62	1327.65	9651.15	1327.61
9688.18	1327.49	9710.66	1327.42	9738.75	1327.32	9770.16	1327.21	9789.31	1327.14
9803.45	1327.08	9839.87	1326.95	9889.17	1326.77	9890.43	1326.76	9891.66	1326.74
9892.44	1326.73	9893.62	1326.7	9958.03	1325.74	9966.33	1325.43	9978.82	1325.11
9989.28	1324.99	9991.23	1325	9993.59	1325.02	10000	1325.05	10012.09	1325.38
10070.08	1326.62	10082.43	1326.64	10113.83	1326.73	10120.99	1326.75	10123.81	1326.75
10159.56	1326.84	10177.53	1326.88	10198.12	1326.94	10231.26	1327.03	10236.68	1327.04
10250.48	1327.09	10275.25	1327.16	10284.98	1327.19	10313.81	1327.29	10338.71	1327.38
10352.38	1327.44	10387.13	1327.57	10390.94	1327.59	10392.44	1327.59	10429.5	1327.73
10446.16	1327.78	10468.07	1327.86	10499.89	1327.96	10506.63	1327.99	10523.78	1328.04
10545.19	1328.11	10553.61	1328.13	10583.76	1328.22	10607.34	1328.29	10622.32	1328.34
10660.44	1328.46	10660.89	1328.46	10661.06	1328.46	10699.45	1328.58	10714.79	1328.63

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9307.67	.041	9889.17	.041	10070.08	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9889.17	10070.08	1210	1377	1280	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1327.94	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.16	* Wt. n-Val.	* 0.041	* 0.041	* 0.041	*
* W.S. Elev (ft)	* 1327.79	* Reach Len. (ft)	* 1210.00	* 1377.00	* 1280.00	*
* Crit W.S. (ft)	* 1327.41	* Flow Area (sq ft)	* 144.48	* 348.17	* 240.54	*
* E.G. Slope (ft/ft)	*0.004319	* Area (sq ft)	* 144.48	* 348.17	* 240.54	*
* Q Total (cfs)	* 1920.00	* Flow (cfs)	* 213.18	* 1282.85	* 423.98	*
* Top Width (ft)	* 855.05	* Top Width (ft)	* 296.32	* 180.91	* 377.82	*
* Vel Total (ft/s)	* 2.62	* Avg. Vel. (ft/s)	* 1.48	* 3.68	* 1.76	*
* Max Chl Dpth (ft)	* 2.80	* Hydr. Depth (ft)	* 0.49	* 1.92	* 0.64	*
* Conv. Total (cfs)	* 29216.5	* Conv. (cfs)	* 3243.9	* 19521.0	* 6451.6	*
* Length Wtd. (ft)	* 1321.69	* Wetted Per. (ft)	* 296.32	* 180.95	* 377.82	*
* Min Ch El (ft)	* 1324.99	* Shear (lb/sq ft)	* 0.13	* 0.52	* 0.17	*
* Alpha	* 1.46	* Stream Power (lb/ft s)	* 0.19	* 1.91	* 0.30	*
* Frctn Loss (ft)	* 7.26	* Cum Volume (acre-ft)	* 34.64	* 54.00	* 35.64	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 36.06	* 28.11	* 30.62	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 1 RS: 2.567

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*******************************************************************************
 9363.24 1320.55 9388.82 1320.37 9401.02 1320.35  9450.2 1319.43 9457.69  1319.3
 9458.29  1319.3  9462.4 1319.31 9464.86 1319.31 9503.86 1319.77 9517.31  1319.9
 9528.45 1319.98 9533.75    1320  9549.3 1320.14 9588.84  1320.1 9598.73 1320.09
 9638.84 1320.05 9648.16 1320.03 9688.84 1319.97 9697.59 1319.95 9738.85 1319.87
 9747.02 1319.86 9788.85 1319.77 9796.45 1319.75 9838.86 1319.64 9845.88 1319.63
 9888.86 1319.53  9895.3 1319.51 9938.86  1319.4 9992.59 1317.77 9996.81 1317.68
   10000 1317.7810002.88 1317.8910015.62 1318.3310043.36 1318.7610053.97 1319.01
10060.15 1319.1410064.34 1319.2210101.07 1319.6610110.19 1319.6910113.99 1319.71
10148.43 1319.8210168.16 1319.9210186.66 1319.9910222.32 1320.16 10224.9 1320.17
10231.09  1320.210263.14 1320.2710276.49 1320.3210301.37 1320.3810330.65  1320.4
10339.61 1320.4210361.11 1320.55

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9363.24    .041 9938.86    .04110101.07    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9938.8610101.07             1385    1366    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1320.69  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.20  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1320.49  * Reach Len. (ft)         * 1385.00  * 1366.00  * 1300.00  *
* Crit W.S. (ft)          * 1320.32  * Flow Area (sq ft)       *  366.56  *  284.36  *   93.03  *
* E.G. Slope (ft/ft)      *0.006935  * Area (sq ft)            *  366.56  *  284.36  *   93.03  *
* Q Total (cfs)           * 2220.00  * Flow (cfs)              *  827.21  * 1247.48  *  145.30  *
* Top Width (ft)          *  978.99  * Top Width (ft)          *  566.90  *  162.21  *  249.89  *
* Vel Total (ft/s)        *    2.98  * Avg. Vel. (ft/s)        *    2.26  *    4.39  *    1.56  *
* Max Chl Dpth (ft)       *    2.81  * Hydr. Depth (ft)        *    0.65  *    1.75  *    0.37  *
* Conv. Total (cfs)       * 26658.6  * Conv. (cfs)             *  9933.5  * 14980.2  *  1744.9  *
* Length Wtd. (ft)        * 1360.92  * Wetted Per. (ft)        *  566.91  *  162.26  *  249.89  *
* Min Ch El (ft)          * 1317.68  * Shear (lb/sq ft)        *    0.28  *    0.76  *    0.16  *
* Alpha                   *    1.45  * Stream Power (lb/ft s)   *    0.63  *    3.33  *    0.25  *
* Frctn Loss (ft)         *   10.25  * Cum Volume (acre-ft)    *   27.54  *   44.00  *   30.74  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   24.07  *   22.68  *   21.39  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES9 (E49)
REACH: REACH 1            RS: 2.308

INPUT
Description:
Station Elevation Data     num=      80
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9299.54 1311.44 9300.13 1311.44 9315.04 1311.44 9337.17 1311.41  9371.5 1311.37
 9374.21 1311.36 9379.37 1311.34 9411.24 1311.23 9427.95 1311.18 9448.28 1311.06
 9484.41 1310.86 9487.03 1310.84 9522.35 1310.54 9548.39 1309.99  9567.6  1309.7
 9595.08 1309.93 9595.31 1309.94 9595.49 1309.95 9597.33 1309.95 9633.46 1309.69
 9653.78 1309.56 9670.49 1309.48 9702.36 1309.32 9707.53 1309.29 9710.24 1309.28
 9744.57 1309.17  9766.7 1309.09  9781.6 1309.07 9810.03 1309.04 9818.64 1309.02
 9823.15 1309.01 9855.68 1308.98 9879.61 1308.97 9892.71 1308.96 9917.69 1308.96
 9929.75 1308.96 9936.07 1308.96 9971.34 1309.56 9998.18 1310.01   10000 1309.97
10006.64  1309.810014.39 1309.6110019.69 1309.5110024.51 1309.4610066.33 1309.07
10074.55 1309.0910081.66 1309.11   10110 1309.1710142.78 1309.2410145.45 1309.25
10147.76 1309.25 10180.9 1309.3310213.86 1309.3910216.35  1309.410219.23  1309.4
 10251.8 1309.4710279.96 1309.5210287.24 1309.5310295.67 1309.5510322.69 1309.59
10346.05 1309.6210358.14 1309.6410372.12 1309.6610393.59 1309.6910412.15 1309.71
10429.04 1309.7310448.57 1309.7610464.49 1309.7810478.25 1309.8110499.93 1309.84
10525.02 1309.8910540.08 1310.1410542.98 1310.2110547.32  1310.310552.37 1310.38
10589.06 1311.0210597.77 1311.1210609.26 1311.2610617.22 1311.3810626.62 1311.51

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9299.54    .041 9744.57    .041 10180.9    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9744.57 10180.9             1260    1329    1295            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1310.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1310.28	Reach Len. (ft)	1260.00	1329.00	1295.00
Crit W.S. (ft)	1310.05	Flow Area (sq ft)	138.61	473.06	231.37
E.G. Slope (ft/ft)	0.008115	Area (sq ft)	138.61	473.06	231.37
Q Total (cfs)	2530.00	Flow (cfs)	343.14	1629.92	556.94
Top Width (ft)	1011.74	Top Width (ft)	209.93	436.33	365.48
Vel Total (ft/s)	3.00	Avg. Vel. (ft/s)	2.48	3.45	2.41
Max Chl Dpth (ft)	1.32	Hydr. Depth (ft)	0.66	1.08	0.63
Conv. Total (cfs)	28084.7	Conv. (cfs)	3809.1	18093.3	6182.4
Length Wtd. (ft)	1308.75	Wetted Per. (ft)	209.94	436.35	365.48
Min Ch El (ft)	1308.96	Shear (lb/sq ft)	0.33	0.55	0.32
Alpha	1.08	Stream Power (lb/ft s)	0.83	1.89	0.77
Frctn Loss (ft)	6.47	Cum Volume (acre-ft)	19.51	32.12	25.90
C & E Loss (ft)	0.02	Cum SA (acres)	11.72	13.30	12.21

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 1 RS: 2.056

INPUT
Description:
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8958.46	1305.06	8980.5	1304.8	8989.43	1304.73	9030.5	1304.37	9040.07	1304.31
9080.51	1304.07	9090.72	1304.04	9130.51	1303.9	9141.37	1303.87	9180.51	1303.78
9192.02	1303.75	9230.52	1303.66	9242.67	1303.63	9280.52	1303.55	9293.32	1303.51
9330.53	1303.43	9343.97	1303.39	9380.53	1303.29	9394.62	1303.25	9430.53	1303.16
9445.27	1303.12	9480.54	1303.03	9495.92	1303	9530.54	1302.91	9546.57	1302.89
9580.55	1302.81	9613.67	1302.75	9630.55	1302.73	9647.87	1302.71	9680.55	1302.65
9698.52	1302.62	9730.56	1302.56	9749.17	1302.53	9780.56	1302.47	9799.82	1302.44
9830.57	1302.38	9850.47	1302.35	9880.57	1302.3	9901.12	1302.27	9930.58	1302.23
9982.83	1302.85	9998.89	1303.05	10000	1303.03	10021.96	1302.57	10028.89	1302.42
10031.41	1302.37	10032.93	1302.33	10034.01	1302.31	10043.25	1302.24	10072.4	1302.31
10101.53	1302.39	10107.75	1302.41	0113.98	1302.42	10143.11	1302.49	10172.23	1302.57
10178.46	1302.59	10184.7	1302.61	0213.82	1302.67	10242.93	1302.75	10249.18	1302.77
10255.42	1302.79	10284.53	1302.86	10313.63	1302.93	10319.89	1302.95	10326.15	1302.97
10362.22	1303.21	0368.88	1303.33	10378.81	1303.51	0382.56	1303.53	10392.34	1303.45
10401.72	1303.33	10442.79	1303.27	10449.21	1303.25	10452.45	1303.26	10454.72	1303.28
10456.39	1303.28	10457.3	1303.28	10458.15	1303.27	10458.94	1303.27	10459.85	1303.28
10467.59	1303.24	10496.67	1303.31	0525.73	1303.37	10532.02	1303.39	10538.32	1303.41
10567.38	1303.52	10596.43	1303.63	10602.73	1303.66	10609.04	1303.69	10638.09	1303.84
10667.13	1303.99	10673.45	1304.03	10679.8	1304.06				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8958.46	.041	9749.17	.041	10184.7	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9749.17	10184.7	1185	1268	1260	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1303.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1303.85	Reach Len. (ft)	1330.00	1330.00	1330.00
Crit W.S. (ft)	1303.36	Flow Area (sq ft)	425.35	610.55	296.15
E.G. Slope (ft/ft)	0.003450	Area (sq ft)	425.35	610.55	296.15
Q Total (cfs)	2820.00	Flow (cfs)	719.41	1627.82	472.77
Top Width (ft)	1492.02	Top Width (ft)	600.52	435.53	455.96
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)	1.69	2.67	1.60
Max Chl Dpth (ft)	1.62	Hydr. Depth (ft)	0.71	1.40	0.65
Conv. Total (cfs)	48013.6	Conv. (cfs)	12248.8	27715.5	8049.4
Length Wtd. (ft)	1330.00	Wetted Per. (ft)	600.53	435.54	455.97
Min Ch El (ft)	1302.23	Shear (lb/sq ft)	0.15	0.30	0.14

```
* Alpha                  *    1.17  * Stream Power (lb/ft s) *    0.26  *    0.80  *    0.22  *
* Frctn Loss (ft)        *    6.07  * Cum Volume (acre-ft)   *   11.36  *   15.59  *   18.06  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)         *          *          *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 1.816

INPUT
Description:
Station Elevation Data num= 71

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9263.98 1298.07 9286.17 1298.01 9306.02 1297.95 9357.37 1297.78 9357.93 1297.78
 9358.14 1297.78 9409.84 1297.58 9430.12 1297.49 9461.74 1297.37 9502.09 1297.23
 9513.65 1297.19 9543.56 1297.08 9565.56 1297.01 9574.06 1296.98 9617.46 1296.86
 9646.03 1296.79 9669.37 1296.72    9718 1296.57 9721.27 1296.56 9729.75 1296.53
 9773.18 1296.34 9789.97 1296.26 9829.06 1296.31 9833.99 1296.36 9840.56 1296.44
 9850.41 1296.57 9859.85 1296.71 9865.97  1296.8 9868.65  1296.8 9869.48  1296.8
 9889.03 1296.67 9894.36 1296.66 9899.64 1296.65 9919.36 1295.98 9921.73 1295.94
  9923.6  1295.9 9925.08 1295.87 9926.14 1295.84  9926.7 1295.82 9927.09  1295.8
 9927.41 1295.78 9927.72 1295.75 9927.99 1295.73 9928.64  1295.7 9929.02  1295.7
 9950.52 1294.64 9960.02  1294.2 9983.94 1293.07 9984.31 1293.07 9984.53 1293.07
   10000 1293.7110003.01 1293.8310006.22 1293.9310013.72 1294.2810019.71  1294.6
10024.76 1294.7810026.46  1294.810068.55 1295.3710082.23 1295.35 10092.7 1295.33
10132.66 1295.2610137.24 1295.2510154.57 1293.7110184.38    129210193.14 1291.68
10207.39 1291.1410220.08 1290.6610234.74 1291.7810248.08  1292.810283.98 1295.45
10356.68 1297.58
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9263.98    .041 9929.02    .04110068.55    .041
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.

```
       9929.0210068.55            1500    1539    1500            .1       .3
```

Ineffective Flow num= 1

```
   Sta L   Sta R    Elev  Permanent
   1007010356.68    1298       F
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1297.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.42  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1297.40  * Reach Len. (ft)         * 1500.00  * 1539.00  * 1500.00  *
* Crit W.S. (ft)         * 1297.19  * Flow Area (sq ft)       *  318.53  *  410.88  *    2.94  *
* E.G. Slope (ft/ft)     *0.006129  * Area (sq ft)            *  318.53  *  410.88  *  886.78  *
* Q Total (cfs)          * 3100.00  * Flow (cfs)              *  692.68  * 2393.94  *   13.38  *
* Top Width (ft)         *  896.17  * Top Width (ft)          *  474.71  *  139.53  *  281.93  *
* Vel Total (ft/s)       *    4.23  * Avg. Vel. (ft/s)        *    2.17  *    5.83  *    4.55  *
* Max Chl Dpth (ft)      *    6.74  * Hydr. Depth (ft)        *    0.67  *    2.94  *    2.03  *
* Conv. Total (cfs)      * 39596.9  * Conv. (cfs)             *  8847.7  * 30578.3  *   170.9  *
* Length Wtd. (ft)       * 1533.93  * Wetted Per. (ft)        *  474.73  *  139.63  *    1.45  *
* Min Ch El (ft)         * 1293.07  * Shear (lb/sq ft)        *    0.26  *    1.13  *    0.78  *
* Alpha                  *    1.53  * Stream Power (lb/ft s)  *    0.56  *    6.56  *    3.53  *
* Frctn Loss (ft)        *    8.23  * Cum Volume (acre-ft)    *   66.05  *  156.00  *   45.70  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)          *   24.03  *   30.05  *   12.16  *
*****************************************************************************************
```

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: 4S1ES9 (E49)

REACH: REACH 2 RS: 1.522

INPUT
Description: Channel on west side of 99th Avenue.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9868.37	1291.916	9882.39	1292.057	9919.59	1289.122	9931.96	1288.117	9937.07	1287.691
9952.13	1285.987	9966.11	282.369	10000	1282.36	10008.42	1282.36	10014.17	1282.332
10026.33	1285.58	210074.46	1298.487						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9868.37	.041	9952.13	.041	10026.33	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9952.13	10026.33	890	895	895	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1289.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1288.61	Reach Len. (ft)	890.00	895.00	895.00
Crit W.S. (ft)		Flow Area (sq ft)	31.75	418.66	17.09
E.G. Slope (ft/ft)	0.004797	Area (sq ft)	31.75	418.66	17.09
Q Total (cfs)	3450.00	Flow (cfs)	90.23	3304.53	55.25
Top Width (ft)	111.72	Top Width (ft)	26.23	74.20	11.29
Vel Total (ft/s)	7.38	Avg. Vel. (ft/s)	2.84	7.89	3.23
Max Chl Dpth (ft)	6.28	Hydr. Depth (ft)	1.21	5.64	1.51
Conv. Total (cfs)	49809.8	Conv. (cfs)	1302.6	47709.5	797.7
Length Wtd. (ft)	894.85	Wetted Per. (ft)	26.36	75.09	11.69
Min Ch El (ft)	1282.33	Shear (lb/sq ft)	0.36	1.67	0.44
Alpha	1.10	Stream Power (lb/ft s)	1.03	13.18	1.42
Frctn Loss (ft)	3.96	Cum Volume (acre-ft)	60.02	141.35	30.13
C & E Loss (ft)	0.12	Cum SA (acres)	15.40	26.27	7.11

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 1.355

INPUT
Description: Channel on west side of 99th Avenue.
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9742.54	1286.66	9773.02	1286.6	9776.55	1286.57	9823.02	1286.83	9828.85	1286.88
9878.95	1286.86	9931.14	1282.23	9970.2	1279.64	10000	1279.98	10005.79	1280.04
10040.02	1282.16	10052.93	1280.31	10097.91	1289.09				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9742.54	.041	9931.14	.041	10040.02	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9931.14	10040.02	1425	1427	1425	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1285.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1284.93	Reach Len. (ft)	1425.00	1427.00	1425.00
Crit W.S. (ft)	1283.55	Flow Area (sq ft)	41.00	467.91	102.28
E.G. Slope (ft/ft)	0.004101	Area (sq ft)	41.00	467.91	102.28
Q Total (cfs)	3450.00	Flow (cfs)	115.86	2867.81	466.33
Top Width (ft)	175.85	Top Width (ft)	30.40	108.88	36.56
Vel Total (ft/s)	5.64	Avg. Vel. (ft/s)	2.83	6.13	4.56
Max Chl Dpth (ft)	5.29	Hydr. Depth (ft)	1.35	4.30	2.80
Conv. Total (cfs)	53873.1	Conv. (cfs)	1809.2	44782.0	7281.9
Length Wtd. (ft)	1426.61	Wetted Per. (ft)	30.52	109.03	37.14
Min Ch El (ft)	1279.64	Shear (lb/sq ft)	0.34	1.10	0.70

* Alpha	* 1.08	* Stream Power (lb/ft s)	* 0.97	* 6.73	* 3.21 *
* Frctn Loss (ft)	* 8.63	* Cum Volume (acre-ft)	* 59.28	* 132.24	* 28.91 *
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 14.83	* 24.39	* 6.62 *

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 1.085

INPUT
Description: Channel on west side of 99th Avenue.
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9711.92	1283.02	9716.82	1282.77	9724.65	1282.99	9732.26	1282.62	9742.52	1282.11
9753.34	1282.37	9762.69	1281.28	9762.97	1281.26	9769.75	1280.26	9773.88	1279.88
9780.96	1279.39	9786.55	1278.89	9793.37	1278.49	9802.2	1278.62	9804.71	1278.66
9816.5	1278.91	9825.04	1279.1	9833.1	1279.3	9850.56	1279.75	9852.48	1279.8
9857.4	1279.91	9865.48	1279.1	9866.28	1279.08	9866.81	1279.12	9869.59	1278.84
9890.36	1277.43	9896.64	1276.91	9901.2	1276.49	9928.94	1273.99	9940.87	1272.69
9967.18	1272.88	10000	1270.92	10015.92	1269.92	10019.49	1269.46	10045.53	1274.87
10086.7	1283.8	10095.18	1282.95						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9711.92	.044	9967.18	.049	10045.53	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9967.18	10045.53	1400	1409	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1276.79	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.87	* Wt. n-Val.	* 0.044	* 0.049	* 0.044 *
* W.S. Elev (ft)	* 1275.92	* Reach Len. (ft)	* 1400.00	* 1409.00	* 1400.00 *
* Crit W.S. (ft)	* 1275.15	* Flow Area (sq ft)	* 133.72	* 339.25	* 2.52 *
* E.G. Slope (ft/ft)	*0.009800	* Area (sq ft)	* 133.72	* 339.25	* 2.52 *
* Q Total (cfs)	* 3460.00	* Flow (cfs)	* 764.63	* 2689.97	* 5.40 *
* Top Width (ft)	* 142.79	* Top Width (ft)	* 59.62	* 78.35	* 4.82 *
* Vel Total (ft/s)	* 7.28	* Avg. Vel. (ft/s)	* 5.72	* 7.93	* 2.14 *
* Max Chl Dpth (ft)	* 6.46	* Hydr. Depth (ft)	* 2.24	* 4.33	* 0.52 *
* Conv. Total (cfs)	* 34952.0	* Conv. (cfs)	* 7724.1	* 27173.4	* 54.5 *
* Length Wtd. (ft)	* 1405.57	* Wetted Per. (ft)	* 59.77	* 79.03	* 4.94 *
* Min Ch El (ft)	* 1269.46	* Shear (lb/sq ft)	* 1.37	* 2.63	* 0.31 *
* Alpha	* 1.06	* Stream Power (lb/ft s)	* 7.83	* 20.82	* 0.67 *
* Frctn Loss (ft)	* 5.38	* Cum Volume (acre-ft)	* 56.42	* 119.02	* 27.19 *
* C & E Loss (ft)	* 0.20	* Cum SA (acres)	* 13.35	* 21.32	* 5.94 *

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 0.819

INPUT
Description: Channel on west side of 99th Avenue.
Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9788.25	1273.16	9847.52	1266.66	9855.86	1266.58	9924.59	1265.9	9941.64	1268.79
9956.43	1271.31	9965.08	1268.34	9975.58	1264.85	10000	1264.62	10003.72	1264.59

10020.14 1264.4710073.28 1279.1110089.45 1283.49

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9788.25	.044	9956.43	.04	910073.28	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9956.43	10073.28	950	960	950	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1271.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.044	0.049	
W.S. Elev (ft)	1271.00	Reach Len. (ft)	950.00	960.00	950.00
Crit W.S. (ft)		Flow Area (sq ft)	526.19	416.95	
E.G. Slope (ft/ft)	0.002027	Area (sq ft)	526.19	416.95	
Q Total (cfs)	3470.00	Flow (cfs)	1869.12	1600.88	
Top Width (ft)	233.17	Top Width (ft)	146.66	86.51	
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)	3.55	3.84	
Max Chl Dpth (ft)	6.53	Hydr. Depth (ft)	3.59	4.82	
Conv. Total (cfs)	77079.6	Conv. (cfs)	41519.0	35560.7	
Length Wtd. (ft)	957.20	Wetted Per. (ft)	147.33	88.40	
Min Ch El (ft)	1264.47	Shear (lb/sq ft)	0.45	0.60	
Alpha	1.00	Stream Power (lb/ft s)	1.61	2.29	
Frctn Loss (ft)	4.48	Cum Volume (acre-ft)	45.82	106.79	27.15
C & E Loss (ft)	0.16	Cum SA (acres)	10.04	18.66	5.87

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 0.637

INPUT
Description: Upstream of 11-56" x 39" CMP's which cross 99th Avenue.
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9913.12	1270.83	9925.33	1267.65	9926.19	1267.43	9956.55	1262.91	9975.84	1260.21
9989.6	1260.11	10000	1260.02	10002.6	1260	10019.69	1259.97	10033.67	1263.28
10041.28	1264.95	10064.35	1270.07						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9913.12	.044	9956.55	.04	910033.67	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9956.55	10033.67	300	330	300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1266.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1264.76	Reach Len. (ft)	300.00	330.00	300.00
Crit W.S. (ft)	1264.76	Flow Area (sq ft)	11.55	311.98	5.02
E.G. Slope (ft/ft)	0.020216	Area (sq ft)	11.55	311.98	5.02
Q Total (cfs)	3470.00	Flow (cfs)	52.34	3398.21	19.45
Top Width (ft)	96.34	Top Width (ft)	12.46	77.12	6.76
Vel Total (ft/s)	10.56	Avg. Vel. (ft/s)	4.53	10.89	3.87
Max Chl Dpth (ft)	4.79	Hydr. Depth (ft)	0.93	4.05	0.74
Conv. Total (cfs)	24405.2	Conv. (cfs)	368.1	23900.3	136.8
Length Wtd. (ft)	329.30	Wetted Per. (ft)	12.59	77.70	6.93
Min Ch El (ft)	1259.97	Shear (lb/sq ft)	1.16	5.07	0.91
Alpha	1.05	Stream Power (lb/ft s)	5.25	55.20	3.55
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	39.95	98.76	27.10
C & E Loss (ft)	0.52	Cum SA (acres)	8.30	16.85	5.79

```
Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 4S1ES9 (E49)
REACH: REACH 2            RS: 0.580

INPUT
Description: Input by hand using survey points and dtm.
Station Elevation Data    num=       7
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*******************************************************************************
    9780   1263.7    9840     1262    9950 1256.38   10000 1257.07   10050 1257.31
   10140     1262   10260   1263.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9780    .044    9840    .049   10140    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9840   10140              150     150     150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1263.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.08  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1263.53  * Reach Len. (ft)         *  150.00  *  150.00  *  150.00  *
* Crit W.S. (ft)         * 1259.65  * Flow Area (sq ft)       *   41.07  * 1482.05  *   82.14  *
* E.G. Slope (ft/ft)     *0.000673  * Area (sq ft)            *   41.07  * 1482.05  *   82.14  *
* Q Total (cfs)          * 3470.00  * Flow (cfs)              *   30.03  * 3379.90  *   60.07  *
* Top Width (ft)         *  461.53  * Top Width (ft)          *   53.84  *  300.00  *  107.69  *
* Vel Total (ft/s)       *    2.16  * Avg. Vel. (ft/s)        *    0.73  *    2.28  *    0.73  *
* Max Chl Dpth (ft)      *    7.15  * Hydr. Depth (ft)        *    0.76  *    4.94  *    0.76  *
* Conv. Total (cfs)      *133758.5  * Conv. (cfs)             *  1157.5  *130285.5  *  2315.5  *
* Length Wtd. (ft)       *  150.00  * Wetted Per. (ft)        *   53.86  *  300.27  *  107.70  *
* Min Ch El (ft)         * 1256.38  * Shear (lb/sq ft)        *    0.03  *    0.21  *    0.03  *
* Alpha                  *    1.09  * Stream Power (lb/ft s)   *    0.02  *    0.47  *    0.02  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)     *   39.77  *   91.96  *   26.80  *
* C & E Loss (ft)        *          * Cum SA (acres)           *    8.08  *   15.42  *    5.40  *
*****************************************************************************************

CULVERT


RIVER: 4S1ES9 (E49)
REACH: REACH 2            RS: 0.566

INPUT
Description: 11 - 56" x 39" CMP's
Structure 8
Crosses 99th Avenue
Distance from Upstream XS =       50
Deck/Roadway Width        =       36
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*******************************************************************
    9730 1262.94            9820 1261.04            10000 1260.73
   10116 1262.09           10400  1264.8

Upstream Bridge Cross Section Data
Station Elevation Data    num=       7
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
```

```
*******************************************************************************
    9780  1263.7    9840    1262    9950 1256.38   10000 1257.07   10050 1257.31
   10140    1262   10260  1263.7

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9780    .044    9840    .049   10140    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9840   10140             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       5
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*******************************************************************************
    9730 1262.94            9820 1260.77           10000 1260.41
   10116 1261.99           10400  1264.8

Downstream Bridge Cross Section Data
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
    9600  1263.2    9700  1262.3    9910 1259.79    9950 1257.08   10000 1256.39
   10050 1255.58   10070  1260.8   10230  1262.4   10400  1263.2

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9600    .044    9910    .049   10070    .044

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9910   10070             .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name      Shape      Rise    Span
Culvert #1        Ellipse    3.25    4.67
FHWA Chart # 29- Horizontal Ellipse; Concrete
FHWA Scale # 1 - Square edge with headwall
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
                 50      95     .024     .024     1.75                   .5                  1
Number of Barrels =  11
Upstream   Elevation =  1255.93
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
    9950    9960    9970    9980    9990   10000   10010   10020   10030   10040
   10050
Downstream Elevation =  1254.72
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
    9950    9960    9970    9980    9990   10000   10010   10020   10030   10040
   10050

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
*****************************************************************
* Q Culv Group (cfs)     *  272.61  * Culv Full Len (ft)     *   95.00  *
* # Barrels              *      11  * Culv Vel US (ft/s)     *    4.61  *
* Q Barrel (cfs)         *   24.78  * Culv Vel DS (ft/s)     *    4.61  *
* E.G. US. (ft)          * 1263.61  * Culv Inv El Up (ft)    * 1255.93  *
* W.S. US. (ft)          * 1263.53  * Culv Inv El Dn (ft)    * 1254.72  *
* E.G. DS (ft)           * 1262.05  * Culv Frctn Ls (ft)     *    1.31  *
* W.S. DS (ft)           * 1261.80  * Culv Exit Loss (ft)    *    0.08  *
* Delta EG (ft)          *    1.56  * Culv Entr Loss (ft)    *    0.16  *
* Delta WS (ft)          *    1.73  * Q Weir (cfs)           * 3197.39  *
* E.G. IC (ft)           * 1263.45  * Weir Sta Lft (ft)      * 9783.38  *
* E.G. OC (ft)           * 1263.61  * Weir Sta Rgt (ft)      *10253.25  *
* Culvert Control        *  Outlet  * Weir Submerg           *    0.24  *
* Culv WS Inlet (ft)     * 1259.18  * Weir Max Depth (ft)    *    2.87  *
* Culv WS Outlet (ft)    * 1257.97  * Weir Avg Depth (ft)    *    1.79  *
```

```
* Culv Nml Depth (ft)    *          * Weir Flow Area (sq ft) *  841.22  *
* Culv Crt Depth (ft)    *    0.96  * Min El Weir Flow (ft)  * 1260.74  *
*********************************************************************

CROSS SECTION


RIVER: 4S1ES9 (E49)
REACH: REACH 2            RS: 0.552

INPUT
Description: Input by hand using survey points and dtm.
Station Elevation Data    num=      9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
    9600  1263.2    9700  1262.3    9910 1259.79    9950 1257.08   10000 1256.39
   10050 1255.58   10070  1260.8   10230  1262.4   10400  1263.2

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9600    .044    9910    .049   10070    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9910   10070              300     300     300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1262.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)          * 1261.80  * Reach Len. (ft)         *  300.00  *  300.00  *  300.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  168.41  *  750.24  *   49.65  *
* E.G. Slope (ft/ft)      *0.002437  * Area (sq ft)            *  168.41  *  750.24  *   49.65  *
* Q Total (cfs)           * 3470.00  * Flow (cfs)              *  281.38  * 3136.60  *   52.02  *
* Top Width (ft)          *  427.52  * Top Width (ft)          *  167.87  *  160.00  *   99.65  *
* Vel Total (ft/s)        *    3.58  * Avg. Vel. (ft/s)        *    1.67  *    4.18  *    1.05  *
* Max Chl Dpth (ft)       *    6.22  * Hydr. Depth (ft)        *    1.00  *    4.69  *    0.50  *
* Conv. Total (cfs)       * 70285.3  * Conv. (cfs)             *  5699.5  * 63532.1  *  1053.7  *
* Length Wtd. (ft)        *  300.00  * Wetted Per. (ft)        *  167.88  *  160.77  *   99.65  *
* Min Ch El (ft)          * 1255.58  * Shear (lb/sq ft)        *    0.15  *    0.71  *    0.08  *
* Alpha                   *    1.25  * Stream Power (lb/ft s)   *    0.26  *    2.97  *    0.08  *
* Frctn Loss (ft)         *    0.81  * Cum Volume (acre-ft)    *   39.41  *   88.12  *   26.57  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *    7.69  *   14.63  *    5.04  *
*****************************************************************************************

CROSS SECTION


RIVER: 4S1ES9 (E49)
REACH: REACH 2            RS: 0.495

INPUT
Description: Downstream of 11-56" x 39" CMP's which cross 99th Avenue.
Station Elevation Data    num=     28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9812.961261.929  9832.91261.843 9854.12 1261.57 9874.681261.353 9885.581258.294
 9899.04 1254.99 9901.81 1254.99 9916.81 1254.99 9926.061258.556 9933.541262.039
 9945.461258.492 9948.391257.644  9949.81257.239 9957.281254.978 9981.641255.124
10000.411255.31710037.251255.68910048.791259.03910055.561261.343 10070.51261.834
10123.141262.80610131.751262.842 10139.71262.89510167.141262.805 10196.91262.891
10202.521262.89110207.71 1262.9110237.911262.996

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9812.96    .044 9874.68    .04910055.56    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9874.6810055.56              450     450     450            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1261.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.31  * Wt. n-Val.              *          *   0.049  *          *
* W.S. Elev (ft)          * 1260.91  * Reach Len. (ft)         *  450.00  *  450.00  *  450.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *          *  773.51  *          *
* E.G. Slope (ft/ft)      *0.003028  * Area (sq ft)            *          *  773.51  *          *
* Q Total (cfs)           * 3470.00  * Flow (cfs)              *          * 3470.00  *          *
```

* Top Width (ft)	* 171.86	* Top Width (ft)	*	*	171.86	*	*
* Vel Total (ft/s)	* 4.49	* Avg. Vel. (ft/s)	*	*	4.49	*	*
* Max Chl Dpth (ft)	* 5.94	* Hydr. Depth (ft)	*	*	4.50	*	*
* Conv. Total (cfs)	* 63064.6	* Conv. (cfs)	*	*	63064.6	*	*
* Length Wtd. (ft)	* 450.00	* Wetted Per. (ft)	*	*	175.46	*	*
* Min Ch El (ft)	* 1254.98	* Shear (lb/sq ft)	*	*	0.83	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	*	3.74	*	*
* Frctn Loss (ft)	* 1.41	* Cum Volume (acre-ft)	* 38.83	*	82.87	* 26.40	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 7.12	*	13.49	* 4.70	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 0.409

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9530.44	1260.69	9539.55	1260.95	9543.39	1260.94	9589.56	1260.76	9592.99	1260.75
9639.56	1260.65	9642.59	1260.65	9689.56	1260.54	9692.19	1260.54	9739.56	1260.36
9741.79	1260.37	9789.56	1259.99	9791.39	1259.96	9839.57	1258.52	9840.99	1258.5
9901.86	1259.6	9908.52	1259.68	9916.36	1259.66	9918.25	1259.62	9924.44	1257.82
9932.36	1255.97	9936.94	1254.74	9942.62	1253.45	9951.44	1253.56	9954	1253.58
9960.82	1253.66	9966.43	1253.71	9973.18	1253.78	9978.42	1253.84	9984.67	1253.88
9992.53	1253.97	10000	1254.09	10029.89	1254.41	10036.43	1254.36	10041.97	1255.44
10051.19	1257.25	10055.57	1258.24	10055.78	1258.57	10059.41		125810113.05	1257.89
10136.34	1259.65	10169.75	1260.51	10172.28	1260.55	10175.93	1260.54	10208.21	1260.22
10230.57	1260.33	10263.77	1260.49	10280.08	1260.57	10291.38	1260.62	10316.02	1260.73
10351.61	1260.85	10351.95	1260.85	10352.19	1260.85	10387.89	1260.99	10413	1261.09
10423.82	1261.13	10439.45	1261.18	10459.76	1261.24	10473.82	1261.31	10495.69	1261.38
10527.29	1261.46	10531.63	1261.48	10534.63	1261.48	10567.56	1261.56		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9530.44	.044	9918.25	.049	10055.78	.044

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9918.25	10055.78	630	630	630	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1259.81	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.34	* Wt. n-Val.	* 0.044	* 0.049	* 0.044	*
* W.S. Elev (ft)	* 1259.47	* Reach Len. (ft)	* 630.00	* 630.00	* 630.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 42.41	* 653.16	* 102.54	*
* E.G. Slope (ft/ft)	*0.003260	* Area (sq ft)	* 42.41	* 653.16	* 102.54	*
* Q Total (cfs)	* 3470.00	* Flow (cfs)	* 50.71	* 3182.57	* 236.72	*
* Top Width (ft)	* 301.97	* Top Width (ft)	* 86.79	* 137.01	* 78.16	*
* Vel Total (ft/s)	* 4.35	* Avg. Vel. (ft/s)	* 1.20	* 4.87	* 2.31	*
* Max Chl Dpth (ft)	* 6.02	* Hydr. Depth (ft)	* 0.49	* 4.77	* 1.31	*
* Conv. Total (cfs)	* 60777.3	* Conv. (cfs)	* 888.3	* 55742.9	* 4146.1	*
* Length Wtd. (ft)	* 630.00	* Wetted Per. (ft)	* 86.82	* 138.34	* 78.27	*
* Min Ch El (ft)	* 1253.45	* Shear (lb/sq ft)	* 0.10	* 0.96	* 0.27	*
* Alpha	* 1.17	* Stream Power (lb/ft s)	* 0.12	* 4.68	* 0.62	*
* Frctn Loss (ft)	* 1.49	* Cum Volume (acre-ft)	* 38.61	* 75.50	* 25.87	*
* C & E Loss (ft)	* 0.06	* Cum SA (acres)	* 6.67	* 11.89	* 4.29	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES9 (E49)
REACH: REACH 2 RS: 0.289

```
INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9711.31 1258.72 9711.89 1258.73 9712.96 1258.73 9715.39 1258.71 9750.88 1258.29
 9772.02 1257.71 9789.16 1257.28 9820.96 1256.47 9844.18 1255.44 9853.55 1254.95
 9861.75 1254.93 9902.56  1254.7 9930.49 1254.58 9940.48 1254.53 9963.11 1254.46
  9978.4 1254.43 9985.14 1254.37   10000 1254.3210015.39 1254.24 10043.5 1254.26
10051.17 1254.3210061.66 1254.3710104.33 1253.88 10120.4 1253.3610138.51 1256.41
10145.21 1257.7510170.37 1258.3210194.28 1258.3810229.35  1258.810230.06 1258.81
10231.03 1258.8110265.84 1258.69 10291.3 1258.8610301.62 1258.9810315.72 1259.04
10337.39 1259.1310353.25 1259.1910373.17 1259.28 10400.4 1259.3710408.95 1259.39
 10415.2 1259.4110444.73 1259.5110477.16 1259.5910480.51  1259.610485.08  1259.6
10516.28 1259.64

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9711.31    .044 9820.96    .04910138.51    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9820.9610138.51              925     865     815             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1258.26  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.14  * Wt. n-Val.              *   0.044  *   0.049  *   0.044  *
* W.S. Elev (ft)         * 1258.12  * Reach Len. (ft)         *  925.00  *  865.00  *  815.00  *
* Crit W.S. (ft)         *           * Flow Area (sq ft)       *   53.65  * 1130.46  *   10.09  *
* E.G. Slope (ft/ft)     *0.001794  * Area (sq ft)            *   53.65  * 1130.46  *   10.09  *
* Q Total (cfs)          * 3460.00  * Flow (cfs)               *   68.19  * 3383.57  *    8.25  *
* Top Width (ft)         *  404.82  * Top Width (ft)           *   64.04  *  317.55  *   23.23  *
* Vel Total (ft/s)       *    2.90  * Avg. Vel. (ft/s)         *    1.27  *    2.99  *    0.82  *
* Max Chl Dpth (ft)      *    4.76  * Hydr. Depth (ft)         *    0.84  *    3.56  *    0.43  *
* Conv. Total (cfs)      * 81678.5  * Conv. (cfs)              *  1609.6  * 79874.2  *   194.7  *
* Length Wtd. (ft)       *  869.86  * Wetted Per. (ft)         *   64.06  *  317.85  *   23.36  *
* Min Ch El (ft)         * 1253.36  * Shear (lb/sq ft)         *    0.09  *    0.40  *    0.05  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)    *    0.12  *    1.19  *    0.04  *
* Frctn Loss (ft)        *    0.15  * Cum Volume (acre-ft)     *   37.92  *   62.61  *   25.06  *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)            *    5.58  *    8.61  *    3.56  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES9 (E49)
REACH: REACH 2            RS: 0.125

INPUT
Description: X-Section within Waterman Wash floodplain.
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9098.53 1255.39 9140.75  1255.1 9146.21 1255.06 9190.85 1254.78 9199.74 1254.72
 9240.95 1254.43 9253.27 1254.38 9291.05 1254.22 9306.81 1254.19 9341.16 1254.11
 9360.34  1254.1 9391.26 1254.09 9413.87 1254.07 9441.36 1254.01  9467.4 1253.96
 9491.46 1253.86 9520.93 1253.78 9541.56 1253.72 9559.71 1253.68 9591.67 1253.56
    9628 1253.42 9641.77 1253.33 9681.53 1253.14 9691.87 1253.11 9735.06 1252.89
 9742.31 1252.93 9749.47  1253.1 9811.51 1254.59 9842.08 1253.99 9842.18 1253.99
 9842.94 1253.99 9888.05  1253.9 9892.28 1253.81 9895.66 1253.79 9942.38 1253.58
 9949.19 1253.55 9992.49 1253.37   10000 1253.3510001.82 1253.3510012.51 1253.35
10037.55 1253.3510071.23 1253.4710073.29 1253.4810074.82 1253.4810109.02 1253.65
10137.12 1253.8110144.76 1253.8510155.03 1253.91 10180.5 1254.0710199.43 1254.18
10216.23 1254.3110238.83 1254.4510251.97 1254.5410261.74 1254.59 10287.7 1254.73
10322.63  1254.910323.44 1254.9110324.04 1254.9110359.18 1255.0710386.35 1255.19
10394.91 1255.2210406.43 1255.2510430.65 1255.3310448.66 1255.3810466.38 1255.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9098.53    .044 9559.71    .04910109.02    .044

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9559.7110109.02             1000    1020    1000             .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1258.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.044	0.049	0.044
W.S. Elev (ft)	1258.06	Reach Len. (ft)	660.00	660.00	660.00
Crit W.S. (ft)		Flow Area (sq ft)	1728.99	2479.22	1216.99
E.G. Slope (ft/ft)	0.000062	Area (sq ft)	1728.99	2479.22	1216.99
Q Total (cfs)	3460.00	Flow (cfs)	1108.19	1620.94	730.87
Top Width (ft)	1367.85	Top Width (ft)	461.18	549.31	357.36
Vel Total (ft/s)	0.64	Avg. Vel. (ft/s)	0.64	0.65	0.60
Max Chl Dpth (ft)	5.17	Hydr. Depth (ft)	3.75	4.51	3.41
Conv. Total (cfs)	438265.8	Conv. (cfs)	140369.8	205319.0	92576.9
Length Wtd. (ft)	660.00	Wetted Per. (ft)	463.86	549.34	359.98
Min Ch El (ft)	1252.89	Shear (lb/sq ft)	0.01	0.02	0.01
Alpha	1.00	Stream Power (lb/ft s)	0.01	0.01	0.01
Frctn Loss (ft)		Cum Volume (acre-ft)	18.99	26.77	13.58
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 6.207

INPUT
Description:
Station Elevation Data num= 68

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9193.54	1409.23	9197.94	1409.19	9245.8	1408.96	9248.37	1408.95	9248.75	1408.95
9314.56	1408.76	9319.9	1408.77	9322.93	1408.78	9326.32	1408.79	9329.84	1408.81
9336.08	1408.82	9336.19	1408.82	9336.25	1408.82	9340.06	1408.83	9342.62	1408.83
9348.55	1408.84	9350	1408.84	9354.45	1408.84	9354.91	1408.84	9356.58	1408.84
9360.1	1408.84	9361.87	1408.84	9366.63	1408.83	9373.02	1408.79	9378.14	1408.74
9386.94	1408.52	9392.96	1408.28	9396.64	1408.2	9422.87	1408.25	9450.08	1408.2
9480.91	1408.22	9500.51	1408.26	9538.95	1408.47	9550.93	1408.55	9596.99	1408.84
9601.36	1408.87	9630.36	1408.94	9651.79	1408.98	9705.59	1407.85	9710.79	1407.83
9712.57	1407.82	9718.36	1407.97	9724.61	1408.14	9738.45	1408.42	9752.65	1408.88
9771.1	1408.85	9803.07	1408.83	9829.14	1408.81	9853.5	1408.82	9887.18	1408.81
9903.93	1408.82	9945.22	1408.82	9954.36	1408.83	9985.09	1407.49	10000	1406.84
10003.77	1407.01	10007.18	1407.13	10027.63	1407.65	10035.37	1407.96	10044.18	1408.19
10053.02	1408.39	10061.46	1408.67	10086.12	1409.72	10092.8	1410.1	10098.24	1410.45
10102.08	1410.63	10103.71	1410.62	10118.12	1411.48				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9193.54	.042	9954.36	.043	10061.46	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9954.36	10061.46	14500	1549	1450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1407.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.		0.043	
W.S. Elev (ft)	1407.73	Reach Len. (ft)	14500.00	1549.00	1450.00
Crit W.S. (ft)	1407.73	Flow Area (sq ft)		21.27	
E.G. Slope (ft/ft)	0.036957	Area (sq ft)		21.27	
Q Total (cfs)	80.00	Flow (cfs)		80.00	
Top Width (ft)	49.92	Top Width (ft)		49.92	
Vel Total (ft/s)	3.76	Avg. Vel. (ft/s)		3.76	
Max Chl Dpth (ft)	0.89	Hydr. Depth (ft)		0.43	
Conv. Total (cfs)	416.1	Conv. (cfs)		416.1	
Length Wtd. (ft)	4224.70	Wetted Per. (ft)		49.95	
Min Ch El (ft)	1406.84	Shear (lb/sq ft)		0.98	
Alpha	1.00	Stream Power (lb/ft s)		3.70	
Frctn Loss (ft)	5.08	Cum Volume (acre-ft)	168.66	246.53	183.00
C & E Loss (ft)	0.06	Cum SA (acres)	256.05	266.31	287.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 5.913

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8957.75	1399.93	8960.61	1399.92	8977.77	1399.86	9026.41	1399.74	9028.98	1399.73
9037.99	1399.69	9080.19	1399.52	9092.22	1399.46	9131.41	1399.28	9158.02	1399.15
9182.62	1399.03	9223.82	1398.84	9233.84	1398.8	9268.99	1398.65	9285.05	1398.58
9289.63	1398.57	9336.27	1398.39	9355.43	1398.31	9387.48	1398.19	9421.23	1398.04
9438.69	1397.97	9487.04	1397.74	9489.91	1397.73	9499.98	1397.69	9541.12	1397.52
9552.84	1397.49	9592.34	1397.38	9628.38	1395.92	9640.97	1395.54	9645.17	1395.44
9648.22	1395.57	9694.76	1397.18	9730.98	1397.14	9745.98	1397.12	9750.25	1397.12
9797.19	1397.07	9816.05	1397.05	9848.41	1397.01	9881.86	1396.97	9899.62	1396.95
9947.66	1396.93	9950.83	1396.93	9955.44	1396.74	9956	1396.71	9956.72	1396.69
9958.21	1396.62	9960.88	1396.5	9967.23	1396.23	10000	1394.84	10011.45	1395.32
10028.31	1395.93	10034.85	1396.11	10039.69	1396.24	10043.23	1396.36	10045.75	1396.46
10075.51	1397.12	10103.79	1397.21	10138.19	1397.36	10154.67	1397.43	10200.87	1397.68
10205.55	1397.71	10225.72	1397.83	10256.43	1398.02	10263.55	1398.07	10307.31	1398.36
10326.24	1398.48	10358.19	1398.71	10388.92	1398.89	10409.07	1399.02	10451.6	1399.27
10459.94	1399.32	10495.91	1399.53	10510.82	1399.61	10514.28	1399.63	10561.7	1399.87
10576.97	1399.94	10590.32	1399.99						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8957.75	.042	9947.66	.043	10075.51	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9947.66	10075.51	1300	1361	1300	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1397.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1397.19	Reach Len. (ft)	1300.00	1361.00	1300.00
Crit W.S. (ft)		Flow Area (sq ft)	124.69	144.86	0.80
E.G. Slope (ft/ft)	0.000682	Area (sq ft)	124.69	144.86	0.80
Q Total (cfs)	200.00	Flow (cfs)	57.85	142.07	0.08
Top Width (ft)	502.20	Top Width (ft)	350.56	127.85	23.79
Vel Total (ft/s)	0.74	Avg. Vel. (ft/s)	0.46	0.98	0.10
Max Chl Dpth (ft)	2.35	Hydr. Depth (ft)	0.36	1.13	0.03
Conv. Total (cfs)	7655.8	Conv. (cfs)	2214.4	5438.5	2.9
Length Wtd. (ft)	1339.13	Wetted Per. (ft)	350.63	127.93	23.79
Min Ch El (ft)	1394.84	Shear (lb/sq ft)	0.02	0.05	0.00
Alpha	1.36	Stream Power (lb/ft s)	0.01	0.05	0.00
Frctn Loss (ft)	7.40	Cum Volume (acre-ft)	147.91	243.57	182.99
C & E Loss (ft)	0.03	Cum SA (acres)	197.70	263.15	287.52

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 5.656

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9285.2	1392.45	9319.17	1392.27	9339.63	1392.15	9355.08	1392.05	9394.06	1391.79
9445.67	1391.45	9448.49	1391.43	9450.62	1391.42	9502.93	1391.1	9546.17	1390.86
9557.36	1390.8	9572.17	1390.73	9611.79	1390.56	9641.71	1390.46	9666.22	1390.37
9683.3	1390.18	9685.81	1390.16	9689.59	1390.14	9695.03	1390.1	9702.89	1390.06

```
 9733.67 1389.88 9738.41 1389.86 9744.94 1389.83 9746.42 1389.83 9758.16 1389.65
 9759.23 1389.63 9768.72 1389.47  9775.9 1389.35 9780.41 1389.24 9785.87 1389.15
 9789.46 1389.08 9796.06 1388.94 9798.49 1388.89 9807.14 1388.68 9808.03 1388.66
 9812.15 1388.53 9830.86 1388.93 9844.14 1389.22 9883.95 1389.89 9928.34 1389.85
 9938.38 1389.84  9946.5 1389.58 9948.18 1389.51 9955.19  1389.2 9993.85 1387.28
 9994.67 1387.26   10000  1387.110044.87 1389.8110087.56 1389.8410096.56 1389.84
10121.89 1389.8710148.24  1389.9 10157.6 1389.9110199.93 1389.9410227.65 1389.95
10251.62 1389.96 10297.7 1389.9510303.31 1389.9510319.12 1389.94   10355 1389.92
10367.74 1389.9210406.69 1389.9110449.39 1388.0610452.09 1387.9210486.71 1389.13
10498.52 1389.5410502.53 1389.6810504.54 1389.7510505.99  1389.8 10506.9 1389.83
10510.06 1389.9710516.35 1389.9810561.75 1389.9910577.88    139010613.44 1390.02
10647.92 1390.0510665.13 1390.0610713.57 1390.1110716.82 1390.1210717.97 1390.12
10768.51  1390.210788.02 1390.24 10820.2  1390.310853.75 1390.36

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9285.2    .042 9928.34    .04310044.87    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9928.3410044.87             1150    1207    1150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1389.76  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.32  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)          * 1389.44  * Reach Len. (ft)         * 1150.00  * 1207.00  * 1150.00  *
* Crit W.S. (ft)          * 1389.37  * Flow Area (sq ft)       *   37.04  *  106.32  *   59.06  *
* E.G. Slope (ft/ft)      *0.016946  * Area (sq ft)            *   37.04  *  106.32  *   59.06  *
* Q Total (cfs)           *  860.00  * Flow (cfs)              *   96.62  *  537.86  *  225.53  *
* Top Width (ft)          *  254.08  * Top Width (ft)          *   86.87  *   89.04  *   78.17  *
* Vel Total (ft/s)        *    4.25  * Avg. Vel. (ft/s)        *    2.61  *    5.06  *    3.82  *
* Max Chl Dpth (ft)       *    2.34  * Hydr. Depth (ft)        *    0.43  *    1.19  *    0.76  *
* Conv. Total (cfs)       *  6606.3  * Conv. (cfs)             *   742.2  *  4131.7  *  1732.5  *
* Length Wtd. (ft)        * 1180.39  * Wetted Per. (ft)        *   86.89  *   89.16  *   78.23  *
* Min Ch El (ft)          * 1387.10  * Shear (lb/sq ft)        *    0.45  *    1.26  *    0.80  *
* Alpha                   *    1.14  * Stream Power (lb/ft s)  *    1.18  *    6.38  *    3.05  *
* Frctn Loss (ft)         *    5.61  * Cum Volume (acre-ft)    *  145.50  *  239.65  *  182.10  *
* C & E Loss (ft)         *    0.08  * Cum SA (acres)          *  191.17  *  259.76  *  285.99  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 5.427

INPUT
Description: Approximately 500' upstream of Schumacher Ln.
Station Elevation Data     num=       86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9457.25 1384.39 9469.62 1384.35 9512.65 1384.23 9519.84 1384.21 9568.05 1384.09
 9570.06 1384.08  9589.5 1384.04 9620.28 1383.97 9623.45 1383.96  9670.5 1383.87
 9689.96 1383.26 9714.81 1382.53 9723.82 1382.23 9729.72 1381.88 9746.11 1380.84
 9754.24 1381.72    9766 1382.61 9766.57 1382.67    9767 1382.69 9768.86 1382.62
 9778.18 1382.82  9786.9 1382.92 9794.24 1383.01 9800.04 1383.07  9804.8 1383.12
 9808.41 1383.16 9811.69 1383.19 9814.65  1383.2 9820.29 1383.15 9825.32 1383.04
 9856.86 1383.12 9861.91 1383.04 9863.58 1383.06 9865.16 1383.08 9866.65  1383.1
 9867.71 1383.11 9872.53 1383.14 9893.18 1383.77 9921.59 1383.78  9939.1 1383.79
 9983.45    1382 9991.97  1381.6   10000 1381.3410004.71 1381.2910005.62 1381.28
 10006.5 1381.2810006.84 1381.2710009.09 1381.3310018.09  1381.6 10035.6 1382.34
10044.62  1382.810050.88 1383.1510060.23 1383.51 10063.7 1383.5410066.18 1383.56
10067.85 1383.6110079.75 1383.8910122.09 1383.9310168.96 1383.9610172.15 1383.96
 10221.7 1383.9910222.21 1383.9910231.78 1383.9910272.28 1383.9710274.45 1383.97
10322.34 1383.97 10327.6 1383.7110329.52  1383.710332.53 1383.6810338.82 1383.55
10358.22 1383.0710386.46 1382.3810392.48 1382.5410400.09 1382.7310405.87 1382.88
10460.89 1384.2210472.54 1384.2510485.43  1384.3 10522.6 1384.4410538.18  1384.5
10572.67 1384.6610590.93 1384.7310622.73 1384.8610643.67 1384.94 10672.8 1385.06
10686.49 1385.11

Manning's n Values          num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9457.25    .042  9939.1    .04310079.75    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9939.110079.75             1200    1236    1200            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1384.07  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1384.02  * Reach Len. (ft)         * 1200.00  * 1236.00  * 1200.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  285.28  *  205.82  *  124.24  *
* E.G. Slope (ft/ft)     *0.002394  * Area (sq ft)            *  285.28  *  205.82  *  124.24  *
* Q Total (cfs)          *  990.00  * Flow (cfs)              *  438.34  *  448.32  *  103.34  *
* Top Width (ft)         *  854.56  * Top Width (ft)          *  340.97  *  140.65  *  372.94  *
* Vel Total (ft/s)       *    1.61  * Avg. Vel. (ft/s)        *    1.54  *    2.18  *    0.83  *
* Max Chl Dpth (ft)      *    3.18  * Hydr. Depth (ft)        *    0.84  *    1.46  *    0.33  *
* Conv. Total (cfs)      * 20233.4  * Conv. (cfs)             *  8958.6  *  9162.7  *  2112.0  *
* Length Wtd. (ft)       * 1226.31  * Wetted Per. (ft)        *  341.14  *  140.75  *  372.99  *
* Min Ch El (ft)         * 1381.27  * Shear (lb/sq ft)        *    0.12  *    0.22  *    0.05  *
* Alpha                  *    1.26  * Stream Power (lb/ft s)  *    0.19  *    0.48  *    0.04  *
* Frctn Loss (ft)        *    5.40  * Cum Volume (acre-ft)    *  141.24  *  235.32  *  179.68  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *  185.52  *  256.58  *  280.04  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 5.193

INPUT
Description: Approximately 725' downstream of Schumacher Ln.
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9115.23 1380.02 9150.94 1379.94  9151.7 1379.93 9156.71 1379.92 9202.13  1379.8
 9209.02 1379.77 9252.56 1379.62 9267.11 1379.57 9302.99 1379.43 9325.19 1379.35
 9353.42 1379.23 9383.28  1379.1 9403.86 1379.01 9441.37 1378.85 9454.29  1378.8
 9499.45 1378.61 9504.72 1378.59 9539.43 1378.47 9555.15 1378.41 9557.54  1378.4
 9605.59 1378.26 9615.63 1378.22 9656.02 1378.12 9673.71 1378.08 9706.45 1377.98
  9731.8 1377.92 9756.88 1377.87 9789.89 1377.81 9807.31 1377.77 9847.97 1377.72
 9857.75  1377.7 9906.06 1377.65 9908.18 1377.65 9922.15 1377.64 9958.61 1377.61
 9968.68 1377.67   10000 1377.7710025.02 1377.7910059.43 1377.7510079.64 1377.81
10109.82 1377.8910137.23 1377.9910160.21 1378.0710194.83 1378.2410210.59 1378.32
10252.42 1378.6310260.98 1378.6910310.02 1379.1110311.37 1379.1210320.86  1379.2
10361.76 1379.5210367.61 1379.5610379.01 1379.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9115.23    .042 9605.59    .04310194.83    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9605.5910194.83            1700    1761    1700            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1378.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.11  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1378.56  * Reach Len. (ft)         * 1700.00  * 1761.00  * 1700.00  *
* Crit W.S. (ft)         * 1378.35  * Flow Area (sq ft)       *   14.70  *  410.84  *    8.42  *
* E.G. Slope (ft/ft)     *0.009467  * Area (sq ft)            *   14.70  *  410.84  *    8.42  *
* Q Total (cfs)          * 1110.00  * Flow (cfs)              *   14.80  * 1086.18  *    9.02  *
* Top Width (ft)         *  730.60  * Top Width (ft)          *   92.89  *  589.24  *   48.47  *
* Vel Total (ft/s)       *    2.56  * Avg. Vel. (ft/s)        *    1.01  *    2.64  *    1.07  *
* Max Chl Dpth (ft)      *    0.95  * Hydr. Depth (ft)        *    0.16  *    0.70  *    0.17  *
* Conv. Total (cfs)      * 11408.0  * Conv. (cfs)             *   152.2  * 11163.2  *    92.7  *
* Length Wtd. (ft)       * 1748.68  * Wetted Per. (ft)        *   92.89  *  589.24  *   48.47  *
* Min Ch El (ft)         * 1377.61  * Shear (lb/sq ft)        *    0.09  *    0.41  *    0.10  *
* Alpha                  *    1.05  * Stream Power (lb/ft s)  *    0.09  *    1.09  *    0.11  *
* Frctn Loss (ft)        *    6.98  * Cum Volume (acre-ft)    *  137.11  *  226.58  *  177.85  *
```

```
* C & E Loss (ft)        *    0.02  * Cum SA (acres)        *  179.55  *  246.23  *  274.23  *
*****************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 4.859

INPUT
Description:
Station Elevation Data num= 57

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9245.63 1372.09 9248.84 1372.08 9287.82 1371.92 9311.44 1371.85 9338.69 1371.77
 9374.03 1371.68 9389.56 1371.65 9436.63 1371.52 9440.43 1371.51 9456.92 1371.47
  9491.3 1371.37 9499.23 1371.35 9542.17  1371.2 9561.82 1371.14 9593.04 1371.03
 9624.42 1370.94 9643.91 1370.88 9687.02 1370.78 9694.78 1370.76 9728.46  1370.7
 9745.65 1370.67 9749.61 1370.66 9796.52 1370.59 9812.21 1370.57 9847.39 1370.53
 9874.81 1370.51 9898.26 1370.51  9937.4 1370.51 9949.13 1370.51   10000  1370.5
10045.66 1370.5510050.25 1370.5510091.31 1370.6110100.51 1370.6210136.96 1370.66
10150.76 1370.6710182.62  1370.710201.01 1370.7210228.27 1370.7510251.27 1370.78
10273.92 1370.8210301.52 1370.8810319.58 1370.9310351.77 1371.0410365.23 1371.09
10402.03 1371.2510410.88 1371.2910452.28 1371.4810456.54 1371.49 10498.8 1371.66
10502.19 1371.6710502.53 1371.6710547.84 1371.8210552.79 1371.83 10593.5 1371.96
10603.04 1371.9910619.32 1372.06
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*****************************************************
 9245.63    .042 9728.46    .04310136.96    .042
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9728.4610136.96             1200    1260    1200            .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************
* E.G. Elev (ft)         * 1371.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1371.63  * Reach Len. (ft)         * 1200.00  * 1260.00  * 1200.00  *
* Crit W.S. (ft)         * 1371.12  * Flow Area (sq ft)       *  162.72  *  438.23  *  221.21  *
* E.G. Slope (ft/ft)     *0.002277  * Area (sq ft)            *  162.72  *  438.23  *  221.21  *
* Q Total (cfs)          * 1200.00  * Flow (cfs)              *  170.40  *  757.34  *  272.27  *
* Top Width (ft)         * 1097.06  * Top Width (ft)          *  333.15  *  408.50  *  355.41  *
* Vel Total (ft/s)       *    1.46  * Avg. Vel. (ft/s)        *    1.05  *    1.73  *    1.23  *
* Max Chl Dpth (ft)      *    1.13  * Hydr. Depth (ft)        *    0.49  *    1.07  *    0.62  *
* Conv. Total (cfs)      * 25145.1  * Conv. (cfs)             *  3570.5  * 15869.4  *  5705.1  *
* Length Wtd. (ft)       * 1232.71  * Wetted Per. (ft)        *  333.16  *  408.50  *  355.41  *
* Min Ch El (ft)         * 1370.50  * Shear (lb/sq ft)        *    0.07  *    0.15  *    0.09  *
* Alpha                  *    1.12  * Stream Power (lb/ft s)  *    0.07  *    0.26  *    0.11  *
* Frctn Loss (ft)        *    5.72  * Cum Volume (acre-ft)    *  133.65  *  209.41  *  173.37  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *  171.24  *  226.06  *  266.35  *
*****************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 4.621

INPUT
Description:
Station Elevation Data num= 53

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9606.16 1365.95 9641.02  1365.6 9667.89 1365.53  9692.3 1365.47 9734.31 1365.39
 9743.58 1365.37    9775 1365.33 9794.87 1365.31 9800.73 1365.31 9846.15 1365.26
```

```
 9867.15 1365.26 9897.43 1365.26 9933.57 1365.26 9948.71 1365.26   10000 1365.29
10041.53  1365.410051.38 1365.4310083.06 1365.4910102.77 1365.5210124.59 1365.55
10154.16 1365.5810166.13 1365.5810205.55 1365.5710207.66 1365.5710216.55 1365.56
10249.19 1365.5410256.94 1365.5310290.72 1365.4910308.33 1365.4810332.26 1365.46
10359.72 1365.4510373.79 1365.43 10411.1 1365.4110415.32 1365.41 10433.1  1365.4
10456.86 1365.3810462.49 1365.3810498.39 1365.3610513.88 1365.3710539.92 1365.36
10565.27 1365.3610581.45 1365.3510616.66 1365.3510622.99 1365.3510649.65 1365.36
10664.52 1365.3610668.05 1365.3610706.05 1365.4310719.44 1365.4410747.58 1365.57
10770.82 1365.6610789.12 1365.7710805.19 1365.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9606.16    .042  9692.3    .04310083.06    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9692.310083.06             1300    1360    1300            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1365.94  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.09  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1365.85  * Reach Len. (ft)         * 1300.00  * 1360.00  * 1300.00  *
* Crit W.S. (ft)         * 1365.75  * Flow Area (sq ft)       *   19.11  *  203.62  *  274.38  *
* E.G. Slope (ft/ft)     *0.014345  * Area (sq ft)            *   19.11  *  203.62  *  274.38  *
* Q Total (cfs)          * 1190.00  * Flow (cfs)              *   32.28  *  545.72  *  612.00  *
* Top Width (ft)         * 1185.16  * Top Width (ft)          *   75.91  *  390.76  *  718.48  *
* Vel Total (ft/s)       *    2.39  * Avg. Vel. (ft/s)        *    1.69  *    2.68  *    2.23  *
* Max Chl Dpth (ft)      *    0.59  * Hydr. Depth (ft)        *    0.25  *    0.52  *    0.38  *
* Conv. Total (cfs)      *  9935.6  * Conv. (cfs)              *   269.5  *  4556.3  *  5109.8  *
* Length Wtd. (ft)       * 1341.32  * Wetted Per. (ft)        *   75.92  *  390.76  *  718.48  *
* Min Ch El (ft)         * 1365.26  * Shear (lb/sq ft)        *    0.23  *    0.47  *    0.34  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.38  *    1.25  *    0.76  *
* Frctn Loss (ft)        *    6.25  * Cum Volume (acre-ft)    *  131.14  *  200.13  *  166.54  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *  165.60  *  214.50  *  251.56  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 4.363

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9439.85 1359.97 9480.01 1359.81 9490.49 1359.77 9493.04 1359.77 9541.44 1359.61
 9556.41 1359.57 9592.39 1359.46 9619.78 1359.39 9643.34 1359.32 9683.15 1359.22
 9694.29 1359.19  9708.4 1359.15 9741.43 1359.11 9750.74  1359.1 9754.75  1359.1
 9762.49  1359.1 9771.96  1359.1  9796.7 1359.03 9809.25 1359.01 9847.15 1358.88
 9873.26 1358.84  9898.1 1358.81 9936.63 1358.78 9949.05 1358.77   10000 1358.74
10043.27 1358.7610050.74 1358.7610086.54 1358.7810101.48 1358.7910129.81 1358.81
10152.22 1358.8310173.08 1358.8310202.96 1358.8510216.34 1358.85 10253.7 1358.86
10259.61 1358.8610293.85 1358.8710302.88 1358.8810304.44 1358.8810346.15 1358.88
10355.18 1358.8910389.42 1358.8910405.92  1358.910432.69 1358.9110456.66 1358.93
10475.96 1358.93 10507.4 1358.9510519.22 1358.9610558.14 1358.9810562.49 1358.98
10587.71 1358.9810605.76 1358.9810608.88 1358.9810649.03 1358.9610659.62 1358.96
 10692.3 1358.9610710.36 1358.9510735.57 1358.95 10761.1 1358.9410778.84 1358.95
10811.84 1358.9610822.11 1358.9810862.58 1359.0610865.37 1359.0710881.56 1359.14
10908.64 1359.2510913.32 1359.2710951.91 1359.5110964.06 1359.5910995.18  1359.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9439.85    .042  9796.7    .04310881.56    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9796.710881.56             1200    1255    1200            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

E.G. Elev (ft)	1359.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1359.63	Reach Len. (ft)	1200.00	1255.00	1200.00
Crit W.S. (ft)	1359.22	Flow Area (sq ft)	89.59	803.32	24.04
E.G. Slope (ft/ft)	0.002257	Area (sq ft)	89.59	803.32	24.04
Q Total (cfs)	1170.00	Flow (cfs)	73.66	1079.43	16.92
Top Width (ft)	1435.49	Top Width (ft)	261.91	1084.86	88.72
Vel Total (ft/s)	1.28	Avg. Vel. (ft/s)	0.82	1.34	0.70
Max Chl Dpth (ft)	0.89	Hydr. Depth (ft)	0.34	0.74	0.27
Conv. Total (cfs)	24627.4	Conv. (cfs)	1550.4	22720.9	356.1
Length Wtd. (ft)	1250.13	Wetted Per. (ft)	261.91	1084.86	88.72
Min Ch El (ft)	1358.74	Shear (lb/sq ft)	0.05	0.10	0.04
Alpha	1.05	Stream Power (lb/ft s)	0.04	0.14	0.03
Frctn Loss (ft)	6.11	Cum Volume (acre-ft)	129.52	184.41	162.09
C & E Loss (ft)	0.01	Cum SA (acres)	160.56	191.46	239.52

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 4.125

INPUT
Description:
Station Elevation Data num= 73

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9333.08	1354.63	9340.28	1354.62	9385.97	1354.59	9391.03	1354.58	9394.59	1354.58
9415.13	1354.56	9441.78	1354.53	9447.37	1354.52	9492.52	1354.44	9508.77	1354.4
9543.27	1354.3	9570.18	1354.22	9594.02	1354.14	9631.58	1354	9644.77	1353.95
9664.74	1353.56	9670.97	1353.46	9682.49	1353.28	9709.63	1352.86	9722.61	1352.68
9724.5	1352.64	9747.82	1352.9	9763.44	1353.07	9772.14	1353.17	9777.4	1353.25
9781.23	1353.3	9797.01	1353.41	9815.79	1353.36	9847.76	1353.27	9877.19	1353.2
9898.5	1353.16	9938.59	1353.07	9949.25	1353.05	10000	1352.9	10040.41	1352.96
10052.02	1352.9	10080.83	1352.98	10104.04	1352.99	10121.25	135	310156.06	1353
10161.66	1353.01	10181.19	135	310208.08	1353	10242.5	1353	10260.1	1352.99
10282.91	1352.99	10312.12	1352.97	10323.33	1352.97	10362.39	1352.94	10363.75	1352.94
10364.14	1352.94	10404.16	1352.92	10416.15	1352.91	10444.58	1352.91	10468.17	1352.88
10484.99	1352.87	10520.19	1352.85	10525.41	1352.85	10543.58	1352.84	10565.83	1352.84
10572.21	1352.84	10606.24	1352.85	10624.23	1352.88	10646.66	1352.92	10676.25	1353.03
10687.08	1353.06	10724.78	1353.31	10727.49	1353.31	10728.27	1353.32	10767.91	1353.58
10780.29	1353.67	10808.33	1353.84	10829.26	1353.99				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9333.08	.042	9877.19	.043	10724.78	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9877.19	10724.78	1200	1253	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1353.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1353.42	Reach Len. (ft)	1200.00	1253.00	1200.00
Crit W.S. (ft)	1353.32	Flow Area (sq ft)	56.37	380.04	1.13
E.G. Slope (ft/ft)	0.018104	Area (sq ft)	56.37	380.04	1.13
Q Total (cfs)	1150.00	Flow (cfs)	113.99	1035.18	0.83
Top Width (ft)	1069.64	Top Width (ft)	203.56	847.59	18.49
Vel Total (ft/s)	2.63	Avg. Vel. (ft/s)	2.02	2.72	0.74
Max Chl Dpth (ft)	0.78	Hydr. Depth (ft)	0.28	0.45	0.06
Conv. Total (cfs)	8546.9	Conv. (cfs)	847.2	7693.5	6.2
Length Wtd. (ft)	1239.35	Wetted Per. (ft)	203.57	847.59	18.49
Min Ch El (ft)	1352.84	Shear (lb/sq ft)	0.31	0.51	0.07
Alpha	1.03	Stream Power (lb/ft s)	0.63	1.38	0.05
Frctn Loss (ft)	6.44	Cum Volume (acre-ft)	127.51	167.36	161.74
C & E Loss (ft)	0.02	Cum SA (acres)	154.15	163.63	238.04

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 3.888

INPUT
Description: Approximately 1000' upstream of Gas Line Road.
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9138.04	1348.6	9138.65	1348.6	9151.53	1348.53	9189.31	1348.33	9212.14	1348.2
9239.98	1348.06	9272.74	1347.91	9290.65	1347.83	9333.34	1347.67	9341.32	1347.65
9381.97	1347.52	9391.99	1347.49	9393.95	1347.49	9442.65	1347.33	9454.55	1347.29
9493.32	1347.15	9515.16	1347.06	9543.99	1346.94	9575.76	1346.83	9594.66	1346.77
9636.37	1346.66	9645.32	1346.64	9690.98	1346.56	9695.99	1346.55	9738.82	1346.48
9747.94	1346.58	9750.55	1346.59	9754.79	1346.61	9761.64	1346.66	9778.11	1346.78
9811.55	1347.04	9823.49	1347.09	9828.98	1346.99	9842.67	1346.77	9850.08	1346.65
9881.23	1346.55	9888.63	1346.47	9892.29	1346.44	9912.94	1346.26	9949.33	1346.19
10000	1346.07	10040.21	1346.03	10052.16	1346.02	10080.42	1345.99	10104.32	1345.98
10120.64	1345.97	10156.48	1345.95	10160.85	1345.95	10175.57	1345.96	10201.06	1345.97
10208.64	1345.97	10241.28	1346	10260.8	1346.02	10281.49	1346.05	10312.96	1346.08
10321.7	1346.09	10351.13	1346.12	10361.91	1346.14	10365.12	1346.14	10402.13	1346.19
10417.28	1346.21	10442.34	1346.24	10469.44	1346.27	10482.55	1346.29	10521.6	1346.32
10522.77	1346.32	10526.7	1346.33	10562.98	1346.36	10573.76	1346.38	10603.19	1346.42
10625.92	1346.45	10643.4	1346.51	10678.08	1346.58	10683.62	1346.61	10702.27	1346.71
10723.83	1346.82	10730.24	1346.85	10764.04	1347.13	10782.4	1347.28	10804.26	1347.49
10834.56	1347.77	10844.47	1347.87	10861.55	1348.03				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9138.04	.042	9912.94	.043	10312.96	.042

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9912.94	10312.96	1200	1281	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1347.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.042	0.043	0.042
W.S. Elev (ft)	1347.03	Reach Len. (ft)	1200.00	1281.00	1200.00
Crit W.S. (ft)	1346.60	Flow Area (sq ft)	126.37	395.03	282.87
E.G. Slope (ft/ft)	0.002412	Area (sq ft)	126.37	395.03	282.87
Q Total (cfs)	1140.00	Flow (cfs)	108.25	664.84	366.91
Top Width (ft)	1211.03	Top Width (ft)	372.45	400.02	438.56
Vel Total (ft/s)	1.42	Avg. Vel. (ft/s)	0.86	1.68	1.30
Max Chl Dpth (ft)	1.08	Hydr. Depth (ft)	0.34	0.99	0.64
Conv. Total (cfs)	23211.4	Conv. (cfs)	2204.0	13536.7	7470.7
Length Wtd. (ft)	1262.96	Wetted Per. (ft)	372.46	400.02	438.56
Min Ch El (ft)	1345.95	Shear (lb/sq ft)	0.05	0.15	0.10
Alpha	1.13	Stream Power (lb/ft s)	0.04	0.25	0.13
Frctn Loss (ft)	6.82	Cum Volume (acre-ft)	124.99	156.22	157.83
C & E Loss (ft)	0.01	Cum SA (acres)	146.21	145.68	231.74

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 3.646

INPUT
Description: Approximately 200' downstream of Gas Line Road.
Station Elevation Data num= 40

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9591.26	1340.59	9599.33	1340.57	9649.55	1340.15	9683.46	1340.05	9699.61	1340

```
 9736.22 1339.89 9749.68 1339.86 9788.97 1339.76 9799.74 1339.73 9841.73 1339.64
 9849.81 1339.62 9894.49 1339.55 9899.87 1339.54 9947.25 1339.48 9949.94 1339.48
   10000 1339.4310044.06 1339.4610050.54 1339.4610088.11 1339.4810101.08 1339.48
10132.16  1339.510151.62 1339.5110176.22 1339.5110202.16 1339.5110220.27 1339.51
 10252.7 1339.5110264.33 1339.5210303.24 1339.5410308.38 1339.5410343.32 1339.58
10352.43 1339.5910353.77 1339.5910396.49 1339.7210404.31 1339.7410440.54 1339.96
10454.85 1340.0510484.59 1340.2910505.39 1340.4610528.65 1340.6710541.11 1340.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9591.26    .042 9788.97    .04310440.54    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9788.9710440.54             1200    1262    1200            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1340.23  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.16  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1340.07  * Reach Len. (ft)         * 1200.00  * 1262.00  * 1200.00  *
* Crit W.S. (ft)         * 1340.01  * Flow Area (sq ft)       *   17.78  *  332.86  *    0.89  *
* E.G. Slope (ft/ft)     *0.022060  * Area (sq ft)            *   17.78  *  332.86  *    0.89  *
* Q Total (cfs)          * 1120.00  * Flow (cfs)              *   27.56  * 1091.76  *    0.67  *
* Top Width (ft)         *  778.85  * Top Width (ft)          *  110.98  *  651.57  *   16.31  *
* Vel Total (ft/s)       *    3.19  * Avg. Vel. (ft/s)        *    1.55  *    3.28  *    0.76  *
* Max Chl Dpth (ft)      *    0.64  * Hydr. Depth (ft)        *    0.16  *    0.51  *    0.05  *
* Conv. Total (cfs)      *  7540.8  * Conv. (cfs)             *   185.6  *  7350.6  *     4.5  *
* Length Wtd. (ft)       * 1245.08  * Wetted Per. (ft)        *  110.98  *  651.57  *   16.31  *
* Min Ch El (ft)         * 1339.43  * Shear (lb/sq ft)        *    0.22  *    0.70  *    0.08  *
* Alpha                  *    1.04  * Stream Power (lb/ft s)  *    0.34  *    2.31  *    0.06  *
* Frctn Loss (ft)        *    6.10  * Cum Volume (acre-ft)    *  123.01  *  145.51  *  153.92  *
* C & E Loss (ft)        *    0.04  * Cum SA (acres)          *  139.56  *  130.22  *  225.48  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 3.406

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9385.72 1334.51 9395.41 1334.48 9424.91 1334.32 9445.79 1334.21 9482.42 1333.98
 9496.18  1333.9 9539.93 1333.65 9546.56 1333.61 9593.43 1333.38 9596.94 1333.36
 9597.44 1333.36 9647.32 1333.19 9654.95 1333.17 9697.71 1333.06 9712.46 1333.02
 9748.09 1332.94 9786.26 1333.72 9810.27 1334.05  9817.4 1334.14 9825.94 1334.24
 9836.45 1334.08 9849.44 1333.68 9863.64 1333.71 9899.24 1332.65 9942.49 1332.61
 9949.62 1332.61   10000 1332.5710044.32 1332.5610050.48 1332.5610078.29 1333.38
10093.98 1333.7810102.66 1333.6410151.45 1332.6610177.27 1332.7310201.93 1332.81
10221.59 1332.9210252.41 1333.12 10265.9 1333.2610302.89 1333.6510310.22 1333.74
10353.37 1334.2810354.54  1334.310362.91  1334.410398.85 1334.8310403.85 1334.89
10443.17 1335.2810454.33 1335.3910487.49 1335.5910504.82 1335.69 10531.8 1335.79
 10555.3 1335.8610576.12 1335.8910605.78 1335.9510620.44 1335.9610656.26 1336.01
10664.75 1336.0210706.74 1336.0710709.07 1336.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9385.72    .042 9825.94    .04310093.98    .042

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9825.9410093.98             1400    1521    1400            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1334.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.042  *   0.043  *   0.042  *
* W.S. Elev (ft)         * 1334.07  * Reach Len. (ft)         * 1400.00  * 1521.00  * 1400.00  *
* Crit W.S. (ft)         * 1333.45  * Flow Area (sq ft)       *  220.63  *  299.96  *  212.35  *
```

```
* E.G. Slope (ft/ft)      *0.002068  * Area (sq ft)            *  220.63  *  299.96  *  212.35  *
* Q Total (cfs)           * 1100.00  * Flow (cfs)              *  264.64  *  522.45  *  312.91  *
* Top Width (ft)          *  842.15  * Top Width (ft)          *  342.79  *  257.07  *  242.28  *
* Vel Total (ft/s)        *    1.50  * Avg. Vel. (ft/s)        *    1.20  *    1.74  *    1.47  *
* Max Chl Dpth (ft)       *    1.51  * Hydr. Depth (ft)        *    0.64  *    1.17  *    0.88  *
* Conv. Total (cfs)       * 24186.3  * Conv. (cfs)             *  5818.7  * 11487.5  *  6880.1  *
* Length Wtd. (ft)        * 1442.16  * Wetted Per. (ft)        *  342.81  *  257.11  *  242.30  *
* Min Ch El (ft)          * 1332.56  * Shear (lb/sq ft)        *    0.08  *    0.15  *    0.11  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    0.10  *    0.26  *    0.17  *
* Frctn Loss (ft)         *    5.14  * Cum Volume (acre-ft)    *  119.72  *  136.35  *  150.98  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  133.31  *  117.06  *  221.92  *
*****************************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 3.118

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9584.18 1328.94 9613.58 1328.95  9635.4 1328.96  9679.5 1328.96 9686.63 1328.96
 9711.51 1328.96 9737.86 1328.95 9745.41 1328.95 9789.08 1328.91 9811.33 1328.87
 9840.31 1328.83 9877.24 1328.76 9891.54 1328.73 9941.38 1328.61 9942.76 1328.61
   10000 1327.5910028.36 1328.1210035.44 1328.2610055.06 1328.4210094.19 1328.39
10103.46 1328.3910144.21 1328.3810151.86 1328.3810194.24 1328.3710200.25 1328.37
10244.27 1328.3610248.65 1328.36 10294.3 1328.3510297.05 1328.3410344.33 1328.32
10345.45 1328.3210378.71 1328.3210393.85 1328.3210394.36 1328.3210442.24 1328.32
10444.38 1328.3210490.64 1328.3410494.41 1328.3410498.45 1328.3410553.63 1327.85
10567.52 1327.5110576.58 1327.3210616.07 1327.9710630.38 1328.28 10644.5 1328.54
10684.23 1328.6310694.53 1328.6510732.63 1328.7510744.56 1328.7810781.03 1328.88
10794.58 1328.9210829.43 1329.0410844.61 1329.0910877.83 1329.2210894.64 1329.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9584.18    .041 9941.38    .04110055.06    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.3810055.06             1150    1216    1150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1328.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1328.88  * Reach Len. (ft)         * 1150.00  * 1216.00  * 1150.00  *
* Crit W.S. (ft)          * 1328.64  * Flow Area (sq ft)       *   16.25  *   89.42  *  396.42  *
* E.G. Slope (ft/ft)      *0.007595  * Area (sq ft)            *   16.25  *   89.42  *  396.42  *
* Q Total (cfs)           * 1090.00  * Flow (cfs)              *   12.53  *  240.63  *  836.84  *
* Top Width (ft)          *  974.03  * Top Width (ft)          *  134.87  *  113.68  *  725.48  *
* Vel Total (ft/s)        *    2.17  * Avg. Vel. (ft/s)        *    0.77  *    2.69  *    2.11  *
* Max Chl Dpth (ft)       *    1.56  * Hydr. Depth (ft)        *    0.12  *    0.79  *    0.55  *
* Conv. Total (cfs)       * 12507.4  * Conv. (cfs)             *   143.7  *  2761.2  *  9602.5  *
* Length Wtd. (ft)        * 1167.03  * Wetted Per. (ft)        *  134.87  *  113.70  *  725.50  *
* Min Ch El (ft)          * 1327.59  * Shear (lb/sq ft)        *    0.06  *    0.37  *    0.26  *
* Alpha                   *    1.07  * Stream Power (lb/ft s)  *    0.04  *    1.00  *    0.55  *
* Frctn Loss (ft)         *    4.68  * Cum Volume (acre-ft)    *  115.92  *  129.55  *  141.20  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *  125.63  *  110.58  *  206.37  *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION
```

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 2.888

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9298.12	1324.3	9298.38	1324.3	9313.16	1324.3	9353	1324.24	9364.96	1324.22
9369.4	1324.21	9416.76	1324.09	9440.42	1324	9468.56	1323.89	9511.44	1323.7
9520.36	1323.66	9544.4	1323.56	9572.15	1323.46	9582.45	1323.43	9623.95	1323.3
9653.47	1323.25	9675.75	1323.2	9724.49	1323.15	9727.55	1323.15	9735.8	1323.15
9779.35	1323.14	9795.51	1323.14	9831.15	1323.15	9866.53	1323.17	9882.95	1323.17
9927.19	1323.2	9934.75	1323.2	9940.11	1323.18	9950.52	1323.12	10000	1322.82
10015.98	1322.98	10018.26	1323.01	10075.97	1323.48	10087.45	1323.51	10096.84	1323.53
10137.7	1323.63	10142.5	1323.64	10187.95	1323.75	10188.16	1323.75	10190.26	1323.75
10233.83	1323.84	10238.2	1323.85	10279.49	1323.91	10288.46	1323.93	10325.16	1323.99
10338.71	1324.01	10370.82	1324.07	10388.96	1324.11	10416.48	1324.18	10439.21	1324.24
10462.15	1324.32	10489.46	1324.43	10507.81	1324.51	10539.72	1324.65	10553.48	1324.71
10589.97	1324.89	10599.14	1324.94						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9298.12	.041	9927.19	.041	10075.97	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9927.19	10075.97	1250	1300	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1324.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1324.23	Reach Len. (ft)	1250.00	1300.00	1250.00
Crit W.S. (ft)		Flow Area (sq ft)	437.66	167.79	132.11
E.G. Slope (ft/ft)	0.002505	Area (sq ft)	437.66	167.79	132.11
Q Total (cfs)	1120.00	Flow (cfs)	667.28	329.73	122.99
Top Width (ft)	1075.96	Top Width (ft)	567.92	148.78	359.26
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	1.52	1.97	0.93
Max Chl Dpth (ft)	1.41	Hydr. Depth (ft)	0.77	1.13	0.37
Conv. Total (cfs)	22378.6	Conv. (cfs)	13332.8	6588.4	2457.4
Length Wtd. (ft)	1282.67	Wetted Per. (ft)	567.92	148.78	359.26
Min Ch El (ft)	1322.82	Shear (lb/sq ft)	0.12	0.18	0.06
Alpha	1.13	Stream Power (lb/ft s)	0.18	0.35	0.05
Frctn Loss (ft)	6.84	Cum Volume (acre-ft)	109.93	125.96	134.22
C & E Loss (ft)	0.01	Cum SA (acres)	116.35	106.92	192.05

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 2.642

INPUT
Description:
Station Elevation Data num= 81

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8760.07	1320.83	8783.87	1320.79	8817.77	1320.73	8866.26	1320.65	8880.68	1320.63
8927.26	1320.57	8943.59	1320.55	8948.65	1320.55	9006.5	1320.48	9031.04	1320.45
9069.41	1320.39	9113.43	1320.27	9132.31	1320.19	9193.27	1319.79	9195.22	1319.77
9195.82	1319.77	9258.13	1319.12	9278.22	1318.89	9321.04	1318.42	9360.61	1318.01
9383.95	1317.78	9443	1317.32	9446.85	1317.29	9459.29	1317.22	9509.76	1316.94
9525.39	1316.88	9572.67	1316.69	9607.78	1316.57	9635.58	1316.47	9690.18	1316.32
9694.89	1316.31	9698.48	1316.3	9725.31	1316.27	9761.39	1316.23	9772.57	1316.24
9824.3	1316.33	9854.96	1316.44	9887.21	1316.57	9937.35	1316.81	9944.59	1316.84
9962.18	1316.95	9970.59	1316.98	10000	1317.11	10031.53	1317.32	10042.97	1317.43
10049.2	1317.48	10053.7	1317.48	10057.13	1317.47	10059.81	1317.46	10060.98	1317.46
10061.93	1317.46	10104.34	1317.67	10110.44	1317.72	10154.78	1317.92	10160.49	1317.95
10206.95	1318.16	10210.53	1318.17	10259.11	1318.38	10260.57	1318.39	10295.07	1318.52
10310.61	1318.58	10311.27	1318.58	10360.65	1318.75	10363.43	1318.76	10410.69	1318.88
10415.59	1318.89	10460.73	1318.99	10467.75	1319	10510.77	1319.08	10519.91	1319.1

```
10560.82 1319.1810572.07  1319.210610.86 1319.2810624.23 1319.31 10660.9 1319.39
10676.39 1319.4310710.94 1319.5210728.55 1319.5710760.98 1319.6510780.71 1319.71
10811.02  1319.8

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8760.07    .041 9321.04    .04110259.11    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9321.0410259.11             1200    1276    1200            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1317.41  * Element               *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.18  * Wt. n-Val.             *          *    0.041 *          *
* W.S. Elev (ft)         * 1317.23  * Reach Len. (ft)       * 1200.00  * 1276.00  * 1200.00  *
* Crit W.S. (ft)         * 1317.11  * Flow Area (sq ft)     *          *   339.99 *          *
* E.G. Slope (ft/ft)     *0.017225  * Area (sq ft)          *          *   339.99 *          *
* Q Total (cfs)          * 1160.00  * Flow (cfs)            *          *  1160.00 *          *
* Top Width (ft)         *  559.63  * Top Width (ft)        *          *   559.63 *          *
* Vel Total (ft/s)       *    3.41  * Avg. Vel. (ft/s)      *          *     3.41 *          *
* Max Chl Dpth (ft)      *    1.00  * Hydr. Depth (ft)      *          *     0.61 *          *
* Conv. Total (cfs)      *  8838.6  * Conv. (cfs)           *          *   8838.6 *          *
* Length Wtd. (ft)       * 1275.46  * Wetted Per. (ft)      *          *   559.64 *          *
* Min Ch El (ft)         * 1316.23  * Shear (lb/sq ft)      *          *     0.65 *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s) *          *     2.23 *          *
* Frctn Loss (ft)        *    4.47  * Cum Volume (acre-ft)   *  103.65  *   118.38 *  132.33  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)         *  108.20  *    96.35 *  186.89  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 2.400

INPUT
Description:
Station Elevation Data    num=      96
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************
 8442.25 1313.87 8445.15 1313.87 8476.78 1313.84 8515.17 1313.81 8531.64  1313.8
 8564.31 1313.78 8590.92 1313.56 8597.29 1313.65 8605.93 1313.75 8619.52  1313.7
 8623.52 1313.66 8629.63 1313.69 8677.69 1313.69 8696.23 1313.68  8745.3 1313.63
 8751.09 1313.62 8758.13 1313.61 8805.95 1313.55 8845.34 1313.49 8860.82 1313.46
  8879.6 1313.43 8915.68 1313.36 8945.39  1313.3 8970.54 1313.25 9001.08 1313.18
 9025.41 1313.12 9045.44 1313.07 9080.27 1312.99 9122.56 1312.89 9135.13 1312.86
 9145.49 1312.83 9189.99 1312.73 9244.03 1312.59 9244.86 1312.59 9245.54 1312.59
 9299.72 1312.44 9345.58 1312.32 9354.58  1312.3 9365.51 1312.27 9409.45 1312.18
 9445.63 1312.11 9464.31 1312.08 9486.98 1312.04 9519.17 1311.98 9545.68 1311.93
 9574.03 1311.88 9608.46 1311.82  9628.9 1311.78 9645.73 1311.75 9683.76 1311.68
 9729.93 1311.61 9738.62  1311.6 9745.78 1311.59 9793.49 1311.54 9845.83  1311.5
 9848.35 1311.49 9851.41 1311.49 9903.21 1311.46 9945.87 1311.45 9961.56 1311.54
 9962.31 1311.56 9963.32 1311.59 9964.69 1311.63 9966.83 1311.69 9970.61  1311.8
   10000 1312.7210062.16 1311.62 10082.4 1311.7310112.46  1311.910138.88 1312.09
10162.76 1312.2710195.36 1312.5610213.05 1312.7210251.84 1313.0310263.35 1313.12
10308.32 1313.4210313.65 1313.4510357.03 1313.7310363.95 1313.78 10364.8 1313.78
10414.25 1314.0910421.28 1314.1410464.55 1314.4110477.76 1314.4810514.85 1314.68
10534.24 1314.7610565.14 1314.8910590.72 1314.9610615.44 1315.04 10647.2  1315.1
10665.74 1315.1410703.68 1315.1810716.04  1315.210760.16 1315.2310766.34 1315.24
10816.64 1315.25

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8442.25    .041 9299.72    .04110213.05    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9299.7210213.05             1500    1562    1500            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
```

* E.G. Elev (ft)	* 1312.89	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.03	* Wt. n-Val.	* 0.041	* 0.041	* 0.041 *
* W.S. Elev (ft)	* 1312.86	* Reach Len. (ft)	* 1500.00	* 1562.00	* 1500.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 34.01	* 871.29	* 1.27 *
* E.G. Slope (ft/ft)	*0.001495	* Area (sq ft)	* 34.01	* 871.29	* 1.27 *
* Q Total (cfs)	* 1200.00	* Flow (cfs)	* 16.59	* 1183.10	* 0.30 *
* Top Width (ft)	* 1096.70	* Top Width (ft)	* 165.56	* 913.33	* 17.81 *
* Vel Total (ft/s)	* 1.32	* Avg. Vel. (ft/s)	* 0.49	* 1.36	* 0.24 *
* Max Chl Dpth (ft)	* 1.41	* Hydr. Depth (ft)	* 0.21	* 0.95	* 0.07 *
* Conv. Total (cfs)	* 31036.8	* Conv. (cfs)	* 429.1	* 30599.8	* 7.9 *
* Length Wtd. (ft)	* 1559.87	* Wetted Per. (ft)	* 165.56	* 913.36	* 17.81 *
* Min Ch El (ft)	* 1311.45	* Shear (lb/sq ft)	* 0.02	* 0.09	* 0.01 *
* Alpha	* 1.04	* Stream Power (lb/ft s)	* 0.01	* 0.12	* 0.00 *
* Frctn Loss (ft)	* 6.11	* Cum Volume (acre-ft)	* 103.18	* 100.64	* 132.31 *
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 105.92	* 74.78	* 186.65 *

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 2.104

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9600.91	1307.18	9654.03	1306.98	9661.52	1306.95	9669.91	1306.86	9686.86	1306.85
9722.13	1306.72	9775.32	1306.51	9782.75	1306.48	9798.92	1306.41	9843.36	1306.23
9863.77	1306.16	9903.97	1306.01	9952.23	1305.85	9959.56	1305.83	9967.81	1305.82
9969.79	1305.86	9972.81	1305.87	9979.22	1305.87	10000	1305.88	10022.65	1305.81
10036.07	1305.78	10045.08	1305.75	10053.07	1305.73	10058.93	1305.71	10094.27	1305.76
10120.78	1305.78	10147.02	1305.82	10170.78	1305.85	10196.76	1305.91	10220.78	1305.96
10246.5	1306.01	10270.78	1306.06	10296.25	1306.11	10320.78	1306.16	10345.99	1306.21
10370.79	1306.26	10395.73	1306.31	10420.79	1306.34	10445.48	1306.37	10470.79	1306.41
10495.22	1306.44	10520.79	1306.46	10544.96	1306.49	10570.79	1306.52	10594.7	1306.55
10618.21	1306.57								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9600.91	.041	9843.36	.041	10345.99	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9843.36	10345.99	900	943	900	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1306.76	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.23	* Wt. n-Val.	* 0.041	* 0.041	* 0.041 *
* W.S. Elev (ft)	* 1306.53	* Reach Len. (ft)	* 900.00	* 943.00	* 900.00 *
* Crit W.S. (ft)	* 1306.53	* Flow Area (sq ft)	* 10.90	* 299.17	* 32.94 *
* E.G. Slope (ft/ft)	*0.023763	* Area (sq ft)	* 10.90	* 299.17	* 32.94 *
* Q Total (cfs)	* 1250.00	* Flow (cfs)	* 17.19	* 1182.64	* 50.17 *
* Top Width (ft)	* 806.85	* Top Width (ft)	* 72.71	* 502.63	* 231.51 *
* Vel Total (ft/s)	* 3.64	* Avg. Vel. (ft/s)	* 1.58	* 3.95	* 1.52 *
* Max Chl Dpth (ft)	* 0.82	* Hydr. Depth (ft)	* 0.15	* 0.60	* 0.14 *
* Conv. Total (cfs)	* 8108.8	* Conv. (cfs)	* 111.5	* 7671.8	* 325.4 *
* Length Wtd. (ft)	* 929.50	* Wetted Per. (ft)	* 72.71	* 502.63	* 231.51 *
* Min Ch El (ft)	* 1305.71	* Shear (lb/sq ft)	* 0.22	* 0.88	* 0.21 *
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 0.35	* 3.49	* 0.32 *
* Frctn Loss (ft)	* 0.15	* Cum Volume (acre-ft)	* 102.40	* 79.66	* 131.72 *
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 101.82	* 49.39	* 182.35 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 1.926

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8940.41	1305.56	8983.63	1305.46	9002.64	1305.41	9060.89	1305.25	9068.23	1305.23
9109.51	1305.1	9133.82	1305.03	9138.14	1305.02	9199.41	1304.83	9215.4	1304.79
9265	1304.63	9292.65	1304.54	9330.59	1304.41	9369.91	1304.26	9396.18	1304.16
9447.16	1303.94	9461.77	1303.87	9524.42	1303.61	9527.36	1303.6	9543.89	1303.53
9592.95	1303.31	9601.67	1303.28	9658.54	1303.03	9678.93	1302.95	9724.13	1302.76
9756.18	1302.63	9789.72	1302.5	9818.49	1302.25	9824.94	1302.27	9869.31	1301.85
9873.52	1301.74	9878.7	1301.62	9883.16	1301.44	9888.68	1301.27	9894.53	1301.1
9896.22	1301.06	9902.44	1300.97	9910.71	1300.93	9921.48	1300.85	9937.08	1300.8
9939.92	1300.82	9951.71	1300.92	9955.14	1300.95	9959.26	1300.99	9968.18	1301.07
9996.89	1301.5	9997.26	1301.5	10000	1301.5	10007.48	1301.53	10013.65	1301.57
10016.42	1301.59	10018.78	1301.61	10086.02	1302.07	10092.58	1301.87	10096.49	1301.8
10143.67	1300.79	10145.17	1301.04	10146.49	1301.21	10155.75	1302.28	10179.42	1305.21
10182.8	1305.52	10191.13	1304.02	10202.16	1302.12	10222.38	1302.21	10277.7	1302.37
10288.89	1302.44	10291.61	1302.45	10296.1	1302.42	10342.57	1302.58	10384.88	1302.71
10392.63	1302.73	10432.69	1302.85	10442.42	1302.96	10449.09	1303.81	10486.46	1303.99
10489.94	1304.81	10498.61	1306.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8940.41	.041	9818.49	.041	10086.02	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9818.49	10086.02	120	120	120	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1305.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.00	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1305.15	Reach Len. (ft)	120.00	120.00	120.00
Crit W.S. (ft)		Flow Area (sq ft)	942.17	972.33	1012.89
E.G. Slope (ft/ft)	0.000044	Area (sq ft)	942.17	972.33	1012.89
Q Total (cfs)	1280.00	Flow (cfs)	270.10	553.05	456.85
Top Width (ft)	1391.67	Top Width (ft)	724.56	267.53	399.58
Vel Total (ft/s)	0.44	Avg. Vel. (ft/s)	0.29	0.57	0.45
Max Chl Dpth (ft)	4.36	Hydr. Depth (ft)	1.30	3.63	2.53
Conv. Total (cfs)	192783.3	Conv. (cfs)	40679.7	83296.5	68807.1
Length Wtd. (ft)	120.00	Wetted Per. (ft)	724.57	267.55	400.31
Min Ch El (ft)	1300.80	Shear (lb/sq ft)	0.00	0.01	0.01
Alpha	1.20	Stream Power (lb/ft s)	0.00	0.01	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	92.56	65.89	120.92
C & E Loss (ft)	0.00	Cum SA (acres)	93.59	41.05	175.83

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 1.904

INPUT
Description: Hand generated cross section. Within floodplain of another wash.
Station Elevation Data num= 8

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9500	1305	9700	1304	9950	1303	9990	1297.39	10010	1297.39
10050	1303	10300	1304	10500	1305				

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9500    .041    9950    .041   10050    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9950   10050               65      65      65             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1305.14  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.02  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1305.12  * Reach Len. (ft)         *   20.00  *   20.00  *   20.00  *
* Crit W.S. (ft)          * 1300.80  * Flow Area (sq ft)       *  530.48  *  548.93  *  530.48  *
* E.G. Slope (ft/ft)      *0.000150  * Area (sq ft)            *  530.48  *  548.93  *  530.48  *
* Q Total (cfs)           * 1280.00  * Flow (cfs)              *  262.78  *  754.45  *  262.78  *
* Top Width (ft)          * 1000.00  * Top Width (ft)          *  450.00  *  100.00  *  450.00  *
* Vel Total (ft/s)        *    0.80  * Avg. Vel. (ft/s)        *    0.50  *    1.37  *    0.50  *
* Max Chl Dpth (ft)       *    7.73  * Hydr. Depth (ft)        *    1.18  *    5.49  *    1.18  *
* Conv. Total (cfs)       *104486.6  * Conv. (cfs)             * 21450.5  * 61585.6  * 21450.5  *
* Length Wtd. (ft)        *   20.00  * Wetted Per. (ft)        *  450.13  *  100.78  *  450.13  *
* Min Ch El (ft)          * 1297.39  * Shear (lb/sq ft)        *    0.01  *    0.05  *    0.01  *
* Alpha                   *    1.92  * Stream Power (lb/ft s)  *    0.01  *    0.07  *    0.01  *
* Frctn Loss (ft)         *    0.01  * Cum Volume (acre-ft)    *   90.53  *   63.80  *  118.79  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   91.97  *   40.55  *  174.66  *
*****************************************************************************************

Warning: The cross-section end points had to be extended vertically for the computed water surface.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

BRIDGE


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 1.898

INPUT
Description: 35' Bridge
Distance from Upstream XS =      20
Deck/Roadway Width        =      25
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*********************************************************************
    9200 1304.95          9982.49  1304.5    1300  9982.5  1304.5 1301.19
   10000 1304.43 1301.19 10017.5  1304.5 1301.1910017.51  1304.5    1298
   11000 1304.67

Upstream Bridge Cross Section Data
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    9500    1305    9700    1304    9950    1303    9990 1297.39   10010 1297.39
   10050    1303   10300    1304   10500    1305

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9500    .041    9950    .041   10050    .041

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9950   10050             .1       .3

Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*********************************************************************
    9200 1304.95          9982.49  1304.5    1298  9982.5  1304.5 1301.19
   10000 1304.43 1301.19 10017.5  1304.5 1301.1910017.51  1304.5    1296
   11000 1304.67

Downstream Bridge Cross Section Data
Station Elevation Data    num=       6
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    9700    1302    9900    1300    9990 1297.37   10010 1297.37   10100    1300
   10300    1302
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9700    .045    9900    .038   10100    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9900   10100            .1       .3

Upstream Embankment side slope              =       0 horiz. to 1.0 vertical
Downstream Embankment side slope            =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  1

Pier Data
Pier Station     Upstream=   10000    Downstream=   10000
Upstream     num=       2
    Width   Elev    Width   Elev
*******************************
       3    1300       3    1304
Downstream     num=       2
    Width   Elev    Width   Elev
*******************************
       3    1298       3    1302

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Energy Only

Additional Bridge Parameters
       Add Friction component to Momentum
       Do not add Weight component to Momentum
       Class B flow critical depth computations use critical depth
           inside the bridge at the upstream end
       Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. US. (ft)          *    1305.14  * Element                *Inside BR US *Inside BR DS *
* W.S. US. (ft)          *    1305.12  * E.G. Elev (ft)         *    1305.12  *    1302.93  *
* Q Total (cfs)          *    1280.00  * W.S. Elev (ft)         *    1304.93  *    1301.11  *
* Q Bridge (cfs)         *     621.69  * Crit W.S. (ft)         *    1304.93  *    1301.11  *
* Q Weir (cfs)           *             * Max Chl Dpth (ft)      *       7.54  *       3.74  *
* Weir Sta Lft (ft)      *             * Vel Total (ft/s)       *       2.94  *      10.84  *
* Weir Sta Rgt (ft)      *             * Flow Area (sq ft)      *     435.91  *     118.11  *
* Weir Submerg           *             * Froude # Chl           *       0.19  *       0.99  *
* Weir Max Depth (ft)    *             * Specif Force (cu ft)   *     820.52  *     648.79  *
* Min El Weir Flow (ft)  *    1304.44  * Hydr Depth (ft)        *       0.45  *       3.69  *
* Min El Prs (ft)        *    1301.19  * W.P. Total (ft)        *    1049.91  *      46.71  *
* Delta EG (ft)          *       3.76  * Conv. Total (cfs)      *    10031.9  *     8572.8  *
* Delta WS (ft)          *       3.81  * Top Width (ft)         *     972.13  *      32.00  *
* BR Open Area (sq ft)   *     114.14  * Frctn Loss (ft)        *       0.47  *       0.04  *
* BR Open Vel (ft/s)     *       5.45  * C & E Loss (ft)        *       0.16  *       0.53  *
* Coef of Q              *             * Shear Total (lb/sq ft) *       0.42  *       3.52  *
* Br Sel Method          *Energy only  * Power Total (lb/ft s)  *       1.24  *      38.14  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
```

```
valid,
        energy was used.
Warning: The energy equation could not be balanced within the specified number of iterations.  The
        program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
        additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
        0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
        depth, the calculated water surface came back below critical depth.  This indicates that there
is
        not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 1.892

INPUT
Description: Hand generated cross section.  Within floodplain of another wash.
Station Elevation Data    num=       6
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*******************************************************************************
    9700     1302     9900     1300     9990 1297.37    10010 1297.37    10100     1300
   10300     1302

Manning's n Values        num=       3
     Sta    n Val     Sta    n Val     Sta    n Val
*********************************************
    9700     .045     9900     .038    10100     .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9900   10100              360     360     360              .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1301.38  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)         * 1301.32  * Reach Len. (ft)         *  360.00  *  360.00  *  360.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   86.42  *  552.24  *   86.42  *
* E.G. Slope (ft/ft)     *0.000748  * Area (sq ft)            *   86.42  *  552.24  *   86.42  *
* Q Total (cfs)          * 1280.00  * Flow (cfs)              *   59.00  * 1162.01  *   59.00  *
* Top Width (ft)         *  462.94  * Top Width (ft)          *  131.47  *  200.00  *  131.47  *
* Vel Total (ft/s)       *    1.77  * Avg. Vel. (ft/s)        *    0.68  *    2.10  *    0.68  *
* Max Chl Dpth (ft)      *    3.94  * Hydr. Depth (ft)        *    0.66  *    2.76  *    0.66  *
* Conv. Total (cfs)      * 46805.4  * Conv. (cfs)             *  2157.3  * 42490.7  *  2157.3  *
* Length Wtd. (ft)       *  360.00  * Wetted Per. (ft)        *  131.48  *  200.08  *  131.48  *
* Min Ch El (ft)         * 1297.37  * Shear (lb/sq ft)        *    0.03  *    0.13  *    0.03  *
* Alpha                  *    1.30  * Stream Power (lb/ft s)  *    0.02  *    0.27  *    0.02  *
* Frctn Loss (ft)        *    0.62  * Cum Volume (acre-ft)    *   90.33  *   63.40  *  118.57  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   91.61  *   40.41  *  174.31  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
        0.7 or greater than 1.4.  This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 1.824

INPUT
Description: Directly downstream of SR-238.
Limit of Sudy.
Station Elevation Data    num=      70
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*******************************************************************************
 8962.47  1301.83  8965.18  1301.82   9010.3  1301.77  9044.38  1301.73  9063.02  1301.71
 9100.14  1301.65  9115.74  1301.63  9123.57  1301.61  9168.46  1301.54  9202.77  1301.45
 9221.18   1301.4  9257.83  1301.27   9273.9  1301.21  9281.97  1301.17  9326.62  1300.97
 9361.16   1300.8  9379.34   1300.7  9415.53  1300.53  9432.06  1300.45  9440.36  1300.41
 9484.78  1300.22  9519.56  1300.12   9537.5  1300.06  9573.23  1299.99  9590.22  1299.95
 9598.75  1299.94  9642.94  1299.88  9677.95  1299.84  9695.66  1299.81  9730.92  1299.77
 9748.38  1299.76  9757.14  1299.76   9801.1  1299.74  9836.34  1299.77  9853.82  1299.78
```

```
 9888.62 1299.83 9906.54 1299.85 9941.56  1299.9 9976.54 1298.72 9997.58 1297.44
   10000 1297.4910004.71 1297.58 10077.2 1299.6210085.12 1299.6510092.74 1299.57
10095.42 1299.5410120.08 1299.7610134.71 1299.8910161.43  1300.210202.54 1300.25
10211.45 1300.2610254.04 1300.3310261.47 1300.3510305.53 1300.4410311.49 1300.46
10357.02 1300.5610361.51 1300.5710408.51  1300.710411.53 1300.71   10460 1300.84
10461.63 1300.8510462.31 1300.8610511.56 1300.9510511.61 1300.9510514.11 1300.95
10561.59    130110562.99    130110611.61    130110614.48    130110649.99 1301.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8962.47    .045 9941.56    .03810161.43    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.5610161.43             1375    1425    1405             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1300.75  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.13  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)         * 1300.62  * Reach Len. (ft)         * 1375.00  * 1425.00  * 1405.00  *
* Crit W.S. (ft)         * 1300.31  * Flow Area (sq ft)       *  355.87  *  336.65  *   51.57  *
* E.G. Slope (ft/ft)     *0.004352  * Area (sq ft)            *  355.87  *  336.65  *   51.57  *
* Q Total (cfs)          * 1780.00  * Flow (cfs)              *  583.66  * 1153.29  *   43.05  *
* Top Width (ft)         *  981.97  * Top Width (ft)          *  544.72  *  219.87  *  217.38  *
* Vel Total (ft/s)       *    2.39  * Avg. Vel. (ft/s)        *    1.64  *    3.43  *    0.83  *
* Max Chl Dpth (ft)      *    3.18  * Hydr. Depth (ft)        *    0.65  *    1.53  *    0.24  *
* Conv. Total (cfs)      * 26982.6  * Conv. (cfs)             *  8847.6  * 17482.4  *   652.6  *
* Length Wtd. (ft)       * 1405.60  * Wetted Per. (ft)        *  544.72  *  219.96  *  217.38  *
* Min Ch El (ft)         * 1297.44  * Shear (lb/sq ft)        *    0.18  *    0.42  *    0.06  *
* Alpha                  *    1.49  * Stream Power (lb/ft s)  *    0.29  *    1.42  *    0.05  *
* Frctn Loss (ft)        *    5.51  * Cum Volume (acre-ft)    *   88.50  *   59.73  *  118.00  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   88.81  *   38.67  *  172.86  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 1.554

INPUT
Description:
Station Elevation Data    num=      98
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8995.33 1295.93  9001.2 1295.92 9037.38 1295.84 9067.51 1295.76  9092.3  1295.7
 9122.07  1295.6 9147.22 1295.53 9168.16 1295.46 9202.14 1295.34 9214.88  1295.3
 9242.94  1295.2 9257.06 1295.16 9268.81 1295.12 9311.98 1294.99 9363.81 1294.82
  9366.9 1294.81 9369.47 1294.81 9421.81 1294.67 9470.12 1294.59 9476.73 1294.57
 9484.68 1294.56 9531.65 1294.51 9570.77 1294.49 9586.57 1294.48 9605.55 1294.47
 9641.49 1294.46 9671.42 1294.47 9696.41 1294.47 9726.42 1294.47 9751.33 1294.47
 9805.85 1294.31 9809.94 1294.31 9834.39 1294.34 9846.08 1294.36 9850.56 1294.37
 9852.86 1294.37 9854.36 1294.37 9861.17 1294.36 9872.73 1294.34 9916.09 1294.29
 9944.96 1293.82 9950.21 1293.74 9957.97 1293.66    9986 1293.31  9998.4 1293.14
   10000 1293.18 10002.3 1293.2410059.38 1294.2410073.62 1294.2510088.37 1294.26
10123.62 1294.2810139.29 1294.2910173.63 1294.3110190.21 1294.3110223.64 1294.31
10241.13 1294.3210273.65 1294.3310292.04 1294.3310323.66 1294.3310342.96 1294.35
10373.66 1294.3610393.88 1294.3910423.67 1294.42 10444.8 1294.4510473.68  1294.5
10495.72 1294.5410523.69  1294.610546.64 1294.65 10573.7  1294.710597.56 1294.76
 10623.7 1294.8110648.48 1294.8710673.71 1294.9310699.39 1295.0110723.72 1295.08
10750.31 1295.1610773.73 1295.2410801.23 1295.3210823.74 1295.3910852.15 1295.45
10873.74 1295.5110903.07 1295.5610923.75  1295.610953.99 1295.6310973.76 1295.66
11004.91 1295.6611023.77 1295.6711055.83 1295.6711073.78 1295.6811106.74 1295.67
11123.78 1295.6711157.66 1295.6811173.79 1295.6911208.58 1295.69 11223.8  1295.7
 11259.5 1295.7411273.81 1295.7611310.42 1295.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8995.33    .045 9916.09    .03810059.38    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9916.0910059.38             1285    1371    1335             .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1295.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1295.16	Reach Len. (ft)	1285.00	1371.00	1335.00
Crit W.S. (ft)	1294.87	Flow Area (sq ft)	386.47	209.57	437.41
E.G. Slope (ft/ft)	0.003559	Area (sq ft)	386.47	209.57	437.41
Q Total (cfs)	1800.00	Flow (cfs)	534.04	629.84	636.12
Top Width (ft)	1490.65	Top Width (ft)	657.81	143.29	689.55
Vel Total (ft/s)	1.74	Avg. Vel. (ft/s)	1.38	3.01	1.45
Max Chl Dpth (ft)	2.02	Hydr. Depth (ft)	0.59	1.46	0.63
Conv. Total (cfs)	30172.8	Conv. (cfs)	8951.9	10557.8	10663.1
Length Wtd. (ft)	1337.84	Wetted Per. (ft)	657.81	143.31	689.55
Min Ch El (ft)	1293.14	Shear (lb/sq ft)	0.13	0.32	0.14
Alpha	1.47	Stream Power (lb/ft s)	0.18	0.98	0.20
Frctn Loss (ft)	4.63	Cum Volume (acre-ft)	76.78	50.80	110.11
C & E Loss (ft)	0.00	Cum SA (acres)	69.83	32.73	158.24

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 1.294

INPUT
Description:
Station Elevation Data num= 103

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9231.89	1290.66	9240.05	1290.62	9279.69	1290.61	9316.12	1290.58	9346.04	1290.57
9392.19	1290.55	9410.58	1290.36	9413.28	1290.25	9418.44	1289.98	9432.16	1289.26
9441.35	1288.96	9446.87	1288.97	9509.29	1290.34	9544.32	1290.24	9545.08	1290.24
9550.24	1290.22	9611.42	1290.02	9620.39	1289.99	9677.77	1289.88	9696.46	1289.86
9744.12	1289.79	9772.52	1289.74	9810.46	1289.67	9848.59	1289.58	9876.81	1289.51
9924.66	1289.4	9934.54	1289.37	9958.18	1288.98	9963.42	1288.87	9972.23	1288.69
9990.51	1288.32	9998.1	1288.18	9998.73	1288.18	9999.14	1288.18	10000	1288.18
10000.75	1288.18	10010.6	1288.24	10014.76	1288.34	10021.08	1288.41	10029.33	1288.57
10045.89	1288.88	10052.24	1288.88	10058.14	1288.91	10117.88	1289.89	10118.02	1289.89
10118.08	1289.89	10118.19	1289.89	10173.09	1290.09	10193.43	1290.11	10228.16	1290.15
10237.51	1290.15	10268.79	1290.15	10283.23	1290.16	10306.47	1290.14	10338.29	1290.13
10344.15	1290.12	10356.84	1290.11	10381.83	1290.08	10393.36	1290.07	10419.51	1290.06
10448.43	1290.05	10457.19	1290.05	10476.16	1290.04	10494.86	1290.03	10503.5	1290.02
10532.54	1290.01	10558.56	1290.01	10570.22	1290	10595.49	1290.03	10607.9	1290.04
10613.63	1290.04	10645.58	1290.07	10668.7	1290.09	10683.26	1290.11	10714.81	1290.14
10720.94	1290.14	10723.76	1290.14	10758.62	1290.21	10778.83	1290.23	10796.29	1290.24
10833.9	1290.29	10833.97	1290.29	10834.14	1290.29	10871.65	1290.32	10888.97	1290.34
10909.33	1290.38	10944.03	1290.43	10947.01	1290.43	10953.46	1290.45	10984.69	1290.52
10999.1	1290.55	11022.37	1290.59	11054.17	1290.72	11072.79	1290.78	11097.73	1290.85
11109.23	1290.91	11140.47	1291.03	11166.71	1291.28	11173.08	1291.17	11192.11	1291.27
11210.76	1291.37	11219.37	1291.41	11248.44	1291.57				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9231.89	.045	9876.81	.038	10117.88	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9876.81	10117.88	1350	1454	1380	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1290.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1290.51	Reach Len. (ft)	1350.00	1454.00	1380.00
Crit W.S. (ft)	1290.22	Flow Area (sq ft)	319.16	355.12	315.94
E.G. Slope (ft/ft)	0.003374	Area (sq ft)	319.16	355.12	315.94
Q Total (cfs)	1820.00	Flow (cfs)	465.73	1044.12	310.14
Top Width (ft)	1584.69	Top Width (ft)	480.84	241.07	862.78
Vel Total (ft/s)	1.84	Avg. Vel. (ft/s)	1.46	2.94	0.98
Max Chl Dpth (ft)	2.33	Hydr. Depth (ft)	0.66	1.47	0.37
Conv. Total (cfs)	31334.9	Conv. (cfs)	8018.5	17976.6	5339.7
Length Wtd. (ft)	1396.68	Wetted Per. (ft)	480.89	241.10	862.79
Min Ch El (ft)	1288.18	Shear (lb/sq ft)	0.14	0.31	0.08
Alpha	1.68	Stream Power (lb/ft s)	0.20	0.91	0.08

```
* Frctn Loss (ft)        *    7.24  * Cum Volume (acre-ft)   *   66.37  *   41.91  *   98.57  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *   53.04  *   26.69  *  134.45  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 1.019

INPUT
Description:
Station Elevation Data num= 118

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 8995.28 1283.75 9024.46  1283.7 9075.26 1283.63  9079.4 1283.62 9084.36 1283.61
 9134.34 1283.53 9176.11 1283.46 9189.28 1283.43 9205.03 1283.41 9244.22 1283.38
 9276.97 1283.35 9299.16 1283.33  9325.7 1283.32 9354.09 1283.33 9377.83 1283.33
 9409.03 1283.33 9446.37 1283.28 9463.97 1283.25 9478.69  1283.2 9518.91 1283.07
 9548.61 1282.67  9573.4  1282.2 9586.11    1282 9598.03 1281.82 9601.33 1281.86
 9609.22 1281.97 9683.73 1282.61  9687.7 1282.61 9738.66 1282.71 9781.26 1282.77
  9793.6 1282.79 9808.37 1282.81 9848.54 1282.85 9882.12  1282.9 9903.48 1282.93
 9929.04 1282.96 9949.23 1282.97 9968.74 1282.79 9972.94 1282.72 9981.31 1282.59
   10000 1282.2710000.06 1282.2710000.59 1282.2710002.08 1282.2710002.36 1282.27
10002.74 1282.2710006.43 1282.3110062.67    128310105.91 1283.0210113.08 1283.03
10161.71 1283.0310163.49 1283.0310163.75 1283.03 10213.9 1282.9910221.59 1282.99
10264.31 1282.9510279.42 1282.9410314.72 1282.9110341.98 1282.8610365.13 1282.84
 10395.1 1282.8110415.54  1282.810452.94 1282.7610465.95 1282.7410510.78 1282.72
10516.36 1282.7110554.25 1282.6810566.77 1282.6710610.02 1282.6510620.92 1282.65
10622.52 1282.6410625.65 1282.6210631.51  1282.610650.67 1282.5210653.53 1282.51
10671.25 1282.52   10718 1282.6510742.13 1282.6410768.41 1282.6510799.97 1282.67
10818.82 1282.68 10857.8 1282.7110869.23 1282.7210915.64 1282.7410919.64 1282.75
 10946.8 1282.7810970.05 1282.8110973.48 1282.8111020.46 1282.8511031.32 1282.86
11070.87 1282.8711089.16 1282.8911121.29  1282.911146.99 1282.91 11171.7 1282.93
11204.83 1282.9611222.11 1282.9611262.67 1283.0111272.52 1283.0211320.51 1283.12
11322.93 1283.1211339.34 1283.1811373.34 1283.2911378.35 1283.3111423.75 1283.48
11436.19 1283.5211474.16 1283.6711494.02 1283.7311524.57 1283.8411551.86  1283.9
11574.98 1283.96 11609.7    128411625.39 1284.0211667.54 1284.05 11675.8 1284.06
11725.38 1284.0611726.21 1284.0611731.89 1284.06
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8995.28    .045 9929.04    .03810105.91    .045
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9929.0410105.91             1395    1407    1250            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1283.34  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)         * 1283.28  * Reach Len. (ft)         * 1395.00  * 1407.00  * 1250.00  *
* Crit W.S. (ft)         * 1283.09  * Flow Area (sq ft)       *  278.92  *   90.63  *  562.78  *
* E.G. Slope (ft/ft)     *0.008907  * Area (sq ft)            *  278.92  *   90.63  *  562.78  *
* Q Total (cfs)          * 1840.00  * Flow (cfs)              *  603.33  *  214.15  * 1022.52  *
* Top Width (ft)         * 1923.33  * Top Width (ft)          *  482.31  *  176.87  * 1264.15  *
* Vel Total (ft/s)       *    1.97  * Avg. Vel. (ft/s)        *    2.16  *    2.36  *    1.82  *
* Max Chl Dpth (ft)      *    1.46  * Hydr. Depth (ft)        *    0.58  *    0.51  *    0.45  *
* Conv. Total (cfs)      * 19496.6  * Conv. (cfs)             *  6392.8  *  2269.1  * 10834.6  *
* Length Wtd. (ft)       * 1318.96  * Wetted Per. (ft)        *  482.33  *  176.88  * 1264.15  *
* Min Ch El (ft)         * 1282.27  * Shear (lb/sq ft)        *    0.32  *    0.28  *    0.25  *
* Alpha                  *    1.03  * Stream Power (lb/ft s)  *    0.70  *    0.67  *    0.45  *
* Frctn Loss (ft)        *    4.05  * Cum Volume (acre-ft)    *   57.11  *   34.47  *   84.65  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   38.12  *   19.71  *  100.76  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 0.752

INPUT
Description:
Station Elevation Data num= 97

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9523.79	1279.4	9536.05	1279.38	9580.71	1278.38	9589.9	1278.18	9609.5	1277.7
9648.52	1278.2	9701.24	1278.98	9726.92	1278.92	9756.3	1278.85	9781.46	1278.8
9811.37	1278.73	9846.29	1278.66	9866.43	1278.62	9883.67	1278.58	9921.49	1278.51
9940.31	1277.68	9944.06	1277.59	9980.35	1277.03	9987.75	1276.85	9992.7	1276.81
9995.25	1276.78	9996.19	1276.78	9999.2	1276.78	10000	1276.78	10000.13	1276.78
10000.98	1276.78	10003.08	1276.84	10077.52	1278.33	10080.82	1278.33	10119.15	1278.35
10132.16	1278.37	10160.79	1278.4	10183.5	1278.42	10202.42	1278.44	10234.84	1278.47
10244.06	1278.48	10283.63	1278.52	10285.7	1278.52	10286.18	1278.52	10327.33	1278.52
10337.52	1278.53	10368.97	1278.52	10388.86	1278.51	10410.61	1278.47	10440.2	1278.43
10452.24	1278.41	10491.54	1278.31	10493.88	1278.31	10503.92	1278.27	10535.52	1278.21
10542.88	1278.21	10577.15	1278.16	10594.22	1278.13	10618.79	1278.12	10645.56	1278.09
10673.03	1278.14	10676.62	1278.14	10683.19	1278.14	10708.03	1278.17	10712.97	1278.16
10718.57	1278.15	10723.05	1278.15	10746.95	1278.11	10749.52	1278.11	10755.55	1278.13
10770.56	1278.19	10785.76	1278.35	10793.7	1278.47	10798.29	1278.51	10822.48	1278.48
10850.92	1278.54	10868.61	1278.57	10902.26	1278.64	10910.24	1278.66	10944.49	1278.68
10951.88	1278.69	10953.6	1278.69	10993.51	1278.69	11004.94	1278.71	11035.15	1278.7
11056.28	1278.71	11076.79	1278.71	11107.62	1278.72	11118.42	1278.73	11158.96	1278.78
11160.06	1278.78	11164.78	1278.79	11201.69	1278.85	11210.3	1278.86	11243.33	1278.95
11261.64	1279	11284.97	1279.09	11312.98	1279.19	11326.6	1279.26	11364.32	1279.41
11368.24	1279.43	11385.06	1279.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9523.79	.045	9921.49	.038	10077.52	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9921.49	10077.52	1385	1479	1405	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1279.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1279.25	Reach Len. (ft)	1385.00	1479.00	1405.00
Crit W.S. (ft)	1278.81	Flow Area (sq ft)	251.15	277.15	926.80
E.G. Slope (ft/ft)	0.001547	Area (sq ft)	251.15	277.15	926.80
Q Total (cfs)	1860.00	Flow (cfs)	247.60	625.09	987.32
Top Width (ft)	1783.41	Top Width (ft)	379.75	156.03	1247.63
Vel Total (ft/s)	1.28	Avg. Vel. (ft/s)	0.99	2.26	1.07
Max Chl Dpth (ft)	2.47	Hydr. Depth (ft)	0.66	1.78	0.74
Conv. Total (cfs)	47289.0	Conv. (cfs)	6294.9	15892.4	25101.7
Length Wtd. (ft)	1423.73	Wetted Per. (ft)	379.78	156.07	1247.64
Min Ch El (ft)	1276.78	Shear (lb/sq ft)	0.06	0.17	0.07
Alpha	1.49	Stream Power (lb/ft s)	0.06	0.39	0.08
Frctn Loss (ft)	5.06	Cum Volume (acre-ft)	48.62	28.53	63.28
C & E Loss (ft)	0.01	Cum SA (acres)	24.31	14.33	64.72

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 4S1ES15A (F34)
REACH: REACH 1 RS: 0.548

INPUT
Description:
Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9407.36	1274.34	9441.25	1274.37	9460.98	1274.39	9491.36	1274.42	9514.59	1274.42
9541.47	1274.41	9568.21	1274.38	9591.58	1274.36	9621.82	1274.28	9641.68	1274.25
9675.44	1274.17	9691.79	1274.13	9729.06	1274.04	9741.9	1274.01	9782.67	1273.94

```
    9792 1273.92 9836.29 1273.86 9842.11 1273.85  9889.9 1273.82 9892.22 1273.81
 9925.27 1273.79 9942.32 1273.77 9944.78 1273.72 9947.04 1273.68 9964.35 1273.49
   10000 1273.0510000.35 1273.05 10000.7 1273.0710041.74 1273.6610042.32 1273.67
10042.47 1273.6710042.75 1273.6710087.56 1273.6810093.11 1273.6810132.54 1273.69
10143.46 1273.6910157.91 1273.8110169.31 1273.8610193.93 1273.8410197.74  1273.8
10215.11 1273.5910244.17 1273.6710267.48 1273.6510294.53 1273.6210312.47  1273.6
10344.88 1273.5410357.45 1273.5310395.24 1273.4710402.43 1273.46 10445.6 1273.42
10447.41 1273.4210462.61 1273.4310492.39 1273.4410495.95 1273.4410510.27 1273.41
10524.94 1273.3310577.94 1273.1310593.52 1273.1810647.02 1273.3810672.32 1273.36
10697.37 1273.36 10717.3 1273.3610747.73 1273.3710762.28 1273.3810798.09 1273.37
10807.27 1273.3810848.44 1273.4510852.25 1273.46 10884.1 1273.5310897.23 1273.57
 10898.8 1273.5710942.21  1273.710949.15 1273.7210987.19 1273.8310999.51 1273.86
11032.17 1273.9411049.87 1273.9611077.16 1273.9911100.22 1274.0111122.14 1274.04
11150.58 1274.0611186.73 1274.0811203.38 1274.1211204.75 1274.1211206.03 1274.12
11207.57 1274.1211209.59 1274.1211213.45 1274.1111218.43 1274.11 11224.7  1274.1
11253.61 1274.1511264.27 1274.1211277.45 1274.0811279.77 1274.0811292.98 1274.08
11296.15 1274.0811299.32 1274.0911302.39  1274.1 11308.2 1274.0911313.85 1274.08
 11326.9  1274.3 11335.6  1274.611336.63 1274.6311343.39  1274.8 11351.4 1274.84
11363.31 1274.7411373.69 1274.7411380.61 1274.7611384.09 1274.7711390.41 1274.75
11396.62 1274.7411402.62 1274.7411414.59 1274.9311422.45 1274.9611434.68 1275.25
11446.28  1275.411467.87 1275.2611472.78 1275.2311477.31 1275.1911481.25 1275.15
11488.89 1275.0911494.58 1275.0411499.12    127511502.05 1274.9811529.86 1274.87

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
 9407.36    .045 9925.27    .03810169.31    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9925.2710169.31             1285    1540    1635            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1274.22  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1274.11  * Reach Len. (ft)         * 1285.00  * 1540.00  * 1635.00  *
* Crit W.S. (ft)          * 1273.97  * Flow Area (sq ft)       *   44.48  *  129.68  *  541.96  *
* E.G. Slope (ft/ft)      *0.014800  * Area (sq ft)            *   44.48  *  129.68  *  541.96  *
* Q Total (cfs)           * 1880.00  * Flow (cfs)              *   60.63  *  404.70  * 1414.67  *
* Top Width (ft)          * 1558.07  * Top Width (ft)          *  224.98  *  244.04  * 1089.05  *
* Vel Total (ft/s)        *    2.63  * Avg. Vel. (ft/s)        *    1.36  *    3.12  *    2.61  *
* Max Chl Dpth (ft)       *    1.06  * Hydr. Depth (ft)        *    0.20  *    0.53  *    0.50  *
* Conv. Total (cfs)       * 15453.7  * Conv. (cfs)             *   498.4  *  3326.7  * 11628.7  *
* Length Wtd. (ft)        * 1515.52  * Wetted Per. (ft)        *  224.98  *  244.05  * 1089.05  *
* Min Ch El (ft)          * 1273.05  * Shear (lb/sq ft)        *    0.18  *    0.49  *    0.46  *
* Alpha                   *    1.06  * Stream Power (lb/ft s)  *    0.25  *    1.53  *    1.20  *
* Frctn Loss (ft)         *    3.26  * Cum Volume (acre-ft)    *   43.92  *   21.62  *   39.59  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   14.70  *    7.54  *   27.04  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 4S1ES15A (F34)
REACH: REACH 1            RS: 0.278

INPUT
Description:
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9094.18 1271.08 9109.06 1271.04 9109.49 1271.04 9109.75 1271.04 9168.23 1270.88
    9205  1270.8 9226.97 1270.74 9262.33 1270.59 9285.72  1270.5 9300.25 1270.43
 9344.46 1270.19  9395.5 1269.94 9403.21 1269.91  9415.6 1269.85 9461.95 1269.64
 9490.75 1269.52  9520.7 1269.41 9568.87 1269.24 9579.44  1269.2 9586.01 1269.19
 9638.18 1269.09 9681.26 1269.02 9696.93    1269 9722.15 1268.95 9755.67 1268.89
 9776.51 1268.84 9814.42 1268.76 9871.76 1268.61 9872.63 1268.61 9873.61 1268.62
  9874.8 1268.64  9935.3 1269.48 9943.28  1269.3 9945.56 1269.25 9948.88 1269.19
 9954.08  1269.1 9974.15 1268.69 9993.67  1268.5 9997.72 1268.48   10000 1268.49
 10016.7 1268.59 10029.1 1268.6410039.64 1268.6810049.12 1268.7210068.25 1268.91
10117.92  1269.410120.57  1269.410122.21  1269.410125.98  1269.410127.14  1269.4
10127.66  1269.410128.41  1269.410131.44 1269.3310189.63 1268.3610200.27 1268.37
```

```
10256.39 1268.4310275.74 1268.4810323.14 1268.6510351.21 1268.7910389.89 1269.01
10416.45 1269.4410419.96 1269.4610424.59 1269.5410431.16 1269.75   10440 1270.09
 10461.3 1270.5610470.18 1270.9210478.44 1271.0710486.06 1271.1510487.19 1271.11
10492.38 1270.9910500.14 1271.02 10512.9 1271.1410523.28 1271.3610531.93  1271.5
10539.55 1271.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9094.18    .045  9935.3    .03810117.92    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9935.310117.92             1300    1516    1375            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1270.94  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1270.89  * Reach Len. (ft)         * 1515.00  * 1515.00  * 1515.00  *
* Crit W.S. (ft)          * 1269.68  * Flow Area (sq ft)       * 1033.29  *  368.29  *  687.64  *
* E.G. Slope (ft/ft)      *0.001205  * Area (sq ft)            * 1033.29  *  368.29  *  687.64  *
* Q Total (cfs)           * 3470.00  * Flow (cfs)              * 1439.24  *  798.00  * 1232.76  *
* Top Width (ft)          * 1305.68  * Top Width (ft)          *  771.49  *  182.62  *  351.57  *
* Vel Total (ft/s)        *    1.66  * Avg. Vel. (ft/s)        *    1.39  *    2.17  *    1.79  *
* Max Chl Dpth (ft)       *    2.53  * Hydr. Depth (ft)        *    1.34  *    2.02  *    1.96  *
* Conv. Total (cfs)       * 99952.8  * Conv. (cfs)             * 41457.1  * 22986.3  * 35509.5  *
* Length Wtd. (ft)        * 1515.00  * Wetted Per. (ft)        *  771.50  *  182.63  *  351.61  *
* Min Ch El (ft)          * 1268.48  * Shear (lb/sq ft)        *    0.10  *    0.15  *    0.15  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)  *    0.14  *    0.33  *    0.26  *
* Frctn Loss (ft)         *    3.60  * Cum Volume (acre-ft)    *   28.02  *   12.82  *   16.52  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS25A (D31)
REACH: REACH 1            RS: 1.547

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      62
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**************************************************************************
 9580.38 1238.53  9582.7 1238.55 9606.77 1238.68 9620.35 1238.75 9649.61 1238.82
    9658 1238.84 9661.89 1238.84 9695.65  1238.8 9717.01 1238.72  9733.3 1238.64
  9768.4 1238.41 9770.95 1238.39 9772.13 1238.38  9808.6 1238.07 9827.25 1237.91
 9846.25 1237.71 9882.37 1237.37  9883.9 1237.35  9887.2 1237.32 9921.55 1237.02
 9948.81 1236.74 9976.26 1236.36 9991.73 1236.21 9995.51 1236.12 9998.47 1236.08
   10000 1236.1410006.87 1236.4510015.21 1236.8110022.55 1237.0410033.91 1237.19
10044.88 1237.2310060.45 1237.07 10072.2 1236.9310081.27 1236.8110089.39 1236.72
10130.37 1236.4210138.48 1236.4410146.78 1236.4710173.83 1236.5610200.24 1236.68
10209.19 1236.7310218.37 1236.7810244.55 1236.91 10270.1 1237.0810279.91 1237.14
10289.96 1237.2110315.27 1237.3910339.97 1237.5810350.62 1237.6710361.54 1237.78
10385.98 1238.0310409.83 1238.2810421.34  1238.410433.13 1238.53 10456.7 1238.79
 10479.7 1239.0510492.06 1239.1910504.72 1239.3110527.41 1239.5410549.57 1239.72
10562.77 1239.82 10576.3 1239.89

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9580.38    .045 9921.55    .03810033.91    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9921.5510033.91            1240    1301    1295            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1237.26  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.03  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1237.24  * Reach Len. (ft)         * 1240.00  * 1301.00  * 1295.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *    2.70  *   67.68  *  115.36  *
* E.G. Slope (ft/ft)      *0.003110  * Area (sq ft)            *    2.70  *   67.68  *  115.36  *
* Q Total (cfs)           *  230.00  * Flow (cfs)              *    1.13  *  105.25  *  123.62  *
* Top Width (ft)          *  397.08  * Top Width (ft)          *   24.86  *  112.36  *  259.86  *
```

* Vel Total (ft/s)	* 1.24	* Avg. Vel. (ft/s)	* 0.42	* 1.56	* 1.07	*
* Max Chl Dpth (ft)	* 1.16	* Hydr. Depth (ft)	* 0.11	* 0.60	* 0.44	*
* Conv. Total (cfs)	* 4124.0	* Conv. (cfs)	* 20.3	* 1887.1	* 2216.6	*
* Length Wtd. (ft)	* 1299.41	* Wetted Per. (ft)	* 24.86	* 112.39	* 259.87	*
* Min Ch El (ft)	* 1236.08	* Shear (lb/sq ft)	* 0.02	* 0.12	* 0.09	*
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 0.01	* 0.18	* 0.09	*
* Frctn Loss (ft)	* 6.58	* Cum Volume (acre-ft)	* 75.28	* 56.82	* 48.38	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 18.17	* 38.72	* 23.22	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS25A (D31)
REACH: REACH 1 RS: 1.300

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9568.31	1231.43	9570.06	1231.43	9578.26	1231.41	9621.29	1231.36	9648.63	1231.3
9672.52	1231.23	9690.52	1231.16	9723.75	1231.03	9732.41	1230.99	9771.21	1230.79
9774.29	1230.78	9774.98	1230.77	9816.18	1230.58	9826.21	1230.53	9858.07	1230.39
9877.44	1230.3	9899.95	1230.21	9928.66	1230.11	9941.84	1230.08	9978.01	1229.92
10000	1229.77	10000.6	1229.77	10012.13	1229.88	10058.35	1230.11	10093.36	1230.26
10094.56	1230.26	10095.33	1230.27	10130.77	1230.52	10154.63	1230.72	10166.98	1230.84
10186.36	1231.04	10203.19	1231.21	10213.93	1231.33	10239.4	1231.61	10273.23	1231.91
10275.61	1231.93	10279.35	1231.96	10311.82	1232.22	10332.53	1232.33	10348.04	1232.41
10372.34	1232.46	10384.25	1232.49	10391.84	1232.49	10420.46	1232.44	10451.14	1232.34
10456.67	1232.31	10465.34	1232.26						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9568.31	.045	9771.21	.03	10154.63	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9771.21	10154.63	1270	1305	1285	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1230.67	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.06	* Wt. n-Val.	*	* 0.038	* *
* W.S. Elev (ft)	* 1230.61	* Reach Len. (ft)	* 1270.00	* 1305.00	* 1285.00 *
* Crit W.S. (ft)	* 1230.44	* Flow Area (sq ft)	*	* 138.91	* *
* E.G. Slope (ft/ft)	*0.008476	* Area (sq ft)	*	* 138.91	* *
* Q Total (cfs)	* 280.00	* Flow (cfs)	*	* 280.00	* *
* Top Width (ft)	* 331.55	* Top Width (ft)	*	* 331.55	* *
* Vel Total (ft/s)	* 2.02	* Avg. Vel. (ft/s)	*	* 2.02	* *
* Max Chl Dpth (ft)	* 0.84	* Hydr. Depth (ft)	*	* 0.42	* *
* Conv. Total (cfs)	* 3041.4	* Conv. (cfs)	*	* 3041.4	* *
* Length Wtd. (ft)	* 1302.04	* Wetted Per. (ft)	*	* 331.55	* *
* Min Ch El (ft)	* 1229.77	* Shear (lb/sq ft)	*	* 0.22	* *
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.45	* *
* Frctn Loss (ft)	* 6.58	* Cum Volume (acre-ft)	* 75.24	* 53.74	* 46.66 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 17.82	* 32.09	* 19.36 *

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS25A (D31)
REACH: REACH 1 RS: 1.053

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
*******************************************************************************
 9554.02 1225.93 9568.65 1225.79 9575.14 1225.73 9608.56 1225.41 9627.52 1225.21
 9648.48 1225.01  9679.9 1224.68 9688.39 1224.61 9715.58 1224.35 9728.31 1224.23
 9732.29 1224.19 9768.22 1223.92 9784.67 1223.77 9808.14  1223.6 9837.05 1223.41
 9848.05 1223.36 9883.29 1223.19 9887.97 1223.17 9889.43 1223.17 9894.47 1223.19
 9941.51 1223.45 9977.08 1223.17 9998.64  1223.2   10000  1223.210018.82 1223.35
10031.57 1223.4810039.05 1223.5710044.03 1223.5910047.27 1223.5610101.44 1223.73
10105.33 1223.6910108.32 1223.6710126.19 1223.5910148.53 1223.6910173.75 1223.82
10183.95 1223.8710192.98 1223.9110219.37 1224.0110249.16 1224.1410254.79 1224.16
10259.77 1224.1810290.21 1224.2510324.57 1224.3110325.63 1224.3110326.57 1224.32
10361.05  1224.310393.36 1224.2810396.47 1224.2710399.98 1224.26

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9554.02    .045 9837.05    .03810044.03    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9837.0510044.03             1100    1178    1100             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1224.09  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)         * 1224.04  * Reach Len. (ft)         * 1100.00  * 1178.00  * 1100.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   28.15  *  152.18  *   54.68  *
* E.G. Slope (ft/ft)     *0.003679  * Area (sq ft)            *   28.15  *  152.18  *   54.68  *
* Q Total (cfs)          *  370.00  * Flow (cfs)              *   26.97  *  294.03  *   49.00  *
* Top Width (ft)         *  474.80  * Top Width (ft)          *   85.10  *  206.98  *  182.72  *
* Vel Total (ft/s)       *    1.57  * Avg. Vel. (ft/s)        *    0.96  *    1.93  *    0.90  *
* Max Chl Dpth (ft)      *    0.87  * Hydr. Depth (ft)        *    0.33  *    0.74  *    0.30  *
* Conv. Total (cfs)      *  6100.1  * Conv. (cfs)             *   444.7  *  4847.6  *   807.8  *
* Length Wtd. (ft)       * 1165.39  * Wetted Per. (ft)        *   85.10  *  206.98  *  182.73  *
* Min Ch El (ft)         * 1223.17  * Shear (lb/sq ft)        *    0.08  *    0.17  *    0.07  *
* Alpha                  *    1.27  * Stream Power (lb/ft s)  *    0.07  *    0.33  *    0.06  *
* Frctn Loss (ft)        *    8.72  * Cum Volume (acre-ft)    *   74.83  *   49.38  *   45.86  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   16.58  *   24.03  *   16.66  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS25A (D31)
REACH: REACH 1            RS: 0.830

INPUT
Description:
Station Elevation Data     num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9550.47 1218.45 9560.32 1218.43 9586.09 1218.31 9597.14 1218.26 9617.23 1218.12
 9633.96 1218.01 9643.15 1217.94 9670.78 1217.72  9700.2 1217.46 9707.59 1217.39
 9721.04 1217.26 9744.41 1217.06 9756.46 1217.07 9771.34 1217.06 9783.52  1217.1
 9804.27 1217.03 9831.51 1216.96 9883.83 1216.46 9927.61 1215.14 9928.34 1215.11
 9928.41 1215.11  9928.5 1215.11 9928.65 1215.11 9965.32 1214.63 9985.48 1214.26
   10000 1214.2210002.19 1214.2210017.19 1214.2410039.92 1214.3310072.16 1214.53
10077.66 1214.5810089.69  1214.610115.39 1214.8310127.13 1214.9110153.12  1215.3
 10182.1 1215.3610190.85 1215.41   10210 1215.4310228.59  1215.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9550.47    .045 9965.32    .03810077.66    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9965.3210077.66             1300    1322    1300             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1215.34  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.28  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)         * 1215.06  * Reach Len. (ft)         * 1300.00  * 1322.00  * 1300.00  *
* Crit W.S. (ft)         * 1215.06  * Flow Area (sq ft)       *    7.07  *   79.33  *   17.52  *
```

* E.G. Slope (ft/ft)	*0.020408	* Area (sq ft)	* 7.07	* 79.33	* 17.52	*
* Q Total (cfs)	* 400.00	* Flow (cfs)	* 11.98	* 351.44	* 36.58	*
* Top Width (ft)	* 204.70	* Top Width (ft)	* 32.87	* 112.34	* 59.48	*
* Vel Total (ft/s)	* 3.85	* Avg. Vel. (ft/s)	* 1.69	* 4.43	* 2.09	*
* Max Chl Dpth (ft)	* 0.84	* Hydr. Depth (ft)	* 0.22	* 0.71	* 0.29	*
* Conv. Total (cfs)	* 2800.0	* Conv. (cfs)	* 83.9	* 2460.0	* 256.1	*
* Length Wtd. (ft)	* 1315.51	* Wetted Per. (ft)	* 32.88	* 112.34	* 59.49	*
* Min Ch El (ft)	* 1214.22	* Shear (lb/sq ft)	* 0.27	* 0.90	* 0.38	*
* Alpha	* 1.20	* Stream Power (lb/ft s)	* 0.46	* 3.99	* 0.78	*
* Frctn Loss (ft)	* 5.53	* Cum Volume (acre-ft)	* 74.39	* 46.25	* 44.95	*
* C & E Loss (ft)	* 0.07	* Cum SA (acres)	* 15.09	* 19.71	* 13.61	*

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS25A (D31)
REACH: REACH 1 RS: 0.580

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9446.39	1209.98	9448.99	1209.97	9480.89	1209.83	9505.38	1209.71	9517.96	1209.64
9542.08	1209.5	9555.02	1209.42	9561.77	1209.38	9592.08	1209.18	9618.16	1209
9629.15	1208.92	9650.22	1208.76	9666.21	1208.63	9674.55	1208.56	9703.27	1208.35
9730.94	1208.13	9740.33	1208.06	9758.35	1207.95	9777.4	1207.82	9797.73	1208.27
9816.82	1208.57	9833.85	1208.86	9849.15	1208.51	9871.21	1208.08	9888.58	1207.42
9900.11	1207.4	9925.65	1207.41	9956.5	1207.46	9970.06	1207.78	9982.24	1208.18
9996.95	1208.7	10000	1208.671	0053.45	1208.111	0071.39	1207.921	0072.77	1207.92
10075.09	1207.931	0109.26	1208.02	10129.5	1208.121	0145.76	1208.16	10173.2	1208.34
10182.25	1208.41	0187.62	1208.431	0218.75	1208.641	0245.73	1208.791	0255.25	1208.87
10271.31	1208.961	0291.74	1209.091	0303.84	1209.161	0328.24	1209.341	0361.96	1209.55
10364.73	1209.571	0369.42	1209.61	0401.23	1209.811	0420.07	1209.921	0437.73	1210.01

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9446.39	.045	9833.85	.038	10000	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9833.85	10000	1425	1448	1410	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1208.85	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.03	* Wt. n-Val.	* 0.045	* 0.038	* 0.045	*
* W.S. Elev (ft)	* 1208.82	* Reach Len. (ft)	* 1425.00	* 1448.00	* 1410.00	*
* Crit W.S. (ft)	* 1208.36	* Flow Area (sq ft)	* 95.47	* 160.15	* 129.88	*
* E.G. Slope (ft/ft)	*0.002013	* Area (sq ft)	* 95.47	* 160.15	* 129.88	*
* Q Total (cfs)	* 490.00	* Flow (cfs)	* 89.55	* 275.95	* 124.51	*
* Top Width (ft)	* 603.42	* Top Width (ft)	* 189.47	* 164.47	* 249.48	*
* Vel Total (ft/s)	* 1.27	* Avg. Vel. (ft/s)	* 0.94	* 1.72	* 0.96	*
* Max Chl Dpth (ft)	* 1.42	* Hydr. Depth (ft)	* 0.50	* 0.97	* 0.52	*
* Conv. Total (cfs)	* 10922.4	* Conv. (cfs)	* 1996.0	* 6151.1	* 2775.3	*
* Length Wtd. (ft)	* 1441.41	* Wetted Per. (ft)	* 189.48	* 164.51	* 249.49	*
* Min Ch El (ft)	* 1207.40	* Shear (lb/sq ft)	* 0.06	* 0.12	* 0.07	*
* Alpha	* 1.28	* Stream Power (lb/ft s)	* 0.06	* 0.21	* 0.06	*
* Frctn Loss (ft)	* 7.57	* Cum Volume (acre-ft)	* 72.86	* 42.61	* 42.75	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 11.77	* 15.51	* 9.00	*

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS25A (D31)
REACH: REACH 1 RS: 0.305

INPUT
Description:
Station Elevation Data num= 47

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9448.98	1203.46	9479.36	1203.29	9497.76	1203.15	9533.53	1202.93	9535.99	1202.92
9541.89	1202.89	9574.23	1202.72	9587.7	1202.64	9612.46	1202.54	9641.87	1202.49
9650.7	1202.46	9671.89	1202.37	9688.93	1202.31	9696.03	1202.28	9727.17	1202.08
9750.2	1201.9	9765.4	1201.78	9801.9	1201.42	9803.64	1201.41	9804.37	1201.4
9841.88	1201.08	9858.53	1200.91	9880.11	1200.73	9912.7	1200.53	9923.78	1200.45
9938.71	1200.31	9951.75	1200.19	9961.11	1200.2	10000	1200.24	10031.37	1200.35
10066.61	1200.62	10086.61	1200.75	10102.34	1200.87	10123.42	1201.02	10138.06	1201.13
10148.99	1201.22	10173.79	1201.41	10207.02	1201.63	10209.52	1201.65	10211.38	1201.66
10245.25	1201.82	10273.76	1201.89	10280.97	1201.91	10290.63	1201.9	10316.7	1201.91
10336.15	1201.85								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9448.98	.045	9727.17	.038	10273.76	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9727.17	10273.76	1470	1540	1470	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1201.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.		0.038	
W.S. Elev (ft)	1201.02	Reach Len. (ft)	1470.00	1540.00	1470.00
Crit W.S. (ft)	1201.02	Flow Area (sq ft)		135.35	
E.G. Slope (ft/ft)	0.026876	Area (sq ft)		135.35	
Q Total (cfs)	540.00	Flow (cfs)		540.00	
Top Width (ft)	275.67	Top Width (ft)		275.67	
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)		3.99	
Max Chl Dpth (ft)	0.83	Hydr. Depth (ft)		0.49	
Conv. Total (cfs)	3293.9	Conv. (cfs)		3293.9	
Length Wtd. (ft)	1513.72	Wetted Per. (ft)		275.67	
Min Ch El (ft)	1200.19	Shear (lb/sq ft)		0.82	
Alpha	1.00	Stream Power (lb/ft s)		3.29	
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	71.29	37.70	40.64
C & E Loss (ft)	0.07	Cum SA (acres)	8.67	8.19	4.96

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS25A (D31)
REACH: REACH 1 RS: 0.014

INPUT
Description: Cross section within Waterman Wash floodplain.
Station Elevation Data num= 69

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9382.92	1192.76	9398.07	1192.68	9421.99	1192.56	9429.92	1192.52	9461.55	1192.36
9482.6	1192.26	9501.1	1192.18	9535.28	1192.05	9540.66	1192.03	9556.9	1191.97
9580.22	1191.89	9587.96	1191.87	9619.78	1191.77	9640.64	1191.72	9659.34	1191.67
9693.31	1191.57	9698.9	1191.57	9715.72	1191.52	9738.45	1191.47	9745.99	1191.45

```
 9778.01 1191.41 9798.67 1191.36 9817.57 1191.33 9851.35 1191.27 9857.13 1191.26
 9874.55 1191.24 9896.69 1191.21 9904.03  1191.2 9911.81 1190.73 9950.63 1190.22
 9952.34 1190.18  9955.2 1190.14 9958.28 1190.11 9964.09 1190.01 9969.55 1189.91
   10000 1188.7910008.87 1188.4510010.23 1188.4510015.61 1188.3910016.78 1188.38
10018.03 1188.3610019.23 1188.3310020.53 1188.3110022.04 1188.3110026.27 1188.33
10027.76 1188.39 10029.3  1188.410030.84  1188.510034.18 1188.6110036.33  1188.6
10037.82  1188.610060.99 1189.9510077.96 1190.9910084.48 1191.3510086.07 1191.36
10151.57  1191.610155.23 1191.6110159.12 1191.6310220.15 1191.9310225.97 1191.95
10232.17 1191.9610261.35 1192.0110288.73 1192.0410296.72 1192.0610305.23 1192.06
10332.09  1192.110357.31  1192.110367.46 1192.1110378.28  1192.1

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9382.92    .045 9896.69    .03810084.48    .045

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9896.6910084.48             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1199.52  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.00  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1199.52  * Reach Len. (ft)         *  660.00  *  660.00  *  660.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 3961.53  * 1829.50  * 2251.91  *
* E.G. Slope (ft/ft)      *0.000000  * Area (sq ft)            * 3961.53  * 1829.50  * 2251.91  *
* Q Total (cfs)           *  610.00  * Flow (cfs)              *  276.50  *  178.19  *  155.32  *
* Top Width (ft)          *  995.36  * Top Width (ft)          *  513.77  *  187.79  *  293.80  *
* Vel Total (ft/s)        *    0.08  * Avg. Vel. (ft/s)        *    0.07  *    0.10  *    0.07  *
* Max Chl Dpth (ft)       *   11.20  * Hydr. Depth (ft)        *    7.71  *    9.74  *    7.66  *
* Conv. Total (cfs)       *1116597.0  * Conv. (cfs)            *506125.6  *326168.6  *284303.0  *
* Length Wtd. (ft)        *  660.00  * Wetted Per. (ft)        *  520.53  *  187.93  *  301.22  *
* Min Ch El (ft)          * 1188.31  * Shear (lb/sq ft)        *    0.00  *    0.00  *    0.00  *
* Alpha                   *    1.08  * Stream Power (lb/ft s)   *    0.00  *    0.00  *    0.00  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *    4.45  *    2.97  *    2.65  *
* C & E Loss (ft)         *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************

CROSS SECTION


RIVER: 3S1WS25B (D32)
REACH: REACH 1            RS: 0.551

INPUT
Description: Limit of Sudy.
Station Elevation Data     num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9188.29 1208.14 9195.29 1208.16 9226.54 1208.22 9233.23 1208.23 9248.46 1208.24
 9271.18 1208.24 9281.15 1208.23 9309.12 1208.18 9335.76 1208.08 9347.07 1208.03
  9372.8 1207.85 9385.01 1207.77 9390.37 1207.72 9422.95 1207.41 9444.98 1207.17
  9460.9    1207 9497.14 1206.57 9498.84 1206.55 9499.59 1206.54 9536.79 1206.05
  9554.2 1205.85 9574.73 1205.56 9608.81 1205.15 9612.68  1205.1 9621.48 1205.01
 9650.62 1204.69 9663.42 1204.57 9688.57 1204.34 9718.03 1204.11 9726.51 1204.06
 9745.82 1203.94 9764.46 1203.82 9772.64 1203.76  9802.4 1203.65 9827.25 1203.54
 9840.34 1203.51 9870.16 1203.43 9878.29 1203.41 9881.86  1203.4 9916.23 1203.36
 9936.47 1203.35 9954.18 1203.34 9991.89  1204.5   10000 1204.4110001.78 1204.41
10005.83 1204.4210030.18 1203.94 10048.3 1203.7110063.87 1203.5410077.95 1203.59
10099.51 1203.6410116.23 1203.7110135.14 1203.7810159.51 1203.8910170.78 1203.92
10179.52 1203.9610206.41 1204.0510241.07 1204.1710242.05 1204.1710242.81 1204.18
10277.68 1204.25 10306.1 1204.3210313.32 1204.3310322.63 1204.3510348.96  1204.4
10369.39 1204.4510384.59 1204.4710404.19  1204.510420.23 1204.5310432.68 1204.55
10455.86 1204.5810485.75 1204.65 10491.5 1204.6610495.96 1204.6710527.14 1204.74
10559.25 1204.8310562.77 1204.8510567.31 1204.8710598.41 1204.9810622.54 1205.09
10634.04 1205.1610648.87 1205.2310669.68 1205.3410685.83 1205.4210705.31 1205.53
10730.43 1205.65

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9188.29    .045  9802.4    .03810116.23    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9802.410116.23              1335    1382    1355             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1204.26  * Element                 *  Left OB *  Channel * Right OB *
```

Vel Head (ft)	0.02	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1204.24	Reach Len. (ft)	1335.00	1382.00	1355.00
Crit W.S. (ft)		Flow Area (sq ft)	33.20	185.87	37.23
E.G. Slope (ft/ft)	0.001726	Area (sq ft)	33.20	185.87	37.23
Q Total (cfs)	270.00	Flow (cfs)	21.71	228.61	19.68
Top Width (ft)	538.75	Top Width (ft)	100.84	282.18	155.73
Vel Total (ft/s)	1.05	Avg. Vel. (ft/s)	0.65	1.23	0.53
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)	0.33	0.66	0.24
Conv. Total (cfs)	6498.3	Conv. (cfs)	522.6	5502.1	473.6
Length Wtd. (ft)	1374.66	Wetted Per. (ft)	100.84	282.20	155.73
Min Ch El (ft)	1203.34	Shear (lb/sq ft)	0.04	0.07	0.03
Alpha	1.20	Stream Power (lb/ft s)	0.02	0.09	0.01
Frctn Loss (ft)	7.04	Cum Volume (acre-ft)	41.70	31.79	40.56
C & E Loss (ft)	0.01	Cum SA (acres)	13.31	12.52	11.46

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS25B (D32)
REACH: REACH 1 RS: 0.289

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9151.88	1198.8	9155.27	1198.78	9181.45	1198.71	9198.2	1198.63	9232.3	1198.48
9241.12	1198.44	9283.14	1198.24	9284.05	1198.24	9289.02	1198.22	9326.98	1198.04
9333.98	1198.01	9369.91	1197.85	9384.82	1197.78	9412.84	1197.68	9435.66	1197.59
9455.77	1197.54	9486.51	1197.45	9498.7	1197.42	9537.35	1197.31	9541.63	1197.3
9564.84	1197.25	9584.56	1197.21	9588.19	1197.21	9627.49	1197.15	9639.03	1197.13
9670.42	1197.08	9689.88	1197.06	9713.34	1197.03	9740.72	1196.98	9756.27	1196.96
9791.56	1196.88	9799.2	1196.87	9840.67	1196.79	9842.13	1196.78	9842.4	1196.78
9885.06	1196.66	9893.25	1196.64	9927.99	1196.56	9944.71	1196.57	9950.72	1196.62
9963.25	1196.64	9993.18	1196.46	9993.49	1196.45	9994.49	1196.45	10000	1196.43
10005.61	1196.48	10047.26	1196.62	10056.13	1196.66	10082.99	1196.75	10118.47	1196.89
10118.72	1196.89	10119.06	1196.89	10154.46	1196.95	10180.82	1197	10190.19	1197.01
10202.76	1197.04	10225.92	1197.08	10243.16	1197.12	10261.65	1197.14	10286.47	1197.19
10297.38	1197.2	10305.51	1197.22	10333.11	1197.26	10367.85	1197.36	10368.84	1197.36
10370.17	1197.37	10404.57	1197.47	10430.2	1197.55	10440.3	1197.58	10453.87	1197.62
10476.04	1197.69	10492.54	1197.75	10511.77	1197.81	10537.58	1197.9	10547.5	1197.94
10554.89	1197.97	10583.23	1198.08						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9151.88	.045	9885.06	.038	10056.13	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9885.06 10056.13 1425 1506 1440 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1197.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1197.04	Reach Len. (ft)	1425.00	1506.00	1440.00
Crit W.S. (ft)	1197.04	Flow Area (sq ft)	30.70	80.51	23.63
E.G. Slope (ft/ft)	0.022889	Area (sq ft)	30.70	80.51	23.63
Q Total (cfs)	370.00	Flow (cfs)	47.01	288.20	34.80
Top Width (ft)	499.57	Top Width (ft)	180.88	171.07	147.62
Vel Total (ft/s)	2.74	Avg. Vel. (ft/s)	1.53	3.58	1.47
Max Chl Dpth (ft)	0.61	Hydr. Depth (ft)	0.17	0.47	0.16
Conv. Total (cfs)	2445.6	Conv. (cfs)	310.7	1904.9	230.0
Length Wtd. (ft)	1471.75	Wetted Per. (ft)	180.88	171.07	147.62
Min Ch El (ft)	1196.43	Shear (lb/sq ft)	0.24	0.67	0.23
Alpha	1.39	Stream Power (lb/ft s)	0.37	2.41	0.34
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	40.72	27.56	39.61
C & E Loss (ft)	0.05	Cum SA (acres)	9.00	5.33	6.74

Warning: The energy equation could not be balanced within the specified number of iterations. The

```
        program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
        0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
        depth, the calculated water surface came back below critical depth.  This indicates that there
is
        not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS25B (D32)
REACH: REACH 1            RS: 0.004

INPUT
Description: Cross section within Waterman Wash floodplain.
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9581.36 1189.98 9590.88 1189.93 9600.49 1189.89 9639.79 1189.62  9650.5 1189.54
  9688.7 1189.23 9700.51 1189.13 9737.61 1188.79 9750.53 1188.67 9786.52 1188.37
 9800.54 1188.25 9835.43 1188.04 9850.55 1187.93 9884.34 1187.85 9900.57 1187.77
 9933.25 1187.77 9950.58 1187.75 9980.22  1185.3 9997.42 1183.26   10000 1183.14
10006.94 1183.0410009.03 1183.0110015.88 1183.1310019.89 1183.1710027.51 1183.36
 10031.4 1183.3910053.09 1184.3810065.36 1184.7110077.23  1184.910087.97 1184.98
10098.44 1184.9610106.72 1184.7910116.37 1184.5310139.35 1184.2910148.26  1184.3
10153.18  1184.5 10181.5 1186.1610185.42 1186.3710187.91 1186.5110192.21 1186.65
10195.38 1186.7310198.16 1186.8110201.97 1186.9910251.05 1186.4510258.08 1186.66
10263.54 1186.8110295.78 1188.0810307.74 1188.0910317.02 1188.0910348.32 1186.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 9581.36    .045 9950.58    .03810087.97    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.5810087.97               50      57      50             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)          * 1195.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.00  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1195.21  * Reach Len. (ft)         *  660.00  *  660.00  *  660.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 2418.65  * 1465.15  * 2328.98  *
* E.G. Slope (ft/ft)      *0.000000  * Area (sq ft)            * 2418.65  * 1465.15  * 2328.98  *
* Q Total (cfs)           *  420.00  * Flow (cfs)              *  132.51  *  132.62  *  154.88  *
* Top Width (ft)          *  766.96  * Top Width (ft)          *  369.22  *  137.39  *  260.35  *
* Vel Total (ft/s)        *    0.07  * Avg. Vel. (ft/s)        *    0.05  *    0.09  *    0.07  *
* Max Chl Dpth (ft)       *   12.20  * Hydr. Depth (ft)        *    6.55  *   10.66  *    8.95  *
* Conv. Total (cfs)       *877974.4  * Conv. (cfs)             *276992.7  *277225.6  *323756.0  *
* Length Wtd. (ft)        *  660.00  * Wetted Per. (ft)        *  374.46  *  137.65  *  269.63  *
* Min Ch El (ft)          * 1183.01  * Shear (lb/sq ft)        *    0.00  *    0.00  *    0.00  *
* Alpha                   *    1.13  * Stream Power (lb/ft s)  *    0.00  *    0.00  *    0.00  *
* Frctn Loss (ft)         *          * Cum Volume (acre-ft)    *    0.66  *    0.85  *    0.72  *
* C & E Loss (ft)         *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************************

CROSS SECTION


RIVER: 3S1WS26 (D33)
REACH: REACH 1            RS: 2.227

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      84
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8786.56 1245.91 8799.58 1245.78  8815.6 1245.63 8849.43 1245.35 8868.12 1245.19
 8876.96 1245.13 8920.64 1244.86 8954.35 1244.72 8973.15 1244.66 9012.87 1244.58
 9025.67 1244.56 9031.73 1244.56 9078.19 1244.56 9109.12 1244.57 9130.71 1244.59
 9176.31  1244.6 9183.23  1244.6  9186.5  1244.6 9235.74 1244.59 9263.88 1244.54
 9293.77 1243.85 9296.11 1243.79 9317.79 1243.81 9354.76 1243.29 9384.69 1242.81
 9394.43 1242.89 9427.38 1242.14  9428.4 1242.14  9428.8 1242.14 9469.11 1242.32
 9489.89 1242.54 9524.32 1243.12 9537.62 1243.32 9546.36 1243.42 9550.89 1243.43
 9573.42 1243.72 9603.37 1243.59  9650.8 1243.48 9655.89 1243.45 9666.63  1243.4
```

```
 9708.41 1243.21 9728.19 1243.15 9760.92 1243.04 9805.57  1242.9 9813.44 1242.87
 9830.06 1242.82 9865.96 1242.72 9882.96 1242.67 9918.48 1242.58 9945.29 1242.75
 9962.12 1242.84 9996.75 1243.19   10000 1243.1710033.45 1242.8610076.23  1242.7
10098.45  1242.810128.89 1242.9310165.69 1243.1110177.61 1243.1710181.55 1243.19
10217.19 1243.3610234.21 1243.4410256.77 1243.5410286.87 1243.6810296.35 1243.73
10325.04 1243.8810335.93 1243.9410339.53 1243.9610375.51 1244.1710392.19 1244.28
10415.09 1244.4210444.85 1244.6210454.67 1244.68 10484.4 1244.8510494.25  1244.9
10497.51 1244.9210533.83 1245.0710550.17 1245.1510573.41 1245.2310602.83 1245.34
10612.99 1245.3710643.76 1245.4710652.57  1245.510655.49 1245.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8786.56    .045 9760.92    .03810165.69    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9760.9210165.69             1360    1386    1375             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1244.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1244.45  * Reach Len. (ft)         * 1360.00  * 1386.00  * 1375.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  619.31  *  647.84  *  180.63  *
* E.G. Slope (ft/ft)      *0.004414  * Area (sq ft)            *  619.31  *  647.84  *  180.63  *
* Q Total (cfs)           * 4200.00  * Flow (cfs)              * 1581.36  * 2302.86  *  315.77  *
* Top Width (ft)          * 1151.85  * Top Width (ft)          *  493.16  *  404.77  *  253.92  *
* Vel Total (ft/s)        *    2.90  * Avg. Vel. (ft/s)        *    2.55  *    3.55  *    1.75  *
* Max Chl Dpth (ft)       *    2.31  * Hydr. Depth (ft)        *    1.26  *    1.60  *    0.71  *
* Conv. Total (cfs)       * 63217.0  * Conv. (cfs)             * 23802.1  * 34661.9  *  4752.9  *
* Length Wtd. (ft)        * 1378.75  * Wetted Per. (ft)        *  493.19  *  404.78  *  253.93  *
* Min Ch El (ft)          * 1242.58  * Shear (lb/sq ft)        *    0.35  *    0.44  *    0.20  *
* Alpha                   *    1.14  * Stream Power (lb/ft s)  *    0.88  *    1.57  *    0.34  *
* Frctn Loss (ft)         *    7.29  * Cum Volume (acre-ft)    *   83.06  *  166.25  *   75.25  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)          *   61.31  *   68.86  *   63.20  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS26 (D33)
REACH: REACH 1            RS: 1.965

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9481.22 1237.66 9491.13 1237.62 9529.02 1237.52 9579.63 1237.14 9583.41 1237.12
 9586.24 1237.09  9637.8 1236.63 9681.34 1236.25 9692.19 1236.16 9706.67 1236.05
 9746.57 1235.72 9776.45 1235.51 9800.96 1235.34 9833.72 1235.15 9855.35 1235.02
 9871.55 1234.96 9909.74 1234.82  9937.1 1234.76 9956.08 1234.79 9988.61 1234.75
 9999.49 1234.85   10000 1234.8510037.01  1234.910067.74 1234.9110072.73 1234.93
10106.94 1235.1410116.82  1235.210118.27 1235.2110160.92 1235.54 10168.8  1235.6
10205.01 1235.8910219.33    123610249.11 1236.2210269.85 1236.37 10293.2  1236.5
10320.38 1236.65 10337.3 1236.7110370.91 1236.8410381.39 1236.8710421.44 1236.98
10425.49 1236.99 10453.2 1237.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9481.22    .045 9800.96    .03810118.27    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9800.9610118.27             1365    1378    1345             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1237.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1236.97  * Reach Len. (ft)         * 1365.00  * 1378.00  * 1345.00  *
* Crit W.S. (ft)          * 1236.57  * Flow Area (sq ft)       *  172.07  *  644.19  *  215.49  *
* E.G. Slope (ft/ft)      *0.006471  * Area (sq ft)            *  172.07  *  644.19  *  215.49  *
* Q Total (cfs)           * 4120.00  * Flow (cfs)              *  411.67  * 3248.86  *  459.47  *
* Top Width (ft)          *  818.22  * Top Width (ft)          *  201.30  *  317.31  *  299.62  *
```

* Vel Total (ft/s)	*	3.99	* Avg. Vel. (ft/s)	*	2.39	*	5.04	*	2.13	*
* Max Chl Dpth (ft)	*	2.22	* Hydr. Depth (ft)	*	0.85	*	2.03	*	0.72	*
* Conv. Total (cfs)	*	51216.1	* Conv. (cfs)	*	5117.5	*	40386.8	*	5711.7	*
* Length Wtd. (ft)	*	1373.02	* Wetted Per. (ft)	*	201.30	*	317.31	*	299.62	*
* Min Ch El (ft)	*	1234.75	* Shear (lb/sq ft)	*	0.35	*	0.82	*	0.29	*
* Alpha	*	1.33	* Stream Power (lb/ft s)	*	0.83	*	4.14	*	0.62	*
* Frctn Loss (ft)	*	7.25	* Cum Volume (acre-ft)	*	70.71	*	145.70	*	68.99	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	50.47	*	57.37	*	54.46	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS26 (D33)
REACH: REACH 1 RS: 1.704

INPUT
Description:
Station Elevation Data num= 44

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9585.58	1229.97	9603.39	1229.88	9630.04	1229.75	9676.61	1229.42	9683.25	1229.37
9687.06	1229.34	9736.46	1228.91	9770.73	1228.61	9789.67	1228.44	9822.77	1228.15
9842.88	1227.98	9854.4	1227.9	9896.1	1227.6	9938.07	1227.4	9949.31	1227.36
9954.49	1227.34	9960.64	1227.33	9997.51	1227.41	10000	1227.4	10032.3	1227.29
10059.5	1227.35	10083.39	1227.45	10116.31	1227.62	10120.3	1227.64	10127.7	1227.69
10157.2	1227.86	10173.12	1227.96	10194.11	1228.11	10229.93	1228.36	10231.01	1228.37
10233.02	1228.38	10267.91	1228.65	10286.74	1228.81	10304.82	1228.96	10338.33	1229.24
10341.72	1229.26	10343.55	1229.28	10378.62	1229.54	10400.36	1229.69	10415.53	1229.79
10443.65	1229.94	10452.43	1229.99	10457.17	1230.02	10489.34	1230.16		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9585.58	.045	9854.4	.038	10173.12	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9854.4	10173.12	1280	1301	1290	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1230.03	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.25	* Wt. n-Val.	*	0.045	*	0.038	*	0.045	*
* W.S. Elev (ft)	*	1229.77	* Reach Len. (ft)	*	1280.00	*	1301.00	*	1290.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	207.29	*	716.44	*	217.31	*
* E.G. Slope (ft/ft)	*	0.004378	* Area (sq ft)	*	207.29	*	716.44	*	217.31	*
* Q Total (cfs)	*	4050.00	* Flow (cfs)	*	424.12	*	3180.96	*	444.92	*
* Top Width (ft)	*	787.04	* Top Width (ft)	*	228.74	*	318.72	*	239.58	*
* Vel Total (ft/s)	*	3.55	* Avg. Vel. (ft/s)	*	2.05	*	4.44	*	2.05	*
* Max Chl Dpth (ft)	*	2.48	* Hydr. Depth (ft)	*	0.91	*	2.25	*	0.91	*
* Conv. Total (cfs)	*	61206.1	* Conv. (cfs)	*	6409.6	*	48072.6	*	6723.9	*
* Length Wtd. (ft)	*	1298.40	* Wetted Per. (ft)	*	228.75	*	318.72	*	239.59	*
* Min Ch El (ft)	*	1227.29	* Shear (lb/sq ft)	*	0.25	*	0.61	*	0.25	*
* Alpha	*	1.30	* Stream Power (lb/ft s)	*	0.51	*	2.73	*	0.51	*
* Frctn Loss (ft)	*	7.19	* Cum Volume (acre-ft)	*	64.77	*	124.17	*	62.31	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	43.73	*	47.31	*	46.14	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS26 (D33)
REACH: REACH 1 RS: 1.457

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9655.97	1222.92	9666.77	1222.86	9692.02	1222.69	9713.15	1222.51	9742.19	1222.26
9759.52	1222.05	9792.35	1221.68	9805.89	1221.5	9842.52	1221.07	9852.26	1220.96

```
 9892.69 1220.53 9898.64 1220.47 9942.85 1220.16 9949.49 1220.16 9951.55 1220.15
 9955.69 1220.14 9969.14 1220.12 9999.66 1220.05   10000 1220.0510018.72 1220.01
10044.85 1220.0710073.11 1220.2210096.95 1220.3610113.41 1220.4910149.05 1220.78
10153.71 1220.8310169.61 1220.9710194.01 1221.1910201.15 1221.2610234.31 1221.56
10253.25 1221.72 10274.6 1221.8910305.35 1222.13 10314.9  1222.210347.52 1222.42
 10355.2 1222.4710357.45 1222.49 10395.5 1222.7110409.55 1222.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9655.97    .045 9852.26    .03810169.61    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9852.2610169.61             1290    1268    1200             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1222.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.41  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1222.41  * Reach Len. (ft)         * 1290.00  * 1268.00  * 1200.00  *
* Crit W.S. (ft)          * 1222.05  * Flow Area (sq ft)       *   89.72  *  651.66  *  119.77  *
* E.G. Slope (ft/ft)      *0.007270  * Area (sq ft)            *   89.72  *  651.66  *  119.77  *
* Q Total (cfs)           * 3970.00  * Flow (cfs)              *  199.66  * 3510.11  *  260.23  *
* Top Width (ft)          *  621.69  * Top Width (ft)          *  127.68  *  317.35  *  176.66  *
* Vel Total (ft/s)        *    4.61  * Avg. Vel. (ft/s)        *    2.23  *    5.39  *    2.17  *
* Max Chl Dpth (ft)       *    2.40  * Hydr. Depth (ft)        *    0.70  *    2.05  *    0.68  *
* Conv. Total (cfs)       * 46560.5  * Conv. (cfs)             *  2341.6  * 41166.9  *  3052.0  *
* Length Wtd. (ft)        * 1264.89  * Wetted Per. (ft)        *  127.69  *  317.36  *  176.67  *
* Min Ch El (ft)          * 1220.01  * Shear (lb/sq ft)        *    0.32  *    0.93  *    0.31  *
* Alpha                   *    1.23  * Stream Power (lb/ft s)   *    0.71  *    5.02  *    0.67  *
* Frctn Loss (ft)         *    6.76  * Cum Volume (acre-ft)     *   60.40  *  103.74  *   57.32  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *   38.49  *   37.81  *   39.97  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS26 (D33)
REACH: REACH 1            RS: 1.217

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9607.56 1216.25 9613.45 1216.21 9634.18 1216.07 9664.75 1215.85 9675.91 1215.78
 9716.05 1215.51 9717.63  1215.5 9724.48 1215.46 9759.35 1215.27 9767.35 1215.21
 9801.07 1215.07 9818.65 1214.94 9842.79 1214.84 9869.95  1214.5 9884.51 1214.27
 9921.26 1213.81 9926.23  1213.7 9996.41 1213.64 9999.87 1213.69   10000 1213.69
10018.03 1213.1610044.08 1212.4210065.07 1212.3910079.87 1212.3310090.66 1212.42
10115.65 1212.7310149.93  1213.110151.44 1213.1210152.54 1213.1410187.23 1213.81
10214.42 1214.1410223.01 1214.2210234.79 1214.42 10258.8 1214.8610276.31    1215
10294.58 1215.1910319.65 1215.3810330.37 1215.4710338.19 1215.5410366.16 1215.71
10400.07 1215.8710401.94 1215.8810404.51 1215.8910437.73    1216

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9607.56    .045 9921.26    .03810187.23    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9921.2610187.23             1280    1310    1260             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1216.04  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.30  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1215.73  * Reach Len. (ft)         * 1280.00  * 1310.00  * 1260.00  *
* Crit W.S. (ft)          * 1214.99  * Flow Area (sq ft)       *  186.12  *  696.64  *  148.90  *
* E.G. Slope (ft/ft)      *0.004075  * Area (sq ft)            *  186.12  *  696.64  *  148.90  *
* Q Total (cfs)           * 3910.00  * Flow (cfs)              *  332.85  * 3304.14  *  273.01  *
* Top Width (ft)          *  687.67  * Top Width (ft)          *  238.16  *  265.97  *  183.53  *
* Vel Total (ft/s)        *    3.79  * Avg. Vel. (ft/s)        *    1.79  *    4.74  *    1.83  *
* Max Chl Dpth (ft)       *    3.40  * Hydr. Depth (ft)        *    0.78  *    2.62  *    0.81  *
* Conv. Total (cfs)       * 61248.0  * Conv. (cfs)             *  5213.9  * 51757.6  *  4276.6  *
```

* Length Wtd. (ft)	* 1300.46	* Wetted Per. (ft)	* 238.17	* 266.00	* 183.55	*
* Min Ch El (ft)	* 1212.33	* Shear (lb/sq ft)	* 0.20	* 0.67	* 0.21	*
* Alpha	* 1.36	* Stream Power (lb/ft s)	* 0.36	* 3.16	* 0.38	*
* Frctn Loss (ft)	* 5.50	* Cum Volume (acre-ft)	* 56.32	* 84.12	* 53.62	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 33.08	* 29.32	* 35.01	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS26 (D33)
REACH: REACH 1 RS: 0.969

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9521.61	1210.58	9528.48	1210.56	9531.31	1210.56	9557.84	1210.47	9576.74	1210.41
9578.76	1210.39	9622.17	1210.18	9629.05	1210.13	9637.58	1210.06	9679.33	1209.8
9713.02	1209.59	9729.62	1209.47	9758.44	1209.28	9779.9	1209.12	9803.87	1208.94
9830.19	1208.74	9849.3	1208.58	9880.47	1208.36	9894.72	1208.24	9930.76	1208.02
9940.15	1207.95	9985.46	1207.38	9996.45	1207.33	10000	1207.35	10016.52	1207.46
10045.76	1207.67	10051.87	1207.71	10062.22	1207.75	10064.07	1207.78	10067.1	1207.82
10071.56	1207.85	10113.68	1208.19	10126.22	1208.19	10147.79	1208.21	10153.32	1208.23
10158.84	1208.21	10191.75	1208.58	10200.86	1208.69	10218.75	1209.07	10238.68	1209.28
10253.6	1209.44	10274.4	1209.65	10302.15	1209.96	10310.11	1210.04	10316.07	1210.11
10345.83	1210.41	10378.55	1210.77	10381.55	1210.81	10385.55	1210.84		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9521.61	.045	9894.72	.038	10113.68	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9894.72	10113.68	1300	1326	1330	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1210.53	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.26	* Wt. n-Val.	* 0.045	* 0.038	* 0.045	*
* W.S. Elev (ft)	* 1210.26	* Reach Len. (ft)	* 1300.00	* 1326.00	* 1330.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 278.34	* 544.00	* 261.92	*
* E.G. Slope (ft/ft)	*0.004401	* Area (sq ft)	* 278.34	* 544.00	* 261.92	*
* Q Total (cfs)	* 3830.00	* Flow (cfs)	* 593.34	* 2588.65	* 648.01	*
* Top Width (ft)	* 727.11	* Top Width (ft)	* 289.94	* 218.96	* 218.21	*
* Vel Total (ft/s)	* 3.53	* Avg. Vel. (ft/s)	* 2.13	* 4.76	* 2.47	*
* Max Chl Dpth (ft)	* 2.93	* Hydr. Depth (ft)	* 0.96	* 2.48	* 1.20	*
* Conv. Total (cfs)	* 57732.1	* Conv. (cfs)	* 8943.8	* 39020.4	* 9767.9	*
* Length Wtd. (ft)	* 1323.80	* Wetted Per. (ft)	* 289.95	* 218.97	* 218.22	*
* Min Ch El (ft)	* 1207.33	* Shear (lb/sq ft)	* 0.26	* 0.68	* 0.33	*
* Alpha	* 1.37	* Stream Power (lb/ft s)	* 0.56	* 3.25	* 0.82	*
* Frctn Loss (ft)	* 7.89	* Cum Volume (acre-ft)	* 49.49	* 65.46	* 47.68	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 25.32	* 22.03	* 29.20	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS26 (D33)
REACH: REACH 1 RS: 0.718

INPUT
Description:
Station Elevation Data num= 49

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9613.48	1202.44	9628.76	1202.4	9651.27	1202.36	9701.47	1202.3	9704.57	1202.29
9705.94	1202.29	9742.47	1202.19	9760.62	1202.1	9780.38	1201.99	9815.29	1201.71

```
 9818.28 1201.68 9825.03 1201.61 9856.19 1201.26 9869.97 1201.11 9894.09 1200.75
 9924.65  1200.4 9931.99 1200.27 9959.62 1200.19   10000 1199.8610002.89 1199.84
 10013.3 1199.7810029.59 1199.7110037.46  1199.810041.24 1199.8610076.06    1200
10083.47 1200.0610086.78  1200.110121.31 1200.3210141.57  1200.510159.14 1200.62
10196.35 1200.9110196.98 1200.9210198.39 1200.9310234.82  1201.210251.14 1201.31
10272.66 1201.4810305.93 1201.71 10310.5 1201.7510320.71 1201.8210348.34 1202.01
10360.71 1202.0910386.18 1202.26 10415.5 1202.4210424.02 1202.4710443.03 1202.58
10461.85 1202.6910470.28 1202.7210499.69 1202.8910525.07 1203.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9613.48    .045 9894.09    .03810196.35    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9894.0910196.35             1600    1651    1630            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1202.63  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.45  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1202.18  * Reach Len. (ft)        * 1600.00  * 1651.00  * 1630.00  *
* Crit W.S. (ft)          * 1201.92  * Flow Area (sq ft)      *   87.09  *  589.00  *  110.41  *
* E.G. Slope (ft/ft)      *0.008583  * Area (sq ft)           *   87.09  *  589.00  *  110.41  *
* Q Total (cfs)           * 3760.00  * Flow (cfs)             *  185.59  * 3328.73  *  245.67  *
* Top Width (ft)          *  630.00  * Top Width (ft)         *  149.77  *  302.26  *  177.96  *
* Vel Total (ft/s)        *    4.78  * Avg. Vel. (ft/s)       *    2.13  *    5.65  *    2.23  *
* Max Chl Dpth (ft)       *    2.47  * Hydr. Depth (ft)       *    0.58  *    1.95  *    0.62  *
* Conv. Total (cfs)       * 40586.1  * Conv. (cfs)            *  2003.3  * 35930.9  *  2651.8  *
* Length Wtd. (ft)        * 1641.13  * Wetted Per. (ft)       *  149.78  *  302.27  *  177.97  *
* Min Ch El (ft)          * 1199.71  * Shear (lb/sq ft)       *    0.31  *    1.04  *    0.33  *
* Alpha                   *    1.26  * Stream Power (lb/ft s) *    0.66  *    5.90  *    0.74  *
* Frctn Loss (ft)         *    8.50  * Cum Volume (acre-ft)   *   44.04  *   48.22  *   41.99  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)         *   18.75  *   14.09  *   23.15  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS26 (D33)
REACH: REACH 1            RS: 0.405

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9550.27 1195.17 9572.95 1195.07 9583.38    1195 9612.97 1194.76 9635.68 1194.59
 9652.99 1194.43 9687.98 1194.06    9693    1194 9709.37 1193.83 9733.02 1193.57
 9740.28 1193.48 9773.04 1193.09 9792.59 1192.86 9813.06 1192.63 9844.89 1192.28
 9853.08  1192.2 9879.77 1191.98  9893.1 1191.86 9897.19 1191.83 9933.12 1191.58
 9956.57 1191.03 9972.16 1190.62 9996.95 1189.96   10000 1190.0310023.77 1190.73
10049.06 1191.28 10058.7 1191.2910085.99 1191.3510115.45 1191.4510122.91 1191.49
10136.82 1191.5710159.84  1191.7 10172.2 1191.7910196.76 1191.9910228.95 1192.26
10233.69 1192.3110242.52 1192.3910270.62 1192.67 10285.7 1192.8310307.54 1193.04
10342.45 1193.3710348.22 1193.4210381.39  1193.7 10399.2 1193.8510418.32 1193.98
10453.92 1194.1710455.24 1194.1710455.96 1194.1810492.17 1194.2410512.71 1194.28
10529.09 1194.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9550.27    .045 9933.12    .03810049.06    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9933.1210049.06             1025    1080    1060            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1194.05  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.22  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1193.83  * Reach Len. (ft)        * 1025.00  * 1080.00  * 1060.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *  275.00  *  358.84  *  519.74  *
```

* E.G. Slope (ft/ft)	*0.003431	* Area (sq ft)	* 275.00	* 358.84	* 519.74	*
* Q Total (cfs)	* 3670.00	* Flow (cfs)	* 610.46	* 1745.22	* 1314.32	*
* Top Width (ft)	* 687.25	* Top Width (ft)	* 223.66	* 115.94	* 347.65	*
* Vel Total (ft/s)	* 3.18	* Avg. Vel. (ft/s)	* 2.22	* 4.86	* 2.53	*
* Max Chl Dpth (ft)	* 3.87	* Hydr. Depth (ft)	* 1.23	* 3.10	* 1.50	*
* Conv. Total (cfs)	* 62654.5	* Conv. (cfs)	* 10421.8	* 29794.6	* 22438.2	*
* Length Wtd. (ft)	* 1065.20	* Wetted Per. (ft)	* 223.67	* 115.98	* 347.66	*
* Min Ch El (ft)	* 1189.96	* Shear (lb/sq ft)	* 0.26	* 0.66	* 0.32	*
* Alpha	* 1.42	* Stream Power (lb/ft s)	* 0.58	* 3.22	* 0.81	*
* Frctn Loss (ft)	* 6.13	* Cum Volume (acre-ft)	* 37.39	* 30.26	* 30.20	*
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 11.90	* 6.17	* 13.32	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS26 (D33)
REACH: REACH 1 RS: 0.201

INPUT
Description:
Station Elevation Data num= 41

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9605.43	1188.4	9635.18	1188.27	9638.69	1188.24	9654.98	1188.11	9680.76	1187.91
9686.33	1187.86	9722.83	1187.51	9737.48	1187.36	9764.89	1187.07	9788.63	1186.83
9806.96	1186.64	9839.79	1186.35	9849.03	1186.27	9890.94	1185.98	9891.09	1185.98
9891.8	1185.97	9933.16	1185.72	9942.09	1185.67	9988.38	1184.28	9998.98	1184.01
10000	1184.03	10015.23	1184.22	10046.13	1185.21	10050.02	1185.31	10052.25	1185.4
10086.88	1185.52	10112.46	1185.64	10122.92	1185.71	10138.52	1185.83	10158.96	1186
10172.66	1186.13	10194.99	1186.35	10228.28	1186.71	10231.03	1186.74	10232.87	1186.76
10267.06	1187.11	10293.07	1187.35	10303.1	1187.41	10318.05	1187.51	10339.14	1187.64
10353.28	1187.7								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9605.43	.045	9942.09	.038	10052.25	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9942.09	10052.25	1000	1025	930	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1187.87	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.65	* Wt. n-Val.	* 0.045	* 0.038	* 0.045 *
* W.S. Elev (ft)	* 1187.22	* Reach Len. (ft)	* 1000.00	* 1025.00	* 930.00 *
* Crit W.S. (ft)	* 1187.22	* Flow Area (sq ft)	* 166.37	* 276.48	* 242.33 *
* E.G. Slope (ft/ft)	*0.011747	* Area (sq ft)	* 166.37	* 276.48	* 242.33 *
* Q Total (cfs)	* 3610.00	* Flow (cfs)	* 542.01	* 2163.40	* 904.60 *
* Top Width (ft)	* 529.20	* Top Width (ft)	* 191.55	* 110.16	* 227.48 *
* Vel Total (ft/s)	* 5.27	* Avg. Vel. (ft/s)	* 3.26	* 7.82	* 3.73 *
* Max Chl Dpth (ft)	* 3.21	* Hydr. Depth (ft)	* 0.87	* 2.51	* 1.07 *
* Conv. Total (cfs)	* 33307.9	* Conv. (cfs)	* 5000.9	* 19960.7	* 8346.3 *
* Length Wtd. (ft)	* 995.69	* Wetted Per. (ft)	* 191.56	* 110.20	* 227.49 *
* Min Ch El (ft)	* 1184.01	* Shear (lb/sq ft)	* 0.64	* 1.84	* 0.78 *
* Alpha	* 1.51	* Stream Power (lb/ft s)	* 2.08	* 14.40	* 2.92 *
* Frctn Loss (ft)	* 0.10	* Cum Volume (acre-ft)	* 32.20	* 22.38	* 20.93 *
* C & E Loss (ft)	* 0.19	* Cum SA (acres)	* 7.01	* 3.37	* 6.32 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS26 (D33)
REACH: REACH 1 RS: 0.006

INPUT
Description: Cross section within Waterman Wash floodplain.
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9508.3	1180.66	9511.03	1180.66	9543.99	1180.64	9555.8	1180.63	9583.1	1180.58
9608.91	1180.56	9622.2	1180.54	9659.34	1180.52	9661.31	1180.52	9662.02	1180.52
9663.51	1180.51	9726.45	1179.53	9730.73	1179.33	9736.67	1179.13	9751.17	1178.93
9765.48	1178.66	9782.79	1178.69	9799.54	1178.69	9813.29	1178.63	9828.28	1178.53
9843.49	1178.28	9846.28	1178.28	9860.6	1178.51	9872.05	1178.71	9927.56	1180.14
9935.66	1179.29	9940.68	1178.99	9950.21	1178.47	9999.45	1175.13	10000	1175.14
10001.03	1175.191	0016.89	1175.241	0018.99	1175.321	0025.75	1175.561	0032.08	1175.74
10042.25	1175.991	0047.52	1176.041	0050.92	1176.141	0057.08	1176.71	0081.08	1178.16
10103.52	1180.63	10120	1180.681	0143.85	1180.75	10164.3	1180.811	0191.88	1180.88
10225.09	1180.971	0227.82	1180.981	0231.77	1180.991	0263.76	1181.121	0285.87	1181.2
10299.7	1181.26	10319.7	1181.351	0335.64	1181.421	0346.66	1181.461	0371.58	1181.54
10407.44	1181.691	0407.52	1181.691	0407.62	1181.691	0443.46	1181.81	0468.23	1181.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9508.3	.045	9927.56	.03	10103.52	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9927.56	10103.52	240	240	240	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1185.73	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.01	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1185.72	Reach Len. (ft)	660.00	660.00	660.00
Crit W.S. (ft)		Flow Area (sq ft)	2528.31	1508.15	1637.12
E.G. Slope (ft/ft)	0.000028	Area (sq ft)	2528.31	1508.15	1637.12
Q Total (cfs)	3560.00	Flow (cfs)	1464.27	1316.12	779.61
Top Width (ft)	959.93	Top Width (ft)	419.26	175.96	364.71
Vel Total (ft/s)	0.63	Avg. Vel. (ft/s)	0.58	0.87	0.48
Max Chl Dpth (ft)	10.59	Hydr. Depth (ft)	6.03	8.57	4.49
Conv. Total (cfs)	667071.1	Conv. (cfs)	274373.6	246614.8	146082.8
Length Wtd. (ft)	660.00	Wetted Per. (ft)	424.36	176.36	368.53
Min Ch El (ft)	1175.13	Shear (lb/sq ft)	0.01	0.02	0.01
Alpha	1.19	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	1.27	1.38	0.87
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 8.704

INPUT
Description: Limit of study.
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9822.48	1814.28	9824.98	1813.77	9845.86	1814.27	9868.68	1812.49	9896.25	1811.43
9904.19	1811.21	9910.77	1811.08	9954.95	1806.66	9961.73	1806.21	9980.94	1804.24
9999.99	1801.71	0026.06	1807.69	10032.04	1809.21	10046.68	1812.38	10058.39	1813.88
10082.54	1816.44	10094.65	1817.93						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9822.48	.045	9910.77	.03	10046.68	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9910.77	10046.68	1000	1069	1000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1808.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.		0.038	
W.S. Elev (ft)	1807.41	Reach Len. (ft)	1000.00	1069.00	1000.00
Crit W.S. (ft)	1807.41	Flow Area (sq ft)		206.80	
E.G. Slope (ft/ft)	0.015451	Area (sq ft)		206.80	
Q Total (cfs)	1920.00	Flow (cfs)		1920.00	
Top Width (ft)	77.36	Top Width (ft)		77.36	
Vel Total (ft/s)	9.28	Avg. Vel. (ft/s)		9.28	
Max Chl Dpth (ft)	5.71	Hydr. Depth (ft)		2.67	
Conv. Total (cfs)	15446.5	Conv. (cfs)		15446.5	
Length Wtd. (ft)	1069.00	Wetted Per. (ft)		78.33	
Min Ch El (ft)	1801.70	Shear (lb/sq ft)		2.55	
Alpha	1.00	Stream Power (lb/ft s)		23.64	
Frctn Loss (ft)	16.47	Cum Volume (acre-ft)	229.85	469.28	179.44
C & E Loss (ft)	0.00	Cum SA (acres)	212.64	239.08	195.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 8.502

INPUT
Description:
Station Elevation Data num= 12

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9812.82	1752.4	9823.21	1751.45	9831.38	1750.51	9873.22	1746.31	9882.66	1745.43
9923.24	1742.15	9954.14	1739.12	10000	1734.67	10065.27	1748.27	10069.58	1749.19
10074.69	1750.34	10102.05	1753.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9812.82	.045	9882.66	.038	10074.69	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9882.66	10074.69	1000	1051	1000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1741.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.36	Wt. n-Val.		0.038	
W.S. Elev (ft)	1740.07	Reach Len. (ft)	1000.00	1051.00	1000.00
Crit W.S. (ft)	1740.07	Flow Area (sq ft)		220.45	
E.G. Slope (ft/ft)	0.015359	Area (sq ft)		220.45	
Q Total (cfs)	2060.00	Flow (cfs)		2060.00	
Top Width (ft)	81.51	Top Width (ft)		81.51	
Vel Total (ft/s)	9.34	Avg. Vel. (ft/s)		9.34	
Max Chl Dpth (ft)	5.40	Hydr. Depth (ft)		2.70	
Conv. Total (cfs)	16622.2	Conv. (cfs)		16622.2	
Length Wtd. (ft)	1051.00	Wetted Per. (ft)		82.33	
Min Ch El (ft)	1734.67	Shear (lb/sq ft)		2.57	
Alpha	1.00	Stream Power (lb/ft s)		23.99	
Frctn Loss (ft)	15.80	Cum Volume (acre-ft)	229.85	464.04	179.44
C & E Loss (ft)	0.05	Cum SA (acres)	212.64	237.13	195.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 8.303

INPUT
Description:
Station Elevation Data num= 10

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9849.92	1706.7	9879.26	1700.93	9924.75	1695.92	9934.07	1695.03	10000	1681.63
10028.86	1691.28	10035.7	1693.54	10053.86	1698.07	10090.31	1699.73	10117.28	1700.45

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9849.92	.045	9934.07	.038	10053.86	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9934.07 10053.86 975 1010 975 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1690.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.		0.038	
W.S. Elev (ft)	1688.74	Reach Len. (ft)	975.00	1010.00	975.00
Crit W.S. (ft)	1688.74	Flow Area (sq ft)		199.80	
E.G. Slope (ft/ft)	0.014725	Area (sq ft)		199.80	
Q Total (cfs)	2160.00	Flow (cfs)		2160.00	
Top Width (ft)	56.22	Top Width (ft)		56.22	
Vel Total (ft/s)	10.81	Avg. Vel. (ft/s)		10.81	
Max Chl Dpth (ft)	7.11	Hydr. Depth (ft)		3.55	
Conv. Total (cfs)	17800.4	Conv. (cfs)		17800.4	
Length Wtd. (ft)	1010.00	Wetted Per. (ft)		58.10	
Min Ch El (ft)	1681.63	Shear (lb/sq ft)		3.16	
Alpha	1.00	Stream Power (lb/ft s)		34.18	
Frctn Loss (ft)	15.08	Cum Volume (acre-ft)	229.85	458.97	179.44
C & E Loss (ft)	0.09	Cum SA (acres)	212.64	235.47	195.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 8.111

INPUT
Description:
Station Elevation Data num= 18

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9828.76	1665.02	9846.74	1663.42	9863.56	1662.51	9897.78	1660.44	9905.89	1660.11
9945.27	1658.28	9948.22	1658.15	9948.83	1658.12	9950.16	1657.76	10000.01	1646.25
10020.68	1647.44	10082.59	1655.29	10106.07	1658.42	10108.62	1658.47	10115.76	1658.62
10147.74	1659.29	10159.17	1659.51	10178.81	1659.77				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9828.76	.045	9945.27	.038	10106.07	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9945.27 10106.07 1000 1088 1000 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1653.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.51	Wt. n-Val.		0.038	

W.S. Elev (ft)	1651.59	Reach Len. (ft)	1000.00	1088.00	1000.00	
Crit W.S. (ft)	1651.59	Flow Area (sq ft)		227.82		
E.G. Slope (ft/ft)	0.015134	Area (sq ft)		227.82		
Q Total (cfs)	2250.00	Flow (cfs)		2250.00		
Top Width (ft)	76.54	Top Width (ft)		76.54		
Vel Total (ft/s)	9.88	Avg. Vel. (ft/s)		9.88		
Max Chl Dpth (ft)	5.34	Hydr. Depth (ft)		2.98		
Conv. Total (cfs)	18289.4	Conv. (cfs)		18289.4		
Length Wtd. (ft)	1088.00	Wetted Per. (ft)		77.44		
Min Ch El (ft)	1646.25	Shear (lb/sq ft)		2.78		
Alpha	1.00	Stream Power (lb/ft s)		27.45		
Frctn Loss (ft)	17.17	Cum Volume (acre-ft)	229.85	454.01	179.44	
C & E Loss (ft)	0.12	Cum SA (acres)	212.64	233.93	195.91	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 7.905

INPUT
Description:
Station Elevation Data num= 21

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9778.98	1622.83	9784.85	1622.54	9785.1	1622.53	9785.68	1622.51	9823.18	1621.2
9839.26	1620.75	9861.25	1620.25	9893.67	1619.78	9899.32	1619.73	9945.88	1618.02
9948.57	1617.94	9971.55	1617.1	10000	1614.35	10030.97	1619.73	10048.7	1622.45
10063.68	1622.93	10084.62	1623.51	10114.75	1624.27	10120.54	1624.43	10124.58	1624.52
10147.09	1624.99								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9778.98	.045	9899.32	.038	10048.7	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9899.32	10048.7	1000	1043	1000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1620.76	Element	Left OB	Channel	Right OB	
Vel Head (ft)	1.10	Wt. n-Val.		0.038		
W.S. Elev (ft)	1619.65	Reach Len. (ft)	1000.00	1043.00	1000.00	
Crit W.S. (ft)	1619.65	Flow Area (sq ft)		282.67		
E.G. Slope (ft/ft)	0.016423	Area (sq ft)		282.67		
Q Total (cfs)	2380.00	Flow (cfs)		2380.00		
Top Width (ft)	129.15	Top Width (ft)		129.15		
Vel Total (ft/s)	8.42	Avg. Vel. (ft/s)		8.42		
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)		2.19		
Conv. Total (cfs)	18571.8	Conv. (cfs)		18571.8		
Length Wtd. (ft)	1042.90	Wetted Per. (ft)		129.78		
Min Ch El (ft)	1614.35	Shear (lb/sq ft)		2.23		
Alpha	1.00	Stream Power (lb/ft s)		18.80		
Frctn Loss (ft)	17.97	Cum Volume (acre-ft)	229.85	447.64	179.44	
C & E Loss (ft)	0.10	Cum SA (acres)	212.64	231.36	195.91	

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 7.708

INPUT
Description:
Station Elevation Data num= 17

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9841.16	1594.72	9842.94	1594.56	9848.07	1594.1	9882.21	1590.92	9894.11	1590.31
9942.51	1589.35	9954.51	1589.12	10000	1588.11	10036.13	1588.99	10059.73	1589.49
10072.25	1589.77	10091.42	1590.11	10108.38	1590.41	10119.46	1590.59	10144.5	1591.07
10179.18	1591.62	10180.62	1591.65						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9841.16	.045	9882.21	.038	10108.38	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9882.21	10108.38	1100	1169	1100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1591.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.		0.038	0.045
W.S. Elev (ft)	1590.88	Reach Len. (ft)	1100.00	1169.00	1100.00
Crit W.S. (ft)	1590.88	Flow Area (sq ft)		345.02	6.54
E.G. Slope (ft/ft)	0.018079	Area (sq ft)		345.02	6.54
Q Total (cfs)	2420.00	Flow (cfs)		2408.54	11.46
Top Width (ft)	251.82	Top Width (ft)		225.45	26.37
Vel Total (ft/s)	6.88	Avg. Vel. (ft/s)		6.98	1.75
Max Chl Dpth (ft)	2.78	Hydr. Depth (ft)		1.53	0.25
Conv. Total (cfs)	17998.3	Conv. (cfs)		17913.0	85.2
Length Wtd. (ft)	1168.85	Wetted Per. (ft)		225.51	26.37
Min Ch El (ft)	1588.10	Shear (lb/sq ft)		1.73	0.28
Alpha	1.02	Stream Power (lb/ft s)		12.05	0.49
Frctn Loss (ft)	19.38	Cum Volume (acre-ft)	229.85	440.12	179.36
C & E Loss (ft)	0.07	Cum SA (acres)	212.64	227.12	195.61

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 7.487

INPUT
Description:
Station Elevation Data num= 32

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9674.07	1561.84	9696.07	1561.29	9705.34	1561.06	9711.44	1560.89	9741.43	1560.09
9771.32	1559.16	9777.53	1558.94	9786.95	1558.73	9813.62	1558.23	9831.2	1557.94
9849.72	1557.55	9877.84	1557.01	9885.81	1556.85	9891.07	1556.72	9921.91	1555.84
9950.95	1555.35	9959.19	1554.56	9964.93	1553.82	10000	1549.4	10037.2	1552.46
10084.41	1557.57	10114.4	1560.11	10118.29	1560.48	10125.87	1560.86	10132.72	1560.82
10143.79	1560.62	10165.23	1560.29	10168.87	1560.25	10170.29	1560.25	10189.6	1561.37
10202.5	1561.87	10215.21	1562.71						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9674.07	.045	9950.95	.038	10125.87	.045

```
Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.9510125.87                950     987     950            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1556.22  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.42  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)         * 1554.79  * Reach Len. (ft)         *  950.00  *  987.00  *  950.00  *
* Crit W.S. (ft)         * 1554.79  * Flow Area (sq ft)       *          *  284.21  *          *
* E.G. Slope (ft/ft)     *0.015394  * Area (sq ft)            *          *  284.21  *          *
* Q Total (cfs)          * 2720.00  * Flow (cfs)              *          * 2720.00  *          *
* Top Width (ft)         *  101.99  * Top Width (ft)          *          *  101.99  *          *
* Vel Total (ft/s)       *    9.57  * Avg. Vel. (ft/s)        *          *    9.57  *          *
* Max Chl Dpth (ft)      *    5.39  * Hydr. Depth (ft)        *          *    2.79  *          *
* Conv. Total (cfs)      * 21922.7  * Conv. (cfs)             *          * 21922.7  *          *
* Length Wtd. (ft)       *  987.00  * Wetted Per. (ft)        *          *  102.58  *          *
* Min Ch El (ft)         * 1549.40  * Shear (lb/sq ft)        *          *    2.66  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   25.48  *          *
* Frctn Loss (ft)        *   14.62  * Cum Volume (acre-ft)    *  229.85  *  431.68  *  179.28  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *  212.64  *  222.73  *  195.28  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 7.299

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9907.9 1533.92 9922.88 1534.19 9953.82 1529.84  9973.6 1526.41 9980.55 1526.49
   10000  1526.210045.11 1539.8610071.37 1541.3610099.98 1542.3310109.16 1542.55
10129.48 1542.8210139.81 1542.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9907.9    .045 9922.88    .03810045.11    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9922.8810045.11                850     877     850            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1533.25  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    1.72  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)         * 1531.53  * Reach Len. (ft)         *  850.00  *  877.00  *  850.00  *
* Crit W.S. (ft)         * 1531.53  * Flow Area (sq ft)       *          *  260.40  *          *
* E.G. Slope (ft/ft)     *0.014261  * Area (sq ft)            *          *  260.40  *          *
* Q Total (cfs)          * 2740.00  * Flow (cfs)              *          * 2740.00  *          *
* Top Width (ft)         *   75.78  * Top Width (ft)          *          *   75.78  *          *
* Vel Total (ft/s)       *   10.52  * Avg. Vel. (ft/s)        *          *   10.52  *          *
* Max Chl Dpth (ft)      *    5.33  * Hydr. Depth (ft)        *          *    3.44  *          *
* Conv. Total (cfs)      * 22944.5  * Conv. (cfs)             *          * 22944.5  *          *
* Length Wtd. (ft)       *  877.00  * Wetted Per. (ft)        *          *   76.98  *          *
* Min Ch El (ft)         * 1526.20  * Shear (lb/sq ft)        *          *    3.01  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *   31.69  *          *
* Frctn Loss (ft)        *   11.87  * Cum Volume (acre-ft)    *  229.85  *  425.51  *  179.28  *
* C & E Loss (ft)        *    0.33  * Cum SA (acres)          *  212.64  *  220.71  *  195.28  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
```

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 7.076

INPUT
Description:
Station Elevation Data num= 45

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9518.54	1515.37	9541.36	1515.19	9543.52	1515.16	9579.84	1514.67	9596.21	1514.42
9617.64	1513.96	9651.05	1513.21	9655.44	1513.03	9665.17	1512.67	9693.24	1511.56
9705.9	1511.04	9733.93	1507.61	9742.67	1506.92	9754.98	1506	9766.72	1505.22
9776.77	1504.57	9780.88	1504.38	9791.17	1503.83	9801.1	1503.12	9801.84	1503.16
9811.65	1503.65	9870.44	1505.08	9882.26	1505.03	9908.48	1505.18	9920.06	1505.25
9925.29	1505.26	9957.15	1503.24	9991.4	1501.28	10000	1502.84	10019.98	1506.72
10026.92	1507.96	10029.58	1508.42	10038.75	1509.53	10080.16	1511.66	10082.52	1511.78
10082.88	1511.81	10126.28	1513.98	10133.49	1514.27	10170.04	1515.66	10184.1	1516.08
10213.81	1516.91	10234.71	1517.33	10257.57	1517.78	10285.32	1518.17	10299.62	1518.35

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9518.54	.045	9742.67	.03	10038.75	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9742.67	10038.75	1125	1187	1125	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1506.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.		0.038	
W.S. Elev (ft)	1505.83	Reach Len. (ft)	1125.00	1187.00	1125.00
Crit W.S. (ft)	1505.64	Flow Area (sq ft)		436.90	
E.G. Slope (ft/ft)	0.012871	Area (sq ft)		436.90	
Q Total (cfs)	2750.00	Flow (cfs)		2750.00	
Top Width (ft)	257.84	Top Width (ft)		257.84	
Vel Total (ft/s)	6.29	Avg. Vel. (ft/s)		6.29	
Max Chl Dpth (ft)	4.55	Hydr. Depth (ft)		1.69	
Conv. Total (cfs)	24240.0	Conv. (cfs)		24240.0	
Length Wtd. (ft)	1185.55	Wetted Per. (ft)		258.50	
Min Ch El (ft)	1501.28	Shear (lb/sq ft)		1.36	
Alpha	1.00	Stream Power (lb/ft s)		8.55	
Frctn Loss (ft)	16.14	Cum Volume (acre-ft)	229.85	418.49	179.28
C & E Loss (ft)	0.02	Cum SA (acres)	212.64	217.35	195.28

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 6.909

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9686.95	1500.11	9696.13	1499.73	9715.47	1498.78	9729.74	1496.56	9733.65	1496.32
9738.71	1496.03	9745.44	1495.58	9775.07	1493.1	9792.28	1491.59	9815.19	1489.18
9817.82	1489.07	9836.93	1488.72	9854.18	1488.49	9867.2	1488.62	9875.8	1488.83
9881.91	1488.93	9919.3	1487.58	9927.85	1487.42	9935.62	1487.21	9963.25	1486.82
10000	1485.64	10046.25	1489.57	10086.4	1492.53	10096.79	1492.93	10130.44	1493.78
10147.34	1494.08	10174.48	1494.63	10197.88	1494.66	10218.52	1494.98	10248.42	1495.25
10262.57	1495.32	10298.96	1495.98	10306.61	1496.08	10349.5	1496.22	10350.65	1496.23
10358.43	1496.41	10358.69	1496.41						

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9686.95    .045  9875.8    .03810096.79    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9875.810096.79              1000    1059    1000              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1490.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.86  * Wt. n-Val.              *   0.045  *   0.038  *         *
* W.S. Elev (ft)          * 1489.42  * Reach Len. (ft)        * 1000.00  * 1059.00  * 1000.00  *
* Crit W.S. (ft)          * 1489.42  * Flow Area (sq ft)      *   42.45  *  347.56  *         *
* E.G. Slope (ft/ft)      *0.014423  * Area (sq ft)           *   42.45  *  347.56  *         *
* Q Total (cfs)           * 2770.00  * Flow (cfs)             *  129.47  * 2640.53  *         *
* Top Width (ft)          *  231.60  * Top Width (ft)         *   62.90  *  168.70  *         *
* Vel Total (ft/s)        *    7.10  * Avg. Vel. (ft/s)       *    3.05  *    7.60  *         *
* Max Chl Dpth (ft)       *    3.78  * Hydr. Depth (ft)       *    0.67  *    2.06  *         *
* Conv. Total (cfs)       * 23065.1  * Conv. (cfs)            *  1078.0  * 21987.1  *         *
* Length Wtd. (ft)        * 1046.26  * Wetted Per. (ft)       *   62.92  *  168.91  *         *
* Min Ch El (ft)          * 1485.64  * Shear (lb/sq ft)       *    0.61  *    1.85  *         *
* Alpha                   *    1.10  * Stream Power (lb/ft s) *    1.85  *   14.08  *         *
* Frctn Loss (ft)         *   15.36  * Cum Volume (acre-ft)   *  229.30  *  407.80  *  179.28  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)         *  211.83  *  211.54  *  195.28  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 6.708

INPUT
Description:
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9705.76 1479.67 9712.64 1479.33 9738.19 1478.05    9748 1477.55 9758.15 1477.03
 9783.36 1476.98 9807.75 1476.86 9818.72 1476.81 9830.07 1476.76 9854.08 1476.73
 9877.32 1476.42 9889.45 1476.28 9901.98 1476.12 9924.81 1475.89 9946.88 1475.45
 9975.93 1472.69   10000 1468.7310019.85 1469.6510072.65 1472.3810087.53 1472.31
10111.43 1472.16 10156.9 1470.5110160.16 1470.4410165.86 1470.5510172.25 1470.65
10227.08 1471.5510273.64 1473.0810301.39 1474.1610305.33 1474.2310315.72 1474.38
10343.22  1474.8

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9705.76    .045 9946.88    .03810072.65    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9946.8810072.65             1050    1123    1050              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1473.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.74  * Wt. n-Val.              *          *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1472.77  * Reach Len. (ft)        * 1050.00  * 1123.00  * 1050.00  *
* Crit W.S. (ft)          * 1472.77  * Flow Area (sq ft)      *          *  213.23  *  232.65  *
* E.G. Slope (ft/ft)      *0.014936  * Area (sq ft)           *          *  213.23  *  232.65  *
* Q Total (cfs)           * 2780.00  * Flow (cfs)             *          * 1711.34  * 1068.66  *
* Top Width (ft)          *  289.07  * Top Width (ft)         *          *   97.55  *  191.52  *
* Vel Total (ft/s)        *    6.23  * Avg. Vel. (ft/s)       *          *    8.03  *    4.59  *
* Max Chl Dpth (ft)       *    4.04  * Hydr. Depth (ft)       *          *    2.19  *    1.21  *
* Conv. Total (cfs)       * 22747.5  * Conv. (cfs)            *          * 14003.1  *  8744.4  *
* Length Wtd. (ft)        * 1093.16  * Wetted Per. (ft)       *          *   97.97  *  191.58  *
* Min Ch El (ft)          * 1468.73  * Shear (lb/sq ft)       *          *    2.03  *    1.13  *
* Alpha                   *    1.23  * Stream Power (lb/ft s) *          *   16.29  *    5.20  *
```

```
* Frctn Loss (ft)        *   14.34  * Cum Volume (acre-ft)   *  228.81  *  400.99  *  176.61  *
* C & E Loss (ft)        *    0.07  * Cum SA (acres)         *  211.11  *  208.31  *  193.08  *
*******************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 6.495

INPUT
Description:
Station Elevation Data    num=      56
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9535.74 1459.93 9549.86 1459.84 9567.45 1459.74 9585.63 1459.65 9610.41 1459.51
  9621.4 1459.44 9629.45  1459.4 9657.17 1459.27 9691.46 1459.09 9692.94 1459.09
 9694.96 1459.08 9728.71  1458.9 9753.47 1458.77 9764.48  1458.7  9779.5 1458.61
 9800.25 1458.48 9815.47 1458.37 9836.02 1458.22 9864.04 1457.99  9871.8 1457.93
 9877.48 1457.88 9907.57  1457.6 9939.49 1457.26 9943.34 1457.21 9950.32 1456.51
10000.01 1451.8510037.41 1454.4110045.71 1455.0310065.03 1455.6610101.65 1455.04
10110.95 1454.9310151.86 1454.6910156.88 1454.6910202.08 1454.69 10202.8  1454.7
10210.52 1454.7310248.73 1454.94 10252.3 1454.9510294.65 1455.2210302.52 1455.26
10340.58  1455.310352.74 1455.3510386.51 1455.4810402.95 1455.5510432.43 1455.64
10453.17 1455.7610512.82 1457.1510516.08 1457.2410519.72 1457.1610541.98 1456.67
10570.21 1456.4610603.83 1456.6210644.37 1456.7810654.04 1456.8210662.06 1456.84
10699.86 1456.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9535.74    .045 9943.34    .03810065.03    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9943.3410065.03             1250    1305    1250            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*******************************************************************************************
* E.G. Elev (ft)         * 1456.57  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.49  * Wt. n-Val.              *          *    0.038  *   0.045  *
* W.S. Elev (ft)         * 1456.07  * Reach Len. (ft)         * 1250.00  * 1305.00  * 1250.00  *
* Crit W.S. (ft)         * 1456.07  * Flow Area (sq ft)       *          *   230.52  *  363.82  *
* E.G. Slope (ft/ft)     *0.011619  * Area (sq ft)            *          *   230.52  *  363.82  *
* Q Total (cfs)          * 2800.00  * Flow (cfs)              *          *  1587.61  * 1212.39  *
* Top Width (ft)         *  511.66  * Top Width (ft)          *          *   110.06  *  401.60  *
* Vel Total (ft/s)       *    4.71  * Avg. Vel. (ft/s)        *          *     6.89  *    3.33  *
* Max Chl Dpth (ft)      *    4.22  * Hydr. Depth (ft)        *          *     2.09  *    0.91  *
* Conv. Total (cfs)      * 25975.7  * Conv. (cfs)             *          *  14728.3  * 11247.4  *
* Length Wtd. (ft)       * 1292.70  * Wetted Per. (ft)        *          *   110.38  *  401.62  *
* Min Ch El (ft)         * 1451.85  * Shear (lb/sq ft)        *          *     1.52  *    0.66  *
* Alpha                  *    1.43  * Stream Power (lb/ft s)   *          *    10.43  *    2.19  *
* Frctn Loss (ft)        *   17.66  * Cum Volume (acre-ft)    *  228.81  *   395.27  *  169.42  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)          *  211.11  *   205.63  *  185.93  *
*******************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15A (G40)
```

REACH: REACH 1 RS: 6.248

INPUT
Description:
Station Elevation Data num= 46

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9651.4	1439.95	9658.39	1439.88	9686.28	1439.57	9718.78	1439.21	9721.74	1439.18
9724.28	1439.15	9757.2	1438.82	9790.17	1438.31	9792.66	1438.28	9795.56	1438.24
9828.12	1437.84	9856.06	1437.39	9863.57	1437.34	9872.33	1437.23	9899.03	1437.06
9921.95	1436.75	9952.41	1435.88	10000	1434.05	10020.86	1434.95	10046.99	1435.4
10061.95	1435.81	10087.4	1437.11	10121.29	1437.68	10128	1437.72	10152.15	1437.89
10168.61	1438.05	10173.18	1438.08	10209.21	1437.95	10225.08	1437.84	10249.82	1437.85
10276.98	1437.81	10290.42	1437.93	10328.88	1437.95	10331.03	1437.97	10338.75	1438
10371.63	1438.17	10380.78	1438.22	10412.24	1438.45	10432.67	1438.58	10452.84	1438.77
10484.57	1439.04	10493.44	1439.13	10525.34	1439.46	10534.05	1439.56	10536.47	1439.58
10563.55	1439.78								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9651.4	.045	9899.03	.038	10121.29	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9899.03	10121.29	1225	1294	1225	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1438.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.	0.045	0.038	
W.S. Elev (ft)	1437.64	Reach Len. (ft)	1225.00	1294.00	1225.00
Crit W.S. (ft)	1437.64	Flow Area (sq ft)	20.31	383.16	
E.G. Slope (ft/ft)	0.016282	Area (sq ft)	20.31	383.16	
Q Total (cfs)	2810.00	Flow (cfs)	42.29	2767.71	
Top Width (ft)	278.33	Top Width (ft)	58.47	219.86	
Vel Total (ft/s)	6.96	Avg. Vel. (ft/s)	2.08	7.22	
Max Chl Dpth (ft)	3.59	Hydr. Depth (ft)	0.35	1.74	
Conv. Total (cfs)	22022.1	Conv. (cfs)	331.4	21690.7	
Length Wtd. (ft)	1291.09	Wetted Per. (ft)	58.48	219.97	
Min Ch El (ft)	1434.05	Shear (lb/sq ft)	0.35	1.77	
Alpha	1.06	Stream Power (lb/ft s)	0.74	12.79	
Frctn Loss (ft)	16.85	Cum Volume (acre-ft)	228.52	386.07	164.20
C & E Loss (ft)	0.06	Cum SA (acres)	210.27	200.69	180.17

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 6.003

INPUT
Description:
Station Elevation Data num= 39

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9530.14	1420	9553.18	1419.88	9565.32	1419.82	9573.03	1419.77	9601.55	1419.63
9632.24	1419.46	9637.78	1419.44	9646.53	1419.39	9674.01	1419.26	9691.45	1419.17
9710.24	1419.09	9739.88	1418.95	9746.47	1418.93	9750.66	1418.91	9782.7	1418.81
9809.87	1418.71	9818.93	1418.68	9833.23	1418.63	9855.16	1418.56	9869.08	1418.52
9891.39	1418.42	9926.57	1418.28	9927.62	1418.28	9928.29	1418.28	10000	1416.33
10057.43	1416.57	10067.9	1416.61	10109.57	1417.75	10137.27	1418.57	10140.12	1418.59
10183	1418.94	10190.36	1419	10228.72	1419.36	10240.61	1419.47	10274.45	1419.81
10290.85	1419.97	10320.17	1420.24	10341.1	1420.44	10353.53	1420.53		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9530.14	.045	9926.57	.038	10137.27	.045

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9926.5710137.27              1000    1073    1000            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1419.69  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.59  * Wt. n-Val.               *   0.045   *   0.038   *   0.045   *
* W.S. Elev (ft)          * 1419.10  * Reach Len. (ft)          * 1000.00   * 1073.00   * 1000.00   *
* Crit W.S. (ft)          * 1419.03  * Flow Area (sq ft)        *   90.13   *  414.60   *   17.24   *
* E.G. Slope (ft/ft)      *0.010714  * Area (sq ft)             *   90.13   *  414.60   *   17.24   *
* Q Total (cfs)           * 2830.00  * Flow (cfs)               *  170.79   * 2634.52   *   24.69   *
* Top Width (ft)          *  492.62  * Top Width (ft)            *  218.34   *  210.70   *   63.59   *
* Vel Total (ft/s)        *    5.42  * Avg. Vel. (ft/s)          *    1.89   *    6.35   *    1.43   *
* Max Chl Dpth (ft)       *    2.77  * Hydr. Depth (ft)          *    0.41   *    1.97   *    0.27   *
* Conv. Total (cfs)       * 27341.3  * Conv. (cfs)               *  1650.1   * 25452.7   *   238.6   *
* Length Wtd. (ft)        * 1054.72  * Wetted Per. (ft)          *  218.34   *  210.75   *   63.59   *
* Min Ch El (ft)          * 1416.33  * Shear (lb/sq ft)          *    0.28   *    1.32   *    0.18   *
* Alpha                   *    1.29  * Stream Power (lb/ft s)    *    0.52   *    8.36   *    0.26   *
* Frctn Loss (ft)         *   15.53  * Cum Volume (acre-ft)      *  226.97   *  374.22   *  163.96   *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)            *  206.37   *  194.29   *  179.27   *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 5.800

INPUT
Description:
Station Elevation Data     num=      61
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9342.08 1405.12 9352.62 1405.07  9371.1 1404.99 9389.73 1404.84 9425.81  1404.6
 9426.84 1404.59 9427.37 1404.59 9463.95 1404.23 9483.64 1404.06 9501.06 1403.87
 9534.81 1403.52 9538.17 1403.48 9539.91 1403.47 9575.28 1403.07 9596.18 1402.97
  9612.4 1402.94  9643.8 1402.74 9649.51  1402.7 9652.45 1402.69 9661.68 1402.65
 9708.72 1402.51 9723.73 1402.54  9752.8 1402.57 9760.84 1402.58 9764.99 1402.58
 9797.95 1402.76 9821.26 1402.86 9835.06 1402.95 9861.79  1403.1 9872.17 1403.16
 9877.53 1403.18 9941.75 1401.93 9944.08 1401.87 9977.22 1402.22   10000 1402.57
10030.44 1402.5810042.12  1402.510063.76  1402.710093.26 1403.0110101.34 1403.11
 10144.4 1403.7710166.48 1404.0310195.54 1404.4510231.63 1404.9210246.69 1405.11
10296.77 1405.7510297.83 1405.7610301.69 1405.8110348.97 1406.4410361.92 1406.62
10400.11 1407.1410427.06 1407.5110451.25 1407.85 10492.2 1408.37 10502.4  1408.5
10539.62 1408.8910553.54 1409.0410557.35 1409.0810604.68 1409.4610622.49 1409.58
10636.51 1409.67

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9342.08    .045 9861.79    .038 10144.4    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9861.79 10144.4              1150    1228    1150            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1404.11  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.42  * Wt. n-Val.               *   0.045   *   0.038   *           *
* W.S. Elev (ft)          * 1403.69  * Reach Len. (ft)          * 1150.00   * 1228.00   * 1150.00   *
* Crit W.S. (ft)          * 1403.66  * Flow Area (sq ft)        *  286.33   *  280.98   *           *
* E.G. Slope (ft/ft)      *0.021446  * Area (sq ft)             *  286.33   *  280.98   *           *
* Q Total (cfs)           * 2850.00  * Flow (cfs)               * 1226.93   * 1623.07   *           *
* Top Width (ft)          *  620.56  * Top Width (ft)            *  343.25   *  277.31   *           *
* Vel Total (ft/s)        *    5.02  * Avg. Vel. (ft/s)          *    4.29   *    5.78   *           *
* Max Chl Dpth (ft)       *    1.82  * Hydr. Depth (ft)          *    0.83   *    1.01   *           *
* Conv. Total (cfs)       * 19461.3  * Conv. (cfs)               *  8378.1   * 11083.2   *           *
* Length Wtd. (ft)        * 1211.24  * Wetted Per. (ft)          *  343.26   *  277.33   *           *
* Min Ch El (ft)          * 1401.87  * Shear (lb/sq ft)          *    1.12   *    1.36   *           *
* Alpha                   *    1.07  * Stream Power (lb/ft s)    *    4.79   *    7.84   *           *
* Frctn Loss (ft)         *   16.02  * Cum Volume (acre-ft)      *  222.65   *  365.66   *  163.76   *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)            *  199.93   *  188.28   *  178.54   *
```

```
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 5.567

INPUT
Description:
Station Elevation Data    num=      89
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  9272.3 1389.61 9294.91 1389.47 9316.64 1389.36  9330.7 1389.29 9350.01  1389.2
 9366.49 1389.12 9378.49 1389.07 9402.28 1388.98 9434.98 1388.88 9438.07 1388.87
 9440.33 1388.87 9473.86 1388.78 9502.17 1388.75 9509.66 1388.73 9519.94 1388.72
 9545.45 1388.68 9564.01 1388.67 9581.24 1388.63  9604.9 1388.58 9617.03 1388.56
 9625.85 1388.54 9652.82 1388.45  9687.7 1388.33 9688.61 1388.33 9689.87 1388.33
  9724.4 1388.17 9749.54 1388.08 9760.19 1388.03 9774.83 1387.98 9795.99 1387.89
 9811.38 1387.82  9836.5 1387.05  9839.5  1386.9 9842.91 1386.69 9846.41 1386.47
 9886.98  1385.9  9890.8 1385.72  9894.9 1385.67 9933.18 1386.42 9934.32 1386.43
 9935.39 1386.45 9936.34 1386.47 9937.49 1386.48 9938.49 1386.49 9939.36  1386.5
 9940.25  1386.5 9940.76 1386.49 9941.35 1386.49 9942.01 1386.48 9942.75 1386.47
 9943.82 1386.45 9945.26 1386.41 9961.99 1385.88 9989.23 1384.94   10000 1384.57
10000.34 1384.5710001.65 1384.5710018.27 1384.9510025.78 1385.0910026.92 1385.12
10032.16 1385.2410035.77 1385.3510060.36  1386.110097.82  1386.410106.79 1386.46
10147.98 1386.7710153.23  1386.810198.14 1387.1610199.67 1387.1710218.72 1387.34
 10246.1 1387.57 10248.3 1387.5910292.54 1388.0110298.46 1388.0610338.97 1388.44
10348.62 1388.5210385.41 1388.8110398.78 1388.8910431.84 1389.0710448.94 1389.15
10478.28 1389.26 10499.1 1389.3310524.71 1389.4110549.26 1389.4810571.15 1389.56
10599.42 1389.6510617.58 1389.7110649.58 1389.82 10662.7 1389.88

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9272.3    .045 9795.99    .03810338.97    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9795.9910338.97             1200    1243    1200             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1388.07  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.33  * Wt. n-Val.              *          *    0.038 *          *
* W.S. Elev (ft)         * 1387.74  * Reach Len. (ft)         * 1200.00  * 1243.00  * 1200.00  *
* Crit W.S. (ft)         * 1387.37  * Flow Area (sq ft)       *          *   622.46 *          *
* E.G. Slope (ft/ft)     *0.008974  * Area (sq ft)            *          *   622.46 *          *
* Q Total (cfs)          * 2860.00  * Flow (cfs)              *          * 2860.00  *          *
* Top Width (ft)         *  450.48  * Top Width (ft)           *          *   450.48 *          *
* Vel Total (ft/s)       *    4.59  * Avg. Vel. (ft/s)         *          *     4.59 *          *
* Max Chl Dpth (ft)      *    3.17  * Hydr. Depth (ft)         *          *     1.38 *          *
* Conv. Total (cfs)      * 30191.4  * Conv. (cfs)              *          * 30191.4  *          *
* Length Wtd. (ft)       * 1242.68  * Wetted Per. (ft)         *          *   450.59 *          *
* Min Ch El (ft)         * 1384.57  * Shear (lb/sq ft)         *          *     0.77 *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)   *          *     3.56 *          *
* Frctn Loss (ft)        *   13.30  * Cum Volume (acre-ft)     *  218.87  *   352.92 *  163.76  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *  195.40  *   178.02 *  178.54  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 5.332

INPUT
Description:
Station Elevation Data    num=      97
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
*****************************************************************************
   9249  1376.4 9252.95 1376.37 9288.25 1376.07 9288.51 1376.07 9288.85 1376.07
 9324.08 1375.78 9352.33 1375.55 9359.65 1375.49 9368.79 1375.41 9395.22 1375.19
 9416.41 1375.06 9430.79 1374.95 9448.72 1374.84 9466.36 1374.72  9480.5 1374.63
 9501.93 1374.49 9528.66 1374.34  9537.5 1374.29 9544.58 1374.25 9573.07 1374.09
  9608.6 1373.92 9608.63 1373.92 9608.67 1373.92  9644.2 1373.76 9672.75 1373.66
 9679.77 1373.63 9688.53  1373.6 9715.34 1373.52 9736.83 1373.47 9750.91 1373.45
 9768.47 1373.42 9794.85 1372.96 9796.06 1372.92  9797.6 1372.85 9799.43  1372.8
 9801.55 1372.76 9803.44 1372.77 9805.64 1372.81 9808.18 1372.84 9811.15 1372.87
 9818.04 1372.84 9833.69 1372.66 9839.06 1372.57 9845.04 1372.41 9847.39 1372.34
 9847.78 1372.33 9853.05 1372.35 9859.74 1372.41  9864.9 1372.46 9868.87 1372.51
 9928.34 1373.16 9928.75 1373.16 9929.67 1373.16 9931.09 1373.16  9974.2 1373.14
   10000 1373.4510038.09 1373.3710041.12 1373.3610042.25 1373.3610045.12 1373.34
10088.28 1373.6410095.63  1373.710132.48 1373.9510146.13 1374.0510176.69 1374.23
10196.64 1374.3510220.89 1374.4710247.14 1374.57 10265.1 1374.6610297.65 1374.76
 10309.3  1374.810348.15 1374.9110353.51 1374.9210391.07 1375.0110397.71 1375.02
10398.66 1375.0310441.92  1375.110449.16 1375.1110464.23 1375.0110491.65 1374.78
10516.97 1374.5810531.89 1374.7910574.53 1375.3610600.68 1375.4210618.74 1375.46
10651.18 1375.5310662.94 1375.5410701.69  1375.610707.15  1375.610745.43 1375.62
10751.35 1375.6210752.19 1375.6210795.56  1375.6 10802.7  1375.610839.76 1375.54
10853.21 1375.5210866.43 1375.49

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
    9249    .045  9608.6    .03810176.69    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9608.610176.69             1300    1357    1300            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1374.77  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.33  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1374.43  * Reach Len. (ft)         * 1300.00  * 1357.00  * 1300.00  *
* Crit W.S. (ft)          * 1374.30  * Flow Area (sq ft)       *   25.65  *  608.48  *    3.54  *
* E.G. Slope (ft/ft)      *0.012976  * Area (sq ft)            *   25.65  *  608.48  *    3.54  *
* Q Total (cfs)           * 2880.00  * Flow (cfs)              *   39.90  * 2837.29  *    2.81  *
* Top Width (ft)          *  701.28  * Top Width (ft)           *   96.49  *  568.09  *   36.70  *
* Vel Total (ft/s)        *    4.52  * Avg. Vel. (ft/s)        *    1.56  *    4.66  *    0.79  *
* Max Chl Dpth (ft)       *    2.10  * Hydr. Depth (ft)        *    0.27  *    1.07  *    0.10  *
* Conv. Total (cfs)       * 25282.5  * Conv. (cfs)             *   350.3  * 24907.6  *    24.6  *
* Length Wtd. (ft)        * 1348.80  * Wetted Per. (ft)        *   96.49  *  568.11  *   36.70  *
* Min Ch El (ft)          * 1372.33  * Shear (lb/sq ft)        *    0.22  *    0.87  *    0.08  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)   *    0.33  *    4.05  *    0.06  *
* Frctn Loss (ft)         *   16.41  * Cum Volume (acre-ft)    *  218.51  *  335.36  *  163.71  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)           *  194.07  *  163.49  *  178.04  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 5.075

INPUT
Description:
Station Elevation Data     num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9148.75 1360.22 9148.81 1360.22 9177.97 1360.04 9211.97 1359.82 9213.62  1359.8
 9215.74 1359.79 9249.26 1359.54 9275.13 1359.34 9284.91 1359.26 9297.58 1359.16
 9320.56 1358.97 9338.29 1358.83  9356.2 1358.68 9379.41 1358.48 9391.85 1358.38
 9401.45  1358.3  9427.5 1358.09 9461.25 1357.83 9463.15 1357.82 9464.61 1357.81
 9498.79 1357.59 9537.15 1356.32 9543.96 1356.22 9561.37 1355.93 9561.97 1355.93
 9562.28 1355.93 9562.67 1355.93  9571.4 1356.21 9605.74 1357.26 9624.91 1357.26
 9641.38 1357.27 9654.09 1357.28 9677.03 1357.31 9706.75 1357.36 9712.68 1357.37
 9717.25 1357.38 9748.33 1357.41 9780.41 1357.43 9783.97 1357.43 9788.58 1357.43
 9819.62 1357.41 9843.57  1357.4 9855.27 1357.38 9870.42 1357.36 9890.92 1357.33
 9945.15 1355.78  9951.1 1355.62 9955.22  1355.5 9968.08 1355.14 9992.14 1354.94
 9994.98  1354.9   10000 1354.9210004.92 1355.1710032.89 1356.1210047.79 1356.66
10076.28 1357.6910092.15  1357.810126.35 1358.0210139.65 1358.1110176.42 1358.36
10187.16 1358.44 10226.5 1358.6910234.66 1358.7410276.57 1358.9810282.16 1359.01
10326.64 1359.2310329.66 1359.2510376.72 1359.4410377.16 1359.4510385.41 1359.48
10424.67 1359.6310426.79 1359.6410472.17 1359.7710476.86 1359.7910519.67 1359.88
```

```
10526.94  1359.910552.93 1359.94

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9148.75    .045 9890.92    .03810076.28    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9890.9210076.28             1300    1338    1300            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1358.35  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.47  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1357.88  * Reach Len. (ft)         * 1300.00  * 1338.00  * 1300.00  *
* Crit W.S. (ft)          * 1357.88  * Flow Area (sq ft)       *  291.64  *  338.27  *    2.73  *
* E.G. Slope (ft/ft)      *0.011431  * Area (sq ft)            *  291.64  *  338.27  *    2.73  *
* Q Total (cfs)           * 2900.00  * Flow (cfs)              *  786.76  * 2111.24  *    2.00  *
* Top Width (ft)          *  650.70  * Top Width (ft)          *  436.56  *  185.36  *   28.78  *
* Vel Total (ft/s)        *    4.58  * Avg. Vel. (ft/s)        *    2.70  *    6.24  *    0.73  *
* Max Chl Dpth (ft)       *    2.98  * Hydr. Depth (ft)        *    0.67  *    1.82  *    0.09  *
* Conv. Total (cfs)       * 27124.5  * Conv. (cfs)             *  7358.8  * 19747.0  *    18.7  *
* Length Wtd. (ft)        * 1330.13  * Wetted Per. (ft)        *  436.61  *  185.44  *   28.78  *
* Min Ch El (ft)          * 1354.90  * Shear (lb/sq ft)        *    0.48  *    1.30  *    0.07  *
* Alpha                   *    1.44  * Stream Power (lb/ft s)  *    1.29  *    8.12  *    0.05  *
* Frctn Loss (ft)         *   14.80  * Cum Volume (acre-ft)    *  213.78  *  320.61  *  163.62  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *  186.11  *  151.75  *  177.06  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 4.821

INPUT
Description:
Station Elevation Data     num=      80
     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev     Sta     Elev
*********************************************************************************
 9326.05 1343.78 9331.01 1343.75 9361.13 1343.55 9385.44  1343.4 9396.69 1343.34
 9410.63 1343.27 9432.25 1343.17 9449.69 1343.09  9467.8 1343.03 9490.25 1342.95
 9503.36 1342.92 9513.93 1342.88 9538.91 1342.82 9569.87 1342.75 9574.47 1342.74
 9578.18 1342.73 9610.03 1342.67 9642.43  1342.6 9645.58 1342.59 9649.49 1342.59
 9681.14 1342.52 9706.68 1342.45  9716.7 1342.43 9729.11 1342.41 9752.25 1342.36
 9771.82 1341.62 9775.14  1341.5 9779.38 1341.52  9785.9 1341.66  9786.6 1341.66
  9797.8 1341.92 9805.86 1341.96 9812.26 1341.93 9817.31  1341.9 9820.27  1341.9
 9858.92 1342.12 9888.35 1342.04 9894.48 1342.03 9899.43 1342.02 9930.04 1341.93
   10000 1340.9510042.57  1341.410073.84 1341.9510084.08 1341.9910125.31 1342.15
10125.45 1342.1510126.05 1342.1610166.82 1342.3710176.77 1342.4210193.14  1342.5
10228.24 1342.6910249.57 1342.8110279.71 1342.9610290.94    134310331.17 1343.17
10332.31 1343.1710336.98 1343.1810373.68  1343.310382.64 1343.3310415.06 1343.43
10434.11  1343.510456.43 1343.5810485.57 1343.71 10497.8 1343.7610537.04 1343.94
10539.17 1343.9510547.91    134410580.54 1344.1710588.51 1344.2110621.92 1344.38
10639.98 1344.4510663.29 1344.5410691.44 1344.6410704.66 1344.6810742.91 1344.76
10746.03 1344.7710758.83 1344.79 10787.4 1344.8410794.38 1344.85 10808.6 1344.86

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9326.05    .045 9752.25    .03810125.31    .045

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9752.2510125.31             1200    1235    1200            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1343.45  * Element                 *  Left OB *  Channel * Right OB *
```

* Vel Head (ft)	* 0.34	* Wt. n-Val.	* 0.045	* 0.038	* 0.045	*
* W.S. Elev (ft)	* 1343.11	* Reach Len. (ft)	* 1200.00	* 1235.00	* 1200.00	*
* Crit W.S. (ft)	* 1343.00	* Flow Area (sq ft)	* 124.90	* 503.53	* 87.99	*
* E.G. Slope (ft/ft)	*0.010841	* Area (sq ft)	* 124.90	* 503.53	* 87.99	*
* Q Total (cfs)	* 2920.00	* Flow (cfs)	* 236.03	* 2503.67	* 180.30	*
* Top Width (ft)	* 870.80	* Top Width (ft)	* 306.52	* 373.06	* 191.22	*
* Vel Total (ft/s)	* 4.08	* Avg. Vel. (ft/s)	* 1.89	* 4.97	* 2.05	*
* Max Chl Dpth (ft)	* 2.16	* Hydr. Depth (ft)	* 0.41	* 1.35	* 0.46	*
* Conv. Total (cfs)	* 28044.5	* Conv. (cfs)	* 2266.9	* 24045.9	* 1731.7	*
* Length Wtd. (ft)	* 1230.79	* Wetted Per. (ft)	* 306.52	* 373.10	* 191.22	*
* Min Ch El (ft)	* 1340.95	* Shear (lb/sq ft)	* 0.28	* 0.91	* 0.31	*
* Alpha	* 1.31	* Stream Power (lb/ft s)	* 0.52	* 4.54	* 0.64	*
* Frctn Loss (ft)	* 10.51	* Cum Volume (acre-ft)	* 207.56	* 307.69	* 162.27	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 175.03	* 143.18	* 173.78	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 4.587

INPUT
Description:
Station Elevation Data num= 55

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9536.11	1334.1	9556.74	1333.95	9577.22	1333.79	9595.26	1333.66	9631	1333.39
9633.78	1333.37	9640.78	1333.32	9672.29	1333.1	9684.79	1333.01	9710.81	1332.85
9738.57	1332.68	9749.33	1332.62	9776.46	1332.45	9787.84	1332.39	9792.36	1332.36
9826.36	1332.13	9846.14	1332	9864.88	1331.88	9899.92	1331.64	9903.4	1331.61
9912.15	1331.56	9941.91	1331.37	9953.71	1331.3	10000	1327.88	10024.63	1329.04
10057.01	1331.14	10077.8	1331.21	10107.05	1331.31	10129.95	1331.41	10157.1	1331.54
10185.63	1331.25	10196.18	1331.35	10210.67	1331.58	10213.43	1331.66	10226.3	1331.9
10231.34	1331.91	10235.3	1331.91	10238.49	1331.89	10257.78	1331.86	10259.51	1331.85
10286.4	1332.25	10307.22	1332.37	10338.55	1332.53	10357.26	1332.64	10390.7	1332.81
10407.3	1332.91	10442.85	1333.08	10457.34	1333.16	10495	1333.34	10507.38	1333.4
10547.15	1333.57	10557.42	1333.61	10599.3	1333.76	10607.46	1333.79	10638.69	1333.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9536.11	.045	9953.71	.038	10307.22	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.71	10307.22	1175	1230	1175	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1332.93	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.30	* Wt. n-Val.	* 0.045	* 0.038	* 0.045 *
* W.S. Elev (ft)	* 1332.63	* Reach Len. (ft)	* 1175.00	* 1230.00	* 1175.00 *
* Crit W.S. (ft)	* 1332.24	* Flow Area (sq ft)	* 136.48	* 583.98	* 6.51 *
* E.G. Slope (ft/ft)	*0.006907	* Area (sq ft)	* 136.48	* 583.98	* 6.51 *
* Q Total (cfs)	* 2940.00	* Flow (cfs)	* 284.41	* 2650.91	* 4.69 *
* Top Width (ft)	* 608.15	* Top Width (ft)	* 206.24	* 353.51	* 48.40 *
* Vel Total (ft/s)	* 4.04	* Avg. Vel. (ft/s)	* 2.08	* 4.54	* 0.72 *
* Max Chl Dpth (ft)	* 4.75	* Hydr. Depth (ft)	* 0.66	* 1.65	* 0.13 *
* Conv. Total (cfs)	* 35375.7	* Conv. (cfs)	* 3422.2	* 31897.1	* 56.4 *
* Length Wtd. (ft)	* 1222.41	* Wetted Per. (ft)	* 206.24	* 353.74	* 48.40 *
* Min Ch El (ft)	* 1327.88	* Shear (lb/sq ft)	* 0.29	* 0.71	* 0.06 *
* Alpha	* 1.16	* Stream Power (lb/ft s)	* 0.59	* 3.23	* 0.04 *
* Frctn Loss (ft)	* 8.93	* Cum Volume (acre-ft)	* 203.96	* 292.27	* 160.96 *
* C & E Loss (ft)	* 0.04	* Cum SA (acres)	* 167.96	* 132.88	* 170.48 *

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 4.355

```
INPUT
Description:
Station Elevation Data     num=      33
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9664.14  1323.9 9699.58 1323.74 9708.42  1323.7 9749.59 1323.51 9757.75 1323.47
 9799.59 1323.27 9807.08 1323.23  9849.6 1322.99 9893.29 1322.72  9899.6 1322.68
 9943.98 1322.41 9952.34 1321.91 9954.47 1321.73 9959.97 1321.28   10000 1317.88
10049.63 1322.1310055.97 1322.1410099.65  1322.210107.34 1322.2310149.66 1322.36
10158.72 1322.3910199.68 1322.5610210.09 1322.61 10249.7 1322.8210261.47 1322.89
10299.72 1323.1410312.84 1323.2210349.73 1323.4810364.22 1323.5810399.75 1323.84
10415.59 1323.9510449.77 1324.1810462.57 1324.26

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 9664.14    .045 9943.98    .03810049.63    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9943.9810049.63              1200    1275    1200              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*************************************************************************************************
* E.G. Elev (ft)          * 1323.96  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.70  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1323.26  * Reach Len. (ft)         * 1200.00  * 1275.00  * 1200.00  *
* Crit W.S. (ft)          * 1323.26  * Flow Area (sq ft)       *   59.18  *  330.59  *  187.25  *
* E.G. Slope (ft/ft)      *0.007735  * Area (sq ft)            *   59.18  *  330.59  *  187.25  *
* Q Total (cfs)           * 2950.00  * Flow (cfs)              *   95.80  * 2426.71  *  427.49  *
* Top Width (ft)          *  516.50  * Top Width (ft)           *  142.20  *  105.65  *  268.65  *
* Vel Total (ft/s)        *    5.11  * Avg. Vel. (ft/s)         *    1.62  *    7.34  *    2.28  *
* Max Chl Dpth (ft)       *    5.38  * Hydr. Depth (ft)         *    0.42  *    3.13  *    0.70  *
* Conv. Total (cfs)       * 33541.8  * Conv. (cfs)              *  1089.3  * 27591.9  *  4860.6  *
* Length Wtd. (ft)        * 1259.84  * Wetted Per. (ft)         *  142.20  *  106.02  *  268.65  *
* Min Ch El (ft)          * 1317.88  * Shear (lb/sq ft)         *    0.20  *    1.51  *    0.34  *
* Alpha                   *    1.73  * Stream Power (lb/ft s)   *    0.33  *   11.05  *    0.77  *
* Frctn Loss (ft)         *    7.09  * Cum Volume (acre-ft)     *  201.32  *  279.36  *  158.35  *
* C & E Loss (ft)         *    0.10  * Cum SA (acres)           *  163.26  *  126.40  *  166.20  *
*************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1             RS: 4.113

INPUT
Description:
Station Elevation Data     num=      51
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9519.27 1312.71 9541.49 1312.58 9561.97 1312.55 9581.85 1312.52 9614.03 1312.48
 9622.22 1312.47  9650.5 1312.44 9662.58 1312.43 9666.08 1312.43 9702.95 1312.38
 9718.13 1312.37 9743.31 1312.32 9770.19 1312.26 9783.68 1312.21 9822.24  1312.1
 9824.04 1312.09 9830.25 1312.07 9864.41 1311.94  9874.3  1311.9 9904.77 1311.79
 9926.35 1311.72  9953.4 1310.36 9961.36  1309.9 9973.84 1309.18   10000  1307.8
10035.24 1309.4410066.18 1311.5510080.43 1311.5510100.63 1311.5810131.17 1311.62
10161.96 1311.6910181.91 1311.7310223.29 1311.8510232.65 1311.8810277.51 1312.01
10283.39 1312.0310284.62 1312.0310334.13 1312.1610345.95 1312.1910384.87 1312.27
10407.28 1312.3210435.61 1312.3810468.61 1312.4410486.35 1312.4810529.94 1312.55
10537.09 1312.5610571.36 1312.6110587.83 1312.6410591.27 1312.6510638.57 1312.76
10641.91 1312.77

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
***********************************************
 9519.27    .045 9926.35    .03810066.18    .045
```

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9926.3510066.18 925 969 925 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1313.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1312.70	Reach Len. (ft)	925.00	969.00	925.00
Crit W.S. (ft)	1312.40	Flow Area (sq ft)	172.51	426.92	311.25
E.G. Slope (ft/ft)	0.004283	Area (sq ft)	172.51	426.92	311.25
Q Total (cfs)	2970.00	Flow (cfs)	210.92	2296.98	462.10
Top Width (ft)	1091.76	Top Width (ft)	405.37	139.83	546.56
Vel Total (ft/s)	3.26	Avg. Vel. (ft/s)	1.22	5.38	1.48
Max Chl Dpth (ft)	4.90	Hydr. Depth (ft)	0.43	3.05	0.57
Conv. Total (cfs)	45382.2	Conv. (cfs)	3222.9	35098.3	7061.0
Length Wtd. (ft)	953.26	Wetted Per. (ft)	405.37	140.04	546.56
Min Ch El (ft)	1307.80	Shear (lb/sq ft)	0.11	0.82	0.15
Alpha	2.15	Stream Power (lb/ft s)	0.14	4.39	0.23
Frctn Loss (ft)	6.65	Cum Volume (acre-ft)	198.13	268.27	151.48
C & E Loss (ft)	0.01	Cum SA (acres)	155.72	122.80	154.97

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 3.930

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8968.84	1306.37	8973.43	1306.35	8979.05	1306.33	9012.03	1306.24	9032.72	1306.19
9050.63	1306.16	9086.4	1306.11	9089.24	1306.11	9096.49	1306.1	9127.84	1306.08
9140.08	1306.08	9166.44	1306.07	9193.76	1306.08	9205.04	1306.08	9233.92	1306.08
9243.64	1306.09	9247.44	1306.09	9282.24	1306.08	9301.12	1306.07	9320.85	1306.06
9354.79	1306.02	9359.45	1306.01	9371.36	1305.99	9398.05	1305.95	9408.47	1305.93
9436.65	1305.88	9462.15	1305.84	9475.25	1305.81	9508.8	1305.78	9513.85	1305.77
9515.83	1305.77	9552.46	1305.74	9569.51	1305.74	9591.06	1305.75	9623.19	1305.77
9629.66	1305.78	9646.23	1305.79	9668.26	1305.8	9676.86	1305.81	9706.86	1305.81
9730.54	1305.8	9745.46	1305.78	9783.67	1305.71	9784.07	1305.71	9784.22	1305.71
9822.67	1305.6	9837.9	1305.56	9861.27	1305.48	9891.58	1305.37	9900.82	1305.24
9905.44	1305.16	9913.39	1305	9961.34	1304.48	9973.84	1304.17	10000	1303.79
10045.88	1304.88	10051.3	1305	10058.95	1305.11	10071.24	1305.14	10108.17	1305.22
10137.21	1305.29	10162.8	1305.33	10195.35	1305.39	10217.43	1305.42	10234.79	1305.42
10272.06	1305.44	10319.46	1305.39	10326.69	1305.38	10332.37	1305.37	10381.32	1305.29
10429.95	1305.24	10435.95	1305.24	10443.57	1305.24	10490.58	1305.24	10527.53	1305.31
10545.21	1305.34	10567.68	1305.42	10599.84	1305.54	10625.12	1305.66	10654.47	1305.8
10691.8	1306.01	10709.1	1306.11	10722.7	1306.19	10757.59	1306.4		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8968.84	.045	9891.58	.03	10071.24	.045

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9891.5810071.24 1300 1386 1300 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1306.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1306.06	Reach Len. (ft)	1300.00	1386.00	1300.00
Crit W.S. (ft)	1306.06	Flow Area (sq ft)	160.97	262.60	413.87
E.G. Slope (ft/ft)	0.013296	Area (sq ft)	160.97	262.60	413.87
Q Total (cfs)	2980.00	Flow (cfs)	263.38	1524.86	1191.77
Top Width (ft)	1380.40	Top Width (ft)	571.46	179.66	629.28
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)	1.64	5.81	2.88
Max Chl Dpth (ft)	2.27	Hydr. Depth (ft)	0.28	1.46	0.66
Conv. Total (cfs)	25843.5	Conv. (cfs)	2284.1	13224.0	10335.4
Length Wtd. (ft)	1343.45	Wetted Per. (ft)	571.46	179.69	629.29
Min Ch El (ft)	1303.79	Shear (lb/sq ft)	0.23	1.21	0.55

* Alpha	* 1.64	* Stream Power (lb/ft s)	* 0.38	* 7.04	* 1.57 *
* Frctn Loss (ft)	* 11.08	* Cum Volume (acre-ft)	* 194.59	* 260.60	* 143.79 *
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 145.35	* 119.25	* 142.49 *

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 3.667

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9563.06	1294.9	9579.89	1294.88	9613.65	1294.87	9623.73	1294.84	9664.24	1294.76
9667.56	1294.75	9689.15	1294.66	9711.4	1294.57	9714.83	1294.56	9755.24	1294.33
9765.42	1294.27	9799.07	1294.06	9816.01	1293.96	9842.91	1293.8	9866.6	1293.66
9886.75	1293.56	9917.19	1293.41	9930.58	1293.35	9972.78	1292.32	9979.69	1292.19
9988.51	1292.06	9997.97	1291.9	10000	1291.89	10052.58	1292.97	10055.12	1292.99
10057.05	1292.99	10058.53	1292.98	10068.24	1293.05	10074.83	1293.06	10118.31	1293.08
10127.65	1293.11	10168.38	1293.16	10180.48	1293.19	10218.45	1293.28	10233.31	1293.32
10268.52	1293.43	10286.14	1293.51	10318.59	1293.62	10338.96	1293.71	10368.65	1293.84
10391.79	1293.96	10418.72	1294.09	10444.62	1294.23	10468.79	1294.36	10497.45	1294.53
10518.86	1294.65	10550.27	1294.85	10568.93	1294.97	10603.1	1295.21	10618.99	1295.32
10655.93	1295.58	10669.06	1295.68	10708.75	1295.93	10719.13	1295.99	10761.58	1296.2
10769.2	1296.23	10797.28	1296.32						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9563.06	.045	9917.19	.03	10068.24	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9917.19	10068.24	1150	1207	1150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1294.92	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.22	* Wt. n-Val.	* 0.045	* 0.038	* 0.045 *
* W.S. Elev (ft)	* 1294.70	* Reach Len. (ft)	* 1150.00	* 1207.00	* 1150.00 *
* Crit W.S. (ft)	* 1294.32	* Flow Area (sq ft)	* 150.96	* 313.57	* 480.56 *
* E.G. Slope (ft/ft)	*0.005625	* Area (sq ft)	* 150.96	* 313.57	* 480.56 *
* Q Total (cfs)	* 3000.00	* Flow (cfs)	* 275.99	* 1496.35	* 1227.65 *
* Top Width (ft)	* 847.76	* Top Width (ft)	* 238.00	* 151.05	* 458.71 *
* Vel Total (ft/s)	* 3.17	* Avg. Vel. (ft/s)	* 1.83	* 4.77	* 2.55 *
* Max Chl Dpth (ft)	* 2.81	* Hydr. Depth (ft)	* 0.63	* 2.08	* 1.05 *
* Conv. Total (cfs)	* 39999.4	* Conv. (cfs)	* 3679.9	* 19951.1	* 16368.4 *
* Length Wtd. (ft)	* 1181.08	* Wetted Per. (ft)	* 238.00	* 151.08	* 458.72 *
* Min Ch El (ft)	* 1291.89	* Shear (lb/sq ft)	* 0.22	* 0.73	* 0.37 *
* Alpha	* 1.42	* Stream Power (lb/ft s)	* 0.41	* 3.48	* 0.94 *
* Frctn Loss (ft)	* 9.12	* Cum Volume (acre-ft)	* 189.94	* 251.44	* 130.44 *
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 133.27	* 113.99	* 126.25 *

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 3.438

INPUT

Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9392.88	1286.23	9432.74	1286.24	9433.42	1286.23	9435.86	1286.23	9473.96	1286.17
9484.67	1286.16	9514.5	1286.08	9536.61	1286.02	9555.04	1285.95	9588.55	1285.83
9595.58	1285.8	9620.55	1285.67	9636.12	1285.59	9640.49	1285.57	9676.66	1285.34
9692.43	1285.24	9717.19	1285.08	9744.37	1284.89	9757.73	1284.8	9796.31	1284.54
9798.27	1284.53	9805.25	1284.48	9838.81	1284.27	9848.25	1284.21	9879.35	1284.04
9900.19	1283.94	9937.33	1283.8	9958.94	1283.61	9960.84	1283.34	9965.17	1283
9967.66	1282.91	9970.83	1282.83	9974.95	1282.71	9983.45	1282.44	10000	1281.89
10017.93	1282.54	10026.13	1282.84	10055.6	1283.83	10070.53	1283.89	10107.15	1284.02
10139.42	1284.13	10158.71	1284.2	10208.3	1284.35	10210.27	1284.36	10216.12	1284.37
10261.83	1284.49	10277.18	1284.53	10313.38	1284.63	10346.07	1284.71	10364.94	1284.76
10414.95	1284.9	10416.5	1284.9	10421.1	1284.92	10468.06	1285.07	10483.84	1285.13
10519.61	1285.27	10552.72	1285.41	10571.17	1285.48	10621.6	1285.71	10622.73	1285.71
10626.07	1285.73	10674.29	1285.97	10690.49	1286.05	10701.99	1286.11		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9392.88	.045	9937.33	.03	10070.53	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9937.33	10070.53	1200	1271	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1285.78	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1285.30	Reach Len. (ft)	1200.00	1271.00	1200.00
Crit W.S. (ft)	1285.30	Flow Area (sq ft)	207.32	302.07	324.39
E.G. Slope (ft/ft)	0.010528	Area (sq ft)	207.32	302.07	324.39
Q Total (cfs)	3580.00	Flow (cfs)	613.34	2091.20	875.46
Top Width (ft)	843.60	Top Width (ft)	254.10	133.20	456.29
Vel Total (ft/s)	4.29	Avg. Vel. (ft/s)	2.96	6.92	2.70
Max Chl Dpth (ft)	3.41	Hydr. Depth (ft)	0.82	2.27	0.71
Conv. Total (cfs)	34890.1	Conv. (cfs)	5977.5	20380.5	8532.1
Length Wtd. (ft)	1252.56	Wetted Per. (ft)	254.11	133.29	456.30
Min Ch El (ft)	1281.89	Shear (lb/sq ft)	0.54	1.49	0.47
Alpha	1.70	Stream Power (lb/ft s)	1.59	10.31	1.26
Frctn Loss (ft)	8.26	Cum Volume (acre-ft)	185.21	242.91	119.81
C & E Loss (ft)	0.02	Cum SA (acres)	126.77	110.05	114.18

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 3.198

INPUT
Description:
Station Elevation Data num= 65

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9454.54	1277.72	9461.26	1277.72	9489.37	1277.68	9515.38	1277.65	9527.64	1277.6
9557.24	1277.49	9565.91	1277.45	9569.5	1277.44	9604.18	1277.22	9623.62	1277.1
9642.44	1276.94	9677.74	1276.67	9680.71	1276.64	9687.9	1276.58	9718.98	1276.29
9731.86	1276.18	9757.25	1275.94	9785.98	1275.68	9795.52	1275.59	9818.55	1275.39
9833.79	1275.25	9840.1	1275.19	9872.05	1274.94	9894.22	1274.76	9915.03	1273.78
9918.85	1273.59	9919.1	1273.57	9924.32	1273.26	9931.2	1272.92	9934.11	1272.81
9937.37	1272.71	9969.96	1271.8	9972.01	1271.72	9975.36	1271.63	9979.1	1271.54
9983.1	1271.44	9987.1	1271.34	9991.44	1271.21	10000	1270.91	10055.56	1274.47
10055.68	1274.47	10055.71	1274.48	10055.72	1274.48	10055.76	1274.48	10055.77	1274.48
10055.8	1274.48	10109.12	1274.79	10140.77	1274.99	10162.47	1275.12	10199.08	1275.32
10215.82	1275.41	10225.75	1275.45	10269.17	1275.61	10310.72	1275.71	10322.52	1275.74

```
10342.43 1275.7810375.88 1275.84 10395.7 1275.8910429.23 1275.9510480.68 1276.11
10482.58 1276.1110485.78 1276.1210535.93 1276.3110565.65 1276.4310583.76 1276.49

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9454.54    .045 9894.22    .03810109.12    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9894.2210109.12               1075    1120    1075            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1276.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.43  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1276.15  * Reach Len. (ft)         * 1075.00  * 1120.00  * 1075.00  *
* Crit W.S. (ft)          * 1275.56  * Flow Area (sq ft)       *  114.36  *  649.46  *  209.60  *
* E.G. Slope (ft/ft)      *0.004743  * Area (sq ft)            *  114.36  *  649.46  *  209.60  *
* Q Total (cfs)           * 4180.00  * Flow (cfs)              *  208.52  * 3653.60  *  317.88  *
* Top Width (ft)          *  758.98  * Top Width (ft)          *  159.27  *  214.90  *  384.81  *
* Vel Total (ft/s)        *    4.29  * Avg. Vel. (ft/s)        *    1.82  *    5.63  *    1.52  *
* Max Chl Dpth (ft)       *    5.25  * Hydr. Depth (ft)        *    0.72  *    3.02  *    0.54  *
* Conv. Total (cfs)       * 60697.1  * Conv. (cfs)             *  3027.9  * 53053.4  *  4615.9  *
* Length Wtd. (ft)        * 1107.77  * Wetted Per. (ft)        *  159.28  *  215.09  *  384.81  *
* Min Ch El (ft)          * 1270.90  * Shear (lb/sq ft)        *    0.21  *    0.89  *    0.16  *
* Alpha                   *    1.52  * Stream Power (lb/ft s)  *    0.39  *    5.03  *    0.24  *
* Frctn Loss (ft)         *    6.56  * Cum Volume (acre-ft)    *  180.78  *  229.02  *  112.46  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  121.08  *  104.97  *  102.59  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1             RS: 2.986

INPUT
Description:
Station Elevation Data      num=      91
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 8809.87 1269.77 8820.11 1269.77 8833.25 1269.77 8856.01 1269.77 8888.45 1269.77
 8891.91 1269.78 8894.33 1269.77  8927.8 1269.78  8955.4 1269.77  8963.7 1269.77
 8975.52 1269.76 8999.59 1269.75 9016.48 1269.73 9035.49 1269.71  9062.6 1269.68
 9071.38 1269.67 9077.55 1269.66 9107.28 1269.62 9138.62 1269.58 9143.18 1269.58
 9149.67 1269.57 9179.07 1269.54  9199.7 1269.53 9214.97 1269.52 9236.74  1269.5
 9250.86 1269.49 9260.77 1269.49 9286.76 1269.46 9321.84 1269.42 9322.65 1269.42
 9323.81 1269.42 9358.55 1269.35 9382.92 1269.31 9394.44 1269.28 9410.88 1269.24
 9430.34 1269.19 9443.99 1269.16 9466.24 1269.11 9497.95 1269.05 9502.13 1269.04
 9505.06 1269.04 9538.03 1268.97 9566.14 1268.92 9573.92  1268.9 9585.02 1268.88
 9609.82 1268.81 9627.21 1268.76 9645.71  1268.7 9672.09 1268.61 9681.61 1268.58
 9688.28 1268.55 9717.51 1268.43 9749.36 1268.31  9753.4 1268.29 9759.16 1268.27
  9789.3 1268.13 9810.43 1268.04 9825.19 1267.97 9846.24 1267.88 9861.09 1267.82
 9871.51 1267.78 9896.98 1267.67 9932.58 1267.54 9932.88 1267.54 9933.22 1267.53
 9933.68 1267.52   10000 1265.8910024.72 1266.6410038.07 1267.0510076.18 1267.43
10088.74 1267.6410113.13  1268.110161.82  1268.4 10172.8 1268.4710193.31 1268.58
10232.47 1268.8110253.44 1268.9110292.13 1269.0910345.07 1269.28 10351.8 1269.31
10364.37 1269.3410411.47 1269.4410436.69 1269.4710471.13 1269.5110528.32 1269.53
 10530.8 1269.5310535.43 1269.5310590.47 1269.5410619.95 1269.5610650.14 1269.59
10696.28 1269.65

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8809.87    .045 9932.58    .03810088.74    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9932.5810088.74               1100    1183    1100            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1270.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.43  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1269.60  * Reach Len. (ft)         * 1100.00  * 1183.00  * 1100.00  *
* Crit W.S. (ft)          * 1269.37  * Flow Area (sq ft)       *  606.57  *  429.11  *  271.75  *
```

* E.G. Slope (ft/ft)	*0.007380	* Area (sq ft)	* 606.57	* 429.11	* 271.75	*
* Q Total (cfs)	* 4720.00	* Flow (cfs)	* 1420.84	* 2827.53	* 471.63	*
* Top Width (ft)	* 1532.42	* Top Width (ft)	* 808.39	* 156.16	* 567.87	*
* Vel Total (ft/s)	* 3.61	* Avg. Vel. (ft/s)	* 2.34	* 6.59	* 1.74	*
* Max Chl Dpth (ft)	* 3.71	* Hydr. Depth (ft)	* 0.75	* 2.75	* 0.48	*
* Conv. Total (cfs)	* 54942.3	* Conv. (cfs)	* 16539.0	* 32913.3	* 5490.0	*
* Length Wtd. (ft)	* 1162.99	* Wetted Per. (ft)	* 808.39	* 156.20	* 567.88	*
* Min Ch El (ft)	* 1265.89	* Shear (lb/sq ft)	* 0.35	* 1.27	* 0.22	*
* Alpha	* 2.15	* Stream Power (lb/ft s)	* 0.81	* 8.34	* 0.38	*
* Frctn Loss (ft)	* 8.92	* Cum Volume (acre-ft)	* 171.88	* 215.16	* 106.52	*
* C & E Loss (ft)	* 0.03	* Cum SA (acres)	* 109.14	* 100.20	* 90.83	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 2.762

INPUT
Description:
Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9178.77	1260.93	9206.59	1260.87	9206.64	1260.87	9206.69	1260.87	9242	1260.8
9276.57	1260.71	9277.35	1260.71	9278.15	1260.71	9312.71	1260.62	9346.46	1260.54
9348.07	1260.54	9349.72	1260.53	9383.43	1260.44	9416.35	1260.35	9421.28	1260.33
9454.14	1260.23	9486.23	1260.14	9489.5	1260.13	9492.85	1260.12	9524.86	1260.03
9587.72	1260.27	9591.37	1260.26	9603.16	1260.11	9620.21	1259.88	9630.93	1259.71
9635.98	1259.7	9666.29	1259.63	9695.89	1259.56	9701.65	1259.55	9707.54	1259.54
9737.01	1259.46	9765.78	1259.4	9772.36	1259.38	9779.11	1259.37	9807.72	1259.28
9835.67	1259.19	9843.08	1259.17	9850.67	1259.15	9878.44	1259.04	9905.55	1258.94
9913.79	1258.91	9922.23	1258.88	9949.15	1258.78	9977	1258.79	9982.47	1258.81
9989.99	1258.84	10000	1258.881	0008.63	1258.811	0026.96	1258.691	0029.85	1258.69
10035.36	1258.771	0069.71	1258.751	0096.47	1258.841	0114.34	1258.911	0146.89	1259.04
10158.97	1259.091	0197.31	1259.27	10203.6	1259.311	0247.72	1259.551	0248.23	1259.56
10252.14	1259.581	0292.86	1259.841	0298.14	1259.871	0337.49	1260.111	0348.56	1260.18
10382.12	1260.351	0398.98	1260.441	0426.75	1260.56	10449.4	1260.641	0471.38	1260.72
10513.88	1261.621	0518.72	1261.691	0526.71	1261.82	10536.2	1261.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9178.77	.045	9630.93	.03810248.23		.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9630.93	10248.23	1200	1282	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1261.08	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.33	* Wt. n-Val.	* 0.045	* 0.038	* 0.045 *
* W.S. Elev (ft)	* 1260.75	* Reach Len. (ft)	* 1200.00	* 1282.00	* 1200.00 *
* Crit W.S. (ft)	* 1260.48	* Flow Area (sq ft)	* 162.28	* 994.01	* 123.28 *
* E.G. Slope (ft/ft)	*0.007951	* Area (sq ft)	* 162.28	* 994.01	* 123.28 *
* Q Total (cfs)	* 5280.00	* Flow (cfs)	* 275.27	* 4761.50	* 243.23 *
* Top Width (ft)	* 1213.17	* Top Width (ft)	* 371.13	* 617.30	* 224.74 *
* Vel Total (ft/s)	* 4.13	* Avg. Vel. (ft/s)	* 1.70	* 4.79	* 1.97 *
* Max Chl Dpth (ft)	* 2.06	* Hydr. Depth (ft)	* 0.44	* 1.61	* 0.55 *
* Conv. Total (cfs)	* 59212.8	* Conv. (cfs)	* 3087.1	* 53398.1	* 2727.7 *
* Length Wtd. (ft)	* 1252.94	* Wetted Per. (ft)	* 371.13	* 617.31	* 224.74 *
* Min Ch El (ft)	* 1258.69	* Shear (lb/sq ft)	* 0.22	* 0.80	* 0.27 *
* Alpha	* 1.23	* Stream Power (lb/ft s)	* 0.37	* 3.83	* 0.54 *
* Frctn Loss (ft)	* 10.43	* Cum Volume (acre-ft)	* 162.17	* 195.83	* 101.53 *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 94.25	* 89.70	* 80.83 *

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)

REACH: REACH 1 RS: 2.519

INPUT
Description:
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9162.08	1250.94	9166.37	1250.91	9177.05	1250.84	9202.16	1250.67	9236.65	1250.44
9237.95	1250.43	9238.9	1250.42	9273.74	1250.18	9300.75	1250	9309.53	1249.94
9321.59	1249.86	9345.32	1249.72	9362.6	1249.62	9381.11	1249.52	9406.54	1249.41
9416.9	1249.37	9427.03	1249.31	9429.85	1249.31	9434.72	1249.3	9443.83	1249.29
9463.94	1249.28	9484.89	1249.24	9488.68	1249.28	9508.61	1249.26	9526.17	1249.24
9534.28	1249.24	9539.28	1249.24	9560.07	1249.1	9576.44	1249.09	9595.86	1249.07
9610	1249.06	9631.65	1249.03	9661.38	1249	9667.44	1248.99	9671.84	1248.99
9703.23	1248.93	9733.69	1248.88	9739.02	1248.86	9746.33	1248.84	9774.81	1248.77
9795.54	1248.71	9810.6	1248.66	9831.28	1248.59	9846.39	1248.54	9857.39	1248.5
9882.18	1248.41	9916.23	1248.31	9917.97	1248.3	9919.24	1248.3	9953.76	1248.19
9985.92	1247.19	10000	1246.45	10016.43	1247.09	10024.58	1247.46	10031.38	1247.79
10037.04	1247.97	10040.36	1248.01	10100.01	1248.67	10101.65	1248.68	10111.84	1248.73
10152.12	1248.94	10158.57	1248.97	10202.59	1249.17	10217.12	1249.24	10253.07	1249.4
10275.68	1249.52	10303.54	1249.64	10334.23	1249.79	10354.01	1249.89	10392.79	1250.06
10404.49	1250.11	10451.34	1250.28	10454.96	1250.31	10477.56	1250.36	10505.44	1250.44
10509.9	1250.45	10555.91	1250.55	10568.45	1250.57	10587.64	1250.62		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9162.08	.045	9953.76	.03	10100.01	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.76	10100.01	1500	1543	1500	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1250.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1250.25	Reach Len. (ft)	1500.00	1543.00	1500.00
Crit W.S. (ft)	1250.09	Flow Area (sq ft)	809.40	365.25	261.76
E.G. Slope (ft/ft)	0.008687	Area (sq ft)	809.40	365.25	261.76
Q Total (cfs)	5890.00	Flow (cfs)	2768.94	2449.60	671.47
Top Width (ft)	1180.92	Top Width (ft)	690.67	146.25	344.00
Vel Total (ft/s)	4.10	Avg. Vel. (ft/s)	3.42	6.71	2.57
Max Chl Dpth (ft)	3.80	Hydr. Depth (ft)	1.17	2.50	0.76
Conv. Total (cfs)	63193.7	Conv. (cfs)	29707.9	26281.7	7204.1
Length Wtd. (ft)	1520.12	Wetted Per. (ft)	690.67	146.32	344.00
Min Ch El (ft)	1246.45	Shear (lb/sq ft)	0.64	1.35	0.41
Alpha	1.48	Stream Power (lb/ft s)	2.17	9.08	1.06
Frctn Loss (ft)	13.12	Cum Volume (acre-ft)	148.79	175.83	96.23
C & E Loss (ft)	0.01	Cum SA (acres)	79.62	78.46	72.99

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 2.227

INPUT
Description:
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9063.14	1239.96	9089.27	1239.74	9122.9	1239.45	9124.82	1239.43	9126.38	1239.42
9160.37	1239.11	9190.75	1238.84	9195.92	1238.8	9202.29	1238.75	9231.46	1238.49
9255.12	1238.29	9267.01	1238.19	9281.68	1238.08	9302.56	1237.92	9319.49	1237.81
9338.11	1237.67	9361.07	1237.53	9373.66	1237.45	9383.86	1237.4	9409.2	1237.26
9440.46	1237.1	9444.75	1237.08	9448.23	1237.06	9480.3	1236.91	9512.6	1236.77
9515.85	1236.75	9519.86	1236.73	9551.4	1236.58	9576.97	1236.47	9586.94	1236.42
9599.25	1236.36	9622.49	1236.24	9641.34	1236.15	9658.04	1236.06	9678.64	1235.95
9693.59	1235.88	9705.7	1235.81	9729.13	1235.69	9758.03	1235.53	9764.68	1235.49
9770.07	1235.46	9800.23	1235.28	9834.44	1235.09	9835.78	1235.09	9837.42	1235.08
9871.33	1234.9	9898.81	1234.77	9906.87	1234.73	9916.81	1234.69	9942.42	1234.59
9972.72	1233.87	10000	1233.07	10034.24	1234.09	10043.03	1234.39	10045.35	1234.5
10058.88	1234.69	10099.43	1234.91	10101.54	1234.92	10112.45	1234.99	10144.21	1235.18
10150.36	1235.22	10186.87	1235.45	10201.29	1235.55	10229.53	1235.73	10252.22	1235.87

```
10286.47 1235.8510315.66  1235.510347.44 1236.2510354.08 1236.3410357.51 1236.36
10375.19  1236.410400.17 1236.4710405.01 1236.4710442.83 1236.5510455.94 1236.56
10485.49 1236.6210506.87 1236.6510528.15 1236.7110557.81 1236.7810570.82 1236.82
10608.74 1236.9310613.48 1236.9510637.93 1237.0310656.14 1237.0910659.67  1237.1
 10698.8 1237.24 10710.6 1237.2910741.46  1237.410761.53 1237.4810782.94 1237.56

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9063.14    .045 9898.81    .03810058.88    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9898.8110058.88               1175    1232    1175            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1237.52  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.51  * Wt. n-Val.               *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1237.01  * Reach Len. (ft)          * 1175.00  * 1232.00  * 1175.00  *
* Crit W.S. (ft)          * 1236.88  * Flow Area (sq ft)        *  478.62  *  463.37  *  557.61  *
* E.G. Slope (ft/ft)      *0.008581  * Area (sq ft)             *  478.62  *  463.37  *  557.61  *
* Q Total (cfs)           * 6630.00  * Flow (cfs)               * 1547.62  * 3408.70  * 1673.67  *
* Top Width (ft)          * 1174.09  * Top Width (ft)           *  440.38  *  160.07  *  573.65  *
* Vel Total (ft/s)        *    4.42  * Avg. Vel. (ft/s)         *    3.23  *    7.36  *    3.00  *
* Max Chl Dpth (ft)       *    3.94  * Hydr. Depth (ft)         *    1.09  *    2.89  *    0.97  *
* Conv. Total (cfs)       * 71570.6  * Conv. (cfs)              * 16706.5  * 36796.8  * 18067.2  *
* Length Wtd. (ft)        * 1212.65  * Wetted Per. (ft)         *  440.38  *  160.12  *  573.66  *
* Min Ch El (ft)          * 1233.07  * Shear (lb/sq ft)         *    0.58  *    1.55  *    0.52  *
* Alpha                   *    1.66  * Stream Power (lb/ft s)   *    1.88  *   11.41  *    1.56  *
* Frctn Loss (ft)         *   10.58  * Cum Volume (acre-ft)     *  126.61  *  161.16  *   82.12  *
* C & E Loss (ft)         *    0.07  * Cum SA (acres)           *   60.15  *   73.04  *   57.19  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15A (G40)
REACH: REACH 1            RS: 1.993

INPUT
Description:
Station Elevation Data      num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9488.52 1226.93 9494.72 1226.91 9519.59  1226.8 9530.43 1226.76 9538.56 1226.72
 9566.15 1226.58 9601.05 1226.41 9601.86 1226.41 9602.94  1226.4 9637.58 1226.22
 9663.55 1226.09 9673.29 1226.05 9686.29 1225.98 9709.01 1225.88 9726.04 1225.81
 9744.72 1225.73 9769.63 1225.64 9780.44  1225.6 9788.54 1225.57 9816.15 1225.48
 9851.03 1225.37 9851.87 1225.37 9852.98 1225.36 9887.58 1225.27 9913.53 1225.21
  9923.3 1225.18  9941.6 1225.04 9954.39 1224.99   10000 1224.9110079.99 1225.22
10082.05 1225.2210123.18 1225.3510132.81 1225.3810166.36 1225.4910183.58 1225.55
10227.72 1224.8110250.36 1224.91   10267 1225.5310278.24 1225.8310279.55 1225.84
 10280.6 1225.8310295.91 1225.9110335.87 1226.02 10339.1 1226.0210357.48 1226.06
10382.28 1226.1110386.64 1226.1110425.47 1226.16 10437.4 1226.1710468.65  1226.2
10488.16 1226.2210511.84 1226.2510538.93 1226.2810555.02  1226.310589.69 1226.34
10598.21 1226.3610640.46 1226.4410641.39 1226.44 10646.7 1226.4510684.57 1226.54
10691.22 1226.5610727.76 1226.6710741.99 1226.7210770.94 1226.8210792.75 1226.91
10814.13    122710843.52 1227.1410857.31  1227.210894.28 1227.38 10900.5 1227.41
10935.92 1227.5910943.68 1227.6310945.04 1227.6410953.54 1227.68

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9488.52    .045 9663.55    .03810295.91    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9663.5510295.91               1200    1273    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1226.87  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.               *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1226.60  * Reach Len. (ft)          * 1200.00  * 1273.00  * 1200.00  *
```

Crit W.S. (ft)	1226.40	Flow Area (sq ft)	25.84	786.01	145.50	
E.G. Slope (ft/ft)	0.008990	Area (sq ft)	25.84	786.01	145.50	
Q Total (cfs)	3630.00	Flow (cfs)	32.46	3368.88	228.66	
Top Width (ft)	1143.18	Top Width (ft)	101.68	632.36	409.14	
Vel Total (ft/s)	3.79	Avg. Vel. (ft/s)	1.26	4.29	1.57	
Max Chl Dpth (ft)	1.79	Hydr. Depth (ft)	0.25	1.24	0.36	
Conv. Total (cfs)	38285.0	Conv. (cfs)	342.4	35531.0	2411.6	
Length Wtd. (ft)	1269.98	Wetted Per. (ft)	101.68	632.39	409.14	
Min Ch El (ft)	1224.81	Shear (lb/sq ft)	0.14	0.70	0.20	
Alpha	1.20	Stream Power (lb/ft s)	0.18	2.99	0.31	
Frctn Loss (ft)	9.63	Cum Volume (acre-ft)	119.81	143.49	72.64	
C & E Loss (ft)	0.00	Cum SA (acres)	52.84	61.83	43.94	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 1.752

INPUT
Description:
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9396.29	1218.81	9425.59	1218.75	9452.92	1218.68	9462.56	1218.66	9480.68	1218.61
9499.53	1218.56	9509.55	1218.53	9536.5	1218.45	9566.18	1218.34	9573.47	1218.32
9587.17	1218.25	9610.44	1218.16	9622.81	1218.1	9647.41	1217.97	9679.44	1217.79
9684.38	1217.75	9693.66	1217.69	9721.35	1217.51	9736.07	1217.41	9758.32	1217.23
9792.7	1216.96	9795.29	1216.94	9800.16	1216.9	9832.26	1216.64	9849.33	1216.5
9869.23	1216.34	9905.96	1216.04	9906.2	1216.04	9906.65	1216.04	9943.17	1215.78
9980.96	1213.99	9985.26	1213.68	9991.28	1213.27	10000	1212.88	10000.68	1213.03
10001.34	1213.16	10002.22	1213.33	10002.74	1213.41	10004.03	1213.57	10004.66	1213.64
10022.94	1214.22	10028.55	1214.36	10043.89	1214.43	10047.46	1214.45	10050.2	1214.5
10052.78	1214.55	10055.08	1214.61	10056.81	1214.64	10058.3	1214.69	10059.59	1214.73
10061.65	1214.79	10063.2	1214.85	10085.71	1215.49	10118.09	1215.56	10144.31	1215.63
10168.56	1215.7	10202.9	1215.82	10219.04	1215.88	10261.5	1216.06	10273.19	1215.94
10274.02	1215.91	10275.1	1215.88	10276.52	1215.83	10279.25	1215.73	10284.49	1215.53
10299.13	1215.02	10316.82	1214.47	10351.31	1215.79	10361.14	1216.19	10370.47	1216.54
10378.68	1216.57	10420.95	1216.74	10437.28	1216.81	10471.43	1216.93	10497.27	1217.03
10521.91	1217.13	10554.47	1217.26	10572.38	1217.33	10613.06	1217.48	10622.86	1217.53
10671.66	1217.71	10673.34	1217.72	10683.78	1217.76	10691.04	1217.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9396.29	.045	9849.33	.03	10370.47	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9849.33	10370.47	1100	1159	1100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1217.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1216.97	Reach Len. (ft)	1100.00	1159.00	1100.00
Crit W.S. (ft)	1216.48	Flow Area (sq ft)	13.35	822.79	23.40
E.G. Slope (ft/ft)	0.006458	Area (sq ft)	13.35	822.79	23.40
Q Total (cfs)	3540.00	Flow (cfs)	13.39	3504.54	22.07
Top Width (ft)	689.00	Top Width (ft)	57.47	521.14	110.39
Vel Total (ft/s)	4.12	Avg. Vel. (ft/s)	1.00	4.26	0.94
Max Chl Dpth (ft)	4.09	Hydr. Depth (ft)	0.23	1.58	0.21
Conv. Total (cfs)	44052.3	Conv. (cfs)	166.6	43611.0	274.6
Length Wtd. (ft)	1142.55	Wetted Per. (ft)	57.47	521.38	110.39
Min Ch El (ft)	1212.88	Shear (lb/sq ft)	0.09	0.64	0.09
Alpha	1.06	Stream Power (lb/ft s)	0.09	2.71	0.08
Frctn Loss (ft)	7.88	Cum Volume (acre-ft)	119.27	119.98	70.31
C & E Loss (ft)	0.02	Cum SA (acres)	50.65	44.98	36.78

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 1.533

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9287.12	1209.98	9310.58	1209.89	9321.94	1209.85	9348.76	1209.75	9376.19	1209.64
9386.93	1209.59	9412.43	1209.49	9425.11	1209.44	9430.45	1209.42	9463.28	1209.3
9484.7	1209.22	9501.46	1209.16	9538.96	1209.03	9539.63	1209.03	9541.23	1209.03
9577.81	1208.92	9593.21	1208.87	9615.98	1208.8	9647.47	1208.7	9654.16	1208.68
9670.03	1208.63	9692.33	1208.55	9701.72	1208.52	9730.51	1208.42	9755.98	1208.34
9768.68	1208.3	9798.84	1208.23	9806.86	1208.2	9810.23	1208.2	9845.03	1208.1
9864.49	1208.06	9883.2	1208.03	9918.74	1207.96	9923.74	1207.87	9924.41	1207.86
9925.3	1207.85	9926.48	1207.84	9928.32	1207.81	9931.12	1207.78	9935.99	1207.71
9982.62	1207.02	9990.43	1206.98	10000	1206.92	10014.33	1207.08	10075.16	1207.91
10093.8	1207.94	10125.19	1208.01	10142.13	1208.04	10175.22	1208.11	10190.47	1208.13
10225.25	1208.19	10238.8	1208.21	10275.28	1208.24	10287.14	1208.26	10325.31	1208.3
10335.48	1208.31	10375.34	1208.36	10383.81	1208.37	10425.37	1208.44	10432.15	1208.45
10475.41	1208.53	10480.49	1208.54	10540.31	1207.05	10547.72	1206.88	10548.23	1206.9
10625.49	1208.87	10673.83	1209.03	10675.53	1209.03	10722.17	1209.22	10725.56	1209.23
10770.5	1209.42	10775.59	1209.45	10818.84	1209.67	10825.62	1209.71	10867.18	1209.93
10875.65	1209.98	10881.67	1210.01						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9287.12	.045	9918.74	.03	10125.19	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9918.74	10125.19	1250	1307	1250	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1209.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1209.15	Reach Len. (ft)	1250.00	1307.00	1250.00
Crit W.S. (ft)	1208.87	Flow Area (sq ft)	264.90	334.49	516.99
E.G. Slope (ft/ft)	0.007389	Area (sq ft)	264.90	334.49	516.99
Q Total (cfs)	3470.00	Flow (cfs)	558.71	1550.82	1360.47
Top Width (ft)	1199.08	Top Width (ft)	413.55	206.45	579.09
Vel Total (ft/s)	3.11	Avg. Vel. (ft/s)	2.11	4.64	2.63
Max Chl Dpth (ft)	2.27	Hydr. Depth (ft)	0.64	1.62	0.89
Conv. Total (cfs)	40368.8	Conv. (cfs)	6499.9	18041.7	15827.2
Length Wtd. (ft)	1287.44	Wetted Per. (ft)	413.55	206.46	579.13
Min Ch El (ft)	1206.92	Shear (lb/sq ft)	0.30	0.75	0.41
Alpha	1.35	Stream Power (lb/ft s)	0.62	3.46	1.08
Frctn Loss (ft)	9.55	Cum Volume (acre-ft)	115.75	104.58	63.49
C & E Loss (ft)	0.02	Cum SA (acres)	44.70	35.30	28.08

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 1.285

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9344.17	1201.81	9350.64	1201.79	9374.32	1201.72	9387.99	1201.68	9410.92	1201.56
9445.73	1201.4	9447.52	1201.39	9450.64	1201.37	9484.13	1201.16	9503.46	1201.03
9520.73	1200.9	9550.63	1200.67	9557.33	1200.62	9561.2	1200.59	9593.93	1200.32
9618.94	1200.11	9630.54	1200.02	9650.62	1199.87	9667.14	1199.73	9676.67	1199.66
9703.74	1199.45	9734.41	1199.22	9740.34	1199.18	9750.62	1199.11	9776.94	1198.93
9792.15	1198.83	9813.55	1198.71	9849.88	1198.5	9850.15	1198.5	9850.61	1198.5
9886.75	1198.34	9907.62	1198.27	9923.35	1198.21	9950.6	1198.15	9959.95	1198.12
9970.19	1197.68	9972.33	1197.55	9978.05	1197.32	10000	1196.61	10057.66	1197.81
10062.65	1197.91	10065.38	1197.94	10068.63	1197.99	10069.71	1198	10073.57	1198.11
10075.67	1198.11	10082.15	1198.12	10115.37	1198.17	10131.01	1197.65	10133.75	1197.51

```
10137.99 1197.3110140.84 1197.1710144.65 1196.9810149.95 1196.73 10167.7 1195.93
10168.91 1195.8810209.43 1197.6210219.45 1198.0610222.92 1198.2110225.08 1198.31
10226.55 1198.3710227.86 1198.4210228.81 1198.4610229.51  1198.5 10229.9 1198.54
10234.48 1198.76 10244.5 1198.8510274.18 1199.1310283.79 1199.2310313.88 1199.56
10336.35 1199.8310353.59 1200.03 10388.9 1200.4410393.29 1200.4910406.85 1200.64
10432.99 1200.9410441.45 1201.0210472.69 1201.3410494.01 1201.54 10512.4 1201.71
10546.56 1201.99 10552.1 1202.0310569.21 1202.16 10591.8 1202.3210599.12 1202.37
 10631.5 1202.5510651.67 1202.6510671.21 1202.7210704.23 1202.8310710.91 1202.84
10731.56 1202.8710750.61  1202.910756.78 1202.9110790.31  1202.910800.26  1202.9

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9344.17    .045  9950.6    .03810234.48    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9950.610234.48              1225    1283    1225              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1199.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.39  * Wt. n-Val.              *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1199.39  * Reach Len. (ft)         * 1225.00  * 1283.00  * 1225.00  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       *  174.53  *  557.32  *   20.99  *
* E.G. Slope (ft/ft)      *0.007450  * Area (sq ft)            *  174.53  *  557.32  *   20.99  *
* Q Total (cfs)           * 3380.00  * Flow (cfs)              *  403.39  * 2948.16  *   28.45  *
* Top Width (ft)          *  586.89  * Top Width (ft)          *  239.01  *  283.88  *   64.00  *
* Vel Total (ft/s)        *    4.49  * Avg. Vel. (ft/s)        *    2.31  *    5.29  *    1.36  *
* Max Chl Dpth (ft)       *    3.51  * Hydr. Depth (ft)        *    0.73  *    1.96  *    0.33  *
* Conv. Total (cfs)       * 39158.7  * Conv. (cfs)             *  4673.4  * 34155.7  *   329.6  *
* Length Wtd. (ft)        * 1277.24  * Wetted Per. (ft)        *  239.02  *  284.04  *   64.00  *
* Min Ch El (ft)          * 1195.88  * Shear (lb/sq ft)        *    0.34  *    0.91  *    0.15  *
* Alpha                   *    1.24  * Stream Power (lb/ft s)   *    0.78  *    4.83  *    0.21  *
* Frctn Loss (ft)         *    9.23  * Cum Volume (acre-ft)     *  109.45  *   91.20  *   55.77  *
* C & E Loss (ft)         *    0.03  * Cum SA (acres)           *   35.34  *   27.94  *   18.85  *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 1.042

INPUT
Description:
Station Elevation Data num= 94

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9323.45 1194.11 9325.74  1194.1 9328.25 1194.09 9330.14 1194.09 9363.96  1193.9
 9392.73 1193.72 9399.66 1193.67 9408.86 1193.59 9435.37 1193.36 9455.32 1193.18
 9471.07 1193.01 9491.99 1192.79 9506.77 1192.63 9517.91 1192.51 9542.48 1192.23
 9575.11 1191.86 9578.18 1191.82  9580.5  1191.8 9613.89 1191.44 9643.09 1191.13
 9649.59 1191.07 9658.23 1190.98  9685.3 1190.72 9705.68 1190.54    9721  1190.4
 9741.35 1190.22 9756.71 1190.09 9768.27 1189.99 9792.41 1189.79 9824.47 1189.55
 9828.12 1189.53 9830.86 1189.51 9863.82  1189.3 9893.45 1189.14 9899.52 1189.11
 9907.59 1189.08 9935.23 1188.97 9960.21 1188.25 9975.71 1187.79 9981.62 1187.58
 9986.42 1187.41 9992.29 1187.18   10000 1186.8910006.26 1187.1810044.15 1188.82
10072.65 1188.8410081.39 1188.8610098.73  1188.910118.62 1188.9310128.63 1188.95
10155.85 1189.0310184.62 1189.1210193.08 1189.1610205.39 1188.7310207.59 1188.69
10210.45 1188.6410216.71 1188.52 10227.8 1188.3210251.88 1187.8810270.49 1188.52
10278.61 1188.8110283.22 1188.97 10285.4 1189.0410287.09  1189.110304.78 1189.65
10321.05 1189.7210342.01 1189.8110352.57 1189.8610379.24 1189.9610408.55 1190.07
10416.47  1190.1 10432.2 1190.15 10453.7 1190.2210464.53 1190.2610490.94 1190.33
10520.52  1190.410528.17 1190.4210543.36 1190.45 10565.4  1190.5 10576.5 1190.52
10602.63 1190.5510632.48 1190.5910639.86  1190.610654.51  1190.610677.09 1190.63
10688.47 1190.6410722.92 1190.6610744.45 1190.6810751.56 1190.6910765.67 1190.69
10788.79 1190.7110800.43 1190.7110826.02 1190.7310846.51 1190.73

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9323.45    .045 9893.45    .03810304.78    .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9893.4510304.78             1225    1273    1225              .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1190.54	Element			
Vel Head (ft)	0.30	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1190.24	Reach Len. (ft)	1225.00	1273.00	1225.00
Crit W.S. (ft)	1189.88	Flow Area (sq ft)	92.07	673.42	42.37
E.G. Slope (ft/ft)	0.007000	Area (sq ft)	92.07	673.42	42.37
Q Total (cfs)	3290.00	Flow (cfs)	180.54	3059.80	49.66
Top Width (ft)	718.62	Top Width (ft)	153.95	411.33	153.34
Vel Total (ft/s)	4.07	Avg. Vel. (ft/s)	1.96	4.54	1.17
Max Chl Dpth (ft)	3.35	Hydr. Depth (ft)	0.60	1.64	0.28
Conv. Total (cfs)	39322.6	Conv. (cfs)	2157.9	36571.3	593.5
Length Wtd. (ft)	1260.03	Wetted Per. (ft)	153.95	411.45	153.35
Min Ch El (ft)	1186.89	Shear (lb/sq ft)	0.26	0.72	0.12
Alpha	1.17	Stream Power (lb/ft s)	0.51	3.25	0.14
Frctn Loss (ft)	8.63	Cum Volume (acre-ft)	105.70	73.08	54.88
C & E Loss (ft)	0.00	Cum SA (acres)	29.81	17.70	15.79

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 0.801

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9509.12	1181.73	9516.84	1181.73	9546.75	1181.71	9556.68	1181.69	9588	1181.64
9596.51	1181.62	9599.2	1181.61	9636.34	1181.47	9651.65	1181.42	9676.17	1181.29
9704.1	1181.16	9716	1181.1	9753.55	1180.92	9755.83	1180.91	9756.55	1180.9
9795.66	1180.73	9809	1180.67	9835.49	1180.57	9861.45	1180.48	9875.32	1180.45
9913.9	1180.36	9916.63	1180.3	9917.13	1180.28	9917.56	1180.28	9918.1	1180.27
9918.77	1180.26	9992.34	1178.89	9995.14	1178.89	9995.68	1178.89	10000	1178.89
10001.46	1178.89	10001.95	1178.89	10003.4	1178.89	10019.64	1179.19	10026.66	1179.31
10033.86	1179.44	10068.27	1180.37	10085.28	1180.42	10118.53	1180.52	10157.47	1179.64
10193.13	1178.87	10247.09	1180.62	10267.71	1181.31	10269.31	1181.32	10313.32	1181.64
10319.57	1181.68	10358.93	1181.99	10369.83	1182.08	10404.54	1182.33	10420.09	1182.44
10428.24	1182.48								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9509.12	.045	9913.9	.03	10068.27	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9913.9	10068.27	1125	1192	1125	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1181.91	Element			
Vel Head (ft)	0.29	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1181.62	Reach Len. (ft)	1125.00	1192.00	1125.00
Crit W.S. (ft)	1181.21	Flow Area (sq ft)	216.82	321.34	325.65
E.G. Slope (ft/ft)	0.006701	Area (sq ft)	216.82	321.34	325.65
Q Total (cfs)	3200.00	Flow (cfs)	453.06	1676.64	1070.30
Top Width (ft)	716.19	Top Width (ft)	319.00	154.37	242.82
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)	2.09	5.22	3.29
Max Chl Dpth (ft)	2.75	Hydr. Depth (ft)	0.68	2.08	1.34
Conv. Total (cfs)	39092.4	Conv. (cfs)	5534.8	20482.5	13075.1
Length Wtd. (ft)	1165.67	Wetted Per. (ft)	319.00	154.40	242.88
Min Ch El (ft)	1178.89	Shear (lb/sq ft)	0.28	0.87	0.56
Alpha	1.35	Stream Power (lb/ft s)	0.59	4.54	1.84
Frctn Loss (ft)	8.72	Cum Volume (acre-ft)	101.36	58.54	49.70
C & E Loss (ft)	0.00	Cum SA (acres)	23.16	9.44	10.22

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 0.575

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9570.17	1173.04	9581.73	1173	9607.53	1172.92	9618.09	1172.89	9624.57	1172.87
9654.44	1172.77	9683.24	1172.67	9690.79	1172.64	9703.1	1172.6	9727.15	1172.52
9741.91	1172.47	9763.5	1172.41	9804.52	1171.18	9815.93	1170.91	9816.97	1170.89
9818.49	1170.92	9832.91	1171.24	9839.33	1171.38	9843.8	1171.48	9872.56	1172.16
9894.26	1172.11	9908.92	1172.08	9917.91	1172.07	9945.27	1172.03	10000	1169.68
10004.56	1170.02	10006.53	1170.17	10007.68	1170.21	10010.75	1170.45	10044.98	1170.89
10063.78	1171.12	10066.59	1171.15	10068.48	1171.14	10081.93	1171.25	10089.18	1171.13
10094.95	1171.09	10104.67	1170.91	10105.25	1170.91	10105.73	1170.89	10106.64	1170.87
10107.08	1170.86	10110.72	1170.83	10115.19	1170.92	10122.37	1171.27	10128.11	1171.63
10176.04	1172.14	10191.01	1172.16	10215.21	1172.21	10281.23	1171.45	10281.37	1171.45
10281.63	1171.46	10307.23	1171.78	10350.14	1172.68	10371.89	1172.78	10403.18	1172.94
10411.06	1172.98	10433.27	1173.11	10450.22	1173.21	10456.23	1173.23	10489.39	1173.4
10509.27	1173.51	10527.75	1173.6						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9570.17	.045	9945.27	.038	10176.04	.045

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.27	10176.04	1000	1043	1000	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1173.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.045	0.038	0.045
W.S. Elev (ft)	1172.87	Reach Len. (ft)	1000.00	1043.00	1000.00
Crit W.S. (ft)		Flow Area (sq ft)	230.80	410.21	159.02
E.G. Slope (ft/ft)	0.008425	Area (sq ft)	230.80	410.21	159.02
Q Total (cfs)	3120.00	Flow (cfs)	563.16	2159.79	397.05
Top Width (ft)	762.93	Top Width (ft)	319.50	230.77	212.67
Vel Total (ft/s)	3.90	Avg. Vel. (ft/s)	2.44	5.27	2.50
Max Chl Dpth (ft)	3.19	Hydr. Depth (ft)	0.72	1.78	0.75
Conv. Total (cfs)	33991.4	Conv. (cfs)	6135.4	23530.2	4325.8
Length Wtd. (ft)	1019.52	Wetted Per. (ft)	319.53	230.88	212.68
Min Ch El (ft)	1169.68	Shear (lb/sq ft)	0.38	0.93	0.39
Alpha	1.38	Stream Power (lb/ft s)	0.93	4.92	0.98
Frctn Loss (ft)	6.69	Cum Volume (acre-ft)	95.58	48.53	43.44
C & E Loss (ft)	0.07	Cum SA (acres)	14.91	4.17	4.34

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15A (G40)
REACH: REACH 1 RS: 0.378

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8840.01	1166.55	8840.67	1166.55	8863.9	1166.51	8876.09	1166.49	8886.89	1166.47
8911.5	1166.42	8939.26	1166.36	8946.92	1166.35	8953.72	1166.34	8982.34	1166.28
9014.61	1166.22	9017.76	1166.22	9020.56	1166.21	9053.18	1166.15	9087.39	1166.09
9088.6	1166.09	9089.97	1166.09	9124.02	1166.03	9154.22	1165.98	9159.44	1165.97
9166.11	1165.71	9171.25	1165.53	9187.03	1165.02	9230.02	1163.76	9244.16	1163.35
9246.66	1163.29	9258.77	1163.65	9269.7	1163.97	9295.56	1164.52	9304.88	1164.74
9311.67	1164.91	9336.53	1165.78	9354.71	1165.77	9371.95	1165.76	9391.38	1165.76
9407.37	1165.76	9421.55	1165.76	9442.79	1165.76	9466.74	1165.78	9478.21	1165.78
9490.39	1165.4	9491.72	1165.35	9493.55	1165.29	9495.89	1165.22	9498.94	1165.13
9503.33	1165	9509.54	1164.82	9518.88	1164.55	9536.54	1164.14	9540.62	1163.96
9542.35	1163.89	9546.85	1163.9	9549.46	1163.88	9555.49	1163.87	9565.36	1163.79
9566.74	1163.78	9568.91	1163.8	9585.02	1164.44	9606.86	1165.36	9611.52	1165.56
9619.88	1165.83	9622.04	1165.83	9655.3	1165.81	9688.87	1165.8	9690.72	1165.79

```
 9692.8 1165.79 9726.14 1165.76 9755.71 1165.74 9761.56 1165.74 9768.15 1165.74
9796.97 1165.73 9822.54 1165.73 9832.39 1165.72 9843.51 1165.72 9867.81 1165.73
9889.37 1165.73 9903.23 1165.73 9918.86 1165.73 9938.65 1165.74 9978.39 1164.66
  10000 1163.87 10005.6 1164.0510010.23 1164.1910055.93 1165.7910067.94 1165.82
10090.83 1165.0210098.56 1164.7910111.62 1164.42 10136.1 1163.7610137.82 1163.71
10138.28  1163.710152.68 1164.3310161.53 1164.6710166.99 1164.9110188.27  1166.2
10219.51 1166.3210232.38 1166.3810270.04 1166.55 10276.5 1166.5810320.57 1166.76
10320.61 1166.7610320.93 1166.7610364.73 1166.9410371.09 1166.9710408.84 1167.12
10421.62 1167.1710452.95 1167.3110472.14  1167.410497.07 1167.5110522.67 1167.62
10541.18 1167.7110573.19 1167.8610585.29 1167.9210623.72 1168.0910629.41 1168.12
10668.56  1168.310673.52 1168.3210674.24 1168.3210717.63 1168.5110724.77 1168.54
10748.67 1168.64

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8840.01     .045 9938.65     .03810055.93     .045

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9938.6510055.93               1900    1995    1900              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1166.44  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.               *   0.045  *   0.038  *   0.045  *
* W.S. Elev (ft)          * 1166.33  * Reach Len. (ft)          * 2300.00  * 2300.00  * 2300.00  *
* Crit W.S. (ft)          * 1165.63  * Flow Area (sq ft)        *  858.63  *  174.20  *  197.71  *
* E.G. Slope (ft/ft)      *0.005231  * Area (sq ft)             *  858.63  *  174.20  *  197.71  *
* Q Total (cfs)           * 3050.00  * Flow (cfs)               * 1877.66  *  641.14  *  531.21  *
* Top Width (ft)          * 1262.73  * Top Width (ft)            *  979.86  *  117.28  *  165.59  *
* Vel Total (ft/s)        *    2.48  * Avg. Vel. (ft/s)          *    2.19  *    3.68  *    2.69  *
* Max Chl Dpth (ft)       *    3.04  * Hydr. Depth (ft)          *    0.88  *    1.49  *    1.19  *
* Conv. Total (cfs)       * 42168.6  * Conv. (cfs)               * 25960.0  *  8864.2  *  7344.4  *
* Length Wtd. (ft)        * 2300.00  * Wetted Per. (ft)          *  980.01  *  117.34  *  165.69  *
* Min Ch El (ft)          * 1163.87  * Shear (lb/sq ft)          *    0.29  *    0.48  *    0.39  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)    *    0.63  *    1.78  *    1.05  *
* Frctn Loss (ft)         *    6.66  * Cum Volume (acre-ft)      *   83.07  *   41.54  *   39.35  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *          *          *          *
*****************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 36.434

INPUT
Description:

```
Station Elevation Data     num=      103
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
  9681.4 1521.17 9717.31 1521.15 9722.23 1521.13 9740.58 1521.06 9763.06 1520.98
 9769.04 1520.81  9770.2 1520.79 9770.81 1520.78 9771.51 1520.76 9772.33 1520.75
 9773.49 1520.72 9774.89 1520.68 9776.57 1520.64 9782.35 1520.61  9798.8 1520.67
 9809.95 1520.65 9831.43 1520.71 9836.17 1520.68 9840.14 1520.65 9843.48 1520.62
 9847.89 1520.59 9851.48 1520.57 9854.44 1520.54  9859.9 1520.41 9864.05 1520.27
 9867.43 1520.18 9870.49 1520.17 9872.99 1520.19 9885.55 1520.17 9924.36 1519.92
 9926.38 1519.91    9938 1519.48 9946.92 1519.25   10000 1517.9310022.02 1518.65
10028.61 1518.89 10032.8 1519.0910042.32 1519.5310047.02 1519.5310077.68 1519.53
10107.74 1519.5310113.03 1519.5310118.43 1519.5410148.39 1519.5610177.77 1519.61
10183.75 1519.6210189.85 1519.6310219.11 1519.67 10247.8 1519.7210254.46 1519.73
10261.26 1519.7410289.82  1519.810317.83 1519.8510325.18 1519.8710332.67 1519.89
10360.53 1519.9410387.85 1519.9910395.89 1520.0110404.09 1520.0310431.25 1520.07
10457.88 1520.1310466.61 1520.15 10475.5 1520.1710501.96 1520.2210527.91 1520.28
10537.32 1520.2910546.92 1520.3110572.68 1520.3510597.94 1520.3910608.03  1520.4
10618.33 1520.4210643.39 1520.4410667.97 1520.4510678.75 1520.4610689.74 1520.47
 10714.1 1520.4710737.99 1520.4610749.46 1520.4610761.16 1520.4610784.82 1520.46
10808.02 1520.4610820.18 1520.4610832.57 1520.4710855.53 1520.4810878.05  1520.5
10890.89 1520.5110903.99 1520.5310926.25 1520.5510948.08 1520.59 10961.6 1520.61
 10975.4 1520.6410996.96 1520.69 11018.1 1520.7411032.32 1520.7811046.81 1520.82
11067.68 1520.8911088.13 1520.9411103.03 1520.9911118.23 1521.0411138.39 1521.11
11158.16 1521.1611173.75 1521.2111189.19 1521.26

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
```

```
*********************************************
  9681.4    .048 9924.36    .05410042.32    .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9924.3610042.32              1100    1142    1100            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1521.16  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.               *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)          * 1521.10  * Reach Len. (ft)          * 1100.00  * 1142.00  * 1100.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *  108.85  *  270.89  *  950.09  *
* E.G. Slope (ft/ft)      *0.003047  * Area (sq ft)             *  108.85  *  270.89  *  950.09  *
* Q Total (cfs)           * 2320.00  * Flow (cfs)               *  126.09  *  716.04  * 1477.87  *
* Top Width (ft)          * 1407.08  * Top Width (ft)           *  195.05  *  117.96  * 1094.06  *
* Vel Total (ft/s)        *    1.74  * Avg. Vel. (ft/s)         *    1.16  *    2.64  *    1.56  *
* Max Chl Dpth (ft)       *    3.17  * Hydr. Depth (ft)         *    0.56  *    2.30  *    0.87  *
* Conv. Total (cfs)       * 42025.9  * Conv. (cfs)              * 2284.1  * 12970.8  * 26771.0  *
* Length Wtd. (ft)        * 1110.90  * Wetted Per. (ft)         *  195.06  *  118.02  * 1094.07  *
* Min Ch El (ft)          * 1517.93  * Shear (lb/sq ft)         *    0.11  *    0.44  *    0.17  *
* Alpha                   *    1.24  * Stream Power (lb/ft s)   *    0.12  *    1.15  *    0.26  *
* Frctn Loss (ft)         *    5.46  * Cum Volume (acre-ft)     *  274.31  *  889.98  *  319.96  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *  362.29  *  755.81  *  494.69  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1              RS: 36.218

INPUT
Description:
Station Elevation Data     num=     102
      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9512.55  1517.3 9514.32 1517.31  9516.9 1517.29 9550.28 1517.05 9573.22 1516.98
 9586.23 1516.91 9605.16 1516.73  9633.9 1516.36 9658.15 1516.07 9693.41 1515.66
  9694.1 1515.65 9694.58 1515.65 9730.06 1515.29 9755.25 1515.11 9766.02 1515.04
 9781.67 1514.95 9801.97 1514.82 9815.93 1514.77 9837.93 1514.69 9869.93 1514.63
 9873.89 1514.62 9876.61 1514.61 9909.84 1514.55 9937.28 1514.52  9945.8 1514.51
 9980.67 1514.39   10000 1513.9410026.06 1513.9710034.78 1514.0410053.61 1514.49
10058.86 1514.4910089.53  1514.510119.77 1514.5210125.45 1514.5310133.62 1514.53
10161.37 1514.5610180.68 1514.5710197.29 1514.5810221.18 1514.5910233.21 1514.59
10241.59 1514.5910269.13 1514.59 10302.5  1514.610305.06  1514.610308.73  1514.6
10340.98 1514.6110363.41 1514.61 10376.9 1514.6210396.28 1514.6410412.82 1514.66
10424.32 1514.6710448.74 1514.7110483.84 1514.7610484.66 1514.7610485.23 1514.76
10520.58 1514.8310546.14 1514.86 10556.5 1514.8810571.39  1514.910592.42 1514.95
10607.04 1514.9710628.34 1515.0310658.94 1515.0910664.26 1515.1110667.95 1515.11
10700.18  1515.210728.86 1515.26 10736.1 1515.27 10746.5 1515.2910772.02 1515.32
10789.77 1515.3410807.94 1515.3710834.05 1515.3910843.86 1515.3910850.68  1515.4
10879.78  1515.410911.59 1515.42 10915.7 1515.42 10921.6 1515.4210951.62 1515.42
 10972.5 1515.4310987.54 1515.4411009.16 1515.4511023.46 1515.4711033.41 1515.49
11059.38 1515.5511094.32 1515.64 11095.3 1515.6511096.71 1515.6511131.22 1515.75
11155.23 1515.8211167.14 1515.8511184.26  1515.911203.06 1515.9511216.14 1515.99
11238.98 1516.0511271.82 1516.11 11274.9 1516.1211277.05 1516.1311310.82 1516.21
11337.95 1516.2811338.71 1516.29

Manning's n Values         num=       3
      Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9512.55    .048  9945.8    .05410053.61    .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9945.810053.61               1200    1238    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1515.69  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.10  * Wt. n-Val.               *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)          * 1515.59  * Reach Len. (ft)          * 1200.00  * 1238.00  * 1200.00  *
* Crit W.S. (ft)          * 1515.25  * Flow Area (sq ft)        *  181.88  *  148.91  *  639.05  *
* E.G. Slope (ft/ft)      *0.009224  * Area (sq ft)             *  181.88  *  148.91  *  639.05  *
```

* Q Total (cfs)	* 2320.00	* Flow (cfs)	* 442.73	* 488.06	* 1389.21	*
* Top Width (ft)	* 1375.45	* Top Width (ft)	* 245.52	* 107.81	* 1022.13	*
* Vel Total (ft/s)	* 2.39	* Avg. Vel. (ft/s)	* 2.43	* 3.28	* 2.17	*
* Max Chl Dpth (ft)	* 1.65	* Hydr. Depth (ft)	* 0.74	* 1.38	* 0.63	*
* Conv. Total (cfs)	* 24156.1	* Conv. (cfs)	* 4609.7	* 5081.7	* 14464.6	*
* Length Wtd. (ft)	* 1210.18	* Wetted Per. (ft)	* 245.52	* 107.82	* 1022.13	*
* Min Ch El (ft)	* 1513.94	* Shear (lb/sq ft)	* 0.43	* 0.80	* 0.36	*
* Alpha	* 1.09	* Stream Power (lb/ft s)	* 1.04	* 2.61	* 0.78	*
* Frctn Loss (ft)	* 5.87	* Cum Volume (acre-ft)	* 270.64	* 884.48	* 299.90	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 356.72	* 752.85	* 467.97	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 35.983

INPUT
Description:
Station Elevation Data num= 77

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9438.45	1509.92	9457.34	1509.83	9468.26	1509.79	9497.9	1509.67	9520.19	1509.57
9538.45	1509.51	9572.12	1509.39	9579.01	1509.36	9603.57	1509.29	9619.56	1509.24
9624.04	1509.22	9660.12	1509.12	9675.97	1509.08	9700.67	1509.02	9727.9	1508.95
9741.22	1508.92	9796.19	1508.96	9799.11	1508.99	9799.32	1508.99	9803.98	1508.97
9808.28	1508.97	9811.96	1508.94	9824.34	1508.74	9862.89	1508.52	9883.69	1508.44
9903.44	1508.37	9935.62	1508.28	9944	1508.26	9979.08	1507.23	10000	1507
10020.1	1507.2	10029.43	1507.39	10057.61	1508.31	10068.98	1508.33	10093.2	1508.38
10112.46	1508.41	10128.78	1508.43	10149.3	1508.44	10164.37	1508.46	10176.35	1508.47
10199.95	1508.49	10229.62	1508.51	10235.53	1508.51	10240.24	1508.52	10271.12	1508.53
10304.13	1508.55	10306.7	1508.55	10309.93	1508.55	10342.29	1508.57	10368.02	1508.58
10377.87	1508.58	10390.25	1508.58	10413.45	1508.59	10431.91	1508.61	10449.04	1508.6
10470.57	1508.62	10484.62	1508.64	10495.8	1508.65	10520.21	1508.68	10550.88	1508.74
10555.79	1508.75	10559.69	1508.76	10591.37	1508.86	10623.58	1508.98	10626.96	1509
10631.2	1509.02	10662.54	1509.17	10687.47	1509.31	10698.13	1509.35	10711.52	1509.43
10733.71	1509.54	10751.36	1509.63	10769.29	1509.72	10791.84	1509.84	10804.88	1509.91
10815.25	1509.95	10817.1	1509.96						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9438.45	.048	9935.62	.054	10093.2	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9935.62	10093.2	975	1006	975	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1509.80	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.06	* Wt. n-Val.	* 0.048	* 0.054	* 0.048	*
* W.S. Elev (ft)	* 1509.75	* Reach Len. (ft)	* 975.00	* 1006.00	* 975.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 328.63	* 315.91	* 668.92	*
* E.G. Slope (ft/ft)	*0.002985	* Area (sq ft)	* 328.63	* 315.91	* 668.92	*
* Q Total (cfs)	* 2320.00	* Flow (cfs)	* 446.70	* 755.04	* 1118.26	*
* Top Width (ft)	* 1294.50	* Top Width (ft)	* 456.17	* 157.58	* 680.75	*
* Vel Total (ft/s)	* 1.77	* Avg. Vel. (ft/s)	* 1.36	* 2.39	* 1.67	*
* Max Chl Dpth (ft)	* 2.74	* Hydr. Depth (ft)	* 0.72	* 2.00	* 0.98	*
* Conv. Total (cfs)	* 42461.4	* Conv. (cfs)	* 8175.6	* 13819.0	* 20466.8	*
* Length Wtd. (ft)	* 986.64	* Wetted Per. (ft)	* 456.18	* 157.61	* 680.75	*
* Min Ch El (ft)	* 1507.00	* Shear (lb/sq ft)	* 0.13	* 0.37	* 0.18	*
* Alpha	* 1.14	* Stream Power (lb/ft s)	* 0.18	* 0.89	* 0.31	*
* Frctn Loss (ft)	* 5.56	* Cum Volume (acre-ft)	* 263.61	* 877.87	* 281.88	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 347.06	* 749.08	* 444.51	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 35.793

INPUT
Description:
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9304.73	1505.64	9311.9	1505.57	9339.32	1505.32	9352.87	1505.2	9356.41	1505.17
9393.83	1504.9	9408.09	1504.85	9434.79	1504.7	9459.78	1504.57	9475.76	1504.47
9511.46	1504.31	9516.72	1504.28	9536.83	1504.19	9557.69	1504.1	9563.14	1504.09
9598.65	1503.99	9614.83	1503.96	9639.62	1503.92	9666.51	1503.86	9703.76	1503.96
9725.53	1504.07	9732.14	1504.01	9750.91	1503.83	9769.88	1503.68	9803.47	1503.61
9821.56	1503.56	9844.44	1503.51	9873.24	1503.43	9885.4	1503.39	9924.93	1503.28
9926.37	1503.27	9932.94	1503.09	10000	1501.29	10031.23	1502.61	10042.52	1503
10047.29	1502.99	10077.89	1502.97	10107.26	1502.96	10113.25	1502.96	10119.49	1502.96
10148.61	1502.96	10176.57	1502.98	10183.97	1502.98	10191.68	1502.99	10219.34	1503.01
10245.89	1503.05	10254.7	1503.07	10263.88	1503.09	10290.06	1503.14	10315.2	1503.19
10325.42	1503.22	10336.07	1503.24	10360.79	1503.31	10384.52	1503.36	10396.15	1503.38
10408.27	1503.41	10431.51	1503.47	10453.83	1503.53	10466.87	1503.55	10480.46	1503.58
10502.24	1503.62	10523.15	1503.67	10537.6	1503.69	10552.66	1503.72	10572.96	1503.76
10592.46	1503.81	10608.33	1503.83	10624.85	1503.87	10643.69	1503.91	10661.77	1503.95
10679.05	1503.98	10697.05	1504.03	10714.41	1504.07	10731.09	1504.11	10749.78	1504.14
10769.24	1504.18	10785.14	1504.21	10812.79	1504.55	10834.28	1504.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9304.73	.048	9885.4	.05	10042.52	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9885.4	10042.52	1450	1517	1450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1504.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1504.05	Reach Len. (ft)	1450.00	1517.00	1450.00
Crit W.S. (ft)	1503.87	Flow Area (sq ft)	82.40	240.03	447.96
E.G. Slope (ft/ft)	0.013676	Area (sq ft)	82.40	240.03	447.96
Q Total (cfs)	2420.00	Flow (cfs)	149.24	1024.29	1246.47
Top Width (ft)	1126.19	Top Width (ft)	304.30	157.12	664.78
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)	1.81	4.27	2.78
Max Chl Dpth (ft)	2.76	Hydr. Depth (ft)	0.27	1.53	0.67
Conv. Total (cfs)	20693.4	Conv. (cfs)	1276.2	8758.7	10658.5
Length Wtd. (ft)	1485.41	Wetted Per. (ft)	304.30	157.18	664.78
Min Ch El (ft)	1501.29	Shear (lb/sq ft)	0.23	1.30	0.58
Alpha	1.21	Stream Power (lb/ft s)	0.42	5.56	1.60
Frctn Loss (ft)	8.20	Cum Volume (acre-ft)	259.01	871.45	269.38
C & E Loss (ft)	0.04	Cum SA (acres)	338.55	745.45	429.45

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 35.505

INPUT
Description:
Station Elevation Data num= 124

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9118.46	1499.05	9122.28	1499.06	9131.63	1499.08	9160.44	1499.1	9185.91	1499.08
9198.6	1499.04	9228.67	1498.91	9236.76	1498.88	9240.18	1498.86	9274.92	1498.65
9294.45	1498.52	9313.09	1498.39	9348.73	1498.11	9351.25	1498.1	9357.22	1498.05
9389.41	1497.8	9403	1497.69	9427.57	1497.49	9457.27	1497.25	9465.73	1497.19
9485.78	1497.05	9503.9	1496.91	9511.55	1496.87	9542.06	1496.7	9565.82	1496.6
9580.22	1496.54	9614.34	1496.45	9618.38	1496.44	9620.09	1496.44	9637.19	1496.05

```
9687.29 1494.96 9689.72 1495.03 9711.72 1495.64 9718.54 1495.82 9727.36 1496.06
9732.87 1496.14 9742.89 1496.11 9771.03 1496.04 9782.91 1496.01 9809.19 1495.93
9837.18 1495.82 9847.36 1495.77 9871.45 1495.64 9885.52 1495.56 9891.46 1495.52
9923.68 1495.26 9945.73 1495.09 9961.84 1494.96   10000 1494.5210035.59 1494.41
10063.91 1494.3510071.17 1494.3610080.28 1494.3510106.75 1494.3710127.82 1494.29
10142.33 1494.2910160.56 1494.2710177.92 1494.2310191.73 1494.24 10213.5 1494.27
10240.84 1494.2710249.08 1494.2710255.64 1494.2710284.66  1494.310319.55 1494.32
10320.25 1494.3310321.13 1494.3310355.83 1494.3610383.46 1494.3910391.41 1494.39
10401.41 1494.3910426.99  1494.410447.36 1494.3910474.13 1494.6310497.01 1495.12
 10519.2 1495.5810560.08 1494.6610561.43 1494.6210562.45 1494.5910563.27 1494.57
10567.22 1494.4910571.42  1494.410578.72 1494.4910582.44 1494.4810584.53 1494.43
10587.62 1494.3310592.69 1494.2210600.77 1494.1310618.57 1494.0210630.45 1493.94
10633.06 1493.95 10639.6 1493.99 10644.7 1494.0810649.38  1494.3   10703 1494.57
10711.65 1494.5810722.53  1494.610747.24 1494.6410766.91 1494.6810782.82  1494.7
10800.15 1494.8410804.05 1494.9810809.33 1495.2110816.83 1495.4710824.68 1495.64
10836.04 1495.8210845.72 1495.9610857.06 1495.7210871.95 1495.4110878.06 1495.29
10881.38 1495.22 10884.7 1495.1510886.48 1495.1110894.72 1495.0410925.15 1495.22
10958.63 1495.4910960.73 1495.5110963.37 1495.5310996.31 1495.8111022.54 1496.06
 11031.9 1496.1311043.65 1496.2111067.48 1496.3711075.59 1496.43

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9118.46     .048 9732.87     .054 10519.2     .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9732.87 10519.2              1200    1248    1200              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1495.99  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.               *   0.048   *   0.054   *   0.048  *
* W.S. Elev (ft)          * 1495.94  * Reach Len. (ft)          * 1200.00   * 1248.00   * 1200.00  *
* Crit W.S. (ft)          * 1495.11  * Flow Area (sq ft)        *   39.42   *  904.74   *  493.07  *
* E.G. Slope (ft/ft)      *0.003059  * Area (sq ft)             *   39.42   *  904.74   *  493.07  *
* Q Total (cfs)           * 2570.00  * Flow (cfs)               *   41.84   * 1613.27   *  914.90  *
* Top Width (ft)          * 1282.75  * Top Width (ft)            *   80.75   *  713.46   *  488.54  *
* Vel Total (ft/s)        *    1.79  * Avg. Vel. (ft/s)          *    1.06   *    1.78   *    1.86  *
* Max Chl Dpth (ft)       *    2.00  * Hydr. Depth (ft)          *    0.49   *    1.27   *    1.01  *
* Conv. Total (cfs)       * 46464.2  * Conv. (cfs)               *   756.4   * 29166.9   * 16540.8  *
* Length Wtd. (ft)        * 1226.75  * Wetted Per. (ft)          *   80.77   *  713.48   *  488.60  *
* Min Ch El (ft)          * 1494.23  * Shear (lb/sq ft)          *    0.09   *    0.24   *    0.19  *
* Alpha                   *    1.01  * Stream Power (lb/ft s)    *    0.10   *    0.43   *    0.36  *
* Frctn Loss (ft)         *    5.12  * Cum Volume (acre-ft)      *  256.98   *  851.52   *  253.72  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *  332.14   *  730.29   *  410.26  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 35.269

INPUT
Description:
Station Elevation Data     num=     144
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************
  9370.3   1491.8 9372.69 1491.78  9399.2 1491.53 9424.97 1491.26 9439.25 1491.12
 9477.24 1490.74 9479.31 1490.72 9486.08 1490.67 9519.36 1490.37 9529.52  1490.3
 9559.41 1490.12 9581.79 1490.01 9599.47 1489.95 9634.07 1489.84 9639.52 1489.84
 9657.39 1489.81 9679.58 1489.78 9688.22 1489.77 9688.68 1489.77 9688.98 1489.78
  9689.2 1489.78 9689.65 1489.78 9690.15 1489.78  9690.7 1489.78 9691.61 1489.78
 9692.64 1489.79 9695.54  1489.8 9697.75 1489.81 9700.73 1489.81 9748.37 1489.71
    9749 1489.71 9780.59 1489.56 9787.81 1489.57 9791.41  1489.6 9791.95  1489.6
 9792.48  1489.6 9792.94  1489.6 9799.74 1489.69  9828.7 1489.69 9839.79 1489.69
 9843.18 1489.69 9879.84 1489.67 9895.45 1489.67  9919.9 1489.67 9947.73 1489.65
 9959.95 1489.63   10000 1489.6110035.38 1489.6310068.67 1489.6710070.75 1489.67
10072.95 1489.6710106.12 1489.6710137.35 1489.6710141.49 1489.6810145.89 1489.68
10176.86 1489.6810206.02 1489.6910212.23 1489.6910218.84 1489.69 10247.6 1489.71
10274.69 1489.7510282.98 1489.7610291.78 1489.7710318.35 1489.8110344.47  1489.1
10351.72 1489.1110356.94 1489.0310363.64  1488.910371.24 1488.7510373.43  1488.8
10404.97 1489.6410414.32 1489.9310418.81 1490.0410437.67 1490.1910459.83 1490.27
 10480.7 1490.33 10495.2 1490.3610510.61 1490.3910530.58 1490.4210549.37 1490.44
```

```
10565.95 1490.4510583.56 1490.4610601.32 1490.4510618.04 1490.4510636.69 1490.45
 10656.5 1490.4510672.06 1490.4410686.71 1490.4310707.43 1490.4210754.11 1490.06
 10774.1 1489.9510786.13  1490.110798.68 1490.2710824.05 1490.4110848.92  1490.4
10875.33 1490.4110884.29 1490.4110892.72 1490.4110919.66  1490.410948.28 1490.41
10955.03 1490.4110961.39 1490.41 10990.4 1490.4111021.22 1490.4111025.78 1490.41
11030.07 1490.4111061.15 1490.4211094.16 1490.4211096.52 1490.4211098.74 1490.42
11131.89 1490.4211167.11 1490.4311167.26 1490.4311167.41 1490.4311202.63 1490.44
11236.08 1490.47   11238 1490.4711240.05 1490.4711273.38 1490.5111304.75 1490.55
11308.75 1490.5511312.99 1490.5511344.12  1490.611373.42 1490.6611385.94 1490.67
11414.86 1490.7211442.09 1490.7911450.23 1490.8111458.88 1490.82 11485.6 1490.89
11510.76 1490.9711520.98 1490.9911531.83 1491.0311556.35 1491.1111579.43  1491.2
11591.72 1491.2411604.77  1491.311627.09 1491.41 11648.1 1491.5111662.46 1491.59
11677.71 1491.6511697.83 1491.7511716.77 1491.8411724.25 1491.88

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9370.3    .048 9748.37    .054 10247.6    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9748.37 10247.6             1175    1220    1175            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1490.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)          * 1490.81  * Reach Len. (ft)         * 1175.00  * 1220.00  * 1175.00  *
* Crit W.S. (ft)          * 1490.38  * Flow Area (sq ft)       *  212.74  *  571.78  *  621.05  *
* E.G. Slope (ft/ft)      *0.005910  * Area (sq ft)            *  212.74  *  571.78  *  621.05  *
* Q Total (cfs)           * 2700.00  * Flow (cfs)              *  423.81  * 1324.10  *  952.09  *
* Top Width (ft)          * 1978.26  * Top Width (ft)          *  277.79  *  499.23  * 1201.24  *
* Vel Total (ft/s)        *    1.92  * Avg. Vel. (ft/s)        *    1.99  *    2.32  *    1.53  *
* Max Chl Dpth (ft)       *    2.06  * Hydr. Depth (ft)        *    0.77  *    1.15  *    0.52  *
* Conv. Total (cfs)       * 35120.3  * Conv. (cfs)             *  5512.7  * 17223.2  * 12384.4  *
* Length Wtd. (ft)        * 1208.56  * Wetted Per. (ft)        *  277.80  *  499.23  * 1201.28  *
* Min Ch El (ft)          * 1489.56  * Shear (lb/sq ft)        *    0.28  *    0.42  *    0.19  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)   *    0.56  *    0.98  *    0.29  *
* Frctn Loss (ft)         *    6.74  * Cum Volume (acre-ft)     *  253.51  *  830.37  *  238.37  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *  327.20  *  712.91  *  386.98  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 35.038

INPUT
Description:
Station Elevation Data     num=     128
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
    9176 1486.38 9181.66  1486.4 9202.46 1486.45 9236.22 1486.45 9240.43 1486.45
 9250.09 1486.42 9278.41 1486.34 9290.77 1486.27 9316.39 1486.12 9345.33  1485.9
 9354.37 1485.83 9375.08 1485.64 9392.35 1485.48 9399.88 1485.41 9430.32 1485.13
 9454.44  1484.9  9468.3 1484.76 9500.06 1484.47 9506.28 1484.43    9509 1484.41
 9544.26 1484.13 9563.55 1484.02 9582.24 1483.89 9618.11 1483.72 9620.22 1483.71
 9625.05  1483.7 9658.19 1483.59 9672.66 1483.55 9696.17  1483.5 9727.22 1483.44
 9734.15 1483.42 9750.03 1483.39 9772.13 1483.35 9781.77 1483.33 9810.11 1483.28
 9836.33 1483.23 9848.08 1483.21 9903.57 1482.27 9906.44  1482.2 9927.32 1482.46
 9930.67 1482.54 9933.28 1482.61 9962.02  1483.1   10000  1483.110037.59 1483.14
10055.23 1483.1710075.18 1483.1910110.46 1483.2410112.77 1483.2410117.69 1483.24
10150.36 1483.2710165.69 1483.2810187.95 1483.2910220.93 1483.2810225.54 1483.28
10234.51 1482.9710238.12 1482.8610245.72 1482.6210269.36 1481.8810273.58 1481.75
10277.13 1481.8410301.34 1482.4310311.26 1482.6810316.79 1482.8110320.25 1482.89
10322.76 1482.9410324.67 1482.9810326.04 1483.0110327.22 1483.0310328.22 1483.05
10329.66 1483.0410338.32 1483.2110353.07  1483.210375.91 1483.1810386.62 1483.17
 10413.5 1483.1310441.86 1483.0810451.09 1483.0710470.76 1483.0410488.68 1483.02
10497.09 1483.0110526.27 1483.0110552.32    148310563.86    148310588.46    1483
10601.45    148310607.55    148310639.04 1483.0210662.78 1483.0210676.63 1483.04
10706.15 1483.0810714.23 1483.0910718.02 1483.0910734.32  1482.710750.72 1482.36
10764.04 1482.0910770.38 1481.9610784.88  1482.310804.35 1482.7610818.18 1483.09
 10821.7 1483.1710823.33 1483.2110825.02 1483.2510825.85 1483.2710828.48 1483.32
10864.59 1483.4310883.71 1483.4910919.47 1482.7310926.56 1482.56   10963 1483.34
10994.18 1483.9411014.95 1484.0311049.41 1484.1811052.54  1484.211059.22 1484.22
```

```
11090.14 1484.3511104.64 1484.4111127.73  1484.511159.87 1484.6211165.32 1484.64
11176.92 1484.6711202.91 1484.7611215.11 1484.79 11240.5 1484.8611270.34 1484.93
11278.09 1484.9411294.61 1484.9611307.48 1484.98

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
    9176    .048 9658.19    .05410994.18    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9658.1910994.18              1150    1202    1150            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1484.13  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.               *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)          * 1484.07  * Reach Len. (ft)          * 1150.00  * 1202.00  * 1150.00  *
* Crit W.S. (ft)          * 1483.54  * Flow Area (sq ft)        *   28.19  * 1372.04  *    1.87  *
* E.G. Slope (ft/ft)      *0.005281  * Area (sq ft)             *   28.19  * 1372.04  *    1.87  *
* Q Total (cfs)           * 2820.00  * Flow (cfs)               *   26.74  * 2792.59  *    0.67  *
* Top Width (ft)          * 1468.24  * Top Width (ft)           *  102.93  * 1335.99  *   29.32  *
* Vel Total (ft/s)        *    2.01  * Avg. Vel. (ft/s)         *    0.95  *    2.04  *    0.36  *
* Max Chl Dpth (ft)       *    2.32  * Hydr. Depth (ft)         *    0.27  *    1.03  *    0.06  *
* Conv. Total (cfs)       * 38805.6  * Conv. (cfs)              *   368.0  * 38428.4  *     9.2  *
* Length Wtd. (ft)        * 1188.65  * Wetted Per. (ft)         *  102.93  * 1336.10  *   29.32  *
* Min Ch El (ft)          * 1481.75  * Shear (lb/sq ft)         *    0.09  *    0.34  *    0.02  *
* Alpha                   *    1.02  * Stream Power (lb/ft s)    *    0.09  *    0.69  *    0.01  *
* Frctn Loss (ft)         *    5.94  * Cum Volume (acre-ft)      *  250.26  *  803.15  *  229.97  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)            *  322.06  *  687.22  *  370.39  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 34.810

INPUT
Description:
Station Elevation Data     num=     146
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 8969.09 1479.59 8989.88 1479.45 9011.47 1479.28 9030.29 1479.14  9063.5 1478.86
 9070.69 1478.81 9095.68 1478.63  9111.1 1478.51 9117.43 1478.43 9119.69  1478.4
 9121.64 1478.34    9165 1477.92 9168.25 1477.73 9172.85 1477.53 9183.43 1477.33
 9206.19 1476.92 9213.75 1476.95    9215 1476.96  9217.1 1476.97 9228.05 1476.83
 9229.75 1476.79 9230.67 1476.77 9231.78 1476.74 9233.18 1476.71 9237.28 1476.62
 9245.09 1476.45 9265.84    1476 9265.92    1476 9265.95    1476 9276.34 1476.34
 9283.34 1476.58 9288.38 1476.74 9290.42 1476.81  9292.2 1476.87 9293.78 1476.92
 9297.15 1477.03 9299.82 1477.12 9302.01 1477.18 9323.64 1477.85 9373.32 1473.83
 9374.01 1473.77 9377.51 1474.05 9410.96  1476.7  9427.7    1478 9434.33 1478.01
 9457.41 1478.05 9474.74 1478.07 9479.72 1478.08 9515.14 1478.08 9531.75 1478.08
 9555.55 1478.05 9583.78 1478.04 9595.95 1478.02 9635.81 1477.95 9636.36 1477.95
 9638.27 1477.95 9676.76 1477.83 9687.83 1477.79 9717.17 1477.68 9739.86  1477.6
 9757.57 1477.56 9791.89 1477.45 9797.98 1477.44 9819.14  1477.4 9838.38 1477.36
 9843.92 1477.35 9878.79 1477.29 9895.94 1477.26 9919.19 1477.24 9947.97 1477.18
 9959.59 1477.15   10000 1477.0510035.37 1477.0110068.84 1476.9510070.74 1476.95
10072.74 1476.9410106.11 1476.8510137.69 1476.6910141.47 1476.6810145.48 1476.66
10176.84 1476.6410206.53 1476.6710212.21  1476.710218.91  1476.710220.91 1476.73
10222.99 1476.7410226.21 1476.7410232.03 1476.7410251.43 1476.7410268.58 1476.75
10277.63 1476.7610286.78 1476.7710292.88 1476.7710297.51 1476.7710344.22 1476.95
10353.69 1476.98 10363.7    147710389.06 1477.0910413.06 1477.1310424.42 1477.16
10436.43 1477.1910459.79 1477.26 10481.9 1477.3110495.16 1477.3310509.17 1477.36
10530.53  1477.410550.74 1477.45 10565.9 1477.4810581.91 1477.5210601.27 1477.55
10619.59  1477.610642.62 1477.1510645.14 1477.0610648.66 1476.9310653.69 1476.76
10659.51 1476.5510660.91 1476.5710667.18 1476.6410672.62 1476.7110677.33 1476.77
10704.47 1477.1910710.82 1477.2910715.73 1477.3610718.32 1477.3910720.56 1477.42
10722.51 1477.4510724.18 1477.4710742.74 1477.9610757.27 1478.0310778.11 1478.11
10800.13 1478.2210813.48 1478.2810826.12 1478.3510848.85 1478.4510872.87 1478.58
10884.22 1478.6410894.96  1478.710919.59 1478.8210945.61 1478.9410954.96 1478.99
 10963.8 1479.0310990.32 1479.1211018.35 1479.1911025.69 1479.2111032.65 1479.22
11041.12 1479.23

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
```

```
*********************************************
 8969.09    .048 9878.79    .054 10481.9    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9878.79 10481.9             1175    1235    1175            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1478.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.06  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)         * 1478.13  * Reach Len. (ft)         * 1175.00  * 1235.00  * 1175.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  587.08  *  706.99  *  218.06  *
* E.G. Slope (ft/ft)     *0.004740  * Area (sq ft)            *  587.08  *  706.99  *  218.06  *
* Q Total (cfs)          * 2940.00  * Flow (cfs)              * 1076.00  * 1489.12  *  374.89  *
* Top Width (ft)         * 1639.95  * Top Width (ft)          *  735.86  *  603.11  *  300.98  *
* Vel Total (ft/s)       *    1.94  * Avg. Vel. (ft/s)        *    1.83  *    2.11  *    1.72  *
* Max Chl Dpth (ft)      *    4.36  * Hydr. Depth (ft)        *    0.80  *    1.17  *    0.72  *
* Conv. Total (cfs)      * 42701.4  * Conv. (cfs)             * 15628.0  * 21628.4  *  5445.0  *
* Length Wtd. (ft)       * 1212.16  * Wetted Per. (ft)        *  736.25  *  603.11  *  301.00  *
* Min Ch El (ft)         * 1476.64  * Shear (lb/sq ft)        *    0.24  *    0.35  *    0.21  *
* Alpha                  *    1.02  * Stream Power (lb/ft s)   *    0.43  *    0.73  *    0.37  *
* Frctn Loss (ft)        *    6.69  * Cum Volume (acre-ft)     *  242.14  *  774.46  *  227.07  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *  310.99  *  660.46  *  366.03  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 34.577

INPUT
Description:
Station Elevation Data    num=      77
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
  9195.3 1472.21 9199.68 1472.21 9227.74  1472.2  9249.7 1472.18 9279.22 1472.17
 9299.72 1472.16 9342.33  1471.1 9347.19    1471 9352.86 1470.97 9363.81 1470.92
 9370.92 1470.87 9406.84 1470.77  9418.4 1471.16 9449.78 1472.08 9485.16 1472.04
  9499.8 1472.02 9536.64 1471.95 9549.82 1471.92 9588.13 1471.82 9599.84  1471.8
 9639.61 1471.69 9649.86 1471.66  9691.1 1471.51 9699.88 1471.47 9742.58 1471.28
  9749.9 1471.24 9794.06 1470.98 9799.92 1470.94 9845.55 1470.64 9849.94 1470.61
 9897.03 1470.34 9899.96 1470.32 9948.52  1470.1 9949.98  1470.1   10000 1469.95
10039.52 1469.9510052.72 1469.9610079.03 1469.9810105.44 1470.0110118.54 1470.02
10157.77 1470.0510158.06 1470.0510158.15 1470.0510197.57 1470.0810210.87 1470.09
10237.09 1470.1110263.59 1470.13 10276.6 1470.1410315.55  1470.210316.11  1470.2
 10316.3  1470.210318.55 1470.1310364.17 1468.5910371.56 1468.9410380.72 1469.41
10421.74  1470.410434.66 1470.4210473.32 1470.4810474.17 1470.4810474.46 1470.48
10475.03 1470.4810527.17 1470.54 10553.2 1470.5610579.89 1470.5810592.71 1470.58
10631.09 1470.5910632.23 1470.5910632.61 1470.5910671.74  1470.610685.33  1470.6
10711.26 1470.5910738.04 1470.5910750.77 1470.5910788.87 1470.5910790.29 1470.59
10790.76 1470.5910847.98 1471.65

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  9195.3    .048 9845.55    .05410421.74    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9845.5510421.74             1000    1074    1000            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1471.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)         * 1471.41  * Reach Len. (ft)         * 1000.00  * 1074.00  * 1000.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   88.45  *  805.61  *  332.53  *
* E.G. Slope (ft/ft)     *0.006454  * Area (sq ft)            *   88.45  *  805.61  *  332.53  *
* Q Total (cfs)          * 3060.00  * Flow (cfs)              *  117.64  * 2226.68  *  715.68  *
* Top Width (ft)         * 1217.23  * Top Width (ft)          *  227.98  *  576.19  *  413.06  *
* Vel Total (ft/s)       *    2.49  * Avg. Vel. (ft/s)        *    1.33  *    2.76  *    2.15  *
* Max Chl Dpth (ft)      *    2.82  * Hydr. Depth (ft)        *    0.39  *    1.40  *    0.81  *
* Conv. Total (cfs)      * 38088.8  * Conv. (cfs)             *  1464.3  * 27716.2  *  8908.3  *
* Length Wtd. (ft)       * 1032.19  * Wetted Per. (ft)        *  228.00  *  576.25  *  413.06  *
* Min Ch El (ft)         * 1468.59  * Shear (lb/sq ft)        *    0.16  *    0.56  *    0.32  *
```

* Alpha	* 1.08	* Stream Power (lb/ft s)	* 0.21	* 1.56	* 0.70	*
* Frctn Loss (ft)	* 5.41	* Cum Volume (acre-ft)	* 233.02	* 753.02	* 219.64	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 297.99	* 643.74	* 356.40	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 34.373

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9250.25	1466.02	9252.32	1465.57	9265.31	1465.63	9281.68	1465.69	9290.96	1465.73
9329.98	1465.87	9349.22	1465.82	9364.11	1465.78	9399.63	1465.65	9408.81	1465.61
9450.03	1465.48	9487.3	1465.07	9517.05	1464.68	9519.51	1464.79	9587.62	1465.46
9601.25	1465.47	9632.33	1465.5	9651.65	1465.52	9677.03	1465.54	9702.06	1465.56
9734.41	1465.54	9752.47	1465.53	9766.43	1465.51	9802.87	1465.44	9811.14	1465.43
9853.28	1465.34	9855.84	1465.33	9875.93	1465.3	9900.54	1465.25	9903.68	1465.24
9945.24	1465.15	9954.09	1465.13	9973.99	1464.43	9981.91	1464.17	10000	1463.6
10007.92	1463.75	10060.04	1464.91	10066.83	1464.91	10081.45	1464.87	10104.48	1464.82
10115.16	1464.81	10142.12	1464.75	10170.29	1464.71	10179.77	1464.69	10200.2	1464.67
10217.42	1464.65	10225.41	1464.65	10255.07	1464.63	10280.54	1464.61	10292.71	1464.6
10318.94	1464.58	10330.36	1464.57	10335.66	1464.57	10368.01	1464.54	10390.79	1464.53
10405.66	1464.52	10437.68	1464.52	10443.3	1464.52	10445.91	1464.53	10480.95	1464.59
10501.04	1464.64	10527.53	1464.28	10539.34	1464.16	10566.59	1464.01	10577.88	1463.97
10593.72	1463.94	10601.55	1463.92	10605.91	1464.08	10611.79	1464.28	10666.42	1465.39
10669.19	1465.41	10675.17	1465.44	10706.84	1465.59	10721.54	1465.67	10744.49	1465.76
10776.67	1465.92	10782.13	1465.94	10793.91	1465.98	10819.78	1466.07	10831.79	1466.1
10857.43	1466.12	10886.92	1466.17	10895.08	1466.18	10912.66	1466.17	10932.73	1466.17
10942.04	1466.17	10970.37	1466.17	10980.69	1466.16				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9250.25	.048	9945.24	.05	10060.04	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.24	10060.04	950	1009	950	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1466.09	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.08	* Wt. n-Val.	* 0.048	* 0.054	* 0.048 *
* W.S. Elev (ft)	* 1466.01	* Reach Len. (ft)	* 950.00	* 1009.00	* 950.00 *
* Crit W.S. (ft)	* 1465.38	* Flow Area (sq ft)	* 392.84	* 189.93	* 910.84 *
* E.G. Slope (ft/ft)	*0.004370	* Area (sq ft)	* 392.84	* 189.93	* 910.84 *
* Q Total (cfs)	* 3170.00	* Flow (cfs)	* 549.57	* 483.18	* 2137.25 *
* Top Width (ft)	* 1551.54	* Top Width (ft)	* 694.93	* 114.80	* 741.80 *
* Vel Total (ft/s)	* 2.12	* Avg. Vel. (ft/s)	* 1.40	* 2.54	* 2.35 *
* Max Chl Dpth (ft)	* 2.41	* Hydr. Depth (ft)	* 0.57	* 1.65	* 1.23 *
* Conv. Total (cfs)	* 47954.5	* Conv. (cfs)	* 8313.7	* 7309.3	* 32331.5 *
* Length Wtd. (ft)	* 967.27	* Wetted Per. (ft)	* 694.99	* 114.84	* 741.83 *
* Min Ch El (ft)	* 1463.60	* Shear (lb/sq ft)	* 0.15	* 0.45	* 0.33 *
* Alpha	* 1.12	* Stream Power (lb/ft s)	* 0.22	* 1.15	* 0.79 *
* Frctn Loss (ft)	* 4.62	* Cum Volume (acre-ft)	* 227.50	* 740.75	* 205.37 *
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 287.40	* 635.23	* 343.14 *

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 34.182

INPUT
Description:

Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9268.47	1461.82	9271.28	1461.81	9300.31	1461.53	9317.09	1461.37	9318.71	1461.35
9362.9	1460.81	9368.94	1460.72	9408.71	1460.47	9419.17	1460.46	9454.53	1460.66
9469.4	1460.68	9500.34	1460.55	9518.99	1459.92	9532.96	1459.43	9543.99	1458.81
9548.64	1458.53	9555.11	1458.42	9567.06	1458.78	9584.03	1459.19	9588.71	1459.37
9620.1	1460.88	9637.77	1460.92	9670.33	1460.98	9683.59	1460.99	9720.56	1460.99
9729.4	1460.98	9770.8	1460.92	9775.21	1460.91	9820.99	1460.81	9821.02	1460.81
9866.84	1460.69	9871.26	1460.68	9912.65	1460.58	9927.27	1460.12	9937.79	1459.68
9962.4	1458.63	9988.38	1458.2	10000	1457.9	910035.86	1458.1	110050.55	1459.08
10072.26	1460.5	210095.19	1460.5	410122.53	1460.5	610140.66	1460.5	810172.81	1460.59
10186.13	1460.5	910223.09	1460.6	10231.6	1460.5	910273.37	1460.5	810277.07	1460.58
10312.11	1460.5	810322.55	1460.5	810323.65	1460.5	810326.43	1460.5	110328.44	1460.47
10338.83	1460.2	310382.65	1459.2	210391.63	1459.5	710403.66	1460.0	110424.21	1460.63
10458.96	1460.6	810474.48	1460.6	910504.43	1460.7	610524.76	1460.79	10549.9	1460.83
10575.04	1460.8	810595.38	1460.9	10625.32	1460.9	310642.11	1460.5	110648.06	1460.45
10651.86	1460.4	510656.92	1460.4	610662.74	1460.4	810681.17	1460.7	110725.88	1461.5
10774.79	1461.7	410776.16	1461.7	510787.74	1461.7	910822.73	1461.9	210826.43	1461.93
10868.21	1461.9	910876.71		146	210895.55	1461.98			

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9268.47	.048	9912.65	.05	410122.53	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9912.65	10122.53	1200	1278	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1461.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1461.37	Reach Len. (ft)	1200.00	1278.00	1200.00
Crit W.S. (ft)	1460.88	Flow Area (sq ft)	488.87	434.22	473.38
E.G. Slope (ft/ft)	0.005225	Area (sq ft)	488.87	434.22	473.38
Q Total (cfs)	3270.00	Flow (cfs)	959.41	1401.83	908.77
Top Width (ft)	1400.73	Top Width (ft)	595.15	209.88	595.70
Vel Total (ft/s)	2.34	Avg. Vel. (ft/s)	1.96	3.23	1.92
Max Chl Dpth (ft)	3.37	Hydr. Depth (ft)	0.82	2.07	0.79
Conv. Total (cfs)	45236.4	Conv. (cfs)	13272.2	19392.5	12571.7
Length Wtd. (ft)	1248.95	Wetted Per. (ft)	595.25	210.00	595.76
Min Ch El (ft)	1457.99	Shear (lb/sq ft)	0.27	0.67	0.26
Alpha	1.21	Stream Power (lb/ft s)	0.53	2.18	0.50
Frctn Loss (ft)	5.90	Cum Volume (acre-ft)	217.89	733.52	190.28
C & E Loss (ft)	0.01	Cum SA (acres)	273.33	631.46	328.56

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 33.940

INPUT
Description:
Station Elevation Data num= 86

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9157.3	1456.41	9188.57	1456.31	9199.71	1456.27	9238.62	1456.11	9252.02	1456.05
9288.66	1455.87	9304.32	1455.81	9338.71	1455.66	9356.62	1455.6	9388.76	1455.48
9408.93	1455.44	9438.8	1455.39	9461.23	1455.36	9488.85	1455.33	9513.53	1455.32
9543.55	1454.8	9548.66	1454.73	9555.81	1454.62	9559.14	1454.56	9563.17	1454.49
9568.21	1454.4	9571.36	1454.34	9574.94	1454.29	9579.05	1454.21	9586.59	1454.09
9591.44	1454	9595	1454.07	9601.3	1454.19	9617.61	1454.3	9627.93	1454.24
9634.85	1454.29	9670.44	1455.1	9689.04	1455.06	9722.75	1454.97	9739.08	1454.92
9754.07	1454.88	9789.13	1454.79	9827.35	1454.69	9839.17	1454.66	9879.65	1454.58
9889.22	1454.56	9931.96	1454.49	9939.27	1454.48	9954.51	1453.86	10000	1451.96
10026.85	1453.6	10039.75	1454.4	10074.85	1454.4	110090.29	1454.4	110136.09	1452.28
10144.33	1451.8	510148.14	1452.1	210191.37	1454.42	10207	1454.4	210241.91	1454.41
10251.05	1454.4	210292.45	1454.42	10295.1	1454.4	210313.12	1454.4	410339.15	1454.47
10342.99	1454.4	710366.57	1453.5	810398.35	1452.4	210414.87	1452.82	10494.6	1454.73
10515.35	1454.7	510545.14	1454.7	810559.41	1454.7	910595.68	1454.8	10603.46	1454.85
10646.22	1455.0	810647.51	1455.0	910656.22	1455.1	10691.56	1455.1	410699.46	1455.17
10700.94	1455.1	910703.47	1455.2	210723.58	1455.3	10751.81	1455.3	310775.26	1455.11

```
 10788.6 1454.9210823.71 1455.3910848.38 1455.4410881.58 1455.4910898.92 1455.52
10924.12 1455.56

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
  9157.3    .048 9839.17    .054 10494.6    .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9839.17 10494.6              1250    1321    1250            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1455.56  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.               *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)          * 1455.48  * Reach Len. (ft)          * 1250.00  * 1321.00  * 1250.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *  258.38  * 1063.29  *  152.73  *
* E.G. Slope (ft/ft)      *0.004273  * Area (sq ft)             *  258.38  * 1063.29  *  152.73  *
* Q Total (cfs)           * 3170.00  * Flow (cfs)               *  361.67  * 2639.60  *  168.74  *
* Top Width (ft)          * 1483.05  * Top Width (ft)           *  449.06  *  655.43  *  378.56  *
* Vel Total (ft/s)        *    2.15  * Avg. Vel. (ft/s)         *    1.40  *    2.48  *    1.10  *
* Max Chl Dpth (ft)       *    3.63  * Hydr. Depth (ft)         *    0.58  *    1.62  *    0.40  *
* Conv. Total (cfs)       * 48497.2  * Conv. (cfs)              *  5533.1  * 40382.6  *  2581.4  *
* Length Wtd. (ft)        * 1314.96  * Wetted Per. (ft)         *  449.08  *  655.75  *  378.57  *
* Min Ch El (ft)          * 1451.85  * Shear (lb/sq ft)         *    0.15  *    0.43  *    0.11  *
* Alpha                   *    1.17  * Stream Power (lb/ft s)    *    0.21  *    1.07  *    0.12  *
* Frctn Loss (ft)         *    7.43  * Cum Volume (acre-ft)      *  207.59  *  711.55  *  181.65  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)            *  258.95  *  618.77  *  315.14  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1              RS: 33.690

INPUT
Description:
Station Elevation Data      num=      82
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8898.94 1450.63 8945.32 1450.53 8948.99 1450.52 8993.26 1450.41 8999.04  1450.4
  9041.2 1450.29 9049.09 1450.27 9089.14 1450.17 9099.14 1450.15 9137.08 1450.05
 9149.18 1450.02 9185.02 1449.92 9199.23 1449.88 9232.96 1449.78 9249.28 1449.73
  9280.9 1449.66 9299.33 1449.61 9328.84 1449.56 9349.38 1449.52 9376.78 1449.49
 9399.43 1449.47 9424.72 1449.47 9449.47 1449.47 9472.66 1449.48 9507.87 1447.67
    9518 1447.03 9536.65 1445.66  9536.7 1445.66 9536.83 1445.67 9568.85 1447.15
 9577.79 1447.64 9583.73 1447.98 9588.01 1448.21 9591.23 1448.36 9593.92 1448.47
 9596.02 1448.58 9616.48 1449.48 9649.67 1449.46 9687.73 1445.62 9697.51 1444.98
 9729.32 1444.98 9750.19 1444.97 9762.99 1444.99 9776.66 1444.97  9795.8 1445.81
 9849.86 1448.36 9856.18 1448.27 9899.91 1447.77 9904.12 1447.73 9949.96 1447.23
 9952.07 1447.2210000.01 1446.9310047.22 1446.83 10050.1 1446.8210056.38 1446.72
 10063.8 1446.54 10096.6 1445.7210117.55  1446.310150.28 1446.8110188.85 1446.82
10200.38 1446.8310236.06 1446.8410250.47 1446.8510283.27 1446.8610300.56 1446.87
10330.48  1446.910350.66 1446.9210373.46 1448.1410400.75  1449.610426.81 1449.58
10450.84 1449.5710480.17 1449.5410500.94 1449.5210533.52 1449.4910551.03 1449.49
10586.87 1449.4710601.12 1449.4710613.74 1449.4710651.22 1449.4710660.95 1449.48
10701.31 1449.5110708.16 1449.53

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 8898.94    .048 9249.28    .05410400.75    .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9249.2810400.75              1325    1386    1325            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1448.13  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.               *         *   0.054  *         *
* W.S. Elev (ft)          * 1447.99  * Reach Len. (ft)          * 1325.00  * 1386.00  * 1325.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)        *         * 1019.08  *         *
```

* E.G. Slope (ft/ft)	*0.007909	* Area (sq ft)	*		*	1019.08	*		*
* Q Total (cfs)	* 3060.00	* Flow (cfs)	*		*	3060.00	*		*
* Top Width (ft)	* 749.39	* Top Width (ft)	*		*	749.39	*		*
* Vel Total (ft/s)	* 3.00	* Avg. Vel. (ft/s)	*		*	3.00	*		*
* Max Chl Dpth (ft)	* 3.02	* Hydr. Depth (ft)	*		*	1.36	*		*
* Conv. Total (cfs)	* 34407.4	* Conv. (cfs)	*		*	34407.4	*		*
* Length Wtd. (ft)	* 1386.00	* Wetted Per. (ft)	*		*	749.80	*		*
* Min Ch El (ft)	* 1444.97	* Shear (lb/sq ft)	*		*	0.67	*		*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*		*	2.02	*		*
* Frctn Loss (ft)	* 6.20	* Cum Volume (acre-ft)	*	203.89	*	679.98	*	179.46	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	*	252.51	*	597.47	*	309.70	*

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 33.427

INPUT
Description:
Station Elevation Data num= 111

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8113.86	1444.98	8115.7	1444.98	8165.21	1444.84	8165.72	1444.84	8184.96	1444.79
8215.74	1444.71	8216.56	1444.7	8265.75	1444.59	8267.91	1444.59	8315.77	1444.52
8319.26	1444.51	8365.79	1444.46	8370.61	1444.45	8415.8	1444.39	8421.96	1444.38
8465.82	1444.29	8473.31	1444.26	8515.84	1444.14	8524.66	1444.1	8565.86	1443.96
8576.01	1443.93	8615.87	1443.78	8627.36	1443.74	8665.89	1443.61	8678.71	1443.57
8715.91	1443.46	8730.06	1443.42	8765.92	1443.32	8781.41	1443.28	8815.94	1443.18
8832.76	1443.13	8865.96	1443.04	8884.11	1442.99	8915.97	1442.89	8935.45	1442.83
8965.99	1442.73	8986.81	1442.66	9016.01	1442.57	9038.15	1442.5	9066.02	1442.41
9089.5	1442.34	9116.04	1442.26	9140.85	1442.19	9166.06	1442.11	9192.2	1442.04
9216.07	1441.97	9243.55	1441.88	9266.09	1441.81	9294.9	1441.71	9316.11	1441.64
9346.25	1441.54	9366.12	1441.47	9397.6	1441.36	9416.14	1441.3	9448.95	1441.2
9476.75	1440.17	9495.77	1439.09	9537.62	1438.73	9542.68	1438.71	9546.86	1438.82
9616.21	1440.68	9654.35	1440.54	9666.23	1440.5	9705.7	1440.36	9716.24	1440.32
9726.25	1440.29	9766.26	1440.17	9808.4	1440.05	9816.28	1440.03	9859.75	1439.92
9866.29	1439.91	9911.1	1439.8	9916.31	1439.79	9962.45	1439.69	9966.33	1439.68
9970.65	1439.58	9973.56	1439.53	10000	1439.08	10057.47	1439.43	10061.22	1439.45
10066.35	1439.49	10080.21	1439.39	10113.03	1439.14	10116.35	1439.36	10116.62	1439.38
10164.23	1442.49	10165.47	1442.58	10166.36	1442.65	10166.73	1442.65	10191.64	1442.71
10216.36	1442.76	10216.74	1442.76	10266.37	1442.91	10267.52	1442.91	10316.37	1443.07
10318.29	1443.08	10366.38	1443.28	10369.07	1443.29	10416.39	1443.51	10419.84	1443.51
10466.39	1443.72	10470.61	1443.74	10516.4	1443.94	10521.39	1443.96	10566.4	1444.16
10572.16	1444.19	10616.41	1444.42	10622.94	1444.46	10666.41	1444.72	10673.71	1444.77
10694.23	1444.9								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8113.86	.048	9089.5	.05	10165.47	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9089.5	10165.47	1200	1259	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1441.90	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	* 0.06	* Wt. n-Val.	*		*	0.054	*		*
* W.S. Elev (ft)	* 1441.84	* Reach Len. (ft)	*	1200.00	*	1259.00	*	1200.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	*		*	1454.77	*		*
* E.G. Slope (ft/ft)	*0.002829	* Area (sq ft)	*		*	1454.77	*		*
* Q Total (cfs)	* 2940.00	* Flow (cfs)	*		*	2940.00	*		*
* Top Width (ft)	* 896.47	* Top Width (ft)	*		*	896.47	*		*
* Vel Total (ft/s)	* 2.02	* Avg. Vel. (ft/s)	*		*	2.02	*		*
* Max Chl Dpth (ft)	* 3.13	* Hydr. Depth (ft)	*		*	1.62	*		*
* Conv. Total (cfs)	* 55273.0	* Conv. (cfs)	*		*	55273.0	*		*
* Length Wtd. (ft)	* 1259.00	* Wetted Per. (ft)	*		*	896.64	*		*
* Min Ch El (ft)	* 1438.71	* Shear (lb/sq ft)	*		*	0.29	*		*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*		*	0.58	*		*
* Frctn Loss (ft)	* 5.77	* Cum Volume (acre-ft)	*	203.89	*	640.62	*	179.46	*

```
* C & E Loss (ft)        *    0.01  * cum SA (acres)        *  252.51  *  571.29  *  309.70  *
*****************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 33.189

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
7827.23	1438.91	7846.74	1438.87	7880.23	1438.78	7896.82	1438.73	7933.22	1438.6
7946.89	1438.56	7986.21	1438.42	7996.97	1438.38	8039.21	1438.26	8047.04	1438.23
8092.2	1438.16	8097.12	1438.15	8145.2	1438.07	8147.2	1438.07	8181.5	1438.03
8197.27	1438.01	8198.19	1438.01	8247.35	1437.96	8251.19	1437.96	8297.42	1437.93
8304.18	1437.93	8347.5	1437.9	8357.18	1437.89	8397.58	1437.84	8410.17	1437.82
8447.65	1437.77	8463.16	1437.74	8497.73	1437.68	8516.16	1437.65	8547.8	1437.59
8569.15	1437.56	8597.88	1437.52	8622.15	1437.49	8647.95	1437.46	8675.14	1437.43
8698.03	1437.4	8728.14	1437.35	8748.11	1437.3	8781.13	1437.24	8798.18	1437.2
8834.12	1437.13	8848.26	1437.1	8887.12	1437.01	8898.33	1436.99	8940.11	1436.88
8948.41	1436.86	8993.11	1436.73	8998.48	1436.72	9046.1	1436.55	9048.56	1436.54
9090.75	1436.39	9098.64	1436.36	9099.1	1436.36	9148.71	1436.14	9152.09	1436.12
9198.79	1435.92	9205.08	1435.9	9248.86	1435.73	9258.08	1435.7	9298.94	1435.57
9311.07	1435.54	9349.01	1435.43	9364.07	1435.39	9399.09	1435.29	9417.06	1435.24
9449.17	1435.15	9470.06	1435.09	9499.24	1435	9523.05	1434.92	9549.32	1434.83
9576.05	1434.74	9599.39	1434.66	9629.04	1434.56	9649.47	1434.49	9682.03	1434.41
9699.55	1434.37	9735.03	1434.31	9749.62	1434.29	9788.02	1434.26	9799.7	1434.25
9841.02	1434.24	9849.77	1434.23	9894.01	1434.22	9899.85	1434.22	9947.01	1434.21
9949.92	1434.21	10000	1434.21	10048.48	1436.68	10050.03	1436.76	10096.96	1436.85
10100.05	1436.86	10145.43	1436.99	10150.08	1437.01	10193.91	1437.18	10200.1	1437.21
10242.39	1437.41	10250.13	1437.45	10290.87	1437.66	10300.15	1437.71	10339.34	1437.92
10350.18	1437.98	10387.82	1438.17	10400.2	1438.23	10436.3	1438.42	10450.23	1438.49
10484.78	1438.65	10500.25	1438.73	10533.25	1438.87	10550.28	1438.94	10581.73	1439.06
10600.31	1439.13	10630.21	1439.25	10650.33	1439.31	10678.69	1439.42		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
7827.23	.048	8887.12	.05	10048.48	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
8887.12	10048.48	1450	1509	1450	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1436.12	* Element	* Left OB	* Channel	* Right OB
* Vel Head (ft)	* 0.13	* Wt. n-Val.	*	* 0.054	*
* W.S. Elev (ft)	* 1436.00	* Reach Len. (ft)	* 1450.00	* 1509.00	* 1450.00
* Crit W.S. (ft)	* 1435.42	* Flow Area (sq ft)	*	* 991.43	*
* E.G. Slope (ft/ft)	*0.008886	* Area (sq ft)	*	* 991.43	*
* Q Total (cfs)	* 2840.00	* Flow (cfs)	*	* 2840.00	*
* Top Width (ft)	* 854.25	* Top Width (ft)	*	* 854.25	*
* Vel Total (ft/s)	* 2.86	* Avg. Vel. (ft/s)	*	* 2.86	*
* Max Chl Dpth (ft)	* 1.79	* Hydr. Depth (ft)	*	* 1.16	*
* Conv. Total (cfs)	* 30127.5	* Conv. (cfs)	*	* 30127.5	*
* Length Wtd. (ft)	* 1508.71	* Wetted Per. (ft)	*	* 854.29	*
* Min Ch El (ft)	* 1434.21	* Shear (lb/sq ft)	*	* 0.64	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 1.84	*
* Frctn Loss (ft)	* 7.15	* Cum Volume (acre-ft)	* 203.89	* 605.27	* 179.46
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 252.51	* 545.99	* 309.70

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 32.903

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8617.63	1430.51	8635.9	1430.5	8641.17	1430.49	8681.92	1430.45	8691.5	1430.43
8692.74	1430.43	8741.83	1430.37	8749.58	1430.35	8792.15	1430.29	8806.41	1430.24
8842.48	1430.14	8863.25	1430.04	8892.81	1429.91	8920.09	1429.76	8943.13	1429.64
8976.93	1429.45	8993.46	1429.35	9033.76	1429.15	9043.79	1429.1	9090.6	1428.92
9094.11	1428.91	9121.28	1428.84	9144.44	1428.78	9147.44	1428.78	9194.77	1428.71
9204.28	1428.73	9245.1	1428.75	9261.11	1428.83	9295.42	1428.95	9317.95	1428.97
9345.75	1429.04	9374.79	1428.95	9396.08	1428.93	9431.63	1428.82	9446.4	1428.79
9488.46	1428.6	9496.73	1428.58	9545.3	1428.4	9547.06	1428.4	9560.64	1428.39
9597.38	1428.35	9602.14	1428.33	9647.71	1428.08	9658.98	1427.93	9698.04	1427.29
9715.81	1427.19	9748.36	1427.04	9772.65	1427.02	9798.69	1426.97	9829.49	1426.95
9849.02	1426.94	9886.33	1426.91	9899.35	1426.9	9943.16	1426.85	9949.67	1426.84
10000	1426.75	10050.14	1426.66	10054.2	1426.65	10100.28	1426.57	10175.48	1425.62
10178.13	1425.59	10181.68	1425.81	10250.7	1430.23	10271.01	1430.34	10300.84	1430.49
10325.21	1430.65	10350.98	1430.81	10379.41	1430.97	10401.12	1431.11	0433.61	1431.26
10451.26	1431.35	10487.82	1431.49	10501.4	1431.55	10542.02	1431.68	10551.54	1431.71
10596.22	1431.86	10601.68	1431.88	10650.42	1432.02	10651.82	1432.02	10669.12	1432.05
10701.96	1432.11	10704.62	1432.11	10714.94	1432.09				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8617.63	.048	9547.06	.054	10250.7	.048

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9547.06 10250.7 1225 1290 1225 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1428.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.048	0.054	
W.S. Elev (ft)	1428.88	Reach Len. (ft)	1225.00	1290.00	1225.00
Crit W.S. (ft)		Flow Area (sq ft)	50.18	1227.94	
E.G. Slope (ft/ft)	0.002882	Area (sq ft)	50.18	1227.94	
Q Total (cfs)	2710.00	Flow (cfs)	27.08	2682.92	
Top Width (ft)	989.89	Top Width (ft)	307.28	682.60	
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)	0.54	2.18	
Max Chl Dpth (ft)	3.29	Hydr. Depth (ft)	0.16	1.80	
Conv. Total (cfs)	50477.3	Conv. (cfs)	504.3	49973.0	
Length Wtd. (ft)	1289.67	Wetted Per. (ft)	307.29	682.72	
Min Ch El (ft)	1425.59	Shear (lb/sq ft)	0.03	0.32	
Alpha	1.05	Stream Power (lb/ft s)	0.02	0.71	
Frctn Loss (ft)	6.18	Cum Volume (acre-ft)	203.05	566.83	179.46
C & E Loss (ft)	0.00	Cum SA (acres)	247.39	519.37	309.70

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 32.659

INPUT
Description:
Station Elevation Data num= 101

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8193.32	1424.93	8200.32	1424.9	8221.51	1424.81	8262.38	1424.65	8272.32	1424.62
8317.26	1424.47	8323.14	1424.46	8324.44	1424.45	8373.95	1424.35	8386.49	1424.33
8424.76	1424.28	8448.55	1424.26	8475.58	1424.25	8510.61	1424.25	8526.39	1424.25
8572.67	1424.23	8577.21	1424.24	8597.71	1424.22	8628.02	1424.21	8634.73	1424.2
8678.83	1424.14	8696.78	1424.11	8729.65	1424.06	8758.84	1424.02	8780.46	1423.98
8795.45	1423.96	8831.28	1423.91	8878.17	1423.84	8882.09	1423.84	8882.96	1423.84
8932.9	1423.77	8945.02	1423.74	8983.72	1423.66	9007.07	1423.59	9034.53	1423.52

```
9069.13  1423.4 9085.35 1423.35 9131.19 1423.18 9136.16 1423.16 9158.63 1423.07
9186.97 1422.96 9193.25 1422.94 9237.79 1422.76 9255.31 1422.69  9288.6 1422.56
9317.36 1422.44 9339.42 1422.35 9379.42  1422.2 9390.23 1422.16 9439.09 1422.01
9441.04 1422.01 9441.48 1422.01 9491.86 1421.89 9503.54 1421.87 9542.67 1421.81
9565.59  1421.8 9593.49 1421.77 9627.65 1421.75  9644.3 1421.74 9689.71  1421.7
9695.12  1421.7 9719.54 1421.68 9745.93 1421.66 9751.77 1421.65 9796.74 1421.61
9813.83 1421.59 9847.56 1421.56 9875.88 1421.54 9898.37 1421.52 9937.94 1421.49
9949.19 1421.48   10000 1421.4110050.29 1421.3410056.42 1421.3310100.59 1421.26
10112.85 1421.2510150.88 1421.2210169.27 1421.2610201.18 1421.32 10225.7 1421.48
10251.47 1421.6610282.12 1421.8810301.77 1422.0610338.55  1423.310352.06  1423.7
10394.97    142410402.35 1424.05 10451.4 1424.4310452.65 1424.43 10462.9 1424.51
10502.94 1424.8110507.82 1424.8410553.24 1425.1410564.25  1425.210603.53 1425.43
10620.67 1425.5210653.83  1425.7 10677.1 1425.8110704.12 1425.9510733.52 1426.06
10747.33 1426.11

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 8193.32    .048 9158.63    .05410394.97    .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
      9158.6310394.97               1050    1107    1050            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1422.77  * Element                  *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.               *          *    0.054 *          *
* W.S. Elev (ft)          * 1422.66  * Reach Len. (ft)          * 1050.00  * 1107.00  * 1050.00  *
* Crit W.S. (ft)          * 1422.25  * Flow Area (sq ft)        *          *   993.33 *          *
* E.G. Slope (ft/ft)      *0.009834  * Area (sq ft)             *          *   993.33 *          *
* Q Total (cfs)           * 2600.00  * Flow (cfs)               *          * 2600.00  *          *
* Top Width (ft)          * 1057.36  * Top Width (ft)           *          * 1057.36  *          *
* Vel Total (ft/s)        *    2.62  * Avg. Vel. (ft/s)         *          *    2.62  *          *
* Max Chl Dpth (ft)       *    1.44  * Hydr. Depth (ft)         *          *    0.94  *          *
* Conv. Total (cfs)       * 26218.5  * Conv. (cfs)              *          * 26218.5  *          *
* Length Wtd. (ft)        * 1106.99  * Wetted Per. (ft)         *          * 1057.37  *          *
* Min Ch El (ft)          * 1421.22  * Shear (lb/sq ft)         *          *    0.58  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)    *          *    1.51  *          *
* Frctn Loss (ft)         *    5.50  * Cum Volume (acre-ft)      *  202.34  *  533.94  *  179.46  *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)            *  243.07  *  493.60  *  309.70  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 32.449

INPUT
Description:
Station Elevation Data     num=      71
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 9123.52 1419.96 9125.99 1419.96 9130.92 1419.95 9180.61 1419.84 9219.65 1419.74
 9235.24 1419.69 9255.08 1419.64 9289.86 1419.55 9317.19 1419.46 9344.49 1419.37
 9379.23 1419.21 9399.11  1419.1 9414.74 1418.99 9453.74 1418.71 9503.38  1418.3
 9508.37 1418.26 9512.28 1418.23 9562.99 1417.81 9609.82 1417.44 9617.62 1417.38
 9627.54 1417.32 9672.24 1417.04 9707.37 1416.86 9726.87 1416.76 9751.69 1416.65
 9781.49 1416.51 9804.91 1416.41 9836.12 1416.28 9875.84 1416.12 9890.75 1416.06
 9902.45 1416.02 9945.37 1415.87   10000 1415.7110050.57 1415.6810059.65 1415.68
10101.15 1415.67 10119.3 1415.6710151.72 1415.6710178.96 1415.68 10202.3 1415.68
10238.61 1415.6810252.88 1415.6810298.26 1415.6410303.45 1415.6310332.35  1415.6
10354.03 1415.5710357.92 1415.57 10404.6 1415.5210417.57 1415.5110455.18 1415.49
10477.22 1415.4810505.75 1415.4810536.88 1415.5110556.33 1415.5310596.53 1415.64
 10606.9 1415.6710656.18  1415.910657.48 1415.91 10664.7 1415.9510708.06 1416.24
10715.84  1416.310758.63 1416.6410775.49    141810809.21 1420.6710835.14 1420.89
10859.78 1421.09 10894.8 1421.3110910.36 1421.4110954.45 1421.5310960.93 1421.55
10980.22 1421.55

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
**********************************************
 9123.52    .048 9562.99    .05410758.63    .048
```

```
Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9562.9910758.63              1175    1235    1175              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1417.25  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *          *    0.054 *    0.048 *
* W.S. Elev (ft)          * 1417.20  * Reach Len. (ft)         * 1175.00  * 1235.00  * 1175.00  *
* Crit W.S. (ft)          * 1416.36  * Flow Area (sq ft)       *          * 1424.51  *    1.93  *
* E.G. Slope (ft/ft)      *0.002942  * Area (sq ft)            *          * 1424.51  *    1.93  *
* Q Total (cfs)           * 2510.00  * Flow (cfs)              *          * 2508.62  *    1.38  *
* Top Width (ft)          * 1118.47  * Top Width (ft)          *          * 1111.56  *    6.91  *
* Vel Total (ft/s)        *    1.76  * Avg. Vel. (ft/s)        *          *    1.76  *    0.72  *
* Max Chl Dpth (ft)       *    1.72  * Hydr. Depth (ft)        *          *    1.28  *    0.28  *
* Conv. Total (cfs)       * 46273.1  * Conv. (cfs)             *          * 46247.6  *    25.4  *
* Length Wtd. (ft)        * 1234.98  * Wetted Per. (ft)        *          * 1111.56  *    6.94  *
* Min Ch El (ft)          * 1415.48  * Shear (lb/sq ft)        *          *    0.24  *    0.05  *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *    0.41  *    0.04  *
* Frctn Loss (ft)         *    5.46  * Cum Volume (acre-ft)    *  202.34  *  503.22  *  179.44  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  243.07  *  466.04  *  309.62  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 32.215

INPUT
Description:
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8997.37 1412.31 9019.34 1412.33 9036.01 1412.34 9080.63 1412.38 9086.75 1412.38
 9116.17  1412.4 9137.49  1412.4 9141.92  1412.4 9188.22 1412.43 9203.21 1412.42
 9238.96  1412.4  9264.5 1412.35 9289.69 1412.31  9325.8 1412.22 9340.43  1412.2
 9387.09 1412.06 9391.17 1412.05 9410.78 1411.99  9441.9  1411.9 9448.38 1411.88
 9492.64 1411.76 9509.67 1411.72 9543.37 1411.65 9570.96 1411.57 9594.11 1411.51
 9632.25 1411.35 9644.85 1411.31 9693.54 1411.09 9695.58 1411.08 9705.39 1411.03
 9746.32 1410.82 9754.83 1410.79 9797.05 1410.59 9816.13 1410.54 9847.79 1410.45
 9877.42 1410.39 9898.53 1410.34 9938.71 1410.27 9949.26 1410.25   10000 1410.17
10050.48 1410.1510058.67 1410.1510100.97 1410.1710117.35 1410.1910151.45 1410.21
10176.02 1410.2410201.94 1410.2810234.69 1410.3210252.42 1410.3510293.37 1410.45
10302.91 1410.4710352.04 1410.6210353.39 1410.6210361.74 1410.6710403.88 1410.88
10410.71 1410.9410454.36 1411.2710469.38 1411.4110504.85 1411.7410528.06 1411.94
10555.33 1412.1910586.73 1412.4310605.81 1412.59 10645.4 1412.82 10656.3 1412.89
10704.08 1413.0410706.78 1413.0510723.47 1413.0610757.27 1413.0910762.75 1413.08
10807.75 1413.0310817.43 1413.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8997.37    .048 9543.37    .05410504.85    .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9543.3710504.85              1200    1265    1200              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1411.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.09  * Wt. n-Val.              *   0.048  *    0.054 *          *
* W.S. Elev (ft)          * 1411.69  * Reach Len. (ft)         * 1200.00  * 1265.00  * 1200.00  *
* Crit W.S. (ft)          * 1411.14  * Flow Area (sq ft)       *    0.41  *  987.30  *          *
* E.G. Slope (ft/ft)      *0.007541  * Area (sq ft)            *    0.41  *  987.30  *          *
* Q Total (cfs)           * 2410.00  * Flow (cfs)              *    0.08  * 2409.92  *          *
* Top Width (ft)          *  976.27  * Top Width (ft)          *   20.00  *  956.27  *          *
* Vel Total (ft/s)        *    2.44  * Avg. Vel. (ft/s)        *    0.20  *    2.44  *          *
* Max Chl Dpth (ft)       *    1.54  * Hydr. Depth (ft)        *    0.02  *    1.03  *          *
* Conv. Total (cfs)       * 27753.1  * Conv. (cfs)             *     1.0  * 27752.1  *          *
* Length Wtd. (ft)        * 1262.98  * Wetted Per. (ft)        *   20.00  *  956.28  *          *
* Min Ch El (ft)          * 1410.15  * Shear (lb/sq ft)        *    0.01  *    0.49  *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *    0.00  *    1.19  *          *
```

```
* Frctn Loss (ft)        *    6.38  * Cum Volume (acre-ft)   *  202.34  *  469.03  *  179.41  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)         *  242.80  *  436.73  *  309.53  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 31.976

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9309.96	1406.04	9328.88	1405.98	9374.72	1405.73	9380.51	1405.7	9397.23	1405.58
9432.13	1405.35	9444.2	1405.27	9483.76	1405	9513.67	1404.82	9535.38	1404.69
9583.15	1404.45	9587	1404.43	9591.26	1404.47	9594.31	1404.47	9596.89	1404.45
9602.57	1404.4	9625.61	1404.14	9652.58	1403.81	9655.36	1403.94	9663.24	1404.24
9668.53	1404.41	9712.5	1404.08	9741.88	1404.02	9791.57	1403.91	9793.5	1403.91
9799.08	1403.9	9845.12	1403.83	9868.88	1403.61	9882.33	1403.45	9908.24	1403.14
9913.2	1403.19	9928.4	1403.38	9934.76	1403.46	9938.6	1403.51	9940.1	1403.52
9941.38	1403.54	9942.51	1403.55	9943.21	1403.55	9943.86	1403.56	9958.93	1403.74
10000	1403.71	10050.63	1403.69	10060.22	1403.71	10101.26	1403.74	10120.45	1403.79
10151.89	1403.85	10180.67	1403.94	10202.52	1404.01	10240.89	1404.17	10253.15	1404.22
10301.12	1404.45	10303.78	1404.46	10317.83	1404.53	10354.41	1404.69	10361.34	1404.73
10405.04	1404.93	10421.57	1405.02	10455.67	1405.21	10481.79	1405.37	10506.3	1405.52
10542.02	1405.72	10556.93	1405.81	10602.24	1406.02	10607.56	1406.04	10635.66	1406.12
10658.19	1406.18	10662.46	1406.19	10708.82	1406.23	10722.69	1406.22	10750.17	1406.22

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9309.96	.048	9583.15	.05	10317.83	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9583.15	10317.83	1050	1125	1050	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1405.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1405.33	Reach Len. (ft)	1050.00	1125.00	1050.00
Crit W.S. (ft)	1404.58	Flow Area (sq ft)	68.87	1039.57	66.65
E.G. Slope (ft/ft)	0.003569	Area (sq ft)	68.87	1039.57	66.65
Q Total (cfs)	2300.00	Flow (cfs)	76.64	2153.84	69.52
Top Width (ft)	1039.52	Top Width (ft)	147.52	734.68	157.32
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)	1.11	2.07	1.04
Max Chl Dpth (ft)	2.19	Hydr. Depth (ft)	0.47	1.41	0.42
Conv. Total (cfs)	38500.0	Conv. (cfs)	1282.9	36053.4	1163.7
Length Wtd. (ft)	1099.02	Wetted Per. (ft)	147.52	734.71	157.32
Min Ch El (ft)	1403.14	Shear (lb/sq ft)	0.10	0.32	0.09
Alpha	1.07	Stream Power (lb/ft s)	0.12	0.65	0.10
Frctn Loss (ft)	5.08	Cum Volume (acre-ft)	201.38	439.60	178.49
C & E Loss (ft)	0.00	Cum SA (acres)	240.49	412.18	307.36

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 31.763

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9148.58	1400.82	9190.78	1400.58	9196.6	1400.55	9201.95	1400.52	9252.03	1400.26
9306.59	1400.06	9307.47	1400.06	9308.27	1400.06	9362.9	1399.93	9412.41	1398.89
9425.24	1398.56	9432.78	1398.38	9438.48	1398.52	9449.41	1398.78	9494.63	1399.68

```
 9529.19 1399.59 9538.23 1399.57 9584.62 1399.45 9627.21 1399.35 9640.06 1399.32
 9650.86 1399.24 9652.77 1399.23 9655.78 1399.21 9661.24 1399.18 9675.25 1399.09
 9700.78 1398.94 9720.95 1399.07 9734.27 1399.16  9739.8  1399.2 9742.91 1399.22
  9744.9 1399.23 9757.05 1399.35 9769.87 1399.37 9806.35 1399.42 9839.84 1399.43
 9861.78 1399.43 9885.68 1399.41 9917.21  1399.4  9944.5 1399.38   10000 1397.12
10026.78 1398.04 10068.9 1399.5810075.77  1399.610084.34 1399.6110126.07 1399.71
10140.82 1399.7210176.37 1399.7710197.29 1399.7510226.67 1399.7510253.76 1399.71
10276.97 1399.7110310.23 1399.6610327.26 1399.6310366.71 1399.6110377.56 1399.59
10423.18 1399.7110427.86 1399.7210466.01 1399.9610478.16 1400.0310479.65 1400.04
10528.46 1400.3810536.12 1400.4210578.75 1400.59 10592.6 1400.6110629.05 1400.72
10649.07 1400.7910679.35 1400.8810705.54 1401.0510729.65 1401.3110761.18 1401.38

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9148.58    .048  9944.5    .054 10068.9    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9944.5 10068.9             1250    1316    1250             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1400.30  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.10  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)         * 1400.20  * Reach Len. (ft)         * 1250.00  * 1316.00  * 1250.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  532.38  *  236.87  *  203.10  *
* E.G. Slope (ft/ft)     *0.006295  * Area (sq ft)            *  532.38  *  236.87  *  203.10  *
* Q Total (cfs)          * 2210.00  * Flow (cfs)              * 1115.13  *  794.04  *  300.83  *
* Top Width (ft)         * 1233.99  * Top Width (ft)          *  675.95  *  124.40  *  433.64  *
* Vel Total (ft/s)       *    2.27  * Avg. Vel. (ft/s)        *    2.09  *    3.35  *    1.48  *
* Max Chl Dpth (ft)      *    3.08  * Hydr. Depth (ft)        *    0.79  *    1.90  *    0.47  *
* Conv. Total (cfs)      * 27855.3  * Conv. (cfs)             * 14055.3  * 10008.3  *  3791.8  *
* Length Wtd. (ft)       * 1274.30  * Wetted Per. (ft)        *  675.98  *  124.49  *  433.64  *
* Min Ch El (ft)         * 1397.12  * Shear (lb/sq ft)        *    0.31  *    0.75  *    0.18  *
* Alpha                  *    1.27  * Stream Power (lb/ft s)  *    0.65  *    2.51  *    0.27  *
* Frctn Loss (ft)        *    7.10  * Cum Volume (acre-ft)    *  194.14  *  423.11  *  175.24  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)          *  230.57  *  401.08  *  300.24  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 31.513

INPUT
Description:
Station Elevation Data    num=      59
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9616.36 1394.15 9620.04 1394.16 9630.21 1393.85  9633.9 1393.55 9637.36  1393.2
 9640.61 1392.99 9642.72 1392.96 9644.73 1392.99 9646.62 1393.01 9692.72 1392.89
 9697.73 1392.89 9700.69 1392.89 9702.61 1392.89 9703.49 1392.89 9704.23 1392.89
 9704.87 1392.89 9705.57 1392.88 9711.77 1392.85 9729.67 1392.78 9771.19 1392.61
 9794.34 1392.51  9830.6 1392.36 9886.91 1392.07 9890.01 1392.06 9895.58 1392.01
 9949.43 1391.66 9967.56 1391.24 9969.28 1391.07 9971.46  1390.9 9974.06 1390.79
 9977.46 1390.71 9982.06  1390.6 9986.37 1390.49 9992.07 1390.34   10000 1390.12
10028.94  1390.910057.44 1391.5110068.18 1391.5710107.44 1391.5810117.93 1391.64
10157.44 1391.6110167.67 1391.6610207.44 1392.0310217.42 1392.0910257.44 1392.02
10267.17    139210307.44 1391.9710316.91 1391.9710357.44 1392.0410366.66 1392.17
10407.45 1392.58 10416.4 1392.8410457.45 1393.7410466.15 1393.8810507.45 1395.05
 10515.9 1395.1110557.45 1395.5710565.64 1395.6110585.89 1395.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9616.36    .048 9949.43    .05410057.44    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9949.4310057.44            1300    1378    1300             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1393.21  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.11  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
```

W.S. Elev (ft)	1393.10	Reach Len. (ft)	1300.00	1378.00	1300.00
Crit W.S. (ft)	1392.57	Flow Area (sq ft)	196.01	240.49	420.23
E.G. Slope (ft/ft)	0.004936	Area (sq ft)	196.01	240.49	420.23
Q Total (cfs)	2100.00	Flow (cfs)	313.73	792.50	993.76
Top Width (ft)	789.06	Top Width (ft)	310.45	108.01	370.60
Vel Total (ft/s)	2.45	Avg. Vel. (ft/s)	1.60	3.30	2.36
Max Chl Dpth (ft)	2.98	Hydr. Depth (ft)	0.63	2.23	1.13
Conv. Total (cfs)	29891.6	Conv. (cfs)	4465.7	11280.6	14145.3
Length Wtd. (ft)	1328.86	Wetted Per. (ft)	310.46	108.06	370.61
Min Ch El (ft)	1390.12	Shear (lb/sq ft)	0.19	0.69	0.35
Alpha	1.19	Stream Power (lb/ft s)	0.31	2.26	0.83
Frctn Loss (ft)	6.30	Cum Volume (acre-ft)	183.69	415.90	166.30
C & E Loss (ft)	0.01	Cum SA (acres)	216.42	397.57	288.70

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 31.252

INPUT
Description:
Station Elevation Data num= 63

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9468.03	1387.3	9498.29	1387.29	9518.61	1387.3	9557.97	1387.16	9569.18	1387.13
9617.65	1386.85	9619.76	1386.84	9631.48	1386.75	9670.34	1386.46	9677.33	1386.41
9720.92	1386.09	9737.01	1385.99	9771.5	1385.78	9796.69	1385.68	9822.07	1385.58
9856.37	1385.57	9872.65	1385.54	9916.05	1385.6	9923.23	1385.61	9942.16	1385.29
10000	1384.33	10042.51	1385.22	10055.31	1385.48	10077.04	1385.98	10104.98	1385.93
10129.02	1385.95	10145.46	1385.92	10180.99	1385.92	10185.94	1385.91	10203.37	1385.92
10226.42	1385.93	10232.97	1385.94	10266.9	1385.98	10284.95	1386.02	10319.89	1383.98
10324.63	1383.67	10386.05	1386.12	10387.6	1386.18	10388.9	1386.23	10428.83	1386.31
10440.88	1386.33	10469.31	1386.41	10492.86	1386.45	10509.79	1386.51	10544.83	1386.57
10550.27	1386.58	10569.4	1386.62	10590.75	1386.68	10596.81	1386.69	10631.23	1386.81
10648.79	1386.87	10671.71	1386.96	10700.77	1387.08	10712.19	1387.13	10752.42	1387.33
10752.67	1387.33	10752.74	1387.33	10793.15	1387.51	10804.72	1387.56	10833.63	1387.68
10856.7	1387.8	10874.12	1387.88	10907.03	1388.05				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9468.03	.048	9916.05	.05	10077.04	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9916.05	10077.04	1400	1486	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1386.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1386.82	Reach Len. (ft)	1400.00	1486.00	1400.00
Crit W.S. (ft)	1386.19	Flow Area (sq ft)	254.73	279.54	455.76
E.G. Slope (ft/ft)	0.004560	Area (sq ft)	254.73	279.54	455.76
Q Total (cfs)	2070.00	Flow (cfs)	485.02	750.28	834.70
Top Width (ft)	1009.64	Top Width (ft)	293.03	160.99	555.62
Vel Total (ft/s)	2.09	Avg. Vel. (ft/s)	1.90	2.68	1.83
Max Chl Dpth (ft)	3.14	Hydr. Depth (ft)	0.87	1.74	0.82
Conv. Total (cfs)	30654.9	Conv. (cfs)	7182.7	11111.0	12361.2
Length Wtd. (ft)	1422.47	Wetted Per. (ft)	293.03	161.02	555.74
Min Ch El (ft)	1384.33	Shear (lb/sq ft)	0.25	0.49	0.23
Alpha	1.10	Stream Power (lb/ft s)	0.47	1.33	0.43
Frctn Loss (ft)	7.13	Cum Volume (acre-ft)	176.96	407.68	153.23
C & E Loss (ft)	0.01	Cum SA (acres)	207.41	393.32	274.88

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash

REACH: REACH 1 RS: 30.971

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9148.92	1380.01	9151.38	1380	9182.19	1379.88	9195.67	1379.83	9232.68	1379.7
9239.96	1379.68	9283.17	1379.57	9284.25	1379.57	9292	1379.55	9328.54	1379.46
9333.65	1379.44	9372.83	1379.32	9384.14	1379.28	9417.12	1379.16	9434.63	1379.1
9461.41	1379.05	9485.11	1378.97	9518.95	1377.53	9530.99	1376.96	9558.38	1377.95
9586.09	1378.96	9594.29	1378.99	9636.57	1379.02	9638.58	1379.01	9652.89	1379.11
9682.87	1379.32	9687.06	1379.34	9727.16	1379.49	9737.55	1379.46	9771.45	1379.48
9788.03	1379.54	9815.74	1379.42	9838.52	1379.42	9860.03	1379.42	9889.01	1379.27
9904.32	1379.35	9939.5	1379.23	9948.61	1379.2	10000	1378.2	10028.62	1378.31
10070.82	1378.67	10096.95	1378.57	10109.32	1378.54	10140.41	1378.51	10147.81	1378.49
10150.76	1378.51	10186.31	1378.52	10204.57	1378.55	10224.8	1378.58	10258.39	1378.62
10263.3	1378.62	10275.65	1378.63	10301.79	1378.66	10312.2	1378.67	10340.29	1378.7
10366.01	1378.72	10378.79	1378.73	10410.89	1378.75	10417.28	1378.76	10419.82	1378.76
10455.78	1378.83	10473.64	1378.85	10494.27	1378.89	10527.45	1378.94	10532.77	1378.95
10546.13	1378.97	10571.26	1379.03	10581.26	1379.05	10609.76	1379.12	10635.08	1379.17
10648.25	1379.21	10681.37	1379.27	10686.75	1379.29	10688.89	1379.29	10725.24	1379.4
10742.7	1379.43	10763.74	1379.48	10796.51	1379.55	10802.23	1379.56	10816.61	1379.59
10840.73	1379.64	10850.33	1379.66	10879.23	1379.7	10904.14	1379.75	10917.72	1379.77
10951.85	1379.83	10956.22	1379.83	10957.95	1379.84	10994.71	1379.87	11011.77	1379.89
11033.21	1379.92	11034.69	1379.92						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9148.92	.048	9939.5	.054	10070.82	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9939.5	10070.82	1200	1251	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1379.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1379.69	Reach Len. (ft)	1200.00	1251.00	1200.00
Crit W.S. (ft)		Flow Area (sq ft)	390.99	146.67	588.55
E.G. Slope (ft/ft)	0.005550	Area (sq ft)	390.99	146.67	588.55
Q Total (cfs)	2040.00	Flow (cfs)	610.08	323.63	1106.29
Top Width (ft)	1633.65	Top Width (ft)	702.49	131.32	799.84
Vel Total (ft/s)	1.81	Avg. Vel. (ft/s)	1.56	2.21	1.88
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	0.56	1.12	0.74
Conv. Total (cfs)	27383.3	Conv. (cfs)	8189.2	4344.1	14850.0
Length Wtd. (ft)	1214.64	Wetted Per. (ft)	702.57	131.33	799.84
Min Ch El (ft)	1378.20	Shear (lb/sq ft)	0.19	0.39	0.25
Alpha	1.04	Stream Power (lb/ft s)	0.30	0.85	0.48
Frctn Loss (ft)	6.11	Cum Volume (acre-ft)	166.58	400.41	136.45
C & E Loss (ft)	0.00	Cum SA (acres)	191.41	388.33	253.10

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 30.734

INPUT
Description:
Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8727.21	1374.64	8732.3	1374.64	8733.89	1374.64	8742.18	1374.64	8784.54	1374.64
8792.67	1374.64	8835.18	1374.64	8853.03	1374.63	8885.83	1374.62	8913.4	1374.62
8936.47	1374.61	8973.77	1374.61	8987.11	1374.61	9034.13	1374.59	9037.76	1374.59
9056.64	1374.58	9088.4	1374.56	9094.5	1374.56	9139.05	1374.52	9154.87	1374.5
9189.69	1374.46	9215.23	1374.41	9240.34	1374.36	9297.81	1372.2	9318.49	1371.39
9370.56	1373.19	9382.79	1373.62	9392.27	1373.91	9396.33	1373.9	9442.91	1373.76
9456.7	1373.73	9493.56	1373.66	9550.18	1371.64	9564.95	1371.21	9607.64	1372.35
9645.49	1373.38	9685.55	1373.3	9696.13	1373.28	9698.17	1373.28	9746.78	1373.19
9758.53	1373.16	9797.42	1373.07	9818.9	1373.01	9848.07	1372.91	9879.27	1372.8
9898.71	1372.73	9939.63	1372.57	9949.36	1372.53	10000	1372.37	10040.18	1372.36

```
10052.19 1372.3710080.36 1372.3910104.37 1372.4310120.54 1372.4610156.56 1372.53
10160.71 1372.5410174.63 1372.5610200.89  1372.610208.74 1372.6110241.07 1372.66
10260.92 1372.6910281.25 1372.7110313.11 1372.7410321.43 1372.7510349.27 1372.78
10361.61 1372.7910365.29 1372.7910401.78 1372.8310417.48 1372.8510441.96 1372.88
10469.66 1372.9210482.14 1372.9410521.85 1372.9910522.32 1372.99 10523.9 1372.99
 10562.5 1373.0410574.03 1373.0610602.68 1373.0910626.22 1373.1210642.85 1373.15
 10678.4  1373.210683.03  1373.210698.53 1373.2310723.21 1373.2710730.59 1373.28
10763.39 1373.3110782.77 1373.3310803.57 1373.3410834.96 1373.3710843.75 1373.38
10873.16  1373.410883.93  1373.410887.14  1373.4 10924.1 1373.4610939.33 1373.48
10964.28 1373.5210991.51 1373.5811004.46 1373.94 11043.7 1375.0411044.64 1375.04
 11047.8 1375.0511084.82 1375.1911095.88 1375.24   11125 1375.3811148.06 1375.51
11165.17 1375.6211200.25 1375.8511205.35 1375.8811222.43 1375.9911245.53 1376.15
11252.43  1376.211273.18 1376.32

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8727.21     .048  9818.9     .05410260.92     .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9818.910260.92               1225    1301    1225            .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1373.64  * Element                  *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.05  * Wt. n-Val.               *   0.048   *   0.054   *   0.048   *
* W.S. Elev (ft)          * 1373.59  * Reach Len. (ft)          * 1225.00   * 1301.00   * 1225.00   *
* Crit W.S. (ft)          * 1373.15  * Flow Area (sq ft)        *  386.99   *  448.10   *  340.93   *
* E.G. Slope (ft/ft)      *0.004575  * Area (sq ft)             *  386.99   *  448.10   *  340.93   *
* Q Total (cfs)           * 2020.00  * Flow (cfs)               *  748.94   *  841.65   *  429.41   *
* Top Width (ft)          * 1616.92  * Top Width (ft)           *  444.11   *  442.02   *  730.79   *
* Vel Total (ft/s)        *    1.72  * Avg. Vel. (ft/s)         *    1.94   *    1.88   *    1.26   *
* Max Chl Dpth (ft)       *    2.38  * Hydr. Depth (ft)         *    0.87   *    1.01   *    0.47   *
* Conv. Total (cfs)       * 29864.2  * Conv. (cfs)              * 11072.6   * 12443.2   *  6348.5   *
* Length Wtd. (ft)        * 1250.91  * Wetted Per. (ft)         *  444.26   *  442.02   *  730.79   *
* Min Ch El (ft)          * 1372.36  * Shear (lb/sq ft)         *    0.25   *    0.29   *    0.13   *
* Alpha                   *    1.08  * Stream Power (lb/ft s)   *    0.48   *    0.54   *    0.17   *
* Frctn Loss (ft)         *    5.72  * Cum Volume (acre-ft)     *  155.87   *  391.87   *  123.64   *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)           *  175.62   *  380.10   *  232.01   *
*****************************************************************************************
```

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 30.488

INPUT
Description:

```
Station Elevation Data     num=       92
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 9181.29 1368.47 9217.13 1368.42 9255.12 1368.35 9269.32 1368.33 9302.55 1368.25
 9321.51  1368.2 9329.61 1368.17  9373.7    1368  9404.1 1367.86 9425.89 1367.76
 9476.91 1367.58 9478.09 1367.58 9478.59 1367.57 9530.28 1367.37 9582.65 1366.66
 9598.97 1366.21  9616.4 1365.82 9636.16 1366.13 9667.18 1366.77 9686.85 1367.11
 9702.05 1367.13 9739.05 1367.18 9776.54 1367.26 9791.24 1367.28 9825.64 1367.33
 9843.43 1367.36 9851.03 1367.37 9895.62 1367.43 9925.52 1367.47 9947.81 1367.49
10000.01 1367.5410041.92 1367.6510051.22 1367.6810083.83 1367.7510102.44 1367.79
10125.75 1367.8110153.66 1367.8410167.66 1367.8210204.87 1367.7910209.57 1367.77
10230.76  1367.710251.49 1367.6310256.09 1367.61 10293.4 1367.4510307.31  1367.4
10335.32 1367.2710358.52 1367.1710377.23 1367.0910409.74 1366.9510419.14 1366.92
10460.96 1366.7910461.06 1366.7910461.51 1366.7910502.97 1366.7210512.17 1366.71
10544.88  1366.710563.39 1366.69 10586.8  1366.710614.61 1366.7110628.71 1366.71
10665.82 1366.7210670.63 1366.7210692.26 1366.7310712.54 1366.7310717.04 1366.74
10754.45 1366.7410768.26 1366.7410796.37 1366.7310819.47 1366.7210838.28 1366.72
10870.69 1366.7110880.19  1366.710921.91 1366.6710922.11 1366.6710923.01 1366.67
10964.02 1366.6410973.12 1366.6311005.94 1367.8911024.34 1368.5911047.85 1368.61
11075.56 1368.6411089.76 1368.6511126.77 1368.6811131.68 1368.6911153.76 1368.71
11173.59 1368.7411177.99 1368.7411215.51 1368.7911229.21 1368.8111257.42 1368.85
11280.43 1368.8911296.05 1368.92

Manning's n Values          num=        3
     Sta   n Val      Sta   n Val      Sta   n Val
```

```
*********************************************
 9181.29    .048 9530.28    .05410125.75    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9530.2810125.75             1200    1266    1200            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1367.91  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)         * 1367.86  * Reach Len. (ft)         * 1200.00  * 1266.00  * 1200.00  *
* Crit W.S. (ft)         * 1367.30  * Flow Area (sq ft)       *   31.37  *  380.50  *  758.62  *
* E.G. Slope (ft/ft)     *0.004571  * Area (sq ft)            *   31.37  *  380.50  *  758.62  *
* Q Total (cfs)          * 1990.00  * Flow (cfs)              *   25.97  *  525.17  * 1438.86  *
* Top Width (ft)         * 1600.97  * Top Width (ft)          *  126.10  *  595.47  *  879.40  *
* Vel Total (ft/s)       *    1.70  * Avg. Vel. (ft/s)        *    0.83  *    1.38  *    1.90  *
* Max Chl Dpth (ft)      *    2.04  * Hydr. Depth (ft)        *    0.25  *    0.64  *    0.86  *
* Conv. Total (cfs)      * 29432.7  * Conv. (cfs)             *   384.1  *  7767.4  * 21281.2  *
* Length Wtd. (ft)       * 1229.89  * Wetted Per. (ft)        *  126.10  *  595.50  *  879.42  *
* Min Ch El (ft)         * 1365.82  * Shear (lb/sq ft)        *    0.07  *    0.18  *    0.25  *
* Alpha                  *    1.08  * Stream Power (lb/ft s)   *    0.06  *    0.25  *    0.47  *
* Frctn Loss (ft)        *    5.64  * Cum Volume (acre-ft)     *  149.99  *  379.49  *  108.18  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *  167.60  *  364.61  *  209.37  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 30.248

INPUT
Description:
Station Elevation Data     num=     102
      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 9133.79  1362.6  9167.4 1362.58 9195.64 1362.55 9219.44 1362.53 9268.76 1362.44
 9271.48 1362.44 9278.19 1362.43 9323.52 1362.33 9341.89 1362.28 9375.55 1362.19
 9415.01 1362.08 9427.59 1362.05 9458.64 1361.96 9479.63  1361.9 9488.13 1361.88
 9531.67 1361.75 9561.26 1361.66  9583.7  1361.6 9634.38 1361.44 9635.74 1361.43
 9639.09 1361.42 9687.78 1361.25 9707.51 1361.18 9739.82 1361.07 9780.63 1360.95
 9791.85 1360.92 9819.55 1360.85 9843.89  1360.8 9853.75  1360.8 9895.93 1360.77
 9926.88 1360.79 9947.97  1360.8   10000 1360.8510040.05 1360.9810052.28 1361.03
 10080.1 1361.1310104.56 1361.2110120.15 1361.2510156.84 1361.3810160.19 1361.39
10171.16 1361.4310200.24 1361.5310209.12 1361.5610240.29 1361.68 10261.4 1361.76
10280.34 1361.8310313.69 1361.9610320.39 1361.9810342.33 1362.0610360.43 1362.11
10365.97 1362.1310400.48 1362.1910418.25 1362.2310440.53 1362.2310470.53 1362.23
10480.58 1362.2110513.49 1362.1610520.63 1362.1510522.81 1362.1410560.67 1362.06
10575.09 1362.0210600.72 1361.9610627.37 1361.8910640.77 1361.8710679.65  1361.8
10680.82 1361.7910684.65 1361.7910720.87 1361.7510731.93 1361.7310760.91 1361.72
10784.21 1361.7110800.96 1361.7110836.49 1361.7210841.01 1361.7210855.81 1361.72
10881.06 1361.7210888.77 1361.7210921.11 1361.7210941.05 1361.7210961.15 1361.71
10993.33 1361.71 11001.2  1361.711026.97 1361.6911041.25 1361.6911045.61 1361.69
 11081.3 1361.6611097.89 1361.6511121.35 1361.6411150.17 1361.6211161.39 1361.61
11198.13  1361.611201.44 1361.5911202.45 1361.5911203.85 1361.6111204.35 1361.61
11262.37 1362.1211279.62 1362.1611325.39 1362.48 11354.9 1362.5411391.32 1362.74
11430.17 1362.8111458.69 1362.94

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9133.79    .048 9687.78    .05410156.84    .048

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9687.7810156.84             1150    1217    1150            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1362.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)         * 1362.22  * Reach Len. (ft)         * 1150.00  * 1217.00  * 1150.00  *
* Crit W.S. (ft)         * 1361.84  * Flow Area (sq ft)       *  150.35  *  586.13  *  441.35  *
* E.G. Slope (ft/ft)     *0.004595  * Area (sq ft)            *  150.35  *  586.13  *  441.35  *
* Q Total (cfs)          * 1970.00  * Flow (cfs)              *  188.92  * 1268.38  *  512.71  *
* Top Width (ft)         * 1866.22  * Top Width (ft)          *  324.50  *  469.06  * 1072.66  *
```

* Vel Total (ft/s)	*	1.67	* Avg. Vel. (ft/s)	*	1.26	*	2.16	*	1.16	*
* Max Chl Dpth (ft)	*	1.45	* Hydr. Depth (ft)	*	0.46	*	1.25	*	0.41	*
* Conv. Total (cfs)	*	29062.1	* Conv. (cfs)	*	2786.9	*	18711.5	*	7563.6	*
* Length Wtd. (ft)	*	1190.05	* Wetted Per. (ft)	*	324.50	*	469.06	*	1072.67	*
* Min Ch El (ft)	*	1360.77	* Shear (lb/sq ft)	*	0.13	*	0.36	*	0.12	*
* Alpha	*	1.26	* Stream Power (lb/ft s)	*	0.17	*	0.78	*	0.14	*
* Frctn Loss (ft)	*	6.07	* Cum Volume (acre-ft)	*	147.48	*	365.45	*	91.65	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	161.40	*	349.14	*	182.48	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 30.018

INPUT
Description:
Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8799.49	1357.42	8822.56	1357.39	8841.87	1357.36	8881.18	1357.31	8894.51	1357.29
8901.05	1357.28	8947.15	1357.21	8979.55	1357.16	8999.79	1357.12	9041.01	1357.04
9052.44	1357.02	9058.04	1357	9105.08	1356.89	9136.54	1356.77	9157.72	1356.7
9200.84	1356.54	9210.36	1356.5	9215.04	1356.48	9263	1356.31	9293.53	1356.2
9315.65	1356.12	9360.67	1355.99	9368.29	1355.96	9372.03	1355.95	9420.93	1355.82
9450.52	1355.75	9473.57	1355.7	9520.51	1355.6	9524.8	1355.59	9526.22	1355.59
9529.02	1355.58	9578.86	1355.49	9607.52	1355.45	9631.5	1355.42	9680.34	1355.38
9684.14	1355.37	9686.01	1355.37	9736.78	1355.32	9764.51	1355.26	9789.43	1355.22
9840.17	1355.09	9842.07	1355.09	9843	1355.08	9894.71	1354.95	9921.5	1354.89
9947.35	1354.83	10000	1354.74	10038.78	1354.88	10053.45	1354.94	10077.57	1355.02
10106.91	1355.16	10116.35	1355.19	10141.32	1355.28	10155.14	1355.34	10160.37	1355.36
10193.93	1355.46	10213.83	1355.52	10232.71	1355.56	10267.28	1355.63	10271.5	1355.63
10282.64	1355.64	10310.28	1355.66	10320.74	1355.66	10349.07	1355.66	10374.2	1355.64
10387.86	1355.64	10423.96	1355.62	10426.64	1355.62	10427.66	1355.62	10465.43	1355.62
10481.11	1355.61	10504.21	1355.62	10534.57	1355.64	10543	1355.64	10565.28	1355.65
10581.79	1355.66	10588.03	1355.67	10620.57	1355.69	10641.49	1355.71	10659.36	1355.71
10694.94	1355.71	10698.14	1355.71	10706.6	1355.72	10736.93	1355.72	10748.4	1355.73
10775.72	1355.75	10801.86	1355.77	10814.5	1355.78	10847.92	1355.81	10853.29	1355.8
10855.32	1355.81	10892.07	1355.83	10908.78	1355.85	10930.86	1355.86	10962.23	1355.89
10969.65	1355.89	10989.25	1355.91	11008.43	1355.91	11015.69	1355.92	11030.91	1355.93
11031.78	1355.93	11112.4	1355.96	11117.76	1355.96	11121.72	1355.97	11200.96	1356.03
11213.7	1356.05	11289.73	1356.14	11358.48	1356.26	11375.71	1356.31	11440.96	1356.43
11461.69	1356.48	11472.84	1356.5						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8799.49	.048	9736.78	.05	10160.37	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9736.78	10160.37	1200	1256	1200	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1356.21	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.06	* Wt. n-Val.	*	0.048	*	0.054	*	0.048	*
* W.S. Elev (ft)	*	1356.16	* Reach Len. (ft)	*	1200.00	*	1256.00	*	1200.00	*
* Crit W.S. (ft)	*		* Flow Area (sq ft)	*	220.87	*	477.57	*	439.58	*
* E.G. Slope (ft/ft)	*	0.005704	* Area (sq ft)	*	220.87	*	477.57	*	439.58	*
* Q Total (cfs)	*	1950.00	* Flow (cfs)	*	330.36	*	1075.08	*	544.56	*
* Top Width (ft)	*	1994.86	* Top Width (ft)	*	431.63	*	423.59	*	1139.64	*
* Vel Total (ft/s)	*	1.71	* Avg. Vel. (ft/s)	*	1.50	*	2.25	*	1.24	*
* Max Chl Dpth (ft)	*	1.42	* Hydr. Depth (ft)	*	0.51	*	1.13	*	0.39	*
* Conv. Total (cfs)	*	25820.3	* Conv. (cfs)	*	4374.4	*	14235.4	*	7210.6	*
* Length Wtd. (ft)	*	1233.84	* Wetted Per. (ft)	*	431.63	*	423.59	*	1139.64	*
* Min Ch El (ft)	*	1354.74	* Shear (lb/sq ft)	*	0.18	*	0.40	*	0.14	*
* Alpha	*	1.23	* Stream Power (lb/ft s)	*	0.27	*	0.90	*	0.17	*
* Frctn Loss (ft)	*	6.86	* Cum Volume (acre-ft)	*	142.58	*	350.59	*	80.02	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	151.41	*	336.67	*	153.28	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 29.780

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9387.96	1349.94	9393.69	1349.94	9408.78	1349.92	9444.22	1349.87	9467.9	1349.79
9494.75	1349.68	9527.03	1349.5	9545.27	1349.4	9586.15	1349.14	9595.8	1349.07
9645.27	1348.78	9646.32	1348.77	9652.51	1348.74	9696.85	1348.53	9704.39	1348.49
9747.38	1348.33	9763.52	1348.29	9797.9	1348.21	9822.64	1348.16	9848.43	1348.12
9881.76	1348.07	9898.95	1348.05	9940.88	1347.99	9949.48	1347.98	10000	1347.92
10038.07	1347.95	10054.42	1347.96	10076.14	1347.98	10108.83		134810114.21	1348.01
10126.72	1348.02	10152.27	1348.04	10163.25	1348.05	10190.34	1348.07	10217.67	1348.11
10228.41	1348.12	10253.43	1348.16	10266.48	1348.19	10272.08		1348.210304.55	1348.27
10326.5	1348.33	10342.61	1348.38	10380.14	1348.48	10380.68	1348.48	10380.91	1348.48
10418.75		1348.610435.33	1348.66	10456.82	1348.73	10489.74	1348.84	10494.88	1348.86
10506.86		1348.910532.95		134910544.16	1349.04	10571.02	1349.14	10598.57	1349.22
10609.09	1349.25	10633.57	1349.31	0647.16	1349.33	10652.99	1349.34	10685.22	1349.36
10707.4	1349.36	10723.29	1349.37	10760.28	1349.35	10761.36	1349.35	10761.82	1349.35
10799.43	1349.34	10816.24	1349.34	10837.49	1349.34	10870.65	1349.34	10875.56	1349.34
10887	1349.35	10913.63	1349.36	10925.07	1349.37	10939.75	1349.41	10943.33	1349.42

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9387.96	.048	9797.9	.05	10228.41	.048

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9797.91	10228.41	1325	1400	1325	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1349.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1349.28	Reach Len. (ft)	1325.00	1400.00	1325.00
Crit W.S. (ft)	1348.78	Flow Area (sq ft)	147.25	537.52	246.28
E.G. Slope (ft/ft)	0.005426	Area (sq ft)	147.25	537.52	246.28
Q Total (cfs)	1920.00	Flow (cfs)	246.83	1263.28	409.89
Top Width (ft)	1059.09	Top Width (ft)	233.63	430.51	394.95
Vel Total (ft/s)	2.06	Avg. Vel. (ft/s)	1.68	2.35	1.66
Max Chl Dpth (ft)	1.36	Hydr. Depth (ft)	0.63	1.25	0.62
Conv. Total (cfs)	26066.1	Conv. (cfs)	3351.0	17150.4	5564.7
Length Wtd. (ft)	1374.28	Wetted Per. (ft)	233.63	430.51	394.95
Min Ch El (ft)	1347.92	Shear (lb/sq ft)	0.21	0.42	0.21
Alpha	1.08	Stream Power (lb/ft s)	0.36	0.99	0.35
Frctn Loss (ft)	6.17	Cum Volume (acre-ft)	137.51	335.95	70.58
C & E Loss (ft)	0.01	Cum SA (acres)	142.25	324.35	132.14

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 29.515

INPUT
Description:
Station Elevation Data num= 96

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8679.34	1344.29	8717.54	1344.2	8732.17	1344.17	8760.45	1344.09	8785	1344.03
8797.69	1344	8837.82	1343.9	8877.85	1343.8	8890.65	1343.77	8915.39	1343.72
8943.47	1343.67	8958	1343.66	8996.3	1343.62	9038.15	1343.61	9049.13	1343.6
9070.33	1343.6	9101.95	1343.59	9118.31	1343.58	9154.78	1343.57	9198.46	1343.54
9207.6	1343.53	9225.28	1343.52	9260.43	1343.49	9278.62	1343.47	9313.26	1343.44
9358.77	1343.34	9366.08	1343.32	9380.22	1343.28	9418.91	1343.15	9438.92	1343.06
9471.73	1342.93	9519.08	1342.69	9524.56	1342.66	9535.17	1342.61	9577.39	1342.39
9599.23	1342.29	9630.21	1342.15	9679.38	1341.96	9683.04	1341.95	9690.11	1341.93

```
 9735.87 1341.81 9759.54 1341.78 9788.69 1341.73 9839.69  1341.7 9841.52  1341.7
 9845.05 1341.69 9894.34 1341.71 9919.84 1341.72 9947.17 1341.73   10000 1341.81
10040.35 1341.9510052.05 1341.9810073.32 1342.0310104.11 1342.1210121.07 1342.16
10156.17 1342.1810161.42 1342.1910179.53 1342.1910201.78 1342.2210208.23 1342.22
10242.14 1342.2610260.29 1342.26 10282.5 1342.2910312.35  1342.310322.85 1342.31
10359.07 1342.3210363.21 1342.3210364.41 1342.3310403.57 1342.3910416.47  1342.4
10443.93 1342.4410468.53 1342.4810484.28 1342.5110520.59 1342.5510524.64 1342.56
10538.61 1342.59   10565 1342.6610572.65 1342.6710605.36 1342.7610624.71 1342.81
10645.71 1342.8810676.77 1342.9710686.07 1343.0110718.15 1343.1310726.43 1343.16
10728.83 1343.1710766.78 1343.3110780.89 1343.3510807.14 1343.4210832.95 1343.47
 10847.5 1343.4710885.01  1343.510887.86  1343.510897.68  1343.510928.21 1343.49
10937.07 1343.49

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8679.34     .048 9630.21     .05410121.07     .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9630.2110121.07               1200    1278    1200              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1343.17  * Element                    *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.                 *   0.048  *   0.054  *   0.048  *
* W.S. Elev (ft)          * 1343.12  * Reach Len. (ft)            * 1200.00  * 1278.00  * 1200.00  *
* Crit W.S. (ft)          * 1342.60  * Flow Area (sq ft)          *   98.25  *  624.89  *  379.91  *
* E.G. Slope (ft/ft)      *0.003770  * Area (sq ft)               *   98.25  *  624.89  *  379.91  *
* Q Total (cfs)           * 1890.00  * Flow (cfs)                 *  114.35  * 1240.15  *  535.49  *
* Top Width (ft)          * 1290.84  * Top Width (ft)             *  205.06  *  490.86  *  594.93  *
* Vel Total (ft/s)        *    1.71  * Avg. Vel. (ft/s)           *    1.16  *    1.98  *    1.41  *
* Max Chl Dpth (ft)       *    1.43  * Hydr. Depth (ft)           *    0.48  *    1.27  *    0.64  *
* Conv. Total (cfs)       * 30781.5  * Conv. (cfs)                *  1862.4  * 20197.8  *  8721.3  *
* Length Wtd. (ft)        * 1247.13  * Wetted Per. (ft)           *  205.06  *  490.86  *  594.93  *
* Min Ch El (ft)          * 1341.69  * Shear (lb/sq ft)           *    0.11  *    0.30  *    0.15  *
* Alpha                   *    1.10  * Stream Power (lb/ft s)     *    0.13  *    0.59  *    0.21  *
* Frctn Loss (ft)         *    6.08  * Cum Volume (acre-ft)       *  133.78  *  317.27  *   61.05  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)             *  135.58  *  309.55  *  117.09  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 29.273

INPUT
Description:
Station Elevation Data     num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9044.31 1338.53 9069.89 1338.52 9076.89 1338.52 9100.58 1338.48 9128.18 1338.44
 9136.33 1338.42 9179.46  1338.3 9202.77  1338.2 9230.74 1338.09  9269.2 1337.89
 9282.03 1337.83 9325.43  1337.6 9333.31 1337.56 9335.64 1337.54  9384.6  1337.3
 9402.08 1337.22 9435.88 1337.07 9468.51 1336.94 9487.16 1336.86 9503.83  1336.5
 9532.32 1336.13 9551.23 1336.29 9577.61 1336.52 9589.73 1336.55 9601.39 1336.53
 9641.02 1336.45 9667.82 1336.41  9692.3 1336.38 9734.26 1336.33 9743.58 1336.33
 9775.15 1336.29 9794.87 1336.27  9800.7 1336.27 9846.15 1336.22 9867.13 1336.21
 9897.44 1336.19 9933.57 1336.18 9948.72 1336.18   10000  1336.210043.25 1336.31
10050.75 1336.3310086.51 1336.4210101.49 1336.4610129.76 1336.5310152.24 1336.58
10173.01 1336.6410202.98 1336.7110216.26 1336.7410253.73 1336.8210259.51 1336.84
10292.85 1336.9210302.76 1336.9410304.47 1336.9510346.01 1337.0510355.22 1337.07
10389.26 1337.1710405.97 1337.2110432.51  1337.310456.71 1337.3910475.76 1337.46
10507.46 1337.5910519.01 1337.63 10558.2 1337.8110562.26 1337.8210585.69 1337.92
10605.51 1337.9910608.95 1338.0110648.76 1338.1610659.69  1338.210673.44 1338.24

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9044.31     .048 9794.87     .05410086.51     .048

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9794.8710086.51               1200    1259    1200              .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1337.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.048	0.054	0.048
W.S. Elev (ft)	1337.03	Reach Len. (ft)	1200.00	1259.00	1200.00
Crit W.S. (ft)	1336.76	Flow Area (sq ft)	199.01	231.34	76.24
E.G. Slope (ft/ft)	0.008819	Area (sq ft)	199.01	231.34	76.24
Q Total (cfs)	1010.00	Flow (cfs)	397.72	512.26	100.02
Top Width (ft)	892.29	Top Width (ft)	349.16	291.64	251.50
Vel Total (ft/s)	1.99	Avg. Vel. (ft/s)	2.00	2.21	1.31
Max Chl Dpth (ft)	0.90	Hydr. Depth (ft)	0.57	0.79	0.30
Conv. Total (cfs)	10754.9	Conv. (cfs)	4235.1	5454.8	1065.0
Length Wtd. (ft)	1240.06	Wetted Per. (ft)	349.16	291.64	251.50
Min Ch El (ft)	1336.18	Shear (lb/sq ft)	0.31	0.44	0.17
Alpha	1.06	Stream Power (lb/ft s)	0.63	0.97	0.22
Frctn Loss (ft)	6.32	Cum Volume (acre-ft)	129.68	304.71	54.77
C & E Loss (ft)	0.00	Cum SA (acres)	127.95	298.07	105.43

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 29.034

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9371.7	1331.38	9394.68	1331.47	9417.83	1331.52	9445.12	1331.59	9476.04	1331.59
9495.56	1331.61	9534.26	1331.55	9546.01	1331.53	9592.48	1331.36	9596.45	1331.35
9622.23	1331.21	9646.9	1331.07	9650.7	1331.05	9697.34	1330.76	9708.91	1330.69
9747.78	1330.45	9767.13	1330.35	9798.23	1330.18	9825.35	1330.07	9848.67	1329.99
9883.57	1329.9	9899.11	1329.86	9941.78	1329.8	9949.56	1329.79	10000	1329.72
10050.18	1329.68	10054.86	1329.68	10100.36	1329.66	10109.71	1329.65	10150.55	1329.64
10164.57	1329.65	10200.73	1329.68	10219.43	1329.71	10250.91	1329.76	10274.29	1329.82
10301.09	1329.89	10329.14	1329.99	10351.27	1330.07	10384	1330.21	10401.45	1330.27
10438.85	1330.42	10451.63	1330.47	10493.71	1330.62	10501.81	1330.65	10548.57	1330.81
10552	1330.82	10588.78	1330.93	10602.18	1330.97	10603.43	1330.98	10652.36	1331.12
10658.28	1331.14	10661.44	1331.15						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9371.7	.041	9848.67	.041	10301.09	.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9848.67 10301.09 1300 1356 1300 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1330.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1330.71	Reach Len. (ft)	1300.00	1356.00	1300.00
Crit W.S. (ft)	1330.30	Flow Area (sq ft)	57.51	436.90	89.58
E.G. Slope (ft/ft)	0.003385	Area (sq ft)	57.51	436.90	89.58
Q Total (cfs)	1070.00	Flow (cfs)	65.88	900.09	104.03
Top Width (ft)	815.22	Top Width (ft)	143.61	452.42	219.20
Vel Total (ft/s)	1.83	Avg. Vel. (ft/s)	1.15	2.06	1.16
Max Chl Dpth (ft)	1.07	Hydr. Depth (ft)	0.40	0.97	0.41
Conv. Total (cfs)	18390.1	Conv. (cfs)	1132.2	15469.8	1788.0
Length Wtd. (ft)	1349.48	Wetted Per. (ft)	143.61	452.42	219.20
Min Ch El (ft)	1329.64	Shear (lb/sq ft)	0.08	0.20	0.09
Alpha	1.13	Stream Power (lb/ft s)	0.10	0.42	0.10
Frctn Loss (ft)	5.11	Cum Volume (acre-ft)	126.15	295.05	52.49
C & E Loss (ft)	0.00	Cum SA (acres)	121.16	287.32	98.95

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 28.777

INPUT
Description: Approximately at crossing of Gas Line Road.
Station Elevation Data num= 72

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9295.09	1325.75	9335.92	1325.68	9354.01	1325.65	9387.01	1325.58	9418.61	1325.52
9438.09	1325.49	9483.21	1325.43	9489.17	1325.42	9511.73	1325.4	9540.26	1325.38
9547.8	1325.38	9591.34	1325.35	9612.4	1325.35	9642.42	1325.33	9677	1325.31
9693.5	1325.3	9741.6	1325.28	9744.59	1325.28	9755.86	1325.28	9795.67	1325.27
9806.2	1325.26	9846.75	1325.24	9870.8	1325.24	9897.84	1325.23	9935.4	1325.21
9948.92	1325.2	10000	1325.17	10043.59	1325.18	10050.65	1325.18	10087.18	1325.12
10101.31	1325.11	10130.77	1324.98	10151.96	1324.91	10174.36	1324.79	10202.61	1324.66
10217.95	1324.58	10253.26	1324.41	10261.54	1324.39	10303.91	1324.26	10305.13	1324.27
10312.6	1324.27	10348.71	1324.28	10354.57	1324.28	10392.3	1324.43	10405.22	1324.46
10435.89	1324.64	10455.87	1324.73	10479.48	1324.86	10506.52	1325.01	10523.07	1325.1
10557.17	1325.28	10566.66	1325.32	10607.83	1325.49	10610.25	1325.5	10625.2	1325.55
10653.84	1325.63	10658.48	1325.64	10697.43	1325.71	10709.13	1325.73	10741.02	1325.74
10759.78	1325.75	10784.61	1325.76	10810.44	1325.76	10846.25	1325.77	10861.09	1325.77
10871.78	1325.78	10911.74	1325.8	10915.37	1325.8	10937.8	1325.81	10958.96	1325.81
10962.39	1325.81	10963.98	1325.81						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9295.09	.041	9795.67	.041	10566.66	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9795.67	10566.66	1100	1168	1100	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1325.65	Element				
Vel Head (ft)	0.05	Wt. n-Val.		0.041	0.041	0.041
W.S. Elev (ft)	1325.60	Reach Len. (ft)		1100.00	1168.00	1100.00
Crit W.S. (ft)	1325.29	Flow Area (sq ft)		93.79	555.47	9.98
E.G. Slope (ft/ft)	0.004232	Area (sq ft)		93.79	555.47	9.98
Q Total (cfs)	1140.00	Flow (cfs)		81.53	1052.45	6.02
Top Width (ft)	1266.92	Top Width (ft)		418.89	770.99	77.04
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)		0.87	1.89	0.60
Max Chl Dpth (ft)	1.34	Hydr. Depth (ft)		0.22	0.72	0.13
Conv. Total (cfs)	17524.7	Conv. (cfs)		1253.3	16178.9	92.6
Length Wtd. (ft)	1159.60	Wetted Per. (ft)		418.89	770.99	77.04
Min Ch El (ft)	1324.26	Shear (lb/sq ft)		0.06	0.19	0.03
Alpha	1.13	Stream Power (lb/ft s)		0.05	0.36	0.02
Frctn Loss (ft)	4.46	Cum Volume (acre-ft)		123.89	279.61	51.00
C & E Loss (ft)	0.00	Cum SA (acres)		112.76	268.27	94.53

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 28.556

INPUT
Description:
Station Elevation Data num= 56

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9395.46	1321.36	9437.5	1321.19	9454.28	1321.14	9493.75	1321.03	9535.73	1320.91
9550	1320.87	9563.42	1320.84	9606.25	1320.74	9651.8	1320.65	9662.5	1320.63
9672.57	1320.61	9718.75	1320.53	9767.86	1320.45	9775	1320.44	9781.71	1320.44
9831.25	1320.36	9883.93	1320.27	9887.5	1320.27	9890.85	1320.26	9943.75	1320.17
10000	1320.09	10043.86	1320.16	10050.58	1320.17	10087.73	1320.22	10101.17	1320.24
10131.59	1320.29	10151.75	1320.32	10175.45	1320.37	10202.33	1320.42	10219.32	1320.45
10252.92	1320.51	10263.18	1320.53	10303.5	1320.59	10307.04	1320.61	10330.18	1320.62
10350.91	1320.64	10354.08	1320.65	10394.77	1320.66	10404.67	1320.66	10438.63	1320.66
10455.25	1320.65	10482.5	1320.67	10505.83	1320.65	10526.36	1320.69	10556.42	1320.7

```
10570.23 1320.73   10607 1320.7910614.09 1320.8110657.58 1321.0110657.95 1321.01
10660.37 1321.0310701.82 1321.3610708.17 1321.4110745.68 1321.6910758.75 1321.88
 10772.9 1321.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9395.46    .041  9651.8    .04110354.08    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9651.810354.08             1250    1328    1250             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1321.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.05  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1321.14  * Reach Len. (ft)         * 1250.00  * 1328.00  * 1250.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *   52.15  *  542.05  *  129.82  *
* E.G. Slope (ft/ft)     *0.003522  * Area (sq ft)            *   52.15  *  542.05  *  129.82  *
* Q Total (cfs)          * 1180.00  * Flow (cfs)              *   46.12  *  980.95  *  152.93  *
* Top Width (ft)         * 1220.36  * Top Width (ft)          *  197.85  *  702.28  *  320.23  *
* Vel Total (ft/s)       *    1.63  * Avg. Vel. (ft/s)        *    0.88  *    1.81  *    1.18  *
* Max Chl Dpth (ft)      *    1.05  * Hydr. Depth (ft)        *    0.26  *    0.77  *    0.41  *
* Conv. Total (cfs)      * 19884.1  * Conv. (cfs)             *   777.1  * 16529.9  *  2577.1  *
* Length Wtd. (ft)       * 1321.53  * Wetted Per. (ft)        *  197.85  *  702.28  *  320.23  *
* Min Ch El (ft)         * 1320.09  * Shear (lb/sq ft)        *    0.06  *    0.17  *    0.09  *
* Alpha                  *    1.10  * Stream Power (lb/ft s)   *    0.05  *    0.31  *    0.10  *
* Frctn Loss (ft)        *    7.24  * Cum Volume (acre-ft)     *  122.05  *  264.89  *   49.24  *
* C & E Loss (ft)        *    0.00  * Cum SA (acres)           *  104.98  *  248.52  *   89.51  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 28.305

INPUT
Description:
Station Elevation Data    num=      85
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8858.56 1317.55  8896.9 1317.42 8910.32 1317.37 8917.52 1317.32 8963.28 1317.01
 8998.89 1316.63 9016.24  1316.4 9048.58 1315.94  9069.2 1315.66 9080.27 1315.51
 9122.16 1315.05 9161.64 1314.73 9175.12 1314.63 9200.25 1314.55 9228.08 1314.45
 9243.01 1314.42 9281.04 1314.32 9324.39 1314.21    9334 1314.19 9351.92 1314.13
 9377.89 1314.05 9386.96 1314.02 9405.76 1313.95 9439.92 1313.83 9487.13 1313.65
 9492.88 1313.63  9503.6  1313.6 9545.84 1313.48 9568.51 1313.44  9598.8 1313.37
 9649.88 1313.28 9651.76 1313.28 9655.27 1313.27 9704.72 1313.21 9731.25 1313.18
 9757.68 1313.16 9806.95 1313.11 9810.65  1313.1 9812.63  1313.1 9863.61 1313.06
    9894 1313.04 9916.57 1313.03  9938.2 1313.67 9942.63 1313.82  9949.4 1314.04
 9960.65 1314.38   10000 1315.3610033.72 1314.1510071.23 1313.1110085.48 1313.13
10121.23 1313.1710135.84 1313.1910171.23 1313.23 10186.2 1313.2410221.24 1313.27
10236.56 1313.2810271.24  1313.310286.92 1313.3110321.24 1313.3410337.28 1313.35
10371.24 1313.3910387.65  1313.410421.24 1313.4410438.01 1313.4710471.24 1313.52
10488.37 1313.5410521.24 1313.5910538.73 1313.6210571.24 1313.6810589.09 1313.71
10621.25 1313.7710639.45 1313.8110671.25 1313.8910689.81 1313.9510721.25 1314.07
10740.17 1314.1810771.25 1314.3910790.53 1314.5510821.25  1314.810840.89 1314.99
10871.25 1315.2710891.25 1315.4610921.25 1315.7110941.61 1315.8610963.55 1315.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8858.56    .041 9048.58    .04110921.25    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9048.5810921.25             1425    1508    1425             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1313.95  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.07  * Wt. n-Val.              *          *   0.041  *          *
* W.S. Elev (ft)         * 1313.87  * Reach Len. (ft)         * 1425.00  * 1508.00  * 1425.00  *
```

* Crit W.S. (ft)	* 1313.68	* Flow Area (sq ft)	*	* 556.58	*	*
* E.G. Slope (ft/ft)	*0.009467	* Area (sq ft)	*	* 556.58	*	*
* Q Total (cfs)	* 1220.00	* Flow (cfs)	*	* 1220.00	*	*
* Top Width (ft)	* 1135.67	* Top Width (ft)	*	* 1135.67	*	*
* Vel Total (ft/s)	* 2.19	* Avg. Vel. (ft/s)	*	* 2.19	*	*
* Max Chl Dpth (ft)	* 0.84	* Hydr. Depth (ft)	*	* 0.49	*	*
* Conv. Total (cfs)	* 12538.8	* Conv. (cfs)	*	* 12538.8	*	*
* Length Wtd. (ft)	* 1508.00	* Wetted Per. (ft)	*	* 1135.69	*	*
* Min Ch El (ft)	* 1313.03	* Shear (lb/sq ft)	*	* 0.29	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.63	*	*
* Frctn Loss (ft)	* 4.45	* Cum Volume (acre-ft)	* 121.30	* 248.15	* 47.37	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 102.14	* 220.50	* 84.92	*

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 28.019

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9267.76	1311.56	9269.92	1311.56	9302.35	1311.51	9324.11	1311.46	9352.49	1311.4
9378.3	1311.31	9402.62	1311.24	9432.49	1311.12	9452.76	1311.05	9486.67	1310.9
9502.9	1310.84	9540.86	1310.66	9553.04	1310.6	9595.05	1310.42	9603.18	1310.39
9649.24	1310.19	9653.32	1310.17	9703.42	1309.96	9703.46	1309.96	9703.91	1309.96
9753.6	1309.69	9757.61	1309.66	9803.74	1309.33	9811.8	1309.25	9853.88	1308.9
9865.99	1308.79	9904.02	1308.48	9936.76	1308.35	9962.3	1308.71	9964.71	1308.75
9969.26	1308.81	10000.01	1309.26	10010.48	1309.05	10054.78	1308.11	10067.86	1308.09
10105.23	1308.03	10112.31	1308.03	10155.69	1307.98	10156.75	1307.98	10164.58	1307.98
10201.19	1307.97	10206.15	1307.97	10245.64	1307.99	10256.6	1308	10290.08	1308.03
10307.06	1308.05	10334.52	1308.08	10357.51	1308.11	10378.97	1308.14	10407.97	1308.17
10423.41	1308.21	10458.42	1308.27	10467.86	1308.29	10508.88	1308.39	10512.3	1308.4
10537.59	1308.46	10556.74	1308.51	10559.33	1308.52	10601.19	1308.65	10609.79	1308.68
10645.63	1308.78	10660.24	1308.83	10690.07	1308.92	10710.7	1308.98	10734.52	1309.06
10761.15	1309.14	10778.96	1309.19	10811.61	1309.28	10823.4	1309.31	10862.06	1309.41
10867.85	1309.42	10910.61	1309.53	10912.29	1309.53	10912.52	1309.53	10956.74	1309.61
10962.98	1309.63	11001.18	1309.69	11013.43	1309.71	11045.62	1309.75	11063.89	1309.77
11090.07	1309.81	11114.34	1309.83	11134.51	1309.85	11164.8	1309.89	11178.95	1309.9
11215.25	1309.94	11223.4	1309.95	11238.54	1309.96				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9267.76	.041	9753.6	.041	10910.61	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9753.6	10910.61	1150	1218	1150	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1309.48	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.03	* Wt. n-Val.	*	* 0.041	*	*
* W.S. Elev (ft)	* 1309.45	* Reach Len. (ft)	* 1150.00	* 1218.00	* 1150.00	*
* Crit W.S. (ft)	* 1308.70	* Flow Area (sq ft)	*	* 985.35	*	*
* E.G. Slope (ft/ft)	*0.001453	* Area (sq ft)	*	* 985.35	*	*
* Q Total (cfs)	* 1270.00	* Flow (cfs)	*	* 1270.00	*	*
* Top Width (ft)	* 1093.54	* Top Width (ft)	*	* 1093.54	*	*
* Vel Total (ft/s)	* 1.29	* Avg. Vel. (ft/s)	*	* 1.29	*	*
* Max Chl Dpth (ft)	* 1.48	* Hydr. Depth (ft)	*	* 0.90	*	*
* Conv. Total (cfs)	* 33314.2	* Conv. (cfs)	*	* 33314.2	*	*
* Length Wtd. (ft)	* 1218.00	* Wetted Per. (ft)	*	* 1093.56	*	*
* Min Ch El (ft)	* 1307.97	* Shear (lb/sq ft)	*	* 0.08	*	*
* Alpha	* 1.00	* Stream Power (lb/ft s)	*	* 0.11	*	*
* Frctn Loss (ft)	* 4.95	* Cum Volume (acre-ft)	* 121.30	* 221.46	* 47.37	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 102.14	* 181.92	* 84.92	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 27.788

INPUT
Description:
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9079.3	1305.48	9088.51	1305.46	9095.42	1305.45	9139.15	1305.36	9155.72	1305.34
9189.79	1305.28	9216.03	1305.25	9240.43	1305.22	9276.33	1305.19	9291.06	1305.18
9336.64	1305.13	9341.7	1305.12	9368.22	1305.07	9392.34	1305.03	9403.25	1305.11
9409.03	1305.15	9442.95	1305.37	9448.89	1305.41	9449.01	1305.41	9474.47	1305.07
9476.98	1305.04	9519.93	1304.57	9544.26	1304.45	9577.86	1304.27	9594.89	1304.18
9638.17	1303.99	9645.53	1303.96	9684.11	1303.85	9696.17	1303.81	9698.47	1303.81
9746.81	1303.74	9758.78	1303.74	9797.45	1303.73	9819.08	1303.72	9848.09	1303.72
9879.39	1303.71	9898.72	1303.7	9939.7	1303.69	9949.36	1303.68	10000	1303.66
10041.6	1303.71	10051.36	1303.72	10083.21	1303.76	10102.71	1303.78	10124.81	1303.81
10154.07	1303.86	10166.41	1303.88	10205.42	1303.95	10208.02	1303.95	10219.09	1303.97
10249.62	1304.03	10256.78	1304.04	10291.22	1304.09	10308.13	1304.11	10332.83	1304.15
10359.49	1304.19	10374.43	1304.22	10410.84	1304.29	10416.03	1304.3	10438.18	1304.35
10457.64	1304.4	10462.2	1304.41	10499.24	1304.5	10513.55	1304.54	10540.84	1304.63
10564.91	1304.72	10582.45	1304.79	10616.26	1304.94	10624.05	1304.97	10657.28	1305.14
10665.65	1305.18	10667.62	1305.19	10707.26	1305.39	10718.97	1305.46	10748.86	1305.62
10770.33	1305.74	10790.46	1305.84	10821.68	1306.01	10832.07	1306.06	10873.04	1306.26
10873.67	1306.26	10876.37	1306.27	10915.27	1306.43	10924.39	1306.46	10956.88	1306.58
10975.75	1306.64	10998.48	1306.7	11027.1	1306.76	11040.08	1306.78	11078.46	1306.81
11081.69	1306.82	11095.46	1306.81	11123.29	1306.79	11126.98	1306.79		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9079.3	.041	9442.95	.041	10718.97	.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9442.9 10718.97 1100 1155 1100 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1304.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.		0.041	
W.S. Elev (ft)	1304.30	Reach Len. (ft)	1100.00	1155.00	1100.00
Crit W.S. (ft)	1304.30	Flow Area (sq ft)		353.39	
E.G. Slope (ft/ft)	0.033390	Area (sq ft)		353.39	
Q Total (cfs)	1310.00	Flow (cfs)		1310.00	
Top Width (ft)	843.85	Top Width (ft)		843.85	
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)		3.71	
Max Chl Dpth (ft)	0.64	Hydr. Depth (ft)		0.42	
Conv. Total (cfs)	7169.0	Conv. (cfs)		7169.0	
Length Wtd. (ft)	1140.08	Wetted Per. (ft)		843.86	
Min Ch El (ft)	1303.66	Shear (lb/sq ft)		0.87	
Alpha	1.00	Stream Power (lb/ft s)		3.24	
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	121.30	202.74	47.37
C & E Loss (ft)	0.06	Cum SA (acres)	102.14	154.83	84.92

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Waterman Wash

REACH: REACH 1 RS: 27.570

INPUT
Description:
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8889.51	1302.35	8894.7	1302.35	8901.94	1302.33	8910.65	1302.31	8956.84	1302.2
8995.19	1302.07	9011.74	1302.01	9031.69	1301.92	9066.65	1301.74	9095.67	1301.58
9121.55	1301.43	9152.73	1301.24	9176.45	1300.97	9196.15	1300.76	9231.36	1300.39
9273.77	1299.99	9286.26	1299.88	9296.63	1299.77	9351.27	1299.45	9394.81	1299.35
9396.07	1299.35	9397.11	1299.36	9447.24	1299.93	9495.4	1299.96	9510.67	1300.1
9548.67	1299.95	9595.12	1299.94	9624.99	1300.06	9670.04	1300.12	9694.29	1299.95
9734.43	1300.04	9775.2	1300.13	9799.04	1300.16	9835.29	1300.05	9878.97	1299.92
9890.2	1299.88	9899.52	1299.86	9945.1	1299.71	10000	1299.55	10041.64	1299.57
10051.34	1299.57	10083.28	1299.61	10102.68	1299.61	10124.91	1299.65	10154.02	1299.68
10166.55	1299.71	10205.36	1299.78	10208.19	1299.78	10220.3	1299.81	10249.82	1299.87
10256.7	1299.89	10291.46	1299.96	10308.04	1299.99	10333.1	1300.04	10359.38	1300.09
10374.73	1300.12	10410.72	1300.17	10416.37	1300.18	10440.59	1300.21	10458.01	1300.24
10462.06	1300.24	10499.64	1300.29	10513.4	1300.31	10541.28	1300.34	10564.74	1300.38
10582.91	1300.4	10616.08	1300.46	10660.89	1300.55	10666.19	1300.56	10667.42	1300.56
10707.82	1300.65	10718.76	1300.68	10757.42	1301.06	10773.03	1301.09	10783.13	1301.13
10793.3	1301.04	10872.17	1301.03	10876.62	1301.03	10941.44	1300.88	10968.73	1300.97
10999.28	1301.25	11026.8	1301.29	11040.92	1301.31	11078.14	1301.36	11082.55	1301.36
11101.47	1301.4	11124.19	1301.44	11129.48	1301.44	11165.82	1301.52	11180.82	1301.55
11207.46	1301.62	11232.16	1301.7	11249.1	1301.76	11283.5	1301.88	11290.73	1301.9
11321.77	1302	11332.37	1302.03	11334.84	1302.04				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8889.51	.041	9799.04	.041	10410.72	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9799.04	10410.72	600	611	600	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1301.65	Element			
Vel Head (ft)	0.00	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1301.64	Reach Len. (ft)	600.00	611.00	600.00
Crit W.S. (ft)	1300.20	Flow Area (sq ft)	1066.05	1112.97	614.39
E.G. Slope (ft/ft)	0.000109	Area (sq ft)	1066.05	1112.97	614.39
Q Total (cfs)	1350.00	Flow (cfs)	527.08	628.40	194.52
Top Width (ft)	2130.78	Top Width (ft)	714.97	611.68	804.13
Vel Total (ft/s)	0.48	Avg. Vel. (ft/s)	0.49	0.56	0.32
Max Chl Dpth (ft)	2.29	Hydr. Depth (ft)	1.49	1.82	0.76
Conv. Total (cfs)	129151.0	Conv. (cfs)	50424.4	60117.4	18609.2
Length Wtd. (ft)	611.00	Wetted Per. (ft)	714.98	611.68	804.14
Min Ch El (ft)	1299.55	Shear (lb/sq ft)	0.01	0.01	0.01
Alpha	1.11	Stream Power (lb/ft s)	0.01	0.01	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	107.84	183.30	39.62
C & E Loss (ft)		Cum SA (acres)	93.11	135.54	74.76

CULVERT

RIVER: Waterman Wash
REACH: REACH 1 RS: 27.530

INPUT
Description: 2 - 4' x 2.5' Box
Distance from Upstream XS = 200
Deck/Roadway Width = 25
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 4

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9000	1301.55		10000	1301.59		10692.68	1300.8	
10692.69	1302							

Upstream Bridge Cross Section Data
Station Elevation Data num= 98

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8889.51	1302.35	8894.7	1302.35	8901.94	1302.33	8910.65	1302.31	8956.84	1302.2
8995.19	1302.07	9011.74	1302.01	9031.69	1301.92	9066.65	1301.74	9095.67	1301.58

```
 9121.55 1301.43 9152.73 1301.24 9176.45 1300.97 9196.15 1300.76 9231.36 1300.39
 9273.77 1299.99 9286.26 1299.88 9296.63 1299.77 9351.27 1299.45 9394.81 1299.35
 9396.07 1299.35 9397.11 1299.36 9447.24 1299.93  9495.4 1299.96 9510.67  1300.1
 9548.67 1299.95 9595.12 1299.94 9624.99 1300.06 9670.04 1300.12 9694.29 1299.95
 9734.43 1300.04  9775.2 1300.13 9799.04 1300.16 9835.29 1300.05 9878.97 1299.92
  9890.2 1299.88 9899.52 1299.86  9945.1 1299.71   10000 1299.5510041.64 1299.57
10051.34 1299.5710083.28  1299.610102.68 1299.6110124.91 1299.6510154.02 1299.68
10166.55  1299.710205.36 1299.7810208.19 1299.78 10220.3 1299.8110249.82 1299.87
 10256.7 1299.8910291.46 1299.9610308.04 1299.99 10333.1 1300.0410359.38 1300.09
10374.73 1300.1210410.72 1300.1710416.37 1300.1810440.59 1300.2110458.01 1300.24
10462.06 1300.2410499.64 1300.29 10513.4 1300.3110541.28 1300.3410564.74 1300.38
10582.91  1300.410616.08 1300.4610660.89 1300.5510666.19 1300.5610667.42 1300.56
10707.82 1300.6510718.76 1300.6810757.42 1301.0610773.03 1301.0910783.13 1301.13
 10793.3 1301.0410872.17 1301.0310876.62 1301.0310941.44 1300.8810968.73 1300.97
10999.28 1301.25 11026.8 1301.2911040.92 1301.3111078.14 1301.3611082.55 1301.36
11101.47  1301.411124.19 1301.4411129.48 1301.4411165.82 1301.5211180.82 1301.55
11207.46 1301.6211232.16  1301.7 11249.1 1301.76 11283.5 1301.8811290.73  1301.9
11321.77    130211332.37 1302.0311334.84 1302.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8889.51    .041 9799.04    .04110410.72    .041

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9799.0410410.72              .1       .3

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
*****************************************************************************
    9000 1301.55            10000 1301.59        10904.61  1300.4
10904.62 1301.55

Downstream Bridge Cross Section Data
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9141.87 1298.79 9151.61 1298.73 9195.04  1298.5  9205.6 1298.44 9212.87 1298.42
 9259.59 1298.24 9303.97  1298.1 9313.58 1298.07 9327.56 1298.04 9367.57 1297.95
 9395.08 1297.91 9421.56 1297.88 9460.09 1297.83 9475.55 1297.81 9486.19  1297.8
 9529.54 1297.75 9577.29 1297.71 9583.53  1297.7 9592.61 1297.69 9637.52 1297.63
  9668.4 1297.58 9691.51 1297.55 9725.14  1297.5  9745.5 1297.47  9759.5 1297.45
 9799.49  1297.4 9850.61 1297.35 9853.48 1297.34 9857.67 1297.34 9907.47 1297.29
 9941.72 1297.25 9961.47 1297.23 9990.19 1297.21   10000  1297.210014.33  1297.2
 10018.8  1297.210064.37 1297.2210070.98 1297.2210114.41 1297.2410123.16 1297.25
10164.45 1297.2810175.34 1297.2910214.49 1297.3310227.51 1297.3410264.54 1297.38
10279.69  1297.410314.58 1297.4410331.87 1297.4610364.62 1297.4910384.05  1297.5
10414.66 1297.5310436.23 1297.53 10464.7 1297.5510488.41 1297.5510514.74 1297.55
10540.59 1297.5510564.79 1297.5410592.76 1297.5510614.83 1297.5510644.94 1297.56
10664.87 1297.5510697.12 1297.5510720.84 1297.5910759.84 1297.57 10771.3 1297.68
10809.37 1297.6410822.06 1297.7510853.98 1297.8110894.19 1298.0610904.62 1298.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9141.87    .041 9799.49    .04110214.49    .041

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9799.4910214.49              .1       .3

Upstream Embankment side slope                =       0 horiz. to 1.0 vertical
Downstream Embankment side slope              =       0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins           =
Energy head used in spillway design           =
Spillway height used in design                =
Weir crest shape                              = Broad Crested

Number of Culverts =  1

Culvert Name     Shape      Rise    Span
Culvert #1           Box      2.5       4
FHWA Chart # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    Top n  Bottom n  Depth Blocked  Entrance Loss Coef   Exit Loss Coef
              210       25     .014      .014          0                  .5                  1
Number of Barrels =  2
```

```
Upstream   Elevation =  1295.98
Centerline Stations
    Sta.    Sta.
  9997.5 10002.5
Downstream Elevation =  1295.96
Centerline Stations
    Sta.    Sta.
  9997.5 10002.5

CULVERT OUTPUT  Profile #PF 1  Culv Group:  Culvert #1
*****************************************************************************
* Q Culv Group (cfs)      *  219.61  * Culv Full Len (ft)      *   25.00  *
* # Barrels               *       2  * Culv Vel US (ft/s)      *   10.98  *
* Q Barrel (cfs)          *  109.81  * Culv Vel DS (ft/s)      *   10.98  *
* E.G. US. (ft)           * 1301.65  * Culv Inv El Up (ft)    * 1295.98  *
* W.S. US. (ft)           * 1301.64  * Culv Inv El Dn (ft)    * 1295.96  *
* E.G. DS (ft)            * 1298.02  * Culv Frctn Ls (ft)     *    0.38  *
* W.S. DS (ft)            * 1297.94  * Culv Exit Loss (ft)    *    2.31  *
* Delta EG (ft)           *    3.63  * Culv Entr Loss (ft)     *    0.94  *
* Delta WS (ft)           *    3.70  * Q Weir (cfs)            * 1117.24  *
* E.G. IC (ft)            * 1301.66  * Weir Sta Lft (ft)       * 9083.34  *
* E.G. OC (ft)            * 1301.65  * Weir Sta Rgt (ft)       *11216.10  *
* Culvert Control         *  Outlet  * Weir Submerg            *    0.00  *
* Culv WS Inlet (ft)      * 1298.48  * Weir Max Depth (ft)     *    1.03  *
* Culv WS Outlet (ft)     * 1298.46  * Weir Avg Depth (ft)     *    0.30  *
* Culv Nml Depth (ft)     *    2.50  * Weir Flow Area (sq ft) *  640.54  *
* Culv Crt Depth (ft)     *    2.50  * Min El Weir Flow (ft)  * 1300.63  *
*****************************************************************************

Note:    Culvert critical depth exceeds the height of the culvert.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 27.454

INPUT
Description: Directly downstream of SR-238
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9141.87 1298.79 9151.61 1298.73 9195.04  1298.5  9205.6 1298.44 9212.87 1298.42
 9259.59 1298.24 9303.97  1298.1 9313.58 1298.07 9327.56 1298.04 9367.57 1297.95
 9395.08 1297.91 9421.56 1297.88 9460.09 1297.83 9475.55 1297.81 9486.19  1297.8
 9529.54 1297.75 9577.29 1297.71 9583.53  1297.7 9592.61 1297.69 9637.52 1297.63
  9668.4 1297.58 9691.51 1297.55 9725.14  1297.5  9745.5 1297.47  9759.5 1297.45
 9799.49  1297.4 9850.61 1297.35 9853.48 1297.34 9857.67 1297.34 9907.47 1297.29
 9941.72 1297.25 9961.47 1297.23 9990.19 1297.21   10000  1297.210014.33  1297.2
 10018.8  1297.210064.37 1297.2210070.98 1297.2210114.41 1297.2410123.16 1297.25
10164.45 1297.2810175.34 1297.2910214.49 1297.3310227.51 1297.3410264.54 1297.38
10279.69  1297.410314.58 1297.4410331.87 1297.4610364.62 1297.4910384.05  1297.5
10414.66 1297.5310436.23 1297.53 10464.7 1297.5510488.41 1297.5510514.74 1297.55
10540.59 1297.5510564.79 1297.5410592.76 1297.5510614.83 1297.5510644.94 1297.56
10664.87 1297.5510697.12 1297.5510720.84 1297.5910759.84 1297.57 10771.3 1297.68
10809.37 1297.6410822.06 1297.7510853.98 1297.8110894.19 1298.0610904.62 1298.06

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*****************************************
 9141.87    .041 9799.49    .04110214.49    .041

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9799.4910214.49               850     889     850          .1          .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1298.02  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.08  * Wt. n-Val.              *   0.041   *   0.041   *   0.041  *
* W.S. Elev (ft)          * 1297.94  * Reach Len. (ft)         *  850.00   *  889.00   *  850.00  *
* Crit W.S. (ft)          * 1297.81  * Flow Area (sq ft)       *  112.55   *  278.86   *  261.02  *
* E.G. Slope (ft/ft)      *0.008643  * Area (sq ft)            *  112.55   *  278.86   *  261.02  *
* Q Total (cfs)           * 1350.00  * Flow (cfs)              *  155.78   *  720.82   *  473.40  *
* Top Width (ft)          * 1503.41  * Top Width (ft)          *  427.46   *  415.00   *  660.95  *
* Vel Total (ft/s)        *    2.07  * Avg. Vel. (ft/s)        *    1.38   *    2.58   *    1.81  *
* Max Chl Dpth (ft)       *    0.74  * Hydr. Depth (ft)        *    0.26   *    0.67   *    0.39  *
* Conv. Total (cfs)       * 14521.0  * Conv. (cfs)             *  1675.6   *  7753.4   *  5092.0  *
* Length Wtd. (ft)        *  877.10  * Wetted Per. (ft)        *  427.46   *  415.00   *  660.95  *
* Min Ch El (ft)          * 1297.20  * Shear (lb/sq ft)        *    0.14   *    0.36   *    0.21  *
```

* Alpha	*	1.15	* Stream Power (lb/ft s)	*	0.20	*	0.94	*	0.39	*
* Frctn Loss (ft)	*	2.90	* Cum Volume (acre-ft)	*	99.72	*	173.54	*	33.59	*
* C & E Loss (ft)	*	0.02	* Cum SA (acres)	*	85.24	*	128.34	*	64.67	*

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 27.258

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9244.28	1295.11	9248.46	1295.07	9270.87	1294.94	9277.59	1294.9	9322.18	1294.64
9344.3	1294.54	9373.5	1294.43	9411.01	1294.3	9424.81	1294.26	9470.83	1294.2
9476.13	1294.2	9477.72	1294.19	9527.44	1294.17	9544.43	1294.17	9578.75	1294.17
9611.13	1294.15	9630.07	1294.14	9677.84	1294.11	9681.38	1294.11	9693.19	1294.12
9732.7	1294.16	9744.55	1294.17	9784.01	1294.18	9811.26	1294.18	9835.33	1294.2
9877.97	1294.21	9886.64	1294.21	9915.55	1294.23	9937.95	1294.24	9944.68	1294.24
9989.27	1294.28	10000	1294.28	10011.32	1294.28	10040.55	1294.29	10077.64	1294.28
10091.82	1294.27	10140.13	1294.23	10143.09	1294.23	10143.96	1294.23	10194.36	1294.21
10210.28	1294.22	10245.63	1294.23	10276.6	1294.25	10296.9	1294.26	10342.92	1294.31
10348.18	1294.32	10366.07	1294.34	10399.45	1294.38	10409.24	1294.38	10450.72	1294.4
10475.56	1294.44	10501.99	1294.47	10541.88	1294.5	10553.26	1294.51	10592.01	1294.55
10604.53	1294.56	10644.01	1294.6	10655.8	1294.61	10674.53	1294.65	10707.07	1294.72
10740.85	1294.77	10758.35	1294.81	10807.17	1294.84	10809.62	1294.85	10817.96	1294.85
10860.89	1294.86	10894.74	1294.89	10912.16	1294.9	10939.81	1294.92	10963.43	1294.91
11006.13	1294.93	11014.7	1294.93	11043.9	1294.94	11065.97	1294.96	11072.45	1294.96
11117.25	1294.99	11145.47	1295.01	11168.52	1295.04	11205.1	1295.06	11219.79	1295.07
11269.84	1295.15	11271.06	1295.15	11271.42	1295.15				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9244.28	.041	9373.5	.04	11039	9.45 .041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9373.5	10399.45	900	1464	1500	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	*	1295.10	* Element	*	Left OB	*	Channel	*	Right OB	*
* Vel Head (ft)	*	0.03	* Wt. n-Val.	*	0.041	*	0.041	*	0.041	*
* W.S. Elev (ft)	*	1295.08	* Reach Len. (ft)	*	900.00	*	1464.00	*	1500.00	*
* Crit W.S. (ft)	*	1294.62	* Flow Area (sq ft)	*	44.42	*	873.18	*	256.04	*
* E.G. Slope (ft/ft)	*	0.001774	* Area (sq ft)	*	44.42	*	873.18	*	256.04	*
* Q Total (cfs)	*	1410.00	* Flow (cfs)	*	33.88	*	1196.94	*	179.18	*
* Top Width (ft)	*	1976.49	* Top Width (ft)	*	125.78	*	1025.95	*	824.76	*
* Vel Total (ft/s)	*	1.20	* Avg. Vel. (ft/s)	*	0.76	*	1.37	*	0.70	*
* Max Chl Dpth (ft)	*	0.97	* Hydr. Depth (ft)	*	0.35	*	0.85	*	0.31	*
* Conv. Total (cfs)	*	33479.2	* Conv. (cfs)	*	804.4	*	28420.4	*	4254.5	*
* Length Wtd. (ft)	*	1357.69	* Wetted Per. (ft)	*	125.78	*	1025.95	*	824.77	*
* Min Ch El (ft)	*	1294.11	* Shear (lb/sq ft)	*	0.04	*	0.09	*	0.03	*
* Alpha	*	1.16	* Stream Power (lb/ft s)	*	0.03	*	0.13	*	0.02	*
* Frctn Loss (ft)	*	3.04	* Cum Volume (acre-ft)	*	98.19	*	161.78	*	28.54	*
* C & E Loss (ft)	*	0.00	* Cum SA (acres)	*	79.85	*	113.63	*	50.18	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 27.052

INPUT
Description:

Station Elevation Data num= 74

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9013.39	1293.4	9068.37	1293.4	9080.04	1293.4	9081.61	1293.4	9146.69	1293.32
9157.23	1293.31	9213.34	1293.19	9232.85	1293.15	9279.99	1293.06	9308.47	1293
9346.63	1292.96	9384.09	1292.88	9413.28	1292.8	9459.71	1292.51	9479.93	1292.31
9535.33	1291.69	9546.58	1291.6	9610.95	1291.23	9613.23	1291.22	9630.14	1291.18
9679.88	1291.09	9686.57	1291.08	9746.53	1291.02	9762.19	1291.01	9813.17	1290.95
9837.81	1290.93	9860.14	1290.9	9877.36	1291.48	9893.88	1291.53	9918.2	1291.77
9940.83	1291.25	9954.45	1291.01	9989.05	1290.64	10000	1290.63	10011.39	1290.63
10047.31	1290.68	10069.25	1290.7	10084.98	1290.74	10127.1	1290.83	10184.35	1291
10184.96	129	110185.81	129	110242.82	1291.14	10283.72	1290.93	10300.68	1290.94
10324.31	1291.18	10358.54	1291.61	10383.09	1291.66	10416.39	1291.76	10462.81	1291.93
10474.25	1292.03	10482.46	129	210532.11	1292.01	10581.83	1292.13	10589.97	1292.13
10601.31	1292.12	10647.83	1291.85	10681.2	1291.85	10705.68	1291.95	10739.81	1292.09
10763.54	1292.16	10780.57	1292.19	10821.4	1292.28	10878.31	1292.37	10879.26	1292.37
10879.94	1292.37	10937.12	1292.3	10979.3	1292.24	10994.97	1292.22	11016.81	1292.22
11052.83	1292.23	11078.67	1292.25	11102.93	1292.35	11106.57	1292.5		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9013.39	.041	9918.2	.041	10358.54	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9918.2	10358.54	1250	1559	1750	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1292.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1292.01	Reach Len. (ft)	1250.00	1559.00	1750.00
Crit W.S. (ft)	1291.50	Flow Area (sq ft)	319.07	463.10	37.65
E.G. Slope (ft/ft)	0.002879	Area (sq ft)	319.07	463.10	37.65
Q Total (cfs)	1480.00	Flow (cfs)	523.87	931.37	24.76
Top Width (ft)	1106.24	Top Width (ft)	411.29	440.34	254.61
Vel Total (ft/s)	1.81	Avg. Vel. (ft/s)	1.64	2.01	0.66
Max Chl Dpth (ft)	1.38	Hydr. Depth (ft)	0.78	1.05	0.15
Conv. Total (cfs)	27581.1	Conv. (cfs)	9762.8	17356.8	461.4
Length Wtd. (ft)	1494.49	Wetted Per. (ft)	411.30	440.36	254.61
Min Ch El (ft)	1290.63	Shear (lb/sq ft)	0.14	0.19	0.03
Alpha	1.08	Stream Power (lb/ft s)	0.23	0.38	0.02
Frctn Loss (ft)	3.59	Cum Volume (acre-ft)	94.44	139.33	23.49
C & E Loss (ft)	0.00	Cum SA (acres)	74.30	88.99	31.59

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 26.756

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8810.4	1290.04	8816.13	1290.03	8841.94	1289.94	8868.94	1289.85	8921.38	1289.68
8921.75	1289.68	8921.94	1289.68	8974.56	1289.53	9001.94	1289.46	9027.37	1289.39
9076.75	1289.25	9080.18	1289.24	9081.94	1289.24	9132.99	1289.08	9161.94	1289.01
9185.8	1288.95	9232.12	1288.88	9238.61	1288.87	9241.95	1288.87	9291.42	1288.82
9321.95	1288.77	9344.22	1288.73	9387.49	1288.59	9397.03	1288.55	9401.95	1288.54
9449.84	1288.44	9481.95	1288.36	9502.65	1288.31	9542.86	1288.22	9555.46	1288.2
9561.95	1288.18	9608.27	1288.07	9641.95	1287.98	9661.08	1287.92	9698.23	1287.83
9713.89	1287.8	9721.95	1287.78	9766.7	1287.69	9801.96	1287.53	9819.51	1287.46
9853.6	1287.23	9872.32	1287.1	9881.96	1287.05	9925.13	1286.8	9959.59	1286.36
9972.52	1285.59	9989.52	1284.99	9991.91	1285.16	9994.46	1285.33	9997.9	1285.55
10000	1285.54	10004.95	1285.51	10010.92	1285.73	10016.92	1285.83	10031.57	1285.97
10040.15	1286.03	10046.56	1286.09	10089.22	1287.05	10114.39	1287.23	10145.61	1287.43
10179.61	1287.64	10201.99	1287.78	10209.03	1287.81	10222.54	1287.87	10258.38	1288.03
10297.43	1288.17	10314.77	1288.23	10330.69	1288.31	10371.16	1288.48	10415.25	1288.68
10427.55	1288.74	10438.83	1288.79	10483.94	1288.98	10533.07	1289.21	10540.32	1289.25
10546.98	1289.28	10596.71	1289.46	10650.89	1289.6	10653.1	1289.61	10655.13	1289.62
10709.49	1289.72	10763.28	1289.83	10765.88	1289.84	10768.7	1289.84	10822.26	1289.92

10871.43 1289.9410878.65 1289.9510886.52 1289.98

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8810.4	.041	9853.6	.04110145.61		.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9853.610145.61 1000 806 750 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1288.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1288.38	Reach Len. (ft)	1000.00	806.00	750.00
Crit W.S. (ft)		Flow Area (sq ft)	180.71	535.18	87.42
E.G. Slope (ft/ft)	0.002057	Area (sq ft)	180.71	535.18	87.42
Q Total (cfs)	1580.00	Flow (cfs)	180.90	1317.25	81.85
Top Width (ft)	875.60	Top Width (ft)	380.23	292.01	203.37
Vel Total (ft/s)	1.97	Avg. Vel. (ft/s)	1.00	2.46	0.94
Max Chl Dpth (ft)	3.39	Hydr. Depth (ft)	0.48	1.83	0.43
Conv. Total (cfs)	34836.5	Conv. (cfs)	3988.6	29043.1	1804.7
Length Wtd. (ft)	858.85	Wetted Per. (ft)	380.23	292.09	203.37
Min Ch El (ft)	1284.99	Shear (lb/sq ft)	0.06	0.24	0.06
Alpha	1.35	Stream Power (lb/ft s)	0.06	0.58	0.05
Frctn Loss (ft)	2.24	Cum Volume (acre-ft)	87.27	121.46	20.97
C & E Loss (ft)	0.00	Cum SA (acres)	62.94	75.89	22.39

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 26.604

INPUT
Description: Approximately 800' upstream of 83rd Avenue.
Station Elevation Data num= 84

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8826.88	1287.78	8838.81	1287.75	8869.11	1287.65	8904.97	1287.55	8920.36	1287.51
8971.12	1287.41	8971.62	1287.41	8973.31	1287.41	9022.87	1287.32	9037.28	1287.29
9074.12	1287.21	9103.44	1287.15	9125.38	1287.1	9169.59	1286.98	9176.63	1286.96
9200.82	1286.9	9227.88	1286.83	9235.75	1286.81	9279.14	1286.68	9301.91	1286.59
9330.39	1286.49	9368.07	1286.4	9381.64	1286.36	9428.33	1286.22	9432.9	1286.2
9434.22	1286.2	9484.15	1286.12	9500.38	1286.06	9535.4	1285.93	9566.54	1285.77
9586.66	1285.67	9632.69	1285.42	9637.91	1285.39	9655.84	1285.32	9689.16	1285.17
9698.85	1285.15	9740.41	1285.06	9765.01	1285.03	9791.67	1284.98	9831.16	1284.91
9842.92	1284.89	9883.35	1284.82	9894.17	1284.8	9897.32	1284.8	9945.43	1284.78
10000	1284.14	10002.12	1284.12	10009.07	1284.04	10035.68	1284.51	10045.82	1284.69
10049.04	1284.75	10055.69	1284.88	10100.16	1285.12	10105.99	1285.12	10112.31	1285.12
10113.29	1285.12	10113.86	1285.12	10119.32	1285.12	10127.11	1285.11	10136.47	1285.12
10159.18	1285.21	10175.94	1285.31	10198.19	1285.49	10229.39	1285.71	10232.07	1285.74
10232.78	1285.75	10233.28	1285.76	10244.2	1285.81	10293.89	1286.11	10321.02	1286.24
10341.66	1286.41	10344.19	1286.42	10346.95	1286.42	10348.79	1286.42	10412.85	1286.74
10412.99	1286.74	10413.07	1286.74	10472.54	1287.06	10505.13	1287.23	10524.82	1287.3
10528.15	1287.32	10530.32	1287.37	10532.46	1287.43	10581.5	1287.68		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8826.88	.041	9945.43	.04110100.16		.041

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9945.4310100.16 1300 1567 1550 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1286.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1286.15	Reach Len. (ft)	1300.00	1567.00	1550.00
Crit W.S. (ft)	1285.61	Flow Area (sq ft)	407.75	240.28	123.55
E.G. Slope (ft/ft)	0.003378	Area (sq ft)	407.75	240.28	123.55
Q Total (cfs)	1640.00	Flow (cfs)	774.04	678.67	187.29
Top Width (ft)	833.70	Top Width (ft)	476.60	154.73	202.36

* Vel Total (ft/s)	* 2.13	* Avg. Vel. (ft/s)	* 1.90	* 2.82	* 1.52	*
* Max Chl Dpth (ft)	* 2.10	* Hydr. Depth (ft)	* 0.86	* 1.55	* 0.61	*
* Conv. Total (cfs)	* 28217.1	* Conv. (cfs)	* 13317.7	* 11677.0	* 3222.4	*
* Length Wtd. (ft)	* 1504.75	* Wetted Per. (ft)	* 476.60	* 154.74	* 202.37	*
* Min Ch El (ft)	* 1284.04	* Shear (lb/sq ft)	* 0.18	* 0.33	* 0.13	*
* Alpha	* 1.17	* Stream Power (lb/ft s)	* 0.34	* 0.92	* 0.20	*
* Frctn Loss (ft)	* 4.52	* Cum Volume (acre-ft)	* 80.51	* 114.29	* 19.16	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 53.11	* 71.75	* 18.90	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 26.307

INPUT
Description: Approximately 500' downstream of 83rd Avenue,
Station Elevation Data num= 94

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8981.67	1282	8984.13	1281.99	9017.34	1281.82	9038.48	1281.72	9054.2	1281.68
9092.84	1281.58	9144.83	1281.51	9147.19	1281.51	9148.95	1281.51	9201.55	1281.44
9222.7	1281.4	9255.9	1281.34	9272.32	1281.3	9310.26	1281.19	9338.46	1281.12
9364.61	1281.06	9399.8	1280.98	9418.97	1280.93	9433.21	1280.9	9473.32	1280.82
9527.29	1280.73	9527.68	1280.73	9527.97	1280.73	9582.03	1280.65	9622.72	1280.59
9636.39	1280.56	9654.78	1280.54	9690.74	1280.48	9717.48	1280.46	9745.1	1280.42
9782.26	1280.41	9799.45	1280.41	9812.23	1280.41	9853.81	1280.41	9906.98	1280.41
9908.16	1280.41	9908.64	1280.41	9910.1	1280.37	9910.98	1280.35	9913.86	1280.29
9980.29	1279.14	9988.23	1279.46	10000	1279.92	10011.08	1280.36	10022.4	1280.38
10033.72	1280.39	10040.5	1280.41	10074.55	1280.51	10126.71	1280.93	10131.44	1280.96
10135.43	1280.99	10188.33	1281.44	10213.71	1281.46	10218.06	1281.43	10223.46	1281.39
10230.01	1281.37	10254.57	1281.32	10262.41	1281.32	10263.12	1281.32	10263.71	1281.32
10265.83	1281.35	10276.08	1281.56	10281.62	1281.63	10339.18	1282.24	10344.92	1282.27
10354.1	1282.5	10359	1282.53	10375.55	1282.63	10415.89	1282.87	10449.88	1283.12
10472.78	1283.28	10499.97	1283.45	10529.67	1283.63	10554.69	1283.81	10586.56	1284
10624.39	1284.24	10643.45	1284.35	10659.51	1284.43	10700.34	1284.61	10748.81	1284.63
10757.23	1284.63	10764.33	1284.63	10814.12	1284.61	10869.14	1284.67	10871.01	1284.68
10873.24	1284.68	10927.9	1284.81	10973.96	1284.93	10984.79	1284.97	10997.66	1285.02
11041.68	1285.21	11078.77	1285.41	11098.57	1285.51	11122.08	1285.65		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8981.67	.041	9144.83	.041	10339.18	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9144.83	10339.18	1330	1330	1290	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1281.69	* Element	* Left OB	* Channel	* Right OB *
* Vel Head (ft)	* 0.05	* Wt. n-Val.	* 0.041	* 0.041	* *
* W.S. Elev (ft)	* 1281.65	* Reach Len. (ft)	* 1330.00	* 1330.00	* 1290.00 *
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 6.06	* 1002.90	* *
* E.G. Slope (ft/ft)	*0.002707	* Area (sq ft)	* 6.06	* 1002.90	* *
* Q Total (cfs)	* 1740.00	* Flow (cfs)	* 2.09	* 1737.91	* *
* Top Width (ft)	* 1215.55	* Top Width (ft)	* 77.29	* 1138.25	* *
* Vel Total (ft/s)	* 1.72	* Avg. Vel. (ft/s)	* 0.35	* 1.73	* *
* Max Chl Dpth (ft)	* 2.51	* Hydr. Depth (ft)	* 0.08	* 0.88	* *
* Conv. Total (cfs)	* 33444.7	* Conv. (cfs)	* 40.2	* 33404.6	* *
* Length Wtd. (ft)	* 1327.28	* Wetted Per. (ft)	* 77.30	* 1138.30	* *
* Min Ch El (ft)	* 1279.14	* Shear (lb/sq ft)	* 0.01	* 0.15	* *
* Alpha	* 1.01	* Stream Power (lb/ft s)	* 0.00	* 0.26	* *
* Frctn Loss (ft)	* 5.22	* Cum Volume (acre-ft)	* 74.34	* 91.93	* 16.96 *
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 44.84	* 48.50	* 15.30 *

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 26.055

INPUT
Description:
Station Elevation Data num= 121

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8679.84	1278.97	8688.07	1278.96	8730.74	1278.82	8744.63	1278.76	8760.21	1278.69
8801.19	1278.49	8837.72	1278.31	8857.75	1278.21	8880.21	1278.09	8914.3	1277.92
8944.7	1277.76	8970.86	1277.62	9000.2	1277.49	9027.42	1277.36	9051.68	1277.23
9083.97	1277.07	9120.19	1276.83	9140.53	1276.7	9146.8	1276.67	9161.57	1276.74
9172.7	1276.89	9209.38	1277.32	9211.37	1277.38	9243.25	1276.62	9248.99	1276.46
9251.28	1276.4	9257.8	1276.36	9265.65	1276.34	9294.79	1276.35	9308.16	1276.48
9310.76	1276.5	9360.18	1276.12	9366.76	1276.1	9370.53	1276.12	9372.61	1276.13
9381.27	1276.19	9414.43	1276.41	9474.99	1275.91	9479.01	1275.88	9479.34	1275.87
9479.78	1275.87	9479.87	1275.87	9480.17	1275.87	9536.43	1275.74	9586.59	1275.61
9592.99	1275.6	9600.16	1275.57	9649.55	1275.42	9693.57	1275.32	9706.1	1275.29
9720.16	1275.27	9762.66	1275.19	9800.56	1275.13	9819.22	1275.12	9849.76	1275.12
9877.88	1274.35	9881.17	1274.29	9885.37	1274.24	9890.32	1274.17	9894.68	1274.11
9906.68	1273.84	9908.2	1273.84	9910.75	1273.84	9910.85	1273.84	9912.24	1273.88
9916.83	1274.02	9960.75	1275.13	9988.89	1275.19	10000	1275.23	10011.61	1275.28
10033.64	1275.39	10070.27	1275.22	10088.09	1275.15	10107.36	1275.34	10125.05	1275.49
10128.61	1275.51	10172.71	1276.17	10182.8	1276.22	10234.31	1276.53	10248.57	1276.62
10268.39	1276.74	10295.92	1276.92	10353.98	1277.33	10357.52	1277.35	10366.6	1277.4
10419.12	1277.68	10439.57	1277.79	10480.73	1278.03	10525.17	1278.27	10542.33	1278.37
10586.41	1278.69	10603.94	1278.82	10610.76	1278.91	10665.54	1279.52	10686.65	1279.53
10693.23	1279.55	10701.79	1279.55	10717.56	1279.51	10739.68	1279.49	10752.42	1279.39
10755.43	1279.45	10771.47	1279.81	10782.43	1280.04	10795.2	1280.29	10799.36	1280.36
10803.01	1280.42	10809.49	1280.51	10850.35	1281.55	10867.53	1281.71	10911.95	1282.11
10953.13	1282.49	10973.56	1282.67	11026.03	1283.15	11035.16	1283.24	11038.72	1283.27
11096.77	1283.8	11124.31	1284	11158.37	1284.24	11209.9	1284.63	11219.97	1284.71
11245.84	1284.89								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8679.84	.041	9762.66	.041	10033.64	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9762.66	10033.64	1440	1533	1400	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
8679.84	9414.43	1277	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1276.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.041	0.041	0.041
W.S. Elev (ft)	1276.32	Reach Len. (ft)	1440.00	1533.00	1400.00
Crit W.S. (ft)	1275.98	Flow Area (sq ft)	239.01	390.48	119.92
E.G. Slope (ft/ft)	0.005658	Area (sq ft)	246.70	390.48	119.92
Q Total (cfs)	2140.00	Flow (cfs)	518.17	1357.99	263.84
Top Width (ft)	839.43	Top Width (ft)	403.07	270.98	165.38
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	2.17	3.48	2.20
Max Chl Dpth (ft)	2.48	Hydr. Depth (ft)	0.71	1.44	0.73
Conv. Total (cfs)	28449.3	Conv. (cfs)	6888.6	18053.3	3507.5
Length Wtd. (ft)	1507.21	Wetted Per. (ft)	337.04	271.01	165.39
Min Ch El (ft)	1273.84	Shear (lb/sq ft)	0.25	0.51	0.26
Alpha	1.15	Stream Power (lb/ft s)	0.54	1.77	0.56
Frctn Loss (ft)	3.50	Cum Volume (acre-ft)	70.48	70.66	15.18
C & E Loss (ft)	0.02	Cum SA (acres)	37.51	26.98	12.85

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water
surface was used.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 1 RS: 25.765

```
INPUT
Description:
Station Elevation Data     num=      123
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*****************************************************************************************
 8790.77 1275.03 8793.86 1275.02 8840.89 1274.75  8845.9 1274.72 8858.26 1274.62
 8897.94 1274.27 8914.03 1274.14 8949.98 1273.83 8987.18 1273.62 9002.02 1273.52
 9038.62 1273.36 9054.06 1273.29 9060.32 1273.27  9106.1 1273.03 9133.46 1272.94
 9158.14 1272.84 9206.61 1272.71 9210.18 1272.69 9218.98 1272.66 9262.22 1272.47
 9279.75  1272.4 9314.26 1272.24 9352.89 1272.07 9366.29 1272.02 9399.35 1271.87
 9418.33 1271.79 9426.03 1271.74 9431.74 1271.72 9470.37 1271.52 9499.18 1271.36
 9522.41 1271.22 9535.24 1271.16  9590.8 1271.17 9598.64 1270.97 9608.57 1270.71
 9614.28 1270.57 9619.03 1270.46 9626.53 1270.34 9632.49 1270.33 9638.36 1270.36
 9643.92 1270.39 9649.63 1270.41 9666.43 1270.49 9672.11 1270.51 9677.28 1270.53
 9681.49 1270.55 9685.21 1270.57  9720.7 1270.83 9723.49 1270.86 9725.21 1270.88
 9726.59  1270.9 9727.66 1270.91 9737.18 1271.05 9777.35 1270.19 9780.33 1270.14
 9781.53 1270.14 9788.08 1270.22 9800.02 1270.34 9809.65 1270.43 9817.13  1270.5
  9822.8 1270.56 9858.34 1271.06  9904.4 1269.65 9906.07 1269.58 9914.89 1269.75
  9979.5 1271.09 9990.77 1271.09   10000 1271.0910017.86  1271.110049.41 1271.88
10069.08 1272.3610086.28 1272.7610095.94 1272.4310132.04 1271.9410148.75 1271.64
10153.86 1271.5510162.96 1271.3810171.62 1271.4110216.54 1271.6110265.78 1271.98
10275.55 1272.0610291.95 1272.2610334.55 1272.7710359.94 1273.1110393.56 1273.58
   10450 1274.3810452.57 1274.42 10454.1 1274.4410511.57 1275.2310548.26 1275.69
10570.58 1275.9410608.05 1276.2410629.59 1276.4210642.42  1276.510688.59 1276.85
10736.58  1277.3 10747.6  1277.4 10766.1 1277.5310806.61 1277.8510830.73 1277.96
10865.61  1278.110924.15 1278.4610924.62 1278.4610924.89 1278.4610983.63 1278.84
11019.05 1279.0911042.63 1279.2611082.21  1279.511101.64 1279.6211113.21 1279.68
11160.64 1279.9411207.37  1280.211219.65 1280.2711240.26 1280.4111278.66 1280.66
11301.54 1280.8211337.67 1281.05 11395.7 1281.4711396.67 1281.4811398.31 1281.49
11455.68  1281.911489.85 1282.1411514.68 1282.31

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8790.77    .041  9590.8    .04110069.08    .041

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
        9590.810069.08              1520    1547    1590              .1        .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev  Permanent
 10086.311514.68    1274       F

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1272.95  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.07  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)          * 1272.87  * Reach Len. (ft)         * 1520.00  * 1547.00  * 1590.00  *
* Crit W.S. (ft)          * 1271.71  * Flow Area (sq ft)       *  395.15  * 1043.19  *    5.41  *
* E.G. Slope (ft/ft)      *0.001459  * Area (sq ft)            *  395.15  * 1043.19  *  233.44  *
* Q Total (cfs)           * 2940.00  * Flow (cfs)              *  508.28  * 2428.27  *    3.46  *
* Top Width (ft)          * 1192.62  * Top Width (ft)          *  441.10  *  478.28  *  273.25  *
* Vel Total (ft/s)        *    2.04  * Avg. Vel. (ft/s)        *    1.29  *    2.33  *    0.64  *
* Max Chl Dpth (ft)       *    3.29  * Hydr. Depth (ft)        *    0.90  *    2.18  *    0.31  *
* Conv. Total (cfs)       * 76977.5  * Conv. (cfs)             * 13308.1  * 63578.9  *    90.5  *
* Length Wtd. (ft)        * 1536.06  * Wetted Per. (ft)        *  441.10  *  478.36  *   17.22  *
* Min Ch El (ft)          * 1269.58  * Shear (lb/sq ft)        *    0.08  *    0.20  *    0.03  *
* Alpha                   *    1.15  * Stream Power (lb/ft s)   *    0.10  *    0.46  *    0.02  *
* Frctn Loss (ft)         *    2.09  * Cum Volume (acre-ft)    *   59.87  *   45.43  *    9.50  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   23.55  *   13.80  *    5.80  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Note:    Multiple critical depths were found at this location.  The critical depth with the lowest,
valid, water
         surface was used.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 1            RS: 25.571

INPUT
Description:
Station Elevation Data     num=      81
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
```

```
*********************************************************************************
 8834.45 1271.08 8846.53 1271.05 8848.48 1271.04 8852.36 1271.03 8908.57 1270.89
 8936.68 1270.83 8968.66 1270.74 9026.82 1270.51 9028.75  1270.5 9032.59 1270.48
 9088.84 1270.17 9116.97 1270.04 9148.93 1269.89 9207.12 1269.63 9209.02 1269.62
 9212.82 1269.61 9269.11 1269.39 9297.26  1269.3  9329.2 1269.19 9387.41 1269.08
 9389.29 1269.08 9393.05 1269.08 9449.38    1269 9477.56 1268.94 9509.47 1268.88
  9567.7 1268.74 9569.56 1268.74 9604.87 1268.64 9651.78 1269.21 9669.15 1269.45
 9681.51 1269.33  9697.1 1268.91 9704.44 1268.74 9714.16 1268.52  9732.5 1268.57
 9742.16 1268.56 9749.34 1268.56 9783.08 1268.69 9792.11 1268.79 9794.79 1268.82
 9819.27 1269.08 9828.55 1269.15 9853.81  1269.4 9854.89  1269.4  9859.1  1269.4
 9860.16  1269.4 9862.63  1269.4 9863.64  1269.4  9867.8 1269.27 9870.97 1269.16
 9928.28 1268.37  9930.1 1268.37 9933.74 1268.38 9990.19 1268.43   10000 1268.45
10015.36 1268.4910056.07 1268.6410090.46 1268.8110123.07 1268.9910153.83 1269.48
10157.86 1269.5110163.17  1269.610170.69 1269.8410180.77 1270.2310198.11 1270.61
10207.38 1270.9910216.01 1271.1510218.72 1271.1810222.64 1271.0210227.56 1270.91
10238.78 1270.9610250.78 1271.0710260.57 1271.2810268.74 1271.4210275.96 1271.46
10283.16 1271.4610290.49 1271.4410302.23 1271.37 10328.4  1271.510341.06 1271.42
10351.85 1271.34

Manning's n Values        num=       3
      Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8834.45    .041  9859.1    .04110157.86    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9859.110157.86             1400    1457    1400            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1270.84  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.05  * Wt. n-Val.              *   0.041  *    0.041  *   0.041  *
* W.S. Elev (ft)          * 1270.79  * Reach Len. (ft)         * 1410.00  * 1410.00  * 1410.00  *
* Crit W.S. (ft)          * 1269.69  * Flow Area (sq ft)       * 1296.96  *  616.76  *   29.11  *
* E.G. Slope (ft/ft)      *0.001290  * Area (sq ft)            * 1296.96  *  616.76  *   29.11  *
* Q Total (cfs)           * 3470.00  * Flow (cfs)              * 2139.89  * 1301.64  *   28.47  *
* Top Width (ft)          * 1252.33  * Top Width (ft)          *  908.88  *  298.76  *   44.69  *
* Vel Total (ft/s)        *    1.79  * Avg. Vel. (ft/s)        *    1.65  *    2.11  *    0.98  *
* Max Chl Dpth (ft)       *    2.42  * Hydr. Depth (ft)        *    1.43  *    2.06  *    0.65  *
* Conv. Total (cfs)       * 96608.1  * Conv. (cfs)             * 59576.6  * 36238.9  *   792.5  *
* Length Wtd. (ft)        * 1410.00  * Wetted Per. (ft)        *  908.91  *  298.78  *   44.71  *
* Min Ch El (ft)          * 1268.37  * Shear (lb/sq ft)        *    0.11  *    0.17  *    0.05  *
* Alpha                   *    1.05  * Stream Power (lb/ft s)  *    0.19  *    0.35  *    0.05  *
* Frctn Loss (ft)         *    3.51  * Cum Volume (acre-ft)    *   30.35  *   15.95  *    4.71  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 2            RS: 25.296

INPUT
Description:
Station Elevation Data    num=     151
      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************
 9075.54 1267.55 9077.31 1267.54 9078.83 1267.54 9110.15 1267.44 9126.41 1267.42
 9136.26  1267.4 9179.85 1267.32 9222.07 1267.29 9233.29 1267.27 9251.83 1267.23
 9286.73 1267.15 9307.87  1267.1 9340.17 1267.02  9393.5 1266.86 9393.61 1266.86
 9393.67 1266.86 9447.05 1266.69 9471.18 1266.61 9504.88 1267.15 9521.49 1267.36
 9537.43 1267.56  9547.9 1267.34 9561.79 1267.14 9586.57 1266.88 9599.16 1266.74
 9607.27 1266.63  9614.2 1266.48 9658.48 1266.08 9660.58 1266.04 9662.18 1266.02
 9663.85 1266.01 9676.85 1265.94 9714.24 1265.84 9736.88  1265.8 9767.68 1265.74
 9818.53 1265.65 9820.41 1265.64 9821.19 1265.64 9821.33 1265.64 9821.51 1265.64
 9821.72 1265.64 9822.32 1265.63 9869.93 1265.46 9875.37 1265.44 9885.57 1265.43
 9894.09 1265.41 9900.91  1265.4 9905.09 1265.42 9913.71 1265.46 9915.93  1265.5
 9919.14 1265.54 9931.95 1265.64 9935.55 1265.63 9973.75 1265.74 9986.59  1265.9
   10000 1264.9910005.17 1264.6510015.98 1263.9310017.36 1263.9310018.61 1263.93
10020.36 1263.9310021.74 1263.93   10023 1263.9310035.94 1264.1110044.87 1264.21
10083.97 1265.0810113.05 1265.4810120.61 1265.5510131.46  1265.710139.35 1265.83
10139.68 1265.8310141.69 1265.8510159.75 1266.0910164.15 1266.0910183.94  1266.2
10196.55 1266.0210228.59 1265.7510232.46 1265.7110236.57 1265.7110242.67 1265.84
 10286.9 1266.0310292.54 1266.22 10297.9 1266.3510301.53 1266.3810305.43 1266.39
10309.02 1266.3810355.54 1266.56 10359.3 1266.54   10371 1266.5310374.58 1266.55
```

```
10378.19 1266.5710382.33 1266.5810431.19 1266.7710433.92 1266.7610436.34 1266.71
10438.62 1266.6510440.66 1266.6310443.92 1266.7110500.76    126710503.66 1267.11
10506.31 1267.1810508.24 1267.1810518.35 1266.9910573.19 1267.1510585.51 1267.17
10648.09  1267.510652.66 1267.5310692.26 1267.8210719.81 1268.0110722.99 1268.04
10786.96 1268.5610797.89 1268.6510854.12 1269.2110872.79 1269.4110921.27 1269.92
 10947.7  1270.210988.42 1270.58 11022.6 1270.8811055.57 1271.15 11097.5 1271.43
11122.72 1271.58 11172.4  1271.911183.62 1271.83 11188.1 1271.87 11251.1 1272.27
11253.67 1272.28 11254.9 1272.2611256.63 1272.2411259.27 1272.2111262.17 1272.18
11298.23 1271.84   11305 1271.7611313.11 1271.6811335.52 1271.6211339.56 1271.73
11356.98 1272.3311388.16 1273.0711392.26 1273.1711392.99 1273.1811393.55 1273.18
11394.02 1273.1911394.57 1273.2111395.11 1273.2311395.59 1273.2611459.69 1273.71
11461.08 1273.7611462.32  1273.811463.43 1273.8211472.01 1273.7811525.64    1274
11546.91 1274.07

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9075.54      .05 9986.59     .04310159.75      .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.   Expan.
       9986.5910159.75               1400    1531    1400             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1267.33  * Element                  *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.               *   0.050   *   0.043   *   0.050   *
* W.S. Elev (ft)          * 1267.13  * Reach Len. (ft)          * 1400.00   * 1531.00   * 1400.00   *
* Crit W.S. (ft)          * 1266.71  * Flow Area (sq ft)        *  578.12   *  368.97   *  262.10   *
* E.G. Slope (ft/ft)      *0.006263  * Area (sq ft)             *  578.12   *  368.97   *  262.10   *
* Q Total (cfs)           * 3650.00  * Flow (cfs)               * 1477.48   * 1670.31   *  502.22   *
* Top Width (ft)          * 1207.03  * Top Width (ft)           *  633.14   *  173.16   *  400.73   *
* Vel Total (ft/s)        *    3.02  * Avg. Vel. (ft/s)         *    2.56   *    4.53   *    1.92   *
* Max Chl Dpth (ft)       *    3.20  * Hydr. Depth (ft)         *    0.91   *    2.13   *    0.65   *
* Conv. Total (cfs)       * 46120.7  * Conv. (cfs)              * 18669.1   * 21105.7   *  6345.9   *
* Length Wtd. (ft)        * 1462.46  * Wetted Per. (ft)         *  633.15   *  173.24   *  400.75   *
* Min Ch El (ft)          * 1263.93  * Shear (lb/sq ft)         *    0.36   *    0.83   *    0.26   *
* Alpha                   *    1.37  * Stream Power (lb/ft s)    *    0.91   *    3.77   *    0.49   *
* Frctn Loss (ft)         *    3.38  * Cum Volume (acre-ft)      *  135.78   *   93.93   *   45.63   *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)            *   62.15   *   21.26   *   23.06   *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 2              RS: 25.005

INPUT
Description:
Station Elevation Data     num=     192
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 8163.13 1267.54 8206.43 1267.33  8208.2 1267.33 8212.29 1267.34 8217.36 1267.35
 8224.71 1267.37 8258.56 1267.38 8265.23 1267.41 8273.56 1267.47 8284.34 1267.53
 8291.09 1267.54 8304.87 1267.49 8321.53 1267.27 8346.29 1266.87 8370.28 1266.71
 8385.25 1266.56  8390.6 1266.54 8415.69 1266.39 8436.91 1266.29 8438.43 1266.23
 8440.18 1266.18 8441.83 1266.17 8443.71 1266.16 8445.87 1266.15  8457.4 1266.02
 8497.37 1265.79 8514.04 1265.29 8518.67 1265.32 8544.65 1265.67 8551.63 1265.86
  8571.9 1266.19  8606.5 1265.82 8608.26 1265.82 8610.05 1265.82 8611.76 1265.81
 8615.33 1265.76 8636.13 1265.52 8664.52  1265.4 8693.96 1265.31 8720.63 1265.22
 8746.35 1265.14 8776.73 1265.06 8808.24 1264.95 8832.84 1264.87 8856.56 1264.78
 8888.94 1264.65 8922.51 1264.49 8945.05 1264.38 8952.38 1264.35 9014.04 1265.27
 9020.22 1265.35 9035.72 1264.87 9048.54 1264.46 9053.33 1264.29 9063.92 1263.96
  9110.7 1264.54 9115.95  1264.6 9152.97    1264 9166.14 1263.83 9171.36 1263.77
 9187.21 1263.51 9225.57 1263.38 9265.35 1263.14 9281.68 1263.06 9297.43 1262.95
 9337.78 1262.72 9361.35 1262.62 9414.85 1262.64 9432.01 1262.61 9437.63 1262.56
 9447.13 1262.31 9472.89 1262.26  9506.1 1262.18 9510.07 1262.18 9518.52 1262.02
 9531.39 1261.82 9577.87 1261.16 9593.22 1260.92 9604.52 1262.28 9612.18 1262.91
 9627.36  1264.4 9646.44 1266.02    9648 1265.96 9649.72 1265.92 9668.74 1265.47
 9687.66 1264.91 9692.69 1263.39 9697.61 1261.78 9700.09 1261.04 9702.84 1260.09
 9706.68 1260.09 9707.25 1260.09 9708.16 1260.09 9708.41 1260.09 9708.66 1260.09
 9720.94 1260.09 9724.12 1260.09  9739.8 1260.09 9760.15 1260.09 9772.63 1260.09
```

```
 9780.25 1260.09 9793.94 1260.09 9806.64 1260.09 9807.56 1260.09 9808.07 1260.09
 9812.73 1260.61 9816.66 1261.04 9822.04 1261.66 9825.85 1262.04  9828.6  1262.3
 9830.55 1262.52 9840.36 1263.97 9849.13 1264.71 9852.27  1265.2  9860.1 1266.38
 9874.64 1268.27 9887.32 1270.03 9904.54 1265.82 9917.86 1262.06 9927.62  1261.7
 9928.88 1261.66 9930.36 1261.63 9932.56 1261.57 9951.46 1260.89 9956.32 1260.81
 9992.29 1259.62 9994.24 1259.62 9995.03 1259.65 9996.44 1259.68 9997.14 1259.71
 9997.88 1259.75 9999.63 1259.81   10000 1259.8110000.49 1259.82 10001.4 1259.82
10002.16 1259.8410022.32 1260.0610032.56 1260.0810041.73 1260.1510048.93 1260.24
10069.42 1260.6110076.79 1260.73 10082.4 1260.9110109.64 1262.0510140.19 1262.19
10170.59  1262.310193.59  1262.410226.16 1262.5610246.98  1262.710292.75 1262.97
10300.38 1263.01 10313.1 1263.0910353.77 1263.3410378.14  1263.510407.16 1263.69
10455.62 1263.9810460.56 1264.0110463.52 1264.0310513.95 1264.38 10548.9 1264.59
10567.35  1264.710598.13 1264.8610620.74 1264.9710634.28 1265.0510674.13 1265.27
10719.66 1265.5310727.53 1265.5710740.65 1265.6510780.92 1265.8810805.05    1266
10834.32 1266.1410883.17 1266.3810887.71 1266.4110890.43 1266.42 10941.1 1266.65
10975.81 1266.84 10994.5 1266.9411025.68 1267.1111047.89 1267.24 11061.2 1267.32
11101.29 1267.5711146.58 1267.8611154.68 1267.91 11168.2 1268.0111208.07 1268.31
11231.96 1268.4811261.47 1268.6911310.72 1269.0711314.86 1269.1111317.35 1269.13
11368.26 1269.5111402.73 1269.75

Manning's n Values          num=       3
      Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8163.13      .05 9917.86     .04310246.98      .05

Bank Sta: Left   Right     Lengths: Left Channel   Right      Coeff Contr.    Expan.
       9917.8610246.98               1620    1778    1690              .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1263.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1263.84  * Reach Len. (ft)         * 1620.00  * 1778.00  * 1690.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1058.85  *  823.03  *  107.92  *
* E.G. Slope (ft/ft)      *0.001194  * Area (sq ft)            * 1058.85  *  823.03  *  107.92  *
* Q Total (cfs)           * 3650.00  * Flow (cfs)              * 1762.79  * 1810.10  *   77.11  *
* Top Width (ft)          * 1126.32  * Top Width (ft)          *  611.28  *  329.12  *  185.92  *
* Vel Total (ft/s)        *    1.83  * Avg. Vel. (ft/s)        *    1.66  *    2.20  *    0.71  *
* Max Chl Dpth (ft)       *    4.22  * Hydr. Depth (ft)        *    1.73  *    2.50  *    0.58  *
* Conv. Total (cfs)       *105642.1  * Conv. (cfs)             * 51020.4  * 52389.8  *  2231.8  *
* Length Wtd. (ft)        * 1709.54  * Wetted Per. (ft)        *  612.52  *  329.20  *  185.92  *
* Min Ch El (ft)          * 1259.62  * Shear (lb/sq ft)        *    0.13  *    0.19  *    0.04  *
* Alpha                   *    1.11  * Stream Power (lb/ft s)  *    0.21  *    0.41  *    0.03  *
* Frctn Loss (ft)         *    4.99  * Cum Volume (acre-ft)    *  109.47  *   72.98  *   39.68  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *   42.15  *   12.43  *   13.63  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 2              RS: 24.668

INPUT
Description:
Station Elevation Data     num=     110
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8924.01  1259.4 8946.58 1259.31 8962.74 1259.27 8965.13 1259.27 8967.68 1259.27
 9029.63 1259.06 9030.38 1259.06 9031.14 1259.06 9032.11 1259.07 9033.69 1259.08
  9037.1 1259.05 9047.88 1258.93 9082.66 1258.61 9088.37 1258.53    9092 1258.51
 9092.98 1258.51 9106.81  1258.5 9109.37  1258.5 9121.36 1258.53 9125.45 1258.53
  9135.6 1258.55 9149.95 1258.43 9156.34 1258.43 9161.59 1258.43 9186.37 1258.03
 9188.64 1258.02 9192.26 1258.01 9202.46 1257.82 9221.51 1257.94 9230.91 1258.08
 9267.89 1258.44 9289.98 1258.42 9348.22 1258.32 9353.86 1258.31 9386.95 1258.24
 9417.75 1258.17 9428.55 1258.15 9481.63 1258.03 9508.88 1257.95 9537.15 1257.74
  9539.1 1257.74 9541.39 1257.73 9544.01 1257.72 9546.21 1257.72 9548.55 1257.72
 9551.16 1257.71 9555.02 1257.71 9559.81 1257.71  9588.5 1257.57 9593.44 1257.54
 9602.09  1257.3 9612.83 1256.89 9624.15 1256.56 9625.94 1256.53  9633.7 1256.56
  9641.2  1256.6 9652.03 1256.71 9660.67 1256.79 9667.94 1256.84 9674.19 1256.88
```

```
 9679.65  1256.9 9682.79 1256.92 9685.78 1256.93 9688.66 1256.94 9691.83 1256.95
 9694.84 1256.96  9733.9 1257.13 9735.04 1257.14 9736.73 1257.15 9738.11 1257.16
 9739.18 1257.17 9740.82 1257.18 9751.59 1257.28  9756.5  1257.3 9763.49 1257.33
 9785.32 1257.43 9811.63 1257.54 9822.65 1257.34 9835.47 1257.15 9842.34 1257.06
 9864.94 1256.92 9885.13 1256.95 9910.51 1256.95 9928.83 1256.96  9956.3 1256.96
 9988.04 1254.27 9999.57 1253.45   10000 1253.4710043.92 1255.9410057.26 1256.69
10062.47 1257.0110062.78 1257.0110063.13 1257.0110063.43 1257.01 10128.9 1257.44
10129.52 1257.4410130.12 1257.4510130.62 1257.4610131.98 1257.4710136.89 1257.53
10199.07    125810209.47  1258.110268.04 1258.6110274.87 1258.6710282.05 1258.74
10337.02  1259.210354.63 1259.33   10406 1259.7310427.21 1259.8810474.97  1260.2

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8924.01     .05  9956.3    .04310062.47     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9956.310062.47              870     791     790             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1258.85  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)           *    0.59  * Wt. n-Val.              *   0.050   *   0.043   *   0.050  *
* W.S. Elev (ft)          * 1258.26  * Reach Len. (ft)         *  870.00   *  791.00   *  790.00  *
* Crit W.S. (ft)          * 1258.26  * Flow Area (sq ft)       *  524.14   *  326.65   *  110.34  *
* E.G. Slope (ft/ft)      *0.011040  * Area (sq ft)            *  524.14   *  326.65   *  110.34  *
* Q Total (cfs)           * 4230.00  * Flow (cfs)              * 1462.41   * 2505.05   *  262.53  *
* Top Width (ft)          *  930.94  * Top Width (ft)           *  658.88   *  106.17   *  165.88  *
* Vel Total (ft/s)        *    4.40  * Avg. Vel. (ft/s)         *    2.79   *    7.67   *    2.38  *
* Max Chl Dpth (ft)       *    4.81  * Hydr. Depth (ft)         *    0.80   *    3.08   *    0.67  *
* Conv. Total (cfs)       * 40257.8  * Conv. (cfs)              * 13918.1   * 23841.1   *  2498.6  *
* Length Wtd. (ft)        *  821.35  * Wetted Per. (ft)         *  658.92   *  106.41   *  165.89  *
* Min Ch El (ft)          * 1253.45  * Shear (lb/sq ft)         *    0.55   *    2.12   *    0.46  *
* Alpha                   *    1.96  * Stream Power (lb/ft s)   *    1.53   *   16.23   *    1.09  *
* Frctn Loss (ft)         *    0.55  * Cum Volume (acre-ft)     *   80.04   *   49.52   *   35.45  *
* C & E Loss (ft)         *    0.17  * Cum SA (acres)           *   18.53   *    3.55   *    6.81  *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program selected the water surface that had the least amount of error between computed and
         assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 2              RS: 24.518

INPUT
Description:
Station Elevation Data     num=     149
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8265.56 1259.67    8288 1259.54 8324.79 1259.32  8330.8  1259.3 8390.72 1259.05
  8407.5 1258.97 8456.65 1258.71 8484.21 1258.56 8522.58 1258.36 8560.91 1258.18
 8588.52 1258.04 8637.62  1257.8 8654.45  1257.7 8714.33  1257.4 8720.38 1257.37
 8757.44 1257.19 8786.31 1257.05 8791.03 1257.02 8852.25 1256.74 8867.74  1256.7
 8918.18 1256.66 8937.51 1256.57 8940.58 1256.57 8945.04 1256.57 8955.15 1256.56
 8984.11 1256.47 8998.36 1256.48    9017 1256.48 9017.94 1256.48 9033.52 1256.47
  9046.1 1256.46 9056.73 1256.45 9064.41 1256.44 9093.08 1256.31 9097.47  1256.3
 9100.94 1256.29  9106.5 1256.28 9109.68 1256.27 9174.94 1256.05 9176.68 1256.04
 9177.16 1256.04 9177.61 1256.04 9181.91    1256 9226.88 1255.86 9247.84  1255.8
 9249.82 1255.78    9250 1255.78 9250.23 1255.77  9250.5 1255.77 9252.23 1255.74
    9259 1255.58 9293.26 1254.89 9300.85 1254.61 9315.82 1254.66 9334.19 1254.88
 9344.28 1255.06  9379.7 1255.45 9404.67 1255.39 9445.64 1255.31 9481.38 1255.24
 9511.57  1255.2 9547.68 1254.86 9552.84 1254.83 9559.91 1254.79 9569.84  1254.7
 9596.94  1254.2 9605.81 1254.32 9631.73 1254.63 9635.73 1254.71 9643.43 1254.87
 9696.31 1254.72 9709.36 1254.69 9710.35 1254.68 9712.41  1254.7 9712.93 1254.71
 9716.17 1254.72  9780.9 1254.86 9785.38 1254.74 9826.39 1253.62 9840.49  1253.1
 9849.62 1252.63 9878.72 1253.48 9897.99 1254.04 9923.09 1255.01 9941.61 1255.02
```

```
 9971.57 1253.69 9973.65 1253.48 9977.87 1253.13 9984.82 1252.59 9997.04 1251.66
   10000 1251.4310010.06 1251.8510019.29 1252.2310026.13 1252.5310065.47 1254.82
10098.86 1254.9710104.44 1254.9810160.96 1255.1510188.75 1255.3110223.06 1255.52
10273.06 1255.8610282.12 1255.78 10282.7 1255.7710283.53 1255.7610284.51 1255.74
10285.71 1255.7210286.86 1255.6810288.36 1255.6310290.41  1255.610293.77 1255.64
10335.83 1255.2110355.83 1256.0310355.88 1256.0410355.96 1256.0510357.25 1256.06
10396.72 1256.4210407.01 1256.4310413.14 1256.4510416.53 1256.4710441.67  1256.8
10471.45 1256.9910525.98 1257.3310533.55 1257.3810554.73 1257.4910595.65 1257.72
10610.29  1257.810657.75 1258.11 10694.6 1258.3110719.85 1258.46 10778.9 1258.88
10781.95  1258.910790.48 1258.9610844.05 1259.3110863.21 1259.4710906.15 1259.82
10947.52 1260.1210968.25 1260.2611026.23 1260.6311030.35 1260.6611031.83 1260.67
11092.45 1260.9911116.14 1261.1211154.55 1261.2811200.44  1261.511216.65 1261.59
11261.98 1261.7911278.75 1261.8711284.75  1261.911340.85 1262.17

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8265.56     .05  9780.9    .04310065.47     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9780.910065.47             1210    1321    1210             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1258.08  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.02  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1258.06  * Reach Len. (ft)        * 1321.00  * 1321.00  * 1321.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)      * 2505.62  * 1261.25  * 1061.78  *
* E.G. Slope (ft/ft)     *0.000218  * Area (sq ft)           * 2505.62  * 1261.25  * 1061.78  *
* Q Total (cfs)          * 4230.00  * Flow (cfs)             * 1800.34  * 1735.99  *  693.67  *
* Top Width (ft)         * 2065.96  * Top Width (ft)         * 1196.57  *  284.57  *  584.82  *
* Vel Total (ft/s)       *    0.88  * Avg. Vel. (ft/s)       *    0.72  *    1.38  *    0.65  *
* Max Chl Dpth (ft)      *    6.63  * Hydr. Depth (ft)       *    2.09  *    4.43  *    1.82  *
* Conv. Total (cfs)      *286352.9  * Conv. (cfs)            *121875.2  *117519.3  * 46958.4  *
* Length Wtd. (ft)       * 1321.00  * Wetted Per. (ft)       * 1196.61  *  284.86  *  584.86  *
* Min Ch El (ft)         * 1251.43  * Shear (lb/sq ft)       *    0.03  *    0.06  *    0.02  *
* Alpha                  *    1.39  * Stream Power (lb/ft s) *    0.02  *    0.08  *    0.02  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)   *   49.78  *   35.10  *   24.82  *
* C & E Loss (ft)        *          * Cum SA (acres)         *          *          *          *
*****************************************************************************************

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 3            RS: 24.268

INPUT
Description:
Station Elevation Data    num=      91
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8786.48  1254.3  8824.5 1254.22 8852.54  1254.1 8896.47  1253.9 8922.05 1253.81
 8968.44 1253.58 8991.56 1253.47 9040.42  1253.2 9061.07 1253.07 9112.39 1252.77
 9130.58 1252.68 9184.36 1252.44  9200.1 1252.38 9256.34 1252.17 9269.61 1252.13
 9328.31 1251.96 9339.12 1251.94 9400.28 1251.84 9408.63 1251.83 9472.25 1251.76
 9478.15 1251.74 9544.23 1251.68 9547.66 1251.68  9616.2 1251.33 9617.17 1251.33
 9644.59 1251.19 9686.68 1250.98 9688.17 1250.97  9756.2 1250.62 9760.15  1250.6
 9825.71 1250.25 9832.12 1250.22 9895.22 1250.02 9904.09 1250.02 9964.73 1250.13
 9976.07 1250.13   10000 1250.1210029.31 1250.1410061.61 1250.1710086.05 1250.33
 10096.4 1250.3810141.93 1250.6810142.35 1250.6810186.66 1250.5910207.75 1250.71
10246.23 1250.9410267.23 1251.0610305.27  1251.310326.71 1251.4410338.54 1251.51
10386.19 1251.7910430.85 1252.0610445.67 1252.1410472.52  1252.310505.15 1252.48
10523.16  1252.610564.63 1252.9110615.47 1253.2610624.12 1253.3210639.78 1253.43
 10683.6 1253.7310707.78 1253.8910743.08 1254.1110800.09  1254.510802.56 1254.51
10807.03 1254.5410862.04 1254.86 10892.4 1255.0410921.52 1255.2210974.28  1255.5
   10981 1255.5410984.71 1255.5611040.48 1255.8811077.02 1256.1111099.96 1256.26
11141.53 1256.5411159.45 1256.6611169.33 1256.7411218.93 1257.0811261.64 1257.34
11278.41 1257.4511308.78 1257.6911337.89 1257.9211353.95 1258.0411397.37 1258.36
11446.26 1258.7611456.85 1258.8411476.04 1258.9811516.33 1259.2811538.57 1259.44
11575.81  1259.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8786.48     .05  9756.2    .04310141.93     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9756.210141.93             1850    2062    1890             .1       .3
```

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1253.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.13	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1252.97	Reach Len. (ft)	1850.00	2062.00	1890.00
Crit W.S. (ft)	1252.06	Flow Area (sq ft)	777.53	1053.86	575.25
E.G. Slope (ft/ft)	0.002673	Area (sq ft)	777.53	1053.86	575.25
Q Total (cfs)	6060.00	Flow (cfs)	1309.15	3679.77	1071.08
Top Width (ft)	1494.77	Top Width (ft)	677.81	385.73	431.23
Vel Total (ft/s)	2.52	Avg. Vel. (ft/s)	1.68	3.49	1.86
Max Chl Dpth (ft)	2.95	Hydr. Depth (ft)	1.15	2.73	1.33
Conv. Total (cfs)	117208.3	Conv. (cfs)	25320.7	71171.6	20716.0
Length Wtd. (ft)	1959.18	Wetted Per. (ft)	677.82	385.73	431.24
Min Ch El (ft)	1250.02	Shear (lb/sq ft)	0.19	0.46	0.22
Alpha	1.36	Stream Power (lb/ft s)	0.32	1.59	0.41
Frctn Loss (ft)	5.24	Cum Volume (acre-ft)	539.53	442.32	485.60
C & E Loss (ft)	0.00	Cum SA (acres)	331.40	99.72	281.53

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 23.877

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8771.61	1249.01	8781.56	1248.97	8805.61	1248.88	8843.78	1248.74	8889.61	1248.58
8906.01	1248.52	8952.84	1248.35	8968.23	1248.29	8973.62	1248.27	9030.45	1248.03
9057.62	1247.92	9092.68	1247.76	9141.62	1247.59	9154.9	1247.54	9192.84	1247.43
9217.12	1247.36	9225.62	1247.33	9279.34	1247.17	9309.62	1247.07	9341.57	1246.97
9393.62	1246.83	9403.79	1246.8	9432.84	1246.71	9466.01	1246.6	9477.62	1246.56
9528.24	1246.37	9561.63	1246.25	9590.46	1246.14	9645.63	1245.93	9652.69	1245.9
9672.85	1245.82	9714.91	1245.66	9729.63	1245.61	9777.13	1245.48	9813.63	1245.41
9839.36	1245.37	9897.63	1245.32	9901.58	1245.32	9935.64	1245.29	9966.76	1243.58
9983.53	1242.96	10000	1242.34	10001.09	1242.29	10039.48	1244.91	10041.85	1245.07
10042.67	1245.13	10043.09	1245.15	10044.86	1245.24	10047.88	1245.24	10102.28	1245.25
10144.23	1245.31	10159.7	1245.35	10179.77	1245.42	10217.12	1245.52	10245.93	1245.59
10274.54	1245.69	10311.65	1245.84	10331.96	1245.91	10347.62	1245.99	10389.38	1246.19
10443.54	1246.41	10446.8	1246.42	10449.32	1246.43	10504.22	1246.65	10551.01	1246.9
10561.64	1246.96	10575.43	1247.05	10619.06	1247.33	10652.71	1247.54	10676.48	1247.7
10707.31	1247.92	10733.9	1248.1	10754.4	1248.23	10791.32	1248.53	10839.2	1248.85
10848.74	1248.93	10856.1	1248.98	10906.16	1249.32	10957.79	1249.66	10963.58	1249.69
10971.08	1249.74	11021	1250.05	11059.49	1250.31	11078.42	1250.41	11102.97	1250.93
11135.84	1251.61	11161.18	1251.75	11193.26	1251.91	11234.85	1252.14	11250.68	1252.23
11262.88	1252.3	11308.1	1252.55						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8771.61	.05	9935.64	.04	10044.86	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9935.64	10044.86	1430	1482	1440	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1247.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1247.72	Reach Len. (ft)	1430.00	1482.00	1440.00
Crit W.S. (ft)	1246.88	Flow Area (sq ft)	1103.45	438.13	984.20
E.G. Slope (ft/ft)	0.002681	Area (sq ft)	1103.45	438.13	984.20
Q Total (cfs)	6060.00	Flow (cfs)	2052.40	1976.99	2030.62
Top Width (ft)	1573.31	Top Width (ft)	830.24	109.22	633.84
Vel Total (ft/s)	2.40	Avg. Vel. (ft/s)	1.86	4.51	2.06
Max Chl Dpth (ft)	5.43	Hydr. Depth (ft)	1.33	4.01	1.55
Conv. Total (cfs)	117044.7	Conv. (cfs)	39640.6	38184.1	39220.0
Length Wtd. (ft)	1450.84	Wetted Per. (ft)	830.25	109.39	633.85
Min Ch El (ft)	1242.29	Shear (lb/sq ft)	0.22	0.67	0.26
Alpha	1.61	Stream Power (lb/ft s)	0.41	3.02	0.54
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	499.59	407.01	451.77

```
* C & E Loss (ft)        *    0.00  * Cum SA (acres)        *  299.38  *   88.01  *  258.43  *
*****************************************************************************************************
```

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 23.597

INPUT
Description:
Station Elevation Data num= 91

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
  8654.5 1246.17 8659.72 1246.14 8717.22  1245.7 8726.89 1245.62 8792.09 1245.08
 8794.06 1245.06 8811.19 1244.93 8861.23 1244.52 8866.97 1244.48  8928.4 1244.01
 8941.85 1243.92 8995.57 1243.62 9016.73 1243.54 9062.74  1243.4 9091.61 1243.33
 9129.91  1243.2 9166.48 1243.06 9197.08 1242.94 9241.36 1242.76 9264.25 1242.68
 9316.24 1242.51 9324.24 1242.48 9331.42 1242.46 9391.12 1242.25 9398.59 1242.23
  9463.7 1242.02 9465.76 1242.01    9466 1242.01 9532.93 1241.78 9540.87 1241.75
  9600.1  1241.5 9615.75 1241.42 9667.27 1241.15 9690.63 1241.02 9734.44 1240.77
 9765.51 1240.62 9801.61  1240.5 9840.38  1240.4 9868.78 1240.39 9915.26 1240.44
 9935.95 1240.49 9973.31 1239.42 9976.01 1239.33 9979.33 1239.22 9983.38 1239.08
 9988.47 1238.91 9991.93  1238.8 9995.98 1238.66   10000 1238.5110000.71 1238.49
 10002.1 1238.4210058.95 1240.3110063.45 1240.4510064.94  1240.510067.85 1240.64
10069.51 1240.6410094.49 1240.6610135.95 1240.6910141.88  1240.710202.38 1240.77
10217.82 1240.7910268.81 1240.8910293.76 1240.9510335.24 1241.09 10369.7 1241.21
10401.67 1241.3110445.64 1241.45 10468.1 1241.5310521.58 1241.7110534.53 1241.75
10597.52 1241.8910600.97  1241.910625.04 1241.97 10667.4 1242.0910673.46  1242.1
10733.83 1242.27 10749.4 1242.3210800.26 1242.4510825.34 1242.5110866.69 1242.67
10901.28 1242.9410933.12 1243.1410977.22 1243.4510999.55 1243.6311053.16  1244.1
11065.98  1244.2 11129.1 1244.7111132.42 1244.7311155.58  1244.911198.85  1245.2
11205.04 1245.25
```

Manning's n Values num= 3

```
     Sta   n Val     Sta   n Val     Sta   n Val
*************************************************
  8654.5     .05 9935.95    .04310067.85     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.9510067.85             1350    1409    1300            .1        .3
```

CROSS SECTION OUTPUT Profile #PF 1

```
*****************************************************************************************************
* E.G. Elev (ft)         * 1242.87  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.19  * Wt. n-Val.              *   0.050  *    0.043  *   0.050  *
* W.S. Elev (ft)         * 1242.68  * Reach Len. (ft)         * 1350.00  * 1409.00  * 1300.00  *
* Crit W.S. (ft)         * 1242.09  * Flow Area (sq ft)       *  834.55  *  417.34  *  916.04  *
* E.G. Slope (ft/ft)     *0.004577  * Area (sq ft)            *  834.55  *  417.34  *  916.04  *
* Q Total (cfs)          * 6060.00  * Flow (cfs)              * 1941.49  * 2102.10  * 2016.41  *
* Top Width (ft)         * 1602.03  * Top Width (ft)          *  670.51  *  131.90  *  799.62  *
* Vel Total (ft/s)       *    2.80  * Avg. Vel. (ft/s)        *    2.33  *    5.04  *    2.20  *
* Max Chl Dpth (ft)      *    4.26  * Hydr. Depth (ft)        *    1.24  *    3.16  *    1.15  *
* Conv. Total (cfs)      * 89574.0  * Conv. (cfs)             * 28697.5  * 31071.6  * 29804.9  *
* Length Wtd. (ft)       * 1367.19  * Wetted Per. (ft)        *  670.51  *  131.97  *  799.63  *
* Min Ch El (ft)         * 1238.42  * Shear (lb/sq ft)        *    0.36  *    0.90  *    0.33  *
* Alpha                  *    1.55  * Stream Power (lb/ft s)  *    0.83  *    4.55  *    0.72  *
* Frctn Loss (ft)        *    3.52  * Cum Volume (acre-ft)    *  467.77  *  392.46  *  420.36  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *  274.75  *   83.91  *  234.73  *
*****************************************************************************************************
```

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 23.330

INPUT
Description:

Station Elevation Data num= 87

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8814.6	1242.6	8828.14	1242.56	8854.44	1242.46	8910.39	1242.23	8914.37	1242.21
8917.41	1242.2	8940.33	1242.11	8980.38	1241.95	8992.64	1241.9	9043.35	1241.7
9074.89	1241.57	9106.33	1241.43	9157.14	1241.2	9169.3	1241.14	9209.02	1240.95
9232.27	1240.83	9239.39	1240.8	9295.24	1240.54	9321.64	1240.42	9358.21	1240.26
9403.88	1240.07	9421.18	1239.99	9477.69	1239.73	9484.15	1239.7	9486.13	1239.69
9547.13	1239.38	9568.38	1239.24	9610.1	1238.96	9650.63	1238.56	9673.07	1238.34
9732.88	1237.57	9736.04	1237.53	9746.37	1237.39	9799.01	1236.7	9815.13	1236.54
9861.98	1235.93	9897.38	1235.75	9924.96	1235.73	9978.71	1234.48	9987.09	1234.2
9991.57	1234.04	9997.34	1233.83	9998.12	1233.8	10000	1233.86	10002.48	1233.93
10023.98	1234.55	10033.13	1234.81	10038.11	1234.96	10042.08	1235.08	10044.43	1235.16
10045.97	1235.21	10055.62	1235.51	10061.47	1235.52	10114.31	1235.75	10143.19	1235.9
10177.53	1236.11	10224.9	1236.43	10240.74	1236.55	10294.87	1236.94	10303.96	1237.01
10306.62	1237.02	10367.17	1237.39	10388.33	1237.51	10430.39	1237.72	10470.05	1237.91
10493.6	1238.01	10551.76	1238.31	10556.82	1238.32	10574.1	1238.41	10620.03	1238.62
10633.48	1238.69	10683.25	1238.93	10715.19	1239.11	10746.47	1239.27	10796.91	1239.58
10809.68	1239.67	10853.33	1239.95	10872.9	1240.07	10878.62	1240.12	10936.11	1240.52
10960.34	1240.71	10999.33	1240.96	11042.05	1241.23	11062.54	1241.36	11123.77	1241.67
11125.76	1241.68	11132.56	1241.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8814.6	.05	9861.98	.04	10177.53	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9861.98	10177.53	750	986	810	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

			Left OB	Channel	Right OB
E.G. Elev (ft)	1239.33	Element			
Vel Head (ft)	0.14	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1239.19	Reach Len. (ft)	750.00	986.00	810.00
Crit W.S. (ft)		Flow Area (sq ft)	427.10	1208.11	787.38
E.G. Slope (ft/ft)	0.001646	Area (sq ft)	427.10	1208.11	787.38
Q Total (cfs)	6020.00	Flow (cfs)	673.08	4145.14	1201.78
Top Width (ft)	1154.31	Top Width (ft)	285.85	315.55	552.91
Vel Total (ft/s)	2.48	Avg. Vel. (ft/s)	1.58	3.43	1.53
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)	1.49	3.83	1.42
Conv. Total (cfs)	148364.6	Conv. (cfs)	16588.2	102158.2	29618.2
Length Wtd. (ft)	889.80	Wetted Per. (ft)	285.87	315.60	552.92
Min Ch El (ft)	1233.80	Shear (lb/sq ft)	0.15	0.39	0.15
Alpha	1.43	Stream Power (lb/ft s)	0.24	1.35	0.22
Frctn Loss (ft)	1.65	Cum Volume (acre-ft)	448.22	366.17	394.94
C & E Loss (ft)	0.01	Cum SA (acres)	259.93	76.67	214.55

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 23.143

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8669.77	1239.1	8670.37	1239.09	8698.81	1239.03	8749.77	1238.92	8758.22	1238.91
8762.94	1238.9	8817.63	1238.76	8855.5	1238.67	8877.05	1238.62	8915.66	1238.53
8936.46	1238.49	8948.07	1238.47	8995.87	1238.39	9040.63	1238.32	9055.29	1238.29
9081.54	1238.23	9114.7	1238.16	9133.2	1238.12	9174.11	1238.06	9225.77	1237.98
9233.52	1237.96	9247.43	1237.93	9292.94	1237.84	9318.33	1237.78	9352.35	1237.71
9410.9	1237.54	9411.76	1237.54	9413.32	1237.53	9471.18	1237.35	9503.46	1237.22
9530.59	1237.12	9579.2	1236.95	9590	1236.91	9596.03	1236.89	9649.42	1236.63
9688.59	1236.38	9708.83	1236.25	9745.09	1236.02	9768.24	1235.86	9781.16	1235.8
9827.65	1235.63	9873.73	1235.56	9887.07	1235.55	9910.98	1235.55	9946.48	1235.55
9958.71	1234.76	9961.1	1234.56	9965.14	1234.25	9973.05	1233.62	9985.79	1232.61
9999.92	1231.48	10000	1231.49	10040.55	1234.14	10062.41	1235.61	10067.09	1235.62
10119.19	1235.79	10172.61	1236.06	10175.97	1236.08	10179.88	1236.09	10232.75	1236.29
10278.13	1235.67	10289.53	1235.55	10302.8	1235.27	10346.3	1234.65	10383.65	1234.37
10403.08	1234.33	10425.72	1234.41	10459.86	1234.51	10489.17	1234.64	10516.64	1234.78
10548.64	1234.96	10573.42	1235.11	10594.69	1235.24	10630.2	1235.49	10671.56	1235.81

```
10686.98 1235.9310700.21 1236.0310743.76 1236.3810794.48 1236.7610800.54 1236.81
10805.74 1236.8510857.31 1237.2410911.26 1237.6210914.09 1237.64 10917.4 1237.66
10970.87 1238.0311016.77 1238.3511027.65 1238.4511040.32 1238.5711084.43    1239
 11122.3 1239.3711141.21 1239.5711163.24 1239.7811197.99 1240.1411227.82 1240.41

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8669.77     .05 9946.48    .04310062.41     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.4810062.41             1750    1664    1650            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1237.67  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1237.56  * Reach Len. (ft)         * 1750.00  * 1664.00  * 1650.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  604.18  *  463.62  * 1584.44  *
* E.G. Slope (ft/ft)      *0.002095  * Area (sq ft)            *  604.18  *  463.62  * 1584.44  *
* Q Total (cfs)           * 6020.00  * Flow (cfs)              *  884.45  * 1844.61  * 3290.94  *
* Top Width (ft)          * 1497.03  * Top Width (ft)          *  541.26  *  115.93  *  839.84  *
* Vel Total (ft/s)        *    2.27  * Avg. Vel. (ft/s)        *    1.46  *    3.98  *    2.08  *
* Max Chl Dpth (ft)       *    6.08  * Hydr. Depth (ft)        *    1.12  *    4.00  *    1.89  *
* Conv. Total (cfs)       *131509.3  * Conv. (cfs)             * 19321.1  * 40296.3  * 71892.0  *
* Length Wtd. (ft)        * 1683.41  * Wetted Per. (ft)        *  541.26  *  116.22  *  839.86  *
* Min Ch El (ft)          * 1231.48  * Shear (lb/sq ft)        *    0.15  *    0.52  *    0.25  *
* Alpha                   *    1.46  * Stream Power (lb/ft s)   *    0.21  *    2.08  *    0.51  *
* Frctn Loss (ft)         *    4.15  * Cum Volume (acre-ft)    *  439.35  *  347.25  *  372.89  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *  252.81  *   71.79  *  201.60  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 3            RS: 22.828

INPUT
Description:
Station Elevation Data     num=      91
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8852.46 1234.33 8872.34 1234.25 8899.03 1234.14 8956.75 1233.93 8961.09 1233.91
 8973.16 1233.87 9023.15 1233.72 9041.15 1233.66 9085.22 1233.52 9125.55 1233.37
 9147.28 1233.28 9207.62 1232.97 9209.34 1232.96 9209.96 1232.96  9271.4 1232.64
 9294.36 1232.53 9333.46 1232.38 9378.76 1232.24 9395.52 1232.19 9442.07 1232.06
 9457.58 1232.01 9463.17    1232 9519.64 1231.84 9547.57 1231.76 9581.71 1231.67
 9631.97 1231.55 9643.77 1231.52 9676.53 1231.45 9705.83 1231.39 9716.38 1231.36
 9746.06 1231.28 9767.89 1231.22 9781.83 1231.18 9800.78 1231.12 9829.95 1231.04
 9885.19 1230.88 9892.01 1230.87 9910.98 1230.85 9954.08  1230.8 9960.65 1230.79
 9969.02 1229.86 9974.03 1229.31 9996.02 1226.99 9997.52 1226.83   10000 1226.97
10037.92 1229.1410050.02 1229.8310055.58 1230.14   10069 1230.9510074.09 1230.97
10095.72 1231.0810132.89 1231.2810155.78 1231.4110191.69 1231.6210250.02 1231.96
 10250.5 1231.9610250.79 1231.96 10309.3 1232.25 10345.8  1232.4 10368.1 1232.51
10404.32 1232.65 10426.9 1232.7410440.81 1232.79 10485.7 1232.9410535.81 1233.11
10541.18 1233.1310547.98 1233.0410599.78 1232.1710636.42 1233.1510650.15 1233.52
10662.11 1233.5810712.93 1233.8610720.91 1233.9110725.83 1233.9310779.71 1234.22
10820.84 1234.4310838.52 1234.5110867.23 1234.6510897.32  1234.810915.84  1234.9
10956.12 1235.1111010.85  1235.411014.92 1235.4211021.53 1235.4511073.72 1235.67
11105.86  1235.811132.52 1235.9111175.83 1236.0811191.33 1236.1211200.87 1236.12
11250.13 1236.08

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8852.46     .05 9954.08    .04310095.72     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.0810095.72             1400    1507    1440            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1233.51  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.18  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
```

W.S. Elev (ft)	1233.33	Reach Len. (ft)	1400.00	1507.00	1440.00	
Crit W.S. (ft)		Flow Area (sq ft)	1212.78	564.60	560.68	
E.G. Slope (ft/ft)	0.002938	Area (sq ft)	1212.78	564.60	560.68	
Q Total (cfs)	6110.00	Flow (cfs)	2537.90	2654.45	917.64	
Top Width (ft)	1508.08	Top Width (ft)	819.04	141.64	547.40	
Vel Total (ft/s)	2.61	Avg. Vel. (ft/s)	2.09	4.70	1.64	
Max Chl Dpth (ft)	6.50	Hydr. Depth (ft)	1.48	3.99	1.02	
Conv. Total (cfs)	112726.1	Conv. (cfs)	46822.9	48973.2	16930.0	
Length Wtd. (ft)	1451.79	Wetted Per. (ft)	819.04	141.97	547.43	
Min Ch El (ft)	1226.83	Shear (lb/sq ft)	0.27	0.73	0.19	
Alpha	1.73	Stream Power (lb/ft s)	0.57	3.43	0.31	
Frctn Loss (ft)	4.37	Cum Volume (acre-ft)	402.85	327.61	332.26	
C & E Loss (ft)	0.00	Cum SA (acres)	225.48	66.87	175.33	

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 22.542

INPUT
Description:
Station Elevation Data num= 82

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8690.36	1230.36	8702.54	1230.32	8737.78	1230.18	8766.3	1230.06	8818.35	1229.86
8830.07	1229.81	8874.49	1229.66	8893.83	1229.59	8898.93	1229.58	8957.59	1229.32
8979.5	1229.23	9021.35	1229.01	9060.07	1228.81	9085.12	1228.68	9140.64	1228.38
9148.88	1228.34	9180.11	1228.22	9212.64	1228.09	9221.22	1228.05	9276.4	1227.9
9301.79	1227.83	9340.17	1227.75	9382.36	1227.65	9403.93	1227.61	9462.94	1227.46
9467.69	1227.45	9485.73	1227.43	9531.45	1227.38	9543.51	1227.37	9595.22	1227.34
9624.08	1227.31	9658.98	1227.27	9704.65	1227.22	9722.74	1227.2	9785.22	1227.18
9786.5	1227.18	9791.35	1227.18	9850.26	1227.18	9865.8	1227.15	9914.03	1227.04
9942.49	1225.78	9962.86	1224.87	9986.06	1223.83	9999.8	1223.03	10000	1223.04
10023.44	1225.21	10029.49	1225.72	10032.29	1225.94	10041.72	1226.77	10101.41	1226.76
10105.74	1226.76	10106.83	1226.76	10169.77	1226.94	10186.89		12271	10233.79 1227.18
10266.95	1227.33	10297.81	1227.47	10347	1227.72	10361.83	1227.79	10421.01	1228.07
10425.85	1228.09	10427.06	1228.11	10489.87	1228.41	10507.12	1228.49	10553.89	1228.72
10587.18	1228.88	10617.91	1229.04	10667.24	1229.26	10681.94	1229.33	10740.62	1229.6
10745.96	1229.62	10747.29	1229.63	10809.98	1229.93	10827.35	1230.03	10874	1230.27
10907.41	1230.44	10938.02	1230.57	10987.47	1230.69	11002.04	1230.74	11060.23	1231.02
11066.07	1231.05	11067.53	1231.06						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8690.36	.05	9914.03	.04	10041.72	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9914.03	10041.72	1150	1371	1310	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1229.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1228.97	Reach Len. (ft)	1150.00	1371.00	1310.00
Crit W.S. (ft)	1228.33	Flow Area (sq ft)	1157.76	499.39	733.25
E.G. Slope (ft/ft)	0.003087	Area (sq ft)	1157.76	499.39	733.25
Q Total (cfs)	6110.00	Flow (cfs)	2287.78	2376.82	1445.41
Top Width (ft)	1574.08	Top Width (ft)	884.29	127.69	562.10
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)	1.98	4.76	1.97
Max Chl Dpth (ft)	5.94	Hydr. Depth (ft)	1.31	3.91	1.30
Conv. Total (cfs)	109972.2	Conv. (cfs)	41177.1	42779.7	26015.4
Length Wtd. (ft)	1278.50	Wetted Per. (ft)	884.29	127.95	562.11
Min Ch El (ft)	1223.03	Shear (lb/sq ft)	0.25	0.75	0.25
Alpha	1.71	Stream Power (lb/ft s)	0.50	3.58	0.50
Frctn Loss (ft)	3.96	Cum Volume (acre-ft)	364.75	309.20	310.88
C & E Loss (ft)	0.00	Cum SA (acres)	198.11	62.21	156.99

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 22.283

INPUT
Description:
Station Elevation Data num= 95

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8659.82	1226.7	8675.72	1226.65	8696.02	1226.58	8738.78	1226.42	8778.07	1226.28
8801.85	1226.18	8860.11	1225.97	8864.91	1225.95	8898.48	1225.83	8927.98	1225.73
8942.15	1225.68	8991.04	1225.49	9024.19	1225.34	9054.11	1225.2	9106.23	1224.97
9117.18	1224.93	9153.56	1224.8	9180.24	1224.7	9188.27	1224.68	9243.31	1224.54
9270.31	1224.47	9306.37	1224.38	9352.35	1224.26	9369.44	1224.21	9426.22	1224.04
9432.5	1224.02	9434.39	1224.01	9495.57	1223.79	9516.44	1223.69	9558.64	1223.51
9575.95	1223.45	9598.48	1223.36	9621.7	1223.28	9680.52	1223.13	9684.77	1223.11
9698.89	1223.07	9747.83	1222.9	9762.56	1222.88	9810.9	1222.79	9844.6	1222.81
9873.96	1222.89	9926.64	1223.09	9937.03	1223.13	9995.94	1218.59	9998.91	1218.26
10000	1218.37	10015.85	1219.91	10063.57	1223.44	10089.76	1223.43	10127.04	1223.42
10170.94	1223.46	10190.51	1223.48	10252.11	1223.59	10253.97	1223.6	10291.1	1222.74
10304.32	1222.46	10332.42	1222.96	10352.73	1223.24	10380.91	1223.75	10414.46	1223.8
10444.38	1223.85	10466.87	1223.89	10510.17	1224.04	10519.2	1224.05	10556.05	1224.24
10570.18	1224.31	10573.73	1224.32	10576.81	1224.33	10634.79	1224.56	10657.98	1224.65
10698.26	1224.83	10739.16	1225.05	10761.73	1225.16	10820.33	1225.45	10825.2	1225.47
10842.66	1225.55	10888.67	1225.76	10901.51	1225.82	10952.14	1226.03	10965.54	1226.09
10982.68	1226.16	11015.61	1226.31	11063.86	1226.53	11079.08	1226.61	11108.02	1226.75
11157.16	1225.93	11176.08	1225.68	11196.36	1226.52	11214.88	1227.27	11226.2	1227.33
11269.49	1227.56	11307.38	1227.77	11332.96	1227.89	11388.55	1228.11	11396.43	1228.13

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8659.82	.05	9926.64	.04	10063.57	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9926.64	10063.57	1380	1511	1400	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1225.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1225.00	Reach Len. (ft)	1380.00	1511.00	1400.00
Crit W.S. (ft)		Flow Area (sq ft)	1041.30	541.72	789.52
E.G. Slope (ft/ft)	0.003104	Area (sq ft)	1041.30	541.72	789.52
Q Total (cfs)	6080.00	Flow (cfs)	2011.39	2603.83	1464.78
Top Width (ft)	1628.97	Top Width (ft)	826.41	136.93	665.63
Vel Total (ft/s)	2.56	Avg. Vel. (ft/s)	1.93	4.81	1.86
Max Chl Dpth (ft)	6.74	Hydr. Depth (ft)	1.26	3.96	1.19
Conv. Total (cfs)	109125.7	Conv. (cfs)	36101.0	46734.4	26290.4
Length Wtd. (ft)	1467.48	Wetted Per. (ft)	826.42	137.33	665.66
Min Ch El (ft)	1218.26	Shear (lb/sq ft)	0.24	0.76	0.23
Alpha	1.82	Stream Power (lb/ft s)	0.47	3.67	0.43
Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	335.73	292.82	287.98
C & E Loss (ft)	0.01	Cum SA (acres)	175.53	58.04	138.53

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 21.997

INPUT
Description:
Station Elevation Data num= 141

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8720.02	1221.27	8733.37	1221.22	8772.5	1221.11	8794.23	1221.06	8843.55	1221.08
8855.1	1221.09	8860.18	1221.09	8893.11	1221.17	8915.96	1221.2	8947.87	1221.22
8976.83	1221.22	9035.55	1221.06	9037.7	1221.05	9042.57	1221.04	9098.56	1220.93
9123.23	1220.89	9159.43	1220.88	9210.91	1220.75	9220.29	1220.72	9241.59	1220.56
9281.16	1220.27	9298.59	1220.16	9342.03	1219.88	9386.28	1219.65	9402.89	1219.55
9440.6	1219.37	9463.76	1219.26	9473.96	1219.23	9524.62	1219.04	9561.64	1218.94

```
 9585.49 1218.87 9639.62 1218.66 9646.36 1218.63 9649.32 1218.62 9707.22 1218.32
 9737.01 1218.13 9768.09 1217.92 9824.69 1217.49 9828.95 1217.46 9838.63 1217.42
 9889.82 1217.17 9912.37 1217.17 9934.99 1217.22 9954.94 1216.04 9961.63 1215.74
  9967.1 1215.45 9975.32 1214.99 9989.52 1214.19   10000 1213.5710000.64 1213.53
10005.97 1213.9310042.77 1217.4410072.42 1217.4510078.69 1217.4510086.04 1217.35
10089.81 1217.3910096.54 1217.3110156.44 1216.5810156.48 1216.5810163.33 1216.76
 10222.4  1217.910255.02 1218.03 10263.1 1218.0610315.88 1218.2610350.78 1218.41
10376.75 1218.5310435.68 1218.8510437.61 1218.8610438.46 1218.8610498.48 1219.29
10526.15 1219.4510559.35 1219.6410613.83 1219.9710620.21 1220.01 10634.7 1220.07
10681.08 1220.2610701.51 1220.3210741.94 1220.4710765.77 1220.0810766.64 1220.07
10767.54 1220.0610768.48 1220.0610770.96 1220.1110773.73  1220.210776.77 1220.28
10780.38 1220.2910817.52 1220.3510820.97  1220.310824.61 1220.2810831.12 1220.39
10838.33 1220.5810846.27 1220.7210850.68 1220.7210855.34 1220.7110873.71 1220.79
10877.87 1220.7710881.48 1220.7710885.13 1220.7810888.61  1220.810890.69  1220.8
10912.47 1221.0510914.76 1221.0610916.88 1221.0910920.51 1221.2210923.65 1221.38
10926.38 1221.49 10928.9 1221.5110931.17 1221.5110933.23  1221.510935.24  1221.5
10937.09  1221.510964.56 1221.6810985.41 1221.8311032.73 1222.1411046.27 1222.23
11052.24 1222.2611107.14 1222.6111125.77 1222.8211132.36 1222.8211182.29 1223.15
11184.96 1223.1511187.75 1223.1511190.57 1223.15 11227.6 1223.3411228.87 1223.35
11231.74 1223.3611293.29 1223.7711299.95 1223.7711309.93 1223.7711350.86 1223.96
11364.88 1223.9211367.87 1223.9211371.09 1223.9111374.56  1223.911378.03 1223.88
11382.02 1223.8611386.75 1223.8411392.29 1223.8311394.89 1223.8311399.52 1223.86
11406.44 1223.92

Manning's n Values        num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8720.02     .05 9768.09    .043 10222.4     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9768.09 10222.4             1350    1391    1270            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1219.73  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.26  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1219.46  * Reach Len. (ft)         * 1350.00  * 1391.00  * 1270.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  239.22  * 1185.38  *  267.70  *
* E.G. Slope (ft/ft)     *0.004522  * Area (sq ft)            *  239.22  * 1185.38  *  267.70  *
* Q Total (cfs)          * 6080.00  * Flow (cfs)              *  372.92  * 5217.99  *  489.09  *
* Top Width (ft)         * 1107.74  * Top Width (ft)          *  347.20  *  454.31  *  306.22  *
* Vel Total (ft/s)       *    3.59  * Avg. Vel. (ft/s)        *    1.56  *    4.40  *    1.83  *
* Max Chl Dpth (ft)      *    5.93  * Hydr. Depth (ft)        *    0.69  *    2.61  *    0.87  *
* Conv. Total (cfs)      * 90418.9  * Conv. (cfs)             *  5545.9  * 77599.5  *  7273.4  *
* Length Wtd. (ft)       * 1366.79  * Wetted Per. (ft)        *  347.21  *  454.62  *  306.23  *
* Min Ch El (ft)         * 1213.53  * Shear (lb/sq ft)        *    0.19  *    0.74  *    0.25  *
* Alpha                  *    1.32  * Stream Power (lb/ft s)  *    0.30  *    3.24  *    0.45  *
* Frctn Loss (ft)        *    2.79  * Cum Volume (acre-ft)    *  315.44  *  262.86  *  270.99  *
* C & E Loss (ft)        *    0.05  * Cum SA (acres)          *  156.94  *   47.79  *  122.91  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 3            RS: 21.733

INPUT
Description:
Station Elevation Data    num=     132
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*********************************************************************************
 8459.91 1219.46 8502.52  1219.2 8515.87 1218.99 8538.85 1218.49 8575.03  1217.5
 8596.04 1217.28 8619.41 1217.39 8649.99 1217.55 8684.26 1218.15 8701.76 1217.86
 8728.13 1217.95 8752.53 1218.21 8783.08 1218.43  8811.7 1218.28 8860.98 1218.49
 8870.87 1218.54 8876.61 1218.49 8930.03 1217.93 8970.13 1217.65  8989.2 1217.54
 9022.05 1217.33 9048.37 1217.17 9063.65 1217.06 9107.53 1216.78 9157.17 1216.45
  9166.7  1216.4 9183.11 1216.32 9225.86  1216.1 9250.69 1215.99 9285.03 1215.88
 9344.17 1215.66  9344.2 1215.66 9344.21 1215.66 9403.36  1215.5 9437.73 1215.41
 9462.53 1215.33 9505.24 1215.16 9521.69 1215.09 9531.25 1215.04 9580.86 1214.73
 9624.77 1214.51 9640.03 1214.43  9666.3 1214.28 9699.19 1214.09 9718.29 1213.98
 9758.36 1213.74 9811.81 1213.46 9817.52 1213.42 9827.36 1213.38 9876.69 1213.15
 9905.33 1213.11 9932.56 1212.68 9936.17 1212.64 9941.16  1212.5    9946 1212.27
```

```
 9998.14 1209.57 9998.52 1209.54 9999.24 1209.49   10000 1209.5310048.59 1212.16
10058.93 1212.7210064.09 1212.9710067.79 1213.2710074.13 1213.2810126.38  1213.4
10155.07 1213.5110189.96 1213.6910236.01 1214.0110253.55 1214.1310316.95 1214.58
10317.13 1214.5810317.76 1214.5810380.71 1214.98 10397.9 1215.0910444.29 1215.38
10478.84 1215.6110507.87  1215.810559.78 1216.1210571.45 1216.1910614.22 1216.43
10635.03 1216.5410640.72 1216.5710698.62 1216.8310721.66 1216.94 10762.2 1217.13
 10802.6 1217.2910825.78 1217.4110883.54 1217.7110888.12 1217.8110888.34 1217.81
10888.57 1217.8110888.83 1217.82 10889.1 1217.82 10889.4 1217.8310889.72 1217.83
10890.09 1217.8410890.49 1217.8410890.93 1217.85 10932.1 1218.6110934.44 1218.63
10936.97 1218.6410939.63 1218.6610941.81 1218.6710944.04 1218.6810946.27 1218.69
10979.92 1218.7810982.78 1218.7810985.83 1218.7810988.82 1218.7710997.27 1218.63
11003.13 1218.4511052.44  1218.711058.36 1218.6411060.63 1218.6411062.71 1218.64
11080.11 1218.7611126.36 1219.0911138.31 1219.0911138.86 1219.09 11139.4 1219.09
11139.94  1219.111141.13 1219.1211207.14 1219.5811207.27 1219.58 11207.3 1219.58
11270.85 1219.9811288.25 1220.0811334.43 1220.3211369.19 1220.5111398.01 1220.68
11450.13 1220.97 11461.6 1221.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8459.91     .05 9876.69    .04310126.38     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9876.6910126.38               850     881     890             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1216.90  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.11  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1216.78  * Reach Len. (ft)         *  850.00  *  881.00  *  890.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1350.83  * 1156.23  *  931.26  *
* E.G. Slope (ft/ft)      *0.001264  * Area (sq ft)            * 1350.83  * 1156.23  *  931.26  *
* Q Total (cfs)           * 7400.00  * Flow (cfs)              * 2076.96  * 3944.67  * 1378.38  *
* Top Width (ft)          * 1580.94  * Top Width (ft)          *  769.56  *  249.69  *  561.69  *
* Vel Total (ft/s)        *    2.15  * Avg. Vel. (ft/s)        *    1.54  *    3.41  *    1.48  *
* Max Chl Dpth (ft)       *    7.29  * Hydr. Depth (ft)        *    1.76  *    4.63  *    1.66  *
* Conv. Total (cfs)       *208129.5  * Conv. (cfs)             * 58415.6  *110946.2  * 38767.7  *
* Length Wtd. (ft)        *  876.18  * Wetted Per. (ft)        *  769.57  *  249.88  *  561.70  *
* Min Ch El (ft)          * 1209.49  * Shear (lb/sq ft)        *    0.14  *    0.37  *    0.13  *
* Alpha                   *    1.57  * Stream Power (lb/ft s)  *    0.21  *    1.25  *    0.19  *
* Frctn Loss (ft)         *    1.35  * Cum Volume (acre-ft)    *  290.80  *  225.48  *  253.51  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  139.63  *   36.55  *  110.26  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 3            RS: 21.566

INPUT
Description:
Station Elevation Data    num=     100
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8430.93 1217.13 8445.58 1217.08 8491.28 1216.91  8503.8 1216.86 8522.33 1216.79
 8562.03 1216.65 8588.86 1216.54 8620.25 1216.42 8666.71 1216.24 8678.48 1216.19
 8686.43 1216.16  8736.7 1215.98 8754.38 1215.92 8771.75 1215.08 8792.54 1214.18
 8840.78 1215.05 8863.78 1215.55 8881.58 1215.51 8911.38 1215.42 8955.47 1215.33
  8969.6 1215.29 8979.16 1215.27 9027.83 1215.16 9076.73 1215.07 9086.05 1215.06
 9099.85 1215.03 9144.28 1214.93 9174.31 1214.82  9202.5 1214.74 9244.23 1214.64
 9260.73 1214.61 9271.88 1214.58 9318.96 1214.49 9369.46 1214.44 9377.18 1214.42
 9388.61 1214.41 9435.41 1214.33 9467.03 1214.33 9493.63 1214.31 9532.99 1214.26
 9551.86 1214.24 9564.61 1214.21 9610.08 1214.05 9662.19 1213.88 9668.31 1213.85
 9677.37 1213.83 9726.53 1213.67 9759.76 1213.55 9784.76 1213.46 9821.75 1213.37
 9842.98 1213.32 9857.34 1213.33 9901.21 1213.37 9921.28 1213.41 9953.42  1210.9
 9957.46 1210.71 9962.15  1210.5 9967.66 1210.25 9973.97 1209.95 9981.62 1209.59
 9991.09 1209.14   10000 1208.6910000.19 1208.6810014.54 1209.3910027.84 1210.11
10036.58 1210.6210065.35 1213.0910100.34 1212.9510101.44 1212.9510165.58 1212.64
10179.27  1212.610230.82 1212.5710257.11  1212.610296.06 1212.6310334.94 1212.77
10361.31 1212.8610412.77 1213.0510426.55 1213.0910490.61 1213.3410491.79 1213.34
10497.94 1213.3710557.04  1213.610568.44 1213.6510622.28 1213.9410646.27 1214.08
10687.52 1214.3610724.11 1214.5910752.76 1214.7810801.94 1215.1310818.01 1215.24
10879.77 1215.6710883.25 1215.6910901.25  1215.810948.49  1216.110957.61 1216.16
11013.73  1216.511035.44 1216.6211078.98 1216.8411113.27 1217.0111144.22 1217.16
```

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8430.93     .05 9921.28    .04310065.35     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9921.2810065.35             1410    1483    1480            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1215.55  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1215.41  * Reach Len. (ft)         * 1410.00  * 1483.00  * 1480.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1121.10  *  679.06  * 1492.60  *
* E.G. Slope (ft/ft)      *0.001927  * Area (sq ft)            * 1121.10  *  679.06  * 1492.60  *
* Q Total (cfs)           * 7400.00  * Flow (cfs)              * 1497.36  * 2891.98  * 3010.67  *
* Top Width (ft)          * 2015.58  * Top Width (ft)          * 1095.04  *  144.07  *  776.47  *
* Vel Total (ft/s)        *    2.25  * Avg. Vel. (ft/s)        *    1.34  *    4.26  *    2.02  *
* Max Chl Dpth (ft)       *    6.73  * Hydr. Depth (ft)        *    1.02  *    4.71  *    1.92  *
* Conv. Total (cfs)       *168556.7  * Conv. (cfs)             * 34106.7  * 65873.3  * 68576.8  *
* Length Wtd. (ft)        * 1458.79  * Wetted Per. (ft)        * 1095.08  *  144.38  *  776.48  *
* Min Ch El (ft)          * 1208.68  * Shear (lb/sq ft)        *    0.12  *    0.57  *    0.23  *
* Alpha                   *    1.80  * Stream Power (lb/ft s)  *    0.16  *    2.41  *    0.47  *
* Frctn Loss (ft)         *    3.37  * Cum Volume (acre-ft)    *  266.69  *  206.92  *  228.75  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *  121.44  *   32.57  *   96.59  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 3            RS: 21.285

INPUT
Description:
Station Elevation Data     num=      86
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8951.04 1212.62 8955.95 1212.61 8959.79  1212.6 8970.53 1212.57 9021.89 1212.45
 9040.24 1212.41    9084  1212.3 9124.53  1212.2 9146.11 1212.13 9206.54 1211.86
 9208.22 1211.85 9208.82 1211.85 9244.23 1211.64 9289.07 1210.81 9299.95 1210.63
 9332.83 1210.95 9351.51 1211.09 9377.39 1210.96 9394.54 1210.88 9442.55 1210.61
 9456.65 1210.54 9461.68 1210.51 9518.76 1210.23 9545.97  1210.1 9580.86 1209.94
 9630.26 1209.76 9642.97 1209.71 9678.56 1209.57 9705.08 1209.47 9714.55 1209.43
 9767.19 1209.22 9798.84 1209.09 9829.29    1209 9883.13 1208.99  9891.4 1209.01
 9914.57 1209.05 9953.51 1209.15 9964.04 1208.63 9967.25 1208.35 9976.29 1207.61
 9999.05 1205.73   10000 1205.7810031.22 1207.3510050.95 1208.3510067.76 1209.25
10073.51 1209.2610097.78 1209.2610132.26 1209.2510153.68 1209.2810187.11 1209.17
10216.51 1208.8310216.66 1208.8310216.84 1208.8310285.77 1209.7310308.49 1209.85
10344.19 1210.0710367.23 1210.2110404.31 1210.4310425.98 1210.5810439.44 1210.66
10484.72 1210.9610534.69 1211.2510543.46 1211.2910557.57 1211.3210602.21 1211.39
10629.95 1211.4310660.95 1211.4910710.84 1211.5510719.69 1211.55 10725.2 1211.56
10778.44 1211.7110820.45 1211.8810837.18 1211.96 10864.1 1212.0710895.93  1212.2
10915.71 1212.2710954.67 1212.4311010.96 1212.5911013.41  1212.611017.36  1212.6
11072.16  1212.711106.21 1212.66 11130.9 1212.6411170.63  1212.611189.65 1212.59
11201.46 1212.59

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 8951.04     .05 9953.51    .04310067.76     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9953.5110067.76             1320    1467    1310            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1212.17  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.17  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1212.00  * Reach Len. (ft)         * 1320.00  * 1467.00  * 1310.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1462.84  *  513.37  * 1123.71  *
* E.G. Slope (ft/ft)      *0.002761  * Area (sq ft)            * 1462.84  *  513.37  * 1123.71  *
* Q Total (cfs)           * 8250.00  * Flow (cfs)              * 3476.69  * 2535.13  * 2238.18  *
```

* Top Width (ft)	* 1673.49	* Top Width (ft)	* 779.12	* 114.25	* 780.12	*
* Vel Total (ft/s)	* 2.66	* Avg. Vel. (ft/s)	* 2.38	* 4.94	* 1.99	*
* Max Chl Dpth (ft)	* 6.27	* Hydr. Depth (ft)	* 1.88	* 4.49	* 1.44	*
* Conv. Total (cfs)	*156999.1	* Conv. (cfs)	* 66162.0	* 48244.1	* 42593.0	*
* Length Wtd. (ft)	* 1359.17	* Wetted Per. (ft)	* 779.14	* 114.47	* 780.13	*
* Min Ch El (ft)	* 1205.73	* Shear (lb/sq ft)	* 0.32	* 0.77	* 0.25	*
* Alpha	* 1.55	* Stream Power (lb/ft s)	* 0.77	* 3.82	* 0.49	*
* Frctn Loss (ft)	* 3.62	* Cum Volume (acre-ft)	* 224.87	* 186.62	* 184.30	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 91.11	* 28.17	* 70.14	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 21.008

INPUT
Description:
Station Elevation Data num= 108

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8457.33	1210.4	8481.48	1210.32	8502.66	1210.24	8514.67	1210.21	8561.98	1210.1
8607.6	1210.02	8621.3	1210	8645.48	1209.96	8680.62	1209.91	8700.53	1209.88
8739.93	1209.8	8793.46	1209.66	8799.25	1209.64	8809.47	1209.6	8858.57	1209.43
8886.39	1209.32	8917.89	1209.2	8973.47	1209.09	8977.2	1209.08	8979.32	1209.08
9036.52	1208.94	9072.25	1208.69	9095.84	1208.59	9137.46	1208.54	9155.15	1208.49
9165.18	1208.48	9214.47	1208.26	9258.11	1208.12	9267.68	1208.05	9273.79	1208.01
9301.45	1208.33	9333.11	1208.44	9340.09	1208.56	9374.33	1207.17	9385.55	1206.74
9442.72	1207.67	9448.71	1207.72	9451.74	1207.8	9465.45	1207.64	9511.06	1207.39
9536.9	1206.6	9570.38	1205.91	9629.44	1206.72	9629.69	1206.72	9629.83	1206.72
9689.01	1206.62	9722.76	1206.38	9748.33	1206.19	9793.44	1206.07	9807.64	1206.03
9815.69	1206.04	9866.96	1206.18	9908.62	1206.37	9926.28	1206.48	9983.75	1203.79
9990.36	1203.34	9999.13	1202.74	10000	1202.68	10001.11	1202.61	10004.4	1202.81
10016.36	1203.56	10063.5	1206.08	10086.5	1205.92	10108.59	1205.93	10167.2	1206.13
10170.39	1206.14	10171.58	1206.14	10232.18	1205.51	10256.66	1205.43	10293.98	1205.48
10341.75	1205.52	10355.78	1205.58	10393.02	1205.43	10417.57	1205.32	10426.83	1205.33
10479.37	1205.66	10511.91	120	610541.17	1206.61	0596.99	1206.55	10602.97	1206.49
10618.84	1206.85	10664.76	1207.79	10682.07	1208.14	10726.56	1208.19	10767.15	1208.52
10788.36	1208.96	10844.65	1209.09	10850.16	1209.11	0852.23	1209.13	10911.95	1209.44
10937.31	1209.54	10973.75	1209.66	11022.39	1209.64	11035.55	1209.65	11070.47	1209.69
11097.35	1209.71	11107.47	1209.73	11159.14	1209.87	11192.55	1209.99	11220.94	1210.11
11277.63	1210.35	11282.74	1210.37	11296.29	1210.44	11344.53	1210.68	11362.71	1210.77
11406.33	1210.99	11447.79	1211.23	11468.13	1211.35				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8457.33	.05	9926.28	.043	10063.5	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9926.28	10063.5	1250	1347	1220	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1208.54	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.14	* Wt. n-Val.	* 0.050	* 0.043	* 0.050	*
* W.S. Elev (ft)	* 1208.40	* Reach Len. (ft)	* 1250.00	* 1347.00	* 1220.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1031.65	* 527.95	* 1494.77	*
* E.G. Slope (ft/ft)	*0.002575	* Area (sq ft)	* 1031.65	* 527.95	* 1494.77	*
* Q Total (cfs)	* 8250.00	* Flow (cfs)	* 2201.73	* 2270.89	* 3777.38	*
* Top Width (ft)	* 1547.61	* Top Width (ft)	* 721.36	* 137.22	* 689.03	*
* Vel Total (ft/s)	* 2.70	* Avg. Vel. (ft/s)	* 2.13	* 4.30	* 2.53	*
* Max Chl Dpth (ft)	* 5.79	* Hydr. Depth (ft)	* 1.43	* 3.85	* 2.17	*
* Conv. Total (cfs)	*162582.4	* Conv. (cfs)	* 43389.5	* 44752.3	* 74440.7	*
* Length Wtd. (ft)	* 1271.48	* Wetted Per. (ft)	* 721.44	* 137.42	* 689.06	*
* Min Ch El (ft)	* 1202.61	* Shear (lb/sq ft)	* 0.23	* 0.62	* 0.35	*
* Alpha	* 1.27	* Stream Power (lb/ft s)	* 0.49	* 2.66	* 0.88	*
* Frctn Loss (ft)	* 2.32	* Cum Volume (acre-ft)	* 187.07	* 169.08	* 144.93	*
* C & E Loss (ft)	* 0.01	* Cum SA (acres)	* 68.37	* 23.93	* 48.05	*

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 20.752

INPUT
Description:
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8762.13	1206.18	8788.85	1206.1	8803	1206.06	8849.61	1205.93	8891.02	1205.82
8910.37	1205.78	8953.48	1205.68	8971.12	1205.64	8979.04	1205.62	9031.87	1205.48
9067.05	1205.37	9092.63	1205.31	9149.63	1205.21	9153.38	1205.2	9155.07	1205.2
9214.14	1205.12	9243.09	1205.1	9274.89	1205.08	9331.1	1205.02	9335.65	1205.01
9345.78	1204.99	9396.4	1204.9	9419.12	1204.87	9457.16	1204.81	9507.14	1204.67
9517.91	1204.64	9541.93	1204.56	9578.67	1204.43	9595.15	1204.41	9639.42	1204.28
9683.17	1204.04	9700.18	1203.96	9729.18	1203.79	9769.1	1203.56	9770.55	1203.56
9774.7	1203.52	9813.61	1203.17	9837.01	1203.03	9859.2	1202.69	9882.44	1202.32
9934.24	1202.15	9943.2	1202.12	9944.84	1202.1	9947.85	1201.88	9949.36	1201.78
9953.42	1201.54	9999.33	1199.02	10000	1199.06	10002.95	1199.25	10025.11	1200.62
10035.53	1201.22	10044.13	1201.61	10049.52	1201.81	10066.15	1202.52	10118.05	1202.64
10128.25	1202.69	10156.78	1202.53	10190.35	1202.32	10202.35	1202.35	10252.46	1202.7
10286.65	1202.91	10314.56	1203.05	10370.95	1203.39	10376.66	1203.43	10392.64	1203.52
10438.76	1203.81	10455.25	1203.91	10500.87	1204.16	10539.55	1204.34	10562.97	1204.44
10623.85	1204.77	10625.07	1204.77	10628.5	1204.79	10687.18	1205.08	10708.15	1205.17
10749.28	1205.36	10792.45	1205.56	10811.38	1205.66	10864.36	1205.93	10873.48	1205.97
10876.75	1205.99	10935.59	1206.32	10961.05	1206.47	10997.69	1206.71	11045.35	1207
11059.79	1207.11	11100.21	1207.39	11121.9	1207.54	11129.65	1207.59	11184	1207.95

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8762.13	.05	9859.2	.04	10066.15	.05

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
9859.2 10066.15 1370 1540 1390 .1 .3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1206.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1206.10	Reach Len. (ft)	1370.00	1540.00	1390.00
Crit W.S. (ft)		Flow Area (sq ft)	1331.46	975.82	1719.03
E.G. Slope (ft/ft)	0.001363	Area (sq ft)	1331.46	975.82	1719.03
Q Total (cfs)	8250.00	Flow (cfs)	1688.53	3498.87	3062.61
Top Width (ft)	2109.39	Top Width (ft)	1071.57	206.95	830.87
Vel Total (ft/s)	2.05	Avg. Vel. (ft/s)	1.27	3.59	1.78
Max Chl Dpth (ft)	7.08	Hydr. Depth (ft)	1.24	4.72	2.07
Conv. Total (cfs)	223443.7	Conv. (cfs)	45732.3	94763.6	82947.9
Length Wtd. (ft)	1478.32	Wetted Per. (ft)	1071.58	207.14	830.88
Min Ch El (ft)	1199.02	Shear (lb/sq ft)	0.11	0.40	0.18
Alpha	1.66	Stream Power (lb/ft s)	0.13	1.44	0.31
Frctn Loss (ft)	4.36	Cum Volume (acre-ft)	153.16	145.83	99.93
C & E Loss (ft)	0.04	Cum SA (acres)	42.65	18.61	26.77

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 3 RS: 20.461

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8736.67	1203.38	8737.11	1203.38	8738.28	1203.37	8739.49	1203.33	8740.75	1203.29
8783.71	1203.38	8783.97	1203.37	8784.19	1203.37	8784.42	1203.37	8784.65	1203.37
8785.3	1203.38	8796.13	1203.42	8835.33	1203.3	8845.62	1203.27	8886.4	1203.12

```
 8910.09 1203.07 8937.47 1203.01 8974.57 1202.95 8988.54 1202.93 9039.04 1202.93
 9039.61 1202.93 9041.79 1202.93 9090.68 1202.92 9103.51  1202.9 9141.75 1202.84
 9167.98 1202.78 9192.82 1202.71 9232.45 1202.56 9243.88 1202.51 9287.45 1202.27
 9294.95 1202.23 9296.92 1202.22 9346.02 1201.96 9361.39 1201.87 9397.09 1201.69
 9425.87 1201.52 9448.16 1201.39 9490.34 1201.16 9499.23  1201.1 9533.11 1200.94
  9550.3 1200.86 9554.81 1200.84 9601.37  1200.6 9619.28 1200.51 9652.44 1200.36
 9683.75 1200.17 9703.51 1200.06 9748.23 1199.82 9754.58 1199.79 9778.77 1199.64
 9805.65 1199.47  9812.7 1199.44 9856.71 1199.24 9877.17 1199.23 9907.78 1199.17
 9927.86 1199.18 9980.62 1196.64 9998.89 1195.32   10000 1195.3910015.91 1196.47
10059.36 1197.8510069.18 1198.2410071.29 1198.3210072.87 1198.37 10074.1 1198.41
10075.86 1198.4610077.26 1198.4910078.43 1198.5110079.09 1198.5110079.74 1198.52
10087.97 1198.7610142.95 1198.7310161.64 1198.7610211.03 1198.98 10235.3  1199.1
10279.12 1199.3610308.97 1199.5610347.21 1199.8310382.63  1200.110415.29 1200.35
10456.29 1200.6710483.38 1200.8810505.75 1201.0510529.96 1201.2610551.46 1201.43
10603.62 1201.8110619.55  1201.910677.28 1202.2210687.64 1202.2710750.95 1202.56
10755.72 1202.5910814.04  1202.910823.81 1202.9510824.61 1202.95 10891.9 1203.29
10898.27 1203.3210959.98 1203.5910971.94 1203.6311028.07 1203.86 11045.6 1203.94
11096.16 1204.2111119.27 1204.34

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8736.67     .05 9927.86    .04310308.97     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9927.8610308.97             1340    1142    1020            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1201.81  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.55  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1201.26  * Reach Len. (ft)         * 1340.00  * 1142.00  * 1020.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  532.04  * 1125.72  *  192.47  *
* E.G. Slope (ft/ft)      *0.008486  * Area (sq ft)            *  532.04  * 1125.72  *  192.47  *
* Q Total (cfs)           * 9470.00  * Flow (cfs)              * 1614.71  * 7374.71  *  480.58  *
* Top Width (ft)          * 1057.85  * Top Width (ft)          *  455.79  *  381.11  *  220.95  *
* Vel Total (ft/s)        *    5.12  * Avg. Vel. (ft/s)        *    3.03  *    6.55  *    2.50  *
* Max Chl Dpth (ft)       *    5.94  * Hydr. Depth (ft)        *    1.17  *    2.95  *    0.87  *
* Conv. Total (cfs)       *102803.1  * Conv. (cfs)             * 17528.8  * 80057.4  *  5217.0  *
* Length Wtd. (ft)        * 1181.13  * Wetted Per. (ft)        *  455.79  *  381.30  *  220.95  *
* Min Ch El (ft)          * 1195.32  * Shear (lb/sq ft)        *    0.62  *    1.56  *    0.46  *
* Alpha                   *    1.35  * Stream Power (lb/ft s)  *    1.88  *   10.25  *    1.15  *
* Frctn Loss (ft)         *    2.07  * Cum Volume (acre-ft)    *  123.86  *  108.69  *   69.43  *
* C & E Loss (ft)         *    0.14  * Cum SA (acres)          *   18.63  *    8.22  *    9.99  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 3            RS: 20.245

INPUT
Description:
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
**********************************************************************************
 8917.13 1200.64 8954.87 1200.55 8956.38 1200.54 8969.87  1200.5 9023.62 1200.32
 9029.66 1200.29 9090.85 1200.06 9104.46 1199.98 9158.08 1199.72 9179.25 1199.59
 9225.31 1199.31 9254.04 1199.13 9274.32    1199 9292.54 1198.87 9328.84 1198.62
 9359.77 1198.37 9403.63    1198    9427 1197.79 9478.43 1197.33 9494.23  1197.2
 9553.22 1196.73 9561.46 1196.66 9628.01 1196.12 9628.69 1196.12 9634.71 1196.06
 9695.92 1195.45 9702.81 1195.38 9763.15 1194.89  9777.6 1194.81 9830.38 1194.61
  9852.4  1194.6 9897.61 1194.61 9927.19 1194.69 9947.02 1194.78 9962.17 1193.66
 9968.84 1193.29 9980.98  1192.6 9999.85 1191.44   10000 1191.4510009.08 1191.84
10022.78 1192.4710056.34    119410081.93 1194.0210118.54 1194.13 10137.4 1194.24
10154.84 1194.4710192.87 1195.1710234.01 1195.4910248.34 1195.6210261.59 1195.73
10303.81 1196.0910349.49 1196.4710359.28 1196.5510368.34  1196.610414.75 1196.91
10464.96 1197.2310470.22 1197.2610475.08 1197.2910525.69 1197.6310580.44 1198.03
10581.16 1198.0310581.83 1198.0310636.63 1198.3810688.58 1198.68 10692.1  1198.7
10695.91 1198.7210747.57 1199.0310795.32 1199.3510803.04  1199.410811.39 1199.44
10858.51  1199.710902.07 1199.9710913.98 1200.0510926.86 1200.1310969.45 1200.41
11008.81  1200.711024.92 1200.8111042.34 1200.9411080.39 1201.1911115.56  1201.4
```

```
11135.86 1201.5211157.81 1201.6711191.33 1201.92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8917.13     .05 9947.02    .04310192.87     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9947.0210192.87             1920    2109    1940            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1199.60  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.08  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1199.52  * Reach Len. (ft)         * 2109.00  * 2109.00  * 2109.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       * 2140.39  * 1435.03  * 1287.66  *
* E.G. Slope (ft/ft)     *0.000734  * Area (sq ft)            * 2140.39  * 1435.03  * 1287.66  *
* Q Total (cfs)          * 9470.00  * Flow (cfs)              * 3450.62  * 4353.38  * 1666.01  *
* Top Width (ft)         * 1633.37  * Top Width (ft)          *  755.42  *  245.85  *  632.10  *
* Vel Total (ft/s)       *    1.95  * Avg. Vel. (ft/s)        *    1.61  *    3.03  *    1.29  *
* Max Chl Dpth (ft)      *    8.07  * Hydr. Depth (ft)        *    2.83  *    5.84  *    2.04  *
* Conv. Total (cfs)      *349542.8  * Conv. (cfs)             *127364.1  *160685.4  * 61493.3  *
* Length Wtd. (ft)       * 2109.00  * Wetted Per. (ft)        *  755.44  *  246.02  *  632.12  *
* Min Ch El (ft)         * 1191.44  * Shear (lb/sq ft)        *    0.13  *    0.27  *    0.09  *
* Alpha                  *    1.44  * Stream Power (lb/ft s)   *    0.21  *    0.81  *    0.12  *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)    *   82.76  *   75.12  *   52.10  *
* C & E Loss (ft)        *          * Cum SA (acres)          *          *          *          *
*****************************************************************************************

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 4            RS: 19.845

INPUT
Description:
Station Elevation Data    num=      93
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 8612.37  1200.4 8634.13 1200.22 8661.36 1199.99 8662.23 1199.99 8730.98 1199.38
 8734.08 1199.36 8800.61 1198.73 8805.93 1198.69 8870.23 1198.13 8877.78 1198.07
 8939.85 1197.57 8949.63 1197.49 9009.48 1197.03 9021.48 1196.94  9079.1 1196.52
 9093.32 1196.41 9148.73 1196.03 9165.17 1195.91 9218.35 1195.54 9237.02  1195.4
 9287.97 1195.07 9308.87 1194.93  9357.6 1194.68 9380.72 1194.54 9427.22 1194.29
 9452.57 1194.13 9475.06 1193.99 9496.85 1193.84 9524.42 1193.65 9566.47 1193.32
 9596.27 1193.09  9636.1 1192.76 9668.12 1192.49 9705.72 1192.17 9739.97 1191.88
 9775.35  1191.6 9811.82 1191.34 9844.97 1191.13 9883.67 1190.92 9914.59 1190.75
 9934.74 1190.65 9988.84 1187.12 9998.29 1186.67   10000 1186.7410034.65 1188.35
10074.81 1190.3610100.43  1190.410128.99 1190.4810149.43 1190.6710183.17 1190.95
 10230.3 1191.4210237.34  1191.510242.38 1191.5510291.52  1192.110335.34 1192.61
 10345.7 1192.7410360.17  1192.910399.87 1193.3410428.29 1193.6210454.05 1193.87
10490.04 1194.1910508.23 1194.3510521.24 1194.46 10562.4 1194.81 10614.2 1195.22
10616.58 1195.24 10619.9 1195.2610670.75 1195.6610707.15 1195.9210724.93 1196.05
10749.77 1196.2210779.11 1196.41 10800.1 1196.5510833.28 1196.7610879.64 1197.06
10887.46 1197.1110893.06 1197.1410941.64 1197.4610986.01 1197.7810995.81 1197.85
11009.51 1197.9511049.99 1198.2611078.96 1198.5111104.17 1198.7211139.38 1199.03
11158.34  1199.211171.92 1199.3311212.52 1199.6811264.87 1200.1111266.69 1200.13
11269.24 1200.1511305.67 1200.4311320.87 1200.55

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8612.37     .05 9883.67    .04310183.17     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9883.6710183.17               5       5       5            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1195.37  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.15  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1195.22  * Reach Len. (ft)         *    5.00  *    5.00  *    5.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       * 1278.12  * 1668.01  *  864.47  *
* E.G. Slope (ft/ft)     *0.001132  * Area (sq ft)            * 1278.12  * 1668.01  *  864.47  *
* Q Total (cfs)          * 9540.00  * Flow (cfs)              * 2073.31  * 6091.51  * 1375.18  *
* Top Width (ft)         * 1349.08  * Top Width (ft)          *  618.69  *  299.50  *  430.89  *
* Vel Total (ft/s)       *    2.50  * Avg. Vel. (ft/s)        *    1.62  *    3.65  *    1.59  *
* Max Chl Dpth (ft)      *    8.55  * Hydr. Depth (ft)        *    2.07  *    5.57  *    2.01  *
```

* Conv. Total (cfs)	*283491.6	* Conv. (cfs)	* 61610.7	*181015.9	* 40865.0	*
* Length Wtd. (ft)	* 5.00	* Wetted Per. (ft)	* 618.70	* 299.72	* 430.91	*
* Min Ch El (ft)	* 1186.67	* Shear (lb/sq ft)	* 0.15	* 0.39	* 0.14	*
* Alpha	* 1.51	* Stream Power (lb/ft s)	* 0.24	* 1.44	* 0.23	*
* Frctn Loss (ft)	* 0.01	* Cum Volume (acre-ft)	* 28.22	* 66.39	* 27.42	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	* 0.07	* 0.03	* 0.05	*

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 4 RS: 19.844

INPUT
Description: Duplicate of 19.845. Necessary for 2 x-sections within a reach.
This reach separates two tributary inflows to Waterman Wash
Station Elevation Data num= 93

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8612.37	1200.4	8634.13	1200.22	8661.36	1199.99	8662.23	1199.99	8730.98	1199.38
8734.08	1199.36	8800.61	1198.73	8805.93	1198.69	8870.23	1198.13	8877.78	1198.07
8939.85	1197.57	8949.63	1197.49	9009.48	1197.03	9021.48	1196.94	9079.1	1196.52
9093.32	1196.41	9148.73	1196.03	9165.17	1195.91	9218.35	1195.54	9237.02	1195.4
9287.97	1195.07	9308.87	1194.93	9357.6	1194.68	9380.72	1194.54	9427.22	1194.29
9452.57	1194.13	9475.06	1193.99	9496.85	1193.84	9524.42	1193.65	9566.47	1193.32
9596.27	1193.09	9636.1	1192.76	9668.12	1192.49	9705.72	1192.17	9739.97	1191.88
9775.35	1191.6	9811.82	1191.34	9844.97	1191.13	9883.67	1190.92	9914.59	1190.75
9934.74	1190.65	9988.84	1187.12	9998.29	1186.67	10000	1186.74	10034.65	1188.35
10074.81	1190.36	10100.43	1190.41	10128.99	1190.48	10149.43	1190.67	10183.17	1190.95
10230.3	1191.42	10237.34	1191.51	10242.38	1191.55	10291.52	1192.11	10335.34	1192.61
10345.7	1192.74	10360.17	1192.91	10399.87	1193.34	10428.29	1193.62	10454.05	1193.87
10490.04	1194.19	10508.23	1194.35	10521.24	1194.46	10562.4	1194.81	10614.2	1195.22
10616.58	1195.24	10619.9	1195.26	10670.75	1195.66	10707.15	1195.92	10724.93	1196.05
10749.77	1196.22	10779.11	1196.41	10800.1	1196.55	10833.28	1196.76	10879.64	1197.06
10887.46	1197.11	10893.06	1197.14	10941.64	1197.46	10986.01	1197.78	10995.81	1197.85
11009.51	1197.95	11049.99	1198.26	11078.96	1198.51	11104.17	1198.72	11139.38	1199.03
11158.34	1199.21	11171.92	1199.33	11212.52	1199.68	11264.87	1200.11	11266.69	1200.13
11269.24	1200.15	11305.67	1200.43	11320.87	1200.55				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8612.37	.05	9883.67	.043	10183.17	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9883.67	10183.17	1520	1555	1500	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1195.36	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.15	* Wt. n-Val.	* 0.050	* 0.043	* 0.050	*
* W.S. Elev (ft)	* 1195.21	* Reach Len. (ft)	* 1555.00	* 1555.00	* 1555.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 1273.89	* 1665.96	* 861.53	*
* E.G. Slope (ft/ft)	*0.001139	* Area (sq ft)	* 1273.89	* 1665.96	* 861.53	*
* Q Total (cfs)	* 9540.00	* Flow (cfs)	* 2070.21	* 6096.62	* 1373.18	*
* Top Width (ft)	* 1347.16	* Top Width (ft)	* 617.63	* 299.50	* 430.03	*
* Vel Total (ft/s)	* 2.51	* Avg. Vel. (ft/s)	* 1.63	* 3.66	* 1.59	*
* Max Chl Dpth (ft)	* 8.54	* Hydr. Depth (ft)	* 2.06	* 5.56	* 2.00	*
* Conv. Total (cfs)	*282674.9	* Conv. (cfs)	* 61341.3	*180645.7	* 40687.9	*
* Length Wtd. (ft)	* 1555.00	* Wetted Per. (ft)	* 617.65	* 299.72	* 430.05	*
* Min Ch El (ft)	* 1186.67	* Shear (lb/sq ft)	* 0.15	* 0.40	* 0.14	*
* Alpha	* 1.51	* Stream Power (lb/ft s)	* 0.24	* 1.45	* 0.23	*
* Frctn Loss (ft)	*	* Cum Volume (acre-ft)	* 28.07	* 66.20	* 27.32	*
* C & E Loss (ft)	*	* Cum SA (acres)	*	*	*	*

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 5 RS: 19.551

INPUT
Description:
Station Elevation Data num= 88

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8780.98	1194.93	8799.1	1194.89	8828.02	1194.81	8866.92	1194.75	8902.03	1194.66

```
 8934.73 1194.58 8976.04 1194.49 9002.55  1194.4 9050.05 1194.24 9070.36 1194.14
 9124.07 1193.88 9138.18 1193.79 9198.08 1193.44 9205.99 1193.39 9272.09 1193.01
  9273.8    1193 9292.56 1192.88 9341.62 1192.59  9346.1 1192.57 9409.43  1192.2
 9420.12 1192.14 9477.25 1191.74 9494.13 1191.61 9545.06 1191.13 9568.14  1190.9
 9612.88 1190.44 9642.16 1190.12 9680.69 1189.71 9716.17 1189.31 9748.51 1188.96
 9790.18 1188.52 9816.32  1188.3 9864.19 1187.95 9884.14 1187.87 9938.21 1187.73
 9946.97 1187.23 9954.33 1186.29 9988.39 1182.72   10000 1182.8310002.26 1182.86
10006.29 1182.9110027.95 1184.7710040.33 1185.8410064.17 1187.5610089.44 1187.49
10119.25 1187.4110153.97 1187.3410174.33 1187.3210191.82 1187.3610229.41 1187.42
10273.18 1187.6110284.49 1187.68 10294.2 1187.7410339.57 1188.0510392.39 1188.47
10394.64 1188.4910396.58 1188.5110449.72 1188.9810498.96 1189.43 10504.8 1189.48
10511.61 1189.5410559.88 1189.9710601.33 1190.3210614.96 1190.4310630.82 1190.56
10670.03 1190.8910703.71 1191.1610725.11 1191.3410750.03 1191.5510780.19  1191.8
10806.09 1192.0110835.27 1192.2610869.24 1192.5410890.35 1192.7210908.47 1192.86
10945.43 1193.1510988.46 1193.4811000.51 1193.5711010.85 1193.6511055.58 1194.01
11107.67 1194.6511110.66 1194.6811113.23 1194.7111165.74 1195.1811215.61 1195.62
11220.82 1195.6711226.88 1195.73 11275.9  1196.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 8780.98     .05 9790.18    .043 10294.2     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9790.18 10294.2             1060    1089    1120            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1191.25  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.20  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1191.06  * Reach Len. (ft)         * 1060.00  * 1089.00  * 1120.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  298.81  * 2042.90  *  669.37  *
* E.G. Slope (ft/ft)     *0.001905  * Area (sq ft)            *  298.81  * 2042.90  *  669.37  *
* Q Total (cfs)          * 9510.00  * Flow (cfs)              *  451.36  * 7827.95  * 1230.69  *
* Top Width (ft)         * 1138.39  * Top Width (ft)          *  237.76  *  504.02  *  396.61  *
* Vel Total (ft/s)       *    3.16  * Avg. Vel. (ft/s)        *    1.51  *    3.83  *    1.84  *
* Max Chl Dpth (ft)      *    8.34  * Hydr. Depth (ft)        *    1.26  *    4.05  *    1.69  *
* Conv. Total (cfs)      *217893.7  * Conv. (cfs)             * 10341.5  *179354.6  * 28197.6  *
* Length Wtd. (ft)       * 1087.02  * Wetted Per. (ft)        *  237.77  *  504.47  *  396.63  *
* Min Ch El (ft)         * 1182.72  * Shear (lb/sq ft)        *    0.15  *    0.48  *    0.20  *
* Alpha                  *    1.27  * Stream Power (lb/ft s)  *    0.23  *    1.85  *    0.37  *
* Frctn Loss (ft)        *    2.41  * Cum Volume (acre-ft)    *   65.42  *  105.86  *   34.14  *
* C & E Loss (ft)        *    0.01  * Cum SA (acres)          *   22.04  *   15.85  *   14.14  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 5            RS: 19.344

INPUT
Description:
Station Elevation Data    num=      69
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9034.02 1188.99 9053.68 1189.07 9097.44  1189.2 9122.85 1189.24  9169.8 1189.25
 9192.02 1189.24 9242.16 1189.16 9261.19 1189.11 9314.51 1188.87 9330.37 1188.77
 9386.87 1188.32 9399.54 1188.21 9459.23 1187.68 9468.71  1187.6 9531.59 1187.11
 9537.88 1187.06 9603.94 1186.58 9607.05 1186.55 9674.55 1186.11 9676.22  1186.1
  9676.3  1186.1  9745.4 1185.78 9748.66 1185.77 9814.57 1185.59 9821.01 1185.55
 9883.74 1185.45 9893.37 1185.44 9923.81 1185.58 9974.21 1181.06 9992.75 1179.48
   10000 1180.0810006.53 1180.6310008.14 1180.7810009.64 1180.8910066.09 1184.91
10081.38 1185.0310130.31 1185.5210143.07 1185.6610176.32 1186.0810204.76 1186.45
10215.67 1186.5310266.44 1186.6610301.04 1186.9610328.13 1187.2210386.41 1188.21
10389.82 1188.28 10398.7 1188.4410451.51 1189.3910471.78 1189.6310513.19 1190.02
10557.15 1190.4110574.88 1190.5410621.08 1190.8910636.57 1191.0110642.52 1191.06
10698.26 1191.4910727.89 1191.7210759.94 1191.9410813.25  1192.310821.63 1192.35
10843.46 1192.4610883.32 1192.6710898.62 1192.7410945.01 1192.9310983.99 1193.06
 11006.7 1193.1311065.84 1193.3111068.38 1193.3211069.36 1193.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
**********************************************
 9034.02     .05 9923.81    .04310204.76     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9923.8110204.76               970    1109     990            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1188.83  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.27  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1188.56  * Reach Len. (ft)         *  970.00  * 1109.00  *  990.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1128.66  * 1287.43  *  275.52  *
* E.G. Slope (ft/ft)      *0.002621  * Area (sq ft)            * 1128.66  * 1287.43  *  275.52  *
* Q Total (cfs)           * 9510.00  * Flow (cfs)              * 2716.23  * 6276.03  *  517.74  *
* Top Width (ft)          * 1048.91  * Top Width (ft)          *  567.27  *  280.95  *  200.70  *
* Vel Total (ft/s)        *    3.53  * Avg. Vel. (ft/s)        *    2.41  *    4.87  *    1.88  *
* Max Chl Dpth (ft)       *    9.08  * Hydr. Depth (ft)        *    1.99  *    4.58  *    1.37  *
* Conv. Total (cfs)       *185772.1  * Conv. (cfs)             * 53059.9  *122598.5  * 10113.7  *
* Length Wtd. (ft)        * 1057.59  * Wetted Per. (ft)        *  567.28  *  281.43  *  200.71  *
* Min Ch El (ft)          * 1179.48  * Shear (lb/sq ft)        *    0.33  *    0.75  *    0.22  *
* Alpha                   *    1.40  * Stream Power (lb/ft s)  *    0.78  *    3.65  *    0.42  *
* Frctn Loss (ft)         *    2.80  * Cum Volume (acre-ft)    *   48.05  *   64.24  *   21.99  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *   12.24  *    6.03  *    6.46  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 5            RS: 19.134

INPUT
Description:
Station Elevation Data     num=      109
     Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev      Sta    Elev
*****************************************************************************************
 8813.94 1190.45 8854.49 1190.24 8872.83 1190.08 8908.55 1189.77 8932.76 1189.56
 8945.19 1189.48 8992.69 1189.12 9035.89 1188.89 9052.62  1188.8 9085.18  1188.6
 9112.54 1188.42 9126.59 1188.33 9172.47    1188  9217.3 1187.66  9232.4 1187.54
 9261.81 1187.28 9292.33 1187.01    9308 1186.86 9352.26 1186.41  9398.7 1185.91
 9412.18 1185.76 9438.44 1185.47 9472.11  1185.1  9489.4 1184.91 9532.04 1184.46
  9580.1 1183.96 9591.97 1183.84 9615.07 1183.61 9651.89 1183.25  9670.8 1183.09
 9711.82 1182.83 9761.51 1182.67 9767.67 1182.65 9771.75 1182.65  9791.7 1182.63
 9831.68  1182.6 9852.21  1182.6 9891.61 1182.57 9942.91 1182.54  9948.1 1182.54
 9953.01 1181.93 9954.95 1181.65 9960.45 1180.82 9991.18 1176.34 9994.64 1176.61
   10000 1176.9910008.87 1177.5910013.86 1178.0710024.13 1178.47 10049.1 1179.87
10086.76 1182.2810093.23 1182.3110099.27 1182.5110106.55 1182.7610114.83 1182.98
10131.21  1183.1 10141.1  1183.210152.15 1183.1710163.81 1183.1210175.27 1183.12
10187.08 1183.1210190.25 1183.1510201.85 1183.1510212.27 1183.05 10219.7 1183.13
10248.33 1183.8910251.75 1184.1110256.98 1184.2210262.36 1184.17 10267.5 1184.11
10285.33 1184.2310293.02 1184.2210299.51 1184.21 10304.5 1184.2410351.72 1184.58
10353.29  1184.610354.35 1184.6310355.13 1184.6410355.49 1184.6410355.82 1184.64
10356.13 1184.6410361.88 1184.64 10410.6 1184.9510457.65 1185.2710466.31 1185.32
10475.27  1185.410522.01 1185.8410567.15 1186.9510577.72 1187.1810588.67 1187.38
10633.43 1187.9910676.66 1188.4410689.14  1188.610702.06 1188.6910744.85 1189.08
10786.16 1189.4810800.55 1189.5710815.46 1189.6210856.26 1189.6710895.67 1189.83
10911.97  1189.910928.85 1189.9910967.68 1190.1611005.17 1190.3711023.39 1190.47
11042.24 1190.5911079.09  1190.811114.68 1191.05 11134.8 1191.18

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8813.94     .05  9948.1    .043 10141.1     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9948.1 10141.1               930     916     960            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1186.03  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.31  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1185.72  * Reach Len. (ft)         *  916.00  *  916.00  *  916.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1190.63  * 1035.16  *  512.18  *
* E.G. Slope (ft/ft)      *0.002676  * Area (sq ft)            * 1190.63  * 1035.16  *  512.18  *
* Q Total (cfs)           * 9770.00  * Flow (cfs)              * 3130.97  * 5657.64  *  981.38  *
* Top Width (ft)          * 1093.34  * Top Width (ft)          *  532.24  *  193.00  *  368.10  *
* Vel Total (ft/s)        *    3.57  * Avg. Vel. (ft/s)        *    2.63  *    5.47  *    1.92  *
```

Max Chl Dpth (ft)	9.38	Hydr. Depth (ft)	2.24	5.36	1.39
Conv. Total (cfs)	188852.0	Conv. (cfs)	60521.1	109361.0	18969.9
Length Wtd. (ft)	916.00	Wetted Per. (ft)	532.25	193.65	368.12
Min Ch El (ft)	1176.34	Shear (lb/sq ft)	0.37	0.89	0.23
Alpha	1.56	Stream Power (lb/ft s)	0.98	4.88	0.45
Frctn Loss (ft)		Cum Volume (acre-ft)	22.23	34.67	13.04
C & E Loss (ft)		Cum SA (acres)			

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 6 RS: 18.961

INPUT
Description:
Station Elevation Data num= 102

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8779.05	1186.67	8787.46	1186.66	8830.48	1186.55	8860.16	1186.46	8899.35	1186.31
8932.86	1186.2	8968.23	1186.07	9005.56	1185.96	9037.1	1185.82	9078.26	1185.72
9105.97	1185.57	9150.97	1185.36	9174.85	1185.16	9223.67	1184.71	9243.72	1184.49
9296.37	1183.9	9312.6	1183.72	9369.07	1183.13	9381.47	1183.01	9441.77	1182.49
9450.35	1182.43	9514.47	1181.99	9519.22	1181.96	9587.17	1181.58	9588.1	1181.58
9604.75	1181.49	9656.97	1181.23	9659.87	1181.21	9725.85	1180.86	9732.57	1180.83
9764.49	1180.64	9802.03	1178.94	9824.39	1178.28	9853.07	1179.46	9862.97	1179.78
9864.78	1179.82	9867.6	1179.83	9868.96	1179.81	9877.98	1179.97	9932.47	1179.81
9941.33	1179.78	9958.61	1177.95	9990.84	1174.2	10000	1174.8	10002.59	1175.07
10007.63	1175.4	10062.18	1178.7	10082.19	1179.84	10082.33	1179.86	10082.48	1179.88
10082.6	1179.9	10087.34	1179.99	10121.46	1179.59	10138.86	1179.93	10163.73	1180.33
10172.94	1180.53	10180.67	1180.57	10212.13	1180.81	10258.67	1180.95	10266.11	1181.01
10285.13	1181.16	10327.69	1181.49	10344.33	1181.63	10389.26	1181.98	10430	1182.32
10450.84	1182.48	10504.11	1182.91	10512.42	1182.98	10515.67	1183.01	10573.99	1183.47
10601.33	1183.7	10635.57	1183.99	10687	1184.47	10697.15	1184.56	10723.09	1184.82
10758.72	1185.18	10772.66	1185.35	10820.3	1185.92	10858.33	1186.39	10881.88	1186.66
10942.08	1187.18	10943.45	1187.19	10943.99	1187.19	11005.03	1187.65	11029.66	1187.82
11066.61	1188.13	11115.33	1188.57	11128.19	1188.69	11161.06	1189.04	11189.76	1189.34
11200.99	1189.45	11251.34	1189.94	11286.66	1190.23	11312.92	1190.45	11372.32	1191.01
11374.49	1191.03	11380.04	1191.08	11436.07	1191.48	11457.99	1191.71	11497.65	1192.07
11543.65	1192.51	11559.22	1192.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8779.05	.05	9764.49	.04	10212.13	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9764.49	10212.13	800	861	870	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1184.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1184.00	Reach Len. (ft)	800.00	861.00	870.00
Crit W.S. (ft)		Flow Area (sq ft)	923.31	2262.23	728.32
E.G. Slope (ft/ft)	0.001432	Area (sq ft)	923.31	2262.23	728.32
Q Total (cfs)	11490.00	Flow (cfs)	1612.22	8704.36	1173.42
Top Width (ft)	1349.60	Top Width (ft)	477.23	447.64	424.74
Vel Total (ft/s)	2.94	Avg. Vel. (ft/s)	1.75	3.85	1.61
Max Chl Dpth (ft)	9.80	Hydr. Depth (ft)	1.93	5.05	1.71
Conv. Total (cfs)	303626.7	Conv. (cfs)	42603.3	230015.4	31008.0
Length Wtd. (ft)	852.22	Wetted Per. (ft)	477.24	448.23	424.75
Min Ch El (ft)	1174.20	Shear (lb/sq ft)	0.17	0.45	0.15
Alpha	1.38	Stream Power (lb/ft s)	0.30	1.74	0.25
Frctn Loss (ft)	1.44	Cum Volume (acre-ft)	168.27	225.82	187.22
C & E Loss (ft)	0.01	Cum SA (acres)	57.55	27.28	64.68

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 6 RS: 18.798

```
INPUT
Description:
Station Elevation Data    num=      73
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8968.86 1185.41 8969.66 1185.41 9019.22 1185.17 9032.32 1185.11 9036.56 1185.08
 9094.98 1184.59 9119.52 1184.34 9157.64 1183.95 9202.48 1183.67  9220.3 1183.58
 9275.31 1183.29 9282.96 1183.25 9285.44 1183.23 9345.62 1183.09  9368.4 1183.07
 9408.28 1183.21 9451.35 1183.03 9470.94 1182.98  9531.4 1182.38  9533.6 1182.36
 9534.31 1182.35 9596.26  1181.6 9617.27  1181.3 9658.92 1180.51 9700.23 1180.02
 9721.58 1179.78 9783.19 1179.09 9784.24 1179.08 9787.48 1179.06  9846.9 1178.62
 9866.15 1178.55 9909.56 1178.53 9926.57 1178.55  9959.6 1175.09  9991.1 1171.99
   10000 1173.5710007.78 1174.9310010.78 1175.4410014.58 1175.6410068.75  1178.7
10094.61 1178.7110114.37 1178.7110162.85 1178.7310187.85 1178.7510231.08 1178.86
10261.32 1178.9910299.32 1179.2310334.79 1179.4710367.56 1179.7110408.27 1179.99
 10435.8 1180.1810481.74 1180.4710504.03 1180.6210555.22 1180.9410572.27 1181.05
10628.69 1181.3910640.51 1181.4610702.17 1181.8910708.74 1181.9410775.64 1182.48
10776.98 1182.4910794.45 1182.6310845.22 1183.0410849.11 1183.0810913.46 1183.63
10922.59 1183.7210981.69 1184.2610996.06 1184.3911049.93 1184.8811069.54 1185.07
11118.17 1185.5411143.01 1185.79 11186.4 1186.23

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8968.86     .05 9926.57    .04310068.75     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9926.5710068.75             1200    1217    1140            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1182.74  * Element                 *  Left OB  *  Channel  * Right OB  *
* Vel Head (ft)           *    0.26  * Wt. n-Val.              *   0.050   *   0.043   *   0.050   *
* W.S. Elev (ft)          * 1182.47  * Reach Len. (ft)         * 1200.00   * 1217.00   * 1140.00   *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  994.55   *  953.79   * 1625.42   *
* E.G. Slope (ft/ft)      *0.002032  * Area (sq ft)            *  994.55   *  953.79   * 1625.42   *
* Q Total (cfs)           *11490.00  * Flow (cfs)              * 2426.87   * 5266.70   * 3796.44   *
* Top Width (ft)          * 1252.70  * Top Width (ft)          *  404.52   *  142.18   *  706.00   *
* Vel Total (ft/s)        *    3.22  * Avg. Vel. (ft/s)        *    2.44   *    5.52   *    2.34   *
* Max Chl Dpth (ft)       *   10.48  * Hydr. Depth (ft)        *    2.46   *    6.71   *    2.30   *
* Conv. Total (cfs)       *254899.7  * Conv. (cfs)             * 53838.8   *116838.9   * 84222.1   *
* Length Wtd. (ft)        * 1191.87  * Wetted Per. (ft)        *  404.54   *  142.90   *  706.01   *
* Min Ch El (ft)          * 1171.99  * Shear (lb/sq ft)        *    0.31   *    0.85   *    0.29   *
* Alpha                   *    1.65  * Stream Power (lb/ft s)   *    0.76   *    4.68   *    0.68   *
* Frctn Loss (ft)         *    3.18  * Cum Volume (acre-ft)     *  150.66   *  194.04   *  163.71   *
* C & E Loss (ft)         *    0.02  * Cum SA (acres)           *   49.45   *   21.46   *   53.39   *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 6            RS: 18.567

INPUT
Description:
Station Elevation Data    num=      81
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8805.98 1185.76 8845.21 1185.37 8853.83 1185.28 8915.21 1184.72 8925.28 1184.62
 8985.21 1184.02 8996.72  1183.9 9055.21 1183.26 9068.16 1183.13 9125.21 1182.56
 9139.61 1182.42 9195.21 1181.87 9211.05 1181.71 9265.21 1181.15 9282.49 1180.97
 9335.21 1180.44 9353.94 1180.26 9405.21 1179.73 9425.38 1179.52 9475.21 1178.96
 9496.82 1178.71 9545.21 1178.12 9568.27 1177.85 9615.21 1177.29 9639.71 1177.02
 9685.21 1176.56 9711.15 1176.34 9755.21 1176.03  9782.6 1175.91 9825.21 1175.71
 9854.04 1175.61 9895.21 1175.45 9925.48 1175.32 9945.55 1175.26 9973.69 1171.58
 9993.79 1168.84   10000 1169.85 10005.5 1170.7410006.42 1170.8710008.23 1171.05
 10034.1 1173.5310052.09 1175.1710078.93 1175.2510094.49 1175.3310144.35 1175.74
10157.36 1175.8510161.42 1175.8910220.23 1176.67 10243.9 1177.0310283.09 1177.61
10326.38 1178.3110345.96 1178.6310408.74 1179.7210408.83 1179.7210408.86 1179.72
 10471.7 1180.9310491.34 1181.3710534.57  1182.310573.82 1183.1710597.44 1183.68
 10656.3 1184.8710660.31 1184.9410673.13 1185.1110723.17 1185.7910738.79 1185.88
10786.04 1185.9510821.27 1185.9810848.91    118610903.75 1186.1510911.78 1186.18
10937.52 1186.3510974.65 1186.5910986.23  1186.711037.52  1187.211068.71 1187.53
11086.68 1187.7411100.38 1187.8411122.36 1187.8611151.19 1188.2611163.25 1188.42
```

11201.91 1188.9

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8805.98	.05	9945.55	.04	10052.09	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9945.55	10052.09	1110	1311	1320	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

				Left OB	Channel	Right OB
E.G. Elev (ft)	1179.54	Element				
Vel Head (ft)	0.50	Wt. n-Val.		0.050	0.043	0.050
W.S. Elev (ft)	1179.05	Reach Len. (ft)		1110.00	1311.00	1320.00
Crit W.S. (ft)		Flow Area (sq ft)		1121.86	725.68	736.95
E.G. Slope (ft/ft)	0.003668	Area (sq ft)		1121.86	725.68	736.95
Q Total (cfs)	11320.00	Flow (cfs)		3566.18	5430.18	2323.64
Top Width (ft)	902.24	Top Width (ft)		477.92	106.54	317.78
Vel Total (ft/s)	4.38	Avg. Vel. (ft/s)		3.18	7.48	3.15
Max Chl Dpth (ft)	10.21	Hydr. Depth (ft)		2.35	6.81	2.32
Conv. Total (cfs)	186918.4	Conv. (cfs)		58885.5	89664.4	38368.5
Length Wtd. (ft)	1263.38	Wetted Per. (ft)		477.94	107.33	317.81
Min Ch El (ft)	1168.84	Shear (lb/sq ft)		0.54	1.55	0.53
Alpha	1.67	Stream Power (lb/ft s)		1.71	11.58	1.67
Frctn Loss (ft)	4.41	Cum Volume (acre-ft)		121.51	170.57	132.80
C & E Loss (ft)	0.01	Cum SA (acres)		37.30	17.98	39.99

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 6 RS: 18.319

INPUT
Description:
Station Elevation Data num= 158

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8592.36	1185.13	8596.9	1185.11	8640.71	1184.89	8648.23	1184.86	8673.09	1184.73
8699.56	1184.56	8707.57	1184.49	8750.89	1184.16	8774.43	1183.9	8802.22	1183.63
8841.29	1183.15	8853.55	1183.01	8894.1	1182.48	8904.88	1182.34	8908.15	1182.3
8956.21	1181.69	8975.01	1181.46	9007.55	1181.05	9041.87	1180.63	9058.88	1180.43
9108.73	1179.84	9110.21	1179.83	9115.1	1179.76	9161.54	1179.17	9175.59	1178.95
9212.87	1178.37	9242.45	1177.88	9264.2	1177.52	9309.3	1176.79	9315.53	1176.69
9336.11	1176.38	9366.86	1175.94	9376.16	1175.81	9418.19	1175.21	9443.02	1174.89
9469.52	1174.55	9509.88	1174.12	9520.85	1174.01	9557.12	1173.69	9572.19	1173.56
9576.74	1173.53	9623.52	1173.18	9643.6	1173.01	9674.85	1172.77	9710.46	1172.46
9726.18	1172.33	9777.32	1171.92	9777.51	1171.92	9777.63	1171.92	9778.13	1171.92
9819.28	1171.71	9828.84	1171.69	9844.18	1171.67	9880.17	1171.59	9902.59	1171.58
9948.64	1168.02	9960.18	1167.03	9979.56	1165.36	9980.14	1165.34	9983.39	1165.24
10000	1164.73	10005.56	1164.52	10009.77	1164.36	10023.56	1166.43	10050.81	1170.51
10059.01	1171.87	10064.59	1171.91	10122.93	1172.21	10129.43	1172.25	10130.8	1172.26
10194.27	1172.74	10203.01	1172.49	10203.87	1172.52	10204.86	1172.54	10205.94	1172.52
10207.28	1172.48	10208.9	1172.44	10210.41	1172.42	10260.87	1172.61	10262.52	1172.58
10264.31	1172.57	10267.77	1172.66	10271.39	1172.83	10275	1172.95	10280.4	1172.96
10286.5	1172.91	10323.36	1173.11	10329.62	1173.06	10337.25	1173.2	10345.3	1173.41
10353.77	1173.57	10365.49	1173.57	10378.22	1173.47	10393.05	1173.35	10408.54	1173.34
10415.97	1173.41	10431.99	1173.71	10440.7	1173.93	10456.31	1174.34	10469.97	1174.57
10477.53	1174.56	10485.64	1174.52	10493.67	1174.52	10499.49	1174.57	10516.45	1174.71
10525.9	1174.86	10533.65	1174.97	10540.62	1175	10547.29	1175	10553.81	1175.04
10561.67	1175.24	10569.42	1175.51	10577.49	1175.66	10586.48	1175.66	10610.07	1175.88
10617.14	1175.74	10625.64	1175.56	10630.12	1175.48	10635	1175.38	10640.3	1175.35
10647.32	1175.52	10651.71	1175.69	10654.6	1175.88	10661.18	1176.27	10670.94	1176.68
10680.48	1176.97	10690.04	1177.24	10702.98	1177.61	10715.58	1177.93	10717.29	1177.99
10734.7	1178.22	10739.3	1178.21	10740.4	1178.21	10745.25	1178.21	10754.04	1178.21
10762.22	1178.21	10769.88	1178.29	10779.35	1178.31	10789.72	1178.32	10799.67	1178.32
10809.43	1178.31	10823.75	1178.21	10825.2	1178.21	10843.17	1178.43	10857.37	1178.63
10861.91	1178.69	10865.94	1178.75	10902.76	1179.66	10904.51	1179.71	10907.26	1179.75
10909.13	1179.78	10910.44	1179.81	10916.14	1180	10972.33	1180.41	10994.67	1180.58
11037.17	1180.89	11073.21	1181.17	11102.01	1181.42				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val

```
*********************************************
 8592.36     .05 9902.59    .04310059.01     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9902.5910059.01              920     843     840             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1175.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.57  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)         * 1174.55  * Reach Len. (ft)         *  920.00  *  843.00  *  840.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *  778.75  * 1073.09  *  683.25  *
* E.G. Slope (ft/ft)     *0.003330  * Area (sq ft)            *  778.75  * 1073.09  *  683.25  *
* Q Total (cfs)          *11320.00  * Flow (cfs)              * 1975.18  * 7698.56  * 1646.27  *
* Top Width (ft)         * 1016.36  * Top Width (ft)          *  432.97  *  156.42  *  426.98  *
* Vel Total (ft/s)       *    4.47  * Avg. Vel. (ft/s)        *    2.54  *    7.17  *    2.41  *
* Max Chl Dpth (ft)      *   10.19  * Hydr. Depth (ft)        *    1.80  *    6.86  *    1.60  *
* Conv. Total (cfs)      *196162.1  * Conv. (cfs)             * 34227.5  *133406.9  * 28527.8  *
* Length Wtd. (ft)       *  853.15  * Wetted Per. (ft)        *  432.98  *  157.26  *  427.01  *
* Min Ch El (ft)         * 1164.36  * Shear (lb/sq ft)        *    0.37  *    1.42  *    0.33  *
* Alpha                  *    1.85  * Stream Power (lb/ft s)   *    0.95  *   10.18  *    0.80  *
* Frctn Loss (ft)        *    1.40  * Cum Volume (acre-ft)    *   97.29  *  143.51  *  111.28  *
* C & E Loss (ft)        *    0.13  * Cum SA (acres)          *   25.69  *   14.02  *   28.71  *
*****************************************************************************************

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 6            RS: 18.159

INPUT
Description:
Station Elevation Data    num=     165
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8592.67 1176.91 8605.32 1176.93 8615.62 1176.95 8632.19 1176.97 8674.36 1177.03
 8700.59 1177.01  8733.1 1176.94 8785.37 1176.76 8791.84 1176.74 8795.86 1176.73
 8850.58 1176.48 8891.13 1176.35 8909.32 1176.24 8938.55 1176.02 8968.06  1175.8
  8986.4 1175.62 9026.79 1175.12 9081.68 1174.47 9085.53 1174.43  9120.4  1174.1
 9144.27  1173.9 9176.95  1173.6 9203.01 1173.37 9244.92 1173.09 9261.75 1172.96
 9272.22  1172.9 9320.49  1172.6 9367.49 1172.33 9379.23 1172.26  9398.1 1172.15
 9437.97 1171.92 9462.77 1171.78 9490.61 1171.57  9491.7 1171.56  9492.8 1171.49
 9493.99 1171.38 9495.28  1171.3  9497.2 1171.27 9499.23  1171.3 9501.44 1171.26
 9502.94 1171.16 9512.03 1170.78 9545.46 1170.11 9548.51 1170.07 9554.75 1169.97
 9562.08 1169.85 9570.18 1169.77 9579.51  1169.6 9586.97 1169.59 9594.91  1169.6
 9603.07  1169.6  9609.7  1169.6 9615.98 1169.56 9622.56 1169.49 9629.45 1169.45
 9635.92 1169.45 9642.46 1169.47 9648.97 1169.45 9665.56 1168.91 9670.44 1168.93
 9686.31  1168.1 9702.74 1167.68 9708.61 1167.75 9714.04 1167.87 9719.16 1167.97
 9723.59 1168.01 9728.04 1168.03 9732.54 1168.03 9738.39 1168.04 9747.14 1167.77
 9753.43 1167.76 9759.85 1167.72 9765.32 1167.67 9771.02 1167.59 9776.95 1167.53
 9783.87 1167.46 9791.02 1167.41 9792.32 1167.42 9798.79 1167.41 9801.33 1167.43
  9803.9 1167.47  9806.4  1167.5 9812.48 1167.56 9818.28 1167.61 9823.89 1167.65
 9826.69 1167.65  9829.5 1167.64 9832.09 1167.66 9835.12 1167.73 9848.44 1167.88
 9853.89 1168.01 9858.59 1168.14 9864.55 1168.34 9907.88 1169.88 9939.13 1169.84
 9960.22 1168.67 9961.94 1168.58 9968.76 1167.84 9972.91 1167.23 9980.75 1165.98
 9996.64 1163.17   10000 1162.8910002.07 1162.7310010.06 1162.2210015.76 1162.93
10063.56 1169.8110089.84 1169.8810109.66 1169.9310155.84 1170.1110186.25 1170.27
10221.85  1170.5 10246.3 1170.2410248.11 1170.2210250.02 1170.2110252.17 1170.21
 10299.7  1170.510302.09  1170.510304.49  1170.510306.21 1170.5210320.12 1170.87
10322.55 1170.8410325.05 1170.8110364.95 1171.08 10368.2 1171.0810371.86  1171.1
10375.34 1171.1110381.89 1171.1210416.02 1172.0710419.86  1172.110443.83 1172.29
10485.84 1172.4910487.05  1172.510488.01 1172.4910488.97 1172.4910489.76 1172.51
10551.33 1172.7910552.57 1172.8210553.69 1172.8510555.54 1172.8910556.37  1172.9
10557.14 1172.91 10569.2 1173.3110617.88 1173.7110645.79 1173.9510683.89 1174.27
10722.38 1174.6110749.89 1174.8510798.97 1175.28 10815.9 1175.4210875.56 1175.94
 10881.9 1175.9910921.46  1176.310947.91 1176.5110952.15 1176.5411013.91 1176.96
11028.74 1177.0611079.92  1177.411105.33 1177.5811145.93 1177.8911181.92 1178.17
11211.93 1178.4211258.51 1178.8211277.94 1178.99 11335.1  1179.511343.94 1179.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
*********************************************
 8592.67     .05 9648.97    .04310063.56     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9648.9710063.56             1270    1303    1303            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1173.59  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1173.45  * Reach Len. (ft)         * 1270.00  * 1303.00  * 1303.00  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       *  827.05  * 2382.48  * 1187.14  *
* E.G. Slope (ft/ft)      *0.000973  * Area (sq ft)            *  827.05  * 2382.48  * 1187.14  *
* Q Total (cfs)           *11270.00  * Flow (cfs)              * 1142.28  * 8225.54  * 1902.18  *
* Top Width (ft)          * 1391.88  * Top Width (ft)          *  454.83  *  414.59  *  522.46  *
* Vel Total (ft/s)        *    2.56  * Avg. Vel. (ft/s)        *    1.38  *    3.45  *    1.60  *
* Max Chl Dpth (ft)       *   11.23  * Hydr. Depth (ft)        *    1.82  *    5.75  *    2.27  *
* Conv. Total (cfs)       *361251.2  * Conv. (cfs)             * 36614.8  *263663.3  * 60973.0  *
* Length Wtd. (ft)        * 1297.42  * Wetted Per. (ft)        *  454.87  *  415.71  *  522.50  *
* Min Ch El (ft)          * 1162.22  * Shear (lb/sq ft)        *    0.11  *    0.35  *    0.14  *
* Alpha                   *    1.42  * Stream Power (lb/ft s)   *    0.15  *    1.20  *    0.22  *
* Frctn Loss (ft)         *    0.88  * Cum Volume (acre-ft)    *   80.33  *  110.07  *   93.25  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   16.31  *    8.50  *   19.56  *
*****************************************************************************************

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 6            RS: 17.913

INPUT
Description:
Station Elevation Data     num=      68
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
*********************************************************************************
 9025.03 1174.29 9063.19    1174  9066.5 1173.98 9069.55 1173.95 9122.87 1173.52
 9177.86 1173.09 9179.23 1173.08 9180.72 1173.07  9235.6 1172.68 9286.17 1172.29
 9291.96 1172.25 9298.25 1172.19 9348.33 1171.79 9394.48 1171.41  9404.7 1171.33
 9415.78 1171.25 9461.06 1170.91 9502.79  1170.6 9517.43 1170.47 9533.31 1170.32
 9573.79 1169.94  9611.1 1169.53 9630.16  1169.3 9650.83 1169.03 9686.52 1168.58
 9719.41 1168.18 9742.89 1167.89 9768.36 1167.64 9799.26 1167.32 9827.72 1167.11
 9855.62 1166.95 9885.89 1166.91 9911.99 1166.86 9920.22 1166.86  9942.7 1164.34
 9992.42 1159.36   10000 1158.45 10008.6 1157.4310009.42 1157.3410011.15 1157.61
10065.61 1167.2310093.58 1167.3310110.15  1167.410158.64 1167.63 10188.3 1167.81
 10223.7 1168.0410266.46 1168.3610288.75 1168.5310344.61 1168.9810353.81 1169.06
10399.49 1169.4110418.86 1169.5610422.76 1169.5910483.92 1170.0310500.92 1170.14
10548.97 1170.4710562.65 1170.5610579.07 1170.6710614.03 1170.9110657.22  1171.2
10679.09 1171.3610735.38 1171.7610744.14 1171.8310787.67 1172.14 10809.2  1172.3
10813.53 1172.3310874.25 1172.7510891.69 1172.86

Manning's n Values         num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9025.03     .05 9911.99    .04310065.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9911.9910065.61             1400    1408    1340            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1172.70  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.12  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1172.59  * Reach Len. (ft)         * 1408.00  * 1408.00  * 1408.00  *
* Crit W.S. (ft)          *           * Flow Area (sq ft)       * 1947.58  * 1560.04  * 2187.19  *
* E.G. Slope (ft/ft)      *0.000500  * Area (sq ft)            * 1947.58  * 1560.04  * 2187.19  *
* Q Total (cfs)           *11150.00  * Flow (cfs)              * 2651.41  * 5620.44  * 2878.15  *
* Top Width (ft)          * 1603.03  * Top Width (ft)          *  664.33  *  153.62  *  785.08  *
* Vel Total (ft/s)        *    1.96  * Avg. Vel. (ft/s)        *    1.36  *    3.60  *    1.32  *
* Max Chl Dpth (ft)       *   15.25  * Hydr. Depth (ft)        *    2.93  *   10.16  *    2.79  *
* Conv. Total (cfs)       *498554.9  * Conv. (cfs)             *118553.8  *251309.3  *128691.8  *
* Length Wtd. (ft)        * 1408.00  * Wetted Per. (ft)        *  664.36  *  154.99  *  785.10  *
* Min Ch El (ft)          * 1157.34  * Shear (lb/sq ft)        *    0.09  *    0.31  *    0.09  *
* Alpha                   *    1.94  * Stream Power (lb/ft s)   *    0.12  *    1.13  *    0.11  *
* Frctn Loss (ft)         *           * Cum Volume (acre-ft)    *   39.89  *   51.10  *   42.78  *
* C & E Loss (ft)         *           * Cum SA (acres)          *          *          *          *
*****************************************************************************************

CROSS SECTION
```

RIVER: Waterman Wash
REACH: REACH 7 RS: 17.647

INPUT
Description: Duplicate of 17.646.
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8621.02	1172.61	8626.72	1172.57	8669.59	1172.3	8713.12	1171.97	8730.9	1171.82
8774.38	1171.44	8792.21	1171.28	8799.51	1171.21	8831.1	1170.93	8853.52	1170.73
8885.9	1170.46	8914.84	1170.24	8972.3	1169.82	8976.15	1169.79	8985.56	1169.74
9037.46	1169.43	9058.69	1169.31	9098.77	1169.11	9145.08	1168.86	9160.08	1168.78
9196.74	1168.57	9221.39	1168.43	9231.48	1168.37	9282.7	1168.06	9317.87	1167.85
9344.02	1167.67	9404.26	1167.26	9405.33	1167.25	9407.93	1167.23	9466.64	1166.76
9490.66	1166.57	9527.95	1166.25	9577.05	1165.86	9589.26	1165.77	9619.11	1165.57
9650.57	1165.35	9663.44	1165.28	9711.88	1165.04	9749.84	1164.92	9773.2	1164.86
9830.3	1164.79	9834.51	1164.78	9836.23	1164.78	9895.82	1164.72	9922.62	1164.68
9948.04	1164.55	9957.61	1161.27	9967.01	1159.19	9984.17	1155.44	9990.87	1155.29
10000	1155.04	10011.55	1154.76	10018.59	1156.57	10035.96	1159.67	10039.64	1160.01
10043.41	1160.63	10056.58	1163.45	10059.37	1163.59	10071.16	1162.89	10073.45	1162.79
10097.43	1160.42	10101.28	1160.42	10117.13	1160.41	10120.55	1160.41	10122.31	1160.42
10123.22	1160.42	10123.58	1160.42	10123.95	1160.42	10131.28	1160.44	10132.54	1160.44
10133.81	1160.44	10134.95	1160.44	10167.4	1161.99	10169.73	1162.04	10172.44	1162.12
10175.01	1162.22	10177.32	1162.33	10179.89	1162.45	10219.18	1164.61	10233.76	1164.67
10289.78	1164.93	10304.57	1165	10344.24	1164.44	10352.99	1164.28	10370.31	1163.98
10397.15	1163.48	10399.77	1163.57	10408.56	1163.98	10430.44	1164.99	10431.8	1165.07
10432.87	1165.13	10433.77	1165.17	10435.05	1165.22	10436.15	1165.25	10437.09	1165.29
10446.21	1165.71	10501.59	1165.99	10517.03	1166.07	10572.19	1166.41	10587.85	1166.5
10642.8	1166.88	10658.67	1167	10713.4	1167.43	10721.43	1167.49	10753.29	1166.86
10778.56	1166.42	10787.82	1166.6	10827.5	1168.39	10854.6	1168.61	10871.13	1168.73
10925.21	1169.18	10941.94	1169.31	10995.81	1169.73	11012.76	1169.86	11066.41	1170.3
11083.58	1170.44	11137.02	1170.92	11154.4	1171.09	11207.62	1171.61	11225.22	1171.8
11278.22	1172.33	11296.04	1172.52						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8621.02	.05	9948.04	.04	10219.18	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9948.04	10219.18	5	5	5	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1166.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1166.38	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)		Flow Area (sq ft)	520.43	1601.97	459.96
E.G. Slope (ft/ft)	0.002722	Area (sq ft)	520.43	1601.97	459.96
Q Total (cfs)	11150.00	Flow (cfs)	908.83	9385.42	855.75
Top Width (ft)	1056.32	Top Width (ft)	435.36	271.14	349.83
Vel Total (ft/s)	4.32	Avg. Vel. (ft/s)	1.75	5.86	1.86
Max Chl Dpth (ft)	11.62	Hydr. Depth (ft)	1.20	5.91	1.31
Conv. Total (cfs)	213727.7	Conv. (cfs)	17420.8	179903.5	16403.3
Length Wtd. (ft)	5.00	Wetted Per. (ft)	435.36	273.44	349.89
Min Ch El (ft)	1154.76	Shear (lb/sq ft)	0.20	1.00	0.22
Alpha	1.58	Stream Power (lb/ft s)	0.35	5.83	0.42
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	13.50	54.58	9.81
C & E Loss (ft)	0.00	Cum SA (acres)	0.05	0.03	0.04

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 7 RS: 17.646

INPUT
Description:
Station Elevation Data num= 122

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8621.02	1172.61	8626.72	1172.57	8669.59	1172.3	8713.12	1171.97	8730.9	1171.82
8774.38	1171.44	8792.21	1171.28	8799.51	1171.21	8831.1	1170.93	8853.52	1170.73
8885.9	1170.46	8914.84	1170.24	8972.3	1169.82	8976.15	1169.79	8985.56	1169.74
9037.46	1169.43	9058.69	1169.31	9098.77	1169.11	9145.08	1168.86	9160.08	1168.78
9196.74	1168.57	9221.39	1168.43	9231.48	1168.37	9282.7	1168.06	9317.87	1167.85

```
 9344.02 1167.67 9404.26 1167.26 9405.33 1167.25 9407.93 1167.23 9466.64 1166.76
 9490.66 1166.57 9527.95 1166.25 9577.05 1165.86 9589.26 1165.77 9619.11 1165.57
 9650.57 1165.35 9663.44 1165.28 9711.88 1165.04 9749.84 1164.92  9773.2 1164.86
  9830.3 1164.79 9834.51 1164.78 9836.23 1164.78 9895.82 1164.72 9922.62 1164.68
 9948.04 1164.55 9957.61 1161.27 9967.01 1159.19 9984.17 1155.44 9990.87 1155.29
   10000 1155.0410011.55 1154.7610018.59 1156.5710035.96 1159.6710039.64 1160.01
10043.41 1160.6310056.58 1163.4510059.37 1163.5910071.16 1162.8910073.45 1162.79
10097.43 1160.4210101.28 1160.4210117.13 1160.4110120.55 1160.4110122.31 1160.42
10123.22 1160.4210123.58 1160.4210123.95 1160.4210131.28 1160.4410132.54 1160.44
10133.81 1160.4410134.95 1160.44 10167.4 1161.9910169.73 1162.0410172.44 1162.12
10175.01 1162.2210177.32 1162.3310179.89 1162.4510219.18  1164.610233.76 1164.67
10289.78 1164.9310304.57    116510344.24 1164.4410352.99 1164.2810370.31 1163.98
10397.15 1163.4810399.77 1163.5710408.56 1163.9810430.44 1164.99 10431.8 1165.07
10432.87 1165.1310433.77 1165.1710435.05 1165.2210436.15 1165.2510437.09 1165.29
10446.21  1165.710501.59 1165.9910517.03 1166.0710572.19  1166.410587.85  1166.5
 10642.8 1166.8810658.67    1167 10713.4 1167.4310721.43 1167.4910753.29 1166.86
10778.56 1166.4210787.82  1166.6 10827.5 1168.39 10854.6  1168.610871.13 1168.73
10925.21 1169.1810941.94  1169.310995.81 1169.7311012.76 1169.8611066.41  1170.3
11083.58 1170.4411137.02 1170.92 11154.4 1171.0911207.62 1171.6111225.22  1171.8
11278.22 1172.3311296.04 1172.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8621.02     .05 9948.04    .04310219.18     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9948.0410219.18             1100    1223    1250            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1166.82  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.45  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1166.37  * Reach Len. (ft)         * 1225.00  * 1225.00  * 1225.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  515.50  * 1598.89  *  456.00  *
* E.G. Slope (ft/ft)      *0.002708  * Area (sq ft)            *  515.50  * 1598.89  *  456.00  *
* Q Total (cfs)           *11070.00  * Flow (cfs)              *  894.05  * 9331.55  *  844.41  *
* Top Width (ft)          * 1053.10  * Top Width (ft)          *  434.03  *  271.14  *  347.93  *
* Vel Total (ft/s)        *    4.31  * Avg. Vel. (ft/s)        *    1.73  *    5.84  *    1.85  *
* Max Chl Dpth (ft)       *   11.61  * Hydr. Depth (ft)        *    1.19  *    5.90  *    1.31  *
* Conv. Total (cfs)       *212736.2  * Conv. (cfs)             * 17181.2  *179327.7  * 16227.3  *
* Length Wtd. (ft)        * 1225.00  * Wetted Per. (ft)        *  434.04  *  273.44  *  348.00  *
* Min Ch El (ft)          * 1154.76  * Shear (lb/sq ft)        *    0.20  *    0.99  *    0.22  *
* Alpha                   *    1.58  * Stream Power (lb/ft s)  *    0.35  *    5.77  *    0.41  *
* Frctn Loss (ft)         *    2.65  * Cum Volume (acre-ft)    *   13.44  *   54.39  *    9.76  *
* C & E Loss (ft)         *    0.05  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 8            RS: 17.414

INPUT
Description:
Station Elevation Data    num=     184
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8542.38 1169.98 8566.18 1169.93 8601.14 1169.79 8617.51 1169.74    8668  1169.5
 8668.84  1169.5 8671.65 1169.49 8720.17 1169.26 8734.86 1169.19 8771.51 1169.03
 8801.71 1168.91 8822.84 1168.82 8868.57 1168.66 8874.17 1168.64 8892.65 1168.58
  8925.5 1168.47 8935.43 1168.44 8976.83  1168.3 9002.29 1168.21 9028.16 1168.12
 9069.15 1167.93 9079.49 1167.89 9113.66  1167.7 9130.82  1167.6 9136.01 1167.57
 9182.15 1167.26 9202.87 1167.09 9233.48 1166.85 9269.73  1166.5 9284.81 1166.36
 9334.67  1165.8 9336.15 1165.78 9336.59 1165.77 9387.48 1165.13 9403.45 1164.93
 9438.81 1164.48 9470.31 1164.11 9490.14 1163.88 9537.17 1163.42 9541.47 1163.38
 9555.68 1163.26  9592.8 1162.97 9604.03 1162.91 9644.13 1162.66 9670.89 1162.55
 9695.46 1162.42 9737.75 1162.32 9746.79 1162.29 9776.69  1162.3 9798.12 1162.33
 9804.61 1162.37 9849.45 1162.57 9871.47 1162.77 9900.78 1162.96 9919.05 1163.07
 9967.31 1161.93 9973.22 1161.77 9979.67 1157.99 9987.35 1153.35 9996.14 1153.35
   10000 1153.3310007.93 1153.3110013.36 1156.1610027.39 1158.37 10037.7 1158.11
10050.04 1157.6410058.84 1157.4110067.03 1157.1810082.67 1156.3410086.51 1156.19
10090.35 1155.9310093.54  1155.810097.37  1155.510101.79 1155.18 10103.6 1155.13
10116.14 1154.3110122.27 1154.5810123.18 1154.6210123.72 1154.6510141.68 1155.23
```

```
10142.91 1155.3310144.62 1155.45 10157.9 1155.6910161.18 1156.0110165.85 1156.38
10171.05 1156.3910176.36 1156.3310180.86 1156.5710186.29 1156.3810191.91 1156.58
10198.94 1156.2810203.96 1156.1610212.46 1155.5210214.78 1155.02 10219.6 1154.18
10225.21 1155.7310226.17 1156.1210229.09 1157.3310231.76 1158.64 10237.6    1161
10237.69 1161.0510237.92 1161.1410245.17 1161.7810252.57 1161.9610258.73  1161.9
10263.69 1161.8510311.29 1162.21 10314.8 1162.2410316.79 1162.2510317.99 1162.26
10322.09  1162.310325.05 1162.3210352.19 1162.4710389.19 1162.6710398.23 1162.72
10428.78 1162.8810453.34    116310478.04 1163.1310517.49 1163.3210557.86 1163.53
10581.64 1163.6610637.67    116410645.79 1164.0610679.02 1164.2810709.93 1164.49
10717.48 1164.5410774.08 1164.93 10797.3  1165.110838.23 1165.3910877.11 1165.69
10902.38 1165.8810956.92 1166.2710966.53 1166.3311005.85 1166.5911030.67 1166.76
11036.74  1166.811094.82 1167.1711116.55  1167.311158.97 1167.5611196.36 1167.78
11223.12 1167.9411276.17 1168.2611287.26 1168.3311332.67  1168.611352.96 1168.66
11353.18 1168.6611353.52 1168.6711353.94 1168.6811354.42 1168.6911354.73 1168.69
11416.57 1168.9511418.08 1168.9611419.49 1168.9611425.51 1168.9511426.09 1168.94
11426.76 1168.9411427.49 1168.9311428.76 1168.91 11435.2  1169.111436.37  1169.1
11437.68 1169.0911439.13 1169.0811442.01 1169.07 11470.3 1169.0311474.18 1169.01
11481.33 1168.9811484.62 1168.9611488.16 1168.9511494.33 1168.9211500.87  1168.9
11504.89 1168.9211509.58 1168.8911511.29 1168.8711513.72 1168.8711513.77 1168.87
11514.33 1168.8711517.45 1168.8811518.61 1168.8911524.11 1168.9311529.12 1168.98
11533.74 1169.0411537.85  1169.111542.38 1169.1511546.36  1169.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 8542.38     .05 9900.78    .04310311.29     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9900.7810311.29             1280    1156    1180            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1164.12  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.29  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1163.83  * Reach Len. (ft)         * 1280.00  * 1156.00  * 1180.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       *  440.49  * 2269.55  *  237.94  *
* E.G. Slope (ft/ft)      *0.001769  * Area (sq ft)            *  440.49  * 2269.55  *  237.94  *
* Q Total (cfs)           *11070.00  * Flow (cfs)              *  581.75  *10232.54  *  255.71  *
* Top Width (ft)          * 1114.55  * Top Width (ft)          *  405.59  *  410.51  *  298.46  *
* Vel Total (ft/s)        *    3.76  * Avg. Vel. (ft/s)        *    1.32  *    4.51  *    1.07  *
* Max Chl Dpth (ft)       *   10.52  * Hydr. Depth (ft)        *    1.09  *    5.53  *    0.80  *
* Conv. Total (cfs)       *263191.7  * Conv. (cfs)             * 13831.2  *243281.0  *  6079.5  *
* Length Wtd. (ft)        * 1177.85  * Wetted Per. (ft)        *  405.59  *  415.41  *  298.46  *
* Min Ch El (ft)          * 1153.31  * Shear (lb/sq ft)        *    0.12  *    0.60  *    0.09  *
* Alpha                   *    1.34  * Stream Power (lb/ft s)  *    0.16  *    2.72  *    0.09  *
* Frctn Loss (ft)         *    1.96  * Cum Volume (acre-ft)    *   70.69  *   59.37  *  117.18  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *   17.67  *    6.08  *   18.75  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 8            RS: 17.195

INPUT
Description:
Station Elevation Data    num=     110
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 8850.17 1163.51 8883.87 1163.37 8907.66 1163.27 8943.18 1163.11 9000.61 1162.85
 9002.49 1162.84 9005.81 1162.82 9061.81 1162.56 9093.57 1162.41 9121.12 1162.27
  9169.7 1162.03 9180.43 1161.98 9186.52 1161.96 9224.91 1161.78 9254.38  1161.7
 9268.89 1161.67 9312.24 1161.12 9324.37 1161.01 9327.46 1161.02 9379.54 1161.51
 9413.09 1161.48 9428.72 1161.22 9465.37 1161.39 9476.99 1161.35 9497.48 1161.24
  9536.3 1161.05 9558.33 1161.03 9595.62 1161.05 9651.28 1160.72 9654.93  1160.7
 9661.36 1160.66 9714.24  1160.4 9744.23 1160.21 9765.18 1159.52 9767.81  1159.5
 9770.43 1159.45 9773.63 1159.39 9777.64 1159.31 9783.48 1159.22 9791.82 1159.08
  9811.2 1158.62 9818.64 1158.46 9826.97 1158.14 9835.81 1157.71 9836.49 1157.69
 9845.53 1157.47 9853.88 1157.27 9861.06 1157.11 9876.86 1157.68 9884.78 1157.92
  9887.1 1158.06 9889.04  1158.2 9906.96 1159.53 9930.13 1159.45 9943.17 1159.38
 9954.56 1159.39 9964.77 1159.54 9981.17 1159.69 9989.58 1155.05  9994.1 1152.41
 9997.59 1151.75   10000 1151.310010.32 1149.3610020.21 1154.9810026.29 1158.48
10029.02 1160.0910034.68 1159.9910049.23 1159.6810055.76 1159.4810087.32 1158.42
10109.44 1158.2910132.83 1158.1710185.95 1157.85 10193.7 1157.8110197.11 1157.79
```

```
10254.57  1157.510284.78 1157.4510315.44 1157.3810372.45 1157.2610374.73 1157.27
10376.31 1157.2710385.09 1157.2810437.18 1157.3710460.12 1157.4110498.05 1157.51
10547.78 1157.6410558.92 1157.6810584.23 1157.7710619.79 1157.8910626.21 1157.91
10651.46 1158.5210687.83 1159.3610723.41  1158.610733.99 1158.4310741.54 1158.47
10783.37 1158.7310802.41 1158.8510810.79 1158.9110863.28 1159.3410898.46 1159.66
10924.15 1159.9110982.51 1160.5310985.02 1160.5510986.13 1160.5611045.89 1161.21
 11073.8 1161.5311106.76 1161.8811161.46 1162.4811167.63 1162.5411181.65 1162.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8850.17     .05 9981.17    .04310029.02     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.1710029.02             1220    1169    1080            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1162.11  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.15  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1161.97  * Reach Len. (ft)         * 1170.00  * 1170.00  * 1170.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 1190.80  *  391.75  * 3580.88  *
* E.G. Slope (ft/ft)      *0.001588  * Area (sq ft)            * 1190.80  *  391.75  * 3580.88  *
* Q Total (cfs)           *13290.00  * Flow (cfs)              * 1843.05  * 2049.84  * 9397.11  *
* Top Width (ft)          * 1930.67  * Top Width (ft)          *  797.06  *   47.85  * 1085.75  *
* Vel Total (ft/s)        *    2.57  * Avg. Vel. (ft/s)        *    1.55  *    5.23  *    2.62  *
* Max Chl Dpth (ft)       *   12.61  * Hydr. Depth (ft)        *    1.49  *    8.19  *    3.30  *
* Conv. Total (cfs)       *333450.9  * Conv. (cfs)             * 46242.8  * 51431.2  *235777.0  *
* Length Wtd. (ft)        * 1170.00  * Wetted Per. (ft)        *  797.20  *   52.90  * 1085.83  *
* Min Ch El (ft)          * 1149.36  * Shear (lb/sq ft)        *    0.15  *    0.73  *    0.33  *
* Alpha                   *    1.42  * Stream Power (lb/ft s)  *    0.23  *    3.84  *    0.86  *
* Frctn Loss (ft)         *    2.34  * Cum Volume (acre-ft)    *   46.72  *   24.05  *   65.45  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *          *          *          *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 9            RS: 16.974

INPUT
Description:
Station Elevation Data    num=     108
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 8538.38 1159.99 8548.16 1159.56 8555.72 1159.49 8614.39 1159.12 8631.95 1159.05
 8680.63 1158.95 8708.19 1158.86 8746.87 1158.68 8784.42 1158.53  8813.1 1158.44
 8860.66 1158.31 8879.34 1158.28 8936.89 1158.21 8945.58  1158.2 9003.12 1158.05
 9011.81 1158.03 9013.12 1158.03 9078.05 1157.84 9089.36 1157.82 9144.28 1158.21
 9165.59 1158.44 9210.52 1158.91 9241.83 1159.19 9276.76 1159.38 9318.06 1158.69
 9336.19 1157.57 9339.43 1157.47 9344.24 1157.33    9352 1157.05 9369.04 1156.28
 9389.53 1155.41 9399.26 1154.82 9406.11 1154.98 9419.86 1155.33 9470.53 1156.98
 9475.47 1156.97 9508.17 1156.95  9541.7 1156.92 9546.76 1156.92 9607.94 1156.98
    9623 1157.01 9674.18  1157.1 9699.23 1157.16 9740.41 1157.23 9756.71 1157.26
 9775.47 1157.27 9806.65  1157.3  9851.7  1157.3 9872.88 1157.29 9927.93 1157.21
 9937.16 1157.11 9937.65 1157.14 9940.83 1157.19 9951.95 1157.11 9970.31 1156.99
 9976.33 1153.63 9984.56 1148.35   10000 1148.3610003.34 1148.3610007.62 1148.36
10011.84 1150.7410020.91 1156.87 10052.1 1156.8510063.77 1156.8510075.76 1156.89
10083.53 1156.8910134.73 1156.9210160.82 1156.95 10200.3 1157.0110238.11 1157.06
10265.87 1157.1110299.81 1157.0510322.22 1156.8110342.57  1156.710365.25 1156.59
10379.98 1156.5710388.94 1156.52 10393.9 1156.5810406.96 1156.7210461.37 1157.61
10468.04 1157.6210501.44 1157.6710528.15 1157.7710547.25 1157.8110593.73 1157.94
10624.53 1157.98 10659.3 1158.0310701.82 1158.0510724.87 1158.03 10779.1 1158.06
10790.44 1158.0910853.89 1158.3310856.01 1158.3410856.39 1158.3410921.58 1158.83
10933.68 1158.9610987.15 1159.5711010.96 1159.8211052.72 1160.2111088.25 1160.58
 11118.3  1160.911165.53 1161.4811183.87 1161.6711242.82 1162.1211248.39 1162.13
11248.94 1162.1311249.65 1162.1211250.45 1162.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
 8538.38     .05  9851.7    .04310265.87     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
        9851.710265.87              1320    1392    1250            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1159.78  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.14  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1159.64  * Reach Len. (ft)         * 1320.00  * 1392.00  * 1250.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 2288.01  * 1399.21  * 1292.77  *
* E.G. Slope (ft/ft)      *0.002584  * Area (sq ft)            * 2288.01  * 1399.21  * 1292.77  *
* Q Total (cfs)           *13380.00  * Flow (cfs)              * 5024.71  * 5490.56  * 2864.72  *
* Top Width (ft)          * 2447.17  * Top Width (ft)          * 1305.30  *  414.17  *  727.70  *
* Vel Total (ft/s)        *    2.69  * Avg. Vel. (ft/s)        *    2.20  *    3.92  *    2.22  *
* Max Chl Dpth (ft)       *   11.29  * Hydr. Depth (ft)        *    1.75  *    3.38  *    1.78  *
* Conv. Total (cfs)       *263204.9  * Conv. (cfs)             * 98843.7  *108007.8  * 56353.5  *
* Length Wtd. (ft)        * 1321.08  * Wetted Per. (ft)        * 1305.45  *  419.10  *  727.72  *
* Min Ch El (ft)          * 1148.35  * Shear (lb/sq ft)        *    0.28  *    0.54  *    0.29  *
* Alpha                   *    1.27  * Stream Power (lb/ft s)   *    0.62  *    2.11  *    0.64  *
* Frctn Loss (ft)         *    3.79  * Cum Volume (acre-ft)    *  185.71  *   61.98  *  170.68  *
* C & E Loss (ft)         *    0.01  * Cum SA (acres)          *   72.05  *    8.85  *   56.46  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: Waterman Wash
REACH: REACH 9            RS: 16.710

INPUT
Description:
Station Elevation Data     num=      111
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
  8708.7  1156.1 8709.43  1156.1 8761.64 1155.96 8772.53 1155.93 8808.97 1155.83
 8835.63 1155.75  8843.6 1155.73 8898.74 1155.56 8925.56 1155.48 8961.84 1155.36
 9007.52  1155.2 9024.94 1155.14 9083.22 1154.92 9088.04  1154.9 9089.48  1154.9
 9151.14 1154.64 9171.44 1154.56 9214.25 1154.38  9253.4 1154.23 9277.35 1154.14
 9335.36 1153.95 9340.45 1153.93 9357.47 1153.88 9403.55 1153.74 9417.32  1153.7
 9466.65 1153.59 9499.28 1153.52 9529.76 1153.46 9581.24 1153.36 9592.86 1153.34
 9631.72 1153.24 9655.96 1153.18 9660.85 1152.97 9666.03 1152.72 9716.06 1150.36
 9733.22    1151 9757.83 1151.95 9782.17 1152.82 9827.13 1152.77 9845.27 1152.75
 9905.97  1152.8 9908.37  1152.8 9908.68  1152.8 9909.58 1152.82 9909.99 1152.82
 9910.99 1152.82 9925.21 1152.88 9980.85 1153.12 9988.85 1147.39 9991.89 1145.34
   10000 1145.3310002.24 1145.3210010.04  1145.310013.66 1147.5510022.96 1153.54
10038.18 1153.3110086.23 1153.1210111.01 1153.1210131.88 1153.1210182.72 1153.09
10201.63 1153.0810254.43 1153.0810271.38 1153.0810326.15 1153.1610341.13 1153.18
10397.86 1153.2910410.88 1153.3210469.57 1153.4510480.63 1153.4810541.29 1153.64
10550.37 1153.67   10613  1153.910616.61 1153.9110621.37 1153.9410625.13 1153.96
10655.28  1154.110669.84 1153.5710706.24 1152.4610747.73 1154.2710758.05  1154.7
10759.62 1154.7110828.14 1155.2110829.37 1155.2210872.98 1155.5610899.12 1155.77
10899.85 1155.7710968.87 1156.3410971.57 1156.3611038.61 1156.9411043.28 1156.98
11108.36 1157.5811114.99 1157.6411178.11 1158.2511186.71 1158.3311247.86 1158.91
11258.42 1159.0111317.61 1159.5211330.13 1159.6211387.36 1160.0311401.85 1160.13
11457.11 1160.4611473.56 1160.5611526.86 1160.8711545.27 1160.98 11596.6 1161.29
11616.99 1161.4311666.35 1161.75 11688.7  1161.9 11736.1 1162.2211760.41 1162.38
11805.85 1162.69

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
  8708.7     .05 9980.85    .04310022.96     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.8510022.96             1320    1368    1380            .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1155.98  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.25  * Wt. n-Val.              *   0.050  *   0.043  *   0.050  *
* W.S. Elev (ft)          * 1155.73  * Reach Len. (ft)         * 1320.00  * 1368.00  * 1380.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)       * 2206.40  *  342.97  * 1812.99  *
* E.G. Slope (ft/ft)      *0.003198  * Area (sq ft)            * 2206.40  *  342.97  * 1812.99  *
* Q Total (cfs)           *13260.00  * Flow (cfs)              * 5770.32  * 2522.27  * 4967.41  *
* Top Width (ft)          * 2049.55  * Top Width (ft)          * 1136.54  *   42.11  *  870.90  *
* Vel Total (ft/s)        *    3.04  * Avg. Vel. (ft/s)        *    2.62  *    7.35  *    2.74  *
* Max Chl Dpth (ft)       *   10.43  * Hydr. Depth (ft)        *    1.94  *    8.14  *    2.08  *
```

* Conv. Total (cfs)	*234471.3	* Conv. (cfs)	*102034.2	* 44600.3	* 87836.8	*
* Length Wtd. (ft)	* 1351.46	* Wetted Per. (ft)	* 1136.65	* 46.98	* 870.98	*
* Min Ch El (ft)	* 1145.30	* Shear (lb/sq ft)	* 0.39	* 1.46	* 0.42	*
* Alpha	* 1.74	* Stream Power (lb/ft s)	* 1.01	* 10.72	* 1.14	*
* Frctn Loss (ft)	* 3.67	* Cum Volume (acre-ft)	* 117.62	* 34.15	* 126.12	*
* C & E Loss (ft)	* 0.02	* Cum SA (acres)	* 35.05	* 1.56	* 33.52	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 9 RS: 16.451

INPUT
Description:
Station Elevation Data num= 119

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8603.09	1153.47	8646.76	1153.2	8664.86	1153.09	8727.73	1152.66	8728.43	1152.66
8731	1152.64	8792	1152.22	8801.9	1151.82	8861.45	1149.56	8862.12	1149.58
8863.88	1149.64	8906.46	1151.05	8919.14	1151.46	8970.63	1151.22	8982.71	1151.17
9026.84	1151.01	9046.28	1150.94	9051.6	1150.92	9109.85	1150.78	9132.57	1150.73
9173.42	1150.66	9213.53	1150.6	9236.99	1150.57	9294.5	1150.49	9300.55	1150.49
9322.68	1150.47	9364.12	1150.44	9375.47	1150.44	9427.69	1150.4	9456.43	1150.33
9491.26	1150.22	9537.4	1150.09	9549.77	1149.71	9553.11	1149.55	9558.82	1149.29
9573.05	1148.77	9596.87	1147.87	9608.88	1147.51	9612.61	1147.64	9615.29	1147.51
9617.09	1147.58	9663.77	1149.86	9671.41	1150	9680.56	1149.98	9694.45	1149.86
9709.29	1149.72	9716.24	1149.66	9735.73	1149.4	9736.9	1149.39	9741.57	1149.35
9758.42	1149.29	9774.09	1149.16	9795.45	1148.98	9808.73	1148.55	9813.71	1148.18
9817.96	1147.79	9821.64	1147.51	9861.27	1148.51	9872.67	1148.49	9903.27	1148.43
9962.98	1149.16	9971.67	1149.3	9985.63	1143.61	9988.5	1142.35	9990.84	1142.25
10000	1141.84	10010.75	1141.36	10022.41	1147.87	10028.98	1151.27	10046.66	1150.6
10051.84	1150.11	10081.56	1148.97	10107.25	1149.06	10124.79	1149.11	10177.28	1149.3
10187.28	1149.34	10190.62	1149.35	10249.76	1149.42	10273.98	1149.39	10312.25	1149.33
10357.35	1149.31	10374.74	1149.31	10426.8	1149.41	10437.23	1149.43	10440.71	1149.44
10499.71	1149.62	10524.07	1149.72	10545.87	1149.79	10573.28	1149.66	10592.83	1149.59
10612.21	1149.51	10622.89	1149.74	10653.01	1150.29	10687.17	1150.45	10690.8	1150.46
10749.66	1150.66	10774.17	1150.72	10812.15	1150.81	10857.53	1150.88	10874.63	1150.91
10925.82	1150.96	10937.12	1150.97	10940.9	1150.98	10999.61	1151.06	11024.26	1151.1
11062.09	1151.19	11107.62	1151.33	11124.58	1151.41	11153.03	1151.51	11187.07	1151.66
11190.99	1151.68	11249.55	1151.98	11274.35	1152.11	11312.04	1152.33	11357.72	1152.63
11374.53	1152.74	11424.85	1153.11	11437.02	1153.19	11441.08	1153.22		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8603.09	.05	9971.67	.04	10028.98	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9971.67	10028.98	1140	1105	1020	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

* E.G. Elev (ft)	* 1152.30	* Element	* Left OB	* Channel	* Right OB	*
* Vel Head (ft)	* 0.18	* Wt. n-Val.	* 0.050	* 0.043	* 0.050	*
* W.S. Elev (ft)	* 1152.11	* Reach Len. (ft)	* 1103.00	* 1103.00	* 1103.00	*
* Crit W.S. (ft)	*	* Flow Area (sq ft)	* 2486.95	* 437.42	* 2264.91	*
* E.G. Slope (ft/ft)	*0.002333	* Area (sq ft)	* 2486.95	* 437.42	* 2264.91	*
* Q Total (cfs)	*13430.00	* Flow (cfs)	* 5877.92	* 2708.26	* 4843.81	*
* Top Width (ft)	* 2479.82	* Top Width (ft)	* 1176.97	* 57.31	* 1245.54	*
* Vel Total (ft/s)	* 2.59	* Avg. Vel. (ft/s)	* 2.36	* 6.19	* 2.14	*
* Max Chl Dpth (ft)	* 10.75	* Hydr. Depth (ft)	* 2.11	* 7.63	* 1.82	*
* Conv. Total (cfs)	*278021.6	* Conv. (cfs)	*121682.0	* 56065.2	*100274.3	*
* Length Wtd. (ft)	* 1103.00	* Wetted Per. (ft)	* 1177.24	* 61.23	* 1245.61	*
* Min Ch El (ft)	* 1141.36	* Shear (lb/sq ft)	* 0.31	* 1.04	* 0.26	*
* Alpha	* 1.77	* Stream Power (lb/ft s)	* 0.73	* 6.44	* 0.57	*
* Frctn Loss (ft)	* 2.39	* Cum Volume (acre-ft)	* 46.50	* 21.89	* 61.52	*
* C & E Loss (ft)	* 0.00	* Cum SA (acres)	*	*	*	*

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 10 RS: 16.242

INPUT
Description:
Station Elevation Data num= 140

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8374.5	1151.29	8400.36	1151.22	8425.66	1151.16	8466.99	1151.06	8501.3	1150.99
8533.62	1150.91	8576.95	1150.81	8600.25	1150.76	8652.59	1150.67	8666.88	1150.64
8728.24	1150.55	8733.51	1150.54	8772.46	1150.49	8800.14	1150.45	8803.88	1150.44
8866.77	1150.33	8879.53	1150.3	8933.4	1150.18	8955.18	1150.11	9000.03	1149.97
9030.82	1149.86	9066.66	1149.74	9106.47	1149.59	9133.29	1149.5	9182.11	1149.29
9199.92	1149.21	9257.76	1148.87	9266.55	1148.82	9331.58	1148.38	9333.18	1148.37
9333.4	1148.37	9399.82	1147.93	9409.05	1147.87	9466.45	1147.56	9484.69	1147.48
9533.08	1147.37	9560.34	1147.4	9599.28	1145.67	9627.66	1143.49	9632.17	1144.39
9646.34	1147.21	9672.75	1152.48	9678.38	1153.57	9689.94	1154.16	9701.67	1154.58
9707.01	1153.4	9722.39	1147.03	9777.28	1148.05	9779.74	1148.09	9781.76	1148.12
9783.43	1148.15	9786.89	1148.2	9789.28	1148.23	9791.06	1148.25	9799.6	1148.51
9862.92	1148.41	9866.23	1148.37	9923.37	1146.77	9926.93	1146.87	9931.16	1146.83
9937.24	1146.43	9944.84	1145.68	9948.8	1145.32	9962.68	1142.82	9973.32	1140.92
9977.31	1140.35	10000	1139.99	10002.97	1139.94	10037.95	1139.27	10055.15	1142.28
10059.45	1143.03	10082.59	1147.34	10084.17	1147.35	10149.78	1146.58	10184.12	1146.84
10187.69	1146.86	10245.65	1147.02	10273.48	1147.05	10307.18	1147.07	10359.27	1147.05
10368.72	1147.05	10392.67	1147.01	10430.25	1146.96	10445.06	1146.92	10491.78	1146.82
10508.1	1146.77	10539.46	1146.45	10564.1	1146.26	10569.49	1146.22	10599.35	1146.46
10612.93	1146.57	10614.06	1146.58	10614.36	1146.58	10615.59	1146.59	10616.64	1146.59
10676.37	1146.61	10702.43	1146.65	10737.9	1146.72	10788.22	1146.87	10799.43	1146.91
10827.88	1147.04	10860.96	1147.18	10874.01	1147.27	10922.5	1147.61	10959.8	1147.92
10984.03	1148.14	11045.48	1148.75	11045.56	1148.75	11045.59	1148.75	11107.09	1149.36
11131.38	1149.58	11168.62	1149.91	11217.17	1150.29	11230.15	1150.39	11263.08	1150.61
11291.68	1150.81	11302.96	1150.88	11353.21	1151.16	11388.75	1151.36	11414.74	1151.49
11474.53	1151.82	11476.27	1151.83	11480.68	1151.86	11537.8	1152.19	11560.32	1152.33
11599.34	1152.56	11646.11	1152.85	11660.87	1152.94	11698.29	1153.18	11722.4	1153.33
11731.9	1153.39	11783.93	1153.71	11817.69	1153.89	11845.46	1154.05	11903.48	1154.34
11906.99	1154.36	11915.89	1154.41	11968.52	1154.69	11989.27	1154.81	12030.05	1155.03

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8374.5	.05	9862.92	.043	10082.59	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9862.92	10082.59	1140	1212	1230	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1149.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1149.68	Reach Len. (ft)	1140.00	1212.00	1230.00
Crit W.S. (ft)		Flow Area (sq ft)	1186.13	1291.85	2594.29
E.G. Slope (ft/ft)	0.002038	Area (sq ft)	1186.13	1291.85	2594.29
Q Total (cfs)	15070.00	Flow (cfs)	2209.26	6541.32	6319.42
Top Width (ft)	2004.06	Top Width (ft)	723.95	219.67	1060.44
Vel Total (ft/s)	2.97	Avg. Vel. (ft/s)	1.86	5.06	2.44
Max Chl Dpth (ft)	10.41	Hydr. Depth (ft)	1.64	5.88	2.45
Conv. Total (cfs)	333806.2	Conv. (cfs)	48936.0	144892.6	139977.6
Length Wtd. (ft)	1202.77	Wetted Per. (ft)	725.23	220.93	1060.46
Min Ch El (ft)	1139.27	Shear (lb/sq ft)	0.21	0.74	0.31
Alpha	1.60	Stream Power (lb/ft s)	0.39	3.77	0.76
Frctn Loss (ft)	2.81	Cum Volume (acre-ft)	101.45	81.39	210.36
C & E Loss (ft)	0.00	Cum SA (acres)	56.25	11.13	83.23

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 10 RS: 16.012

INPUT

Description:
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
8262.23	1150	8277.11	1149.93	8289.72	1149.87	8350.28	1149.56	8358.21	1149.52
8423.45	1149.2	8426.69	1149.19	8474.01	1149	8495.17	1148.91	8496.62	1148.91
8563.66	1148.7	8569.79	1148.69	8632.14	1148.54	8642.96	1148.51	8700.63	1148.35
8716.13	1148.31	8744.41	1148.4	8772	1148.66	8777.92	1148.71	8836.33	1148.06
8847.02	1147.94	8862.47	1147.7	8906.08	1147.48	8935.64	1147.33	8974.56	1147.14
9008.81	1146.96	9043.05	1146.76	9081.98	1146.47	9111.53	1146.26	9155.15	1145.95
9180.01	1145.82	9228.32	1145.66	9248.5	1145.62	9301.49	1145.55	9316.98	1145.53
9374.66	1145.52	9385.47	1145.52	9447.83	1145.56	9453.95	1145.55	9521	1145.56
9522.46	1145.59	9563.52	1146.42	9607.85	1146.63	9612.84	1146.68	9618.01	1146.68
9662.26	1142.18	9686.55	1140.32	9700.36	1140.7	9703.09	1140.78	9721.91	1142.69
9733.62	1143.49	9740.51	1143.8	9779.57	1142.53	9790.09	1142.31	9808.46	1141.93
9816.64	1141.76	9830.95	1141.97	9833.9	1141.91	9838.45	1141.96	9867.04	1142.24
9878.79	1142.62	9897.49	1143.19	9908.11	1143.39	9925.19	1143.92	9928.67	1143.92
9929.18	1143.96	9929.9	1144.01	9930.96	1144.06	9933.25	1144.1	9957.79	1144.63
9964.88	1144.47	9975.56	1144.43	9975.9	1144.33	9979.3	1141.54	9981.01	1140.04
9987.19	1135.35	10000	1135.02	10014.83	1134.64	10015.32	1134.63	10015.6	1134.77
10033.05	1144.09	10046.57	1144.11	10064.73	1143.96	10069.22	1143.84	10072.47	1143.72
10087.71	1143.64	10100.68	1143.62	10146.43	1143.53	10169.94	1143.51	10218.69	1143.53
10234.93	1143.18	10237.68	1143.19	10241.71	1143.16	10247.89	1143.05	10260.15	1142.78
10289.65	1142.26	10302.16	1141.88	10304.01	1141.83	10319.56	1142.38	10328.55	1142.69
10363.2	1143.8	10377.72	1143.84	10435.45	1144.03	10446.98	1144.07	10507.71	1144.32
10516.24	1144.36	10579.96	1144.67	10585.5	1144.71	10652.22	1145.06	10654.76	1145.07
10713.58	1145.36	10724.02	1145.41	10724.47	1145.41	10759.61	1145.56	10803.76	1144.97
10821.83	1144.72	10845.42	1145.39	10858.42	1145.76	10861.55	1145.85	10862.94	1145.89
10868.99	1146.02	10931.81	1146.27	10941.24	1146.31	10983.39	1146.08	10992.74	1145.91
11005.44	1145.71	11016.21	1145.54	11022.02	1145.66	11043.52	1146.09	11061.7	1146.46
11070.08	1146.61	11074.01	1146.68	11076.45	1146.72	11085.75	1146.94	11139.59	1147.21
11158.01	1147.31	11208.85	1147.61	1230.26	1147.72	11278.11	1148.02	11302.52	1148.16
11347.37	1148.44	11374.77	1148.61	11416.63	1148.86	11447.03	1149.04	11485.89	1149.26
11519.28	1149.45	11555.16	1149.64	11591.54	1149.84	11624.42	1150.03	11663.79	1150.27
11693.68	1150.47	11736.05	1150.76	11762.94	1150.96	11808.31	1151.3	11832.2	1151.48
11880.56	1151.87	11901.46	1152.04	11952.82	1152.48	11970.72	1152.63	12025.07	1153.09
12039.98	1153.2								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
8262.23	.05	9957.79	.04	10033.05	.05

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9957.79	10033.05	2100	2177	2120	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1147.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.050	0.043	0.050
W.S. Elev (ft)	1146.82	Reach Len. (ft)	2100.00	2177.00	2120.00
Crit W.S. (ft)		Flow Area (sq ft)	1916.15	587.62	2365.87
E.G. Slope (ft/ft)	0.002706	Area (sq ft)	1916.15	587.62	2365.87
Q Total (cfs)	15070.00	Flow (cfs)	4809.73	3965.46	6294.81
Top Width (ft)	2048.75	Top Width (ft)	925.69	75.26	1047.80
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)	2.51	6.75	2.66
Max Chl Dpth (ft)	12.19	Hydr. Depth (ft)	2.07	7.81	2.26
Conv. Total (cfs)	289685.0	Conv. (cfs)	92455.6	76226.6	121002.7
Length Wtd. (ft)	2139.74	Wetted Per. (ft)	926.21	80.79	1047.90
Min Ch El (ft)	1134.63	Shear (lb/sq ft)	0.35	1.23	0.38
Alpha	1.77	Stream Power (lb/ft s)	0.88	8.29	1.01
Frctn Loss (ft)	5.64	Cum Volume (acre-ft)	60.86	55.24	140.33
C & E Loss (ft)	0.02	Cum SA (acres)	34.67	7.02	53.47

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Waterman Wash
REACH: REACH 10 RS: 15.600

INPUT
Description:

```
Station Elevation Data    num=     118
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
  9010.2 1142.13 9024.61 1142.09 9081.83 1141.92 9094.44 1141.89 9153.46 1141.73
 9164.26  1141.7 9225.08 1141.51 9234.09 1141.47 9296.71 1141.23 9303.92 1141.19
 9368.34  1140.9 9373.75 1140.87 9439.97 1140.56 9443.58 1140.54  9511.6 1140.17
 9513.41 1140.16 9583.22 1139.73 9583.58 1139.73 9653.06 1139.28 9654.85 1139.27
 9722.89 1138.79 9726.48 1138.77 9785.74  1139.6 9792.92 1139.64 9815.61 1139.33
 9820.38 1139.43 9825.96 1139.51  9835.9 1139.52 9847.77 1139.45 9858.59 1139.39
 9861.52 1139.08 9869.64 1138.08 9875.47 1137.26 9913.13 1133.08 9913.45 1133.08
 9913.49 1133.08 9913.54 1133.08 9913.55 1133.08 9913.57 1133.08 9913.58 1133.08
 9943.08 1132.87 9944.32 1132.86 9945.69 1132.85 9947.15 1132.85 9968.89 1132.72
  9973.5 1132.71  9978.3 1132.71 9986.42 1131.57   10000 1131.1410003.92 1130.95
10035.94 1129.9510043.37 1130.1610050.47 1130.3510057.55 1134.5810064.38  1138.2
 10089.7 1137.3810104.25 1137.0110109.73 1136.8910112.58 1136.8310113.71 1136.81
10114.57 1136.7910122.79 1136.6310133.77 1136.7510172.39 1137.1110200.11 1137.17
10226.58 1137.2710263.46 1137.5610280.77 1137.6510293.19 1137.6210334.96  1137.5
10386.27 1137.4810389.15 1137.4810393.16 1137.4810443.34 1137.5610479.35 1137.63
10497.53 1137.6610522.85 1137.7110551.72 1137.7510572.44 1137.7710605.91 1137.81
10637.25 1136.0610652.91  1134.910671.34 1133.6210684.26 1134.6210697.13 1135.76
10734.31 1138.0410768.47 1138.1410782.23 1138.1810822.66 1138.3310851.68 1138.46
10876.85 1138.5710911.92 1138.7310931.04 1138.8310944.76 1138.9210985.23 1139.17
11037.84 1139.5711039.42 1139.5811040.07 1139.5811041.61  1139.611093.61 1140.04
11130.92 1140.35 11147.8  1140.5 11171.3 1140.6811201.99 1140.9211224.01 1141.07
11256.17 1141.29   11301 1141.5711310.36 1141.6211317.09 1141.6611364.55 1141.94
11410.17 1142.2111418.74 1142.2511430.69 1142.3211472.93 1142.5611503.25 1142.72
11527.12 1142.8511560.38 1143.0211581.31 1143.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
  9010.2     .05 9858.59    .04310064.38     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9858.5910064.38                 5       5       5             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1141.44  * Element                 *  Left OB  *  Channel  * Right OB *
* Vel Head (ft)          *    0.44  * Wt. n-Val.              *   0.050   *   0.043   *   0.050   *
* W.S. Elev (ft)         * 1141.00  * Reach Len. (ft)         *           *           *           *
* Crit W.S. (ft)         * 1139.66  * Flow Area (sq ft)       *  608.63   * 1623.11   * 3401.09   *
* E.G. Slope (ft/ft)     *0.002590  * Area (sq ft)            *  608.63   * 1623.11   * 3401.09   *
* Q Total (cfs)          *22850.00  * Flow (cfs)              * 1032.28   *11217.63   *10600.09   *
* Top Width (ft)         * 1867.61  * Top Width (ft)          *  512.46   *  205.79   * 1149.36   *
* Vel Total (ft/s)       *    4.06  * Avg. Vel. (ft/s)        *    1.70   *    6.91   *    3.12   *
* Max Chl Dpth (ft)      *   11.05  * Hydr. Depth (ft)        *    1.19   *    7.89   *    2.96   *
* Conv. Total (cfs)      *448999.9  * Conv. (cfs)             * 20284.3   *220425.1   *208290.5   *
* Length Wtd. (ft)       *          * Wetted Per. (ft)        *  512.48   *  208.34   * 1149.69   *
* Min Ch El (ft)         * 1129.95  * Shear (lb/sq ft)        *    0.19   *    1.26   *    0.48   *
* Alpha                  *    1.71  * Stream Power (lb/ft s)   *    0.33   *    8.71   *    1.49   *
* Frctn Loss (ft)        *          * Cum Volume (acre-ft)    *           *           *           *
* C & E Loss (ft)        *          * Cum SA (acres)          *           *           *           *
*****************************************************************************************

CROSS SECTION


RIVER: 3S1WS15B (D39)
REACH: REACH 1            RS: 3.202

INPUT
Description: Limit of Sudy.
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9383.47 1230.58 9422.51 1230.21 9438.84 1230.02 9467.02 1229.96 9513.68 1229.89
 9531.72 1229.86 9592.46 1229.78 9596.42 1229.78 9614.63 1229.74 9661.12 1229.66
 9671.24 1229.63 9725.82 1229.49 9750.02 1229.42 9790.52 1229.33  9828.8 1229.24
 9855.23 1229.18 9907.58 1229.09 9919.93 1229.08 9949.89 1229.07 9997.18 1228.27
   10000 1228.2310000.76 1228.2210003.18 1228.27 10025.7  1228.810070.54 1229.34
10088.95 1229.41 10113.2 1229.5110139.41 1229.6210171.69 1229.7710189.88 1229.86
10230.18 1230.0810240.35 1230.1310288.67 1230.3910290.82  1230.410304.35 1230.47
10341.29 1230.6610347.15 1230.6810391.75 1230.8710405.64 1230.9110442.22 1231.02
10464.13 1231.0510492.69 1231.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
***********************************************
```

```
 9383.47    .041 9949.89    .04110070.54    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.8910070.54             1360    1381    1345            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1230.09  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.04  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1230.05  * Reach Len. (ft)         * 1360.00  * 1381.00  * 1345.00  *
* Crit W.S. (ft)         * 1229.61  * Flow Area (sq ft)       *  260.12  *  154.09  *   58.40  *
* E.G. Slope (ft/ft)     *0.002402  * Area (sq ft)            *  260.12  *  154.09  *   58.40  *
* Q Total (cfs)          *  670.00  * Flow (cfs)              *  293.55  *  322.12  *   54.33  *
* Top Width (ft)         *  788.28  * Top Width (ft)          *  513.58  *  120.65  *  154.05  *
* Vel Total (ft/s)       *    1.42  * Avg. Vel. (ft/s)        *    1.13  *    2.09  *    0.93  *
* Max Chl Dpth (ft)      *    1.83  * Hydr. Depth (ft)        *    0.51  *    1.28  *    0.38  *
* Conv. Total (cfs)      * 13671.4  * Conv. (cfs)             *  5989.9  *  6572.8  *  1108.6  *
* Length Wtd. (ft)       * 1370.19  * Wetted Per. (ft)        *  513.58  *  120.67  *  154.05  *
* Min Ch El (ft)         * 1228.22  * Shear (lb/sq ft)        *    0.08  *    0.19  *    0.06  *
* Alpha                  *    1.36  * Stream Power (lb/ft s)  *    0.09  *    0.40  *    0.05  *
* Frctn Loss (ft)        *    7.97  * Cum Volume (acre-ft)    *   29.81  *  112.18  *   71.18  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *   21.53  *   57.35  *   44.28  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15B (D39)
REACH: REACH 1            RS: 2.941

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9345.65 1223.21 9393.48 1223.32 9406.17 1223.11 9428.35 1222.88 9460.38 1222.43
 9479.42 1222.36 9520.68 1222.25 9536.41  1222.2 9549.45 1222.17 9593.39 1222.08
 9646.41 1221.95 9650.38 1221.94 9653.67 1221.93 9707.36 1221.76 9757.89 1221.56
 9764.35 1221.53 9772.14  1221.5 9821.34  1221.3 9862.12 1221.16 9878.32 1221.11
 9897.87  1221.1 9935.31 1221.06 9955.14 1220.87 9959.16 1220.83 9965.86 1220.79
    9978 1220.71 9993.84 1220.59   10000 1220.6510006.19 1220.7110043.25 1221.35
 10060.5 1221.4410093.25 1221.6110111.44 1221.7110143.26 1221.8910162.39 1221.99
10193.27 1222.1510213.33 1222.2510243.28  1222.410264.27 1222.4910293.29 1222.64
10321.26 1222.77 10343.3 1222.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9345.65    .041 9935.31    .04110043.25    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9935.3110043.25             1900    1892    1880            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1222.10  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.25  * Wt. n-Val.              *   0.041  *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1221.85  * Reach Len. (ft)         * 1900.00  * 1892.00  * 1880.00  *
* Crit W.S. (ft)         * 1221.82  * Flow Area (sq ft)       *  117.16  *  105.82  *   23.43  *
* E.G. Slope (ft/ft)     *0.017515  * Area (sq ft)            *  117.16  *  105.82  *   23.43  *
* Q Total (cfs)          *  880.00  * Flow (cfs)              *  334.15  *  500.84  *   45.01  *
* Top Width (ft)         *  455.91  * Top Width (ft)          *  255.51  *  107.94  *   92.46  *
* Vel Total (ft/s)       *    3.57  * Avg. Vel. (ft/s)        *    2.85  *    4.73  *    1.92  *
* Max Chl Dpth (ft)      *    1.26  * Hydr. Depth (ft)        *    0.46  *    0.98  *    0.25  *
* Conv. Total (cfs)      *  6649.4  * Conv. (cfs)             *  2524.9  *  3784.4  *   340.1  *
* Length Wtd. (ft)       * 1893.15  * Wetted Per. (ft)        *  255.51  *  107.95  *   92.46  *
* Min Ch El (ft)         * 1220.59  * Shear (lb/sq ft)        *    0.50  *    1.07  *    0.28  *
* Alpha                  *    1.26  * Stream Power (lb/ft s)  *    1.43  *    5.07  *    0.53  *
* Frctn Loss (ft)        *    8.74  * Cum Volume (acre-ft)    *   23.92  *  108.06  *   69.91  *
* C & E Loss (ft)        *    0.06  * Cum SA (acres)          *    9.52  *   53.72  *   40.48  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
```

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15B (D39)
REACH: REACH 1 RS: 2.582

INPUT
Description:
Station Elevation Data num= 37

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9950.36	1213.57	9953.85	1214.1	9953.97	1214.12	9955.97	1213.98	9983.16	1212.13
9997.92	1211.18	10000	1211.19	10033.59	1211.23	10050.18	1211.25	10072.63	1211.41
10100.12	1211.51	10125.22	1211.59	10139.79	1211.66	10177.8	1211.83	10179.45	1211.84
10184.51	1211.87	10219.12	1212.05	10230.39	1212.12	10258.78	1212.29	10282.97	1212.44
10298.45	1212.53	10335.56	1212.74	10338.11	1212.75	10345.95	1212.79	10377.78	1212.94
10388.15	1213	10417.44	1213.11	10440.73	1213.21	10457.11	1213.25	10493.32	1213.36
10496.77	1213.37	10507.39	1213.41	10536.44	1213.48	10545.9	1213.51	10576.11	1213.58
10598.49	1213.64	10615.77	1213.69						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9950.36	.041	9953.85	.041	10440.73	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9953.85	10440.73	1275	1275	1275	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1213.29	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.		0.041	0.041
W.S. Elev (ft)	1213.24	Reach Len. (ft)	1275.00	1275.00	1275.00
Crit W.S. (ft)	1212.39	Flow Area (sq ft)		530.48	0.17
E.G. Slope (ft/ft)	0.002236	Area (sq ft)		530.48	0.17
Q Total (cfs)	980.00	Flow (cfs)		979.98	0.02
Top Width (ft)	485.50	Top Width (ft)		473.86	11.64
Vel Total (ft/s)	1.85	Avg. Vel. (ft/s)		1.85	0.10
Max Chl Dpth (ft)	2.06	Hydr. Depth (ft)		1.12	0.01
Conv. Total (cfs)	20726.4	Conv. (cfs)		20726.1	0.4
Length Wtd. (ft)	1275.00	Wetted Per. (ft)		473.93	11.64
Min Ch El (ft)	1211.18	Shear (lb/sq ft)		0.16	0.00
Alpha	1.00	Stream Power (lb/ft s)		0.29	0.00
Frctn Loss (ft)	5.88	Cum Volume (acre-ft)	21.36	94.24	69.40
C & E Loss (ft)	0.08	Cum SA (acres)	3.95	41.09	38.23

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15B (D39)
REACH: REACH 1 RS: 2.341

INPUT
Description:
Station Elevation Data num= 14

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9971.43	1206.98	9971.72	1207.06	9974.56	1207.82	9981.18	1206.43	10000	1202.66
10001.55	1202.35	10016.92	1203.51	10040.51	1205.78	10070.09	1206.54	10090.51	1207.08
10119.26	1207.41	10140.52	1207.75	10168.42	1207.73	10190.53	1207.82		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9971.43	.041	9974.56	.041	10040.51	.041

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
      9974.5610040.51             1410    1410    1410             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1207.34  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.81  * Wt. n-Val.              *          *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1206.53  * Reach Len. (ft)         * 1410.00  * 1410.00  * 1410.00  *
* Crit W.S. (ft)         * 1206.33  * Flow Area (sq ft)       *          *  143.52  *   10.90  *
* E.G. Slope (ft/ft)     *0.012765  * Area (sq ft)            *          *  143.52  *   10.90  *
* Q Total (cfs)          * 1070.00  * Flow (cfs)              *          * 1046.83  *   23.17  *
* Top Width (ft)         *   88.93  * Top Width (ft)          *          *   59.80  *   29.13  *
* Vel Total (ft/s)       *    6.93  * Avg. Vel. (ft/s)        *          *    7.29  *    2.13  *
* Max Chl Dpth (ft)      *    4.18  * Hydr. Depth (ft)        *          *    2.40  *    0.37  *
* Conv. Total (cfs)      *  9470.6  * Conv. (cfs)             *          *  9265.5  *   205.1  *
* Length Wtd. (ft)       * 1410.00  * Wetted Per. (ft)        *          *   60.37  *   29.14  *
* Min Ch El (ft)         * 1202.35  * Shear (lb/sq ft)        *          *    1.89  *    0.30  *
* Alpha                  *    1.09  * Stream Power (lb/ft s)   *          *   13.82  *    0.63  *
* Frctn Loss (ft)        *    8.86  * Cum Volume (acre-ft)     *   21.36  *   84.37  *   69.24  *
* C & E Loss (ft)        *    0.21  * Cum SA (acres)           *    3.95  *   33.28  *   37.63  *
*****************************************************************************************

Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15B (D39)
REACH: REACH 1            RS: 2.074

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************
 9957.29 1200.09  9974.8 1200.51  9997.3 1195.83 9999.03 1195.47 9999.48 1195.37
   10000 1195.3510004.65  1195.310066.94 1196.9510084.57 1197.0310119.06 1197.19
10124.85 1197.2210144.57  1197.310165.13 1197.3910171.17 1197.4110201.45 1196.94
10241.14 1196.3710267.64  1197.210275.45 1197.4910285.97 1197.8110321.94 1197.93
10326.25 1197.9510327.51 1197.9510366.53  1198.110379.62 1198.14 10406.8 1198.23
10431.74 1198.3110447.08 1198.3610483.85 1198.4710487.36 1198.4810499.32 1198.51
10527.64 1198.5910535.96 1198.6110567.92 1198.7110588.08 1198.77 10608.2 1198.85
10640.19 1198.9610648.48    119910676.69 1199.1310688.76 1199.19 10692.3  1199.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9957.29    .041  9974.8    .04110066.94    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.810066.94             1355    1356    1355             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)         * 1198.28  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.12  * Wt. n-Val.              *          *   0.041  *   0.041  *
* W.S. Elev (ft)         * 1198.15  * Reach Len. (ft)         * 1355.00  * 1356.00  * 1355.00  *
* Crit W.S. (ft)         *          * Flow Area (sq ft)       *          *  159.39  *  254.18  *
* E.G. Slope (ft/ft)     *0.003661  * Area (sq ft)            *          *  159.39  *  254.18  *
* Q Total (cfs)          * 1030.00  * Flow (cfs)              *          *  548.30  *  481.70  *
* Top Width (ft)         *  397.14  * Top Width (ft)          *          *   80.80  *  316.33  *
* Vel Total (ft/s)       *    2.49  * Avg. Vel. (ft/s)        *          *    3.44  *    1.90  *
* Max Chl Dpth (ft)      *    2.85  * Hydr. Depth (ft)        *          *    1.97  *    0.80  *
* Conv. Total (cfs)      * 17023.8  * Conv. (cfs)             *          *  9062.3  *  7961.5  *
* Length Wtd. (ft)       * 1355.67  * Wetted Per. (ft)        *          *   81.11  *  316.36  *
* Min Ch El (ft)         * 1195.30  * Shear (lb/sq ft)        *          *    0.45  *    0.18  *
* Alpha                  *    1.29  * Stream Power (lb/ft s)   *          *    1.54  *    0.35  *
* Frctn Loss (ft)        *    8.35  * Cum Volume (acre-ft)     *   21.36  *   79.47  *   64.95  *
* C & E Loss (ft)        *    0.03  * Cum SA (acres)           *    3.95  *   31.00  *   32.04  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
```

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15B (D39)
REACH: REACH 1 RS: 1.817

INPUT
Description:
Station Elevation Data num= 26

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9966.23	1191.96	9973.96	1192.81	9984.2	1190.79	9997.63	1188.15	10000	1187.74
10004.14	1187.04	10034.88	1187.74	10090.11	1188.91	10115.16	1188.94	10140.97	1188.97
10158.03	1189	10191.83	1189.07	10200.9	1189.11	10242.69	1189.19	10243.77	1189.2
10249.55	1189.21	10286.64	1189.33	10293.55	1189.35	10329.51	1189.48	10344.41	1189.54
10372.38	1189.67	10395.27	1189.76	10415.25	1189.87	10446.13	1190.01	10458.12	1190.1
10496.99	1190.32								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9966.23	.041	9984.2	.041	10090.11	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9984.2	10090.11	1485	1491	1495	.1	.3

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1189.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.37	Wt. n-Val.		0.041	0.041
W.S. Elev (ft)	1189.53	Reach Len. (ft)	1485.00	1491.00	1495.00
Crit W.S. (ft)	1189.53	Flow Area (sq ft)		149.59	92.71
E.G. Slope (ft/ft)	0.012810	Area (sq ft)		149.59	92.71
Q Total (cfs)	1000.00	Flow (cfs)		804.04	195.96
Top Width (ft)	350.08	Top Width (ft)		99.48	250.61
Vel Total (ft/s)	4.13	Avg. Vel. (ft/s)		5.38	2.11
Max Chl Dpth (ft)	2.49	Hydr. Depth (ft)		1.50	0.37
Conv. Total (cfs)	8835.5	Conv. (cfs)		7104.1	1731.4
Length Wtd. (ft)	1491.40	Wetted Per. (ft)		99.72	250.61
Min Ch El (ft)	1187.04	Shear (lb/sq ft)		1.20	0.30
Alpha	1.42	Stream Power (lb/ft s)		6.45	0.63
Frctn Loss (ft)	9.39	Cum Volume (acre-ft)	21.36	74.66	59.56
C & E Loss (ft)	0.05	Cum SA (acres)	3.95	28.19	23.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: 3S1WS15B (D39)
REACH: REACH 1 RS: 1.534

INPUT
Description:
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9705.11	1181.33	9705.61	1181.33	9724.63	1181.29	9755.62	1181.26	9775.37	1181.2
9805.62	1181.11	9826.11	1181.01	9855.63	1180.87	9876.85	1180.77	9905.63	1180.59
9931.43	1178.89	9943.4	1178.1	9959.81	1177.57	9995.19	1176.27	10000	1176.58
10003.84	1176.83	10055.65	1180.47	10079.81	1180.51	10105.65	1180.51	10130.55	1180.53
10155.66	1180.52	10181.29	1180.55	10205.67	1180.57	10232.04	1180.59	10255.67	1180.63

```
Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9705.11    .041 9905.63    .04110055.65    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9905.6310055.65             1060    1059    1060             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1180.19  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.19  * Wt. n-Val.              *          *    0.041 *          *
* W.S. Elev (ft)          * 1180.00  * Reach Len. (ft)        * 1060.00  * 1059.00  * 1060.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *   273.13 *          *
* E.G. Slope (ft/ft)      *0.003660  * Area (sq ft)           *          *   273.13 *          *
* Q Total (cfs)           *  960.00  * Flow (cfs)              *          *   960.00 *          *
* Top Width (ft)          *  134.36  * Top Width (ft)          *          *   134.36 *          *
* Vel Total (ft/s)        *    3.51  * Avg. Vel. (ft/s)        *          *     3.51 *          *
* Max Chl Dpth (ft)       *    3.73  * Hydr. Depth (ft)        *          *     2.03 *          *
* Conv. Total (cfs)       * 15867.6  * Conv. (cfs)             *          * 15867.6  *          *
* Length Wtd. (ft)        * 1059.01  * Wetted Per. (ft)        *          *   134.58 *          *
* Min Ch El (ft)          * 1176.27  * Shear (lb/sq ft)        *          *     0.46 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s)  *          *     1.63 *          *
* Frctn Loss (ft)         *    5.04  * Cum Volume (acre-ft)    *   21.36  *    67.43 *   57.97  *
* C & E Loss (ft)         *    0.00  * Cum SA (acres)          *    3.95  *    24.19 *   18.93  *
*****************************************************************************************

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

        This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15B (D39)
REACH: REACH 1            RS: 1.334

INPUT
Description:
Station Elevation Data     num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*********************************************************************************
 9566.83 1175.06 9596.79 1175.05 9604.68 1175.06 9650.51 1174.99 9677.22 1174.98
 9704.69 1174.96 9732.98 1174.94  9754.7 1174.92 9783.71 1174.91  9804.7 1174.89
 9834.45 1174.86 9854.71 1174.83 9885.19 1174.79 9904.71 1174.76 9941.48  1172.5
 9947.22 1172.14 9949.33  1172.2 9963.27 1172.52   10000 1173.3210039.16 1174.17
10054.73 1174.6810088.13  1174.710104.73 1174.7110138.87 1174.7510154.74 1174.77
 10181.7 1174.8510217.55 1175.1110239.08 1174.9710254.75 1174.9710291.08 1175.09
10304.76 1175.1310341.82 1175.2410354.76 1175.2710392.56 1175.3810404.77 1175.41

Manning's n Values          num=       3
     Sta   n Val      Sta   n Val      Sta   n Val
*********************************************
 9566.83    .041 9904.71    .04110054.73    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9904.7110054.73             1185    1189    1185             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1175.15  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.23  * Wt. n-Val.              *   0.041  *    0.041 *   0.041  *
* W.S. Elev (ft)          * 1174.92  * Reach Len. (ft)        * 1185.00  * 1189.00  * 1185.00  *
* Crit W.S. (ft)          * 1174.38  * Flow Area (sq ft)      *   10.07  *   231.49 *   24.01  *
* E.G. Slope (ft/ft)      *0.006507  * Area (sq ft)           *   10.07  *   231.49 *   24.01  *
* Q Total (cfs)           *  930.00  * Flow (cfs)              *    4.80  *   903.24 *   21.97  *
* Top Width (ft)          *  440.41  * Top Width (ft)          *  153.34  *   150.02 *  137.05  *
* Vel Total (ft/s)        *    3.50  * Avg. Vel. (ft/s)        *    0.48  *     3.90 *    0.92  *
* Max Chl Dpth (ft)       *    2.78  * Hydr. Depth (ft)        *    0.07  *     1.54 *    0.18  *
* Conv. Total (cfs)       * 11529.2  * Conv. (cfs)             *    59.4  *  11197.4 *   272.4  *
* Length Wtd. (ft)        * 1188.82  * Wetted Per. (ft)        *  153.34  *   150.13 *  137.05  *
* Min Ch El (ft)          * 1172.14  * Shear (lb/sq ft)        *    0.03  *     0.63 *    0.07  *
* Alpha                   *    1.21  * Stream Power (lb/ft s)  *    0.01  *     2.44 *    0.07  *
* Frctn Loss (ft)         *    3.80  * Cum Volume (acre-ft)    *   21.24  *    61.29 *   57.67  *
* C & E Loss (ft)         *    0.04  * Cum SA (acres)          *    2.09  *    20.74 *   17.26  *
*****************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
```

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: 3S1WS15B (D39)
REACH: REACH 1 RS: 1.109

INPUT
Description:
Station Elevation Data num= 48

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9650.46	1171.73	9660.55	1171.72	9693.1	1171.7	9720.61	1171.67	9743.72	1171.64
9780.68	1171.57	9794.33	1171.54	9840.74	1171.42	9844.95	1171.41	9867.48	1171.34
9895.56	1171.25	9899.5	1170.91	9983.71	1167.36	9995.97	1167.57	10000	1167.83
10019.62	1169.09	10046.83	1170.8	10067.4	1170.76	10096.83	1170.71	10117.39	1170.69
10146.83	1170.65	10167.38	1170.63	10217.69	1169.69	10230.07	1169.43	10260.11	1170.11
10296.83	1170.67	10317.91	1169.92	10345.35	1169.09	10349.51	1169.19	10374.16	1169.86
10384.08	1170.21	10391.45	1170.46	10426.35	1171.01	10446.83	1171.08	10467.3	1171.17
10496.83	1171.28	10517.29	1171.37	10546.83	1171.48	10567.27	1171.56	10596.83	1171.66
10617.26	1171.73	10646.83	1171.83	10667.25	1171.91	10696.83	1171.99	10717.24	1172.05
10746.83	1172.14	10767.22	1172.22	10796.83	1172.32				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9650.46	.041	9895.56	.041	10046.83	.041

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
9895.56	10046.83	1285	1287	1285	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
10160	10796.83	1172	F

CROSS SECTION OUTPUT Profile #PF 1

E.G. Elev (ft)	1171.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.		0.041	0.041
W.S. Elev (ft)	1171.21	Reach Len. (ft)	1285.00	1287.00	1285.00
Crit W.S. (ft)	1169.79	Flow Area (sq ft)		323.98	56.88
E.G. Slope (ft/ft)	0.001866	Area (sq ft)		323.98	364.69
Q Total (cfs)	900.00	Flow (cfs)		843.70	56.30
Top Width (ft)	582.54	Top Width (ft)		150.83	431.71
Vel Total (ft/s)	2.36	Avg. Vel. (ft/s)		2.60	0.99
Max Chl Dpth (ft)	3.85	Hydr. Depth (ft)		2.15	0.50
Conv. Total (cfs)	20834.1	Conv. (cfs)		19530.8	1303.3
Length Wtd. (ft)	1286.94	Wetted Per. (ft)		151.02	113.17
Min Ch El (ft)	1167.36	Shear (lb/sq ft)		0.25	0.06
Alpha	1.15	Stream Power (lb/ft s)		0.65	0.06
Frctn Loss (ft)	5.73	Cum Volume (acre-ft)	21.10	53.71	52.39
C & E Loss (ft)	0.06	Cum SA (acres)		16.63	9.52

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: 3S1WS15B (D39)
REACH: REACH 1 RS: 0.865

INPUT
Description: Floodplain follows agricultural channel.
Station Elevation Data num= 25

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
 9688.09 1167.24 9692.83 1167.23 9696.79 1167.22 9743.65 1167.08 9758.91 1167.02
 9794.47 1166.88 9821.02 1166.74 9845.29  1166.6 9883.13 1166.38 9896.11 1166.31
 9912.54 1165.77   10000 1162.2810003.01 1162.18 10043.1 1165.4210048.45 1165.85
10048.59 1165.8510049.41 1165.8510092.02 1165.8810099.14 1165.8910135.46 1165.92
10149.83 1165.94 10178.9 1165.9610200.52 1165.9810222.34    116610251.22 1166.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9688.09    .041 9896.11    .04110048.45    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9896.1110048.45             1225    1232    1230             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1165.53  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.67  * Wt. n-Val.              *          *    0.041 *          *
* W.S. Elev (ft)          * 1164.86  * Reach Len. (ft)        * 1225.00  * 1232.00  * 1230.00  *
* Crit W.S. (ft)          * 1164.86  * Flow Area (sq ft)      *          *   135.80 *          *
* E.G. Slope (ft/ft)      *0.022036  * Area (sq ft)           *          *   135.80 *          *
* Q Total (cfs)           *  890.00  * Flow (cfs)             *          *   890.00 *          *
* Top Width (ft)          *  100.84  * Top Width (ft)         *          *   100.84 *          *
* Vel Total (ft/s)        *    6.55  * Avg. Vel. (ft/s)       *          *     6.55 *          *
* Max Chl Dpth (ft)       *    2.68  * Hydr. Depth (ft)       *          *     1.35 *          *
* Conv. Total (cfs)       *  5995.5  * Conv. (cfs)            *          *   5995.5 *          *
* Length Wtd. (ft)        * 1232.00  * Wetted Per. (ft)       *          *   101.00 *          *
* Min Ch El (ft)          * 1162.18  * Shear (lb/sq ft)       *          *     1.85 *          *
* Alpha                   *    1.00  * Stream Power (lb/ft s) *          *    12.12 *          *
* Frctn Loss (ft)         *    3.28  * Cum Volume (acre-ft)   *   21.10  *    46.92 *    47.01 *
* C & E Loss (ft)         *    0.18  * Cum SA (acres)         *          *    12.91 *     3.15 *
*****************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m).  This may indicate the need for
         additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

CROSS SECTION


RIVER: 3S1WS15B (D39)
REACH: REACH 1            RS: 0.632

INPUT
Description:
Station Elevation Data    num=      10
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*******************************************************************************
 9960.68 1160.48 9974.46 1159.11  9987.1 1157.18 9988.35 1157.06 9991.57 1156.52
   10000 1156.5110087.02 1156.2310094.56 1156.2210096.08  1156.310175.19    1161

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9960.68    .041 9960.68    .04110175.19    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9960.6810175.19             1540    1794    1680             .1       .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************
* E.G. Elev (ft)          * 1159.49  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)           *    0.06  * Wt. n-Val.              *          *    0.041 *          *
* W.S. Elev (ft)          * 1159.43  * Reach Len. (ft)        * 1540.00  * 1794.00  * 1680.00  *
* Crit W.S. (ft)          *          * Flow Area (sq ft)      *          *   430.16 *          *
* E.G. Slope (ft/ft)      *0.000959  * Area (sq ft)           *          *   430.16 *          *
* Q Total (cfs)           *  870.00  * Flow (cfs)             *          *   870.00 *          *
* Top Width (ft)          *  177.48  * Top Width (ft)         *          *   177.48 *          *
* Vel Total (ft/s)        *    2.02  * Avg. Vel. (ft/s)       *          *     2.02 *          *
```

```
* Max Chl Dpth (ft)      *    3.21  * Hydr. Depth (ft)        *          *    2.42  *          *
* Conv. Total (cfs)      * 28097.0  * Conv. (cfs)             *          * 28097.0  *          *
* Length Wtd. (ft)       * 1791.72  * Wetted Per. (ft)        *          *  177.79  *          *
* Min Ch El (ft)         * 1156.22  * Shear (lb/sq ft)        *          *    0.14  *          *
* Alpha                  *    1.00  * Stream Power (lb/ft s)  *          *    0.29  *          *
* Frctn Loss (ft)        *    4.68  * Cum Volume (acre-ft)    *   21.10  *   38.92  *   47.01  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)          *          *    8.98  *    3.15  *
*****************************************************************************************************

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than
         0.7 or greater than 1.4.  This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.

CROSS SECTION


RIVER: 3S1WS15B (D39)
REACH: REACH 1            RS: 0.292

INPUT
Description:
Station Elevation Data    num=      50
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
*****************************************************************************************
 9402.52 1155.39 9440.74 1155.25 9468.67 1155.15 9492.35 1155.06 9538.05 1154.91
 9543.97 1154.89 9561.15 1154.85 9595.58 1154.77 9607.43 1154.75  9647.2 1154.69
 9676.82 1154.67 9698.81 1154.65 9711.83 1154.64 9750.42 1154.64 9762.69 1154.63
 9802.04 1154.63 9815.58 1154.61 9853.65 1154.56 9900.87 1152.22  9908.8 1151.81
 9943.07 1153.59 9956.88  1154.3 9964.23 1154.28   10000 1154.1910008.62 1154.19
10013.64 1154.1910029.56 1154.19 10053.5 1154.1910061.04 1154.1910093.37 1154.22
10113.46 1154.2310133.24 1154.2510165.88 1154.2910173.11 1154.3110196.06 1154.35
10212.98 1154.38 10218.3 1154.3910252.84 1154.4510270.72 1154.4810292.71 1154.52
10323.14 1154.5810332.58  1154.610362.57 1154.6610372.45 1154.6810375.56 1154.68
10412.32 1154.7510427.98 1154.7810452.18 1154.8210480.39 1154.8710492.05 1154.88

Manning's n Values        num=      3
     Sta   n Val     Sta   n Val     Sta   n Val
*********************************************
 9402.52    .041 9853.65    .04110113.46    .041

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9853.6510113.46             1540    1540    1440            .1        .3

CROSS SECTION OUTPUT  Profile #PF 1
*****************************************************************************************************
* E.G. Elev (ft)         * 1154.79  * Element                 *  Left OB *  Channel * Right OB *
* Vel Head (ft)          *    0.29  * Wt. n-Val.              *          *    0.041  *    0.041  *
* W.S. Elev (ft)         * 1154.49  * Reach Len. (ft)         * 1550.00  * 1550.00  * 1550.00  *
* Crit W.S. (ft)         * 1154.49  * Flow Area (sq ft)       *          *  184.31  *   22.98  *
* E.G. Slope (ft/ft)     *0.023411  * Area (sq ft)            *          *  184.31  *   22.98  *
* Q Total (cfs)          *  850.00  * Flow (cfs)              *          *  815.57  *   34.43  *
* Top Width (ft)         *  421.99  * Top Width (ft)          *          *  258.42  *  163.56  *
* Vel Total (ft/s)       *    4.10  * Avg. Vel. (ft/s)         *          *    4.43  *    1.50  *
* Max Chl Dpth (ft)      *    2.68  * Hydr. Depth (ft)         *          *    0.71  *    0.14  *
* Conv. Total (cfs)      *  5555.3  * Conv. (cfs)              *          *  5330.3  *   225.0  *
* Length Wtd. (ft)       * 1550.00  * Wetted Per. (ft)         *          *  258.56  *  163.56  *
* Min Ch El (ft)         * 1151.81  * Shear (lb/sq ft)         *          *    1.04  *    0.21  *
* Alpha                  *    1.12  * Stream Power (lb/ft s)   *          *    4.61  *    0.31  *
* Frctn Loss (ft)        *    3.41  * Cum Volume (acre-ft)     *   21.10  *   26.26  *   46.57  *
* C & E Loss (ft)        *    0.02  * Cum SA (acres)           *          *          *          *
*****************************************************************************************************

Warning: The energy equation could not be balanced within the specified number of iterations.  The
         program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

         This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
         depth, the calculated water surface came back below critical depth.  This indicates that there
is
         not a valid subcritical answer.  The program defaulted to critical depth.

*************************************************************************

SUMMARY OF MANNING'S N VALUES

River:3S1WS22B (G39)
```

Reach	River Sta.	n1	n2	n3
REACH 1	3.753	.045	.038	.045
REACH 1	3.527	.045	.038	.045
REACH 1	3.281	.045	.038	.045
REACH 1	3.005	.045	.038	.045
REACH 1	2.755	.045	.038	.045
REACH 1	2.456	.045	.038	.045
REACH 1	2.200	.045	.038	.045
REACH 1	1.961	.045	.038	.045
REACH 1	1.713	.045	.038	.045
REACH 1	1.451	.045	.038	.045
REACH 1	1.203	.045	.038	.045
REACH 1	0.955	.045	.038	.045
REACH 1	0.696	.045	.038	.045
REACH 1	0.378	.045	.038	.045

River:3S1WS22A (D42)

Reach	River Sta.	n1	n2	n3
REACH 1	0.892	.045	.038	.045
REACH 1	0.577	.045	.038	.045
REACH 1	0.310	.045	.038	.045

River:4S1ES20 (E44)

Reach	River Sta.	n1	n2	n3
REACH 1	1.054	.041	.041	.041
REACH 1	0.785	.041	.041	.041
REACH 1	0.506	.041	.041	.041
REACH 1	0.276	.041	.041	.041

River:4S1ES9 (E49)

Reach	River Sta.	n1	n2	n3
REACH 1	3.282	.041	.041	.041
REACH 1	3.073	.041	.041	.041
REACH 1	2.828	.041	.041	.041
REACH 1	2.567	.041	.041	.041
REACH 1	2.308	.041	.041	.041
REACH 1	2.056	.041	.041	.041
REACH 2	1.816	.041	.041	.041
REACH 2	1.522	.041	.041	.041
REACH 2	1.355	.041	.041	.041
REACH 2	1.085	.044	.049	.044
REACH 2	0.819	.044	.049	.044
REACH 2	0.637	.044	.049	.044
REACH 2	0.580	.044	.049	.044
REACH 2	0.566	Culvert		
REACH 2	0.552	.044	.049	.044
REACH 2	0.495	.044	.049	.044
REACH 2	0.409	.044	.049	.044
REACH 2	0.289	.044	.049	.044
REACH 2	0.125	.044	.049	.044

River:4S1ES15A (F34)

Reach	River Sta.	n1	n2	n3
REACH 1	6.207	.042	.043	.042
REACH 1	5.913	.042	.043	.042
REACH 1	5.656	.042	.043	.042
REACH 1	5.427	.042	.043	.042
REACH 1	5.193	.042	.043	.042
REACH 1	4.859	.042	.043	.042
REACH 1	4.621	.042	.043	.042
REACH 1	4.363	.042	.043	.042
REACH 1	4.125	.042	.043	.042
REACH 1	3.888	.042	.043	.042
REACH 1	3.646	.042	.043	.042
REACH 1	3.406	.042	.043	.042

*REACH 1	3.118	.041*	.041*	.041*
*REACH 1	2.888	.041*	.041*	.041*
*REACH 1	2.642	.041*	.041*	.041*
*REACH 1	2.400	.041*	.041*	.041*
*REACH 1	2.104	.041*	.041*	.041*
*REACH 1	1.926	.041*	.041*	.041*
*REACH 1	1.904	.041*	.041*	.041*
*REACH 1	1.898	*Bridge *	*	*
*REACH 1	1.892	.045*	.038*	.045*
*REACH 1	1.824	.045*	.038*	.045*
*REACH 1	1.554	.045*	.038*	.045*
*REACH 1	1.294	.045*	.038*	.045*
*REACH 1	1.019	.045*	.038*	.045*
*REACH 1	0.752	.045*	.038*	.045*
*REACH 1	0.548	.045*	.038*	.045*
*REACH 1	0.278	.045*	.038*	.045*

River:3S1WS25A (D31)

Reach	River Sta.	n1	n2	n3
*REACH 1	1.547	.045*	.038*	.045*
*REACH 1	1.300	.045*	.038*	.045*
*REACH 1	1.053	.045*	.038*	.045*
*REACH 1	0.830	.045*	.038*	.045*
*REACH 1	0.580	.045*	.038*	.045*
*REACH 1	0.305	.045*	.038*	.045*
*REACH 1	0.014	.045*	.038*	.045*

River:3S1WS25B (D32)

Reach	River Sta.	n1	n2	n3
*REACH 1	0.551	.045*	.038*	.045*
*REACH 1	0.289	.045*	.038*	.045*
*REACH 1	0.004	.045*	.038*	.045*

River:3S1WS26 (D33)

Reach	River Sta.	n1	n2	n3
*REACH 1	2.227	.045*	.038*	.045*
*REACH 1	1.965	.045*	.038*	.045*
*REACH 1	1.704	.045*	.038*	.045*
*REACH 1	1.457	.045*	.038*	.045*
*REACH 1	1.217	.045*	.038*	.045*
*REACH 1	0.969	.045*	.038*	.045*
*REACH 1	0.718	.045*	.038*	.045*
*REACH 1	0.405	.045*	.038*	.045*
*REACH 1	0.201	.045*	.038*	.045*
*REACH 1	0.006	.045*	.038*	.045*

River:3S1WS15A (G40)

Reach	River Sta.	n1	n2	n3
*REACH 1	8.704	.045*	.038*	.045*
*REACH 1	8.502	.045*	.038*	.045*
*REACH 1	8.303	.045*	.038*	.045*
*REACH 1	8.111	.045*	.038*	.045*
*REACH 1	7.905	.045*	.038*	.045*
*REACH 1	7.708	.045*	.038*	.045*
*REACH 1	7.487	.045*	.038*	.045*
*REACH 1	7.299	.045*	.038*	.045*
*REACH 1	7.076	.045*	.038*	.045*
*REACH 1	6.909	.045*	.038*	.045*
*REACH 1	6.708	.045*	.038*	.045*
*REACH 1	6.495	.045*	.038*	.045*
*REACH 1	6.248	.045*	.038*	.045*
*REACH 1	6.003	.045*	.038*	.045*
*REACH 1	5.800	.045*	.038*	.045*
*REACH 1	5.567	.045*	.038*	.045*
*REACH 1	5.332	.045*	.038*	.045*
*REACH 1	5.075	.045*	.038*	.045*
*REACH 1	4.821	.045*	.038*	.045*

*REACH 1	* 4.587	*	.045*	.038*	.045*
*REACH 1	* 4.355	*	.045*	.038*	.045*
*REACH 1	* 4.113	*	.045*	.038*	.045*
*REACH 1	* 3.930	*	.045*	.038*	.045*
*REACH 1	* 3.667	*	.045*	.038*	.045*
*REACH 1	* 3.438	*	.045*	.038*	.045*
*REACH 1	* 3.198	*	.045*	.038*	.045*
*REACH 1	* 2.986	*	.045*	.038*	.045*
*REACH 1	* 2.762	*	.045*	.038*	.045*
*REACH 1	* 2.519	*	.045*	.038*	.045*
*REACH 1	* 2.227	*	.045*	.038*	.045*
*REACH 1	* 1.993	*	.045*	.038*	.045*
*REACH 1	* 1.752	*	.045*	.038*	.045*
*REACH 1	* 1.533	*	.045*	.038*	.045*
*REACH 1	* 1.285	*	.045*	.038*	.045*
*REACH 1	* 1.042	*	.045*	.038*	.045*
*REACH 1	* 0.801	*	.045*	.038*	.045*
*REACH 1	* 0.575	*	.045*	.038*	.045*
*REACH 1	* 0.378	*	.045*	.038*	.045*

River:Waterman Wash

* Reach	* River Sta.	*	n1 *	n2 *	n3 *
*REACH 1	* 36.434	*	.048*	.054*	.048*
*REACH 1	* 36.218	*	.048*	.054*	.048*
*REACH 1	* 35.983	*	.048*	.054*	.048*
*REACH 1	* 35.793	*	.048*	.054*	.048*
*REACH 1	* 35.505	*	.048*	.054*	.048*
*REACH 1	* 35.269	*	.048*	.054*	.048*
*REACH 1	* 35.038	*	.048*	.054*	.048*
*REACH 1	* 34.810	*	.048*	.054*	.048*
*REACH 1	* 34.577	*	.048*	.054*	.048*
*REACH 1	* 34.373	*	.048*	.054*	.048*
*REACH 1	* 34.182	*	.048*	.054*	.048*
*REACH 1	* 33.940	*	.048*	.054*	.048*
*REACH 1	* 33.690	*	.048*	.054*	.048*
*REACH 1	* 33.427	*	.048*	.054*	.048*
*REACH 1	* 33.189	*	.048*	.054*	.048*
*REACH 1	* 32.903	*	.048*	.054*	.048*
*REACH 1	* 32.659	*	.048*	.054*	.048*
*REACH 1	* 32.449	*	.048*	.054*	.048*
*REACH 1	* 32.215	*	.048*	.054*	.048*
*REACH 1	* 31.976	*	.048*	.054*	.048*
*REACH 1	* 31.763	*	.048*	.054*	.048*
*REACH 1	* 31.513	*	.048*	.054*	.048*
*REACH 1	* 31.252	*	.048*	.054*	.048*
*REACH 1	* 30.971	*	.048*	.054*	.048*
*REACH 1	* 30.734	*	.048*	.054*	.048*
*REACH 1	* 30.488	*	.048*	.054*	.048*
*REACH 1	* 30.248	*	.048*	.054*	.048*
*REACH 1	* 30.018	*	.048*	.054*	.048*
*REACH 1	* 29.780	*	.048*	.054*	.048*
*REACH 1	* 29.515	*	.048*	.054*	.048*
*REACH 1	* 29.273	*	.048*	.054*	.048*
*REACH 1	* 29.034	*	.041*	.041*	.041*
*REACH 1	* 28.777	*	.041*	.041*	.041*
*REACH 1	* 28.556	*	.041*	.041*	.041*
*REACH 1	* 28.305	*	.041*	.041*	.041*
*REACH 1	* 28.019	*	.041*	.041*	.041*
*REACH 1	* 27.788	*	.041*	.041*	.041*
*REACH 1	* 27.570	*	.041*	.041*	.041*
*REACH 1	* 27.530	*Culvert *		*	*
*REACH 1	* 27.454	*	.041*	.041*	.041*
*REACH 1	* 27.258	*	.041*	.041*	.041*
*REACH 1	* 27.052	*	.041*	.041*	.041*
*REACH 1	* 26.756	*	.041*	.041*	.041*
*REACH 1	* 26.604	*	.041*	.041*	.041*
*REACH 1	* 26.307	*	.041*	.041*	.041*
*REACH 1	* 26.055	*	.041*	.041*	.041*
*REACH 1	* 25.765	*	.041*	.041*	.041*
*REACH 1	* 25.571	*	.041*	.041*	.041*
*REACH 2	* 25.296	*	.05*	.043*	.05*
*REACH 2	* 25.005	*	.05*	.043*	.05*
*REACH 2	* 24.668	*	.05*	.043*	.05*
*REACH 2	* 24.518	*	.05*	.043*	.05*
*REACH 3	* 24.268	*	.05*	.043*	.05*
*REACH 3	* 23.877	*	.05*	.043*	.05*

*REACH 3	* 23.597	* .05*	.043*	.05*
*REACH 3	* 23.330	* .05*	.043*	.05*
*REACH 3	* 23.143	* .05*	.043*	.05*
*REACH 3	* 22.828	* .05*	.043*	.05*
*REACH 3	* 22.542	* .05*	.043*	.05*
*REACH 3	* 22.283	* .05*	.043*	.05*
*REACH 3	* 21.997	* .05*	.043*	.05*
*REACH 3	* 21.733	* .05*	.043*	.05*
*REACH 3	* 21.566	* .05*	.043*	.05*
*REACH 3	* 21.285	* .05*	.043*	.05*
*REACH 3	* 21.008	* .05*	.043*	.05*
*REACH 3	* 20.752	* .05*	.043*	.05*
*REACH 3	* 20.461	* .05*	.043*	.05*
*REACH 3	* 20.245	* .05*	.043*	.05*
*REACH 4	* 19.845	* .05*	.043*	.05*
*REACH 4	* 19.844	* .05*	.043*	.05*
*REACH 5	* 19.551	* .05*	.043*	.05*
*REACH 5	* 19.344	* .05*	.043*	.05*
*REACH 5	* 19.134	* .05*	.043*	.05*
*REACH 6	* 18.961	* .05*	.043*	.05*
*REACH 6	* 18.798	* .05*	.043*	.05*
*REACH 6	* 18.567	* .05*	.043*	.05*
*REACH 6	* 18.319	* .05*	.043*	.05*
*REACH 6	* 18.159	* .05*	.043*	.05*
*REACH 6	* 17.913	* .05*	.043*	.05*
*REACH 7	* 17.647	* .05*	.043*	.05*
*REACH 7	* 17.646	* .05*	.043*	.05*
*REACH 8	* 17.414	* .05*	.043*	.05*
*REACH 8	* 17.195	* .05*	.043*	.05*
*REACH 9	* 16.974	* .05*	.043*	.05*
*REACH 9	* 16.710	* .05*	.043*	.05*
*REACH 9	* 16.451	* .05*	.043*	.05*
*REACH 10	* 16.242	* .05*	.043*	.05*
*REACH 10	* 16.012	* .05*	.043*	.05*
*REACH 10	* 15.600	* .05*	.043*	.05*

River:3S1WS15B (D39)

* Reach	* River Sta.	* n1	* n2	* n3 *
*REACH 1	* 3.202	* .041*	.041*	.041*
*REACH 1	* 2.941	* .041*	.041*	.041*
*REACH 1	* 2.582	* .041*	.041*	.041*
*REACH 1	* 2.341	* .041*	.041*	.041*
*REACH 1	* 2.074	* .041*	.041*	.041*
*REACH 1	* 1.817	* .041*	.041*	.041*
*REACH 1	* 1.534	* .041*	.041*	.041*
*REACH 1	* 1.334	* .041*	.041*	.041*
*REACH 1	* 1.109	* .041*	.041*	.041*
*REACH 1	* 0.865	* .041*	.041*	.041*
*REACH 1	* 0.632	* .041*	.041*	.041*
*REACH 1	* 0.292	* .041*	.041*	.041*

SUMMARY OF REACH LENGTHS

River: 3S1WS22B (G39)

* Reach	* River Sta.	* Left	* Channel *	Right *
*REACH 1	* 3.753	* 1150*	1194*	1150*
*REACH 1	* 3.527	* 1250*	1301*	1250*
*REACH 1	* 3.281	* 1400*	1456*	1400*
*REACH 1	* 3.005	* 1250*	1320*	1250*
*REACH 1	* 2.755	* 1500*	1579*	1500*
*REACH 1	* 2.456	* 1300*	1354*	1300*
*REACH 1	* 2.200	* 1200*	1263*	1200*
*REACH 1	* 1.961	* 1250*	1309*	1250*
*REACH 1	* 1.713	* 1325*	1382*	1325*
*REACH 1	* 1.451	* 1250*	1308*	1250*
*REACH 1	* 1.203	* 1250*	1311*	1250*
*REACH 1	* 0.955	* 1300*	1369*	1300*
*REACH 1	* 0.696	* 1600*	1679*	1600*
*REACH 1	* 0.378	* *	*	*

River: 3S1WS22A (D42)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.892	1560	1661	1530
REACH 1	0.577	1410	1411	1320
REACH 1	0.310			

River: 4S1ES20 (E44)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.054	1350	1420	1350
REACH 1	0.785	1400	1475	1400
REACH 1	0.506	1150	1214	1150
REACH 1	0.276	1400	1458	1400

River: 4S1ES9 (E49)

Reach	River Sta.	Left	Channel	Right
REACH 1	3.282	1060	1106	800
REACH 1	3.073	1250	1293	1230
REACH 1	2.828	1210	1377	1280
REACH 1	2.567	1385	1366	1300
REACH 1	2.308	1260	1329	1295
REACH 1	2.056	1185	1268	1260
REACH 2	1.816	1500	1539	1500
REACH 2	1.522	890	895	895
REACH 2	1.355	1425	1427	1425
REACH 2	1.085	1400	1409	1400
REACH 2	0.819	950	960	950
REACH 2	0.637	300	330	300
REACH 2	0.580	150	150	150
REACH 2	0.566	Culvert		
REACH 2	0.552	300	300	300
REACH 2	0.495	450	450	450
REACH 2	0.409	630	630	630
REACH 2	0.289	925	865	815
REACH 2	0.125	1000	1020	1000

River: 4S1ES15A (F34)

Reach	River Sta.	Left	Channel	Right
REACH 1	6.207	14500	1549	1450
REACH 1	5.913	1300	1361	1300
REACH 1	5.656	1150	1207	1150
REACH 1	5.427	1200	1236	1200
REACH 1	5.193	1700	1761	1700
REACH 1	4.859	1200	1260	1200
REACH 1	4.621	1300	1360	1300
REACH 1	4.363	1200	1255	1200
REACH 1	4.125	1200	1253	1200
REACH 1	3.888	1200	1281	1200
REACH 1	3.646	1200	1262	1200
REACH 1	3.406	1400	1521	1400
REACH 1	3.118	1150	1216	1150
REACH 1	2.888	1250	1300	1250
REACH 1	2.642	1200	1276	1200
REACH 1	2.400	1500	1562	1500
REACH 1	2.104	900	943	900
REACH 1	1.926	120	120	120
REACH 1	1.904	65	65	65
REACH 1	1.898	Bridge		
REACH 1	1.892	360	360	360
REACH 1	1.824	1375	1425	1405
REACH 1	1.554	1285	1371	1335
REACH 1	1.294	1350	1454	1380
REACH 1	1.019	1395	1407	1250
REACH 1	0.752	1385	1479	1405
REACH 1	0.548	1285	1540	1635
REACH 1	0.278	1300	1516	1375

River: 3S1WS25A (D31)

Reach	River Sta.	Left	Channel	Right
REACH 1	1.547	1240	1301	1295
REACH 1	1.300	1270	1305	1285
REACH 1	1.053	1100	1178	1100
REACH 1	0.830	1300	1322	1300
REACH 1	0.580	1425	1448	1410
REACH 1	0.305	1470	1540	1470
REACH 1	0.014			

River: 3S1WS25B (D32)

Reach	River Sta.	Left	Channel	Right
REACH 1	0.551	1335	1382	1355
REACH 1	0.289	1425	1506	1440
REACH 1	0.004	50	57	50

River: 3S1WS26 (D33)

Reach	River Sta.	Left	Channel	Right
REACH 1	2.227	1360	1386	1375
REACH 1	1.965	1365	1378	1345
REACH 1	1.704	1280	1301	1290
REACH 1	1.457	1290	1268	1200
REACH 1	1.217	1280	1310	1260
REACH 1	0.969	1300	1326	1330
REACH 1	0.718	1600	1651	1630
REACH 1	0.405	1025	1080	1060
REACH 1	0.201	1000	1025	930
REACH 1	0.006	240	240	240

River: 3S1WS15A (G40)

Reach	River Sta.	Left	Channel	Right
REACH 1	8.704	1000	1069	1000
REACH 1	8.502	1000	1051	1000
REACH 1	8.303	975	1010	975
REACH 1	8.111	1000	1088	1000
REACH 1	7.905	1000	1043	1000
REACH 1	7.708	1100	1169	1100
REACH 1	7.487	950	987	950
REACH 1	7.299	850	877	850
REACH 1	7.076	1125	1187	1125
REACH 1	6.909	1000	1059	1000
REACH 1	6.708	1050	1123	1050
REACH 1	6.495	1250	1305	1250
REACH 1	6.248	1225	1294	1225
REACH 1	6.003	1000	1073	1000
REACH 1	5.800	1150	1228	1150
REACH 1	5.567	1200	1243	1200
REACH 1	5.332	1300	1357	1300
REACH 1	5.075	1300	1338	1300
REACH 1	4.821	1200	1235	1200
REACH 1	4.587	1175	1230	1175
REACH 1	4.355	1200	1275	1200
REACH 1	4.113	925	969	925
REACH 1	3.930	1300	1386	1300
REACH 1	3.667	1150	1207	1150
REACH 1	3.438	1200	1271	1200
REACH 1	3.198	1075	1120	1075
REACH 1	2.986	1100	1183	1100
REACH 1	2.762	1200	1282	1200
REACH 1	2.519	1500	1543	1500
REACH 1	2.227	1175	1232	1175
REACH 1	1.993	1200	1273	1200
REACH 1	1.752	1100	1159	1100
REACH 1	1.533	1250	1307	1250
REACH 1	1.285	1225	1283	1225
REACH 1	1.042	1225	1273	1225
REACH 1	0.801	1125	1192	1125
REACH 1	0.575	1000	1043	1000
REACH 1	0.378	1900	1995	1900

River: Waterman Wash

Reach	River Sta.	Left	Channel	Right
REACH 1	36.434	1100	1142	1100
REACH 1	36.218	1200	1238	1200
REACH 1	35.983	975	1006	975
REACH 1	35.793	1450	1517	1450
REACH 1	35.505	1200	1248	1200
REACH 1	35.269	1175	1220	1175
REACH 1	35.038	1150	1202	1150
REACH 1	34.810	1175	1235	1175
REACH 1	34.577	1000	1074	1000
REACH 1	34.373	950	1009	950
REACH 1	34.182	1200	1278	1200
REACH 1	33.940	1250	1321	1250
REACH 1	33.690	1325	1386	1325
REACH 1	33.427	1200	1259	1200
REACH 1	33.189	1450	1509	1450
REACH 1	32.903	1225	1290	1225
REACH 1	32.659	1050	1107	1050
REACH 1	32.449	1175	1235	1175
REACH 1	32.215	1200	1265	1200
REACH 1	31.976	1050	1125	1050
REACH 1	31.763	1250	1316	1250
REACH 1	31.513	1300	1378	1300
REACH 1	31.252	1400	1486	1400
REACH 1	30.971	1200	1251	1200
REACH 1	30.734	1225	1301	1225
REACH 1	30.488	1200	1266	1200
REACH 1	30.248	1150	1217	1150
REACH 1	30.018	1200	1256	1200
REACH 1	29.780	1325	1400	1325
REACH 1	29.515	1200	1278	1200
REACH 1	29.273	1200	1259	1200
REACH 1	29.034	1300	1356	1300
REACH 1	28.777	1100	1168	1100
REACH 1	28.556	1250	1328	1250
REACH 1	28.305	1425	1508	1425
REACH 1	28.019	1150	1218	1150
REACH 1	27.788	1100	1155	1100
REACH 1	27.570	600	611	600
REACH 1	27.530	Culvert		
REACH 1	27.454	850	889	850
REACH 1	27.258	900	1464	1500
REACH 1	27.052	1250	1559	1750
REACH 1	26.756	1000	806	750
REACH 1	26.604	1300	1567	1550
REACH 1	26.307	1330	1330	1290
REACH 1	26.055	1440	1533	1400
REACH 1	25.765	1520	1547	1590
REACH 1	25.571	1400	1457	1400
REACH 2	25.296	1400	1531	1400
REACH 2	25.005	1620	1778	1690
REACH 2	24.668	870	791	790
REACH 2	24.518	1210	1321	1210
REACH 3	24.268	1850	2062	1890
REACH 3	23.877	1430	1482	1440
REACH 3	23.597	1350	1409	1300
REACH 3	23.330	750	986	810
REACH 3	23.143	1750	1664	1650
REACH 3	22.828	1400	1507	1440
REACH 3	22.542	1150	1371	1310
REACH 3	22.283	1380	1511	1400
REACH 3	21.997	1350	1391	1270
REACH 3	21.733	850	881	890
REACH 3	21.566	1410	1483	1480
REACH 3	21.285	1320	1467	1310
REACH 3	21.008	1250	1347	1220
REACH 3	20.752	1370	1540	1390
REACH 3	20.461	1340	1142	1020
REACH 3	20.245	1920	2109	1940
REACH 4	19.845	5	5	5
REACH 4	19.844	1520	1555	1500
REACH 5	19.551	1060	1089	1120
REACH 5	19.344	970	1109	990
REACH 5	19.134	930	916	960

*REACH 6	18.961	800*	861*	870*
*REACH 6	18.798	1200*	1217*	1140*
*REACH 6	18.567	1110*	1311*	1320*
*REACH 6	18.319	920*	843*	840*
*REACH 6	18.159	1270*	1303*	1303*
*REACH 6	17.913	1400*	1408*	1340*
*REACH 7	17.647	5*	5*	5*
*REACH 7	17.646	1100*	1223*	1250*
*REACH 8	17.414	1280*	1156*	1180*
*REACH 8	17.195	1220*	1169*	1080*
*REACH 9	16.974	1320*	1392*	1250*
*REACH 9	16.710	1320*	1368*	1380*
*REACH 9	16.451	1140*	1105*	1020*
*REACH 10	16.242	1140*	1212*	1230*
*REACH 10	16.012	2100*	2177*	2120*
*REACH 10	15.600	5*	5*	5*

River: 3S1WS15B (D39)

Reach	River Sta.	Left	Channel	Right
*REACH 1	3.202	1360*	1381*	1345*
*REACH 1	2.941	1900*	1892*	1880*
*REACH 1	2.582	1275*	1275*	1275*
*REACH 1	2.341	1410*	1410*	1410*
*REACH 1	2.074	1355*	1356*	1355*
*REACH 1	1.817	1485*	1491*	1495*
*REACH 1	1.534	1060*	1059*	1060*
*REACH 1	1.334	1185*	1189*	1185*
*REACH 1	1.109	1285*	1287*	1285*
*REACH 1	0.865	1225*	1232*	1230*
*REACH 1	0.632	1540*	1794*	1680*
*REACH 1	0.292	1540*	1540*	1440*

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: 3S1WS22B (G39)

Reach	River Sta.	Contr.	Expan.
*REACH 1	3.753	.1*	.3*
*REACH 1	3.527	.1*	.3*
*REACH 1	3.281	.1*	.3*
*REACH 1	3.005	.1*	.3*
*REACH 1	2.755	.1*	.3*
*REACH 1	2.456	.1*	.3*
*REACH 1	2.200	.1*	.3*
*REACH 1	1.961	.1*	.3*
*REACH 1	1.713	.1*	.3*
*REACH 1	1.451	.1*	.3*
*REACH 1	1.203	.1*	.3*
*REACH 1	0.955	.1*	.3*
*REACH 1	0.696	.1*	.3*
*REACH 1	0.378	.1*	.3*

River: 3S1WS22A (D42)

Reach	River Sta.	Contr.	Expan.
*REACH 1	0.892	.1*	.3*
*REACH 1	0.577	.1*	.3*
*REACH 1	0.310	.1*	.3*

River: 4S1ES20 (E44)

Reach	River Sta.	Contr.	Expan.
*REACH 1	1.054	.1*	.3*
*REACH 1	0.785	.1*	.3*
*REACH 1	0.506	.1*	.3*
*REACH 1	0.276	.1*	.3*

River: 4S1ES9 (E49)

Reach	River Sta.	Contr.	Expan.
REACH 1	3.282	.1	.3
REACH 1	3.073	.1	.3
REACH 1	2.828	.1	.3
REACH 1	2.567	.1	.3
REACH 1	2.308	.1	.3
REACH 1	2.056	.1	.3
REACH 2	1.816	.1	.3
REACH 2	1.522	.1	.3
REACH 2	1.355	.1	.3
REACH 2	1.085	.1	.3
REACH 2	0.819	.1	.3
REACH 2	0.637	.1	.3
REACH 2	0.580	.1	.3
REACH 2	0.566	Culvert	
REACH 2	0.552	.1	.3
REACH 2	0.495	.1	.3
REACH 2	0.409	.1	.3
REACH 2	0.289	.1	.3
REACH 2	0.125	.1	.3

River: 4S1ES15A (F34)

Reach	River Sta.	Contr.	Expan.
REACH 1	6.207	.1	.3
REACH 1	5.913	.1	.3
REACH 1	5.656	.1	.3
REACH 1	5.427	.1	.3
REACH 1	5.193	.1	.3
REACH 1	4.859	.1	.3
REACH 1	4.621	.1	.3
REACH 1	4.363	.1	.3
REACH 1	4.125	.1	.3
REACH 1	3.888	.1	.3
REACH 1	3.646	.1	.3
REACH 1	3.406	.1	.3
REACH 1	3.118	.1	.3
REACH 1	2.888	.1	.3
REACH 1	2.642	.1	.3
REACH 1	2.400	.1	.3
REACH 1	2.104	.1	.3
REACH 1	1.926	.1	.3
REACH 1	1.904	.1	.3
REACH 1	1.898	Bridge	
REACH 1	1.892	.1	.3
REACH 1	1.824	.1	.3
REACH 1	1.554	.1	.3
REACH 1	1.294	.1	.3
REACH 1	1.019	.1	.3
REACH 1	0.752	.1	.3
REACH 1	0.548	.1	.3
REACH 1	0.278	.1	.3

River: 3S1WS25A (D31)

Reach	River Sta.	Contr.	Expan.
REACH 1	1.547	.1	.3
REACH 1	1.300	.1	.3
REACH 1	1.053	.1	.3
REACH 1	0.830	.1	.3
REACH 1	0.580	.1	.3
REACH 1	0.305	.1	.3
REACH 1	0.014	.1	.3

River: 3S1WS25B (D32)

Reach	River Sta.	Contr.	Expan.
REACH 1	0.551	.1	.3
REACH 1	0.289	.1	.3
REACH 1	0.004	.1	.3

River: 3S1WS26 (D33)

Reach	River Sta.	Contr.	Expan.
REACH 1	2.227	.1	.3
REACH 1	1.965	.1	.3
REACH 1	1.704	.1	.3
REACH 1	1.457	.1	.3
REACH 1	1.217	.1	.3
REACH 1	0.969	.1	.3
REACH 1	0.718	.1	.3
REACH 1	0.405	.1	.3
REACH 1	0.201	.1	.3
REACH 1	0.006	.1	.3

River: 3S1WS15A (G40)

Reach	River Sta.	Contr.	Expan.
REACH 1	8.704	.1	.3
REACH 1	8.502	.1	.3
REACH 1	8.303	.1	.3
REACH 1	8.111	.1	.3
REACH 1	7.905	.1	.3
REACH 1	7.708	.1	.3
REACH 1	7.487	.1	.3
REACH 1	7.299	.1	.3
REACH 1	7.076	.1	.3
REACH 1	6.909	.1	.3
REACH 1	6.708	.1	.3
REACH 1	6.495	.1	.3
REACH 1	6.248	.1	.3
REACH 1	6.003	.1	.3
REACH 1	5.800	.1	.3
REACH 1	5.567	.1	.3
REACH 1	5.332	.1	.3
REACH 1	5.075	.1	.3
REACH 1	4.821	.1	.3
REACH 1	4.587	.1	.3
REACH 1	4.355	.1	.3
REACH 1	4.113	.1	.3
REACH 1	3.930	.1	.3
REACH 1	3.667	.1	.3
REACH 1	3.438	.1	.3
REACH 1	3.198	.1	.3
REACH 1	2.986	.1	.3
REACH 1	2.762	.1	.3
REACH 1	2.519	.1	.3
REACH 1	2.227	.1	.3
REACH 1	1.993	.1	.3
REACH 1	1.752	.1	.3
REACH 1	1.533	.1	.3
REACH 1	1.285	.1	.3
REACH 1	1.042	.1	.3
REACH 1	0.801	.1	.3
REACH 1	0.575	.1	.3
REACH 1	0.378	.1	.3

River: Waterman Wash

Reach	River Sta.	Contr.	Expan.
REACH 1	36.434	.1	.3
REACH 1	36.218	.1	.3
REACH 1	35.983	.1	.3
REACH 1	35.793	.1	.3
REACH 1	35.505	.1	.3
REACH 1	35.269	.1	.3
REACH 1	35.038	.1	.3
REACH 1	34.810	.1	.3
REACH 1	34.577	.1	.3
REACH 1	34.373	.1	.3
REACH 1	34.182	.1	.3
REACH 1	33.940	.1	.3
REACH 1	33.690	.1	.3

```
*REACH 1          *    33.427  *        .1*        .3*
*REACH 1          *    33.189  *        .1*        .3*
*REACH 1          *    32.903  *        .1*        .3*
*REACH 1          *    32.659  *        .1*        .3*
*REACH 1          *    32.449  *        .1*        .3*
*REACH 1          *    32.215  *        .1*        .3*
*REACH 1          *    31.976  *        .1*        .3*
*REACH 1          *    31.763  *        .1*        .3*
*REACH 1          *    31.513  *        .1*        .3*
*REACH 1          *    31.252  *        .1*        .3*
*REACH 1          *    30.971  *        .1*        .3*
*REACH 1          *    30.734  *        .1*        .3*
*REACH 1          *    30.488  *        .1*        .3*
*REACH 1          *    30.248  *        .1*        .3*
*REACH 1          *    30.018  *        .1*        .3*
*REACH 1          *    29.780  *        .1*        .3*
*REACH 1          *    29.515  *        .1*        .3*
*REACH 1          *    29.273  *        .1*        .3*
*REACH 1          *    29.034  *        .1*        .3*
*REACH 1          *    28.777  *        .1*        .3*
*REACH 1          *    28.556  *        .1*        .3*
*REACH 1          *    28.305  *        .1*        .3*
*REACH 1          *    28.019  *        .1*        .3*
*REACH 1          *    27.788  *        .1*        .3*
*REACH 1          *    27.570  *        .1*        .3*
*REACH 1          *    27.530  *culvert  *          *
*REACH 1          *    27.454  *        .1*        .3*
*REACH 1          *    27.258  *        .1*        .3*
*REACH 1          *    27.052  *        .1*        .3*
*REACH 1          *    26.756  *        .1*        .3*
*REACH 1          *    26.604  *        .1*        .3*
*REACH 1          *    26.307  *        .1*        .3*
*REACH 1          *    26.055  *        .1*        .3*
*REACH 1          *    25.765  *        .1*        .3*
*REACH 1          *    25.571  *        .1*        .3*
*REACH 2          *    25.296  *        .1*        .3*
*REACH 2          *    25.005  *        .1*        .3*
*REACH 2          *    24.668  *        .1*        .3*
*REACH 2          *    24.518  *        .1*        .3*
*REACH 3          *    24.268  *        .1*        .3*
*REACH 3          *    23.877  *        .1*        .3*
*REACH 3          *    23.597  *        .1*        .3*
*REACH 3          *    23.330  *        .1*        .3*
*REACH 3          *    23.143  *        .1*        .3*
*REACH 3          *    22.828  *        .1*        .3*
*REACH 3          *    22.542  *        .1*        .3*
*REACH 3          *    22.283  *        .1*        .3*
*REACH 3          *    21.997  *        .1*        .3*
*REACH 3          *    21.733  *        .1*        .3*
*REACH 3          *    21.566  *        .1*        .3*
*REACH 3          *    21.285  *        .1*        .3*
*REACH 3          *    21.008  *        .1*        .3*
*REACH 3          *    20.752  *        .1*        .3*
*REACH 3          *    20.461  *        .1*        .3*
*REACH 3          *    20.245  *        .1*        .3*
*REACH 4          *    19.845  *        .1*        .3*
*REACH 4          *    19.844  *        .1*        .3*
*REACH 5          *    19.551  *        .1*        .3*
*REACH 5          *    19.344  *        .1*        .3*
*REACH 5          *    19.134  *        .1*        .3*
*REACH 6          *    18.961  *        .1*        .3*
*REACH 6          *    18.798  *        .1*        .3*
*REACH 6          *    18.567  *        .1*        .3*
*REACH 6          *    18.319  *        .1*        .3*
*REACH 6          *    18.159  *        .1*        .3*
*REACH 6          *    17.913  *        .1*        .3*
*REACH 7          *    17.647  *        .1*        .3*
*REACH 7          *    17.646  *        .1*        .3*
*REACH 8          *    17.414  *        .1*        .3*
*REACH 8          *    17.195  *        .1*        .3*
*REACH 9          *    16.974  *        .1*        .3*
*REACH 9          *    16.710  *        .1*        .3*
*REACH 9          *    16.451  *        .1*        .3*
*REACH 10         *    16.242  *        .1*        .3*
*REACH 10         *    16.012  *        .1*        .3*
*REACH 10         *    15.600  *        .1*        .3*
*****************************************************
River: 3S1WS15B (D39)
```

Reach	River Sta.	Contr.	Expan.
REACH 1	3.202	.1	.3
REACH 1	2.941	.1	.3
REACH 1	2.582	.1	.3
REACH 1	2.341	.1	.3
REACH 1	2.074	.1	.3
REACH 1	1.817	.1	.3
REACH 1	1.534	.1	.3
REACH 1	1.334	.1	.3
REACH 1	1.109	.1	.3
REACH 1	0.865	.1	.3
REACH 1	0.632	.1	.3
REACH 1	0.292	.1	.3

Appendix F

EROSION AND SEDIMENT TRANSPORT ANALYSIS DOCUMENTATION

APPENDIX F: EROSION AND SEDIMENT TRANSPORT ANALYSIS SUPPORTING DOCUMENTATION

For documentation of this section, refer to Section 6 of the Technical Data Notebook. Also refer to the Flood Hazard Delineation Based on Surficial Geologic Mapping Exhibit in the set of rolled maps.