Flood Control District of Maricopa County
Phoenix, Arizona
April 2002

FLOODPLAIN DELINEATION STUDY
OF
ANDORA HILLS & GALLOWAY WASHES
FCD 99-14

TECHNICAL DATA NOTEBOOK
VOLUME 2 of 2

Submitted by:

JE Fuller / Hydrology and Geomorphology, Inc.
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on behalf of:

Flood Control District of Maricopa County
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Phoenix, AZ 85009
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Flood Control District of Maricopa County
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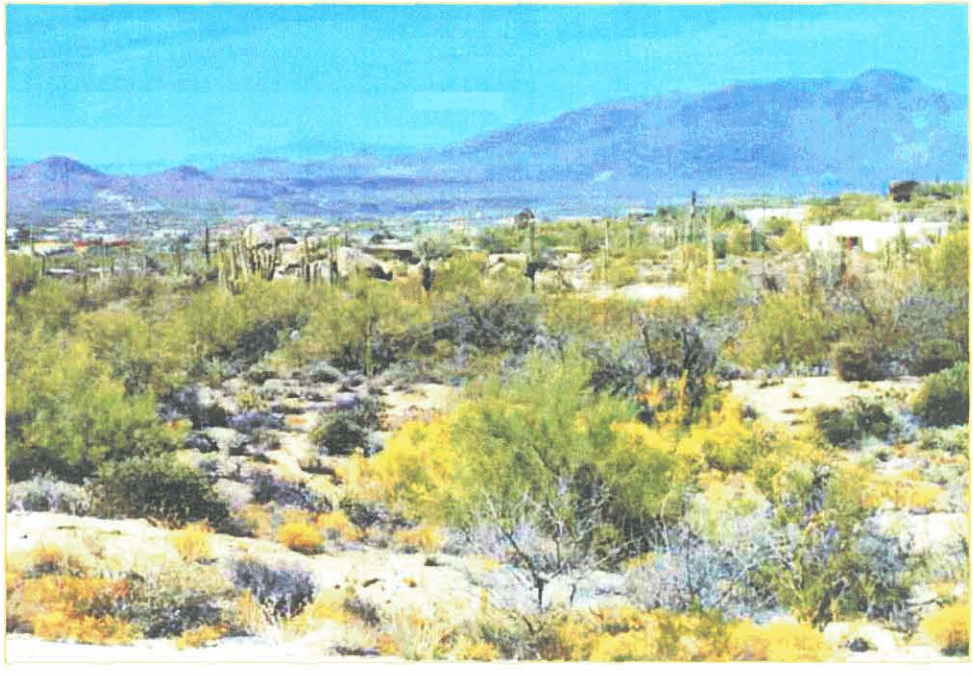

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Registered Professional Engineer (Civil) CERTIFICATE NO. 29325 BRIAN R. ISERMAN Date Signed 4/17/02 ARIZONA, U.S.A.

TABLE OF CONTENTS
TECHNICAL DATA NOTEBOOK

VOLUME 1 OF 2

SECTION 1: INTRODUCTION 1-1

1.1 Purpose of study 1-1

1.2 Authority for study 1-1

1.3 Location of study reach 1-1

1.4 Methodology 1-2

1.5 Study Results 1-2

SECTION 2: ADWR/FEMA Forms and Local Government/ADWR Abstracts 2-1

2.1 Study Documentation Abstract for FEMA Submittals 2-1

2.2 FEMA Forms 2-2

SECTION 3: SURVEY AND MAPPING INFORMATION 3-1

3.1 Field Survey Information 3-1

3.2 Mapping 3-1

SECTION 4: HYDROLOGY 4-1

4.1 Method Description 4-1

4.2 Parameter Estimation 4-3

4.3 Problems Encountered During Study 4-23

4.4 Calibration 4-23

4.5 Final Results 4-23

4.6 References 4-29

SECTION 5: HYDRAULIC ANALYSIS 5-1

5.1 Method Description 5-1

5.2 Work Study Maps 5-2

TABLE OF CONTENTS (Continued)

5.3 Parameter Estimation 5-4

5.4 Cross-section descriptions 5-4

5.5 Modeling Considerations 5-5

5.6 Floodway modeling 5-7

5.7 Special problems encountered during the study 5-8

5.8 Calibration 5-8

5.9 Final Results 5-9

SECTION 6: EROSION AND SEDIMENT TRANSPORT 6-1

SECTION 7: DRAFT FIS REPORT DATA 7-1

7.1 Summary of Discharges 7-1

7.2 Floodway Data 7-2

7.3 Annotated Flood Insurance Rate Maps 7-4

7.4 Flood Profiles 7-5

LIST OF FIGURES

1 Location Map 1-3

2 Vicinity Map 1-4

4.1-1 Project Area 4-2

4.2.2-1 Comparison to Sabol Subbasins 4-4

4.2.2-2 Tc Flow Paths 4-5

4.2.2-3 Lca Map 4-6

4.2.2-4 Routing Reaches 4-7

4.2.2-5 Soils Map 4-8

4.2.2-6 Land Use Map 4-9

4.2.5.5-1 Daily Precipitation Extremes 4-15

4.2.5.5-2 Probability and Time of Year of 2" of Precipitation in One Day 4-16

4.2.5.5-3 Probability and Time of Year of 3" of Precipitation in One Day 4-16

4.5.1-1 Computed 100-Year Discharges 4-25

TABLE OF CONTENTS (Continued)
LIST OF FIGURES

4.5.1-2 Inflow & Outflow Hydrographs at RR282 4-26

Reduced Floodplain Work Maps 5-3

7.3 Annotated Flood Insurance Rate Maps 7-4

LIST OF TABLES

4.2.2-1 Subbasin IDs 4-10

4.2.5.1-1: Monthly Precipitation Summary for Carefree, Arizona (021282) 4-12

4.2.5.1-2: Monthly Precipitation Summary for Carefree Ranch (#4930) 4-12

4.2.5.2-1: Distribution of Annual Peak Flows 4-13

4.2.5.3-1: Point Precipitation Values for Galloway Wash 4-14

4.2.5.4-1: Summary of Areal Reduction Values for Index Storms Used in JD Records .. 4-14

4.2.5.5-1: Extreme Precipitation Events Recorded at FCDMC Carefree Ranch Gauge (4930) 4-15

4.2.6.1-1: Summary of composite Green & Ampt Rainfall Losses with Lag Times 4-17

4.2.6.1-2: Natural-Conditions Rainfall Loss Characteristics for Study Area Soil Map Units 4-18

4.2.6.1-3: Land Use Default Values 4-19

4.2.6.2-1 Maricopa County Unit Hydrograph Proceedure 2 Lag Time Summary 4-19

4.5.1-1 Summary Hydrologic Analyses Results for Galloway Wash 4-24

4.5.1-2 Summary of Reservoir Routing at Charles Blair McDonald Drive, CP282 (100-yr 24-hr) 4-24

4.5.1-3 Computed Discharge Values for Galloway Wash 4-26

4.5.2-1 Comparison of HEC-1 Results to USGS Regional Regression Analysis and Previous Studies 4-28

4.5.2-2: Unit-Discharge Comparison of HEC-1 Model Results with Results of USGS Regional Regression Analysis and Sabol 4-29

5.5.2.1: Culverts and Bridges 5-5

5.5.4.1. Summary of Split Flows and Other Changes in Discharge 5-6

5.9.1 HEC-RAS Floodplain Output 5-10

5.9.2 HEC-RAS Floodway Output 5-11

TABLE OF CONTENTS (Continued)
LIST OF PHOTOS

4-1: Looking upstream (east) at outlet of detention basin on the north branch of Galloway Wash at Charles Blair McDonald Dr. 4-21

4-2: Looking approximately northeast into the inlet chamber to the detention basin outlet. Note the 3'x2' orifice inlet to the chamber at upper right. 4-21

4-3: Looking downstream (west) at entrance to the two unregulated cells of the detention basin located on the north branch of Galloway Wash at Charles Blair McDonald Dr. 4-22

4-4 Aerial view of detention basin outlet structure..... 4-22

LIST OF APPENDICES

A REFERENCES

B GENERAL DOCUMENTATION & CORRESPONDENCE

B.1 Special Problems Report
B.2 Contact (Telephone) Reports
B.3 Meeting Minutes or Reports
B.4 General Correspondence
B.5 Contract Documents

C SURVEY FIELD NOTES

C.1 Survey Field Notes for Aerial Mapping Control
C.2 Survey Field Notes for Hydrologic Modeling
C.3 Survey Field Notes for Hydraulic Modeling

D HYDROLOGIC ANALYSIS SUPPORTING DOCUMENTATION

D.1 Precipitation Data
D.2 Physical Parameter Calculations
D.3 Hydrograph Routing Data
D.4 Reservoir Routing Data
D.5 Hydrologic Calculations

VOLUME 2 OF 2

E HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

E.1: Roughness Coefficient Estimation
E.2: Cross Section Plots
E.3: Expansion and Contraction Coefficients
E.4: Analysis of Structures
E.5: Hydraulic Calculations
E.5.1: Flow Distribution/HEC-2 Analyses to Determine Splits/Overflows Which Were Not Mapped
E.5.2: Flow Data

TABLE OF CONTENTS (Continued)

E HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

E.5.3: Summary of Manning's 'n' Values, Channel Reach Lengths, Coefficients of Contraction and Expansion
E.5.4: HEC-RAS Geometry Data
E.5.5: HEC-RAS Output (Tables 5.9.1, 5.9.2).
Study Work Maps and CD with Hydrology/Hydraulic models Located in Back Pockets

Preface

This study was conducted for the Flood Control District of Maricopa County (FCDMC) by JE Fuller / Hydrology and Geomorphology, Inc. (JEF) in association with Dibble & Associates (Dibble), M&B Aerial Mapping, LLC (M&B), and A Team Professional Associates, Inc (A Team). JEF was responsible for the overall management and integration of the work products from the other team members as well as for the performance of the hydrology and floodplain delineation for Galloway Wash and development of as-built plans for all structures modeled in this study. Dibble performed the floodplain delineation for Andora Hills Wash using existing hydrology provided by the FCDMC in the Technical Data Notebook for the study titled *Cave Creek Above Carefree Highway Floodplain Delineation Study, FCD 95-28*. M&B performed the topographic mapping using control surveyed by A Team. A Team also performed the survey in support of development of the as-built plans for all structures modeled in this study.

Three change orders were issued for this project. **Change Order 1** was for inclusion of the Dream Street Bridge on Galloway Wash, which was constructed after the original study was approximately 95% complete. **Change Order 2** was for a time extension, and **Change Order 3** was for revisions to the floodway on Andora Hills Wash between river stations 1.266 and 1.609. The **Change Order 3** revisions were requested by the Flood Control District of Maricopa County as a result of a shift in the floodplain management strategy for that particular reach of Andora Hills Wash. JEF performed the subsequent floodway modifications to Andora Hills Wash between river stations 1.266 and 1.609.

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed 7-1 Aug 01 ARIZONA, U.S.A.

Registered Professional Engineer (Civil) CERTIFICATE NO. 29325 BRIAN R. ISERMAN Date Signed 8/21/01 ARIZONA, U.S.A.

Brian R. Iserman

APPENDIX E: HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

TABLE OF CONTENTS
APPENDIX E
VOLUME 2 OF 2 OF THE TDN

E.1: Roughness Coefficient Estimation

E.2: Cross Section Plots

E.3: Expansion and Contraction Coefficients

E.4: Analysis of Structures

E.5: Hydraulic Calculations

- E.5.1: Flow Distribution/HEC-2 Analyses to Determine Splits/Overflows Which Were Not Mapped
- E.5.2: Flow Data
- E.5.3: Summary of Manning's 'n' Values, Channel Reach Lengths, Coefficients of Contraction and Expansion
- E.5.4: HEC-RAS Geometry Data
- E.5.5: HEC-RAS Output (Tables 5.9.1, 5.9.2).

Study Work Maps and Data CD Located in Back Pockets

E.1 Roughness Coefficient Estimation

PREFACE

The following report describes the evaluation of Manning's roughness coefficients for this floodplain delineation study.

FLOODPLAIN DELINEATION STUDY
of
Andora Hills & Galloway Washes

FCD CONTRACT NO. 99-14

TASK 6.7.3 FIELD RECONNAISSANCE REPORT

July, 2000 (updated February, 2001)

JE Fuller Hydrology and Geomorphology, Inc., (JEF) conducted field reconnaissance of the project area on February 26 and March 4, 2000. Dibble & Associates, Inc. (JEF's subconsultant for this project) performed field reconnaissance of Andora Hills Wash. The purpose of the field reconnaissance was to document channel and overbank Manning's "n" values, floodplain conditions affecting the floodplain delineation, and major hydraulic structures. The project area, ground photo locations, locations of major hydraulic structures, and locations of bedrock outcrops/locally resistant layers are shown on Figure 1 (in pocket at end of this section).

Photographs in series 1 through 4 were taken by JEF personnel February 26, 2000. Photographs in series 5 and 6 were taken by JEF personnel on March 4, 2000. Photographs in series 7 were taken by JEF personnel on November 28, 2000. All photos taken by JEF include a survey rod with 1-foot increments for scale. Photographs in series A through D were taken by personnel from Dibble on December 15, 1999; these photos show an 18-inch-square scaling grid with 1-inch inner squares.

Manning's "n" Values

Manning's "n" values were determined using the methodology outlined in the USGS report titled, "Estimating Manning's Roughness Coefficients for Stream Channels and Flood Plains in Maricopa County, Arizona" by B.W. Thomsen and H.W. Hjalmarson, (April, 1991). On the following pages, photographs showing typical reach conditions are preceded by the worksheet used to determine the reach-average Manning's "n" values for the reach depicted in the photographs. Reach designations were assigned based on distinctions in general channel morphology, vegetation, and channel and overbank soil characteristics.

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Andora Hills Wash
Location: Reach A1
Photo No: D-4, D-7, D-8, D-11

Channel Conditions			Manning's n Adjustment	Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.032		.032
	Cobble		.030 - .050		0.030	
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.005	.005	.005
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.015	.015	.015
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	.015	.010	.015
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.002	.002	0.002
	Freq. Alt.		.010 - .015			
				.069	.062	.069
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.069	.062	.069
				Use 0.070	Use 0.060	Use 0.070

D-4: Looking at right (northwest) overbank area, Andora Hills Wash, river mile 0.19

D-7: Looking upstream (east), Andora Hills Wash, river mile 0.23

D-8: Looking at channel bed material, Andora Hills Wash, river mile 0.23

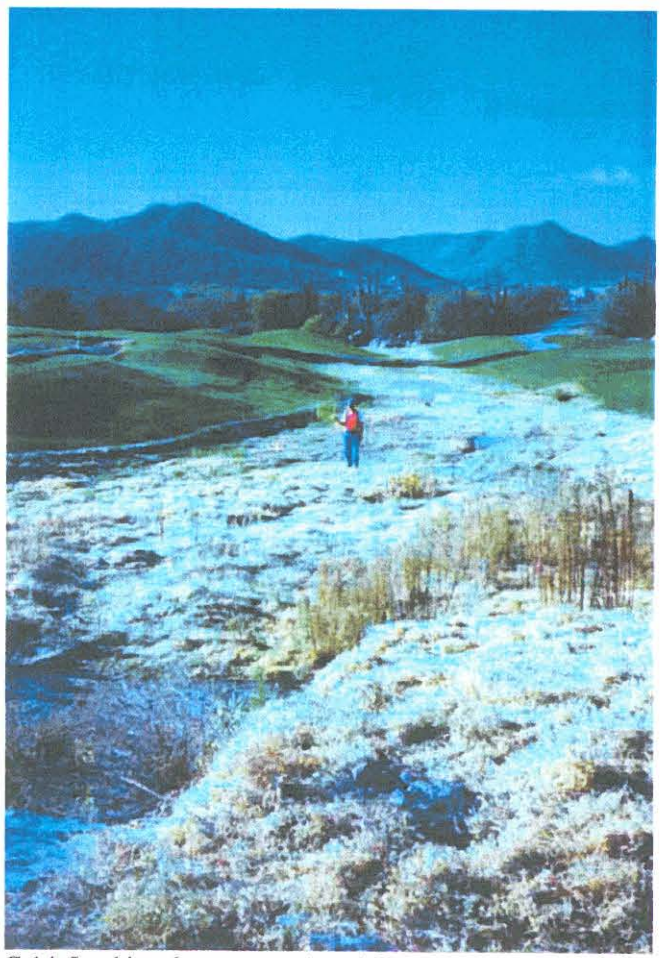
D-11: Looking southeast at left (south) overbank area, Andora Hills Wash, river mile 0.18

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Andora Hills Wash
Location: Reach A2
Photo No: C-13, C14, C-16, C-19, C-24, D-2, D-3

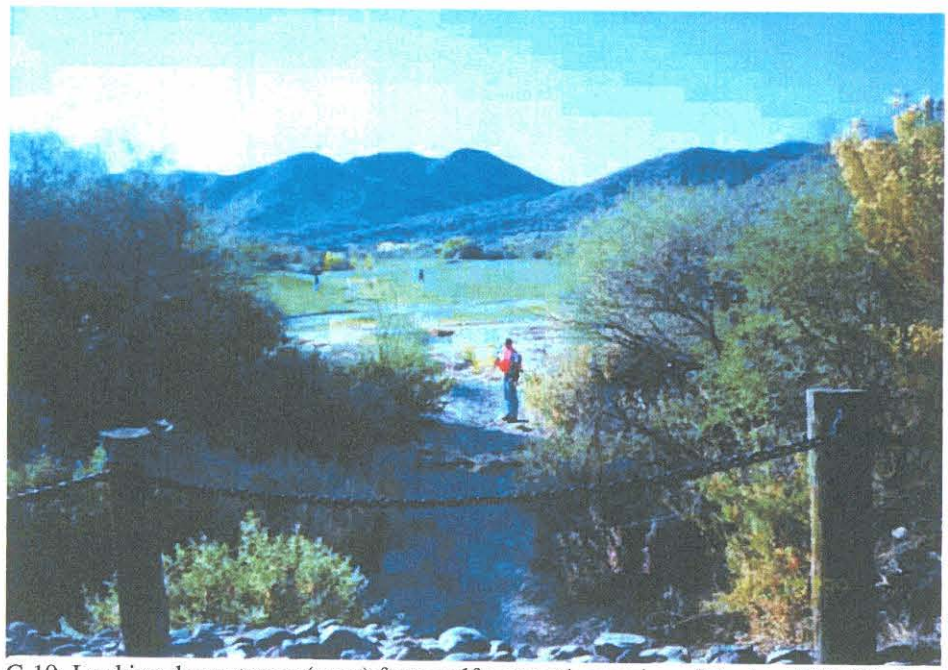
Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032	.025		.025
	Coarse Sand		.026 - .035		.029	
	Gravel		.028 - .035			
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.001	.001	.001
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	.001	.002	.001
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010	.002	.002	.002
	Medium		.010 - .025			
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.001	.001	.001
	Freq. Alt.		.010 - .015			
				.030	.035	.030
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.030	.035	.030
				Use 0.030	Use 0.035	Use 0.030

C-13: Looking upstream (east) at Grapevine Road culverts, Andora Hills Wash, river mile 0.82



C-14: Looking downstream (west) from Grapevine Road, Andora Hills Wash, river mile 0.82

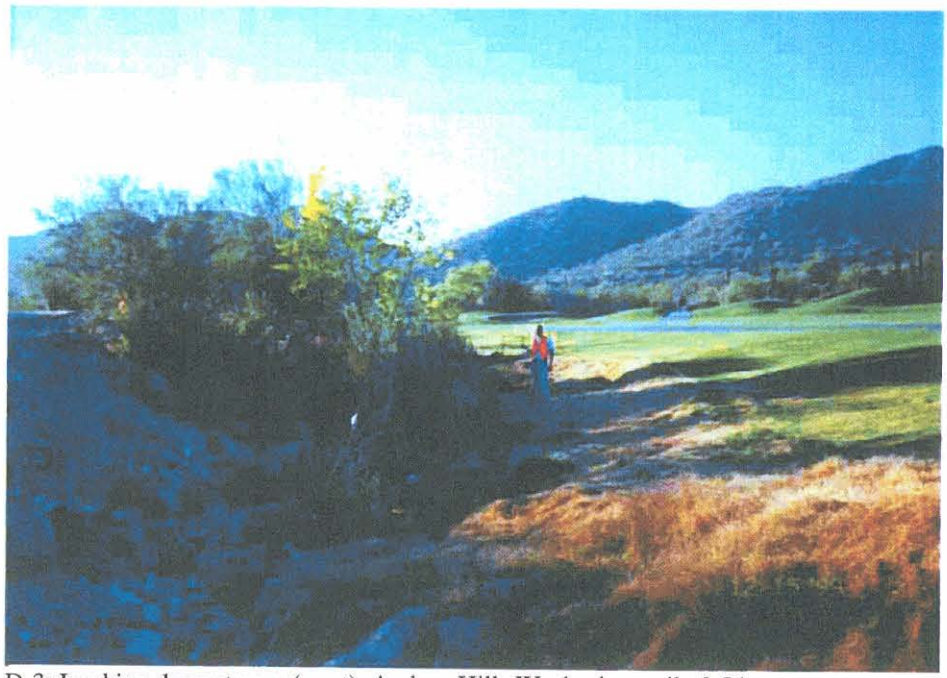
C-16: Looking downstream (west) at upstream-face of golf-cart path crossing of Andora Hills Wash, river mile 0.71



C-19: Looking downstream (west) from golf-cart path crossing of Andora Hills Wash, river mile 0.70

C-24: Looking downstream (northwest) , Andora Hills Wash at Indio Circle, river mile 0.48

D-2: Looking upstream northeast along the left (south) overbank area, Andora Hills Wash, river mile 0.54



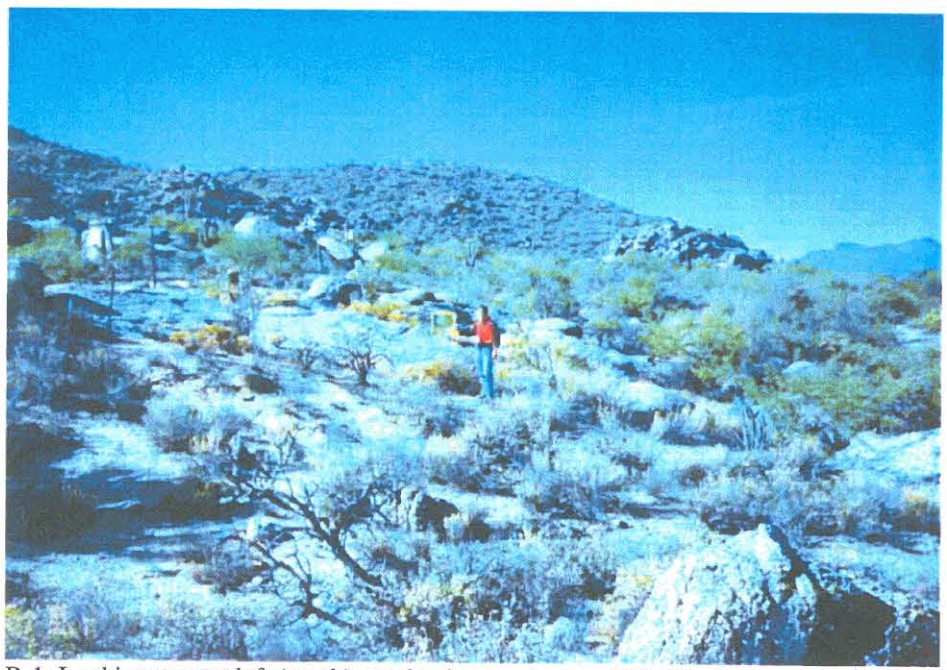
D-3: Looking downstream (west), Andora Hills Wash, river mile 0.54

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Andora Hills Wash
Location: Reach A3
Photo No: A-25, B1 Through B-3, 6-1 Through 6-3

Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
	Concrete		.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035	.035	.035	.035
	Gravel		.028 - .035			
	Cobble		.030 - .050			
Channel Material	Boulder	n_b	.040 - .070			
	Smooth		0			
	Minor		.001 - .005	.001	.003	.001
	Moderate		.006 - .010			
Degree of Irregularity	Severe	n_1	.011 - .020			
	Negligible		.000 - .004			
	Minor		.005 - .015		.015	
	Appreciable		.020 - .030	.030		.030
Effects of Obstruction	Severe	n_2	.040 - .060			
	Small		.002 - .010			
	Medium		.010 - .025	.010	.010	.010
	Large		.025 - .050			
Vegetation	Very Large	n_3	.050 - .100			
	Gradual		0			
	Occ. Alt.		.001 - .005	.004	.002	.004
Variations in Channel Cross section	Freq. Alt.	n_4	.010 - .015			
				.080	.065	.080
	Minor		1	1	1	1
	Appreciable		1.15			
Degree of Meandering	Sever	m	1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				.080	.065	.080
				Use 0.080	Use 0.065	Use 0.080

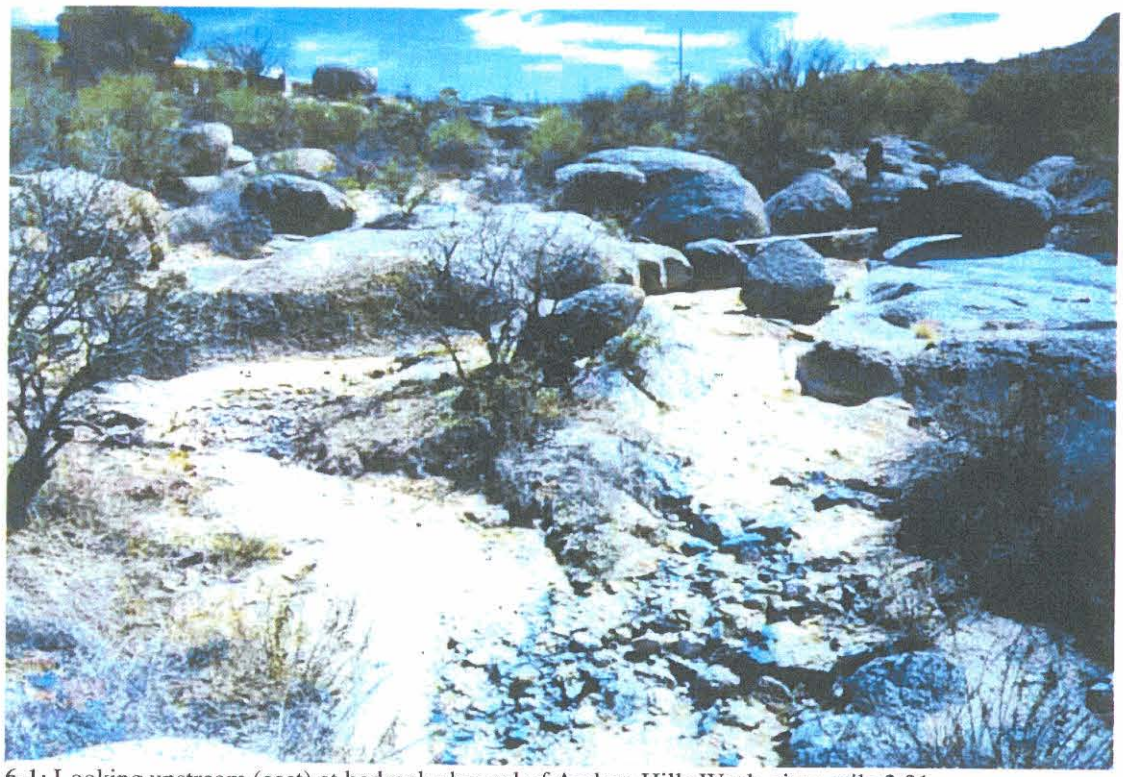
A-25: Looking at channel bed material, Andora Hills Wash, river mile 2.59



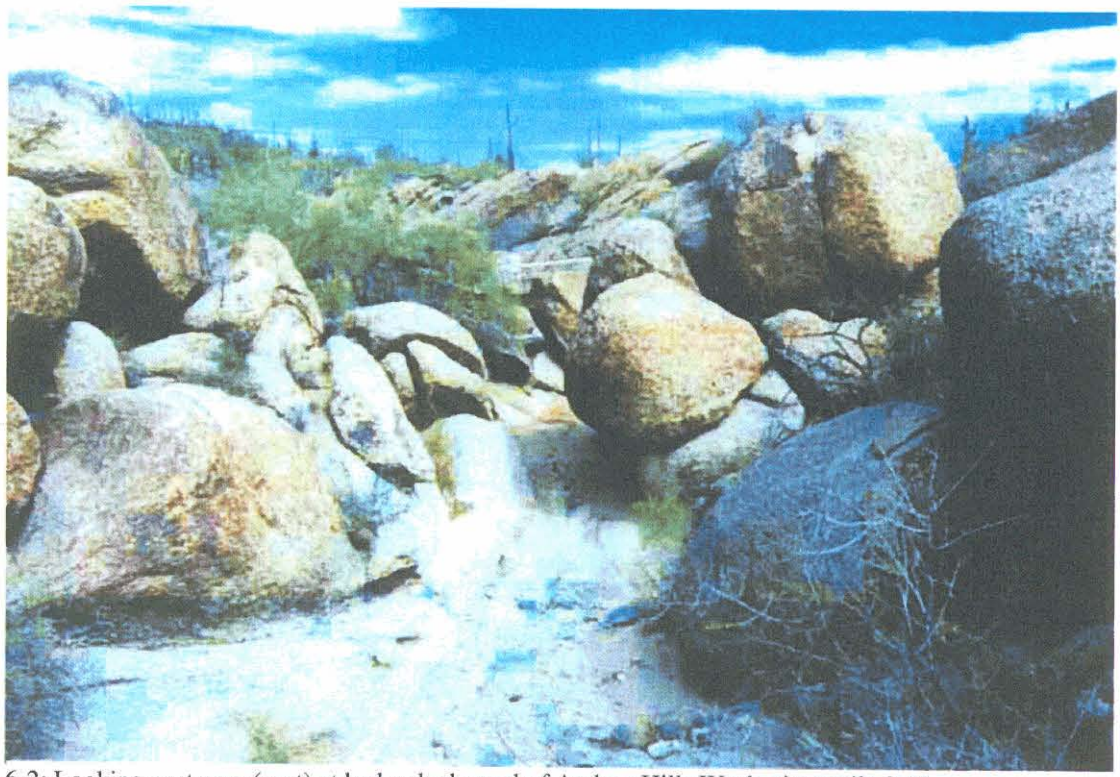
B-1: Looking west at left (south) overbank area, Andora Hills Wash, river mile 2.59

B-2: Looking west at right (north) overbank area, Andora Hills Wash, river mile 2.59

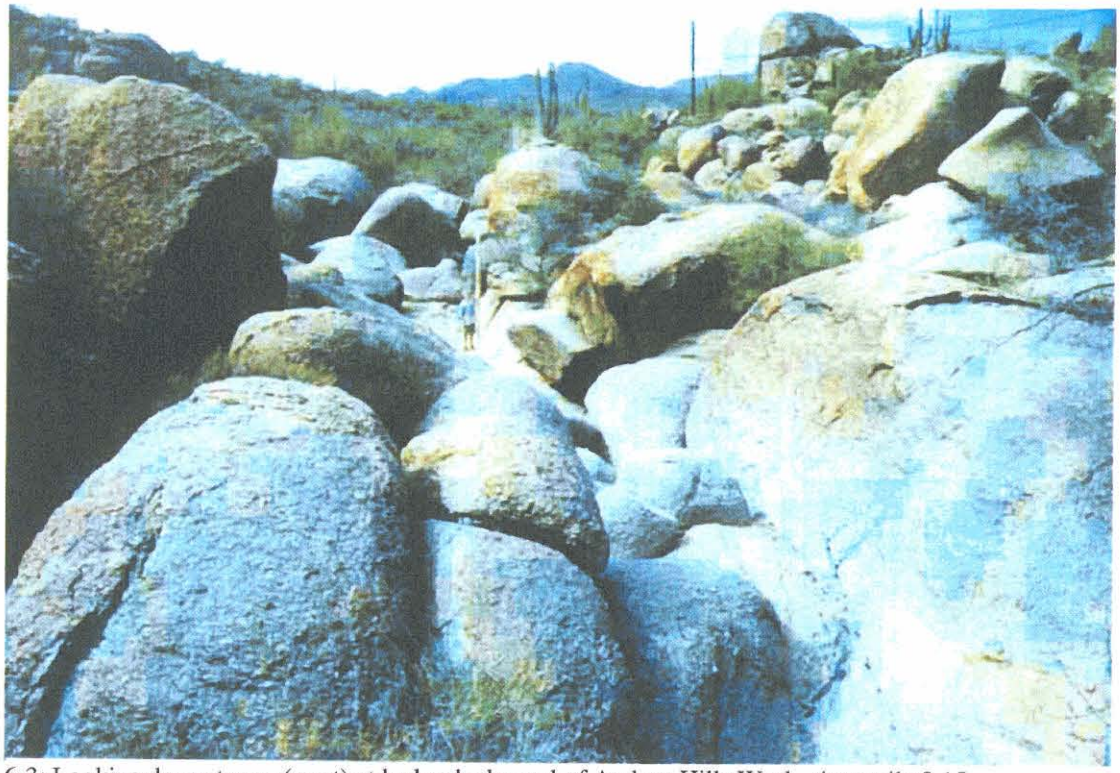
B-3: Looking downstream (west), Andora Hills Wash, river mile 2.59



6-1: Looking upstream (east) at bedrock channel of Andora Hills Wash, river mile 2.31



6-2: Looking upstream (east) at bedrock channel of Andora Hills Wash, river mile 2.15



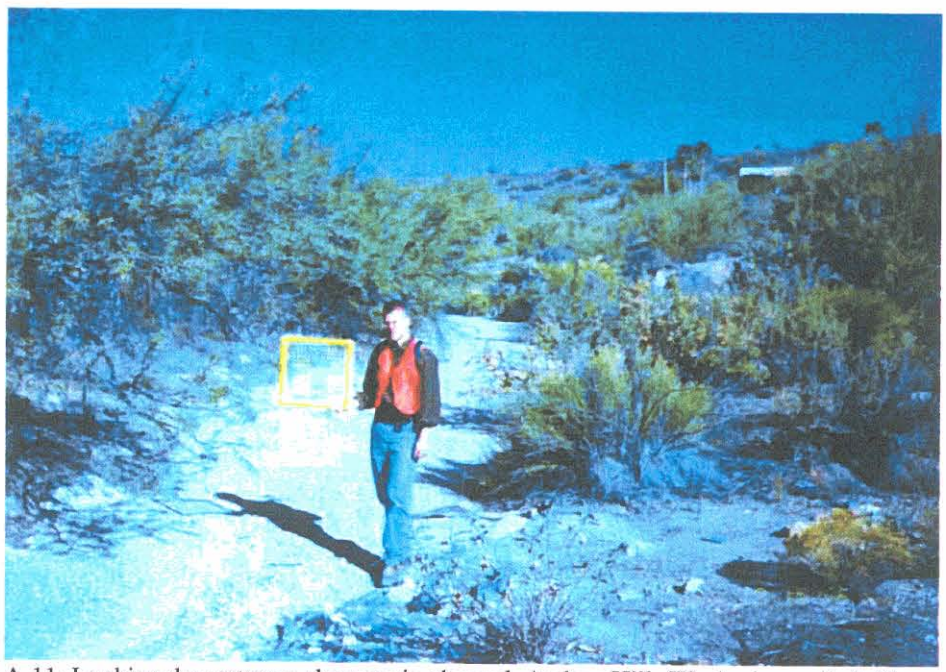
6-3: Looking downstream (west) at bedrock channel of Andora Hills Wash, river mile 2.15

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Andora Hills Wash
Location: Reach A4
Photo No: A-10 Through A-13, A-20, B-11, B-12, B-17, B-23, C-3

Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032	.025		.025
	Coarse Sand		.026 - .035		.030	
	Gravel		.028 - .035			
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.001	.004	.001
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.015	.010	.015
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025		.013	
	Large		.025 - .050	.028		.028
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.001	.003	.001
	Freq. Alt.		.010 - .015			
				.070	.060	.070
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				.070	.060	.070
				Use 0.070	Use 0.060	Use 0.070

A-10: Bed material, Andora Hills Wash, river mile 2.88

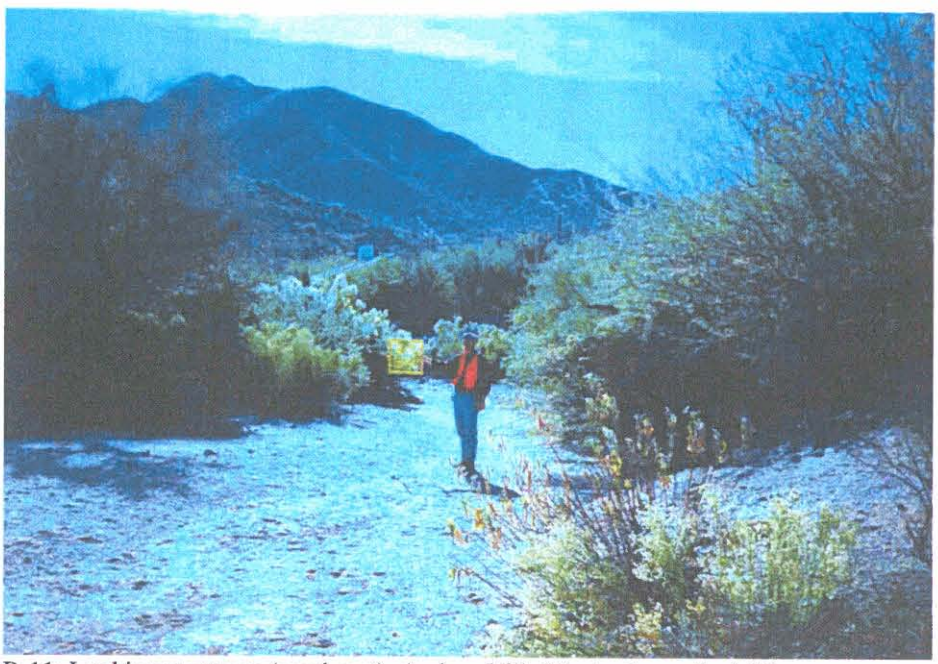


A-11: Looking downstream along main channel, Andora Hills Wash, river mile 2.88

A-12: Looking at right (northeast) overbank area, Andora Hills Wash, river mile 2.88

A-13: Looking north at left (west) overbank area, Andora Hills Wash, river mile 2.88

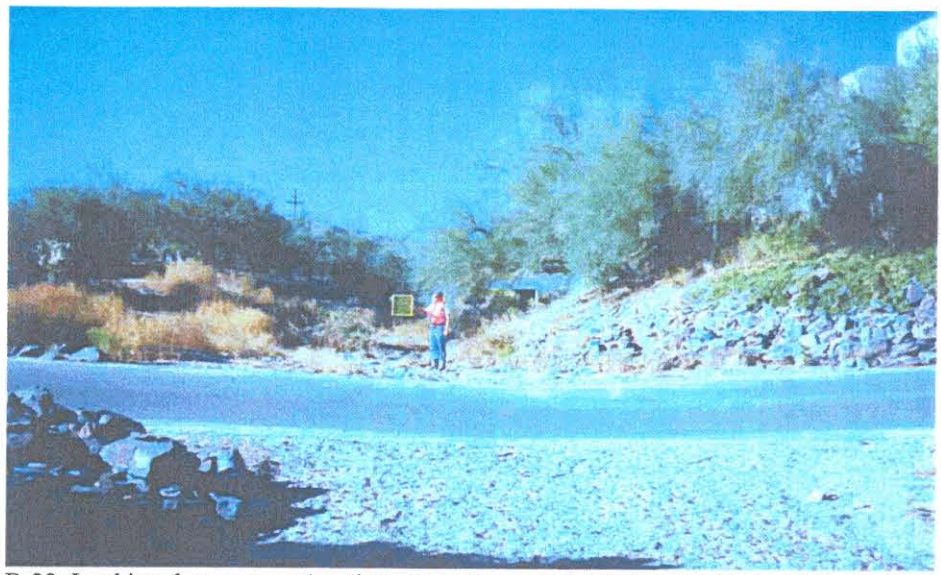
A-20: Looking upstream at front (downstream) face of culverts at the Terrace Estates Circle crossing of Andora Hills Wash, river mile 2.68



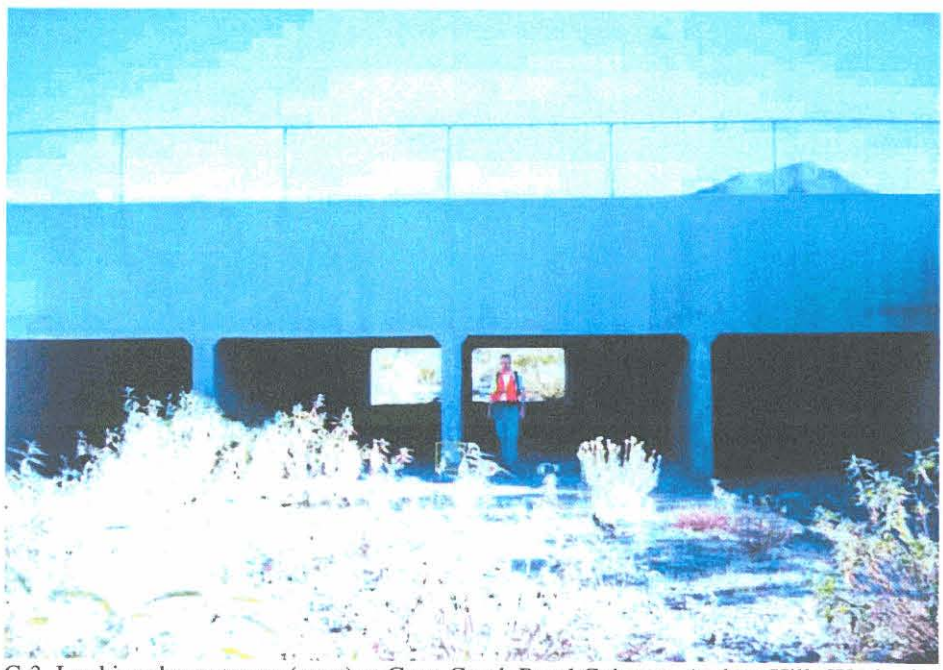
B-11: Looking upstream (southeast), Andora Hills Wash, river mile 1.86

B-12: Looking upstream (east) from Schoolhouse Road, Andora Hills Wash, river mile 1.64

B-17: Looking Downstream (southwest) upstream from Basin Road, Andora Hills Wash, river mile 1.33



B-23: Looking downstream (northwest), note Cave Creek Road CBCs in background, Andora Hills Wash, river mile 1.02

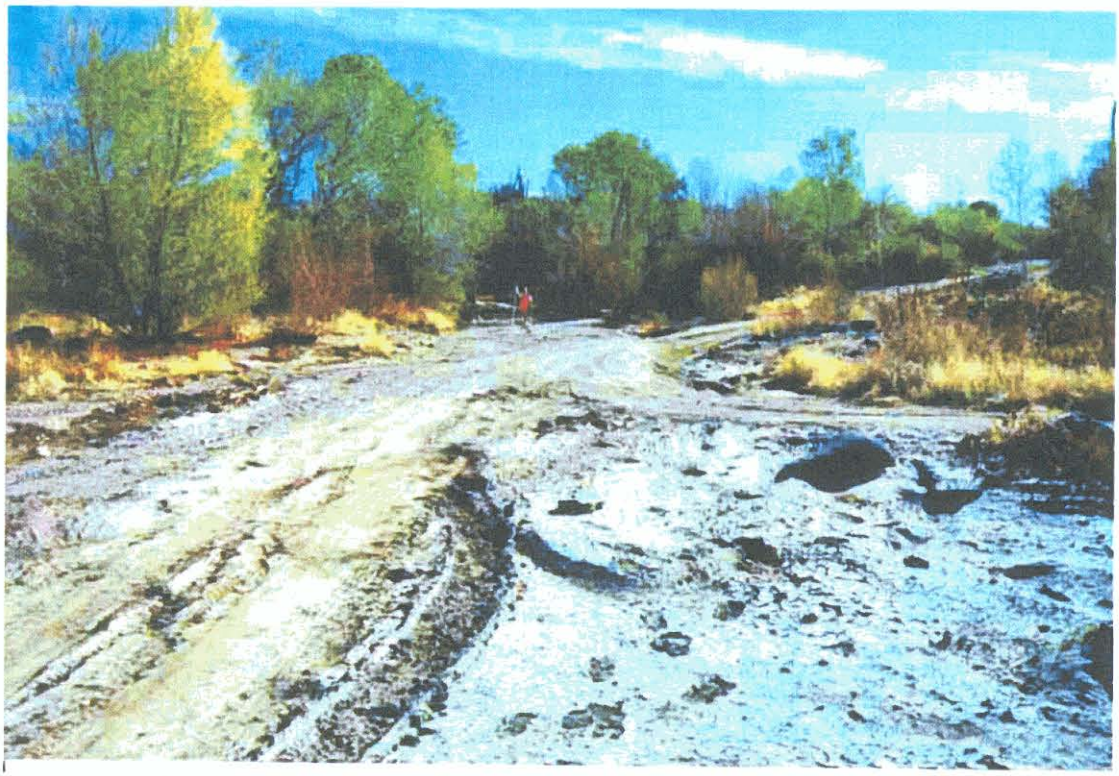


C-3. Looking downstream (west) at Cave Creek Road Culverts, Andora Hills Wash, river mile 0.93

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G1
Photo No: 5-3, 5-7, 5-10, 5-11, 5-13, 5-14

Channel Conditions			Manning's n Adjustment	Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.001	.001	.001
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	.004	.002	.004
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	.020		.025
	Large		.025 - .050		.035	
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.001	.001	.001
	Freq. Alt.		.010 - .015			
				.054	.067	.059
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.054	0.067	.059
				Use 0.055	Use 0.070	Use 0.060



5-3: Looking upstream (east) at mouth of Galloway Wash, river mile 0.0

5-7: Looking north at the right (north) overbank area, Galloway Wash, river mile 0.2

5-10: Looking upstream (east), Galloway Wash, river mile 0.07

5-11: Looking downstream (west), Galloway Wash, river mile 0.13

5-13: Looking upstream (east), Galloway Wash, river mile 0.15

5-14: Looking downstream (west), Galloway Wash, river mile 0.27

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G2
Photo No: 4-3, 4-5, 4-6, 4-7, 4-9, 4-11, 4-12, 4-15, 5-16, 5-18, 5-19, 5-20, 5-24

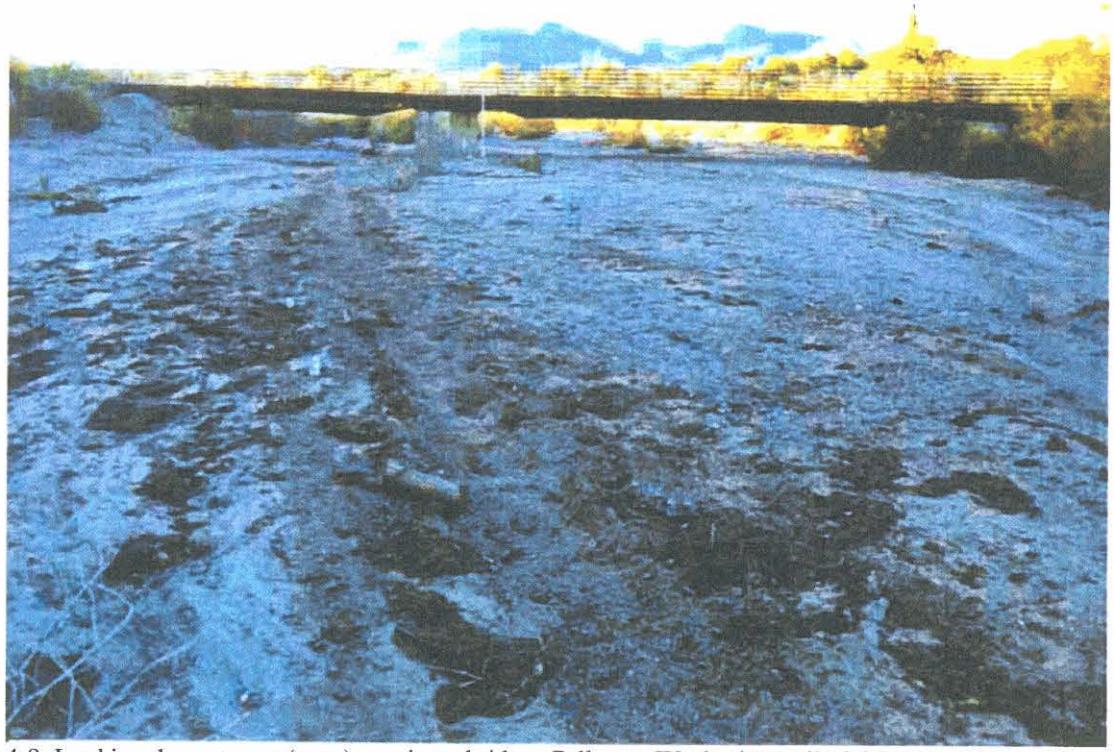
Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.005	.003	.005
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.005	.003	.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		.007	
	Medium		.010 - .025	.015		.015
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.002	.002	.002
	Freq. Alt.		.010 - .015			
				.055	.043	.055
Degree of Meandering	Minor	m	1			
	Appreciable		1.15	1.05	1.05	1.05
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.058	0.045	.058
				Use 0.060	Use 0.045	Use 0.060

4-3: Looking downstream (east), Galloway Wash, river mile 1.15

4-5: Looking downstream (west) along right overbank overflow channel, Galloway Wash, river mile1.1

4-6: Looking upstream (east) along right (north) breakout channel, Galloway Wash, river mile 1.0

4-7: Looking downstream (west) along right (north) breakout channel, Galloway Wash, river mile 0.93



4-9: Looking downstream (west) at private bridge, Galloway Wash, river mile 0.85

4-11: Looking upstream (east), Galloway Wash, river mile 1.0

4-12: Looking north at right (north) bank, Galloway Wash, river mile 1.7

4-15: Looking upstream (east), Galloway Wash, river mile 0.72

5-16: Looking upstream (east), Galloway Wash, river mile 0.30

5-18: Looking upstream (east) at bedrock outcrop in channel, Galloway Wash, river mile 0.43

5-19: Looking southeast at the left (south) bank, Galloway Wash, river mile 0.47

5-20: Looking upstream (east), Galloway Wash, river mile 0.58

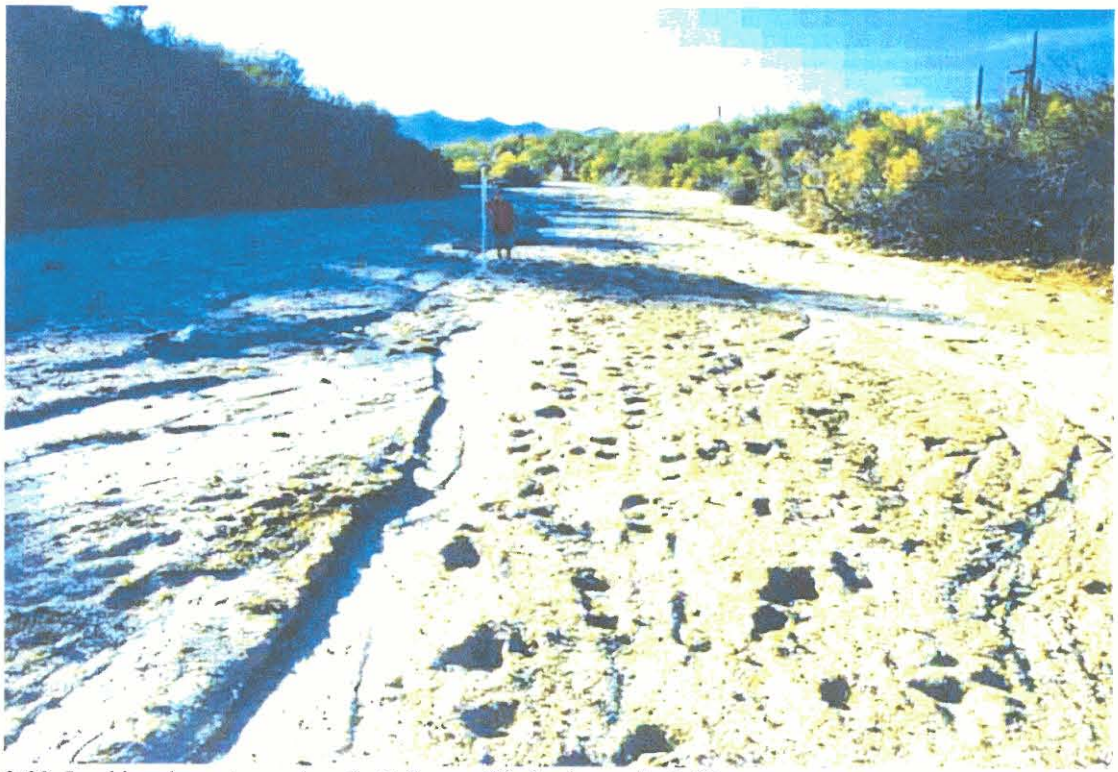
5-24: Looking south at the left (south) overbank area, Galloway Wash, river mile 0.66

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G3
Photo No: 3-21, 3-22, 4-1 & 4-2

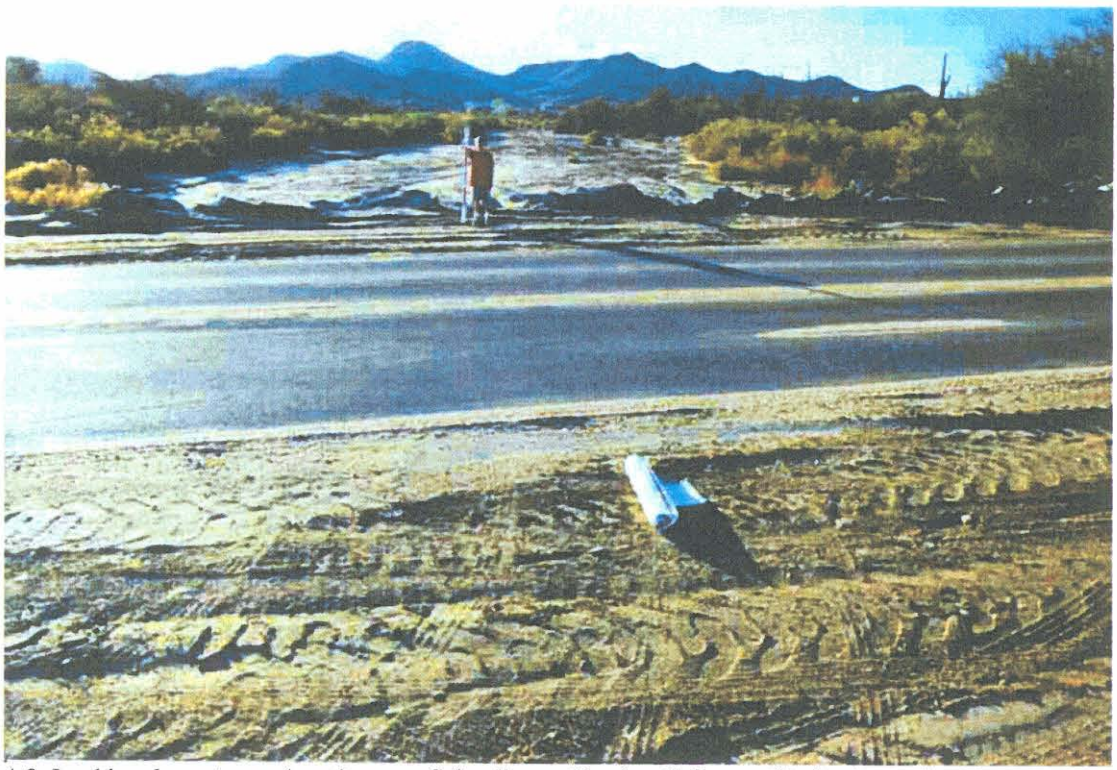
Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.001	.001	.001
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.005	.002	.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		.004	
	Medium		.010 - .025	.015		.015
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.001	.001	.001
	Freq. Alt.		.010 - .015			
				.050	.036	.050
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.050	0.036	.0.050
				Use 0.050	Use 0.035	Use 0.050

3-21: Looking north at right (north) bank, Galloway Wash, river mile 1.68



3-22: Looking downstream (west), Galloway Wash, river mile 1.68

4-1: Looking upstream (east), Galloway Wash, river mile 1.34



4-2: Looking downstream (west) across Schoolhouse Road at Galloway Wash, river mile 1.3

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G4
Photo No: 2-15, 2-17, 2-21, 2-22, 2-26, 3-2, 3-4, 3-6, 3-7, 3-8, 3-10, 3-11, 3-13, 3-14, 3-15 3-18, 3-19, 3-20, 3-23

Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.003	.002	.003
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.005	.005	.005
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		.003	
	Medium		.010 - .025	.015		.015
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.003	.003	.003
	Freq. Alt.		.010 - .015			
				.054	.041	.054
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				**0.054**	**0.041**	**.054**
				Use 0.055	Use 0.040	Use 0.055

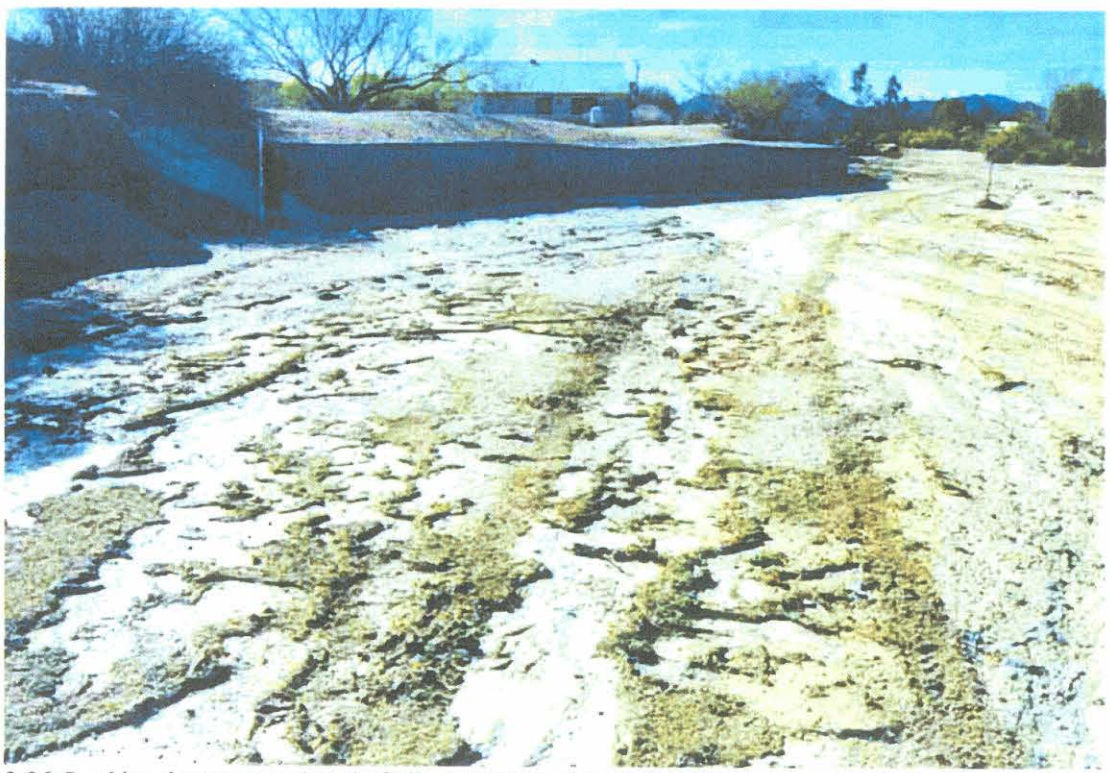
2-15: Looking upstream (east) at confluence of Galloway Wash North Tributary (left of map roll) and Galloway Wash (right of map roll), Galloway Wash, river mile 3.18

2-17: Looking downstream (east) across Tranquil Trail, Galloway Wash, river mile 2.99

2-19: Looking downstream (west) at upstream (east) extent of right (north) overflow channel, Galloway Wash, river mile 2.84

2-21: Looking north across channel at right (north) overbank area of right (north) overflow channel, Galloway Wash, river mile 2.81

2-22: Looking upstream (east) along right (north) overflow channel, Galloway Wash, river mile 2.74

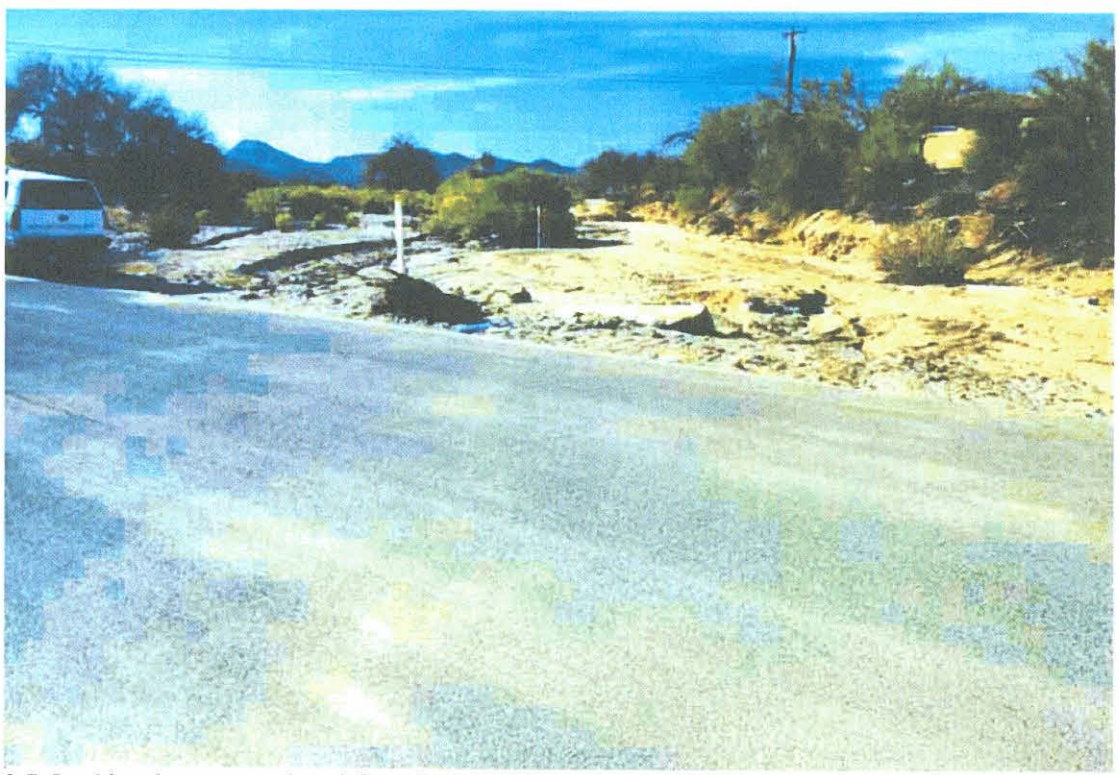


2-26: Looking downstream (west), Galloway Wash, river mile 2.67

3-2: Looking north at island between the right (north) overflow channel and Galloway Wash, river mile 2.75

3-4: Looking upstream (east), note main channel is from Micah (red shirt) left; area to the right of Micah is a backwater area, Galloway Wash, river mile 2.82

3-6: Looking upstream (east) from Scopa Trail, Galloway Wash, river mile 2.48



3-7: Looking downstream (west) from Scopa Trail, Galloway Wash, river mile 2.48

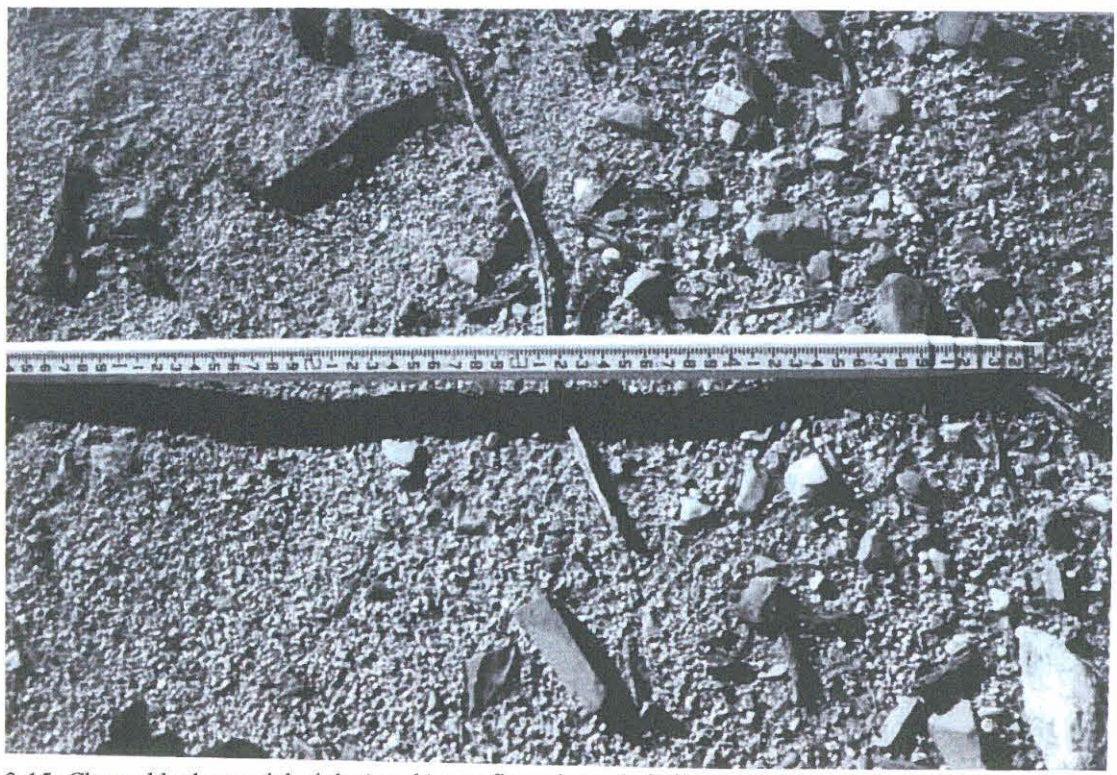
3-8: Looking upstream (east), Galloway Wash, river mile 2.33

3-10: Looking upstream (east) at Galloway Road Culverts, Galloway Wash, river mile 2.23

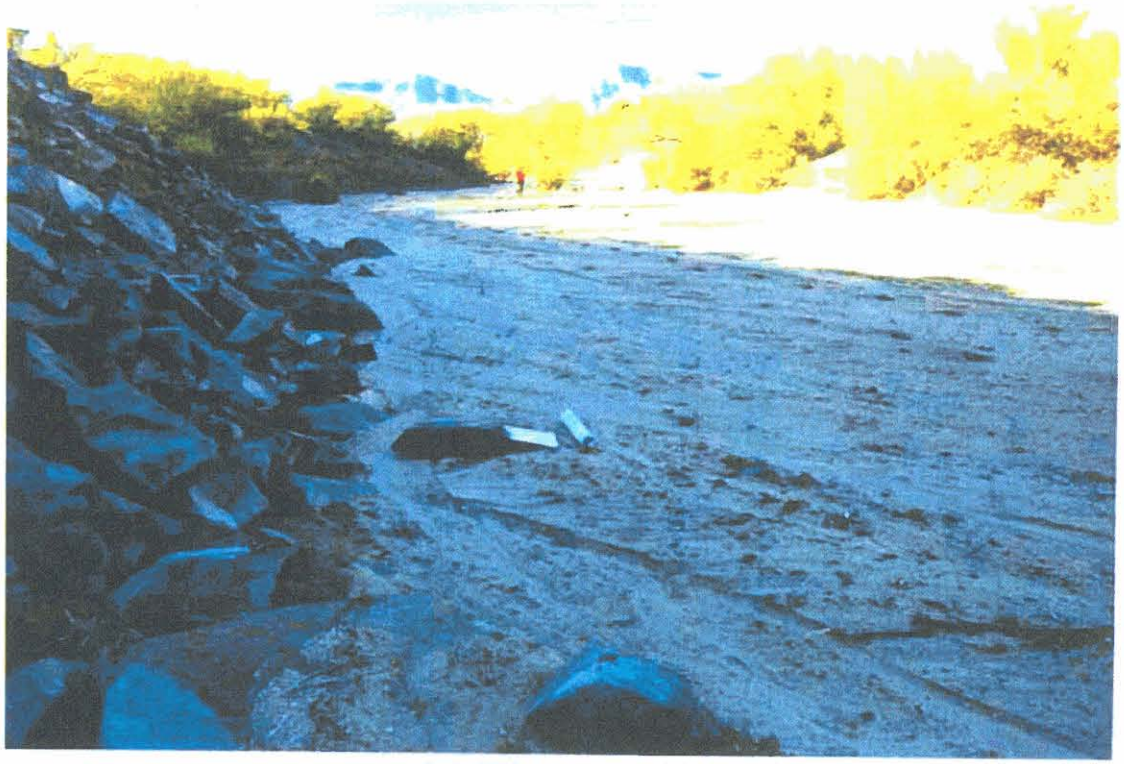
3-11: Looking downstream (west), Galloway Wash, river mile 2.23

3-13: Looking downstream (west), Galloway Wash, river mile 2.04

3-14: Looking downstream (west) along right (north) overflow channel, Galloway Wash, river mile 2.07



3-15: Channel bed material, right (north) overflow channel, Galloway Wash, river mile 2.07



3-18: Looking downstream (west), Galloway Wash, river mile 1.79

3-19: Looking west at east-facing left bank, Galloway Wash, river mile 1.75

3-23: Looking upstream (east), Galloway Wash, river mile 1.88

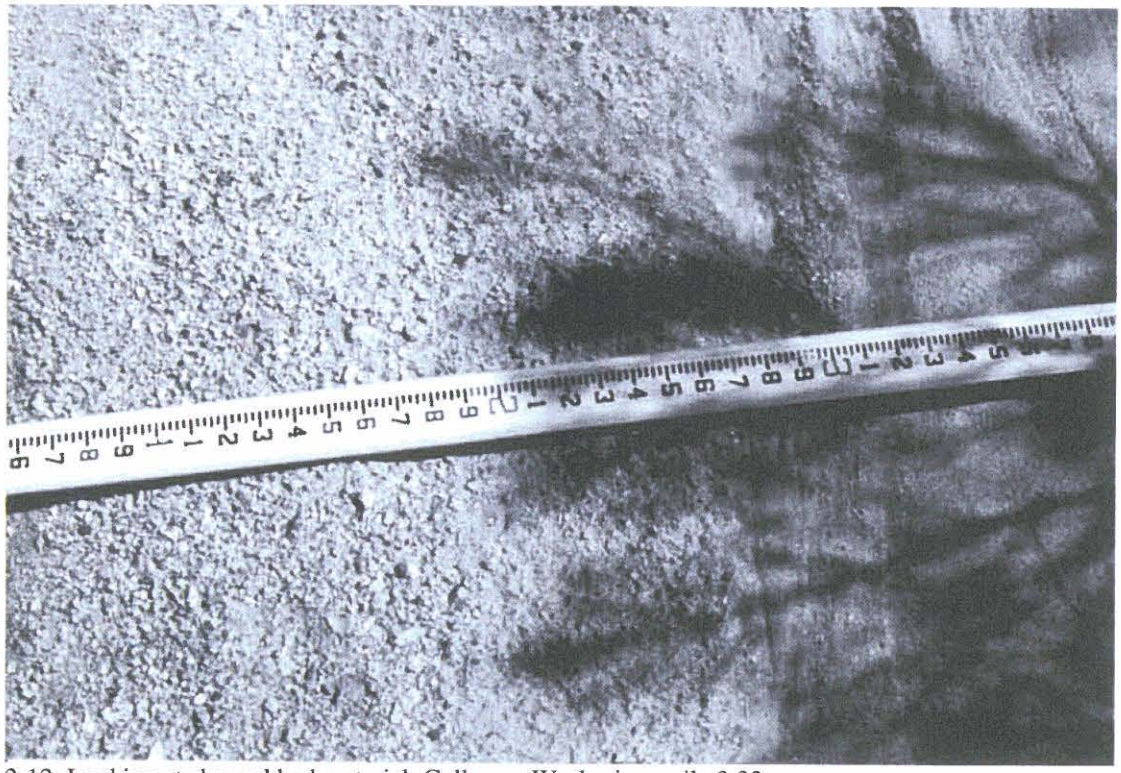
DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G5
Photo No: 2-8, 2-9, 2-12, 2-13

Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.005	.003	.002
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.015	.001	.010
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		.005	
	Medium		.010 - .025	.010		.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.003	.001	.003
	Freq. Alt.		.010 - .015			
				.061	.038	.058
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Severe		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				**0.061**	**0.038**	**.058**
				Use 0.060	Use 0.040	Use 0.060

2-8: Looking downstream at private foot bridge, Galloway Wash, river mile 3.48

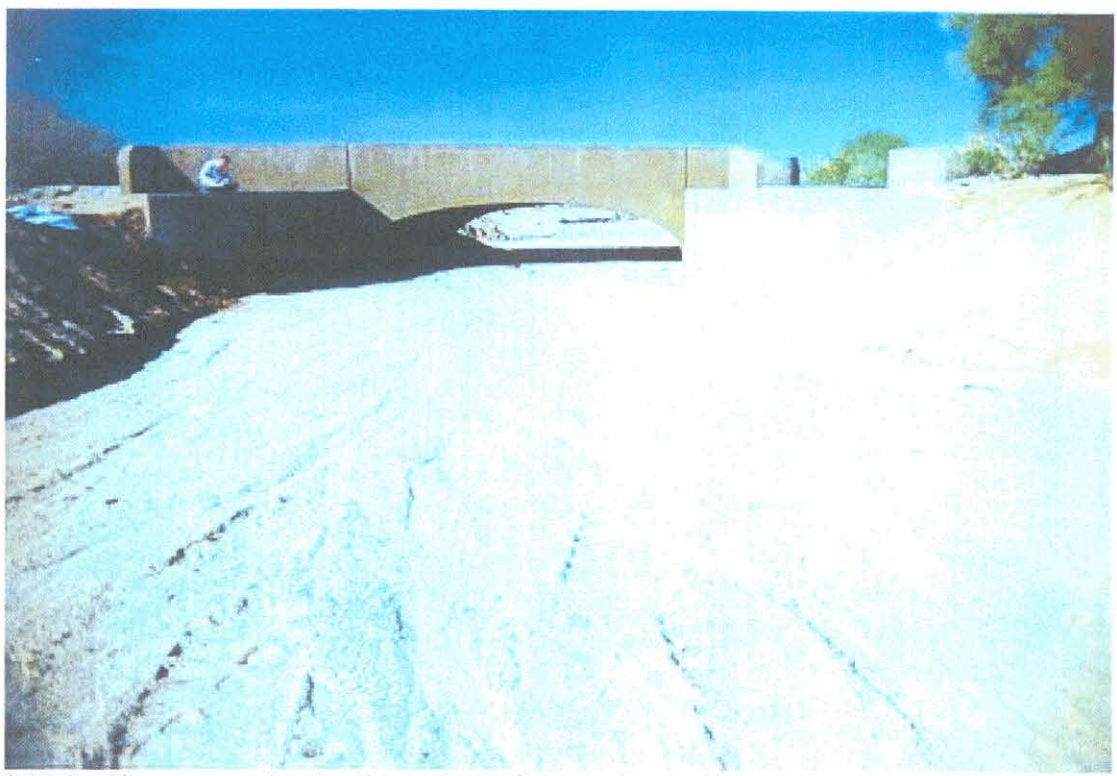
2-9: Looking north at right (north) bank, Galloway Wash, river mile 3.49



2-12: Looking at channel bed material, Galloway Wash, river mile 3.32

2-13: Looking upstream (east) at Dream Street, Galloway Wash, river mile 3.369 (February 26, 2000)

7-5: Looking upstream (east) at Dream Street, Galloway Wash, river mile 3.369 (November 28, 2000)

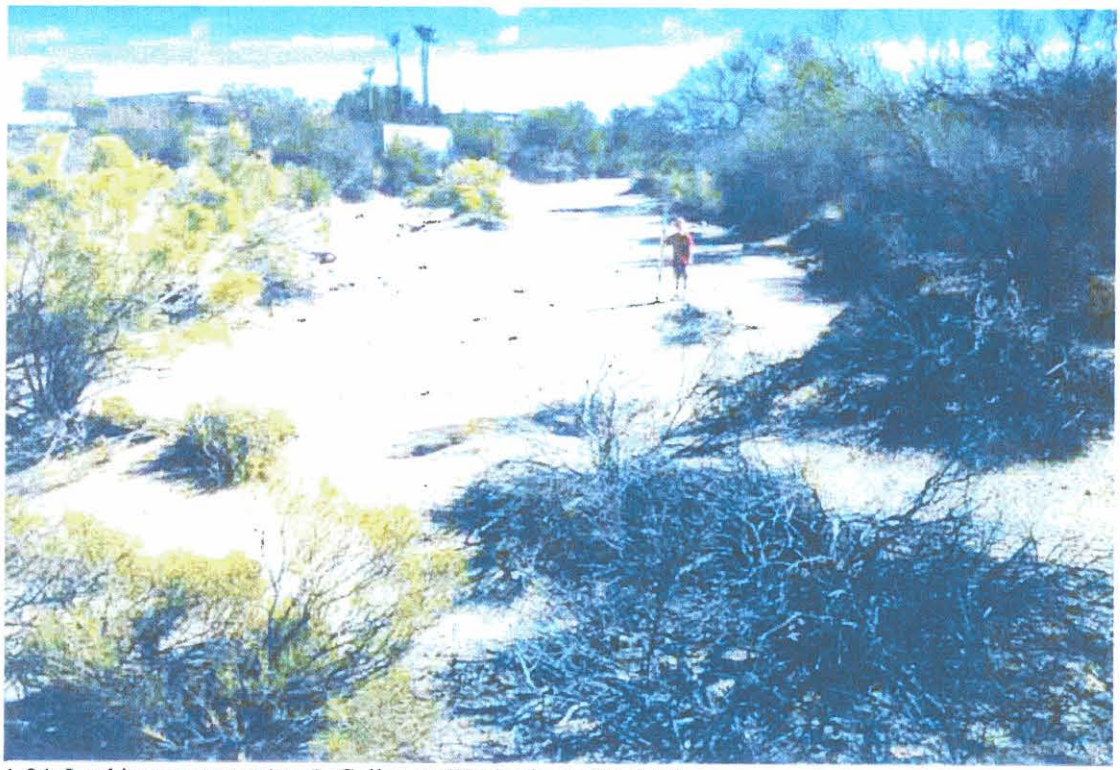


2-13: Looking upstream (east) at Dream Street, Galloway Wash, river mile 3.369 (November 28, 2000)

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G6
Photo No: 1-24, 1-25, 1-26, 2-1, 2-3, 2-5, 2-6

Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.003	.002	.003
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004			
	Minor		.005 - .015	.010	.005	.010
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		.001	
	Medium		.010 - .025	.010		.010
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.003	.003	.003
	Freq. Alt.		.010 - .015			
				.054	.039	.055
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				**0.054**	**0.039**	**.057**
				Use 0.055	Use 0.040	Use 0.055



1-24: Looking upstream (east), Galloway Wash, river mile 4.37

1-25: Looking downstream (west) along left (south) overbank area, Galloway Wash, river mile 4.37

1-26: Looking downstream (west), Galloway Wash, river mile 4.34

2-1: Looking downstream (west) along left (south) bank, Galloway Wash, river mile 4.18

2-3: Looking downstream (west), Galloway Wash, river mile 4.06

2-5: Looking upstream (east), Galloway Wash, river mile 3.74

2-6: Looking south at left (south) overbank area, Galloway Wash, river mile 3.74

DETERMINATION OF MANNING'S ROUGHNESS COEFFICIENTS BY FCDMC METHOD

Project: Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Stream: Galloway Wash
Location: Reach G7
Photo No: 1-16, 1-17, 1-18, 1-22, 1-23

Channel Conditions		Manning's n Adjustment		Left Overbank	Channel	Right Overbank
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035			
	Gravel		.028 - .035	.028	.028	.028
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.004	.003	.004
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004		.003	
	Minor		.005 - .015	.010		.010
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010		.005	
	Medium		.010 - .025	.013		.013
	Large		.025 - .050			
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0			
	Occ. Alt.		.001 - .005	.003	.003	.003
	Freq. Alt.		.010 - .015			
				.058	.042	.058
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				**0.058**	**0.042**	**.058**
				Use 0.060	Use 0.040	Use 0.060

1-16: Channel bed material, Galloway Wash, river mile 4.64

1-17: Looking upstream (east), Galloway Wash, river mile 4.64

1-18: Looking south at the left (south) bank, Galloway Wash, river mile 4.66

1-22: Looking downstream (west), Galloway Wash, river mile 4.55

1-23: Looking upstream (east), Galloway Wash, river mile 4.55

Significant Hydraulic Structures

For the most part, both Andora Hills Wash and Galloway Wash remain in a relatively natural state, with no large-scale bank protection, and no channelization. However, nine significant hydraulic structures have been identified within the study reaches; five are located on Andora Hills Wash, and four are located on Galloway Wash. The following table provides a summary of their description. Eight of these structures have been surveyed by A Team Professional Associates, Inc. (the survey subcontractor for this project) to verify all dimensions. One structure, the Con Arch at Dream street was surveyed by Mr. John Stock of the Flood Control District of Maricopa County in January, 2001. The locations of these structures are noted on Figure 1., and photographs of these structures appear with the n-value photographs in the appropriate reach.

Structure Number	Description
1	2-13'x9' CBC, Andora Hills Wash at El Indio Circle
2	4-48"x36" HECMP & 1-96"x72" HECMP, Andora Hills Wash at Golf Cart Path
3	5-54"x36" HECMP, Andora Hills Wash at Grapevine Road.
4	4- 12'x9' CBC, Andora Hills Wash at Cave Creek Road
5	2-10'x3' CBC, Andora Hills Wash at Terrace Estates Circle
6	2-Span Flatbed Railroad-Car Bridge, Galloway Wash at private road upstream of Spur Cross Road
7	8-10'x6' CBC, Galloway Wash at Galloway Road
8	2-Span wooden, private foot bridge, Galloway Wash downstream of Carefree Drive
9	1-28'x6' ConArch, Galloway Wash at Dream Street

General Floodplain Conditions

Andora Hills Wash and Galloway Wash are tributaries to upper Cave Creek, a large desert riparian corridor. These two washes drain a portion of the southern foothill slopes of the New River Mesa. Both of these desert washes have well-defined, sand/gravel bed channels, and gradually sloping banks in most reaches. Channel bed parent material in Andora Hills Wash is predominantly granite. Galloway Wash has mixed channel bed material, with granite being washed from the southern half of the watershed, and metasedimentary rock (which is locally schistose and contains mica) coming from the Grapevine Wash tributary which drains the northeast portion of the watershed. The beds and banks tend to be devoid of fine silts and sands as well as large cobbles and boulders. Most of the channel material varies from coarse sub-angular sands to coarse, angular gravels.

Both washes pass through short reaches of exposed bedrock and alluvial deposits made resistant by calcification (caliche or carbonates). Stage 3+ (hard, well-developed) carbonates

were observed at several locations along Galloway Wash. The many abrupt bends and slope changes observed in both washes are the natural response to these locally resistant layers.

In general, the study area is covered by the Upper Sonoran plant community. Vegetation throughout the study reaches include trees such as mesquite, little leaf palo verde, some isolated creosote and occotillo, a few cacti including saguaro, barrel, staghorn, and teddy bear cholla, various shrubs such as desert broom, jojoba, mormon tea, brittle bush and hackberry. The lower reaches of both Andora Hills Wash and Galloway Wash contain vegetation indicative of a classic desert riparian zone; including cottonwood, cattails and desert willow.

Andora Hills Wash

For the purpose of this study, Andora Hills Wash has been subdivided into 4 distinct reaches; Reach A1, A2, A3 and A4. The combined length of these reaches is 2.8 miles. From the confluence with Cave Creek to the end of the study area at Carefree Drive and Lazy Burro Road there is a elevation difference of 300 feet, which equates to an average slope of approximately two percent.

Reach A1 is a natural desert wash with a deeper incised channel than the other reaches. Reach A1 begins downstream of the culvert at El Indio Circle and ends at the confluence with Cave Creek. The bed material is comprised of mostly gravels (decomposed granite) with cobbles and a few boulders with diameters greater then ten inches. Cottonwood trees are present in the main channel area in the first 800 feet upstream of the confluence with Cave Creek Wash, and the channel bed material is finer than upstream with less gravel and more sand. For this first 800 feet, the "n" values are the same as Reach 52 of the recent study titled *Cave Creek Above Carefree Highway Floodplain Delineation Study*, FCD No. 95-28.

The table below presents the calculated Manning's "n" values for Reach A1. For the downstream 800-foot portion of this reach, the assigned overbank n values are 0.070, and the assigned channel n value is 0.045.

Manning's "n" Values for Reach A1		
Left Overbank	Channel	Right Overbank
0.070	0.060 (0.045)	0.070

Reach A2 includes Rancho Mañana Golf Course which begins downstream of Grapevine Road and ends at the downstream side of the El Indio Circle culverts. The flora dramatically changes from upper Sonoran desert to turf grass in the overbank areas. The main channel vegetation contains a variety of taller grasses including some areas with cattails and a few scattered cottonwood trees. The side slopes of the overbanks are gently sloping, but the golf course has a slight degree of undulation with only minor degrees of irregularity and negligible obstructions. The table below presents the calculated Manning's "n" values for this reach. The "n" values were adjusted locally to account for the trees in the downstream portion of this reach.

Manning's "n" Values for Reach A2		
Left Overbank	Channel	Right Overbank
0.030	0.035	0.030

Reach A3 is characterized by massive outcroppings of weathered coarse-grained granite at Piedra Grande Drive and ends at 66th Street. The bed material is granite gravels, but there are significantly more cobbles than in the adjacent reaches. The side slopes are gently sloping with large boulders in the overbank areas. There are only minor degrees of irregularity and an appreciable effect due to obstructions. The vegetation is less dense than in Reach A4 and there are fewer trees, but there are taller desert shrubs. The table below presents the calculated Manning's "n" values for this reach. The "n" values were adjusted locally in the HEC-RAS model to account for the increase in roughness due to the presence of very large boulders.

Manning's "n" Values for Reach A3		
Left Overbank	Channel	Right Overbank
0.080	0.065	0.080

Reach A4 is divided into two segments by Reach A3. The upstream segment of Reach A4 begins at Carefree Drive and Lazy Burro Road and ends at Piedra Grande Drive. The second segment of Reach A4 begins downstream of Reach A3 at 66th Street and ends downstream of the five HECMP culverts at Grapevine Road. The main channel is well defined and consists of weathered granite that is mostly gravel with a few cobbles. The second segment of Reach A4 has similar characteristics as the first segment. The table below presents the calculated Manning's "n" values for this reach.

Manning's "n" Values for Reach A4		
Left Overbank	Channel	Right Overbank
0.070	0.060	0.070

Galloway Wash

For the purpose of this study, Galloway Wash has been divided into 7 reaches; Reach G1, G2, G3, G4, G5, G6, and G7. The combined length of these reaches is approximately 4.6 miles. From the confluence with Cave Creek to the end of the study area at Pima Road, there is a elevation difference of approximately 560 feet, which equates to an average slope of approximately 2.3 percent.

Above the confluence with Grapevine Wash, the Galloway Wash channel bed sediments are almost uniformly coarse sub-angular sands and angular gravels of coarse granite origin. Some cobbles were observed, but appear to originate from small-scale riprap bank protection/landscaping, which local homeowners have installed. Downstream of Grapevine Wash, the channel bed material is composed of more of the same granitic sands and gravels, but with the addition of metasedimentary schistose sands, gravels and cobbles, which are easy to identify by the medium- to dark-gray color.

Reach G1 passes through the Rancho Mañana golf course. Water was observed flowing in the lower two-thirds of this reach during the reconnaissance visit of March 4, 2000. It is speculated that the source of the flow, which was estimated to be less-than 0.1 cubic feet per second, is irrigation return from the golf course, or seepage from a nearby pond. The main channel is much narrower and has higher banks than all the other reaches of Galloway Wash.

The left overbank area of this reach is dominated by a golf course fairway and a golf-cart path; the right overbank area is covered by more typical desert vegetation. Cottonwood trees, with trunk diameters of up to approximately 10 inches, along with cattails and desert willow grow densely in the channel of this reach. The table below presents the calculated Manning's "n" values for this reach. For that portion of this reach, which has been encroached upon by the golf course fairway and golf-cart path, the left overbank "n" value is 0.030.

Manning's "n" Values for Reach G1		
Left Overbank	Channel	Right Overbank
0.055 (0.030)	0.070	0.060

Reach G2 tends to have more brush (desert broom) and small trees (paloverde) growing in the sand-bed channel itself, than the other reaches. Notable features in this reach include a large flow split on the upstream one-third, a highly resistant carbonaceous north bank along the lower two-thirds, and a short reach of golf-course fairway near the downstream end of the reach. The table below presents the calculated Manning's "n" values for this reach. For that portion of this reach, which is near the golf course fairway, the overbank n values are 0.030.

Manning's "n" Values for Reach G2		
Left Overbank	Channel	Right Overbank
0.060 (0.030)	0.045	0.060 (0.030)

Reach G3 is the straightest and most uniform of all the reaches, with little vegetation in the main channel. This reach, which is the widest of all 7 reaches, has no appreciable bends because most of this reach is bounded on the south by a straight, uniform ridge of young (Miocene/Pliocene) sedimentary basin-fill deposits. The table below presents the calculated Manning's "n" values for this reach.

Manning's "n" Values for Reach G3		
Left Overbank	Channel	Right Overbank
0.050	0.035	0.050

Reach G4 is distinguished by highly irregular bank alignments. There are also two significant island-splits, and a natural drop of approximately 5 feet over a locally resistant layer of calcified basin fill material (see photo 3-4). There are also numerous patches of established vegetation in the channel, which include paloverde and desert broom. Several block retaining walls have been constructed by local homeowners. These retaining walls are non-continuous, but appear to have been constructed about the same time using identical material. These retaining walls can be seen in photos 2-6 and 3-6. The table below presents the calculated Manning's "n" values for this reach.

Manning's "n" Values for Reach G4		
Left Overbank	Channel	Right Overbank
0.055	0.040	0.055

Reach 5 is narrower than the reaches, which bound it, with the left (south) overbank area of the upstream one-third of Reach 5 being encroached upon by houses. For this reason, it was made into a distinct reach. The table below presents the calculated Manning's "n" values for this reach.

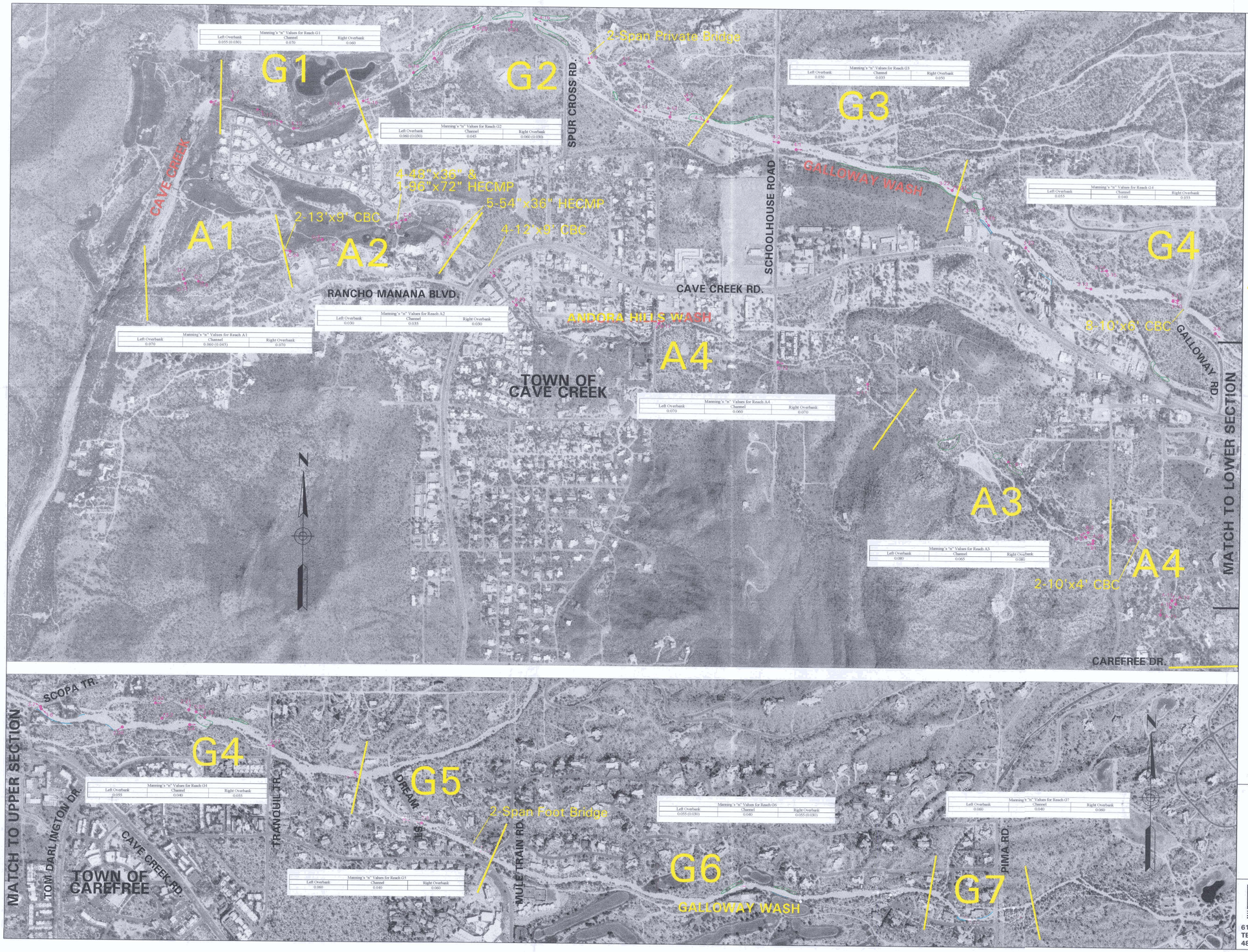
Manning's "n" Values for Reach G5		
Left Overbank	Channel	Right Overbank
0.060	0.040	0.060

Reach 6 has mild meanders and has a main channel, which is relatively free of vegetation. The channel has been encroached upon at two locations by a golf course. At these locations, the banks have been protected with vertically-placed railroad ties. The table below presents the calculated Manning's "n" values for this reach. For that portion of this reach, which is encroached upon by the golf course, the overbank n values are 0.030.

Manning's "n" Values for Reach G6		
Left Overbank	Channel	Right Overbank
0.055 (0.030)	0.040	0.055 (0.030)

Reach 7 contains an abrupt bend, a split around a house, which is located on an "island", and a natural braided section. This reach also has short sections of rip-rap and concrete bank protection. In general, this reach has been altered significantly by the encroachment of two single-family houses. The table below presents the calculated Manning's "n" values for this reach.

Manning's "n" Values for Reach G7		
Left Overbank	Channel	Right Overbank
0.060	0.040	0.060



Manning's "n" Values for Reach G1		
Left Overbank	Channel	Right Overbank
0.055 (0.030)	0.070	0.060

Manning's "n" Values for Reach G2		
Left Overbank	Channel	Right Overbank
0.060 (0.030)	0.045	0.060 (0.030)

Manning's "n" Values for Reach G3		
Left Overbank	Channel	Right Overbank
0.050	0.035	0.050

Manning's "n" Values for Reach G4		
Left Overbank	Channel	Right Overbank
0.055	0.040	0.055

Manning's "n" Values for Reach A1		
Left Overbank	Channel	Right Overbank
0.070	0.060 (0.045)	0.070

Manning's "n" Values for Reach A2		
Left Overbank	Channel	Right Overbank
0.030	0.035	0.030

Manning's "n" Values for Reach A4		
Left Overbank	Channel	Right Overbank
0.070	0.060	0.070

Manning's "n" Values for Reach A3		
Left Overbank	Channel	Right Overbank
0.080	0.065	0.080

Manning's "n" Values for Reach G4		
Left Overbank	Channel	Right Overbank
0.055	0.040	0.055

Manning's "n" Values for Reach G5		
Left Overbank	Channel	Right Overbank
0.060	0.040	0.060

Manning's "n" Values for Reach G6		
Left Overbank	Channel	Right Overbank
0.055 (0.030)	0.040	0.055 (0.030)

Manning's "n" Values for Reach G7		
Left Overbank	Channel	Right Overbank
0.060	0.040	0.060

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

FIGURE 1
PHOTO LOCATION MAP

FEBRUARY, 2001

LEGEND

G2 REACH BOUNDARY & ID

6-1 PHOTO LOCATION/DIRECTION

BEDROCK OR RESISTANT LAYER OUTCROP

BANK PROTECTION OR RETAINING WALL

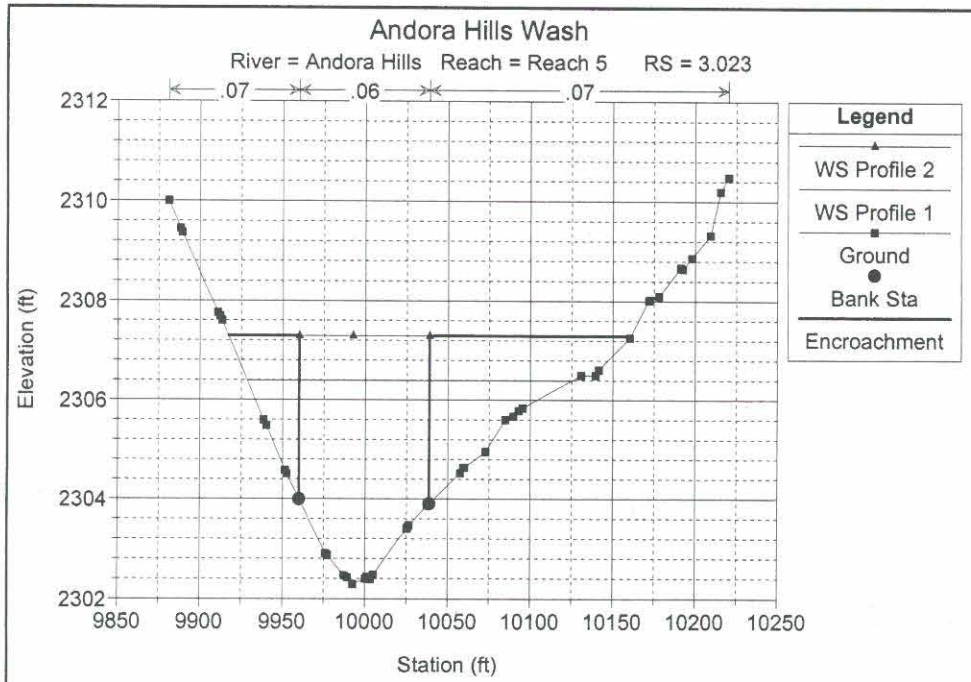
SCALE IN FEET

0 500 1000 1500

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC
6101 SOUTH RURAL ROAD, SUITE 110
TEMPE, ARIZONA 85283
480-752-2124

E.2 Cross Section Plots

Andora Hills Wash HEC RAS Schematic
JE Fuller/Hydrology & Geomorphology, Inc.
April, 2000


Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 3.023
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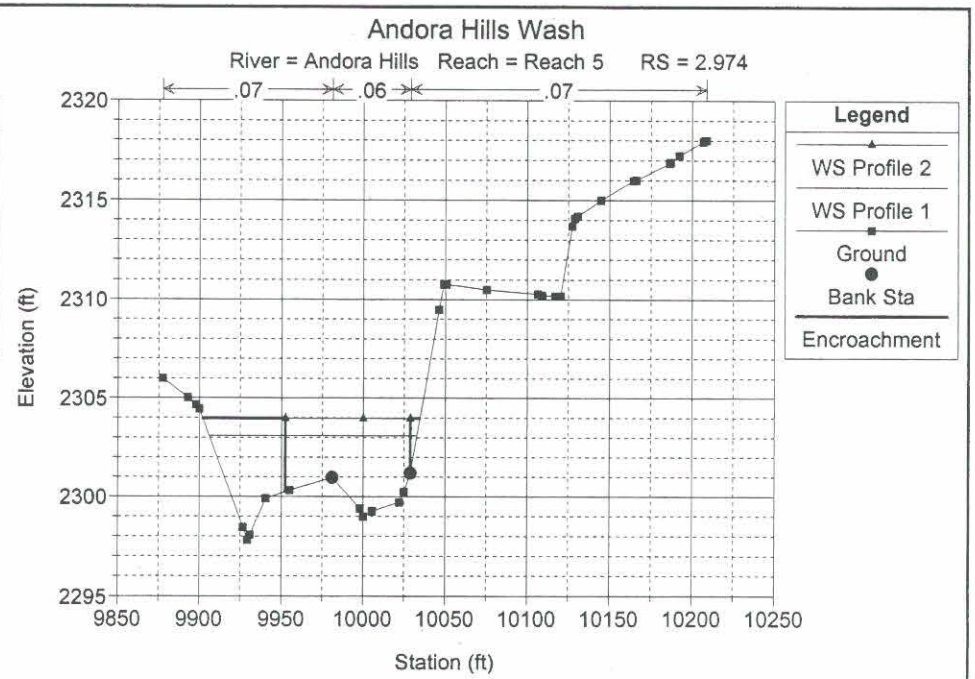
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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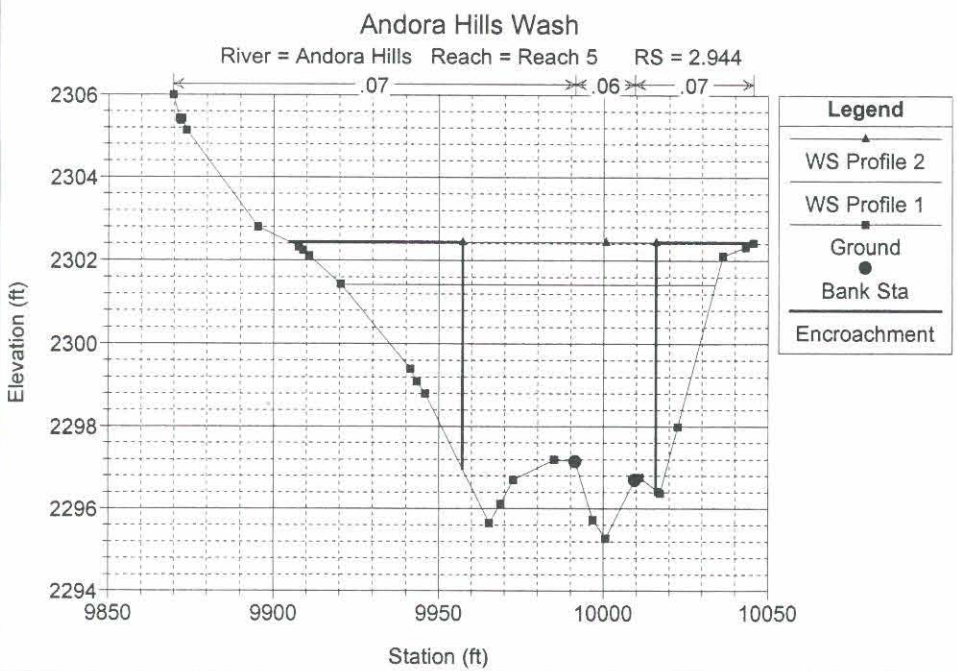
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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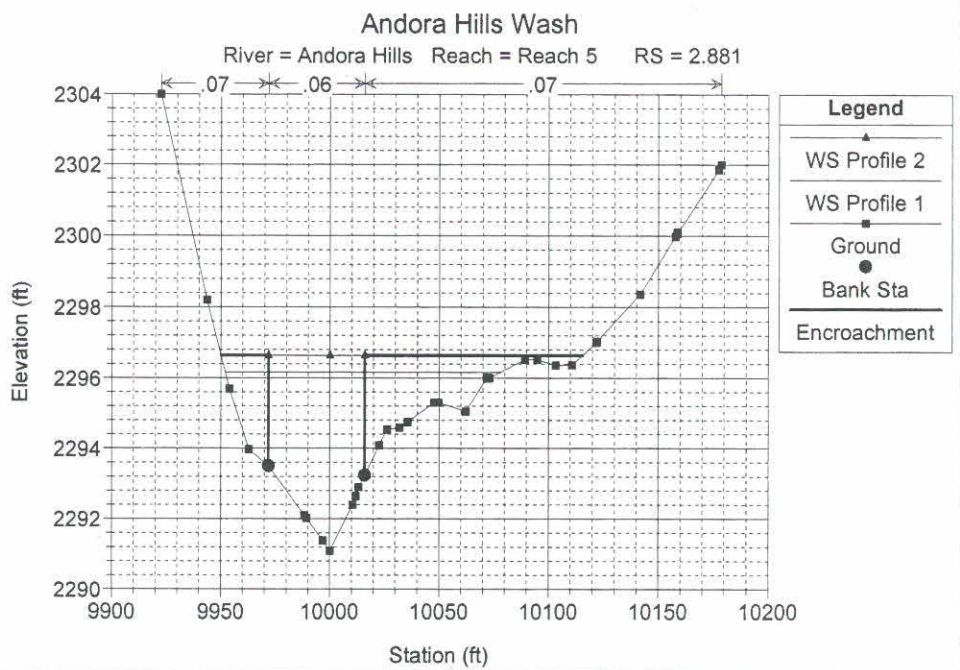
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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.06
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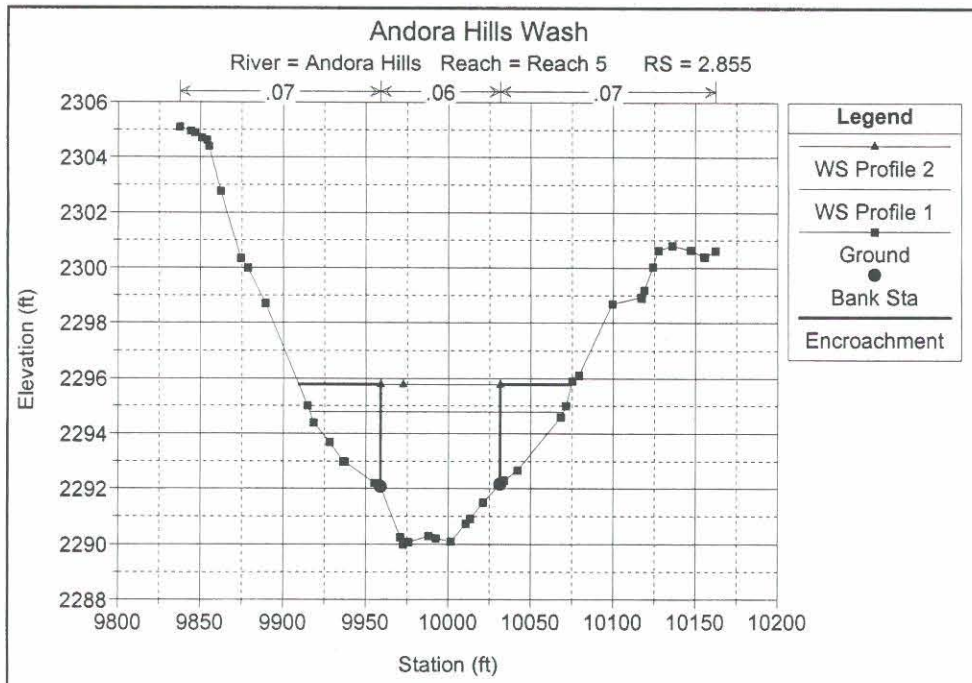
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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.06
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Elevation (ft)
Station (ft)
Legend
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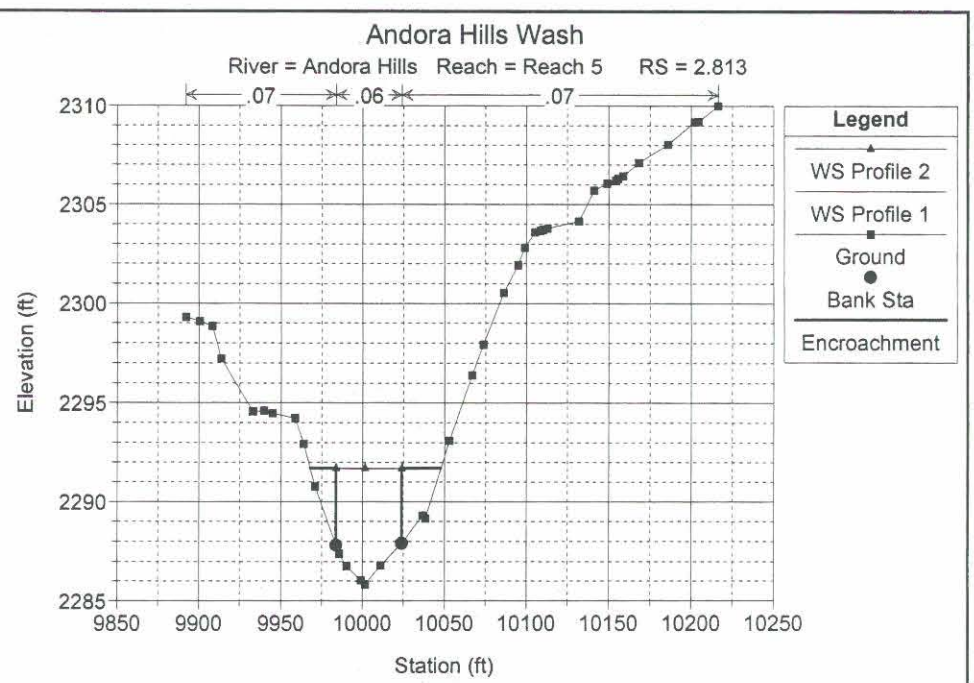
WS Profile 1
Ground
Bank Sta
Encroachment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.06
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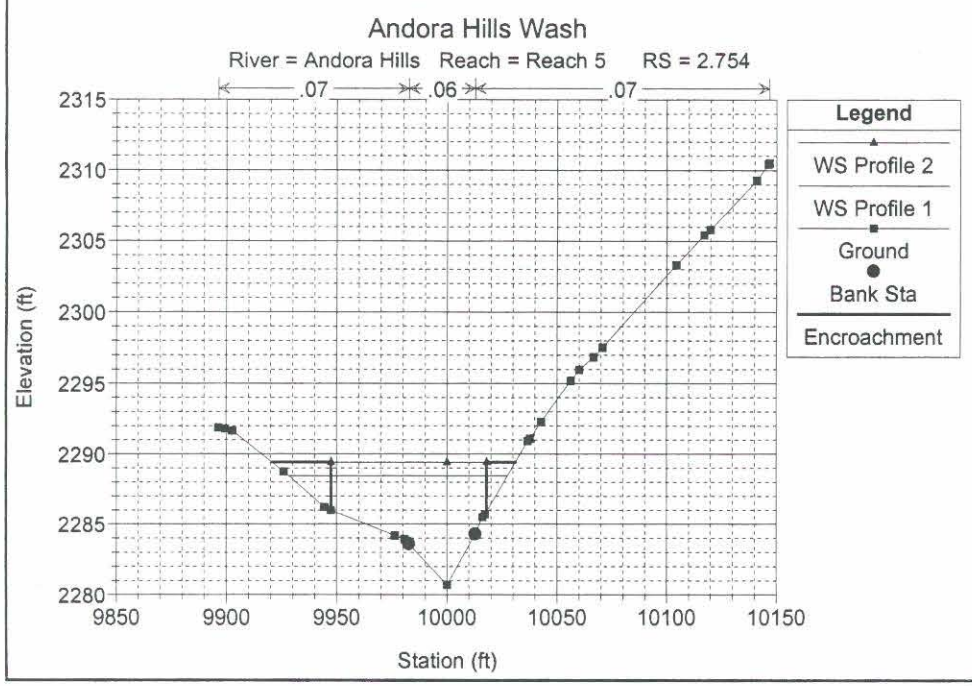
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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River = Andora Hills Reach = Reach 5 RS = 2.754
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.06
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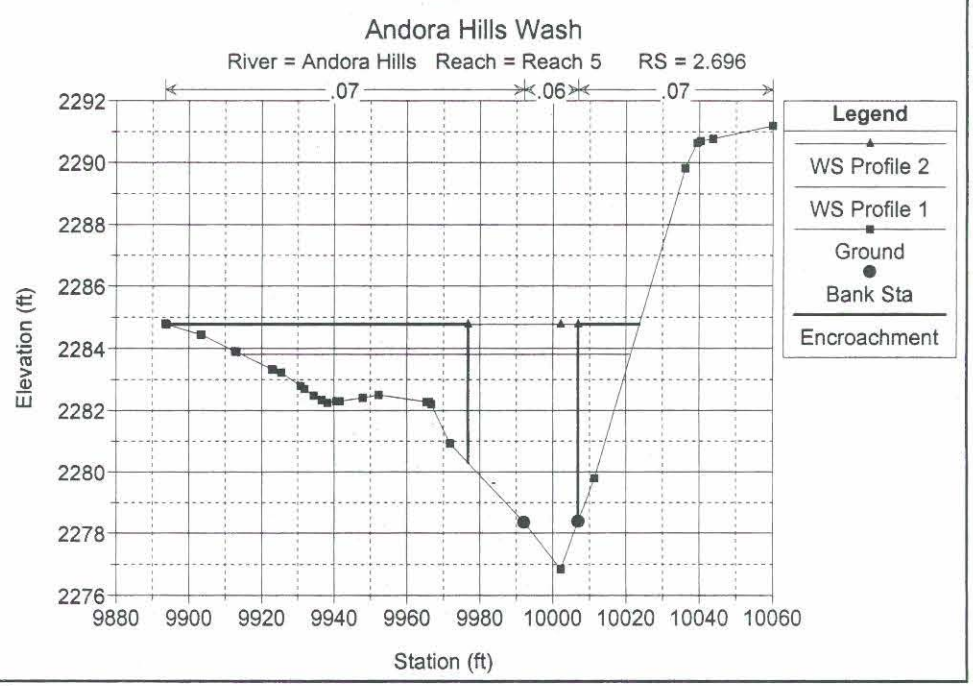
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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.06
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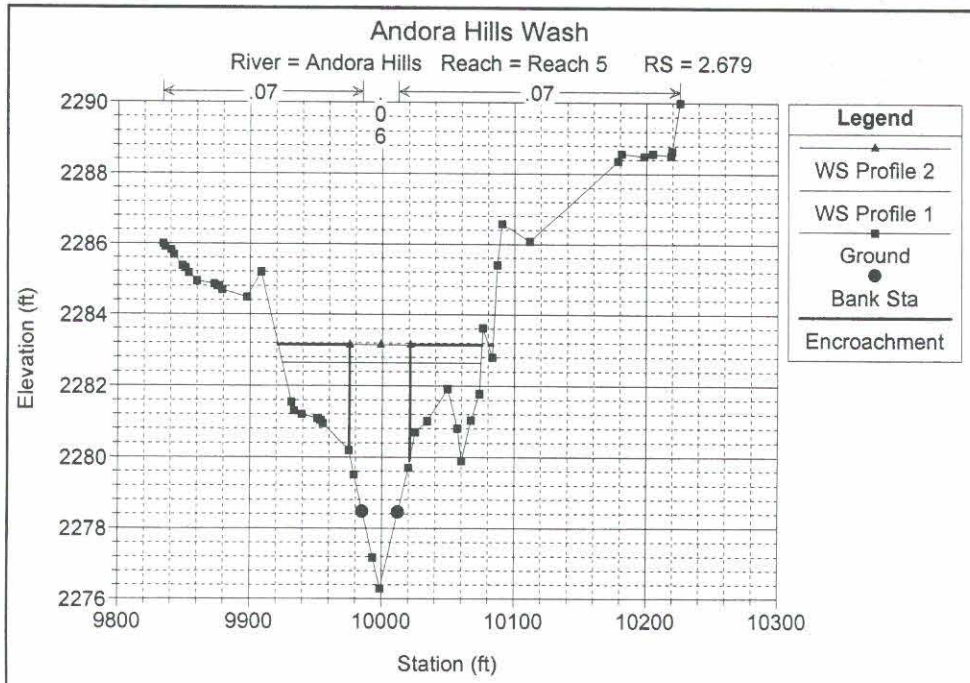
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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.06
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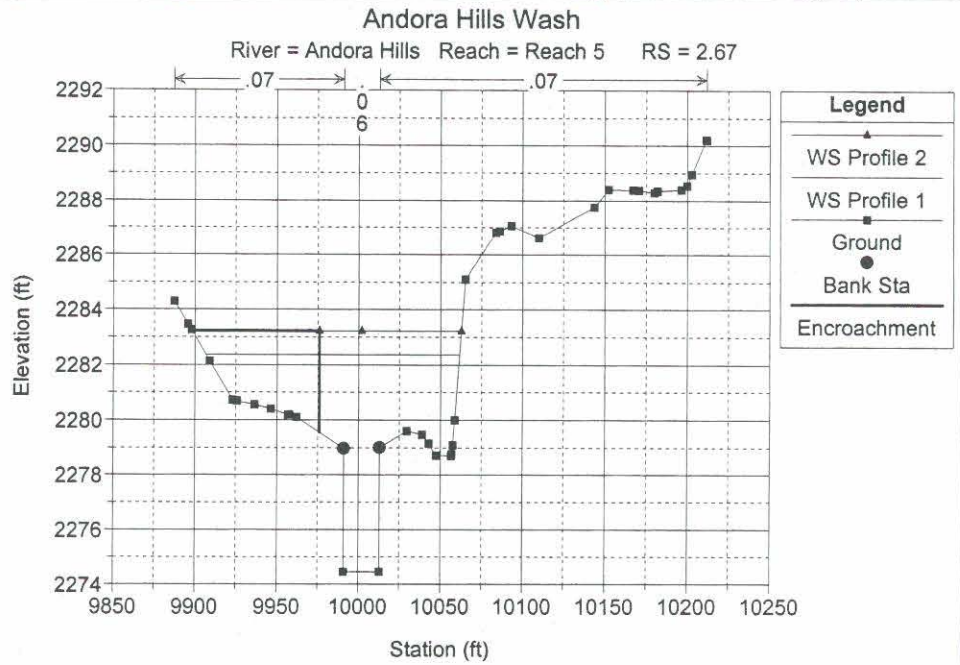
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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River = Andora Hills Reach = Reach 5 RS = 2.67
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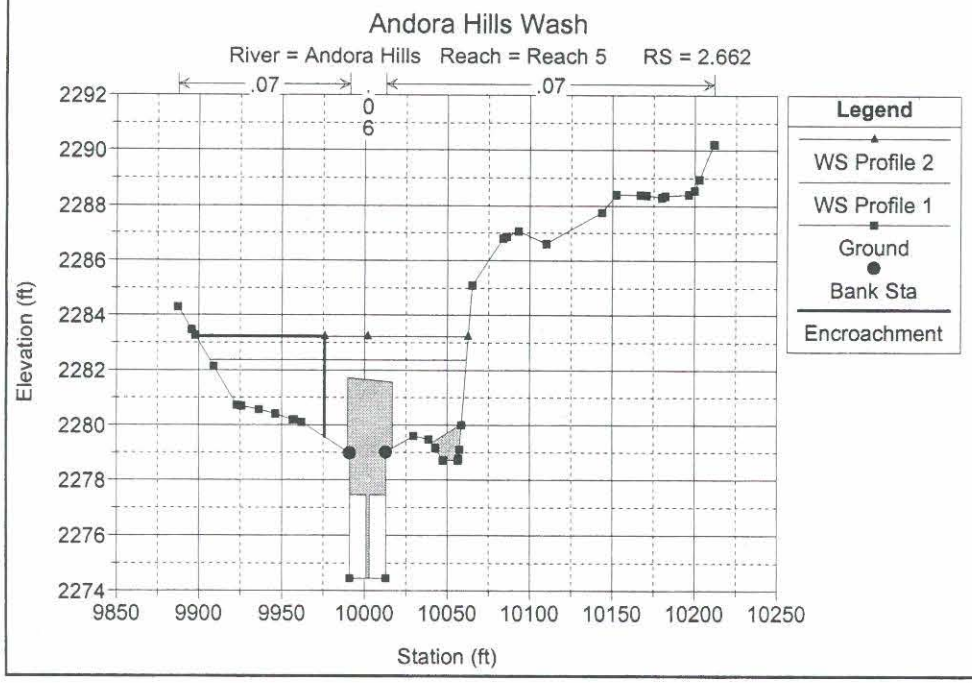
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 2.662
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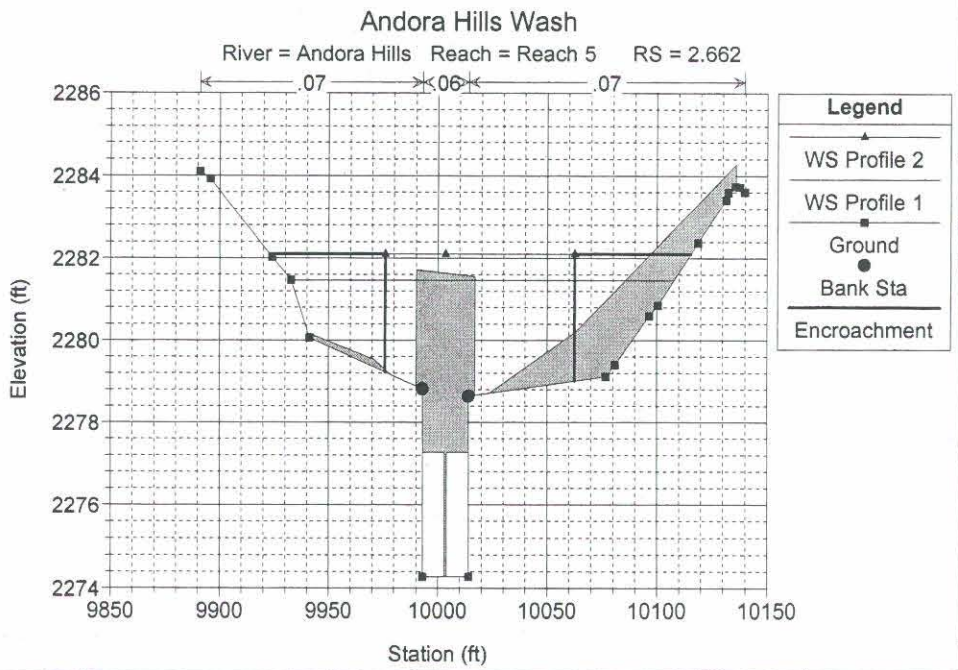
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)


Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 2.662
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.06
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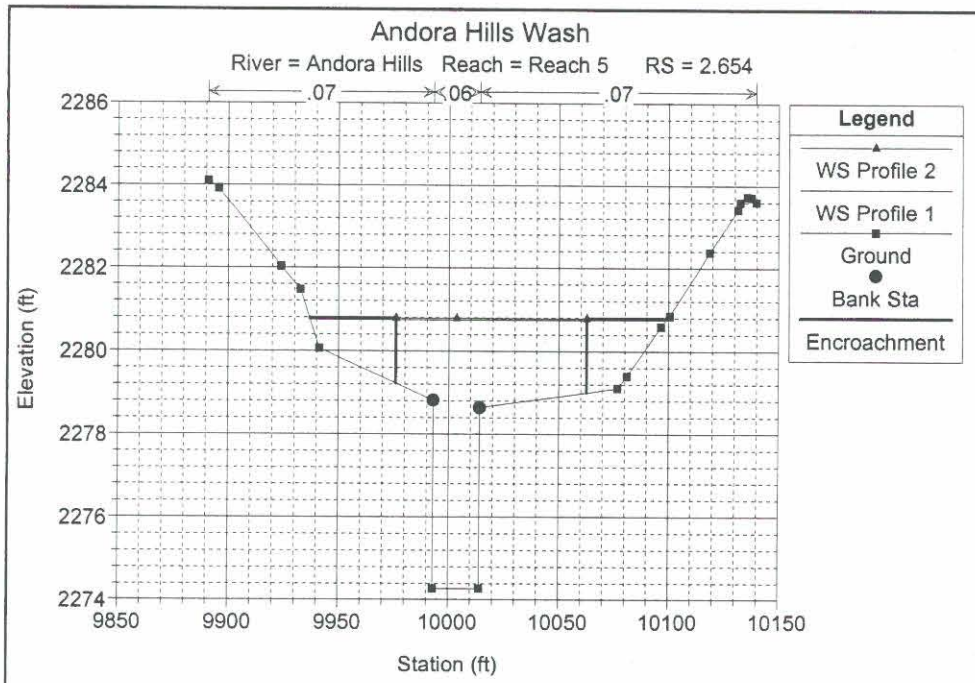
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)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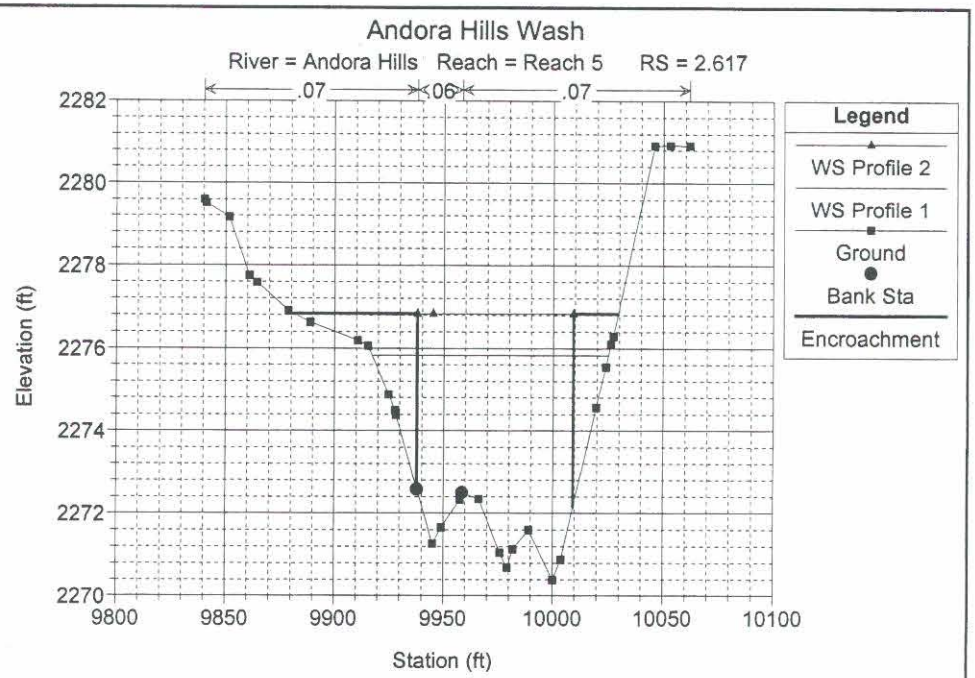
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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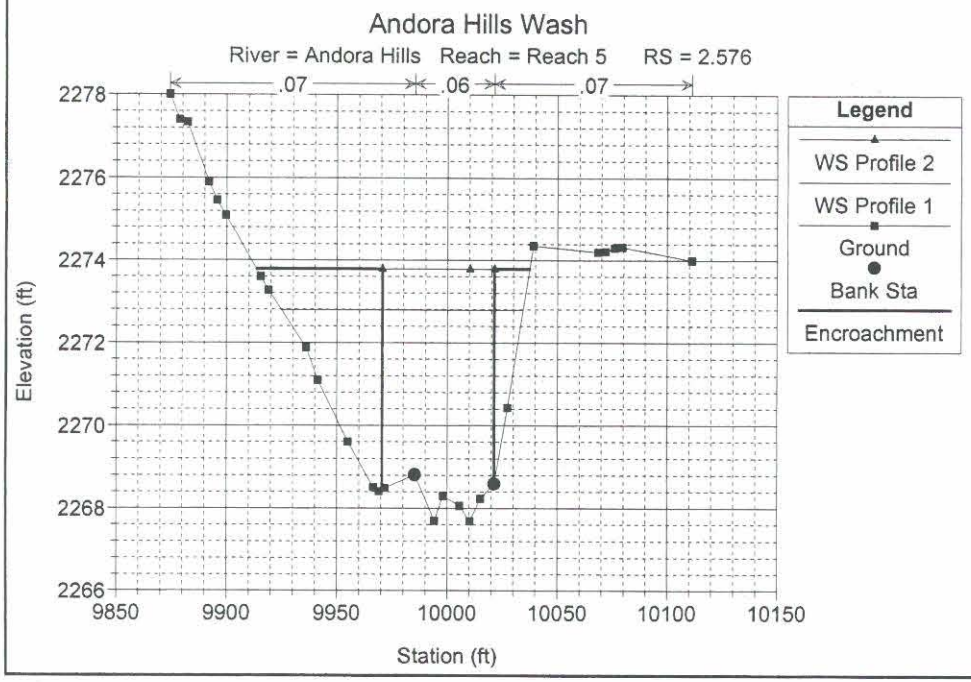
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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River = Andora Hills Reach = Reach 5 RS = 2.576
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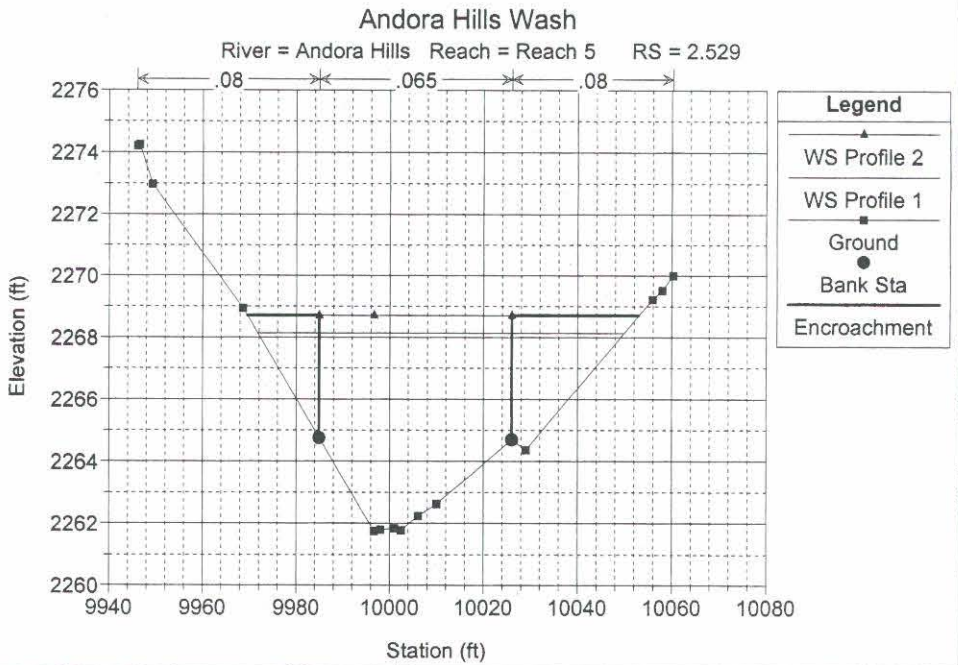
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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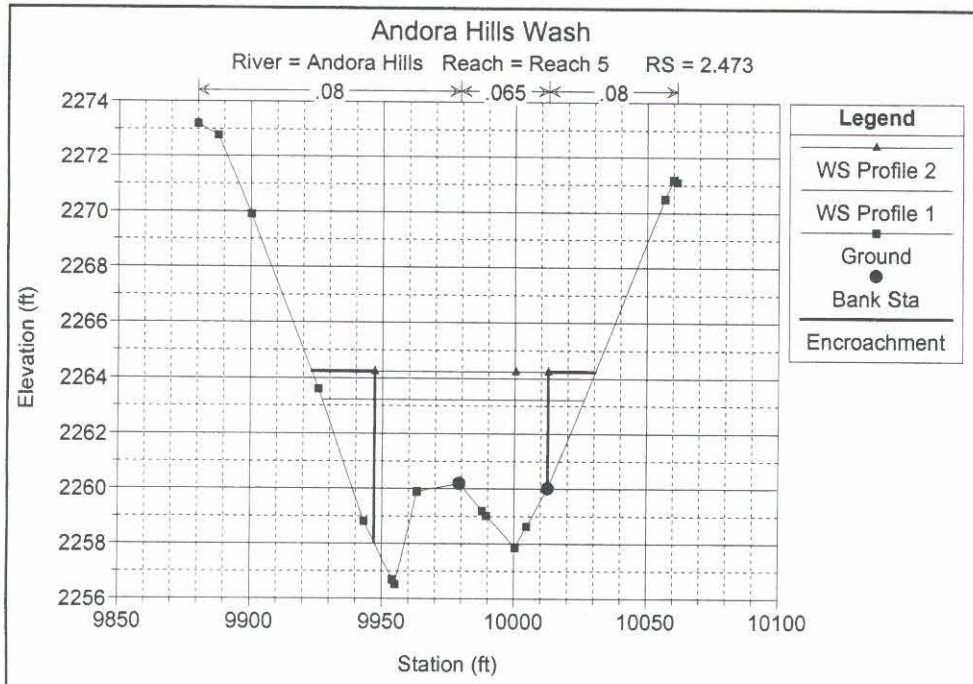
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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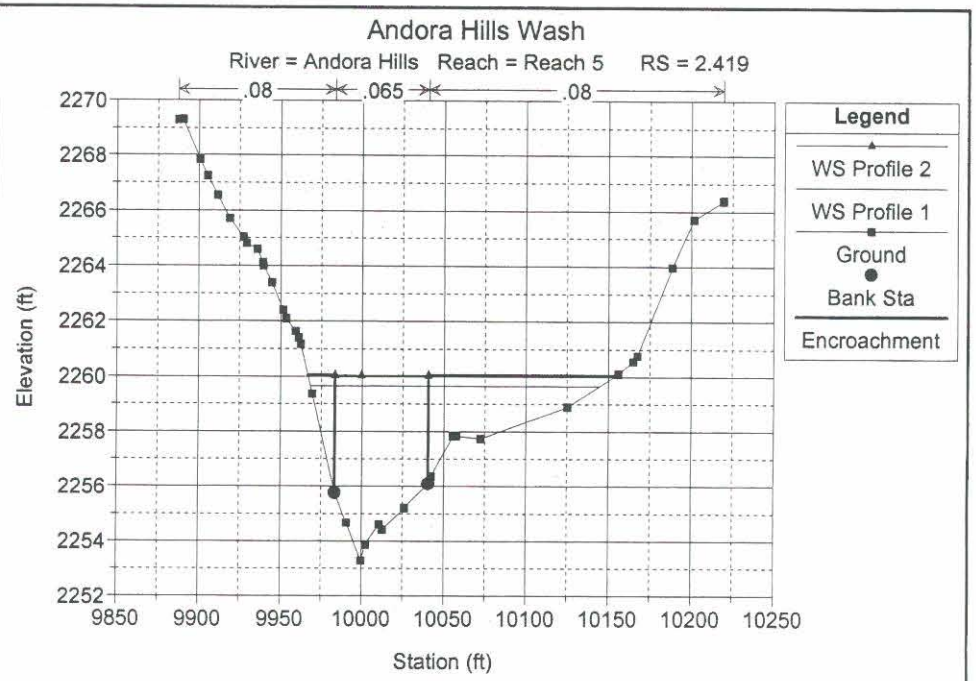
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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River = Andora Hills Reach = Reach 5 RS = 2.419
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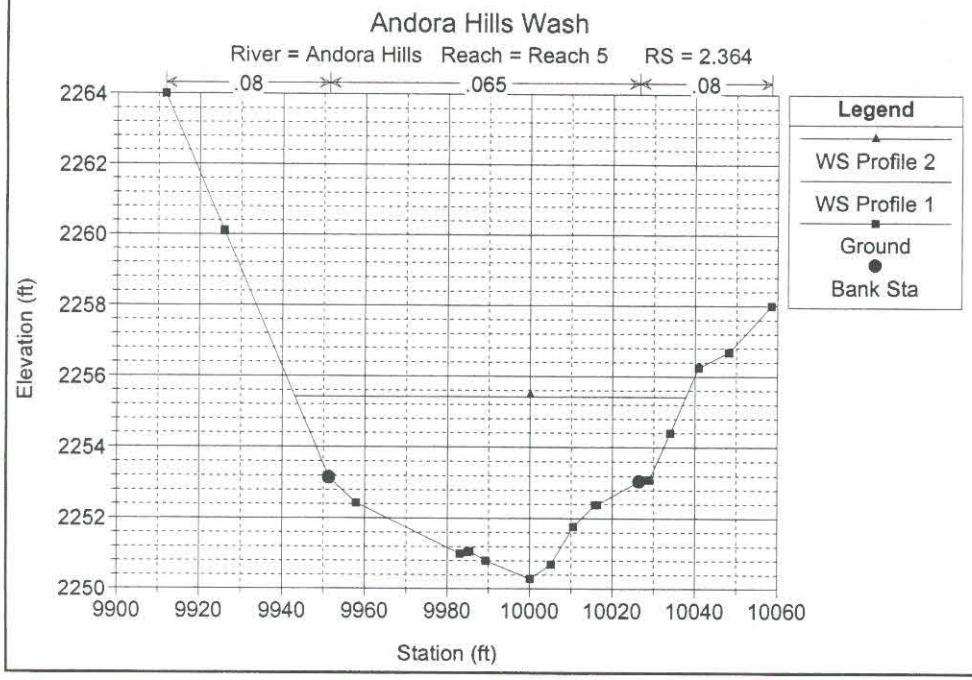
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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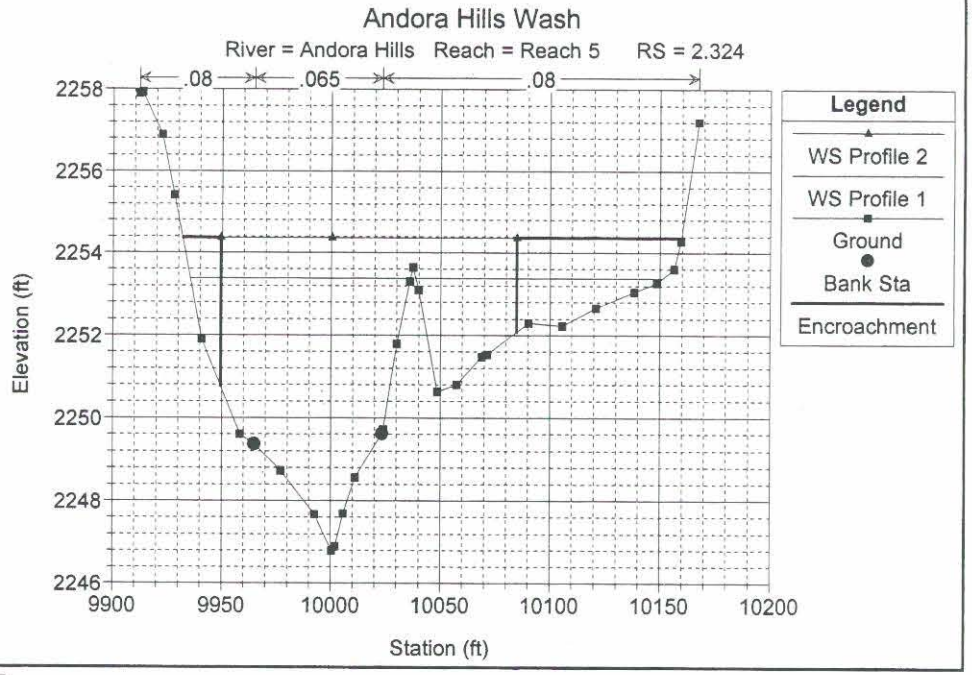
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta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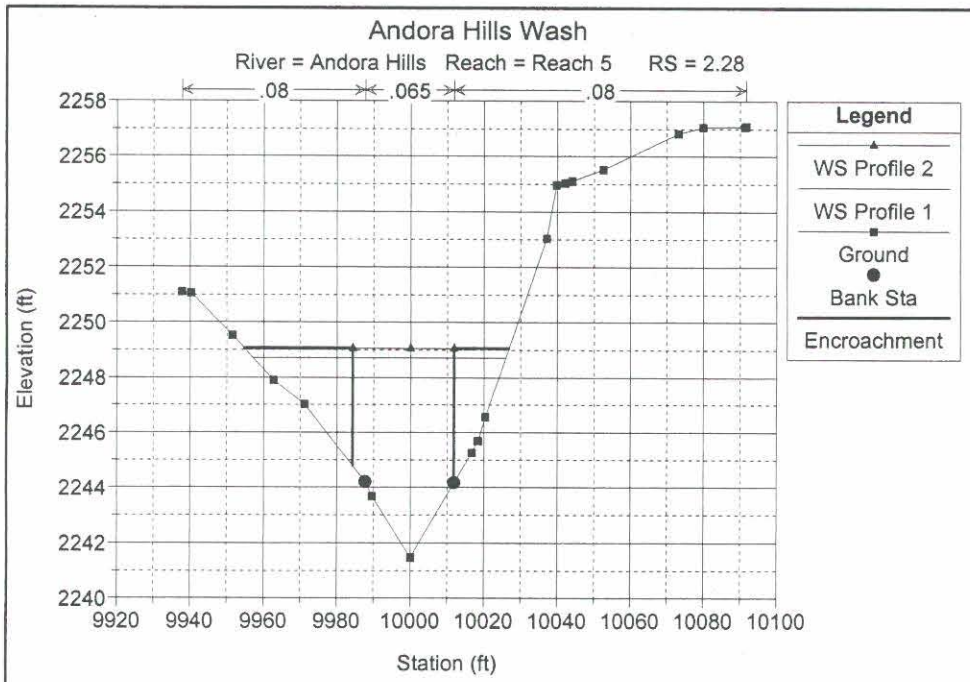
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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River = Andora Hills Reach = Reach 5 RS = 2.28
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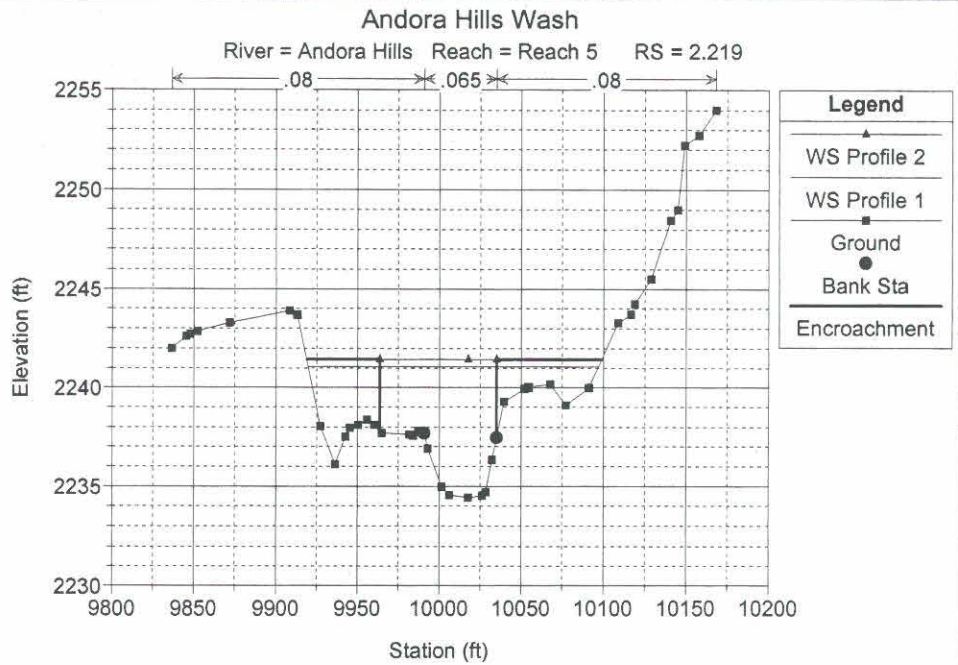
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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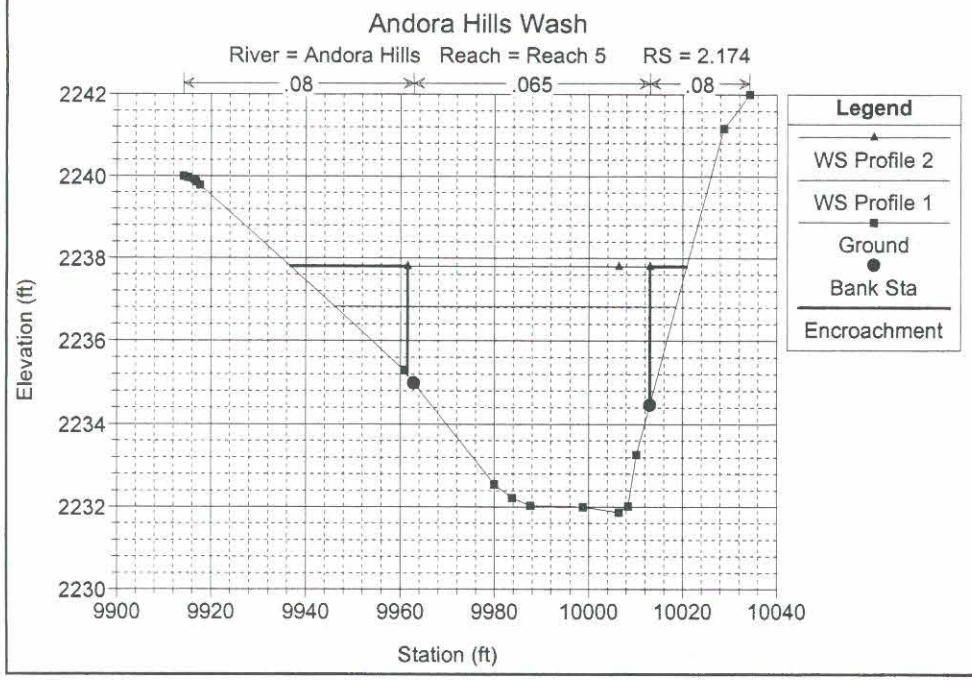
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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River = Andora Hills Reach = Reach 5 RS = 2.174
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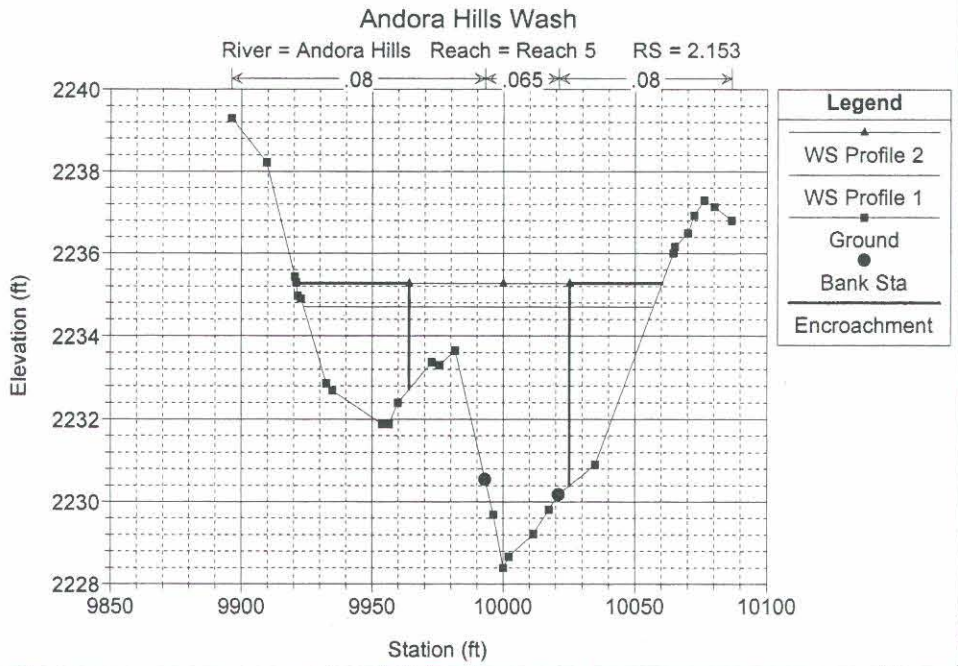
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment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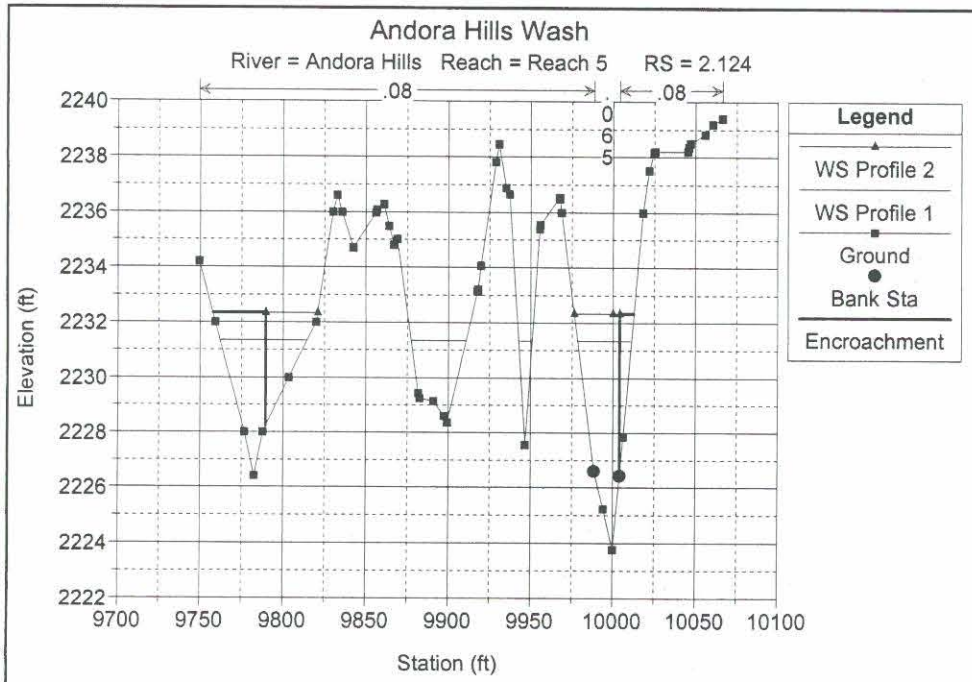
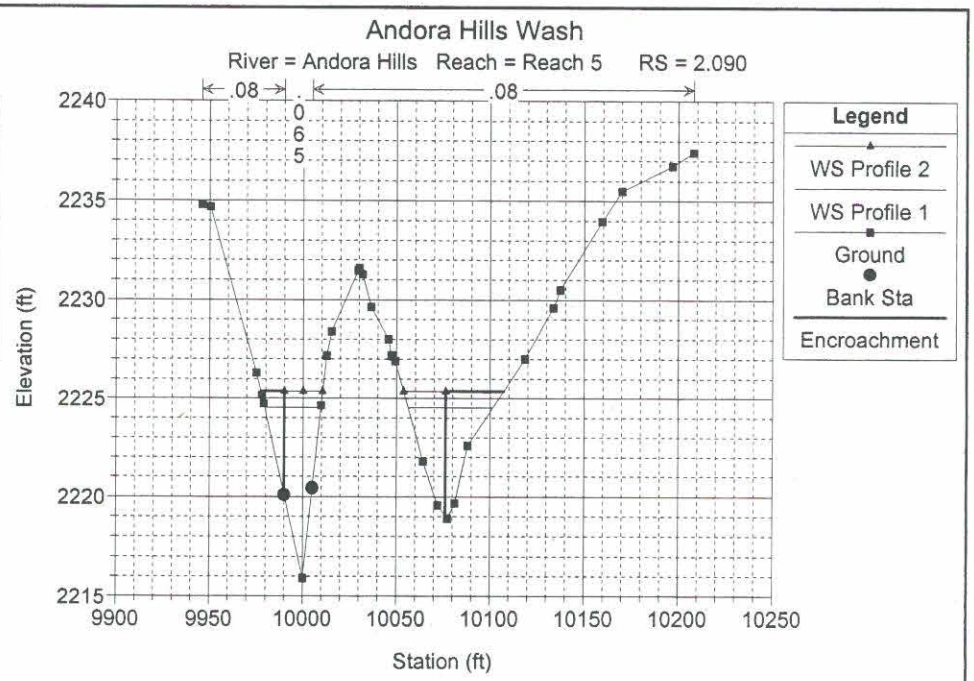
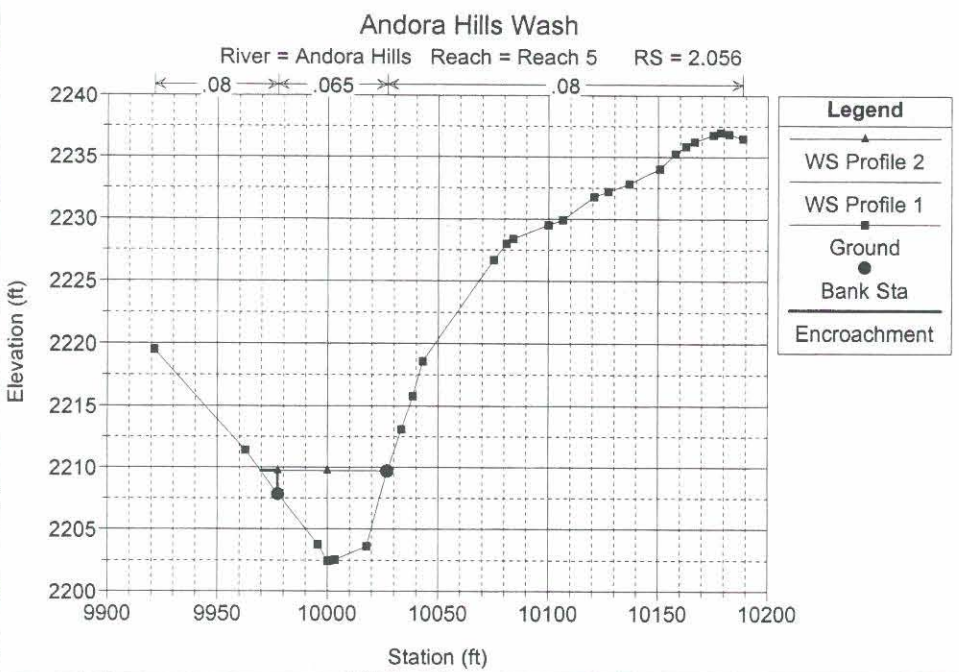
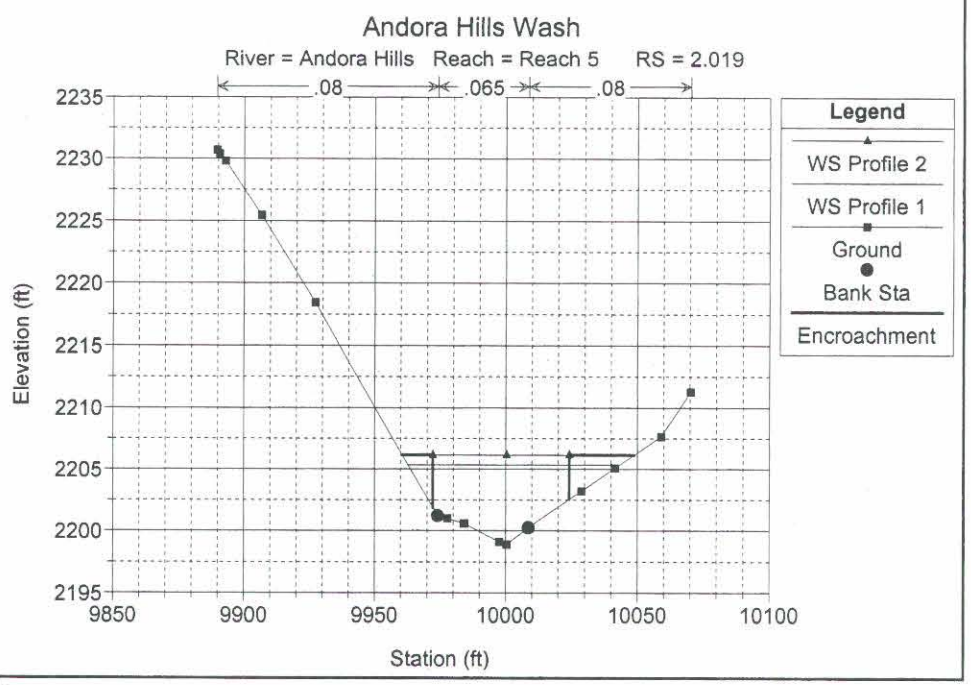
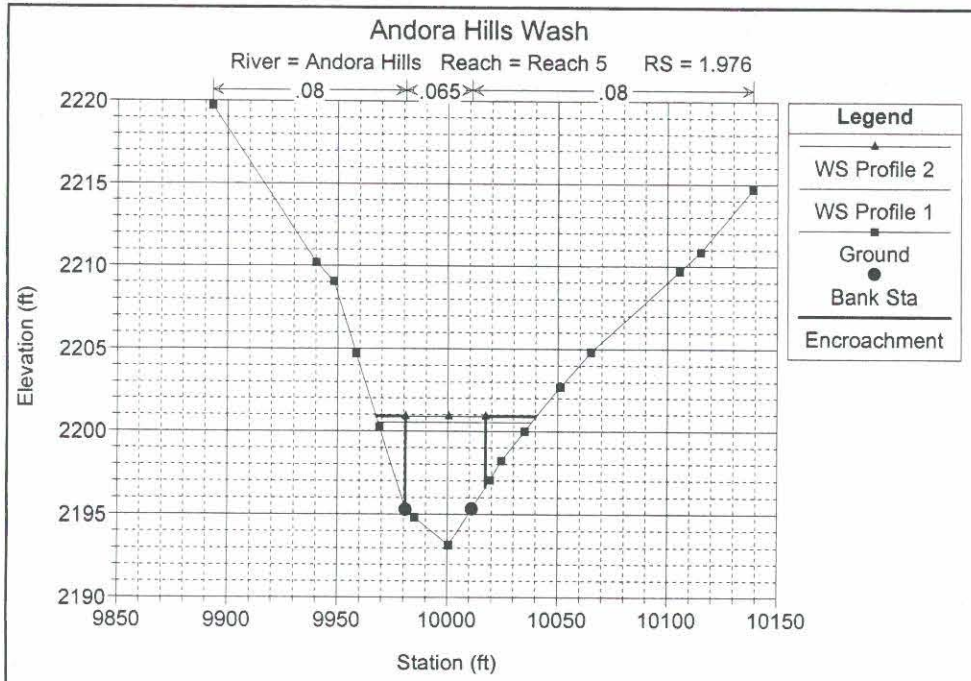
.08
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

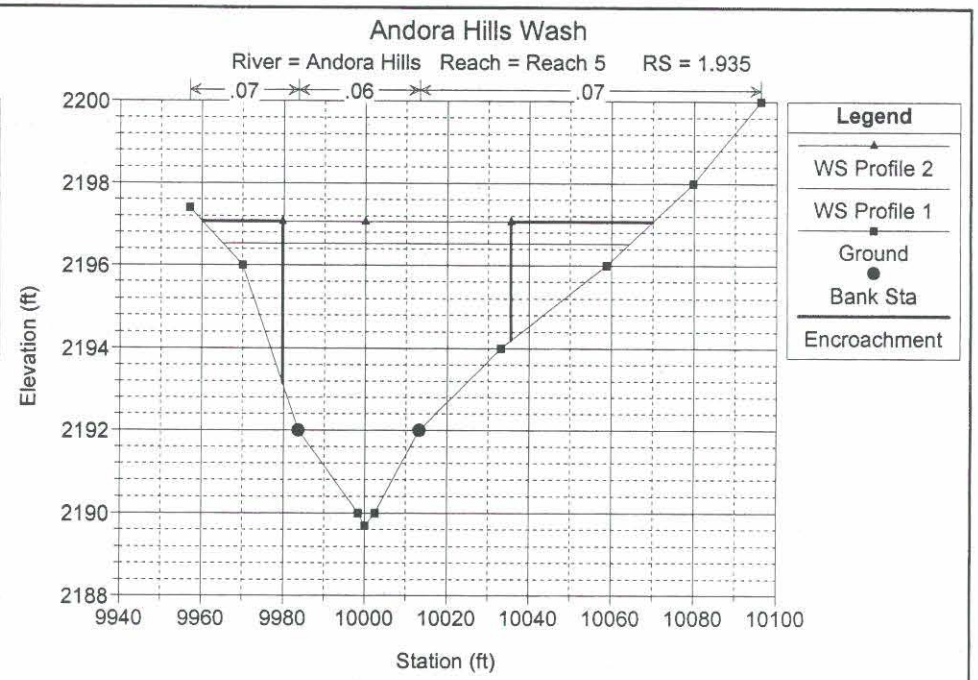

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 2.124
.08
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

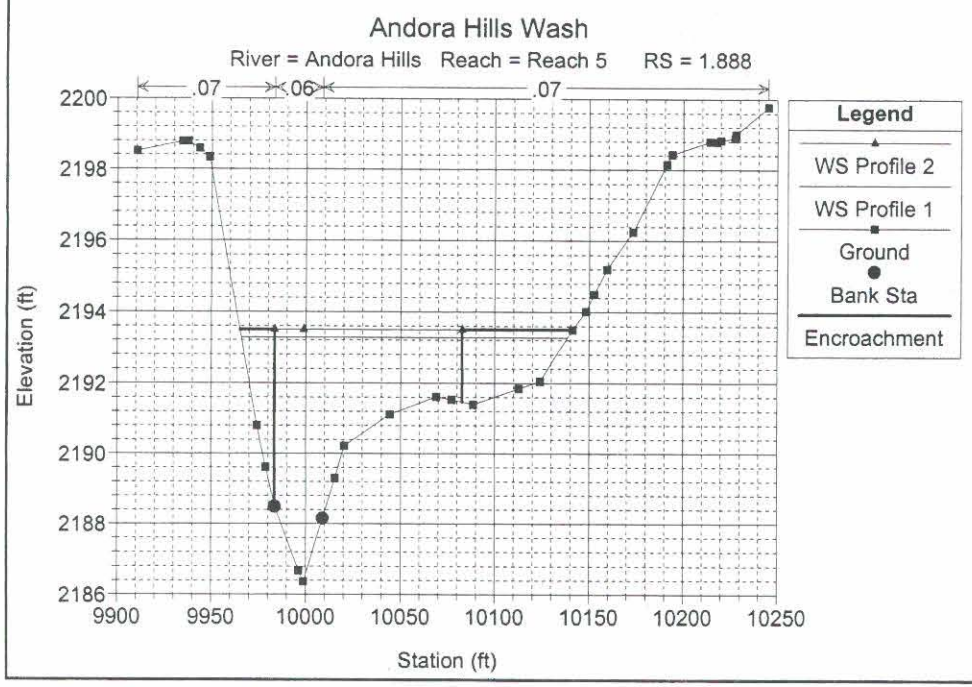

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 2.090
.08
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

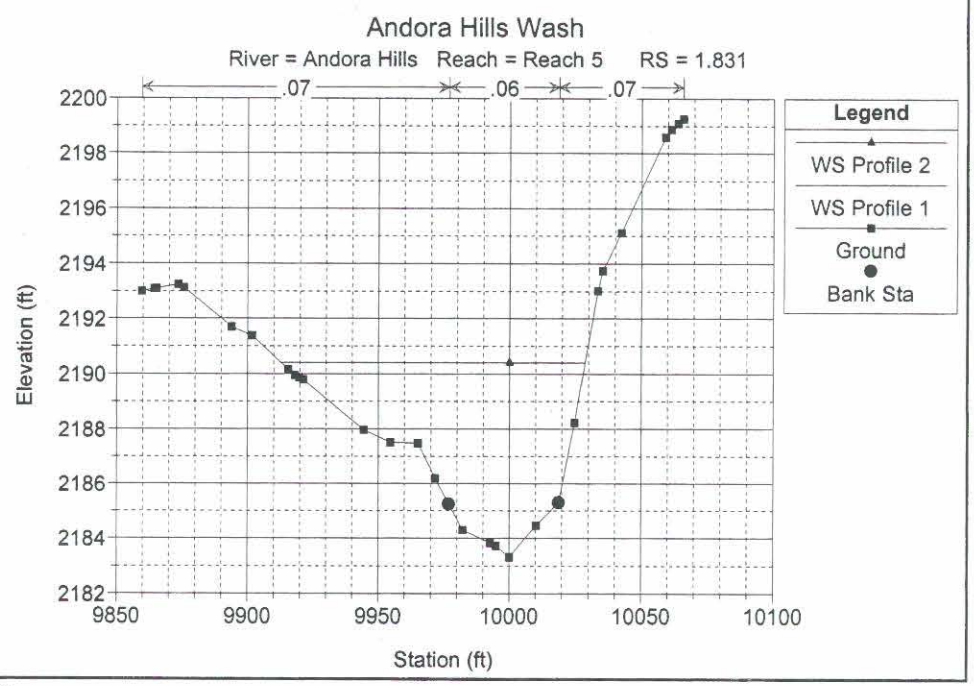

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 2.056
.08
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

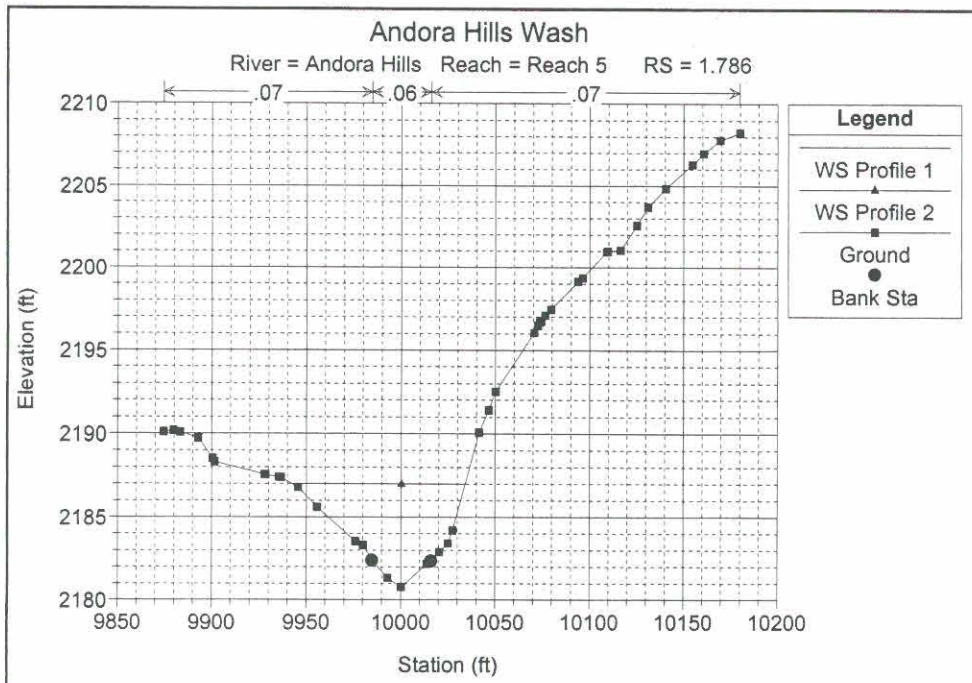

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 2.019
.08
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

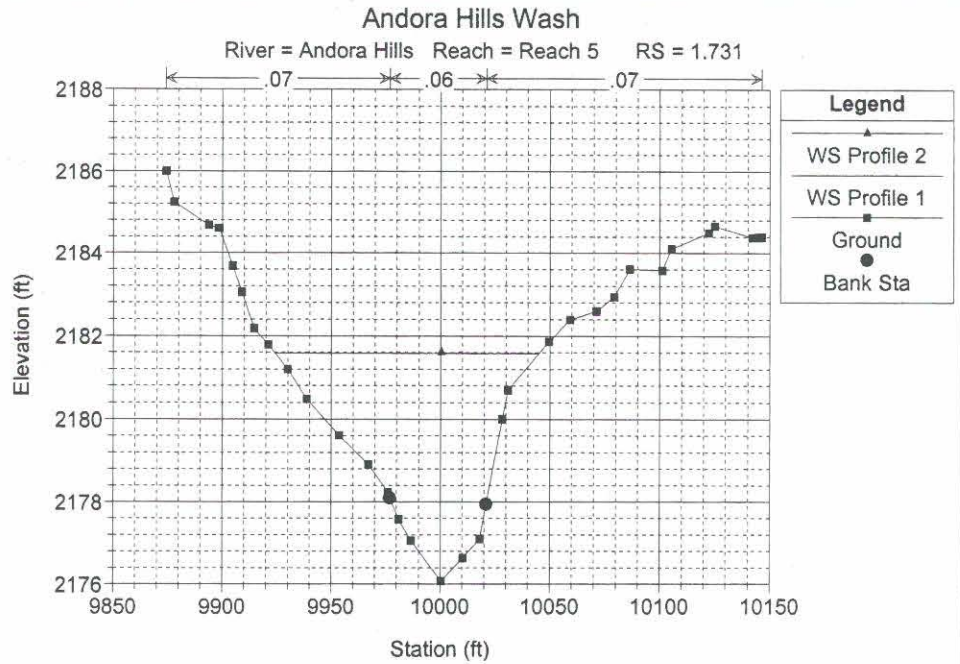

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.976
.08
.065
.08
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

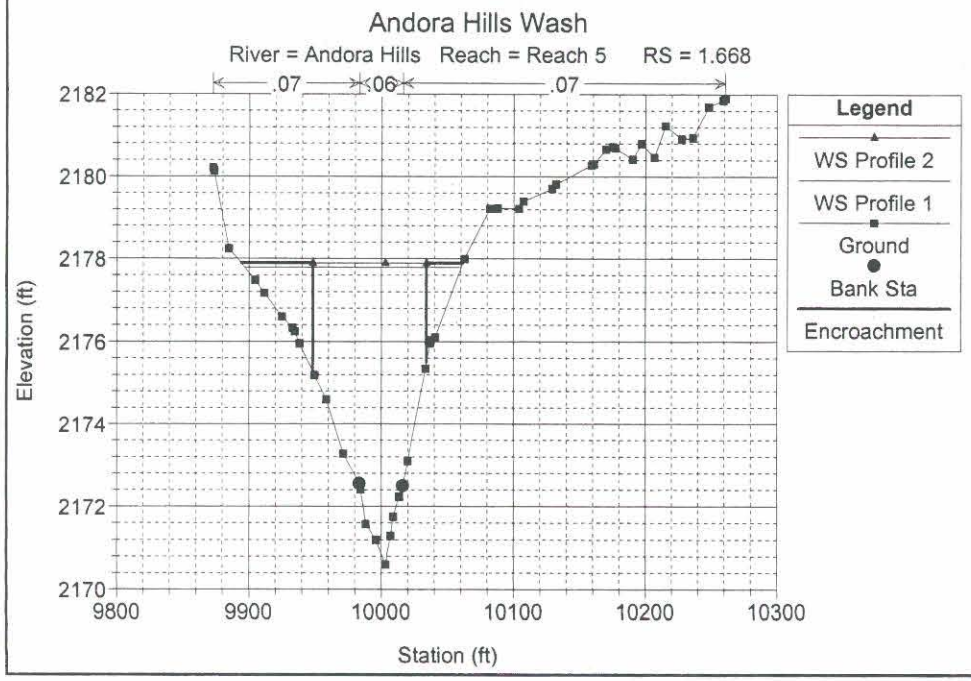

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.935
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

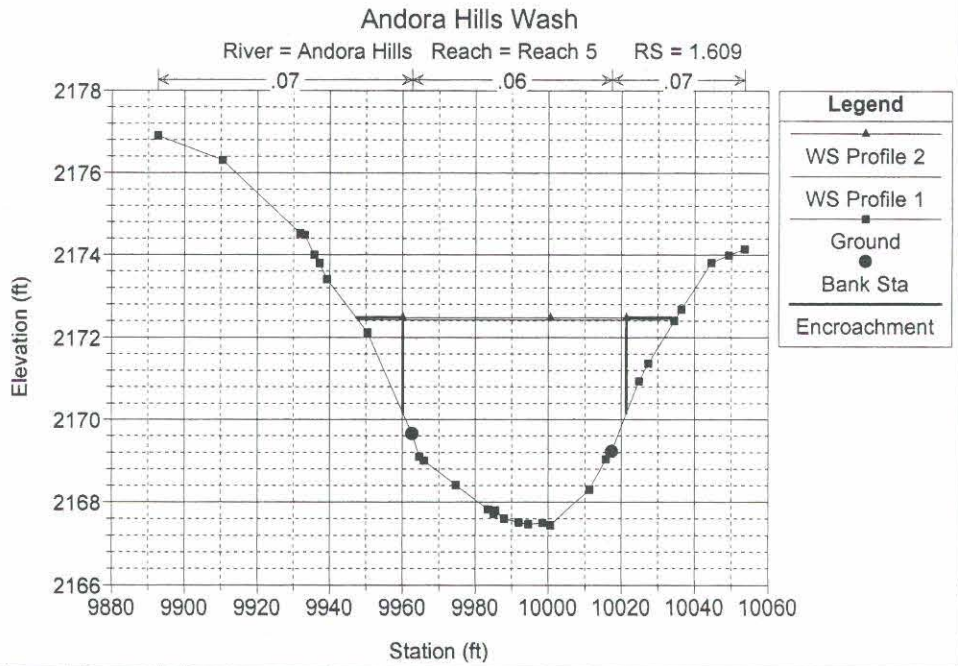

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.888
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

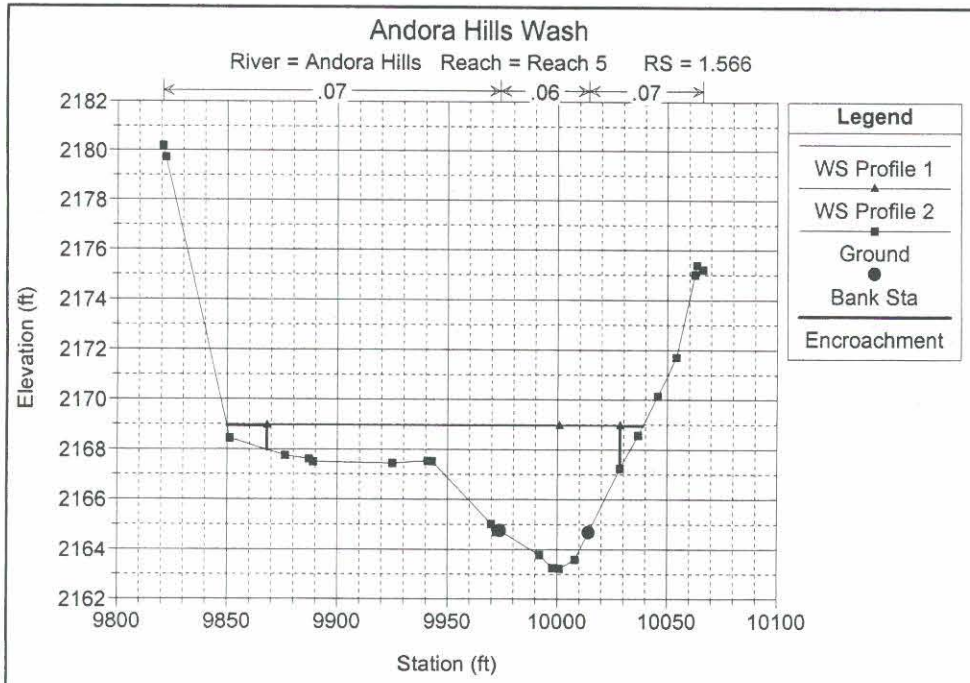

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.831
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta

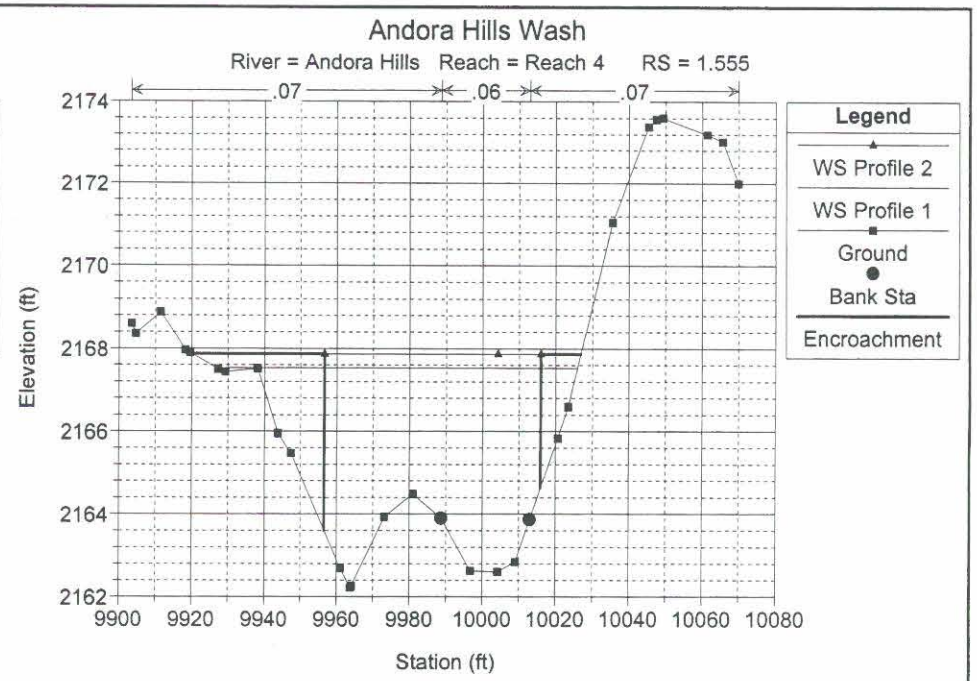

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.786
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

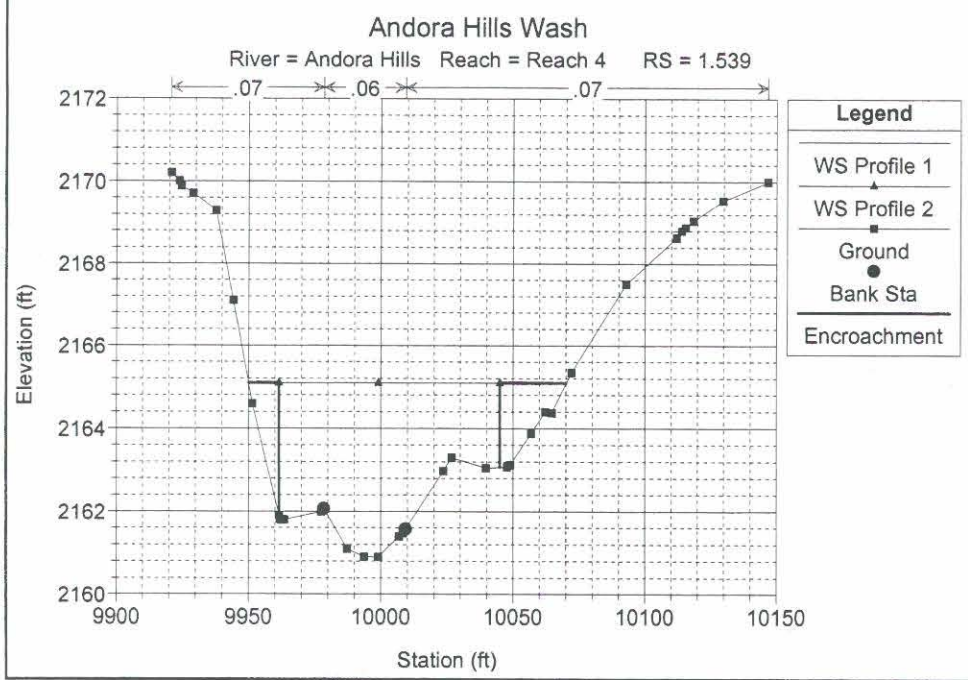

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.731
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta

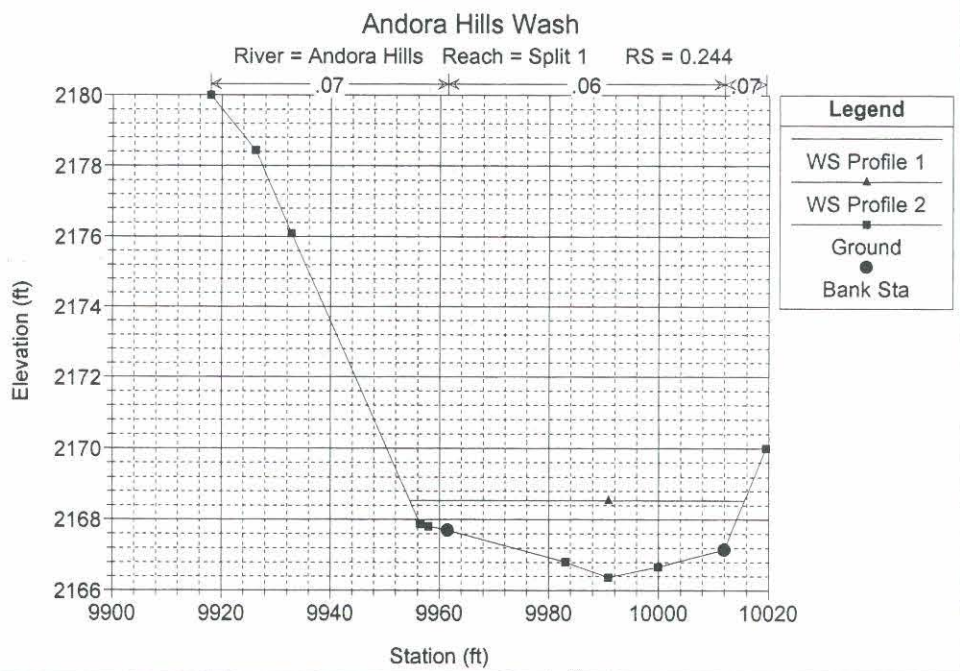

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.668
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

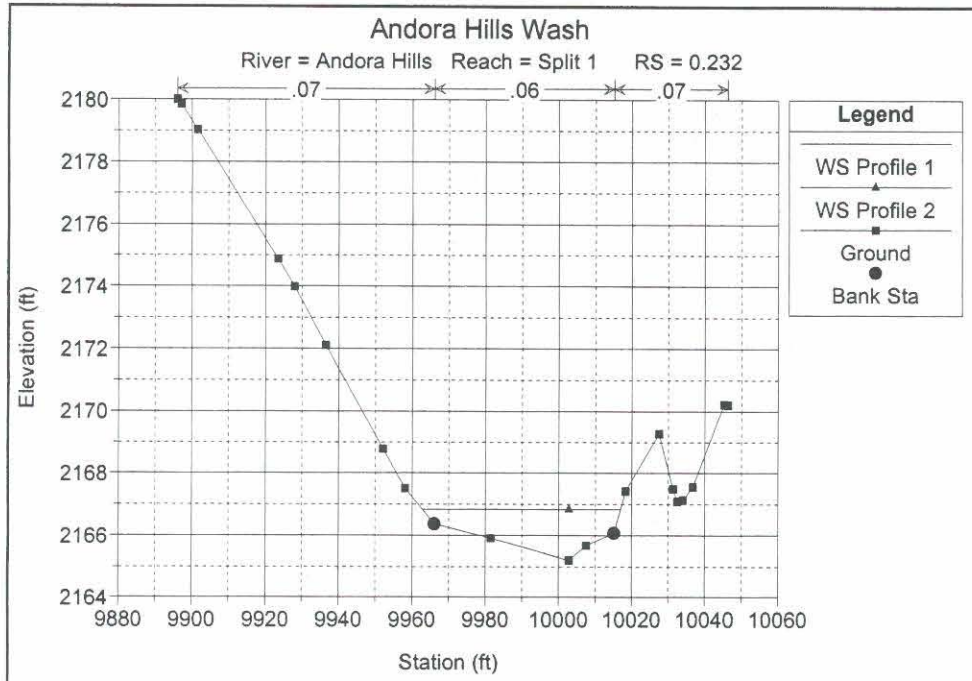

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.609
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

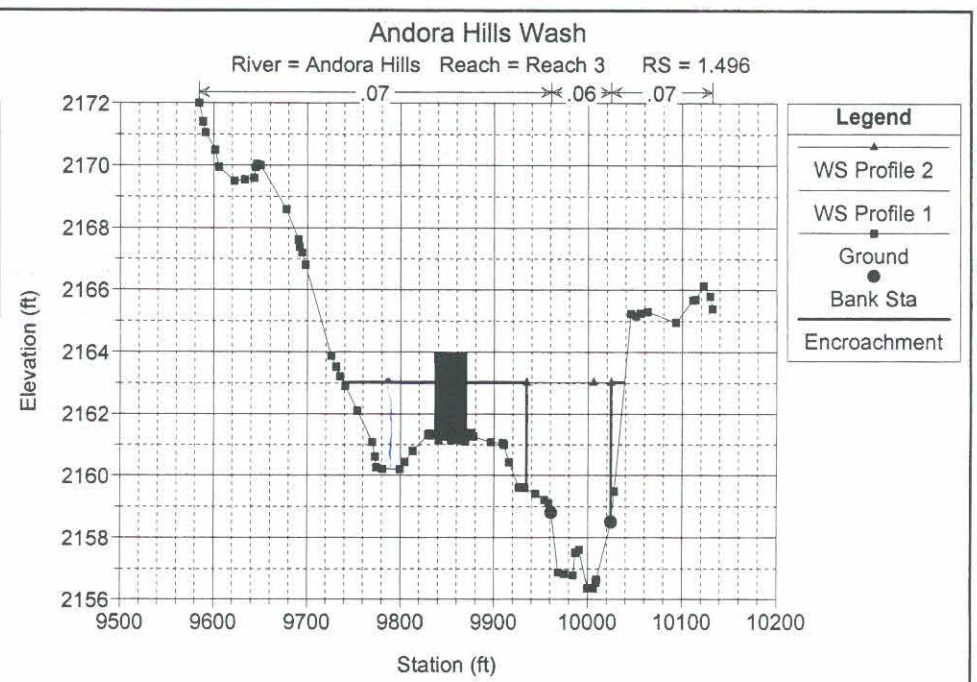

Andora Hills Wash
River = Andora Hills Reach = Reach 5 RS = 1.566
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment

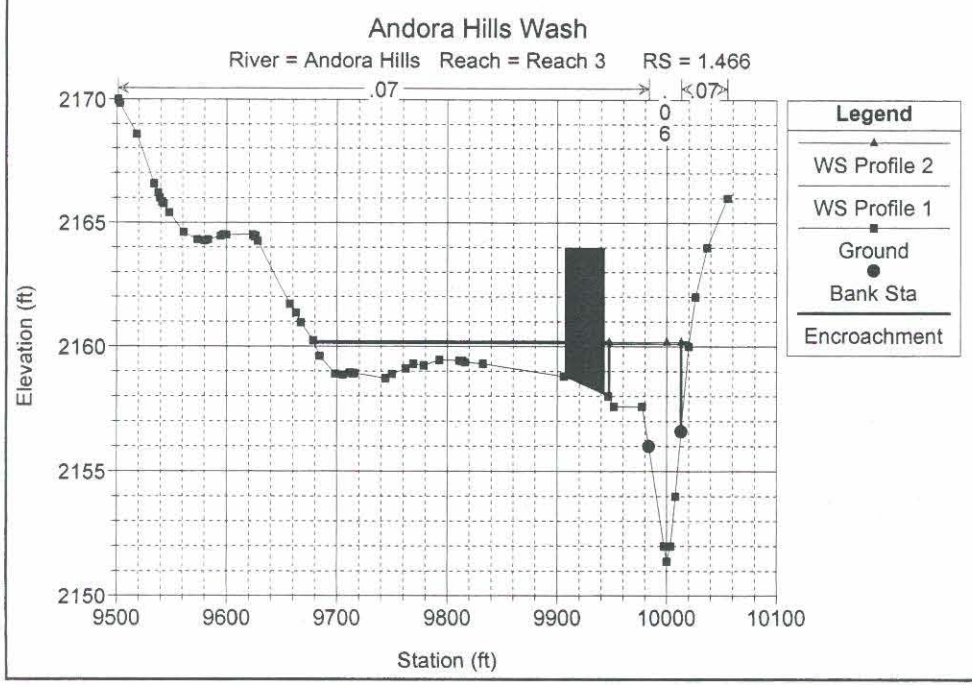

Andora Hills Wash
River = Andora Hills Reach = Reach 4 RS = 1.555
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

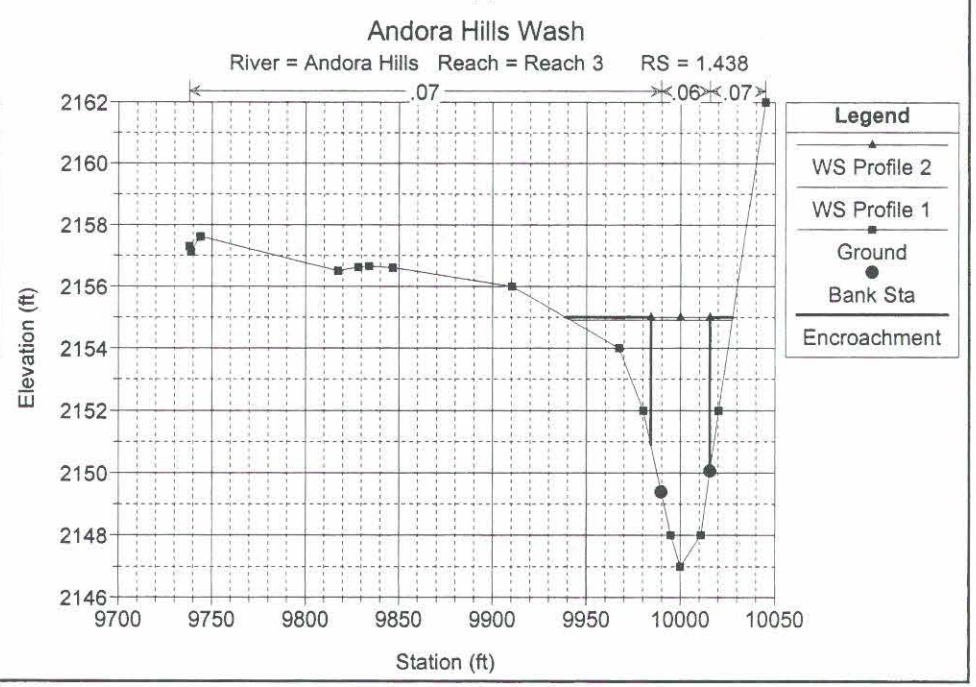

Andora Hills Wash
River = Andora Hills Reach = Reach 4 RS = 1.539
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment

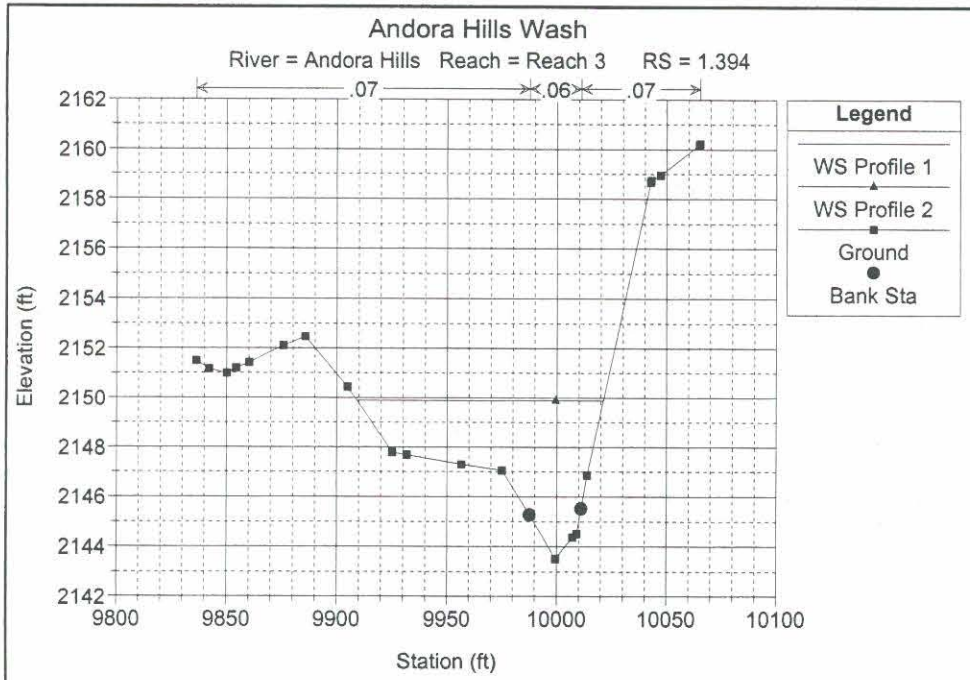

Andora Hills Wash
River = Andora Hills Reach = Split 1 RS = 0.244
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

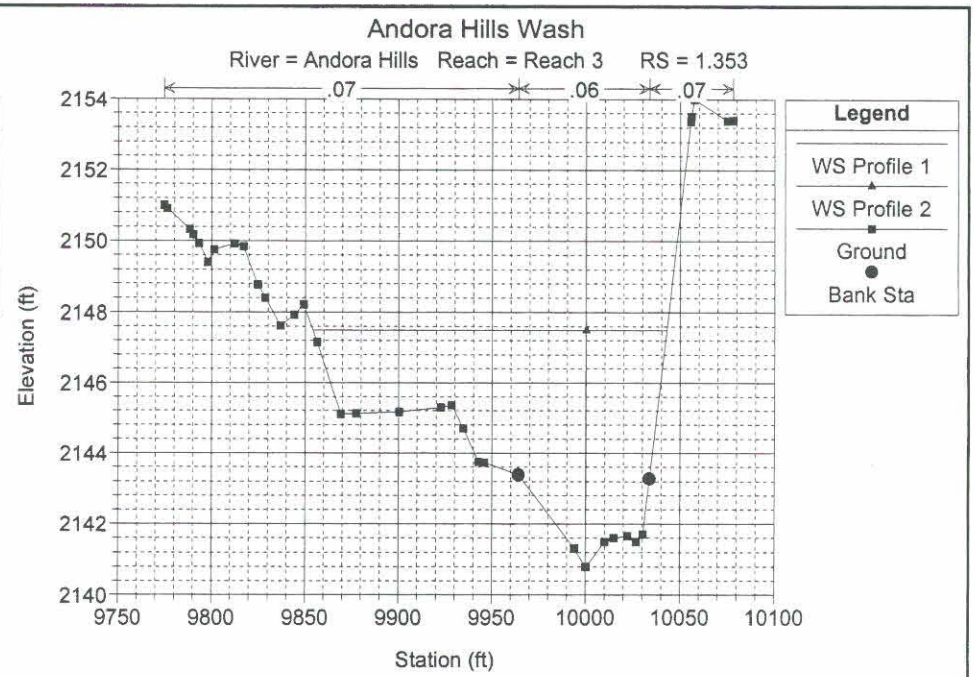

Andora Hills Wash
River = Andora Hills Reach = Split 1 RS = 0.232
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

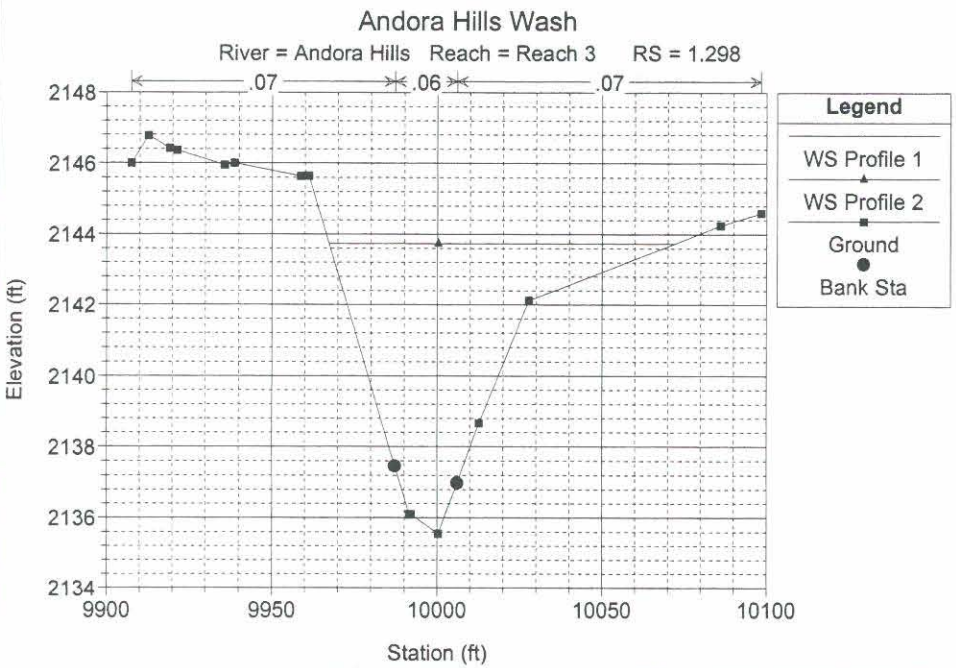

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.496
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

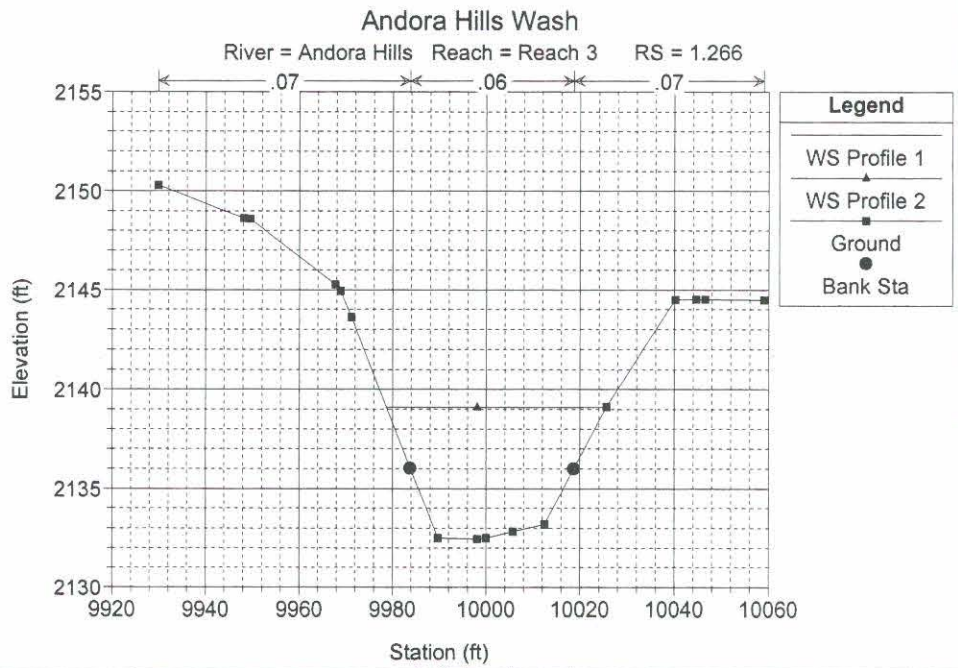

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.466
.07
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

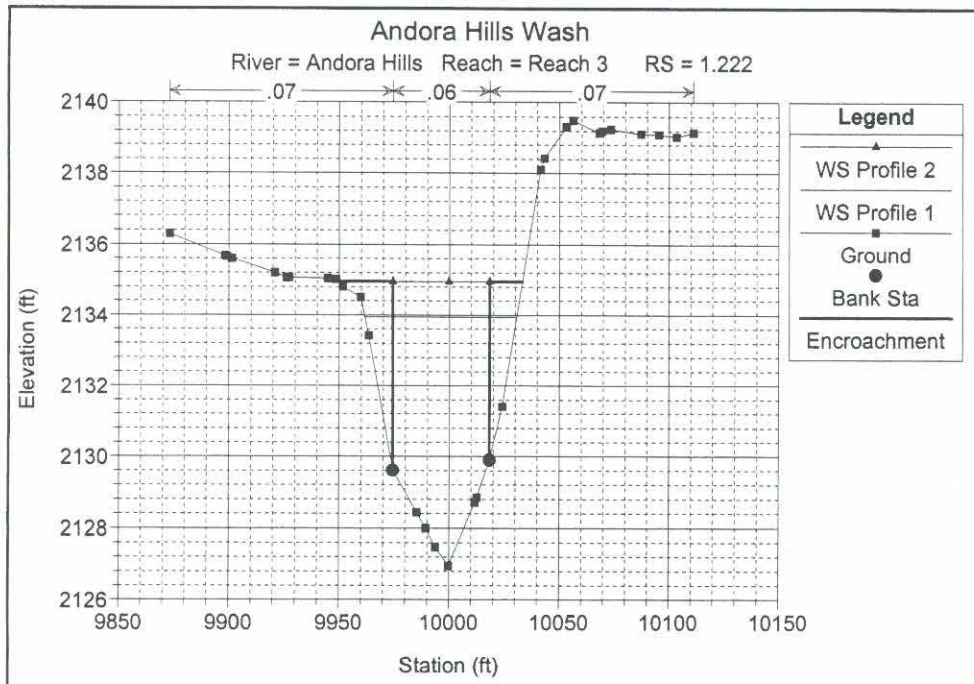

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.438
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

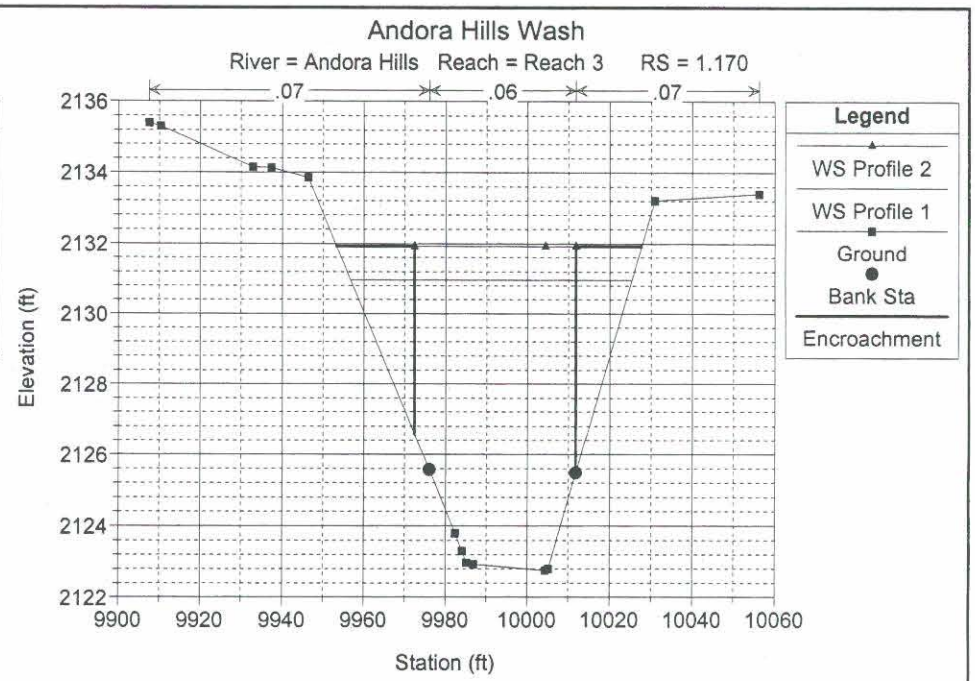

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.394
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

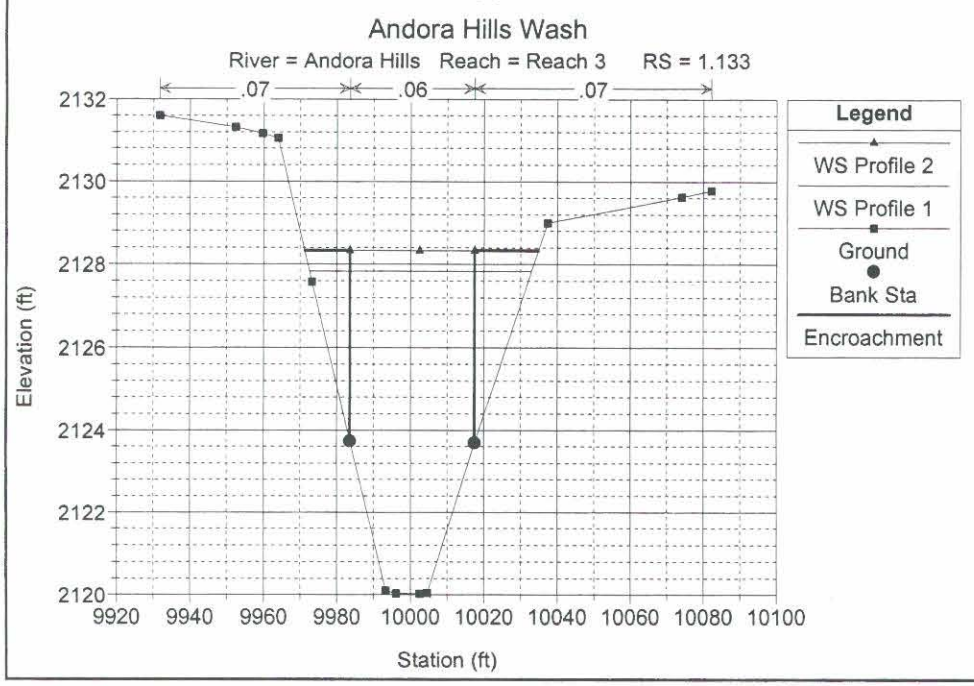

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.353
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

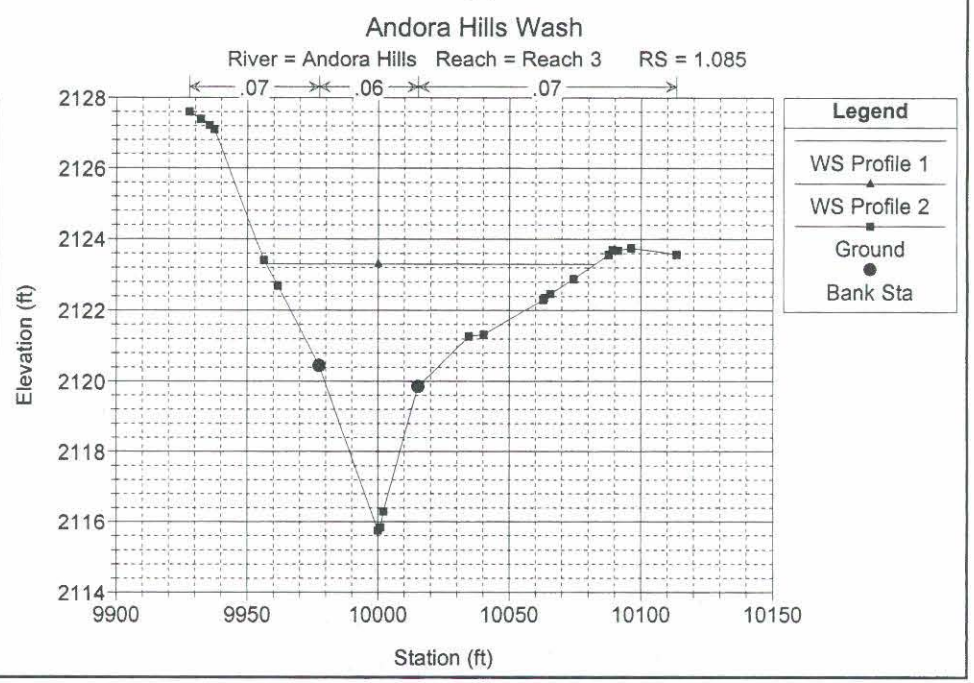

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.298
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

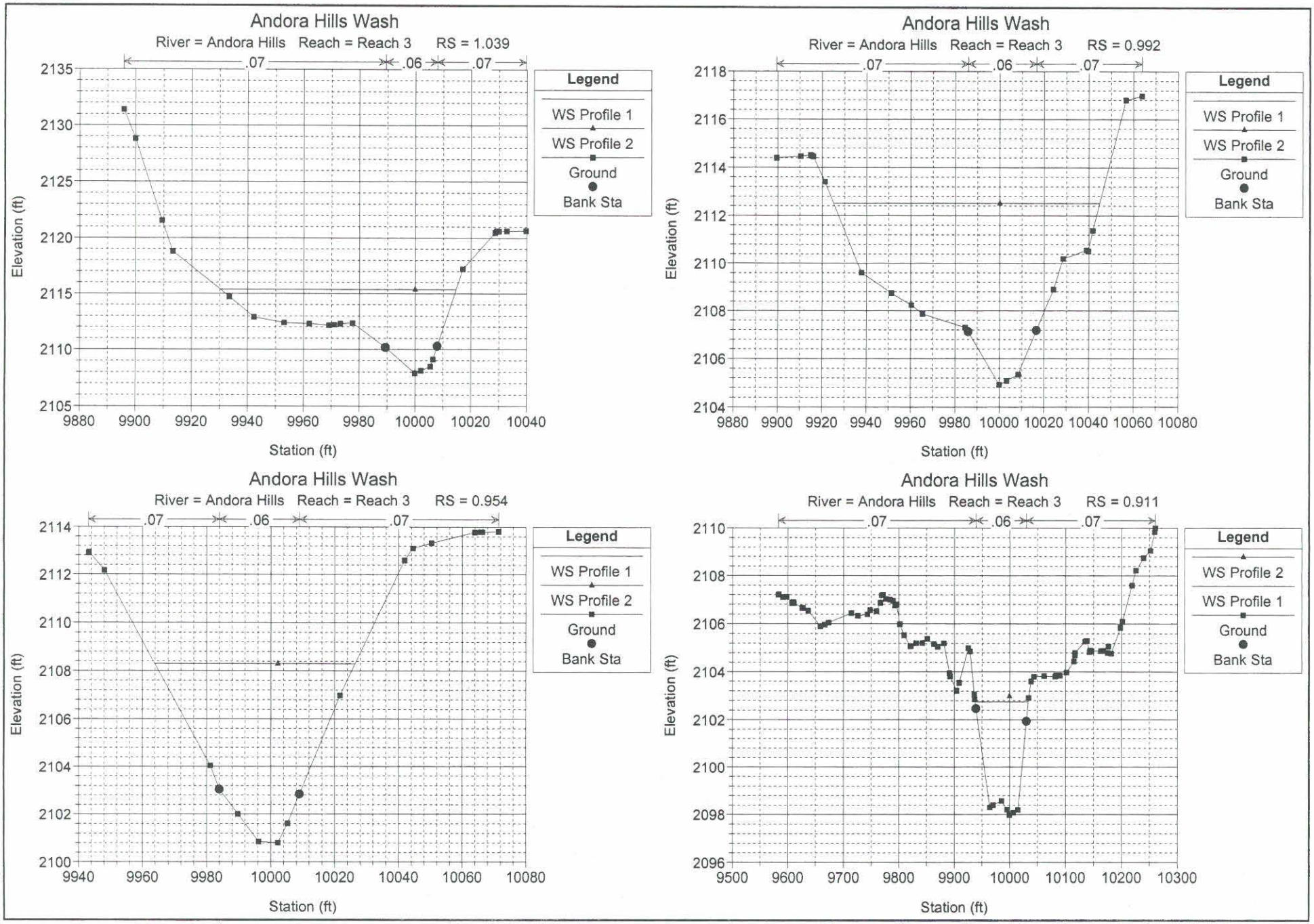

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.266
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

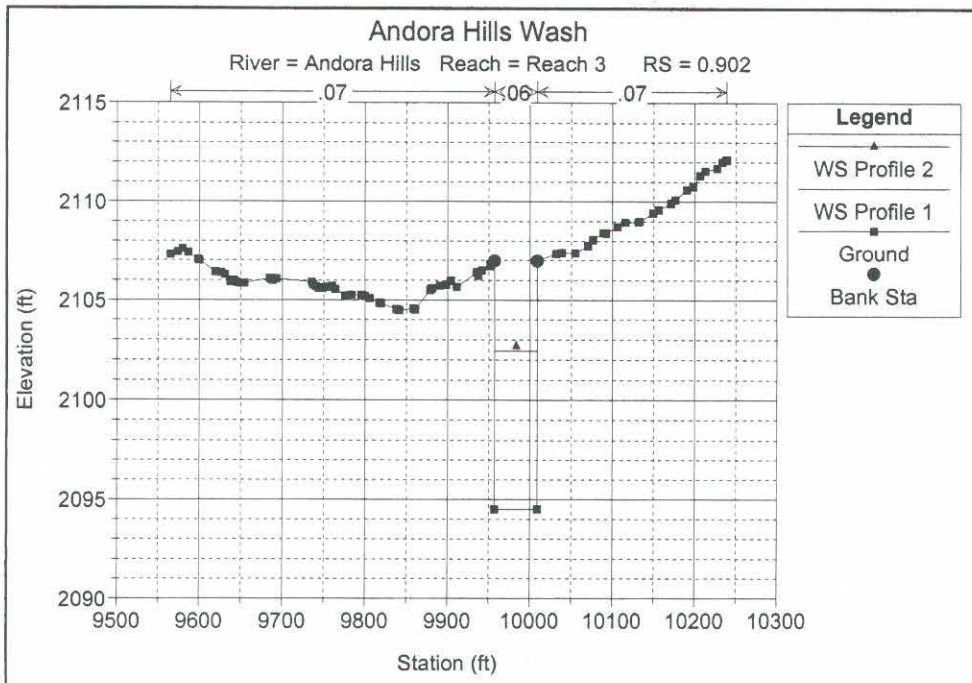

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.222
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

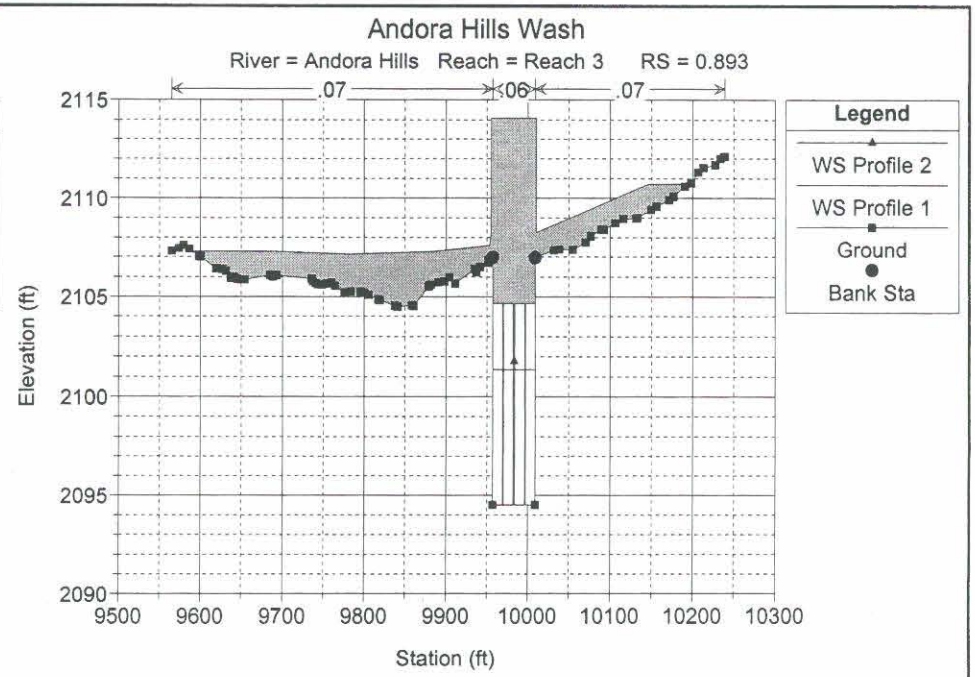

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.170
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

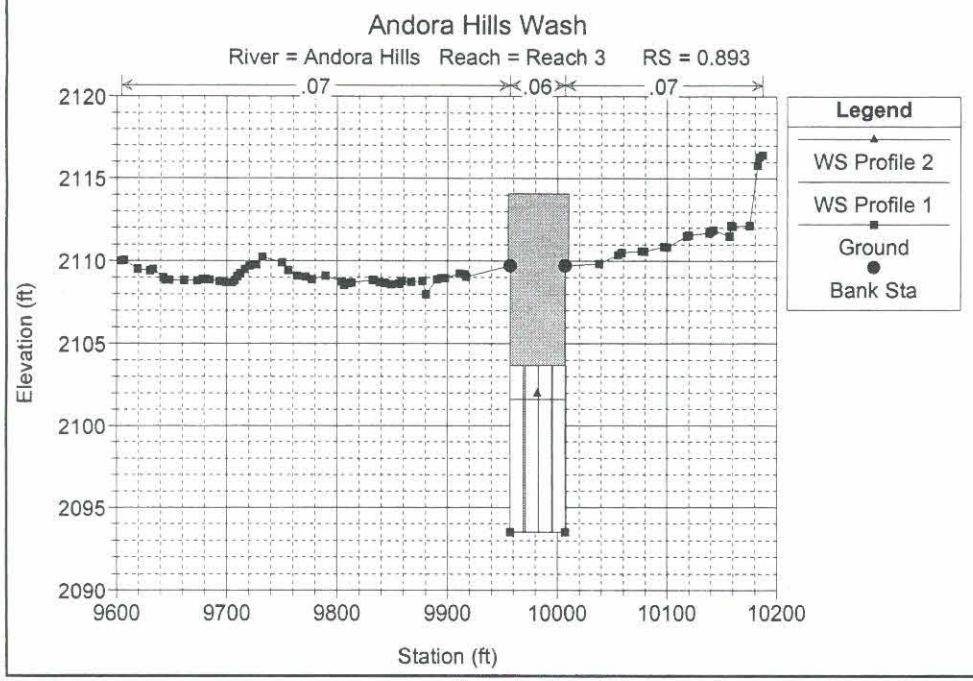

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.133
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

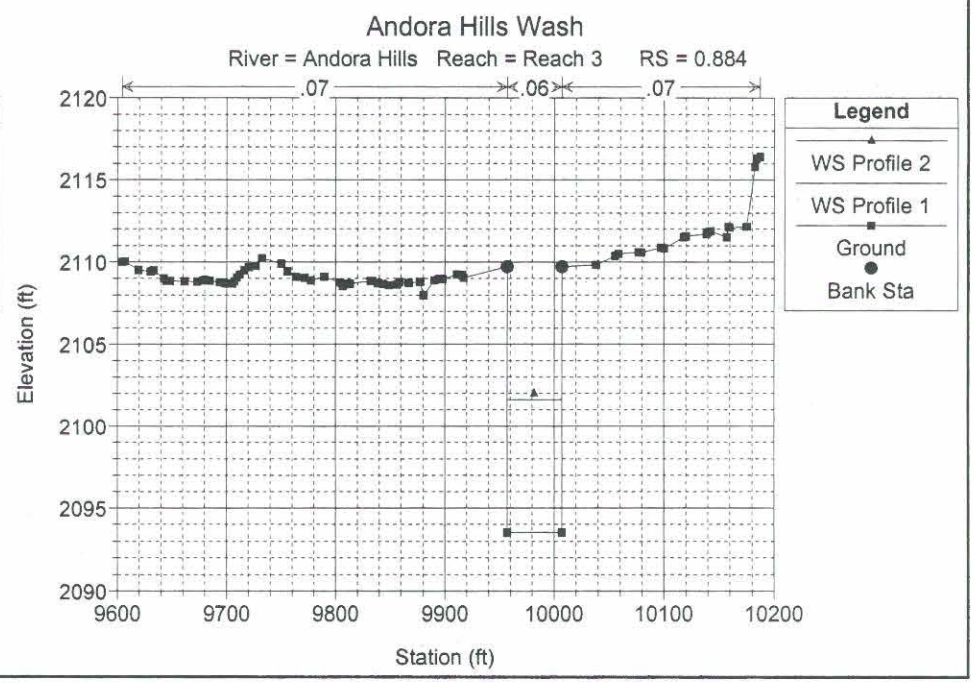

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.085
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

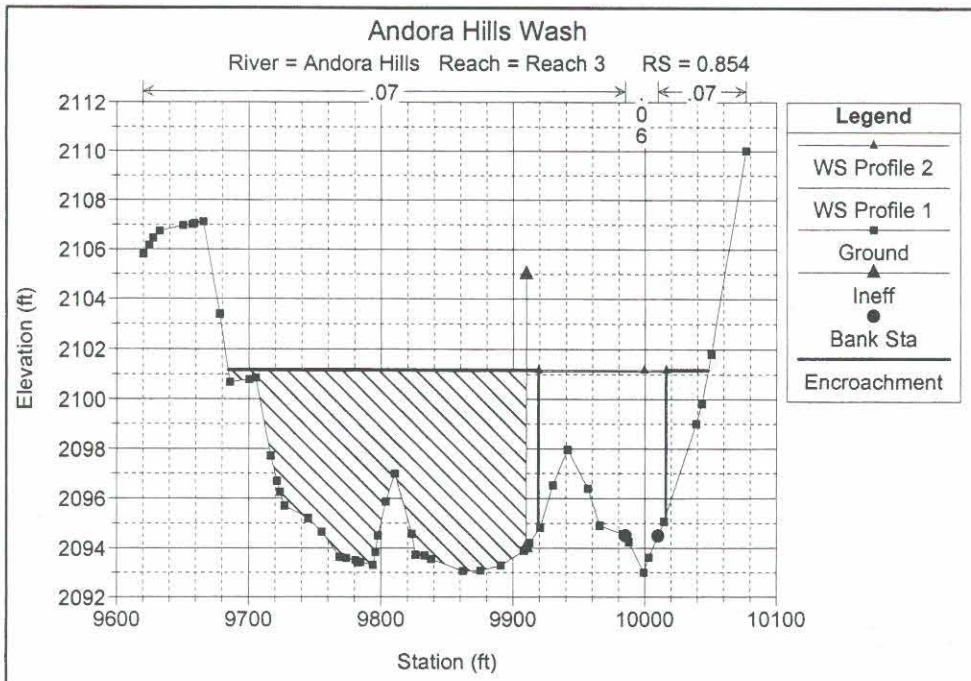

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 1.039
.07 .06 .07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.992
.07 .06 .07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.954
.07 .06 .07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.911
.07 .06 .07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

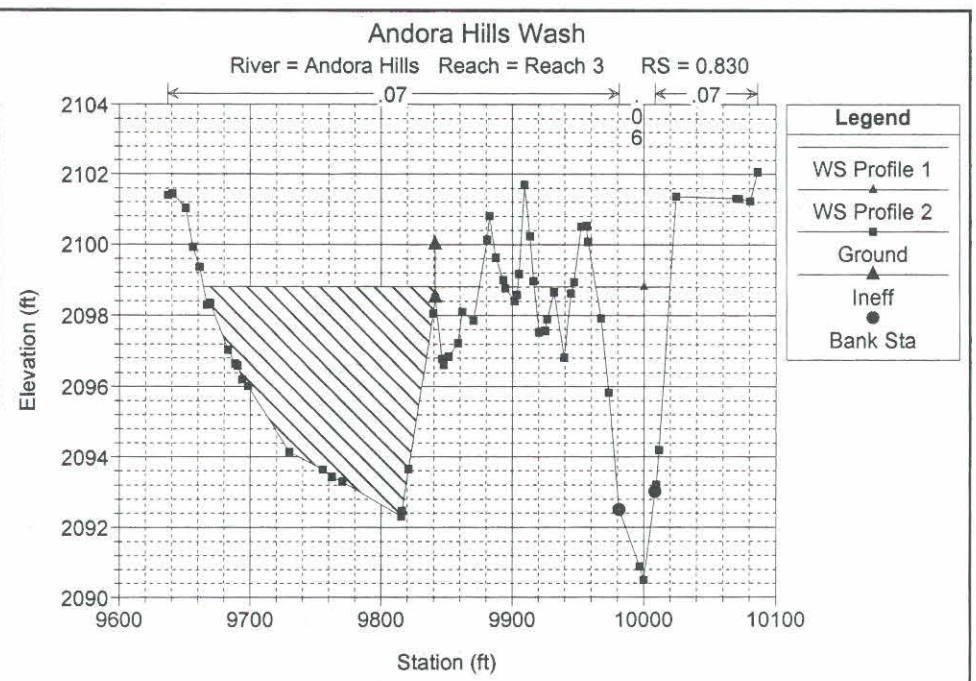

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.902
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

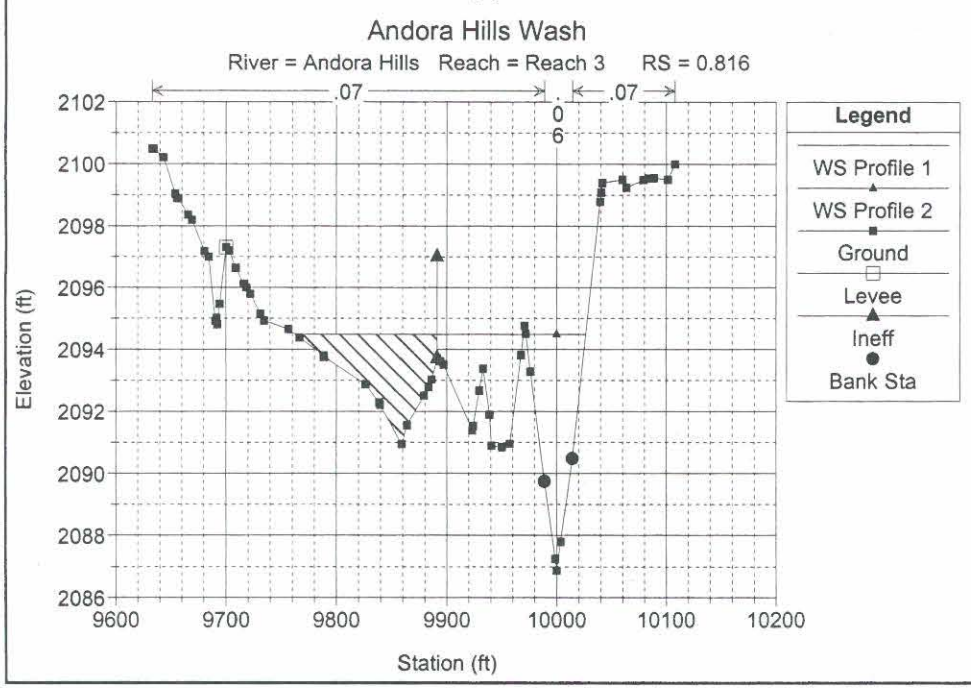

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.893
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

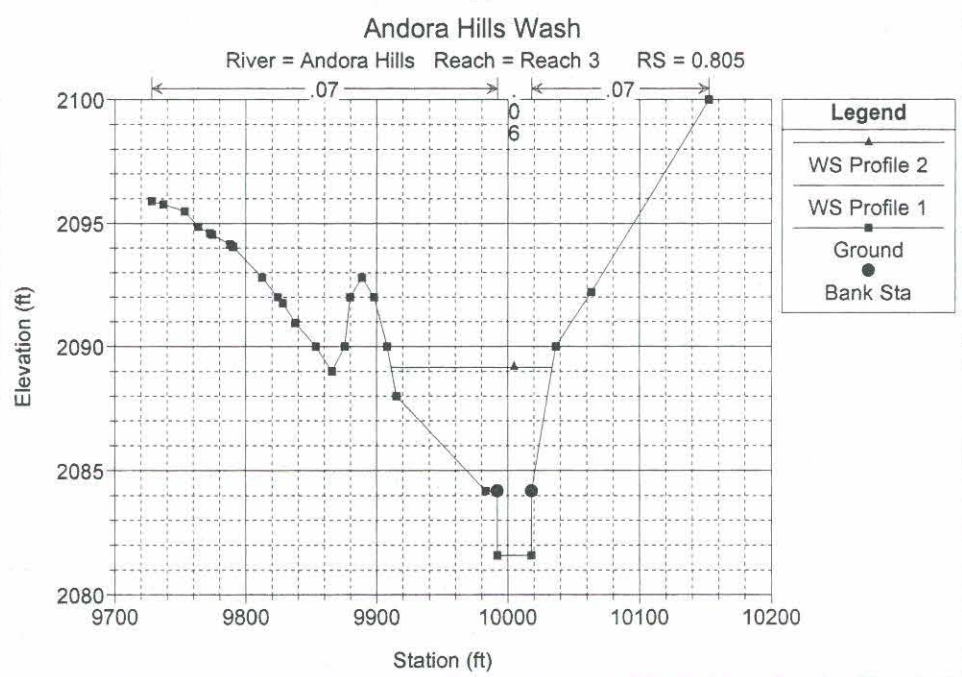

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.893
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

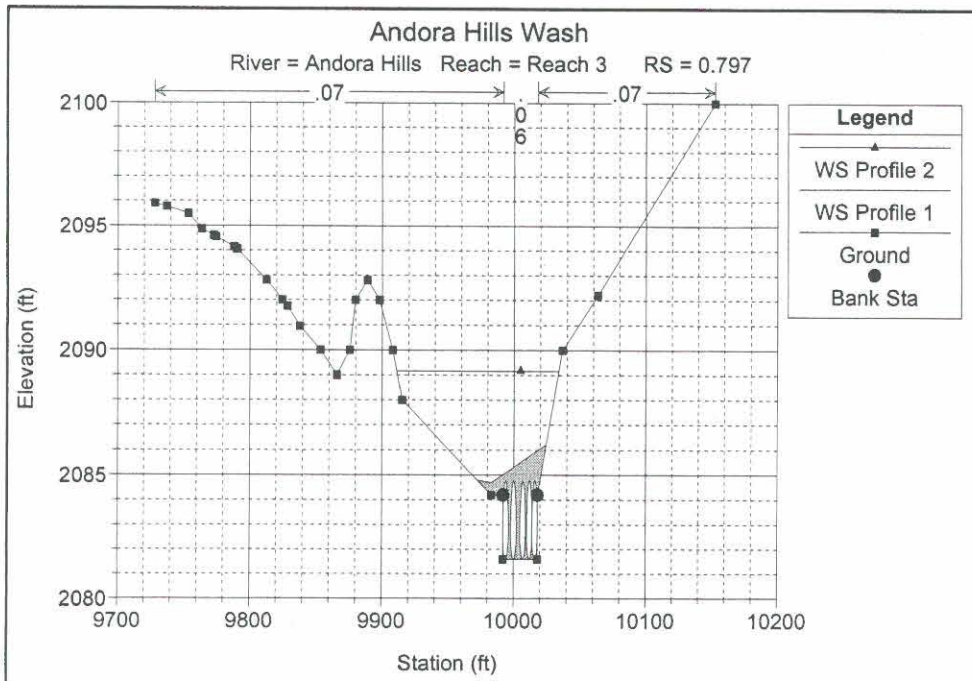

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.884
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

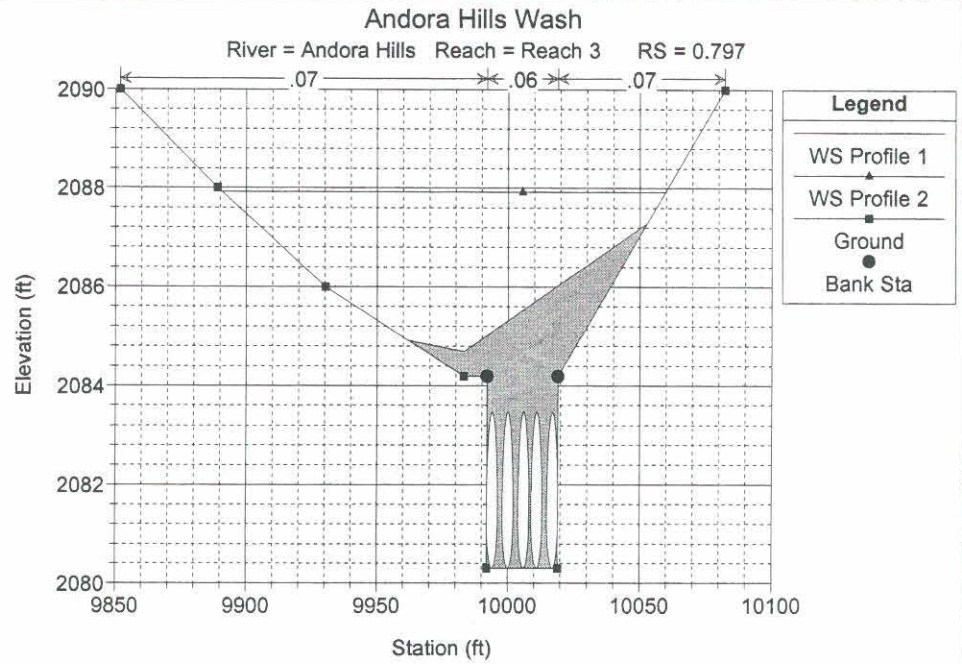

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.854
.07
.07
.06
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

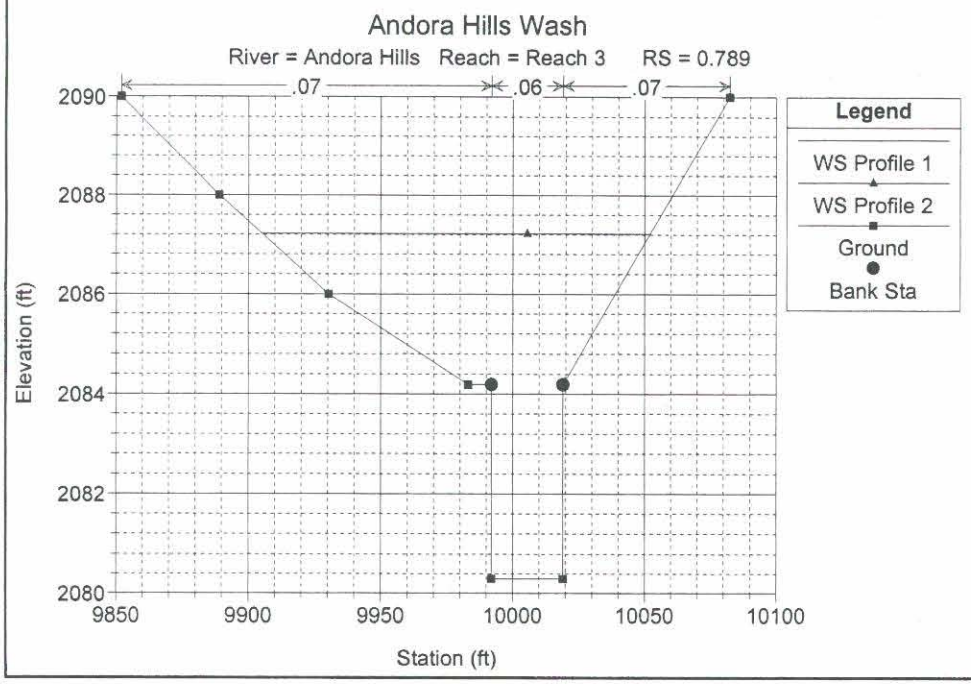

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.830
.07
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

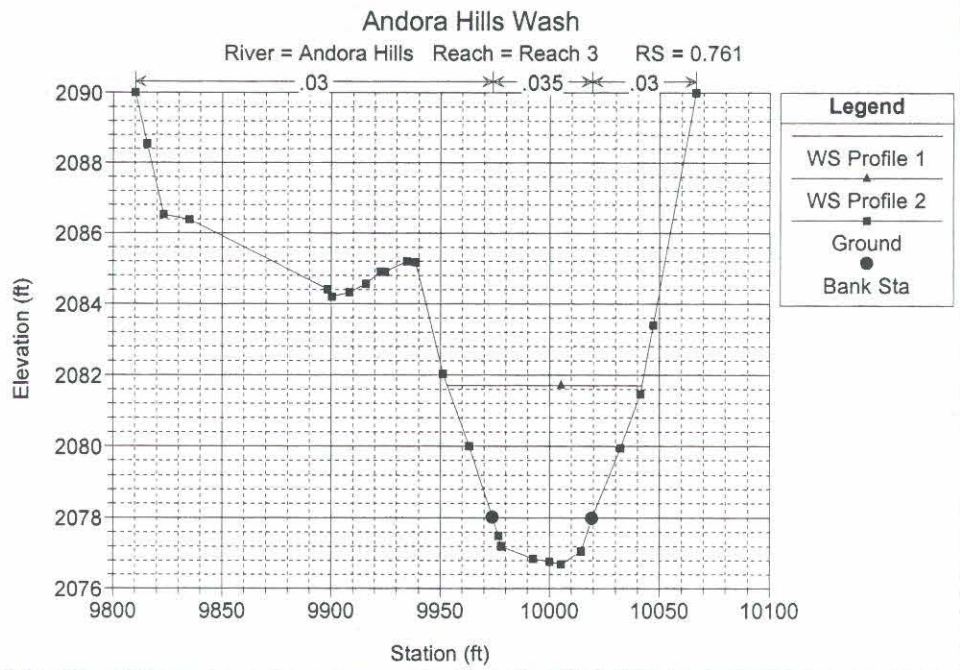

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.816
.07
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

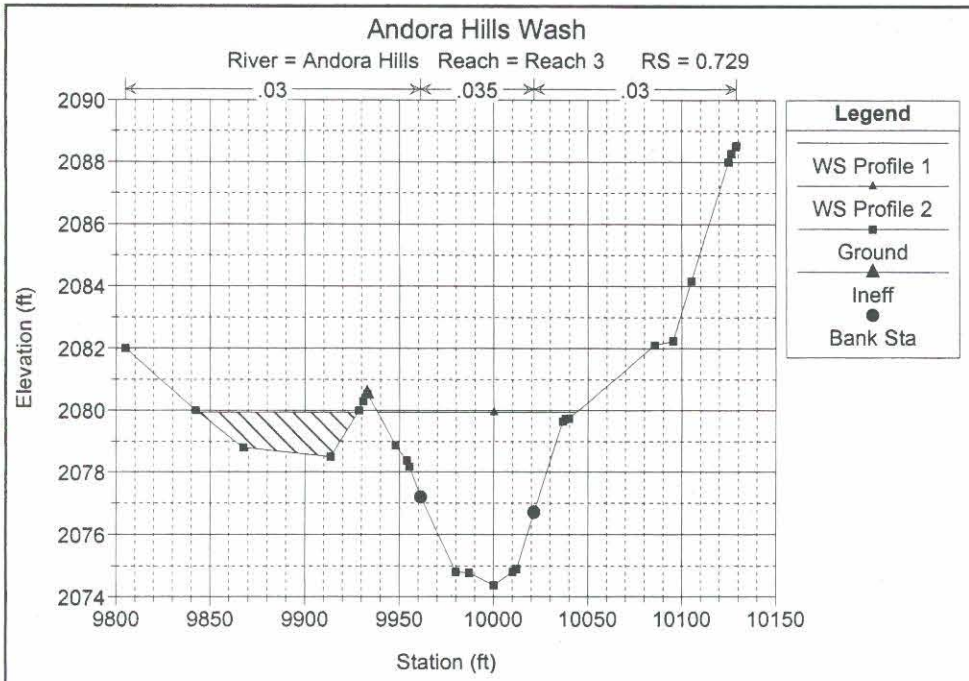

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.805
.07
.07
.06
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

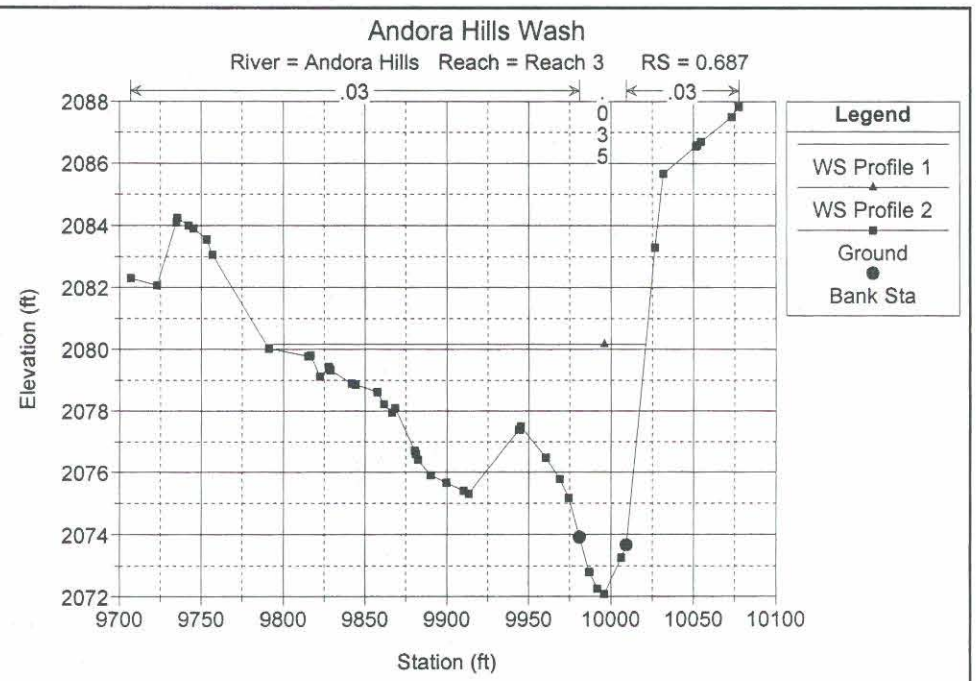

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.797
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

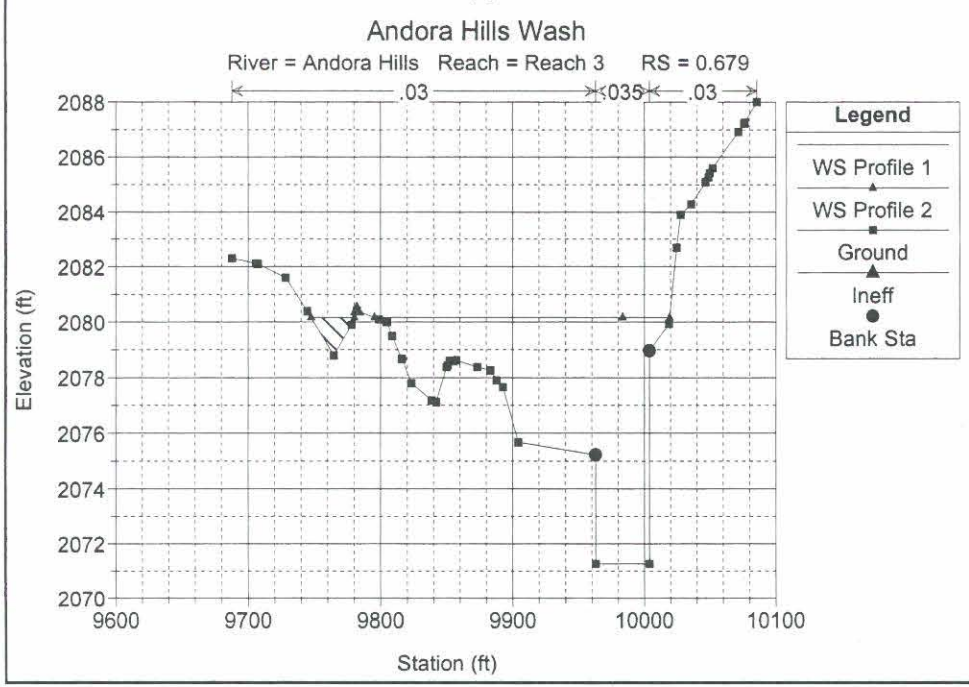

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.797
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

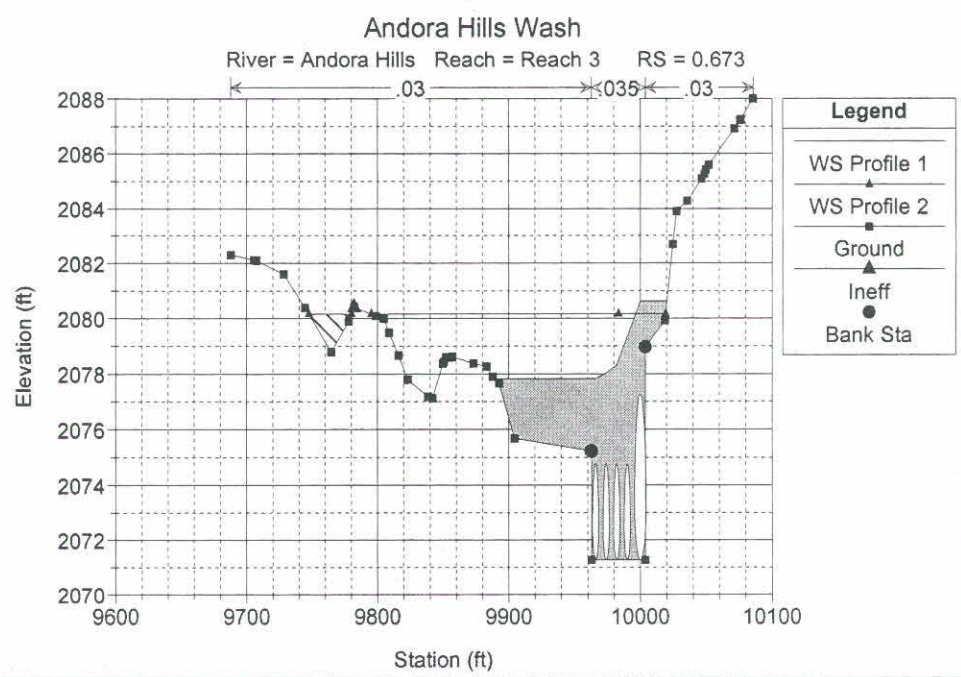

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.789
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

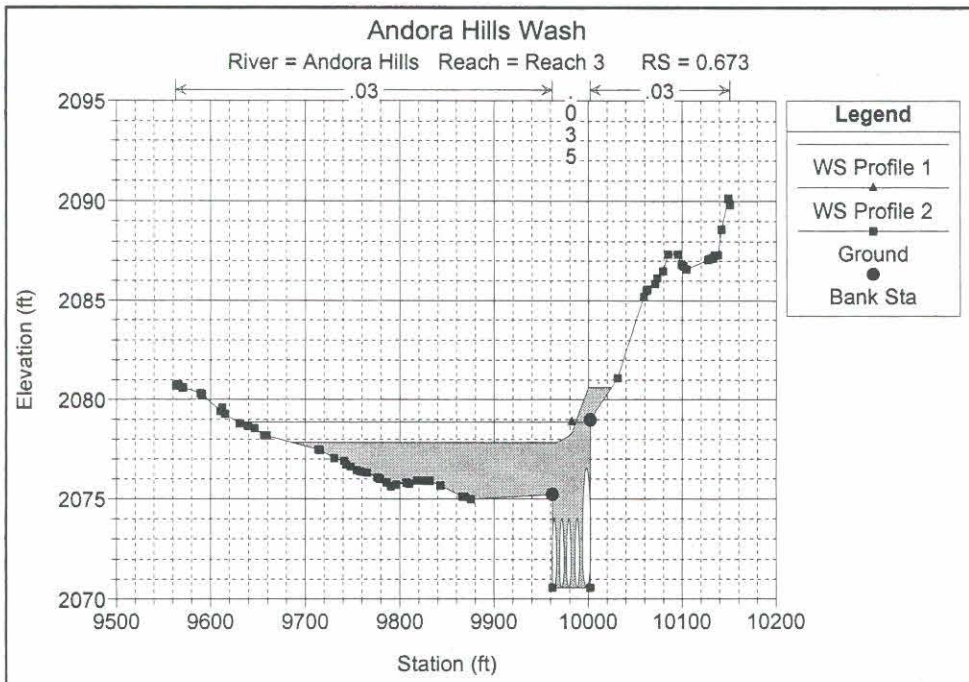

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.761
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

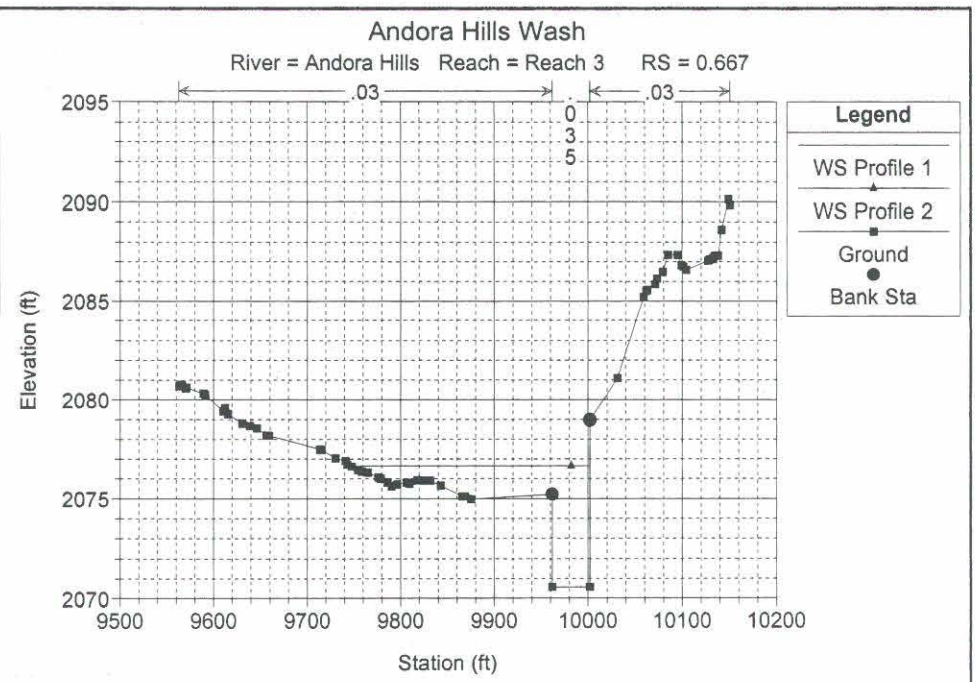

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.729
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

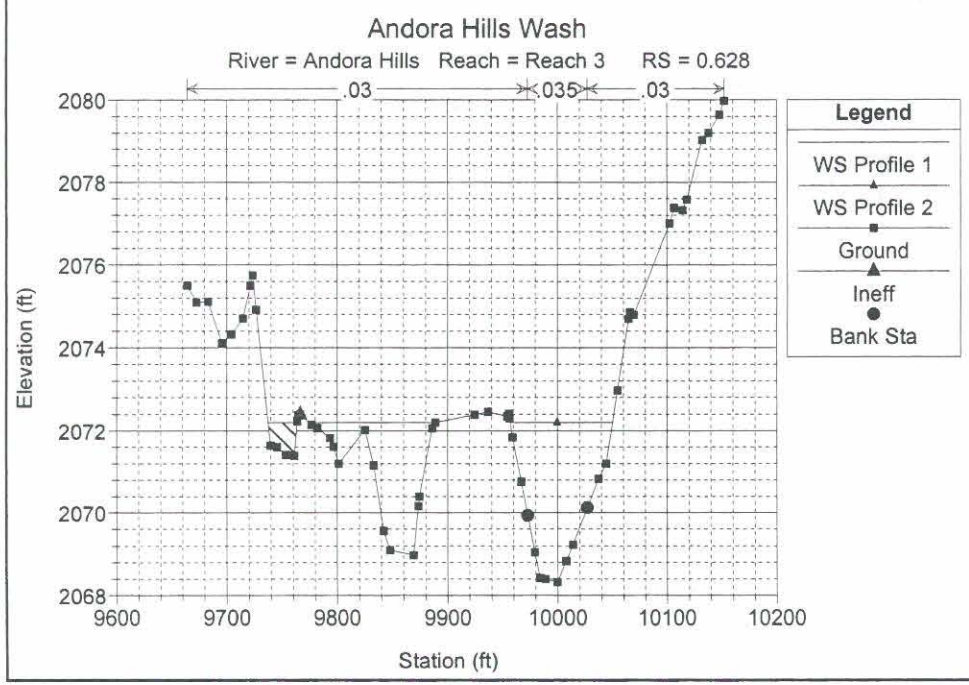

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.687
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

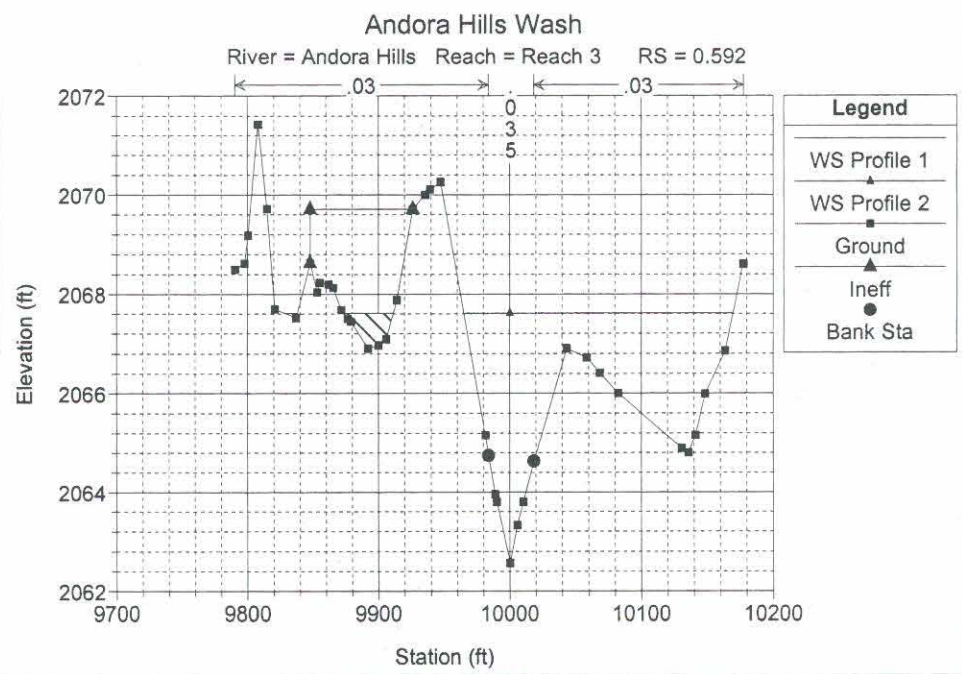

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.679
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

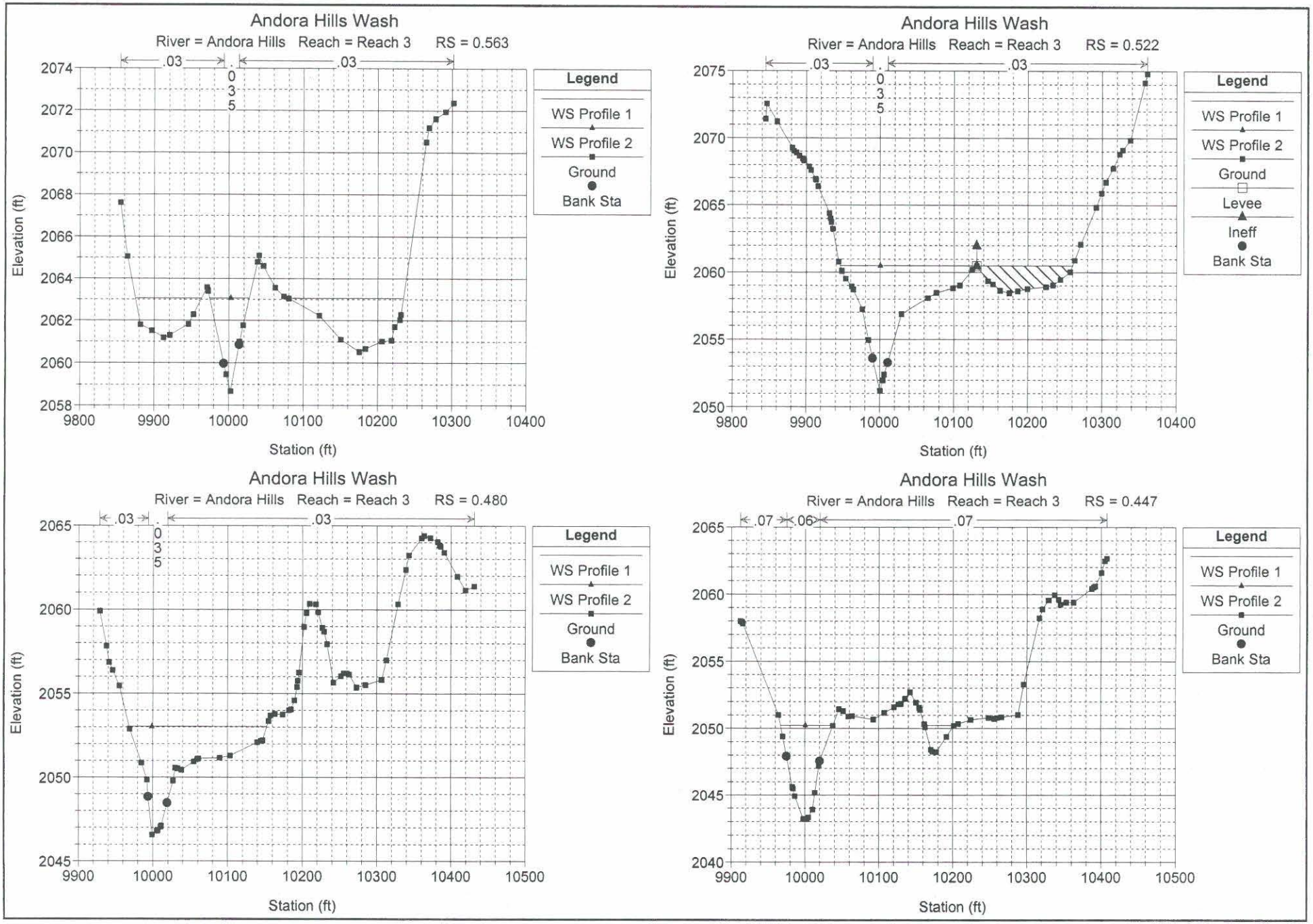

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.673
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

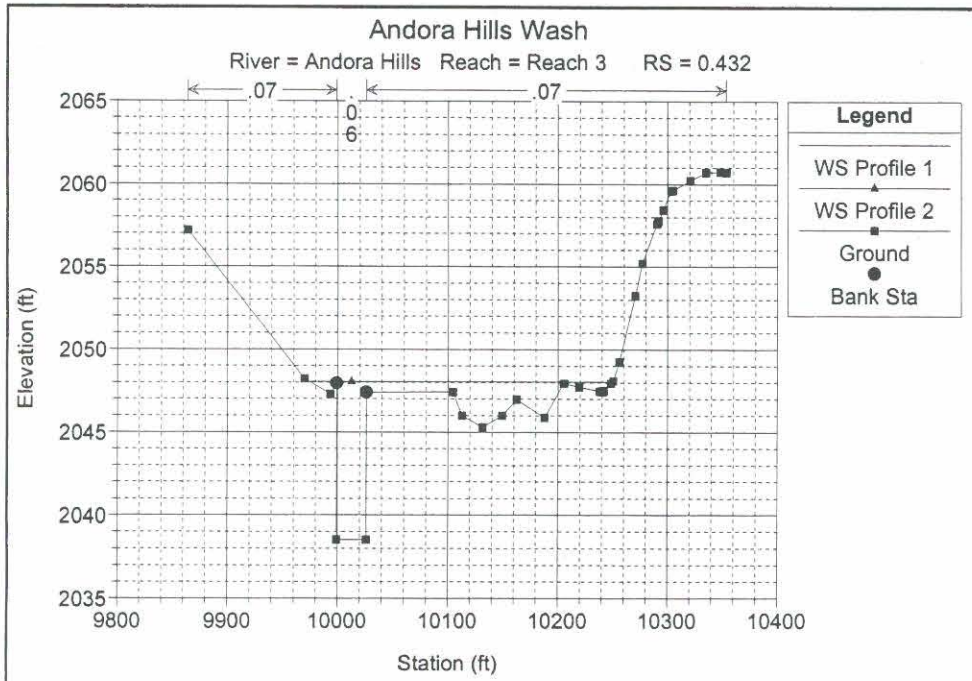

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.673
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

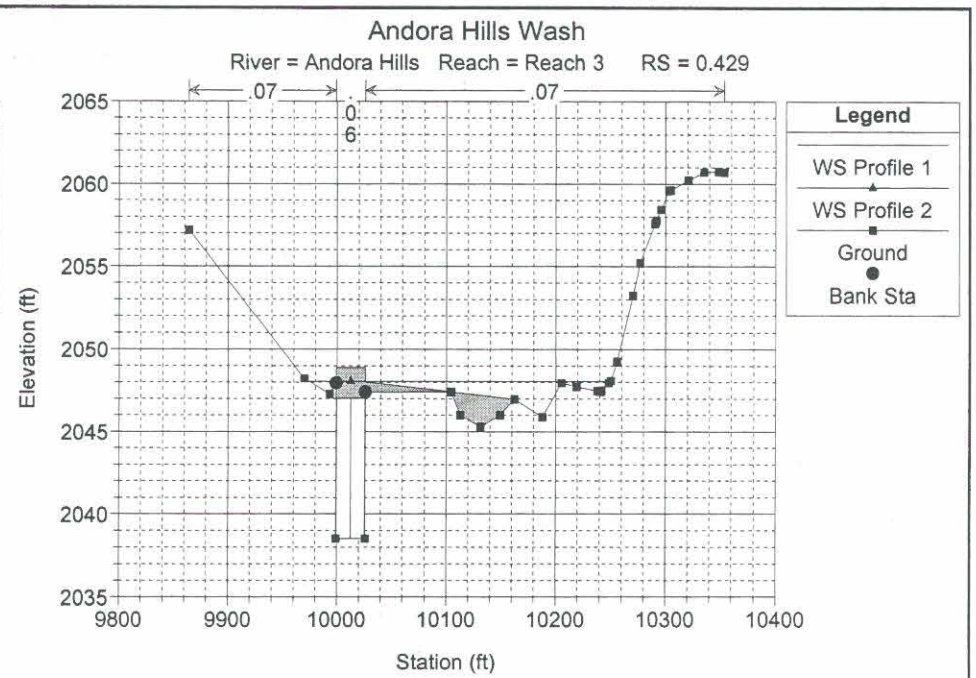

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.667
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

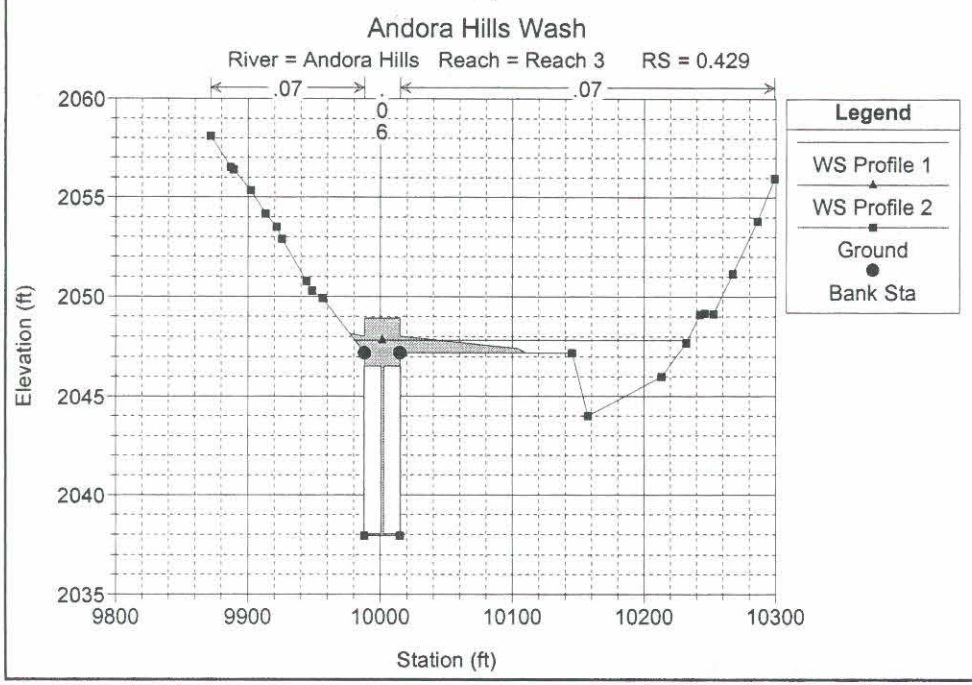

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.628
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

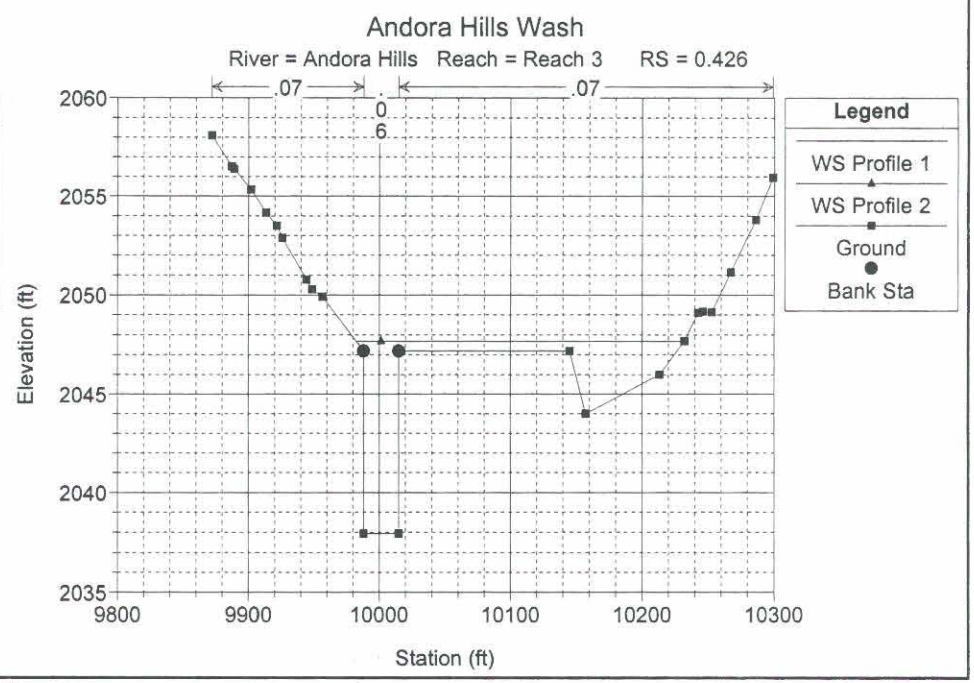

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.592
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

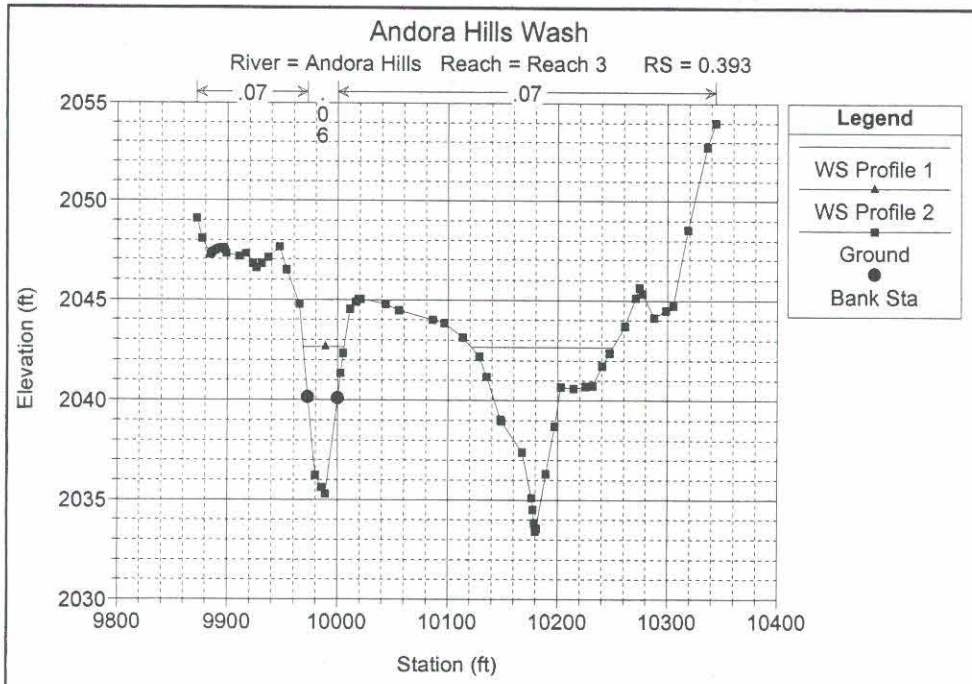

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.563
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.522
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.480
.03
.035
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.447
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

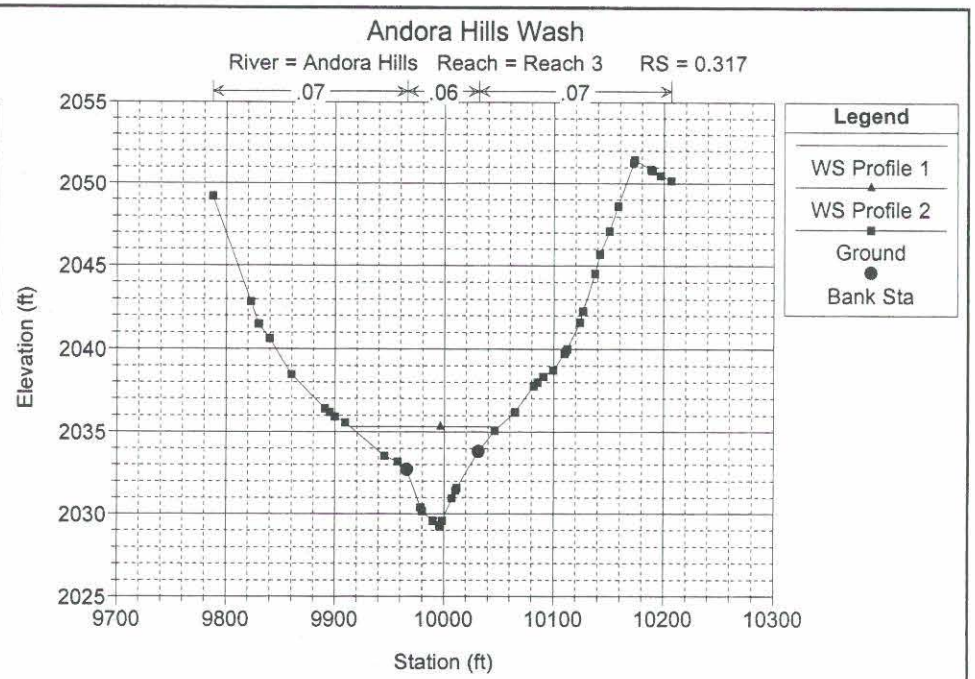

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.432
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

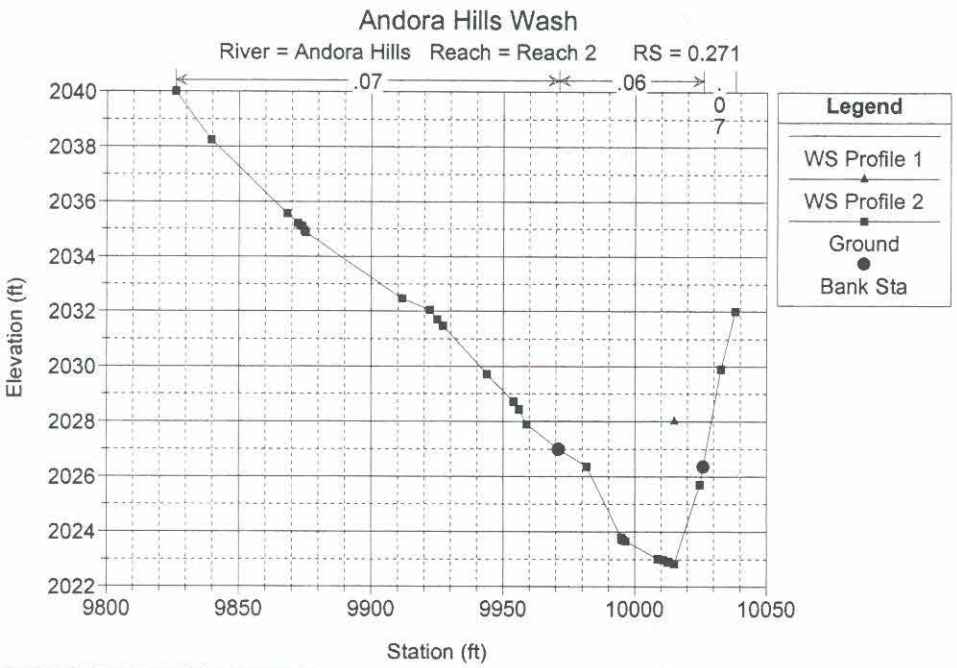

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.429
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

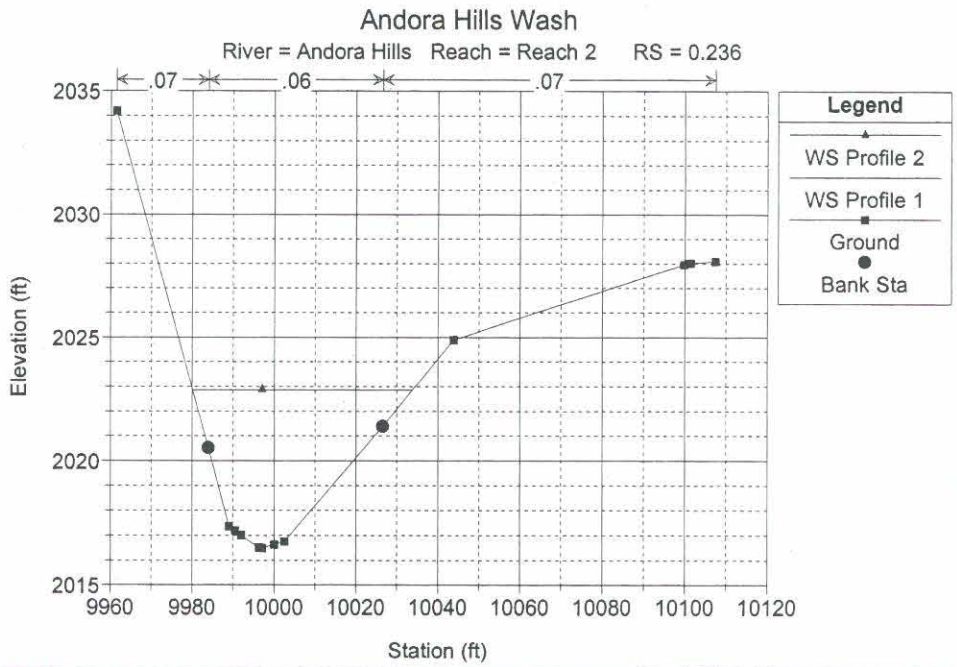

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.429
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

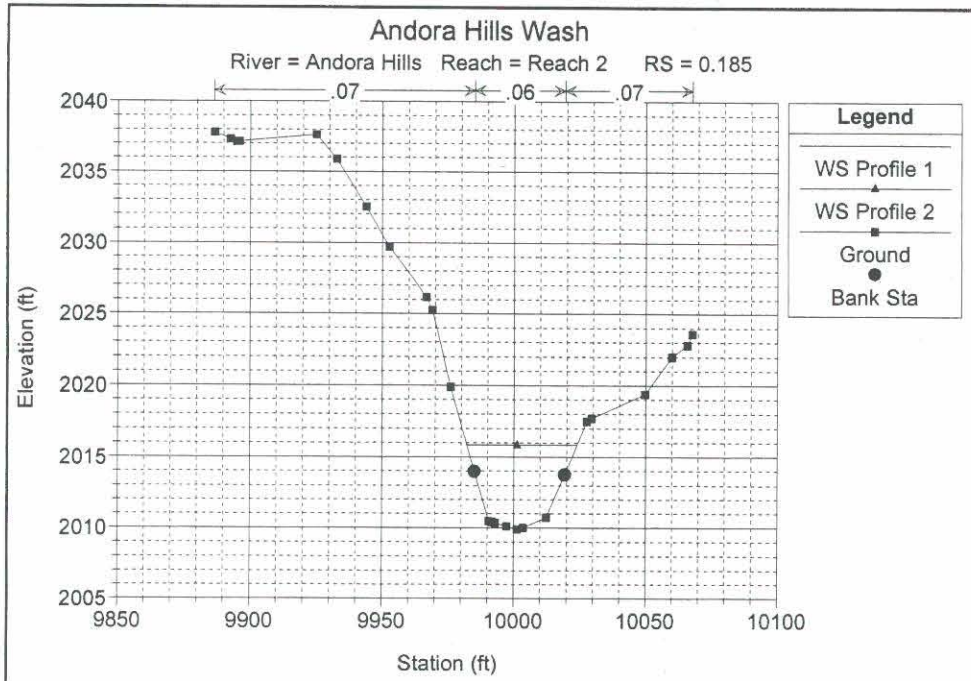

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.426
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

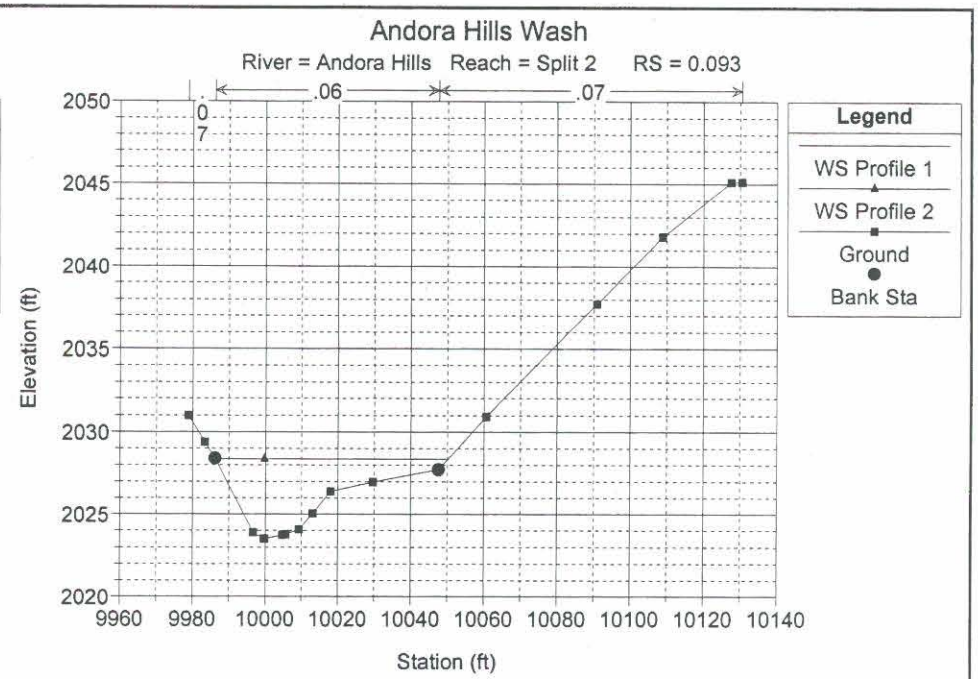

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.393
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

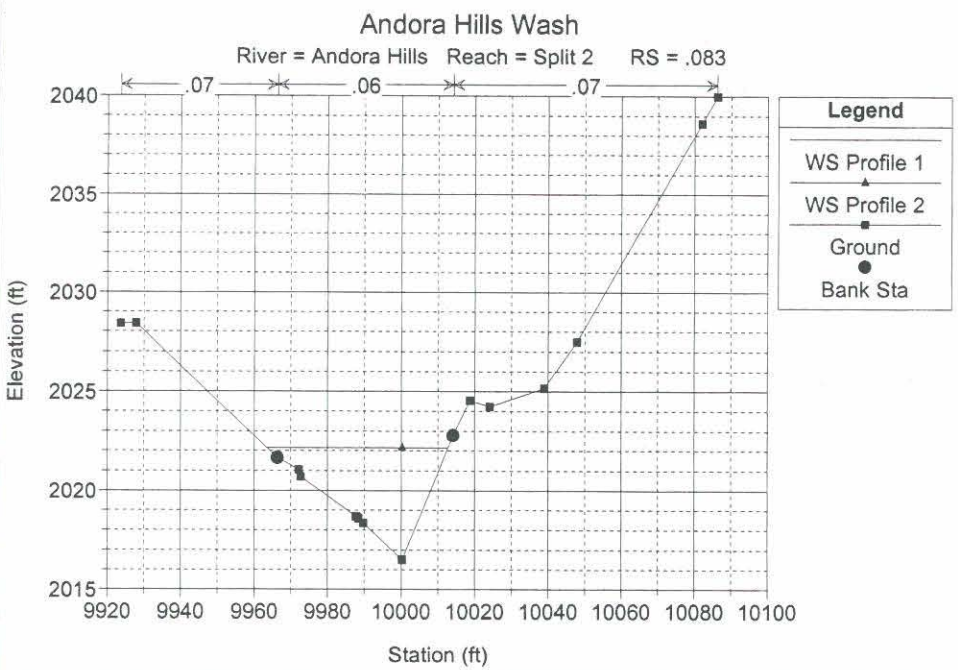

Andora Hills Wash
River = Andora Hills Reach = Reach 3 RS = 0.317
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

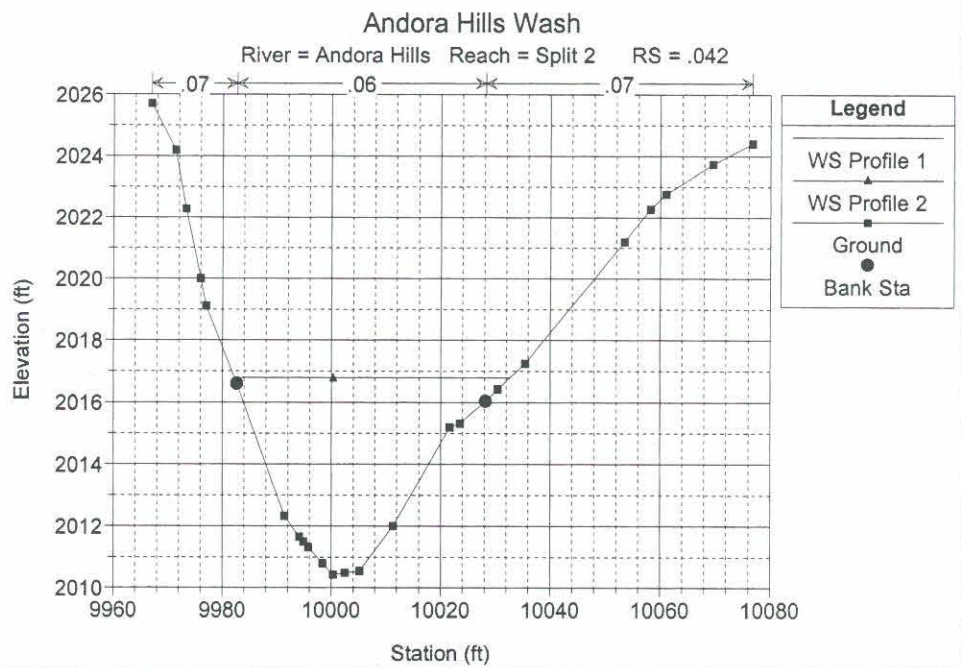

Andora Hills Wash
River = Andora Hills Reach = Reach 2 RS = 0.271
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

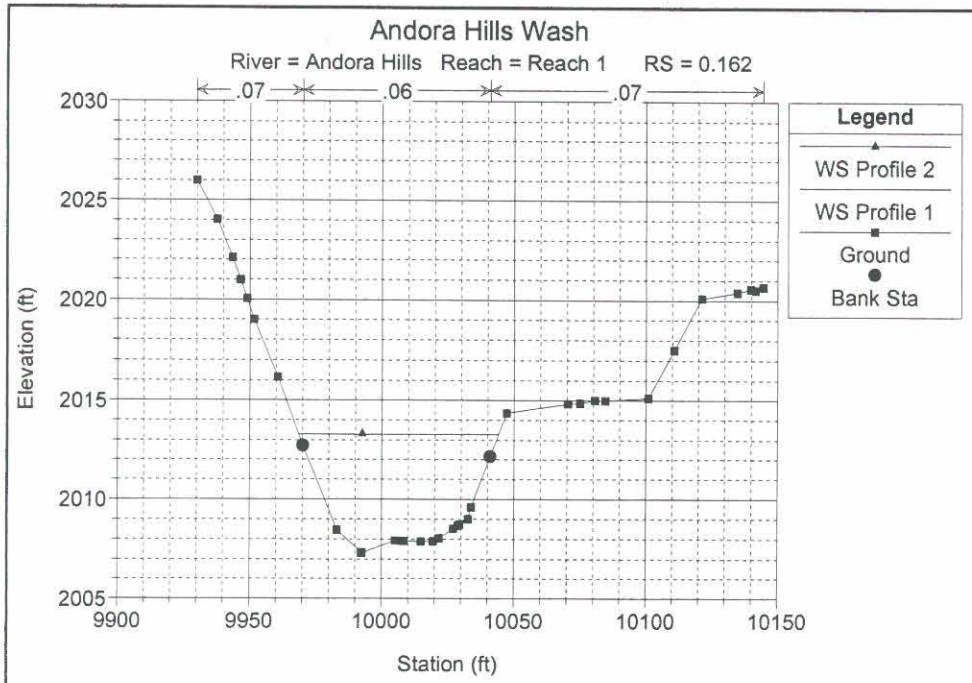

Andora Hills Wash
River = Andora Hills Reach = Reach 2 RS = 0.236
.07
.06
.07
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Elevation (ft)
Station (ft)

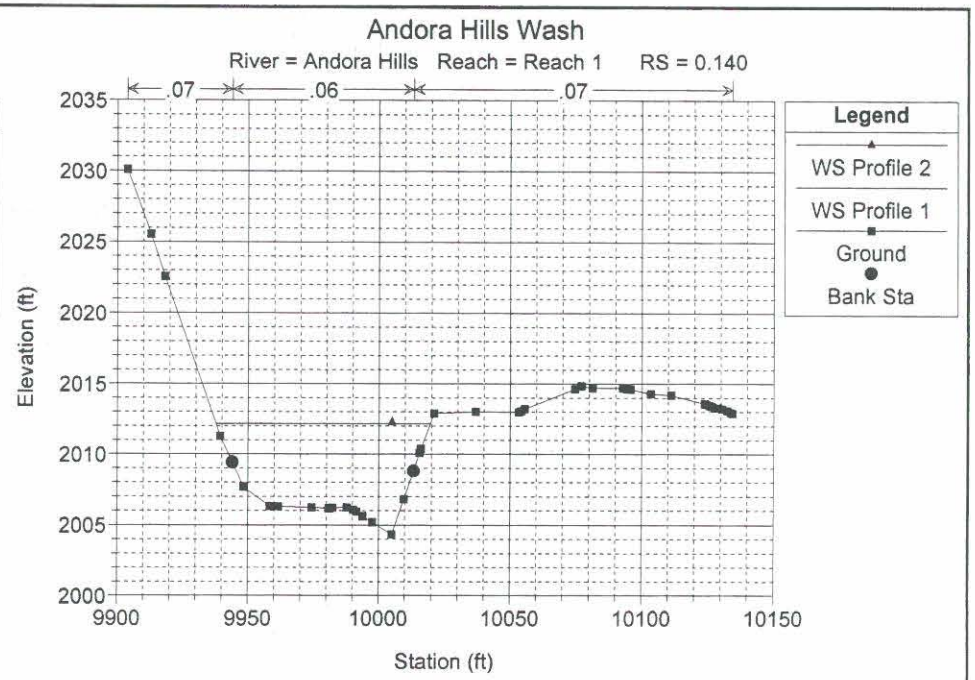

Andora Hills Wash
River = Andora Hills Reach = Reach 2 RS = 0.185
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

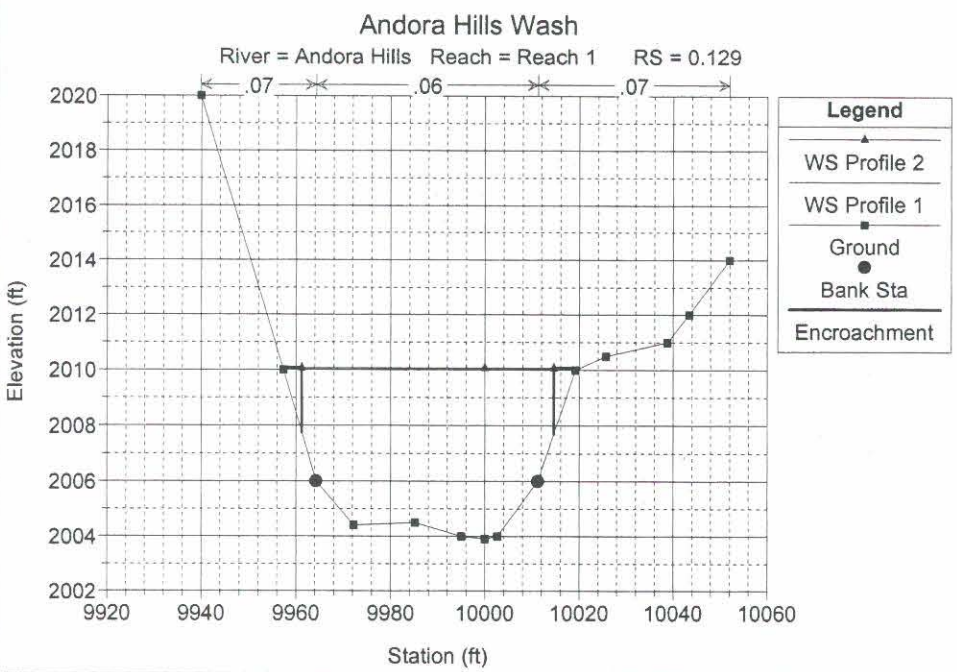

Andora Hills Wash
River = Andora Hills Reach = Split 2 RS = 0.093
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

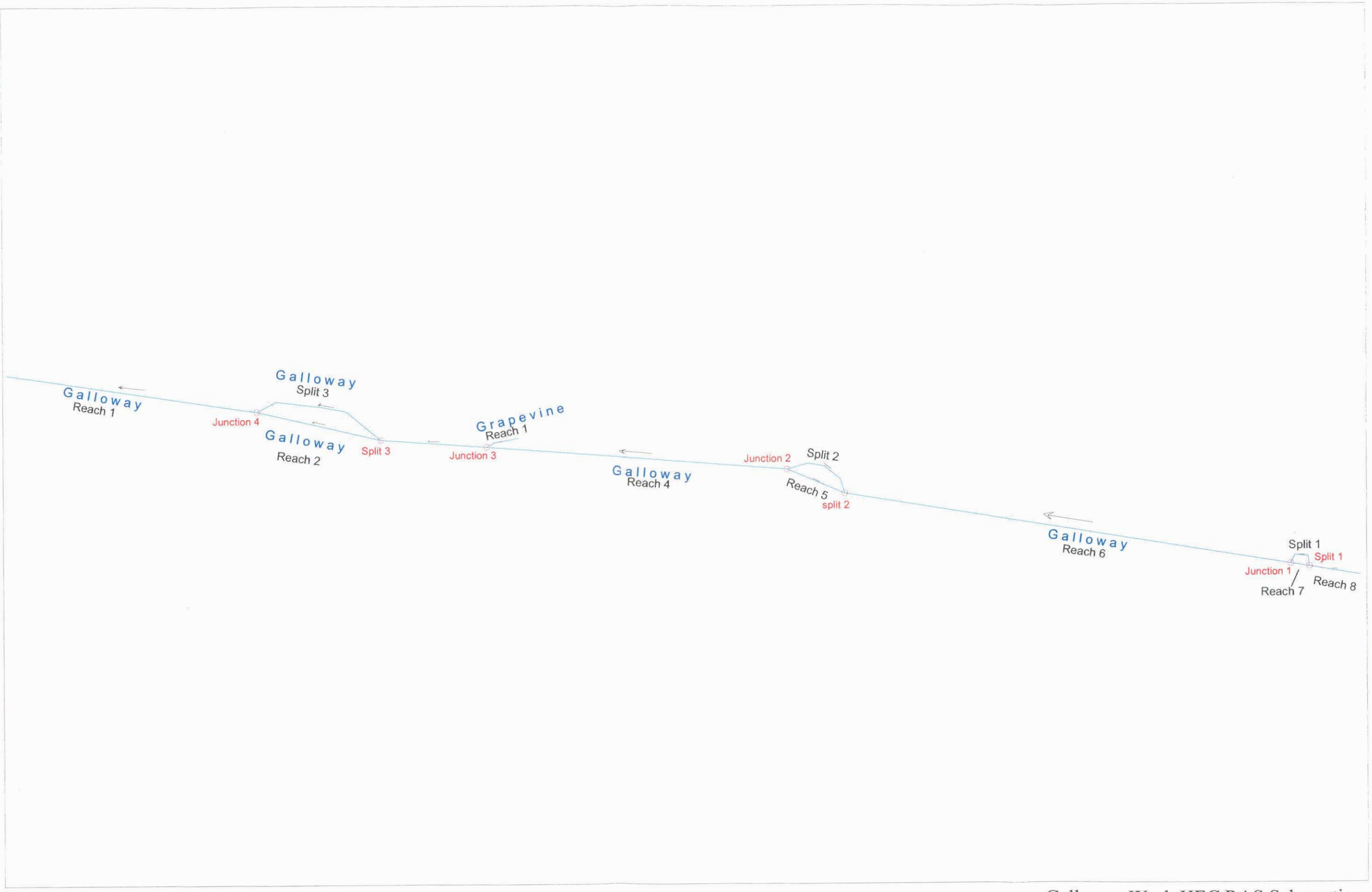

Andora Hills Wash
River = Andora Hills Reach = Split 2 RS = .083
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


Andora Hills Wash
River = Andora Hills Reach = Split 2 RS = .042
.07
.06
.07
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


Andora Hills Wash
River = Andora Hills Reach = Reach 1 RS = 0.162
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta

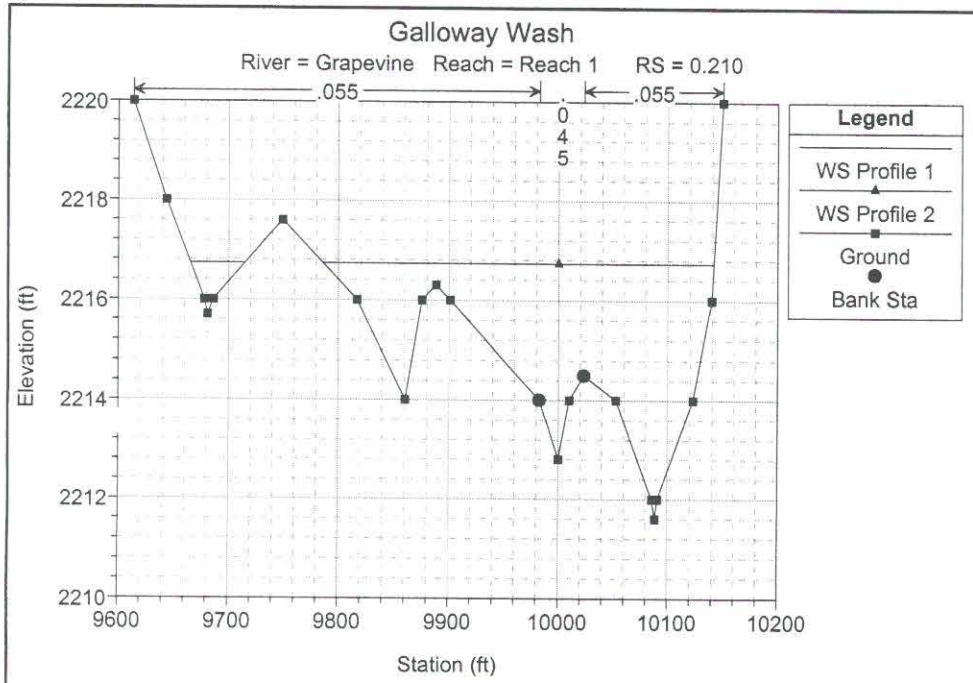

Andora Hills Wash
River = Andora Hills Reach = Reach 1 RS = 0.140
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta

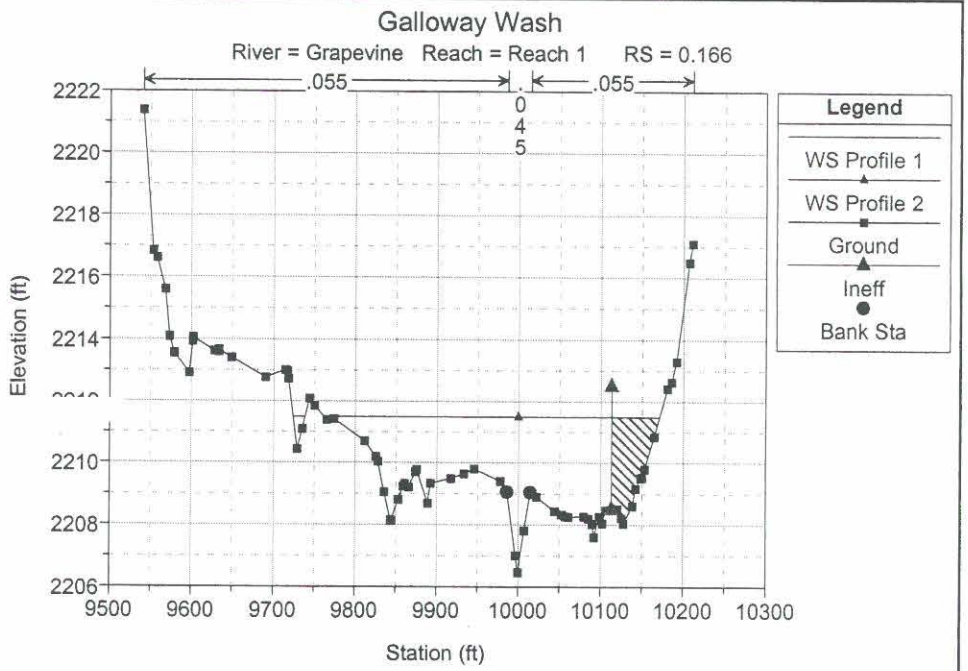

Andora Hills Wash
River = Andora Hills Reach = Reach 1 RS = 0.129
.07
.06
.07
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment

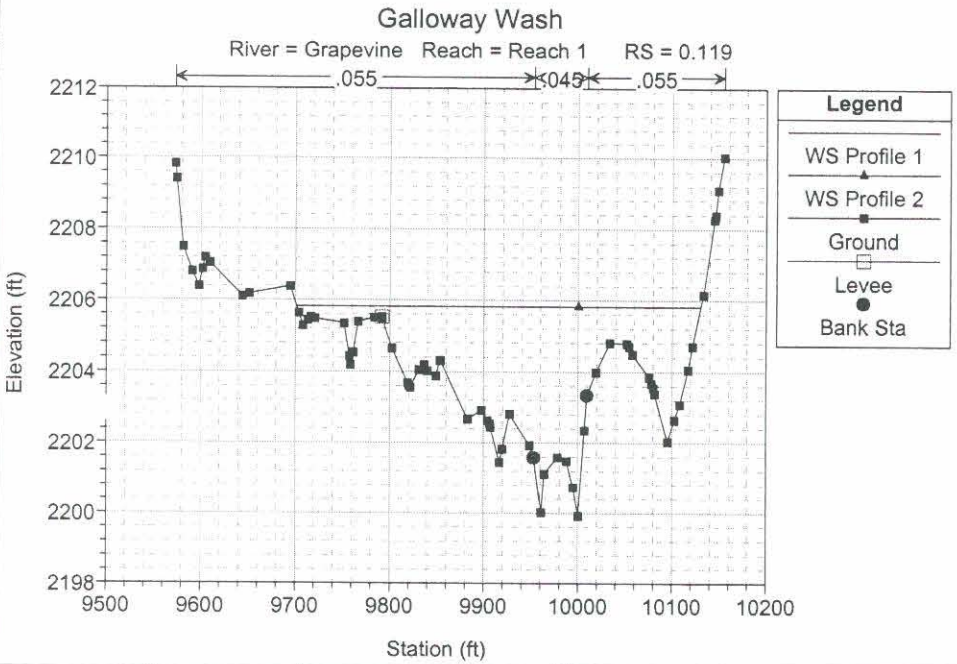


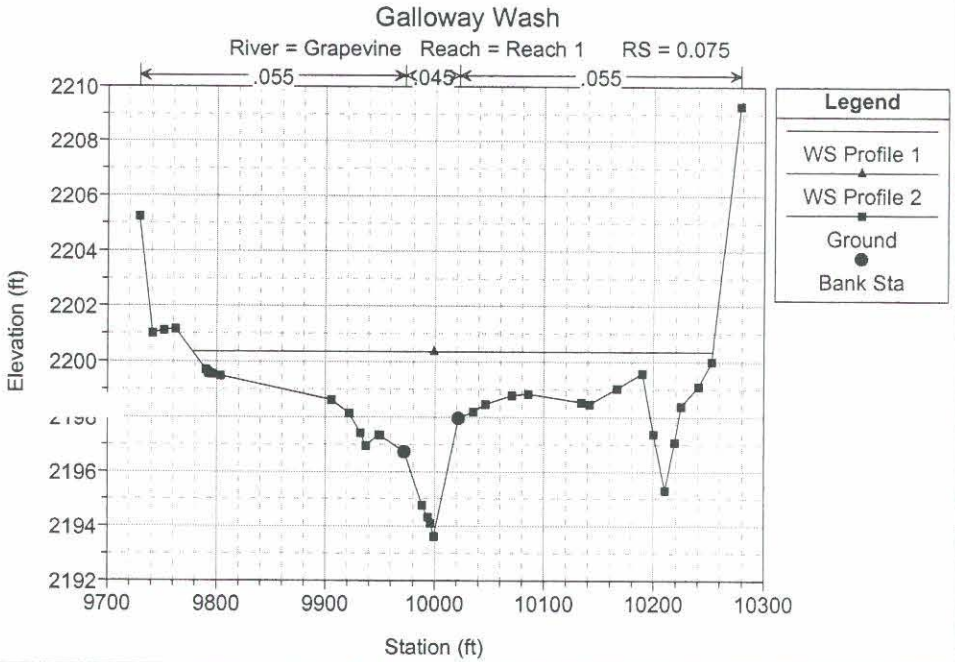
FDS of Andora Hills & Galloway Washes
FCD 99-14

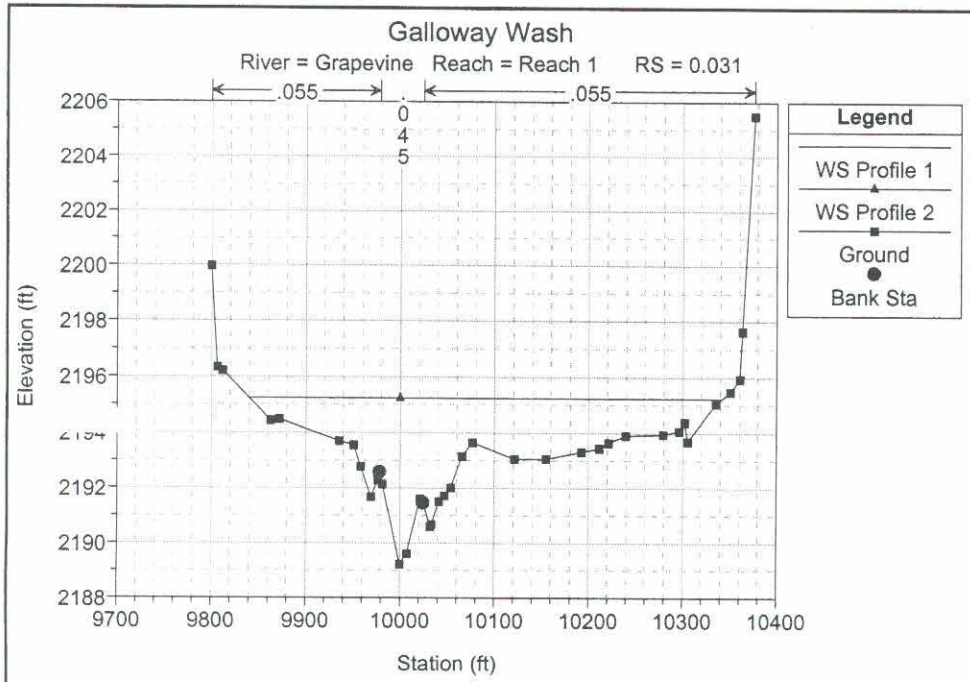
Galloway Wash HEC RAS Schematic
JE Fuller/Hydrology & Geomorphology, Inc.
April, 2000

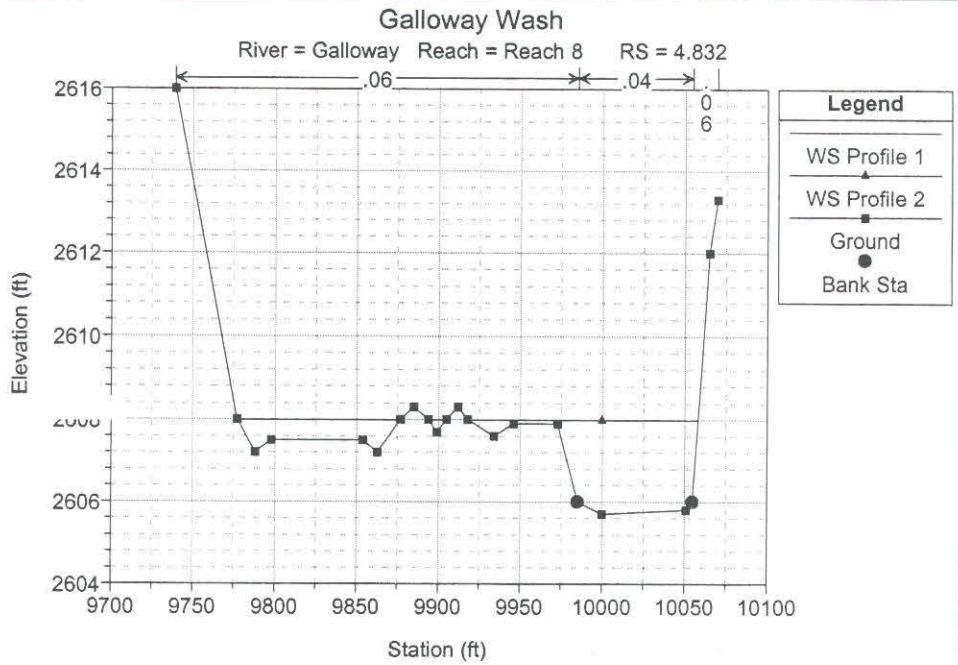

Galloway Wash
River = Grapevine Reach = Reach 1 RS = 0.210
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

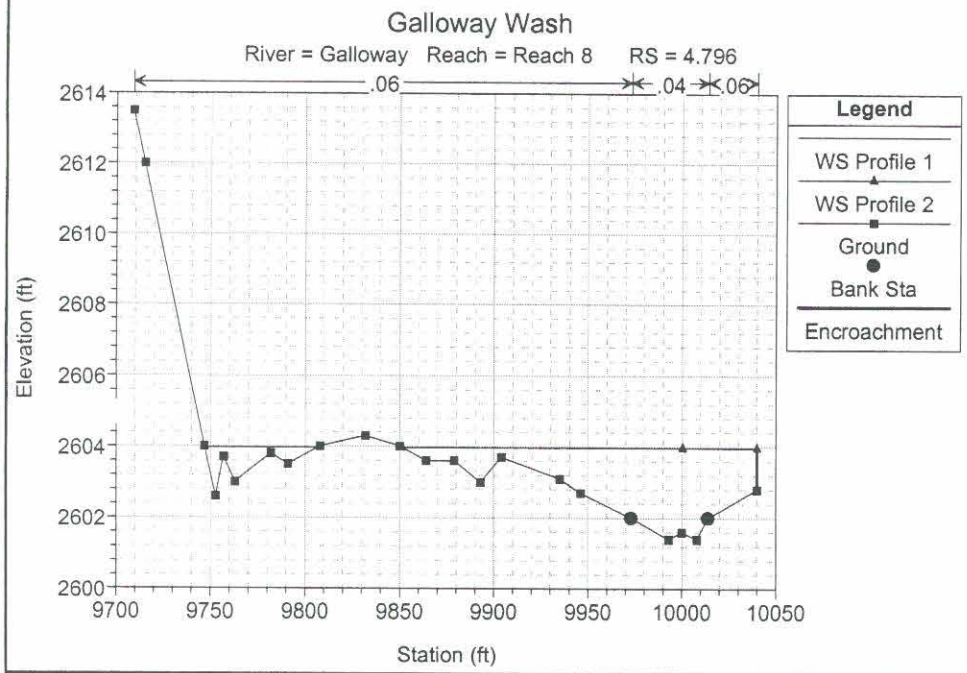

Galloway Wash
River = Grapevine Reach = Reach 1 RS = 0.166
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

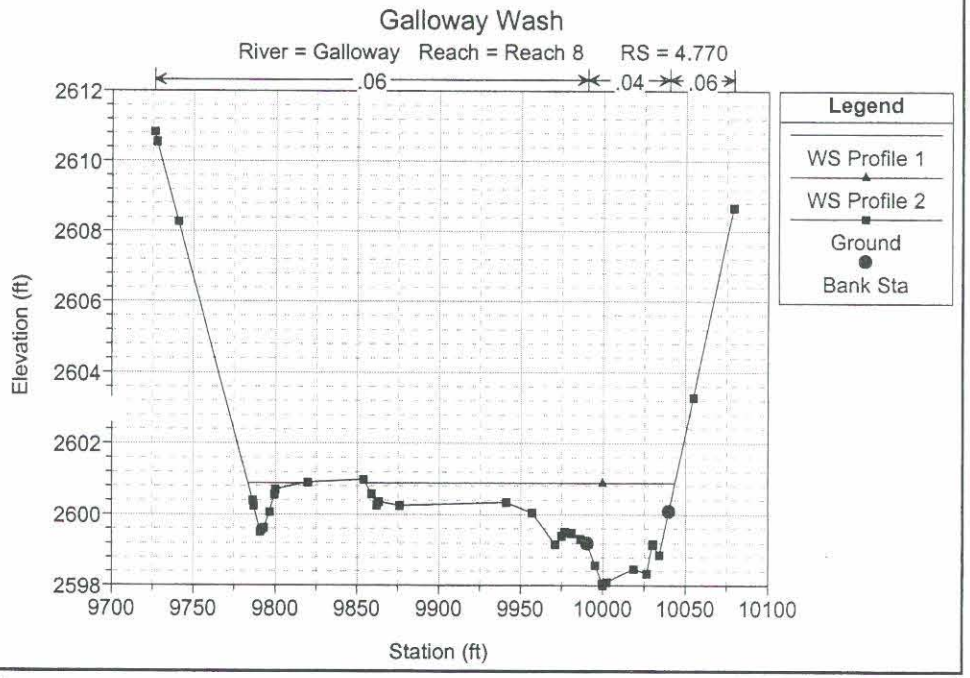

Galloway Wash
River = Grapevine Reach = Reach 1 RS = 0.119
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

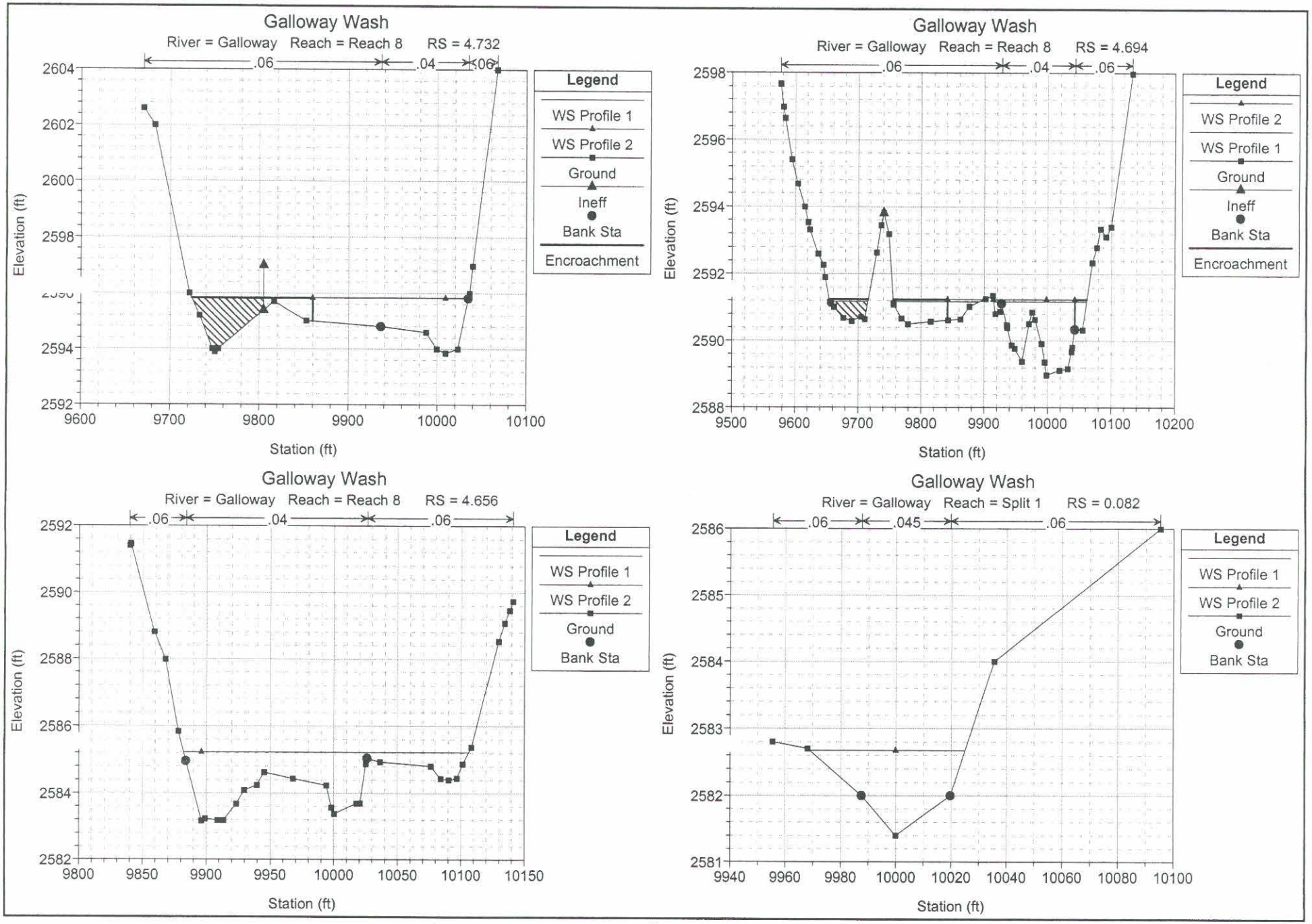

Galloway Wash
River = Grapevine Reach = Reach 1 RS = 0.075
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

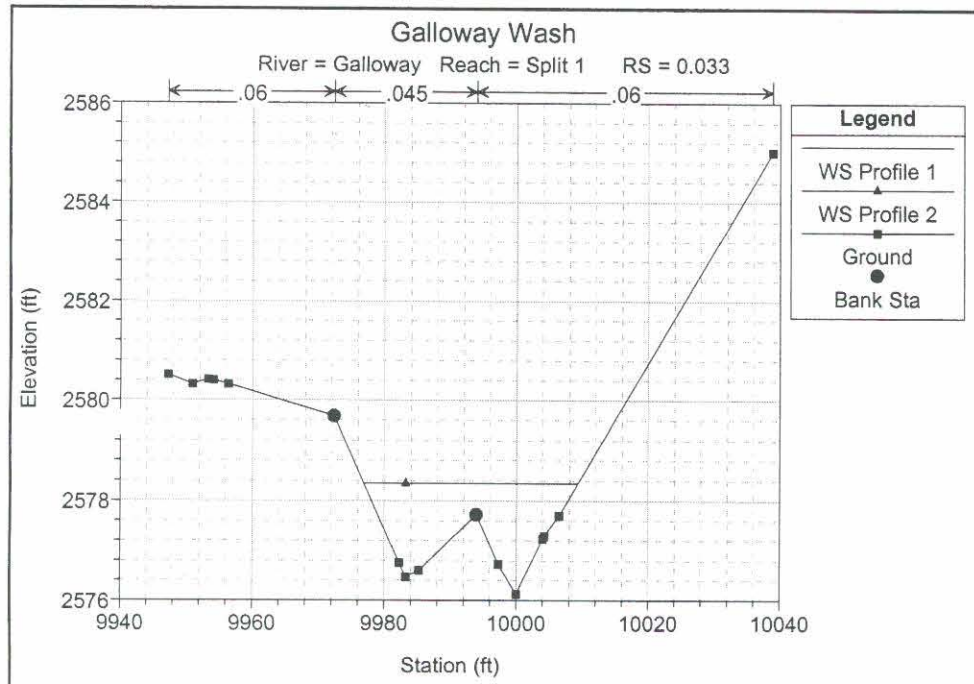

Galloway Wash
River = Grapevine Reach = Reach 1 RS = 0.031
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

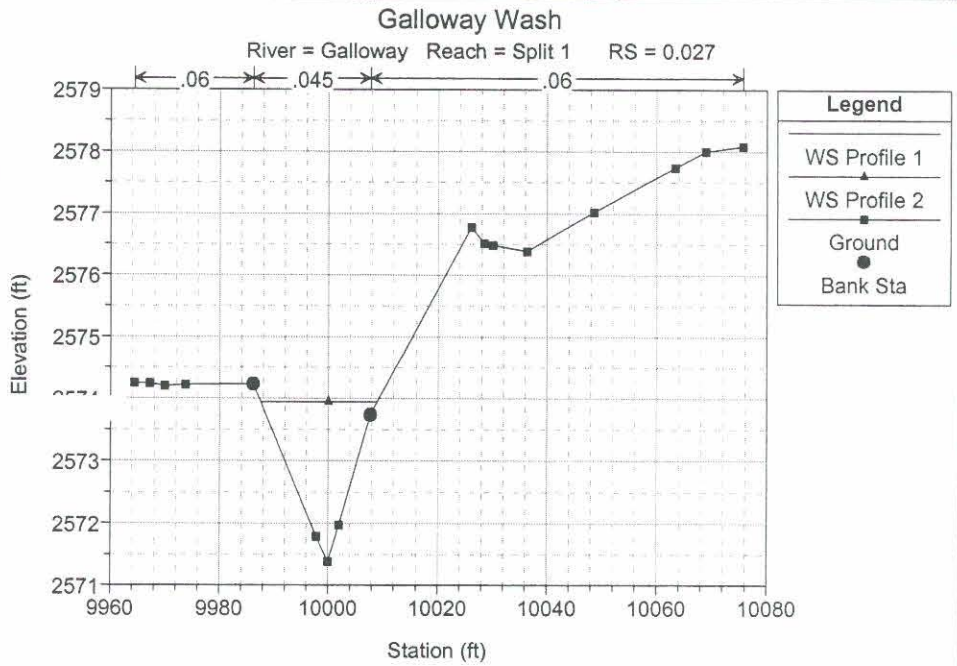

Galloway Wash
River = Galloway Reach = Reach 8 RS = 4.832
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

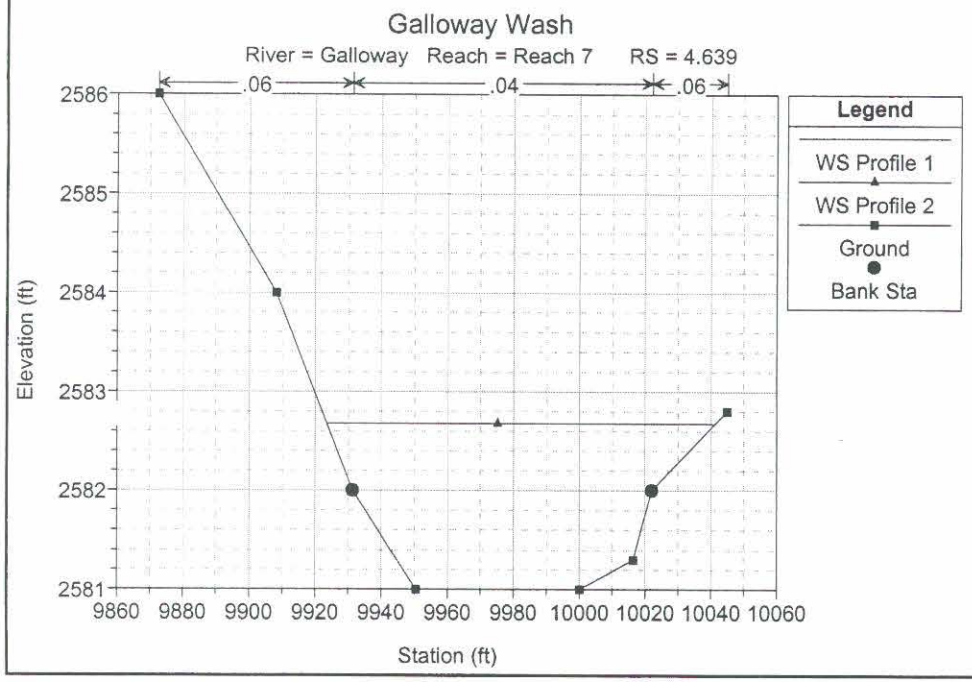

Galloway Wash
River = Galloway Reach = Reach 8 RS = 4.796
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

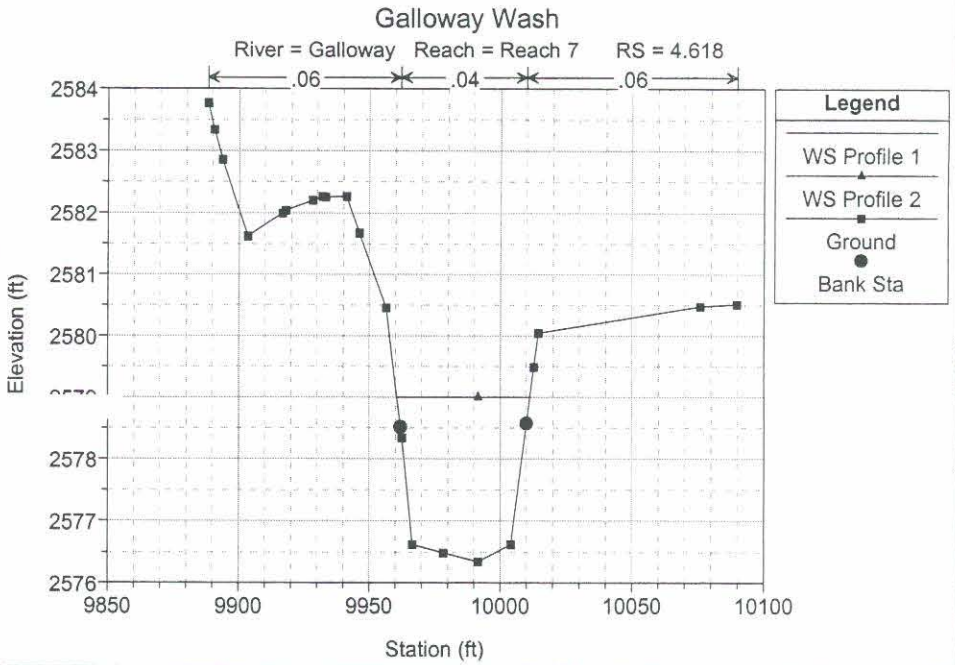

Galloway Wash
River = Galloway Reach = Reach 8 RS = 4.770
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

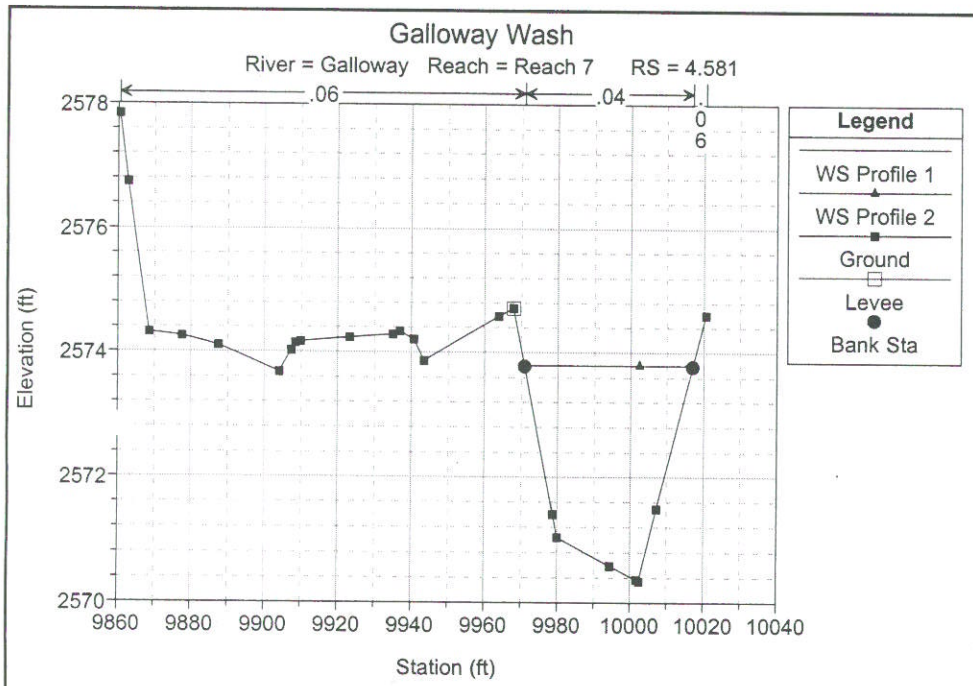

Galloway Wash
River = Galloway Reach = Reach 8 RS = 4.732
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 8 RS = 4.694
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 8 RS = 4.656
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Split 1 RS = 0.082
.06 .045 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

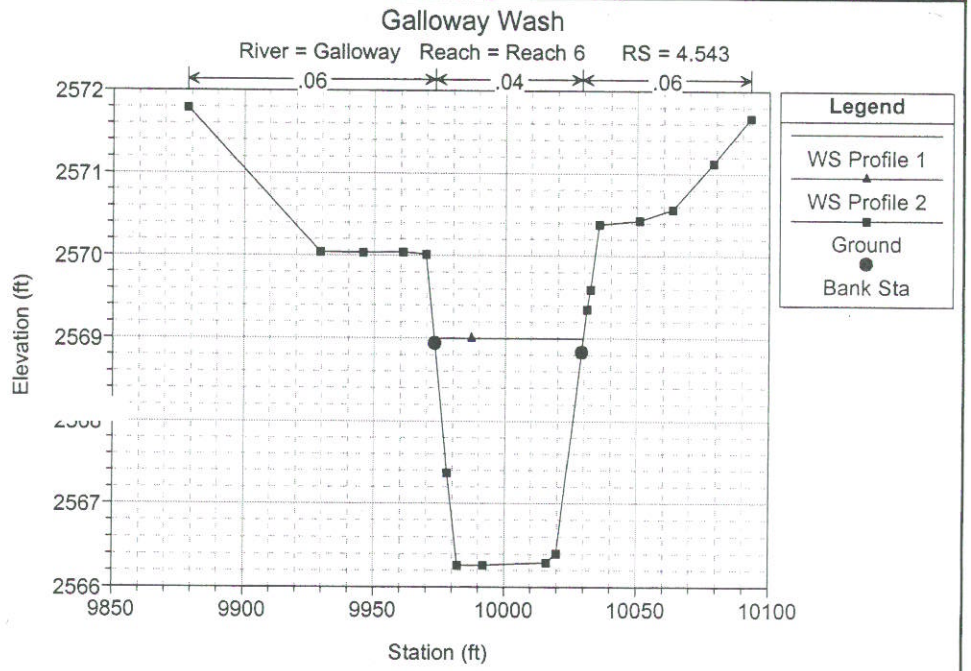

Galloway Wash
River = Galloway Reach = Split 1 RS = 0.033
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

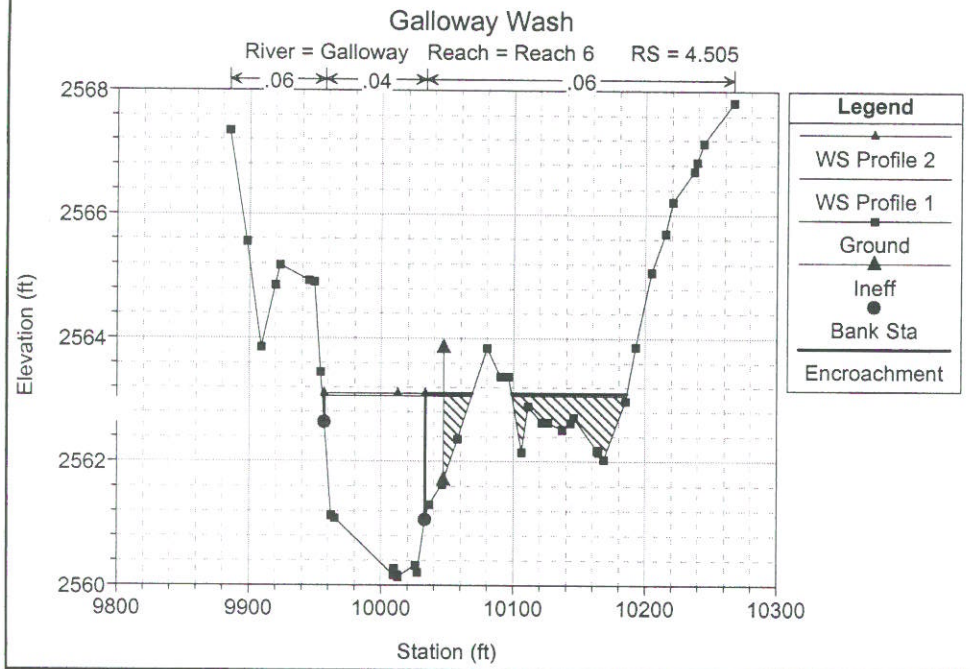

Galloway Wash
River = Galloway Reach = Split 1 RS = 0.027
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

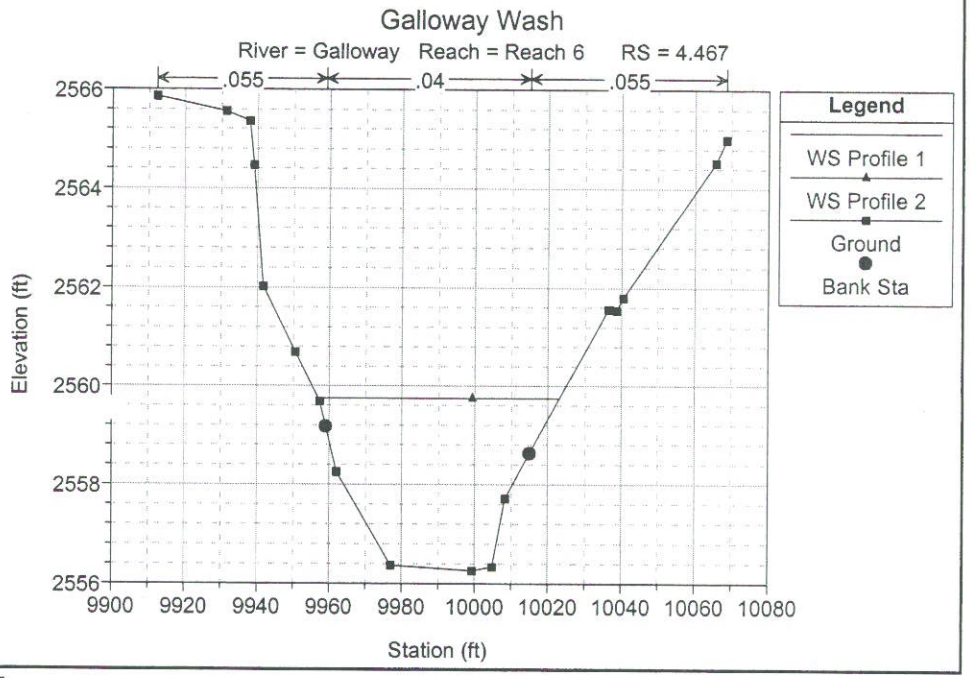

Galloway Wash
River = Galloway Reach = Reach 7 RS = 4.639
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

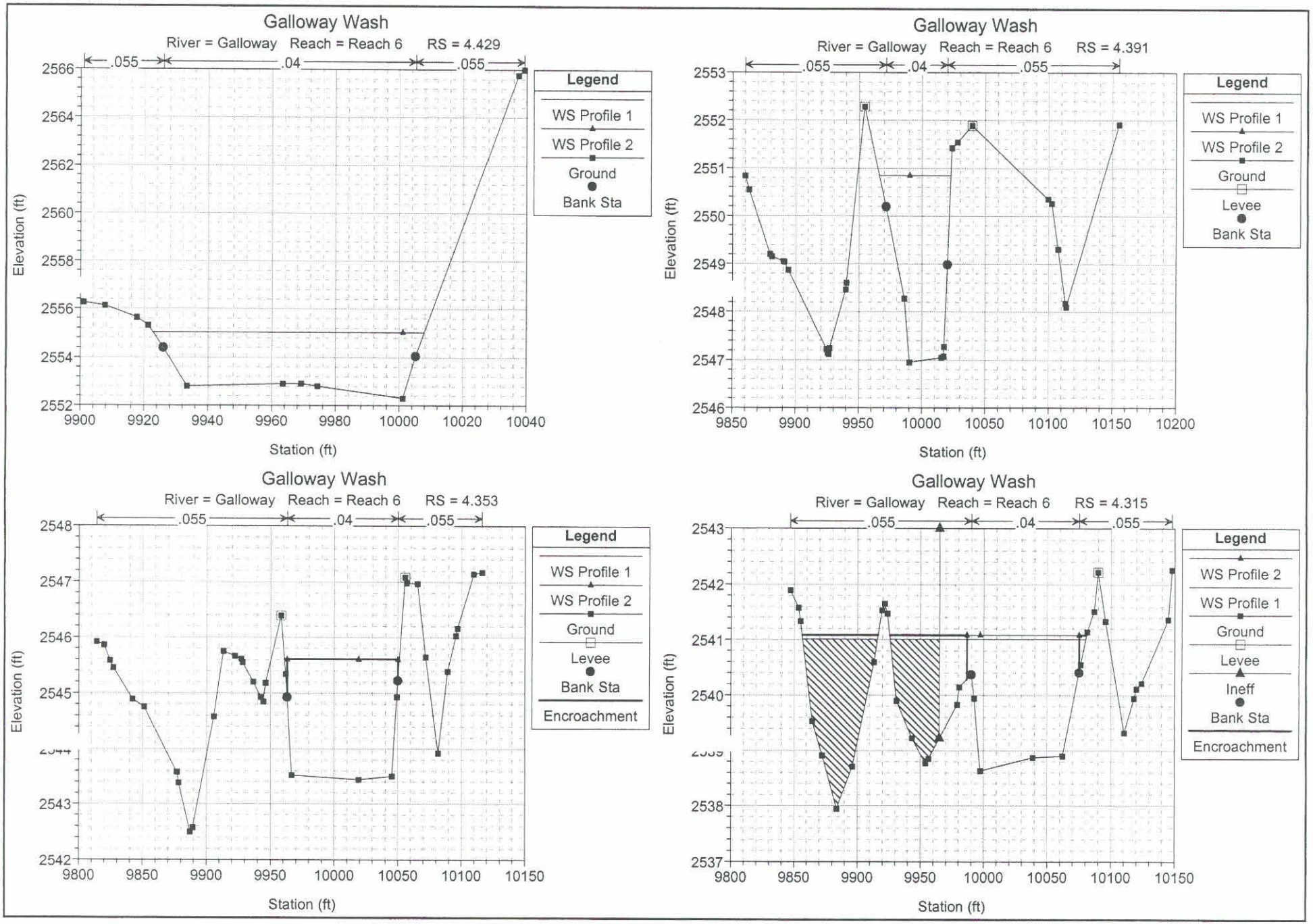

Galloway Wash
River = Galloway Reach = Reach 7 RS = 4.618
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

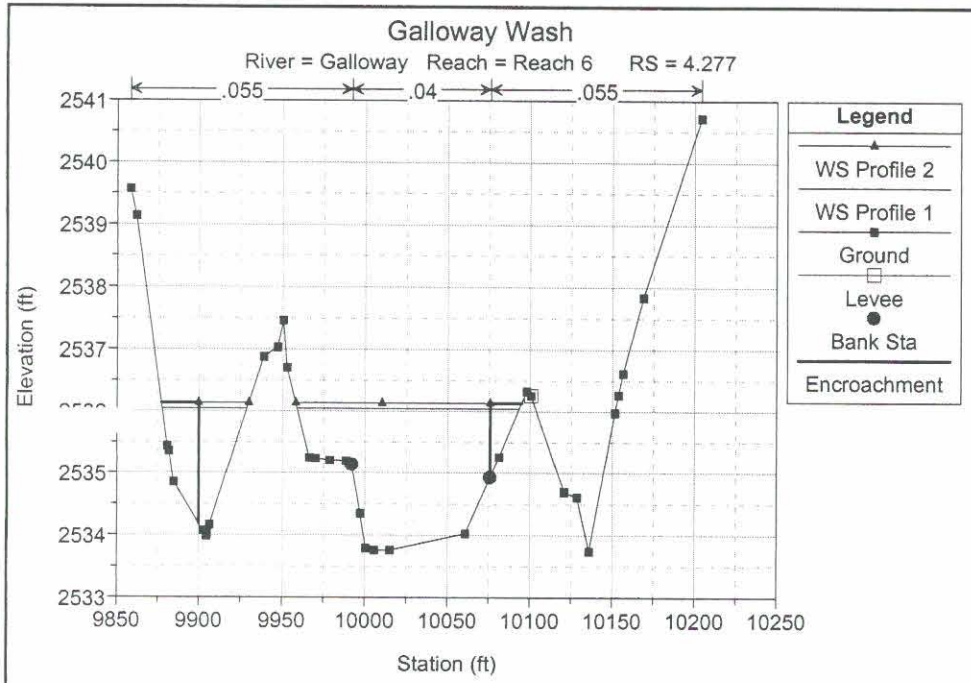

Galloway Wash
River = Galloway Reach = Reach 7 RS = 4.581
.06
.04
0
6
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta

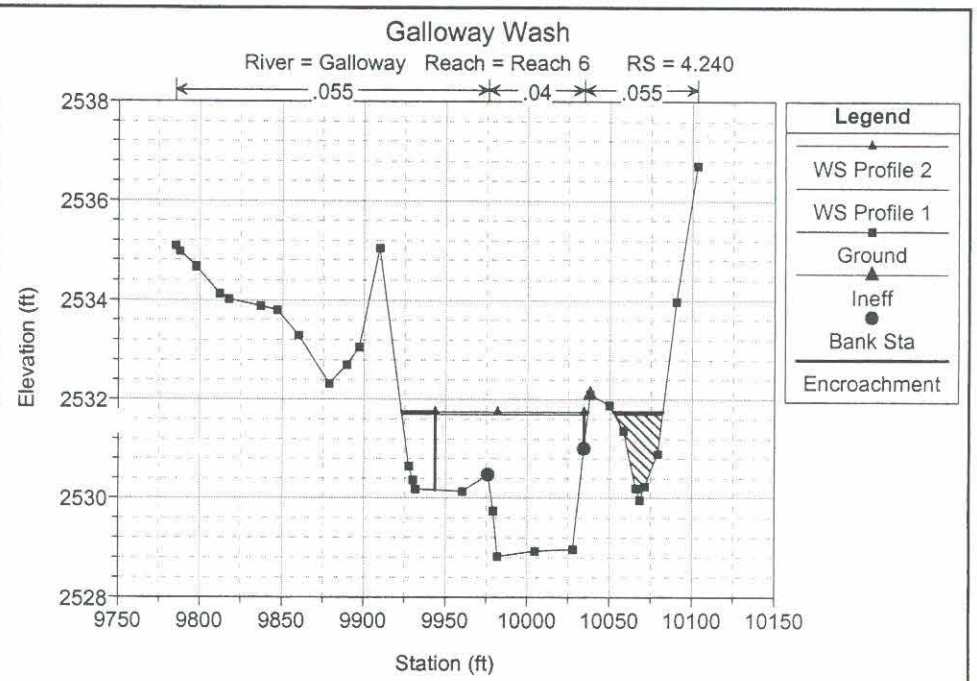

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.543
.06
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

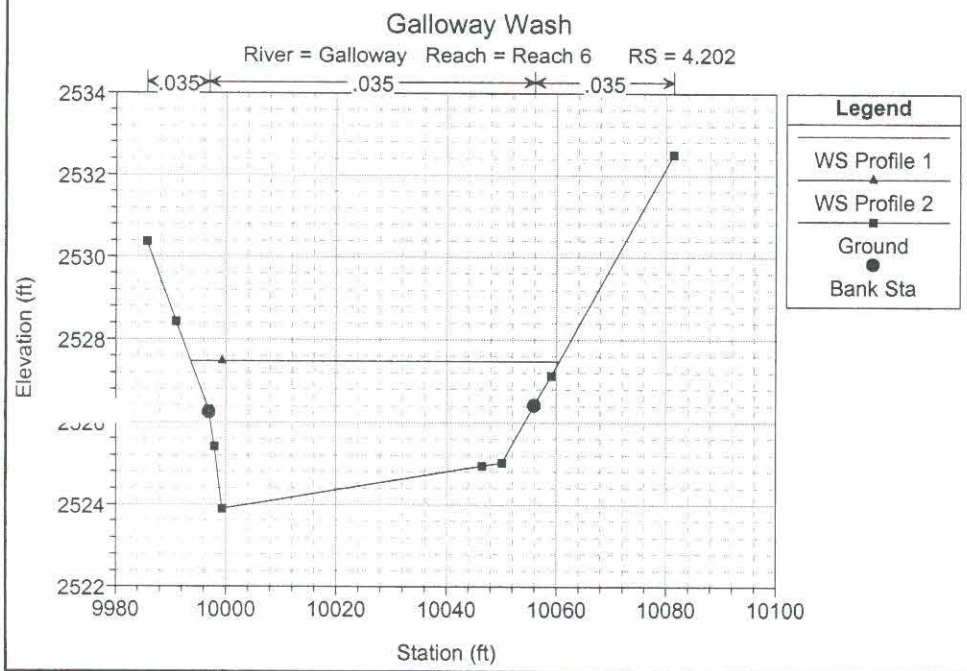

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.505
.06
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment

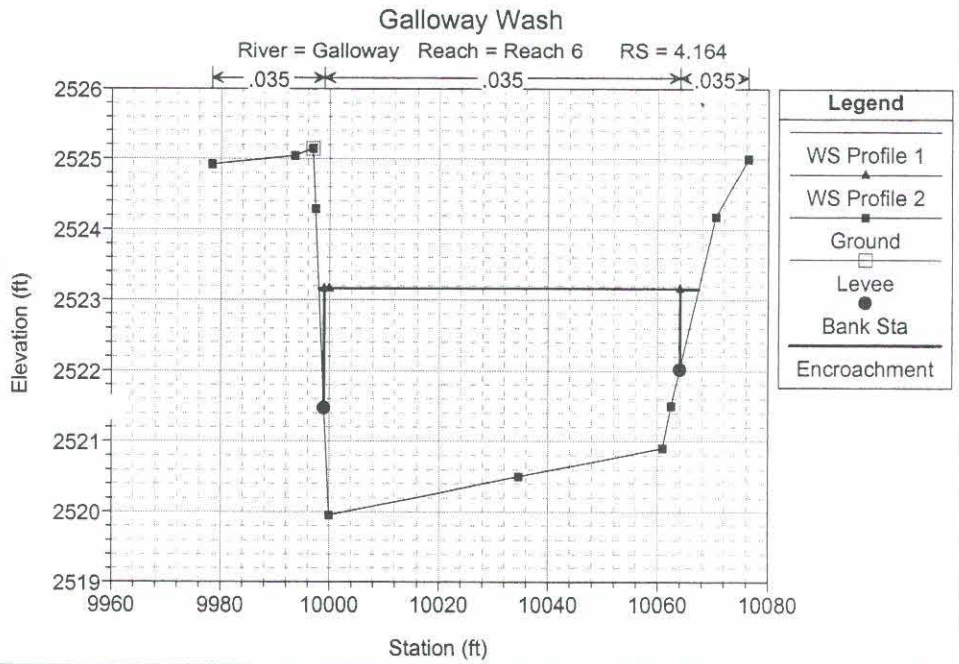

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.467
.055
.04
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

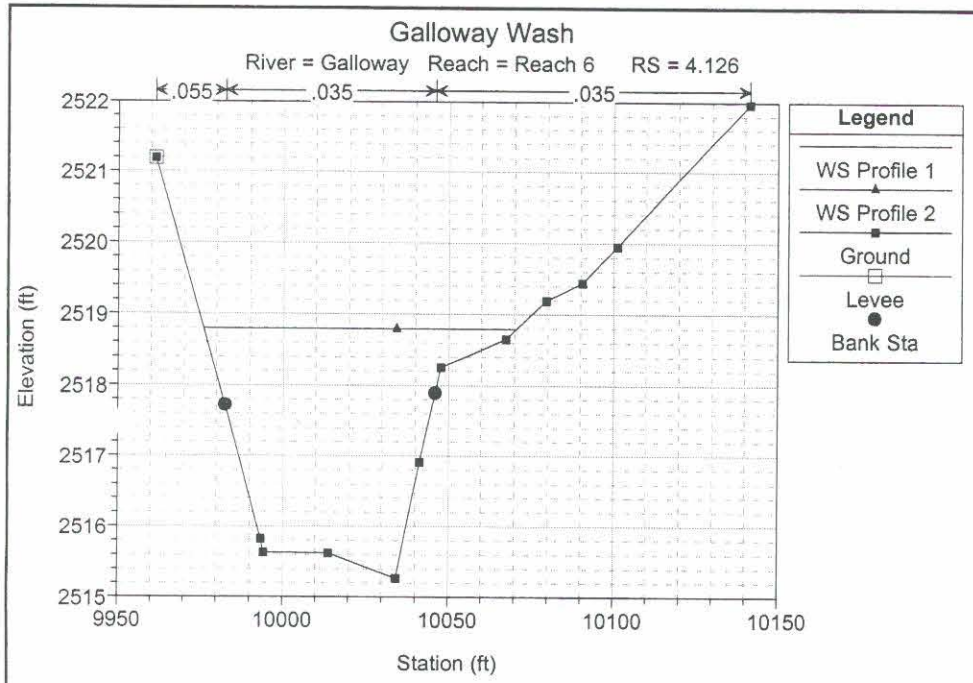

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.429
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.391
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.353
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.315
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Levee
Ineff
Bank Sta
Encroachment

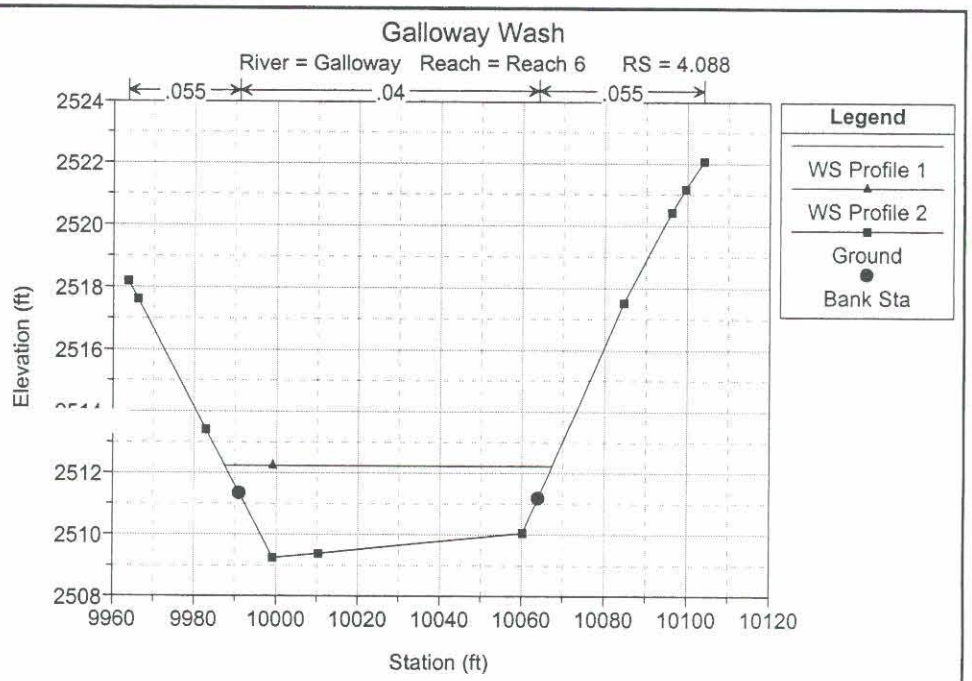

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.277
.055
.04
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Levee
Bank Sta
Encroachment

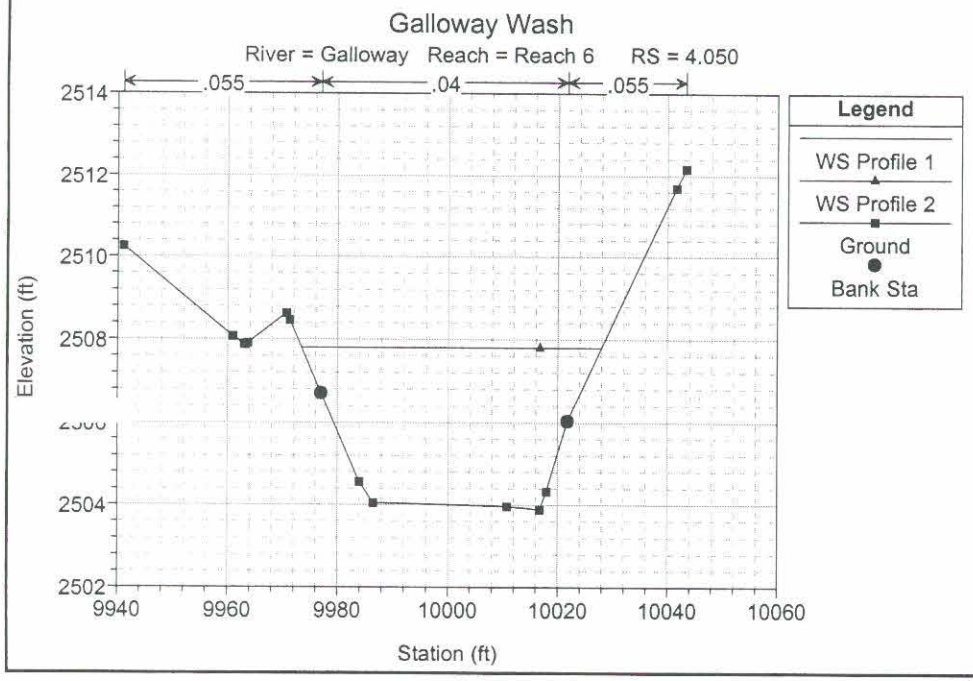

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.240
.055
.04
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment

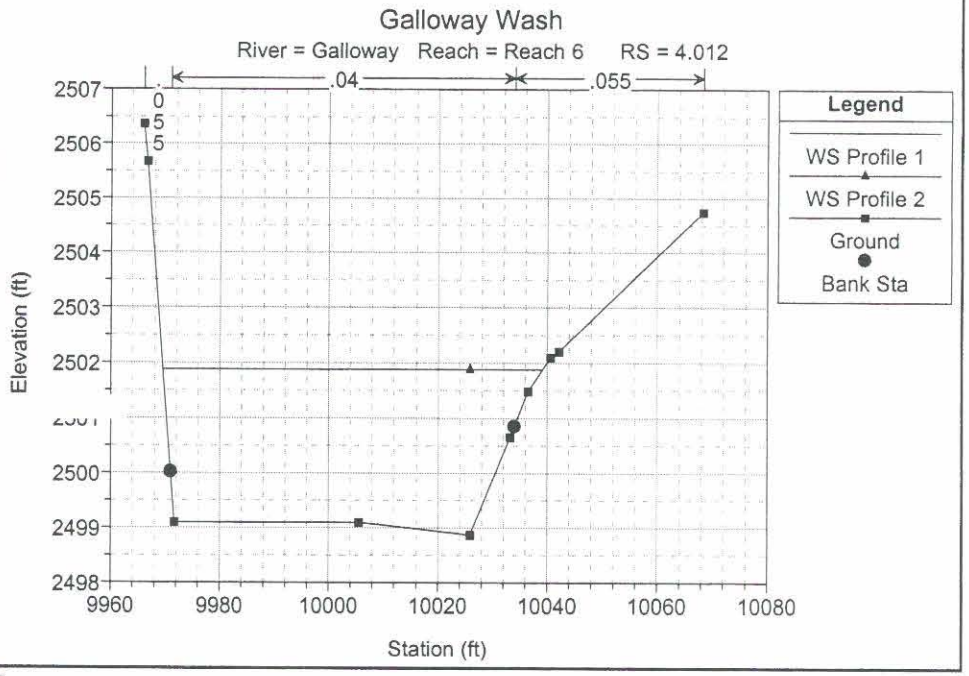

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.202
.035
.035
.035
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

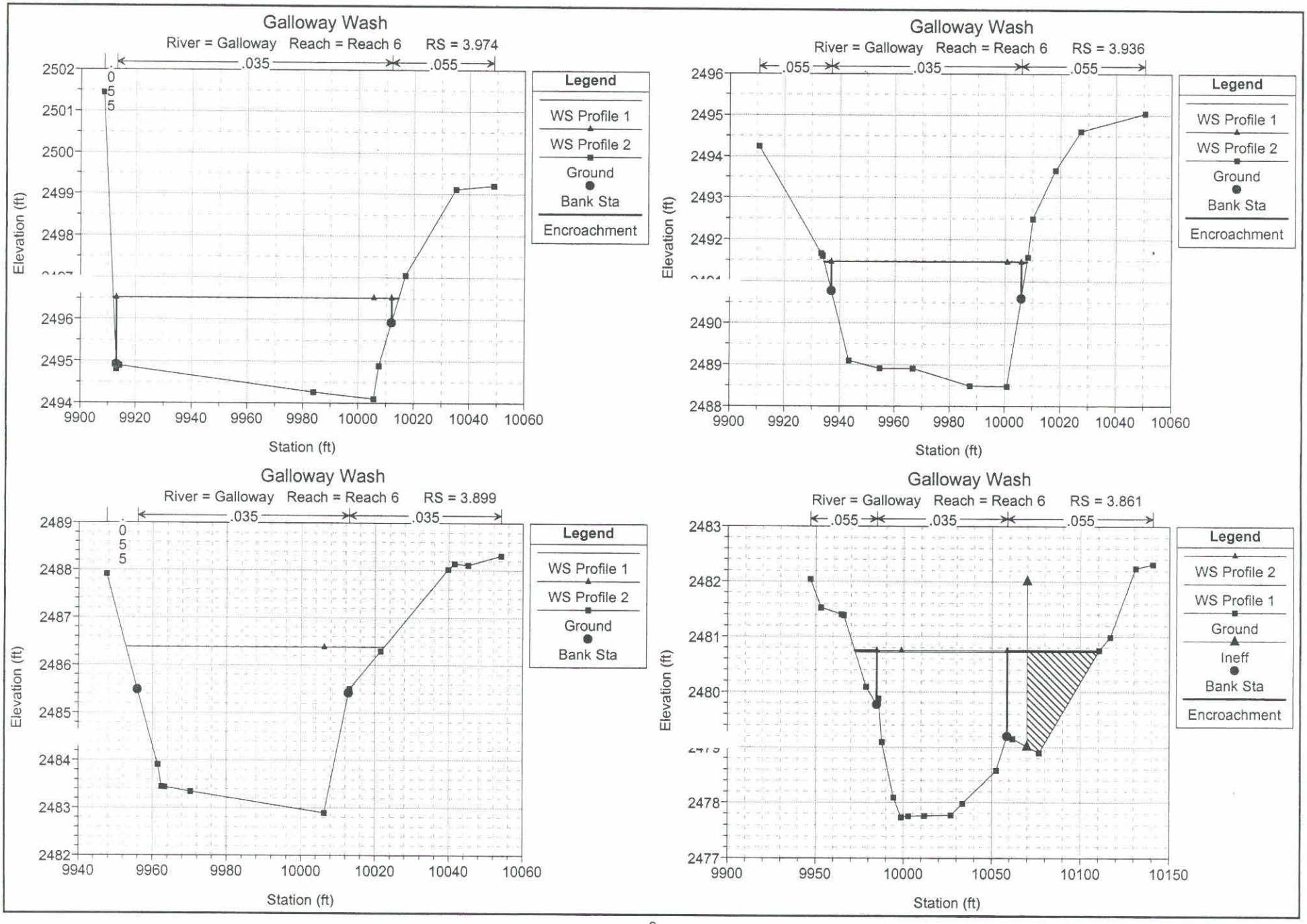

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.164
.035
.035
.035
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Encroachment

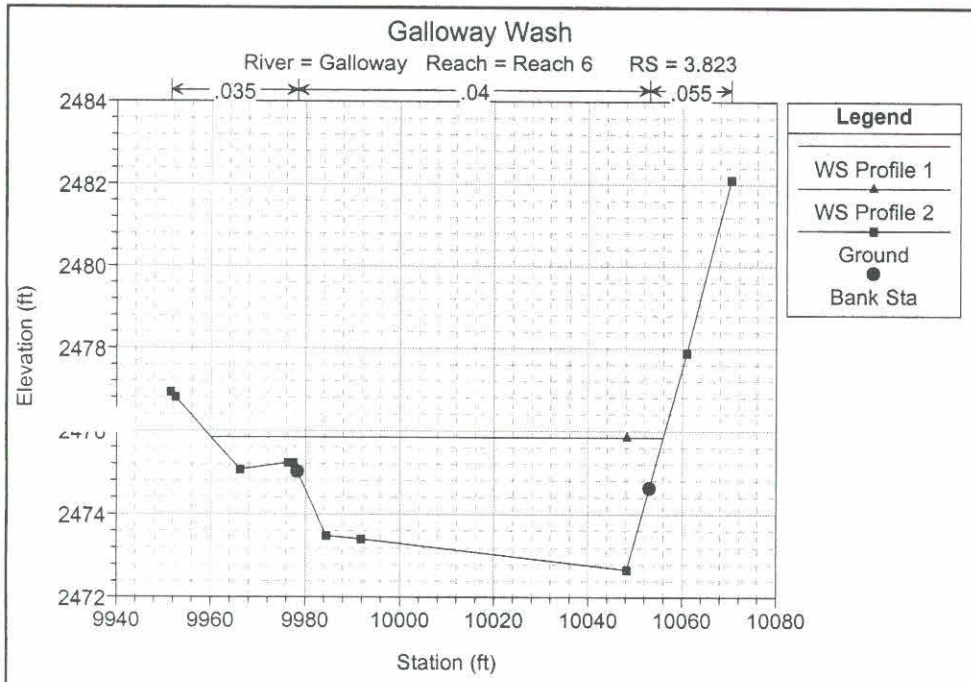

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.126
.055
.035
.035
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

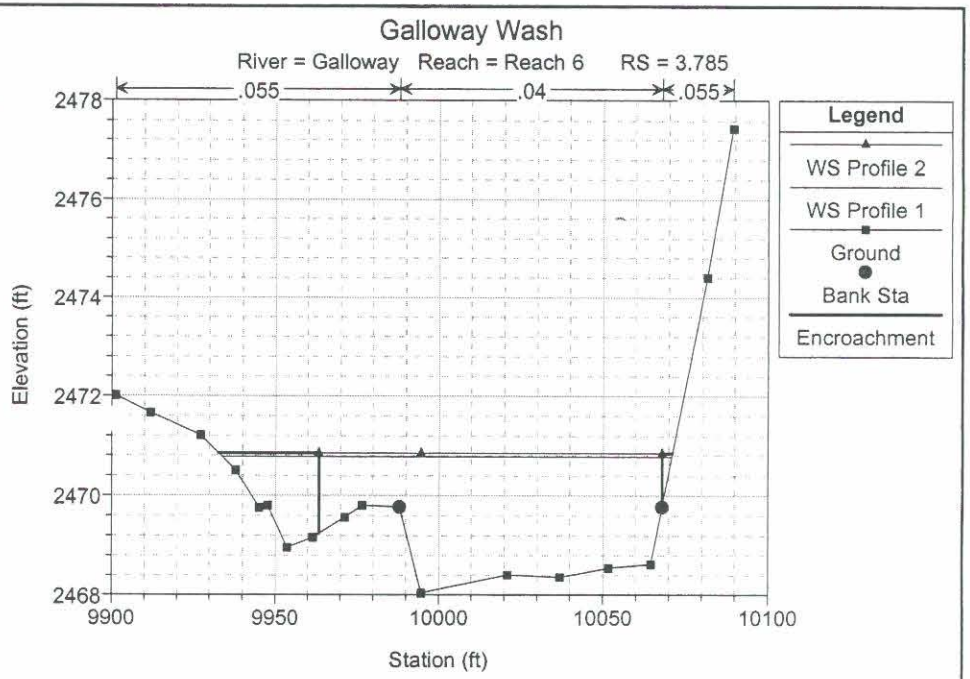

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.088
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

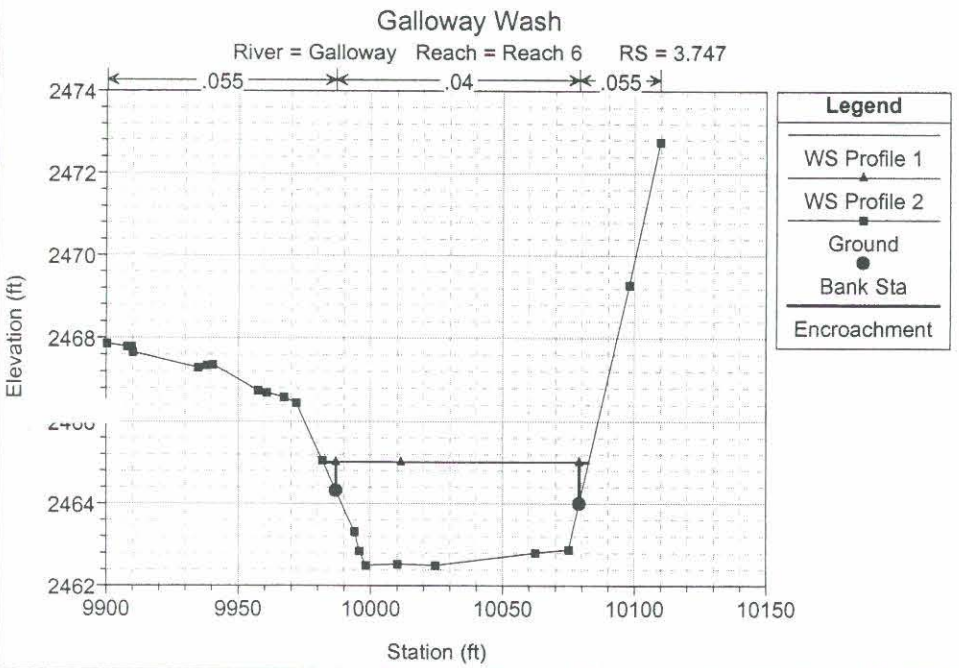

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.050
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

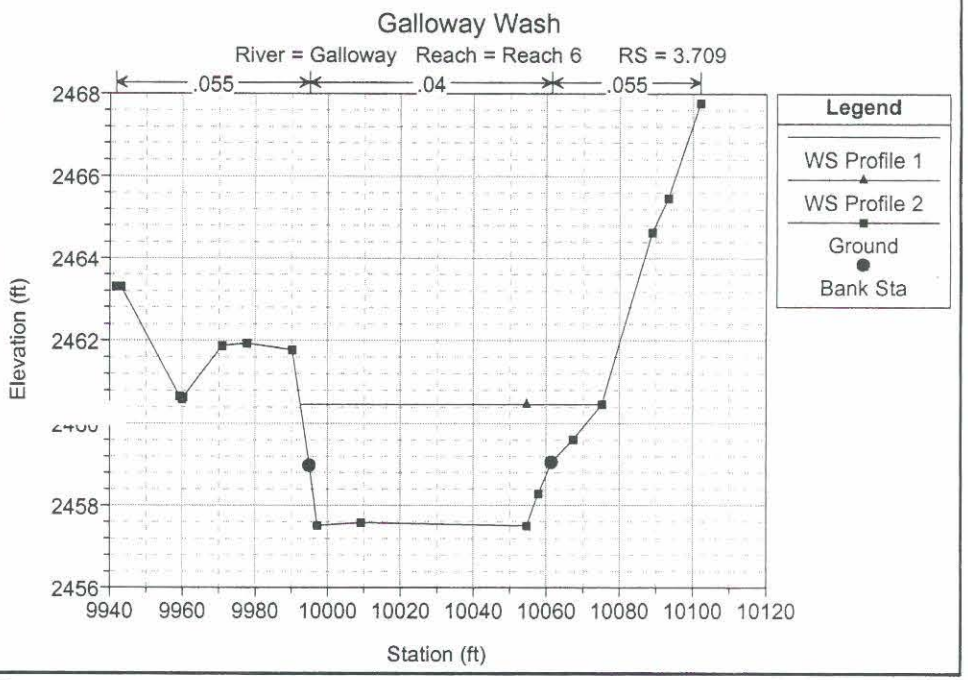

Galloway Wash
River = Galloway Reach = Reach 6 RS = 4.012
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

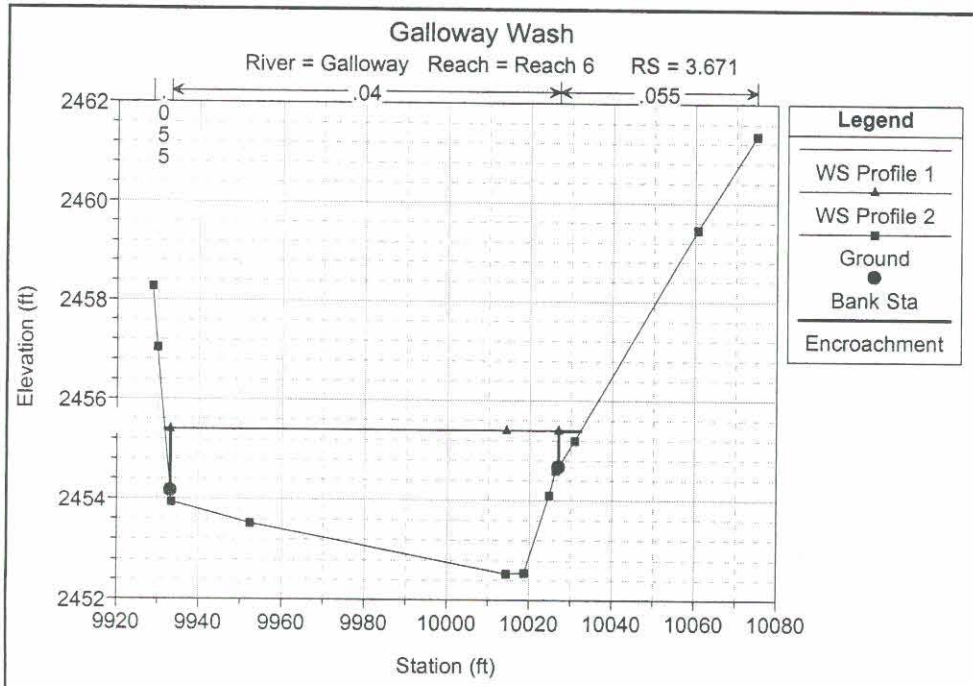

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.974
.035
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.936
.055
.035
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.899
.035
.035
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.861
.055
.035
.055
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

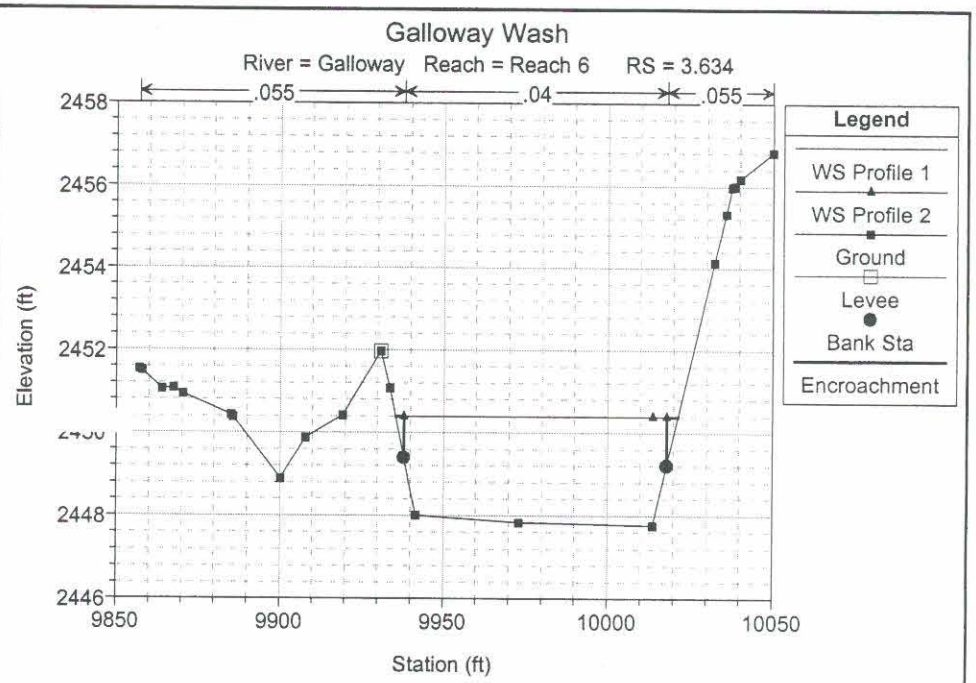

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.823
.035
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

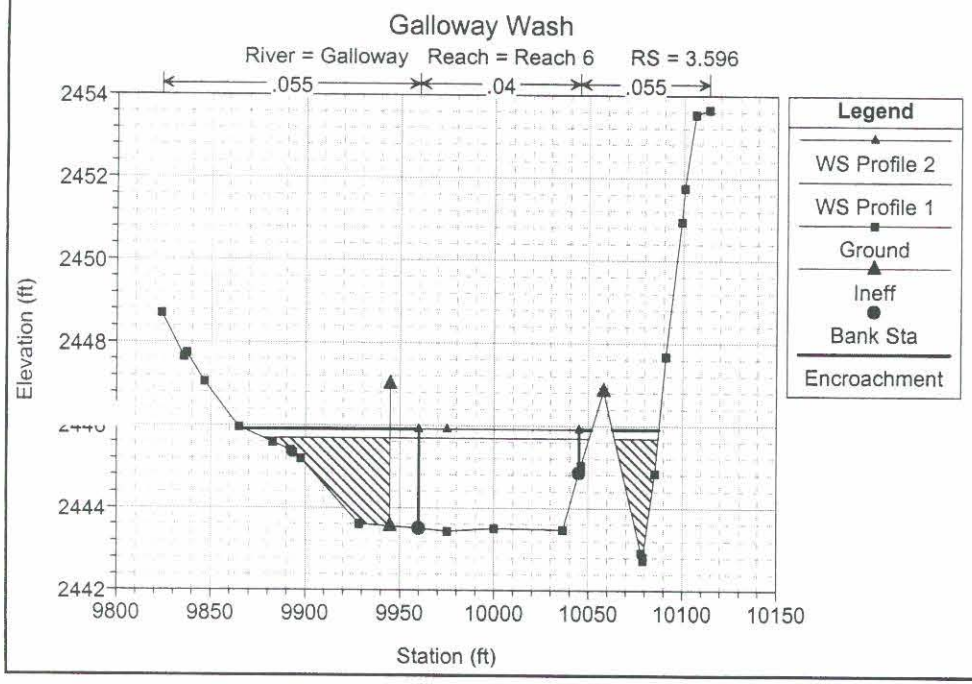

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.785
.055
.04
.055
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

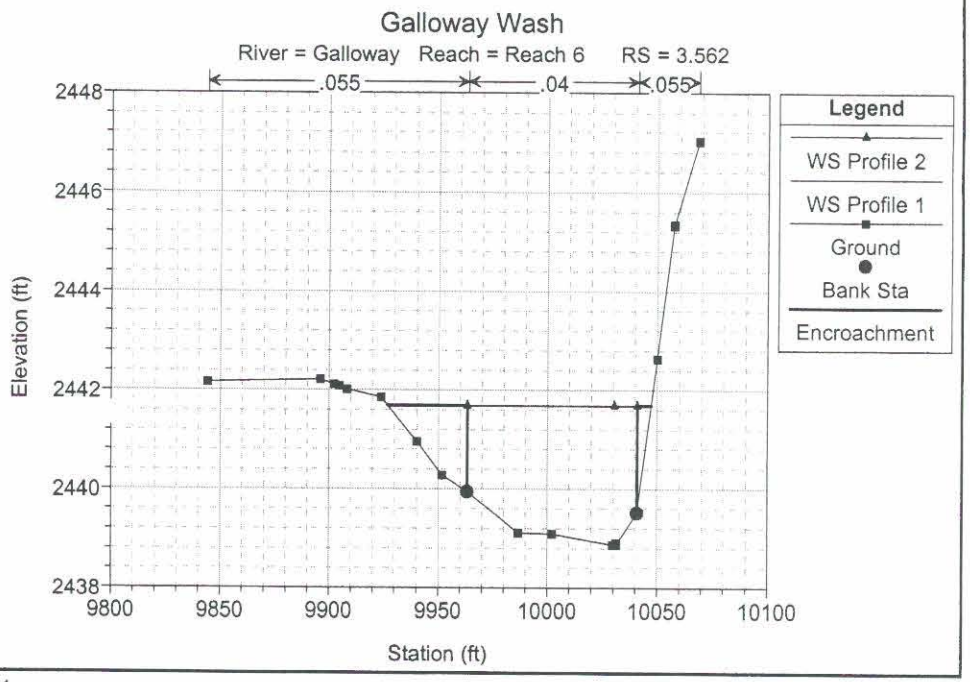

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.747
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

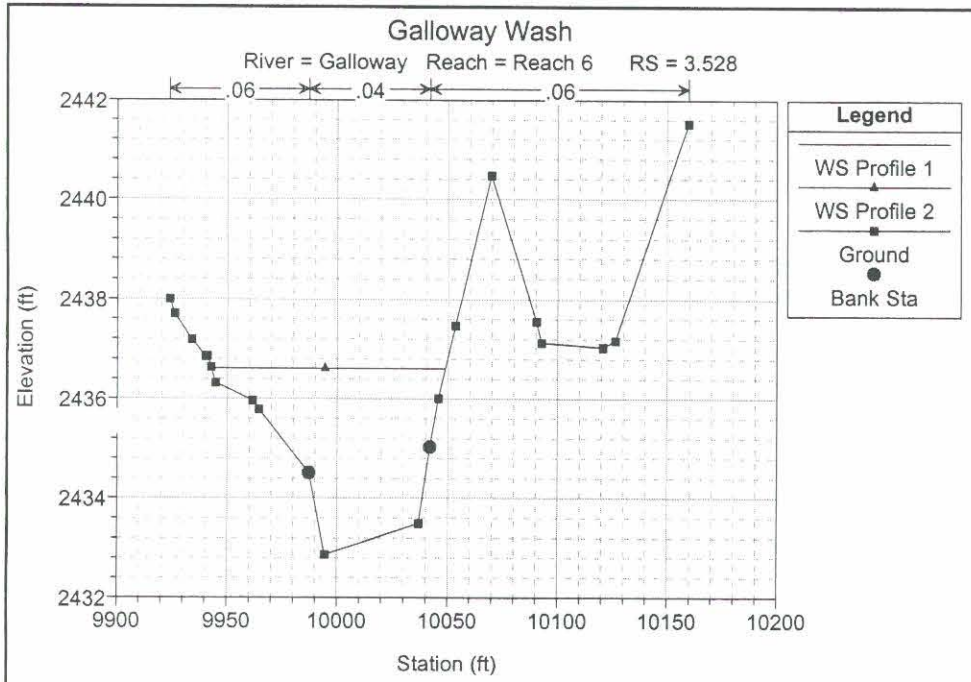

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.709
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

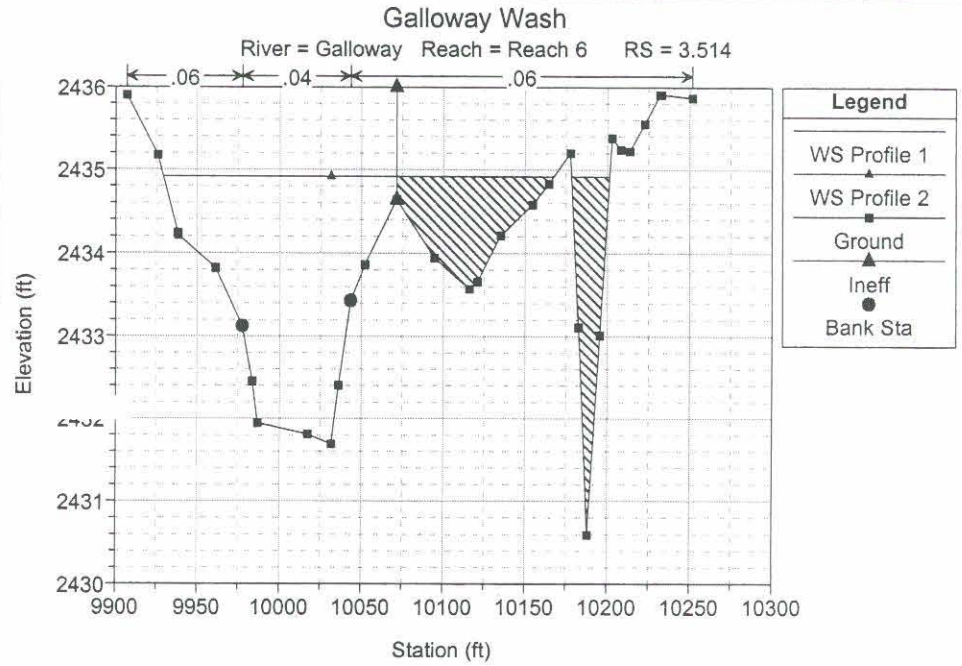

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.671
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

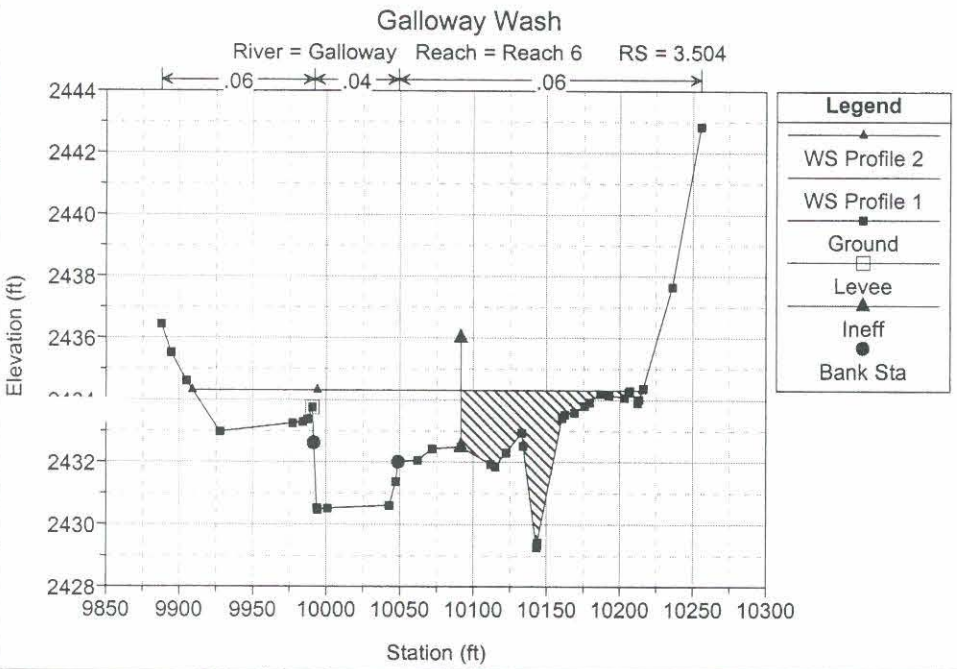

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.634
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

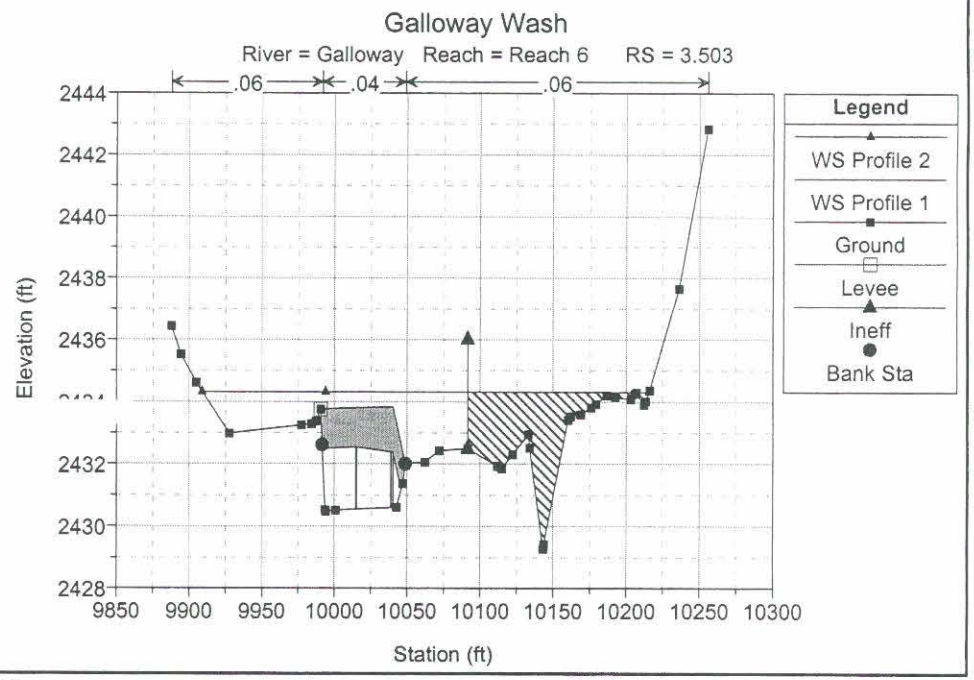

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.596
.055
.04
.055
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

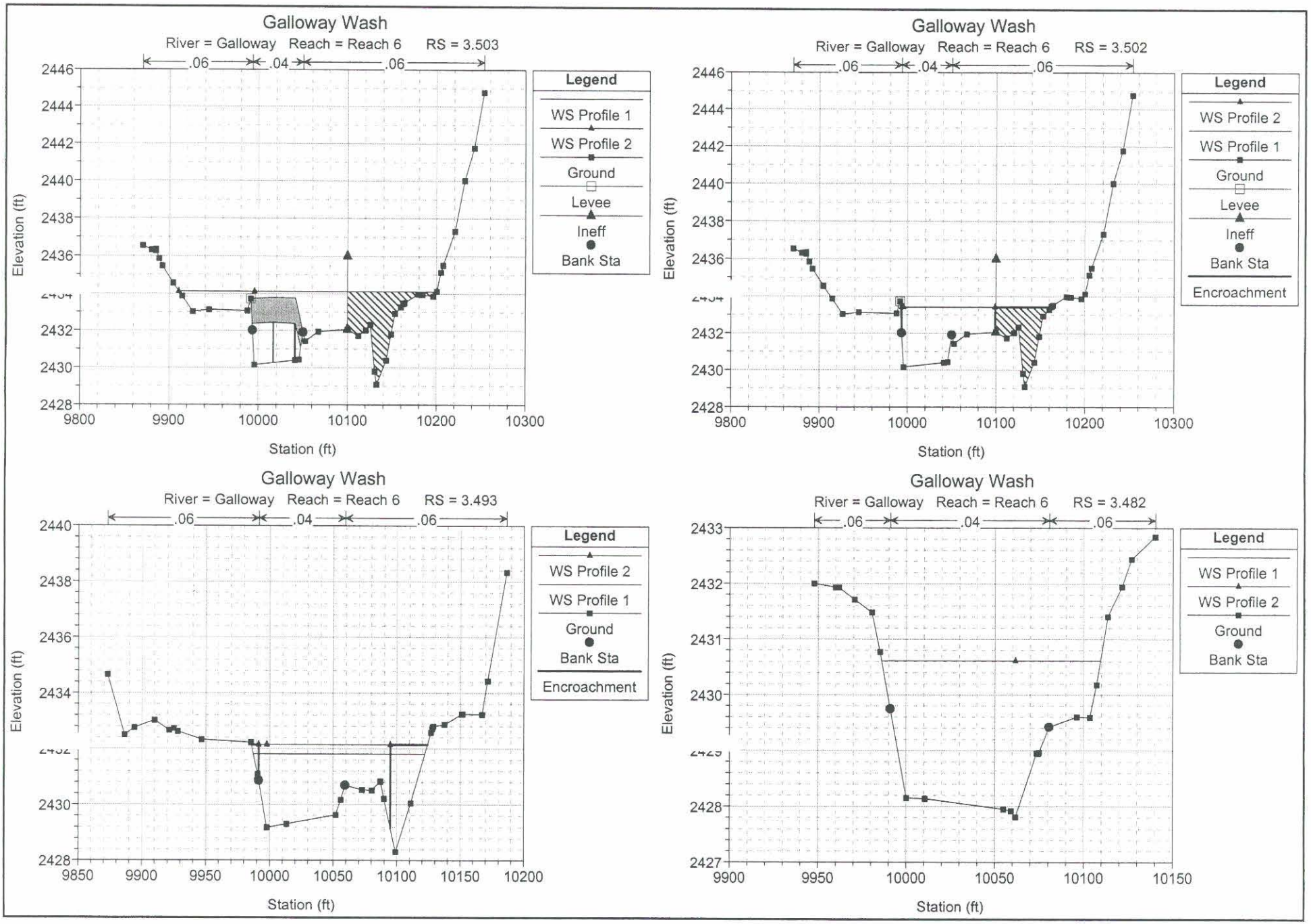

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.562
.055
.04
.055
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

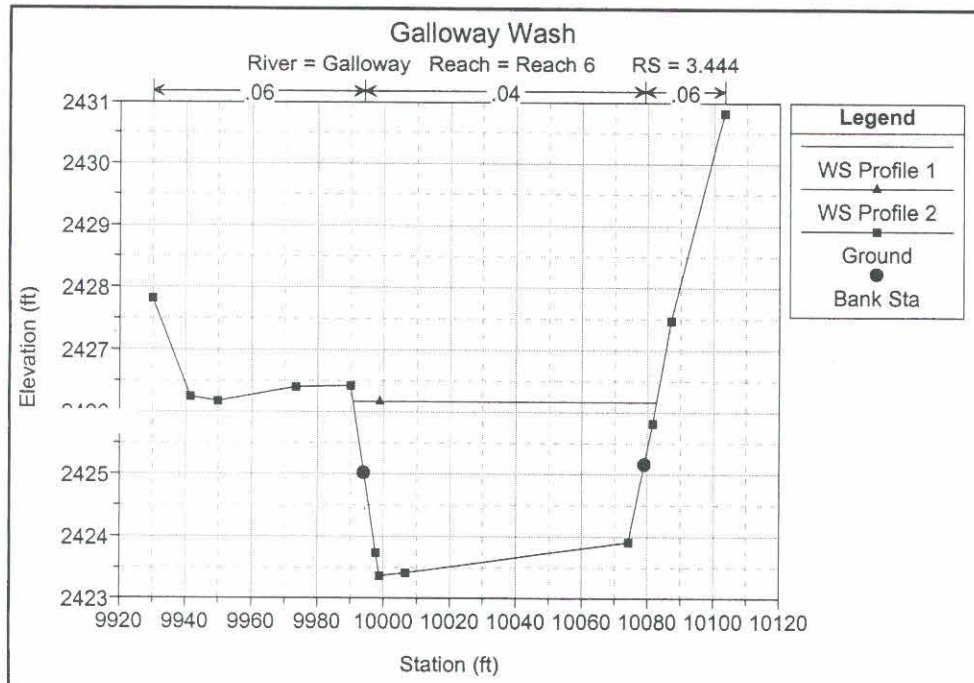

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.528
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

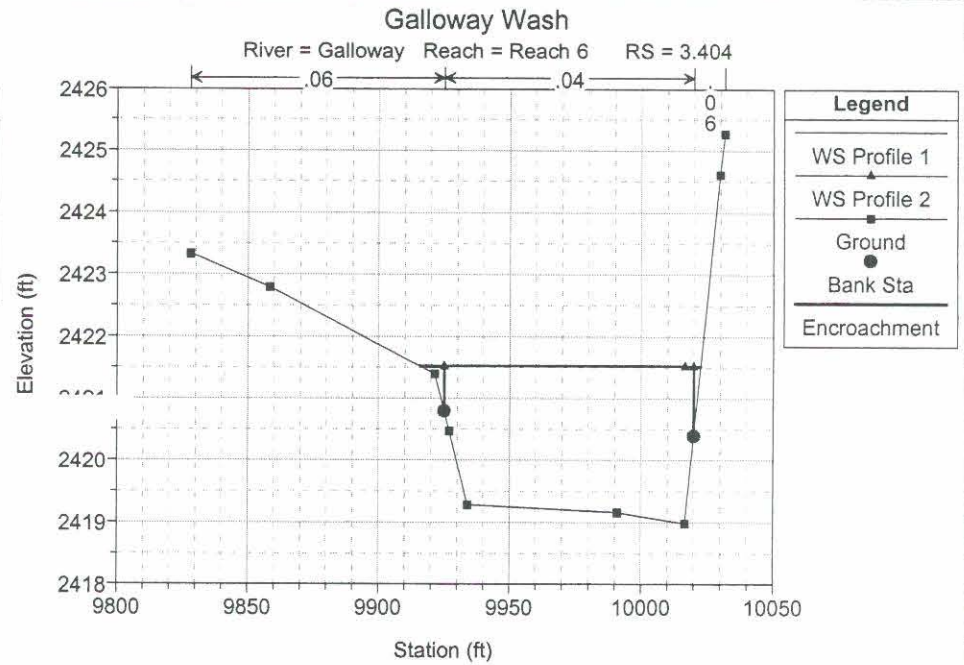

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.514
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

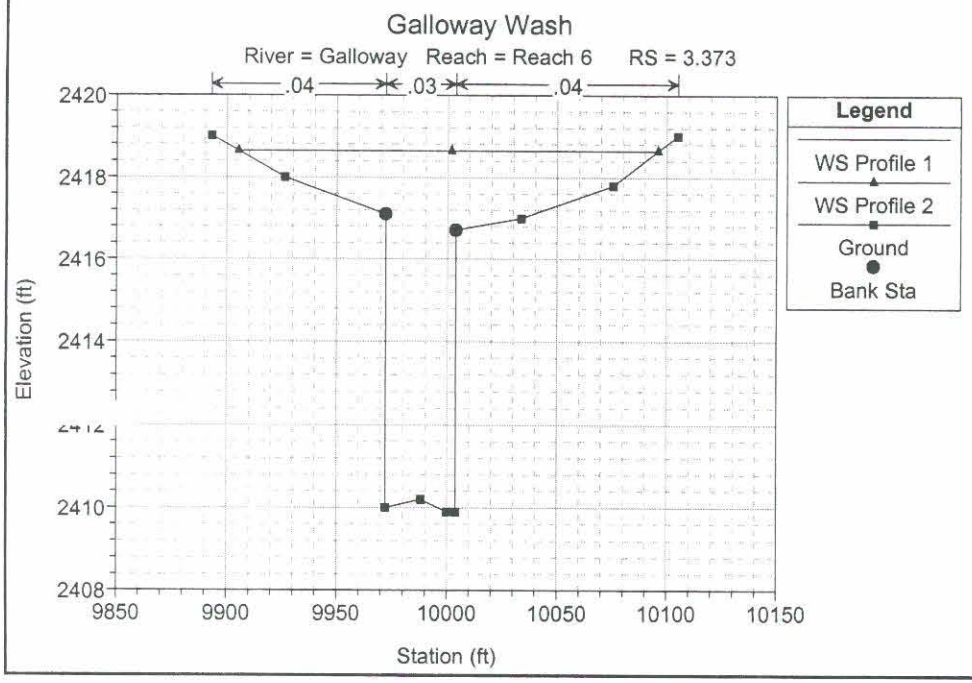

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.504
.06
.04
.06
Legend
WS Profile 2
WS Profile 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

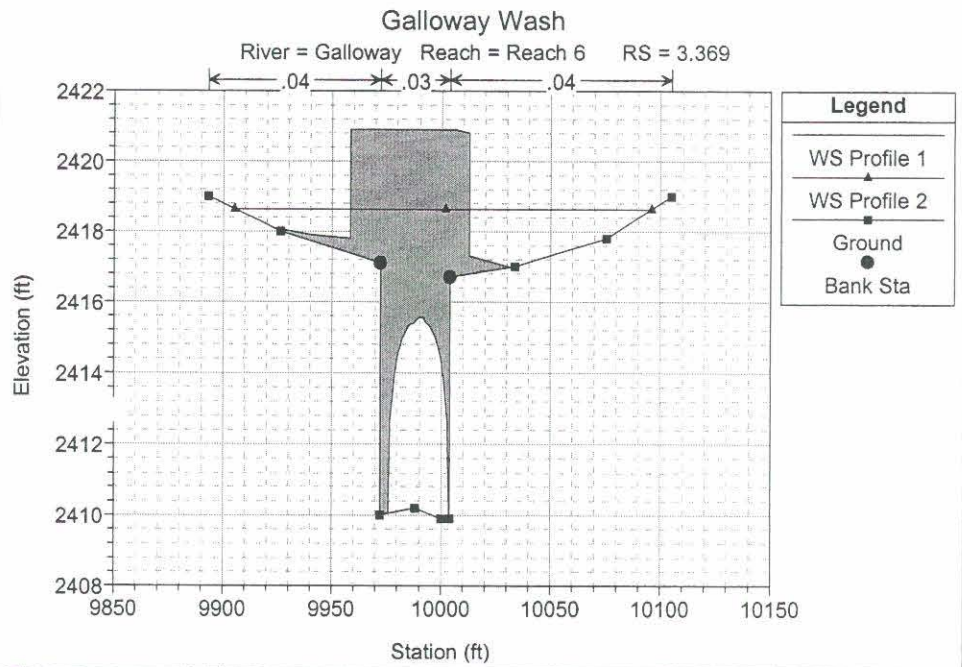

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.503
.06
.04
.06
Legend
WS Profile 2
WS Profile 1
Ground
Levee
Ineff
Bank Sta
Elevation (ft)
Station (ft)

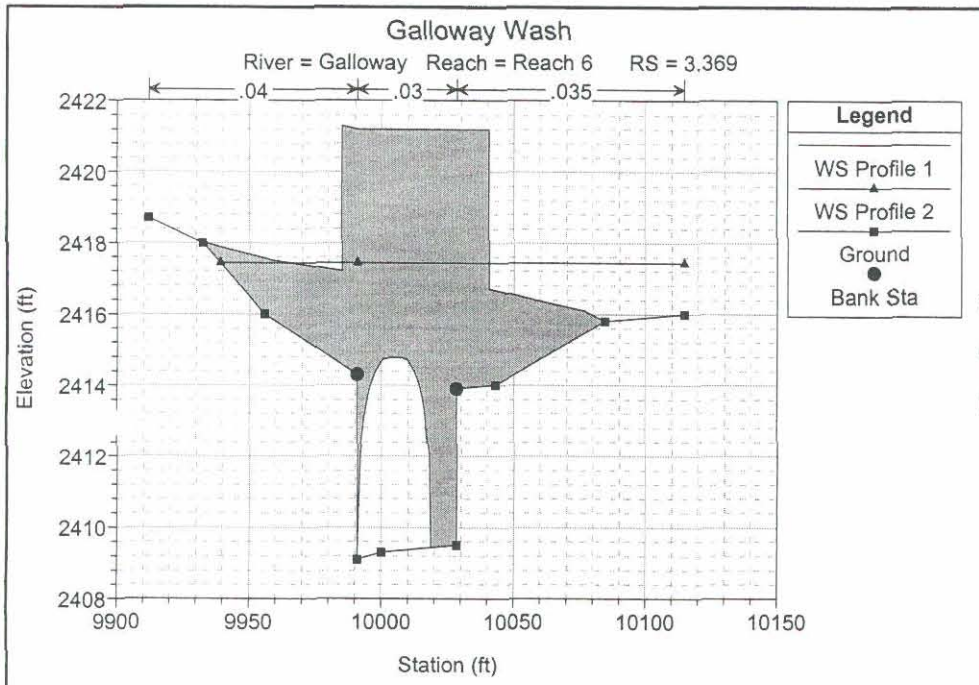

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.503
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Ineff
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.502
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Levee
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.493
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.482
.06 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

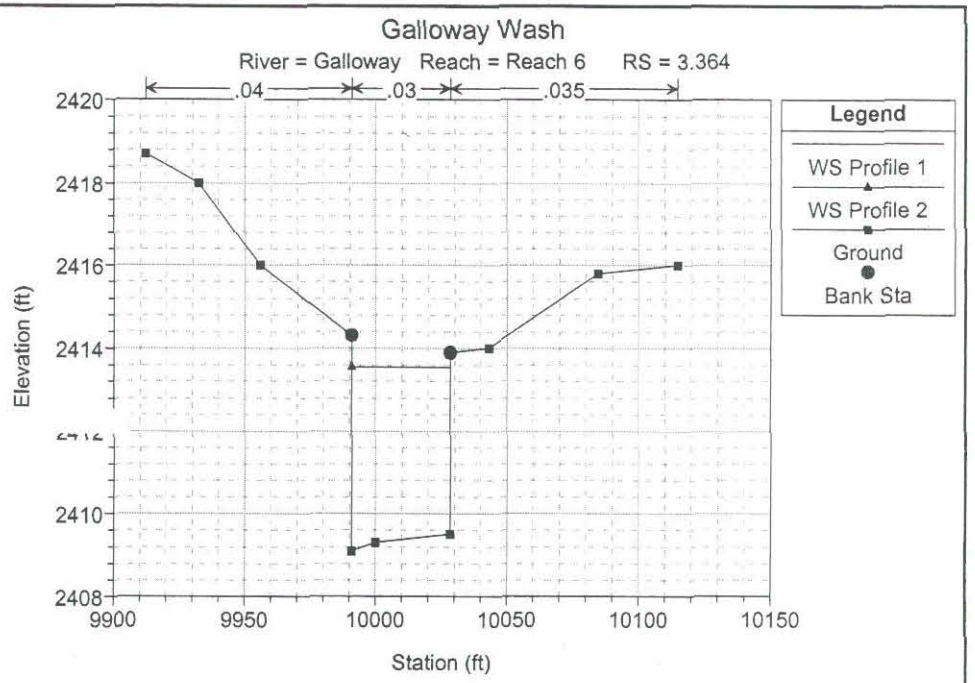

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.444
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

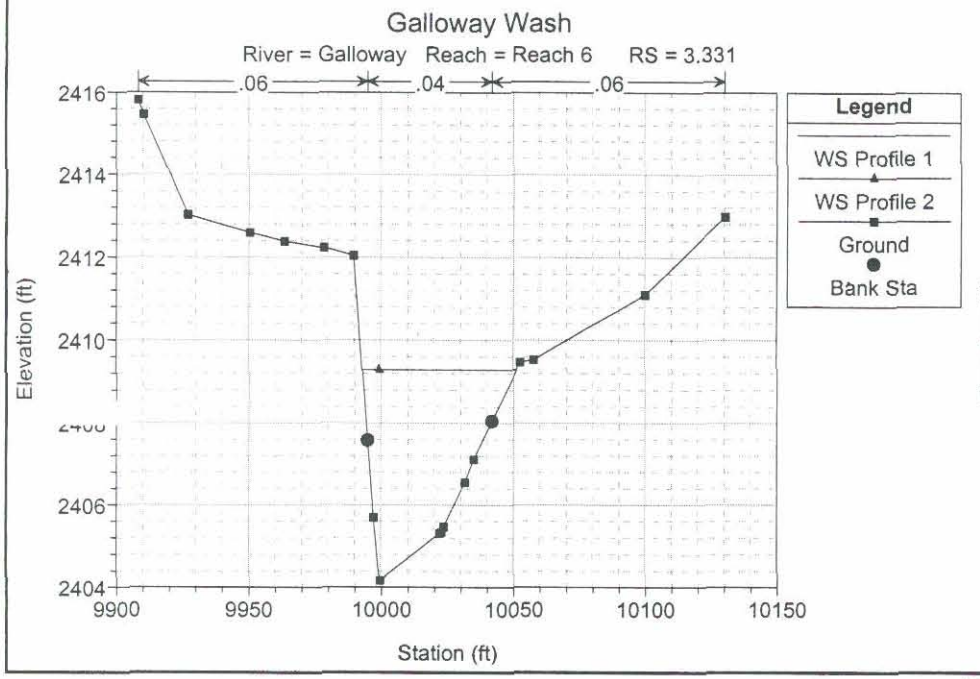

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.404
.06
.04
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

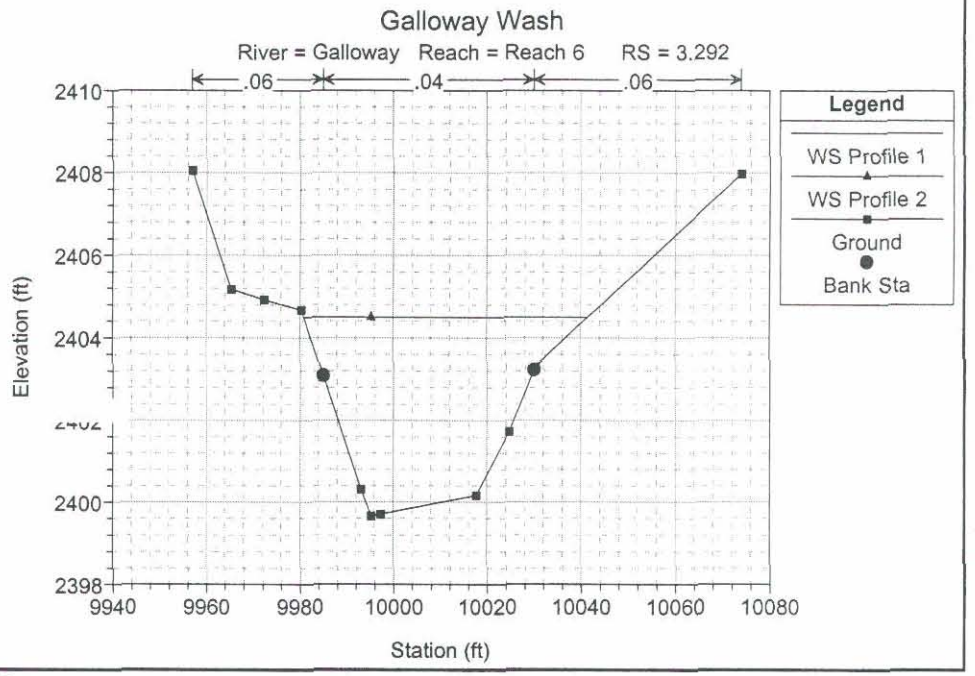

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.373
.04
.03
.04
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

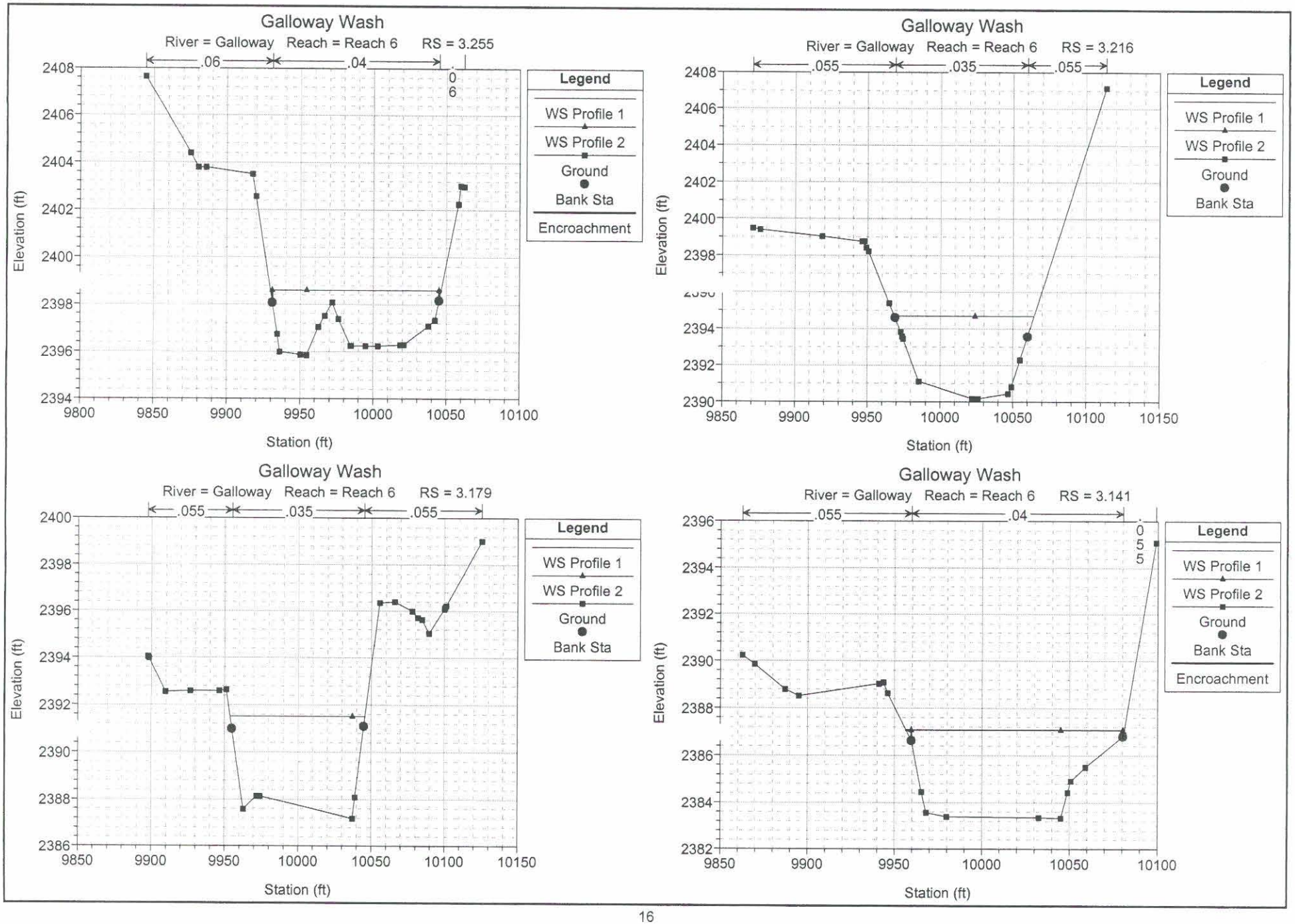

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.369
.04
.03
.04
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

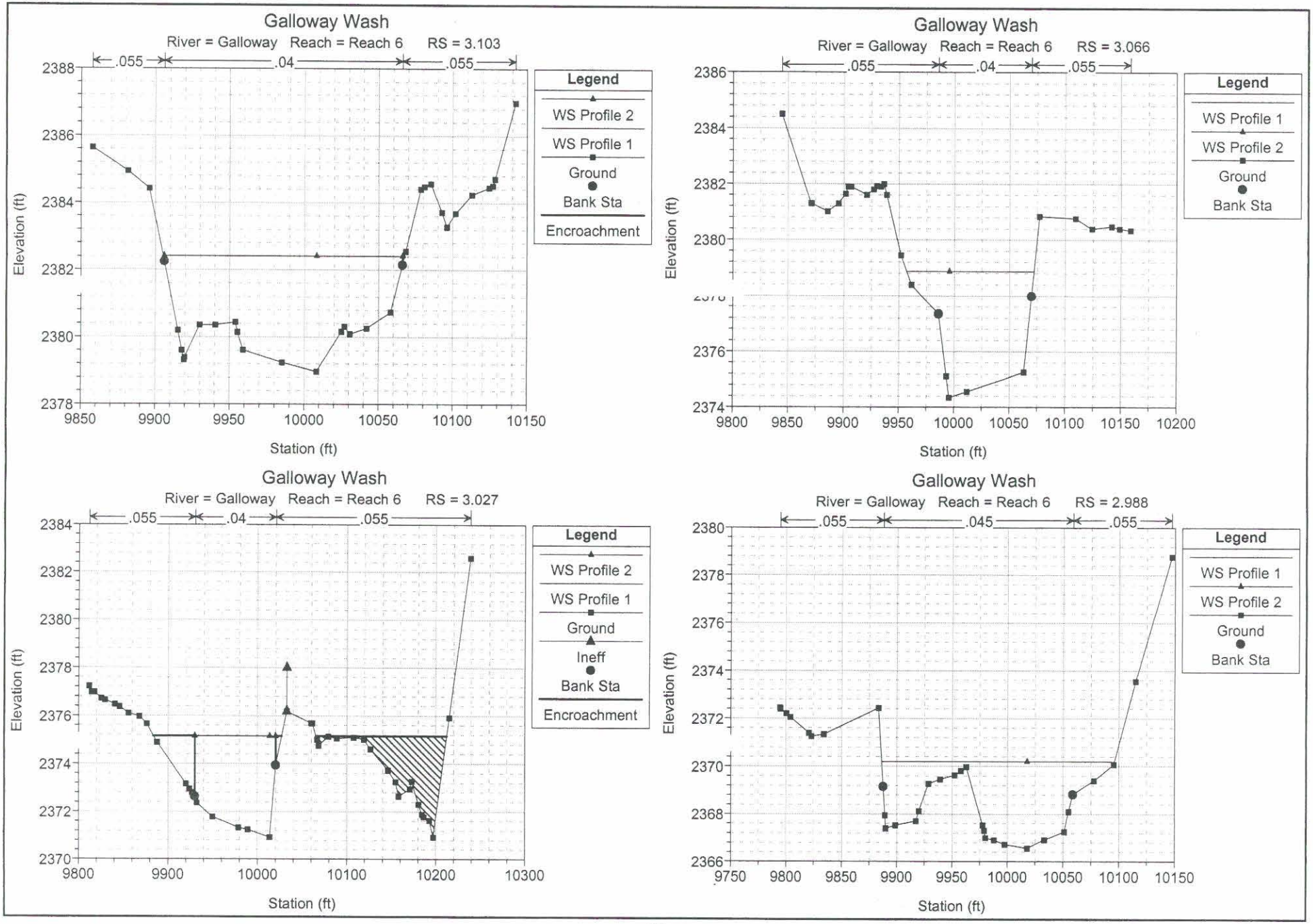

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.369
.04
.03
.035
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

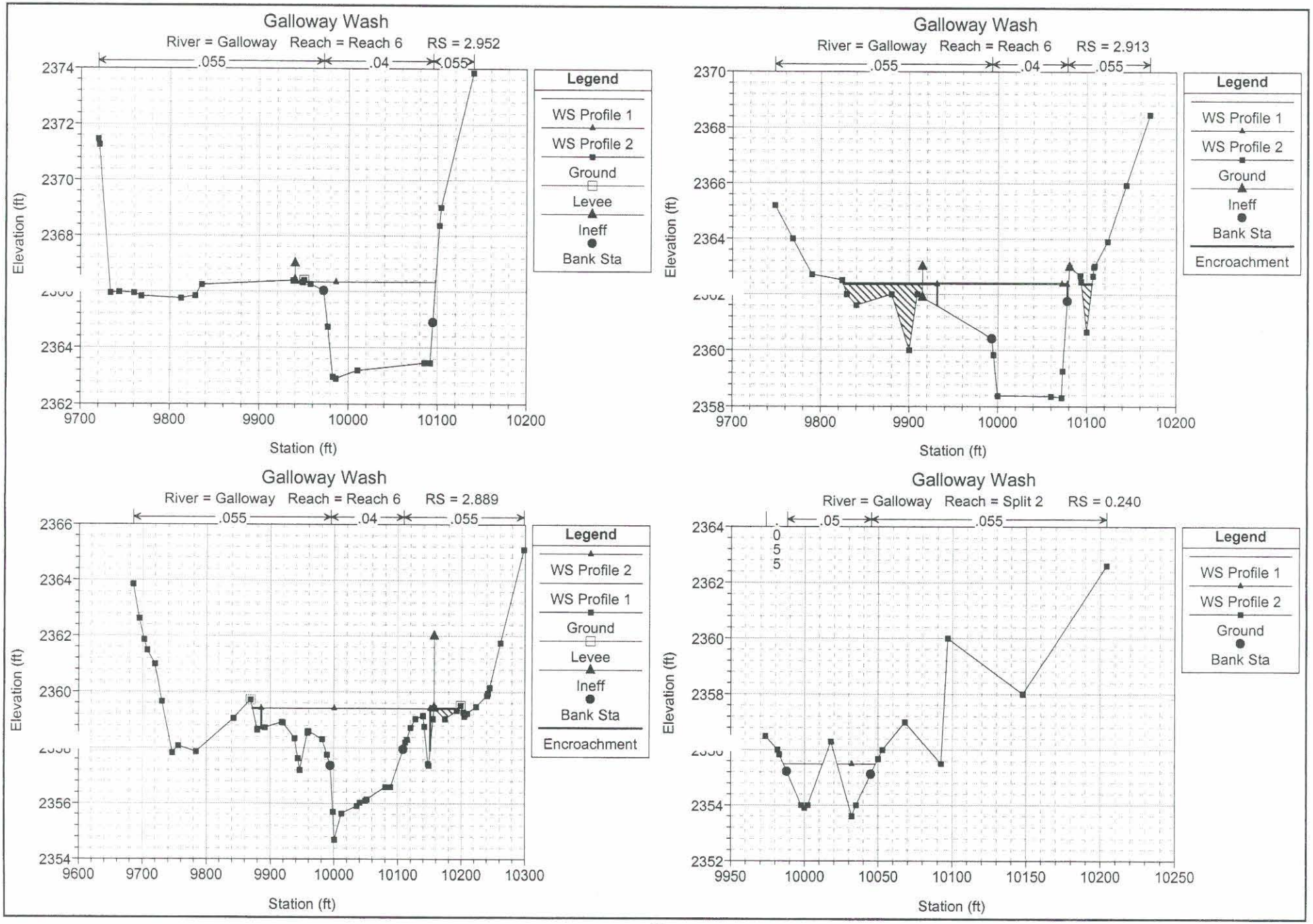

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.364
.04
.03
.035
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

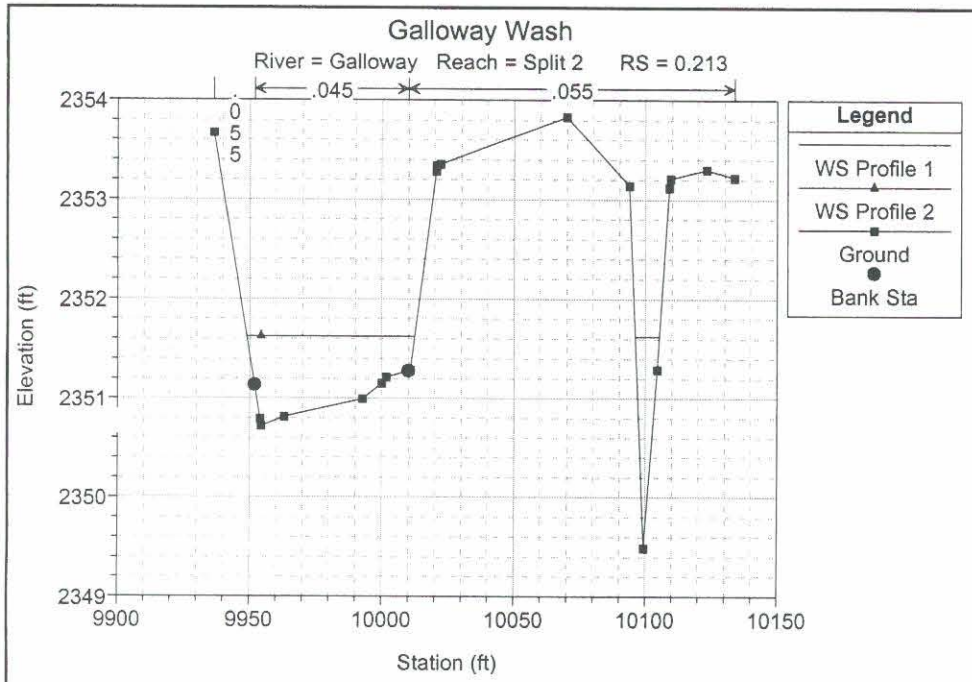

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.331
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

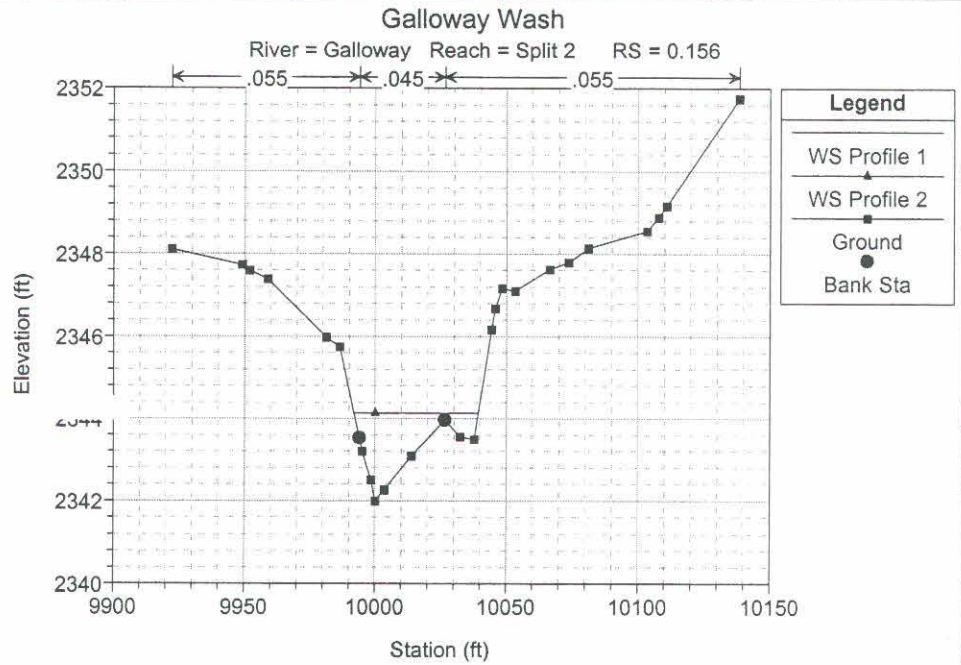

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.292
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

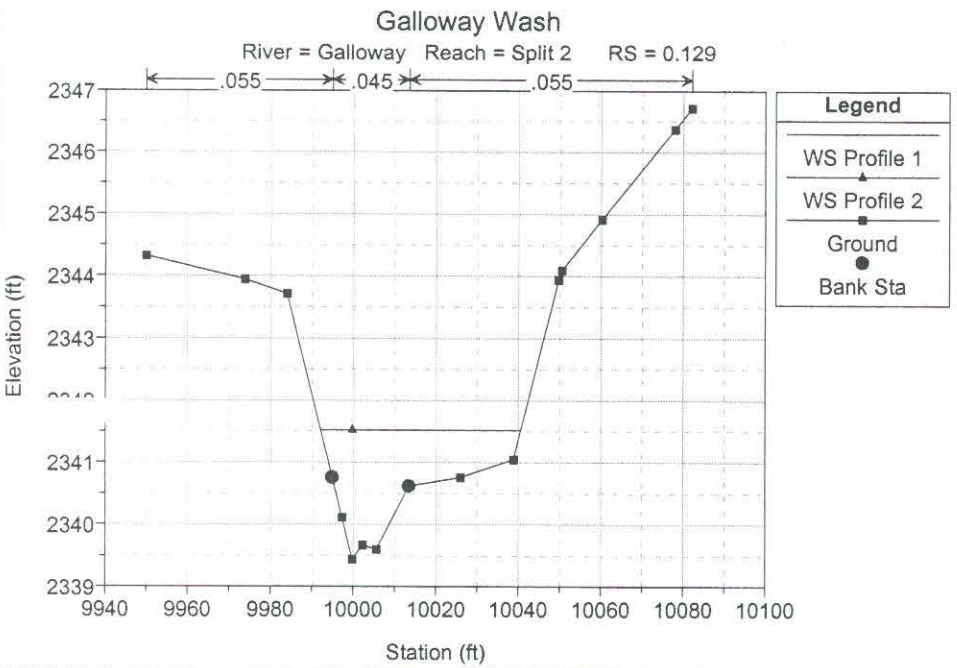

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.255
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.216
.055
.035
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.179
.055
.035
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.141
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

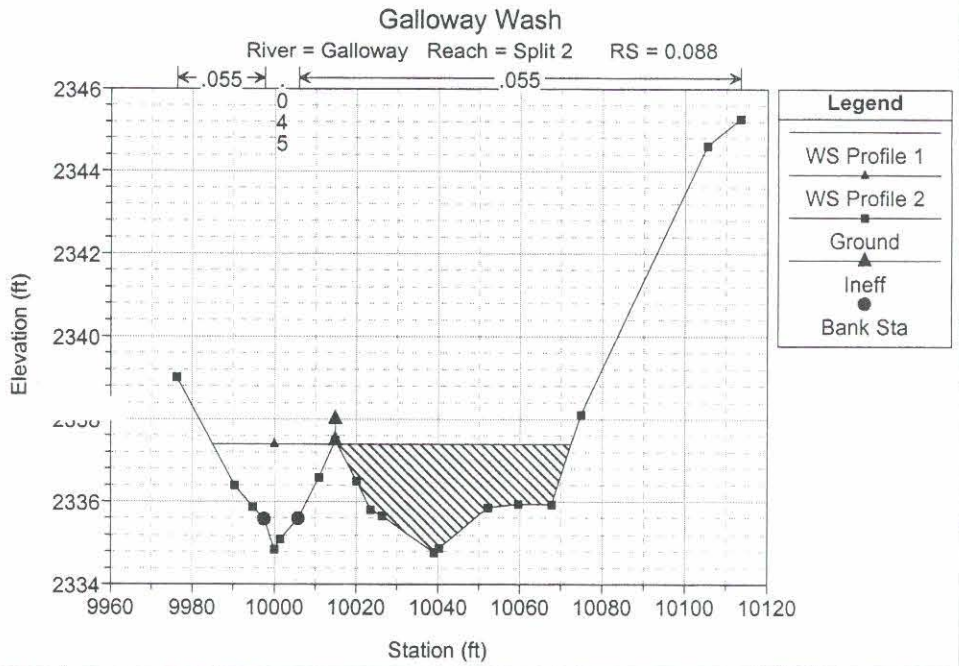

Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.103
.055 .04 .055
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.066
.055 .04 .055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 3.027
.055 .04 .055
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 6 RS = 2.988
.055 .045 .055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

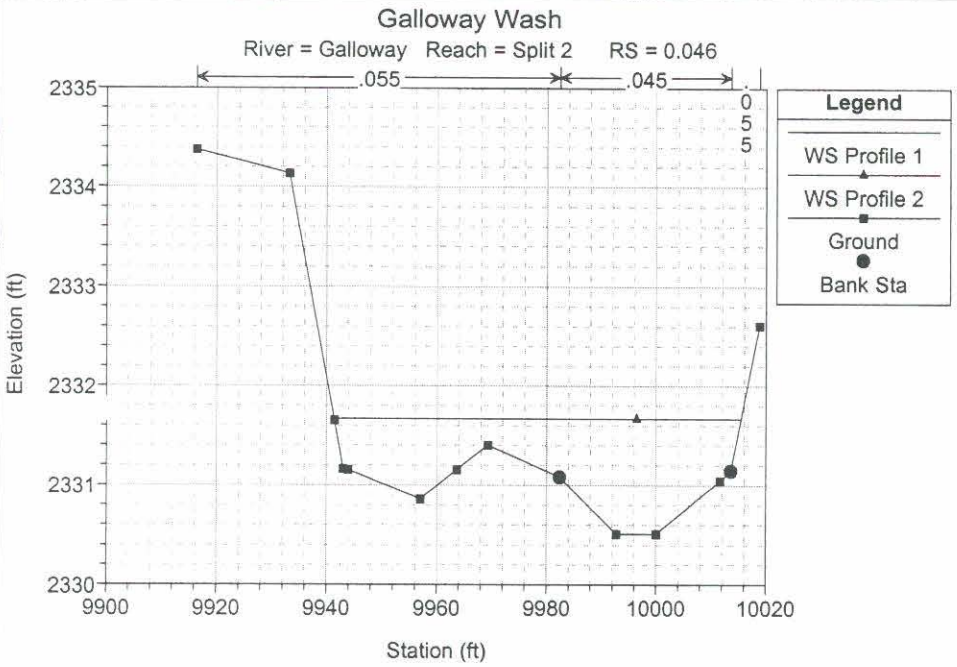

Galloway Wash
River = Galloway Reach = Reach 6 RS = 2.952
.055
.04
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Ineff
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 6 RS = 2.913
.055
.04
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 6 RS = 2.889
.055
.04
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Levee
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Split 2 RS = 0.240
.05
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

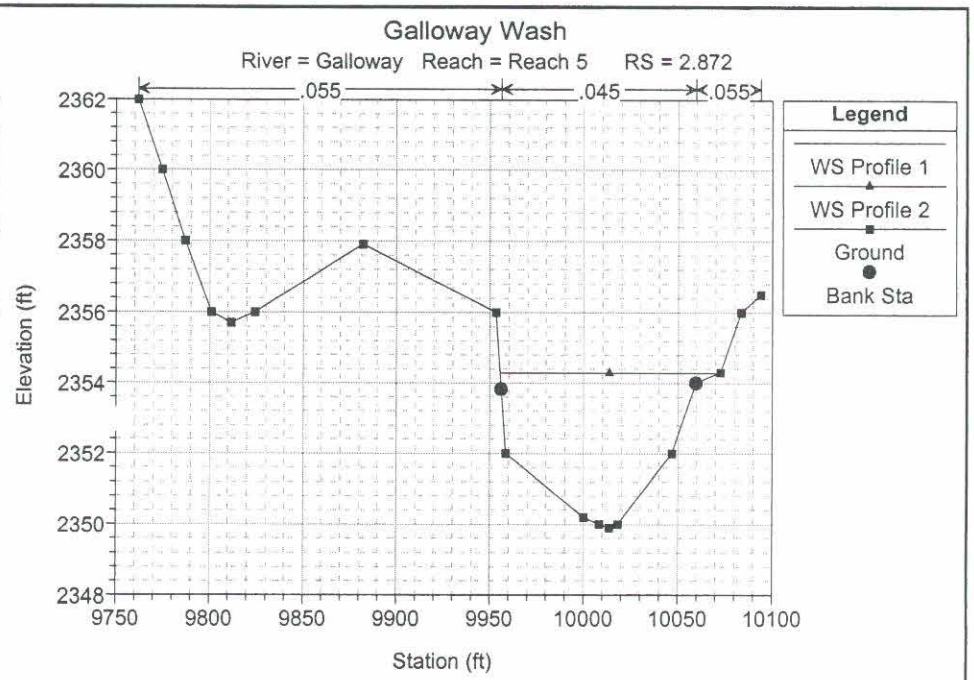

Galloway Wash
River = Galloway Reach = Split 2 RS = 0.213
.045
.055
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

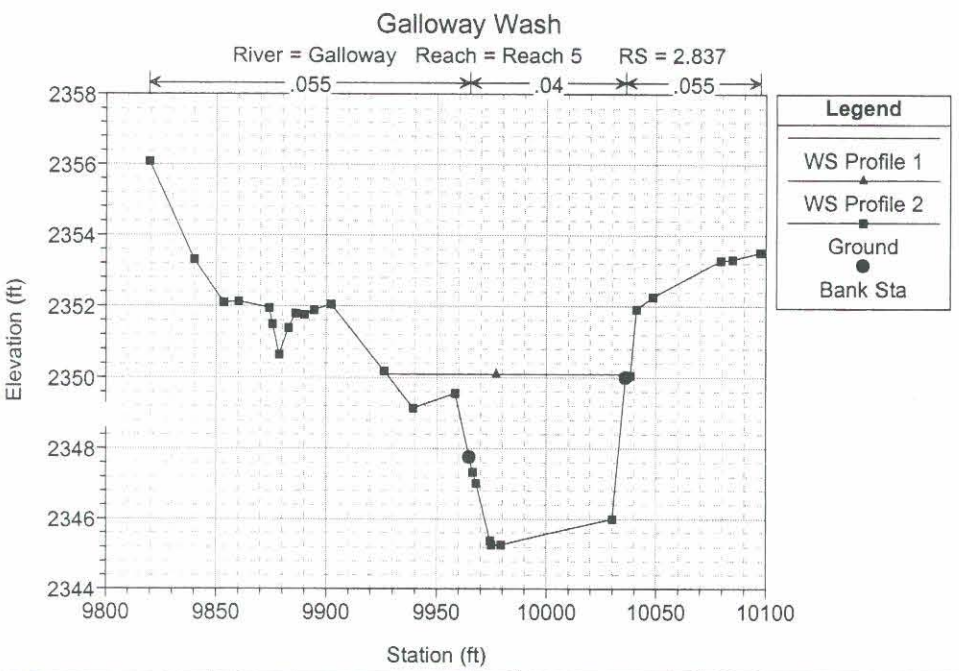

Galloway Wash
River = Galloway Reach = Split 2 RS = 0.156
.055
.045
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

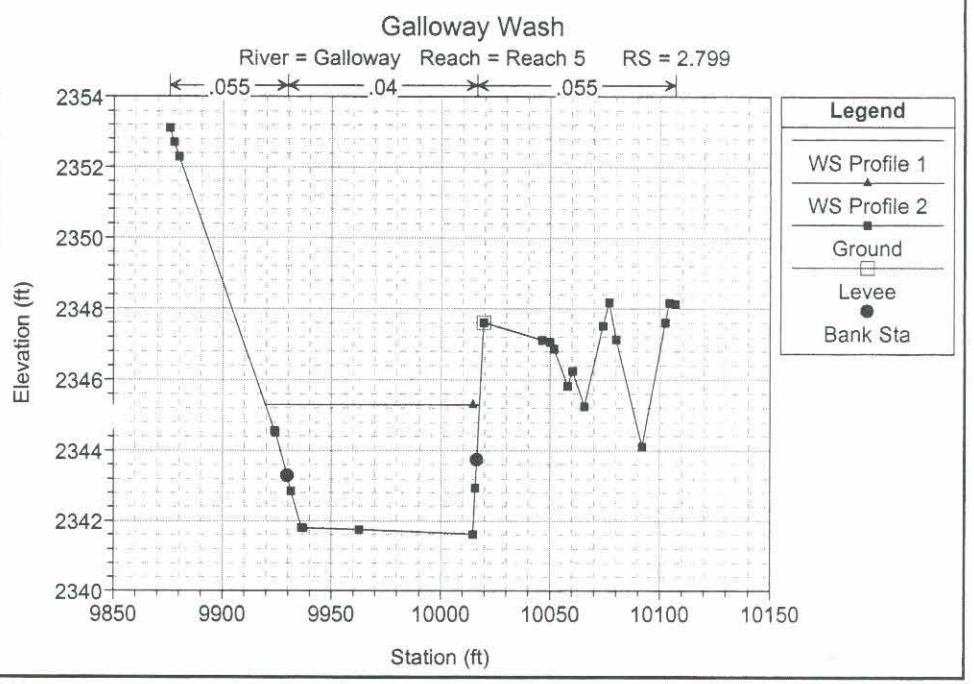

Galloway Wash
River = Galloway Reach = Split 2 RS = 0.129
.055
.045
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

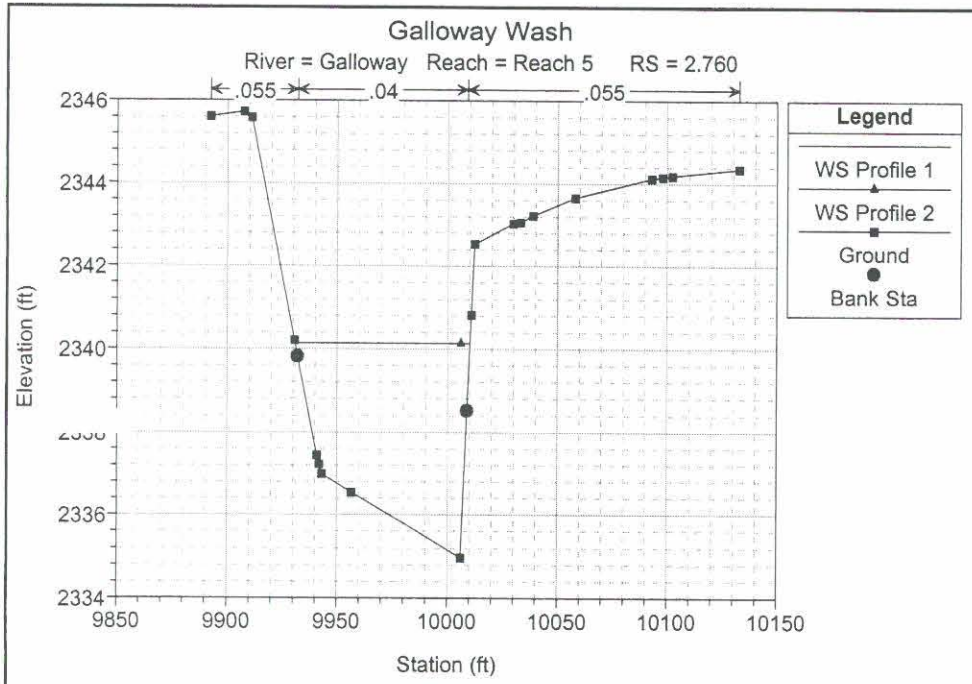

Galloway Wash
River = Galloway Reach = Split 2 RS = 0.088
.055
.055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta

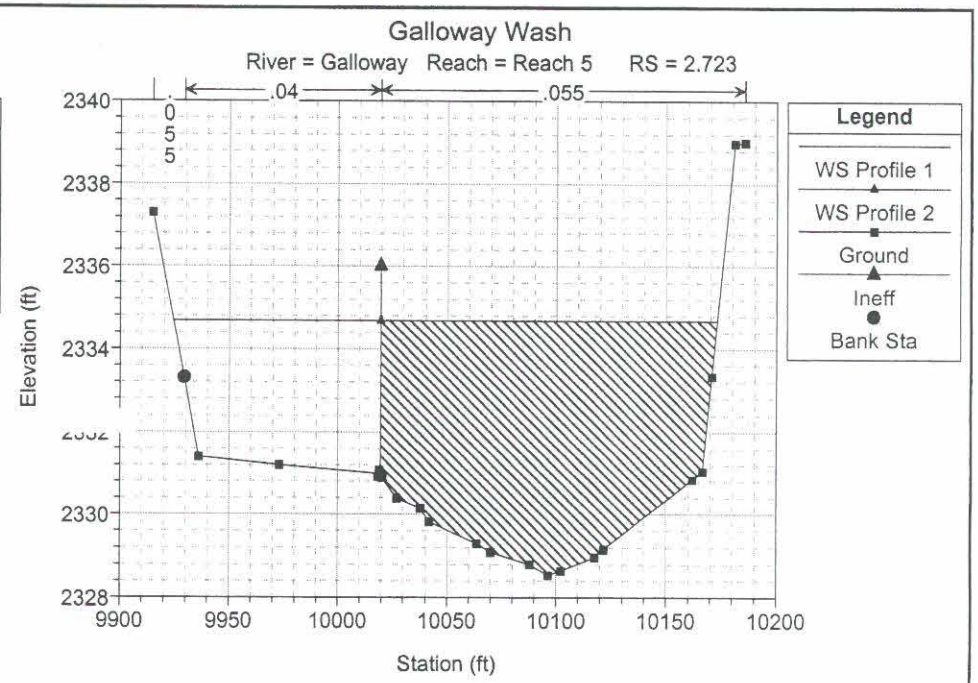

Galloway Wash
River = Galloway Reach = Split 2 RS = 0.046
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

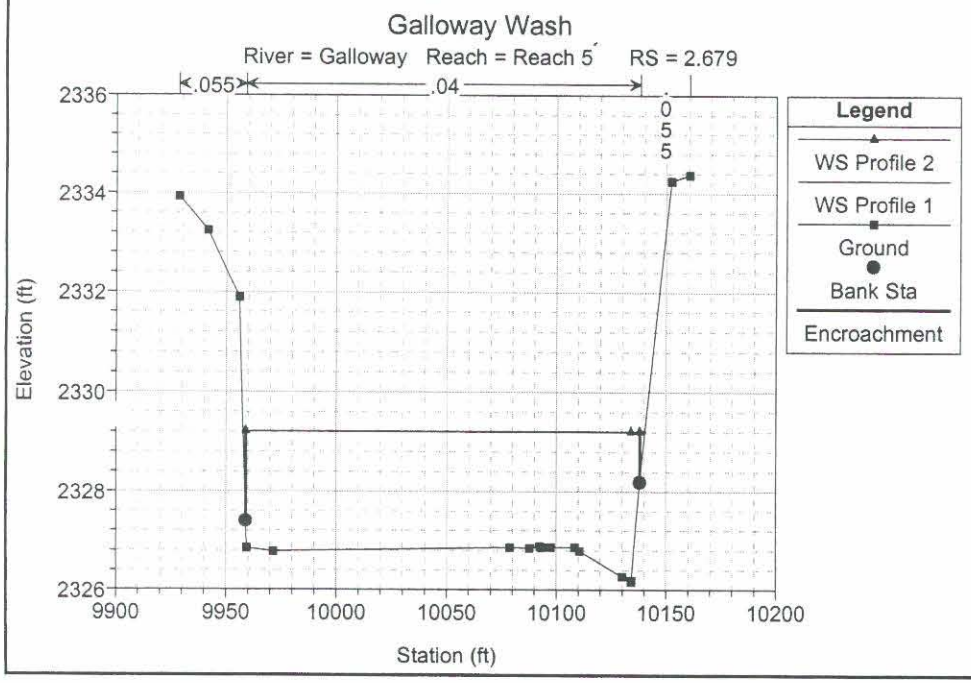

Galloway Wash
River = Galloway Reach = Reach 5 RS = 2.872
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

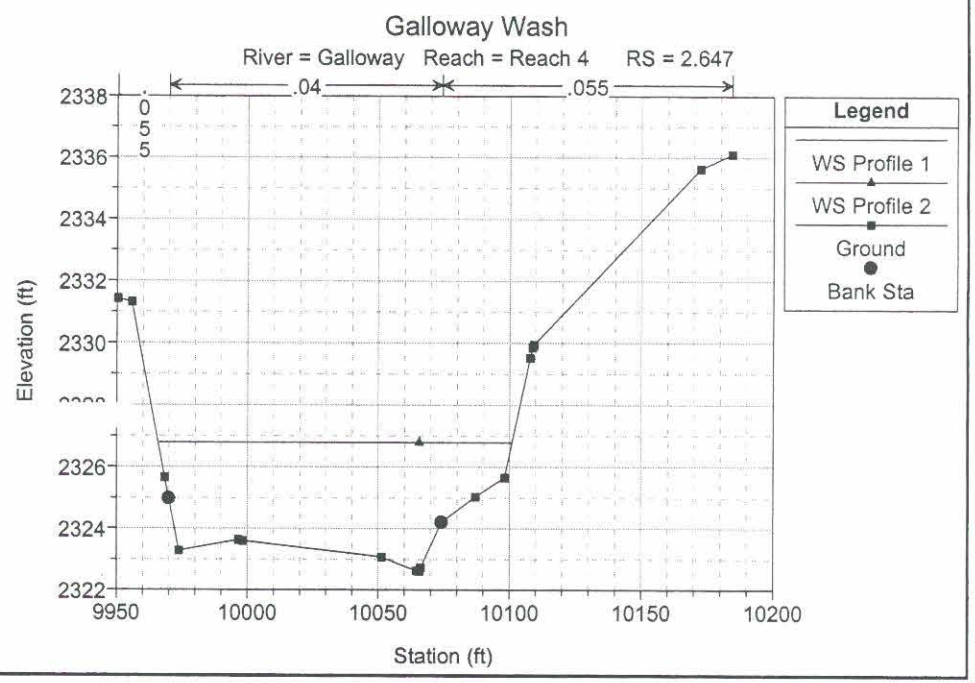

Galloway Wash
River = Galloway Reach = Reach 5 RS = 2.837
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

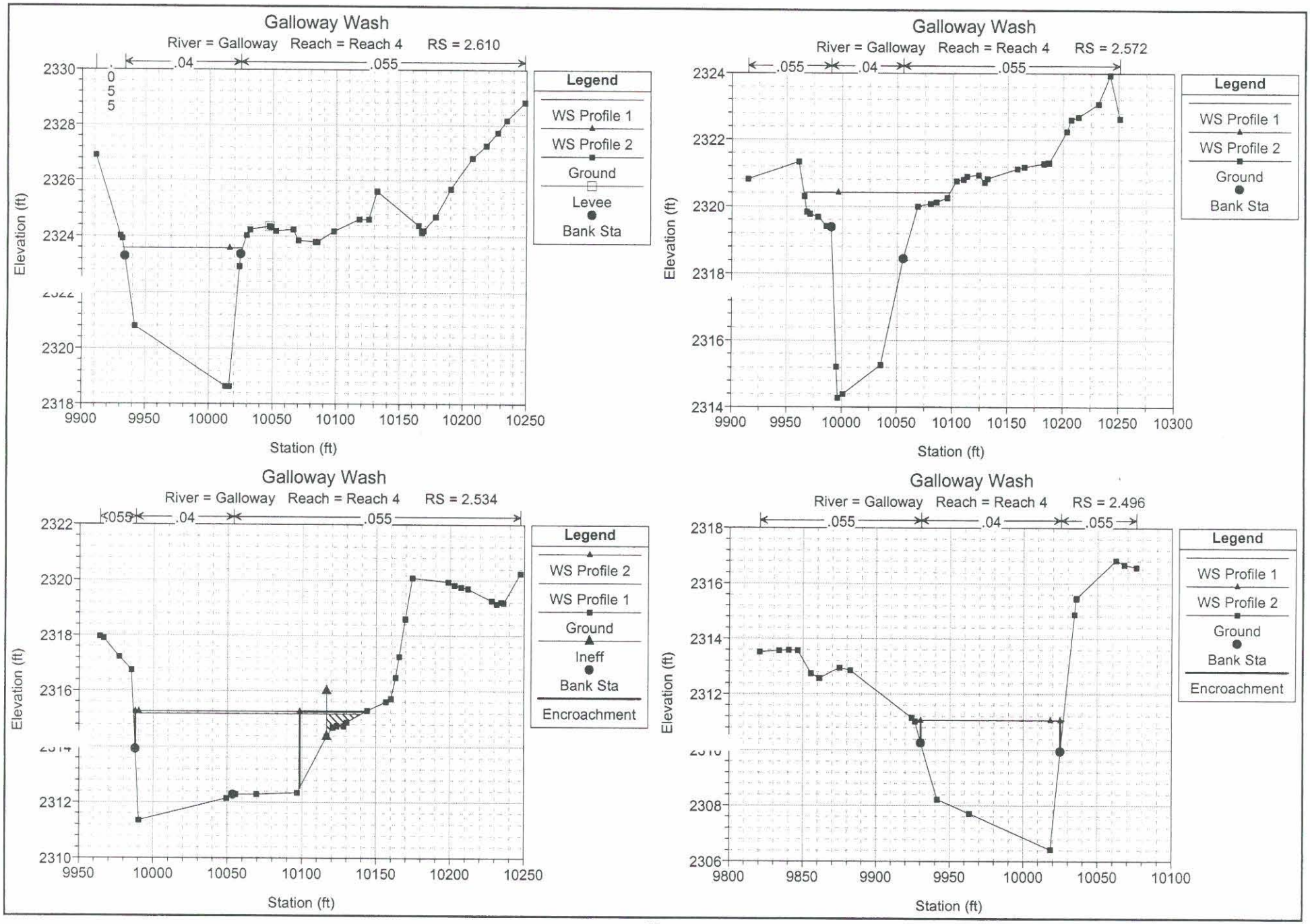

Galloway Wash
River = Galloway Reach = Reach 5 RS = 2.799
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

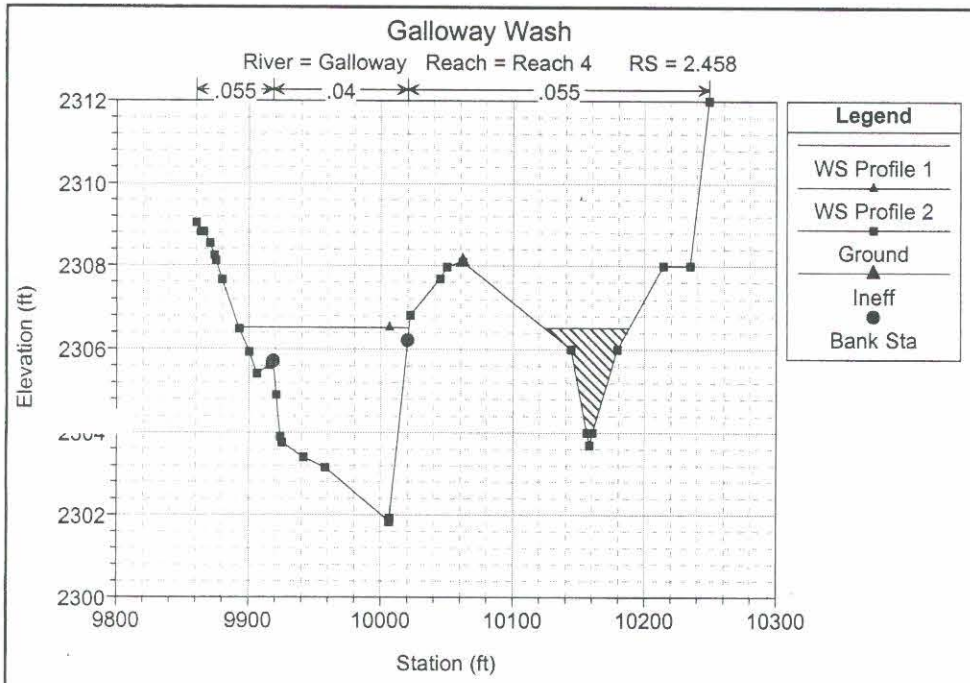

Galloway Wash
River = Galloway Reach = Reach 5 RS = 2.760
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

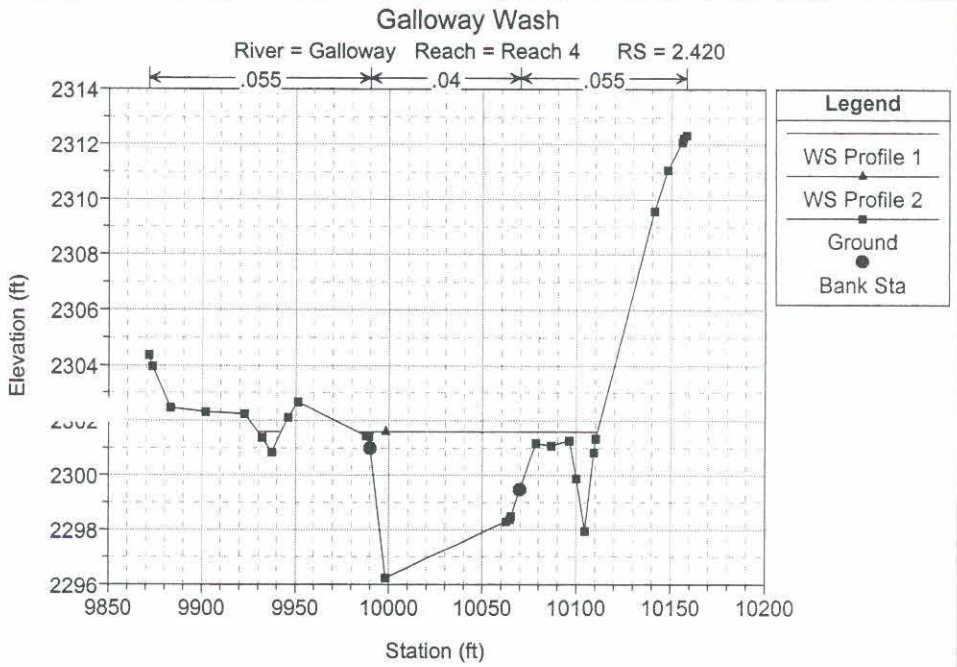

Galloway Wash
River = Galloway Reach = Reach 5 RS = 2.723
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

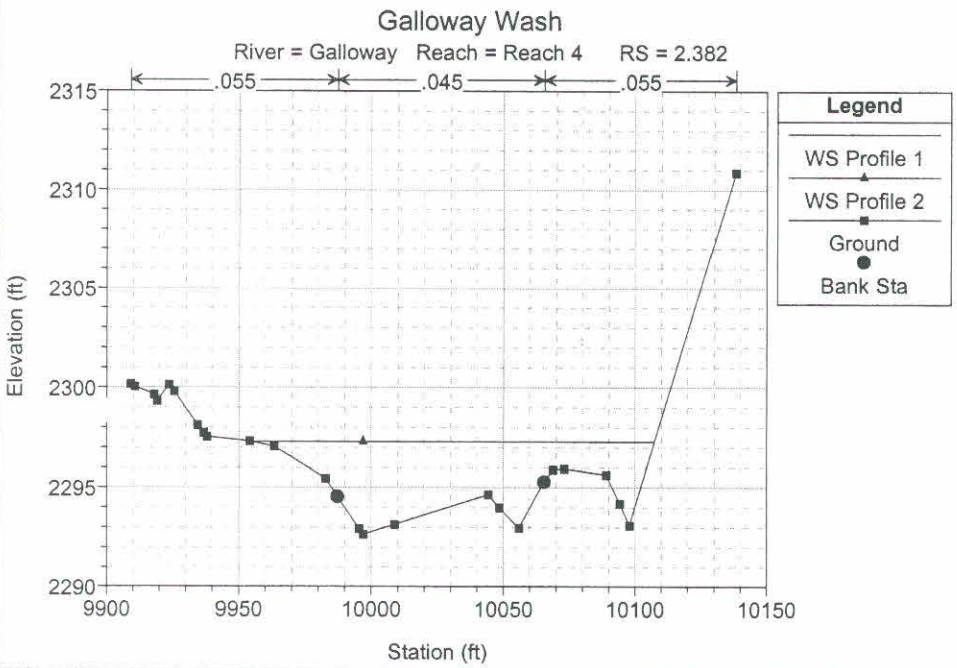

Galloway Wash
River = Galloway Reach = Reach 5 RS = 2.679
.055
.04
Legend
WS Profile 2
WS Profile 1
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

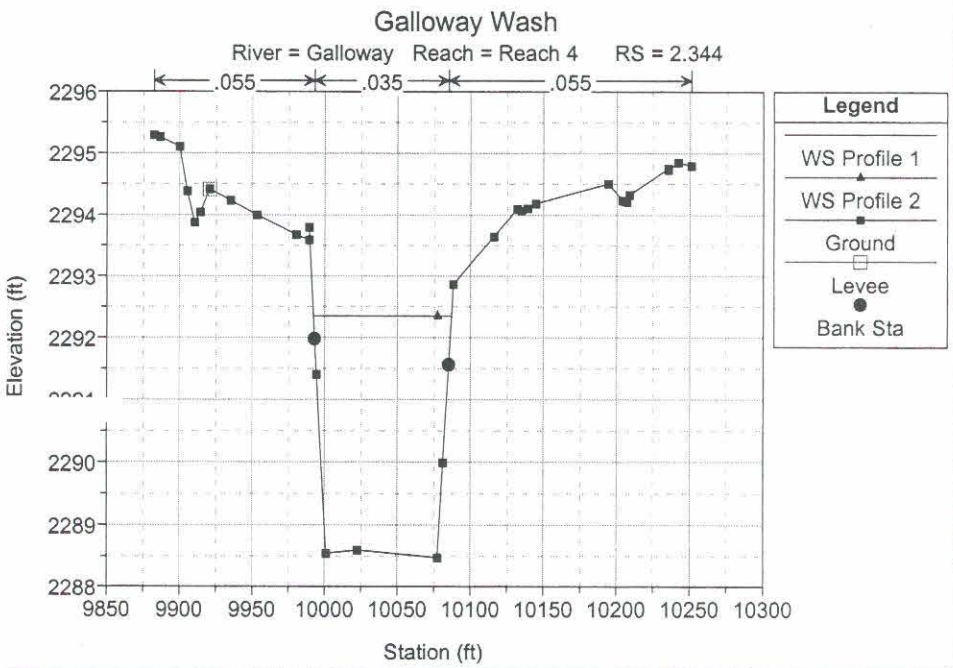

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.647
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

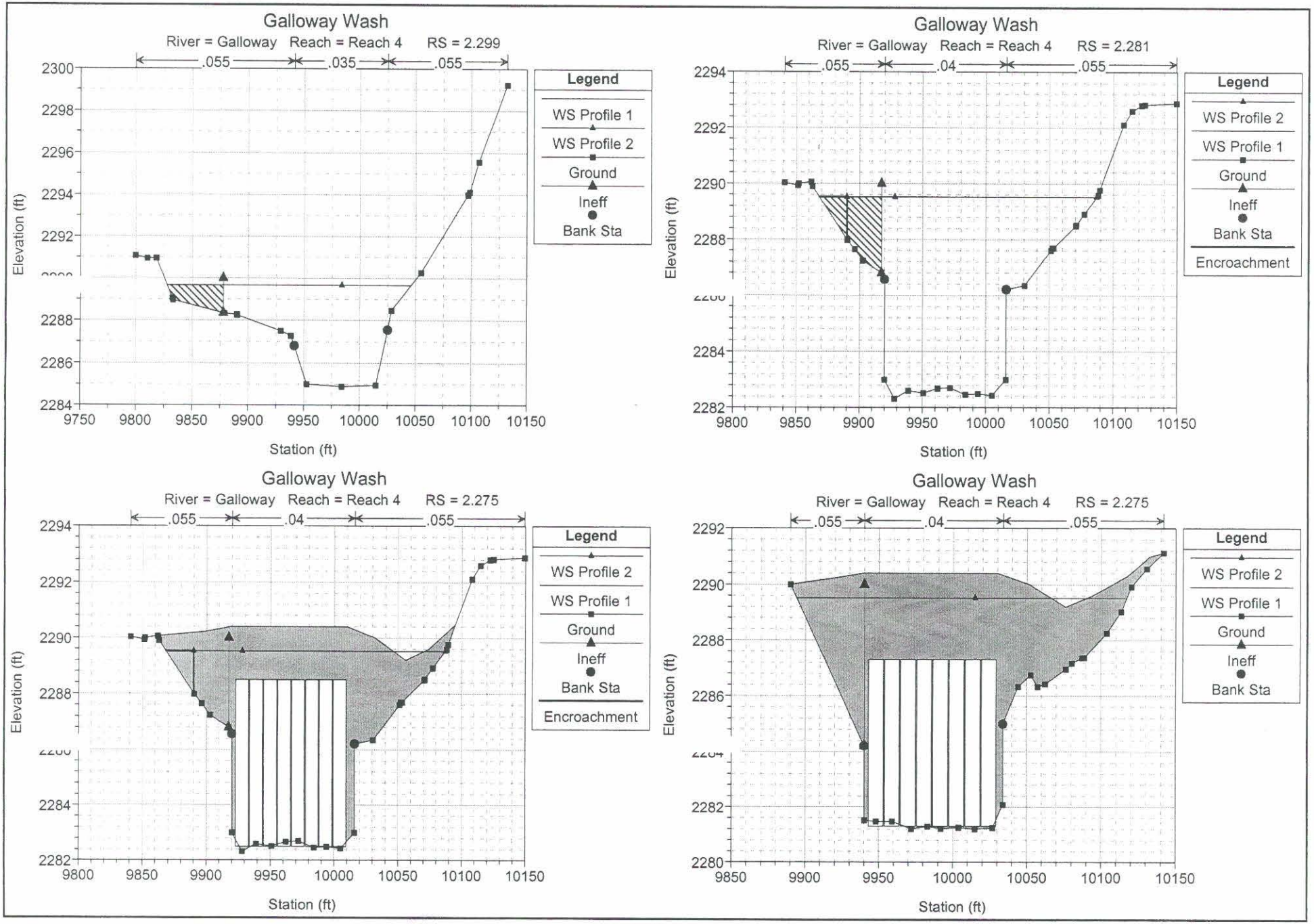

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.610
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.572
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.534
.055
.04
.055
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.496
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Encroachment
Elevation (ft)
Station (ft)

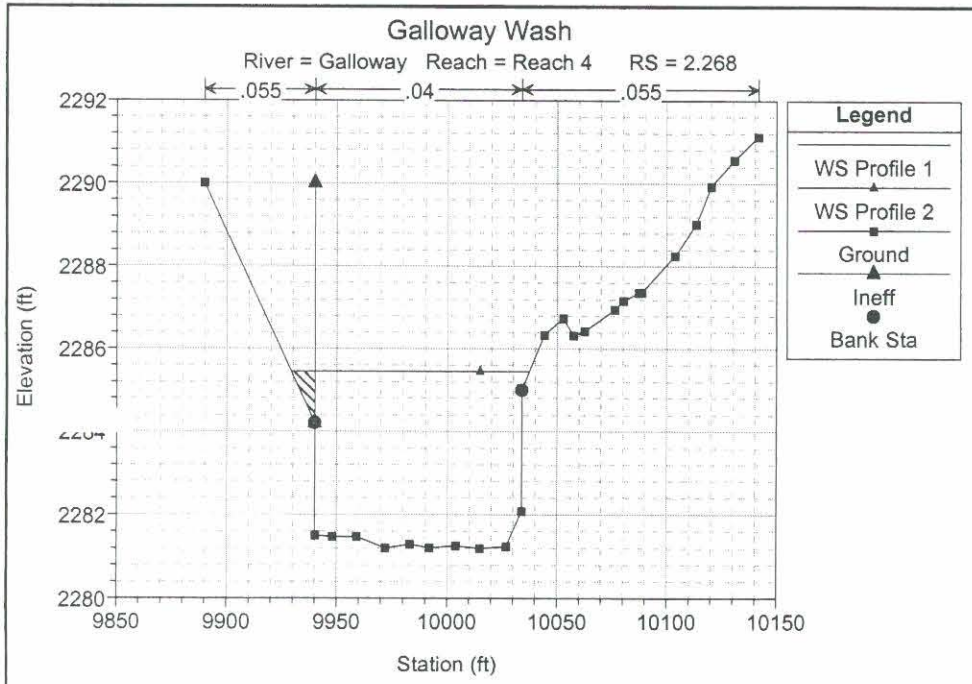

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.458
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

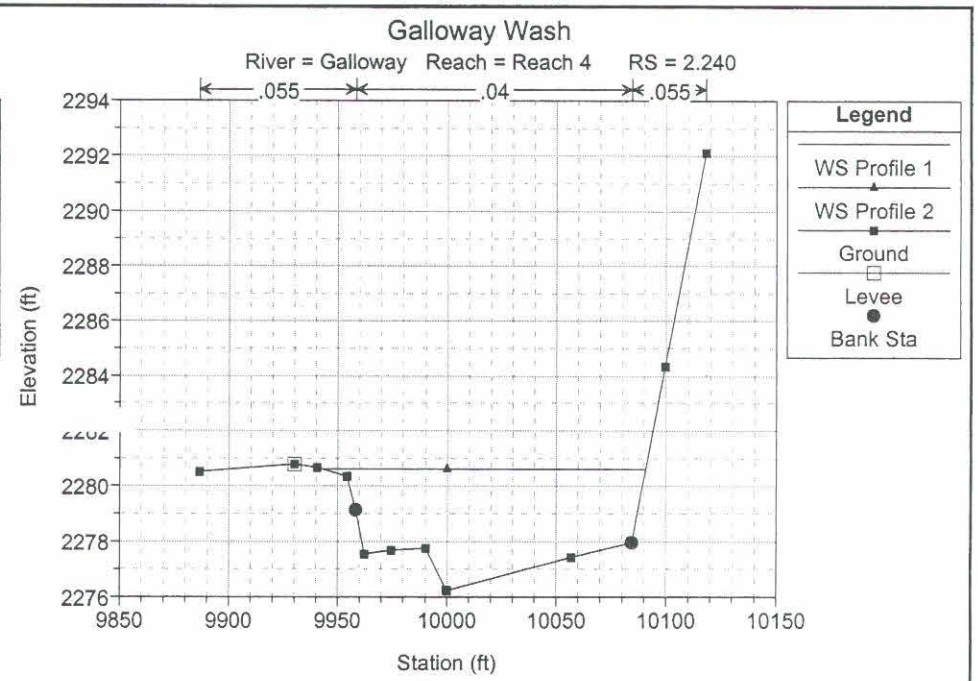

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.420
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

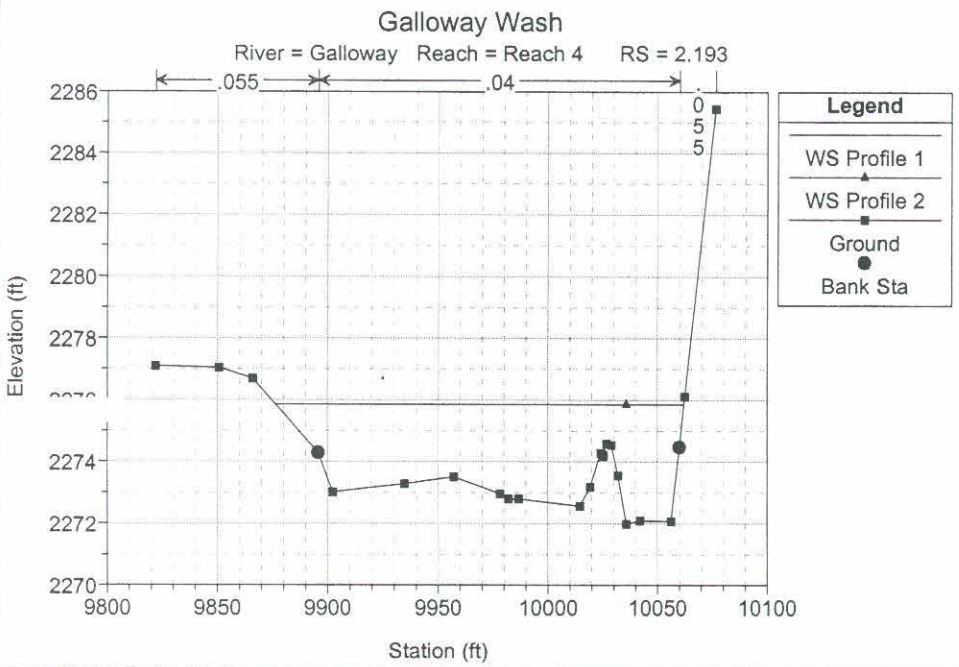

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.382
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

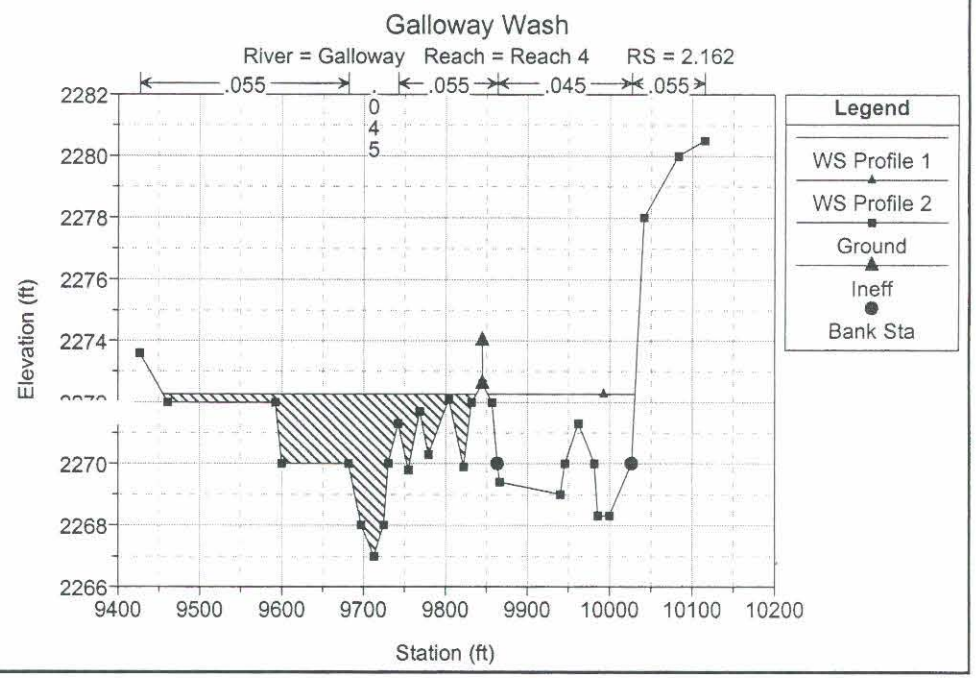

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.344
.055
.035
.055
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

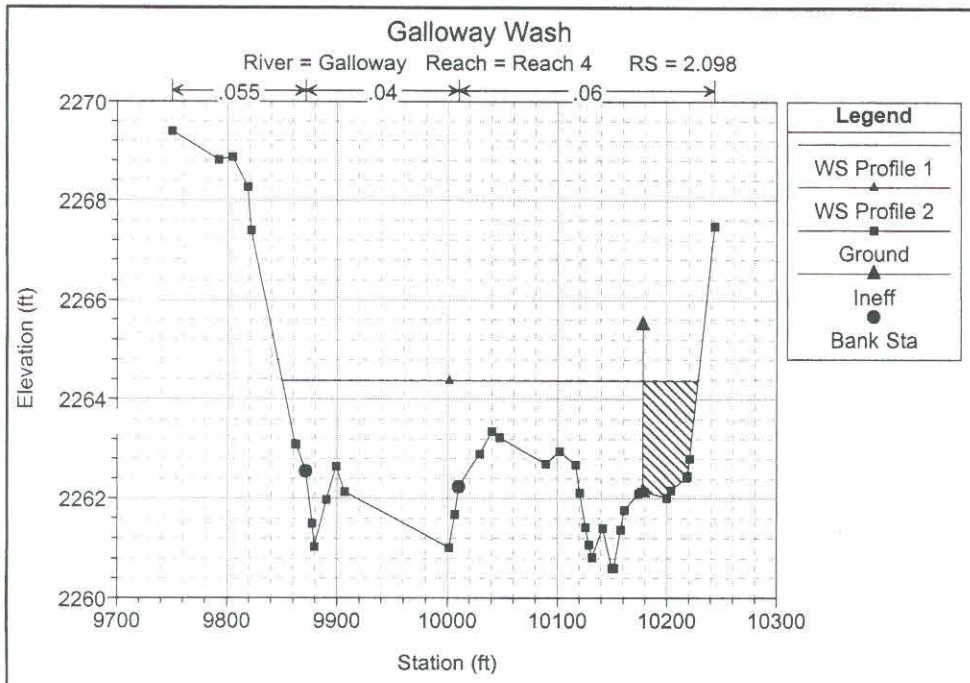

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.299
.055 .035 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.281
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.275
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.275
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 2
WS Profile 1
Ground
Ineff
Bank Sta

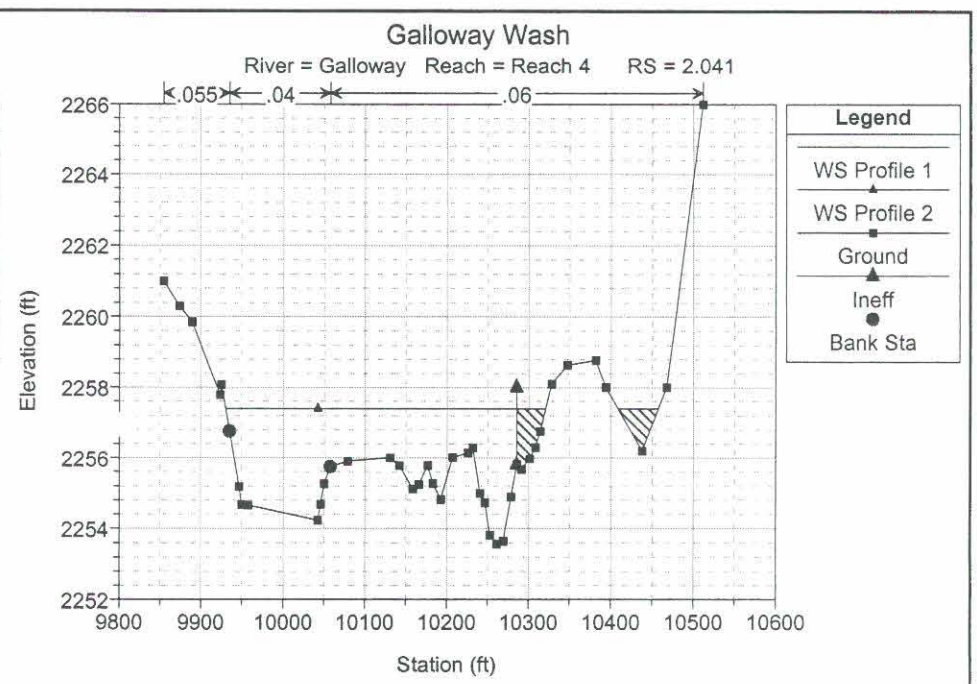

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.268
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

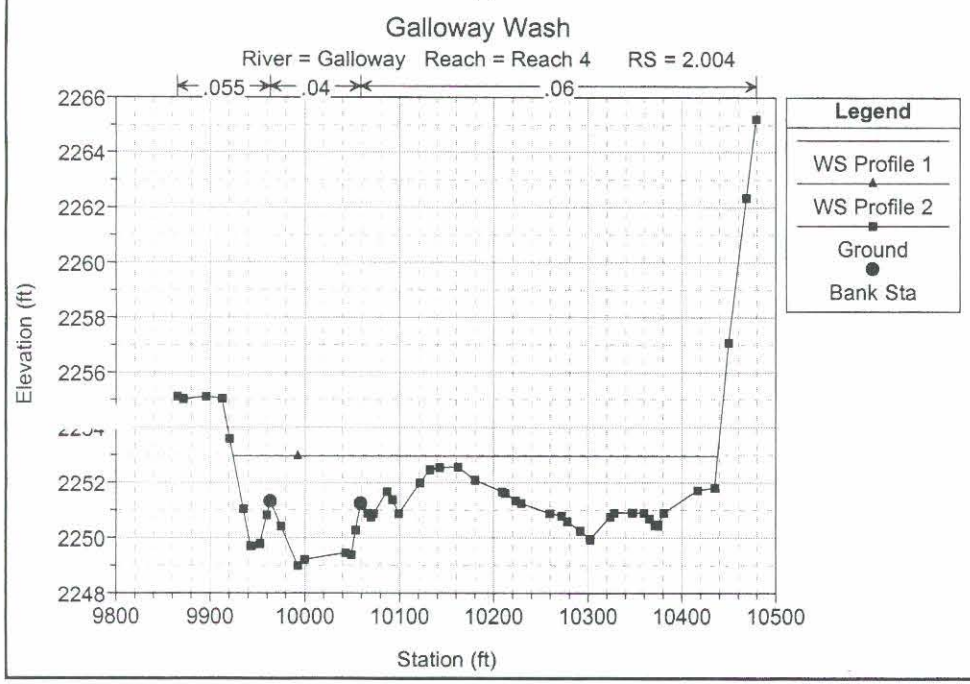

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.240
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Bank Sta
Elevation (ft)
Station (ft)

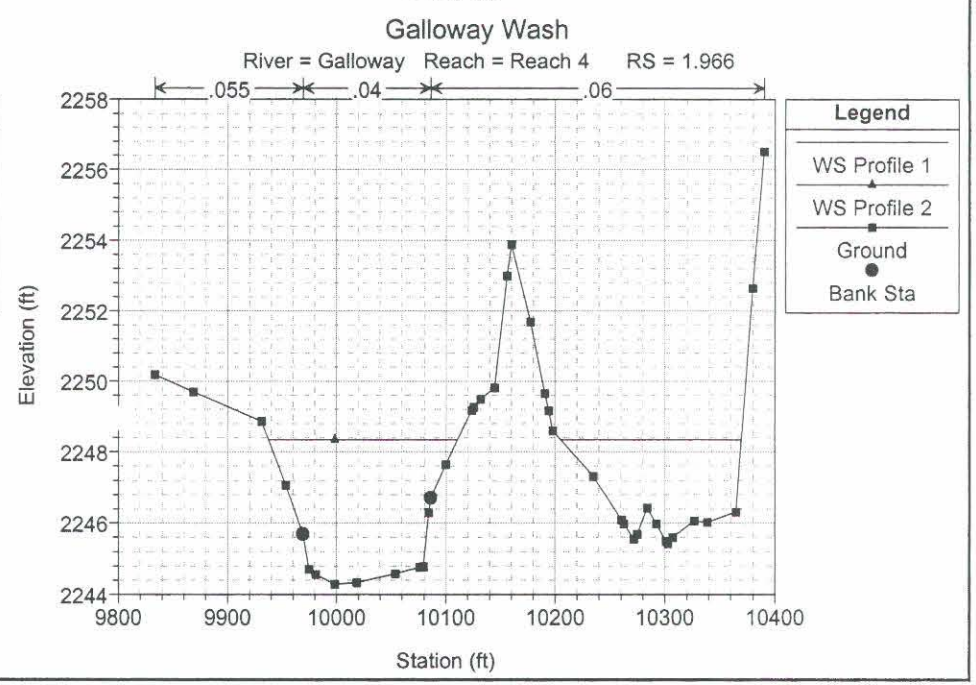

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.193
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

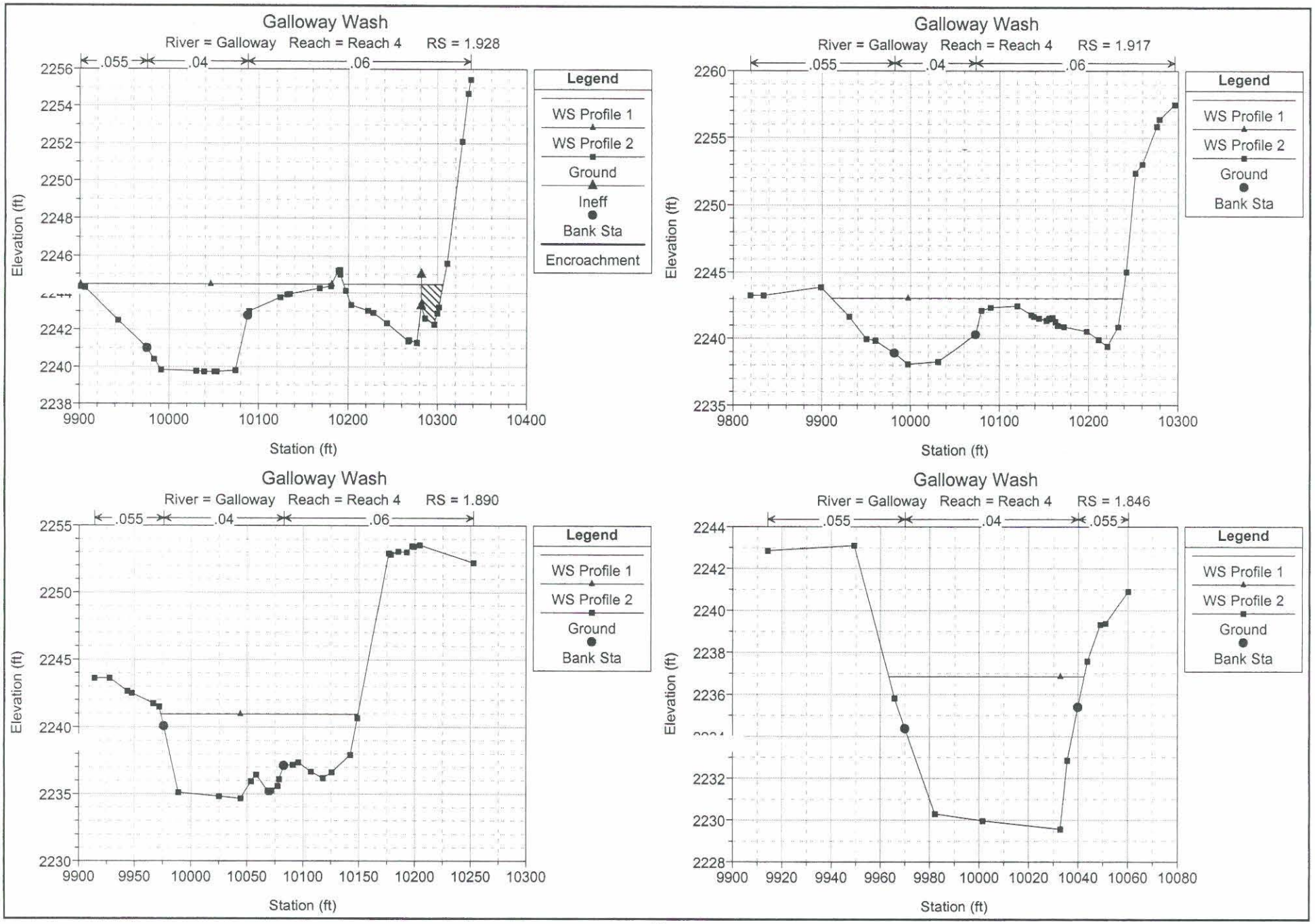

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.162
.055
.045
.055
.055
.045
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

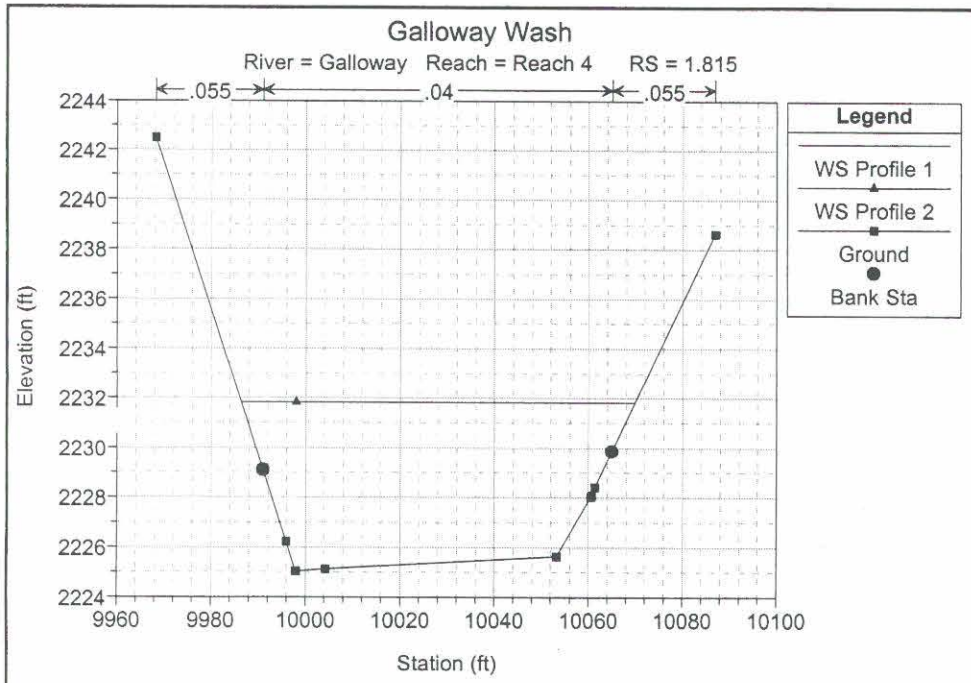

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.098
.055
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta

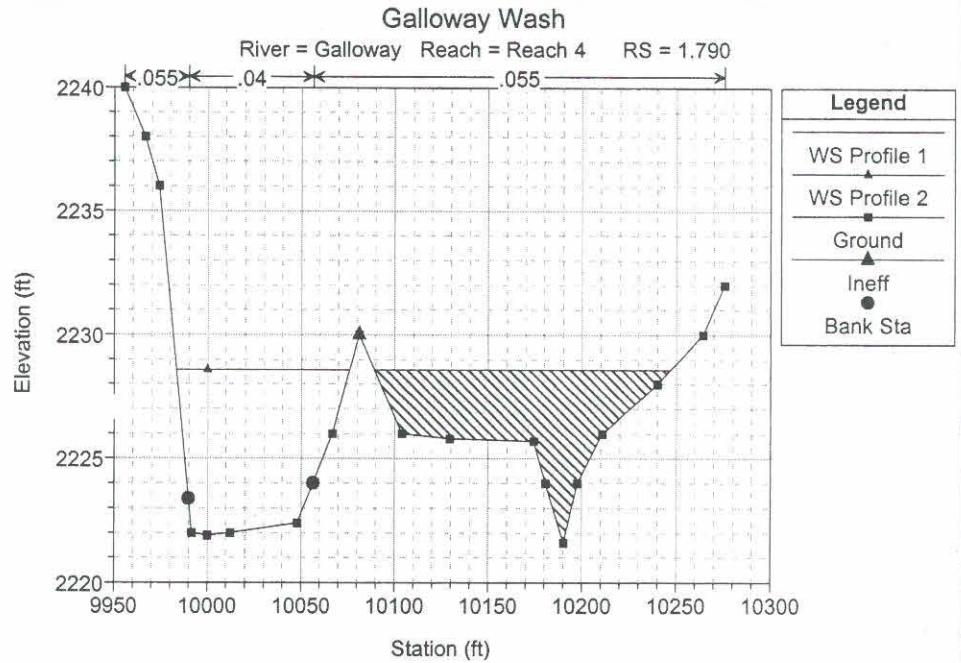

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.041
.055
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta

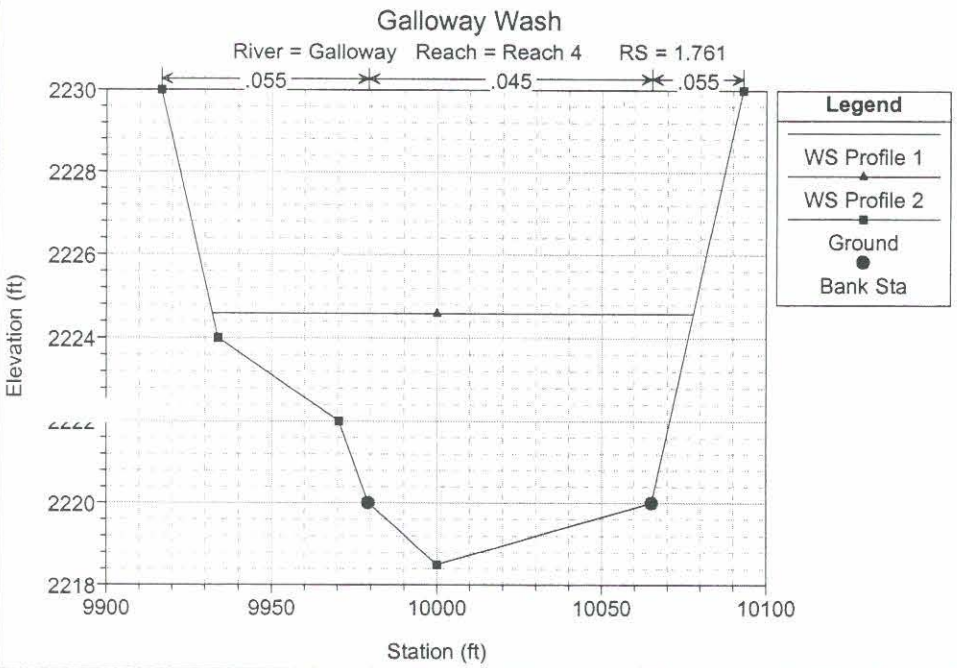

Galloway Wash
River = Galloway Reach = Reach 4 RS = 2.004
.055
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

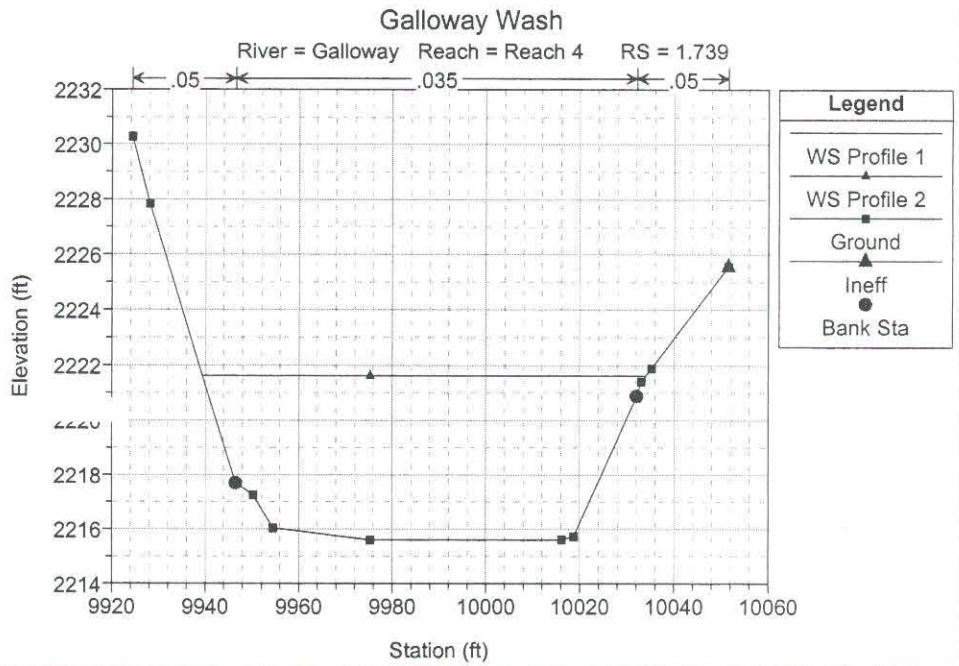

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.966
.055
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

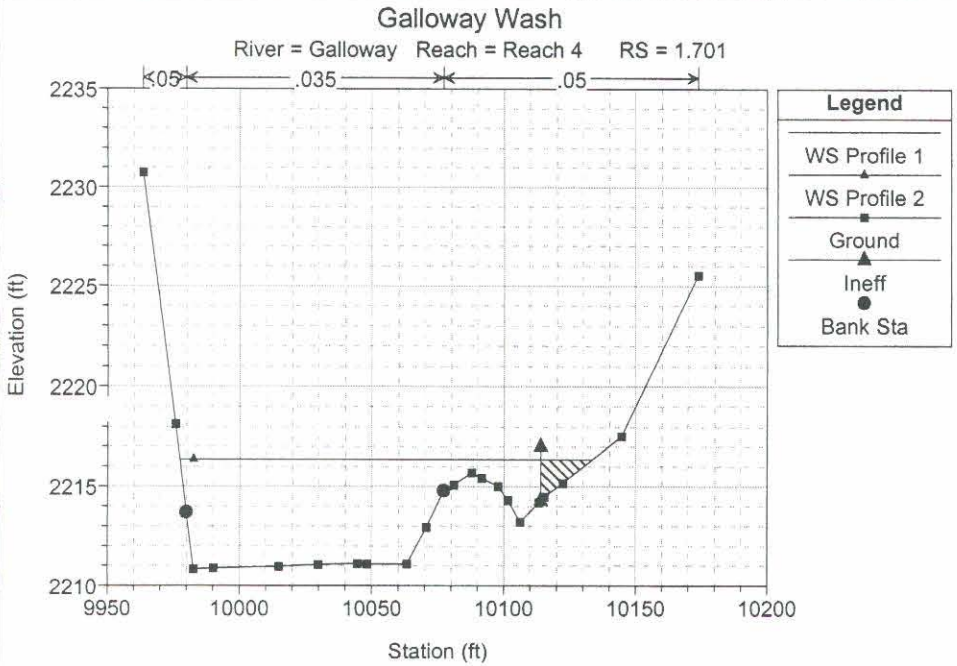

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.928
.055 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Encroachment
Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.917
.055 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.890
.055 .04 .06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.846
.055 .04 .055
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

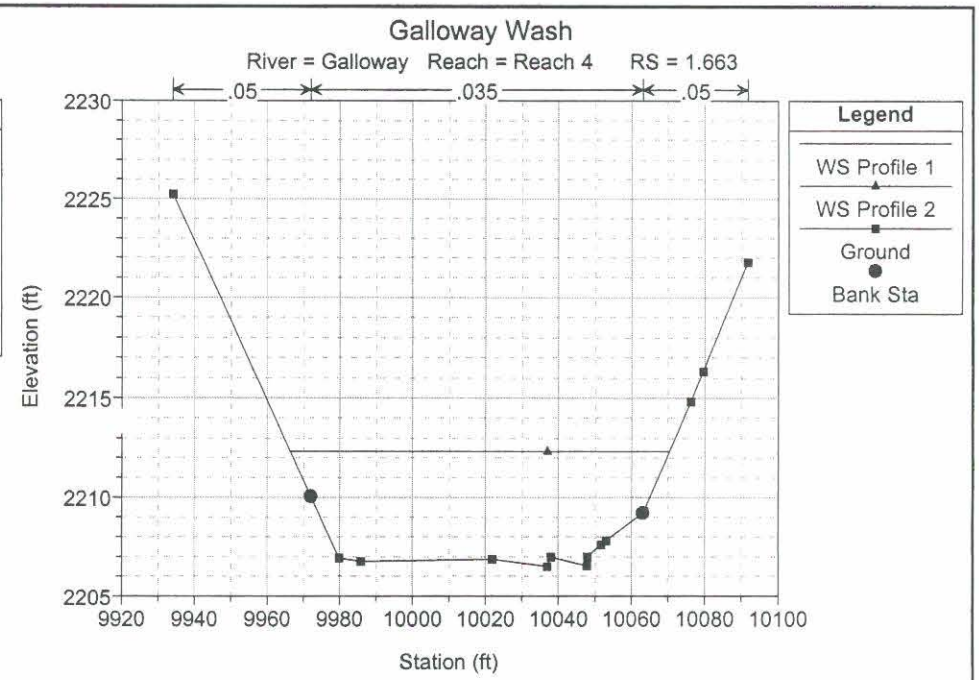

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.815
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

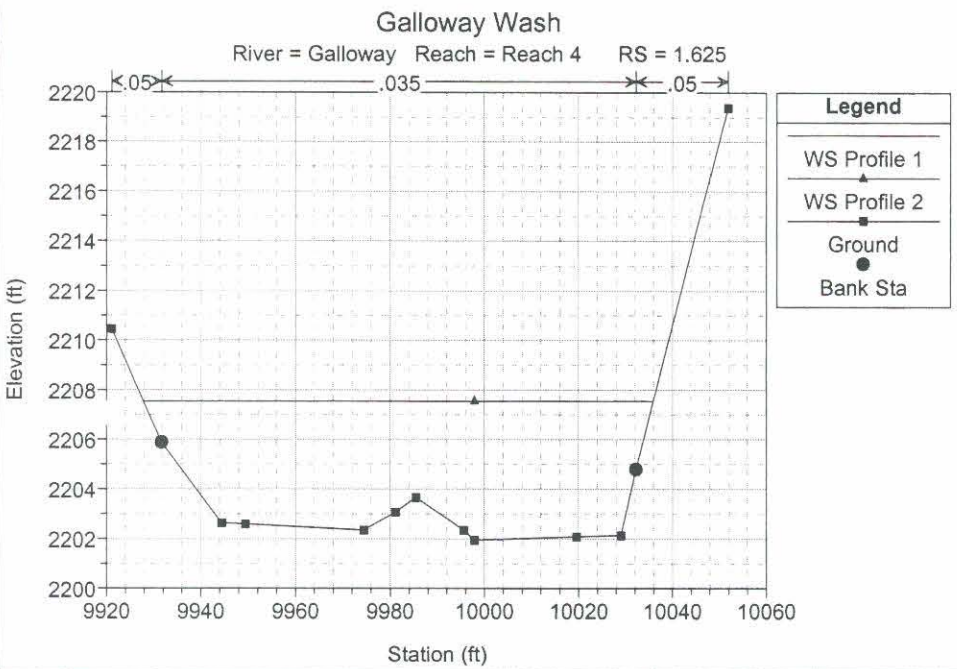

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.790
.055
.04
.055
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

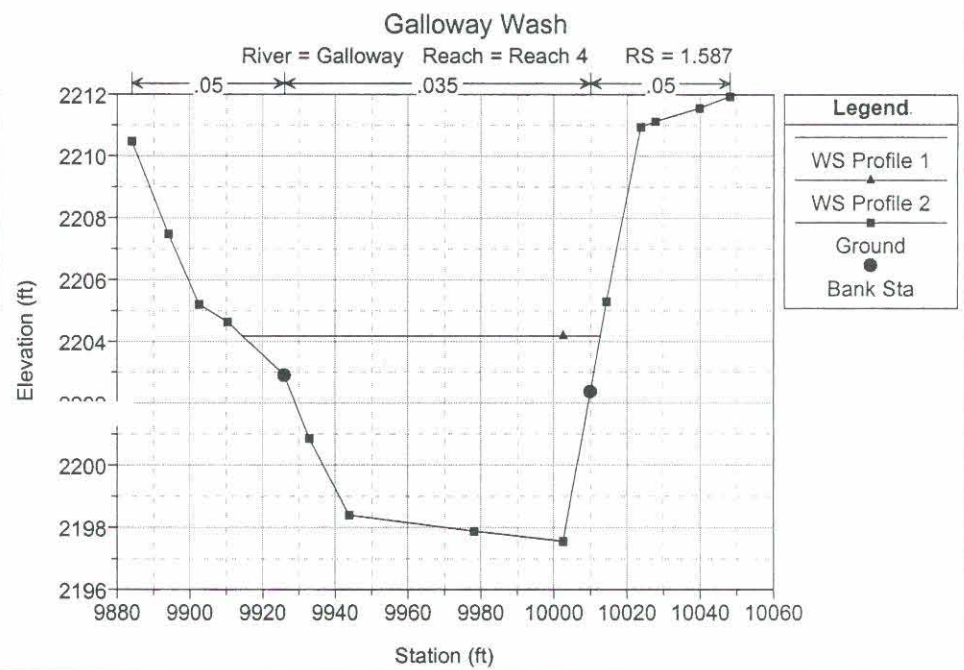

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.761
.055
.045
.055
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

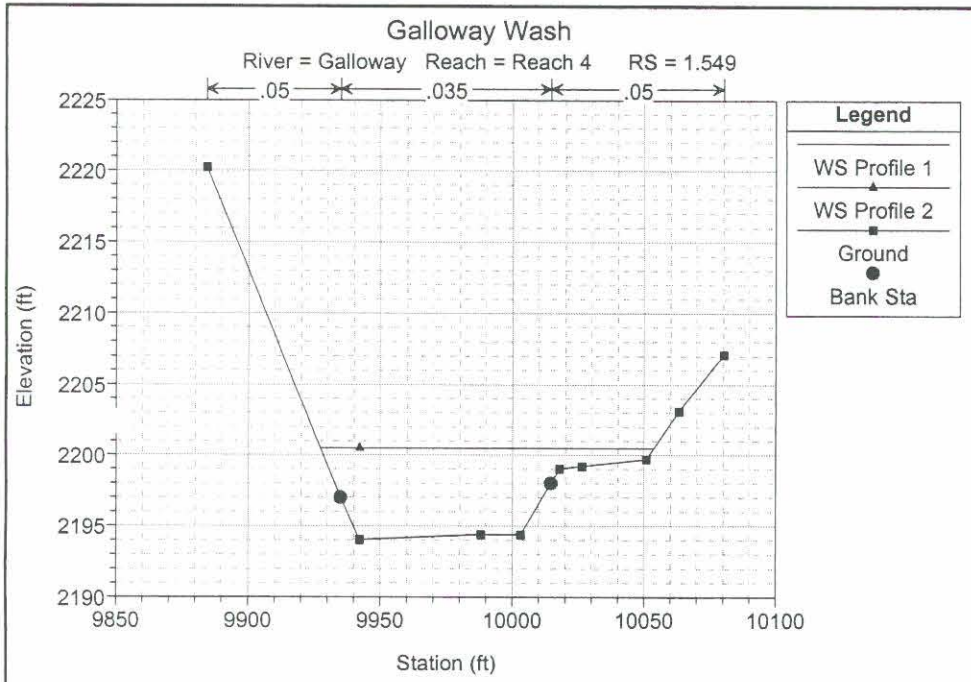

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.739
.05
.035
.05
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

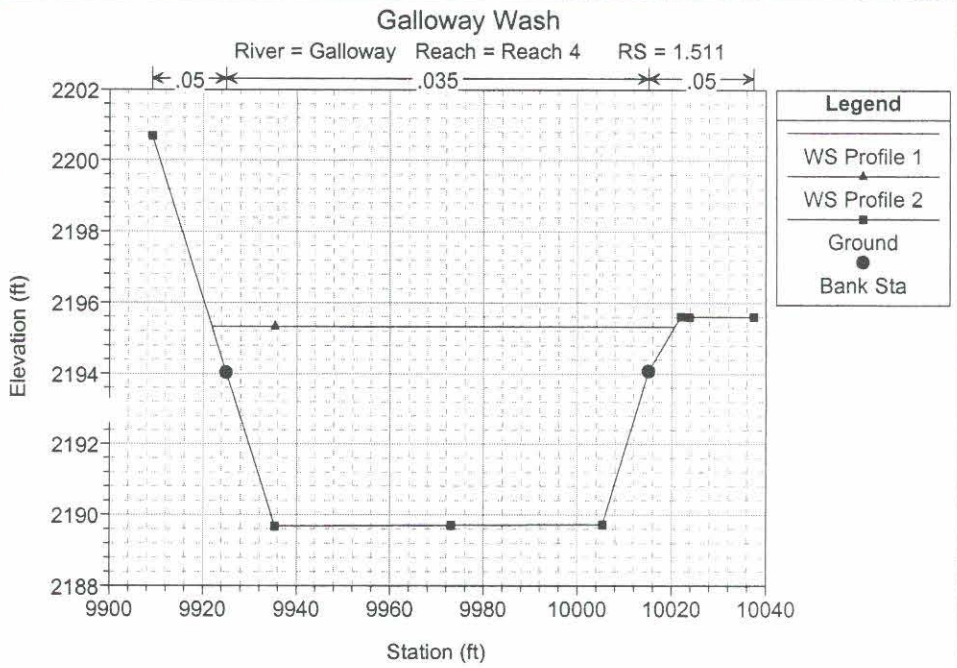

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.701
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta

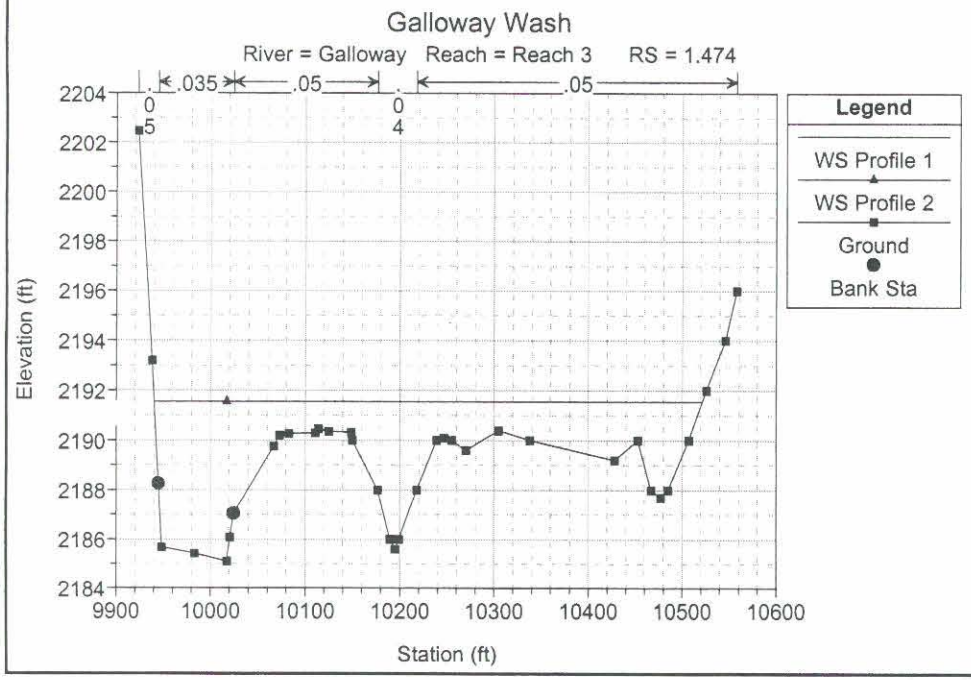

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.663
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

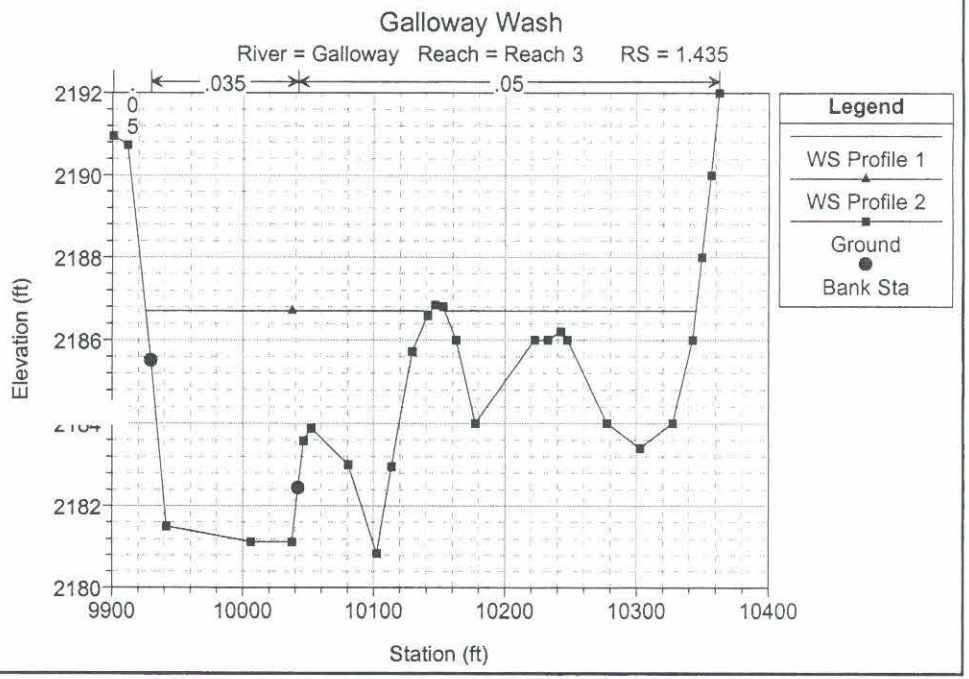

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.625
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

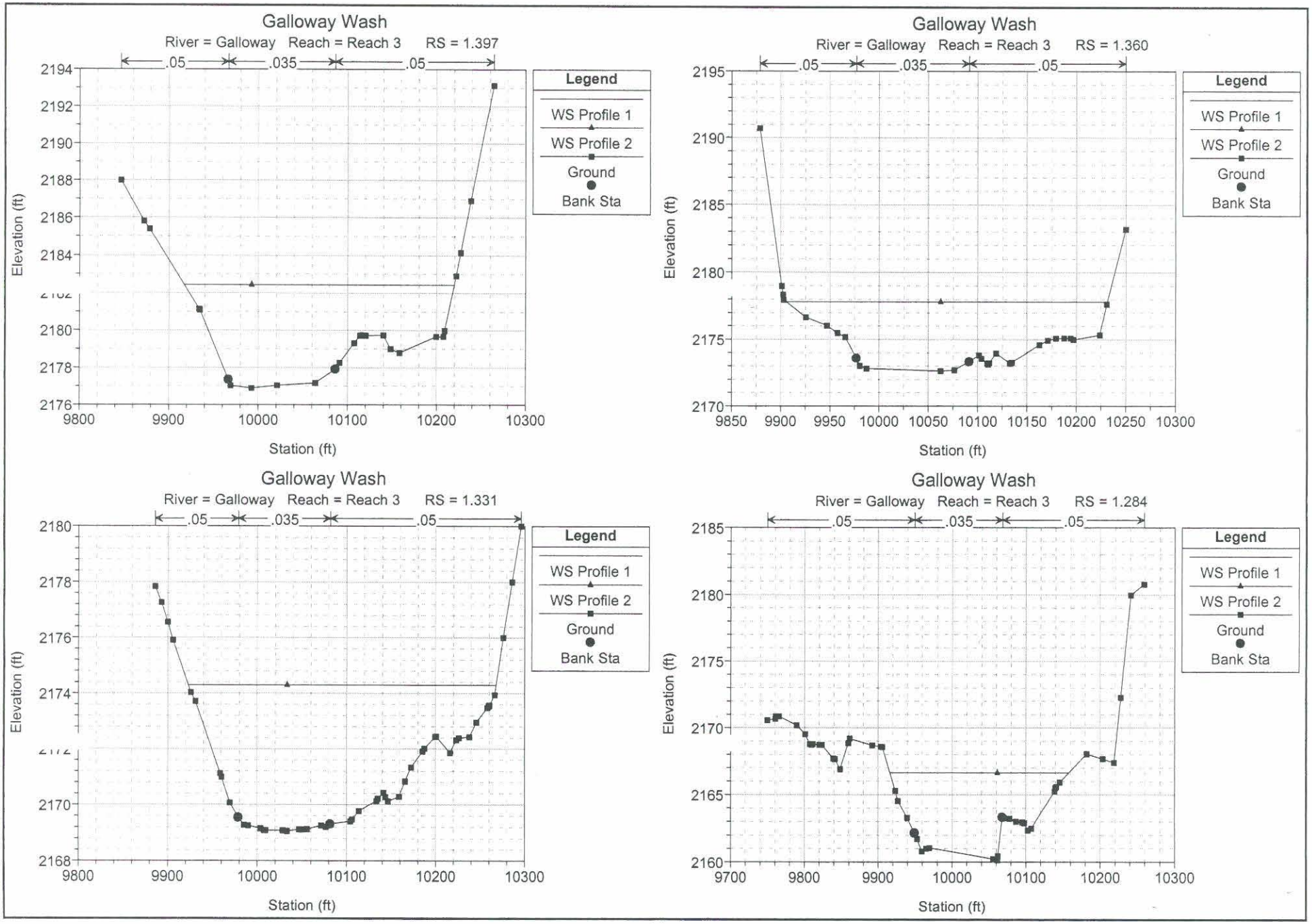

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.587
.05
.035
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

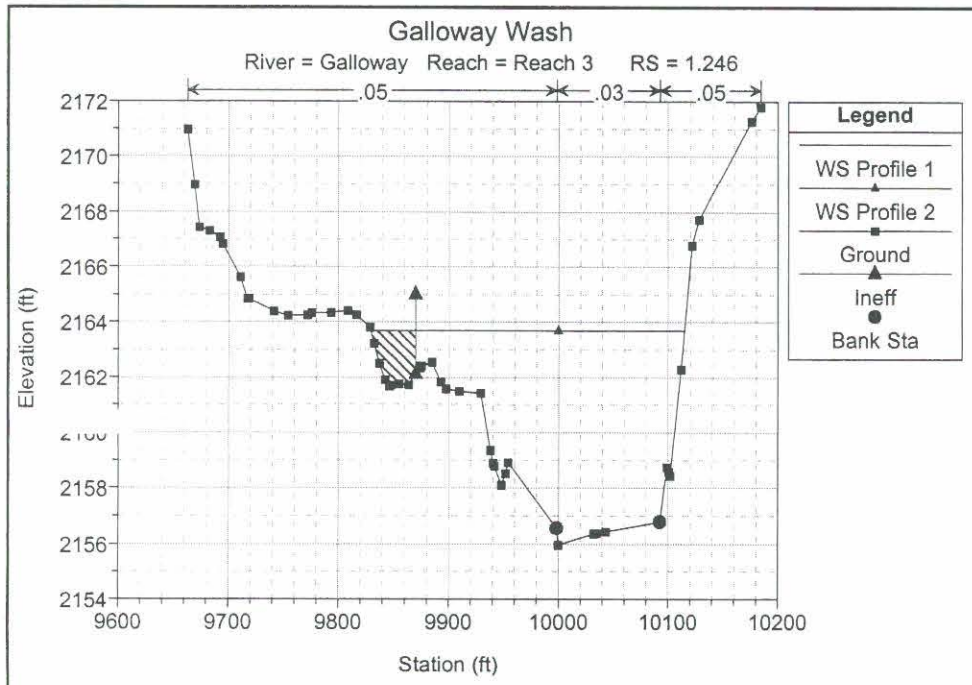

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.549
.05
.035
.05
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

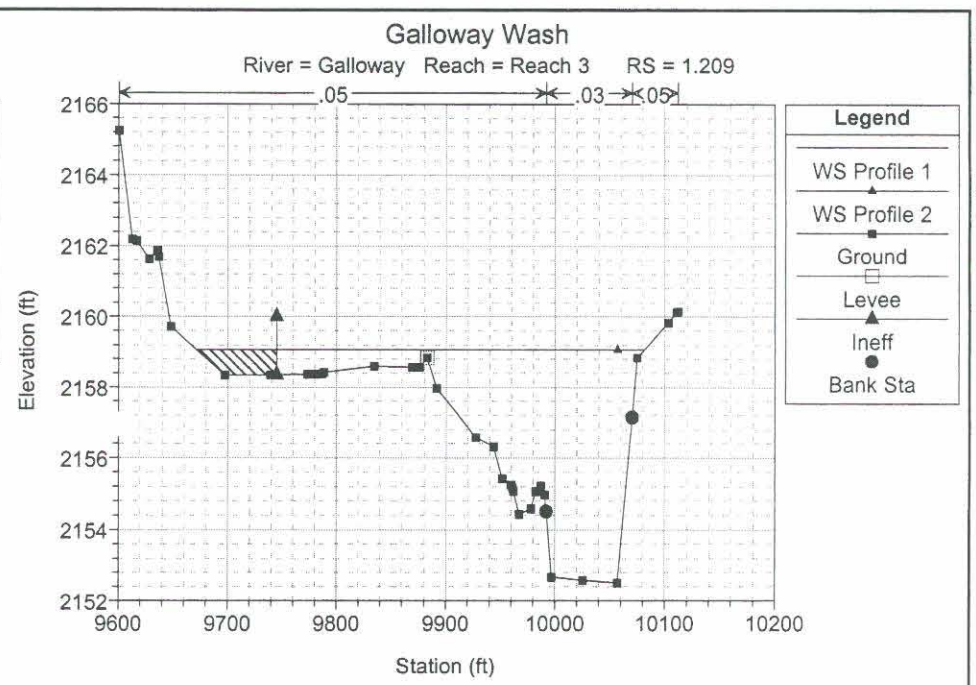

Galloway Wash
River = Galloway Reach = Reach 4 RS = 1.511
.05
.035
.05
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

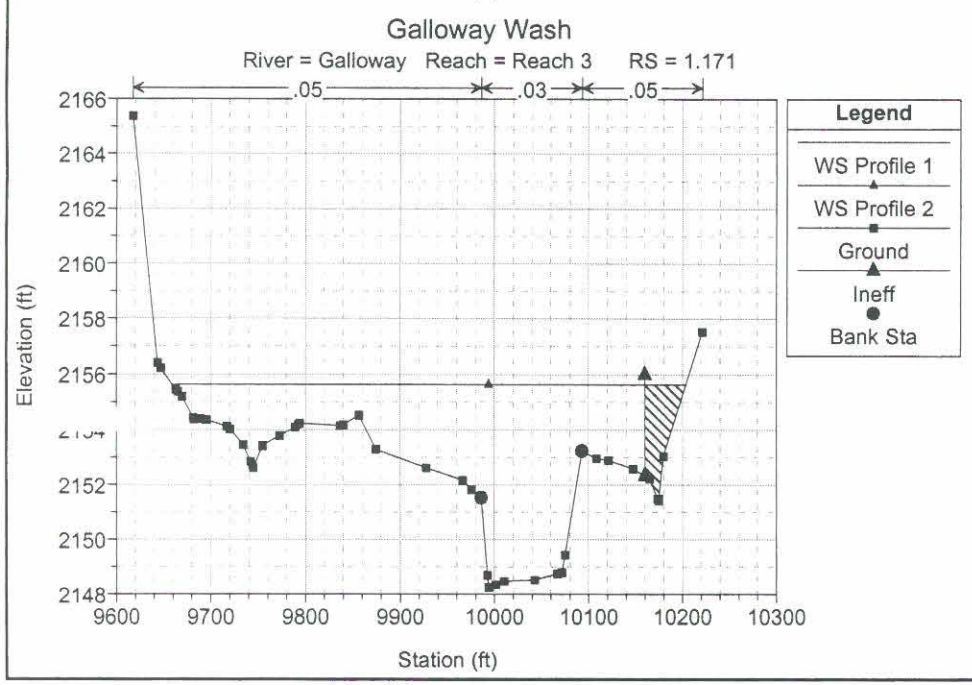

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.474
.035
.05
.05
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

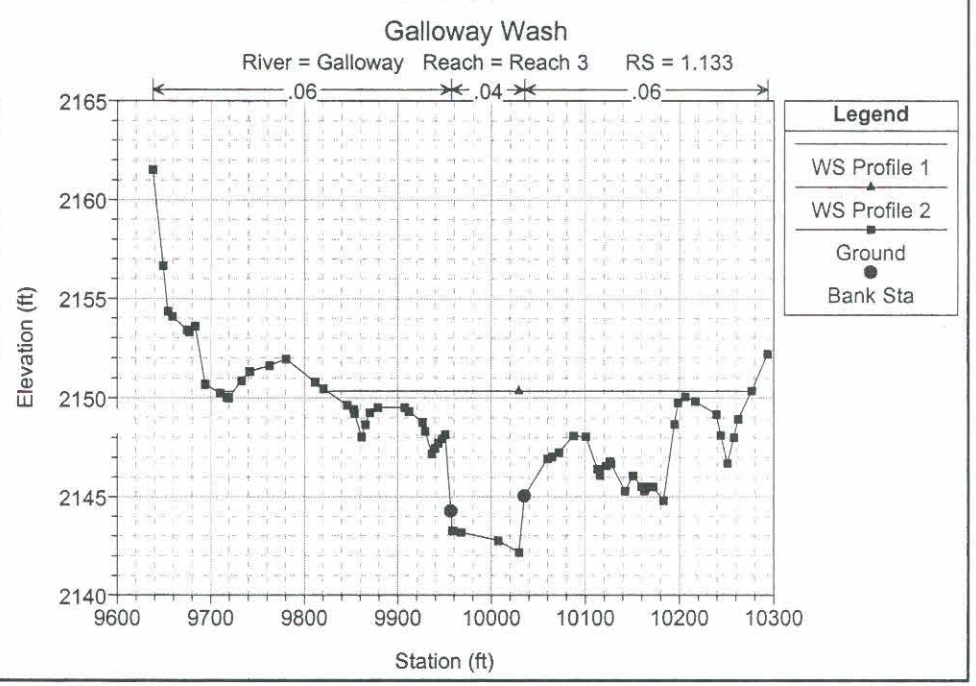

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.435
.035
.05
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

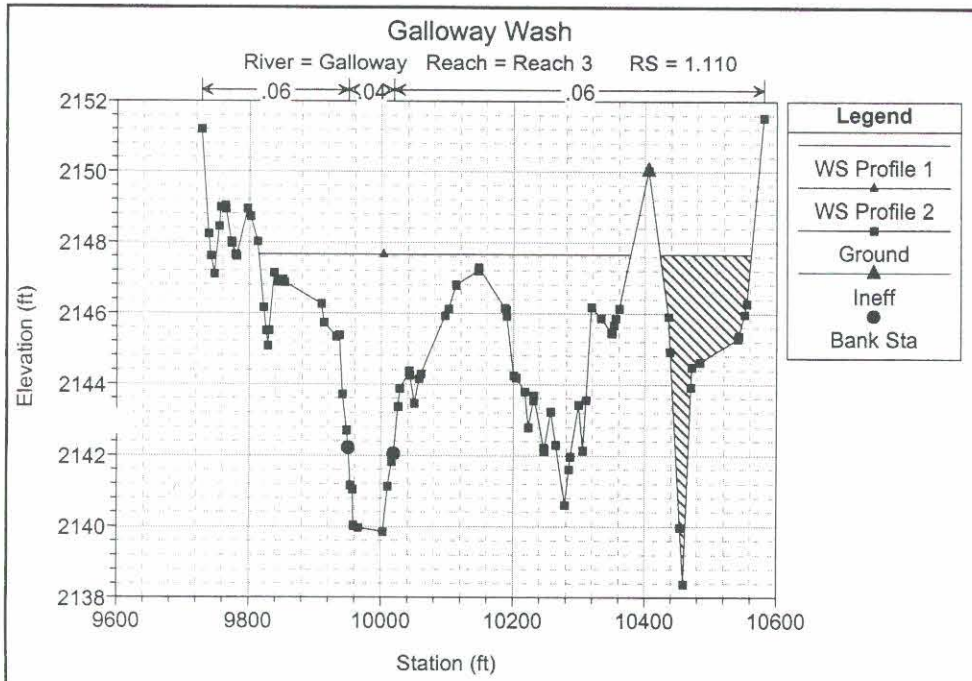

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.397
.05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.360
.05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.331
.05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.284
.05 .035 .05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

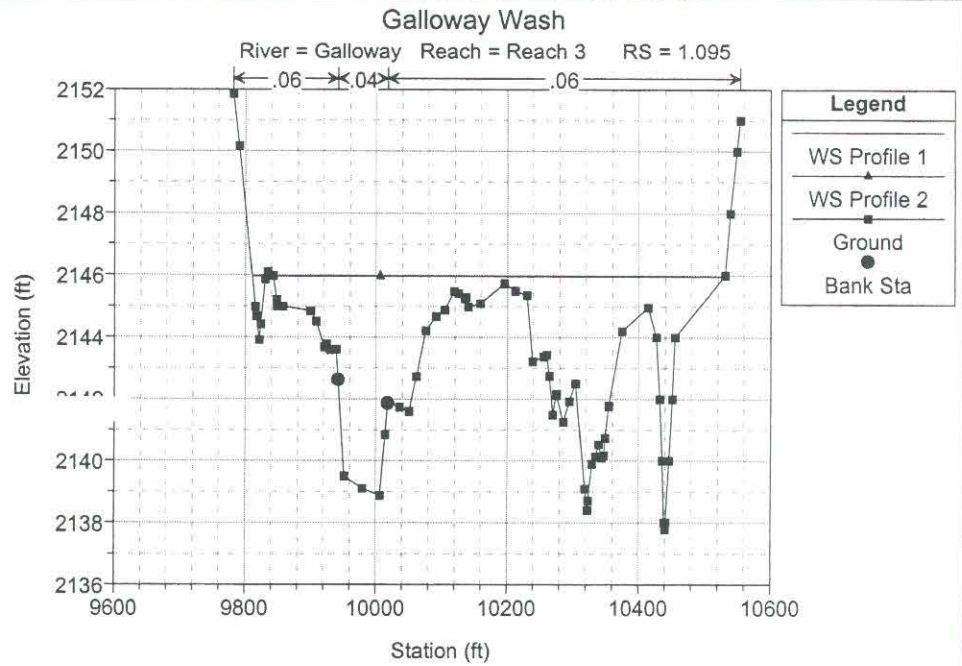

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.246
.05
.03
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta

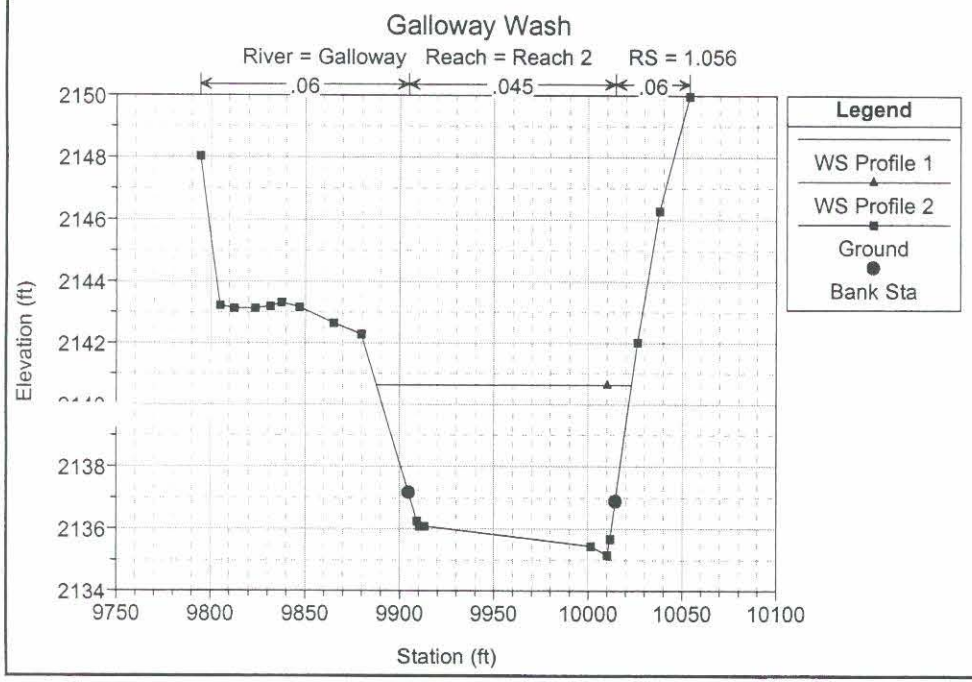

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.209
.05
.03
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Levee
Ineff
Bank Sta

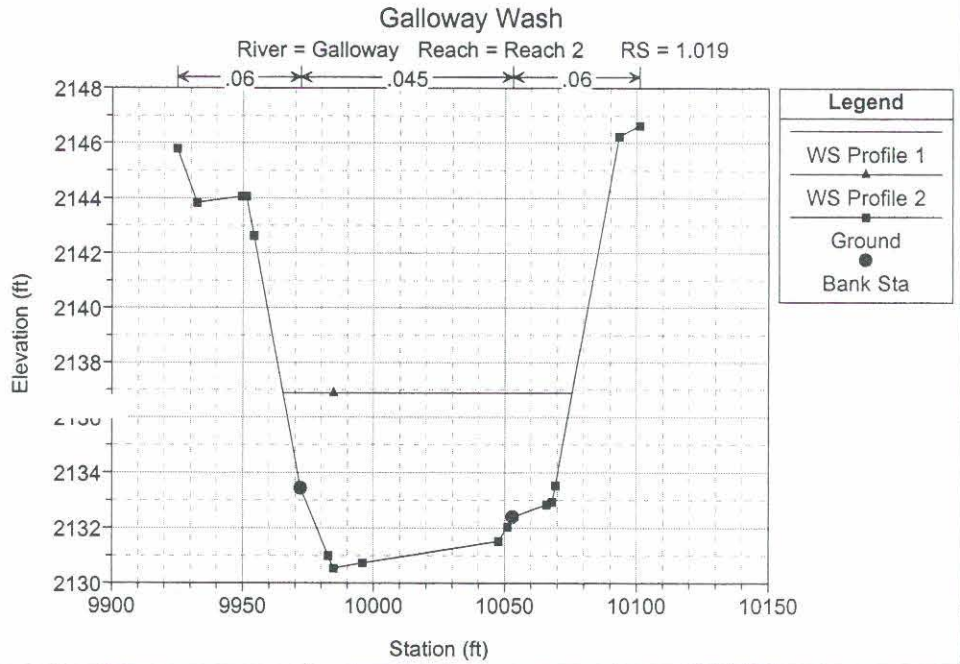

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.171
.05
.03
.05
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta

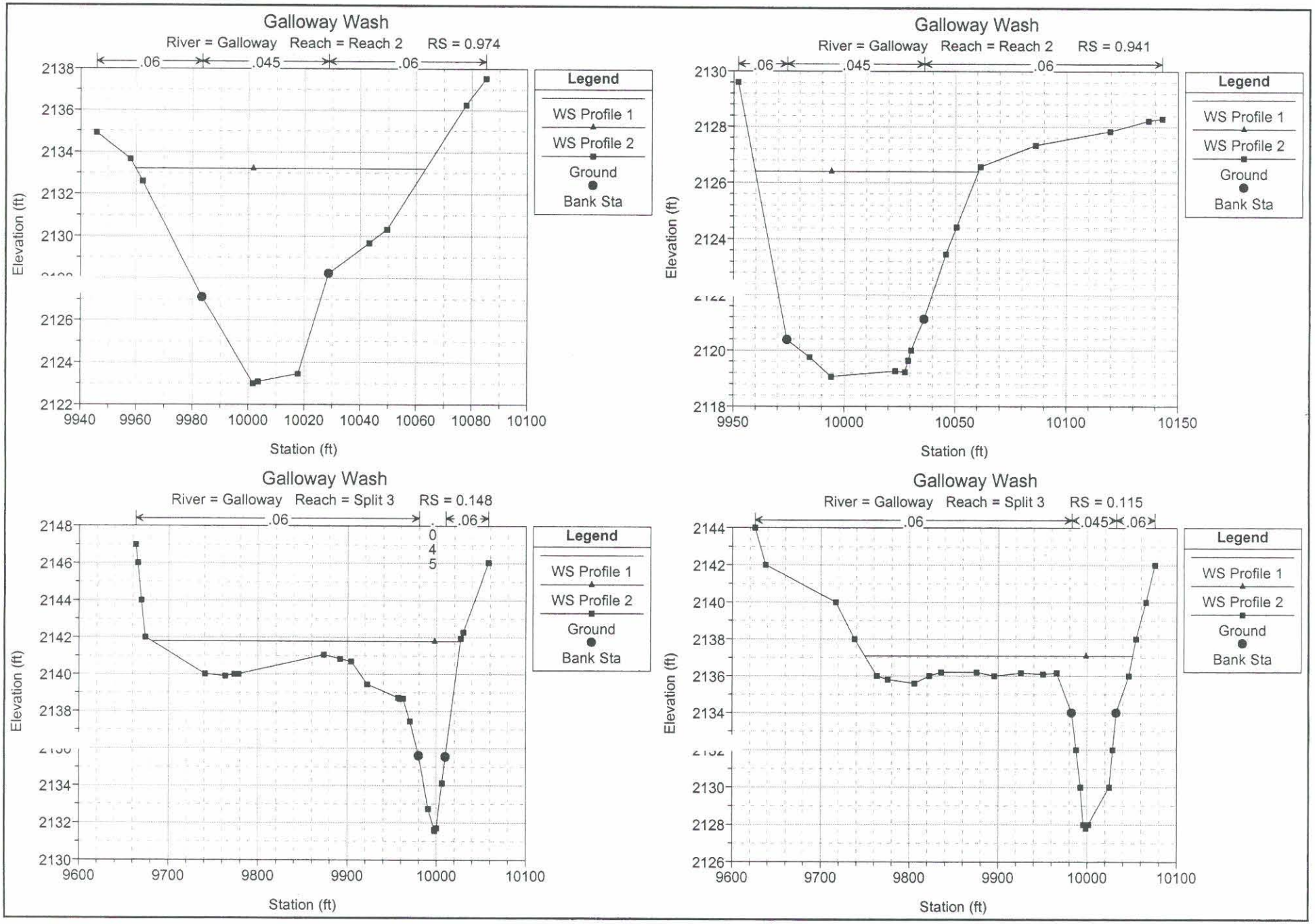

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.133
.06
.04
.06
Elevation (ft)
Station (ft)
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta

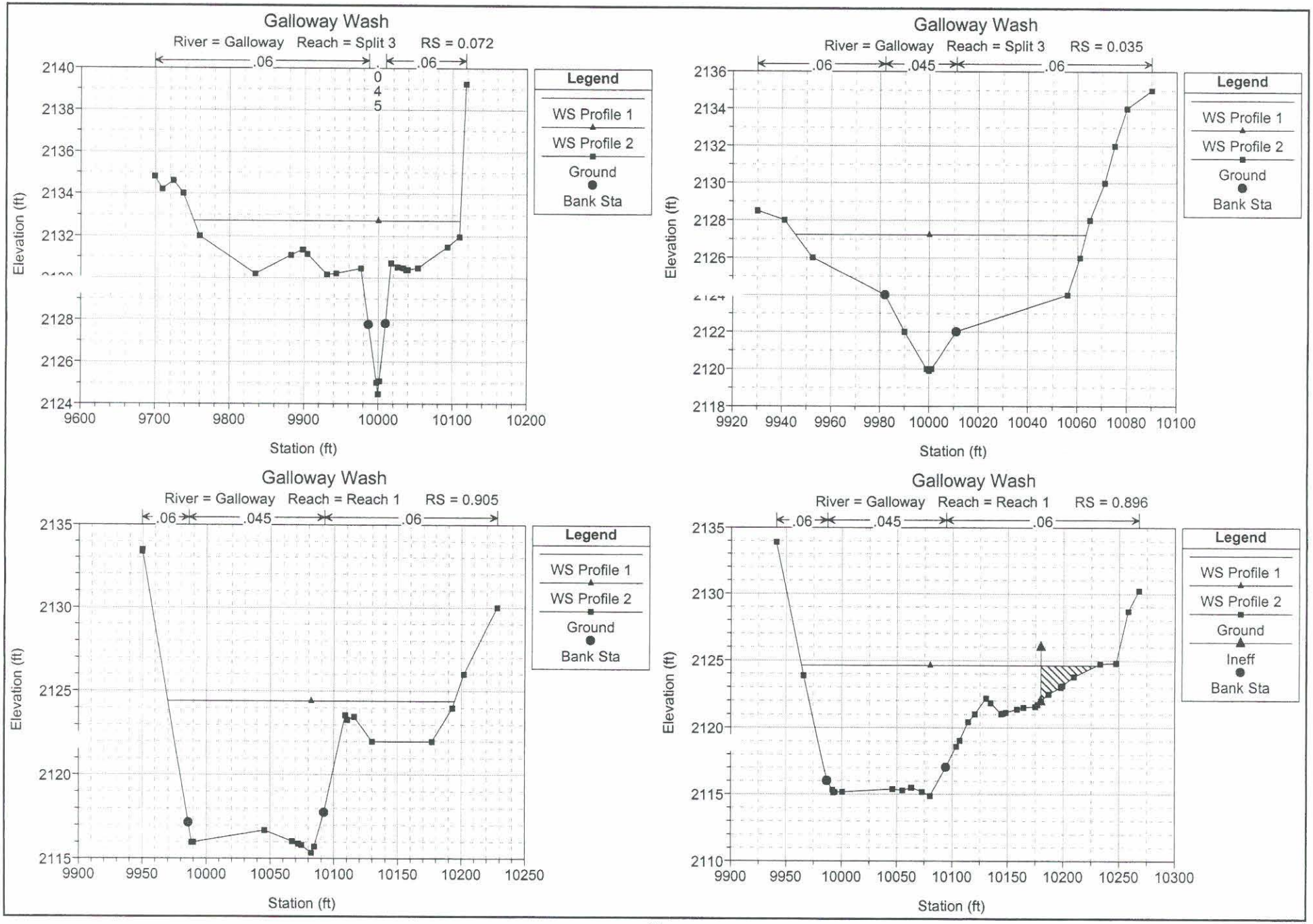

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.110
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

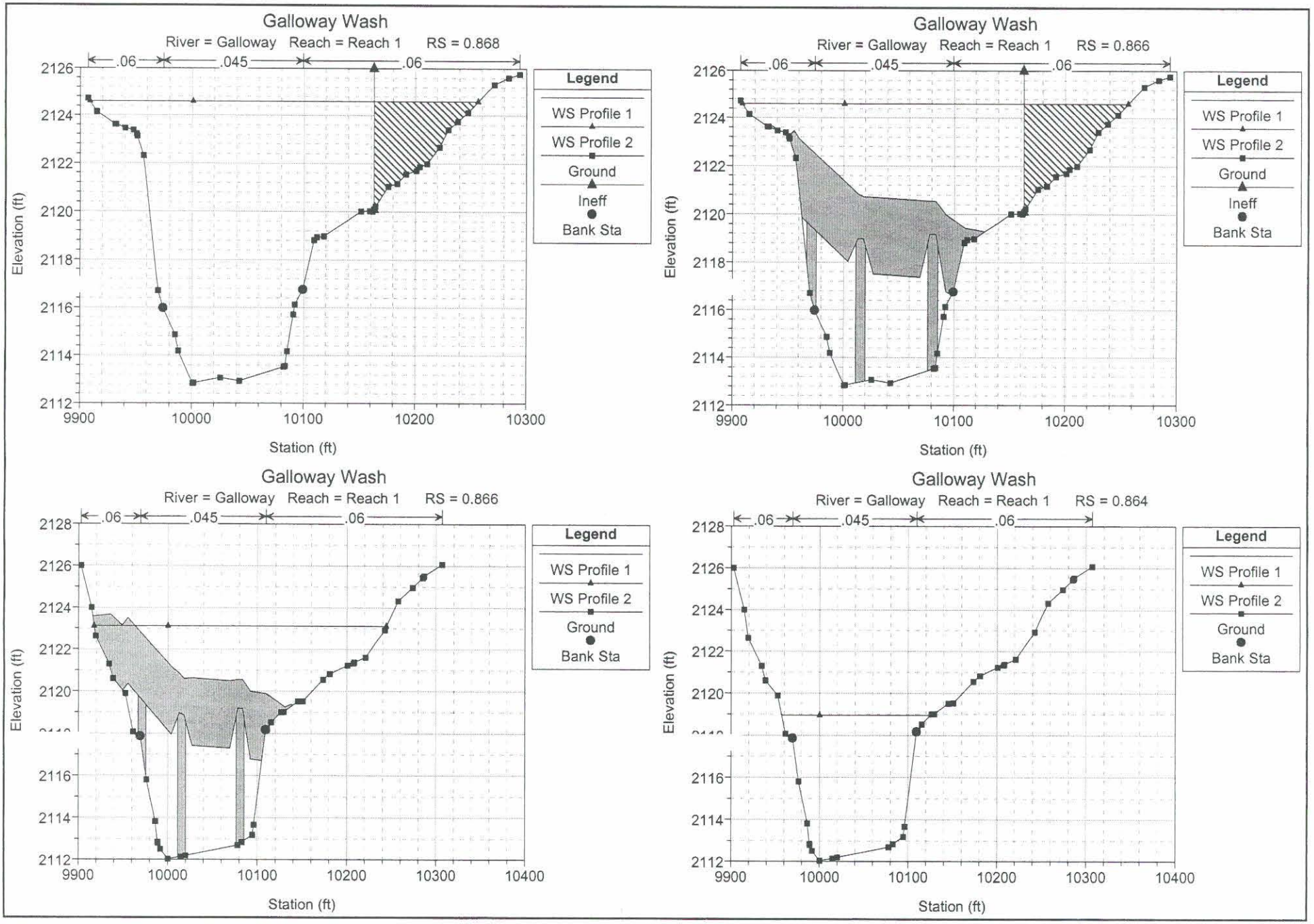

Galloway Wash
River = Galloway Reach = Reach 3 RS = 1.095
.06
.04
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

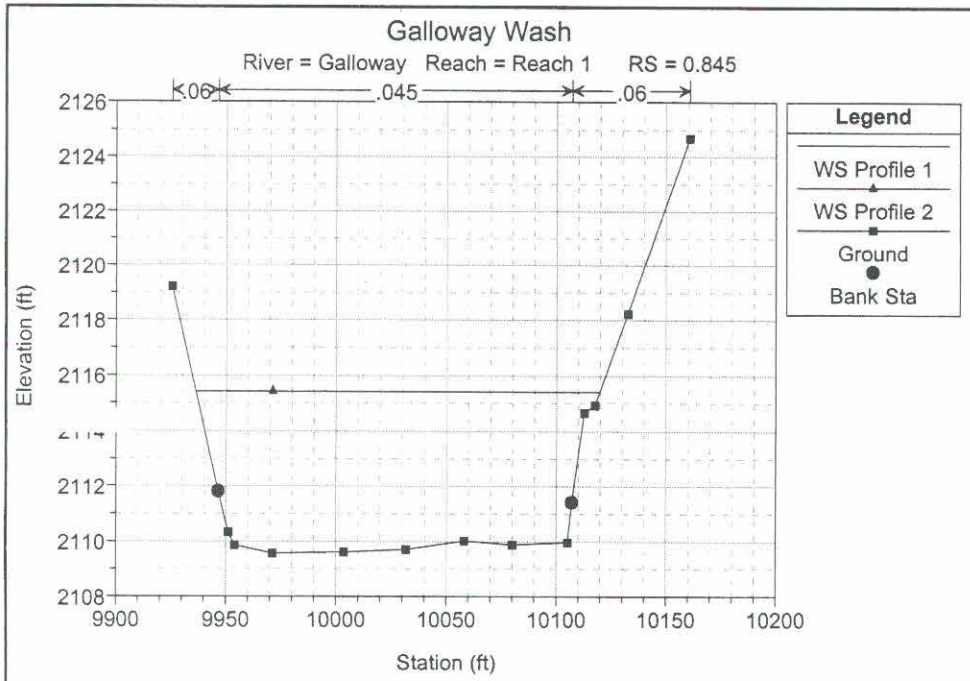

Galloway Wash
River = Galloway Reach = Reach 2 RS = 1.056
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

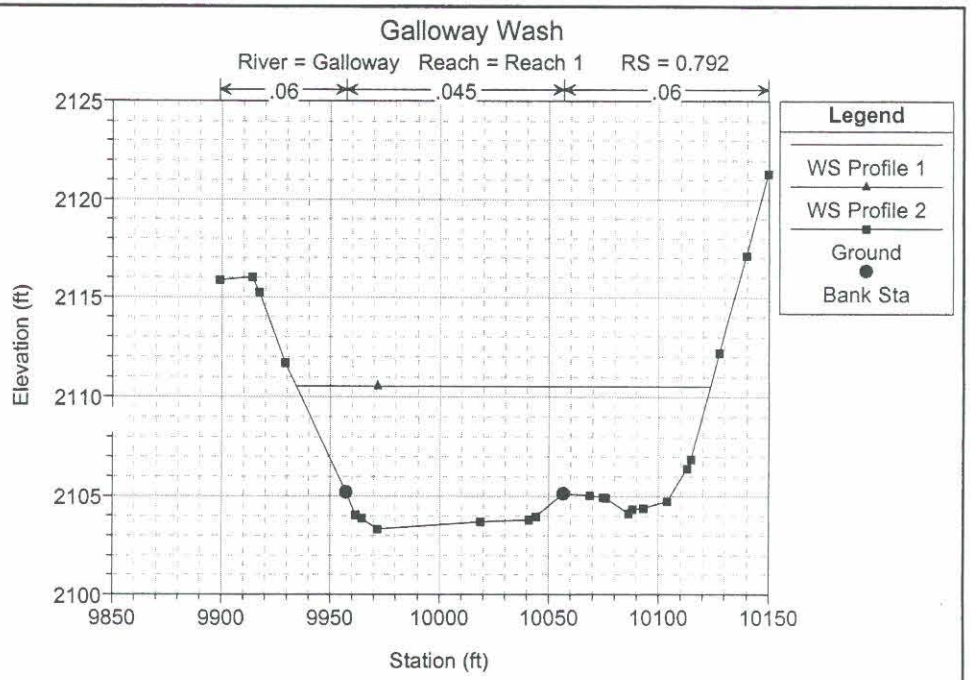

Galloway Wash
River = Galloway Reach = Reach 2 RS = 1.019
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

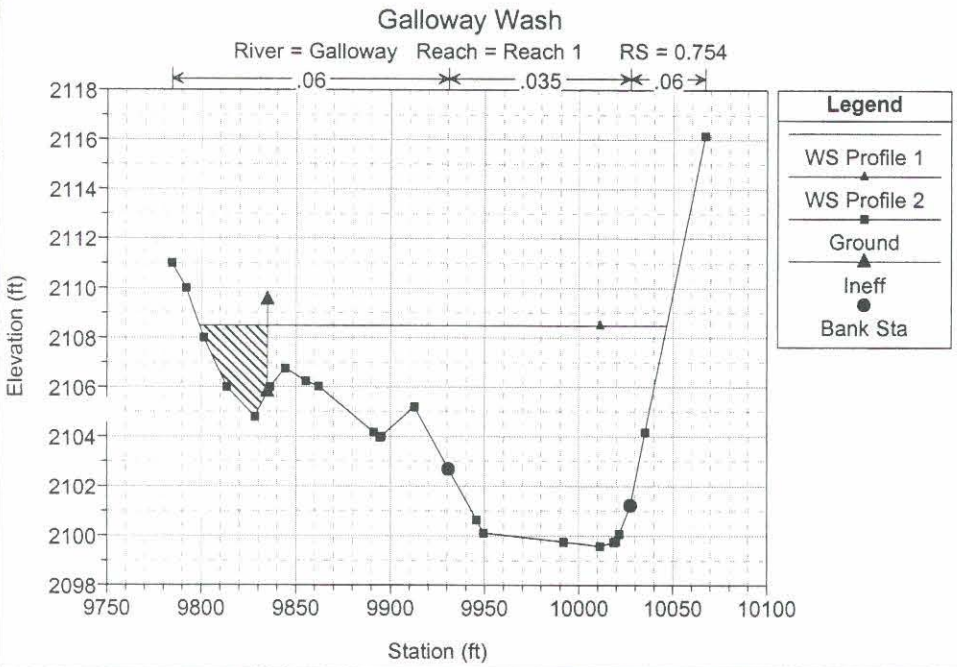

Galloway Wash
River = Galloway Reach = Reach 2 RS = 0.974
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 2 RS = 0.941
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Split 3 RS = 0.148
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Split 3 RS = 0.115
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

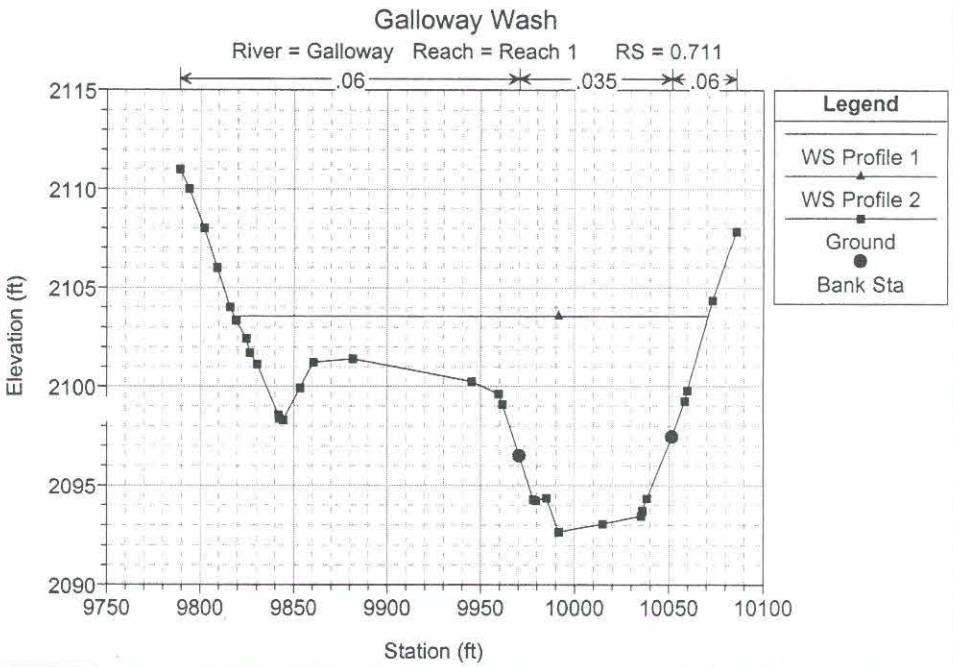

Galloway Wash
River = Galloway Reach = Split 3 RS = 0.072
.06
.06
0
4
5
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Split 3 RS = 0.035
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.905
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.896
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

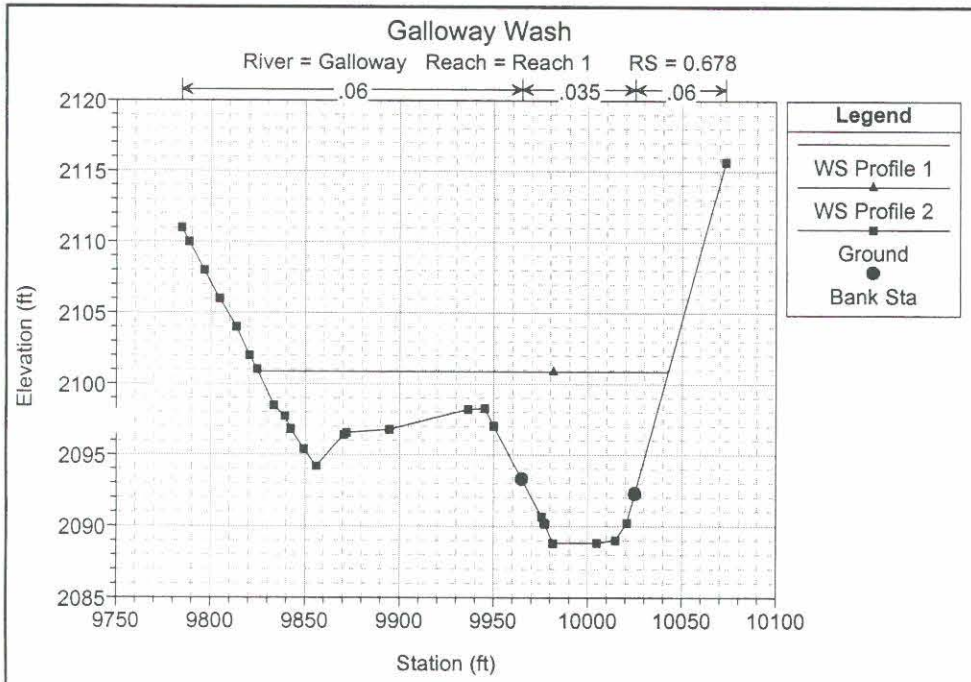

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.868
.06 .045 .06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.866
.06 .045 .06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.866
.06 .045 .06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.864
.06 .045 .06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

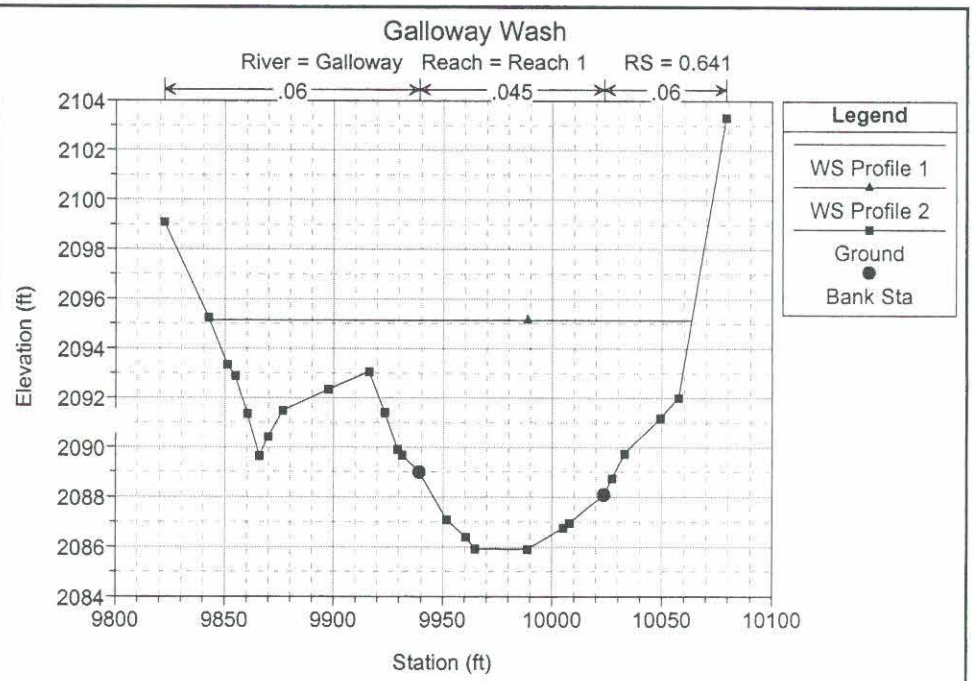

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.845
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

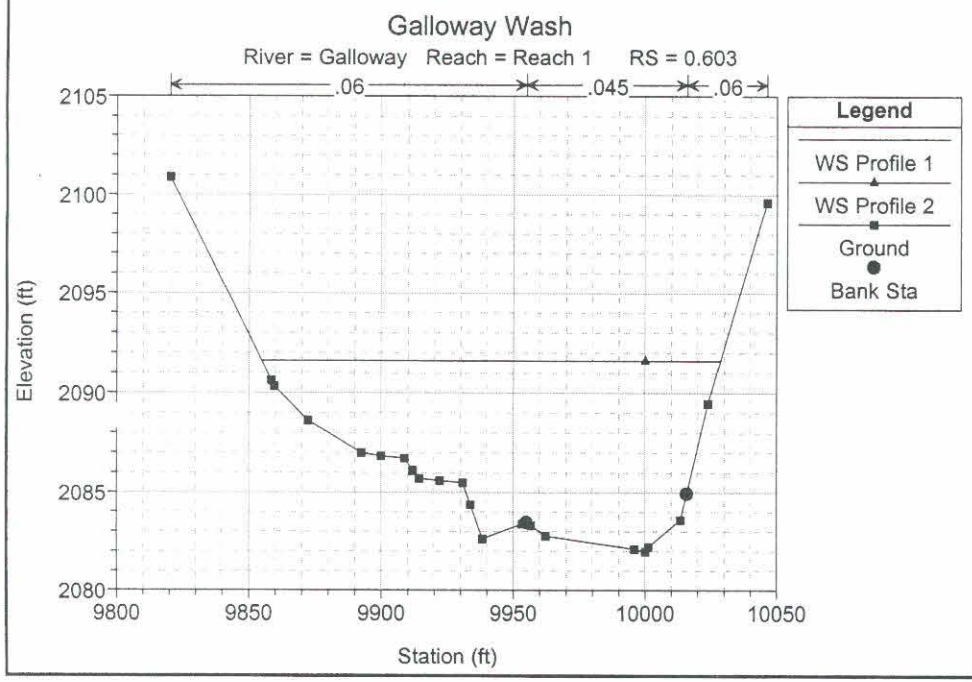

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.792
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

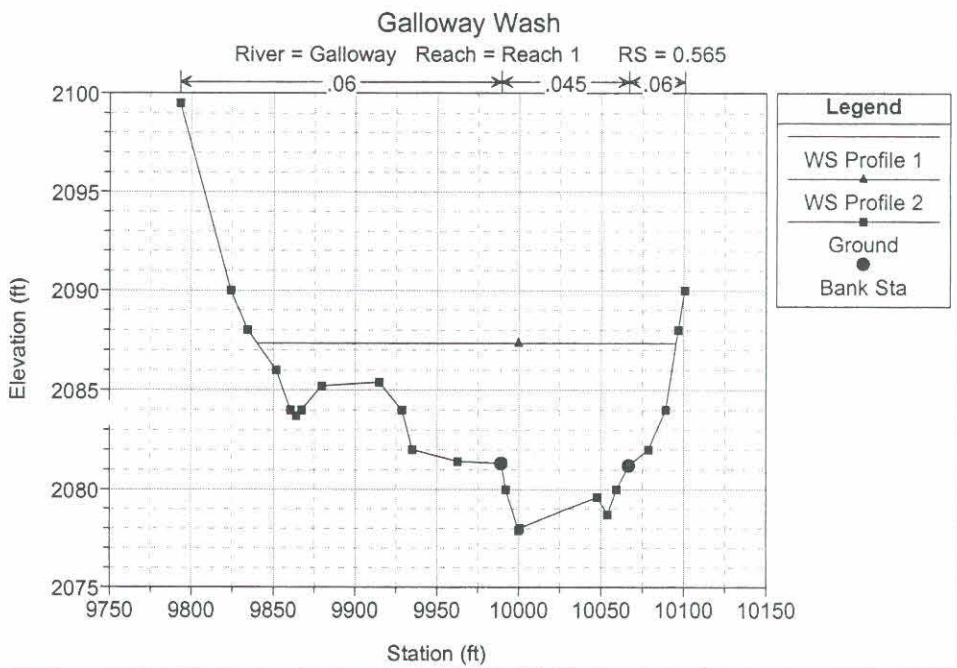

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.754
.06
.035
.06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

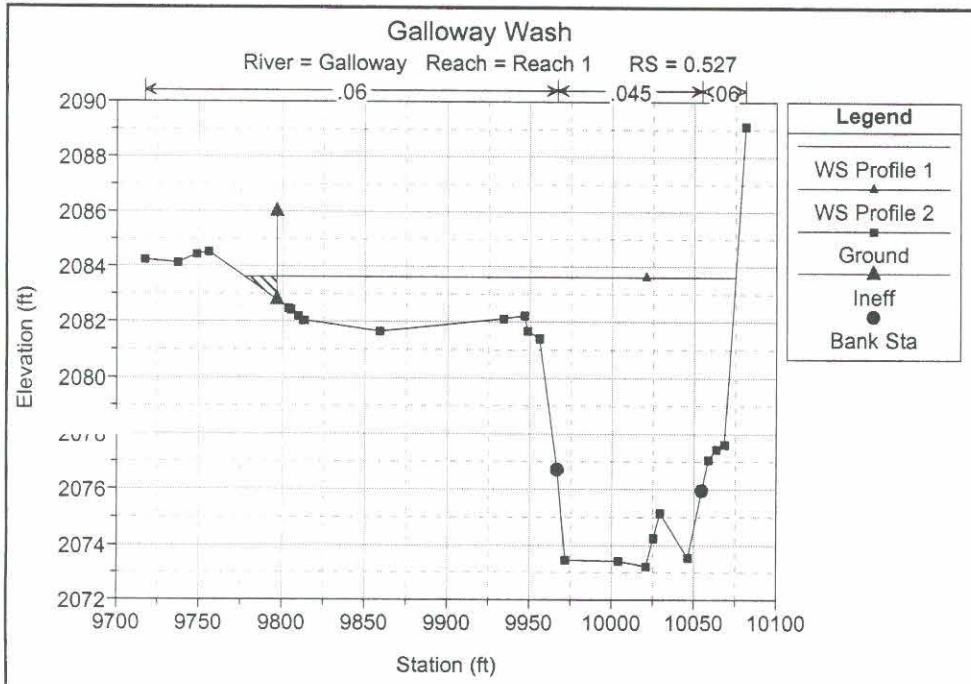

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.711
.06
.035
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

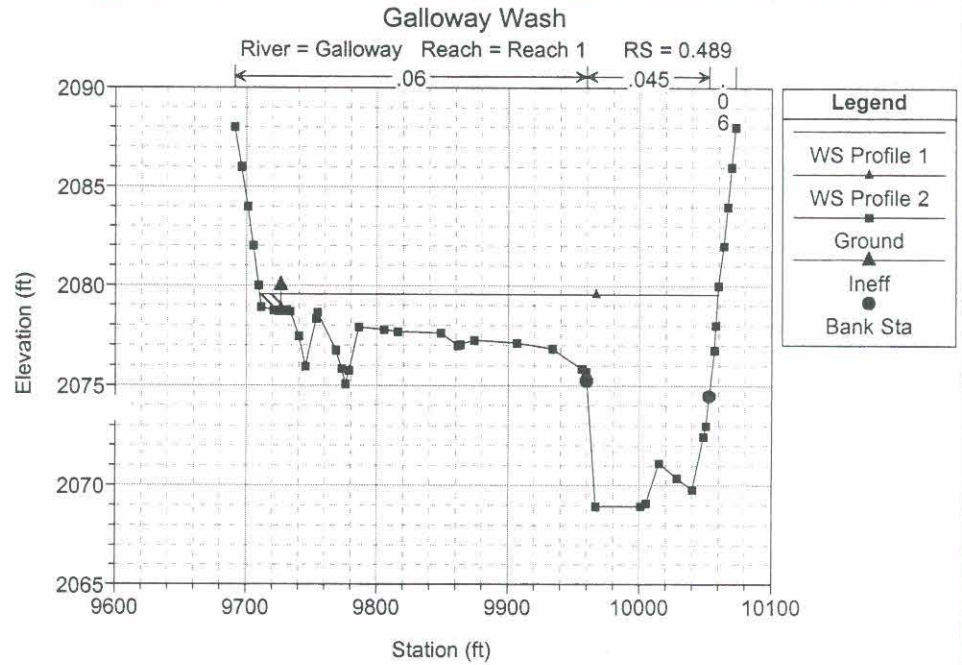

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.678
.06
.035
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

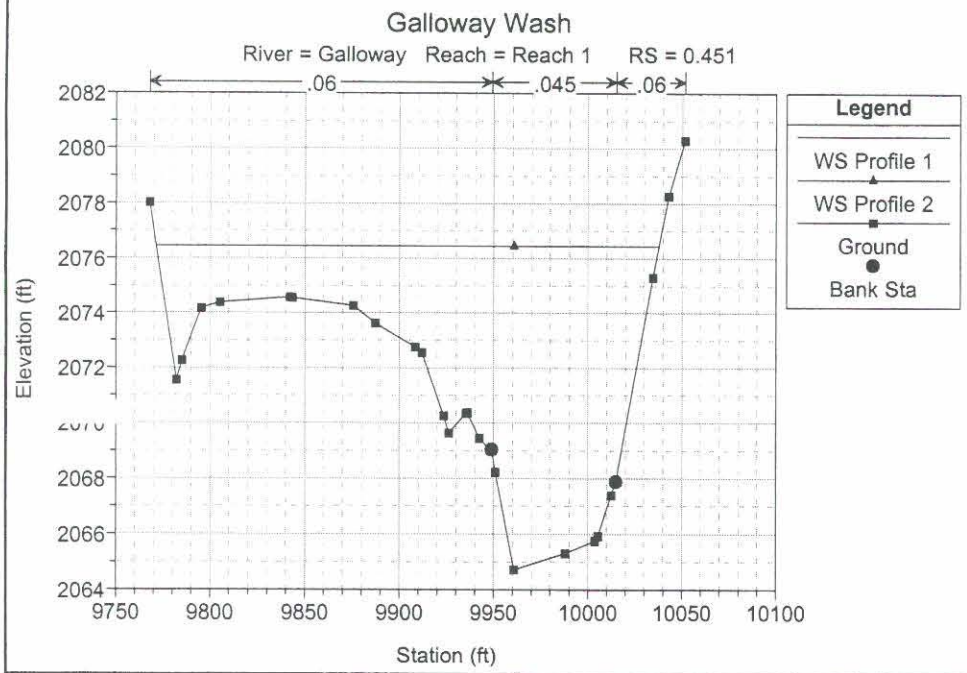

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.641
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

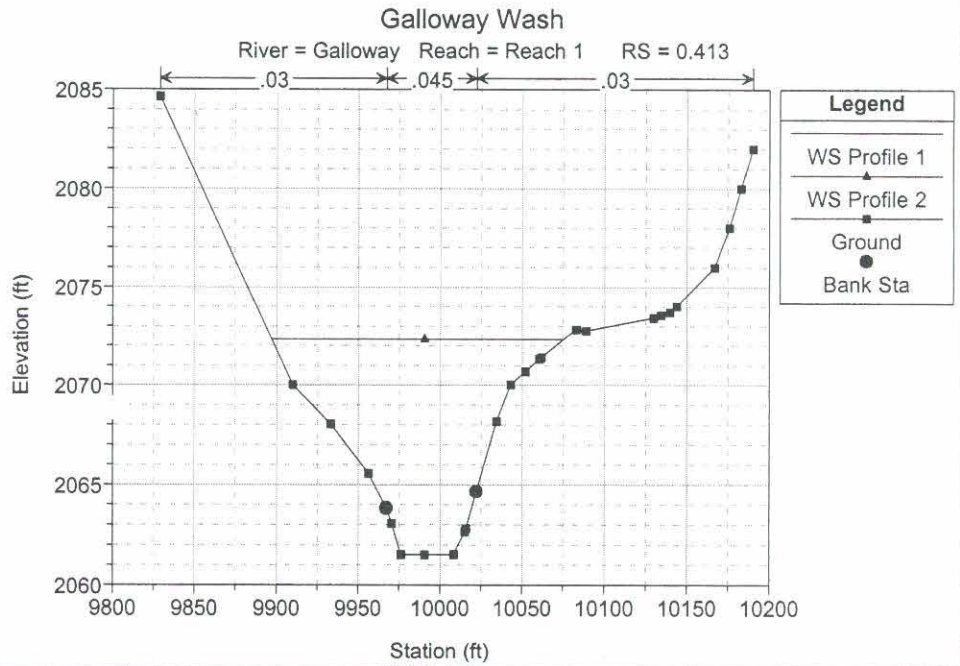

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.603
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

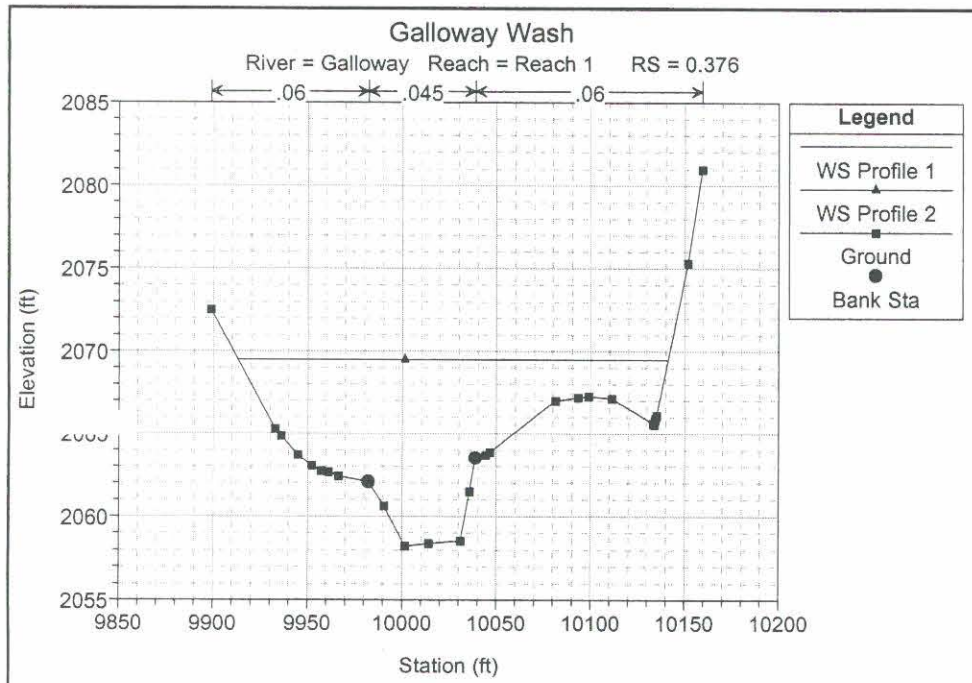

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.565
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

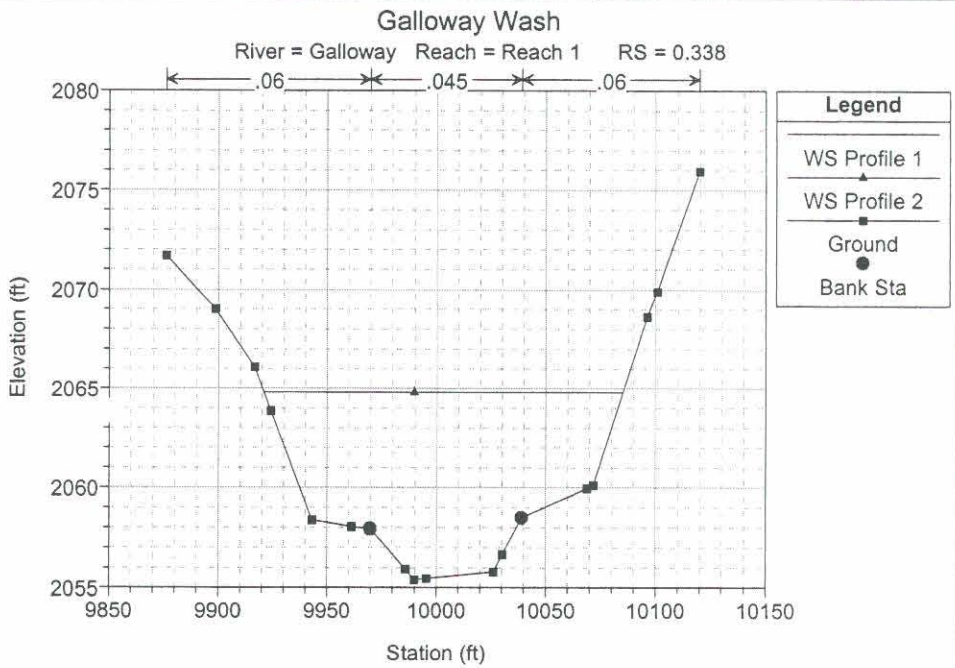

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.527
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

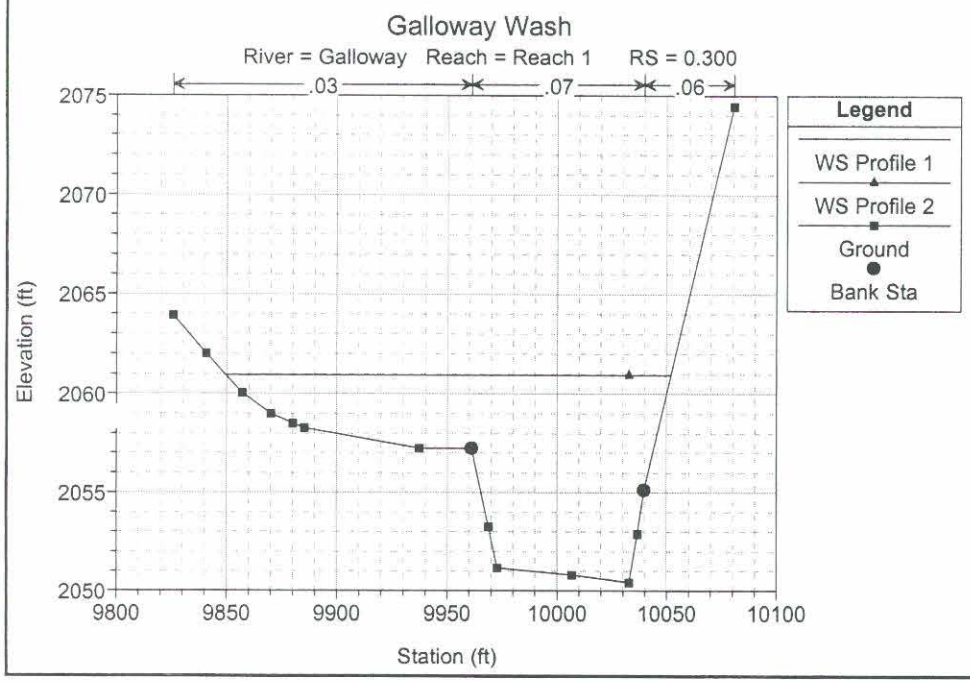

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.489
.06
.045
Legend
WS Profile 1
WS Profile 2
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

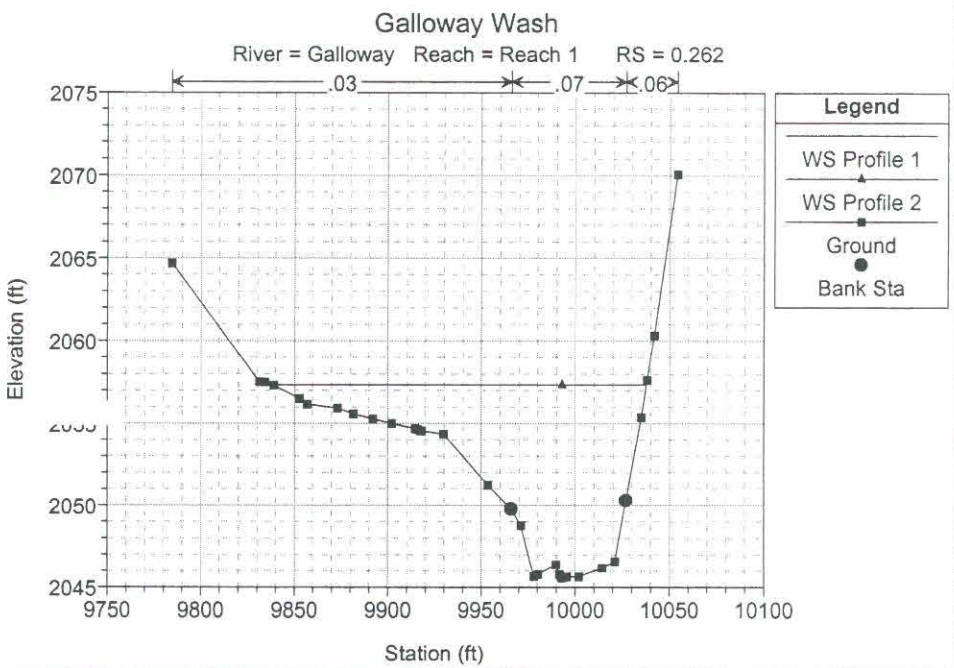

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.451
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

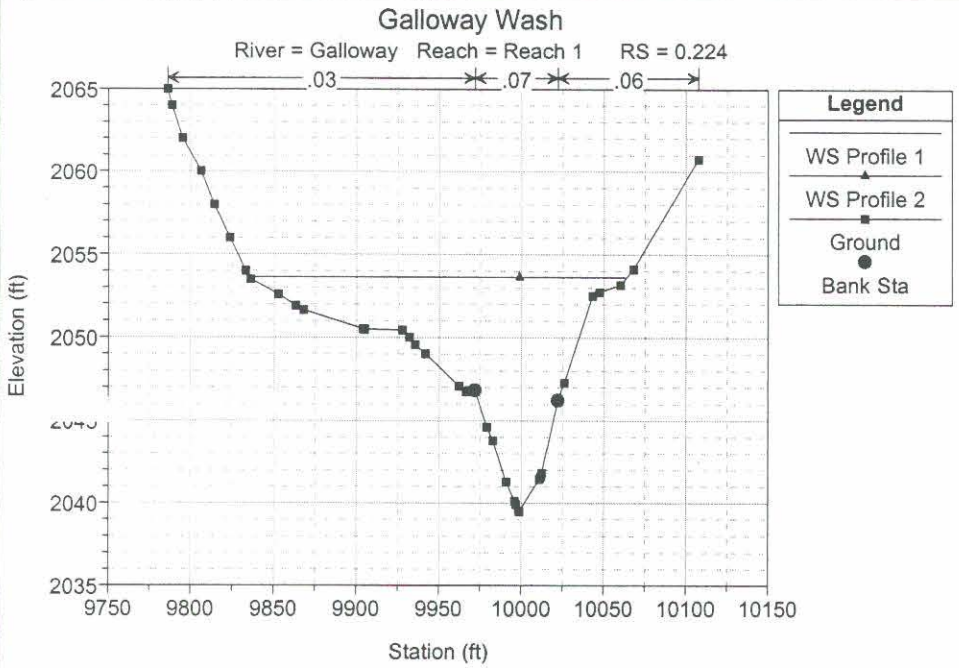

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.413
.03
.045
.03
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

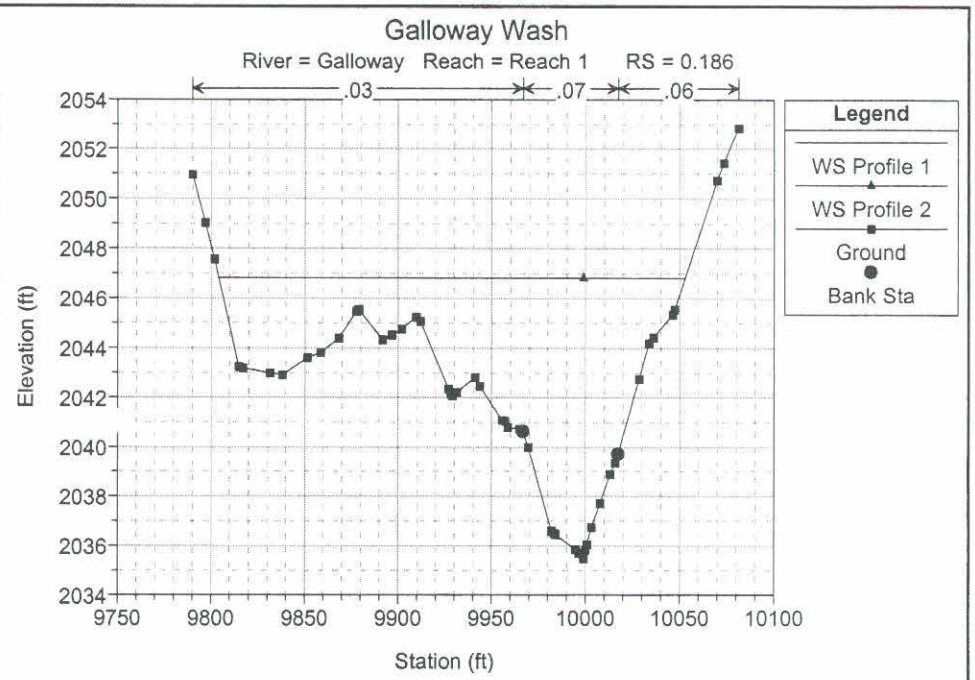

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.376
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

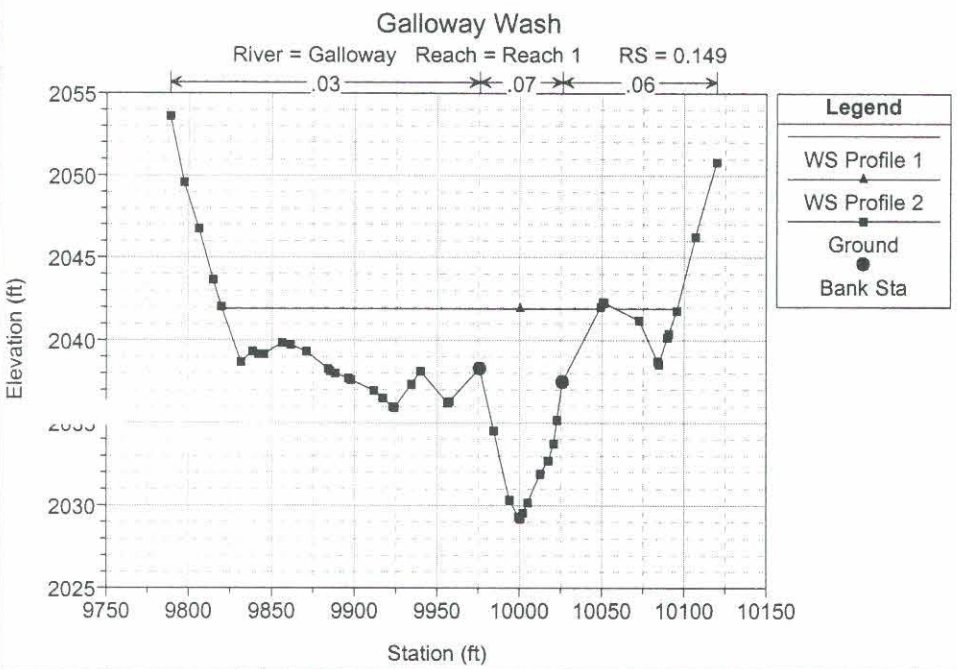

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.338
.06
.045
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

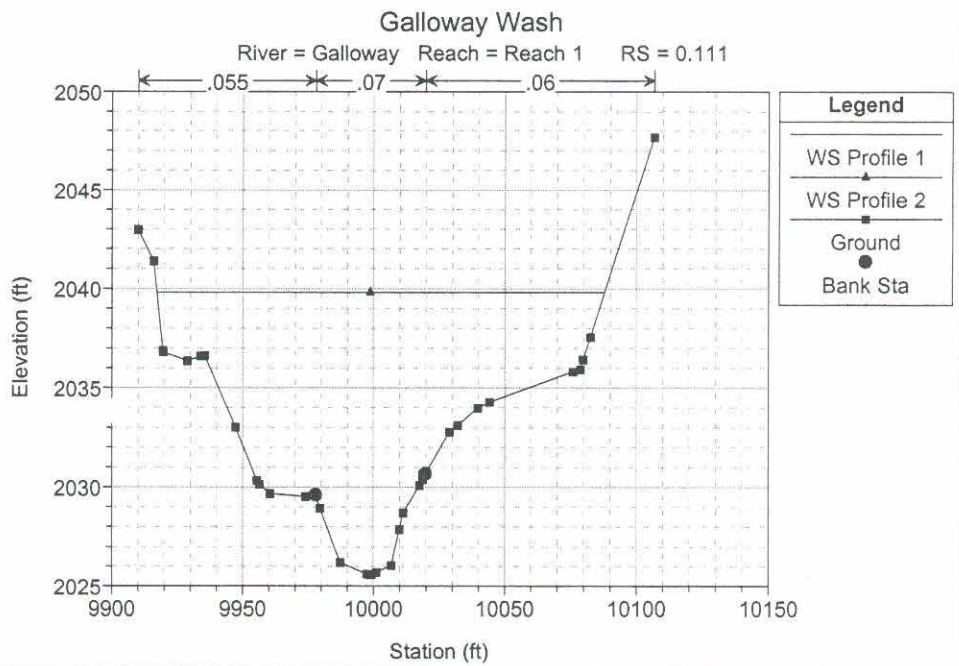

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.300
.03
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

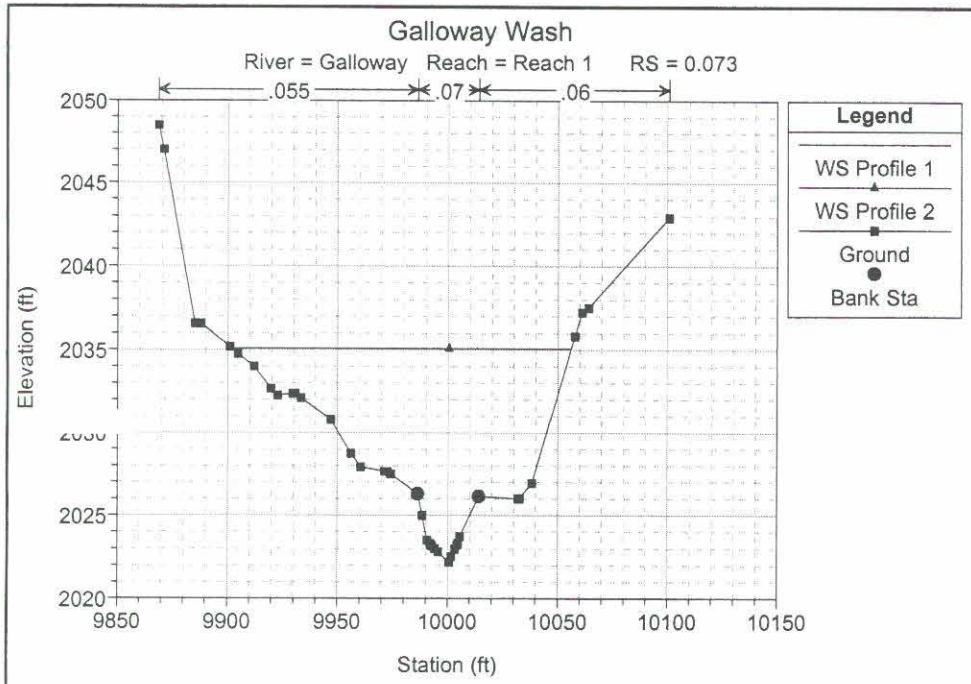

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.262
.03
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)

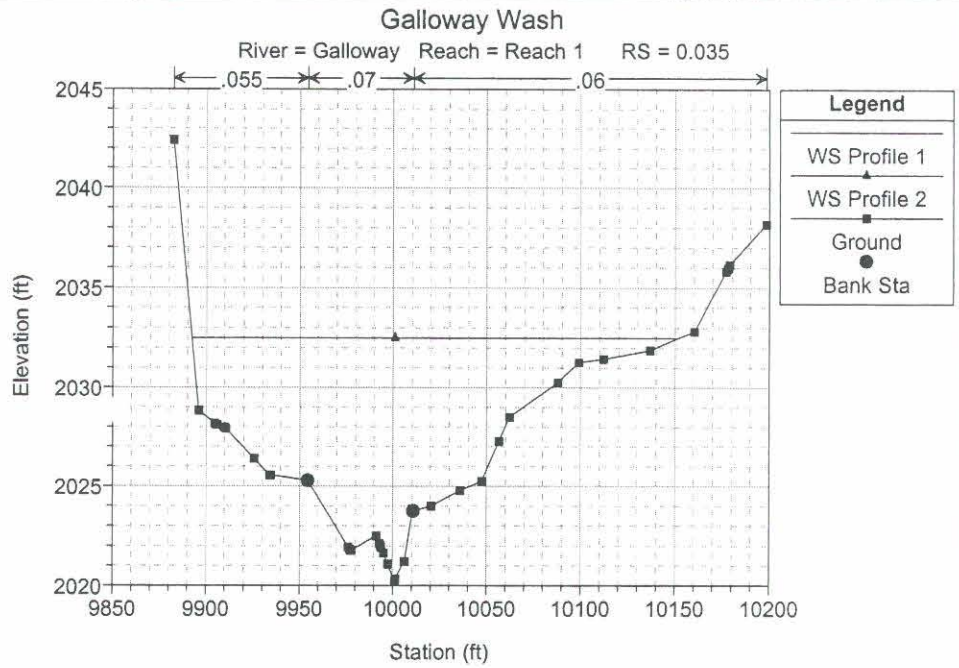

Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.224
.03
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.186
.03
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.149
.03
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.111
.055
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)


Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.073
.055
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
2050
2045
2040
2035
2025
2020
9850
9900
9950
10000
10050
10100
10150


Galloway Wash
River = Galloway Reach = Reach 1 RS = 0.035
.055
.07
.06
Legend
WS Profile 1
WS Profile 2
Ground
Bank Sta
Elevation (ft)
Station (ft)
2045
2040
2035
2030
2025
2020
9850
9900
9950
10000
10050
10100
10150
10200

E.3 Expansion and Contraction Coefficients

No special data were gathered or calibration performed to estimate expansion and contraction coefficients. Local ineffective flow areas resulting from rapid expansion or contraction of the floodplain were defined using an assumed expansion coefficient of 1:4 (lateral-feet:flow-direction feet), and an assumed contraction coefficient of 1:1.

E.4 Analysis of Structures

No independent hydraulic modeling was performed for structures; culvert and bridge analyses are included in the HEC-RAS results.

E.5 Hydraulic Calculations

E.5.1 Flow Distributions/HEC-2 Analysis/and Hydraulic Analyses to Characterize Splits/Overflows Which Were Not Mapped.

The following analyses are in support of the **"explanation of water surface higher than the endpoints of cross sections"** notes accompanying Section 4 of the FEMA Riverine Hydraulic Analysis forms for Andora Hills and Galloway Washes.

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS
Since 1962

2633 East Indian School Road, Suite 401
Phoenix, Arizona 85016-6763
Tel. (602) 957-1155
Fax (602) 957-2838

CIVIL ENGINEERING ■ Transportation ■ Airports ■ Drainage/Flood Control ■ Water Resources ■ Land Development ■ Surveying

LETTER OF TRANSMITTAL

TO: JEFuller / Hydrology & Geomorphology, Inc.
5235 South Kyrene, Suite 205
Tempe, AZ 85283

DATE: August 1, 2000

RE: FCD 99-14
Andora Hills Wash

ATTENTION: Mr. Brian R. Iserman, P.E.

Transmitted herewith are the following items:

- ❑ Plans
- ❑ Reports
- ❑ Details
- ❑ Specifications
- ❑ Estimate
- ❑ Calculations
- ❑ Prints
- ❑ Change Order
- ■ Other
- ❑ Copy of Letter
- Shop Drawings

Copies	Date	I.D. Number	Description
1 ea.	-		Zone A technical appendix originals

These are transmitted as checked below:

- ❑ For Approval
- → For Your Use
- ❑ As Requested
- ❑ Returned
- ❑ For Review and Comment
- ❑ For Information Only
- ❑ For Use as Guideline Only
- ❑ Other
- ❑ Approve
- ❑ Disapprove
- ❑ Approve with Comments

REMARKS: Mr. Brian R. Iserman, P.E.,

If you have any questions or comments concerning this submittal do not hesitate to call.

copy: 9924 letter

Sincerely,
DIBBLE & ASSOCIATES

Frank Edward Brown

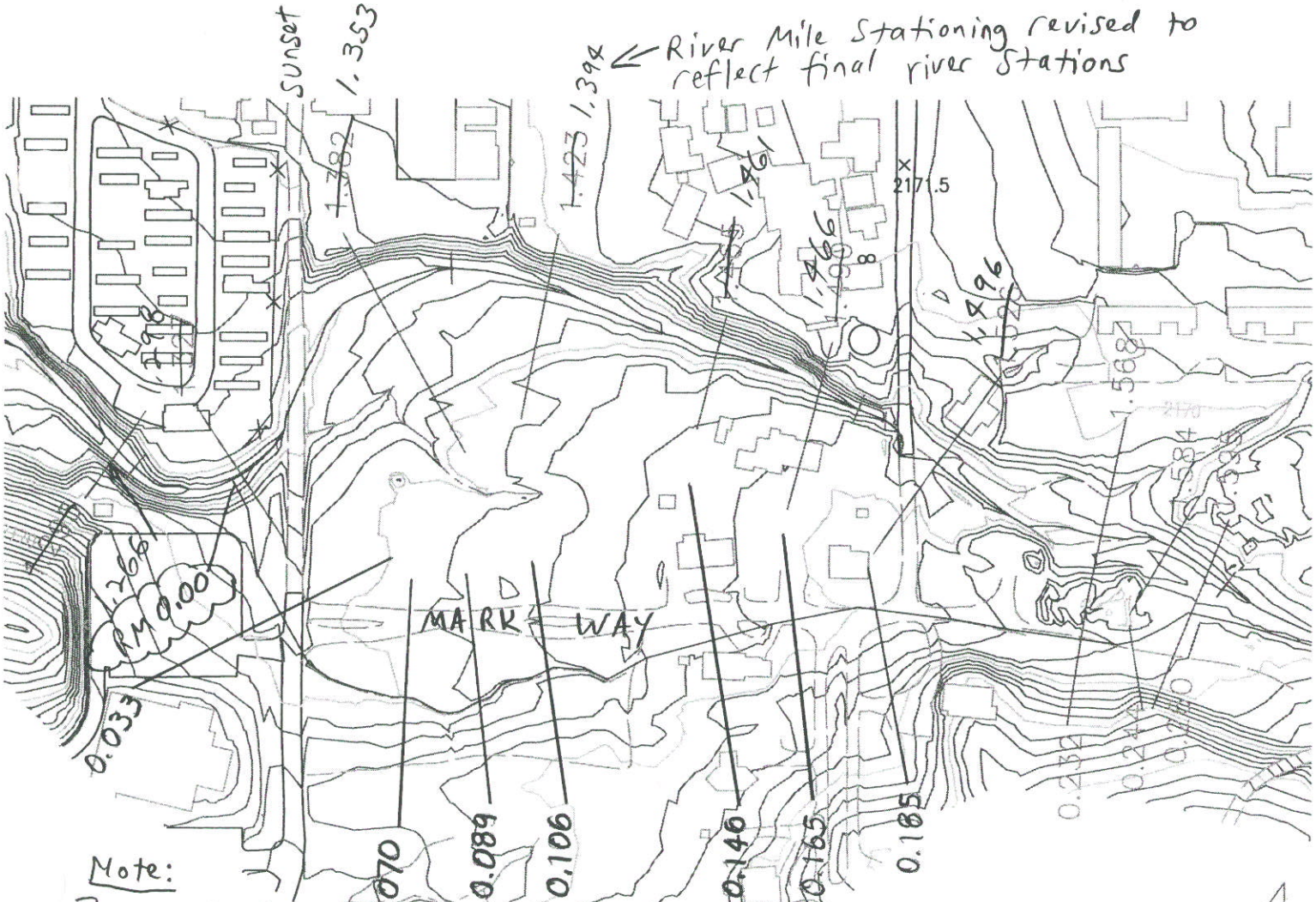
Frank Edward Brown, P.E.

Zone A Floodplain Determination near main stem
River Mile 1.298 to 1.496

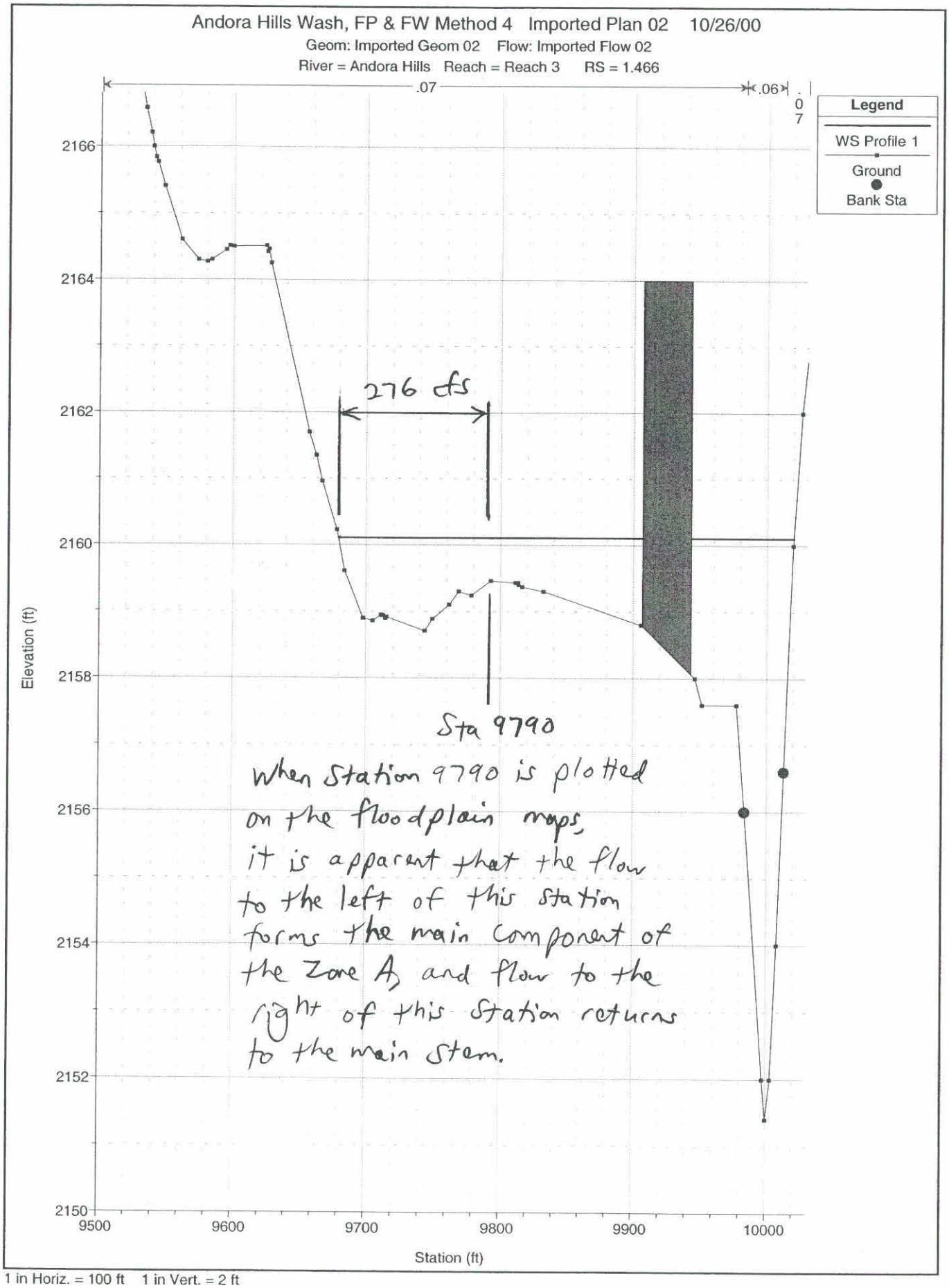
Note: The ridgeline at the right end of these cross sections is overtopped. Therefore, shallow flooding will occur from the right end of cross sections down to the main stem floodplain. The entire area is mapped in Zone A.

N

1" = 200'



Note:
7 cross sections used to determine limits of Zone A floodplain RM 0.033 to RM 0.185, measured from zero point at Main Stem as noted.



1 in Horiz. = 100 ft 1 in Vert. = 2 ft

Errors Warnings and Notes (Continued)

	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.

Plan: Imported Pla River: Andora Hills Reach:Reach 3 Riv Sta: 1.496 Profile: Profile 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
9735.01	9760.12	0.36	0.72	4.75	0.01	0.15	0.50
9760.12	9785.24	63.26	31.06	25.21	2.34	1.24	2.04
9785.24	9810.35	106.24	42.34	25.13	3.93	1.69	2.51
9810.35	9835.47	38.21	22.93	25.13	1.42	0.91	1.67
9835.47	9860.58	0.33	0.41	1.31	0.01	0.77	0.82
9860.58	9885.70	15.05	10.81	15.52	0.56	0.74	1.39
9885.70	9910.81	37.24	22.57	25.12	1.38	0.90	1.65
9910.81	9935.93	140.46	50.10	25.18	5.20	1.99	2.80
9935.93	9961.04	230.79	67.46	25.15	8.55	2.69	3.42
LB 9961.04	RB 10024.54	2013.36	308.05	64.07	74.57	4.85	6.54
10024.54	10132.16	54.68	19.52	11.48	2.03	1.78	2.80

Errors Warnings and Notes

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.

FLOW DISTRIBUTION @ RM 1,466

Plan: Imported Pla River: Andora Hills Reach:Reach 3 Riv Sta: 1.466 Profile: Profile 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
9661.91	9694.06	13.77	8.68	14.65	0.51	0.59	1.59
9694.06	9726.21	98.33	38.67	32.16	3.64	1.20	2.54
9726.21	9758.37	108.76	41.08	32.15	4.03	1.28	2.65
9758.37	9790.52	55.40	27.41	32.16	2.05	0.85	2.02
9790.52	9822.67	38.84	22.15	32.15	1.44	0.69	1.75
9822.67	9854.82	55.83	27.53	32.15	2.07	0.86	2.03
9854.82	9886.97	81.01	34.42	32.15	3.00	1.07	2.35
9886.97	9919.12	61.93	24.81	21.22	2.29	1.25	2.50
9919.12	9951.27	59.20	18.01	10.19	2.19	2.22	3.29
9951.27	9983.42	367.84	85.55	32.36	13.62	2.66	4.30
LB 9983.42	RB 10013.00	1721.73	191.80	31.30	63.77	6.48	8.98
10013.00	10055.32	37.34	12.18	7.90	1.38	1.72	3.07

276.26 cfs

Used to delineate the Zone A

Errors Warnings and Notes

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:	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.

Plan: Imported Pla River: Andora Hills Reach:Reach 3 Riv Sta: 1.461 Profile: Profile 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
9650.68	9687.16	33.13	17.97	28.36	1.23	0.64	1.84
9687.16	9723.64	38.32	21.69	36.49	1.42	0.59	1.77
9723.64	9760.12	0.49	0.91	8.95	0.02	0.10	0.54
9760.12	9833.08						
9833.08	9869.56	4.43	5.33	27.85	0.16	0.19	0.83
9869.56	9906.04	13.54	8.77	18.06	0.50	0.50	1.54

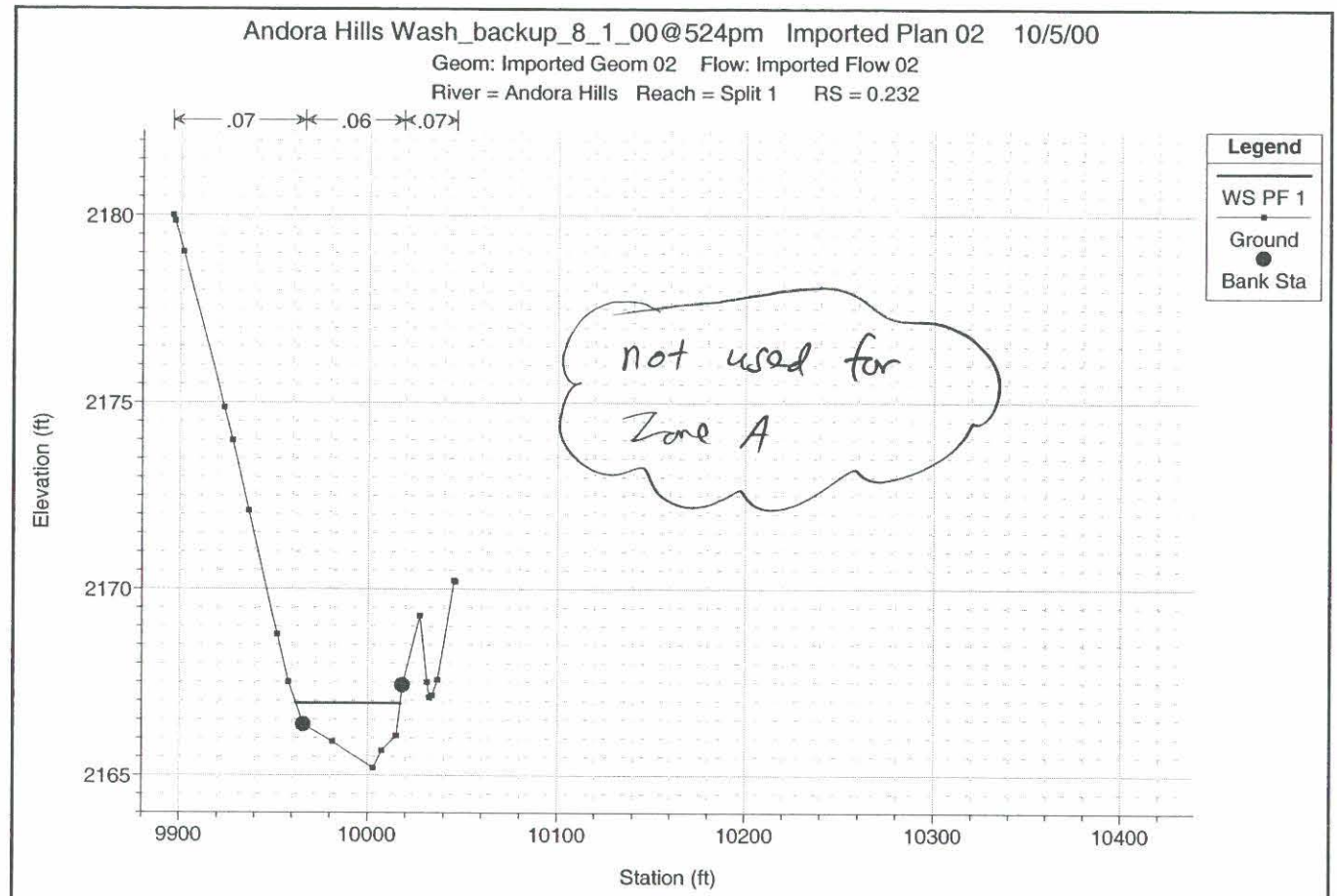
71.94 cfs

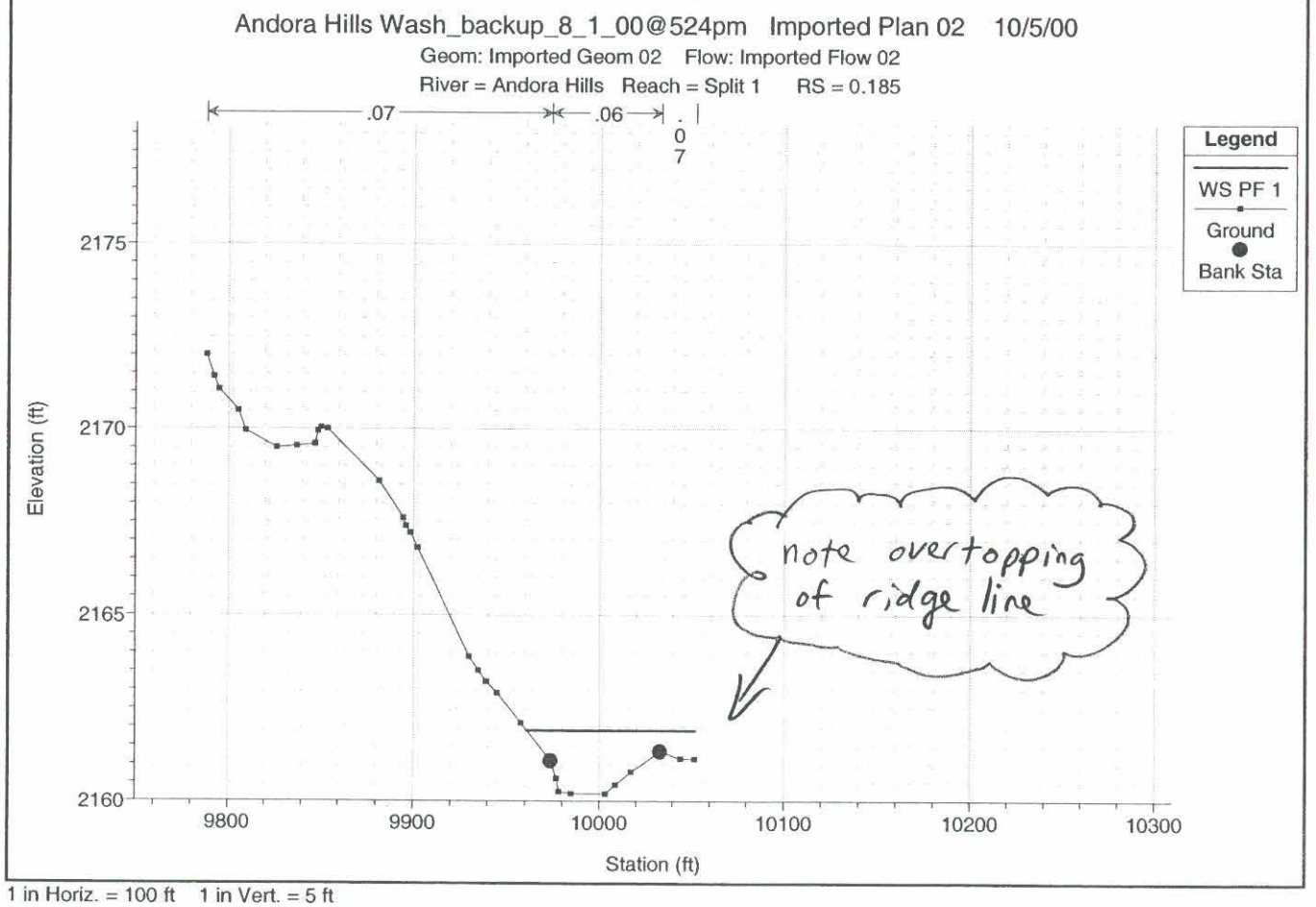
HL .AS Plan: Imported Pla River: Andora Hills Reach: Split 1

used for Zone A

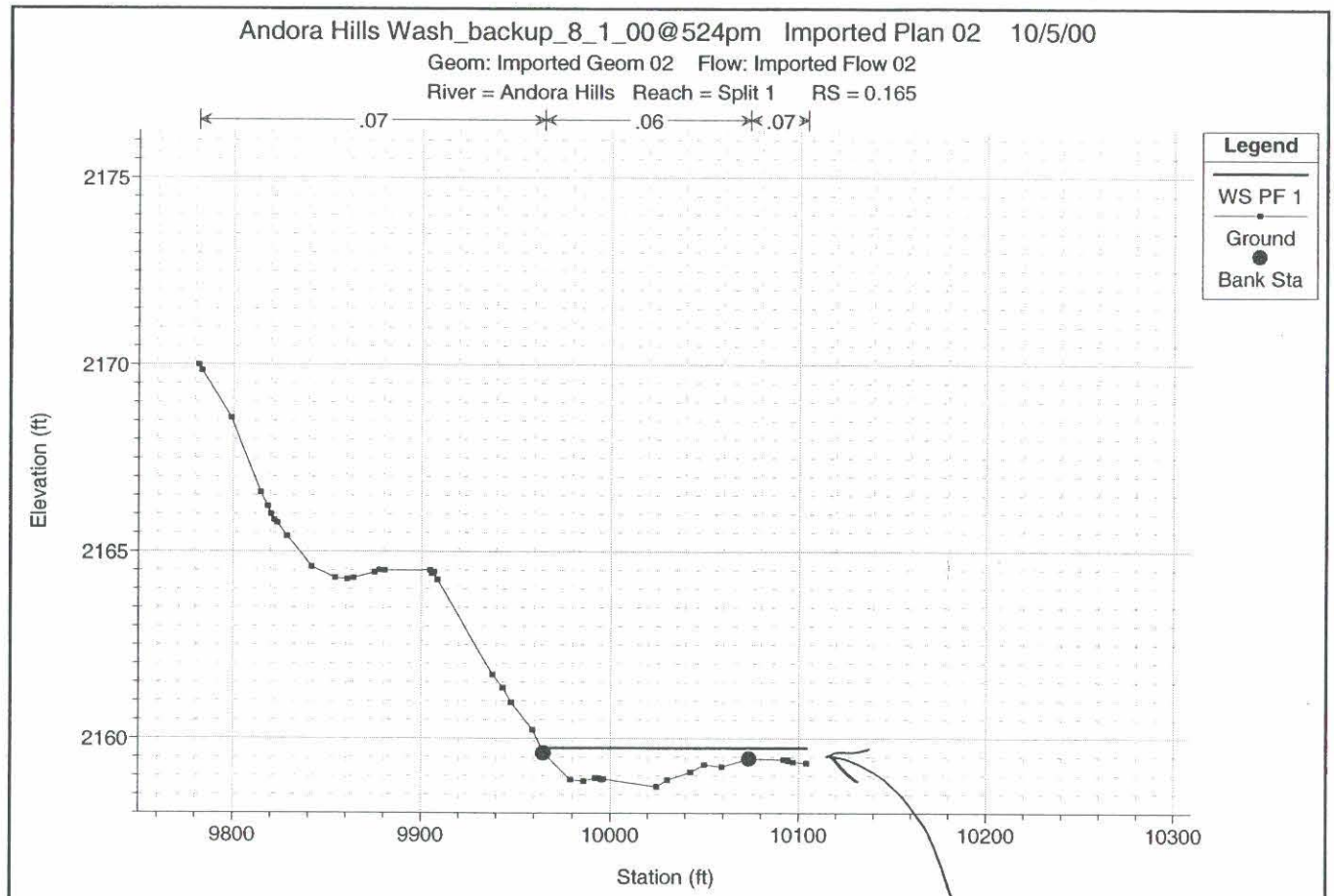
Reach	River Sta	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
		(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Split 1	0.033	310	2146.9	2149.0	2148.2	2149.1	0.005	2.4	138	134	0.3
Split 1	0.070	310	2149.3	2151.2	2151.2	2151.6	0.052	5.8	71	100	1.0
Split 1	0.089	310	2151.5	2153.2	2152.8	2153.3	0.009	2.8	160	177	0.4
Split 1	0.106	310	2152.4	2154.4	2154.4	2154.7	0.029	4.8	101	172	0.8
Split 1	0.146	310	2157.3	2158.1	2157.7	2158.1	0.011	1.9	160	213	0.4
Split 1	0.165	310	2158.7	2159.8	2159.7	2160.0	0.036	3.7	88	141	0.8
Split 1	0.185	310	2160.2	2161.9	2161.5	2162.1	0.013	3.5	99	91	0.5
Split 1	0.232	310	2165.2	2166.9	2166.8	2167.4	0.039	5.3	59	55	0.9
Split 1	0.244	310	2166.4	2168.5	2168.0	2168.7	0.013	3.8	85	61	0.5
Split 1	0.260	310	2163.2	2168.8	2165.1	2168.8	0.000	1.0	427	187	0.1

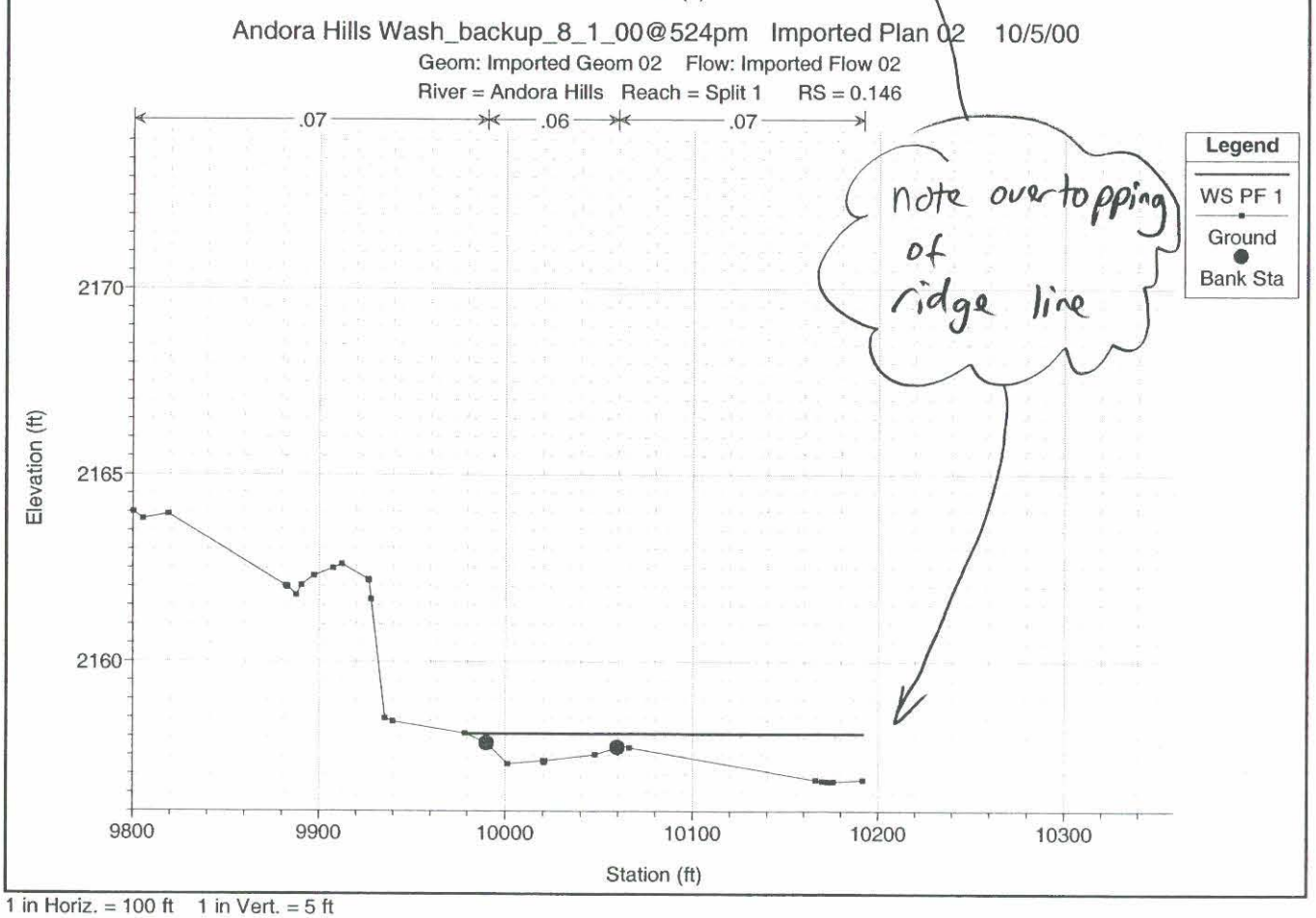
not used for Zone A



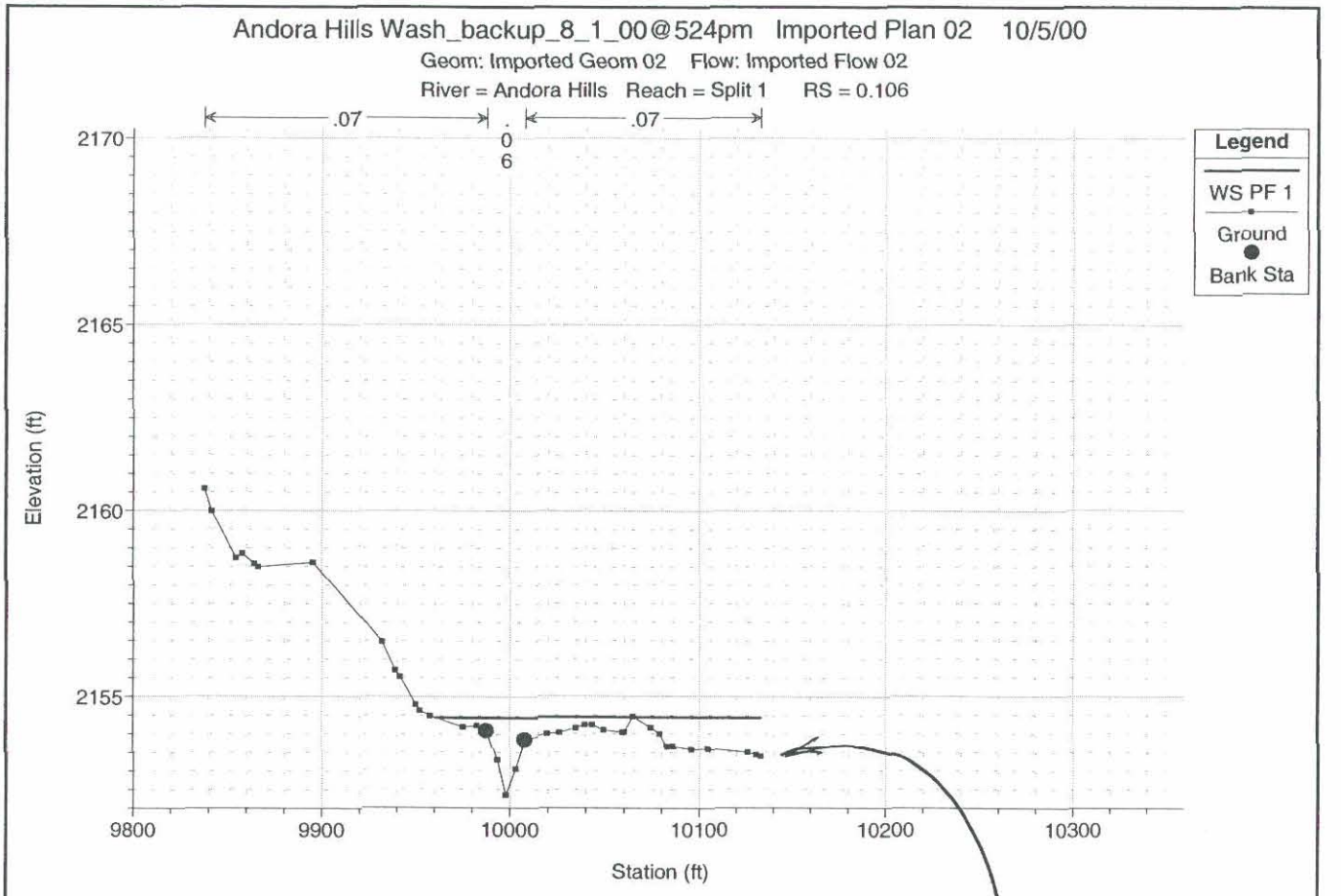


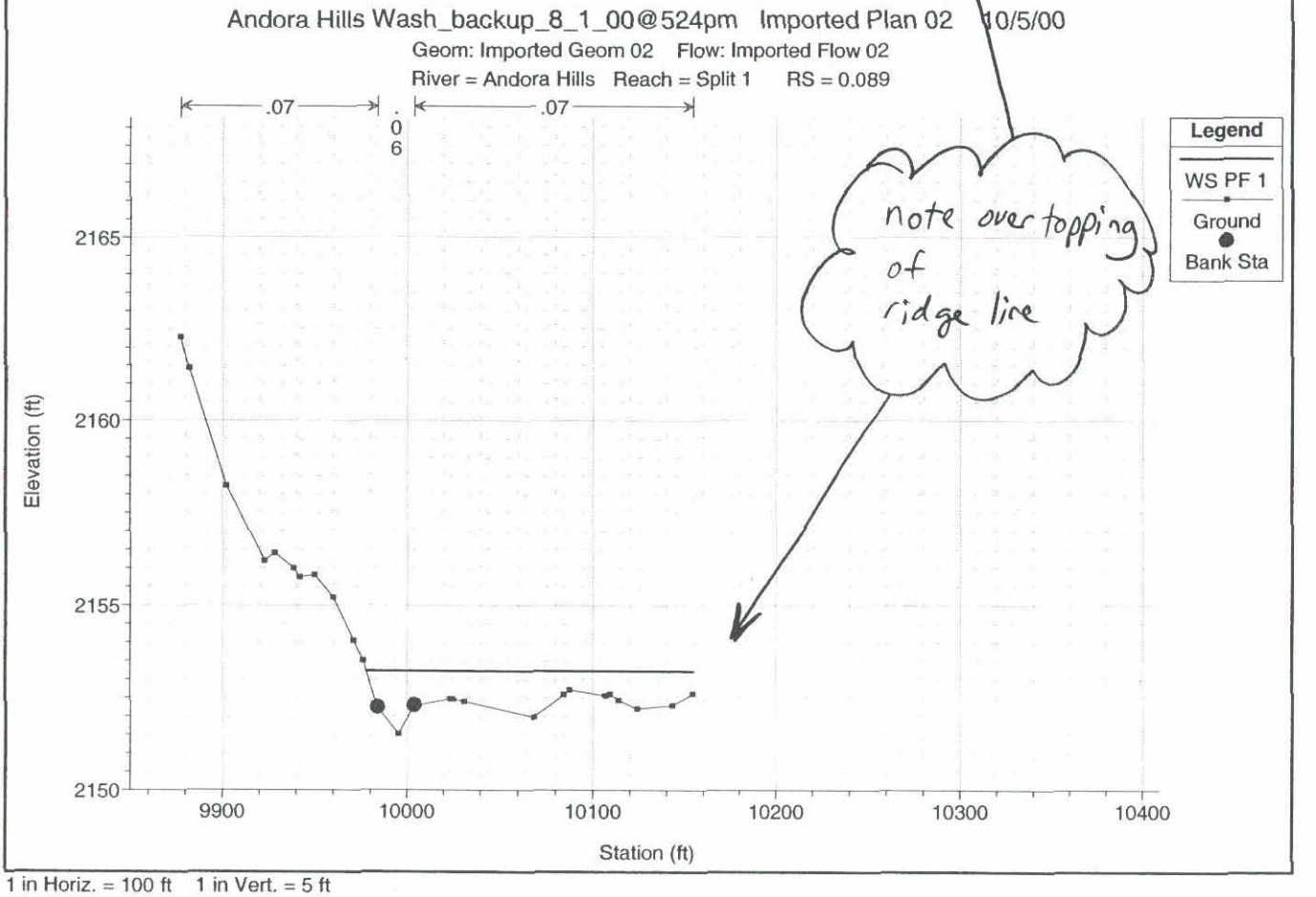
1 in Horiz. = 100 ft 1 in Vert. = 5 ft





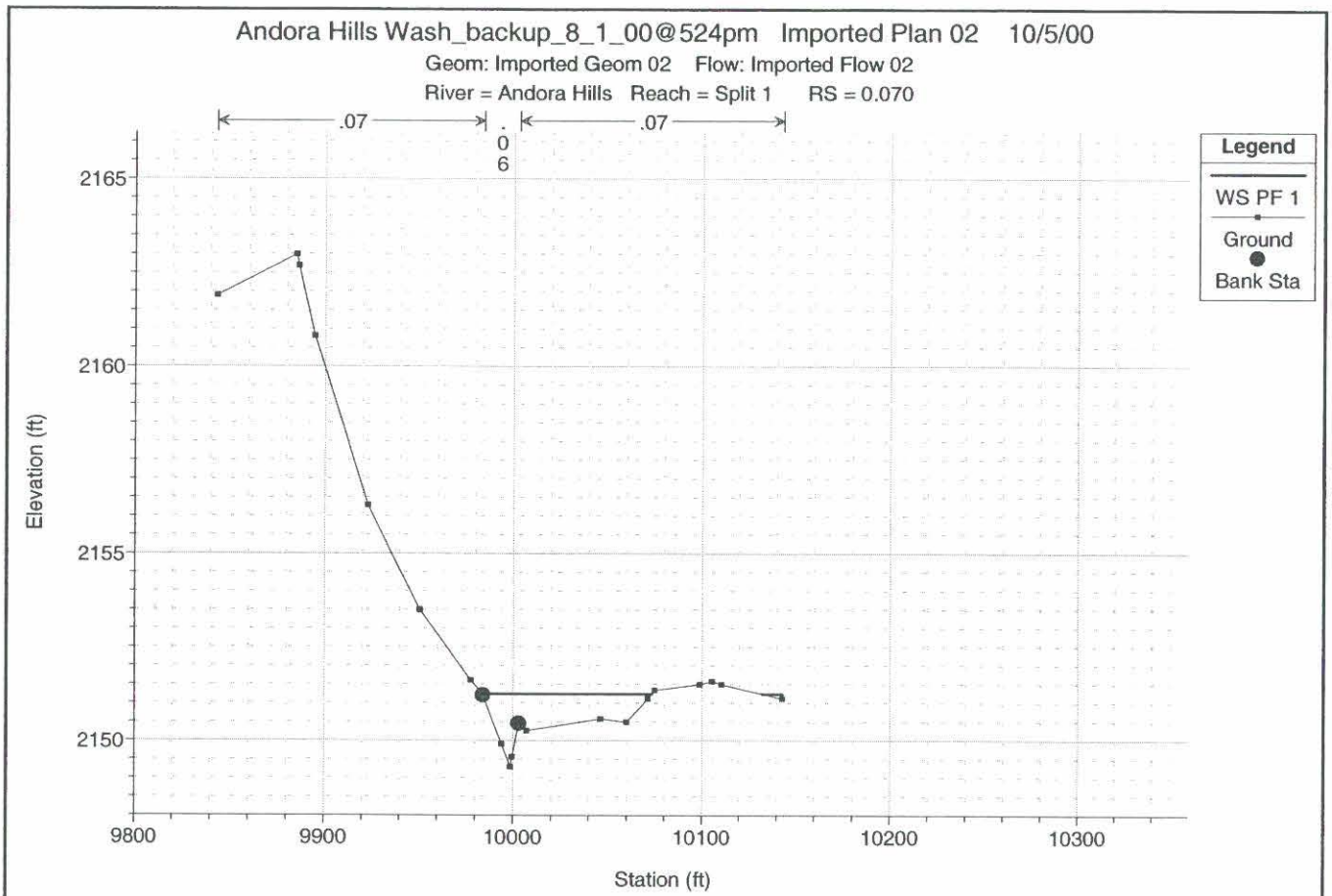
1 in Horiz. = 100 ft 1 in Vert. = 5 ft

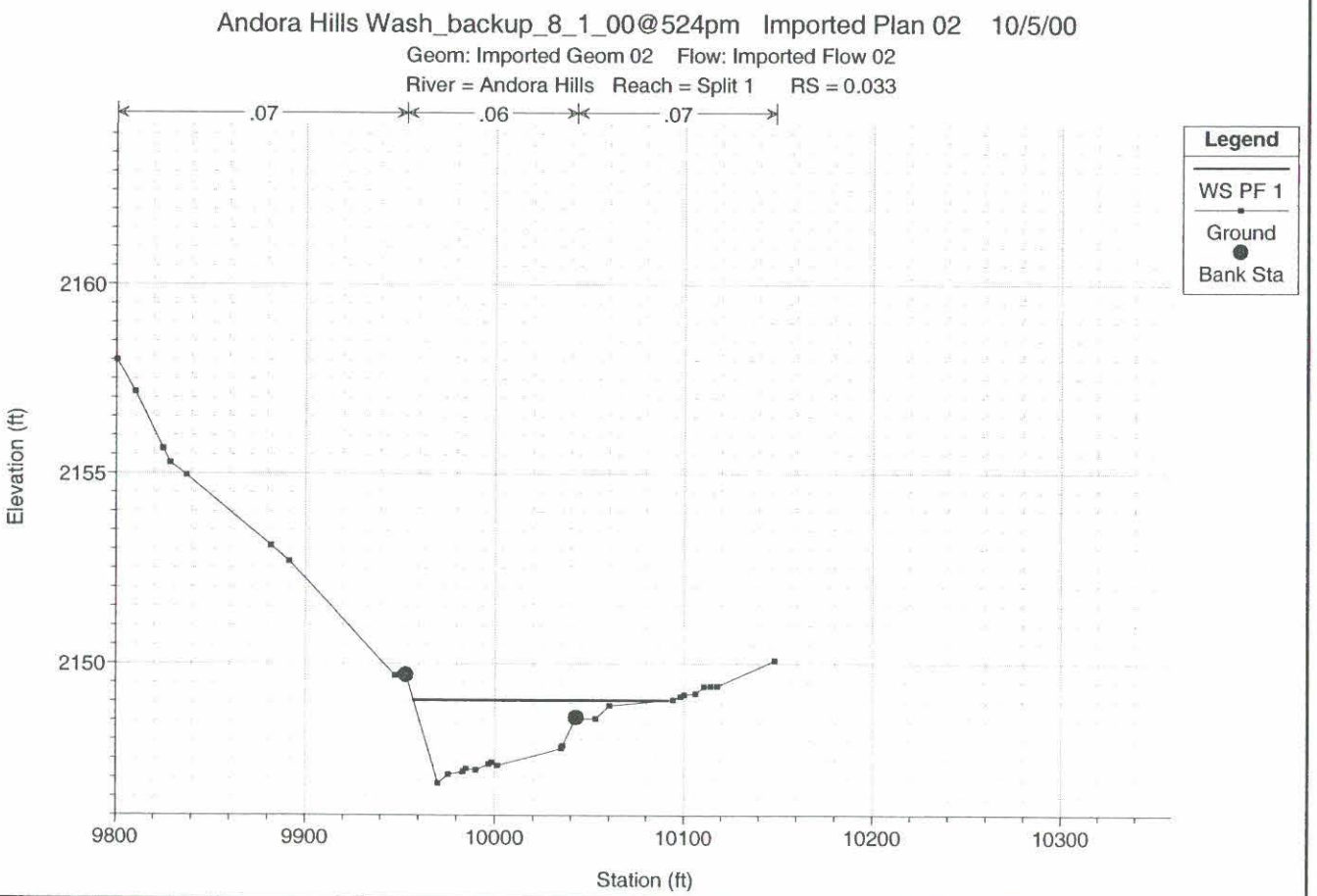




note overtopping of ridge line

1 in Horiz. = 100 ft 1 in Vert. = 5 ft





1 in Horiz. = 100 ft 1 in Vert. = 5 ft

E.5.1.1 HEC-2 Split 1, River Station 4.832 to 4.796

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES          *
 *                                        *
 *  Version   4.6.2;  May 1991            *
 *                                        *
 *  RUN DATE    14JUL00    TIME   11:47:56 *
 *****************************************
```

```
****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
```

1

14JUL00 11:47:56

THIS RUN EXECUTED 14JUL00 11:47:56

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

SPLIT FLOW BEING PERFORMED

SF

```
TW  WEIR BETWEEN 4.832 & 4.796
WS     7   4.796   4.832      -1       3
WC     0  2602.8      34    2604      58    2606      79    2608     117    2610
WC   167    2612     207  2613.3

TW  WEIR BETWEEN 4.796 & 4.770
WS     5   4.770   4.796      -1       3
WC     0 2608.68      57    2608      93    2606     125    2604     150  2602.8
```

1

```
T1  SPLIT FLOW ON GALLOWAY WASH FROM RS 4.832 TO 4.770
T2  FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES, FCD 99-14
T3      GALLOWAY WASH SPLIT FLOW, JULY, 2000, JEF, INC.

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                         0.027                         1110   2591.25

NC     0.06      0.06      0.04       0.1       0.3
X1    4.694        65    9975.88  10042.95    231.46    198.37    198.02
X3        0                         9740.8   2593.81
GR   2600.5   9549.39   2600.29    9558.35   2598.62   9571.51   2597.67   9576.98   2596.97   9581.24
GR   2596.6   9584.02    2595.4    9594.89   2594.68   9604.12   2593.99   9615.35   2593.53   9620.91
GR   2593.3   9623.36    2592.6    9636.67   2592.27   9644.68   2591.89   9647.63   2591.15   9655.01
GR   2591.1   9656.96   2591.01    9661.61   2590.67   9676.61   2590.58   9689.97   2590.71   9704.72
GR   2590.6   9710.53   2592.64    9729.57   2593.45   9736.51   2593.81    9740.8   2593.18   9748.83
GR   2591.1   9756.26   2591.08    9756.64   2590.66   9769.16   2590.49   9779.39   2590.56    9815.2
GR   2590.6   9842.48   2590.64    9862.22   2591.02   9876.17   2591.25   9902.13   2591.35   9913.47
GR   2590.8   9917.44   2590.87    9925.07    2591.1   9927.65   2590.47   9935.65   2590.44   9936.05
GR   2590.4   9936.28   2589.87    9943.65   2589.77   9948.27   2589.38   9959.91    2590.5   9970.75
GR   2590.8   9975.88    2590.6    9980.53   2589.91   9990.61   2589.36   9995.57   2588.98   9998.26
GR   2589.1  10018.91   2589.17    10032.1   2589.67  10037.94    2589.8  10038.74   2590.34  10042.95
GR   2590.3  10055.07   2592.34   10070.25    2592.8  10077.52   2593.35  10083.13   2593.11  10091.88
GR   2593.4  10099.96   2597.98   10133.12   2598.05  10134.94   2598.63   10144.4   2598.85  10153.38

NC     0.06      0.06      0.04       0.1       0.3
X1    4.732        17    9999.22  10036.22    216.23    169.53    201.99
X3                                9816.22      2600
GR   2602.6   9670.22      2602    9682.72      2596   9721.72    2595.2   9733.22      2594   9747.22
GR   2593.9   9750.22      2594    9754.22    2595.7   9816.22      2595   9852.72    2594.8   9936.22
GR   2594.6   9987.22      2594    9999.22   2593.85  10009.22      2594  10023.22      2596  10036.22
GR     2604  10067.22    2605.1   10078.22

NC     0.06      0.06      0.04       0.1       0.3
X1     4.77        40    9990.25  10030.58    196.97    201.23    200.24
GR   2610.8   9725.87   2610.55    9727.35   2608.27   9740.65   2600.39   9786.15   2600.24   9786.92
GR   2599.5   9790.74   2599.57     9791.5   2599.62      9793   2600.06    9796.5   2600.55   9799.54
GR   2600.7      9800    2600.9    9819.93   2600.98   9854.24   2600.57   9858.94   2600.25   9862.17
GR   2600.3   9863.52   2600.24    9876.11   2600.33   9941.18   2600.04   9956.91   2599.16   9971.07
GR   2599.4   9974.86    2599.5    9976.82   2599.47   9980.87   2599.32   9986.33   2599.19   9990.25
GR   2598.5   9995.18   2598.05    9999.59   2598.04   9999.76      2598   9999.96   2598.09  10002.27
GR   2598.4   10018.6   2598.34   10026.61   2599.14     10030   2599.18  10030.26   2599.16  10030.58
GR   2598.8  10034.32   2603.28   10054.91   2608.68  10079.05   2608.41    10082.9   2603.12  10119.34

NC     0.06      0.06      0.04       0.1       0.3
X1    4.796        23      9973     10014    120.45     142.2    137.88
GR   2613.5      9709      2612      9715      2604      9747    2602.6      9753    2603.7      9757
GR     2603      9763    2603.8      9782    2603.5      9791      2604      9808    2604.3      9832
GR     2604      9850    2603.6      9864    2603.6      9879      2603      9893    2603.7      9904
```

```
GR   2603.1       9935     2602.7       9946        2602        9973      2601.4        9993      2601.6       10000
GR   2601.4      10008       2602      10014      2602.8       10040
1
   14JUL00      11:47:56                                                                                          PAGE    3


NC     0.06       0.06       0.04        0.1         0.3
X1    4.832         22       9985      10055      166.73      198.61      190.09
GR     2616       9739       2608       9777      2607.2        9788      2607.5        9798      2607.5        9854
GR   2607.2       9863       2608       9877      2608.3        9885        2608        9894      2607.7        9899
GR     2608       9905     2608.3       9912        2608        9918      2607.6        9934      2607.9        9946
GR   2607.9       9973       2606       9985      2605.7       10000      2605.8       10051        2606       10055
GR     2612      10065     2613.3      10070

1
   14JUL00      11:47:56                                                                                          PAGE    4

    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WTN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


*PROF 1

CCHV=     .100 CEHV=     .300
*SECNO 4.694

3265 DIVIDED FLOW

3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9740.8   10153.4  TYPE=      1  TARGET=    -9740.800
 ELENCL=   2593.81  ELENCR= 100000.00
     4.694      2.15   2591.13   2591.13   2591.25   2591.59       .46       .00       .00   2590.80
    1016.0     296.7     688.8      30.5     113.2     108.4      12.3        .0        .0   2590.34
       .00      2.62      6.36      2.47      .060      .040      .060      .000   2588.98   9756.16
   .015477      231.      198.      198.         0        11         0       .00    278.32  10061.23


CCHV=     .100 CEHV=     .300
*SECNO 4.732
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9816.2   10078.2  TYPE=      1  TARGET=    -9816.220
 ELENCL=   2600.00  ELENCR= 100000.00
     4.732      1.97   2595.82   2595.82       .00   2596.27       .45      3.73       .00   2594.00
    1016.0     607.2     408.8        .0     169.5      56.3        .0       1.1       1.2   2596.00
       .01      3.58      7.27       .00      .060      .040      .000      .000   2593.85   9816.22
```

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   .021064      216.      202.      170.         4        12         0       .00    218.83  10035.05

CCHV=     .100 CEHV=     .300
*SECNO 4.770

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     4.770      2.83   2600.83   2600.83       .00   2601.38       .55      2.93       .03   2599.19
    1016.0     273.4     691.4      51.3     114.4      98.6      16.4       2.1       2.2   2599.16
       .02      2.39      7.01      3.13      .060      .040      .060      .000   2598.00   9783.60
   .010893      197.      200.      201.         3        11         0       .00    217.26  10043.66
```



```
    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

CCHV=     .100 CEHV=     .300
*SECNO 4.796

3265 DIVIDED FLOW

3280 CROSS SECTION      4.80 EXTENDED      1.04 FEET

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     4.796      2.44   2603.84   2603.84       .00   2604.38       .54      1.58       .00   2602.00
    1035.5     258.8     646.6     130.1     102.7      90.7      37.4       2.8       2.9   2602.00
       .03      2.52      7.13      3.48      .060      .040      .060      .000   2601.40   9747.69
   .012785      120.      138.      142.        20        15         0       .00    239.23  10040.00

CCHV=     .100 CEHV=     .300
*SECNO 4.832

3265 DIVIDED FLOW

7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED
     4.832      2.24   2607.94   2607.94       .00   2608.55       .62      2.25       .02   2606.00
    1110.0     104.4     998.3       7.3      62.2     150.9       3.1       3.8       3.8   2606.00
       .04      1.68      6.62      2.33      .060      .040      .060      .000   2605.70   9777.89
```

.011397	167.	190.	199.	3	8	0	.00	244.24	10058.23

TW WEIR BETWEEN 4.832 & 4.796

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
74.49	74.25	.32	74.49	74.25	.32	5	2603.839	2607.935	4.796	4.832

TW WEIR BETWEEN 4.796 & 4.770

ASQ	QCOMP	ERRAC	TASQ	TCQ	TABER	NITER	DSWS	USWS	DSSNO	USSNO
19.47	19.42	.24	93.95	93.67	.30	5	2600.832	2603.839	4.770	4.796

THIS RUN EXECUTED 14JUL00 11:47:56

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

GALLOWAY WASH SPLIT FLOW

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	4.694	.00	.00	.00	2588.98	1016.05	2591.13	2591.13	2591.59	154.77	6.36	233.89	81.67
*	4.732	201.99	.00	.00	2593.85	1016.05	2595.82	2595.82	2596.27	210.64	7.27	225.75	70.01
*	4.770	200.24	.00	.00	2598.00	1016.05	2600.83	2600.83	2601.38	108.93	7.01	229.33	97.35
*	4.796	137.88	.00	.00	2601.40	1035.51	2603.84	2603.84	2604.38	127.85	7.13	230.82	91.58

*	4.832	190.09	.00	.00	2605.70	1110.00	2607.94	2607.94	2608.55	113.97	6.62	216.21	103.97

GALLOWAY WASH SPLIT FLOW

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	4.694	1016.05	2591.13	.00	.00	-.12	278.32	.00
*	4.732	1016.05	2595.82	.00	4.69	.00	218.83	201.99
*	4.770	1016.05	2600.83	.00	5.01	.00	217.26	200.24
*	4.796	1035.51	2603.84	.00	3.01	.00	239.23	137.88
*	4.832	1110.00	2607.94	.00	4.10	.00	244.24	190.09

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      4.694  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      4.732  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.732  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      4.770  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.770  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      4.796  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.796  PROFILE=  1  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=      4.796  PROFILE=  1  20 TRIALS ATTEMPTED TO BALANCE WSEL

CAUTION SECNO=      4.832  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.832  PROFILE=  1  MINIMUM SPECIFIC ENERGY
```

E.5.1.2 HEC-2 Split 2, River Station 4.391 to 4.429

```
1*****************************************
 *  HEC-2 WATER SURFACE PROFILES           *
 *                                         *
 *  Version   4.6.2;  May 1991             *
 *                                         *
 *  RUN DATE    15JUL00    TIME   13:04:33 *
 *****************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

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X     X  XXXXXXX   XXXXX              XXXXX
X     X  X        X     X            X     X
X     X  X        X                        X
XXXXXXX  XXXX     X          XXXXX    XXXXX
X     X  X        X                  X
X     X  X        X     X            X
X     X  XXXXXXX   XXXXX             XXXXXXX
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1

15JUL00 13:04:33 PAGE 1

THIS RUN EXECUTED 15JUL00 13:04:33

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
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SPLIT FLOW BEING PERFORMED

SF

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TW  WEIR BETWEEN 4.391 & 4.429
WS    10   4.391   4.429      -1       3
WC     0  2552.2      32  2552.2      55  2552.4      84  2552.3     110    2554
WC   118    2554     127  2553.8     135    2554     187    2556     197  2556.3
```

1

15JUL00 13:04:33 PAGE 2

T1 SPLIT FLOW ON GALLOWAY WASH FROM RS 4.391 TO RS 4.429

```
T2  FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WAHES, FCD 99-14
T3      GALLOWAY WASH SPLIT FLOW 2, JULY, 2000, JEF, INC.

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                2                         0.023                           1110    2540.5

NC    0.055     0.055     0.04      0.1       0.3
X1    4.315        60  9990.28  10076.25    200.17    193.59    200.44
X3                                 9922      2545     10090      9845
GR   2547.4   9749.67    2546.4   9766.96   2545.91   9774.44   2545.87   9775.61   2545.82   9778.69
GR   2545.4    9789.7   2545.11   9798.74   2544.45   9805.43   2544.27   9810.67   2543.76   9815.93
GR     2543   9830.06      2543    9830.6   2542.84   9834.43   2542.69    9836.5   2542.65    9837.7
GR   2541.9   9846.93   2541.57   9853.43   2541.33   9854.96   2539.53   9864.59   2538.91   9872.14
GR   2537.9   9883.58   2538.71   9896.14   2540.59   9913.24   2541.53   9919.46   2541.65   9921.54
GR   2541.4   9923.82    2539.9   9931.06   2539.22   9943.41   2538.77   9953.97   2538.85   9956.39
GR   2539.8   9978.93   2540.14   9980.63   2540.37   9990.28   2539.94   9992.47   2538.63   9997.27
GR   2538.8  10038.93    2538.9  10062.13   2540.55  10076.25   2541.14  10081.38   2541.51  10086.77
GR   2542.2   10089.8   2541.33  10095.76   2539.32  10110.51   2539.94  10118.19   2540.11  10120.07
GR   2540.2  10124.29   2541.36  10144.89   2542.26  10147.85   2544.88  10182.55   2544.99  10189.09
GR     2543  10211.99    2542.5  10214.75    2541.1  10220.49   2540.77  10221.96   2540.81  10222.32
GR   2541.6  10236.64   2542.82   10244.8   2544.53   10258.1   2545.14  10259.94   2547.18   10267.1

NC    0.055     0.055     0.04      0.1       0.3
X1    4.353        60  9958.28  10055.33     197.1    203.14    200.05
X3                                 9954      2555     10062      9954
GR   2552.9   9695.73   2552.29   9703.83   2551.33   9711.6   2547.57   9740.13   2547.12   9755.17
GR   2546.5   9760.63   2544.67   9771.52   2543.73   9774.59   2544.03   9776.12    2545.9   9783.35
GR   2544.9   9796.27   2544.52   9804.97   2545.05   9808.66   2545.92   9813.98   2545.86   9819.77
GR   2545.5   9824.43   2545.45   9827.19   2544.89   9842.18   2544.75   9851.44   2543.58   9876.72
GR   2543.5   9876.98   2543.38   9878.15    2542.5   9887.24   2542.57   9889.44   2544.58   9905.78
GR   2545.7   9913.13   2545.66   9922.32   2545.61   9927.11   2545.55   9928.17    2545.2   9936.57
GR   2544.9   9942.33   2544.85   9944.41   2545.18   9946.21   2546.39   9958.28   2545.34   9961.91
GR   2543.5   9966.69   2543.44  10019.23    2543.5  10045.31    2544.9  10049.17   2547.08  10055.33
GR   2546.9  10056.66   2546.97   10065.2   2545.65  10071.75   2543.92  10081.63   2545.39  10089.26
GR     2546  10095.72   2546.16  10096.96   2547.14  10109.47   2547.17  10116.16   2548.81  10148.02
GR   2548.7   10153.6   2549.59  10178.28   2550.74  10188.32   2549.92  10200.04   2549.72  10207.14
GR     2549  10215.35    2550.9  10230.24   2551.07   10231.1   2551.98  10238.67   2555.13   10248.5

NC    0.055     0.055     0.04      0.1       0.3
X1    4.391        67  9971.59  10023.47    200.06    196.42    199.24
X3                                 9956      2555     10038      2555
GR   2554.8   9676.37   2554.03   9702.93   2554.04   9709.04   2553.84   9722.28   2553.76   9725.26
GR   2553.7   9729.75   2553.62   9733.27   2553.33   9738.29   2553.14   9741.42   2553.13   9741.55
GR     2553   9742.05   2552.94   9743.25   2552.45   9753.58   2552.33   9755.48   2551.83   9766.87
GR   2551.6   9772.03   2551.53   9773.64   2551.43   9776.55   2550.63   9782.86   2550.61    9783.1
GR     2549   9802.69   2549.77    9808.6   2549.53   9813.81   2549.36   9817.79   2550.38   9821.65
GR   2550.6   9822.51   2550.43   9837.66   2550.43   9838.04   2550.43   9838.54   2550.38   9838.66
GR   2550.1   9840.53   2549.12   9846.98   2549.83   9852.62   2550.83   9859.99   2550.54    9863.2
GR   2549.2   9879.78   2549.15   9881.32   2549.05   9890.35   2549.04   9891.03   2548.87   9894.15
GR   2547.2   9924.57   2547.15    9925.5   2547.12   9926.24   2547.24   9927.08   2548.46   9939.61
GR   2548.6   9940.21   2552.28   9954.55   2550.19   9971.59   2548.28   9986.07   2546.95    9990.4
```

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GR     2547   10015.38    2547.07   10017.27     2547.27    10017.56     2551.42    10023.47     2551.54    10027.83
1
   15JUL00       13:04:33                                                                                          PAGE     3

GR   2551.9   10039.48    2550.35   10099.44     2550.26    10102.34     2549.31    10107.24     2548.18    10113.18
GR   2548.1   10113.78     2548.1   10113.82     2551.91    10155.23      2552.3    10161.86     2553.86    10181.02
GR   2554.9   10198.94    2557.54   10219.18

NC    0.055      0.055       0.04        0.1         0.3
X1    4.429         46    9921.28   10005.14      197.08      196.01      199.32
X3                                      9904        2560
GR   2558.4    9571.05    2555.54    9662.85     2555.52     9663.63     2555.48     9664.19     2555.11     9689.34
GR   2555.1    9691.57    2555.03    9692.69     2553.97     9707.43     2554.42      9723.8     2554.71     9735.52
GR   2554.9    9753.32     2555.1    9766.37     2555.28     9777.03     2555.46     9783.63     2555.61     9789.58
GR   2555.6    9791.14     2555.8    9806.43      2555.4     9818.94     2555.39     9820.28     2554.72     9833.36
GR   2555.2    9839.83    2555.25    9841.05     2555.24     9843.68     2555.41     9848.31     2556.28     9870.11
GR   2556.3    9872.39    2556.25    9878.92     2556.24     9880.82     2555.79     9883.78     2555.12     9887.86
GR   2554.4     9890.7    2555.32    9893.94     2556.06      9896.3     2556.27     9901.04     2556.12     9907.74
GR   2555.6    9917.76    2555.31    9921.28      2554.4     9925.97     2552.81     9933.48     2552.91     9963.54
GR   2552.9    9969.25    2552.81    9974.39      2552.3    10001.12     2554.05    10005.14     2565.76    10037.45
GR     2565   10039.33

NC    0.055      0.055       0.04        0.1         0.3
X1    4.467         54    9957.31   10008.31      182.88      202.73       200.4
X3                                      9875        2570
GR   2561.3    9510.26    2562.79    9597.73     2562.84     9598.95     2562.91     9604.02     2562.91     9606.01
GR   2562.1    9616.02    2561.07    9622.44     2559.24     9635.36     2558.17     9645.67     2557.58     9655.23
GR   2558.3     9667.8    2558.63    9672.49     2559.51      9696.1     2560.09     9717.12     2560.04     9723.15
GR   2559.8    9728.59    2559.58    9732.02     2559.89     9739.45     2560.13     9746.06     2559.96        9760
GR   2559.8    9773.19    2559.58    9780.48     2559.26      9784.9     2560.33     9795.43     2560.42     9796.37
GR   2560.4    9797.66    2560.36    9807.29     2560.76     9814.01     2563.89     9833.77     2566.96     9848.85
GR   2566.9    9850.21    2566.09     9888.9     2565.87     9901.48     2565.86     9912.31     2565.56     9931.33
GR   2565.3    9937.78    2564.46       9939     2562.02     9941.63     2560.69     9950.61     2559.68     9957.31
GR   2558.2    9961.99    2556.37    9977.03     2556.26     9999.34     2556.34    10004.85     2557.71    10008.31
GR   2561.5   10036.42     2561.5   10036.74     2561.54    10038.63      2561.8    10040.46     2564.52    10065.72
GR     2564   10068.55     2567.5   10084.52     2568.03    10088.97     2570.23    10098.69

1
   15JUL00       13:04:33                                                                                          PAGE     4

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

*PROF 1
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```
CCHV=     .100 CEHV=     .300
*SECNO 4.315
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9922.0   10090.0  TYPE=      1  TARGET=      168.000
 ELENCL=   2545.00  ELENCR=   9845.00
     4.315      2.55   2540.45   2540.45   2540.50   2541.08       .63       .00       .00   2540.37
    1110.0     246.9     863.1        .0      58.9     125.7        .0        .0        .0   2540.55
       .00      4.19      6.87       .00      .055      .040      .000      .000   2537.90   9928.42
   .020408      200.      200.      194.         0         8         0       .00    146.95  10075.37


CCHV=     .100 CEHV=     .300
*SECNO 4.353
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9954.0   10062.0  TYPE=      1  TARGET=      108.000
 ELENCL=   2555.00  ELENCR=   9954.00
     4.353      2.76   2545.26   2545.26       .00   2546.12       .87      4.06       .07   2546.39
    1110.0        .0    1110.0        .0        .0     148.6        .0        .8        .5   2547.08
       .01       .00      7.47       .00      .000      .040      .000      .000   2542.50   9962.13
   .020292      197.      200.      203.         0         8         0       .00     88.04  10050.17


CCHV=     .100 CEHV=     .300
*SECNO 4.391
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9956.0   10038.0  TYPE=      1  TARGET=       82.000
 ELENCL=   2555.00  ELENCR=   2555.00
     4.391      3.35   2550.30   2550.30       .00   2551.55      1.25      3.82       .12   2550.19
    1110.0        .0    1110.0        .0        .0     123.7        .0       1.4        .9   2551.42
       .01       .04      8.97       .00      .055      .040      .000      .000   2546.95   9970.69
   .018175      200.      199.      196.         2        11         0       .00     51.19  10021.88


CCHV=     .100 CEHV=     .300
*SECNO 4.429
7185 MINIMUM SPECIFIC ENERGY
1
   15JUL00      13:04:33                                                                                    PAGE     5

    SECNO      DEPTH      CWSEL      CRIWS      WSELK      EG         HV         HL         OLOSS      L-BANK ELEV
    Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
    TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
    SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

3720 CRITICAL DEPTH ASSUMED
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```
3470 ENCROACHMENT STATIONS=     9904.0   10039.3  TYPE=      1  TARGET=    -9904.000
 ELENCL=   2560.00  ELENCR= 100000.00
     4.429      2.37   2554.67   2554.67       .00   2555.58       .91      3.77       .03   2555.31
    1110.0        .0    1109.1        .9        .0     144.7        .5       2.0       1.2   2554.05
       .02       .00      7.66      1.67      .000      .040      .055      .000   2552.30   9924.57
   .019675      197.      199.      196.         4        19         0       .00     82.29  10006.86


CCHV=     .100 CEHV=     .300
*SECNO 4.467
7185 MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9875.0   10098.7  TYPE=      1  TARGET=    -9875.000
 ELENCL=   2570.00  ELENCR= 100000.00
     4.467      3.06   2559.32   2559.32       .00   2560.47      1.15      3.61       .07   2559.68
    1110.0        .0    1081.4      28.6        .0     124.0       9.6       2.6       1.5   2557.71
       .03       .00      8.72      2.99      .000      .040      .055      .000   2556.26   9958.46
   .016587      183.      200.      203.         2        11         0       .00     61.76  10020.22
```

1

15JUL00 13:04:33 PAGE 6

```
 TW  WEIR BETWEEN 4.391 & 4.429

    ASQ      QCOMP     ERRAC     TASQ       TCQ      TABER     NITER     DSWS      USWS     DSSNO     USSNO
       .00       .00       .00       .00       .00       .00         2  2550.301  2554.672     4.391     4.429
```

15JUL00 13:04:33 PAGE 7

THIS RUN EXECUTED 15JUL00 13:04:33

```
*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

GALLOWAY WASH SPLIT FLOW

SUMMARY PRINTOUT TABLE 150

	SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10*KS	VCH	AREA	.01K
*	4.315	.00	.00	.00	2537.90	1110.00	2540.45	2540.45	2541.08	204.08	6.87	184.63	77.70
*	4.353	200.05	.00	.00	2542.50	1110.00	2545.26	2545.26	2546.12	202.92	7.47	148.64	77.92
*	4.391	199.24	.00	.00	2546.95	1110.00	2550.30	2550.30	2551.55	181.75	8.97	123.80	82.34
*	4.429	199.32	.00	.00	2552.30	1110.00	2554.67	2554.67	2555.58	196.75	7.66	145.25	79.14
*	4.467	200.40	.00	.00	2556.26	1110.00	2559.32	2559.32	2560.47	165.87	8.72	133.57	86.19

1

GALLOWAY WASH SPLIT FLOW

SUMMARY PRINTOUT TABLE 150

	SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
*	4.315	1110.00	2540.45	.00	.00	-.05	146.95	.00
*	4.353	1110.00	2545.26	.00	4.81	.00	88.04	200.05
*	4.391	1110.00	2550.30	.00	5.04	.00	51.19	199.24
*	4.429	1110.00	2554.67	.00	4.37	.00	82.29	199.32
*	4.467	1110.00	2559.32	.00	4.64	.00	61.76	200.40

1

SUMMARY OF ERRORS AND SPECIAL NOTES

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CAUTION SECNO=      4.315  PROFILE=  1  CRITICAL DEPTH ASSUMED

CAUTION SECNO=      4.353  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.353  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      4.391  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.391  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      4.429  PROFILE=  1  CRITICAL DEPTH ASSUMED
```

No split

```
CAUTION SECNO=      4.429  PROFILE=  1  MINIMUM SPECIFIC ENERGY

CAUTION SECNO=      4.467  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      4.467  PROFILE=  1  MINIMUM SPECIFIC ENERGY
```

E.5.1.3 HEC-2 Split 3, River Station 2.090 to 2.124

```
1*********************************************
 *  HEC-2 WATER SURFACE PROFILES             *
 *                                           *
 *  Version   4.6.2;  May 1991               *
 *                                           *
 *  RUN DATE    26OCT00    TIME   11:29:00   *
 *********************************************
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****************************************
*  U.S. ARMY CORPS OF ENGINEERS        *
*  HYDROLOGIC ENGINEERING CENTER       *
*  609 SECOND STREET, SUITE D          *
*  DAVIS, CALIFORNIA 95616-4687        *
*          (916) 756-1104              *
****************************************
```

```
X     X  XXXXXXX   XXXXX              XXXXX
X     X  X         X     X           X     X
X     X  X         X                       X
XXXXXXX  XXXX      X          XXXXX    XXXXX
X     X  X         X                  X
X     X  X         X     X            X
X     X  XXXXXXX   XXXXX              XXXXXXX
```

1

26OCT00 11:29:00

THIS RUN EXECUTED 26OCT00 11:29:00

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*************************************
 HEC-2 WATER SURFACE PROFILES

 Version   4.6.2;  May 1991
*************************************
```

SPLIT FLOW BEING PERFORMED

SF

```
TW  WEIR BETWEEN 2.090 & 2.124
WS     8   2.090   2.124      -1       3
WC     0  2234.8    39.4    2234    66.6    2232    82.3    2230    95.3    2229
WC   127    2230   143.5    2232   153.8  2234.2
```

1

26OCT00 11:29:00


```
T1  SPLIT FLOW ON ANDORA HILLS WASH FROM RS 2.090 TO 2.124
T2  FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES, FCD 99-14
T3      ANDORA HILLS WASH SPLIT FLOW, OCTOBER, 2000, JEF, INC.

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

                0                             0                           2260   2224.52

NC    0.08      0.08     0.065       0.1       0.3
X1    2.090       32      9990     10005       185       155    181.33
GR   2234.8   9945.96   2234.69   9950.33    2226.3   9974.94   2225.16   9977.91   2224.73   9978.92
GR   2220.1      9990    2215.9     10000   2220.44     10005   2224.63   10009.62  2227.16   10012.73
GR   2228.4  10015.32   2231.47  10029.47    2231.6  10030.15   2231.28   10031.8   2229.64   10036.33
GR   2228.0  10045.68   2227.18  10047.36    2227.2  10047.61   2227.12   10048.21   2226.9   10049.36
GR   2221.8  10064.06   2219.58  10071.96    2218.9  10077.17   2219.67   10081.07  2222.59   10087.96
GR   2227.0  10118.59    2229.6  10133.63    2230.5  10137.36   2233.97   10159.35   2235.5   10169.9
GR   2236.7  10196.69   2237.43  10208.15

X1    2.124       52   9988.36  10003.99       140       185    174.96
GR   2234.2   9749.4      2232    9759.1      2228    9776.6    2226.4    9782.6      2228    9787.8
GR    2230    9803.1      2232      9820      2236    9830.2    2236.6    9832.6      2236    9835.6
GR   2234.7   9842.5   2235.97    9856.1   2236.08   9856.64   2236.28   9860.99    2235.5   9864.07
GR   2234.8      9867   2235.02   9868.99   2229.44   9881.71   2229.25   9882.49   2229.14   9890.86
GR   2228.6   9897.21   2228.36   9899.21   2233.14   9917.57    2233.2   9917.96   2234.06    9919.8
GR   2237.8   9928.78   2238.46   9930.72   2236.88    9934.9   2236.65   9936.99   2227.56   9946.64
GR   2235.4   9955.38   2235.55   9955.88   2236.53   9967.33   2236.52   9967.38    2236.5   9967.44
GR    2236    9968.5    2226.6   9988.36   2225.23   9994.05   2223.76     10000  2226.425   10003.99
GR   2227.9  10006.14      2236  10017.98   2237.51  10021.83   2238.16  10024.61   2238.17   10025.08
GR   2238.2  10025.42    2238.2  10045.27   2238.35  10045.97   2238.51  10046.88   2238.82   10055.81
GR   2239.2  10060.61    2239.4  10066.47

X1    2.153       29      9993  10021.04       120       140    157.09
GR   2239.3   9896.24   2238.22   9909.49   2235.44   9920.36   2235.29   9920.91   2234.97   9921.44
GR   2234.9   9922.72   2232.86   9932.46   2232.69    9934.7   2231.88   9953.81   2231.88   9956.46
GR   2232.4   9959.88   2233.37   9972.67    2233.3   9975.55   2233.65   9981.53  2230.552      9993
GR   2229.7   9996.19    2228.4     10000   2228.67  10002.11   2229.22  10011.47   2220.81  10017.47
GR   2230.2  10021.04    2230.9  10034.9    2236.01  10065.16   2236.16  10065.16    2236.5  10069.97
GR   2236.9  10072.44    2237.3  10076.27   2237.14  10080.15    2236.8  10086.7
```

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26OCT00 11:29:00


```
SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
```

```
     Q          QLOB       QCH        QROB       ALOB       ACH        AROB       VOL        TWA        R-BANK ELEV
     TIME       VLOB       VCH        VROB       XNL        XNCH       XNR        WTN        ELMIN      SSTA
     SLOPE      XLOBL      XLCH       XLOBR      ITRIAL     IDC        ICONT      CORAR      TOPWID     ENDST

 *PROF 1
0

 CCHV=     .100 CEHV=     .300
 *SECNO 2.090

 3265 DIVIDED FLOW

      2.090       8.62   2224.52        .00   2224.52   2226.08       1.56        .00        .00   2220.10
     2258.8      119.1    1179.4      960.3      23.4      97.0      134.3         .0         .0   2220.44
        .00       5.10     12.16       7.15      .080      .065       .080       .000    2215.90   9979.42
    .029101       185.      181.       155.         0         0          0        .00      75.22  10101.36

 *SECNO 2.124

 3265 DIVIDED FLOW

 7185 MINIMUM SPECIFIC ENERGY
 3720 CRITICAL DEPTH ASSUMED
      2.124       7.59   2231.35   2231.35        .00   2232.51       1.15       4.38        .04   2226.60
     2260.0     1079.2    1090.7      90.1      217.0      96.7       17.7        1.1         .4   2226.43
        .01       4.97     11.27       5.08      .080      .065       .080       .000    2223.76   9761.93
    .023525       140.      175.       185.         3        10          0        .00     127.10  10011.19

 *SECNO 2.153
      2.153      13.63   2234.44   2233.56        .00   2235.12        .67       2.56        .05   2230.55
     2260.0      412.6    1434.7     412.7      121.1     186.6       91.0        2.2         .8   2230.20
        .01       3.41      7.69       4.54      .080      .065       .080       .000    2220.81   9924.92
    .014124       120.      157.       140.        12        11          0        .00     130.94  10055.86

1
    26OCT00       11:29:00                                                                                    PAGE    4


  TW  WEIR BETWEEN 2.090 & 2.124

     ASQ       QCOMP      ERRAC      TASQ       TCQ       TABER     NITER      DSWS       USWS      DSSNO      USSNO
      1.16       1.17        .78       1.16       1.17        .78         8  2224.520   2231.354      2.090      2.124

1
    26OCT00       11:29:00                                                                                    PAGE    5


                                                                                THIS RUN EXECUTED 26OCT00     11:29:00
 ************************************
  HEC-2 WATER SURFACE PROFILES

  Version   4.6.2;  May 1991
 ************************************

 NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

 ANDORA HILLS WASH SPLIT

 SUMMARY PRINTOUT TABLE  150

       SECNO      XLCH       ELTRD      ELLC       ELMIN      Q          CWSEL      CRIWS      EG         10*KS      VCH        AREA       .01K

       2.090       .00        .00        .00    2215.90    2258.84    2224.52        .00    2226.08     291.01      12.16     254.64     132.41

 *     2.124    174.96        .00        .00    2223.76    2260.00    2231.35    2231.35    2232.51     235.25      11.27     331.43     147.35

       2.153    157.09        .00        .00    2220.81    2260.00    2234.44    2233.56    2235.12     141.24       7.69     398.72     190.16

1
    26OCT00       11:29:00                                                                                    PAGE    6

 ANDORA HILLS WASH SPLIT

 SUMMARY PRINTOUT TABLE  150

       SECNO        Q         CWSEL     DIFWSP     DIFWSX     DIFKWS     TOPWID     XLCH

       2.090    2258.84    2224.52        .00        .00        .00      75.22       .00

 *     2.124    2260.00    2231.35        .00       6.83        .00     127.10    174.96

       2.153    2260.00    2234.44        .00       3.09        .00     130.94    157.09
```

SUMMARY OF ERRORS AND SPECIAL NOTES

```
CAUTION SECNO=      2.124  PROFILE=  1  CRITICAL DEPTH ASSUMED
CAUTION SECNO=      2.124  PROFILE=  1  MINIMUM SPECIFIC ENERGY
```

E.5.1.4 Flow Distribution Summary at River Station 1.461

Plan: Imported Pla River: Andora Hills Reach:Reach 3 Riv Sta: 1.461 Profile: PF 1

Left Sta	Right Sta	Flow	Area	W.P.	% Conv.	Hydr D.	Velocity
(ft)	(ft)	(cfs)	(sq ft)	(ft)		(ft)	(ft/s)
9650.68	9687.16	33.13	17.97	28.36	1.23	0.64	1.84
9687.16	9723.64	38.32	21.69	36.49	1.42	0.59	1.77
9723.64	9760.12	0.49	0.91	8.95	0.02	0.10	0.54
9760.12	9833.08						
9833.08	9869.56	4.43	5.33	27.85	0.16	0.19	0.83
9869.56	9906.04	13.54	8.77	18.06	0.50	0.50	1.54
9906.04	9942.52	18.93	6.83	5.84	0.70	1.51	2.77
9942.52	9979.00	276.52	71.14	36.66	10.24	1.95	3.89
LB 9979.00	RB 10014.00	2252.60	224.51	36.48	83.43	6.41	10.03
10014.00	10037.64	62.03	16.20	8.86	2.30	2.07	3.83

72 cfs breaks out

E.5.1.5 Flow Distribution Summary at River Station 3.514

Plan: Plan 01 River: Galloway Reach:Reach 6 Riv Sta: 3.514 Profile: Profile 1

Left Sta (ft)	Right Sta (ft)	Flow (cfs)	Area (sq ft)	W.P. (ft)	% Conv.	Hydr D. (ft)	Velocity (ft/s)
9920.97	9935.16	1.27	1.36	6.03	0.07	0.23	0.93
9935.16	9949.34	21.96	10.59	14.20	1.26	0.75	2.07
9949.34	9963.53	36.81	14.44	14.19	2.10	1.02	2.55
9963.53	9977.72	69.73	21.19	14.20	3.98	1.49	3.29
LB 9977.72	9987.16	161.82	22.32	9.52	9.25	2.36	7.25
9987.16	9996.60	241.24	28.27	9.44	13.79	2.99	8.53
9996.60	10006.04	246.65	28.65	9.44	14.09	3.03	8.61
10006.04	10015.48	252.06	29.02	9.44	14.40	3.07	8.68
10015.48	10024.92	259.24	29.52	9.44	14.81	3.13	8.78
10024.92	10034.36	262.12	29.75	9.47	14.98	3.15	8.81
10034.36	RB 10043.80	137.91	20.30	9.54	7.88	2.15	6.79
10043.80	10085.41	59.19	23.90	28.21	3.38	0.85	2.48

60.04 cfs max

E.5.1.6 Weir Flow Summary at River Station 3.369, Dream Street Bridge

Plan: Plan 01 River: Galloway Reach:Reach 6 Riv Sta: 3.369 BR U Profile: Profile 1

Left Sta	Right Sta	Flow	Area	W.P.	% Conv.	Hydr D.	Velocity
(ft)	(ft)	(cfs)	(sq ft)	(ft)		(ft)	(ft/s)
LB 9990.80	9996.17	133.11	18.79	13.09	10.62	3.60	7.08
9996.17	10001.55	295.40	28.07	10.80	23.56	5.22	10.52
10001.55	10006.92	317.57	29.26	10.75	25.33	5.44	10.85
10006.92	10012.29	302.12	28.41	10.77	24.09	5.29	10.63
10012.29	10017.66	200.13	22.60	11.26	15.96	4.21	8.86
10017.66	10023.04	5.55	1.76	4.13	0.44	1.62	3.15

206 cfs max

E.5.2: Flow Data

HEC-RAS September 1998 Version 2.2
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: Andora Hills Wash
Project File : Andora.prj
Run Date and Time: 8/16/2001 9:47:07 AM

Project in English units

Project Description:
Andora Hills Wash with Floodway Revised by JEF per Change Order 3.

Prepared
by Dibble & Associates, sub consultant to JE Fuller Hydrology and Geomorphology, Inc.

FLOW DATA

Flow Title: Imported Flow 02
Flow File : x:\projects\Agency\FCDMC\Galloway\HECRAS\Andora.f02

Flow Data (cfs)

River	Reach	RS	Profile 1	Profile 2
Andora Hills	Reach 5	3.023	2070	2070
Andora Hills	Reach 5	2.617	2260	2260
Andora Hills	Reach 5	2.019	2500	2500
Andora Hills	Reach 5	1.668	2620	2620
Andora Hills	Reach 4	1.555	2395	2395
Andora Hills	Split 1	0.244	305	305
Andora Hills	Reach 3	1.496	2700	2700
Andora Hills	Reach 3	0.992	2750	2750
Andora Hills	Reach 3	0.911	2900	2900
Andora Hills	Reach 3	0.729	3000	3000
Andora Hills	Reach 3	0.522	3100	3100
Andora Hills	Reach 2	0.271	1913	1913
Andora Hills	Split 2	0.093	1287	1287
Andora Hills	Reach 1	0.162	3200	3200

HEC-RAS September 1998 Version 2.2
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: Galloway Wash
Project File : galloway.prj
Run Date and Time: 4/3/02 4:14:40 PM

Project in English units

Project Description:
Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Flood Control District of Maricopa County, October, 2000
JE Fuller Hydrology & Geomorphology, Inc., Tempe Az.

FLOW DATA

Flow Title: Galloway Wash
Flow File : x:\projects\Agency\FCDMC\Galloway\HECRAS\ras with fema comments\galloway.f01

Flow Data (cfs)

River	Reach	RS	Profile 1	Profile 2
Grapevine	Reach 1	0.210	5720	5720
Galloway	Reach 8	4.832	1110	1110
Galloway	Split 1	0.082	175	175
Galloway	Reach 7	4.639	935	935
Galloway	Reach 6	4.543	1110	1110
Galloway	Reach 6	4.505	1440	1440
Galloway	Reach 6	4.277	1595	1595
Galloway	Reach 6	3.861	1750	1750
Galloway	Reach 6	3.504	1840	1840
Galloway	Reach 6	3.216	3440	3440
Galloway	Split 2	0.240	216	216
Galloway	Reach 5	2.872	3224	3224
Galloway	Reach 4	2.647	3440	3440
Galloway	Reach 4	2.299	4410	4410
Galloway	Reach 4	2.098	5490	5490
Galloway	Reach 4	2.004	6060	6060
Galloway	Reach 3	1.474	10800	10800
Galloway	Reach 2	1.056	6693	6693
Galloway	Split 3	0.148	4107	4107
Galloway	Reach 1	0.905	10800	10800
Galloway	Reach 1	0.792	13500	13500

E.5.3: Summary of Manning's 'n' Values, Channel Reach Lengths, Coefficients of Contraction and Expansion

HEC-RAS September 1998 Version 2.2
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: Andora Hills Wash
Project File : Andora.prj
Run Date and Time: 8/16/2001 9:47:07 AM

Project in English units

Project Description:
Andora Hills Wash with Floodway Revised by JEF per Change Order 3.

Prepared
by Dibble & Associates, sub consultant to JE Fuller Hydrology and Geomorphology, Inc.

SUMMARY OF MANNING'S N VALUES

River:Andora Hills

Reach	River Sta.	n1	n2	n3
Reach 5	3.023	.07	.06	.07
Reach 5	2.974	.07	.06	.07
Reach 5	2.944	.07	.06	.07
Reach 5	2.881	.07	.06	.07
Reach 5	2.855	.07	.06	.07
Reach 5	2.813	.07	.06	.07
Reach 5	2.754	.07	.06	.07
Reach 5	2.696	.07	.06	.07
Reach 5	2.679	.07	.06	.07
Reach 5	2.67	.07	.06	.07
Reach 5	2.662	Culvert		
Reach 5	2.654	.07	.06	.07
Reach 5	2.617	.07	.06	.07
Reach 5	2.576	.07	.06	.07
Reach 5	2.529	.08	.065	.08
Reach 5	2.473	.08	.065	.08
Reach 5	2.419	.08	.065	.08
Reach 5	2.364	.08	.065	.08
Reach 5	2.324	.08	.065	.08

Reach 5	2.28	.08	.065	.08
Reach 5	2.219	.08	.065	.08
Reach 5	2.174	.08	.065	.08
Reach 5	2.153	.08	.065	.08
Reach 5	2.124	.08	.065	.08
Reach 5	2.090	.08	.065	.08
Reach 5	2.056	.08	.065	.08
Reach 5	2.019	.08	.065	.08
Reach 5	1.976	.08	.065	.08
Reach 5	1.935	.07	.06	.07
Reach 5	1.888	.07	.06	.07
Reach 5	1.831	.07	.06	.07
Reach 5	1.786	.07	.06	.07
Reach 5	1.731	.07	.06	.07
Reach 5	1.668	.07	.06	.07
Reach 5	1.609	.07	.06	.07
Reach 5	1.566	.07	.06	.07
Reach 4	1.555	.07	.06	.07
Reach 4	1.539	.07	.06	.07
Split 1	0.244	.07	.06	.07
Split 1	0.232	.07	.06	.07
Reach 3	1.496	.07	.06	.07
Reach 3	1.466	.07	.06	.07
Reach 3	1.438	.07	.06	.07
Reach 3	1.394	.07	.06	.07
Reach 3	1.353	.07	.06	.07
Reach 3	1.298	.07	.06	.07
Reach 3	1.266	.07	.06	.07
Reach 3	1.222	.07	.06	.07
Reach 3	1.170	.07	.06	.07
Reach 3	1.133	.07	.06	.07
Reach 3	1.085	.07	.06	.07
Reach 3	1.039	.07	.06	.07
Reach 3	0.992	.07	.06	.07
Reach 3	0.954	.07	.06	.07
Reach 3	0.911	.07	.06	.07
Reach 3	0.902	.07	.06	.07
Reach 3	0.893	Culvert		
Reach 3	0.884	.07	.06	.07
Reach 3	0.854	.07	.06	.07
Reach 3	0.830	.07	.06	.07
Reach 3	0.816	.07	.06	.07
Reach 3	0.805	.07	.06	.07
Reach 3	0.797	Culvert		
Reach 3	0.789	.07	.06	.07
Reach 3	0.761	.03	.035	.03
Reach 3	0.729	.03	.035	.03
Reach 3	0.687	.03	.035	.03
Reach 3	0.679	.03	.035	.03
Reach 3	0.673	Culvert		
Reach 3	0.667	.03	.035	.03
Reach 3	0.628	.03	.035	.03
Reach 3	0.592	.03	.035	.03
Reach 3	0.563	.03	.035	.03
Reach 3	0.522	.03	.035	.03
Reach 3	0.480	.03	.035	.03
Reach 3	0.447	.07	.06	.07

Reach 3	0.432	.07	.06	.07
Reach 3	0.429	Culvert		
Reach 3	0.426	.07	.06	.07
Reach 3	0.393	.07	.06	.07
Reach 3	0.317	.07	.06	.07
Reach 2	0.271	.07	.06	.07
Reach 2	0.236	.07	.06	.07
Reach 2	0.185	.07	.06	.07
Split 2	0.093	.07	.06	.07
Split 2	.083	.07	.06	.07
Split 2	.042	.07	.06	.07
Reach 1	0.162	.07	.06	.07
Reach 1	0.140	.07	.06	.07
Reach 1	0.129	.07	.06	.07

SUMMARY OF REACH LENGTHS

River: Andora Hills

Reach	River Sta.	Left	Channel	Right
Reach 5	3.023	230	254.2	290
Reach 5	2.974	150	161.92	170
Reach 5	2.944	330.17	330.17	320
Reach 5	2.881	150	136.43	120
Reach 5	2.855	230	224.24	224.24
Reach 5	2.813	305	313.37	330
Reach 5	2.754	305.71	305.71	305.71
Reach 5	2.696	86.13	86.13	86.13
Reach 5	2.679	55	51.94	51.94
Reach 5	2.67	85	80.25	80
Reach 5	2.662	Culvert		
Reach 5	2.654	199.65	199.65	199.65
Reach 5	2.617	205	211.68	215
Reach 5	2.576	265	253.35	250
Reach 5	2.529	293.8	293.8	293.8
Reach 5	2.473	290	286.65	286.65
Reach 5	2.419	286.01	286.01	286.01
Reach 5	2.364	215	211.87	150
Reach 5	2.324	240	235.48	235.48
Reach 5	2.28	325	322.29	320
Reach 5	2.219	239.18	239.18	239.18
Reach 5	2.174	110	104.29	100
Reach 5	2.153	120	157.09	140
Reach 5	2.124	140	174.96	185
Reach 5	2.090	185	181.33	155
Reach 5	2.056	195	199.73	205
Reach 5	2.019	230	225.16	230
Reach 5	1.976	210	215.18	220
Reach 5	1.935	259	251.44	217
Reach 5	1.888	300	295.86	290
Reach 5	1.831	240.62	240.62	240.62
Reach 5	1.786	291.68	291.68	291.68
Reach 5	1.731	332.78	332.78	332.78
Reach 5	1.668	308.74	308.74	308.74

Reach 5	1.609	227.04	227.04	227.04
Reach 5	1.566	0	0	0
Reach 4	1.555	87.38	87.38	87.38
Reach 4	1.539	0	0	0
Split 1	0.244	62.86	62.86	62.86
Split 1	0.232	0	0	0
Reach 3	1.496	150.2	154.4	157
Reach 3	1.466	154.2	156.59	156.59
Reach 3	1.438	232.6	230.98	230.98
Reach 3	1.394	215	217.2	217.2
Reach 3	1.353	290	288.92	288.92
Reach 3	1.298	175	170.44	170
Reach 3	1.266	230.08	230.08	230.08
Reach 3	1.222	274.86	274.86	274.86
Reach 3	1.170	197.64	197.64	197.64
Reach 3	1.133	254.28	254.28	254.28
Reach 3	1.085	239.52	239.52	239.52
Reach 3	1.039	252.89	252.89	252.89
Reach 3	0.992	201.01	201.01	201.01
Reach 3	0.954	226.84	226.84	226.84
Reach 3	0.911	45.19	45.19	45.19
Reach 3	0.902	95.58	95.58	95.58
Reach 3	0.893	Culvert		
Reach 3	0.884	156.36	156.36	156.36
Reach 3	0.854	125.74	125.74	125.74
Reach 3	0.830	76.91	76.91	76.91
Reach 3	0.816	58.13	58.13	58.13
Reach 3	0.805	81.63	81.63	81.63
Reach 3	0.797	Culvert		
Reach 3	0.789	149.19	149.19	149.19
Reach 3	0.761	171.43	171.43	171.43
Reach 3	0.729	220.34	220.34	220.34
Reach 3	0.687	40.07	40.07	40.07
Reach 3	0.679	63.09	63.09	63.09
Reach 3	0.673	Culvert		
Reach 3	0.667	206.32	206.32	206.32
Reach 3	0.628	192.86	192.86	192.86
Reach 3	0.592	150	148.28	160
Reach 3	0.563	160	220.26	220
Reach 3	0.522	225	220.66	220
Reach 3	0.480	177.56	177.56	177.56
Reach 3	0.447	75.24	75.24	75.24
Reach 3	0.432	31.91	31.91	31.91
Reach 3	0.429	Culvert		
Reach 3	0.426	176.06	176.06	176.06
Reach 3	0.393	403.66	403.66	403.66
Reach 3	0.317	240.14	240.14	240.14
Reach 2	0.271	184.82	184.82	184.82
Reach 2	0.236	270.89	270.89	270.89
Reach 2	0.185	119.63	119.63	119.63
Split 2	0.093	141.71	141.71	141.71
Split 2	.083	215.36	215.36	215.36
Split 2	.042			
Reach 1	0.162	111.48	111.48	111.48
Reach 1	0.140	57.16	57.16	57.16
Reach 1	0.129			

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Andora Hills

Reach	River Sta.	Contr.	Expan.
Reach 5	3.023	.1	.3
Reach 5	2.974	.1	.3
Reach 5	2.944	.1	.3
Reach 5	2.881	.1	.3
Reach 5	2.855	.1	.3
Reach 5	2.813	.1	.3
Reach 5	2.754	.1	.3
Reach 5	2.696	.1	.3
Reach 5	2.679	.3	.5
Reach 5	2.67	.3	.5
Reach 5	2.662	Culvert	
Reach 5	2.654	.3	.5
Reach 5	2.617	.1	.3
Reach 5	2.576	.1	.3
Reach 5	2.529	.1	.3
Reach 5	2.473	.1	.3
Reach 5	2.419	.1	.3
Reach 5	2.364	.1	.3
Reach 5	2.324	.1	.3
Reach 5	2.28	.1	.3
Reach 5	2.219	.1	.3
Reach 5	2.174	.1	.3
Reach 5	2.153	.1	.3
Reach 5	2.124	.1	.3
Reach 5	2.090	.1	.3
Reach 5	2.056	.1	.3
Reach 5	2.019	.1	.3
Reach 5	1.976	.1	.3
Reach 5	1.935	.1	.3
Reach 5	1.888	.1	.3
Reach 5	1.831	.1	.3
Reach 5	1.786	.1	.3
Reach 5	1.731	.1	.3
Reach 5	1.668	.1	.3
Reach 5	1.609	.1	.3
Reach 5	1.566	.1	.3
Reach 4	1.555	.1	.3
Reach 4	1.539	.1	.3
Split 1	0.244	.1	.3
Split 1	0.232	.1	.3
Reach 3	1.496	.1	.3
Reach 3	1.466	.1	.3
Reach 3	1.438	.1	.3
Reach 3	1.394	.1	.3
Reach 3	1.353	.1	.3
Reach 3	1.298	.1	.3
Reach 3	1.266	.1	.3
Reach 3	1.222	.1	.3
Reach 3	1.170	.1	.3
Reach 3	1.133	.1	.3
Reach 3	1.085	.1	.3

Reach 3	1.039	.1	.3
Reach 3	0.992	.1	.3
Reach 3	0.954	.1	.3
Reach 3	0.911	.3	.5
Reach 3	0.902	.3	.5
Reach 3	0.893	Culvert	
Reach 3	0.884	.3	.5
Reach 3	0.854	.1	.3
Reach 3	0.830	.1	.3
Reach 3	0.816	.3	.5
Reach 3	0.805	.3	.5
Reach 3	0.797	Culvert	
Reach 3	0.789	.3	.5
Reach 3	0.761	.1	.3
Reach 3	0.729	.1	.3
Reach 3	0.687	.3	.5
Reach 3	0.679	.3	.5
Reach 3	0.673	Culvert	
Reach 3	0.667	.3	.5
Reach 3	0.628	.1	.3
Reach 3	0.592	.1	.3
Reach 3	0.563	.1	.3
Reach 3	0.522	.1	.3
Reach 3	0.480	.1	.3
Reach 3	0.447	.3	.5
Reach 3	0.432	.3	.5
Reach 3	0.429	Culvert	
Reach 3	0.426	.3	.5
Reach 3	0.393	.1	.3
Reach 3	0.317	.1	.3
Reach 2	0.271	.1	.3
Reach 2	0.236	.1	.3
Reach 2	0.185	.1	.3
Split 2	0.093	.1	.3
Split 2	.083	.1	.3
Split 2	.042	.1	.3
Reach 1	0.162	.1	.3
Reach 1	0.140	.1	.3
Reach 1	0.129	.1	.3

HEC-RAS September 1998 Version 2.2
U.S. Army Corp of Engineers
Hydrologic Engineering Center
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PROJECT DATA
Project Title: Galloway Wash
Project File : galloway.prj
Run Date and Time: 4/3/02 4:14:40 PM

Project in English units

Project Description:
Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Flood Control District of Maricopa County, October, 2000
JE Fuller
Hydrology & Geomorphology, Inc., Tempe Az.

SUMMARY OF MANNING'S N VALUES

River:Grapevine

Reach	River Sta.	n1	n2	n3
Reach 1	0.210	.055	.045	.055
Reach 1	0.166	.055	.045	.055
Reach 1	0.119	.055	.045	.055
Reach 1	0.075	.055	.045	.055
Reach 1	0.031	.055	.045	.055

River:Galloway

Reach	River Sta.	n1	n2	n3	n4	n5
Reach 8	4.832	.06	.04	.06		
Reach 8	4.796	.06	.04	.06		
Reach 8	4.770	.06	.04	.06		
Reach 8	4.732	.06	.04	.06		
Reach 8	4.694	.06	.04	.06		
Reach 8	4.656	.06	.04	.06		
Split 1	0.082	.06	.045	.06		
Split 1	0.033	.06	.045	.06		
Split 1	0.027	.06	.045	.06		
Reach 7	4.639	.06	.04	.06		
Reach 7	4.618	.06	.04	.06		
Reach 7	4.581	.06	.04	.06		

Reach 6	4.543	.06	.04	.06
Reach 6	4.505	.06	.04	.06
Reach 6	4.467	.055	.04	.055
Reach 6	4.429	.055	.04	.055
Reach 6	4.391	.055	.04	.055
Reach 6	4.353	.055	.04	.055
Reach 6	4.315	.055	.04	.055
Reach 6	4.277	.055	.04	.055
Reach 6	4.240	.055	.04	.055
Reach 6	4.202	.035	.035	.035
Reach 6	4.164	.035	.035	.035
Reach 6	4.126	.055	.035	.035
Reach 6	4.088	.055	.04	.055
Reach 6	4.050	.055	.04	.055
Reach 6	4.012	.055	.04	.055
Reach 6	3.974	.055	.035	.055
Reach 6	3.936	.055	.035	.055
Reach 6	3.899	.055	.035	.035
Reach 6	3.861	.055	.035	.055
Reach 6	3.823	.035	.04	.055
Reach 6	3.785	.055	.04	.055
Reach 6	3.747	.055	.04	.055
Reach 6	3.709	.055	.04	.055
Reach 6	3.671	.055	.04	.055
Reach 6	3.634	.055	.04	.055
Reach 6	3.596	.055	.04	.055
Reach 6	3.562	.055	.04	.055
Reach 6	3.528	.06	.04	.06
Reach 6	3.514	.06	.04	.06
Reach 6	3.504	.06	.04	.06
Reach 6	3.503	Bridge		
Reach 6	3.502	.06	.04	.06
Reach 6	3.493	.06	.04	.06
Reach 6	3.482	.06	.04	.06
Reach 6	3.444	.06	.04	.06
Reach 6	3.404	.06	.04	.06
Reach 6	3.373	.04	.03	.04
Reach 6	3.369	Bridge		
Reach 6	3.364	.04	.03	.035
Reach 6	3.331	.06	.04	.06
Reach 6	3.292	.06	.04	.06
Reach 6	3.255	.06	.04	.06
Reach 6	3.216	.055	.035	.055
Reach 6	3.179	.055	.035	.055
Reach 6	3.141	.055	.04	.055
Reach 6	3.103	.055	.04	.055
Reach 6	3.066	.055	.04	.055
Reach 6	3.027	.055	.04	.055
Reach 6	2.988	.055	.045	.055
Reach 6	2.952	.055	.04	.055
Reach 6	2.913	.055	.04	.055
Reach 6	2.889	.055	.04	.055
Split 2	0.240	.055	.05	.055
Split 2	0.213	.055	.045	.055
Split 2	0.156	.055	.045	.055
Split 2	0.129	.055	.045	.055
Split 2	0.088	.055	.045	.055
Split 2	0.046	.055	.045	.055
Reach 5	2.872	.055	.045	.055
Reach 5	2.837	.055	.04	.055
Reach 5	2.799	.055	.04	.055
Reach 5	2.760	.055	.04	.055
Reach 5	2.723	.055	.04	.055

Reach 5	2.679	.055	.04	.055		
Reach 4	2.647	.055	.04	.055		
Reach 4	2.610	.055	.04	.055		
Reach 4	2.572	.055	.04	.055		
Reach 4	2.534	.055	.04	.055		
Reach 4	2.496	.055	.04	.055		
Reach 4	2.458	.055	.04	.055		
Reach 4	2.420	.055	.04	.055		
Reach 4	2.382	.055	.045	.055		
Reach 4	2.344	.055	.035	.055		
Reach 4	2.299	.055	.035	.055		
Reach 4	2.281	.055	.04	.055		
Reach 4	2.275	Culvert				
Reach 4	2.268	.055	.04	.055		
Reach 4	2.240	.055	.04	.055		
Reach 4	2.193	.055	.04	.055		
Reach 4	2.162	.055	.045	.055	.045	.055
Reach 4	2.098	.055	.04	.06		
Reach 4	2.041	.055	.04	.06		
Reach 4	2.004	.055	.04	.06		
Reach 4	1.966	.055	.04	.06		
Reach 4	1.928	.055	.04	.06		
Reach 4	1.917	.055	.04	.06		
Reach 4	1.890	.055	.04	.06		
Reach 4	1.846	.055	.04	.055		
Reach 4	1.815	.055	.04	.055		
Reach 4	1.790	.055	.04	.055		
Reach 4	1.761	.055	.045	.055		
Reach 4	1.739	.05	.035	.05		
Reach 4	1.701	.05	.035	.05		
Reach 4	1.663	.05	.035	.05		
Reach 4	1.625	.05	.035	.05		
Reach 4	1.587	.05	.035	.05		
Reach 4	1.549	.05	.035	.05		
Reach 4	1.511	.05	.035	.05		
Reach 3	1.474	.05	.035	.05	.04	.05
Reach 3	1.435	.05	.035	.05		
Reach 3	1.397	.05	.035	.05		
Reach 3	1.360	.05	.035	.05		
Reach 3	1.331	.05	.035	.05		
Reach 3	1.284	.05	.035	.05		
Reach 3	1.246	.05	.03	.05		
Reach 3	1.209	.05	.03	.05		
Reach 3	1.171	.05	.03	.05		
Reach 3	1.133	.06	.04	.06		
Reach 3	1.110	.06	.04	.06		
Reach 3	1.095	.06	.04	.06		
Reach 2	1.056	.06	.045	.06		
Reach 2	1.019	.06	.045	.06		
Reach 2	0.974	.06	.045	.06		
Reach 2	0.941	.06	.045	.06		
Split 3	0.148	.06	.045	.06		
Split 3	0.115	.06	.045	.06		
Split 3	0.072	.06	.045	.06		
Split 3	0.035	.06	.045	.06		
Reach 1	0.905	.06	.045	.06		
Reach 1	0.896	.06	.045	.06		
Reach 1	0.868	.06	.045	.06		
Reach 1	0.866	Bridge				
Reach 1	0.864	.06	.045	.06		
Reach 1	0.845	.06	.045	.06		
Reach 1	0.792	.06	.045	.06		
Reach 1	0.754	.06	.035	.06		

Reach 1	0.711	.06	.035	.06
Reach 1	0.678	.06	.035	.06
Reach 1	0.641	.06	.045	.06
Reach 1	0.603	.06	.045	.06
Reach 1	0.565	.06	.045	.06
Reach 1	0.527	.06	.045	.06
Reach 1	0.489	.06	.045	.06
Reach 1	0.451	.06	.045	.06
Reach 1	0.413	.03	.045	.03
Reach 1	0.376	.06	.045	.06
Reach 1	0.338	.06	.045	.06
Reach 1	0.300	.03	.07	.06
Reach 1	0.262	.03	.07	.06
Reach 1	0.224	.03	.07	.06
Reach 1	0.186	.03	.07	.06
Reach 1	0.149	.03	.07	.06
Reach 1	0.111	.055	.07	.06
Reach 1	0.073	.055	.07	.06
Reach 1	0.035	.055	.07	.06

SUMMARY OF REACH LENGTHS

River: Grapevine

Reach	River Sta.	Left	Channel	Right
Reach 1	0.210	216.1	244.3	234.5
Reach 1	0.166	253.33	248.81	249.45
Reach 1	0.119	233.58	234.36	227.06
Reach 1	0.075	219.19	230.55	227.84
Reach 1	0.031	187.68	165	168.62

River: Galloway

Reach	River Sta.	Left	Channel	Right
Reach 8	4.832	166.73	190.09	198.61
Reach 8	4.796	120.45	137.88	142.2
Reach 8	4.770	196.97	200.24	201.23
Reach 8	4.732	216.23	201.99	169.53
Reach 8	4.694	231.46	198.02	198.37
Reach 8	4.656	189.69	200.98	207.12
Split 1	0.082	112.7	116.1	109.4
Split 1	0.033	172.53	172.53	172.53
Split 1	0.027	215.95	201.74	159.75
Reach 7	4.639	116.8	120	125
Reach 7	4.618	204.6	197.46	190.46
Reach 7	4.581	215.95	201.74	159.75
Reach 6	4.543	174.82	201.42	209.08
Reach 6	4.505	180.55	200.08	205.2
Reach 6	4.467	182.88	200.4	202.73
Reach 6	4.429	197.08	199.32	196.01
Reach 6	4.391	200.06	199.24	196.42
Reach 6	4.353	197.1	200.05	203.14
Reach 6	4.315	200.17	200.44	193.59
Reach 6	4.277	194.19	199.88	212.53
Reach 6	4.240	205.89	200.16	175.1
Reach 6	4.202	203.3	200.59	189.22
Reach 6	4.164	194.8	198.76	205.64

Reach 6	4.126	187.81	200.17	228.11
Reach 6	4.088	191.38	199.71	216.93
Reach 6	4.050	204.98	200.74	190.48
Reach 6	4.012	211.29	200.33	187.42
Reach 6	3.974	219.23	199.73	197.41
Reach 6	3.936	199.19	200.02	197.39
Reach 6	3.899	206.23	199.63	190.14
Reach 6	3.861	195.08	200.38	213.91
Reach 6	3.823	197.39	199.08	201.89
Reach 6	3.785	193.4	198.85	213.49
Reach 6	3.747	200.67	202.56	209.44
Reach 6	3.709	200.53	199.18	179.03
Reach 6	3.671	212.76	199.05	189.71
Reach 6	3.634	214.68	200.35	197.1
Reach 6	3.596	193.09	179.62	174.76
Reach 6	3.562	182.11	178.3	175.33
Reach 6	3.528	73	75	76
Reach 6	3.514	49	50	52
Reach 6	3.504	10	10	10
Reach 6	3.503	Bridge		
Reach 6	3.502	52	50	50
Reach 6	3.493	57	57	60
Reach 6	3.482	199.35	200.64	206.71
Reach 6	3.444	196.92	211.88	206.28
Reach 6	3.404	186.98	188.4	180.34
Reach 6	3.373	53	49	60
Reach 6	3.369	Bridge		
Reach 6	3.364	173	172	145
Reach 6	3.331	207.53	202.91	187.42
Reach 6	3.292	184.67	198.56	211.53
Reach 6	3.255	159.33	204.55	220.12
Reach 6	3.216	198.28	198.03	198.99
Reach 6	3.179	191.22	198.48	206.7
Reach 6	3.141	240.1	200.9	169.75
Reach 6	3.103	205.17	197.04	189.55
Reach 6	3.066	206.34	202.75	194.51
Reach 6	3.027	208.54	208.56	213.42
Reach 6	2.988	189.63	186.64	189.43
Reach 6	2.952	203.1	206.4	233.41
Reach 6	2.913	123.27	129.12	152.98
Reach 6	2.889	0	0	0
Split 2	0.240	142.4	143.9	148.44
Split 2	0.213	258.8	300.03	291.61
Split 2	0.156	144.85	143.27	138.6
Split 2	0.129	215	213.78	220
Split 2	0.088	205	222.65	230
Split 2	0.046	0	0	0
Reach 5	2.872	202.74	184.09	150.06
Reach 5	2.837	188.33	200.12	204.48
Reach 5	2.799	223.94	202.85	191.87
Reach 5	2.760	182.26	197.53	281.45
Reach 5	2.723	242.1	230.18	200.21
Reach 5	2.679	159.95	171.26	204.09
Reach 4	2.647	179.67	199.96	201.59
Reach 4	2.610	204.59	199.83	176.75
Reach 4	2.572	203.8	201.35	172.32
Reach 4	2.534	189.05	199.83	208.47
Reach 4	2.496	203.39	199.88	192.83
Reach 4	2.458	201.38	198.8	189.99
Reach 4	2.420	199.62	199.56	195.51
Reach 4	2.382	200.6	201.12	201.19
Reach 4	2.344	216	239	241
Reach 4	2.299	85	93	97

Reach 4	2.281	70	70	70
Reach 4	2.275	Culvert		
Reach 4	2.268	140.78	145.48	150.26
Reach 4	2.240	224.42	249.46	253.52
Reach 4	2.193	146.23	163.37	165.62
Reach 4	2.162	350.91	335.73	332.11
Reach 4	2.098	310.31	300.69	289.79
Reach 4	2.041	218.72	198.98	168.09
Reach 4	2.004	203.17	198.99	188.38
Reach 4	1.966	202.69	201.02	189.28
Reach 4	1.928	63.2	60.68	60.63
Reach 4	1.917	127.72	140.09	162.61
Reach 4	1.890	224.43	232.47	242.35
Reach 4	1.846	183.23	165.48	142.2
Reach 4	1.815	142.48	129.93	91.26
Reach 4	1.790	122	154.7	216
Reach 4	1.761	109	116.99	145
Reach 4	1.739	206.9	200.55	187.09
Reach 4	1.701	188.07	199.43	211.06
Reach 4	1.663	190.54	201.88	207.51
Reach 4	1.625	183.64	200.69	205.02
Reach 4	1.587	205.22	197.57	195.12
Reach 4	1.549	211.45	200.58	198.51
Reach 4	1.511	202.54	198	196.61
Reach 3	1.474	194.97	201.89	207.2
Reach 3	1.435	195.97	200.79	207.93
Reach 3	1.397	199.02	198.05	197.41
Reach 3	1.360	156.07	154.59	158.25
Reach 3	1.331	238.46	245.92	239.68
Reach 3	1.284	201.88	199.89	205.91
Reach 3	1.246	202.82	197.69	188.66
Reach 3	1.209	202	201.52	198.97
Reach 3	1.171	155	200	187
Reach 3	1.133	148.92	122.5	125.2
Reach 3	1.110	77.08	77.5	50.8
Reach 3	1.095	189.36	197.52	196.65
Reach 2	1.056	221.9	199.55	178.17
Reach 2	1.019	243.22	237.45	199.77
Reach 2	0.974	169.28	173.44	174.46
Reach 2	0.941	0	0	0
Split 3	0.148	165.59	174.04	174.47
Split 3	0.115	157	226.46	228.69
Split 3	0.072	175	191.53	199
Split 3	0.035	0	0	0
Reach 1	0.905	46	45	37
Reach 1	0.896	163	147	77
Reach 1	0.868	22	22	22
Reach 1	0.866	Bridge		
Reach 1	0.864	75	102	144
Reach 1	0.845	247.12	277.85	331.24
Reach 1	0.792	193.87	201.37	195.99
Reach 1	0.754	207.13	225.28	233.18
Reach 1	0.711	168.84	175.53	179.35
Reach 1	0.678	194.64	197.14	199.23
Reach 1	0.641	182.19	199.12	205.96
Reach 1	0.603	198.44	202.16	198.49
Reach 1	0.565	186.54	198.68	206.09
Reach 1	0.527	205.48	199.77	197.7
Reach 1	0.489	199.93	201.48	200.43
Reach 1	0.451	202.9	199.84	195.05
Reach 1	0.413	201.11	199.08	192.87
Reach 1	0.376	200.81	200.24	199.04
Reach 1	0.338	195.5	199.34	201.12

Reach 1	0.300	181.56	199.02	207.41
Reach 1	0.262	215.76	201.31	188.69
Reach 1	0.224	219.38	200.19	183.9
Reach 1	0.186	209.89	198.86	189.25
Reach 1	0.149	195.2	200.26	204.06
Reach 1	0.111	200.15	200.69	200.92
Reach 1	0.073	193.74	200.24	204.94
Reach 1	0.035	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS
River: Grapevine

Reach	River Sta.	Contr.	Expan.
Reach 1	0.210	.1	.3
Reach 1	0.166	.1	.3
Reach 1	0.119	.1	.3
Reach 1	0.075	.1	.3
Reach 1	0.031	.1	.3

River: Galloway

Reach	River Sta.	Contr.	Expan.
Reach 8	4.832	.1	.3
Reach 8	4.796	.1	.3
Reach 8	4.770	.1	.3
Reach 8	4.732	.1	.3
Reach 8	4.694	.1	.3
Reach 8	4.656	.1	.3
Split 1	0.082	.1	.3
Split 1	0.033	.1	.3
Split 1	0.027	.1	.3
Reach 7	4.639	.1	.3
Reach 7	4.618	.1	.3
Reach 7	4.581	.1	.3
Reach 6	4.543	.1	.3
Reach 6	4.505	.1	.3
Reach 6	4.467	.1	.3
Reach 6	4.429	.1	.3
Reach 6	4.391	.1	.3
Reach 6	4.353	.1	.3
Reach 6	4.315	.1	.3
Reach 6	4.277	.1	.3
Reach 6	4.240	.1	.3
Reach 6	4.202	.1	.3
Reach 6	4.164	.1	.3
Reach 6	4.126	.1	.3
Reach 6	4.088	.1	.3
Reach 6	4.050	.1	.3
Reach 6	4.012	.1	.3
Reach 6	3.974	.1	.3
Reach 6	3.936	.1	.3
Reach 6	3.899	.1	.3
Reach 6	3.861	.1	.3
Reach 6	3.823	.1	.3
Reach 6	3.785	.1	.3
Reach 6	3.747	.1	.3

Reach 6	3.709		.1	.3
Reach 6	3.671		.1	.3
Reach 6	3.634		.1	.3
Reach 6	3.596		.1	.3
Reach 6	3.562		.1	.3
Reach 6	3.528		.1	.3
Reach 6	3.514		.1	.3
Reach 6	3.504		.1	.3
Reach 6	3.503	Bridge		
Reach 6	3.502		.1	.3
Reach 6	3.493		.1	.3
Reach 6	3.482		.1	.3
Reach 6	3.444		.1	.3
Reach 6	3.404		.3	.5
Reach 6	3.373		.3	.5
Reach 6	3.369	Bridge		
Reach 6	3.364		.3	.5
Reach 6	3.331		.1	.3
Reach 6	3.292		.1	.3
Reach 6	3.255		.1	.3
Reach 6	3.216		.1	.3
Reach 6	3.179		.1	.3
Reach 6	3.141		.1	.3
Reach 6	3.103		.1	.3
Reach 6	3.066		.1	.3
Reach 6	3.027		.1	.3
Reach 6	2.988		.1	.3
Reach 6	2.952		.1	.3
Reach 6	2.913		.1	.3
Reach 6	2.889		.1	.3
Split 2	0.240		.1	.3
Split 2	0.213		.1	.3
Split 2	0.156		.1	.3
Split 2	0.129		.1	.3
Split 2	0.088		.1	.3
Split 2	0.046		.1	.3
Reach 5	2.872		.1	.3
Reach 5	2.837		.1	.3
Reach 5	2.799		.1	.3
Reach 5	2.760		.1	.3
Reach 5	2.723		.1	.3
Reach 5	2.679		.1	.3
Reach 4	2.647		.1	.3
Reach 4	2.610		.1	.3
Reach 4	2.572		.1	.3
Reach 4	2.534		.1	.3
Reach 4	2.496		.1	.3
Reach 4	2.458		.1	.3
Reach 4	2.420		.1	.3
Reach 4	2.382		.1	.3
Reach 4	2.344		.1	.3
Reach 4	2.299		.1	.3
Reach 4	2.281		.1	.3
Reach 4	2.275	Culvert		
Reach 4	2.268		.1	.3
Reach 4	2.240		.1	.3
Reach 4	2.193		.1	.3
Reach 4	2.162		.1	.3
Reach 4	2.098		.1	.3
Reach 4	2.041		.1	.3
Reach 4	2.004		.1	.3
Reach 4	1.966		.1	.3
Reach 4	1.928		.1	.3

Reach 4	1.917		.1	.3
Reach 4	1.890		.1	.3
Reach 4	1.846		.1	.3
Reach 4	1.815		.1	.3
Reach 4	1.790		.1	.3
Reach 4	1.761		.1	.3
Reach 4	1.739		.1	.3
Reach 4	1.701		.1	.3
Reach 4	1.663		.1	.3
Reach 4	1.625		.1	.3
Reach 4	1.587		.1	.3
Reach 4	1.549		.1	.3
Reach 4	1.511		.1	.3
Reach 3	1.474		.1	.3
Reach 3	1.435		.1	.3
Reach 3	1.397		.1	.3
Reach 3	1.360		.1	.3
Reach 3	1.331		.1	.3
Reach 3	1.284		.1	.3
Reach 3	1.246		.1	.3
Reach 3	1.209		.1	.3
Reach 3	1.171		.1	.3
Reach 3	1.133		.1	.3
Reach 3	1.110		.1	.3
Reach 3	1.095		.1	.3
Reach 2	1.056		.1	.3
Reach 2	1.019		.1	.3
Reach 2	0.974		.1	.3
Reach 2	0.941		.1	.3
Split 3	0.148		.1	.3
Split 3	0.115		.1	.3
Split 3	0.072		.1	.3
Split 3	0.035		.1	.3
Reach 1	0.905		.1	.3
Reach 1	0.896		.1	.3
Reach 1	0.868		.1	.3
Reach 1	0.866	Bridge		
Reach 1	0.864		.1	.3
Reach 1	0.845		.1	.3
Reach 1	0.792		.1	.3
Reach 1	0.754		.1	.3
Reach 1	0.711		.1	.3
Reach 1	0.678		.1	.3
Reach 1	0.641		.1	.3
Reach 1	0.603		.1	.3
Reach 1	0.565		.1	.3
Reach 1	0.527		.1	.3
Reach 1	0.489		.1	.3
Reach 1	0.451		.1	.3
Reach 1	0.413		.1	.3
Reach 1	0.376		.1	.3
Reach 1	0.338		.1	.3
Reach 1	0.300		.1	.3
Reach 1	0.262		.1	.3
Reach 1	0.224		.1	.3
Reach 1	0.186		.1	.3
Reach 1	0.149		.1	.3
Reach 1	0.111		.1	.3
Reach 1	0.073		.1	.3
Reach 1	0.035		.1	.3

E.5.4: HEC-RAS Geometry Data

HEC-RAS Version 3.0.1 Mar 2001
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: Andora Hills Wash
Project File : Andora.prj
Run Date and Time: 4/8/02 9:37:52 AM

Project in English units

Project Description:
Andora Hills Wash with Floodway Revised by JEF per Change Order 3.

Prepared
by Dibble & Associates, sub consultant to JE Fuller Hydrology and Geomorphology, Inc.

River Mile stationing based upon River
Mile 0.00 at the confluence with Cave Creek Wash, which occurs at Cave Creek Wash River Mile 32.77.

Flow rates taken from "Cave Creek Wash above
Carefree Highway Floodplain Delineation Study", FCD No.95-28, Technical Data Notebook, Hydrology, Existing Condition", George V. Sabol Consulting Engineers, Inc., March 1997. All flow rates are rounded to the nearest 10 cfs.

Starting water surface elevation using slope-area normal
depth. The peak flow rate is considered to be non-coincident with Cave Creek Wash.

Manning's n-values taken from Field Reconnaissance Report for Andora Hills & Galloway Washes, prepared by JE Fuller, May 2000, FCD No. 99-14. The roughness values for Cave Creek Wash, Reach 52, apply to the lower end of Reach A4, as noted in the comments for individual cross sections.

GEOMETRY DATA

Geometry Title: Imported Geom 02
Geometry File : x:\projects\Agency\FCDMC\Galloway\HECRAS\Andora.g02

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary

```
  Andora Hills     Reach 5                                   Split 1
  Andora Hills     Reach 4              Split 1              Junction 1
  Andora Hills     Split 1              Split 1              Junction 1
  Andora Hills     Reach 3              Junction 1           Split 2
  Andora Hills     Reach 2              Split 2              Junction 2
  Andora Hills     Split 2              Split 2              Junction 2
  Andora Hills     Reach 1              Junction 2


CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 3.023

INPUT
Description: Carefree Drive

Flow change location, HEC-1  C340, Q=2070 cfs.
             Care Free Drive Crossing.
Beginning of Reach A4.
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9880.95    2310 9888.15 2309.45 9889.19 2309.37 9910.93 2307.76  9912.3 2307.69
 9913.32  2307.6 9938.44 2305.59 9940.08 2305.48 9951.48 2304.58 9952.38 2304.51
    99602303.994 9976.14  2302.9 9977.24 2302.86 9987.28 2302.47 9989.22 2302.43
 9992.61 2302.2910000.16  2302.410001.23 2302.4410003.01 2302.4210003.43 2302.39
10005.14 2302.4810025.05  2303.410025.47 2303.4310026.42 2303.4710037.55 2303.87
10038.71 2303.9210038.78  2303.910057.45 2304.5210059.22 2304.6310060.02 2304.63
10072.89 2304.9610084.79  2305.610089.61 2305.67 10092.7 2305.7810095.24 2305.84
10130.66  2306.510139.28  2306.510141.24 2306.6110160.16 2307.2610171.66 2308.01
10172.63 2308.0310178.06  2308.110191.19 2308.6710192.46 2308.6510198.03 2308.87
10209.34 2309.3210215.38  2310.2 10220.3 2310.48

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9880.95     .07    9960     .0610038.78     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          996010038.78              230   254.2     290             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.974

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9877.32    2306 9892.72 2305.02 9897.84 2304.67 9899.74 2304.46 9926.68 2298.46
 9929.45  2297.8 9930.97 2298.06 9940.37  2299.9 9955.01 2300.32 9981.06 2300.96
 9998.05  2299.4   10000 2298.9910005.52 2299.2610022.07  2299.710025.07 2300.23
10028.93  2301.210046.01 2309.48   10049 2310.7810049.26 2310.7710050.53 2310.77
10075.08  2310.510106.36 2310.2910108.94 2310.2210116.91 2310.1710120.19 2310.17
10127.54  2313.710128.78 2314.0910130.58 2314.1910144.73    231510164.31 2315.98
10165.94    231610186.35 2316.8610186.97 2316.9110192.28 2317.2510206.93 2317.94
10207.78    231810208.74    2318

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9877.32     .07 9981.06     .0610028.93     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.0610028.93              150  161.92     170             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.944
```

```
INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9869.69    2306  9871.6 2305.43 9871.98 2305.38 9872.33 2305.43 9873.68 2305.14
  9895.3  2302.8 9907.54 2302.32 9908.82 2302.24  9910.7 2302.11 9920.25 2301.44
 9941.34  2299.4 9943.28  2299.1 9945.82  2298.8 9965.31 2295.65 9968.69 2296.12
 9972.62  2296.7 9984.99  2297.2  9991.4 2297.15 9996.74 2295.7310000.67 2295.28
10009.53  2296.710011.09 2296.7610016.58 2296.4210017.23 2296.3710022.54 2297.99
10036.27  2302.110043.04 2302.3210045.54 2302.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9869.69     .07  9991.4     .0610009.53     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9991.410009.53           330.17  330.17     320             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.881

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9922.56    2304 9943.56  2298.2 9954.03 2295.69 9962.87 2293.97 9971.79  2293.5
  9988.2  2292.1 9989.252292.013  9996.9 2291.3810000.17 2291.0910010.42  2292.4
10011.95 2292.6410013.32  2292.9   100162293.23910022.662294.08210026.28 2294.54
10031.93 2294.5910035.72 2294.75 10047.7  2295.310049.68  2295.3 10062.1 2295.05
 10071.6 2295.9910071.78 2296.0110072.14 2296.0210073.03    229610089.15 2296.53
10094.71 2296.5310103.28 2296.3610110.77 2296.3710121.76    229710121.96 2297.04
10141.56 2298.3610157.64 2299.9710157.88 2299.9910158.52  2300.110158.75 2300.07
 10177.4 2301.8610178.62    2302

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9922.56     .07 9971.79     .06   10016     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.79   10016              150  136.43     120             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.855

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9837.56  2305.1 9844.07 2304.95 9846.79 2304.89 9850.87  2304.7  9854.1 2304.62
 9855.13  2304.4 9862.34 2302.77 9874.36 2300.34 9878.58 2299.99 9889.18  2298.7
 9914.82    2295 9918.48 2294.38 9928.16 2293.68 9936.37 2292.98 9937.27 2292.97
 9955.27  2292.2 9958.67 2292.12 9958.952292.077 9970.87 2290.25 9972.53 2289.99
 9975.74 2290.08 9987.84  2290.3 9992.47 2290.2210001.57  2290.110010.54 2290.74
10013.35 2290.9210021.07  2291.510031.35 2292.1710033.952292.29210041.96 2292.67
10068.02 2294.59 10071.2    229510074.93  2295.910079.08 2296.1110099.32 2298.69
10116.91 2298.94 10117.3  2298.910118.83  2299.210124.01 2300.0410127.36 2300.63
10136.02  2300.810147.11 2300.6410155.26  2300.410155.99  2300.410162.43 2300.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9837.56     .07 9958.95     .0610031.35     .07
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9958.9510031.35              230  224.24  224.24             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.813

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9891.87  2299.3 9900.58 2299.09 9908.18 2298.85 9913.56 2297.23 9932.98 2294.56
 9939.49  2294.6 9944.89 2294.47 9958.67 2294.23    9964 2292.92 9971.03 2290.75
 9983.85  2287.8 9985.86 2287.38 9990.39 2286.77 9998.99 2286.0310001.59 2285.82
10011.17  2286.810024.06 2287.91 10036.6 2289.2910038.37 2289.1510053.01 2293.09
10066.77  2296.410073.56 2297.9410086.18 2300.5310094.97 2301.9510099.04 2302.81
10105.15  2303.610108.45 2303.6710110.06 2303.7310112.85 2303.7910131.78 2304.14
10140.91  2305.710148.83 2306.0610154.22 2306.2110155.59  2306.3 10158.7 2306.44
10168.21  2307.110185.97 2308.0410201.92 2309.1710204.54  2309.210216.39    2310

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9891.87     .07 9983.85     .0610024.06     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.8510024.06              305  313.37     330             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.754

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9896.33  2291.9 9899.46 2291.82 9902.71 2291.67 9925.92 2288.76 9944.43 2286.23
  9947.3    2286 9976.27 2284.18 9980.52 2283.93 9982.59 2283.62   10000  2280.7
10012.71  2284.310016.12  2285.510017.34 2285.6910036.68 2290.9310037.82  2291.1
10042.95  2292.310056.26  2295.210060.03 2295.9910066.59 2296.87 10070.7 2297.52
10104.27  2303.310117.05 2305.4210119.82 2305.8110140.87 2309.3110146.13 2310.43
10146.75  2310.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9896.33     .07 9982.59     .0610012.71     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.5910012.71           305.71  305.71  305.71             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.696

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9893.51  2284.8 9893.88 2284.77 9903.28 2284.45 9903.44 2284.45 9912.72 2283.91
 9913.23  2283.9 9922.84 2283.34  9923.1 2283.33 9925.41 2283.23 9930.75  2282.8
 9931.81  2282.7 9934.34 2282.49 9936.58 2282.34 9938.14 2282.25 9940.61  2282.3
 9941.56  2282.3 9947.89 2282.41 9952.22 2282.51 9965.32 2282.28 9966.02 2282.28
 9966.69  2282.2 9971.72 2280.93 9992.02 2278.38 9992.13 2278.3610002.26 2276.84
   100072278.38410011.35  2279.810036.09 2289.8210039.34 2290.6410040.29  2290.7
10043.64 2290.7810059.99  2291.2

Manning's n Values        num=       3
```

```
     Sta    n Val      Sta    n Val      Sta    n Val
 9893.51      .07 9992.13      .06    10007      .07

Bank Sta: Left    Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
       9992.13    10007             86.13   86.13    86.13              .1        .3

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 5             RS: 2.679

INPUT
Description: Terrace Estates Circle, upstream of 2-10' by 3' CBC.  Culvert
             routine cross section 4.
Station Elevation Data     num=      46
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9834.18     2286 9835.67 2285.91  9840.2 2285.81 9842.42 2285.68 9848.88 2285.36
  9851.3   2285.3 9853.78 2285.16 9859.72 2284.93 9872.95 2284.85 9875.48 2284.79
  9876.7   2284.8 9878.99 2284.69 9897.55 2284.48 9908.21 2285.19 9931.13 2281.55
 9933.21   2281.3 9938.98  2281.2    9951 2281.08 9953.46 2281.04 9955.05 2280.95
    9975   2280.2 9978.87  2279.5 9985.05 2278.47 9993.09 2277.17  9998.8 2276.29
   100122278.44810019.66  2279.710024.97  2280.710033.82 2281.0110049.36 2281.92
10056.85 2280.8110059.91  2279.910066.97 2281.04 10073.5 2281.7810075.97 2283.63
10083.27  2282.810086.88  2285.410090.57 2286.5810111.39 2286.08 10178.4 2288.37
10180.87 2288.5710198.21  2288.510204.85 2288.5710218.88 2288.5210219.49 2288.65
 10225.7    2290

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9834.18      .07 9985.05      .06    10012      .07

Bank Sta: Left    Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
       9985.05    10012                55   51.94    51.94              .3        .5

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 5             RS: 2.67

INPUT
Description: Terrace Estates Circle

upstream of 2-10' by 3' CBC.  Culvert
             routine cross section 3  .Ground profile modified from station
             9962.07 to 10029.57, data input from survey and photographs.
Station Elevation Data     num=      41
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9887.31   2284.3 9895.59 2283.47 9897.83 2283.27 9909.02 2282.14 9923.02 2280.72
 9925.19   2280.7 9925.66 2280.69 9936.15 2280.56 9946.13 2280.41  9956.8 2280.19
 9957.53   2280.2 9962.07  2280.1    9991 2278.97    9991 2274.45   10013 2274.45
   10013 2279.0110029.57  2279.610038.64 2279.4810042.82 2279.1610047.33  2278.7
10047.73 2278.7210056.41  2278.710056.77 2278.7810057.49  2279.110058.63    2280
10065.02  2285.110083.68  2286.810085.81 2286.8610093.16 2287.0610109.93 2286.62
10143.44 2287.7510152.05  2288.4 10166.8 2288.3910170.66 2288.38 10179.9  2288.3
10181.94 2288.3610196.32  2288.410199.94 2288.5410202.72 2288.9510211.59 2290.23
10211.88  2290.2

Manning's n Values         num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9887.31      .07    9991      .06    10013      .07

Bank Sta: Left    Right    Lengths: Left Channel    Right      Coeff Contr.    Expan.
          9991    10013                85   80.25      80              .3        .5

CULVERT                 RIVER: Andora Hills
REACH: Reach 5             RS: 2.662
```

```
INPUT
Description:
Distance from Upstream XS =      26
Deck/Roadway Width        =      41
Weir Coefficient          =     2.6
Upstream  Deck/Roadway Coordinates
    num=        9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9876    2284            9920 2280.61            9971 2279.53
    9990 2278.62            9990 2281.72           10017 2281.56
   10017 2278.46           10063  2280.2           10136 2284.28

Upstream Bridge Cross Section Data
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9887.31  2284.3 9895.59 2283.47 9897.83 2283.27 9909.02 2282.14 9923.02 2280.72
 9925.19  2280.7 9925.66 2280.69 9936.15 2280.56 9946.13 2280.41  9956.8 2280.19
 9957.53  2280.2 9962.07  2280.1    9991 2278.97    9991 2274.45   10013 2274.45
   10013 2279.0110029.57  2279.610038.64 2279.4810042.82 2279.1610047.33  2278.7
10047.73 2278.7210056.41  2278.710056.77 2278.7810057.49  2279.110058.63    2280
10065.02  2285.110083.68  2286.810085.81 2286.8610093.16 2287.0610109.93 2286.62
10143.44 2287.7510152.05  2288.4 10166.8 2288.3910170.66 2288.38 10179.9  2288.3
10181.94 2288.3610196.32  2288.410199.94 2288.5410202.72 2288.9510211.59 2290.23
10211.88  2290.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9887.31     .07    9991     .06   10013     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9991   10013              .3       .5

Downstream  Deck/Roadway Coordinates
    num=        9
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9876    2284            9920 2280.61            9971 2279.53
    9990 2278.62            9990 2281.72           10017 2281.56
   10017 2278.46           10063  2280.2           10136 2284.28

Downstream Bridge Cross Section Data
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9890.99  2284.1  9895.6 2283.92 9923.92 2282.03 9932.67 2281.47 9941.15 2280.06
    99932278.814    9993 2274.27   10014 2274.27   10014 2278.6410076.73 2279.11
10080.92  2279.410096.38 2280.5910100.38 2280.8510118.72 2282.3710131.42 2283.42
10132.47  2283.610135.59 2283.74 10137.6 2283.7310139.75 2283.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9890.99     .07    9993     .06   10014     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9993   10014              .3       .5

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         = 2281.56
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       3      10
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 2 - Wingwall flared 18 to 33.7 deg.; inlet top edge bevel=0.083D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  2      75       .012                   .5                1
Number of Barrels =  2
Upstream   Elevation =  2274.45
Centerline Stations
    Sta.    Sta.
    9996   10008
Downstream Elevation =  2274.27
Centerline Stations
    Sta.    Sta.
    9998   10009

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.654

INPUT
Description: Terrace Estates Circle

downstream of 2-10' by 3' CBC.  Culvert
             routine cross section 2.Ground profile modified from station
             9941.15 to 10076.73, data input from survey and photographs.
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9890.99  2284.1  9895.6 2283.92 9923.92 2282.03 9932.67 2281.47 9941.15 2280.06
    99932278.814    9993 2274.27   10014 2274.27   10014 2278.6410076.73 2279.11
10080.92  2279.410096.38 2280.5910100.38 2280.8510118.72 2282.3710131.42 2283.42
10132.47  2283.610135.59 2283.74 10137.6 2283.7310139.75 2283.61

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9890.99     .07    9993     .06   10014     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9993   10014            199.65  199.65  199.65             .3       .5

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.617

INPUT
Description: Terrace Estates Circle, downstream of 2-10' by 3' CBC.  Culvert
             routine cross section 1.
Flow change location, HEC-1 C350, Q=2260
             cfs.
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9840.22  2279.6 9841.16 2279.52 9851.68 2279.16 9860.88 2277.76 9864.24 2277.59
  9878.7  2276.9 9888.82 2276.63 9910.68 2276.19 9915.36 2276.06 9924.78 2274.88
 9927.69  2274.5 9928.13 2274.38 9937.912272.582 9945.05 2271.27 9948.97 2271.66
 9957.57 2272.33 9958.55  2272.5 9966.27 2272.34 9975.85 2271.05 9979.27 2270.69
 9981.95 2271.14 9989.11  2271.6   10000 2270.3910003.91 2270.8910019.53 2274.57
10023.95 2275.5510026.16  2276.110027.27 2276.2910046.05 2280.9210053.04 2280.93
10061.91 2280.92

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9840.22     .07 9937.91     .06 9958.55     .07
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9937.91 9958.55              205  211.68     215             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.576

INPUT
Description: Piedra Grande Drive

End of Reach A4.
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9874.29    2278 9878.74  2277.4 9882.21 2277.34 9891.86 2275.91 9895.72 2275.46
 9899.61  2275.1 9915.21  2273.6 9918.82 2273.27 9936.07 2271.88 9941.33  2271.1
 9954.98  2269.6 9966.49 2268.51 9969.04 2268.41 9971.57 2268.49  9985.2 2268.82
 9994.16  2267.7 9998.03  2268.310005.61 2268.06 10010.2 2267.6910015.14 2268.23
10021.41  2268.610027.35 2270.43 10039.1 2274.3610068.34  2274.210071.67 2274.22
   10076  2274.310077.06 2274.3310079.48 2274.3310111.28    2274

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9874.29     .07  9985.2     .0610021.41     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9985.210021.41              265  253.35     250             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.529

INPUT
Description: Beginning of Reach A3
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9946.02  2274.2 9946.51 2274.25 9949.24 2272.98 9968.64 2268.93 9984.912264.753
 9996.65 2261.74 9998.02  2261.810001.07 2261.8410002.49 2261.7710006.01 2262.24
10009.98 2262.6410026.04  2264.710029.05 2264.3710055.91 2269.2210057.92 2269.51
10060.27    2270

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9946.02     .08 9984.91    .06510026.04     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.9110026.04             293.8   293.8   293.8             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.473

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9879.94  2273.2  9887.7 2272.78 9900.09  2269.9 9925.74 2263.61 9943.06 2258.81
 9953.97  2256.7 9955.02 2256.53 9963.05 2259.88 9963.18  2259.9 9979.12 2260.19
 9987.81  2259.2 9989.41 2259.0210000.38 2257.8710004.65 2258.6310012.67 2260.01
10056.66  2270.510059.86 2271.1810060.16  2271.210061.33  2271.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9879.94     .08 9979.12    .06510012.67     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.1210012.67              290  286.65  286.65             .1       .3
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```
CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.419

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9887.47  2269.3  9890.2 2269.31 9900.44 2267.84 9905.29 2267.24 9911.37 2266.55
 9918.89  2265.7 9927.19 2265.03  9929.2  2264.8 9935.67  2264.6 9938.95 2264.12
 9939.44    2264 9944.69 2263.39 9951.43  2262.4 9953.43  2262.1 9959.01 2261.63
 9961.08  2261.4  9962.3 2261.18 9969.43 2259.37 9983.51 2255.76 9990.77 2254.66
 9999.58  2253.310002.45 2253.8810010.82  2254.610012.77  2254.410026.18 2255.21
 10040.4  2256.110042.16 2256.3610055.38 2257.8410057.33 2257.8510072.23 2257.74
10125.19  2258.910155.78  2260.110164.98 2260.5610167.54 2260.7710188.44 2263.98
10201.59  2265.7 10219.3 2266.3810219.49 2266.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9887.47     .08 9983.51    .065 10040.4     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.51 10040.4           286.01  286.01  286.01             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.364

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9911.73    2264 9925.89 2260.11 9925.99 2260.09 9951.38 2253.15 9957.92 2252.42
 9983.04    2251 9984.95 2251.05 9985.35 2251.07 9989.29  2250.810000.08 2250.29
10005.17  2250.710010.46 2251.7610015.74 2252.38 10016.3 2252.3910026.46 2253.05
 10028.9  2253.110034.03  2254.410040.87 2256.2610048.25 2256.68 10058.5    2258

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9911.73     .08 9951.38    .06510026.46     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9951.3810026.46              215  211.87     150             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.324

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9912.08  2257.9 9913.43 2257.93 9922.35 2256.89 9928.06 2255.42 9940.68 2251.91
 9958.39  2249.6 9964.83 2249.37 9976.93 2248.73 9992.45 2247.67 10000.4 2246.79
10002.03  2246.910005.64 2247.6910011.04 2248.5710023.41 2249.6210023.78 2249.64
10023.86  2249.710024.02 2249.7210030.13 2251.7910035.98 2253.3110037.39 2253.64
10039.94  2253.110048.52 2250.6310057.52  2250.810068.92 2251.4810071.33 2251.53
10090.29  2252.310105.55 2252.2310120.88 2252.6610138.18 2253.0510148.51 2253.27
10156.34  2253.610159.43 2254.2810167.44 2257.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9912.08     .08 9964.83    .06510023.41     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
       9964.8310023.41                240  235.48  235.48              .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.28

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9937.8  2251.1 9940.24 2251.06 9951.52 2249.52 9962.65  2247.9 9971.12 2247.02
 9987.69  2244.2 9989.57 2243.68   10000 2241.4810011.81 2244.1710016.64 2245.27
10018.21  2245.710018.41  2245.710020.36 2246.5610037.14 2253.0410039.79 2254.96
10042.15 2255.0310044.01  2255.110052.51 2255.5110073.12 2256.8310079.87 2257.07
 10091.3 2257.0810091.66  2257.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9937.8     .08 9987.69    .06510011.81     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.6910011.81               325  322.29     320              .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.219

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9836.46    2242 9845.25 2242.61 9847.79 2242.71 9852.14 2242.85 9871.79  2243.3
 9908.39  2243.9 9912.86  2243.7  9913.2 2243.69 9927.31 2238.04 9936.34 2236.11
 9942.65  2237.5 9945.39 2237.96 9950.37  2238.1 9955.94 2238.37  9960.1 2238.11
 9964.84  2237.7  9981.7 2237.62 9984.02 2237.55 9987.02 2237.81 9990.59 2237.68
 9992.69  2236.910001.32 2234.9710006.09 2234.55 10017.6 2234.4310026.17 2234.53
10028.22  2234.710032.22 2236.34   100352237.46210039.48 2239.2710051.84 2239.94
10053.96 2240.0410054.35    224010054.56 2240.0410067.74 2240.17 10077.1 2239.09
10090.93 2239.9810108.63  2243.310116.47 2243.7110118.79 2244.2510128.86 2245.51
10140.59 2248.4710144.89    224910149.16 2252.2210157.86 2252.7310168.24 2254.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9836.46     .08 9990.59    .065   10035     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9990.59   10035           239.18  239.18  239.18              .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.174

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9914.14    2240 9915.08 2239.97 9916.38 2239.92 9916.77 2239.86  9917.6 2239.78
 9960.75  2235.3 9962.85 2234.99    9980 2232.55  9983.7 2232.22 9987.61 2232.03
 9998.77    223210006.38 2231.8710008.41 2232.0210010.18 2233.27   10013 2234.47
10028.74 2241.1710034.19    2242

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9914.14     .08 9962.85    .065   10013     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
      9962.85   10013                110  104.29     100              .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.153

INPUT
Description:
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9896.24  2239.3 9909.49 2238.22 9920.36 2235.44 9920.91 2235.29 9921.44 2234.97
 9922.72  2234.9 9932.46 2232.86  9934.7 2232.69 9953.81 2231.88 9956.46 2231.88
 9959.88  2232.4 9972.67 2233.37 9975.55  2233.3 9981.53 2233.65    99932230.552
 9996.19 2229.69   10000  2228.410002.11 2228.6710011.47 2229.2210017.47 2229.81
10021.04 2230.18 10034.9  2230.910064.57 2236.0110065.16 2236.1610069.97  2236.5
10072.44 2236.9310076.27  2237.310080.15 2237.14 10086.7  2236.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9896.24     .08    9993    .06510021.04     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          999310021.04               120  157.09     140              .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.124

INPUT
Description: Cross section alignments adjusted from station 9749.4 to station
             9842.5.  Data were recoded from the topo manually by JEF.
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9749.4  2234.2  9759.1    2232  9776.6    2228  9782.6  2226.4  9787.8    2228
  9803.4    2230    9820    2232  9830.2    2236  9832.6  2236.6  9835.6    2236
  9842.5  2234.7  9856.1 2235.97 9856.64 2236.08 9860.99 2236.28 9864.07  2235.5
    9867  2234.8 9868.99 2235.02 9881.71 2229.44 9882.49 2229.25 9890.86 2229.14
 9897.21  2228.6 9899.21 2228.36 9917.57 2233.14 9917.96  2233.2  9919.8 2234.06
 9928.78  2237.8 9930.72 2238.46  9934.9 2236.88 9936.99 2236.65 9946.64 2227.56
 9955.38  2235.4 9955.88 2235.55 9967.33 2236.53 9967.38 2236.52 9967.44  2236.5
  9968.5    2236 9988.36  2226.6 9994.05 2225.23   10000 2223.7610003.992226.425
10006.14 2227.8610017.98    223610021.83 2237.5110024.61 2238.1610025.08 2238.17
10025.42  2238.210045.27  2238.210045.97 2238.3510046.88 2238.5110055.81 2238.82
10060.61  2239.210066.47  2239.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9749.4     .08 9988.36    .06510003.99     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.3610003.99               140  174.96     185              .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.090

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9945.96  2234.8 9950.33 2234.69 9974.94  2226.3 9977.91 2225.16 9978.92 2224.73
    99902220.089   10000  2215.9   100052220.43810009.62 2224.6310012.73 2227.16
10015.32 2228.3910029.47 2231.4710030.15  2231.6 10031.8 2231.2810036.33 2229.64
10045.68 2228.0110047.36 2227.1810047.61  2227.210048.21 2227.1210049.36  2226.9
10064.06 2221.7910071.96 2219.5810077.17  2218.910081.07 2219.6710087.96 2222.59
10118.59 2227.0210133.63  2229.610137.36  2230.510159.35 2233.97 10169.9  2235.5
```

```
10196.69 2236.7410208.15 2237.43

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9945.96     .08    9990    .065   10005     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9990   10005               185  181.33     155             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.056

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9921.39  2219.5 9962.68 2211.41 9977.47 2207.84 9995.57 2203.77   10000 2202.43
10001.33  2202.510003.38 2202.5410017.68 2203.6110026.85  2209.710033.32  2213.1
 10038.4  2215.810043.01 2218.6110075.15 2226.6710080.87 2227.9810083.92 2228.37
10099.95  2229.510106.39  2229.910120.62 2231.7710127.07  2232.2 10136.6 2232.82
10150.69    223410157.89 2235.2510162.61 2235.8510166.65 2236.24 10175.3 2236.79
 10178.3    223710182.34 2236.8510188.55 2236.49

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9921.39     .08 9977.47    .06510026.85     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.4710026.85               195  199.73     205             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 2.019

INPUT
Description: Q=2500, Interpolated Discharge
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9889.64  2230.7 9890.62 2230.38 9892.76 2229.78 9906.56 2225.44 9927.24 2218.43
 9973.98  2201.2 9977.72 2200.99 9984.02 2200.59 9984.25 2200.57 9997.52 2199.09
10000.31  2198.910008.66 2200.2310028.76 2203.2310041.52 2205.0810059.06 2207.67
10070.28  2211.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9889.64     .08 9973.98    .06510008.66     .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.9810008.66               230  225.16     230             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 1.976

INPUT
Description: End of Reach A3
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9893.19  2219.7 9940.09 2210.19 9948.17 2209.05 9958.33 2204.73 9968.96 2200.25
 9980.78  2195.3 9984.94 2194.8210000.43 2193.1810010.912195.324 10019.3 2197.04
10024.46 2198.2110034.95    220010051.12 2202.7110064.92 2204.8310105.53 2209.68
10115.15 2210.8710138.94  2214.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
 9893.19      .08 9980.78     .06510010.91      .08

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.7810010.91               210  215.18     220              .1       .3

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 5             RS: 1.935

INPUT
Description: Beginning of Reach A4
Cross section data for this cross section
             were coded in manually from topo map due to re-alignment of cross
             section by JEF.
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9957  2197.4    9970    2196  9983.6    2192  9998.4    2190   10000  2189.7
 10002.5    2190 10013.2    2192   10033    2194 10058.7    2196 10079.8    2198
 10096.1    2200

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9957     .07  9983.6     .06 10013.2     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9983.6 10013.2               259  251.44     217              .1       .3

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 5             RS: 1.888

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9910.48  2198.5 9934.43 2198.78 9937.44 2198.79 9943.54 2198.58 9948.85 2198.34
 9974.18  2190.8 9978.78 2189.61 9983.41 2188.49 9996.33 2186.68 9998.88 2186.36
   100092188.15110015.49  2189.310020.35 2190.2210044.51 2191.1210068.84 2191.62
10077.04 2191.5410088.47  2191.410112.66 2191.85   10124 2192.0610141.03  2193.5
10148.29 2194.0210152.59  2194.510159.42  2195.210173.25 2196.2510191.07 2198.15
10193.94 2198.4310214.09  2198.810217.46 2198.7910217.55 2198.7910219.91 2198.84
10227.25  2198.910227.73    219910245.22 2199.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9910.48     .07 9983.41     .06   10009     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.41   10009               300  295.86     290              .1       .3

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 5             RS: 1.831

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9859.55     2193 9864.32 2193.09 9865.08  2193.1 9873.36 2193.24 9875.67 2193.13
 9893.94  2191.7  9901.6 2191.39 9915.49 2190.16 9918.03 2189.95  9919.6 2189.87
 9921.22  2189.8 9944.33 2187.96 9954.63 2187.51 9965.08 2187.47 9971.57 2186.19
 9976.852185.246 9982.14  2184.3 9992.64 2183.83 9994.82 2183.73   10000 2183.33
10010.23 2184.4610018.72  2185.310024.73 2188.23 10033.4 2193.0210035.22 2193.74
10042.36 2195.1210059.01  2198.610061.21 2198.88 10063.8 2199.09 10065.9 2199.26

Manning's n Values        num=       3
```

```
     Sta    n Val      Sta    n Val      Sta    n Val
 9859.55      .07 9976.85      .0610018.72      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.8510018.72           240.62  240.62  240.62             .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 1.786

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9874.49  2190.1 9879.74 2190.17 9883.24 2190.07 9892.87 2189.72  9900.6 2188.52
  9901.6  2188.3 9927.88 2187.57 9928.25 2187.57 9928.35 2187.55 9935.49 2187.42
 9936.64  2187.4 9945.68 2186.79 9955.67 2185.61 9976.03 2183.55 9980.09  2183.3
 9984.92  2182.4 9993.04 2181.3410000.24 2180.7710013.76 2182.17   10016 2182.36
10020.38  2182.910024.98 2183.4310027.38  2184.210041.41 2190.0710046.49 2191.42
10050.02  2192.510070.55 2196.0510072.44 2196.4810073.61  2196.710074.37 2196.78
10076.31  2197.110079.42 2197.45 10093.7 2199.1410096.26 2199.3610108.99 2200.95
10109.48    220110116.26 2201.0610125.05 2202.5610131.08 2203.69 10140.4 2204.85
10154.75  2206.310160.72 2206.9810169.66  2207.810179.86 2208.25

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9874.49      .07 9984.92      .06   10016      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.92   10016           291.68  291.68  291.68             .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 1.731

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9874.16     2186 9874.29 2186.01 9877.75 2185.24 9893.77 2184.68 9898.19  2184.6
 9898.53  2184.6 9904.69 2183.68 9908.99 2183.05 9914.39 2182.18 9920.97 2181.79
 9929.91  2181.2 9938.67 2180.48 9953.59 2179.61 9967.09 2178.91 9976.19 2178.23
 9976.94  2178.1 9980.93 2177.58 9986.59 2177.0610000.22 2176.0710010.19 2176.64
10018.04  2177.1   100212177.94910028.18 2180.0110030.85  2180.710049.54 2181.87
10059.22 2182.3910071.08  2182.610079.17 2182.9410086.28 2183.6110101.19 2183.58
10105.41 2184.1110122.33  2184.510125.14 2184.6610141.95 2184.3810144.46 2184.39
10144.88 2184.3810146.27  2184.4

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9874.16      .07 9976.94      .06   10021      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.94   10021           332.78  332.78  332.78             .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 1.668

INPUT
Description: Flow change location, HEC-1 C360, Q=2620 cfs.
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9872.63  2180.2 9873.53 2180.13 9884.86 2178.24 9904.63 2177.48 9911.54 2177.17
 9924.91  2176.6 9932.79 2176.33 9934.43 2176.24 9938.15 2175.95 9949.52 2175.19
 9958.51  2174.6 9971.16 2173.28 9983.36 2172.56 9984.43 2172.41 9988.36 2171.57
```

```
 9996.05  2171.210003.25 2170.6110007.15 2171.2910008.96 2171.7510013.43 2172.23
10015.98  2172.510019.67  2173.110033.08 2175.3510036.69 2175.9610037.36 2176.03
10040.39  2176.110062.73 2177.99 10081.9 2179.2210087.75 2179.2310103.87 2179.22
10107.22  2179.410129.13 2179.7110131.99 2179.82 10158.7 2180.2710159.59  2180.3
10160.48  2180.310169.66 2180.6610174.88 2180.7210176.77 2180.6910189.96 2180.42
10196.86  2180.810206.55 2180.4710215.04 2181.2410227.64 2180.9110235.95 2180.94
10247.98  2181.710259.12 2181.8610260.63 2181.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9872.63     .07 9983.36     .0610015.98     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.3610015.98           308.74  308.74  308.74             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 1.609

INPUT
Description: School House Rd.
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9892.63  2176.9  9910.5  2176.3 9931.78 2174.52 9933.01 2174.48 9935.67    2174
 9937.18  2173.8 9939.21 2173.41 9950.41 2172.12 9962.62 2169.66  9964.6  2169.1
 9965.86    2169 9974.65 2168.41  9983.5 2167.82 9984.98 2167.72 9985.56  2167.8
 9987.89  2167.6 9991.94 2167.52 9994.57 2167.47 9998.45  2167.510000.62 2167.45
10011.23  2168.310015.76 2169.0410017.29 2169.2310024.83 2170.9410027.35 2171.37
10034.41  2172.410036.39 2172.6810044.51 2173.8110049.29 2173.9910053.61 2174.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9892.63     .07 9962.62     .0610017.29     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9962.6210017.29           227.04  227.04  227.04             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 5            RS: 1.566

INPUT
Description: Split 1
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9820.82  2180.2 9821.96 2179.73 9851.22 2168.45 9876.25 2167.76 9887.03 2167.62
 9888.98  2167.5 9924.94 2167.45 9940.77 2167.54 9942.81 2167.53 9969.91 2165.02
 9972.21  2164.7 9973.86 2164.76 9992.04 2163.78 9997.91 2163.2610000.89 2163.23
10007.92  2163.610014.11 2164.68 10028.4 2167.2510036.65 2168.5810045.61 2170.15
10054.02  2171.710062.57 2175.0110063.43 2175.3810066.15 2175.21

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9820.82     .07 9973.86     .0610014.11     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.8610014.11                0       0       0             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 4            RS: 1.555

INPUT
Description: Split 1
XS where the Energy Grade Lines were balanced for the
             split flow, Q=2395cfs
```

```
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9903.39  2168.6 9904.55 2168.35 9911.45 2168.88  9918.3 2167.97  9919.5  2167.9
 9927.21  2167.5 9929.22 2167.44 9938.09 2167.52 9943.74 2165.95 9947.36 2165.47
 9961.03  2162.7 9963.73 2162.22 9964.06 2162.26 9973.13 2163.93 9980.98 2164.48
  9988.7  2163.9 9996.77 2162.6310004.23 2162.6110009.02 2162.85   100132163.871
10020.68 2165.8410023.44  2166.610035.48 2171.0510045.31 2173.3910047.42 2173.57
10049.15 2173.6110061.35  2173.2 10065.6 2173.02 10069.9    2172

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9903.39     .07  9988.7     .06   10013     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9988.7   10013             87.38   87.38   87.38             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 4            RS: 1.539

INPUT
Description: Junction 1
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9920.68  2170.2 9923.81 2170.01 9924.46 2169.89 9929.07 2169.71 9937.78 2169.29
 9944.29  2167.1 9951.45 2164.59 9961.44 2161.91 9961.79 2161.81  9962.4 2161.79
 9963.53  2161.8 9977.41 2161.99 9978.41 2162.07 9987.23  2161.1 9993.68 2160.91
 9998.99  2160.910006.89 2161.39 10008.3 2161.4710009.25 2161.5710023.56 2162.98
10026.75  2163.310039.68 2163.0510047.64 2163.0710048.91 2163.1310056.87 2163.88
10062.18  2164.4 10064.8 2164.3710072.13 2165.3510092.78  2167.510111.97 2168.64
10113.87  2168.810115.35 2168.8910118.47 2169.0510129.81 2169.5410146.76    2170

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9920.68     .07 9978.41     .0610009.25     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.4110009.25                0       0       0             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Split 1            RS: 0.244

INPUT
Description: Andora Hills Wash

XS where the Energy Grade Lines were balanced
             for the split flow, Q=305cfs
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9917.99    2180 9926.19 2178.45 9932.81 2176.09  9956.5 2167.87 9957.95 2167.81
 9961.45  2167.7 9983.04 2166.81 9990.87 2166.37 9999.94 2166.6710011.97 2167.15
10019.45    2170

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9917.99     .07 9961.45     .0610011.97     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.4510011.97             62.86   62.86   62.86             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Split 1            RS: 0.232

INPUT
```

```
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9896.03    2180 9897.08 2179.85  9901.6 2179.03 9923.47 2174.87  9927.9 2173.98
 9936.49  2172.1 9952.07 2168.78 9958.02 2167.51 9966.08 2166.37  9981.5 2165.91
10002.78  2165.2 10007.5 2165.6710015.13 2166.07 10018.3 2167.4210027.46 2169.28
10031.25  2167.510032.44 2167.0910033.98 2167.1410036.72 2167.5610045.28 2170.23
10046.24  2170.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9896.03     .07 9966.08     .0610015.13     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.0810015.13                 0       0       0              .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.496

INPUT
Description: Junction 1, Linda Drive
Interpolated Flow, Q=2700 cfs.
Station Elevation Data    num=      72
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9584.32    2172 9588.41 2171.41  9591.1 2171.07 9601.38 2170.49 9605.54 2169.95
  9622.4  2169.5 9633.09 2169.54 9643.02 2169.59 9644.74 2169.94  9646.3 2170.03
  9649.9    2170 9677.54  2168.6 9690.48 2167.61 9691.94 2167.39 9694.28 2167.21
  9698.1  2166.8 9725.85 2163.88 9731.02 2163.52 9735.23 2163.22 9740.76 2162.91
  9753.7  2162.1 9769.64 2161.08 9772.85 2160.62 9774.22 2160.26 9780.81 2160.21
 9799.42  2160.2 9804.75 2160.44 9813.24 2160.79  9829.1 2161.33 9830.56 2161.35
 9831.13  2161.3 9840.37 2161.15 9853.92 2161.14 9859.62 2161.17 9866.86 2161.14
 9869.25  2161.1 9875.12 2161.37 9877.58 2161.27  9896.3 2161.08 9909.16 2161.06
 9910.57    2161 9915.86 2160.43  9926.4 2159.61 9929.18 2159.62 9930.46 2159.62
 9932.59  2159.6 9944.23 2159.41 9953.71 2159.22  9958.4 2159.11 9960.77  2158.9
 9961.04  2158.8 9968.35 2156.88 9974.81 2156.83 9984.54 2156.79 9986.78  2157.5
    9991  2157.6   10000 2156.3610005.86 2156.3510008.48 2156.5510009.27 2156.64
10024.54  2158.510027.88 2159.4910045.31 2165.23 10050.9 2165.1610055.62 2165.24
10063.16  2165.310093.01 2164.9510111.33 2165.6710114.02 2165.69 10122.6 2166.14
10129.57  2165.810132.16 2165.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9584.32     .07 9961.04     .0610024.54     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.0410024.54            150.2   154.4     157              .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
    9836    9871    2164

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.466

INPUT
Description:
Station Elevation Data    num=      58
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9501.16    2170 9502.64 2169.85 9518.22 2168.58 9533.86 2166.58 9537.69 2166.21
 9539.36    2166 9541.21 2165.84 9542.67 2165.77 9547.78 2165.41  9560.9  2164.6
 9573.37  2164.3 9579.85 2164.27 9583.12  2164.3  9594.4 2164.45 9596.83 2164.51
 9599.69  2164.5 9623.95 2164.51 9624.97 2164.42 9626.03 2164.46 9627.77 2164.25
 9657.13  2161.7 9662.67 2161.35 9667.02 2160.96 9678.35 2160.23 9684.02 2159.61
 9698.19  2158.9 9705.21 2158.86 9711.33 2158.95 9711.83 2158.94 9712.85 2158.94
```

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 9714.43  2158.9 9715.36 2158.92 9743.89 2158.71 9749.57 2158.89 9761.88  2159.1
 9768.91  2159.3 9778.28 2159.24 9792.82 2159.46 9810.93 2159.43 9813.12 2159.43
 9813.41  2159.4 9816.11 2159.37 9832.18  2159.3  9832.3  2159.3 9906.07  2158.8
  9946.2    2158 9951.56  2157.6 9977.31  2157.6 9983.42    2156 9997.57    2152
   10000  2151.410003.33    215210007.86    2154   10013  2156.610019.72    2160
10026.12    216210036.89    216410055.32    2166

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9501.16     .07 9983.42     .06   10013     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.42   10013             154.2  156.59  156.59             .1       .3
Blocked Obstructions     num=       1
   Sta L   Sta R    Elev
 9906.86 9943.14    2164

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.438

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9737.9  2157.3 9738.79 2157.13 9743.66 2157.61 9743.72  2157.6 9744.04 2157.61
 9817.21  2156.5 9828.17 2156.62 9834.04 2156.66  9846.7  2156.6 9910.31    2156
 9967.23    2154 9980.22    2152 9989.742149.397 9994.85    2148   10000    2147
10010.95    214810015.742150.06510020.23    215210044.93    2162

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9737.9     .07 9989.74     .0610015.74     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9989.7410015.74            232.6  230.98  230.98             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.394

INPUT
Description:
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9836.3  2151.5 9842.21 2151.16 9850.19 2150.99 9854.28 2151.19 9860.13 2151.42
  9875.6  2152.1 9885.59 2152.47 9904.75 2150.44 9925.05  2147.8 9931.52 2147.69
 9956.64  2147.3 9975.05 2147.06 9987.66 2145.27 9999.43 2143.5210007.14 2144.36
10008.95  2144.5   100112145.51410013.72 2146.8610042.57 2158.6710042.91 2158.75
10047.16 2158.9510064.86  2160.210065.35 2160.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9836.3     .07 9987.66     .06   10011     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.66   10011              215   217.2   217.2             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.353

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9774.57    2151 9776.15 2150.91 9788.23 2150.32 9790.19 2150.18 9793.16 2149.92
    9798  2149.4 9801.38 2149.74 9812.24 2149.91 9817.04 2149.83 9824.65 2148.77
 9828.47  2148.4 9836.78 2147.62 9844.13 2147.93 9849.12 2148.22 9856.29 2147.15
 9869.16  2145.1 9877.34 2145.12 9900.45 2145.17 9922.55 2145.29 9928.32 2145.36
 9934.52  2144.7 9942.72 2143.75 9945.81 2143.73 9964.13 2143.39 9993.93 2141.31
10000.14  2140.810010.03 2141.4910014.78  2141.610022.16 2141.6510026.71 2141.49
10030.31  2141.710033.742143.27910055.67 2153.3710055.98 2153.5110057.43    2154
10075.12 2153.3910078.13  2153.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9774.57     .07 9964.13     .0610033.74     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9964.1310033.74               290  288.92  288.92             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.298

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9907.47    2146 9912.71 2146.77 9919.09 2146.42 9921.37 2146.37 9935.71 2145.95
 9938.59    2146 9958.77 2145.64 9961.17 2145.65 9987.19 2137.46 9991.49 2136.09
 9991.99  2136.110000.25 2135.55   100062136.98810012.73 2138.67 10027.8 2142.12
10086.07 2144.2410098.37  2144.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9907.47     .07 9987.19     .06   10006     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.19   10006               175  170.44     170             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.266

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9929.83  2150.3 9948.17 2148.63 9949.39 2148.59 9967.72 2145.27 9968.83 2144.95
 9971.25  2143.6  9983.82136.035 9989.63 2132.52 9998.07 2132.47 9999.97 2132.52
10005.69 2132.84 10012.5  2133.210018.652135.99510025.55 2139.1310040.18 2144.51
10044.61 2144.5210046.52 2144.5310058.96  2144.5

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9929.83     .07  9983.8     .0610018.65     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9983.810018.65           230.08  230.08  230.08             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.222

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9873.1  2136.3 9898.36 2135.68 9899.38 2135.65 9901.16  2135.6 9901.58  2135.6
 9920.84  2135.2 9926.12 2135.06 9927.21 2135.07 9944.73 2135.04 9948.47 2135.02
```

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  9951.6  2134.8  9959.7  2134.5 9963.36 2133.42 9974.42 2129.61 9985.19 2128.43
 9989.26    2128 9993.73 2127.47 9999.66 2126.9510011.49 2128.7110012.55 2128.85
10018.22  2129.910024.01 2131.4110041.43  2138.110043.19 2138.4310053.18 2139.32
10056.26  2139.510067.98 2139.1510069.38  2139.210073.32 2139.2610087.02 2139.12
10095.29  2139.110103.37 2139.0410111.14 2139.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9873.1     .07 9974.42     .0610018.22     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.4210018.22           274.86  274.86  274.86             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.170

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9907.46  2135.4 9910.31 2135.31 9932.83 2134.15  9937.3 2134.13 9946.33 2133.86
    99762125.573 9982.35  2123.8 9984.04  2123.3 9985.15 2122.97 9986.86 2122.93
10004.33 2122.7510005.13  2122.810011.76 2125.4910030.87 2133.2110056.17  2133.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9907.46     .07    9976     .0610011.76     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997610011.76           197.64  197.64  197.64             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.133

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9931.74  2131.6 9952.36 2131.32 9959.65 2131.17 9963.93 2131.05 9973.25 2127.58
 9983.582123.738 9993.36  2120.1 9996.14 2120.0310002.46 2120.0210004.58 2120.04
10017.43  2123.710037.39    212910073.99 2129.6310082.21 2129.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9931.74     .07 9983.58     .0610017.43     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.5810017.43           254.28  254.28  254.28             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.085

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9927.79  2127.6 9932.16 2127.39 9935.46 2127.22 9937.29  2127.1 9956.27 2123.41
 9961.53  2122.7 9977.34 2120.46  9977.4 2120.45   10000 2115.7410001.01 2115.83
10002.11  2116.3 10015.2 2119.8610016.02 2119.9110034.65 2121.2710040.24 2121.32
10062.98  2122.310063.35 2122.3610065.61 2122.47 10074.5 2122.8810087.66 2123.56
10089.19  2123.710091.21 2123.6810096.23 2123.7510113.45 2123.57

Manning's n Values        num=       3
```

```
     Sta    n Val      Sta    n Val      Sta    n Val
 9927.79      .07  9977.4      .06 10015.2      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9977.4 10015.2            239.52  239.52  239.52             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 1.039

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9895.75  2131.4 9899.91 2128.82 9909.43 2121.54 9913.23  2118.8 9933.48 2114.73
 9942.32  2112.9 9953.03  2112.4 9962.02  2112.3  9969.1 2112.16 9971.03 2112.19
 9973.18  2112.3 9977.54 2112.35 9989.37 2110.18 9999.87 2107.8910002.09 2108.13
 10005.4  2108.510006.34 2109.1210007.89 2110.2910017.06 2117.2110028.59 2120.48
10029.16 2120.6210029.91  2120.610032.78 2120.6310039.68 2120.65

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9895.75      .07 9989.37      .0610007.89      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9989.3710007.89            252.89  252.89  252.89             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.992

INPUT
Description: Interpolated flow, Q=2750 cfs
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9899.46  2114.4 9910.22 2114.46 9914.82  2114.5 9915.27 2114.48 9915.97 2114.45
 9921.14  2113.4 9937.61 2109.61 9951.26 2108.75 9960.29 2108.24 9965.23 2107.88
 9984.51  2107.3 9985.88 2107.12   10000 2104.9210003.27 2105.0910008.53 2105.34
10016.552107.17510024.09  2108.9 10028.4 2110.1910038.85 2110.56 10039.7 2110.52
10041.64 2111.3710056.59  2116.810063.79 2116.97

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9899.46      .07 9985.88      .0610016.55      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.8810016.55            201.01  201.01  201.01             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.954

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9943.04  2112.9 9943.18 2112.94 9948.07 2112.17 9981.19 2104.04 9983.96 2103.04
 9989.78    2102 9996.29 2100.8510002.19 2100.8110005.22 2101.61   100092102.845
10021.65 2106.9810041.84  2112.6 10044.5 2113.1110050.39 2113.3410063.95 2113.78
10065.79 2113.7910065.96  2113.810066.35 2113.7910071.37 2113.81

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9943.04      .07 9983.96      .06   10009      .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
```

```
       9983.96   10009            226.84  226.84  226.84              .1        .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.911

INPUT
Description: Cave Creek Road, upstream of 4-12' by 9' CBC..  Culvert routine
             cross section 4.
Flow change location, HEC-1 C370 Q=2900 cfs
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9582.8  2107.2  9583.6 2107.23 9590.94  2107.1 9597.58 2107.11 9607.34 2106.85
 9609.45  2106.9 9610.82 2106.86 9625.85 2106.66 9626.71 2106.66 9636.62 2106.54
 9658.32  2105.9 9666.36 2105.96 9673.19 2106.04 9714.11 2106.44 9726.05 2106.33
 9742.98  2106.4  9748.3 2106.57 9759.58 2106.52  9766.4 2106.87 9768.73 2107.19
 9771.28  2107.2 9776.67 2107.03 9783.95    2107 9789.46 2106.95 9793.25 2106.76
 9796.01  2106.8 9801.71 2105.98 9809.44 2105.53 9820.66 2105.07 9821.38 2105.09
 9831.12  2105.2 9842.24 2105.21 9851.04 2105.38 9863.26 2105.17 9869.93 2105.05
 9881.05  2105.2 9890.91 2103.94 9892.35 2103.81 9903.97 2103.21 9908.47 2103.54
 9924.86    2105 9927.99 2104.86 9935.78 2103.06 9936.64 2102.86    99392102.464
 9963.81  2098.3 9969.74  2098.4  9985.2 2098.58 9995.08 2098.21 9999.44 2097.98
10005.96 2098.0710014.74  2098.2   100302101.94210033.99 2102.9210037.98  2103.6
10043.05 2103.7910061.61 2103.8310080.89  2103.810082.13 2103.8410089.09 2103.84
10101.21 2103.9710114.69 2104.4410116.02  2104.710116.56  2104.810134.43 2105.28
10138.18  2105.310142.75 2104.8310144.05  2104.910144.47 2104.8810146.21 2104.88
10163.07 2104.8810167.62 2104.8910175.18  2104.8 10176.8 2105.0710181.52 2104.77
10198.22 2105.8410201.67 2106.0910218.72  2107.610225.96 2108.2210239.44 2108.75
10252.11 2109.0610259.32 2109.8410260.54    2110

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9582.8     .07    9939     .06   10030     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9939   10030             45.19   45.19   45.19              .3       .5

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.902

INPUT
Description: Cave Creek Road

upstream of 4-12' by 9' CBC.  Culvert routine
             cross section 3. Ground profile modified from station 9951.54 to
             10031.4, data input from survey and photographs.
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9564.79  2107.3 9573.34 2107.44 9579.11  2107.6 9586.07 2107.41 9598.06 2107.05
 9600.07    2107 9618.97 2106.42 9626.58 2106.39 9631.07 2106.29 9637.25 2105.94
 9640.81    2106  9641.9 2105.95 9645.06 2105.89 9649.04 2105.86 9654.33 2105.86
 9684.86  2106.1 9685.23 2106.08 9687.63 2106.03 9688.56    2106 9692.83 2106.09
 9735.77  2105.9 9737.31 2105.78 9740.71 2105.68 9743.85 2105.62 9746.13 2105.61
 9748.24  2105.6  9752.8 2105.65 9754.94 2105.66 9760.29 2105.71 9764.34 2105.54
 9776.04  2105.2 9783.57 2105.25 9783.79 2105.25 9795.55 2105.24 9796.28 2105.25
 9799.83  2105.2 9805.45 2105.09 9817.23 2104.86 9819.05 2104.83 9837.79 2104.55
 9841.19  2104.5 9858.15 2104.58 9860.48 2104.52 9878.51  2105.5 9879.37 2105.56
 9881.14  2105.6 9890.82 2105.72 9898.04 2105.77 9903.81 2105.99 9911.11 2105.66
 9935.31  2106.4 9936.99 2106.24 9941.43  2106.5 9951.38 2106.82 9951.54 2106.71
    9957 2106.98    9957  2094.5   10009  2094.5   10009 2106.98 10031.4 2107.34
10038.13  2107.4 10054.4 2107.3810070.09 2107.7510075.82 2108.0610089.02  2108.4
10091.35  2108.410091.97 2108.3910106.16 2108.7310115.78 2108.9510131.48 2108.97
10132.84    210910149.55 2109.4310155.89 2109.5910171.18 2109.9110176.85 2110.08
10190.65  2110.610198.17 2110.7710206.65 2111.3210212.84 2111.5510227.28  2111.7
```

```
10233.53    211210238.09 2112.0910238.98 2112.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9564.79     .07    9957     .06   10009     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9957   10009            95.58   95.58   95.58             .3       .5

CULVERT                 RIVER: Andora Hills
REACH: Reach 3            RS: 0.893

INPUT
Description:
Distance from Upstream XS =      11
Deck/Roadway Width        =      73
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
    95002107.282        9688.6462107.282        9782.201 2107.13
9884.3972107.278         9953.12  2107.6            99552108.203
    9955 2114.09           10010 2114.09           100102108.235
   100632109.208        10145.852110.718           102002110.718

Upstream Bridge Cross Section Data
Station Elevation Data    num=      83
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9564.79  2107.3 9573.34 2107.44 9579.11  2107.6 9586.07 2107.41 9598.06 2107.05
 9600.07    2107 9618.97 2106.42 9626.58 2106.39 9631.07 2106.29 9637.25 2105.94
 9640.81    2106  9641.9 2105.95 9645.06 2105.89 9649.04 2105.86 9654.33 2105.86
 9684.86  2106.1 9685.23 2106.08 9687.63 2106.03 9688.56    2106 9692.83 2106.09
 9735.77  2105.9 9737.31 2105.78 9740.71 2105.68 9743.85 2105.62 9746.13 2105.61
 9748.24  2105.6  9752.8 2105.65 9754.94 2105.66 9760.29 2105.71 9764.34 2105.54
 9776.04  2105.2 9783.57 2105.25 9783.79 2105.25 9795.55 2105.24 9796.28 2105.25
 9799.83  2105.2 9805.45 2105.09 9817.23 2104.86 9819.05 2104.83 9837.79 2104.55
 9841.19  2104.5 9858.15 2104.58 9860.48 2104.52 9878.51  2105.5 9879.37 2105.56
 9881.14  2105.6 9890.82 2105.72 9898.04 2105.77 9903.81 2105.99 9911.11 2105.66
 9935.31  2106.4 9936.99 2106.24 9941.43  2106.5 9951.38 2106.82 9951.54 2106.71
    9957 2106.98    9957  2094.5   10009  2094.5   10009 2106.98 10031.4 2107.34
10038.13  2107.4 10054.4 2107.3810070.09 2107.7510075.82 2108.0610089.02  2108.4
10091.35  2108.410091.97 2108.3910106.16 2108.7310115.78 2108.9510131.48 2108.97
10132.84    210910149.55 2109.4310155.89 2109.5910171.18 2109.9110176.85 2110.08
10190.65  2110.610198.17 2110.7710206.65 2111.3210212.84 2111.5510227.28  2111.7
10233.53    211210238.09 2112.0910238.98 2112.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9564.79     .07    9957     .06   10009     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9957   10009             .3       .5

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
9688.6462107.282        9782.201 2107.13        9884.3972107.278
 9953.12  2107.6            99552108.203            9955 2114.09
   10010 2114.09           100102108.235           100632109.208
10145.892110.718

Downstream Bridge Cross Section Data
Station Elevation Data    num=      76
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9604.42    2110 9606.38 2110.04 9619.14 2109.52 9630.26 2109.42 9633.17 2109.49
 9642.43    2109 9645.17 2108.86 9647.98 2108.85 9661.48 2108.84 9673.03 2108.82
 9678.37  2108.9 9680.36 2108.92 9684.51 2108.88 9693.64 2108.77 9696.98 2108.75
 9699.63  2108.7 9705.17  2108.7 9707.11 2108.83 9709.48 2109.07 9712.08 2109.25
  9716.1  2109.5 9720.29 2109.68 9720.73 2109.69 9726.45 2109.77 9731.97 2110.23
 9749.85  2109.9 9755.43 2109.43 9763.33 2109.11 9771.11 2109.04 9777.03 2108.89
 9789.48  2109.1 9804.19 2108.75 9806.43 2108.55 9808.95 2108.66 9810.07 2108.65
 9813.08  2108.7 9832.01 2108.86 9833.64 2108.86 9838.44 2108.72 9843.08 2108.68
 9848.78  2108.6 9856.43 2108.63 9858.41 2108.79 9866.85 2108.73 9877.16 2108.79
 9880.39    2108 9890.26 2108.89 9894.42 2108.97 9897.78 2108.96 9910.96 2109.25
 9915.39  2109.2 9915.76 2109.21 9916.94 2109.05    9957  2109.7    9957  2093.5
   10007  2093.5   10007  2109.710037.87 2109.8310055.07 2110.3710058.28  2110.5
10076.39 2110.6110079.14 2110.5910097.05 2110.8710099.79 2110.8410117.89  2111.5
10119.72 2111.5610138.45  2111.710139.97  2111.810142.29 2111.8710156.83  2111.5
10158.51 2112.1410159.68 2112.0910175.26 2112.1410182.37 2115.7910183.76  2116.3
10187.01 2116.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9604.42     .07    9957     .06   10007     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9957   10007              .3       .5

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         = 2105.86
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   10.18    11.9
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 1 - Wingwall flared 45 deg.; inlet top edge bevel=0.43D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  2      91       .013                   .5                1
Number of Barrels =  4
Upstream   Elevation =  2094.5
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    9963    9976    9990   10003
Downstream Elevation =  2093.5
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    9963    9977    9989   10002

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.884

INPUT
Description: Cave Creek Road

downstream of 4-12' by 9' CBC.  Culvert routine
             cross section 2.  Ground profile modified from station 9916.94 to
             10037.87, data input from survey and photographs.
Station Elevation Data    num=      76
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9604.42    2110 9606.38 2110.04 9619.14 2109.52 9630.26 2109.42 9633.17 2109.49
 9642.43    2109 9645.17 2108.86 9647.98 2108.85 9661.48 2108.84 9673.03 2108.82
 9678.37  2108.9 9680.36 2108.92 9684.51 2108.88 9693.64 2108.77 9696.98 2108.75
 9699.63  2108.7 9705.17  2108.7 9707.11 2108.83 9709.48 2109.07 9712.08 2109.25
  9716.1  2109.5 9720.29 2109.68 9720.73 2109.69 9726.45 2109.77 9731.97 2110.23
 9749.85  2109.9 9755.43 2109.43 9763.33 2109.11 9771.11 2109.04 9777.03 2108.89
 9789.48  2109.1 9804.19 2108.75 9806.43 2108.55 9808.95 2108.66 9810.07 2108.65
 9813.08  2108.7 9832.01 2108.86 9833.64 2108.86 9838.44 2108.72 9843.08 2108.68
 9848.78  2108.6 9856.43 2108.63 9858.41 2108.79 9866.85 2108.73 9877.16 2108.79
 9880.39    2108 9890.26 2108.89 9894.42 2108.97 9897.78 2108.96 9910.96 2109.25
 9915.39  2109.2 9915.76 2109.21 9916.94 2109.05    9957  2109.7    9957  2093.5
   10007  2093.5   10007  2109.710037.87 2109.8310055.07 2110.3710058.28  2110.5
10076.39 2110.6110079.14 2110.5910097.05 2110.8710099.79 2110.8410117.89  2111.5
10119.72 2111.5610138.45  2111.710139.97  2111.810142.29 2111.8710156.83  2111.5
10158.51 2112.1410159.68 2112.0910175.26 2112.1410182.37 2115.7910183.76  2116.3
10187.01 2116.42

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9604.42     .07    9957     .06   10007     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9957   10007           156.36  156.36  156.36              .3       .5

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 3             RS: 0.854

INPUT
Description: Cave Creek Road

downstream of 4-12' by 9' CBC.  Culvert routine
            cross section 1.
Station Elevation Data    num=      53
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9619.99  2105.8 9624.49 2106.16  9627.6 2106.45 9632.52 2106.74 9650.17 2106.97
 9657.32    2107 9658.84 2107.05 9665.71 2107.12 9677.97 2103.39 9685.95 2100.68
 9700.21  2100.8 9705.21 2100.86  9716.7 2097.72 9721.37  2096.7 9723.74 2096.26
 9726.98  2095.7 9744.77  2095.2 9755.01 2094.64 9768.79 2093.63 9773.75  2093.6
 9780.62  2093.5 9782.51  2093.4 9784.64 2093.43 9793.96 2093.31 9795.89 2093.84
 9797.83  2094.5 9803.78 2095.87 9810.47 2096.99 9823.12 2094.57 9826.18 2093.73
 9832.91  2093.7 9837.78 2093.55 9862.02 2093.06  9875.3 2093.07 9890.76  2093.3
 9908.23  2093.9 9912.52 2094.21 9920.56 2094.81 9930.15 2096.53 9941.17 2097.97
 9956.49  2096.4 9965.55  2094.9  9983.1 2094.55 9985.23  2094.5 9987.85 2094.24
 9999.31    209310002.94 2093.62   100102094.49310014.75 2095.0810039.06 2099.02
10043.46 2099.8210050.42  2101.810076.76 2110.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9619.99     .07 9985.23     .06   10010     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.23   10010           125.74  125.74  125.74              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION           RIVER: Andora Hills
REACH: Reach 3             RS: 0.830

INPUT
Description:
Station Elevation Data    num=      63
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9637.19  2101.4 9640.45 2101.45 9650.72 2101.03 9656.16 2099.92 9661.23 2099.36
 9666.79  2098.3  9669.3 2098.34 9682.91 2097.04 9688.21 2096.65 9690.16  2096.6
 9693.75  2096.2 9698.34 2096.01 9729.87 2094.15 9755.44 2093.64 9762.56 2093.43
 9770.44  2093.3 9815.27 2092.31    9816 2092.46 9820.95 2093.66 9839.42 2098.05
 9840.89  2098.5 9846.02 2096.78 9847.38 2096.62 9851.22 2096.85 9858.27 2097.23
 9861.66  2098.1 9870.33 2097.85 9880.61 2100.13 9882.45 2100.81 9887.36 2099.62
 9892.91    2099 9894.68 2098.76 9901.35 2098.41 9903.39 2098.58 9905.04 2099.17
 9909.26  2101.7 9913.43 2100.23 9916.08 2098.97 9920.35 2097.54 9924.82 2097.57
 9926.47  2097.9 9931.76 2098.65 9939.56 2096.82 9944.69 2098.62    9947 2098.94
 9952.37  2100.5 9956.25 2100.53 9957.57 2100.08 9967.27 2097.92 9973.13 2095.83
 9981.18  2092.5 9996.88 2090.89   10000  2090.510008.48 2093.0110009.54 2093.21
10011.43  2094.210024.44 2101.3810070.07 2101.3110071.36  2101.310071.74  2101.3
 10072.2  2101.310080.44 2101.2410086.11 2102.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9637.19     .07 9981.18     .0610008.48     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9981.1810008.48            76.91   76.91   76.91             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.816

INPUT
Description: Grapevine Road, upstream of 5-54" by 36" HECMP.   Culvert routine
             cross section 4.
Station Elevation Data    num=      67
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9632.75  2100.5 9634.39 2100.49 9642.82 2100.22 9643.19 2100.21 9653.81 2099.04
 9655.39  2098.9 9656.76 2098.89  9665.6 2098.36 9668.95 2098.19 9680.44 2097.18
 9684.53    2097  9690.5 2094.91 9691.67 2095.01  9692.2  2094.8 9694.48 2095.46
 9700.14  2097.3 9702.99 2097.19 9708.74 2096.64  9715.9 2096.12 9718.66    2096
 9722.13  2095.8 9731.25 2095.14 9734.47 2094.92 9756.67 2094.64 9766.62 2094.37
 9788.09  2093.8 9788.43 2093.75 9788.58 2093.76 9788.67 2093.75 9826.17 2092.88
 9838.68  2092.3 9839.33 2092.22 9859.13 2090.95 9863.66 2091.55 9879.33 2092.52
 9883.31  2092.8 9886.24 2093.03 9891.15 2093.71  9894.2 2093.62 9897.11 2093.51
 9923.26  2091.4  9924.1 2091.53 9929.66 2092.68 9933.01 2093.38    9939 2091.89
 9940.55  2090.9 9950.44 2090.85 9957.39 2090.96 9967.68 2093.81 9970.94 2094.76
  9971.9  2094.5 9975.96 2093.28 9988.94 2089.75  9998.7 2087.26   10000 2086.88
10003.71  2087.810014.21 2090.4810039.25 2098.7810040.26 2099.08 10041.4  2099.4
10059.88  2099.510063.31 2099.2410078.88 2099.4910083.31 2099.5410088.36 2099.55
10101.46  2099.510107.75    2100

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9632.75     .07 9988.94     .0610014.21     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.9410014.21            58.13   58.13   58.13             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F
Left Levee      Station= 9700.14      Elevation=  2097.3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.805

INPUT
Description: Grapevine Road
```

```
upstream of 5-54" by 36" HECMP.   Culvert
             routine cross section 3.
Ground profile modified from station
             9837.88 to 10176.89, data input from survey and photographs. The
             profile is crown line minus 0.5 feet for asphalt.
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.12  2095.9 9737.18 2095.77 9753.42 2095.49 9763.66 2094.86 9772.71 2094.59
 9772.74  2094.6 9774.39 2094.54 9787.97 2094.14 9790.08 2094.06 9790.56 2094.04
 9812.41  2092.8  9824.5    2092  9828.3 2091.75 9837.88 2090.95 9853.44    2090
 9865.86    2089  9875.5    2090 9879.67    2092  9888.9  2092.8 9898.05    2092
 9908.09    2090  9915.2    2088    99832084.189    99922084.189    99922081.598
   100182081.598   100182084.18910036.53    209010063.33  2092.210152.79    2100

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.12     .07    9992     .06   10018     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9992   10018             81.63   81.63   81.63              .3       .5

CULVERT                 RIVER: Andora Hills
REACH: Reach 3             RS: 0.797

INPUT
Description:
Distance from Upstream XS =    19.2
Deck/Roadway Width        =      38
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
    98002088.779        9847.0822088.779         9913.652085.425
    99832084.689        10063.33 2087.68        10152.792093.165
10176.892093.413

Upstream Bridge Cross Section Data
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.12  2095.9 9737.18 2095.77 9753.42 2095.49 9763.66 2094.86 9772.71 2094.59
 9772.74  2094.6 9774.39 2094.54 9787.97 2094.14 9790.08 2094.06 9790.56 2094.04
 9812.41  2092.8  9824.5    2092  9828.3 2091.75 9837.88 2090.95 9853.44    2090
 9865.86    2089  9875.5    2090 9879.67    2092  9888.9  2092.8 9898.05    2092
 9908.09    2090  9915.2    2088    99832084.189    99922084.189    99922081.598
   100182081.598   100182084.18910036.53    209010063.33  2092.210152.79    2100

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.12     .07    9992     .06   10018     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9992   10018              .3       .5

Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    98002088.779        9847.0822088.779         9913.652085.425
    99832084.689        10063.33 2087.68        10152.792093.165
10176.892093.413

Downstream Bridge Cross Section Data
Station Elevation Data    num=       9
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9851.85    2090    9889    2088 9930.25    2086    99832084.189    99922084.189
    9992  2080.3   10019  2080.3   100192084.18910082.36    2090

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9851.85     .07    9992     .06   10019     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9992   10019             .3       .5

Upstream Embankment side slope              =       4 horiz. to 1.0 vertical
Downstream Embankment side slope            =       4 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =2084.689
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     Pipe Arch    3.17    4.21
FHWA Chart # 34- 18 inch corner radius; Corrugated metal
FHWA Scale # 2 - Mitered to slope
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  2      78        .02                   .5                1
Number of Barrels =  5
Upstream   Elevation =  2081.598
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
    9994   10000   10007   10012   10016
Downstream Elevation =  2080.3
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.
    9994   10000   10006   10011   10017

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.789

INPUT
Description: Grapevine Road

downstream of 5-54" by 36"  HECMP. Culvert
             routine cross section 2.
End of Reach A4.  Ground profile
             modified from station 9837.88 to 10176.89, data input from survey
             and photographs. The profile is crown line minus 0.5 feet for
             asphalt.
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9851.85    2090    9889    2088 9930.25    2086    99832084.189    99922084.189
    9992  2080.3   10019  2080.3   100192084.18910082.36    2090

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9851.85     .07    9992     .06   10019     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9992   10019            149.19  149.19  149.19              .3       .5

CROSS SECTION          RIVER: Andora Hills
```

```
REACH: Reach 3              RS: 0.761

INPUT
Description: Grapevine Road, downstream of 5-54" by 36" HECMP  Culvert routine
             cross section 1.
Beginning of Reach A2
Station Elevation Data     num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9810.05    2090 9815.55 2088.55 9823.19 2086.53 9834.92 2086.39 9898.37 2084.41
  9900.2  2084.2 9908.32 2084.33 9915.97 2084.56 9922.64 2084.91 9923.09  2084.9
  9924.5  2084.9  9934.7  2085.2 9938.56 2085.17 9951.12 2082.04 9963.16    2080
 9973.792078.018 9976.57  2077.5 9977.87 2077.22 9977.99  2077.2 9992.54 2076.85
   10000 2076.7710005.34  2076.710014.32 2077.0610019.26 2077.9910032.23 2079.95
10041.27 2081.47 10047.2  2083.410066.56    2090

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9810.05     .03 9973.79    .03510019.26     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9973.7910019.26           171.43  171.43  171.43             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3             RS: 0.729

INPUT
Description: Interpolated flow, Q=3000 cfs
Station Elevation Data     num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9804.92    2082 9842.33    2080  9867.5  2078.8 9913.46  2078.5 9928.63    2080
 9930.82  2080.3 9933.08 2080.54 9948.07 2078.88 9953.88 2078.38 9955.22 2078.18
 9961.17  2077.2 9979.98 2074.81 9986.89 2074.7810000.02 2074.3710010.23 2074.81
10012.25  2074.910021.42 2076.71 10036.7 2079.6410038.15 2079.7310039.89 2079.74
10085.54  2082.110095.35 2082.2410105.13 2084.1710124.83    208810126.36 2088.27
10128.66  2088.510128.95 2088.52

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9804.92     .03 9961.17    .03510021.42     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.1710021.42           220.34  220.34  220.34             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3             RS: 0.687

INPUT
Description: Miramonte Drive (golf cart path), upstream of 4-48" by 36" HECMP
             and 1-96" by 72" HECMP.  Culvert routine cross section 4.
Station Elevation Data     num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9706.78  2082.3 9722.74 2082.06 9734.76  2084.1 9735.35 2084.24  9742.2 2083.99
 9745.18  2083.9 9753.19 2083.55 9756.81 2083.06 9791.09 2080.02 9815.07 2079.77
 9816.64  2079.8  9822.4 2079.13 9827.73 2079.43  9828.1 2079.38 9829.01 2079.34
 9841.77  2078.9 9844.18 2078.86 9857.51 2078.62 9861.47 2078.23 9866.65 2077.95
 9868.43  2078.1 9880.41 2076.71 9881.12  2076.6 9881.22 2076.61 9882.53 2076.42
 9890.01  2075.9 9899.68 2075.66  9910.1  2075.4 9913.26 2075.31 9943.89  2077.4
  9944.5  2077.4 9945.01  2077.5 9960.54 2076.48 9968.97 2075.78  9974.3 2075.18
    99812073.904  9986.8  2072.8 9991.59 2072.26 9995.85 2072.0810006.08 2073.26
10009.28 2073.6610026.66  2083.310031.75 2085.6710051.64 2086.5510052.45 2086.58
```

```
10054.56 2086.6910073.25  2087.510077.66 2087.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9706.78     .03    9981    .03510009.28     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998110009.28             40.07   40.07   40.07             .3       .5

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.679

INPUT
Description: Miramonte Drive

(golf cart path), upstream of 4-48" by 36"
             HECMP and 1-96" by 72" HECMP.  Culvert routine cross section 3.
             Ground profile modified from station 9904.45 to 10018.68, data
             input from survey and photographs.
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9688.14  2082.3 9705.87 2082.12 9706.52 2082.11  9706.6 2082.12 9707.34 2082.09
 9728.31  2081.6 9744.69 2080.39 9764.71 2078.79 9778.07  2079.9 9782.17 2080.41
 9798.78  2080.1 9804.32 2080.03 9804.78 2079.99 9808.69 2079.49 9816.03 2078.67
 9823.16  2077.8 9838.51 2077.18 9841.89 2077.12 9849.66 2078.38 9850.63 2078.44
 9852.29  2078.6 9855.12 2078.59 9857.02 2078.63 9873.17 2078.38 9883.17 2078.27
 9887.73  2077.9 9892.71 2077.66 9904.45 2075.67    99632075.218    9963 2071.27
   10004 2071.27   10004 2078.9610018.68 2079.93 10024.7 2082.6910027.58  2083.9
10035.52 2084.2910046.54 2085.0910048.71 2085.2710049.84 2085.4210051.84  2085.6
10071.58 2086.9210075.77 2087.2210076.33 2087.2510085.72    2088

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9688.14     .03    9963    .035   10004     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9963   10004            63.09   63.09   63.09             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

CULVERT                RIVER: Andora Hills
REACH: Reach 3            RS: 0.673

INPUT
Description:
Distance from Upstream XS =       8
Deck/Roadway Width        =      43
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
    98802077.838            99662077.838            99742078.016
    99822078.311            99902079.331           100002080.619
   101002080.619

Upstream Bridge Cross Section Data
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9688.14  2082.3 9705.87 2082.12 9706.52 2082.11  9706.6 2082.12 9707.34 2082.09
 9728.31  2081.6 9744.69 2080.39 9764.71 2078.79 9778.07  2079.9 9782.17 2080.41
 9798.78  2080.1 9804.32 2080.03 9804.78 2079.99 9808.69 2079.49 9816.03 2078.67
 9823.16  2077.8 9838.51 2077.18 9841.89 2077.12 9849.66 2078.38 9850.63 2078.44
```

```
 9852.29  2078.6 9855.12 2078.59 9857.02 2078.63 9873.17 2078.38 9883.17 2078.27
 9887.73  2077.9 9892.71 2077.66 9904.45 2075.67    99632075.218    9963 2071.27
   10004 2071.27   10004 2078.9610018.68 2079.93 10024.7 2082.6910027.58  2083.9
10035.52 2084.2910046.54 2085.0910048.71 2085.2710049.84 2085.4210051.84  2085.6
10071.58 2086.9210075.77 2087.2210076.33 2087.2510085.72    2088

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9688.14     .03    9963    .035   10004     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9963   10004             .3       .5
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F

Downstream  Deck/Roadway Coordinates
    num=       7
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    96002077.838            99662077.838            99742078.016
    99822078.311            99902079.331           100002080.619
   101002080.619

Downstream Bridge Cross Section Data
Station Elevation Data    num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9563.1  2080.7 9565.82 2080.76 9570.04 2080.58 9571.03 2080.62 9589.11 2080.33
 9590.57  2080.3 9591.16 2080.25 9610.68  2079.4 9612.36 2079.58 9615.43 2079.28
 9630.93  2078.8 9639.03 2078.67 9646.46 2078.56 9656.42 2078.21 9658.31 2078.19
 9658.54  2078.2 9659.27 2078.18 9713.75 2077.47 9715.51 2077.46 9730.59 2077.03
 9741.09  2076.9 9743.06 2076.72 9747.83 2076.61 9754.46 2076.44 9758.39 2076.36
 9764.96  2076.3 9776.21 2076.07 9779.07    2076 9786.06 2075.82 9790.63 2075.62
 9796.37  2075.7 9806.69  2075.8 9809.81 2075.76 9817.86 2075.92 9826.36  2075.9
 9831.54  2075.9 9842.78 2075.66 9865.99 2075.11 9868.65  2075.1 9875.34 2074.97
    99622075.218    9962 2070.56   10002 2070.56   10002 2078.9610030.94 2081.09
10058.93  2085.210061.58 2085.5210062.95 2085.5710071.16 2085.8510073.25 2086.15
 10079.6  2086.510084.81 2087.3510095.03 2087.3510099.38 2086.8410101.18 2086.77
10104.48  2086.610127.47 2087.0810129.34 2087.12 10132.3 2087.1710133.12 2087.13
10134.39  2087.310138.03 2087.3110141.81  2088.610149.05 2090.14 10150.8 2089.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9563.1     .03    9962    .035   10002     .03

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9962   10002             .3       .5

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         =2077.838
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Culverts =  2

Culvert Name     Shape      Rise    Span
Culvert #2     Pipe Arch     3.5    4.65
FHWA Chart # 34- 18 inch corner radius; Corrugated metal
FHWA Scale # 2 - Mitered to slope
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
```

```
                  3       53        .02                    .5                 1
Number of Barrels =  4
Upstream   Elevation =  2071.27
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    9966    9974    9982    9990
Downstream Elevation =  2070.56
Centerline Stations
    Sta.    Sta.    Sta.    Sta.
    9964    9972    9979    9988

Culvert Name     Shape      Rise    Span
Culvert #1     Pipe Arch       6    8.71
FHWA Chart # 34- 18 inch corner radius; Corrugated metal
FHWA Scale # 2 - Mitered to slope
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  0       63        .02                    .5                 1
Upstream   Elevation =  2071.27
           Centerline Station =  10000
Downstream Elevation =  2070.56
           Centerline Station =  9998

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.667

INPUT
Description: Miramonte Drive

(golf cart path), downstream of 4-48" by 36"
             HECMP and 1-96" by 72" HECMP.  Culvert routine cross section 2.
             Ground profile modified from station 9875.34 to 10030.94, data
             input from survey and photographs.
Station Elevation Data     num=      65
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9563.1  2080.7 9565.82 2080.76 9570.04 2080.58 9571.03 2080.62 9589.11 2080.33
 9590.57  2080.3 9591.16 2080.25 9610.68  2079.4 9612.36 2079.58 9615.43 2079.28
 9630.93  2078.8 9639.03 2078.67 9646.46 2078.56 9656.42 2078.21 9658.31 2078.19
 9658.54  2078.2 9659.27 2078.18 9713.75 2077.47 9715.51 2077.46 9730.59 2077.03
 9741.09  2076.9 9743.06 2076.72 9747.83 2076.61 9754.46 2076.44 9758.39 2076.36
 9764.96  2076.3 9776.21 2076.07 9779.07    2076 9786.06 2075.82 9790.63 2075.62
 9796.37  2075.7 9806.69  2075.8 9809.81 2075.76 9817.86 2075.92 9826.36  2075.9
 9831.54  2075.9 9842.78 2075.66 9865.99 2075.11 9868.65  2075.1 9875.34 2074.97
    99622075.218    9962 2070.56   10002 2070.56   10002 2078.9610030.94 2081.09
10058.93  2085.210061.58 2085.5210062.95 2085.5710071.16 2085.8510073.25 2086.15
 10079.6  2086.510084.81 2087.3510095.03 2087.3510099.38 2086.8410101.18 2086.77
10104.48  2086.610127.47 2087.0810129.34 2087.12 10132.3 2087.1710133.12 2087.13
10134.39  2087.310138.03 2087.3110141.81  2088.610149.05 2090.14 10150.8 2089.84

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9563.1     .03    9962    .035   10002     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9962   10002           206.32  206.32  206.32             .3       .5

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.628

INPUT
Description: Miramonte Drive (golf cart path), downstream of 4-48" by 36" HECMP
             and 1-96" by 72" HECMP.  Culvert routine cross section 1.
Station Elevation Data     num=      60
```

```
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9664.38  2075.5 9672.63  2075.1 9683.03 2075.11 9695.57 2074.11 9704.58 2074.32
 9714.49  2074.7 9721.07  2075.5 9723.09 2075.75 9726.36 2074.92 9739.54 2071.64
 9745.42  2071.6 9753.58 2071.42 9761.14 2071.39 9763.82 2072.23 9764.88 2072.38
 9766.53  2072.4 9776.81 2072.15 9781.97 2072.07 9793.35 2071.82 9796.63 2071.61
  9801.5  2071.2 9824.97 2072.02 9825.04 2072.02 9832.95 2071.16 9841.96 2069.56
 9847.85  2069.1 9869.08 2068.97 9873.24 2070.16 9874.18  2070.4 9885.86 2072.06
 9888.92  2072.2 9924.65 2072.39 9936.83 2072.46 9954.12 2072.35 9955.83 2072.41
 9956.39  2072.3 9959.02 2071.84 9967.01 2070.76    99732069.928  9979.4 2069.04
 9983.97 2068.43 9988.93  2068.4 9999.92 2068.3210007.61 2068.8310013.75 2069.23
   100272070.12610037.41 2070.8310044.28  2071.210054.64 2072.9710064.82 2074.69
10066.08 2074.8610069.36 2074.7910102.22    207710106.48 2077.3810114.24 2077.32
10117.99 2077.58 10132.1 2079.0310137.84  2079.2 10147.9 2079.6410152.28 2079.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9664.38     .03    9973    .035   10027     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9973   10027            192.86  192.86  192.86             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.592

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9790.43  2068.5 9797.76 2068.62 9800.38 2069.18 9808.05 2071.43  9814.6 2069.72
 9820.73  2067.7 9837.01 2067.52 9847.73 2068.63 9853.05 2068.04 9855.22 2068.23
 9861.93  2068.2 9865.27 2068.13 9871.69 2067.68 9876.66  2067.5 9879.05 2067.44
 9892.27  2066.9 9900.14 2066.97 9906.02 2067.09 9914.17 2067.88 9926.23 2069.71
 9935.56    2070 9939.25 2070.11 9947.34 2070.26 9981.36 2065.16    99842064.744
 9988.97 2063.96 9990.29  2063.810000.15 2062.5710005.95 2063.3210010.46  2063.8
10018.62 2064.6310043.65  2066.910058.84 2066.7210068.53 2066.4110082.52    2066
10130.75 2064.89 10135.9  2064.810141.22 2065.1610148.57 2065.9910163.82 2066.86
10177.36 2068.6110177.71  2068.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9790.43     .03    9984    .03510018.62     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998410018.62              150  148.28     160             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888       F

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.563

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9854.62  2067.6 9864.22 2065.06 9881.68  2061.8 9897.29 2061.52 9912.33 2061.19
 9920.84  2061.3 9945.72 2061.82 9952.55 2062.29 9970.51 2063.57 9971.73 2063.44
 9972.05  2063.4 9993.27 2059.97 9996.75 2059.4610002.64 2058.6710013.52 2060.85
10013.97    2061 10014.2 2060.9910019.08 2061.7710038.26  2064.810040.21 2065.11
10046.17  2064.6 10061.8 2063.5510073.39 2063.1510080.09 2063.0510121.48 2062.23
```

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10150.35  2061.110175.36 2060.5210183.38 2060.6710205.69 2061.0210218.12 2061.06
10222.71  2061.710229.54 2062.0410231.14 2062.2910265.04  2070.510268.87 2071.19
10277.78  2071.610291.25 2071.9410301.55 2072.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9854.62     .03 9993.27    .03510013.52     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9993.2710013.52              160  220.26     220             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.522

INPUT
Description: Interpolated flow, Q=3100 cfs
Station Elevation Data    num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9844.79  2071.4 9846.15 2072.57 9860.15 2071.21 9881.13 2069.28 9883.01 2069.03
 9886.66  2068.9  9890.3 2068.67  9895.1 2068.47 9896.17  2068.4 9896.68 2068.38
 9897.08  2068.3 9903.68 2067.89 9906.33 2067.61 9912.41 2066.95 9913.13 2066.88
 9916.02  2066.4    9931 2064.39 9932.72 2064.01 9933.71 2063.75 9935.85 2063.24
 9943.78  2060.8 9947.91 2060.11 9947.96  2060.1 9953.39 2059.51 9961.69 2058.94
 9963.72  2058.7 9975.82 2057.23 9984.32 2054.95    99902053.60110000.11  2051.2
10004.28 2051.9710005.82  2052.410010.72 2053.2810029.27 2056.8810064.77 2058.07
10076.24 2058.4610098.68  2058.810108.01 2059.0110124.47 2060.1910130.79 2060.48
10146.31 2059.3410152.73  2059.110162.32 2058.6310175.02 2058.4710186.24 2058.59
10199.48 2058.75 10224.3  2058.910233.64 2059.0310243.81 2059.4610256.75 2060.03
10262.72  2060.910270.81  2062.110291.96 2064.8410299.18  2065.910304.89 2066.72
10314.73 2067.7610323.74  2068.810327.83 2069.1110337.97 2069.8610357.59 2074.14
10360.73 2074.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9844.79     .03    9990    .03510010.72     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          999010010.72              225  220.66     220             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev  Permanent
888        F
Right Levee     Station=10130.79      Elevation= 2060.48

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.480

INPUT
Description: End of Reach A2
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9928.35  2059.9 9937.44 2057.81 9941.08 2056.86 9945.97 2056.38  9955.1 2055.44
 9968.95  2052.9  9984.8 2050.88 9992.09 2049.86 9993.57 2048.84  9998.9 2046.57
10005.66  2046.810006.45 2046.8510010.25 2047.0310010.38 2047.0410010.94 2047.09
   10019 2048.4610026.88  2049.810029.87 2050.5810032.97 2050.5410038.26 2050.45
10054.76 2050.9510059.43  2051.110060.27 2051.1310061.01 2051.1310061.08 2051.13
10089.27 2051.1810103.01  2051.310139.73 2052.1110144.81 2052.1910147.17 2052.22
10155.02 2053.3610157.58  2053.710163.18 2053.7910173.52 2053.7510182.16 2054.01
10184.83 2054.0710189.53  2054.610192.85 2055.3910193.76 2055.7510195.18 2056.24
10202.01 2058.9710205.39  2059.810209.28 2060.3510217.91 2060.3210220.85 2059.85
10226.55 2058.92   10229  2058.710233.16 2057.9410241.82 2055.6510251.69 2056.04
 10255.7 2056.2110259.64  2056.2 10262.8 2056.1410272.91 2055.3610284.76  2055.5
10306.58 2055.8210312.63    205710328.25 2060.3310338.61 2062.3710342.81 2063.24
10360.15 2064.2610363.69  2064.410371.92 2064.2710381.66 2064.0410384.44 2063.85
```

```
10385.82 2063.77 10390.4  2063.410408.39 2061.9710419.12 2061.1610431.36  2061.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9928.35     .03 9993.57    .035   10019     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9993.57   10019           177.56  177.56  177.56             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.447

INPUT
Description: El Indio Circle, upstream of 2-13' by 9' CBC.  Culvert routine
             cross section 4.  Beginning of Reach A1.
Station Elevation Data    num=      64
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9912.03    2058 9914.11 2057.94 9914.25 2057.92 9915.11 2057.81 9964.12 2051.01
 9969.95  2049.4    99752047.906 9982.69 2045.63 9983.95 2045.49 9986.21 2044.92
 9997.86  2043.2 9998.57  2043.210000.56 2043.1810002.82  2043.210004.65 2043.33
 10010.3  2043.910013.582045.16510018.86  2047.210019.91 2047.5510037.58  2050.2
10045.85 2051.4510051.52  2051.310058.57 2050.8910063.72 2050.93 10092.5 2050.66
 10107.5 2051.1710120.75  2051.6 10126.5 2051.8110129.07 2051.8210130.16 2051.85
10135.67 2052.23 10142.2  2052.710150.64 2051.9410154.73 2051.5610155.86 2051.39
 10161.6 2050.3310162.69  2050.110170.71 2048.4110172.83 2048.2710177.83 2048.24
10191.39 2049.3810201.37  2050.210207.18 2050.3510224.18 2050.6510248.36 2050.79
10256.02 2050.7310260.02  2050.810265.78 2050.8510288.47 2051.0310296.07 2053.28
10316.74 2058.2410320.83  2058.910329.07 2059.5710337.12 2059.9610342.24 2059.61
10344.78 2059.2510352.52  2059.410362.53 2059.4110386.89 2060.4310389.71 2060.54
10391.61 2060.61 10400.3  2061.610404.98 2062.4710407.48 2062.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9912.03     .07    9975     .0610019.91     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997510019.91            75.24   75.24   75.24             .3       .5

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.432

INPUT
Description: El Indio Circle

upstream of 2-13' by 9' CBC.  Culvert routine
             cross section 3. Ground profile modified from station 9864.215 to
             10205.32, data input from survey and photographs.
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
9864.2152057.1869969.6492048.236 9993.252047.285    9999 2047.96    9999 2038.53
   10026 2038.53   10026  2047.410104.332047.41910112.63    2046 10131.3  2045.3
10149.08    204610162.23 2046.9810187.712045.87310205.32 2047.9510219.09 2047.73
   10238 2047.4710240.84 2047.4310241.76  2047.510247.97 2047.9610250.03 2048.12
10255.72 2049.2610270.41 2053.2210276.77  2055.210290.19 2057.5910291.08 2057.69
10291.66 2057.7910295.68 2058.4410303.12  2059.610304.51 2059.6410320.67 2060.22
10335.05  2060.710348.29 2060.7410353.39  2060.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
9864.215     .07    9999     .06   10026     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9999   10026           31.91   31.91   31.91             .3       .5
```

```
CULVERT                    RIVER: Andora Hills
REACH: Reach 3               RS: 0.429

INPUT
Description:
Distance from Upstream XS =        4
Deck/Roadway Width        =       25
Weir Coefficient          =      2.6
Upstream  Deck/Roadway Coordinates
    num=       10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
9864.2152057.186        9969.6492048.236         9993.252047.285
    9999 2048.02            9999 2048.92           10026 2048.92
   10026 2048.02        10104.332047.419        10162.23 2046.98
10187.712045.873

Upstream Bridge Cross Section Data
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
9864.2152057.1869969.6492048.236 9993.252047.285    9999 2047.96    9999 2038.53
   10026 2038.53   10026  2047.410104.332047.41910112.63    2046 10131.3  2045.3
10149.08    204610162.23 2046.9810187.712045.87310205.32 2047.9510219.09 2047.73
   10238 2047.4710240.84 2047.4310241.76  2047.510247.97 2047.9610250.03 2048.12
10255.72 2049.2610270.41 2053.2210276.77  2055.210290.19 2057.5910291.08 2057.69
10291.66 2057.7910295.68 2058.4410303.12  2059.610304.51 2059.6410320.67 2060.22
10335.05  2060.710348.29 2060.7410353.39  2060.7

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
9864.215     .07    9999     .06   10026     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9999   10026             .3       .5

Downstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
9864.2152057.186        9969.6492048.236            9988 2048.02
    9988 2048.92           10015 2048.92           10015 2048.02
10104.332047.419        10145.08 2046.02

Downstream Bridge Cross Section Data
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9871.94  2058.1 9887.04 2056.52 9889.03 2056.39 9901.99 2055.34 9913.19 2054.17
 9921.38  2053.5 9925.51 2052.88 9944.13 2050.78  9948.3 2050.29 9956.29 2049.91
    9988 2047.19    9988 2037.93   10015 2037.93   10015 2047.1910145.08  2047.2
10157.33    204410213.21    204610232.12  2047.710242.49  2049.110246.17 2049.17
10253.02 2049.1410267.42 2051.1510286.17  2053.810298.92 2055.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9871.94     .07    9988     .06   10015     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9988   10015             .3       .5

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         = 2048.07
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    8.49   12.87
FHWA Chart # 9 - flared wingwalls and Inlet top edge bevel
FHWA Scale # 2 - Wingwall flared 18 to 33.7 deg.; inlet top edge bevel=0.083D
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  2      27       .013                   .5                1
Number of Barrels =  2
Upstream   Elevation =  2038.53
Centerline Stations
    Sta.    Sta.
   10006   10019
Downstream Elevation =  2038.03
Centerline Stations
    Sta.    Sta.
    9994   10009

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.426

INPUT
Description: El Indio Circle

downstream of 2-13' by 9' CBC.  Culvert routine
             cross section 2.  Ground profile modified from station 9956.68 to
             10232.17, data input from survey and photographs.
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9871.94  2058.1 9887.04 2056.52 9889.03 2056.39 9901.99 2055.34 9913.19 2054.17
 9921.38  2053.5 9925.51 2052.88 9944.13 2050.78  9948.3 2050.29 9956.29 2049.91
    9988 2047.19    9988 2037.93   10015 2037.93   10015 2047.1910145.08  2047.2
10157.33    204410213.21    204610232.12  2047.710242.49  2049.110246.17 2049.17
10253.02 2049.1410267.42 2051.1510286.17  2053.810298.92 2055.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9871.94     .07    9988     .06   10015     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9988   10015           176.06  176.06  176.06             .3       .5

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.393

INPUT
Description: El Indio Circle, downstream of 2-13' by 9' CBC.  Culvert routine
             cross section 1.
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9871.94  2049.1 9876.96 2048.08 9884.38 2047.23 9885.18 2047.29 9885.78 2047.34
 9886.74  2047.4    9889 2047.47 9890.92 2047.54  9893.3 2047.59 9895.57 2047.59
 9896.28  2047.6 9897.54 2047.48 9898.86  2047.3 9910.58 2047.16 9916.29  2047.3
 9922.53  2046.8 9925.82  2046.6 9930.74 2046.79 9936.58  2047.1 9946.85 2047.65
 9953.42  2046.5 9965.14 2044.78 9972.76 2040.15 9979.68 2036.22 9985.21 2035.62
 9988.67  2035.3 9999.76  2040.110002.68 2041.35   10005 2042.34 10010.9 2044.55
10016.37  2044.910018.55 2045.0310019.22 2045.05 10020.4 2045.0510020.57 2045.04
10043.35  2044.810055.18 2044.4710085.91    204410096.39 2043.8410113.28 2043.13
 10128.4  2042.210135.13 2041.1910147.75 2039.0410148.69 2038.9610167.65 2037.41
```

```
10176.42  2035.110177.57  2034.510178.69 2033.84 10179.7 2033.5810179.78 2033.42
10179.85  2033.510180.76 2033.5710189.22 2036.3110197.26 2038.7110202.83 2040.67
10214.15  2040.610224.89  2040.710231.47 2040.7410240.28 2041.7310247.07 2042.37
10260.84  2043.7 10270.6 2045.1210274.18 2045.6410276.95 2045.3310287.48 2044.14
10298.41  2044.510305.29 2044.7310318.49 2048.5410336.17 2052.76 10343.9 2054.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9871.94     .07 9972.76     .06 9999.76     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.76 9999.76           403.66  403.66  403.66             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 3            RS: 0.317

INPUT
Description: Split 2
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9787.41  2049.2 9822.68 2042.84 9829.64 2041.49 9839.58 2040.63 9859.93 2038.47
 9890.67  2036.4 9894.99 2036.19 9899.55 2035.91 9909.39 2035.56 9945.55 2033.54
 9957.46  2033.2  9966.1 2032.71 9978.76 2030.39 9980.04 2030.15 9989.89 2029.58
 9995.63  2029.3 9996.12 2029.23 9998.25 2029.5710006.99 2030.9610010.17 2031.44
10011.49  2031.610031.45 2033.8210046.07 2035.0710064.73 2036.1910081.77 2037.79
10085.29    203810090.58 2038.35 10099.6 2038.7410109.81 2039.7410110.55 2039.85
10112.29    204010123.83 2041.6110126.35 2042.2810137.17 2044.5410141.58 2045.68
10150.49  2047.110158.28 2048.6210172.26 2051.2810173.14 2051.4510187.82 2050.88
10189.43  2050.810196.99 2050.4910206.62 2050.17

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9787.41     .07  9966.1     .0610031.45     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9966.110031.45           240.14  240.14  240.14             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 2            RS: 0.271

INPUT
Description: Split 2

XS where the Energy Grade Lines were balanced for the
             split flow, Q=1913cfs
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9826.12    2040 9839.56 2038.25 9868.15 2035.57 9872.24 2035.21 9873.17 2035.12
 9873.86  2035.1  9874.7 2034.95 9875.28 2034.87  9911.5 2032.47 9922.08 2032.05
 9924.86  2031.7  9927.1 2031.48 9943.79 2029.72 9953.87 2028.72 9955.99 2028.44
 9958.94  2027.9 9970.95    2027 9981.54 2026.37 9994.75  2023.8 9995.02 2023.74
 9995.27  2023.7 9995.58  2023.7 9996.48 2023.6610008.69 2023.0310010.83 2022.99
10012.38  2022.910012.83 2022.9210015.06 2022.8410024.69  2025.710024.75 2025.71
   100262026.36510032.74  2029.910038.03    2032

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9826.12     .07 9970.95     .06   10026     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.95   10026           184.82  184.82  184.82             .1       .3

CROSS SECTION          RIVER: Andora Hills
```

```
REACH: Reach 2            RS: 0.236

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9961.41  2034.2 9983.94 2020.53 9989.03 2017.36 9990.52 2017.19 9992.02 2017.01
 9996.31  2016.5 9997.05 2016.49   10000 2016.6310002.56 2016.75 10026.6 2021.39
10043.86  2024.910099.77 2027.9610100.77 2028.0110101.46 2028.0210107.41 2028.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9961.41     .07 9983.94     .06 10026.6     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.94 10026.6           270.89  270.89  270.89             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 2            RS: 0.185

INPUT
Description: Junction 2
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9886.56  2037.8 9892.52 2037.32 9895.01 2037.11 9895.89 2037.14 9924.94 2037.65
 9932.72  2035.9 9943.89 2032.51 9952.67 2029.69 9966.59 2026.18  9968.9 2025.25
 9975.91  2019.9    99852013.999 9990.45 2010.46 9991.43 2010.42 9991.76  2010.4
 9992.98 2010.33 9997.24  2010.110001.17 2009.87 10003.5    2010 10012.3 2010.71
10019.23 2013.7710027.57  2017.510029.33 2017.7110049.61  2019.410059.87 2021.99
10065.77 2022.7910067.63  2023.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9886.56     .07    9985     .0610019.23     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998510019.23           119.63  119.63  119.63             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Split 2            RS: 0.093

INPUT
Description: Andora Hills Wash

XS where the Energy Grade Lines were balanced
             for the split flow, Q=1287cfs
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9978.81    2031 9983.39  2029.4  9986.2  2028.4 9996.69  2023.9 9999.59  2023.5
  9999.8  2023.510004.67 2023.7310005.61 2023.7710009.23 2024.0610013.04 2025.03
10017.97  2026.410029.63 2026.9910047.52 2027.7210060.64 2030.9310090.82 2037.73
10108.79  2041.8 10127.5 2045.1110130.49 2045.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9978.81     .07  9986.2     .0610047.52     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9986.210047.52           141.71  141.71  141.71             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Split 2            RS: .083
```

```
INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9923.57  2028.4 9927.84 2028.42 9966.35 2021.65 9972.17 2021.06 9972.69  2020.7
 9987.59  2018.7 9988.01 2018.66 9988.37 2018.58 9989.75 2018.3510000.13 2016.53
10000.24  2016.510014.13 2022.7810018.68 2024.5510024.12 2024.2410038.99 2025.16
10047.81  2027.510082.01 2038.6210086.23 2039.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9923.57     .07 9966.35     .0610014.13     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.3510014.13           215.36  215.36  215.36             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Split 2            RS: .042

INPUT
Description: Andor Hills Wash
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9966.96  2025.7 9971.34 2024.18  9973.3 2022.27 9975.97    2020 9976.95 2019.11
 9982.63  2016.6 9991.38 2012.32 9994.11 2011.65  9994.9 2011.49 9995.77 2011.32
 9998.39  2010.810000.36 2010.43 10002.5 2010.4910005.19 2010.5510011.31    2012
10021.64  2015.210023.49 2015.3210028.21 2016.0410030.41 2016.4210035.48 2017.25
10053.46  2021.210058.18 2022.2710061.05 2022.76 10069.6 2023.74 10076.7  2024.4

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9966.96     .07 9982.63     .0610028.21     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9982.6310028.21             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 1            RS: 0.162

INPUT
Description: Junction 2
C385, Q=3200 cfs
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9929.95    2026  9937.7 2024.03 9943.53 2022.11 9946.41 2020.98 9948.88 2020.06
 9951.54    2019 9960.64 2016.16 9970.09 2012.72    9983 2008.47 9992.31 2007.33
 9992.51  2007.310005.11 2007.9310008.16 2007.9110014.72 2007.8810019.34 2007.89
 10019.4  2007.910021.64 2008.0510027.08 2008.5410028.73 2008.6810029.43 2008.74
10032.59    200910033.79 2009.61   10041 2012.1710047.17 2014.36 10070.4 2014.82
10074.93 2014.8510080.56    201510084.51 2014.9910100.89 2015.1110110.78 2017.51
10121.27 2020.1110134.69  2020.410139.77 2020.5810141.45 2020.5110144.48 2020.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9929.95     .07 9970.09     .06   10041     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9970.09   10041           111.48  111.48  111.48             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 1            RS: 0.140

INPUT
```

```
Description:
Station Elevation Data    num=      47
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9903.78  2030.1 9912.76 2025.53 9918.23 2022.54 9939.44 2011.27    99442009.426
 9948.34 2007.67 9958.34  2006.3 9961.55 2006.29 9974.38 2006.23 9980.87 2006.16
 9981.17 2006.15 9982.36  2006.2 9987.82 2006.22 9990.25 2006.05 9991.42 2005.93
  9993.9 2005.61 9997.62  2005.210005.05 2004.3410009.68 2006.8110013.27 2008.81
 10015.5 2010.0910015.95  2010.410020.92 2012.8910036.79    201310053.29 2012.98
10054.16 2013.0410055.43  2013.210074.66 2014.6310077.01 2014.8510077.07 2014.85
10081.22 2014.7110092.67  2014.710094.13 2014.6710094.53 2014.6510095.56 2014.62
10103.35 2014.3110111.08  2014.2 10123.8 2013.5910124.47 2013.5410125.63 2013.46
10126.46  2013.410127.83  2013.310128.83  2013.310130.47 2013.2410132.42 2013.09
10133.84 2012.9710134.43  2012.9

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9903.78     .07    9944     .0610013.27     .07

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994410013.27            57.16   57.16   57.16             .1       .3

CROSS SECTION          RIVER: Andora Hills
REACH: Reach 1            RS: 0.129

INPUT
Description: Cave Creek
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9939.84    2020 9957.34    2010 9964.28    2006 9972.26  2004.4 9985.16  2004.5
    9995    2004   10000  2003.910002.66    200410011.27    200610019.17    2010
10025.62  2010.510038.77    201110043.42    201210051.96    2014

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9939.84     .07 9964.28     .0610011.27     .07

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9964.2810011.27             .1       .3
```

HEC-RAS September 1998 Version 2.2
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: Galloway Wash
Project File : galloway.prj
Run Date and Time: 4/3/02 4:14:40 PM

Project in English units

Project Description:
Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14
Flood Control District of Maricopa County, October, 2000
JE Fuller
Hydrology & Geomorphology, Inc., Tempe Az.

GEOMETRY DATA

Geometry Title: Galloway Wash
Geometry File : x:\projects\Agency\FCDMC\Galloway\HECRAS\ras with fema comments\galloway.g01

Reach Connection Table

River	Reach	Upstream Boundary	Downstream Boundary
Grapevine	Reach 1		Junction 3
Galloway	Reach 8		Split 1
Galloway	Split 1	Split 1	Junction 1
Galloway	Reach 7	Split 1	Junction 1
Galloway	Reach 6	Junction 1	split 2
Galloway	Split 2	split 2	Junction 2
Galloway	Reach 5	split 2	Junction 2
Galloway	Reach 4	Junction 2	Junction 3
Galloway	Reach 3	Junction 3	Split 3
Galloway	Reach 2	Split 3	Junction 4
Galloway	Split 3	Split 3	Junction 4
Galloway	Reach 1	Junction 4	

JUNCTION INFORMATION

Name: Junction 4
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Reach 2	to Galloway	Reach 1	187	
Galloway	Split 3	to Galloway	Reach 1	198	

Name: Split 3
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Reach 3	to Galloway	Split 3	232	0
Galloway	Reach 3	to Galloway	Reach 2	205	

Name: Junction 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Reach 5	to Galloway	Reach 4	171.26	
Galloway	Split 2	to Galloway	Reach 4	243.73	

Name: Junction 3
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Reach 4	to Galloway	Reach 3	198	
Grapevine	Reach 1	to Galloway	Reach 3	165	

Name: Split 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Reach 8	to Galloway	Reach 7	81	
Galloway	Reach 8	to Galloway	Split 1	76	

Name: split 2
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Reach 6	to Galloway	Reach 5	82.59	
Galloway	Reach 6	to Galloway	Split 2	109.9	0

Name: Junction 1
Description:
Energy computation Method

Length across Junction River	Reach	Tributary River	Reach	Length	Angle
Galloway	Split 1	to Galloway	Reach 6	142	
Galloway	Reach 7	to Galloway	Reach 6	202	

CROSS SECTION RIVER: Grapevine
REACH: Reach 1 RS: 0.210

```
INPUT
Description: Limit of Detailed Study
This cross section is common to cross
             section 0.00 from CH2M Hill, March, 1990, FIS of Cave Creek and
             Tributaries, Grapevine Wash.  Data are taken from topo developed
             for FCD-99-14, Floodplain Delineation Study of Andora Hills and
             Galloway Washes
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9613.7    2220    9644    2218  9678.3    2216  9681.5  2215.7  9686.6    2216
  9749.3  2217.6  9816.8    2216  9860.6    2214  9875.8    2216  9888.6  2216.3
  9901.5    2216  9982.9    2214   10000  2212.8 10009.8    2214 10023.1  2214.5
 10052.4    2214 10085.7    2212 10088.4  2211.6 10090.9    2212   10123    2214
 10139.9    2216   10150    2220

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9613.7    .055  9982.9    .045 10023.1    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9982.9 10023.1            216.1   244.3   234.5             .1       .3

CROSS SECTION          RIVER: Grapevine
REACH: Reach 1            RS: 0.166

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9540.57 2221.38 9553.08 2216.83 9557.72  2216.6 9567.75 2215.59 9573.08 2214.08
 9578.73 2213.56 9578.76 2213.55 9578.91 2213.55 9597.11 2212.91 9601.31 2213.94
 9601.94 2214.05 9627.93 2213.63 9633.47  2213.6  9633.6 2213.67 9648.53 2213.41
  9690.6 2212.77 9714.62    2213 9717.55 2212.98 9718.73 2212.72 9729.31 2210.43
 9735.56 2211.08 9744.47 2212.08  9750.6 2211.84 9765.68 2211.39 9774.53 2211.42
 9812.24  2210.7 9825.73 2210.19 9828.77 2210.04 9835.95 2209.05 9844.21 2208.15
 9845.17 2208.12  9853.2  2208.8 9859.05 2209.24 9861.11 2209.32 9866.17 2209.21
 9874.24  2209.7 9875.72 2209.78 9889.21 2208.68 9892.46 2209.33 9917.44 2209.49
 9933.71 2209.64  9945.9  2209.8 9978.11  2209.4 9986.15 2209.05 9996.94 2207.01
 9999.76 2206.4710007.48 2207.8110014.79 2209.0410022.25 2208.8910044.57 2208.43
10052.74 2208.32 10056.4 2208.2610060.81 2208.2410079.45 2208.26 10085.4 2208.19
10089.77 2208.0210091.89  2207.610098.06 2208.2610102.18 2208.0410106.54 2208.46
10120.61  2208.510125.01 2208.21   10128 2208.0310138.69 2208.5910142.49 2209.16
10148.61 2209.5110150.32 2209.5310153.49  2209.810165.08 2210.8510181.02 2212.42
10186.19 2212.6310191.85  2213.310207.35 2216.4910211.44 2217.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9540.57    .055 9986.15    .04510014.79    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.1510014.79           253.33  248.81  249.45             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1011310211.44  2212.5

CROSS SECTION          RIVER: Grapevine
REACH: Reach 1            RS: 0.119

INPUT
Description:
Station Elevation Data    num=      74
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9572.93 2209.82  9574.6  2209.4 9581.55 2207.49  9591.2  2206.8 9598.39 2206.38
```

```
 9602.24 2206.86 9604.81 2207.19 9609.64 2207.04 9644.16  2206.1  9651.4 2206.17
 9694.64 2206.38 9703.94 2205.63 9708.25 2205.27 9713.57 2205.43 9716.55 2205.52
 9721.04 2205.47  9751.5 2205.34  9757.6 2204.43 9758.64 2204.18 9761.47 2204.53
  9766.8 2205.38  9783.8  2205.5 9791.48 2205.52 9791.82 2205.44 9802.25 2204.65
 9818.88 2203.68 9820.19 2203.61  9821.8 2203.56  9830.8 2204.05 9836.38 2204.18
 9839.79 2204.02 9848.94 2203.87 9848.97 2203.87 9853.06 2204.31 9853.71  2204.3
 9882.79 2202.67 9882.85 2202.67 9883.17 2202.68 9897.32 2202.91 9903.94 2202.63
 9906.24 2202.54 9906.98 2202.45 9916.59 2201.44 9919.69 2201.82  9927.6 2202.81
 9948.84 2201.93    9953 2201.58  9960.9 2200.02 9964.15 2201.11 9977.94 2201.59
 9987.67 2201.48 9994.61 2200.7310000.17 2199.9210006.69 2202.3610009.55 2203.34
 10019.1 2203.9810033.83  2204.8 10051.9 2204.7810054.33  2204.710057.96 2204.48
10075.81 2203.8610078.11 2203.6710079.98 2203.5510081.67 2203.3810095.38 2202.04
10102.59 2202.6510108.51 2203.0810117.25 2204.0610122.19 2204.7110133.32 2206.15
10145.07 2208.2710146.07 2208.3910148.67  2209.110155.25 2210.03

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9572.93    .055    9953    .04510009.55    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          995310009.55           233.58  234.36  227.06             .1       .3
Left Levee      Station= 9791.48      Elevation= 2205.52

CROSS SECTION          RIVER: Grapevine
REACH: Reach 1            RS: 0.075

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9728.9 2205.22  9741.3    2201 9751.91 2201.11 9762.22 2201.15 9790.11  2199.7
 9791.82 2199.62 9792.75 2199.56 9792.99 2199.56 9794.28 2199.55  9796.7 2199.54
 9803.67 2199.48  9905.6 2198.61 9921.93 2198.13 9931.96 2197.42 9937.16 2196.95
 9949.06 2197.35 9949.31 2197.35 9949.96 2197.34 9972.28 2196.72 9988.72 2194.75
 9993.95 2194.32 9996.11  2194.1 9999.33 2193.6210021.99 2197.9510035.34 2198.19
10046.43 2198.4610070.77 2198.7710085.83 2198.83   10134 2198.5310141.72 2198.45
10166.46 2199.0310189.66 2199.58   10200 2197.3810210.33  2195.310219.23 2197.08
10225.14 2198.3910240.86  2199.1   10253    220010278.27 2209.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9728.9    .055 9972.28    .04510021.99    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.2810021.99           219.19  230.55  227.84             .1       .3

CROSS SECTION          RIVER: Grapevine
REACH: Reach 1            RS: 0.031

INPUT
Description: Junction 3, Galloway Wash
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9799.93 2199.96 9806.39 2196.33  9811.5 2196.21 9862.83 2194.42 9871.94 2194.47
 9935.59 2193.68 9951.12 2193.55  9958.6 2192.76 9969.26 2191.67  9976.6 2192.27
 9978.75 2192.56 9981.22 2192.13 9999.71 2189.2310007.36 2189.6110021.08 2191.59
10024.25 2191.4410031.87 2190.5910033.12 2190.6710040.97  2191.510046.95 2191.71
10053.63    219210065.58 2193.1510076.77 2193.6410121.25 2193.0510154.81 2193.06
10192.21 2193.3110211.27 2193.4410221.17 2193.6410239.49  2193.910279.39 2193.94
10296.45 2194.0710302.49 2194.3810305.32 2193.6910335.53 2195.0510350.86 2195.47
10360.69 2195.9410363.63 2197.6410376.34 2205.49

Manning's n Values        num=       3
```

```
     Sta    n Val      Sta    n Val      Sta    n Val
 9799.93     .055 9978.75     .04510024.25     .055

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
       9978.7510024.25            187.68     165  168.62              .1        .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 8             RS: 4.832

INPUT
Description: Study Limit
Station Elevation Data     num=       22
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9739     2616     9777     2608     9788   2607.2     9798   2607.5     9854   2607.5
    9863   2607.2     9877     2608     9885   2608.3     9894     2608     9899   2607.7
    9905     2608     9912   2608.3     9918     2608     9934   2607.6     9946   2607.9
    9973   2607.9     9985     2606    10000   2605.7    10051   2605.8    10055     2606
   10065     2612    10070   2613.3

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9739      .06     9985      .04    10055      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          9985    10055            166.73  190.09  198.61              .1        .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 8             RS: 4.796

INPUT
Description:
Station Elevation Data     num=       23
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
    9709   2613.5     9715     2612     9747     2604     9753   2602.6     9757   2603.7
    9763     2603     9782   2603.8     9791   2603.5     9808     2604     9832   2604.3
    9850     2604     9864   2603.6     9879   2603.6     9893     2603     9904   2603.7
    9935   2603.1     9946   2602.7     9973     2602     9993   2601.4    10000   2601.6
   10008   2601.4    10014     2602    10040   2602.8

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
    9709      .06     9973      .04    10014      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
          9973    10014            120.45  137.88   142.2              .1        .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 8             RS: 4.770

INPUT
Description:
Station Elevation Data     num=       39
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9725.87  2610.83  9727.35  2610.55  9740.65  2608.27  9786.15  2600.39  9786.92  2600.24
 9790.74  2599.51   9791.5  2599.57     9793  2599.62   9796.5  2600.06  9799.54  2600.55
    9800   2600.7  9819.93   2600.9  9854.24  2600.98  9858.94  2600.57  9862.17  2600.25
 9863.52  2600.35  9876.11  2600.24  9941.18  2600.33  9956.91  2600.04  9971.07  2599.16
 9974.86   2599.4  9976.82  2599.51  9980.87  2599.47  9986.33  2599.32  9990.25  2599.19
 9995.18  2598.57  9999.59  2598.05  9999.76  2598.04  9999.96     259810002.27  2598.09
 10018.6  2598.4610026.61  2598.34    10030  2599.1410030.26  2599.1810030.58  2599.16
10034.32  2598.86   100402600.07910054.91  2603.2810079.05  2608.68

Manning's n Values         num=        3
```

```
     Sta    n Val      Sta    n Val      Sta    n Val
 9725.87      .06 9990.25      .04    10040      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
       9990.25    10040            196.97  200.24  201.23              .1        .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 8             RS: 4.732

INPUT
Description:
Station Elevation Data     num=       18
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9670.22   2602.6 9682.72     2602 9721.72     2596 9733.22   2595.2 9747.22     2594
 9750.22   2593.9 9754.22     2594 9816.22   2595.7 9852.72     2595 9936.22   2594.8
 9987.22   2594.6 9999.22     259410009.22 2593.8510023.22     2594    100352595.812
10036.22     2596    100402596.97610067.22     2604

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9670.22      .06 9936.22      .04    10035      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
       9936.22    10035            216.23  201.99  169.53              .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev
 9670.22     9805     2597

CROSS SECTION           RIVER: Galloway
REACH: Reach 8             RS: 4.694

INPUT
Description: City of Scottsdale
Station Elevation Data     num=       59
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9576.98  2597.67 9581.24  2596.97 9584.02  2596.64 9594.89   2595.4 9604.12  2594.68
 9615.35  2593.99 9620.91  2593.53 9623.36  2593.32 9636.67   2592.6 9644.68  2592.27
 9647.63  2591.89 9655.01  2591.15 9656.96   2591.1 9661.61  2591.01 9676.61  2590.67
 9689.97  2590.58 9704.72  2590.71 9710.53  2590.63 9729.57  2592.64 9736.51  2593.45
  9740.8  2593.81 9748.83  2593.18 9756.26  2591.11 9756.64  2591.08 9769.16  2590.66
 9779.39  2590.49  9815.2  2590.56 9842.48  2590.61 9862.22  2590.64 9876.17  2591.02
 9902.13  2591.25 9913.47  2591.35 9917.44  2590.81 9925.07  2590.87 9927.65  2591.11
 9935.65  2590.47 9936.05  2590.44 9936.28  2590.39 9943.65  2589.87 9948.27  2589.77
 9959.91  2589.38 9970.75   2590.5 9975.88  2590.86 9980.53  2590.63 9990.61  2589.91
 9995.57  2589.36 9998.26  2588.9810018.91 2589.12 10032.1  2589.1710037.94 2589.67
10038.74   2589.810042.95 2590.3410055.07 2590.3310070.25 2592.3410077.52   2592.8
10083.13 2593.3510091.88 2593.1110099.96 2593.4110133.12 2597.98

Manning's n Values         num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9576.98      .06 9927.65      .0410042.95      .06

Bank Sta: Left    Right     Lengths: Left Channel    Right      Coeff Contr.    Expan.
       9927.6510042.95            231.46  198.02  198.37              .1        .3
Ineffective Flow      num=        1
   Sta L    Sta R     Elev
 9576.98   9740.8 2593.81

CROSS SECTION           RIVER: Galloway
REACH: Reach 8             RS: 4.656

INPUT
Description: Pima Rd., Split 1
```

```
Station Elevation Data     num=       34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9839.75  2591.4 9840.52 2591.47 9840.82 2591.44 9859.03  2588.8 9867.78 2587.98
 9878.01 2585.84 9883.93 2584.96 9896.26 2583.17 9899.03 2583.23 9908.92 2583.18
 9913.46 2583.18 9923.36 2583.67 9929.52 2584.08 9939.62 2584.24 9945.28 2584.62
 9967.85 2584.43 9994.18 2584.23 9998.11 2583.57 10000.2 2583.3810017.79 2583.69
10020.66  2583.710025.18 2584.8710026.27 2585.0410036.28 2584.9310076.28 2584.81
 10084.1 2584.4410090.41  2584.410096.88 2584.45 10101.5 2584.8710108.32 2585.37
10129.56 2588.5310134.33 2589.0810138.14 2589.4610140.82 2589.74

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9839.75     .06 9883.93     .0410026.27     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9883.9310026.27            189.69  200.98  207.12              .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 1            RS: 0.082

INPUT
Description: Split 1
Station Elevation Data     num=        7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9955.4  2582.8  9968.1  2582.7  9987.6    2582   10000  2581.4 10019.8    2582
 10035.6    2584 10095.2    2586

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
  9955.4     .06  9987.6    .045 10019.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9987.6 10019.8             112.7   116.1   109.4              .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 1            RS: 0.033

INPUT
Description: Town of Carefree
Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9947.21 2580.51 9950.95 2580.31 9953.31 2580.41 9954.09  2580.4 9956.36 2580.31
  9972.4 2579.68 9982.22 2576.76 9983.21 2576.47 9985.21  2576.6 9993.94 2577.72
 9997.27 2576.73   10000 2576.1210004.01 2577.2310004.24 2577.2910006.47  2577.7
10038.86 2585.01

Manning's n Values         num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9947.21     .06  9972.4    .045 9993.94     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9972.4 9993.94             172.53  172.53  172.53              .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 1            RS: 0.027

INPUT
Description: Juntion 1
Station Elevation Data     num=       17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9964.39 2574.25 9967.19 2574.24 9969.98  2574.2 9973.74 2574.22 9986.17 2574.23
  9997.8 2571.79   10000 2571.3810001.97 2571.9710007.69 2573.7410026.17 2576.77
10028.46 2576.5110030.08 2576.4810036.36 2576.38 10048.5 2577.0210063.36 2577.74
```

```
10068.94    257810075.66 2578.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9964.39     .06 9986.17    .04510007.69     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.1710007.69           215.95  201.74  159.75             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 7            RS: 4.639

INPUT
Description: Split 1
Station Elevation Data    num=       8
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9872.5    2586  9908.2    2584  9931.3    2582  9950.4    2581   10000    2581
 10016.4  2581.3   10022    2582 10044.9  2582.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9872.5     .06  9931.3     .04   10022     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9931.3   10022            116.8     120     125             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 7            RS: 4.618

INPUT
Description: Town of Carefree
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9888.35 2583.77 9890.58 2583.34 9893.73 2582.86  9903.4 2581.62 9916.73 2581.99
 9917.96 2582.04 9928.28  2582.2 9931.98 2582.26 9932.11 2582.26 9932.26 2582.26
 9933.17 2582.25 9941.27 2582.26 9946.06 2581.67 9956.42 2580.45    99622578.514
  9962.5 2578.34 9966.51 2576.62 9978.34 2576.49 9991.59 2576.34 10004.1 2576.62
   100102578.57110012.78 2579.4910014.47 2580.0410076.02 2580.4710089.72 2580.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9888.35     .06    9962     .04   10010     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9962   10010            204.6  197.46  190.46             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 7            RS: 4.581

INPUT
Description: Junction 1, Split 1
Station Elevation Data    num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9860.55 2577.84 9862.82 2576.74 9868.57 2574.31 9877.54 2574.25  9887.5  2574.1
 9904.04 2573.68 9907.35 2574.02 9908.46 2574.14 9909.85 2574.16 9923.23 2574.23
 9934.93 2574.28 9936.81 2574.33 9940.62  2574.2 9943.41 2573.86 9963.84 2574.58
 9967.91 2574.71    99712573.771  9978.8  2571.4 9979.92 2571.03 9994.43 2570.58
10001.72 2570.3710002.39 2570.3410007.15 2571.49   100172573.77410020.56  2574.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9860.55     .06    9971     .04   10017     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9971   10017            215.95  201.74  159.75            .1        .3
Left Levee       Station= 9967.91       Elevation= 2574.71

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.543

INPUT
Description: Junction 1, Split 1
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9878.56 2571.79 9929.25 2570.04 9945.63 2570.03  9960.9 2570.04 9969.61 2570.01
    99732568.939 9977.97 2567.37 9982.05 2566.26 9992.01 2566.2610016.04 2566.29
10019.86  2566.4   100292568.83110030.95 2569.3510032.36 2569.5910035.66 2570.38
 10050.9 2570.4310063.39 2570.5610078.93 2571.1210092.93 2571.67

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9878.56     .06    9973     .04   10029     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9973   10029            174.82  201.42  209.08            .1        .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.505

INPUT
Description:
Station Elevation Data    num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9884.95 2567.34 9898.05 2565.55 9909.25 2563.85 9919.79 2564.85 9923.13 2565.17
 9945.08 2564.93 9949.22 2564.91 9954.19 2563.45    99572562.631 9962.15 2561.13
 9962.43 2561.12  9964.9 2561.0810009.24 2560.1710009.85 2560.2710011.84 2560.17
10012.54 2560.1410025.94 2560.3210027.34 2560.2110033.09 2561.0610036.25  2561.3
10046.08 2561.6310057.72 2562.3610080.03 2563.8410090.35 2563.38 10096.3 2563.38
10106.22 2562.1510111.12 2562.8910121.77 2562.63 10126.4 2562.6310136.94 2562.51
10143.18 2562.6210145.65 2562.7110163.34 2562.1810164.41 2562.1510168.53 2562.03
10185.13 2562.9810192.73 2563.8610204.61 2565.07 10215.2 2565.6910220.44 2566.21
10236.83  2566.710238.69 2566.8510243.97 2567.15 10266.6 2567.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9884.95     .06    9957     .0410033.09     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          995710033.09            180.55  200.08   205.2            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10047.03 10266.6 2563.84

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.467

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9912.31 2565.86 9931.33 2565.56 9937.78 2565.36    9939 2564.46 9941.63 2562.02
 9950.61 2560.69 9957.31 2559.68    99592559.164 9961.99 2558.25 9977.03 2556.37
 9999.34 2556.2610004.85 2556.3410008.31 2557.71   100152558.62610036.42 2561.56
10036.74 2561.5610038.63 2561.5410040.46  2561.810065.72 2564.5210068.55 2564.99

Manning's n Values        num=       3
```

```
     Sta   n Val     Sta   n Val     Sta   n Val
 9912.31    .055    9959     .04   10015    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9959   10015           182.88   200.4  202.73             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.429

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9901.04 2556.27 9907.74 2556.12 9917.76 2555.63 9921.28 2555.31 9925.97  2554.4
    99262554.394 9933.48 2552.81 9963.54 2552.91 9969.25 2552.92 9974.39 2552.81
10001.12  2552.310005.14 2554.0510037.45 2565.7610039.33 2565.99

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9901.04    .055    9926     .0410005.14    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          992610005.14           197.08  199.32  196.01             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.391

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9859.99 2550.83  9863.2 2550.54 9879.78  2549.2 9881.32 2549.15 9890.35 2549.05
 9891.03 2549.04 9894.15 2548.87 9924.57 2547.22  9925.5 2547.15 9926.24 2547.12
 9927.08 2547.24 9939.61 2548.46 9940.21  2548.6 9954.55 2552.28 9971.59 2550.19
 9986.07 2548.28  9990.4 2546.9510015.38 2547.0510017.27 2547.0710017.56 2547.27
   100202548.98410023.47 2551.4210027.83 2551.5410039.48 2551.8910099.44 2550.35
10102.34 2550.2610107.24 2549.3110113.18 2548.1810113.78  2548.110113.82  2548.1
10155.23 2551.91

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9859.99    .055 9971.59     .04   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9971.59   10020           200.06  199.24  196.42             .1       .3
Left Levee      Station= 9954.55      Elevation= 2552.28
Right Levee     Station=10039.48      Elevation= 2551.89

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.353

INPUT
Description:
Station Elevation Data    num=      38
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9813.98 2545.92 9819.77 2545.86 9824.43 2545.58 9827.19 2545.45 9842.18 2544.89
 9851.44 2544.75 9876.72 2543.58 9876.98 2543.58 9878.15 2543.38 9887.24  2542.5
 9889.44 2542.57 9905.78 2544.58 9913.13 2545.75 9922.32 2545.66 9927.11 2545.61
 9928.17 2545.55 9936.57  2545.2 9942.33 2544.93 9944.41 2544.85 9946.21 2545.18
 9958.28 2546.39 9961.91 2545.34    99632544.925 9966.69 2543.5210019.23 2543.44
10045.31  2543.510049.17 2544.93   10050 2545.2210055.33 2547.0810056.66 2546.98
 10065.2 2546.9710071.75 2545.6510081.63 2543.9210089.26 2545.3910095.72 2546.03
10096.96 2546.1610109.47 2547.1410116.16 2547.17
```

```
Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9813.98    .055    9963     .04   10050    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9963   10050            197.1  200.05  203.14            .1        .3
Left Levee      Station= 9958.28      Elevation= 2546.39
Right Levee     Station=10055.33      Elevation= 2547.08

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.315

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9846.93 2541.89 9853.43 2541.57 9854.96 2541.33 9864.59 2539.53 9872.14 2538.91
 9883.58 2537.94 9896.14 2538.71 9913.24 2540.59 9919.46 2541.53 9921.54 2541.65
 9923.82 2541.47 9931.06  2539.9 9943.41 2539.22 9953.97 2538.77 9956.39 2538.85
 9978.93 2539.83 9980.63 2540.14 9990.28 2540.37 9992.47 2539.94 9997.27 2538.63
10038.93 2538.8710062.13  2538.9   100752540.40410076.25 2540.5510081.38 2541.14
10086.77 2541.51 10089.8 2542.2210095.76 2541.3310110.51 2539.3210118.19 2539.94
10120.07 2540.1110124.29 2540.2110144.89 2541.3610147.85 2542.26

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9846.93    .055 9990.28     .04   10075    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9990.28   10075           200.17  200.44  193.59            .1        .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9846.93    9965    2543
Right Levee     Station= 10089.8      Elevation= 2542.22

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.277

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9858.05 2539.57 9861.62 2539.14 9880.69 2535.44  9881.7 2535.36  9884.6 2534.85
 9902.29 2534.07 9904.37 2533.98 9904.89 2534.02 9906.42 2534.16 9938.84 2536.88
 9947.26 2537.03 9950.69 2537.46 9952.84 2536.71 9966.56 2535.25 9970.22 2535.24
 9978.71 2535.21 9988.68  2535.2 9992.34 2535.14 9997.24 2534.3510000.56 2533.79
10005.84 2533.7610015.22 2533.7610060.95 2534.0210075.92 2534.9310081.46 2535.26
10098.11 2536.3310100.71 2536.2610120.75  2534.7 10120.8 2534.6910120.81 2534.69
10128.55 2534.6110136.09 2533.7410151.68 2535.98 10153.8 2536.2710156.61 2536.62
10169.04 2537.8410204.37 2540.72

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9858.05    .055 9992.34     .0410075.92    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9992.3410075.92           194.19  199.88  212.53            .1        .3
Right Levee     Station=10100.71      Elevation= 2536.26

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.240
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```
INPUT
Description:
Station Elevation Data     num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9784.9 2535.09 9787.55 2534.97 9797.46 2534.67 9811.94 2534.13 9817.51 2534.02
 9836.87 2533.88 9846.89  2533.8 9859.96 2533.29 9878.94 2532.32 9889.79  2532.7
 9897.32 2533.05 9909.81 2535.04 9927.69 2530.64 9930.37 2530.36 9931.81 2530.17
 9960.56 2530.13 9976.19 2530.47  9979.2 2529.74 9981.96 2528.82 10004.9 2528.93
10027.98 2528.9610034.52 2531.0110038.27  2532.110049.96 2531.8810058.54 2531.36
 10066.1 2530.1910068.41 2529.9510071.65 2530.2310079.37  2530.910090.45 2533.97
10103.31 2536.71

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9784.9    .055 9976.19     .0410034.52    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.1910034.52           205.89  200.16   175.1             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10038.2710103.31  2532.1

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.202

INPUT
Description:
Station Elevation Data     num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9985.64 2530.37 9990.94 2528.43 9996.92 2526.31    99972526.242 9997.98 2525.41
 9999.39  2523.910046.51 2524.9410050.14 2525.02   10056 2526.4110059.08 2527.14
 10081.3  2532.5

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9985.64    .035    9997    .035   10056    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9997   10056            203.3  200.59  189.22             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.164

INPUT
Description:
Station Elevation Data     num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9978.37 2524.92 9993.55 2525.04 9996.88 2525.14 9997.33 2524.29    9999 2521.47
  9999.9 2519.9510034.65  2520.510060.92  2520.910062.43  2521.5   10064 2522.02
10070.52 2524.1810076.36    2525

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9978.37    .035    9999    .035   10064    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9999   10064            194.8  198.76  205.64             .1       .3
Left Levee       Station= 9996.88       Elevation= 2525.14

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.126

INPUT
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```
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9961.34 2521.19 9982.63 2517.72 9993.38 2515.82 9994.25 2515.6310013.92 2515.62
10034.26 2515.2710041.34 2516.91   100462517.892 10047.7 2518.2510067.41 2518.65
 10079.7 2519.1910090.45 2519.4410101.09 2519.9510141.43 2521.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9961.34    .055 9982.63    .035   10046    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.63   10046           187.81  200.17  228.11             .1       .3
Left Levee      Station= 9961.34      Elevation= 2521.19

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.088

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9963.63 2518.19 9966.07 2517.61 9982.81 2513.41    99912511.327 9999.21 2509.24
10010.39 2509.38 10060.3 2510.04   100642511.17710084.65 2517.5210096.28 2520.42
10099.66 2521.1710104.09 2522.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9963.63    .055    9991     .04   10064    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9991   10064           191.38  199.71  216.93             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.050

INPUT
Description:
Station Elevation Data    num=      17
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9941.04 2510.25 9960.91 2508.07 9962.96 2507.88 9963.23 2507.88 9963.24 2507.87
 9963.63 2507.91 9970.68 2508.62 9971.26 2508.46    99772506.701 9983.99 2504.56
 9986.47 2504.0510010.79 2503.9610016.76 2503.88   10018 2504.3310021.72 2506.03
10041.57 2511.6910043.34 2512.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9941.04    .055    9977     .0410021.72    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997710021.72           204.98  200.74  190.48             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 4.012

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9966 2506.36  9966.7 2505.67    99712500.022 9971.71 2499.0910005.56 2499.09
 10025.9 2498.87 10033.2 2500.65   100342500.84910036.53 2501.4810040.59 2502.09
10042.13  2502.210068.35 2504.74
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Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
    9966    .055    9971     .04   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9971   10034            211.29  200.33  187.42             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.974

INPUT
Description:
Station Elevation Data     num=       11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9908.45 2501.44    99132494.911 9913.07 2494.81 9914.23 2494.89 9983.93 2494.26
10005.65  2494.110007.44 2494.89   100122495.92910016.92 2497.0510035.22 2499.11
10048.83  2499.2

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9908.45    .055    9913    .035   10012    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9913   10012            219.23  199.73  197.41             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.936

INPUT
Description:
Station Elevation Data     num=       16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9910.67 2494.24 9933.28 2491.67 9933.69 2491.62 9933.77  2491.6    99372490.768
 9943.51 2489.09 9954.73 2488.91 9966.77 2488.91 9987.51 2488.4910000.88 2488.47
   100062490.59610008.37 2491.5810010.01 2492.4910018.27 2493.66 10027.4 2494.61
10050.58 2495.04

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9910.67    .055    9937    .035   10006    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9937   10006            199.19  200.02  197.39             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.899

INPUT
Description:
Station Elevation Data     num=       14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9947.57 2487.91    99562485.484 9961.47 2483.91 9962.48 2483.45 9963.32 2483.44
 9970.24 2483.34 10006.3 2482.89 10012.9 2485.4210013.17  2485.510021.49 2486.29
10039.72 2488.0210041.52 2488.1410045.18 2488.11 10054.1 2488.31

Manning's n Values          num=        3
     Sta   n Val     Sta   n Val     Sta   n Val
 9947.57    .055    9956    .035 10012.9    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9956 10012.9            206.23  199.63  190.14             .1       .3

CROSS SECTION          RIVER: Galloway
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REACH: Reach 6            RS: 3.861

INPUT
Description: Un-named Tributary
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9946.98 2482.04 9952.96 2481.52  9964.5  2481.4  9965.8 2481.39 9965.81 2481.38
 9978.65 2480.09 9984.74 2479.77 9985.79 2479.88 9987.69 2479.09 9994.35 2478.09
 9998.75 2477.7310002.83 2477.7510011.99 2477.7610026.82 2477.7710033.37 2477.98
10052.51 2478.5810058.68  2479.210061.84 2479.1510076.71  2478.910110.51 2480.75
10116.68 2480.9910130.97 2482.2410140.64 2482.31

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9946.98    .055 9984.74    .03510058.68    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9984.7410058.68           195.08  200.38  213.91             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1007010140.64    2482

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.823

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9951.5 2476.93 9952.48  2476.8 9966.13 2475.06 9976.36 2475.22 9977.44 2475.22
 9978.31 2475.01 9984.47 2473.48 9991.85  2473.410048.23 2472.67   10053 2474.62
   10061 2477.8910070.34 2482.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9951.5    .035 9978.31     .04   10053    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9978.31   10053           197.39  199.08  201.89             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.785

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9901.15 2472.01 9911.82 2471.66 9927.18 2471.21 9937.92  2470.5 9945.11 2469.76
 9947.74  2469.8 9953.68 2468.96 9961.58 2469.16 9971.34 2469.56 9976.65  2469.8
 9988.09 2469.77 9994.65 2468.0310020.97 2468.4110037.01 2468.3610051.66 2468.55
10064.63 2468.62   100682469.76910081.61 2474.4110089.51 2477.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9901.15    .055 9988.09     .04   10068    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9988.09   10068            193.4  198.85  213.49             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.747

INPUT
```

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Description:
Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9900.32 2467.86 9908.04 2467.79 9909.77 2467.79  9910.1 2467.66 9935.06 2467.29
  9938.3 2467.35 9940.48 2467.36 9957.43 2466.75 9960.76 2466.69 9967.28 2466.58
 9971.97 2466.44 9981.83 2465.05    99872464.309 9993.97 2463.31 9995.84 2462.85
 9998.28  2462.510010.18 2462.5310024.53  2462.510062.41  2462.810074.95 2462.88
   100792464.00310098.03 2469.2810109.81 2472.75

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9900.32    .055    9987     .04   10079    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9987   10079            200.67  202.56  209.44             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.709

INPUT
Description:
Station Elevation Data     num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9941.71  2463.3 9943.08  2463.3 9959.22 2460.66 9959.94 2460.58 9960.31 2460.64
 9971.03 2461.87 9977.75 2461.92 9990.21 2461.77 9994.96    2459    99952458.973
 9997.14 2457.5110009.22 2457.5810054.68  2457.5 10057.9 2458.2810061.51 2459.05
10067.44 2459.6110075.19 2460.46 10088.9 2464.6310093.34 2465.4610102.12 2467.77

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9941.71    .055    9995     .0410061.51    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          999510061.51            200.53  199.18  179.03             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.671

INPUT
Description:
Station Elevation Data     num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9928.68 2458.27 9929.87 2457.04    99332454.168 9933.26 2453.93  9952.3 2453.52
10014.45 2452.5310018.82 2452.55 10024.8  2454.110026.41 2454.59   100272454.668
10030.94 2455.1910060.75 2459.4510075.03 2461.35

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9928.68    .055    9933     .04   10027    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9933   10027            212.76  199.05  189.71             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.634

INPUT
Description:
Station Elevation Data     num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9857.01 2451.54  9857.8  2451.5 9863.98 2451.05 9867.49 2451.07 9870.36 2450.93
 9885.14 2450.42 9885.72 2450.37 9900.26 2448.89 9907.84 2449.87 9919.26 2450.41
  9930.9 2451.97 9933.68 2451.07    99382449.393 9941.59    2448 9973.13 2447.83
```

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10013.79 2447.76   100182449.20310032.37 2454.1310035.86 2455.3210037.63 2455.98
10038.37    245610039.96 2456.1710049.92 2456.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9857.01    .055    9938     .04   10018    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9938   10018           214.68  200.35   197.1             .1       .3
Left Levee      Station=  9930.9      Elevation= 2451.97

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.596

INPUT
Description: 80th St. Alignment
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9823.68  2448.7 9835.61 2447.65 9837.21 2447.74 9846.67 2447.05 9864.91 2445.95
 9882.89 2445.58 9891.94 2445.39 9892.78 2445.36  9893.5 2445.32 9897.61 2445.18
 9928.53  2443.6    9960  2443.5 9960.05  2443.5 9975.08 2443.43   10000  2443.5
10036.53 2443.47   100452444.85910046.04 2445.0310057.98 2446.8410078.08 2442.92
10078.98 2442.7410079.22 2442.82 10085.5 2444.8410091.16 2447.6810099.22 2450.94
10100.86 2451.7610106.67 2453.5410113.72 2453.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9823.68    .055    9960     .04   10045    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9960   10045           193.09  179.62  174.76             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
 9823.68    9945    244710057.9810113.72 2446.84

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.562

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9844.22 2442.16 9895.85 2442.21 9902.31 2442.11 9904.58 2442.08 9908.16 2442.01
 9923.82 2441.85 9940.21 2440.95 9951.76 2440.27 9963.31 2439.94 9986.77 2439.11
10002.23 2439.0910029.68 2438.8710031.21 2438.9110031.31 2438.87 10040.9 2439.51
10049.91 2442.6410057.47 2445.3210057.54 2445.3510068.71 2447.02

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9844.22    .055 9963.31     .04 10040.9    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.31 10040.9           182.11   178.3  175.33             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.528

INPUT
Description:
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9923.92    2438 9926.26 2437.71 9933.95 2437.18  9940.2 2436.85 9941.18 2436.86
 9942.73 2436.64 9944.75 2436.31 9961.44 2435.96 9964.39 2435.78 9987.25  2434.5
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 9994.32 2432.86 9994.51 2432.8610036.85 2433.4910041.99 2435.0310045.71 2436.01
10053.54 2437.4710069.87 2440.4710090.36 2437.5510092.77 2437.1210120.55 2437.03
10126.19 2437.1710159.74 2441.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9923.92     .06 9987.25     .0410041.99     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.2510041.99               73      75      76             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.514

INPUT
Description:
Station Elevation Data    num=      31
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9906.78  2435.9 9925.72 2435.17  9938.1 2434.24 9938.33 2434.21 9961.14 2433.82
 9977.72 2433.12 9983.56 2432.45 9986.74 2431.9410017.45 2431.8110031.89 2431.69
10036.47  2432.4 10043.8 2433.4310052.41 2433.8610071.98 2434.6410094.71 2433.94
10116.16 2433.5710121.03 2433.6610135.38 2434.2110154.81 2434.5810164.73 2434.83
10177.93  2435.210182.74 2433.1110188.15 2430.5910195.59 2433.0110203.07 2435.38
 10208.3 2435.2410213.73 2435.2210222.91 2435.5510232.12 2435.91 10232.8 2435.91
10251.85 2435.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9906.78     .06 9977.72     .04 10043.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.72 10043.8               49      50      52             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10071.9810251.85    2436

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.504

INPUT
Description: Private Foot Bridge
This cross section is 2.6 feet upstream of a
             private footbridge, no sqew adjustment is applied
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9887.74 2436.44  9894.4 2435.52  9904.9 2434.62 9927.76 2432.98 9977.19 2433.25
 9984.19 2433.29  9987.3 2433.37 9990.39 2433.76  9991.52432.618 9993.54 2430.52
 9993.99 2430.4710000.86 2430.5110042.78  2430.610047.04 2431.3710048.83 2432.01
10062.01 2432.0610071.94 2432.4310091.52 2432.4910111.87 2431.9310114.86 2431.86
10122.41 2432.3110133.22 2432.9510134.13 2432.52 10143.2 2429.2810143.74 2429.35
10144.01 2429.4210160.37 2433.4210162.47 2433.5310168.99 2433.5910175.88 2433.81
10179.16 2433.9210186.73 2434.2110192.43 2434.1510203.17 2434.0810205.95 2434.26
10206.99 2434.3110212.15  2433.9 10213.3 2434.0210216.24 2434.3810236.16 2437.65
10255.58 2442.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9887.74     .06  9991.5     .0410048.83     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9991.510048.83               10      10      10             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
```

```
10091.5210255.58    2436
Left Levee      Station= 9990.39      Elevation= 2433.76

BRIDGE                  RIVER: Galloway
REACH: Reach 6             RS: 3.503

INPUT
Description: Private wooden foot bridge
Distance from Upstream XS =     2.6
Deck/Roadway Width        =     4.8
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9990.39 2433.76 2432.49 10014.8  2433.8 2432.54 10040.3 2433.83 2432.38
10048.83 2432.01 2430.55

Upstream Bridge Cross Section Data
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9887.74 2436.44  9894.4 2435.52  9904.9 2434.62 9927.76 2432.98 9977.19 2433.25
 9984.19 2433.29  9987.3 2433.37 9990.39 2433.76  9991.52432.618 9993.54 2430.52
 9993.99 2430.4710000.86 2430.5110042.78  2430.610047.04 2431.3710048.83 2432.01
10062.01 2432.0610071.94 2432.4310091.52 2432.4910111.87 2431.9310114.86 2431.86
10122.41 2432.3110133.22 2432.9510134.13 2432.52 10143.2 2429.2810143.74 2429.35
10144.01 2429.4210160.37 2433.4210162.47 2433.5310168.99 2433.5910175.88 2433.81
10179.16 2433.9210186.73 2434.2110192.43 2434.1510203.17 2434.0810205.95 2434.26
10206.99 2434.3110212.15  2433.9 10213.3 2434.0210216.24 2434.3810236.16 2437.65
10255.58 2442.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9887.74     .06  9991.5     .0410048.83     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9991.510048.83             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10091.5210255.58    2436
Left Levee      Station= 9990.39      Elevation= 2433.76

Downstream  Deck/Roadway Coordinates
    num=       4
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9991.48 2433.72 2432.3610015.89 2433.78 2432.4210041.39 2433.75 2432.37
10049.92 2431.91 2430.53

Downstream Bridge Cross Section Data
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9870.39 2436.54 9880.32 2436.31 9884.76 2436.26 9884.83 2436.35 9888.42 2435.85
 9892.21 2435.46 9904.27 2434.55 9914.51 2433.86 9926.31 2433.02 9944.54 2433.12
 9987.47 2433.07 9991.48 2433.72  9993.52432.012  9995.7 2430.1510040.96 2430.39
10045.48 2430.4310049.92 2431.9110052.56 2431.4210067.03 2431.9510099.86 2432.06
10112.23 2431.7210120.58 2432.0210125.52 2432.3210130.75  2429.810132.74 2429.09
10143.38 2430.4110148.75 2431.8110153.29 2432.9210159.82 2433.28 10162.1 2433.44
10163.45 2433.4810164.02  2433.510179.26 2433.9810179.94 2433.9710184.21 2433.94
10196.15 2433.8610200.25 2434.1310204.94 2435.1310207.26 2435.5110220.78 2437.32
 10231.7 2440.0110242.36 2441.7610253.56 2444.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
 9870.39     .06  9993.5     .0410049.92     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9993.510049.92              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10099.8610253.56    2436
Left Levee      Station= 9991.48      Elevation= 2433.72

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 =  2

Pier Data
Pier Station     Upstream=   10015    Downstream=10016.48
Upstream     num=       2
    Width   Elev    Width   Elev
     .67    2430     .67  2432.6
Downstream     num=       2
    Width   Elev    Width   Elev
     .67    2430     .67  2432.6

Pier Data
Pier Station     Upstream=10039.55    Downstream=10040.64
Upstream     num=       2
    Width   Elev    Width   Elev
     1.5    2430     1.5  2432.5
Downstream     num=       2
    Width   Elev    Width   Elev
     1.5    2430     1.5  2432.5

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =    1.25
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

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 water surface

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.502

INPUT
Description: Private Foot Bridge
```

```
This cross section is 2.6 feet downstream of
            a private footbridge, no sqew adjustment is applied
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9870.39 2436.54 9880.32 2436.31 9884.76 2436.26 9884.83 2436.35 9888.42 2435.85
 9892.21 2435.46 9904.27 2434.55 9914.51 2433.86 9926.31 2433.02 9944.54 2433.12
 9987.47 2433.07 9991.48 2433.72  9993.52432.012  9995.7 2430.1510040.96 2430.39
10045.48 2430.4310049.92 2431.9110052.56 2431.4210067.03 2431.9510099.86 2432.06
10112.23 2431.7210120.58 2432.0210125.52 2432.3210130.75  2429.810132.74 2429.09
10143.38 2430.4110148.75 2431.8110153.29 2432.9210159.82 2433.28 10162.1 2433.44
10163.45 2433.4810164.02  2433.510179.26 2433.9810179.94 2433.9710184.21 2433.94
10196.15 2433.8610200.25 2434.1310204.94 2435.1310207.26 2435.5110220.78 2437.32
 10231.7 2440.0110242.36 2441.7610253.56 2444.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9870.39     .06  9993.5     .0410049.92     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9993.510049.92               52      50      50             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10099.8610253.56    2436
Left Levee      Station= 9991.48      Elevation= 2433.72

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.493

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9873.03 2434.66  9886.6 2432.48 9894.18 2432.75 9909.96 2433.02 9921.32 2432.65
 9924.88 2432.72 9928.09 2432.61 9946.89 2432.32 9985.31 2432.22 9990.67 2431.08
  9991.52430.862 9997.91 2429.18 10013.2 2429.3110052.01 2429.6310055.84 2430.17
10059.25 2430.69 10072.6 2430.5310080.31 2430.5110087.02 2430.8310089.71 2430.22
 10098.9  2428.310110.84 2430.0510126.94 2432.5710127.79  2432.710128.37 2432.77
10128.57 2432.7910137.49 2432.8610151.18 2433.2310151.76 2433.2410151.93 2433.24
10167.15 2433.2210171.44 2434.4310186.27 2438.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9873.03     .06  9991.5     .0410059.25     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9991.510059.25               57      57      60             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.482

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9947.76     2432 9959.86 2431.93 9961.09 2431.93 9961.75 2431.93 9970.66 2431.71
 9980.54 2431.48 9985.17 2430.77    99912429.74910000.13 2428.1510010.55 2428.14
10055.01 2427.9510059.32 2427.9210061.74 2427.8110061.77 2427.8110073.66 2428.95
10074.52 2428.94 10075.1 2428.9610080.57 2429.4210096.26  2429.610103.53 2429.59
 10107.3 2430.1810113.51  2431.410121.41 2431.9410126.87 2432.4410139.94 2432.84
 10140.1 2432.85

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
 9947.76      .06     9991      .0410080.57      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          999110080.57            199.35  200.64  206.71              .1       .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 6             RS: 3.444

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9929.96 2427.82 9941.57 2426.24 9949.86 2426.17 9973.38  2426.4    9990 2426.42
    99942425.019 9997.68 2423.73  9998.8 2423.3610006.53 2423.4110074.27 2423.91
   100792425.15610081.52 2425.82 10087.1 2427.4710103.32 2430.83

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9929.96     .06    9994     .04   10079     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9994   10079           196.92  211.88  206.28              .1       .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 6             RS: 3.404

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9828.01 2423.31  9828.1 2423.33  9858.3 2422.79 9921.32  2421.4    99252420.797
    9927 2420.47 9934.04 2419.27 9991.01 2419.15 10016.7 2418.98   10020 2420.39
10029.88 2424.6110031.65 2425.27

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9828.01     .06    9925     .04   10020     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
          9925   10020           186.98   188.4  180.34              .3       .5

CROSS SECTION           RIVER: Galloway
REACH: Reach 6             RS: 3.373

INPUT
Description: Upstream of Dream Street Bridge
All stations have been adjusted
             for skew angle of 18.5 degrees by multiplying Cos18.5 (0.95) times
             station distances
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9893.2    2419  9926.3    2418  9972.2  2417.1 9972.21    2410  9988.1  2410.2
   10000  2409.9 10003.9  2409.910003.91  2416.7 10033.6    2417 10075.4  2417.8
   10105    2419

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9893.2     .04  9972.2     .0310003.91     .04

Bank Sta: Left   Right    Lengths: Left Channel   Right      Coeff Contr.   Expan.
        9972.210003.91                53      49      60              .3       .5

BRIDGE                  RIVER: Galloway
```

REACH: Reach 6 RS: 3.369

INPUT
Description: Dream Street Con-Arch Bridge
Distance from Upstream XS = 10
Deck/Roadway Width = 30
Weir Coefficient = 2.6
Bridge Deck/Roadway Skew =
Upstream Deck/Roadway Coordinates
num= 45

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9890.8	2418.4	2409.57	9922.1	2418.1	2409.57	9940.5	2417.9	2409.57
9958.3	2417.8	2409.57	9958.3	2420.9	2409.57	9975.8	2420.9	2409.57
9975.9	2420.9	2409.8	9976.8	2420.9	2412.67	9977.7	2420.9	2413.27
9978.7	2420.9	2413.82	9979.6	2420.9	2414.27	9980.6	2420.9	2414.57
9981.5	2420.9	2414.77	9982.5	2420.9	2414.97	9983.4	2420.9	2415.09
9984.4	2420.9	2415.22	9985.3	2420.9	2415.32	9986.3	2420.9	2415.36
9987.2	2420.9	2415.37	9988.2	2420.9	2415.43	9989.8	2420.9	2415.55
9990.8	2420.9	2415.55	9991	2420.9	2415.55	9991.7	2420.9	2415.55
9992.7	2420.9	2415.43	9993.6	2420.9	2415.36	9994.6	2420.9	2415.32
9995.5	2420.9	2415.22	9996.5	2420.9	2415.09	9997.4	2420.9	2414.97
9998.4	2420.9	2414.77	9999.3	2420.9	2414.57	10000.3	2420.9	2414.27
10000.5	2420.9	2414.1	10001.2	2420.9	2413.82	10001.9	2420.9	2413.27
10002.8	2420.9	2412.67	10003.8	2420.9	2409.57	10005.9	2420.9	2409.57
10012.7	2420.8	2409.57	10012.8	2417.3	2409.57	10036	2416.9	2409.57
10057.2	2416.7	2409.57	10077	2416.4	2409.57	10091.2	2416.3	2409.57

Upstream Bridge Cross Section Data
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
9893.2	2419	9926.3	2418	9972.2	2417.1	9972.21	2410	9988.1	2410.2
10000	2409.9	10003.9	2409.91	10003.91	2416.7	10033.6	2417	10075.4	2417.8
10105	2419								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
9893.2	.04	9972.2	.03	10003.91	.04

Bank Sta: Left	Right	Coeff Contr.	Expan.
9972.21	10003.91	.3	.5

Downstream Deck/Roadway Coordinates
num= 44

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
9893.2	2418.9	2408.96	9914.2	2418.4	2408.96	9938	2417.9	2408.96
9958.8	2417.5	2408.96	9985	2417.2	2408.96	9985	2421.3	2408.96
9990.9	2421.2	2408.96	9991.9	2421.2	2412.06	9992.3	2421.2	2412.3
9992.8	2421.2	2412.66	9993.8	2421.2	2413.21	9994.7	2421.2	2413.66
9995.7	2421.2	2413.96	9996.6	2421.2	2414.16	9997.6	2421.2	2414.36
9998.5	2421.2	2414.48	9999.5	2421.2	2414.61	10000.4	2421.2	2414.71
10001.4	2421.2	2414.75	10002.3	2421.2	2414.76	10003.3	2421.2	2414.78
10004.9	2421.2	2414.78	10005.9	2421.2	2414.78	10006.8	2421.2	2414.78
10007.8	2421.2	2414.76	10008.2	2421.2	2414.76	10008.7	2421.2	2414.75
10009.7	2421.2	2414.71	10010.6	2421.2	2414.61	10011.6	2421.2	2414.48
10012.5	2421.2	2414.36	10013.5	2421.2	2414.16	10014.4	2421.2	2413.96
10015.4	2421.2	2413.66	10016.3	2421.2	2413.21	10017	2421.2	2412.66
10017.9	2421.2	2412.06	10018.9	2421.2	2408.96	10021.8	2421.2	2408.96
10040.6	2421.2	2408.96	10040.6	2416.7	2408.96	10058	2416.4	2408.96
10076.7	2416.1	2408.96	10084.5	2415.8	2408.96			

Downstream Bridge Cross Section Data
Station Elevation Data num= 11

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

```
  9912.1  2418.7  9932.4    2418  9955.7    2416  9990.8  2414.3 9990.81  2409.1
   10000  2409.3 10028.4  2409.510028.41  2413.9 10043.2    2414 10084.5  2415.8
 10114.7    2416

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9912.1     .04  9990.8     .0310028.41    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9990.810028.41             .3       .5

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         =  2416.3
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Energy

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

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

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.364

INPUT
Description: Downstream of Dream St. Bridge
All stations have been adjusted
             for skew angle of 18.5 degrees by multiplying Cos18.5 (0.95) times
             station distances
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9912.1  2418.7  9932.4    2418  9955.7    2416  9990.8  2414.3 9990.81  2409.1
   10000  2409.3 10028.4  2409.510028.41  2413.9 10043.2    2414 10084.5  2415.8
 10114.7    2416

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9912.1     .04  9990.8     .0310028.41    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9990.810028.41              173     172     145             .3       .5

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.331

INPUT
```

```
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9908.33 2415.81 9910.31 2415.46 9927.08 2413.02 9950.37 2412.59 9963.53 2412.38
  9978.4 2412.23 9989.67 2412.04    99952407.569 9997.24 2405.69  9999.4 2404.16
10022.08 2405.3110022.79 2405.34 10023.7 2405.4610031.69 2406.5510035.02 2407.11
   100422408.042 10052.7 2409.4710057.84 2409.5310100.04 2411.0910130.36 2412.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9908.33     .06    9995     .04   10042     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9995   10042            207.53  202.91  187.42             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.292

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9957.03 2408.04 9965.39 2405.17 9972.34 2404.92 9980.35 2404.67    99852403.086
 9993.15 2400.31  9995.3 2399.66 9997.34  2399.710017.72 2400.1610024.72 2401.72
   100302403.22910030.25  2403.310073.99 2407.97

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9957.03     .06    9985     .04   10030     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9985   10030            184.67  198.56  211.53             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.255

INPUT
Description:
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9844.62 2407.64 9875.29 2404.39 9880.48 2403.79 9885.71 2403.79 9917.31 2403.51
 9919.92 2402.56    99312398.078 9934.31 2396.74 9936.16 2395.99 9950.27 2395.86
 9954.49 2395.83 9954.59 2395.84 9962.45 2397.04 9966.83  2397.5 9972.01 2398.09
  9976.2 2397.38 9984.51 2396.24    9985 2396.24 9994.85 2396.2310003.15 2396.23
10018.54 2396.28 10019.6 2396.2910020.94 2396.2910037.68 2397.0910042.26 2397.32
   100452398.16710058.18 2402.2410059.81 2403.02 10062.1 2402.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9844.62     .06    9931     .04   10045     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9931   10045            159.33  204.55  220.12             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.216

INPUT
Description: Galloway Wash N. Trib.
Station Elevation Data    num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9870.9 2399.47 9875.87 2399.38 9918.55 2399.02 9946.18 2398.75 9947.64 2398.77
 9948.94 2398.42  9950.6 2398.21  9964.9 2395.38    99692394.588 9972.98 2393.82
```

```
  9912.1  2418.7  9932.4    2418  9955.7    2416  9990.8  2414.3 9990.81  2409.1
   10000  2409.3 10028.4  2409.510028.41  2413.9 10043.2    2414 10084.5  2415.8
 10114.7    2416

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9912.1     .04  9990.8     .0310028.41    .035

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9990.810028.41             .3       .5

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         =  2416.3
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
Selected Low Flow Methods = Energy

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =      .8
           Max Low Cord                =

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

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.364

INPUT
Description: Downstream of Dream St. Bridge
All stations have been adjusted
             for skew angle of 18.5 degrees by multiplying Cos18.5 (0.95) times
             station distances
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9912.1  2418.7  9932.4    2418  9955.7    2416  9990.8  2414.3 9990.81  2409.1
   10000  2409.3 10028.4  2409.510028.41  2413.9 10043.2    2414 10084.5  2415.8
 10114.7    2416

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9912.1     .04  9990.8     .0310028.41    .035

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9990.810028.41              173     172     145             .3       .5

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.331

INPUT
```

```
 9973.86 2393.57 9974.53 2393.44 9985.49 2391.1110022.15 2390.1810023.29 2390.15
10024.62 2390.1510026.13 2390.1610046.89 2390.4410049.19 2390.82   100552392.293
   100602393.56110113.55 2407.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9870.9    .055    9969    .035   10060    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9969   10060           198.28  198.03  198.99             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.179

INPUT
Description:
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9897.72 2394.04 9897.88 2394.02 9898.41 2393.97 9909.49 2392.55 9926.49 2392.58
 9946.35 2392.59 9951.09 2392.64 9954.87 2391.04    99552390.983 9962.83 2387.57
 9971.84 2388.14 9972.08 2388.14 9974.13 2388.1310037.22 2387.1810038.97 2388.09
   100452391.09810055.53 2396.3510065.64  2396.410077.74 2395.9910081.56 2395.71
10084.44 2395.62 10089.3 2395.0310099.79 2396.0810100.08 2396.1210100.33 2396.16
10101.09 2396.2210125.48 2399.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9897.72    .055    9955    .035   10045    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9955   10045           191.22  198.48   206.7             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.141

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9862.6 2390.23 9869.68 2389.84 9887.05 2388.79 9895.05 2388.51 9940.93 2389.03
 9943.57 2389.08 9945.94 2388.63 9959.68 2386.62 9965.42 2384.44 9968.03 2383.56
 9979.74 2383.3910032.43 2383.3510044.94 2383.3310048.89 2384.4210050.73 2384.91
10059.06  2385.510080.42  2386.810080.66 2386.8110080.83 2386.8810099.01 2395.08

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9862.6    .055 9959.68     .0410080.42    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.6810080.42            240.1   200.9  169.75             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.103

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9857.71 2385.64 9881.77 2384.94 9896.12 2384.42    9906 2382.24 9915.29 2380.19
 9917.97  2379.6 9919.32 2379.31 9919.84 2379.39 9929.84 2380.35 9940.41 2380.35
 9953.84 2380.43 9955.25 2380.14 9958.98 2379.61  9985.1 2379.2410008.36 2378.97
10024.98 2380.1610027.06 2380.3110030.66 2380.0910042.06 2380.2510058.06 2380.74
   100662382.15310068.23 2382.55 10078.5 2384.4110080.98 2384.4810085.18 2384.57
```

```
 10092.6 2383.72   10096 2383.2810101.86 2383.6910112.98 2384.2410124.54 2384.45
10126.91 2384.5110128.46 2384.71 10142.3 2386.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9857.71    .055    9906     .04   10066    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9906   10066           205.17  197.04  189.55             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.066

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9844.28  2384.5 9870.56  2381.3 9871.25 2381.29  9885.5 2381.01 9895.45 2381.29
 9901.88 2381.64 9904.29 2381.91 9906.93  2381.9 9920.95  2381.6 9927.32  2381.8
 9930.21 2381.92 9933.86 2381.91 9936.63 2381.99 9939.03  2381.6 9952.09 2379.45
 9961.65 2378.38 9985.96 2377.35 9993.14 2375.12 9995.67 2374.3410011.93 2374.55
10063.26 2375.26   100702377.98610077.06 2380.8410109.29 2380.7610124.15  2380.4
10141.78 2380.4810148.84  2380.410158.88 2380.34

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9844.28    .055 9985.96     .04   10070    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9985.96   10070           206.34  202.75  194.51             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 3.027

INPUT
Description: Tranquil Trail
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9811.69 2377.22 9814.32 2376.97 9817.53 2376.97 9825.29 2376.72 9829.47 2376.65
  9840.8 2376.46 9845.95 2376.37 9855.78  2376.1 9867.93 2375.97 9876.37 2375.66
  9887.7 2374.89  9920.1 2373.16 9923.93 2372.95  9926.8  2372.8 9928.08 2372.74
 9929.69 2372.67    99302372.633  9932.3 2372.36 9949.85 2371.77 9978.81 2371.33
  9989.3 2371.2410013.69 2370.9310020.32 2373.9410032.59 2376.1810059.97 2375.68
10061.21 2375.6810066.47 2375.0110068.38 2374.7610079.31 2375.1310088.82 2375.06
 10107.8 2375.0910119.27 2375.0110126.66 2374.6110145.98 2373.7310154.69 2373.24
10158.11 2372.6410170.78 2372.9410172.87 2373.2610180.48  2372.310184.42 2371.88
10186.44 2371.7710192.68 2371.62 10197.1 2370.9310215.09 2375.9210238.73 2382.59

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9811.69    .055    9930     .0410020.32    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          993010020.32           208.54  208.56  213.42             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10032.5910238.73    2378

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 2.988

INPUT
Description:
```

```
Station Elevation Data     num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9794.45 2372.44 9794.81 2372.39 9800.24  2372.2 9803.84 2372.05 9820.69 2371.38
 9823.02 2371.25 9834.15 2371.33 9883.75 2372.43    98882369.144 9889.57 2367.93
 9890.17 2367.39 9898.88 2367.52 9917.39 2367.69 9920.12 2368.11 9928.97 2369.27
 9939.23 2369.45 9952.29 2369.63 9958.09  2369.8 9962.91 2369.97 9977.63 2367.52
 9979.02  2367.3 9980.06    2367  9987.8 2366.91 9997.58 2366.7210017.92 2366.55
 10033.2 2366.9210051.07 2367.2510055.06 2368.0910058.83 2368.8110077.74  2369.4
10095.59 2370.0710115.05 2373.5410147.22 2378.77

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9794.45    .055    9888    .04510058.83    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          988810058.83            189.63  186.64  189.43             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 2.952

INPUT
Description:
Station Elevation Data     num=      25
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9719.66 2371.46 9720.94 2371.27 9733.83 2365.93 9743.68 2365.96 9760.13 2365.93
 9768.18 2365.82 9812.66 2365.75 9828.61 2365.84 9835.76 2366.23 9938.03 2366.39
 9948.19 2366.33 9948.76 2366.31 9950.36  2366.4 9957.25 2366.26 9972.24 2366.02
 9976.86 2364.73 9982.69 2362.97 9986.21 2362.9110010.55  2363.210085.33 2363.46
10092.02 2363.46   100952364.89610102.21 2368.3710103.88 2369.0210140.38 2373.85

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9719.66    .055 9972.24     .04   10095    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.24   10095            203.1   206.4  233.41             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9719.66    9940    2367
Left Levee      Station= 9950.36      Elevation=  2366.4

CROSS SECTION          RIVER: Galloway
REACH: Reach 6            RS: 2.913

INPUT
Description:
Station Elevation Data     num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9748  2365.2    9768    2364    9790  2362.7    9824  2362.5    9829    2362
    9840  2361.6    9880    2362    9900    2360    9909    2362 9993.27 2360.42
 9995.03 2359.8410000.11 2358.3810059.98 2358.3610071.97 2358.3110072.93 2359.26
   100782361.75810080.48 2362.9810092.42 2362.6710093.42 2362.4510099.74 2360.65
10106.87 2362.6510107.83 2362.9710108.87 2363.0210123.18 2363.91 10144.2 2365.94
10170.75 2368.47

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9748    .055 9993.27     .04   10078    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9993.27   10078           123.27  129.12  152.98             .1       .3
Ineffective Flow     num=       2
   Sta L   Sta R    Elev   Sta L   Sta R    Elev
```

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    9748    9915    236310080.4810170.75 2362.98

CROSS SECTION           RIVER: Galloway
REACH: Reach 6             RS: 2.889

INPUT
Description: Split 2
Station Elevation Data     num=      61
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9685.41 2363.85 9695.09 2362.62 9702.86 2361.86 9707.41 2361.49 9719.35 2360.98
 9730.51 2359.66  9746.8 2357.83 9756.11 2358.07 9784.15 2357.86  9842.8 2359.06
 9869.26 2359.72 9879.69 2358.67 9880.17 2358.64 9891.72 2358.73 9917.92 2358.93
 9919.68  2358.9 9937.89 2358.34 9943.09 2357.63 9946.14  2357.2 9958.19 2358.54
 9958.58  2358.6 9959.74  2358.6 9981.56 2358.31    9989 2357.76 9994.23 2357.36
 9998.46 2355.69 10000.6 2354.6910011.68 2355.63 10036.1 2355.9110040.78 2356.03
10049.26  2356.110051.66 2356.1410080.31 2356.59 10080.5 2356.5910088.63 2356.59
 10108.8 2357.9510111.76  2358.210114.53  2358.310120.02 2358.7310127.78 2359.04
10139.92 2359.1510141.84 2358.7710147.69 2357.4310149.19 2357.3710155.51 2359.04
10157.22 2359.4310174.27 2359.0410193.09 2359.3410199.18 2359.5210199.27 2359.52
10199.34 2359.5210203.32 2359.2810204.91 2359.1410205.96 2359.2110209.45 2359.24
10223.46 2359.4810240.67 2359.8710242.42 2359.9510244.71 2360.1510261.46 2361.76
10297.94  2365.1

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9685.41    .055 9994.23     .04 10108.8    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9994.23 10108.8                 0       0       0              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10157.2210297.94    2362
Left Levee      Station= 9869.26      Elevation= 2359.72
Right Levee     Station= 10199.2      Elevation= 2359.52

CROSS SECTION           RIVER: Galloway
REACH: Split 2             RS: 0.240

INPUT
Description: Split 2, Galloway Wash
Station Elevation Data     num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9973.51  2356.5 9981.69    2356    99832355.838    99882355.218 9997.83    2354
   10000  2353.910002.44    235410017.91  2356.310032.09  2353.6   10035    2354
   100452355.122   100502355.68310052.83    235610068.15    235710092.53  2355.5
   10097    236010147.91    235810204.04  2362.6

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9973.51    .055    9988     .05   10045    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9988   10045            142.4   143.9  148.44              .1       .3

CROSS SECTION           RIVER: Galloway
REACH: Split 2             RS: 0.213

INPUT
Description:
Station Elevation Data     num=      22
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9936.59 2353.67    99522351.133 9954.08 2350.79 9954.41 2350.72 9963.11 2350.81
 9992.85 2350.99   10000 2351.1510001.73 2351.21   100102351.27510010.69 2351.28
```

```
10020.46 2353.2810020.67 2353.3310020.72 2353.3410022.02 2353.3510070.06 2353.83
10093.73 2353.1410099.43 2349.4910104.48 2351.2910109.04 2353.1210109.46 2353.21
10123.31  2353.3 10133.8 2353.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9936.59    .055    9952    .045   10010    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9952   10010             258.8  300.03  291.61             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 2            RS: 0.156

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9922.36  2348.1 9949.19 2347.73    9952 2347.59 9958.93 2347.38 9981.37 2345.98
 9986.46 2345.74    99942343.522 9995.13 2343.19 9998.53  2342.5 10000.1 2341.99
 10003.7 2342.2610013.94 2343.0810026.58 2343.9610032.38 2343.5510037.77 2343.49
10044.33 2346.1610045.85 2346.6710048.47 2347.1610053.47  2347.110066.56 2347.62
 10073.6 2347.7910081.12 2348.13 10103.4 2348.5510107.84 2348.8910110.82 2349.16
10138.43 2351.75

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9922.36    .055    9994    .04510026.58    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          999410026.58            144.85  143.27   138.6             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 2            RS: 0.129

INPUT
Description:
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9949.9 2344.32  9973.8 2343.94 9984.05 2343.71    99952340.757  9997.4 2340.11
 9999.88 2339.4410002.35 2339.6710005.74  2339.610013.55 2340.6210026.04 2340.76
10038.86 2341.0510049.74 2343.94 10050.5 2344.0910060.24 2344.9110078.09 2346.37
10082.22 2346.72

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9949.9    .055    9995    .04510013.55    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          999510013.55               215  213.78     220             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 2            RS: 0.088

INPUT
Description:
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9976.14 2339.01 9990.34  2336.4 9994.75 2335.87 9997.52 2335.5710000.05 2334.85
10001.48  2335.110005.92 2335.5910010.97 2336.5810014.96 2337.48 10020.2  2336.5
 10023.6  2335.8 10026.4 2335.6510039.07 2334.7710040.33 2334.8810052.22 2335.85
10059.65 2335.9410067.78 2335.9310074.79 2338.11 10105.5 2344.6110113.41 2345.27
```

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Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9976.14    .055 9997.52    .04510005.92    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9997.5210005.92              205  222.65     230             .1        .3
Ineffective Flow      num=       1
   Sta L   Sta R    Elev
10014.9610113.41    2338

CROSS SECTION          RIVER: Galloway
REACH: Split 2            RS: 0.046

INPUT
Description: Junction 2, Galloway Wash
Station Elevation Data     num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9916.38 2334.37 9933.19 2334.13 9941.42 2331.65 9943.02 2331.16 9943.89 2331.15
 9957.01 2330.86 9963.65 2331.15  9969.3  2331.4 9982.34 2331.08 9992.74 2330.51
10000.05 2330.5110011.62 2331.04 10013.6 2331.1410018.84 2332.61

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9916.38    .055 9982.34    .045 10013.6    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.34 10013.6                 0       0       0             .1        .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 5            RS: 2.872

INPUT
Description: Split 2
Station Elevation Data     num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9761.98    2362 9774.73    2360 9787.08    2358 9801.07    2356 9811.58  2355.7
 9824.28    2356 9882.21  2357.9 9953.09    2356    99562353.824 9958.44    2352
   10000  2350.210008.32    2350 10013.6  2349.910018.19    235010046.92    2352
10059.67    235410072.63  2354.310083.63    2356 10093.8  2356.5

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9761.98    .055    9956    .04510059.67    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          995610059.67            202.74  184.09  150.06             .1        .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 5            RS: 2.837

INPUT
Description:
Station Elevation Data     num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9819.56 2356.08 9840.11  2353.3 9853.45  2352.1 9860.15 2352.13 9874.11 2351.94
 9875.49 2351.49  9878.6 2350.65 9882.81 2351.38    9886 2351.79    9890 2351.75
 9894.35 2351.88 9902.09 2352.04 9926.15 2350.18 9939.32 2349.14 9958.49 2349.56
    99652347.763 9966.57 2347.33 9968.02 2347.01 9974.47 2345.38 9975.06 2345.26
 9979.47 2345.26   10030    2346   10036    235010038.21 2350.0610041.01 2351.91
10048.53 2352.2510079.41 2353.2810084.79 2353.3110097.55 2353.51

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
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```
 9819.56    .055    9965     .04   10036    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9965   10036            188.33  200.12  204.48             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 5            RS: 2.799

INPUT
Description:
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9875.55 2353.11 9877.48  2352.7 9879.87 2352.29 9923.77 2344.57 9924.14 2344.52
 9929.74 2343.29 9931.42 2342.85 9936.19 2341.81 9937.07 2341.79 9962.68 2341.74
10014.72 2341.6110015.86 2342.94 10016.52343.737 10019.6  2347.610046.36 2347.11
10049.99 2347.0510051.74 2346.8710058.14 2345.8210060.29 2346.2510065.51 2345.25
10074.07 2347.5110076.87 2348.1710080.08 2347.1310091.95 2344.1110102.45  2347.6
10104.21 2348.1610107.03 2348.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9875.55    .055 9929.74     .04 10016.5    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9929.74 10016.5           223.94  202.85  191.87             .1       .3
Right Levee     Station= 10019.6      Elevation=  2347.6

CROSS SECTION          RIVER: Galloway
REACH: Reach 5            RS: 2.760

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9892.37 2345.61  9907.5 2345.72 9911.05 2345.59 9930.59  2340.2    99322339.824
 9940.93 2337.44  9941.9 2337.22 9943.05 2336.99 9956.55 2336.5410006.18 2334.97
   100092338.52510010.82 2340.8210012.25 2342.5410029.85 2343.0210033.07 2343.05
10038.85 2343.2210057.93 2343.6610092.83 2344.1210097.91 2344.1510102.34 2344.18
10132.73 2344.35

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9892.37    .055    9932     .04   10009    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9932   10009            182.26  197.53  281.45             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 5            RS: 2.723

INPUT
Description:
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9914.96 2337.31 9929.56 2333.31 9936.16 2331.39 9972.99  2331.210018.82 2330.99
10018.92 2331.07 10019.52330.93710019.53 2330.9310027.07 2330.39 10037.8 2330.14
10041.74 2329.8110063.64 2329.2910070.04 2329.0910087.87  2328.810096.42 2328.53
10102.23 2328.6410117.46 2328.9710121.61 2329.15 10161.9 2330.8410166.63 2331.04
10170.72 2333.3410181.17 2338.9910185.64 2339.01

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9914.96    .055 9929.56     .04 10019.5    .055
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9929.56 10019.5            242.1  230.18  200.21             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10019.5310185.64    2336

CROSS SECTION          RIVER: Galloway
REACH: Reach 5            RS: 2.679

INPUT
Description: Junction 2, Split 2
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9928.5 2333.93 9941.69 2333.24 9955.92 2331.89    99592327.391 9959.37 2326.85
 9959.38 2326.84 9971.43 2326.7810078.86 2326.8610087.73 2326.8510092.46 2326.89
10093.25 2326.8610097.43 2326.87 10108.2 2326.8710110.42 2326.7910129.84 2326.27
   10134 2326.1610134.08 2326.1910137.98 2328.19 10152.1 2334.2510160.43 2334.37

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9928.5    .055    9959     .0410137.98    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          995910137.98           159.95  171.26  204.09             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.647

INPUT
Description: Junction 2, Split 2
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9950.33 2331.42 9955.79 2331.31 9968.44 2325.66    99702324.974 9973.85 2323.28
 9996.74 2323.63 9998.26  2323.610051.36 2323.0710064.62 2322.6210065.58 2322.59
10066.17 2322.7310074.18  2324.210087.05 2325.0310098.22 2325.6610107.98 2329.52
10108.79 2329.8510109.38 2329.9410172.46 2335.6210184.36  2336.1

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9950.33    .055    9970     .0410074.18    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997010074.18           179.67  199.96  201.59             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.610

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9911.16 2326.91  9930.4 2324.02 9931.98 2323.92    99342323.294 9942.08 2320.79
10013.41 2318.6410016.29 2318.6310023.93 2322.9310024.95 2323.3710029.33 2324.03
10032.19 2324.2310047.26 2324.3510048.37 2324.3210052.29 2324.1910065.98 2324.24
 10070.1 2323.8510083.54  2323.8   10085  2323.810098.07 2324.18   10118 2324.61
10125.53 2324.6110131.99 2325.6110164.55 2324.3910167.14 2324.18 10167.5 2324.14
10168.75 2324.2110178.22  2324.7 10190.2  2325.710207.38 2326.8110218.28 2327.26
10227.33 2327.7310234.35 2328.1710248.81 2328.82

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9911.16    .055    9934     .0410024.95    .055
```

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Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          993410024.95           204.59  199.83  176.75             .1       .3
Right Levee     Station=10047.26      Elevation= 2324.35

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.572

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9914.91  2320.8  9960.9 2321.33 9965.89  2320.3 9968.06 2319.83 9970.79 2319.77
 9978.26 2319.68 9985.75 2319.41 9990.11 2319.38 9995.13 2315.22 9996.56 2314.27
10001.28 2314.3910035.53 2315.2710055.75 2318.4510068.71    232010080.36 2320.08
10085.51 2320.1310095.34 2320.2610103.78 2320.7610110.18  2320.8 10113.2  2320.9
10123.77 2320.9410129.31 2320.71 10131.9 2320.8310158.83 2321.1310165.25 2321.18
10182.91 2321.2810186.56 2321.3110187.33  2321.310203.33 2322.24 10207.4  2322.6
10214.01 2322.6810231.96 2323.0710242.45 2323.9410251.15 2322.63

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9914.91    .055 9990.11     .0410055.75    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9990.1110055.75            203.8  201.35  172.32             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.534

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9963.92 2317.96 9966.36  2317.9 9976.91 2317.22 9985.33 2316.74    99882313.924
 9990.44 2311.35 10049.3 2312.14 10053.8 2312.28 10055.3 2312.2810069.59 2312.29
10096.85 2312.3410116.71 2314.3710120.75 2314.6910123.37 2314.7510128.03 2314.75
10130.19 2314.8810144.06 2315.29 10156.6 2315.6110159.98 2315.7210163.01 2316.48
10165.41 2317.2410169.47  2318.610174.25 2320.0810198.54 2319.9410202.78 2319.82
10207.24 2319.7510211.86  2319.7   10228 2319.2710231.28 2319.1510234.34 2319.22
10235.97 2319.1810247.34 2320.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9963.92    .055    9988     .04 10053.8    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9988 10053.8           189.05  199.83  208.47             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10116.7110247.34    2316

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.496

INPUT
Description: Scopa Trail, Town of Carefree
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9820.6 2313.52 9833.85 2313.57 9840.37 2313.59 9846.52 2313.58  9855.5 2312.74
 9861.11 2312.57 9874.91 2312.94 9882.31 2312.85 9924.25 2311.15 9926.47 2311.02
 9930.42 2310.26 9941.51 2308.22 9963.27 2307.7110018.37 2306.42   100252309.946
10034.26 2314.8710035.28 2315.45 10035.8 2315.4810062.18 2316.8310067.87 2316.68
```

```
10075.95 2316.58

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9820.6    .055 9930.42     .04   10025    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9930.42   10025           203.39  199.88  192.83             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.458

INPUT
Description: Town of Cave Creek
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9860.47 2309.04 9863.87 2308.82 9866.06 2308.82 9870.912308.536 9874.04 2308.25
 9875.36 2308.12 9880.03 2307.66  9892.6 2306.48 9900.24 2305.93 9906.01 2305.42
  9915.8 2305.62  9918.5 2305.71 9920.78  2304.9 9923.98  2303.9 9925.02 2303.76
 9941.67  2303.4 9958.04 2303.1510006.16 2301.8510006.34 2301.8410006.63 2301.92
   100202306.21310021.89 2306.8210044.52 2307.68 10049.7 2307.9710061.72 2308.09
 10143.9    230610155.78    230410158.03  2303.7 10160.2    2304   10179    2306
10214.18    230810234.65    230810249.01    2312

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9860.47    .055  9918.5     .04   10020    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9918.5   10020           201.38   198.8  189.99             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10061.7210249.01 2308.09

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.420

INPUT
Description:
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9871.43 2304.37 9873.36 2303.96 9883.06 2302.45 9901.94  2302.3  9922.6 2302.23
 9932.08 2301.37  9937.2 2300.83 9945.93 2302.11 9951.16 2302.66 9987.77 2301.43
 9989.26 2301.42 9989.92 2300.98 9998.34 2296.25 10062.7  2298.310064.78 2298.38
10065.23  2298.5   100702299.46210078.47 2301.1710086.57 2301.08 10096.2 2301.27
10099.91 2299.88 10104.5 2297.9510109.17 2300.8310110.27 2301.3410141.22 2309.58
10148.34 2311.0710155.94 2312.0710156.68 2312.2210158.36 2312.33

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9871.43    .055 9989.92     .04   10070    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9989.92   10070           199.62  199.56  195.51             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.382

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9909.05 2300.16 9910.62 2300.03 9917.98 2299.63 9919.09 2299.31 9923.63 2300.13
```

```
 9925.66  2299.8 9934.47  2298.1 9936.85 2297.74 9938.04 2297.54 9954.14 2297.31
 9963.46 2297.05 9982.77 2295.45 9987.37 2294.52  9995.5 2292.94 9997.02 2292.65
10008.82 2293.1410044.37 2294.6410048.51 2293.9910055.99 2292.9610065.53 2295.27
10068.84 2295.8910073.07 2295.9310089.03 2295.6210094.28 2294.1810097.98  2293.1
10138.24 2310.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9909.05    .055 9987.37    .04510065.53    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.3710065.53            200.6  201.12  201.19             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.344

INPUT
Description:
Station Elevation Data    num=      34
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9882.57 2295.29 9886.49 2295.26 9899.96  2295.1 9905.33 2294.38  9910.3 2293.87
 9914.26 2294.04 9920.72 2294.41 9935.15 2294.23 9953.16 2293.99  9980.1 2293.67
 9989.16 2293.59 9989.26 2293.79    99932291.973 9994.16 2291.4110000.99 2288.54
10022.43 2288.5910077.33 2288.47 10081.2 2289.99   100852291.56610088.12 2292.86
10116.12 2293.6410132.15 2294.0910135.01 2294.0610139.09  2294.110144.83 2294.18
10194.22  2294.510204.14 2294.2310205.64 2294.2210206.95 2294.2110208.63 2294.32
 10235.2 2294.7510235.45 2294.7310241.99 2294.8510251.02 2294.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9882.57    .055    9993    .035   10085    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9993   10085              216     239     241             .1       .3
Left Levee      Station= 9920.72      Elevation= 2294.41

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.299

INPUT
Description:
Station Elevation Data    num=      21
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9799.63 2291.08 9810.17 2290.94    9818 2290.95 9832.39 2289.05 9832.95 2288.96
    9879 2288.33 9890.01 2288.28 9890.41 2288.24 9929.25  2287.5 9938.38 2287.27
 9941.65  2286.8 9952.64    2285 9984.09 2284.8810014.72 2284.9410025.07 2287.55
10028.49 2288.4710055.04 2290.2710097.11 2293.9910098.78 2294.1210107.03 2295.57
10132.51 2299.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9799.63    .055 9941.65    .03510025.07    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9941.6510025.07              85      93      97             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9799.63    9878    2290

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.281

INPUT
```

```
Description: Galloway Road
This cross section is 3 feet upstream of a set of
            8-10'x6' concrete box culverts at Galloway Road.  This culvert set
            was constructed after the topographic mapping for this project was
            developed, so this cross-section data include as-built survey data
            of the final channel grading.
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9840.85 2290.03 9851.35 2289.93 9851.91    2290 9861.73 2290.06 9861.92 2290.05
  9862.8  2289.9 9890.34 2287.98 9896.26 2287.64 9902.82 2287.24 9917.52 2286.79
    99202286.558  9920.1    2283    9928 2282.31    9939  2282.6    9951 2282.51
    9962 2282.68    9972  2282.7    9984 2282.46    9994 2282.49   10005 2282.43
   10016    2283 10016.1  2286.2 10030.5 2286.3410051.16  2287.6 10052.2 2287.68
10052.27  2287.710053.26  2287.710070.69 2288.4810070.88 2288.5210077.27 2288.92
10088.15 2289.59 10089.4 2289.7710108.24 2292.1110114.82  2292.610122.35 2292.79
10124.91 2292.8210149.48 2292.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9840.85    .055    9920     .04 10016.1    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9920 10016.1               70      70      70              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9840.85 9917.52    2290

CULVERT                 RIVER: Galloway
REACH: Reach 4             RS: 2.275

INPUT
Description: Galloway Road
Distance from Upstream XS =       3
Deck/Roadway Width        =      64
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=       8
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9861.73 2290.06    2281    9899 2290.22    2281    9920  2290.4    2281
   10010  2290.4    2281   10032    2290    2281   10056  2289.2    2281
   10074  2289.6    2281   10100 2290.68    2281

Upstream Bridge Cross Section Data
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9840.85 2290.03 9851.35 2289.93 9851.91    2290 9861.73 2290.06 9861.92 2290.05
  9862.8  2289.9 9890.34 2287.98 9896.26 2287.64 9902.82 2287.24 9917.52 2286.79
    99202286.558  9920.1    2283    9928 2282.31    9939  2282.6    9951 2282.51
    9962 2282.68    9972  2282.7    9984 2282.46    9994 2282.49   10005 2282.43
   10016    2283 10016.1  2286.2 10030.5 2286.3410051.16  2287.6 10052.2 2287.68
10052.27  2287.710053.26  2287.710070.69 2288.4810070.88 2288.5210077.27 2288.92
10088.15 2289.59 10089.4 2289.7710108.24 2292.1110114.82  2292.610122.35 2292.79
10124.91 2292.8210149.48 2292.87

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9840.85    .055    9920     .04 10016.1    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9920 10016.1              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
```

```
 9840.85 9917.52    2290

Downstream  Deck/Roadway Coordinates
    num=      10
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
    9890    2290    2281    9919 2290.22    2281    9940  2290.4    2281
   10030  2290.4    2281   10052    2290    2281   10076  2289.2    2281
   10094  2289.6    2281   10118 2290.31    2281 10132.5 2290.98    2281
10141.86 2291.12    2281

Downstream Bridge Cross Section Data
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9890    2290    9940  2284.2  9940.1  2281.5    9948 2281.47    9959 2281.47
    9972  2281.2    9983 2281.29    9992 2281.21   10004 2281.25   10015 2281.19
   10027 2281.24 10033.9 2282.08   10034    228510044.18 2286.3310052.68 2286.74
10057.34 2286.3210062.41 2286.4210076.31 2286.9510080.16 2287.1710087.25 2287.36
10088.58 2287.3710103.69 2288.2510113.43 2289.0210120.36 2289.9210130.67 2290.56
10141.86 2291.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9890    .055    9940     .04   10034    .055

Bank Sta: Left   Right    Coeff Contr.   Expan.
          9940   10034             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
    9890    9940    2290

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 # 8 - flared wingwalls
FHWA Scale # 1 - Wingwall flared 30 to 75 deg.
Solution Criteria = Highest U.S. EG
Culvert Upstrm Dist  Length    n Value   Entrance Loss Coef   Exit Loss Coef
                  3      64       .011                   .3               .5
Number of Barrels =  8
Upstream   Elevation =  2282.5
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
    9928  9938.9  9949.8  9960.7  9971.6  9982.5  9993.4 10004.3
Downstream Elevation =  2281.3
Centerline Stations
    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.    Sta.
    9948  9958.9  9969.8  9980.7  9991.6 10002.5 10013.4 10024.3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.268

INPUT
Description: Galloway Road
This cross section is 3 feet downstream of a set of
```

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            8-10'x6' concrete box culverts at Galloway Road.  This culvert set
            was constructed after the topographic mapping for this project was
            developed, so this cross-section data include as-built survey data
            of the final channel grading.
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9890    2290    9940  2284.2  9940.1  2281.5    9948 2281.47    9959 2281.47
    9972  2281.2    9983 2281.29    9992 2281.21   10004 2281.25   10015 2281.19
   10027 2281.24 10033.9 2282.08   10034    228510044.18 2286.3310052.68 2286.74
10057.34 2286.3210062.41 2286.4210076.31 2286.9510080.16 2287.1710087.25 2287.36
10088.58 2287.3710103.69 2288.2510113.43 2289.0210120.36 2289.9210130.67 2290.56
10141.86 2291.12

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9890    .055    9940     .04   10034    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9940   10034           140.78  145.48  150.26             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
    9890    9940    2290

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.240

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9886.52 2280.51 9930.04 2280.79 9940.39 2280.66 9954.17 2280.34 9958.29 2279.13
 9962.24 2277.54 9974.51 2277.68 9990.23 2277.75 9999.74 2276.25   10000 2276.22
10056.98 2277.4210084.44 2277.9610099.58 2284.3410118.03 2292.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9886.52    .055 9958.29     .0410084.44    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9958.2910084.44           224.42  249.46  253.52             .1       .3
Left Levee      Station= 9930.04      Elevation= 2280.79

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.193

INPUT
Description: Un-named Tributary
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9822 2277.09 9850.69 2277.04 9865.97 2276.69 9895.73 2274.29 9902.33 2273.01
 9934.77 2273.28 9957.23 2273.51 9978.24 2272.96 9981.98 2272.79 9986.72 2272.79
10014.56 2272.5510019.19 2273.1810024.07 2274.2710024.92 2274.1710025.31 2274.21
10026.74 2274.5910028.91 2274.53   10032 2273.5510035.74 2271.9810042.06 2272.09
10056.19 2272.06   100602274.467 10062.6 2276.1110076.45 2285.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9822    .055 9895.73     .04   10060    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9895.73   10060           146.23  163.37  165.62             .1       .3

CROSS SECTION          RIVER: Galloway
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```
REACH: Reach 4              RS: 2.162

INPUT
Description: Just US of Vermeersch Rd.
Station Elevation Data     num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9426.65  2273.6 9461.06    2272 9592.25    2272 9600.04    2270 9681.58    2270
 9697.47    2268  9712.8    2267 9725.24    2268 9730.55    2270 9742.79  2271.3
 9755.06  2269.8 9768.91  2271.7 9779.36  2270.3  9804.2  2272.1 9822.38  2269.9
 9832.11    2272 9845.32  2272.6    9857    2272 9863.71    2270 9866.27  2269.4
 9940.37    2269 9945.89    2270 9962.17  2271.3 9981.28    2270 9985.74  2268.3
   10000  2268.3 10026.6    227010041.43    227810083.47    2280 10115.4  2280.5

Manning's n Values         num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
 9426.65    .055 9681.58    .045 9742.79    .055 9863.71    .045 10026.6    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9863.71 10026.6           350.91  335.73  332.11              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9426.65 9845.32    2274

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.098

INPUT
Description:
Station Elevation Data     num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9750.06  2269.4 9792.38 2268.81 9804.75 2268.87 9818.95 2268.26 9821.83 2267.39
 9861.95  2263.1 9862.59 2263.09 9871.46 2262.54 9877.31 2261.49 9879.38 2261.03
 9890.23 2261.97    9899 2262.64 9906.71 2262.1310001.52 2261.0110006.77 2261.67
 10010.22262.21710010.28 2262.2310029.37  2262.910040.31 2263.3510047.28 2263.23
10089.58 2262.6910101.79 2262.9510116.46 2262.6710120.21 2262.1110125.55 2261.42
10128.65 2261.0710131.76 2260.8210141.25  2261.4 10149.8  2260.610150.97 2260.61
10151.48  2260.610157.89 2261.3710161.04 2261.7610173.89 2262.0910176.05 2262.13
10179.46 2262.1310199.86 2262.0110203.58 2262.1610217.92 2262.4210218.97 2262.45
10220.65  2262.810243.39 2267.48

Manning's n Values         num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9750.06    .055 9871.46     .0410010.28     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9871.4610010.28           310.31  300.69  289.79              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1017810243.39  2265.5

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.041

INPUT
Description:
Station Elevation Data     num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9854.06    2261 9873.54  2260.3 9889.06 2259.84 9923.23 2257.78 9925.05 2258.07
    99352256.753 9946.88 2255.18 9949.96 2254.67 9957.15 2254.6510042.89 2254.22
10046.41 2254.6810050.71 2255.2610058.43 2255.7410079.34  2255.910131.42    2256
10142.75 2255.7810159.11 2255.1110165.92 2255.2410176.84 2255.7810183.31 2255.27
10193.06 2254.8110207.52 2256.0110225.96 2256.1510232.08 2256.2910241.17 2254.99
10246.96 2254.7210253.16 2253.8110261.08 2253.5610269.65 2253.6410278.97 2254.89
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10285.67 2255.8110291.36 2255.6710301.54 2255.9810308.45  2256.3 10314.3 2256.76
10328.52  2258.110347.42 2258.64 10381.7 2258.77   10394    2258   10438  2256.2
   10468    2258   10512    2266

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9854.06    .055    9935     .0410058.43     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          993510058.43           218.72  198.98  168.09             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 10285.6   10512    2258

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 2.004

INPUT
Description:
Station Elevation Data    num=      54
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9865.07 2255.12 9871.27 2255.04 9871.63 2255.01 9895.67 2255.11 9912.79 2255.04
 9920.69 2253.58 9934.98 2251.04 9942.43  2249.7 9943.92 2249.71  9952.8 2249.79
 9959.88 2250.81 9963.65 2251.32 9974.89 2250.41 9992.43 2248.99 9999.77 2249.21
10043.28 2249.4610049.34 2249.3910053.69 2250.2610059.24 2251.23 10066.2 2250.88
10070.12 2250.73 10072.8 2250.8610086.96 2251.6610092.68 2251.3710099.29 2250.86
10121.54 2251.9810132.39 2252.4610142.62 2252.5310161.83 2252.5510180.07 2252.09
10209.22 2251.6610211.99 2251.6110223.43 2251.3410229.07 2251.2410259.49 2250.87
10272.05 2250.7910278.03 2250.5810291.66 2250.2410302.36 2249.9410323.74 2250.74
10328.02  2250.910346.99 2250.9110347.87 2250.9110359.56  2250.910365.47 2250.69
10371.37 2250.4510374.55 2250.4310374.83 2250.4610380.88  2250.910417.13 2251.71
10434.99 2251.8110449.66 2257.0710468.63 2262.3510479.27 2265.22

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9865.07    .055 9963.65     .0410059.24     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9963.6510059.24           203.17  198.99  188.38             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.966

INPUT
Description:
Station Elevation Data    num=      40
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9833.24 2250.18 9868.89 2249.69  9931.2 2248.86 9953.34 2247.07 9969.25 2245.69
 9974.66 2244.71 9980.75 2244.56 9998.51 2244.2810018.58 2244.3310053.97 2244.58
10076.23 2244.7610079.38 2244.7810084.41 2246.2910086.22 2246.7110099.92 2247.64
10123.78 2249.17 10125.8 2249.2610131.83 2249.4810144.77 2249.8110156.32 2252.99
10160.21 2253.8810177.48 2251.6910190.85 2249.6510194.39 2249.1610197.97 2248.59
10234.52 2247.3110260.78 2246.09 10262.8 2245.9810271.93 2245.5410274.93 2245.68
 10284.1 2246.4210292.31 2245.9710301.04 2245.4910302.79 2245.4310307.17 2245.59
10326.77 2246.0510338.93 2246.02 10364.8 2246.3110379.87 2252.6410390.45 2256.51

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9833.24    .055 9969.25     .0410086.22     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.2510086.22           202.69  201.02  189.28             .1       .3
```

```
CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.928

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9900.88 2244.33  9905.9 2244.28 9943.05  2242.5 9975.64    2241 9983.51 2240.39
 9991.18 2239.8310030.52 2239.7810039.35 2239.7410050.71 2239.7410053.39 2239.74
 10074.2  2239.810087.88 2242.7610089.34    224310123.99 2243.7410131.46  2243.9
10131.96 2243.9110134.44 2243.93 10167.9 2244.2410180.42 2244.3610188.75  2245.2
10190.75 2245.24 10190.9 2244.9910197.06 2244.1210203.12 2243.3510222.28 2243.03
10228.08 2242.9110243.09 2242.3510267.03 2241.3710268.01 2241.4310276.77 2241.29
10281.79 2243.3110285.76 2242.62 10296.2 2242.2810299.83 2242.8910301.39 2243.23
10310.61  2245.610327.76  2252.1 10334.3 2254.67 10337.2 2255.44

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9900.88    .055 9975.64     .0410087.88     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.6410087.88             63.2   60.68   60.63             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10281.79 10337.2    2245

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.917

INPUT
Description: Horny Toad Bar
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9819.23 2243.25 9834.12 2243.24 9898.87 2243.87 9930.84 2241.64 9950.22 2239.94
 9960.24 2239.83 9982.04  2238.9    9997 2238.0610031.07 2238.2410073.21 2240.28
10079.69 2242.12 10089.9 2242.3510120.02 2242.4810135.93 2241.7810138.54 2241.64
10144.32 2241.5210152.76 2241.3610155.38 2241.4810156.28 2241.5410159.56 2241.56
10162.77 2241.2810165.28 2240.9810172.23  2240.910197.82 2240.5510211.33 2239.89
10221.11 2239.4110233.26 2240.8910242.15 2245.0410252.12 2252.3710259.96 2253.03
10276.18 2255.8410279.04 2256.37 10296.2 2257.46

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9819.23    .055 9982.04     .0410073.21     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.0410073.21            127.72  140.09  162.61             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.890

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9914.05 2243.61 9927.42 2243.62 9943.48 2242.64 9947.32  2242.5 9966.47 2241.73
 9971.86 2241.49 9975.86 2240.06 9989.04  2235.1 10025.3 2234.8210044.42 2234.66
10053.72 2235.9310058.42 2236.4410068.61 2235.2510069.83 2235.1210071.94 2235.26
10077.38  2235.610078.78 2236.0910082.93 2237.1210091.06 2237.1910095.97 2237.36
10107.21 2236.6710118.02 2236.1710125.69 2236.6110142.46 2237.9110148.72 2240.66
 10176.7 2252.9210178.39 2252.8310185.02 2253.0510192.63    225310197.48 2253.47
10199.18 2253.4310204.48 2253.54 10252.7 2252.19
```

```
Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9914.05     .055 9975.86      .0410082.93      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9975.8610082.93            224.43  232.47  242.35             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.846

INPUT
Description:
Station Elevation Data      num=       13
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
  9914.2 2242.85  9949.3  2243.1 9965.73 2235.81    99702234.381 9982.22 2230.29
10001.52 2229.9610032.87 2229.5710035.66 2232.86   100402235.40210043.72 2237.58
10048.89 2239.3110050.99 2239.3610060.13  2240.9

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
  9914.2     .055     9970      .04    10040     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9970   10040            183.23  165.48  142.2             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.815

INPUT
Description:
Station Elevation Data      num=       12
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9968.25  2242.5     9991  2229.1 9995.89 2226.22 9997.88 2225.04 9998.07 2225.03
10004.24 2225.12 10053.2 2225.6310060.49 2228.0210060.63 2228.0710061.35 2228.41
   100652229.86610086.94 2238.62

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9968.25     .055     9991      .04    10065     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9991   10065            142.48  129.93  91.26             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.790

INPUT
Description:
Station Elevation Data      num=       21
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9955.44     2240 9966.58     2238 9974.14     2236     9990 2223.37 9991.72     2222
   10000  2221.910012.39     222210047.95  2222.410056.52     222410066.74     2226
10081.07     223010103.93     222610129.44  2225.810174.34  2225.710180.72     2224
10190.38  2221.610197.48     222410210.79     222610239.99     222810264.28     2230
10275.72     2232

Manning's n Values          num=        3
     Sta    n Val      Sta    n Val      Sta    n Val
 9955.44     .055     9990      .0410056.52     .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          999010056.52               122   154.7     216             .1       .3
Ineffective Flow      num=        1
```

```
   Sta L   Sta R    Elev
10081.0710275.72    2230

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.761

INPUT
Description:
Station Elevation Data    num=       7
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9916.66    2230 9933.81    2224 9970.42    2222 9979.29    2220   10000  2218.5
10065.27    222010092.98    2230

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9916.66    .055 9979.29    .04510065.27    .055

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.2910065.27              109  116.99     145             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.739

INPUT
Description:
Station Elevation Data    num=      12
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9924.39 2230.27  9928.1 2227.83 9946.54 2217.69 9950.24 2217.24 9954.51 2216.03
 9975.35  2215.610016.22 2215.6110018.76 2215.7310032.11 2220.8810033.12 2221.41
 10035.3 2221.8810051.57 2225.56

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9924.39     .05 9946.54    .03510032.11     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.5410032.11            206.9  200.55  187.09             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
10051.5710051.57 2225.56

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.701

INPUT
Description:
Station Elevation Data    num=      23
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9963.58 2230.74  9975.9 2218.12    99802213.693 9982.65 2210.83 9990.26 2210.87
 10014.9 2210.9610029.87 2211.05 10044.6  2211.110048.18 2211.0910063.35 2211.08
10070.56 2212.9310077.22 2214.7910081.01 2215.0610087.81 2215.6710091.58  2215.4
10097.79    221510101.58  2214.310106.26 2213.2110113.34 2214.1810115.23 2214.47
10122.29 2215.1510144.58 2217.5310173.96 2225.53

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9963.58     .05    9980    .03510077.22     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998010077.22            188.07  199.43  211.06             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1011410173.96    2217
```

```
CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.663

INPUT
Description:
Station Elevation Data    num=      19
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9934.08 2225.24    99722210.047 9979.78 2206.93 9985.77 2206.7510021.88 2206.87
10037.04 2206.4910038.05 2206.9710047.81 2206.5210047.95 2206.98 10051.7 2207.59
 10053.1 2207.8110063.13  2209.210063.19 2209.2110063.23 2209.2210063.32 2209.26
10063.36 2209.2810076.18 2214.8110079.59 2216.3410091.73 2221.77

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9934.08     .05    9972    .03510063.13     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          997210063.13           190.54  201.88  207.51             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.625

INPUT
Description:
Station Elevation Data    num=      13
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9921.1 2210.45 9931.76 2205.88 9944.42 2202.62 9949.42 2202.58 9974.52 2202.33
 9981.13 2203.06 9985.47 2203.66 9995.68 2202.33 9997.93 2201.9310019.58 2202.08
10029.06 2202.13 10032.3 2204.7910051.88 2219.39

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9921.1     .05 9931.76    .035 10032.3     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9931.76 10032.3           183.64  200.69  205.02             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.587

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9884 2210.47 9894.16 2207.47  9902.6  2205.2 9910.39 2204.63 9926.04  2202.9
 9932.82 2200.86 9943.84 2198.39 9978.15 2197.87 10002.7 2197.55   100102202.373
10014.43  2205.310023.75 2210.9410027.81 2211.13 10039.8 2211.5610048.18 2211.94

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9884     .05 9926.04    .035   10010     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9926.04   10010           205.22  197.57  195.12             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.549

INPUT
Description:
Station Elevation Data    num=      11
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9884.39 2220.23 9934.98 2196.97 9942.18 2194.02 9987.99 2194.3810003.16 2194.36
10014.61 2197.9910017.82 2199.0210026.37 2199.1910050.86 2199.69 10063.2 2203.09
 10080.2 2207.09

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9884.39     .05 9934.98    .03510014.61     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9934.9810014.61           211.45  200.58  198.51             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 4            RS: 1.511

INPUT
Description: Junction 3, Grapevine Wash
Station Elevation Data    num=       9
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9909.12 2200.68    99252194.027  9935.4 2189.67 9973.05  2189.710005.35 2189.72
10015.13 2194.0710021.95 2195.6110023.84 2195.5910037.38  2195.6

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9909.12     .05    9925    .03510015.13     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          992510015.13           202.54     198  196.61             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.474

INPUT
Description: Junction 3, Grapevine Wash
Station Elevation Data    num=      36
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9923.3 2202.47 9938.34  2193.2    99452188.259 9948.49 2185.67 9983.43 2185.41
10017.56 2185.0910020.64 2186.0810024.48 2187.0310066.85 2189.7610073.11  2190.2
10082.89 2190.2710110.63 2190.2910114.24 2190.4610125.04 2190.3510148.79 2190.31
   10150    2190   10177    2188   10190    2186   10195  2185.6   10199    2186
   10218    2188   10239    2190   10247  2190.1   10255    2190   10270  2189.6
   10305  2190.4   10338    2190   10428  2189.2   10453    2190   10467    2188
   10477  2187.7   10485    2188   10507    2190   10526    2192   10546    2194
   10558    2196

Manning's n Values        num=       5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
  9923.3     .05    9945    .03510024.48     .05   10177     .04   10218     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          994510024.48           194.97  201.89   207.2             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.435

INPUT
Description:
Station Elevation Data    num=      29
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9900.78 2190.96 9911.62 2190.73 9929.76 2185.51 9941.72  2181.510006.02 2181.13
10037.49 2181.1210042.14 2182.4410046.22 2183.58 10052.3 2183.88 10080.5    2183
10102.52 2180.8410113.62 2182.9610129.23 2185.7210141.04 2186.59 10146.7 2186.85
 10152.6  2186.8 10162.6    2186 10177.6    2184 10222.6    2186 10232.6    2186
 10242.6  2186.2 10247.6    2186 10277.6    2184 10302.6  2183.4 10327.6    2184
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 10342.6    2186 10349.6    2188 10356.6    2190 10362.6    2192

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9900.78     .05 9929.76    .03510042.14     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9929.7610042.14           195.97  200.79  207.93             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.397

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9846.47 2187.99 9872.23 2185.81  9878.5 2185.38 9933.93 2181.14 9934.55  2181.1
 9966.77 2177.35 9969.35 2177.03 9992.67 2176.8910021.24 2177.0410063.95 2177.17
10086.43 2177.9210091.22 2178.2510107.45 2179.3110114.03 2179.7110116.38 2179.73
10120.52 2179.7110139.99 2179.7410148.41    217910158.19 2178.7910199.43 2179.67
10207.55 2179.6610209.01 2179.9810222.07  2182.910227.11 2184.1510238.57  2186.9
10264.29 2193.13

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9846.47     .05 9966.77    .03510086.43     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.7710086.43           199.02  198.05  197.41             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.360

INPUT
Description:
Station Elevation Data    num=      33
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9878.78  2190.7 9900.97 2178.97 9902.18 2178.34 9902.93 2177.94 9925.61 2176.67
 9946.77 2176.02 9957.63 2175.46 9965.53 2175.17 9976.83 2173.59 9980.41 2173.01
 9987.23  2172.810062.49 2172.6310076.54 2172.6910091.53 2173.3310101.67 2173.81
10103.88 2173.5510109.95 2173.1910110.89 2173.1110111.83 2173.2110118.93 2173.96
10132.63 2173.21 10133.1 2173.1810134.68 2173.2610162.82 2174.5710171.16 2174.92
10179.34 2175.0810187.71 2175.0910194.23 2175.0910196.97 2174.9810197.12 2174.98
10223.64 2175.3210230.73 2177.6310250.02 2183.18

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9878.78     .05 9976.83    .03510091.53     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.8310091.53           156.07  154.59  158.25             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.331

INPUT
Description: School House Road
Station Elevation Data    num=      57
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9885.92 2177.84 9892.91 2177.26 9900.12 2176.55 9905.93 2175.91 9925.92 2174.03
 9930.99 2173.71 9958.87 2171.11 9960.15 2170.99 9969.54 2170.07 9979.12 2169.54
 9985.34 2169.28 9990.06 2169.2510003.99 2169.1510007.53 2169.09 10009.3 2169.09
10028.18 2169.0810033.31 2169.0610046.79 2169.1210050.18 2169.11 10055.9 2169.13
```

```
10071.71 2169.2510076.77 2169.2110080.42 2169.3310081.71 2169.3110104.28  2169.4
10106.45 2169.4710114.01 2169.7710133.62 2170.1310135.21 2170.2210141.24 2170.43
10143.46 2170.2710146.37 2170.1210158.82 2170.2810165.59 2170.8310172.45 2171.33
10185.36 2171.9110187.34 2172.0110199.46 2172.4310200.09 2172.4410200.26 2172.44
10200.46 2172.4410200.78 2172.4410216.35 2171.8510223.19 2172.3110226.28 2172.39
10237.93 2172.43 10245.9 2172.9510258.35 2173.4810259.51 2173.5310259.71 2173.54
10259.98 2173.5310260.11 2173.5510260.43 2173.5710266.33 2173.9410275.92    2176
10285.92    217810295.92    2180

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9885.92     .05 9979.12    .03510081.71     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9979.1210081.71           238.46  245.92  239.68             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.284

INPUT
Description:
Station Elevation Data    num=      48
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9749.69 2170.56 9760.47 2170.67 9761.54 2170.84 9765.61 2170.84 9789.54 2170.18
 9800.86 2169.51  9807.5 2168.77 9809.78 2168.71 9811.62 2168.77  9820.2  2168.7
 9823.35  2168.7 9839.05 2167.69 9841.34 2167.64 9848.28 2166.89 9859.47 2168.84
 9861.13 2169.17 9892.01 2168.68 9903.62 2168.58 9905.83 2168.55 9923.27 2165.29
 9926.94 2164.52 9939.39 2163.28 9949.31 2162.15 9952.92 2161.74 9959.21 2160.79
 9965.36    2161 9969.63 2161.0610055.78 2160.2110061.36 2160.1410062.04 2160.43
10068.13 2163.33 10069.7 2163.27 10077.9 2163.2210086.74    216310094.98 2162.95
10097.63 2162.8810102.77 2162.3510107.42 2162.4810138.57 2165.2310139.45 2165.52
10140.81 2165.5710145.59  2165.910181.71 2168.0310203.31 2167.6610218.54 2167.38
10227.73 2172.2810241.29 2179.9510258.88 2180.78

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9749.69     .05 9949.31    .03510068.13     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.3110068.13           201.88  199.89  205.91             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.246

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9663.11 2170.96 9669.55 2168.95    9674 2167.42 9683.12  2167.3 9692.88 2167.06
 9695.23 2166.83 9710.84 2165.62 9717.43 2164.85 9718.59 2164.85 9741.32 2164.38
  9754.1 2164.23 9771.89 2164.24 9775.61 2164.32 9793.09 2164.33 9808.25  2164.4
 9816.25 2164.25 9828.73 2163.81 9832.13 2163.23 9837.17  2162.5 9842.45  2161.9
 9846.13 2161.67 9847.69 2161.71 9854.54 2161.75 9863.31 2161.72 9873.82 2162.34
 9874.65 2162.39 9874.99  2162.4 9884.87 2162.54 9892.59 2161.82 9897.62 2161.58
  9909.6 2161.48  9929.3 2161.41 9938.07 2159.35 9940.26 2158.89 9941.63 2158.77
 9947.96 2158.08 9951.72 2158.51 9954.12  2158.9 9998.27 2156.57 9999.95 2155.96
10032.09 2156.3610032.62 2156.3710033.45 2156.38 10034.2 2156.3810034.87 2156.38
10043.02 2156.44 10092.5 2156.7910099.14 2158.7410100.62 2158.57 10101.9 2158.43
10111.96 2162.2910121.99 2166.7810128.26 2167.7310176.02 2171.26 10184.4 2171.79

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9663.11     .05 9998.27     .03 10092.5     .05
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9998.27 10092.5           202.82  197.69  188.66             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9663.11    9870    2165

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.209

INPUT
Description:
Station Elevation Data    num=      42
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9600.66 2165.24  9612.6 2162.18 9616.81 2162.13 9628.14 2161.62 9635.37 2161.86
 9635.75 2161.87 9636.77 2161.69 9647.97 2159.71 9697.33 2158.35 9697.46 2158.34
 9697.49 2158.34 9697.51 2158.34 9739.03 2158.35 9773.14 2158.36  9780.4 2158.36
 9786.05 2158.37 9788.31 2158.42 9834.46 2158.59 9869.37 2158.56 9875.65 2158.56
 9882.83 2158.84 9891.47 2157.97 9927.52 2156.58 9943.97 2156.31 9951.86 2155.41
 9959.82 2155.24 9961.13 2155.16 9962.05 2155.07 9967.42 2154.42 9978.22 2154.58
 9982.53 2155.06 9987.23 2155.21 9990.72 2154.97 9992.08  2154.5 9997.25 2152.66
10025.14 2152.5710056.83  2152.5 10070.2 2157.1410074.69 2158.84 10103.2 2159.82
10110.77 2160.1210112.23 2160.14

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9600.66     .05 9992.08     .03 10070.2     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9992.08 10070.2              202  201.52  198.97             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9600.66    9745    2160
Left Levee      Station= 9882.83      Elevation= 2158.84

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.171

INPUT
Description:
Station Elevation Data    num=      51
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9617.49 2165.38 9643.56 2156.41 9647.14 2156.22 9662.73 2155.45 9665.14 2155.38
 9669.53  2155.2 9681.65 2154.43 9682.19 2154.39 9682.34 2154.37 9689.86 2154.38
 9695.11 2154.35 9695.49 2154.35 9717.18 2154.12 9720.05 2154.01 9734.36 2153.45
  9741.9 2152.85  9743.8 2152.72  9744.9  2152.6 9754.55  2153.4 9754.78 2153.42
 9772.91 2153.78 9789.34 2154.08  9792.4 2154.19  9793.8 2154.23 9836.52 2154.14
 9840.44 2154.17 9856.73 2154.53 9874.66 2153.29 9927.34 2152.61 9966.41 2152.16
 9975.67 2151.82 9986.09 2151.53 9992.66  2148.7 9993.94 2148.25 9994.86 2148.26
10001.73 2148.3510010.47 2148.4810042.72 2148.5310067.03 2148.7610071.52 2148.81
10075.12 2149.4410092.95 2153.2310108.32 2152.96   10121 2152.8910147.52 2152.58
10165.25 2152.2110173.74 2151.4910174.57 2151.4210174.88 2151.4910179.96 2153.04
10221.61 2157.52

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9617.49     .05 9986.09     .0310092.95     .05

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0910092.95              155     200     187             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1016010221.61    2156
```

```
CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.133

INPUT
Description:
Station Elevation Data    num=      70
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9637.88 2161.52 9649.24 2156.65 9654.38 2154.35 9659.15 2154.09 9674.66 2153.41
 9677.03 2153.29 9677.41  2153.3 9683.68  2153.6 9694.37 2150.68 9710.42 2150.24
 9717.14 2150.04 9719.67 2149.98 9733.25 2150.87 9741.64 2151.32    9763 2151.61
 9780.52 2151.93 9811.68 2150.79 9820.66 2150.46 9846.11 2149.63  9852.9 2149.42
 9853.92 2149.23 9861.41 2148.02 9865.81 2148.66  9870.3 2149.26 9879.04 2149.52
 9907.73 2149.52    9912 2149.32 9926.38 2148.77 9929.31 2148.32 9936.29 2147.19
 9939.73 2147.45 9943.28 2147.71 9947.13 2147.92  9950.6 2148.16 9956.72 2144.26
 9958.31 2143.26 9959.65 2143.24 9967.29 2143.1810007.49 2142.75 10029.6 2142.18
10035.32 2145.0310060.12 2146.9210064.65 2147.0210072.33 2147.2410087.47 2148.08
10100.47 2148.0410112.86 2146.4110115.49 2146.0810122.22 2146.5610126.18  2146.8
10127.24 2146.6810142.33 2145.2910150.62 2146.0610159.82 2145.5110162.77 2145.29
10163.83 2145.3610165.59 2145.5110172.17  2145.510183.39  2144.810194.76 2148.68
10198.69 2149.76 10206.6 2150.0510216.94 2149.8310239.62 2149.1610243.91  2148.1
10251.14  2146.710258.11    214810262.33 2148.9410276.64 2150.3610293.58  2152.2

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9637.88     .06 9956.72     .0410035.32     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9956.7210035.32           148.92   122.5   125.2             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 3            RS: 1.110

INPUT
Description:
Station Elevation Data    num=      94
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9728.17  2151.2 9738.83 2148.23 9742.24 2147.61 9747.74  2147.1 9755.07 2148.45
 9757.52 2148.99  9763.2 2148.99 9764.48 2149.03 9765.31 2148.94 9773.15 2148.01
 9773.94 2147.97 9779.28 2147.65 9781.19  2147.6 9797.33 2148.94  9802.3 2148.73
 9812.67 2148.01 9821.88 2146.16    9826  2145.5 9828.19 2145.07  9830.2 2145.51
 9837.33 2147.12 9843.18 2146.87 9850.79 2146.94 9853.54 2146.86 9909.23 2146.26
 9913.28 2145.73 9931.86 2145.34  9936.5 2145.37  9941.3 2143.71 9947.69 2142.71
 9950.23 2142.22 9953.77 2141.15    9957 2141.04 9958.62 2140.03 9958.63 2140.02
 9965.64 2139.9610003.62 2139.8410010.32 2141.1210016.26 2141.8210018.85 2142.05
10025.56 2143.3710027.76 2143.8710041.26 2144.3510042.19 2144.3710043.17 2144.25
10049.74 2143.4610057.07 2144.1610059.28 2144.2810096.19 2145.9310101.32 2146.13
10112.74 2146.79 10146.1 2147.1910147.29 2147.2810187.01 2146.1510189.12  2146.1
   10190 2145.9210200.36 2144.2510204.21 2144.1810217.56 2143.7910222.95 2142.79
10230.63 2143.5410231.33 2143.6810246.44 2142.2210247.02 2142.1310247.42 2142.17
10257.09 2143.2310264.99  2142.310278.62  2140.610284.21  2141.610286.26 2141.98
10299.18 2143.42 10305.6 2142.1510310.16 2143.5610317.95 2146.1810318.36 2146.18
10332.73 2145.8610348.27 2145.4610349.95 2145.4410352.46 2145.6610354.91 2145.85
 10360.4 2146.14 10405.2 2150.0310435.37 2145.9110438.13 2144.92 10453.9 2139.97
10459.12 2138.3810469.54 2143.9210471.12 2144.4810483.92 2144.6210541.09 2145.28
10542.35 2145.3510551.11 2145.9710554.68 2146.28 10580.5 2151.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9728.17     .06 9950.23     .0410018.85     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9950.2310018.85            77.08    77.5    50.8             .1       .3
```

```
Ineffective Flow      num=        1
   Sta L    Sta R     Elev
 10405.2 10580.5 2150.03

CROSS SECTION           RIVER: Galloway
REACH: Reach 3             RS: 1.095

INPUT
Description: Split 3
Station Elevation Data     num=       76
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9781.81 2151.85  9791.2 2150.15 9814.97 2144.98 9816.66 2144.67 9820.99 2143.91
 9823.27 2144.41 9830.06 2145.87 9834.34  2146.1 9842.52 2145.97 9847.57  2145.2
 9848.36    2145 9857.45 2144.99 9899.18 2144.84 9900.15 2144.84 9908.17 2144.51
  9920.7 2143.68 9924.16 2143.77 9929.62 2143.59 9938.95 2143.61 9942.07 2142.62
 9951.84 2139.51 9979.51  2139.110006.26 2138.8610014.08 2140.8610018.22 2141.86
10035.94 2141.74 10050.8  2141.610061.63 2142.7210075.79 2144.2110091.11 2144.66
10104.22 2144.8710118.93 2145.4810125.23 2145.4210135.23 2145.2410136.88  2145.3
10140.28 2144.9910159.23 2145.0910195.41 2145.7310212.11  2145.510230.11 2145.36
10239.13 2143.2210256.26 2143.3810260.29 2143.4310264.19 2142.7410269.94  2141.5
10275.28 2142.1410275.37 2142.1610275.66 2142.1210285.91 2141.2710295.15 2141.92
 10304.4  2142.510318.55 2139.0910322.26  2138.410323.32 2138.7110329.45  2139.9
10334.53 2140.1410339.52 2140.5410343.85  2140.110347.41 2140.1810349.49 2140.75
10354.82 2141.7810374.68  2144.210414.12 2144.9610426.62    214410432.12    2142
10436.12    214010439.12    213810440.37  2137.810441.62    213810446.12    2140
10451.12    214210455.12    214410531.12    214610539.12    214810549.12    2150
10554.12    2151

Manning's n Values         num=        3
     Sta    n Val     Sta    n Val     Sta    n Val
 9781.81      .06 9942.07     .0410018.22      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9942.0710018.22           189.36  197.52  196.65             .1       .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 2             RS: 1.056

INPUT
Description: Split 3
Station Elevation Data     num=       20
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9794.58 2148.03 9805.12 2143.21 9812.57 2143.12 9823.54 2143.12 9831.53 2143.18
 9837.43 2143.31 9846.91 2143.15 9865.01 2142.64 9879.75 2142.28 9904.72 2137.16
 9909.13 2136.24 9910.38 2136.08 9913.06 2136.0810001.41 2135.4410010.22 2135.15
10011.73 2135.67 10014.52136.88610026.19 2142.0210037.77 2146.2710053.83 2149.97

Manning's n Values         num=        3
     Sta    n Val     Sta    n Val     Sta    n Val
 9794.58      .06 9904.72     .045 10014.5      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9904.72 10014.5            221.9  199.55  178.17             .1       .3

CROSS SECTION           RIVER: Galloway
REACH: Reach 2             RS: 1.019

INPUT
Description:
Station Elevation Data     num=       17
     Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev      Sta     Elev
 9924.91 2145.78 9932.44 2143.83 9949.52 2144.06 9951.34 2144.05  9954.2 2142.63
 9972.08 2133.43 9982.64    2131 9984.81 2130.54 9995.88 2130.7310047.66 2131.52
```

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10051.05 2132.0310053.09 2132.3910065.96 2132.8410068.02 2132.9310069.33 2133.53
10093.26 2146.2310101.13 2146.62

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9924.91     .06 9972.08    .04510053.09     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.0810053.09           243.22  237.45  199.77             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 2            RS: 0.974

INPUT
Description:
Station Elevation Data    num=      14
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9945.73 2134.91  9957.9 2133.66 9962.26 2132.59 9983.52  2127.110001.82    2123
10003.62 2123.0810017.85 2123.4510017.86 2123.4510028.75 2128.2410043.33 2129.68
10049.53 2130.3210049.66 2130.3210078.07 2136.2610085.21 2137.54

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9945.73     .06 9983.52    .04510028.75     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9983.5210028.75           169.28  173.44  174.46             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 2            RS: 0.941

INPUT
Description: Junction 4, Split 3
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9952.05  2129.6 9974.33 2120.37 9984.55 2119.75 9994.19 2119.0610023.19 2119.26
10027.54 2119.2210029.07 2119.6310030.37    212010036.11 2121.1210045.77 2123.46
10050.56 2124.4210061.27 2126.5710086.19 2127.3410119.53 2127.8310136.85 2128.22
10142.84 2128.29

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9952.05     .06 9974.33    .04510036.11     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9974.3310036.11                 0       0       0             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 3            RS: 0.148

INPUT
Description: Galloway Wash
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9663.33    2147 9665.83    2146 9669.83    2144 9674.33    2142 9740.83    2140
 9763.33  2139.9 9773.33    2140 9778.33    2140 9873.33 2141.06 9891.71 2140.83
 9904.09 2140.71 9922.17 2139.46 9956.88 2138.72 9958.61 2138.66 9962.25 2138.67
 9970.02 2137.45 9980.04  2135.6 9990.85 2132.73 9997.56 2131.62 9997.71 2131.58
 9999.93 2131.7210006.18 2134.12   100102135.54610027.13 2141.9410029.94 2142.28
10057.94 2146.04

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
```

```
 9663.33      .06 9980.04     .045   10010      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9980.04   10010            165.59  174.04  174.47             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 3            RS: 0.115

INPUT
Description:
Station Elevation Data    num=      27
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9625.56    2144 9637.56    2142 9716.56    2140 9738.06    2138 9763.06    2136
 9775.56  2135.8 9805.56  2135.6 9822.56    2136 9835.56  2136.2 9875.56  2136.2
 9895.56    2136 9925.56 2136.15 9950.56  2136.1 9965.56 2136.15 9982.56    2134
 9987.56    2132 9992.56    2130 9995.56    2128 9998.56  2127.810001.56    2128
10024.56    213010028.56    213210032.56    213410046.56    213610054.56    2138
10065.56    214010075.56    2142

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9625.56     .06 9982.56    .04510032.56     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9982.5610032.56              157  226.46  228.69             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 3            RS: 0.072

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9699.52  2134.8 9709.52  2134.2 9724.52  2134.6 9737.52    2134 9759.52    2132
 9834.52  2130.2 9882.13 2131.09 9897.74 2131.36 9898.65 2131.36 9904.09 2131.15
 9930.63 2130.17 9943.01 2130.23 9976.52 2130.46    99872127.762 9997.65 2125.02
 9999.66 2124.4710001.45 2125.0910009.49 2127.8210016.84 2130.7110025.22 2130.53
10033.23 2130.49   10037 2130.3910037.59 2130.3910039.19  2130.410052.94 2130.49
10092.84 2131.4910109.35 2131.9710118.14 2139.25

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9699.52     .06    9987    .04510009.49     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          998710009.49              175  191.53     199             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Split 3            RS: 0.035

INPUT
Description: Galloway Wash
Station Elevation Data    num=      16
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
    9930  2128.5    9941    2128  9952.5    2126    9982    2124    9990    2122
    9999    2120   10000  2119.9   10001    2120   10011    2122   10056    2124
   10061    2126   10065    2128   10071    2130   10075    2132   10080    2134
   10090    2135

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
    9930     .06    9982    .045   10011     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9982   10011                 0       0       0              .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.905

INPUT
Description: Junction 4, Split 3
Station Elevation Data    num=      20
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9949.49 2133.36 9949.75 2133.48 9986.04 2117.15 9988.64 2115.97 9989.98 2115.98
10045.66 2116.6810067.15 2116.0410071.96 2115.9110074.41 2115.8210082.12 2115.34
10084.55 2115.7310092.18 2117.7510108.83 2123.5710110.39  2123.310115.77 2123.48
   10130    2122   10177    2122   10193    2124   10202    2126   10228    2130

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9949.49     .06 9986.04    .04510092.18     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.0410092.18                46      45      37              .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.896

INPUT
Description:
Station Elevation Data    num=      39
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9940.72  2133.9 9965.71 2123.86 9987.02 2116.01 9991.85 2115.32 9992.86 2115.13
 9993.99 2115.1510000.85 2115.1610046.32 2115.39 10055.3 2115.2810063.17 2115.49
10063.49 2115.5110073.03 2115.1810080.31 2114.86 10094.3 2117.03 10103.8  2118.6
10106.87 2119.0410114.37 2120.4210120.47 2121.0110130.62 2122.1810134.74 2121.84
10144.26 2121.0210145.69 2121.05 10148.4 2121.1310158.51 2121.3710164.45  2121.5
   10175 2121.5610177.13 2121.7110180.08 2121.9510186.74 2122.4910197.68 2122.98
10197.71 2122.98 10199.3  2123.110209.45 2123.7610233.11 2124.7310247.41 2124.79
10247.46  2124.810247.51 2124.82 10258.2 2128.6710267.73 2130.24

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9940.72     .06 9987.02    .045 10094.3     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9987.02 10094.3               163     147      77              .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1018010267.73    2126

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.868

INPUT
Description: Private Bridge

This cross-section is five feet upstream of a
             private bridge. Cross-section stations less than station 10099.49
             have been adjusted to account for a 26.6 degree skew angle (i.e.,
             stations have been multiplied by 0.894).  Stations greater than or
             equal to 10099.49 have not been adjusted.
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9907.02 2124.72 9914.69 2124.16 9915.07 2124.14 9931.38 2123.62 9932.42 2123.62
 9940.38 2123.46  9947.8 2123.38 9950.48 2123.22 9951.22 2123.12 9956.99 2122.31
```

```
 9970.06  2116.7  9974.5 2115.98 9985.19 2114.86 9988.27 2114.1810001.04 2112.83
   10002 2112.8410025.89 2113.0610042.97 2112.9310082.16 2113.5310083.55 2113.57
10085.38 2114.1610090.84 2115.7110092.21 2116.1310099.49 2116.7610109.27 2118.82
10111.96 2118.9410118.15 2118.97 10151.6 2120.0110159.39 2120.0310161.76 2120.01
10162.91 2120.0910164.43 2120.22 10175.7 2121.03 10183.7 2121.1610191.64 2121.55
10201.01 2121.6910204.09 2121.8610210.66 2121.9910221.88 2122.6710229.71  2123.4
10238.28 2123.7510247.44 2124.1310271.18 2125.3210283.94 2125.6110294.03 2125.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9907.02     .06  9974.5    .04510099.49     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9974.510099.49               22      22      22             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1016310294.03    2126

BRIDGE                  RIVER: Galloway
REACH: Reach 1             RS: 0.866

INPUT
Description: Private Bridge, 2-railroad flat cars end-to-end.  Skew Angle = 27
             Degrees, Bridge Width = 12', Length = 180 feet.  Bridge Has 4-foot
             hand railing on both sides
Distance from Upstream XS =       5
Deck/Roadway Width        =      12
Weir Coefficient          =     2.6
Bridge Deck/Roadway Skew  =
Upstream  Deck/Roadway Coordinates
    num=      18
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9882.11    2126    2122 9913.17 2123.55    2122 9936.21 2123.65    2122
  9949.3 2123.17 2120.03  9955.6 2123.46 2120.32  9960.3 2123.11 2119.97
 10004.2 2121.23 2118.03 10013.1 2120.84 2118.97 10018.3 2120.72 2118.98
 10027.2  2120.7  2117.5 10069.5 2120.57 2117.37 10078.3 2120.54 2119.17
 10083.6 2120.53 2119.17 10092.5 2119.99 2116.78 10110.2 2119.43 2116.23
10130.75 2119.25 2119.2510137.04 2119.38 2119.3810147.19 2119.27 2119.27

Upstream Bridge Cross Section Data
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9907.02 2124.72 9914.69 2124.16 9915.07 2124.14 9931.38 2123.62 9932.42 2123.62
 9940.38 2123.46  9947.8 2123.38 9950.48 2123.22 9951.22 2123.12 9956.99 2122.31
 9970.06  2116.7  9974.5 2115.98 9985.19 2114.86 9988.27 2114.1810001.04 2112.83
   10002 2112.8410025.89 2113.0610042.97 2112.9310082.16 2113.5310083.55 2113.57
10085.38 2114.1610090.84 2115.7110092.21 2116.1310099.49 2116.7610109.27 2118.82
10111.96 2118.9410118.15 2118.97 10151.6 2120.0110159.39 2120.0310161.76 2120.01
10162.91 2120.0910164.43 2120.22 10175.7 2121.03 10183.7 2121.1610191.64 2121.55
10201.01 2121.6910204.09 2121.8610210.66 2121.9910221.88 2122.6710229.71  2123.4
10238.28 2123.7510247.44 2124.1310271.18 2125.3210283.94 2125.6110294.03 2125.76

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9907.02     .06  9974.5    .04510099.49     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
        9974.510099.49             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
   1016310294.03    2126

Downstream  Deck/Roadway Coordinates
```

```
    num=       18
     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord     Sta Hi Cord Lo Cord
 9882.11    2126    2120 9913.17 2123.55    2120 9936.21 2123.65    2120
  9949.3 2123.12 2119.98  9955.6 2123.49 2120.35  9960.3 2123.26 2120.12
 10004.2 2121.15 2117.95 10013.1 2120.84 2118.97 10018.3 2120.59 2118.85
 10027.2 2120.62 2117.42 10069.5 2120.49 2117.29 10078.3 2120.55 2119.18
 10083.6 2120.54 2119.18 10092.5 2119.99 2116.78 10110.2 2119.88 2116.68
10130.75 2119.25 2116.6810137.04 2119.38 2116.6810147.19 2119.27 2116.68

Downstream Bridge Cross Section Data
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9902.76    2126 9914.75    2124 9919.22 2122.62  9934.3 2121.29 9938.68  2120.6
 9952.67 2119.89  9961.4 2118.08 9969.62 2117.87 9976.41 2115.81 9986.42 2113.82
  9988.7 2112.84 9988.98  2112.8 9991.73 2112.5110000.35 2112.0310014.57 2112.14
10020.09 2112.1910078.08  2112.710078.18  2112.710083.02 2112.8410094.56 2113.18
10096.06 2113.6610109.61 2118.1710110.32 2118.2310110.82 2118.2510115.35 2118.53
10126.38    211910129.29 2119.0110145.09 2119.5110150.62 2119.5210173.46 2120.55
10180.71 2120.8210180.91 2120.82 10200.7 2121.2210207.44 2121.3310208.21 2121.37
10220.86 2121.6110242.36 2122.9210257.29 2124.3210273.55 2124.9710284.77 2125.44
10285.84 2125.4810286.52 2125.52 10306.9 2126.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9902.76     .06 9969.62    .04510109.61     .06

Bank Sta: Left   Right    Coeff Contr.   Expan.
       9969.6210109.61             .1       .3

Upstream Embankment side slope              =       2 horiz. to 1.0 vertical
Downstream Embankment side slope            =       2 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow =     .95
Elevation at which weir flow begins         = 2119.27
Energy head used in spillway design         =
Spillway height used in design              =
Weir crest shape                            = Broad Crested

Number of Piers =  3

Pier Data
Pier Station     Upstream= 9971.43    Downstream= 9971.43
Upstream     num=       2
    Width   Elev    Width   Elev
     8.7    2112     8.7    2120
Downstream     num=       2
    Width   Elev    Width   Elev
     8.7    2112     8.7    2120

Pier Data
Pier Station     Upstream=10015.69    Downstream=10015.69
Upstream     num=       2
    Width   Elev    Width   Elev
     8.7    2112     8.7    2120
Downstream     num=       2
    Width   Elev    Width   Elev
     8.7    2112     8.7    2120

Pier Data
Pier Station     Upstream=10080.96    Downstream=10080.96
Upstream     num=       2
    Width   Elev    Width   Elev
     8.7    2112     8.7    2120
Downstream     num=       2
```

```
    Width   Elev    Width   Elev
     8.7    2112     8.7    2120

Number of Bridge Coefficient Sets =  1

Low Flow Methods and Data
       Energy
       Momentum                Cd   =       2
       Yarnell                 KVal =    1.25
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
       Pressure and Weir flow
           Submerged Inlet Cd          =
           Submerged Inlet + Outlet Cd =       .8
           Max Low Cord                =

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 water surface

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.864

INPUT
Description: Private Bridge
Station Elevation Data    num=      43
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9902.76    2126 9914.75    2124 9919.22 2122.62  9934.3 2121.29 9938.68  2120.6
 9952.67 2119.89  9961.4 2118.08 9969.62 2117.87 9976.41 2115.81 9986.42 2113.82
  9988.7 2112.84 9988.98  2112.8 9991.73 2112.5110000.35 2112.0310014.57 2112.14
10020.09 2112.1910078.08  2112.710078.18  2112.710083.02 2112.8410094.56 2113.18
10096.06 2113.6610109.61 2118.1710110.32 2118.2310110.82 2118.2510115.35 2118.53
10126.38    211910129.29 2119.0110145.09 2119.5110150.62 2119.5210173.46 2120.55
10180.71 2120.8210180.91 2120.82 10200.7 2121.2210207.44 2121.3310208.21 2121.37
10220.86 2121.6110242.36 2122.9210257.29 2124.3210273.55 2124.9710284.77 2125.44
10285.84 2125.4810286.52 2125.52 10306.9 2126.07

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9902.76     .06 9969.62    .04510109.61     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.6210109.61                75     102     144              .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.845

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9925.65 2119.22 9946.74 2111.81 9951.26 2110.34    9954 2109.86 9971.26 2109.56
10003.63 2109.6110031.64 2109.7110058.13 2110.02 10080.1 2109.8810105.15 2109.97
10107.03 2111.4210112.68 2114.6510117.53 2114.9210132.52 2118.2310160.72 2124.68

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9925.65     .06 9946.74    .04510107.03     .06
```

```
Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9946.7410107.03           247.12  277.85  331.24             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.792

INPUT
Description: Rowe Wash
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9899.21 2115.85 9913.88 2116.01 9917.12 2115.24 9929.16 2111.69 9957.28 2105.19
 9961.45 2104.03 9964.45 2103.88 9971.59 2103.3310018.77  2103.710040.99 2103.79
10044.19 2103.9510056.73 2105.1210068.62 2105.0310074.62 2104.9510074.94 2104.94
 10075.2 2104.9310075.88 2104.8910086.41 2104.1110088.12 2104.3310093.12 2104.37
10103.95 2104.7410112.92  2106.410114.71 2106.8810127.65  2112.210139.77 2117.12
10149.77  2121.3

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9899.21     .06 9957.28    .04510056.73     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9957.2810056.73           193.87  201.37  195.99             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.754

INPUT
Description: Spur Cross Road
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9784.45    2111 9791.95    2110 9801.45    2108 9813.45    2106 9828.45  2104.8
 9836.45    2106 9844.45 2106.76 9855.35 2106.23 9862.21 2106.03 9891.18 2104.17
  9894.4 2103.96 9895.14 2104.01 9912.72  2105.2 9930.88 2102.68 9945.62 2100.63
 9949.35  2100.1 9991.74 2099.7510011.26 2099.5810018.63 2099.7410019.77 2099.78
10021.53 2100.06 10027.4 2101.2110035.35 2104.1710067.28 2116.16

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9784.45     .06 9930.88    .035 10027.4     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9930.88 10027.4           207.13  225.28  233.18             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9784.45    9835  2109.5

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.711

INPUT
Description:
Station Elevation Data    num=      32
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9789.07    2111 9794.07    2110 9802.07    2108 9809.07    2106 9816.07    2104
 9819.07 2103.35 9824.67 2102.42 9826.47 2101.71 9830.48 2101.13 9841.81 2098.55
 9842.39 2098.37 9844.42 2098.28 9853.47 2099.93 9860.58 2101.22 9881.69  2101.4
 9945.07 2100.23 9959.57 2099.62 9961.56 2099.08  9970.6 2096.48 9978.08 2094.26
  9979.4 2094.22  9985.1 2094.35 9991.59 2092.6410014.84 2093.0410035.37 2093.46
 10035.9  2093.710038.36 2094.31 10051.6 2097.4410058.58 2099.24 10059.8 2099.78
10073.28 2104.3510085.74 2107.84

Manning's n Values        num=       3
```

```
     Sta    n Val      Sta    n Val      Sta    n Val
 9789.07      .06   9970.6     .035 10051.6      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9970.6 10051.6            168.84  175.53  179.35             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.678

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9784.59    2111 9788.59    2110 9796.59    2108 9804.59    2106 9813.59    2104
 9820.59    2102 9824.59 2101.02 9833.46 2098.45 9839.26  2097.7 9842.41 2096.83
 9849.31  2095.4 9856.08  2094.2 9870.59  2096.4 9871.82 2096.56 9894.58 2096.77
 9936.23 2098.19 9945.14 2098.25    99502097.027    99652093.252 9975.46 2090.62
 9976.81 2090.23 9977.16 2090.15 9981.58 2088.8110004.78 2088.8410014.63 2089.01
 10020.7 2090.2110020.78 2090.23 10020.8 2090.23   100252092.26810073.19 2115.65

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
 9784.59      .06     9965     .035    10025      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
          9965   10025            194.64  197.14  199.23             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.641

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9822.2 2099.09 9842.55 2095.23 9851.15 2093.34 9854.95 2092.88 9860.35 2091.34
 9865.87 2089.66 9869.87 2090.42 9876.55 2091.47  9897.5 2092.34 9916.13 2093.05
 9923.36 2091.39 9929.36 2089.91 9931.37 2089.69 9939.11 2088.98 9951.82 2087.07
 9960.53 2086.39  9964.8 2085.92 9988.85 2085.8910005.13 2086.7510007.97 2086.94
10023.59 2088.0810027.29 2088.74   10033 2089.7410049.29 2091.17 10057.5    2092
10079.25 2103.32

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
  9822.2      .06 9939.11     .04510023.59      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9939.1110023.59            182.19  199.12  205.96             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.603

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9820.22 2100.89 9858.51 2090.62 9859.69 2090.33 9872.42 2088.61 9892.62 2086.98
 9900.04 2086.83 9908.81 2086.72 9911.78 2086.09  9914.3 2085.71 9922.06 2085.59
 9930.87  2085.5 9933.77 2084.36 9938.28 2082.63 9953.46 2083.38 9955.03 2083.46
 9956.67 2083.29 9962.34 2082.78 9995.99 2082.1110000.14 2081.9810001.37 2082.22
10013.55 2083.58   100162084.95310024.06 2089.47 10046.4 2099.61

Manning's n Values        num=       3
     Sta    n Val      Sta    n Val      Sta    n Val
```

```
 9820.22      .06 9955.03     .045   10016      .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9955.03   10016            198.44  202.16  198.49             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.565

INPUT
Description:
Station Elevation Data    num=      24
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9793.13  2099.5 9824.14    2090 9834.24    2088 9851.79    2086 9860.68    2084
 9864.15  2083.7 9867.51    2084 9879.85  2085.2 9914.89  2085.4 9928.81    2084
 9934.91    2082 9962.76  2081.4 9989.39  2081.3 9992.21    2080   10000  2077.9
10000.68    207810047.85  2079.610054.06  2078.710059.53    208010066.85  2081.2
10078.78    208210089.32    208410096.98    208810100.74    2090

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9793.13     .06 9989.39    .04510066.85     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9989.3910066.85            186.54  198.68  206.09             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.527

INPUT
Description:
Station Elevation Data    num=      26
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9716.97 2084.23 9737.04 2084.12  9748.6 2084.43 9755.75 2084.53 9803.87 2082.48
 9805.37 2082.42 9809.82  2082.2 9812.62 2082.04 9813.62 2082.04 9859.24 2081.64
 9934.15 2082.11 9946.88 2082.22 9948.69 2081.67 9955.95  2081.4 9966.98  2076.7
 9971.75 2073.4610003.94 2073.4210021.01 2073.2310025.45 2074.2510029.51 2075.15
 10046.6 2073.54   100552075.94510058.86 2077.0510063.76 2077.44 10068.5 2077.61
10081.21 2089.11

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9716.97     .06 9966.98    .045   10055     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.98   10055            205.48  199.77   197.7             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9716.97 9796.97    2086

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.489

INPUT
Description:
Station Elevation Data    num=      46
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9691.31    2088 9696.31    2086 9701.31    2084 9705.31    2082 9709.31    2080
 9711.31 2078.91 9720.72 2078.75 9725.08 2078.73 9730.54 2078.76 9733.49 2078.69
 9740.28 2077.45 9745.02 2075.95 9753.36 2078.33 9754.33 2078.64 9768.43 2076.75
 9772.83 2075.83 9775.88 2075.06  9778.5 2075.73 9786.12 2077.91 9805.26 2077.77
 9815.94 2077.68 9848.54 2077.61 9861.54 2076.99  9863.3 2077.05 9874.24 2077.25
 9906.53 2077.11 9933.95 2076.84 9956.16 2075.83  9959.3 2075.68 9959.74 2075.24
 9966.73 2068.9310001.05 2068.9410005.04 2069.08   10015  2071.110028.55 2070.35
```

```
10040.17 2069.7610048.45 2072.4410050.54    2073   100532074.47210056.84 2076.77
10057.84    207810059.84    208010063.84    208210066.84    208410069.84    2086
10072.84    2088

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9691.31     .06 9959.74    .045   10053     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9959.74   10053           199.93  201.48  200.43             .1       .3
Ineffective Flow     num=       1
   Sta L   Sta R    Elev
 9691.31 9726.31    2080

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.451

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9767.96 2078.02 9782.24 2071.54 9785.25 2072.25 9795.36 2074.17 9805.29 2074.38
 9842.12 2074.57 9842.76 2074.56  9843.4 2074.55 9875.71 2074.26 9887.34 2073.62
 9908.19 2072.74 9911.91 2072.54 9923.45 2070.25 9926.13 2069.63 9935.31 2070.33
 9935.86 2070.37  9936.1 2070.34 9942.43 2069.44 9948.09 2069.03 9949.12 2069.03
 9950.87 2068.21 9960.92 2064.72 9987.99 2065.3110003.65 2065.7510005.41 2065.93
10012.39 2067.3910015.02 2067.8710034.56 2075.3110043.05 2078.2610051.69 2080.28

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9767.96     .06 9949.12    .04510015.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9949.1210015.02           202.9  199.84  195.05             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.413

INPUT
Description:
Station Elevation Data    num=      30
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9828.95 2084.64    9910    2070 9933.27 2068.03 9956.56 2065.56 9967.49 2063.83
  9970.7 2063.06  9976.3 2061.52 9990.61  2061.510008.32 2061.5310015.16 2062.66
10016.03 2062.8110022.28 2064.6510034.57 2068.16 10043.2 2070.0210052.03 2070.68
10060.57 2071.3210061.91 2071.39   10083 2072.8210083.17 2072.8210083.21 2072.83
10083.24 2072.8310088.91 2072.7610129.93 2073.42 10134.4 2073.5610139.96  2073.7
10143.96    207410166.96    207610175.96    207810182.96    208010189.96    2082

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9828.95     .03 9967.49    .04510022.28     .03

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9967.4910022.28           201.11  199.08  192.87             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.376

INPUT
Description:
Station Elevation Data    num=      28
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
```

```
 9899.02  2072.5 9932.89 2065.27 9936.13 2064.85    9945  2063.7 9952.33 2063.04
 9957.25  2062.7 9961.07 2062.65 9966.42  2062.4  9982.3 2062.06 9990.46  2060.6
10001.36 2058.2110014.13 2058.3610030.95 2058.5310035.74 2061.4710038.91 2063.53
10044.22 2063.6810046.46 2063.8610081.42 2066.9810093.31 2067.1710098.87 2067.26
10111.15 2067.1310133.26 2065.6110133.98 2065.5510134.28 2065.7710134.56  2065.9
10135.04 2066.0710151.88 2075.3110159.49 2080.98

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9899.02     .06  9982.3    .04510038.91     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
        9982.310038.91           200.81  200.24  199.04             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.338

INPUT
Description:
Station Elevation Data    num=      18
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9876.17 2071.69 9898.77    2069 9916.52 2066.07 9924.08 2063.85 9943.13 2058.36
 9961.18 2058.03 9969.81 2057.93 9985.89 2055.94 9989.89 2055.39 9995.42 2055.45
10026.18  2055.810030.33 2056.65 10039.1 2058.4710068.84 2059.9410071.69  2060.1
 10096.2 2068.6310100.77  2069.910120.04 2075.95

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9876.17     .06 9969.81    .045 10039.1     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9969.81 10039.1            195.5  199.34  201.12             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.300

INPUT
Description:
Station Elevation Data    num=      15
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9825.79 2063.92 9840.87 2062.02 9857.11 2060.03 9870.03 2058.98 9880.07  2058.5
 9885.25 2058.27 9937.31 2057.23 9961.09 2057.23 9968.84 2053.25 9972.83 2051.17
10006.62 2050.7910032.85  2050.4 10036.7 2052.8810039.67 2055.1210080.59 2074.45

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9825.79     .03 9961.09     .0710039.67     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9961.0910039.67           181.56  199.02  207.41             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.262

INPUT
Description:
Station Elevation Data    num=      35
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9784.53 2064.68 9831.23 2057.52 9834.13  2057.5 9838.94 2057.32 9852.75 2056.49
 9856.81 2056.15 9873.11 2055.92 9881.65 2055.56 9892.06 2055.25 9902.14 2054.99
 9914.61 2054.66 9915.75 2054.63  9917.1 2054.55 9918.05 2054.53 9929.71 2054.33
 9953.53 2051.22 9966.02 2049.76 9971.13 2048.75 9978.17 2045.64 9980.27 2045.77
 9989.83 2046.38 9991.75 2045.77 9991.92 2045.73  9992.7 2045.63 9993.08 2045.56
```

```
 9993.85 2045.58 9995.56 2045.6210001.94 2045.6310014.24 2046.1710021.09 2046.57
   100272050.28710035.05 2055.3510038.27 2057.6210041.94 2060.3110054.17 2070.05

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9784.53     .03 9966.02     .07   10027     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.02   10027           215.76  201.31  188.69             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.224

INPUT
Description:
Station Elevation Data    num=      45
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9786.14    2065 9788.64    2064 9795.14    2062 9806.14    2060 9814.14    2058
 9823.64    2056 9833.14    2054 9836.14  2053.5 9852.85 2052.59 9863.33 2051.91
 9868.18 2051.64 9904.08 2050.51 9904.93 2050.48 9905.06 2050.47 9905.17 2050.48
 9927.71 2050.43 9932.07 2050.02 9935.61 2049.58  9941.9 2049.03 9962.25 2047.09
 9962.35 2047.08 9962.37 2047.08 9966.39 2046.75 9968.15 2046.83 9972.04 2046.83
 9978.99 2044.61 9982.76 2043.79 9991.03 2041.29 9995.99 2040.12 9996.86 2039.93
 9998.68 2039.54 9999.01 2039.4810011.01 2041.4310011.79 2041.5610011.93 2041.58
10012.04  2041.610012.27 2041.6310012.66 2041.8110022.15 2046.2210026.01 2047.28
10043.29 2052.5110047.46 2052.7310060.19 2053.1710068.31 2054.1310107.84 2060.74

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9786.14     .03 9972.04     .0710022.15     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9972.0410022.15           219.38  200.19   183.9             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.186

INPUT
Description:
Station Elevation Data    num=      55
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9790.2 2050.94 9797.02 2049.02 9801.95 2047.56 9814.83 2043.23  9815.3 2043.22
 9817.09 2043.18 9831.37 2042.99 9838.16 2042.91 9851.54  2043.6 9858.58  2043.8
 9868.26 2044.39  9877.7 2045.45 9878.46 2045.51 9879.08 2045.54 9879.26  2045.5
 9891.71 2044.32 9896.74 2044.52    9902 2044.75 9909.56 2045.23 9911.85 2045.07
 9926.81 2042.35  9928.1 2042.16 9928.51 2042.11 9929.03 2042.07  9931.4 2042.21
 9941.08 2042.82 9943.61 2042.46  9955.5 2041.09 9957.07 2041.06 9958.65 2040.79
 9964.82 2040.73 9966.91 2040.63 9969.57 2039.99 9982.08 2036.59 9982.22 2036.57
 9983.34 2036.49 9984.25 2036.44 9994.87 2035.84 9996.57  2035.7 9998.87 2035.48
 9999.96 2035.8310000.75 2036.0410003.27 2036.7310007.86 2037.7110013.12 2038.89
10015.76 2039.3510017.32 2039.7210028.49 2042.7510033.76 2044.19 10036.1 2044.43
10046.47 2045.3410047.33 2045.5410069.87 2050.7210073.54 2051.4310081.41 2052.84

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9790.2     .03 9966.91     .0710017.32     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9966.9110017.32           209.89  198.86  189.25             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.149
```

```
INPUT
Description:
Station Elevation Data    num=      52
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9788.87 2053.62  9797.2  2049.6 9806.25 2046.73 9814.78 2043.66  9819.7 2042.03
 9831.59 2038.67  9838.5 2039.34 9842.06 2039.17 9845.48 2039.17 9856.59 2039.85
 9861.54 2039.73 9871.19 2039.31 9884.23 2038.26  9885.5 2038.13 9888.59 2037.99
 9896.54 2037.68 9898.05  2037.6 9911.89 2036.94 9917.13 2036.49 9923.02 2035.98
 9924.16 2035.89 9934.51 2037.34 9940.07 2038.12 9956.47 2036.21 9956.72 2036.18
  9957.6 2036.29 9976.03 2038.28 9984.51 2034.52 9994.05 2030.34 9999.47 2029.32
10000.27 2029.2110000.44 2029.1810000.76 2029.2510002.27 2029.55 10005.2 2030.18
10012.85 2031.9110017.48  2032.710020.77 2033.7410022.77 2035.1510026.02 2037.47
 10049.4    204210050.77 2042.2910051.56 2042.2510072.81 2041.1810084.03 2038.71
10084.77 2038.5310084.88 2038.5610089.95 2040.1610090.88 2040.3910095.75 2041.77
10107.06 2046.2310119.66  2050.8

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9788.87     .03 9976.03     .0710026.02     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9976.0310026.02            195.2  200.26  204.06             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.111

INPUT
Description:
Station Elevation Data    num=      37
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9909.98 2042.96 9915.95 2041.37 9919.52 2036.89 9919.59  2036.8 9919.63  2036.8
 9928.96 2036.35  9933.9 2036.59  9935.5 2036.63 9947.28 2033.01 9955.36 2030.34
 9956.31 2030.14 9960.35 2029.67    9974 2029.52 9977.87  2029.6 9979.54 2028.94
 9987.26  2026.2 9997.43 2025.62 9998.69 2025.57 9998.85 2025.57 9999.14 2025.58
 9999.26 2025.58 10001.1 2025.6910006.88 2026.0510009.91 2027.8610011.37  2028.7
10017.48 2030.0810018.65 2030.3810019.81 2030.6710028.95 2032.7710032.09 2033.11
10039.72 2033.97 10044.3 2034.2710076.01  2035.810078.76 2035.9110079.78 2036.41
10082.62 2037.5510106.67 2047.66

Manning's n Values        num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9909.98    .055 9977.87     .0710019.81     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9977.8710019.81           200.15  200.69  200.92             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.073

INPUT
Description:
Station Elevation Data    num=      41
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
  9868.8 2048.48 9871.04 2047.01 9885.23 2036.56 9887.97 2036.55 9901.03 2035.17
 9904.74 2034.74    9912 2034.01 9919.65 2032.66 9922.76 2032.26 9929.56 2032.36
 9930.63 2032.37 9933.36  2032.1 9946.85 2030.78  9956.1 2028.74 9960.56 2027.91
 9971.38 2027.65 9972.47 2027.64 9974.13 2027.49 9986.33 2026.29 9988.42 2024.98
  9990.6  2023.5    9992 2023.31 9992.41 2023.24 9992.85 2023.17 9994.03 2023.02
 9995.61 2022.82 10000.6  2022.210001.68 2022.5210003.25 2022.9710004.19 2023.21
10004.62 2023.3210005.61 2023.7210014.22 2026.1310031.98 2025.9910032.51 2025.99
10032.81 2026.0410038.31 2026.9310057.69 2035.8110060.97 2037.2310064.02  2037.5
 10100.8 2042.91
```

```
Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
  9868.8    .055 9986.33     .0710014.22     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9986.3310014.22           193.74  200.24  204.94             .1       .3

CROSS SECTION          RIVER: Galloway
REACH: Reach 1            RS: 0.035

INPUT
Description: Cave Creek
Station Elevation Data     num=      44
     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev     Sta    Elev
 9882.58 2042.43 9882.62  2042.4 9896.08 2028.82 9904.57 2028.17 9905.49 2028.09
 9906.02 2028.09 9909.59 2027.97 9910.07 2027.96 9910.65 2027.89 9925.68 2026.39
 9934.08 2025.55 9934.54 2025.54 9954.52 2025.27 9976.19 2021.95 9977.07 2021.84
 9977.48 2021.76 9977.86 2021.78  9991.2 2022.49 9992.91 2022.13 9993.41 2022.03
 9993.84 2021.93 9995.08 2021.64 9997.38 2021.0910001.02 2020.2110001.49 2020.33
10006.17 2021.2110010.34 2023.6710010.46 2023.74 10010.8 2023.7510020.33 2023.99
10035.81 2024.7610047.35 2025.2410056.58 2027.26 10062.3 2028.4910088.06 2030.24
10098.92 2031.27 10112.1 2031.4410136.82 2031.8910160.38  2032.810177.28 2035.81
10178.05 2035.9410178.41    203610179.03 2036.1410198.45 2038.17

Manning's n Values          num=       3
     Sta   n Val     Sta   n Val     Sta   n Val
 9882.58    .055 9954.52     .07 10010.8     .06

Bank Sta: Left   Right    Lengths: Left Channel   Right     Coeff Contr.   Expan.
       9954.52 10010.8                 0       0       0             .1       .3
```

E.5.5: HEC-RAS Output (Tables 5.9.1, 5.9.2)

Table 5.9.1
HEC RAS Output - Floodplain

River	Reach	River Sta	Q Total	W.S. Elev	Crit W.S.	Vel Total	Top Width	Max Chl Dpth	Froude # XS	Sta W.S. Lft	Sta W.S. Rgt
			(cfs)	(ft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)
Andora Hills	5	3.023	2070	2306.4	2305.7	5.2	196.5	4.1	0.6	9928.4	10124.9
Andora Hills	5	2.974	2070	2303.1	2302.1	5.5	127.0	5.3	0.6	9905.9	10032.8
Andora Hills	5	2.944	2070	2301.4	2299.7	5.0	113.6	6.1	0.5	9920.4	10034.0
Andora Hills	5	2.881	2070	2296.2	2296.1	7.4	125.9	5.1	0.9	9952.1	10078.0
Andora Hills	5	2.855	2070	2294.8	2293.7	4.9	153.4	4.8	0.5	9916.1	10069.5
Andora Hills	5	2.813	2070	2291.7	2290.9	7.3	79.8	5.9	0.7	9968.0	10047.8
Andora Hills	5	2.754	2070	2288.4	2287.2	5.7	99.2	7.7	0.5	9928.3	10027.5
Andora Hills	5	2.696	2070	2283.8	2283.8	7.2	106.5	7.0	0.8	9914.8	10021.3
Andora Hills	5	2.679	2070	2282.7	2282.4	5.6	150.4	6.4	0.6	9924.2	10074.7
Andora Hills	5	2.670	2070	2282.4	2281.2	4.2	154.8	7.9	0.4	9906.8	10061.6
Andora Hills	5	2.662	Culvert								
Andora Hills	5	2.654	2070	2280.8	2280.8	6.1	161.8	6.5	0.7	9937.0	10098.8
Andora Hills	5	2.617	2260	2275.8	2274.6	6.2	108.0	5.5	0.6	9917.1	10025.1
Andora Hills	5	2.576	2260	2272.8	2271.8	6.2	109.6	5.1	0.6	9924.8	10034.4
Andora Hills	5	2.529	2260	2268.1	2267.5	8.0	78.2	6.4	0.7	9971.7	10049.9
Andora Hills	5	2.473	2260	2263.2	2262.1	6.3	99.1	6.7	0.6	9927.1	10026.2
Andora Hills	5	2.419	2260	2259.7	2258.6	5.0	176.2	6.4	0.5	9968.3	10144.5
Andora Hills	5	2.364	2260	2255.4	2254.7	7.3	94.7	5.1	0.7	9943.1	10037.8
Andora Hills	5	2.324	2260	2253.4	2252.0	4.3	213.2	6.6	0.5	9935.4	10151.0
Andora Hills	5	2.280	2260	2248.7	2248.7	9.3	69.0	7.2	0.9	9957.0	10026.0
Andora Hills	5	2.219	2260	2241.1	2239.3	3.9	177.0	6.6	0.4	9919.7	10096.8
Andora Hills	5	2.174	2260	2236.8	2236.8	10.1	72.5	5.0	1.0	9946.1	10018.5
Andora Hills	5	2.153	2260	2234.7	2234.1	5.8	133.3	6.3	0.6	9923.7	10056.9
Andora Hills	5	2.124	2260	2231.4	2231.4	6.8	127.2	7.6	0.7	9761.9	10011.2
Andora Hills	5	2.090	2260	2224.5	2224.5	8.9	75.2	8.6	0.9	9979.4	10101.3
Andora Hills	5	2.056	2260	2209.7	2208.7	8.9	57.2	7.3	0.7	9969.7	10026.9
Andora Hills	5	2.019	2500	2205.4	2204.9	8.4	80.7	6.5	0.8	9962.7	10043.4
Andora Hills	5	1.976	2500	2200.5	2199.9	8.6	69.8	7.4	0.8	9968.3	10038.1
Andora Hills	5	1.935	2500	2196.5	2196.2	7.9	99.3	6.8	0.8	9965.1	10064.3
Andora Hills	5	1.888	2500	2193.3	2193.0	5.6	172.5	6.9	0.6	9965.9	10138.3
Andora Hills	5	1.831	2500	2190.4	2189.0	5.8	116.0	7.1	0.5	9912.7	10028.7
Andora Hills	5	1.786	2500	2187.0	2186.5	7.9	91.5	6.2	0.8	9942.6	10034.1
Andora Hills	5	1.731	2500	2181.6	2181.3	7.6	120.7	5.5	0.8	9924.2	10044.9
Andora Hills	5	1.668	2620	2177.8	2176.5	5.3	163.8	7.2	0.5	9896.6	10060.4
Andora Hills	5	1.609	2620	2172.4	2172.3	9.4	86.7	5.0	0.9	9947.8	10034.5
Andora Hills	5	1.566	2620	2169.0	2168.7	5.6	189.1	5.8	0.6	9849.8	10039.0
Andora Hills	4	1.555	2395	2167.5	2167.1	7.9	99.4	5.3	0.8	9926.5	10026.0
Andora Hills	4	1.539	2395	2165.1	2165.1	7.9	120.2	4.2	0.9	9950.0	10070.2
Andora Hills	Split 1	0.244	305	2168.5	2168.0	3.5	61.0	2.2	0.5	9954.6	10015.6
Andora Hills	Split 1	0.232	305	2166.8	2166.8	5.7	54.1	1.6	1.0	9962.8	10016.9
Andora Hills	3	1.496	2700	2162.0	2160.9	4.7	245.1	5.6	0.5	9755.4	10035.5
Andora Hills	3	1.466	2700	2160.1	2160.1	5.1	304.3	8.7	0.7	9679.5	10020.1
Andora Hills	3	1.438	2700	2154.9	2154.9	9.6	85.8	7.9	0.9	9941.6	10027.4
Andora Hills	3	1.394	2700	2149.9	2149.9	8.0	112.1	6.4	0.8	9909.0	10021.1
Andora Hills	3	1.353	2700	2147.5	2145.3	3.9	188.9	6.7	0.4	9854.0	10042.9
Andora Hills	3	1.298	2700	2143.7	2143.7	8.2	104.9	8.2	0.8	9967.3	10072.2
Andora Hills	3	1.266	2700	2139.1	2139.1	12.3	46.7	6.6	1.0	9978.7	10025.5
Andora Hills	3	1.222	2700	2134.0	2133.1	8.9	69.1	7.0	0.8	9961.6	10030.6
Andora Hills	3	1.170	2700	2131.0	2129.1	7.6	68.6	8.2	0.6	9956.7	10025.3
Andora Hills	3	1.133	2700	2127.8	2127.2	9.8	60.4	7.8	0.8	9972.6	10033.0
Andora Hills	3	1.085	2700	2123.3	2123.3	8.0	125.5	7.6	0.9	9957.1	10082.6
Andora Hills	3	1.039	2700	2115.4	2115.4	8.8	84.3	7.5	0.8	9930.4	10014.6
Andora Hills	3	0.992	2750	2112.5	2111.0	5.5	119.7	7.6	0.5	9925.0	10044.8
Andora Hills	3	0.954	2750	2108.3	2108.3	10.5	62.5	7.5	0.9	9963.9	10026.4
Andora Hills	3	0.911	2900	2102.8	2102.3	8.9	96.0	4.8	0.9	9937.3	10033.3
Andora Hills	3	0.902	2900	2102.4	2099.1	7.0	52.0	7.9	0.4	9957.0	10009.0
Andora Hills	3	0.893	Culvert								
Andora Hills	3	0.884	2900	2101.6	2098.2	7.1	50.0	8.1	0.4	9957.0	10007.0
Andora Hills	3	0.854	2900	2101.1	2098.4	4.0	363.3	8.1	0.3	9684.7	10048.0
Andora Hills	3	0.830	2900	2098.8	2098.8	8.2	306.2	8.3	0.9	9664.1	10019.8
Andora Hills	3	0.816	2900	2094.5	2094.5	7.4	261.5	7.6	0.8	9762.8	10026.3
Andora Hills	3	0.805	2900	2089.2	2088.1	5.9	126.4	7.6	0.5	9863.9	10033.9
Andora Hills	3	0.797	Culvert								
Andora Hills	3	0.789	2900	2087.2	2087.2	7.4	146.9	6.9	0.8	9905.1	10052.0
Andora Hills	3	0.761	2900	2081.7	2081.7	9.9	88.9	5.0	1.0	9953.1	10042.0
Andora Hills	3	0.729	3000	2079.9	2079.5	8.8	189.7	5.6	0.9	9843.6	10043.8
Andora Hills	3	0.687	3000	2080.2	2078.2	3.9	231.5	8.1	0.4	9789.5	10021.0
Andora Hills	3	0.679	3000	2080.2	2077.0	3.5	256.4	8.9	0.3	9747.5	10019.2
Andora Hills	3	0.673	Culvert								
Andora Hills	3	0.667	3000	2076.6	2076.6	6.2	255.6	6.1	0.8	9746.4	10002.0
Andora Hills	3	0.628	3000	2072.2	2072.2	8.0	234.6	3.9	1.1	9737.3	10050.2

Table 5.9.1
HEC RAS Output - Floodplain

River	Reach	River Sta	Q Total	W.S. Elev	Crit W.S.	Vel Total	Top Width	Max Chl Dpth	Froude # XS	Sta W.S. Lft	Sta W.S. Rgt
			(cfs)	(ft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)
Andora Hills	3	0.592	3000	2067.6	2067.6	7.1	252.5	5.1	0.9	9828.2	10169.7
Andora Hills	3	0.563	3000	2063.1	2063.1	6.5	297.2	4.4	0.9	9874.9	10234.4
Andora Hills	3	0.522	3100	2060.5	2060.5	5.2	314.2	9.3	0.5	9945.7	10259.9
Andora Hills	3	0.480	3100	2053.1	2053.1	7.1	184.7	6.5	0.8	9968.2	10152.9
Andora Hills	3	0.447	3100	2050.2	2050.2	9.6	111.4	7.1	1.0	9966.9	10202.6
Andora Hills	3	0.432	3100	2048.0	2048.0	6.1	274.7	9.5	0.8	9974.4	10249.1
Andora Hills	3	0.429	Culvert								
Andora Hills	3	0.426	3100	2047.7	2047.7	6.0	249.7	9.8	0.7	9982.3	10231.9
Andora Hills	3	0.393	3100	2042.6	2040.3	5.4	165.8	9.2	0.5	9968.7	10249.9
Andora Hills	3	0.317	3100	2035.3	2035.3	8.7	136.2	6.1	1.0	9913.9	10050.1
Andora Hills	2	0.271	1913	2028.0	2028.0	9.7	70.8	5.2	1.0	9958.3	10029.1
Andora Hills	2	0.236	1913	2022.9	2022.4	9.4	53.8	6.4	0.9	9980.1	10033.9
Andora Hills	2	0.185	1913	2015.8	2015.6	10.9	41.7	6.0	0.9	9982.2	10023.9
Andora Hills	Split 2	0.093	1287	2028.4	2028.4	8.7	63.9	4.9	1.0	9986.3	10050.2
Andora Hills	Split 2	0.083	1287	2022.2	2022.2	9.5	49.2	5.7	1.0	9963.5	10012.7
Andora Hills	Split 2	0.042	1287	2016.8	2015.8	7.3	50.4	6.4	0.7	9982.2	10032.6
Andora Hills	1	0.162	3200	2013.3	2012.8	9.9	75.6	6.0	0.9	9968.5	10044.2
Andora Hills	1	0.140	3200	2012.2	2010.4	7.5	81.7	7.8	0.6	9937.8	10019.5
Andora Hills	1	0.129	3200	2010.0	2009.8	11.2	62.1	6.1	0.9	9957.3	10019.4

Table 5.9.2
HEC RAS Output - Floodway

River	Reach	River Sta	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Andora Hills	5	3.023	78.8	337.7	6.1	2307.3	2306.4	0.9
Andora Hills	5	2.974	76.6	295.9	7.0	2304.0	2303.1	0.9
Andora Hills	5	2.944	58.7	349.9	5.9	2302.4	2301.4	1.0
Andora Hills	5	2.881	44.2	194.7	10.6	2296.6	2296.2	0.5
Andora Hills	5	2.855	72.4	364.7	5.7	2295.8	2294.8	1.0
Andora Hills	5	2.813	40.2	197.5	10.5	2291.7	2291.7	0.0
Andora Hills	5	2.754	70.4	396.1	5.2	2289.4	2288.4	1.0
Andora Hills	5	2.696	30.3	190.1	10.9	2284.8	2283.8	1.0
Andora Hills	5	2.679	45.6	228.4	9.1	2283.2	2282.7	0.5
Andora Hills	5	2.670	86.6	442.8	4.7	2283.2	2282.4	0.9
Andora Hills	5	2.662	Culvert					
Andora Hills	5	2.654	86.6	262.3	7.9	2280.8	2280.8	0.0
Andora Hills	5	2.617	71.3	376.9	6.0	2276.8	2275.8	1.0
Andora Hills	5	2.576	50.8	278.7	8.1	2273.8	2272.8	1.0
Andora Hills	5	2.529	41.1	233.2	9.7	2268.7	2268.1	0.6
Andora Hills	5	2.473	65.6	347.0	6.5	2264.2	2263.2	1.0
Andora Hills	5	2.419	56.9	299.2	7.6	2260.1	2259.7	0.4
Andora Hills	5	2.364	95.2	316.8	7.1	2255.5	2255.4	0.1
Andora Hills	5	2.324	135.3	593.4	3.8	2254.4	2253.4	1.0
Andora Hills	5	2.280	27.6	166.4	13.6	2249.1	2248.7	0.3
Andora Hills	5	2.219	71.4	380.1	6.0	2241.5	2241.1	0.4
Andora Hills	5	2.174	51.5	255.9	8.8	2237.8	2236.8	1.0
Andora Hills	5	2.153	61.1	259.2	8.7	2235.3	2234.7	0.6
Andora Hills	5	2.124	108.9	337.9	6.7	2232.3	2231.4	1.0
Andora Hills	5	2.090	43.0	204.1	11.1	2225.4	2224.5	0.8
Andora Hills	5	2.056	49.4	248.4	9.1	2209.7	2209.7	0.0
Andora Hills	5	2.019	52.0	295.0	8.5	2206.2	2205.4	0.8
Andora Hills	5	1.976	36.5	231.1	10.8	2200.9	2200.5	0.3
Andora Hills	5	1.935	55.8	289.9	8.6	2197.1	2196.5	0.5
Andora Hills	5	1.888	99.3	354.0	7.1	2193.5	2193.3	0.2
Andora Hills	5	1.831	116.1	431.6	5.8	2190.4	2190.4	0.0
Andora Hills	5	1.786	91.1	313.7	8.0	2187.0	2187.0	0.0
Andora Hills	5	1.731	121.7	332.0	7.5	2181.6	2181.6	0.0
Andora Hills	5	1.668	85.6	419.3	6.3	2177.9	2177.8	0.1
Andora Hills	5	1.609	61.3	255.0	10.3	2172.5	2172.4	0.1
Andora Hills	5	1.566	160.3	439.4	6.0	2169.0	2169.0	0.0
Andora Hills	4	1.555	59.4	267.4	9.0	2167.9	2167.5	0.3
Andora Hills	4	1.539	83.4	255.0	9.4	2165.1	2165.1	0.0
Andora Hills	Split 1	0.244	61.0	87.2	3.5	2168.5	2168.5	0.0
Andora Hills	Split 1	0.232	54.1	53.3	5.7	2166.8	2166.8	0.0
Andora Hills	3	1.496	89.7	470.2	5.7	2163.0	2162.0	1.0
Andora Hills	3	1.466	65.7	290.1	9.3	2160.2	2160.1	0.1
Andora Hills	3	1.438	31.5	208.1	13.0	2155.0	2154.9	0.1
Andora Hills	3	1.394	112.1	338.5	8.0	2149.9	2149.9	0.0
Andora Hills	3	1.353	188.9	691.2	3.9	2147.5	2147.5	0.0
Andora Hills	3	1.298	104.9	330.5	8.2	2143.7	2143.7	0.0
Andora Hills	3	1.266	46.7	220.2	12.3	2139.1	2139.1	0.0
Andora Hills	3	1.222	43.8	291.8	9.3	2135.0	2134.0	1.0
Andora Hills	3	1.170	39.3	323.8	8.3	2131.9	2131.0	1.0
Andora Hills	3	1.133	33.9	238.7	11.3	2128.3	2127.8	0.5
Andora Hills	3	1.085	125.5	338.1	8.0	2123.3	2123.3	0.0
Andora Hills	3	1.039	84.3	305.4	8.8	2115.4	2115.4	0.0
Andora Hills	3	0.992	119.7	503.5	5.5	2112.5	2112.5	0.0

Table 5.9.2
HEC RAS Output - Floodway

River	Reach	River Sta	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Andora Hills	3	0.954	62.5	262.7	10.5	2108.3	2108.3	0.0
Andora Hills	3	0.911	98.3	351.1	8.3	2103.0	2102.8	0.2
Andora Hills	3	0.902	52.0	426.1	6.8	2102.7	2102.4	0.3
Andora Hills	3	0.893	Culvert					
Andora Hills	3	0.884	50.0	424.4	6.8	2102.0	2101.6	0.4
Andora Hills	3	0.854	96.8	565.4	5.1	2101.2	2101.1	0.1
Andora Hills	3	0.830	129.4	1087.1	8.2	2098.8	2098.8	0.0
Andora Hills	3	0.816	133.1	596.8	7.4	2094.5	2094.5	0.0
Andora Hills	3	0.805	126.8	493.6	5.9	2089.2	2089.2	0.0
Andora Hills	3	0.797	Culvert					
Andora Hills	3	0.789	146.9	391.6	7.4	2087.2	2087.2	0.0
Andora Hills	3	0.761	88.9	294.3	9.9	2081.7	2081.7	0.0
Andora Hills	3	0.729	105.3	422.6	8.8	2079.9	2079.9	0.0
Andora Hills	3	0.687	231.5	762.2	3.9	2080.2	2080.2	0.0
Andora Hills	3	0.679	223.7	887.6	3.5	2080.2	2080.2	0.0
Andora Hills	3	0.673	Culvert					
Andora Hills	3	0.667	255.6	485.3	6.2	2076.6	2076.6	0.0
Andora Hills	3	0.628	208.2	392.7	8.0	2072.2	2072.2	0.0
Andora Hills	3	0.592	214.5	439.5	7.1	2067.6	2067.6	0.0
Andora Hills	3	0.563	297.2	459.9	6.5	2063.1	2063.1	0.0
Andora Hills	3	0.522	185.1	776.9	5.2	2060.5	2060.5	0.0
Andora Hills	3	0.480	184.7	437.9	7.1	2053.1	2053.1	0.0
Andora Hills	3	0.447	111.4	322.6	9.6	2050.2	2050.2	0.0
Andora Hills	3	0.432	274.7	511.8	6.1	2048.0	2048.0	0.0
Andora Hills	3	0.429	Culvert					
Andora Hills	3	0.426	249.7	519.2	6.0	2047.7	2047.7	0.0
Andora Hills	3	0.393	165.8	577.4	5.4	2042.6	2042.6	0.0
Andora Hills	3	0.317	136.2	355.5	8.7	2035.3	2035.3	0.0
Andora Hills	2	0.271	70.8	197.5	9.7	2028.0	2028.0	0.0
Andora Hills	2	0.236	53.9	204.3	9.4	2022.9	2022.9	0.0
Andora Hills	2	0.185	41.6	173.9	11.0	2015.8	2015.8	0.0
Andora Hills	Split 2	0.093	63.9	147.7	8.7	2028.4	2028.4	0.0
Andora Hills	Split 2	0.083	49.2	134.9	9.5	2022.2	2022.2	0.0
Andora Hills	Split 2	0.042	50.2	174.8	7.4	2016.8	2016.8	0.0
Andora Hills	1	0.162	75.8	324.9	9.9	2013.3	2013.3	0.0
Andora Hills	1	0.140	82.2	434.5	7.4	2012.3	2012.2	0.1
Andora Hills	1	0.129	53.4	279.4	11.5	2010.1	2010.0	0.1

Table 5.9.1
HEC RAS Output - Floodplain

River	Reach	River Sta	Q Total	W.S. Elev	Crit W.S.	Vel Total	Top Width	Max Chl Dpth	Froude # XS	Sta W.S. Lft	Sta W.S. Rgt
			(cfs)	(ft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)
Galloway	8	4.832	1110	2608.0	2608.0	4.9	249.7	2.3	0.8	9777.2	10058.3
Galloway	8	4.796	1110	2604.0	2604.0	4.2	248.8	2.6	0.8	9747.1	10040.0
Galloway	8	4.770	1110	2600.9	2600.9	4.7	222.6	2.9	0.8	9783.3	10043.7
Galloway	8	4.732	1110	2595.8	2595.8	4.8	310.9	2.0	1.0	9724.2	10035.1
Galloway	8	4.694	1110	2591.2	2591.2	4.6	343.3	2.2	0.9	9654.9	10061.4
Galloway	8	4.656	1110	2585.2	2585.2	5.3	224.0	2.1	0.9	9882.2	10106.2
Galloway	Split 1	0.082	175	2582.7	2582.7	4.5	56.2	1.3	0.9	9968.9	10025.1
Galloway	Split 1	0.033	175	2578.3		4.6	32.4	2.2	0.8	9976.9	10009.3
Galloway	Split 1	0.027	175	2573.9	2573.9	6.5	21.4	2.6	1.0	9987.6	10008.9
Galloway	7	4.639	935	2582.7	2582.7	6.4	117.8	1.7	1.0	9923.5	10041.3
Galloway	7	4.618	935	2579.0	2579.0	8.5	50.7	2.7	1.0	9960.6	10011.3
Galloway	7	4.581	935	2573.8	2573.8	8.7	46.2	3.5	1.0	9970.9	10017.1
Galloway	6	4.543	1110	2569.0	2569.0	8.6	56.8	2.7	1.0	9972.8	10029.6
Galloway	6	4.505	1440	2563.1	2562.8	6.9	199.7	2.9	0.8	9955.5	10185.8
Galloway	6	4.467	1440	2559.8	2559.8	9.0	66.3	3.5	1.0	9956.9	10023.2
Galloway	6	4.429	1440	2555.0	2555.0	8.3	85.1	2.7	1.0	9922.8	10007.8
Galloway	6	4.391	1440	2550.9	2550.9	9.5	56.4	3.9	1.0	9966.3	10022.7
Galloway	6	4.353	1440	2545.6	2545.6	8.0	90.2	3.1	1.0	9961.0	10051.1
Galloway	6	4.315	1440	2541.0	2541.0	7.1	213.6	3.1	1.0	9856.7	10080.2
Galloway	6	4.277	1595	2536.0	2536.0	6.0	185.8	2.3	0.9	9877.6	10093.6
Galloway	6	4.240	1595	2531.7	2531.7	7.1	142.8	2.9	0.9	9923.4	10082.3
Galloway	6	4.202	1595	2527.5	2527.5	9.2	66.8	3.6	1.0	9993.6	10060.5
Galloway	6	4.164	1595	2523.2	2523.2	9.0	69.5	3.2	1.0	9998.0	10067.5
Galloway	6	4.126	1595	2518.8	2518.8	8.3	94.5	3.5	0.9	9976.1	10070.6
Galloway	6	4.088	1595	2512.2	2512.2	8.7	79.9	3.0	1.0	9987.5	10067.4
Galloway	6	4.050	1595	2507.8	2507.8	9.9	54.5	3.9	1.0	9973.4	10027.9
Galloway	6	4.012	1595	2501.9	2501.9	9.1	69.6	3.0	1.0	9969.6	10039.2
Galloway	6	3.974	1595	2496.5	2496.5	8.0	102.8	2.4	1.0	9911.9	10014.6
Galloway	6	3.936	1595	2491.5	2491.5	9.0	73.9	3.0	1.0	9934.3	10008.1
Galloway	6	3.899	1595	2486.4	2486.4	9.2	69.6	3.5	1.0	9952.9	10022.5
Galloway	6	3.861	1750	2480.7	2480.7	8.2	137.6	3.0	1.0	9972.4	10110.0
Galloway	6	3.823	1750	2475.9	2475.9	8.4	96.0	3.2	0.9	9960.0	10056.0
Galloway	6	3.785	1750	2470.8	2470.8	7.1	137.3	2.8	1.0	9933.7	10071.0
Galloway	6	3.747	1750	2465.0	2465.0	8.3	100.6	2.5	1.0	9982.1	10082.7
Galloway	6	3.709	1750	2460.5	2460.5	8.8	82.7	3.0	1.0	9992.5	10075.2
Galloway	6	3.671	1750	2455.4	2455.4	8.3	100.8	2.9	1.0	9931.7	10032.5
Galloway	6	3.634	1750	2450.4	2450.4	8.7	86.0	2.6	1.0	9935.4	10021.5
Galloway	6	3.596	1750	2445.7	2445.7	8.1	196.1	3.0	1.0	9877.6	10087.2
Galloway	6	3.562	1750	2441.7	2441.7	7.5	120.1	2.8	0.9	9927.0	10047.1
Galloway	6	3.528	1750	2436.6	2436.6	7.7	106.0	3.8	0.9	9942.9	10048.9
Galloway	6	3.514	1750	2434.9	2434.9	6.8	261.6	4.3	0.9	9929.1	10201.6
Galloway	6	3.504	1840	2434.3	2433.8	4.8	306.5	5.0	0.6	9909.2	10215.7
Galloway	6	3.503	Bridge								
Galloway	6	3.502	1840	2433.4	2433.4	7.5	169.7	4.3	0.9	9991.9	10161.6
Galloway	6	3.493	1840	2431.8	2431.8	7.2	134.8	3.5	1.0	9987.2	10122.1
Galloway	6	3.482	1840	2430.6	2430.6	7.7	123.4	2.8	1.0	9986.1	10109.5
Galloway	6	3.444	1840	2426.2	2426.2	8.7	92.0	2.8	1.0	9990.7	10082.7
Galloway	6	3.404	1840	2421.5	2421.5	8.4	107.7	2.6	1.0	9915.0	10022.7
Galloway	6	3.373	1840	2418.6	2414.8	4.2	190.7	8.7	0.4	9905.3	10096.0
Galloway	6	3.369	Bridge								
Galloway	6	3.364	1840	2413.6	2413.6	11.7	37.6	4.5	1.0	9990.8	10028.4
Galloway	6	3.331	1840	2409.3	2409.3	10.3	58.4	5.1	1.0	9993.0	10051.3
Galloway	6	3.292	1840	2404.5	2404.5	10.2	60.5	4.8	1.0	9980.9	10041.4
Galloway	6	3.255	1840	2398.6	2398.6	8.0	116.7	2.8	1.0	9929.7	10046.4
Galloway	6	3.216	3440	2394.7	2394.7	10.6	95.8	4.5	1.0	9968.6	10064.4
Galloway	6	3.179	3440	2391.5	2391.5	10.7	92.1	4.3	1.0	9953.8	10045.8
Galloway	6	3.141	3440	2387.1	2387.1	9.7	124.8	3.8	1.0	9956.5	10081.3
Galloway	6	3.103	3440	2382.4	2382.4	8.8	162.2	3.4	1.0	9905.2	10067.5
Galloway	6	3.066	3440	2378.9	2378.9	9.9	115.0	4.5	1.0	9957.2	10072.2
Galloway	6	3.027	3440	2375.2	2375.2	8.9	289.9	4.2	0.9	9883.9	10212.3
Galloway	6	2.988	3440	2370.2	2370.2	8.0	209.7	3.7	1.0	9886.6	10096.3
Galloway	6	2.952	3440	2366.3	2366.3	9.4	144.3	3.4	1.0	9953.7	10098.0
Galloway	6	2.913	3440	2362.4	2362.4	8.1	267.0	4.1	0.9	9824.9	10106.0
Galloway	6	2.889	3440	2359.4	2359.4	6.6	321.8	4.7	0.8	9872.4	10195.3
Galloway	Split 2	0.240	216	2355.5		4.5	52.8	1.9	0.8	9985.8	10048.3
Galloway	Split 2	0.213	216	2351.6	2351.6	4.3	72.6	2.1	0.9	9949.0	10105.3
Galloway	Split 2	0.156	216	2344.1		4.8	47.4	2.1	0.9	9991.9	10039.4
Galloway	Split 2	0.129	216	2341.5		4.4	48.5	2.1	0.8	9992.2	10040.6

Table 5.9.1
HEC RAS Output - Floodplain

River	Reach	River Sta	Q Total	W.S. Elev	Crit W.S.	Vel Total	Top Width	Max Chl Dpth	Froude # XS	Sta W.S. Lft	Sta W.S. Rgt
			(cfs)	(ft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)
Galloway	Split 2	0.088	216	2337.4	2337.4	5.5	86.7	2.6	0.9	9984.9	10072.5
Galloway	2	0.046	216	2331.7	2331.7	4.2	74.1	1.2	1.0	9941.4	10015.5
Galloway	5	2.872	3224	2354.3	2354.3	9.9	116.6	4.4	1.0	9955.4	10072.0
Galloway	5	2.837	3224	2350.1	2350.1	9.9	111.0	4.8	0.9	9927.3	10038.3
Galloway	5	2.799	3224	2345.3	2345.3	10.2	98.1	3.7	1.0	9919.7	10017.8
Galloway	5	2.760	3224	2340.1	2340.1	11.0	79.4	5.2	1.0	9930.9	10010.3
Galloway	5	2.723	3224	2334.7	2334.7	10.4	248.7	6.2	1.0	9924.6	10173.2
Galloway	5	2.679	3224	2329.2		7.5	182.6	3.0	0.9	9957.8	10140.3
Galloway	4	2.647	3440	2326.8		8.4	135.2	4.2	0.9	9965.9	10101.1
Galloway	4	2.610	3440	2323.6	2323.6	10.6	93.3	5.0	1.0	9933.1	10026.3
Galloway	4	2.572	3440	2320.4	2320.4	9.6	132.5	6.1	0.9	9965.4	10097.9
Galloway	4	2.534	3440	2315.2	2315.2	9.0	153.4	3.8	1.0	9986.8	10140.2
Galloway	4	2.496	3440	2311.1	2311.1	10.4	101.4	4.7	1.0	9925.7	10027.1
Galloway	4	2.458	3440	2306.5	2306.5	9.5	192.8	4.7	1.0	9892.3	10188.0
Galloway	4	2.420	3440	2301.6	2301.6	9.2	140.2	5.3	0.9	9929.8	10111.2
Galloway	4	2.382	3440	2297.3	2297.3	8.7	152.9	4.7	1.0	9954.6	10107.5
Galloway	4	2.344	3440	2292.4	2292.4	10.5	94.7	3.9	1.0	9992.2	10086.9
Galloway	4	2.299	4410	2289.7	2289.7	8.8	218.4	4.8	0.9	9827.7	10046.2
Galloway	4	2.281	4410	2289.5	2286.7	5.4	218.7	7.2	0.4	9868.3	10087.0
Galloway	4	2.275	Culvert								
Galloway	4	2.268	4410	2285.5	2285.5	11.4	108.2	4.3	1.0	9929.2	10037.5
Galloway	4	2.240	4410	2280.6	2280.6	10.1	148.5	4.4	1.0	9942.3	10090.7
Galloway	4	2.193	4410	2275.9	2275.9	9.2	185.8	3.9	1.0	9876.4	10062.2
Galloway	4	2.162	4410	2272.3	2272.3	9.3	562.0	5.3	1.0	9455.2	10030.8
Galloway	4	2.098	5490	2264.4	2264.4	7.5	378.2	3.8	1.0	9850.1	10228.3
Galloway	4	2.041	5490	2257.4	2257.4	7.1	439.8	3.8	1.0	9930.2	10457.9
Galloway	4	2.004	6060	2253.0	2253.0	5.9	514.0	4.0	0.9	9924.2	10438.2
Galloway	4	1.966	6060	2248.3	2248.3	7.5	337.9	4.1	0.9	9937.6	10369.6
Galloway	4	1.928	6060	2244.5	2244.5	7.1	392.2	4.7	0.8	9900.9	10306.2
Galloway	4	1.917	6060	2243.0	2243.0	7.2	327.0	5.0	0.9	9910.8	10237.9
Galloway	4	1.890	6060	2241.0		7.3	176.0	6.3	0.6	9973.4	10149.4
Galloway	4	1.846	6060	2236.8	2236.8	13.6	79.1	7.3	1.0	9963.4	10042.5
Galloway	4	1.815	6060	2231.8	2231.8	13.4	83.5	6.8	1.0	9986.4	10069.9
Galloway	4	1.790	6060	2228.6	2228.6	12.5	250.3	7.0	1.0	9983.5	10247.0
Galloway	4	1.761	6060	2224.6	2224.6	10.5	145.8	6.1	0.9	9932.1	10078.0
Galloway	4	1.739	6060	2221.6	2221.6	12.7	94.7	6.0	1.0	9939.4	10034.1
Galloway	4	1.701	6060	2216.4	2216.4	10.9	156.1	5.5	0.9	9977.5	10133.6
Galloway	4	1.663	6060	2212.3	2212.3	12.4	104.1	5.8	1.0	9966.3	10070.4
Galloway	4	1.625	6060	2207.5	2207.5	12.2	108.1	5.6	1.0	9927.9	10036.0
Galloway	4	1.587	6060	2204.2	2204.2	12.8	98.3	6.6	1.0	9914.5	10012.7
Galloway	4	1.549	6060	2200.5	2200.5	11.5	126.5	6.5	0.9	9927.3	10053.8
Galloway	4	1.511	6060	2195.3	2195.3	12.9	98.8	5.7	1.0	9921.9	10020.7
Galloway	3	1.474	10800	2191.6	2191.6	6.8	581.1	6.5	0.8	9940.6	10521.7
Galloway	3	1.435	10800	2186.7	2186.7	8.6	409.0	5.9	1.0	9925.6	10345.1
Galloway	3	1.397	10800	2182.4	2182.4	9.4	302.7	5.5	1.0	9917.2	10219.9
Galloway	3	1.360	10800	2177.8	2177.8	9.2	326.0	5.2	1.0	9905.3	10231.3
Galloway	3	1.331	10800	2174.3	2174.3	8.8	344.8	5.2	1.0	9923.1	10268.0
Galloway	3	1.284	10800	2166.6	2166.6	10.6	241.9	6.5	1.0	9916.1	10158.0
Galloway	3	1.246	10800	2163.7	2163.1	8.6	285.7	7.7	0.8	9829.4	10115.1
Galloway	3	1.209	10800	2159.1	2159.1	12.5	410.6	6.6	1.4	9671.0	10081.6
Galloway	3	1.171	10800	2155.6	2155.6	6.9	544.9	7.4	0.8	9659.1	10204.0
Galloway	3	1.133	10800	2150.4	2150.4	7.2	471.2	8.2	0.8	9706.5	10276.5
Galloway	3	1.110	10800	2147.7	2147.7	6.2	713.4	9.3	0.8	9742.0	10561.4
Galloway	3	1.095	10800	2146.0	2146.0	5.8	708.5	8.2	0.8	9810.5	10529.7
Galloway	2	1.056	6693	2140.6	2140.6	11.6	135.2	5.5	1.0	9887.8	10023.0
Galloway	2	1.019	6693	2136.9	2136.9	12.3	110.3	6.3	1.0	9965.4	10075.6
Galloway	2	0.974	6693	2133.2	2133.2	11.9	103.7	10.2	0.9	9959.8	10063.5
Galloway	2	0.941	6693	2126.4	2126.4	12.6	100.6	7.3	1.0	9959.8	10060.4
Galloway	Split 3	0.148	4107	2141.8	2141.8	5.2	345.4	10.2	0.6	9681.3	10026.7
Galloway	Split 3	0.115	4107	2137.1	2137.1	6.4	301.4	9.3	0.6	9749.5	10050.9
Galloway	Split 3	0.072	4107	2132.7	2132.7	5.2	358.6	8.2	0.8	9751.7	10110.3
Galloway	Split 3	0.035	4107	2127.2	2127.2	9.3	118.1	7.3	1.0	9945.4	10063.5
Galloway	1	0.905	10800	2124.4		9.4	224.9	9.1	0.7	9969.9	10194.8
Galloway	1	0.896	10800	2124.6	2122.5	7.6	266.8	9.8	0.5	9963.8	10230.6
Galloway	1	0.868	10800	2124.6	2120.0	5.8	348.1	11.8	0.4	9908.7	10256.8
Galloway	1	0.866	Bridge								
Galloway	1	0.864	10800	2119.0	2119.0	13.2	168.1	6.9	1.0	9957.2	10125.3
Galloway	1	0.845	10800	2115.4		11.6	183.3	5.9	0.9	9936.5	10119.8

Table 5.9.1
HEC RAS Output - Floodplain

River	Reach	River Sta	Q Total	W.S. Elev	Crit W.S.	Vel Total	Top Width	Max Chl Dpth	Froude # XS	Sta W.S. Lft	Sta W.S. Rgt
			(cfs)	(ft)	(ft)	(ft/s)	(ft)	(ft)		(ft)	(ft)
Galloway	1	0.792	13500	2110.5	2110.5	12.5	189.5	7.2	1.0	9934.1	10123.6
Galloway	1	0.754	13500	2108.5	2108.5	11.3	247.7	8.9	0.9	9799.2	10046.8
Galloway	1	0.711	13500	2103.6	2103.6	10.3	252.8	10.9	0.8	9818.2	10070.9
Galloway	1	0.678	13500	2100.9	2100.9	10.4	217.6	12.1	0.8	9825.1	10042.7
Galloway	1	0.641	13500	2095.1	2095.1	11.2	220.5	9.2	0.9	9843.0	10063.5
Galloway	1	0.603	13500	2091.6	2091.6	12.3	174.0	9.6	1.0	9854.8	10028.8
Galloway	1	0.565	13500	2087.3	2087.3	10.4	255.6	9.4	0.9	9840.1	10095.7
Galloway	1	0.527	13500	2083.6	2083.6	10.5	298.0	10.4	0.8	9777.1	10075.1
Galloway	1	0.489	13500	2079.6	2079.6	9.3	349.3	10.6	0.7	9710.1	10059.4
Galloway	1	0.451	13500	2076.4	2076.4	9.8	266.4	11.7	0.8	9771.4	10037.8
Galloway	1	0.413	13500	2072.3	2072.3	13.5	178.5	10.8	0.8	9897.1	10075.7
Galloway	1	0.376	13500	2069.5	2069.5	10.6	228.2	11.3	0.9	9913.1	10141.3
Galloway	1	0.338	13500	2064.8	2064.8	12.8	164.3	9.4	1.0	9920.9	10085.2
Galloway	1	0.300	13500	2060.9		12.4	202.3	10.5	0.7	9849.7	10052.0
Galloway	1	0.262	13500	2057.3	2057.3	12.9	199.1	11.8	0.7	9838.8	10037.9
Galloway	1	0.224	13500	2053.6	2053.6	12.3	228.9	14.2	0.7	9835.3	10064.2
Galloway	1	0.186	13500	2046.8	2046.8	12.1	248.7	11.3	0.7	9804.2	10052.9
Galloway	1	0.149	13500	2041.9	2041.8	11.7	266.7	12.7	0.6	9820.1	10096.1
Galloway	1	0.111	13500	2039.8		10.5	170.8	14.2	0.6	9917.2	10088.0
Galloway	1	0.073	13500	2035.1	2035.0	13.7	154.2	12.9	0.9	9901.9	10056.1
Galloway	1	0.035	13500	2032.5	2030.9	9.5	259.8	12.3	0.6	9892.5	10152.2
Grapevine	1	0.210	5720	2216.7	2216.7	7.3	405.4	5.1	1.0	9665.7	10141.8

Table 5.9.2
HEC RAS Output - Floodway

River	Reach	River Sta	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Galloway	8	4.832	249.7	228.6	4.9	2608.0	2608.0	0.0
Galloway	8	4.796	248.8	262.6	4.2	2604.0	2604.0	0.0
Galloway	8	4.770	221.8	235.8	4.7	2600.9	2600.9	0.0
Galloway	8	4.732	175.3	202.9	5.5	2595.8	2595.8	0.0
Galloway	8	4.694	186.6	193.8	5.7	2591.2	2591.2	0.1
Galloway	8	4.656	224.0	210.9	5.3	2585.2	2585.2	0.0
Galloway	Split 1	0.082	56.2	39.4	4.5	2582.7	2582.7	0.0
Galloway	Split 1	0.033	32.4	38.4	4.6	2578.3	2578.3	0.0
Galloway	Split 1	0.027	21.4	27.0	6.5	2573.9	2573.9	0.0
Galloway	7	4.639	117.8	145.5	6.4	2582.7	2582.7	0.0
Galloway	7	4.618	50.7	110.0	8.5	2579.0	2579.0	0.0
Galloway	7	4.581	46.2	107.3	8.7	2573.8	2573.8	0.0
Galloway	6	4.543	56.8	128.6	8.6	2569.0	2569.0	0.0
Galloway	6	4.505	76.1	187.8	7.7	2563.1	2563.1	0.0
Galloway	6	4.467	66.3	160.3	9.0	2559.8	2559.8	0.0
Galloway	6	4.429	85.1	174.3	8.3	2555.0	2555.0	0.0
Galloway	6	4.391	56.4	152.4	9.5	2550.9	2550.9	0.0
Galloway	6	4.353	87.0	177.8	8.1	2545.6	2545.6	0.0
Galloway	6	4.315	88.3	179.9	8.0	2541.1	2541.0	0.1
Galloway	6	4.277	148.0	240.5	6.6	2536.1	2536.0	0.1
Galloway	6	4.240	90.8	203.8	7.8	2531.8	2531.7	0.1
Galloway	6	4.202	66.8	173.4	9.2	2527.5	2527.5	0.0
Galloway	6	4.164	65.0	173.5	9.2	2523.2	2523.2	0.0
Galloway	6	4.126	94.5	191.8	8.3	2518.8	2518.8	0.0
Galloway	6	4.088	79.9	183.2	8.7	2512.2	2512.2	0.0
Galloway	6	4.050	54.5	160.8	9.9	2507.8	2507.8	0.0
Galloway	6	4.012	69.6	174.8	9.1	2501.9	2501.9	0.0
Galloway	6	3.974	99.0	197.5	8.1	2496.5	2496.5	0.0
Galloway	6	3.936	69.0	175.4	9.1	2491.5	2491.5	0.0
Galloway	6	3.899	69.6	173.4	9.2	2486.4	2486.4	0.0
Galloway	6	3.861	73.9	191.6	9.1	2480.8	2480.7	0.0
Galloway	6	3.823	96.0	209.5	8.4	2475.9	2475.9	0.0
Galloway	6	3.785	104.6	221.2	7.9	2470.9	2470.8	0.1
Galloway	6	3.747	92.0	205.5	8.5	2465.0	2465.0	0.0
Galloway	6	3.709	82.7	199.1	8.8	2460.5	2460.5	0.0
Galloway	6	3.671	94.0	206.2	8.5	2455.4	2455.4	0.0
Galloway	6	3.634	80.0	197.3	8.9	2450.4	2450.4	0.0
Galloway	6	3.596	85.0	201.2	8.7	2445.9	2445.7	0.2
Galloway	6	3.562	77.6	193.6	9.0	2441.7	2441.7	0.0
Galloway	6	3.528	106.0	228.0	7.7	2436.6	2436.6	0.0
Galloway	6	3.514	142.8	380.1	6.8	2434.9	2434.9	0.0
Galloway	6	3.504	182.4	571.6	4.8	2434.3	2434.3	0.0
Galloway	6	3.503 B	R U 182.3	492.4	6.1	2434.3	2434.3	0.0
Galloway	6	3.503 B	R D 189.2	488.9	5.8	2434.1	2434.1	0.0
Galloway	6	3.502	105.4	245.5	7.5	2433.4	2433.4	0.0
Galloway	6	3.493	103.3	235.2	7.8	2432.1	2431.8	0.3
Galloway	6	3.482	123.4	239.7	7.7	2430.6	2430.6	0.0
Galloway	6	3.444	92.0	212.4	8.7	2426.2	2426.2	0.0
Galloway	6	3.404	95.0	214.1	8.6	2421.5	2421.5	0.0
Galloway	6	3.373	190.7	441.5	4.2	2418.6	2418.6	0.0
Galloway	6	3.369 B	R U 136.2	247.1	7.5	2418.6	2418.6	0.0

Table 5.9.2
HEC RAS Output - Floodway

River	Reach	River Sta	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Galloway	6	3.369 B	R D 93.3	225.4	8.2	2417.4	2417.4	0.0
Galloway	6	3.364	37.6	158.0	11.7	2413.6	2413.6	0.0
Galloway	6	3.331	58.4	178.8	10.3	2409.3	2409.3	0.0
Galloway	6	3.292	60.5	180.6	10.2	2404.5	2404.5	0.0
Galloway	6	3.255	114.0	228.8	8.0	2398.6	2398.6	0.0
Galloway	6	3.216	95.8	324.0	10.6	2394.7	2394.7	0.0
Galloway	6	3.179	92.1	320.7	10.7	2391.5	2391.5	0.0
Galloway	6	3.141	120.7	352.7	9.8	2387.1	2387.1	0.0
Galloway	6	3.103	160.0	389.3	8.8	2382.4	2382.4	0.0
Galloway	6	3.066	115.0	346.8	9.9	2378.9	2378.9	0.0
Galloway	6	3.027	90.3	322.9	10.7	2375.2	2375.2	0.0
Galloway	6	2.988	209.7	431.3	8.0	2370.2	2370.2	0.0
Galloway	6	2.952	144.3	366.0	9.4	2366.3	2366.3	0.0
Galloway	6	2.913	146.8	405.3	8.5	2362.4	2362.4	-0.1
Galloway	6	2.889	265.2	508.7	6.8	2359.4	2359.4	0.0
Galloway	Split 2	0.240	52.8	47.7	4.5	2355.5	2355.5	0.0
Galloway	Split 2	0.213	72.6	49.7	4.3	2351.6	2351.6	0.0
Galloway	Split 2	0.156	47.4	44.7	4.8	2344.1	2344.1	0.0
Galloway	Split 2	0.129	48.5	49.0	4.4	2341.5	2341.5	0.0
Galloway	Split 2	0.088	29.7	131.7	5.5	2337.4	2337.4	0.0
Galloway	Split 2	0.046	74.1	51.2	4.2	2331.7	2331.7	0.0
Galloway	5	2.872	116.6	326.1	9.9	2354.3	2354.3	0.0
Galloway	5	2.837	111.0	324.6	9.9	2350.1	2350.1	0.0
Galloway	5	2.799	98.1	314.8	10.2	2345.3	2345.3	0.0
Galloway	5	2.760	79.4	293.0	11.0	2340.1	2340.1	0.0
Galloway	5	2.723	95.0	1075.1	10.4	2334.7	2334.7	0.0
Galloway	5	2.679	179.0	432.7	7.5	2329.2	2329.2	0.0
Galloway	4	2.647	135.2	410.6	8.4	2326.8	2326.8	0.0
Galloway	4	2.610	93.3	324.3	10.6	2323.6	2323.6	0.0
Galloway	4	2.572	132.5	357.3	9.6	2320.4	2320.4	0.0
Galloway	4	2.534	110.6	359.3	9.6	2315.3	2315.2	0.1
Galloway	4	2.496	94.6	326.1	10.6	2311.1	2311.1	0.0
Galloway	4	2.458	128.7	426.7	9.5	2306.5	2306.5	0.0
Galloway	4	2.420	140.2	372.5	9.2	2301.6	2301.6	0.0
Galloway	4	2.382	152.9	394.0	8.7	2297.3	2297.3	0.0
Galloway	4	2.344	94.7	326.6	10.5	2292.4	2292.4	0.0
Galloway	4	2.299	168.2	551.1	8.8	2289.7	2289.7	0.0
Galloway	4	2.281	169.5	872.3	5.4	2289.5	2289.5	0.0
Galloway	4	2.275	Culvert					
Galloway	4	2.268	97.5	394.9	11.4	2285.5	2285.5	0.0
Galloway	4	2.240	148.5	437.3	10.1	2280.6	2280.6	0.0
Galloway	4	2.193	185.8	479.2	9.2	2275.9	2275.9	0.0
Galloway	4	2.162	179.1	1046.6	9.3	2272.3	2272.3	0.0
Galloway	4	2.098	327.9	832.1	7.5	2264.4	2264.4	0.0
Galloway	4	2.041	355.4	846.8	7.1	2257.4	2257.4	0.0
Galloway	4	2.004	514.0	1026.3	5.9	2253.0	2253.0	0.0
Galloway	4	1.966	337.9	811.8	7.5	2248.3	2248.3	0.0
Galloway	4	1.928	367.8	895.3	7.1	2244.5	2244.5	0.0
Galloway	4	1.917	327.0	846.4	7.2	2243.0	2243.0	0.0
Galloway	4	1.890	176.0	831.5	7.3	2241.0	2241.0	0.0
Galloway	4	1.846	79.1	444.4	13.6	2236.8	2236.8	0.0

Table 5.9.2
HEC RAS Output - Floodway

River	Reach	River Sta	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Galloway	4	1.815	83.5	451.7	13.4	2231.8	2231.8	0.0
Galloway	4	1.790	92.5	915.8	12.5	2228.6	2228.6	0.0
Galloway	4	1.761	145.8	578.1	10.5	2224.6	2224.6	0.0
Galloway	4	1.739	94.7	477.2	12.7	2221.6	2221.6	0.0
Galloway	4	1.701	136.5	577.0	10.9	2216.4	2216.4	0.0
Galloway	4	1.663	104.1	489.1	12.4	2212.3	2212.3	0.0
Galloway	4	1.625	108.1	495.5	12.2	2207.5	2207.5	0.0
Galloway	4	1.587	98.3	473.0	12.8	2204.2	2204.2	0.0
Galloway	4	1.549	126.5	525.6	11.5	2200.5	2200.5	0.0
Galloway	4	1.511	98.8	468.5	12.9	2195.3	2195.3	0.0
Galloway	3	1.474	581.1	1585.9	6.8	2191.6	2191.6	0.0
Galloway	3	1.435	409.0	1260.6	8.6	2186.7	2186.7	0.0
Galloway	3	1.397	302.7	1148.1	9.4	2182.4	2182.4	0.0
Galloway	3	1.360	326.0	1171.4	9.2	2177.8	2177.8	0.0
Galloway	3	1.331	344.8	1229.7	8.8	2174.3	2174.3	0.0
Galloway	3	1.284	241.9	1022.0	10.6	2166.6	2166.6	0.0
Galloway	3	1.246	245.1	1324.3	8.6	2163.7	2163.7	0.0
Galloway	3	1.209	336.6	911.1	12.5	2159.1	2159.1	0.0
Galloway	3	1.171	500.9	1666.0	6.9	2155.6	2155.6	0.0
Galloway	3	1.133	471.2	1490.9	7.2	2150.4	2150.4	0.0
Galloway	3	1.110	574.6	2175.9	6.2	2147.7	2147.7	0.0
Galloway	3	1.095	708.5	1864.8	5.8	2146.0	2146.0	0.0
Galloway	2	1.056	135.2	577.6	11.6	2140.6	2140.6	0.0
Galloway	2	1.019	110.3	546.3	12.3	2136.9	2136.9	0.0
Galloway	2	0.974	103.7	563.3	11.9	2133.2	2133.2	0.0
Galloway	2	0.941	100.6	530.9	12.6	2126.4	2126.4	0.0
Galloway	Split 3	0.148	345.4	797.9	5.2	2141.8	2141.8	0.0
Galloway	Split 3	0.115	301.4	644.4	6.4	2137.1	2137.1	0.0
Galloway	Split 3	0.072	358.6	796.2	5.2	2132.7	2132.7	0.0
Galloway	Split 3	0.035	118.1	440.2	9.3	2127.2	2127.2	0.0
Galloway	1	0.905	224.9	1152.0	9.4	2124.4	2124.4	0.0
Galloway	1	0.896	216.2	1484.1	7.6	2124.6	2124.6	0.0
Galloway	1	0.868	254.3	2066.6	5.8	2124.6	2124.6	0.0
Galloway	1	0.866 B	R U 254.3	1510.8	8.4	2124.6	2124.6	0.0
Galloway	1	0.866 B	R D 280.5	1210.9	8.9	2123.1	2123.1	0.0
Galloway	1	0.864	168.1	821.6	13.2	2119.0	2119.0	0.0
Galloway	1	0.845	183.3	931.2	11.6	2115.4	2115.4	0.0
Galloway	1	0.792	189.5	1078.7	12.5	2110.5	2110.5	0.0
Galloway	1	0.754	211.8	1282.7	11.3	2108.5	2108.5	0.0
Galloway	1	0.711	252.8	1310.4	10.3	2103.6	2103.6	0.0
Galloway	1	0.678	217.6	1303.2	10.4	2100.9	2100.9	0.0
Galloway	1	0.641	220.5	1204.5	11.2	2095.1	2095.1	0.0
Galloway	1	0.603	174.0	1101.2	12.3	2091.6	2091.6	0.0
Galloway	1	0.565	255.6	1297.8	10.4	2087.3	2087.3	0.0
Galloway	1	0.527	278.2	1292.6	10.5	2083.6	2083.6	0.0
Galloway	1	0.489	333.1	1456.6	9.3	2079.6	2079.6	0.0
Galloway	1	0.451	266.4	1377.0	9.8	2076.4	2076.4	0.0
Galloway	1	0.413	178.5	1003.8	13.5	2072.3	2072.3	0.0
Galloway	1	0.376	228.2	1275.2	10.6	2069.5	2069.5	0.0
Galloway	1	0.338	164.3	1055.5	12.8	2064.8	2064.8	0.0
Galloway	1	0.300	202.3	1091.4	12.4	2060.9	2060.9	0.0

Table 5.9.2
HEC RAS Output - Floodway

River	Reach	River Sta	Top Wdth Act	Area	Vel Total	W.S. Elev	Base WS	Prof Delta WS
			(ft)	(sq ft)	(ft/s)	(ft)	(ft)	(ft)
Galloway	1	0.262	199.1	1047.5	12.9	2057.3	2057.3	0.0
Galloway	1	0.224	228.9	1099.6	12.3	2053.6	2053.6	0.0
Galloway	1	0.186	248.7	1117.0	12.1	2046.8	2046.8	0.0
Galloway	1	0.149	266.7	1156.0	11.7	2041.9	2041.9	0.0
Galloway	1	0.111	170.8	1284.6	10.5	2039.8	2039.8	0.0

Floodplain Delineation Study of Andora Hills & Galloway Washes, FCD 99-14

Community Name: Maricopa County, Arizona
Date Prepared: May, 2002
Study Contractor Name: JE Fuller/Hydrology & Geomorphology, Inc.
6101 S. Rural Road, Suite 110, Tempe, AZ 85283
Flooding Source: Andora Hills Wash and Galloway Wash
Disk 1 of 1

The following HEC-1 files are included on this disk:

Input files:

gwm224.dat	11/29/01 4:28 PM
gwm26.dat	12/30/99 1:56 PM

Output files:

Gwm224.out	11/29/01 4:40 PM
Gwm26.out	12/30/99 1:37 PM

The following HECRAS files are included on this disk:

Flow data files:

andora.f02	8/15/2001 5:21 PM
galloway.f01	3/26/2002 5:24 PM

Geometry data files:

andora.g02	4/08/2002 9:13 AM
galloway.g01	4/03/2002 4:14 PM

Output data files:

andora.O02	5/17/2002 11:28 AM
galloway.O01	5/17/2002 10:45 AM

Plan data files:

andora.p02	8/16/2001 4:32 PM
galloway.p01	3/26/2002 5:24 PM

Project files:

andora.prj	5/17/2002 11:28 AM
galloway.prj	4/04/2002 10:50 AM

Report files:

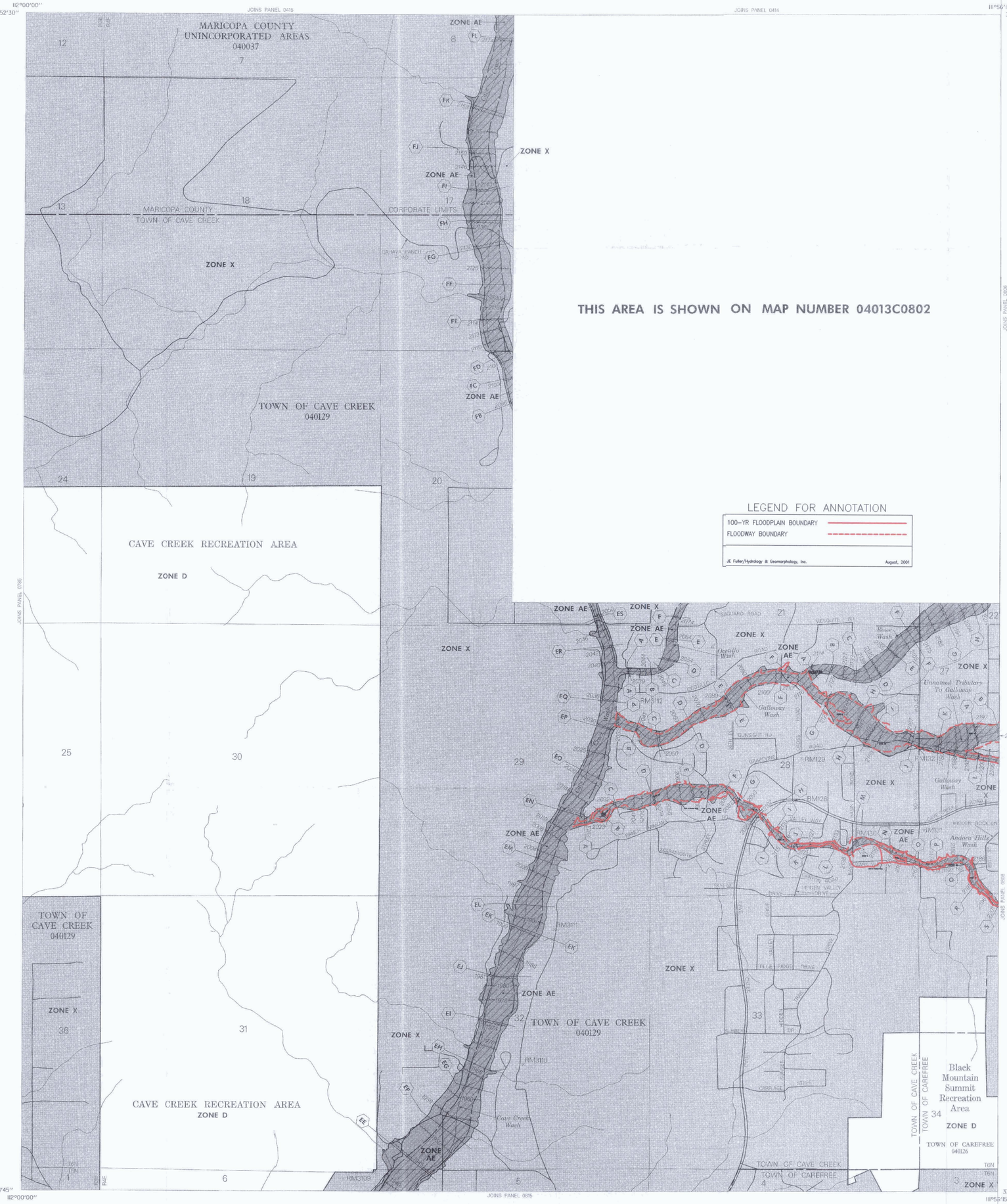
andora.rep	5/17/2002 11:28 AM
galloway.rep	5/17/2002 11:22 AM

HYDRAULICS STUDY WORK MAPS

FDS of Andora Hills & Galloway Washes
FCD 99-14
February, 2001

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM128	2127.89	Top of pavement at centerline intersection of Cave Creek and Spur Cross Roads.
RM129	2132.16	Top concrete base of corner fence post on south side of Grapevine Road at Spur Cross Road, north.
RM130	2164.75	Chiseled square in concrete base for flagpole in front of American Legion Post 34, on south side of Cave Creek Road, 0.2 mile west of School House Road.
RM131	2186.35	Top of -inch rebar at centerline intersection of Cave Creek and School House Roads.
RM132	2175.38	Top pavement at centerline intersection of School House and Grapevine Roads.
RM3109	1993.22	Located at the top of USGLO brass cap at northeast corner of section 6, T5N, R4E.
RM3110	1985.02	Located at the top of brass cap in concrete 7 feet west of power line and 7 feet west of power and telephone pole #PS10076 60 being in the southeast quarter of section 32, T6N, R4E, approximate coordinates N1025619.4, E484463.9.
RM3111	2005.81	Located at the top of brass cap in concrete 10 feet north and 6 feet west of electric transformer #M66450 being on the west side of Andora Hills Wash Drive, being in the northeast quarter of section 32, T6N, R4E, approximate coordinates N1028278.3, E485054.4.
RM3112	2057.34	Located at the top of brass cap in concrete 10 feet south of Ocotillo Road and 55th Street, being in the northeast quarter of section 29, T6N, R4E, approximate coordinates N1032723.2, E486628.2.



THIS AREA IS SHOWN ON MAP NUMBER 04013C0802

LEGEND FOR ANNOTATION

100-YR FLOODPLAIN BOUNDARY
FLOODWAY BOUNDARY

JE Fuller/Hydrology & Geomorphology, Inc. August, 2001

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction ; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100 year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100 year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Identified 1983 | Identified 1990 | Otherwise Protected Areas

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.

D — D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.

RM7 × — Elevation Reference Mark

• M2 — River Mile

97°07'30", 32°22'30" — Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for more detailed data on BFE's, and for any information on floodway delineations, prior to use of this map for property purchase or construction purposes.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, A1-A30, AH, AO, A99, V, VE and V1-V30.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown as 100 inch.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and/or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1980

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
SEPTEMBER 29, 1989, DECEMBER 3, 1993

Map revised July 19, 2001 to update corporate limits, to change base flood elevations, to add base flood elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

LEGEND

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations and therefore may not exactly reflect the flood elevation data presented in the FIS. BFEs shown on the FIRM are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

ERM elevations listed on this map were obtained and/or developed to establish vertical control for determination of flood elevations and floodplain boundaries portrayed on this map. Users should be aware that these ERM elevations may have changed since the publication of this map. To obtain up-to-date elevation information on National Geodetic Survey (NGS) ERMs shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov. Map users should seek verification of non-NGS ERM monument elevations when using these elevations for construction or floodplain management purposes.

Coastal BFE's shown on this map may apply only landward of 0.0' NGVD. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

MAP ROOM 0805G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 805 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CAREFREE, TOWN OF	040126	0805	G
CAVE CREEK, TOWN OF	040129	0805	G
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	0805	G

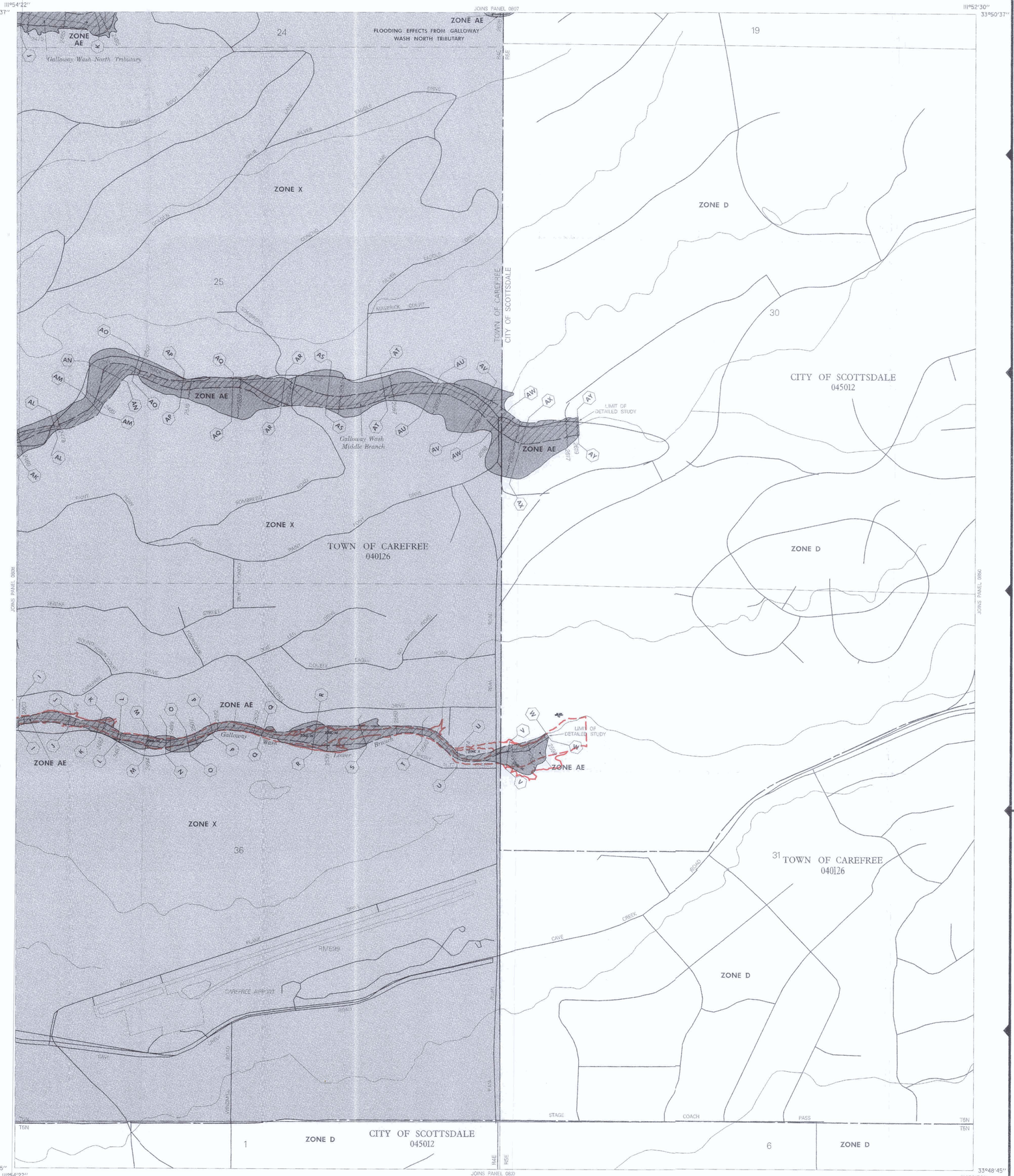
MAP NUMBER
04013C0805 G

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM599	2503.56	Carefree Airport, in island for fuel pump, in concrete slab and flush with surface, standard tablet stamped 21 HRP 1963 2504.



LEGEND FOR ANNOTATION

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	

JE Fuller/Hydrology & Geomorphology, Inc. August, 2001

LEGEND

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ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

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Identified 1983 | Identified 1990 | Otherwise Protected Areas

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Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

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• M2 — River Mile

97°07'30", 32°22'30" — Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

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Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 120 inch.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and /or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

For community map revision history prior to countywide mapping, see Section 8.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
SEPTEMBER 29, 1989, SEPTEMBER 4, 1991, DECEMBER 3, 1993

Map revised July 19, 2001 to update corporate limits, to change base flood elevations, to add base flood elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
500 0 500

MAP ROOM 0809H

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 809 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CAREFREE, TOWN OF	040126	0809	H
SCOTTSDALE, CITY OF	045012	0809	H

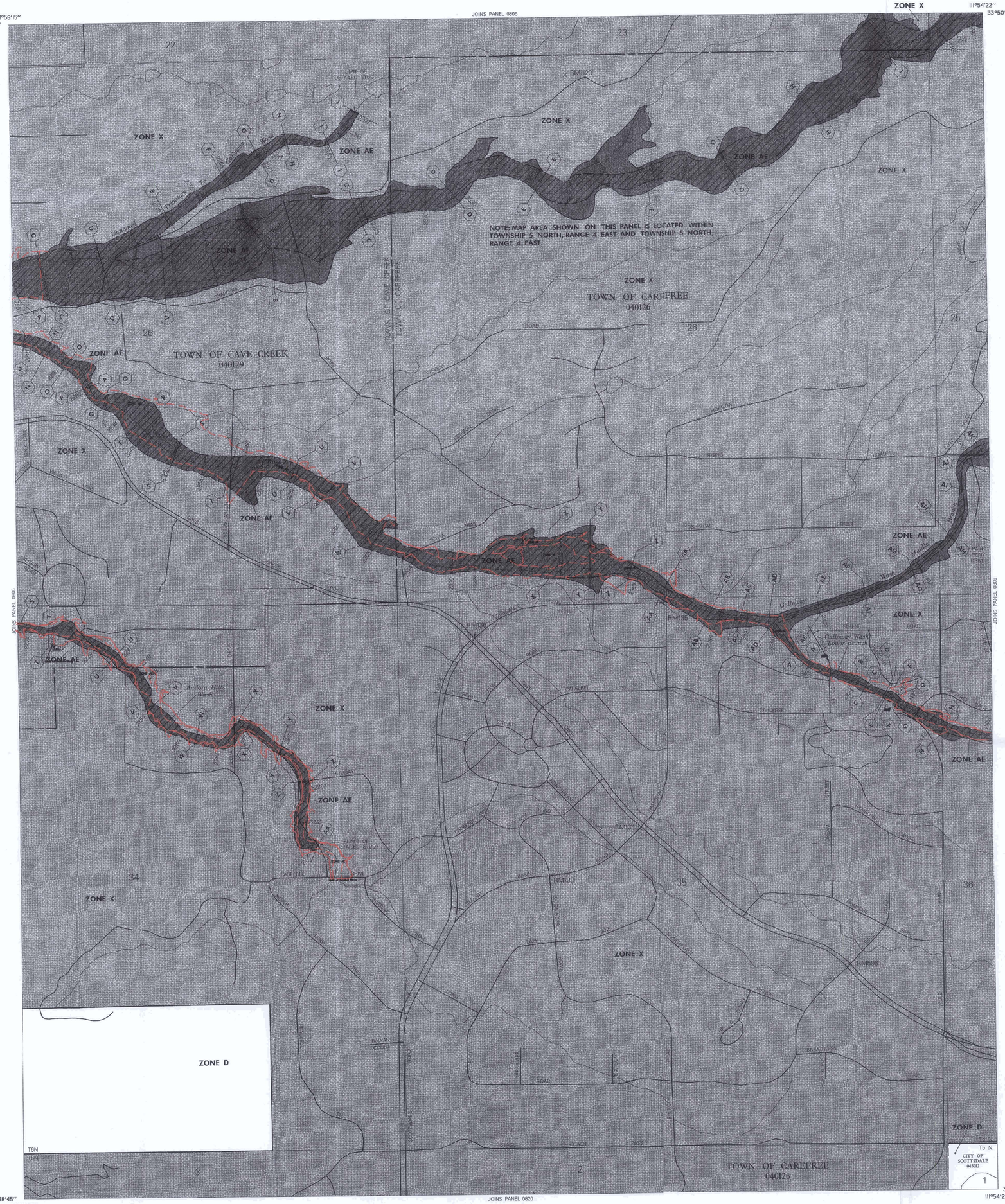
MAP NUMBER
04013C0809 H

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FEET NGVD)	DESCRIPTION OF LOCATION
RM133	2373.54	Top of pavement at centerline intersection of Sidewinder and Bloody Basin Roads.
RM134	2389.00	Top of pavement at centerline intersection of Cave Creek and Bloody Basin Roads.
RM135	2375.04	Top square of concrete base at northwest corner of intersection of Sundance and Tranquil Trails.
RM136	2344.24	Rim of handhole at centerline intersection of Cave Creek and Scottsdale Roads.
RM598	2445.00	Intersection of Cave Creek Road and Long Rifle Road South, copper nail and washer.
RM1123	2406.61	Brass cap in headwall N85W, 1708 feet to the approximate northeast corner of section 27, T6N, R4E.



LEGEND FOR ANNOTATION

100-YR FLOODPLAIN BOUNDARY
FLOODWAY BOUNDARY

JE Fuller/Hydrology & Geomorphology, Inc. April, 2002

LEGEND

To obtain more detailed information in areas where Base Flood Elevations (BFE's) and /or floodways have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFE's shown on the FIRM represent rounded whole-foot elevations and therefore may not exactly reflect the flood elevation data presented in the FIS. BFE's shown on the FIRM are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and /or floodplain management.

ERM elevations listed on this map were obtained and/or developed to establish vertical control for determination of flood elevations and floodplain boundaries portrayed on this map. Users should be aware that these ERM elevations may have changed since the publication of this map. To obtain up-to-date elevation information on National Geodetic Survey (NGS) ERM's shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov. Map users should seek verification of non-NGS ERM monument elevations when using these elevations for construction or floodplain management purposes.

Coastal BFE's shown on this map may apply only landward of 0.0' NGVD. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and /or floodplain management purposes when they are higher than the elevations shown on this FIRM.

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction ; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Identified 1983 | Identified 1990 | Otherwise Protected Areas

Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

~~~513~~~ Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.

(D)——(D) Cross Section Line

(EL. 987) Base Flood Elevation in Feet Where Uniform Within Zone. See Map Index for Elevation Datum.

RM7 × Elevation Reference Mark

• M2 River Mile

97°07'30", 32°22'30" Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for more detailed data on BFE's, and for any information on floodway delineations, prior to use of this map for property purchase or construction purposes.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, A1-A30, AH, AO, A99, V, VE and V1-V30.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Refer to Floodway Data Table where floodway width is shown at 1/20 inch.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and /or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1988

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
SEPTEMBER 29, 1989, SEPTEMBER 4, 1991, DECEMBER 3, 1993

Map revised July 19, 2001 to update corporate limits, to change base flood elevations, to add base flood elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to update map format, to add roads and road names, and to incorporate previously issued Letters of Map Revision.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
500 0 500

MAP ROOM 0808H

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 808 OF 4350
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
CAREFREE, TOWN OF	040126	0808	H
CAVE CREEK, TOWN OF	040129	0808	H
SCOTTSDALE, CITY OF	045012	0808	H

MAP NUMBER
04013C0808 H

MAP REVISED:
JULY 19, 2001

Federal Emergency Management Agency
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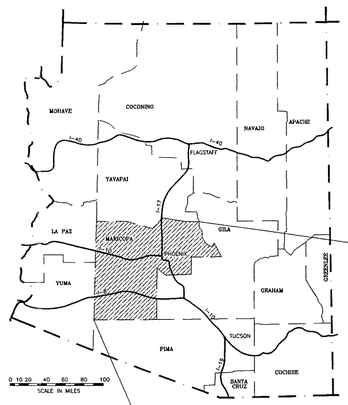
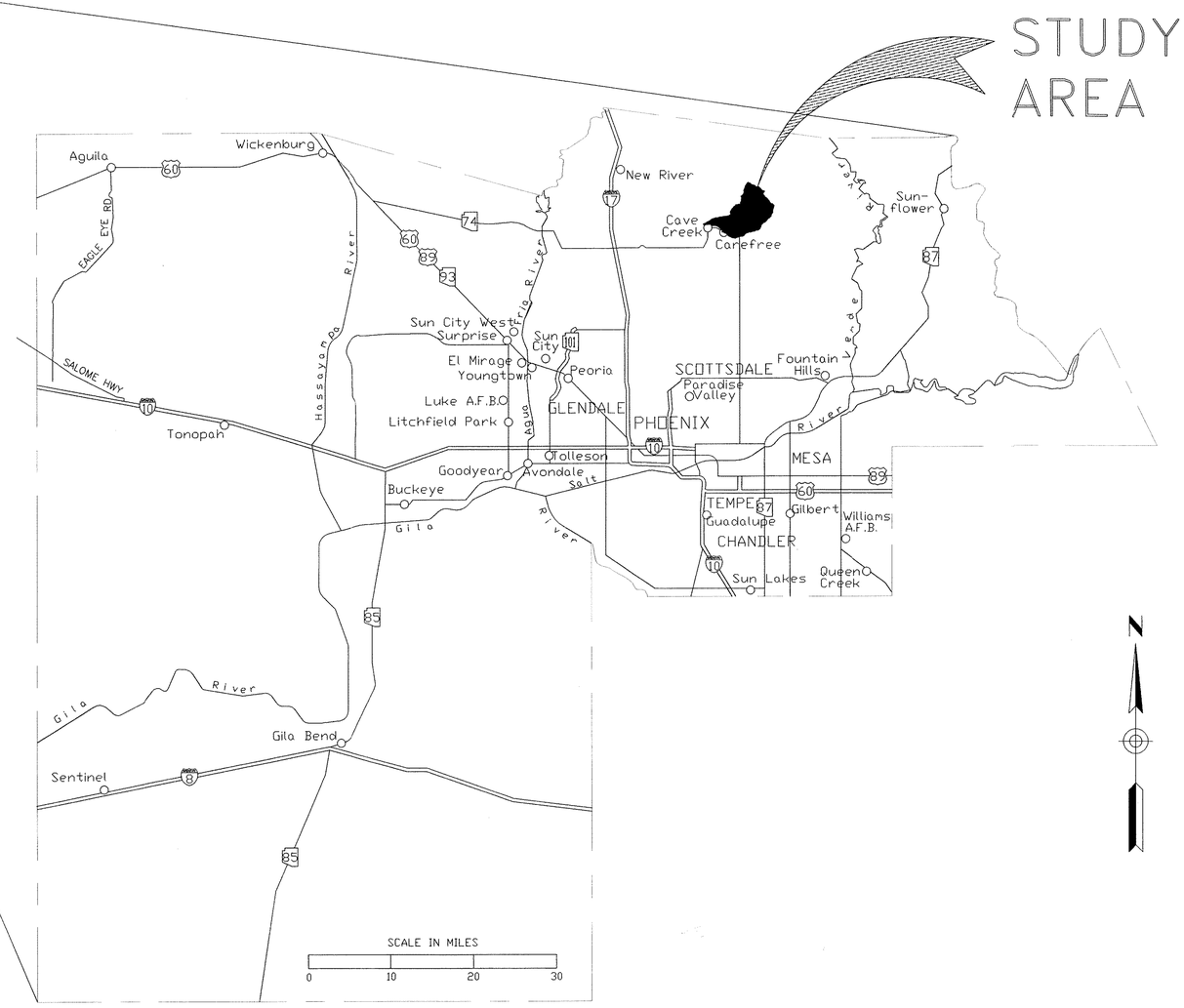
FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES

FCD 99-14





MARICOPA COUNTY

NOTES

1. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929
2. ALL HORIZONTAL COORDINATES ARE BASED ON ARIZONA STATE PLANE COORDINATES BASED ON THE 1983 NORTH AMERICAN DATUM

STATEMENTS OF PROFESSIONAL REGISTRANTS

THE GROUND CONTROL SURVEY WAS PREPARED UNDER MY DIRECT SUPERVISION.

REGISTERED LAND SURVEYOR
CERTIFICATE NO.
24530
DAVID A. RHINE
ARIZONA U.S.A.

THE FLOODPLAIN AND FLOODWAY DELINEATIONS WERE PREPARED UNDER MY DIRECT SUPERVISION USING HYDROLOGY FROM FCD 95-28 AND NEW HYDROLOGY UNDER THIS CONTRACT.

REGISTERED PROFESSIONAL ENGINEER (CIVIL)
CERTIFICATE NO.
56395
BRIAN R. ISERMAN
ARIZONA U.S.A.

FLOOD CONTROL DISTRICT of MARICOPA COUNTY

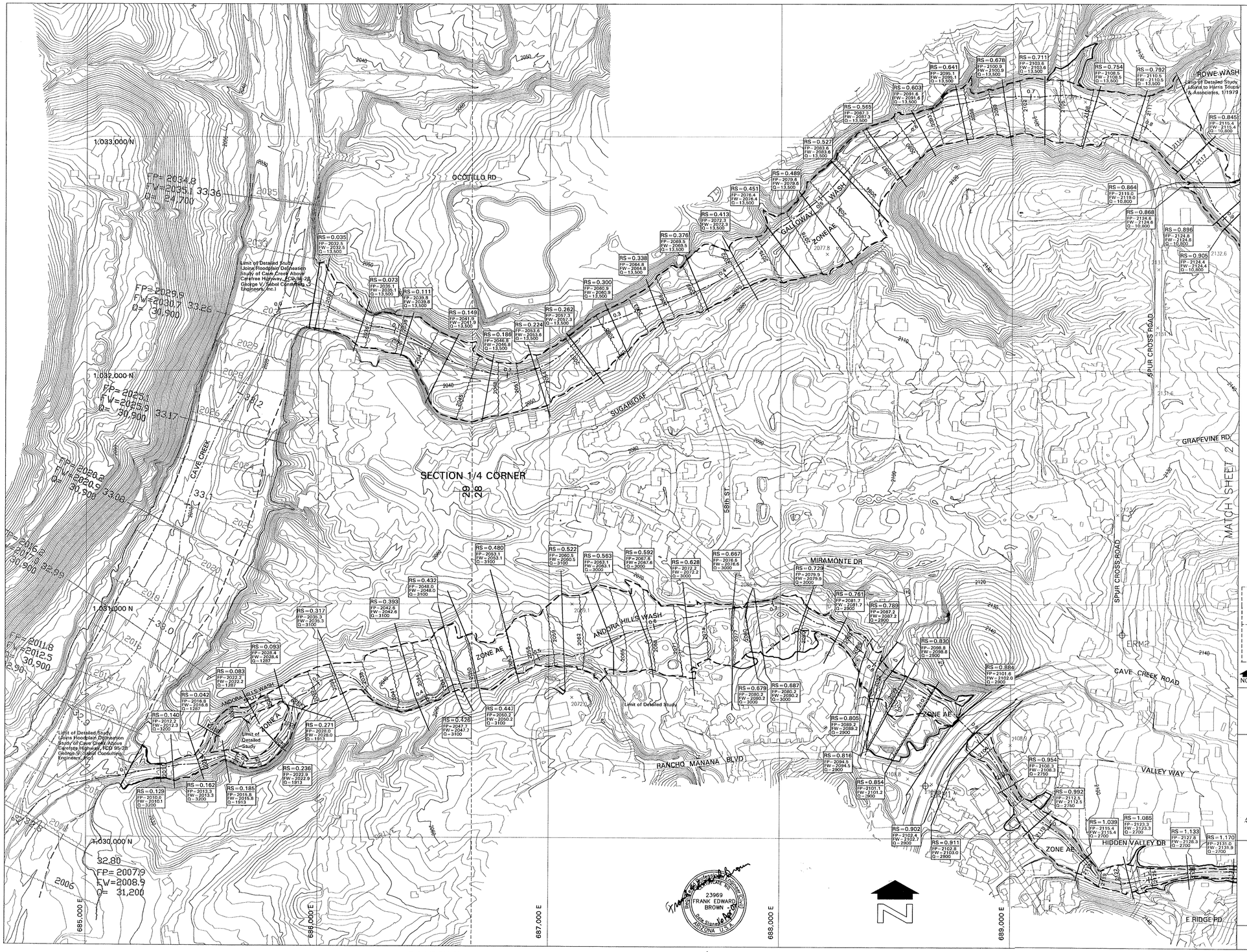
LOCATION MAP

APRIL, 2002

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

APRIL, 2002



LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE WITH RIVER MILE	1.2 — 1.3
CROSS SECTION	RS = 0.300, FP = 2081.0, FW = 2061.5, Q = 13,700
ELEVATION REFERENCE MARK	ERM 4
BASE FLOOD ELEVATIONS	2060
ZONE DESIGNATIONS	ZONE AE
CORPORATE LIMITS	TOWN OF CAVECREEK
SECTION LINE	

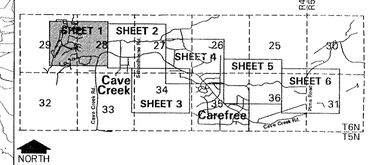
ELEVATION REFERENCE MARKS

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 1	2107.87	BC AT C/L INTERSECTION OF CAVE CREEK RD AND RANCHO MANANA BLVD, SECTION 28, T6N, R4E (N1030225.88, E688635.02)
ERM 2	2128.59	BC AT C/L OF SPUR CROSS RD APPROX 115 FT NORTH OF CAVE CREEK RD, SECTION 28, T6N, R4E (N1030858, E689461.65)

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.
2. HORIZONTAL PROJECTION IS ARIZONA STATEPLANE, CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983.
3. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR: 1988 NGVD = 2.05 + 1929 NGVD

INDEX MAP



200 0' 200 400

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 29325 BRIAN R. ISERMAN Date Signed ARIZONA, U.S.A.

Registered Land Surveyor CERTIFICATE NO. 24530 DAVID A. RHINE Date Signed 6/14/02 ARIZONA, U.S.A.

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed ARIZONA, U.S.A.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC

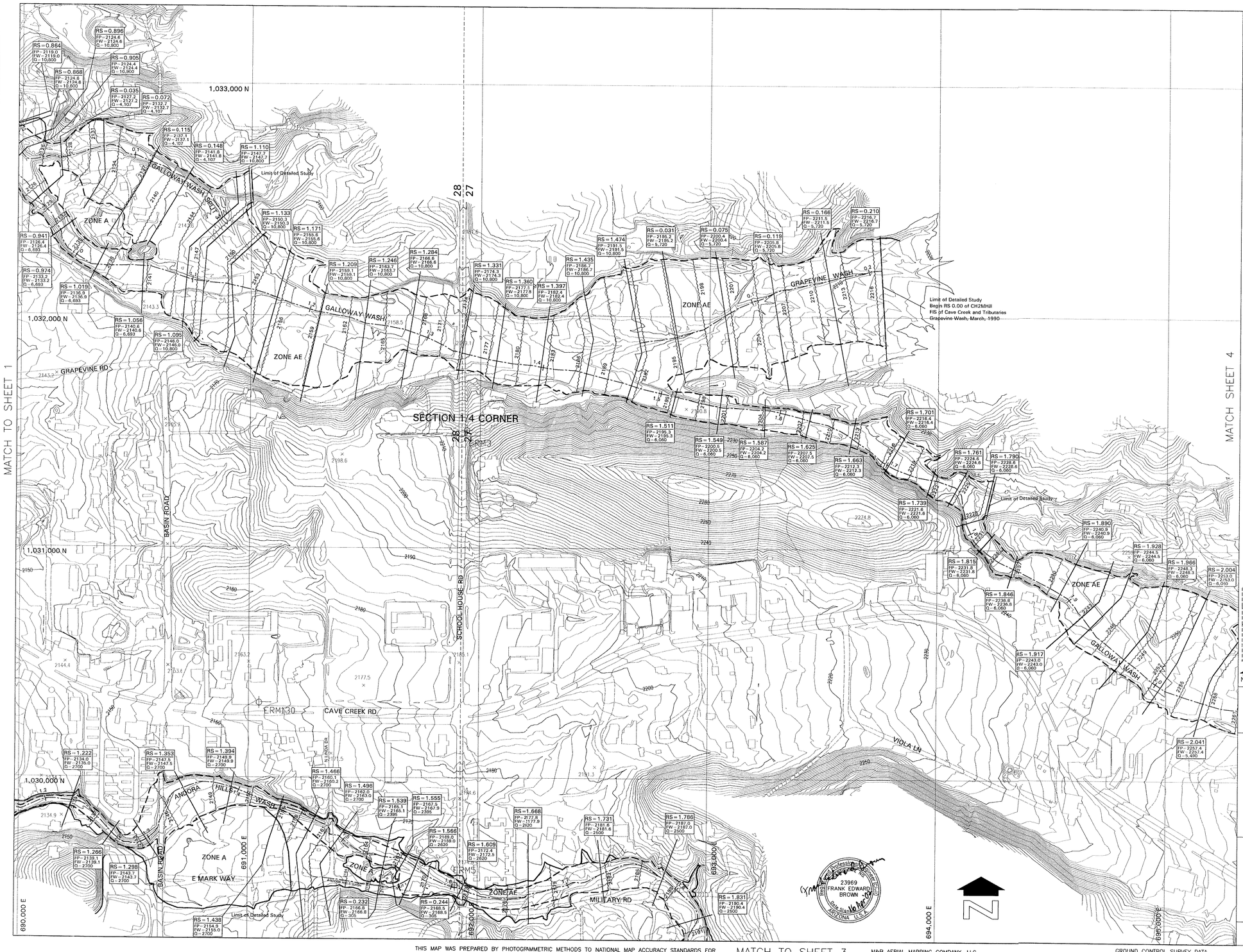
in association with

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS. FLIGHT DATE: 9/30/99

M&B AERIAL MAPPING COMPANY, LLC

GROUND CONTROL SURVEY DATA PROVIDED BY A TEAM PROFESSIONAL ASSOCIATES, INC.



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

APRIL, 2002

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE WITH RIVER MILE	1.2 1.3
CROSS SECTION	RS = 0.300 FP - 2061.0 FW - 2061.5 Q - 13,700
ELEVATION REFERENCE MARK	ERM 4
BASE FLOOD ELEVATIONS	2060
ZONE DESIGNATIONS	ZONE AE
CORPORATE LIMITS	TOWN OF CAVE CREEK
SECTION LINE	

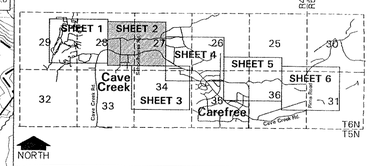
ELEVATION REFERENCE MARKS

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 3	2209.95	EJ COR., MCHD BC IN HANDHOLE AT C/L OF SCHOOL HOUSE RD, APPROX. 0.2 MI N OF CAVE CREEK RD, SECTIONS 27-28, T6N, R4E (N1031481.10, E691918.75)
ERM 5	2168.60	FCDMC BC ON STONE BASE AT N END OF CUTOFF WALL ON W SIDEOF SCHOOL HOUSE RD AT ANDORA HILLS WASH, APPROX. 0.14 MI S OF CAVE CREEK RD, S28, T6N, R4E (N1029534.74,E691901.8)
ERM 130	2164.75	CHISELED SQUARE IN CONCRETE FLAGPOLE BASE AT AMERICAN LEGION POST 34, ON N SIDE OF CAVE CREEK RD, 0.2 MI W OF SCHOOL HOUSE RD, S28, T6N, R4E (N1030324.4, E691046-55)

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.
2. HORIZONTAL PROJECTION IS ARIZONA STATEPLANE, CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983.
3. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR: 1988 NGVD = 2.05 + 1929 NGVD

INDEX MAP



200 0' 200 400

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 23325 BRIAN R. ISERMAN Date Signed 10-16-02

REGISTERED LAND SURVEYOR CERTIFICATE NO. 24530 DAVID A. RHINE Date Signed 10-16-02

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed 10-16-02 ARIZONA, U.S.A.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC
in association with
DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

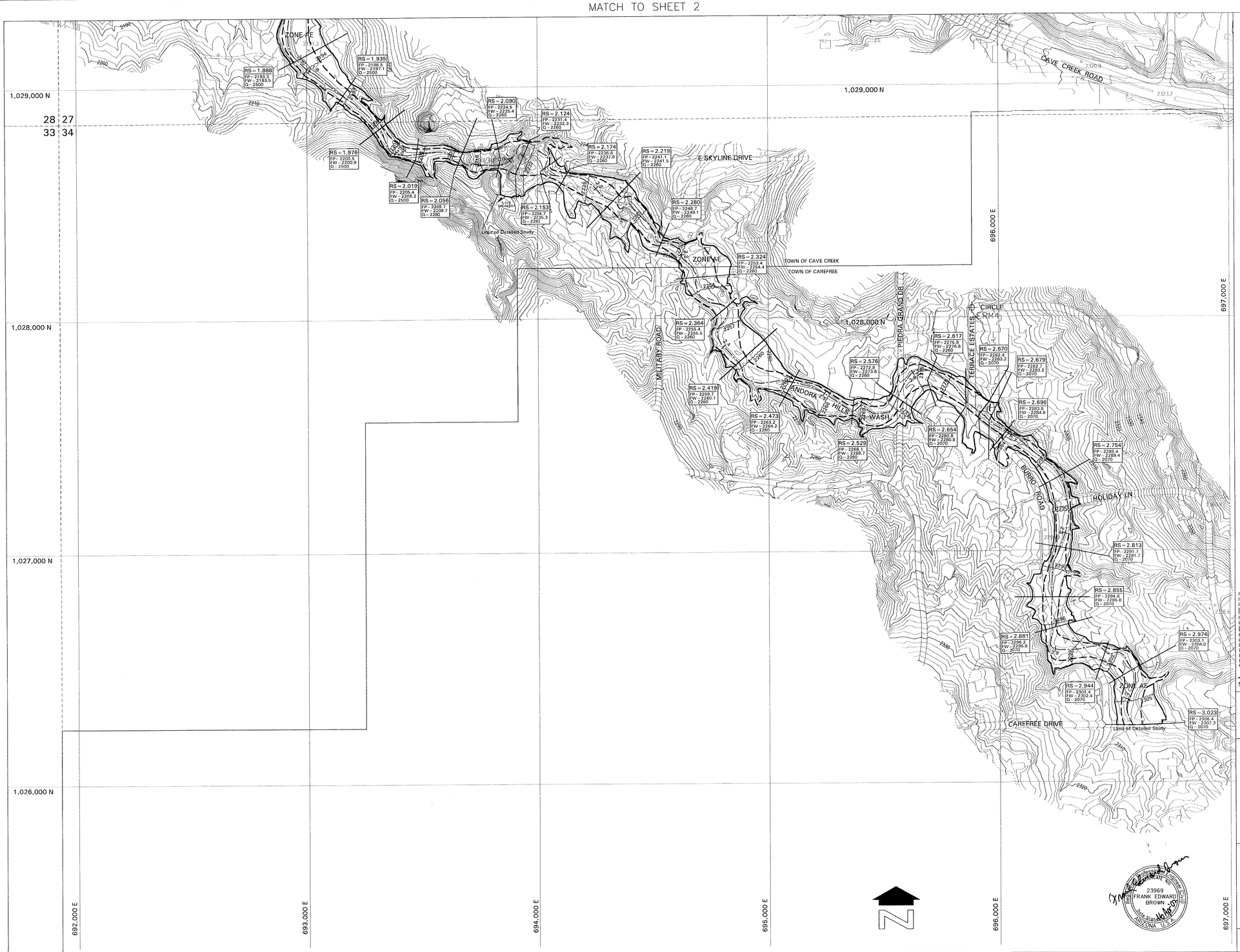
SHEET 2 OF 6

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS. FLIGHT DATE: 9/30/99

M&B AERIAL MAPPING COMPANY, LLC

GROUND CONTROL SURVEY DATA PROVIDED BY A TEAM PROFESSIONAL ASSOCIATES, INC.

MATCH TO SHEET 2



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

APRIL, 2002

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE WITH RIVER MILE	1.2 — 1.3
CROSS SECTION	RS = 0.300 / FP - 2061.0 / FW - 2061.5 / Q - 13,700
ELEVATION REFERENCE MARK	ERM 4
BASE FLOOD ELEVATIONS	2060
ZONE DESIGNATIONS	ZONE AE
CORPORATE LIMITS	TOWN OF CAVE CREEK
SECTION LINE	

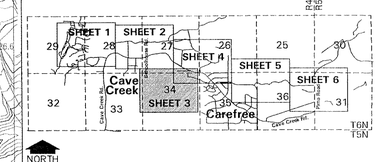
ELEVATION REFERENCE MARKS

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 4	2290.43	BC IN C/L OF TERRACE ESTATES CIRCLE, APPROXIMATELY 1000 FEET NORTH OF INTERSECTION OF BURRO ROAD AND HOLIDAY LANE, S34, T6N, R4E (N1028038.59, E695882.82)

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.
2. HORIZONTAL PROJECTION IS ARIZONA STATEPLANE, CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983.
3. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR: 1988 NGVD = 2.05 + 1929 NGVD

INDEX MAP



200 0' 200 400

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

Registered Professional Engineer (Civil) CERTIFICATE NO. 29325 BRIAN R. ISERMAN Date Signed 4/18/02 ARIZONA U.S.A.

Registered Land Surveyor CERTIFICATE NO. 24530 DAVID A. RHINE Date Signed 4/18/02 ARIZONA U.S.A.

Registered Professional Engineer (Civil) CERTIFICATE NO. 23969 FRANK EDWARD BROWN Date Signed 4/18/02 ARIZONA U.S.A.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

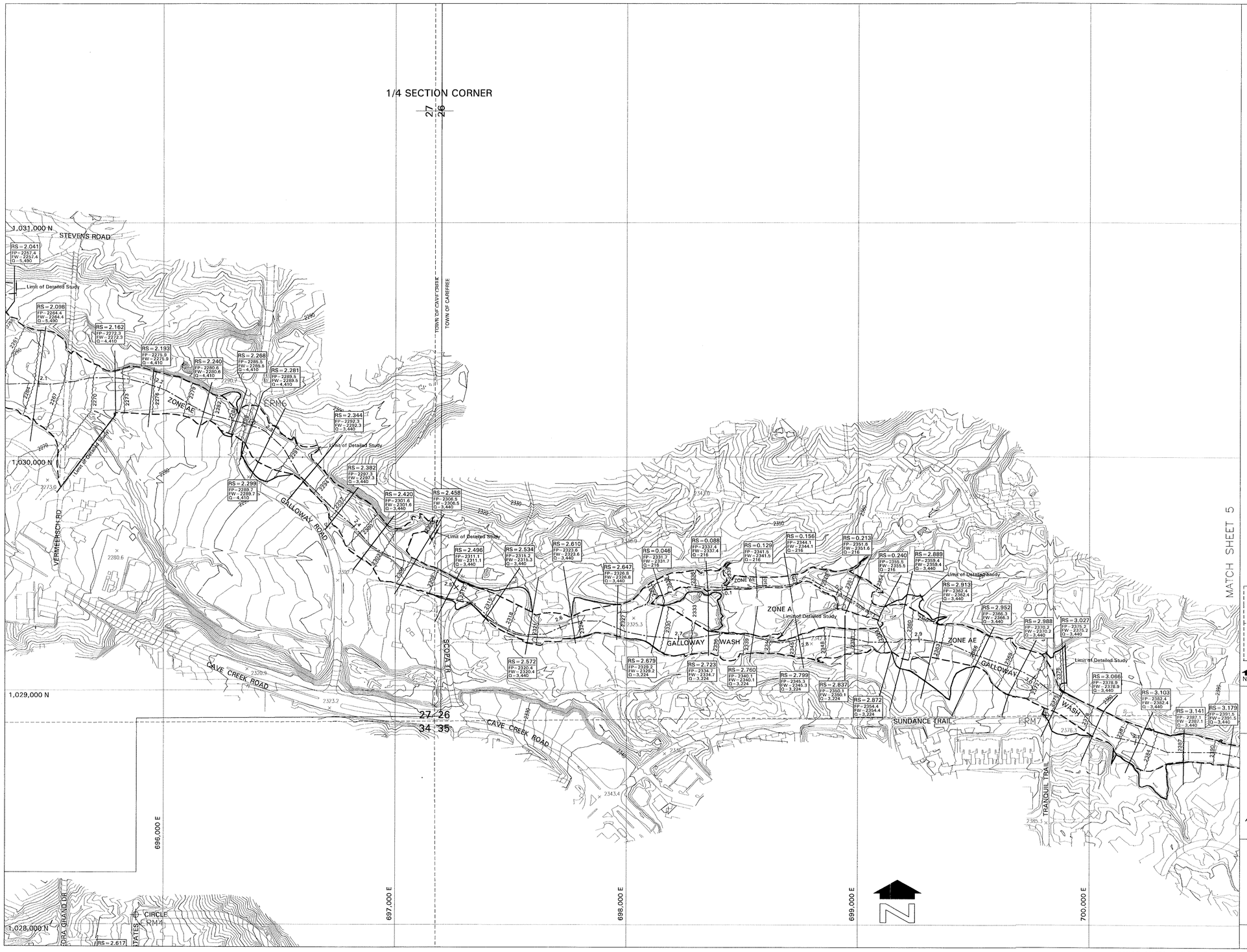
in association with

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS
Since 1962

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS. FLIGHT DATE: 9/30/99

M&B AERIAL MAPPING COMPANY, LLC

GROUND CONTROL SURVEY DATA PROVIDED BY A TEAM PROFESSIONAL ASSOCIATES, INC.



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

APRIL, 2002

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE WITH RIVER MILE	1.2 — 1.3
CROSS SECTION	RS = 0.300 / FP = 2061.0 / FW = 2061.5 / Q = 13,700
ELEVATION REFERENCE MARK	ERM 4
BASE FLOOD ELEVATIONS	2060
ZONE DESIGNATIONS	ZONE AE
CORPORATE LIMITS	TOWN OF CAVECREEK
SECTION LINE	

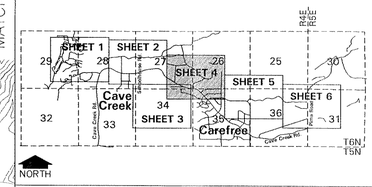
ELEVATION REFERENCE MARKS

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 6	2289.66	FCDMC BC ON TOP OF N END OF CULVERT HEADWALL ON E SIDE OF GALLOWAY RD, APPROX 0.25 MI N OF CAVE CREEK RD, SECTION 27, T6N, R4E (N1030149.93, E696383.49)
ERM 7	2373.76	BC STAMPED "RLS 11062, 1 18, 1997", IN PAVEMENT APPROX 10 FT W & 15 FT N OF C/L INTERSECTION OF SUNDANCE TRAIL & TRANQUIL TRAIL S26, T6N, R4E (N1028893.58, E699813.23)

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.
2. HORIZONTAL PROJECTION IS ARIZONA STATEPLANE, CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983.
3. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR: 1988 NGVD = 2.05 + 1929 NGVD

INDEX MAP



200 0' 200 400

SCALE: 1"= 200 FEET
CONTOUR INTERVAL = 2 FEET

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 29365 BRIAN R. ISERMAN Date Signed 4/18/02

REGISTERED LAND SURVEYOR CERTIFICATE NO. 24530 DAVID A. RHINE Date Signed 4/18/02

JE FULLER HYDROLOGY & GEOMORPHOLOGY, INC

in association with

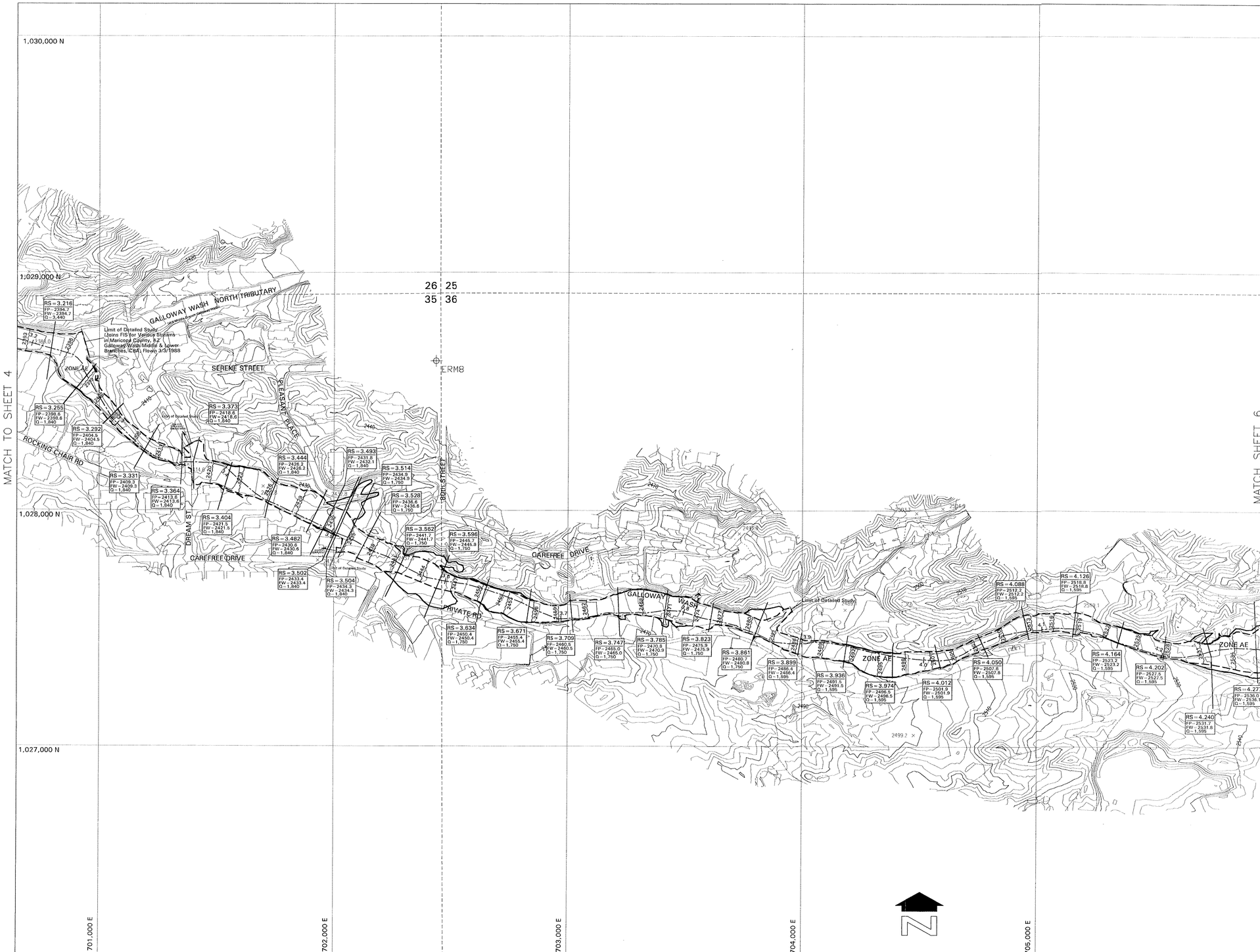
DIBBLE & ASSOCIATES CONSULTING ENGINEERS

SHEET 4 OF 6

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS. FLIGHT DATE: 9/30/99

M&B AERIAL MAPPING COMPANY, LLC

GROUND CONTROL SURVEY DATA PROVIDED BY A TEAM PROFESSIONAL ASSOCIATES, INC.



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

APRIL, 2002

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE WITH RIVER MILE	1.2 — 1.3
CROSS SECTION	RS = 0.300 / FP - 2061.0 / FW - 2061.5 / Q - 13,700
ELEVATION REFERENCE MARK	ERM 4
BASE FLOOD ELEVATIONS	2060
ZONE DESIGNATIONS	ZONE AE
CORPORATE LIMITS	TOWN OF CAVECREEK
SECTION LINE	

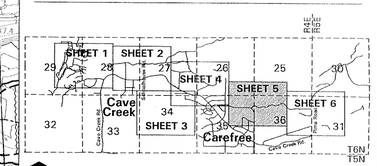
ELEVATION REFERENCE MARKS

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 8	2443.44	BC ON TOP OF SOUTH END OF CULVERT HEADWALL, LOCATED APPROX 25 FT N AND 25 FT W OF C/L INTERSECTION OF MULE TRAIN RD AND SERENE STREET, SECTION 35, T6N, R4E (N1028625.55, E702432.49)

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.
2. HORIZONTAL PROJECTION IS ARIZONA STATEPLANE, CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983.
3. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR: 1988 NGVD = 2.05 + 1929 NGVD

INDEX MAP



200 0' 200 400

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

REGISTERED PROFESSIONAL ENGINEER (CIVIL) CERTIFICATE NO. 29325 BRIAN R. ISERMAN Date Signed 4/16/02

REGISTERED LAND SURVEYOR CERTIFICATE NO. 24530 DAVID A. RHINE Date Signed 4/16/02

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

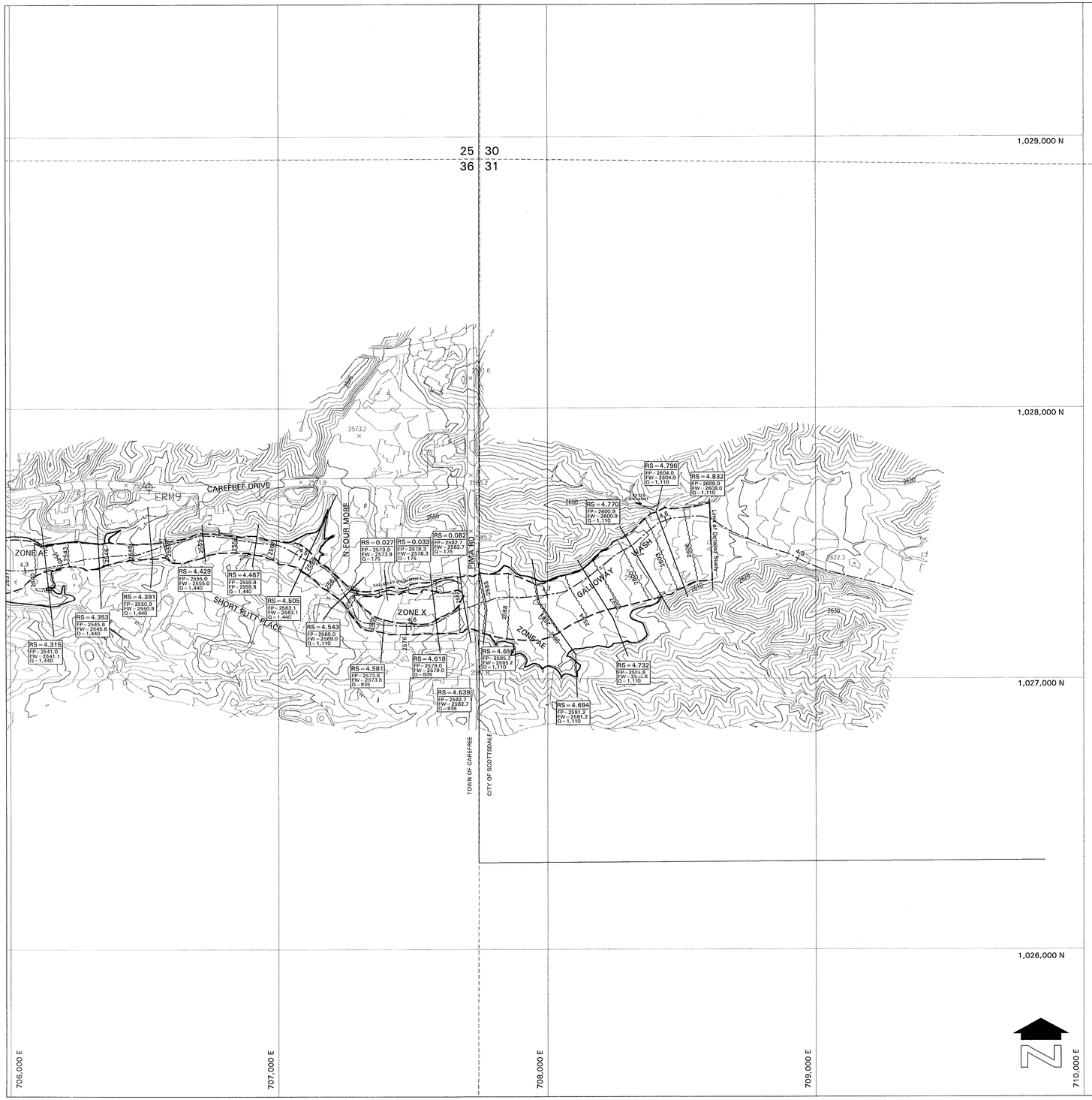
in association with

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

THIS MAP WAS PREPARED BY PHOTOGRAMMETRIC METHODS TO NATIONAL MAP ACCURACY STANDARDS FOR 1"= 200' HORIZONTAL SCALE AND 2' CONTOUR INTERVALS. FLIGHT DATE: 9/30/99

M&B AERIAL MAPPING COMPANY, LLC

GROUND CONTROL SURVEY DATA PROVIDED BY A TEAM PROFESSIONAL ASSOCIATES, INC.



FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

FLOODPLAIN DELINEATION STUDY OF ANDORA HILLS & GALLOWAY WASHES FCD 99-14

APRIL, 2002

LEGEND

100-YR FLOODPLAIN BOUNDARY	
FLOODWAY BOUNDARY	
HYDRAULIC BASE LINE WITH RIVER MILE	1.2 — 1.3
CROSS SECTION	RS = 0.300; FP - 2061.0; FW - 2061.5; Q - 13,700
ELEVATION REFERENCE MARK	ERM 4
BASE FLOOD ELEVATIONS	2060
ZONE DESIGNATIONS	ZONE AE
CORPORATE LIMITS	TOWN OF CAVECREEK
SECTION LINE	

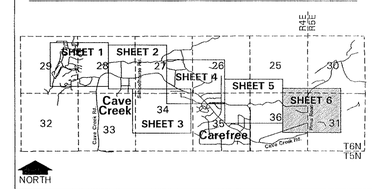
ELEVATION REFERENCE MARKS

I.D. NUMBER	ELEVATION (FT)	DESCRIPTION/LOCATION
ERM 9	2557.10	BC IN C/L OF CAREFREE DRIVE, APPROX 0.2 MI W OF INTERSECTION OF PIMA ROAD AND CAREFREE DRIVE, SECTION 36, T6N, R4E (N1027710.79, E706517.19)

NOTES

1. THE HYDRAULIC BASE LINE IS CROSS SECTION STATION 10,000 UNLESS NOTED OTHERWISE.
2. HORIZONTAL PROJECTION IS ARIZONA STATEPLANE, CENTRAL ZONE, NORTH AMERICAN DATUM OF 1983.
3. ALL ELEVATIONS ARE BASED ON NATIONAL GEODETIC VERTICAL DATUM OF 1929. CONVERSION FACTOR: 1988 NGVD = 2.09 + 1929 NGVD

INDEX MAP



200 0' 200 400

SCALE: 1"= 200 FEET

CONTOUR INTERVAL = 2 FEET

REGISTERED PROFESSIONAL ENGINEER — CERTIFICATE NO. 29335 — BRIAN R. ISERMAN — DATE SIGNED 4/11/02 — ARIZONA U.S.A.

REGISTERED LAND SURVEYOR — CERTIFICATE NO. 24530 — DAVID A. RHINE — DATE SIGNED 4/11/02 — ARIZONA U.S.A.

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

in association with

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS

SHEET 6 OF 6

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