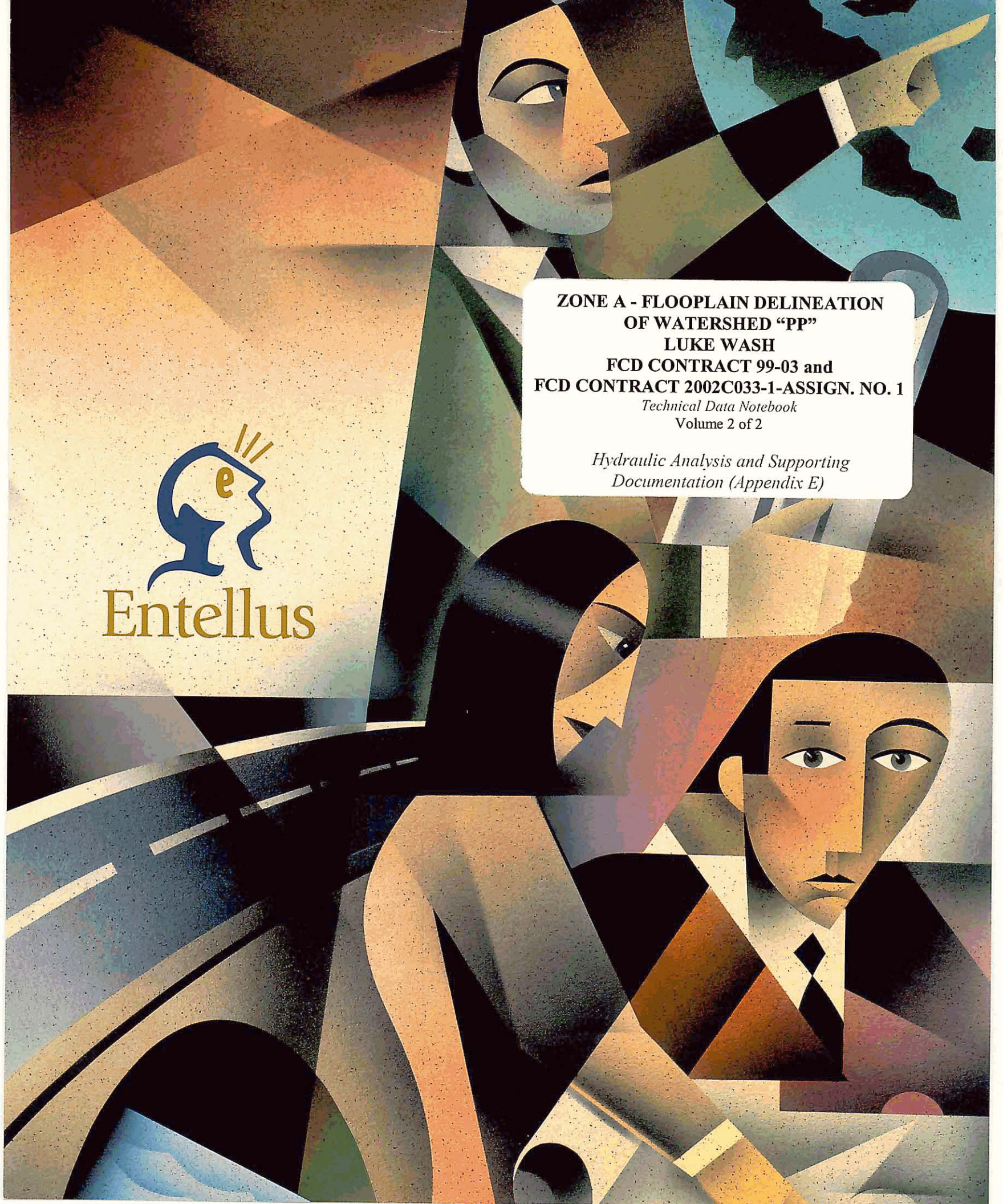

ZONE A - FLOOPLAIN DELINEATION OF WATERSHED "PP" LUKE WASH

FCD CONTRACT 99-03 and
FCD CONTRACT 2002C033-1-ASSIGN. NO. 1

Technical Data Notebook

Volume 2 of 2

Hydraulic Analysis and Supporting Documentation (Appendix E)

Entellus

ZONE A - FLOOPLAIN DELINEATION OF WATERSHED "PP" LUKE WASH FCD CONTRACT 99-03 and FCD CONTRACT 2002C033-1-ASSIGNMENT NO. 1

Technical Data Notebook

Volume 2 of 2

Hydraulic Analysis and Supporting Documentation (Appendix E)

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JUN 18 2003

Registered Professional Engineer (Civil)
CERTIFICATE NO.
29737
HERNAN A.
ARISTIZABAL
Date Signed 6/18/03
ARIZONA, U.S.A.

June, 2003

ZONE A – FLOODPLAIN DELINEATION OF WATERSHED "PP"

LUKE WASH

F.C.D. CONTRACT NO. 99-03

REVISED BY F.C.D. CONTRACT 2002C033-1

Registered Professional Engineer (Civil)
CERTIFICATE NO. 29737
HERNAN A. ARISTIZABAL
Date Signed 4/16/03
ARIZONA, U.S.A.

TECHNICAL DATA NOTEBOOK

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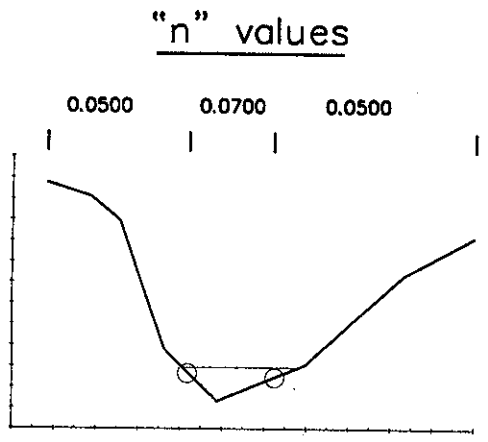
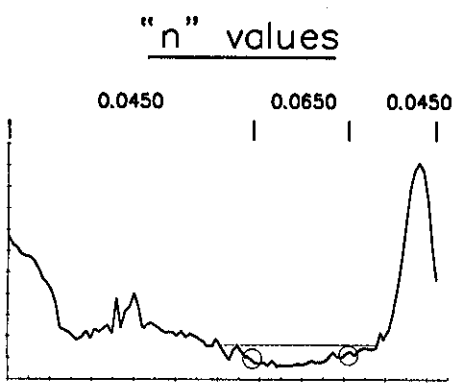
APPENDIX E HYDRAULIC ANALYSIS SUPPORTING DOCUMENTATION

E.1 Roughness Coefficient calculation

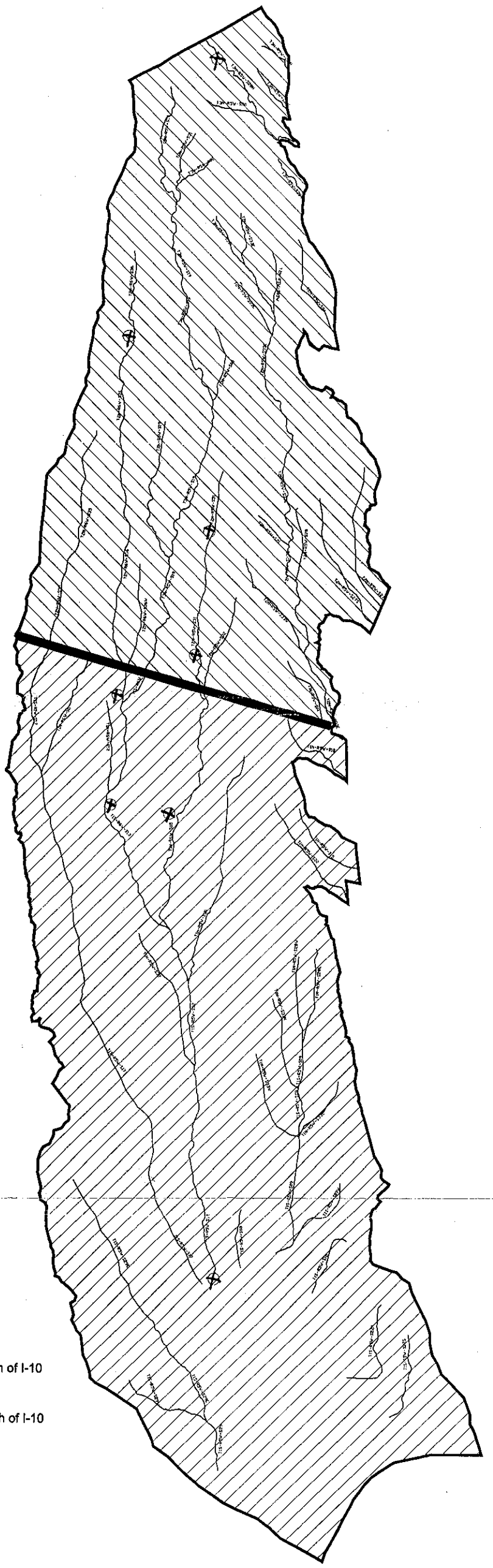
The roughness coefficient was calculated using the methodology described in the *Manning's Roughness Coefficients for Stream Channels and Floodplains in Maricopa County* (**Reference 7**). The results of these calculations are presented in **Figure E.1-1** and the detail calculations are included in **Tables E.1-1** and **E.1-2.** The field photographs are also included as **Figures E.1-2** and **E.1-3.**



General cross section format for washes north of I-10



General cross section format for washes south of I-10



Manning's roughness coefficients were determined by the FCDMC method. "n" values of 0.0450 for overbanks and 0.0650 for channels are representative of wash characteristics south of I-10. North of I-10 "n" values of 0.0500 for overbanks and 0.0700 for channels are applicable.

LEGEND

- Study area North of I-10
- Study area South of I-10
- Overbank limits
- Study boundary
- I-10
- Photo Locations

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FLOOD CONTROL DISTRICT
OF MARICOPA COUNTY

MANNING'S ROUGHNESS

Figure E.1-1

File: EXHIBIT_N_VALUES.dwg Date: 10/05/2000

Table E.1-1
Manning's n Value Calculations (North)

Project: Zone A Floodplain Delineation of Watershed "PP" for Luke Wash F.C.D Contract No. 99-03
Stream: Northern Streams
Location: **Reaches** - I-10 to CAP Canal

Channel Conditions		Manning's n Adjustment		Left Overbank (West)	Channel	Right Overbank (East)
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035	0.026		0.026
	Gravel		.028 - .035		0.028	
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0	0		0
	Minor		.001 - .005		0.001	
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	0	0	0
	Minor		.005 - .015			
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	.024		.024
	Large		.025 - .050		.04	
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0	0		0
	Occ. Alt.		.001 - .005		.001	
	Freq. Alt.		.010 - .015			
				0.05	0.07	0.05
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.05	0.07	0.05

Table E.1-2

Project: Zone A Floodplain Delineation of Watershed "PP" for Luke Wash F.C.D Contract No. 99-03
Stream: Southern Streams
Location: **Reaches** - I-10 to Gila River

Channel Conditions		Manning's n Adjustment		Left Overbank (West)	Channel	Right Overbank (East)
Channel Material	Concrete	n_b	.012 - .018			
	Firm Soil		.025 -.032			
	Coarse Sand		.026 - .035	0.026	.029	0.026
	Gravel		.028 - .035			
	Cobble		.030 - .050			
	Boulder		.040 - .070			
Degree of Irregularity	Smooth	n_1	0			
	Minor		.001 - .005	.001	0.005	.001
	Moderate		.006 - .010			
	Severe		.011 - .020			
Effects of Obstruction	Negligible	n_2	.000 - .004	.0010		0.001
	Minor		.005 - .015		.005	
	Appreciable		.020 - .030			
	Severe		.040 - .060			
Vegetation	Small	n_3	.002 - .010			
	Medium		.010 - .025	.017		.017
	Large		.025 - .050		.026	
	Very Large		.050 - .100			
Variations in Channel Cross section	Gradual	n_4	0	0	0	0
	Occ. Alt.		.001 - .005			
	Freq. Alt.		.010 - .015			
				0.045	0.065	0.045
Degree of Meandering	Minor	m	1	1	1	1
	Appreciable		1.15			
	Sever		1.3			
$n = (n_b+n_1+n_2+n_3+n_4)m$				0.045	0.065	0.045

Figure . .-2

Wash T2N-R5W-S31W

Typical bank for wash T2N-R5W-S31W

Wash T2N-R6W-S36W

Westbank of wash T3N-R5W-S28N at CAP floodway opening

Figure E.1-3

Buckeye west of 355th Ave. looking west at T1S-R6W-S13

On Buckeye looking south at T1S-R6W-S13

Looking up wash T1N-R6W-S05 on Buckeye Rd.

Intersection of wash T1S-R5W-S32 and Southern Pacific RR

ZONE A DELINEATION OF WATERSHED "PP"
LUKE WASH FCD No. 99-03 and
FCD No. 2002C033-1-Assignment No. 1
Wash Cross Sections

This notebook contains cross sections for washes delineated in the Luke Wash area of Watershed "PP" under the Flood Control District of Maricopa County's contract 99-03 and contract 2002C033-1-Assignment No. 1. The cross sections are arranged from south to north, and west to east, as listed below:

T1S-R5W-S29
T1S-R5W-S29W
T1S-R5W-S29E
T1S-R5W-S17
T2N-R6W-S35
T1N-R6W-S11
T2N-R6W-S36
T2N-R6W-S36W
T1S-R5W-S32 (LUKE WASH)
T1N-R5W-S32
T1N-R6W-S12
T1S-R6W-S13 (Phillips Wash South)
T2N-R5W-S31W (Phillips Wash North)
T2N-R5W-S19
T2N-R5W-S08
T3N-R5W-S31
T3N-R5W-S30
T1N-R6W-S05 (Dickey Wash South)
T2N-R5W-S31 (Dickey Wash North)
T1N-R5W-S30

T2N-R5W-S32

T1S-R5W-S08

T1S-R5W-S09

T1N-R5W-S33W

T1N-R5W-S33N

T1N-R5W-S28W

T1S-R5W-S09W

T1N-R5W-S33E

T1N-R5W-S28E

T1S-R5W-S16

T1S-R5W-S22N

T1S-R5W-S22S

T1N-R5W-S22

T1N-R5W-S15

T1N-R5W-S10

T1N-R5W-S04

T2N-R5W-S33E

T2N-R5W-S33W

T2N-R5W-S21

T2N-R5W-S05E

T3N-R5W-S32E

T2N-R5W-S28

T2N-R5W-S05W

T2N-R5W-S27S

T2N-R5W-S27N

T2N-R5W-S04

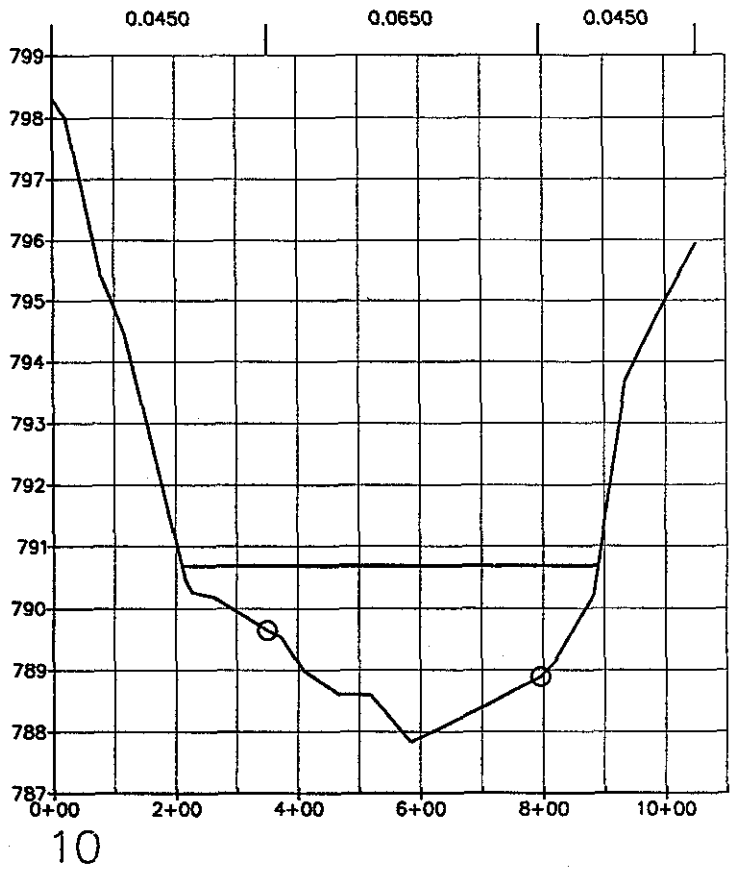
T3N-R5W-S28S

T3N-R5W-S28N

T3N-R5W-S20

T3N-R5W-S21S

T3N-R5W-S21N



Normal Depth Results

Cross-Section:	10	
Elevation:	790.68	ft MSL
Depth:	2.85	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2731	
Flow Regime:	Subcritical	
Flow Area:	1142.49	sq ft
Average Velocity:	2.60	ft/s
Maximum Velocity:	2.69	ft/s
Composite n:	0.0584	
Hydraulic Radius:	1.68	ft
Wetted Perimeter:	679.23	ft
Wetted Top Width:	679.18	ft
Critical Slope:	0.0706	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29–10

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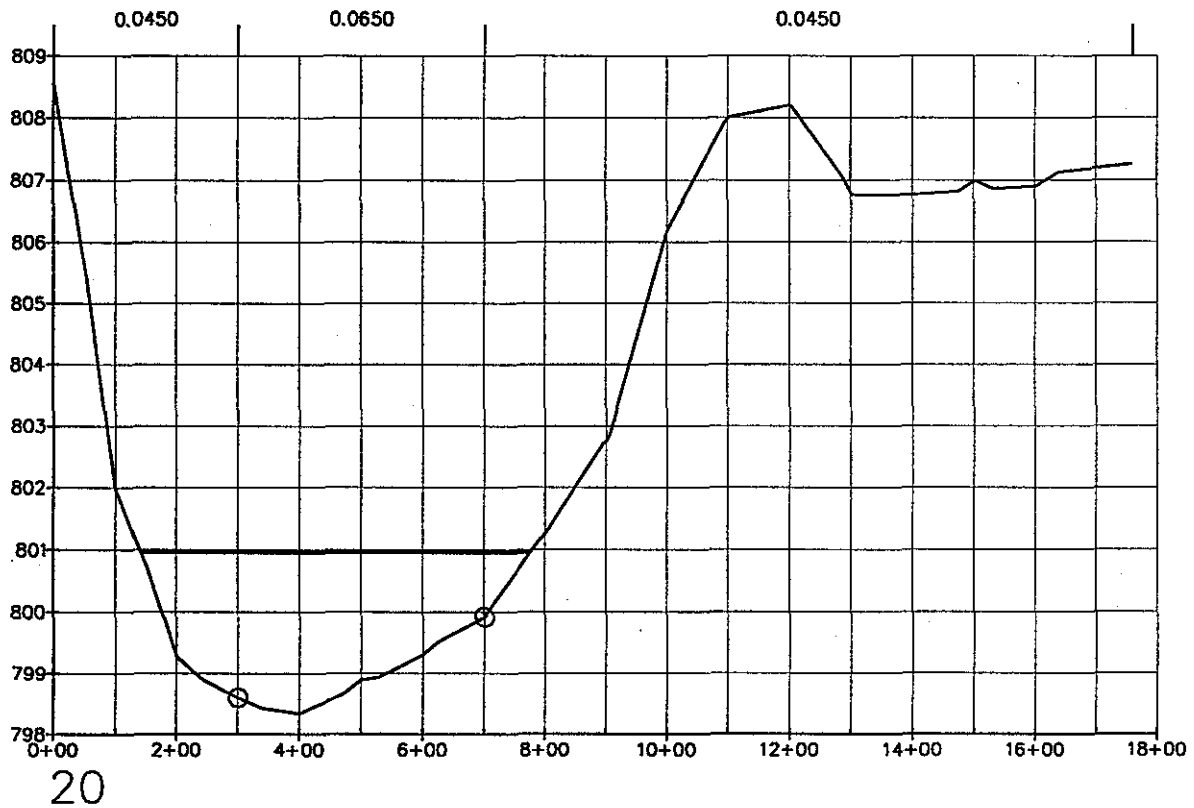
File: WASH-T1S-R5W-S29_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	800.96	ft MSL
Depth:	2.62	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2937	
Flow Regime:	Subcritical	
Flow Area:	1108.45	sq ft
Average Velocity:	2.70	ft/s
Maximum Velocity:	3.22	ft/s
Composite n:	0.058	
Hydraulic Radius:	1.75	ft
Wetted Perimeter:	634.51	ft
Wetted Top Width:	634.47	ft
Critical Slope:	0.0608	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29–20

Entellus™

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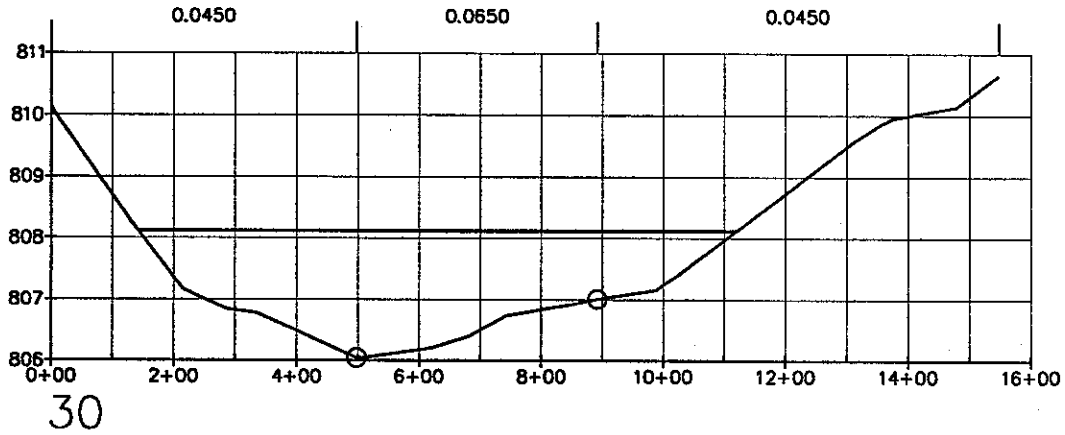


Normal Depth Results

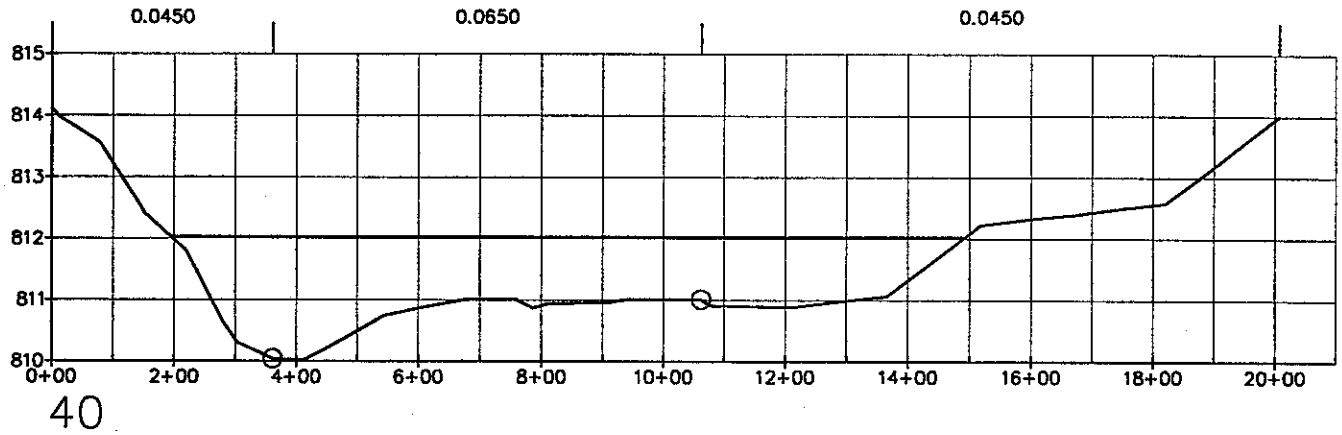
Cross-Section:	30	
Elevation:	808.12	ft MSL
Depth:	2.07	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2926	
Flow Regime:	Subcritical	
Flow Area:	1253.16	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.76	ft/s
Composite n:	0.0535	
Hydraulic Radius:	1.28	ft
Wetted Perimeter:	976.98	ft
Wetted Top Width:	976.97	ft
Critical Slope:	0.0615	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29–30

Entellus™

File: WASH-T1S-R5W-S29_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	40	
Elevation:	812.02	ft MSL
Depth:	2.00	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2562	
Flow Regime:	Subcritical	
Flow Area:	1453.95	sq ft
Average Velocity:	2.06	ft/s
Maximum Velocity:	2.60	ft/s
Composite n:	0.0562	
Hydraulic Radius:	1.12	ft
Wetted Perimeter:	1296.59	ft
Wetted Top Width:	1296.56	ft
Critical Slope:	0.0787	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29–40

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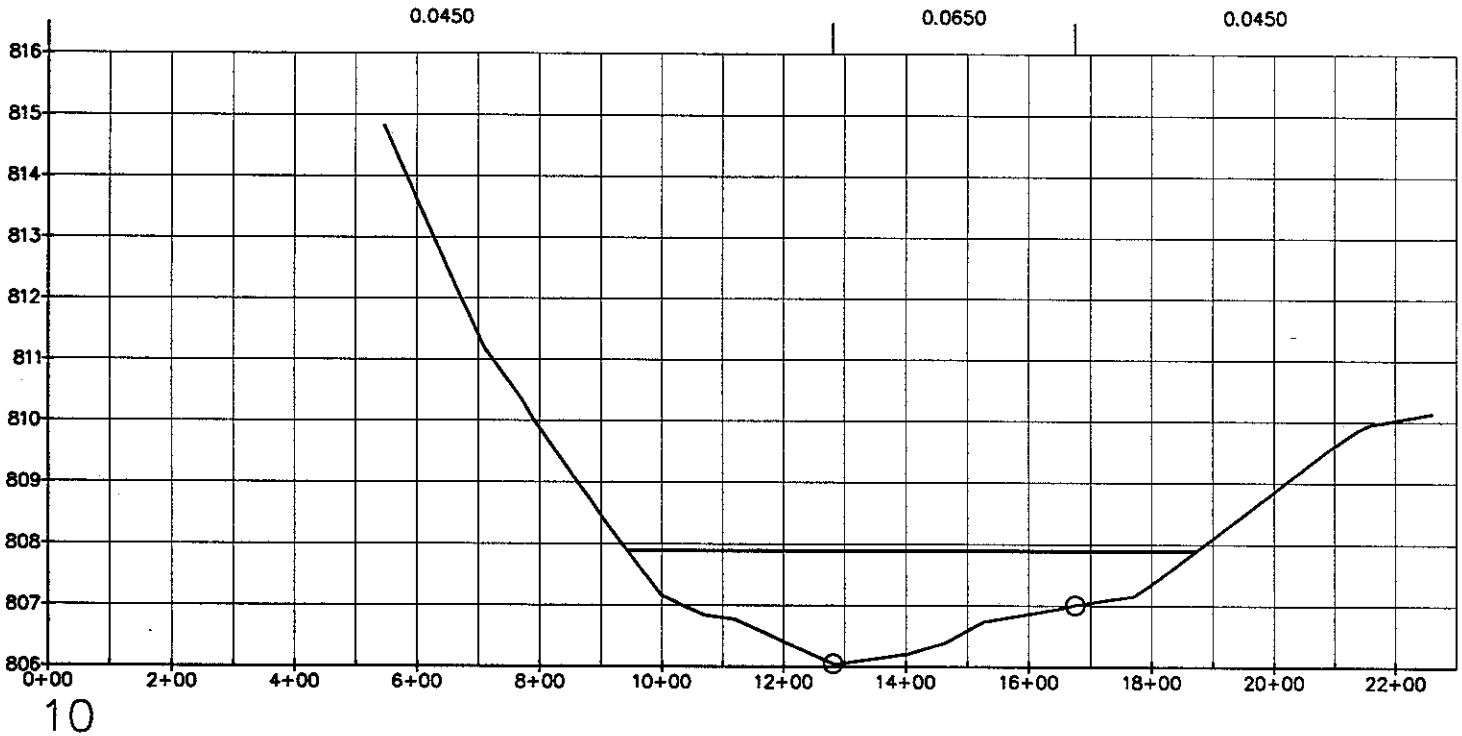
File: WASH–T1S–R5W–S29_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	807.89	ft MSL
Depth:	1.84	ft
Discharge:	2750.00	cfs
Energy Gradient:	0.0075	ft/ft
Froude Number:	0.3446	
Flow Regime:	Subcritical	
Flow Area:	1037.29	sq ft
Average Velocity:	2.64	ft/s
Maximum Velocity:	3.08	ft/s
Composite n:	0.0539	
Hydraulic Radius:	1.12	ft
Wetted Perimeter:	929.40	ft
Wetted Top Width:	929.38	ft
Critical Slope:	0.0669	ft/ft

Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29W–10

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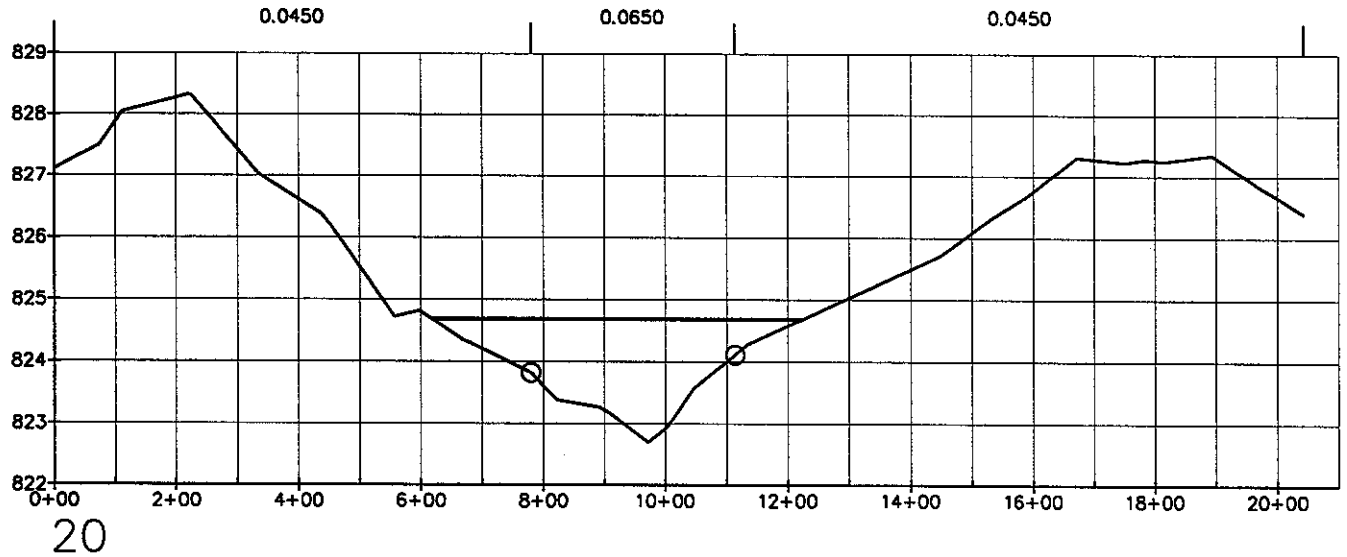

Normal Depth Results

Cross-Section:	20	
Elevation:	824.68	ft MSL
Depth:	1.98	ft
Discharge:	1250.00	cfs
Energy Gradient:	0.0075	ft/ft
Froude Number:	0.2816	
Flow Regime:	Subcritical	
Flow Area:	555.49	sq ft
Average Velocity:	2.27	ft/s
Maximum Velocity:	2.43	ft/s
Composite n:	0.0564	
Hydraulic Radius:	0.92	ft
Wetted Perimeter:	606.05	ft
Wetted Top Width:	606.04	ft
Critical Slope:	0.103	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29W–20

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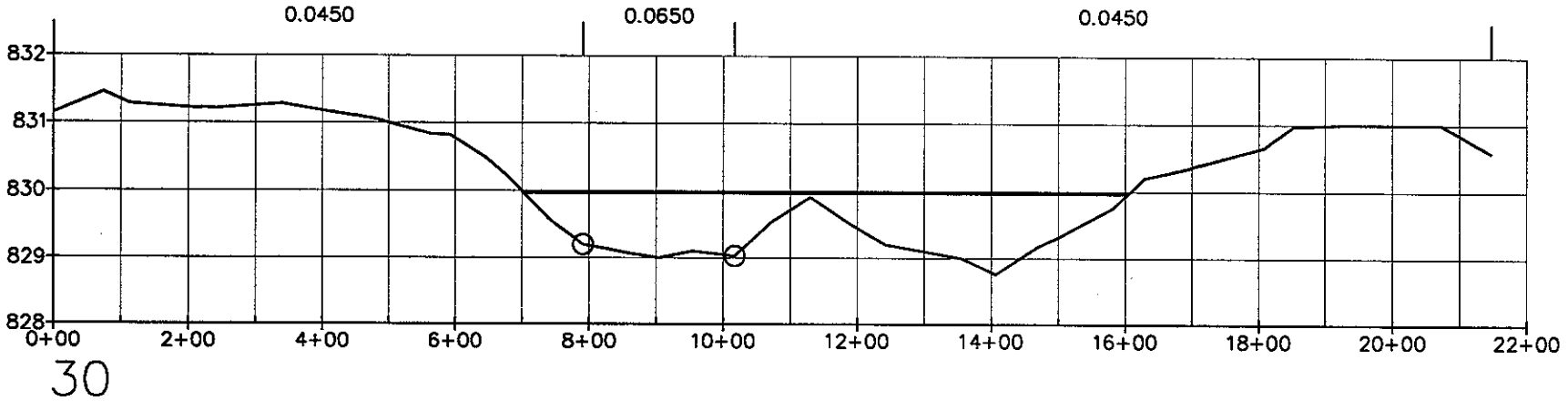

Normal Depth Results

Cross-Section:	30	
Elevation:	829.98	ft MSL
Depth:	1.22	ft
Discharge:	1250.00	cfs
Energy Gradient:	0.0075	ft/ft
Froude Number:	0.3221	
Flow Regime:	Subcritical	
Flow Area:	620.57	sq ft
Average Velocity:	2.01	ft/s
Maximum Velocity:	2.14	ft/s
Composite n:	0.0503	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	903.14	ft
Wetted Top Width:	903.13	ft
Critical Slope:	0.0737	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29W-30

Entellus™

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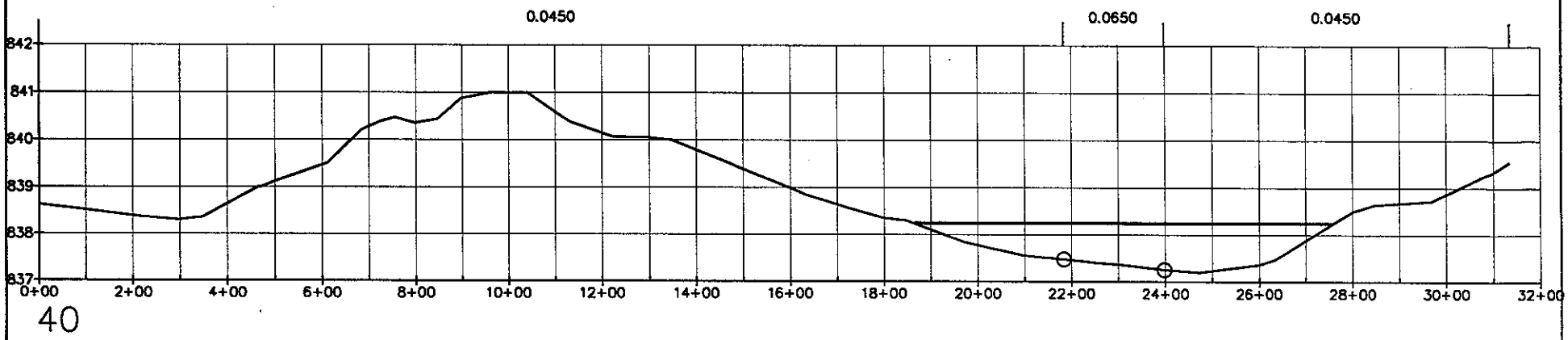


Normal Depth Results

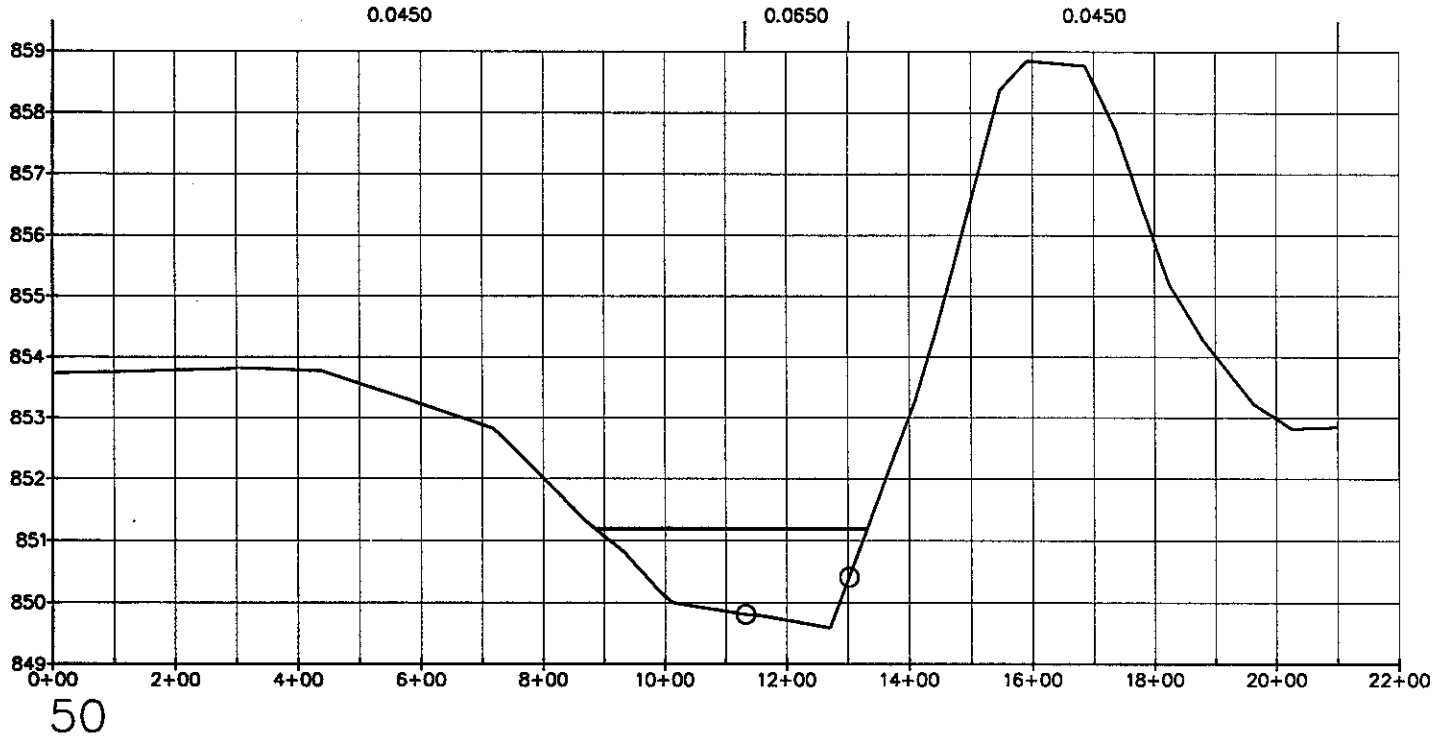
Cross-Section:	40	
Elevation:	838.24	ft MSL
Depth:	1.04	ft
Discharge:	1250.00	cfs
Energy Gradient:	0.0075	ft/ft
Froude Number:	0.3537	
Flow Regime:	Subcritical	
Flow Area:	610.95	sq ft
Average Velocity:	2.05	ft/s
Maximum Velocity:	2.38	ft/s
Composite n:	0.0501	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	895.37	ft
Wetted Top Width:	895.37	ft
Critical Slope:	0.063	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29W-40

Entellus™

File: WASH-T1S-R5W-S29W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	50	
Elevation:	851.19	ft MSL
Depth:	1.60	ft
Discharge:	1250.00	cfs
Energy Gradient:	0.0075	ft/ft
Froude Number:	0.3621	
Flow Regime:	Subcritical	
Flow Area:	480.79	sq ft
Average Velocity:	2.59	ft/s
Maximum Velocity:	2.71	ft/s
Composite n:	0.053	
Hydraulic Radius:	1.08	ft
Wetted Perimeter:	445.77	ft
Wetted Top Width:	445.75	ft
Critical Slope:	0.059	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29W-50

Entellus™

File: WASH-T1S-R5W-S29W_X-SECTION-R14.dwg Date: 9/29/00

Normal Depth Results

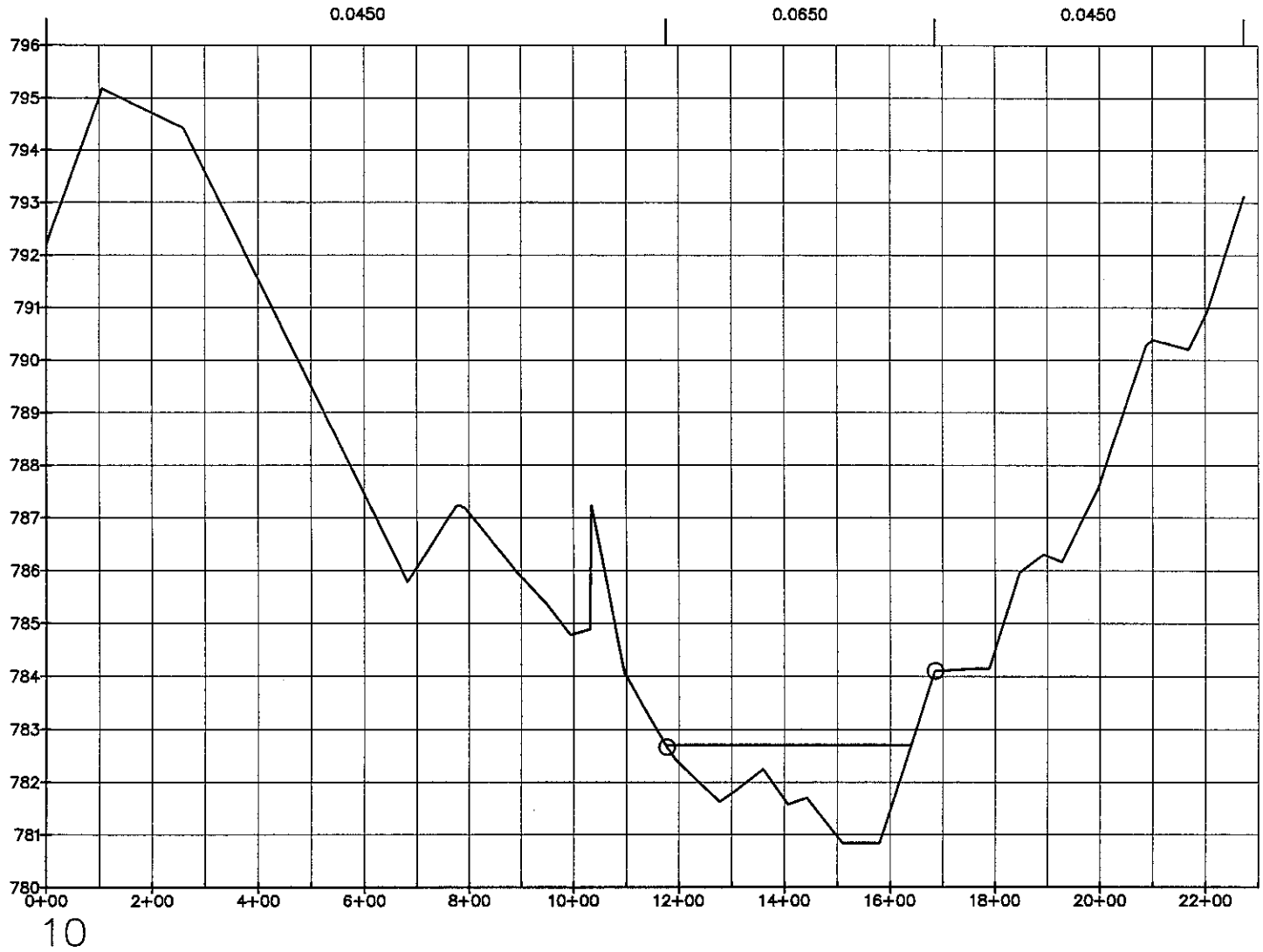
Cross-Section:	1	
Elevation:	779.57	ft MSL
Depth:	1.57	ft
Discharge:	840.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2361	
Flow Regime:	Subcritical	
Flow Area:	499.71	sq ft
Average Velocity:	1.67	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.0635	
Hydraulic Radius:	0.95	ft
Wetted Perimeter:	526.91	ft
Wetted Top Width:	526.90	ft
Critical Slope:	0.0989	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22S-1

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	782.71	ft MSL
Depth:	1.87	ft
Discharge:	840.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2238	
Flow Regime:	Subcritical	
Flow Area:	483.84	sq ft
Average Velocity:	1.74	ft/s
Maximum Velocity:	1.74	ft/s
Composite n:	0.0649	
Hydraulic Radius:	1.04	ft
Wetted Perimeter:	464.60	ft
Wetted Top Width:	464.55	ft
Critical Slope:	0.1081	ft/ft

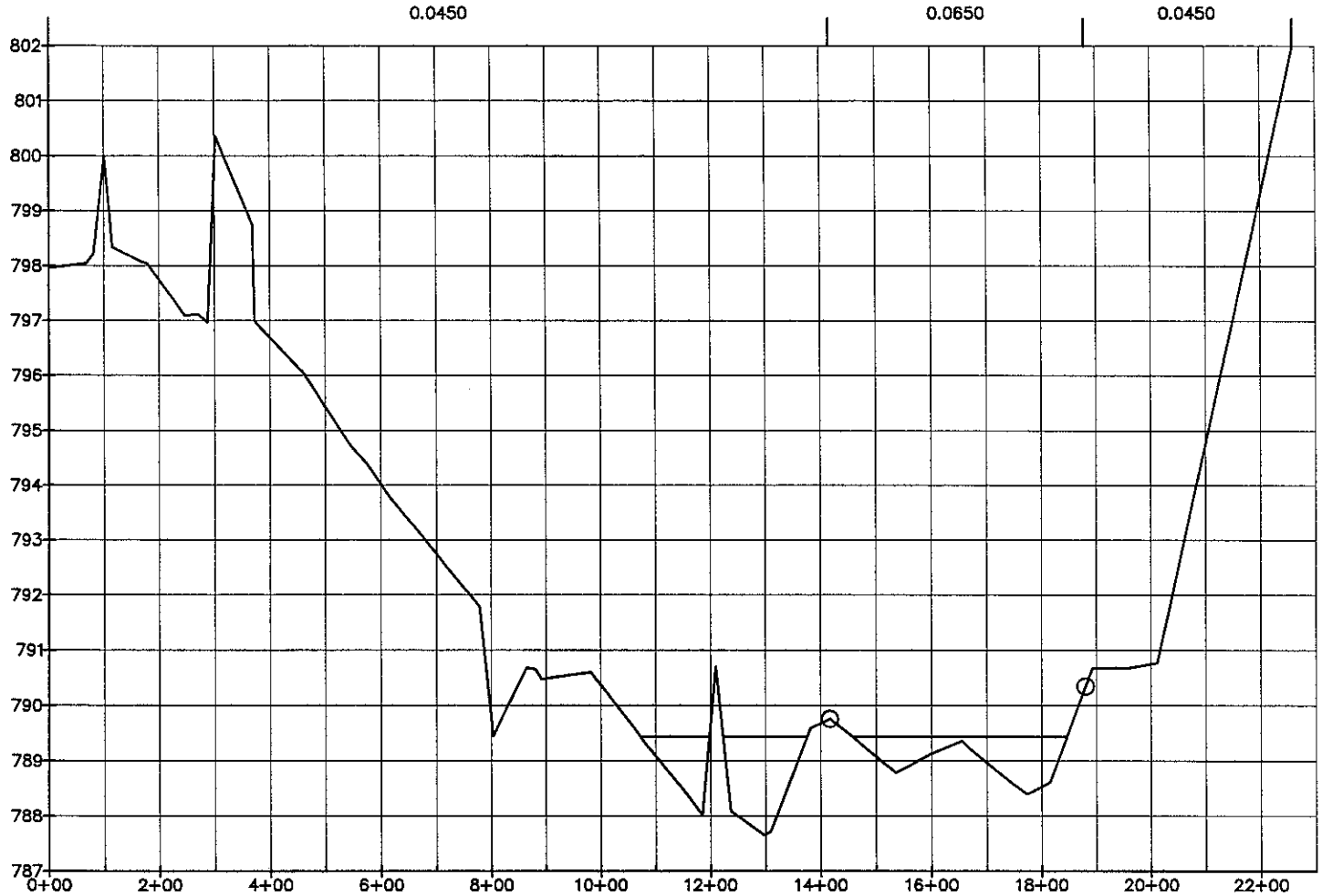
ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22S-10

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 5/28/03



20

Normal Depth Results

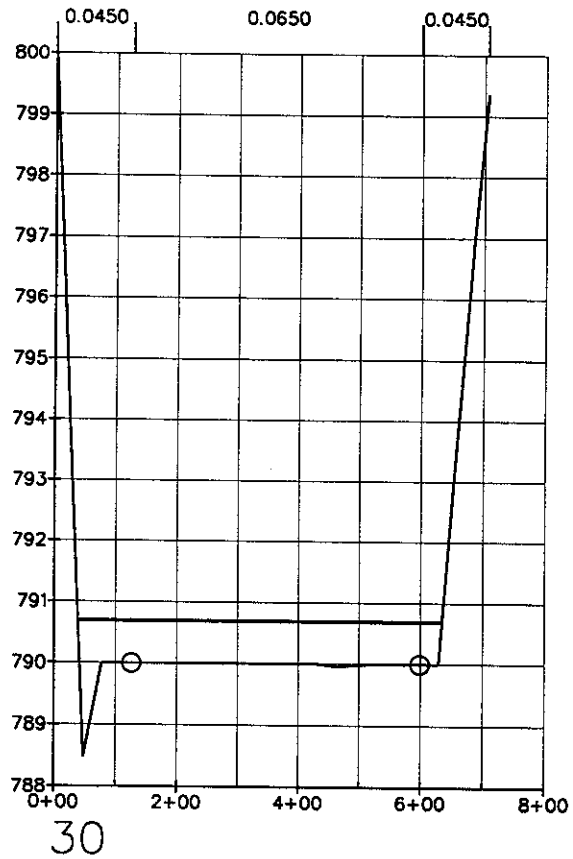
Cross-Section:	20	
Elevation:	789.44	ft MSL
Depth:	1.79	ft
Discharge:	840.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2426	
Flow Regime:	Subcritical	
Flow Area:	456.54	sq ft
Average Velocity:	1.83	ft/s
Maximum Velocity:	2.38	ft/s
Composite n:	0.057	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	667.01	ft
Wetted Top Width:	666.81	ft
Critical Slope:	0.1398	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22S-20

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 5/28/03



Normal Depth Results

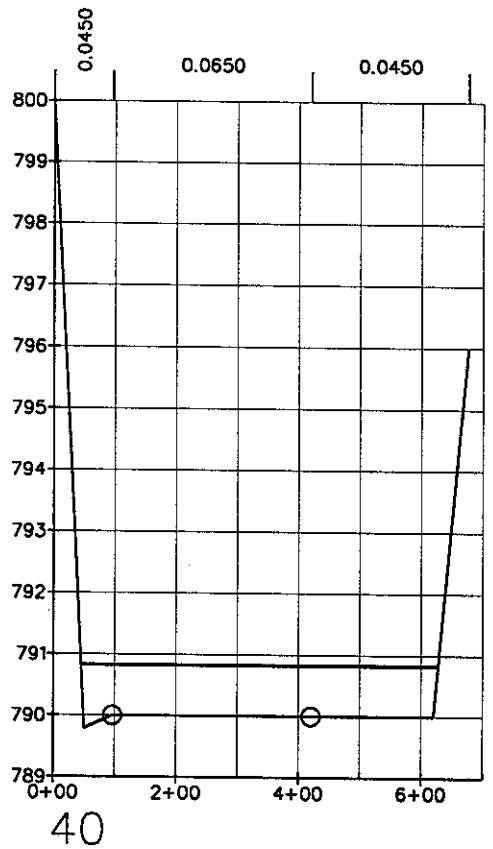
Cross-Section:	30	
Elevation:	790.69	ft MSL
Depth:	2.22	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.1843	
Flow Regime:	Subcritical	
Flow Area:	436.54	sq ft
Average Velocity:	1.56	ft/s
Maximum Velocity:	2.41	ft/s
Composite n:	0.0611	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	595.82	ft
Wetted Top Width:	595.47	ft
Critical Slope:	0.1819	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22S–30

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

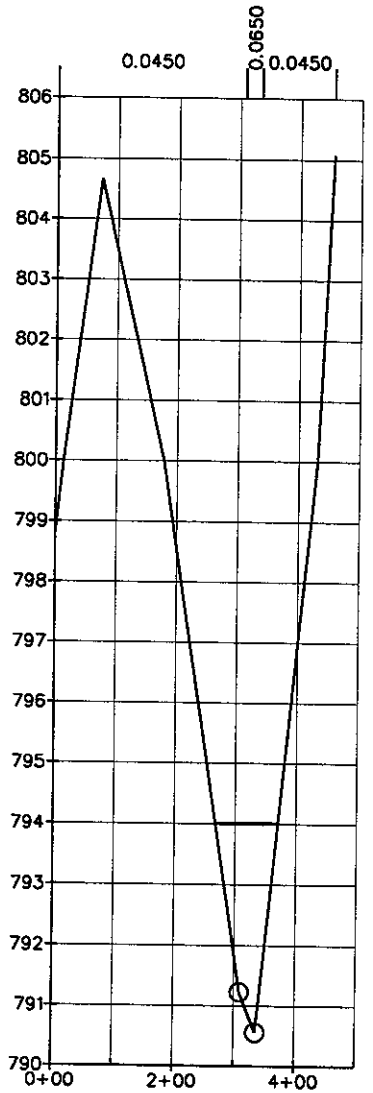
Cross-Section:	40	
Elevation:	790.82	ft MSL
Depth:	1.03	ft
Discharge:	840.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.304	
Flow Regime:	Subcritical	
Flow Area:	479.35	sq ft
Average Velocity:	1.77	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0565	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	582.95	ft
Wetted Top Width:	582.80	ft
Critical Slope:	0.0621	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22S–40

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



50

Normal Depth Results

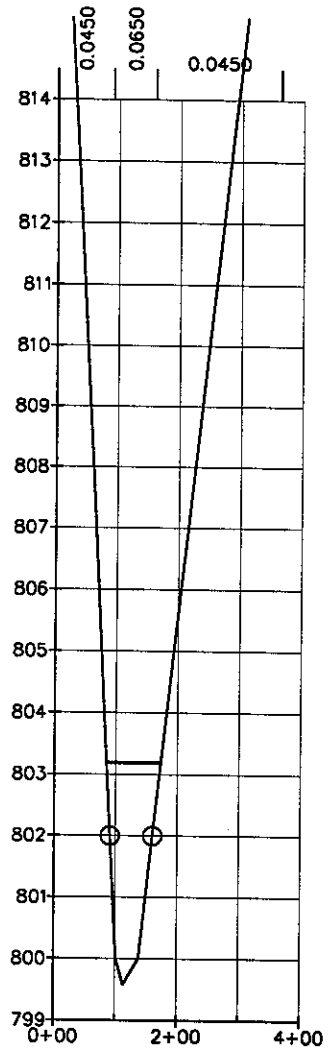
Cross-Section:	50	
Elevation:	794.01	ft MSL
Depth:	3.45	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.3229	
Flow Regime:	Subcritical	
Flow Area:	199.83	sq ft
Average Velocity:	3.40	ft/s
Maximum Velocity:	3.59	ft/s
Composite n:	0.0504	
Hydraulic Radius:	1.94	ft
Wetted Perimeter:	102.99	ft
Wetted Top Width:	102.72	ft
Critical Slope:	0.0526	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22S-50

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



60

Normal Depth Results

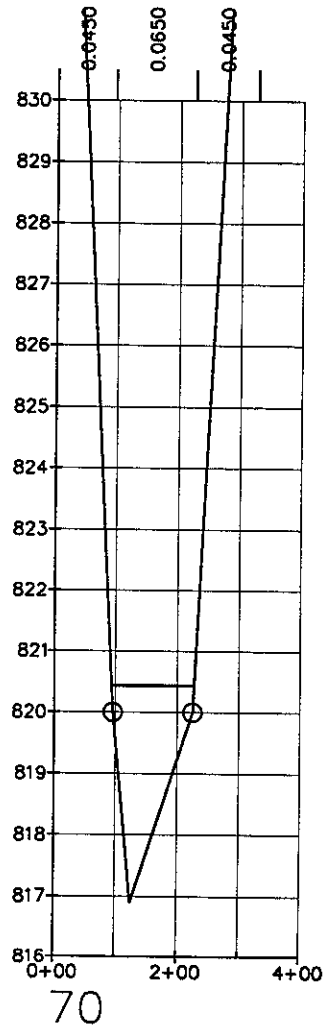
Cross-Section:	60	
Elevation:	803.19	ft MSL
Depth:	3.61	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.3046	
Flow Regime:	Subcritical	
Flow Area:	207.11	sq ft
Average Velocity:	3.28	ft/s
Maximum Velocity:	3.37	ft/s
Composite n:	0.0609	
Hydraulic Radius:	2.34	ft
Wetted Perimeter:	88.60	ft
Wetted Top Width:	88.13	ft
Critical Slope:	0.0626	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22S–60

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

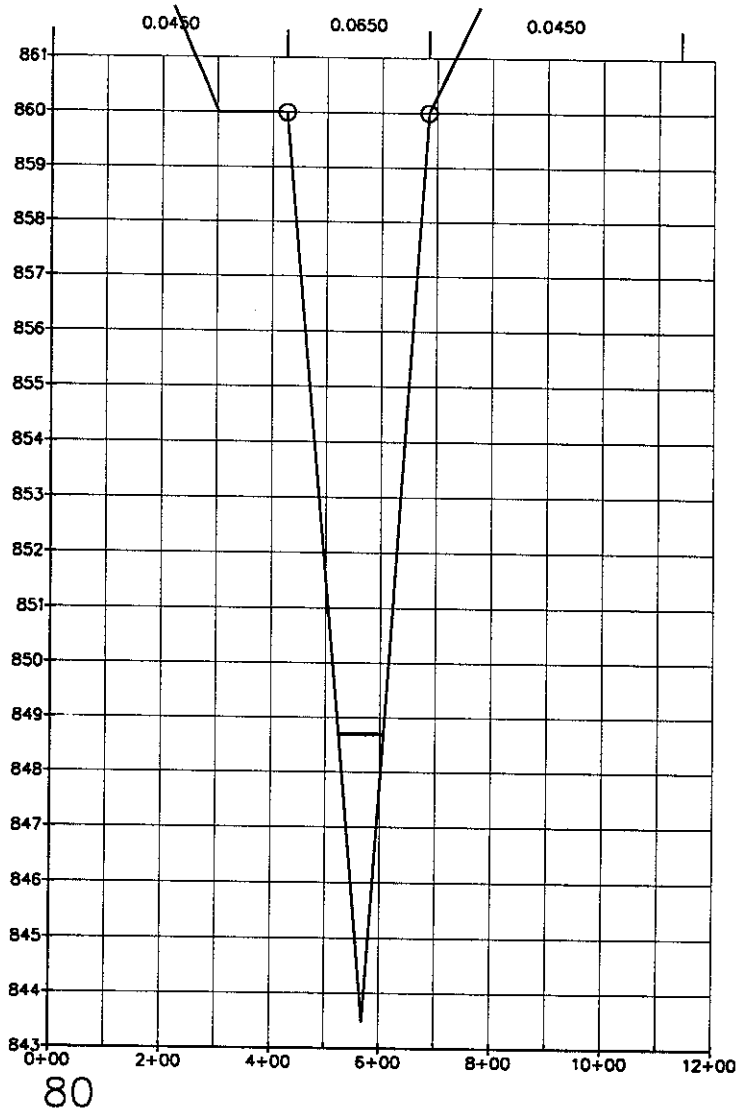
Cross-Section:	70	
Elevation:	820.43	ft MSL
Depth:	3.53	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2478	
Flow Regime:	Subcritical	
Flow Area:	257.46	sq ft
Average Velocity:	2.65	ft/s
Maximum Velocity:	2.65	ft/s
Composite n:	0.0644	
Hydraulic Radius:	1.92	ft
Wetted Perimeter:	134.03	ft
Wetted Top Width:	133.74	ft
Critical Slope:	0.0888	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22S–70

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

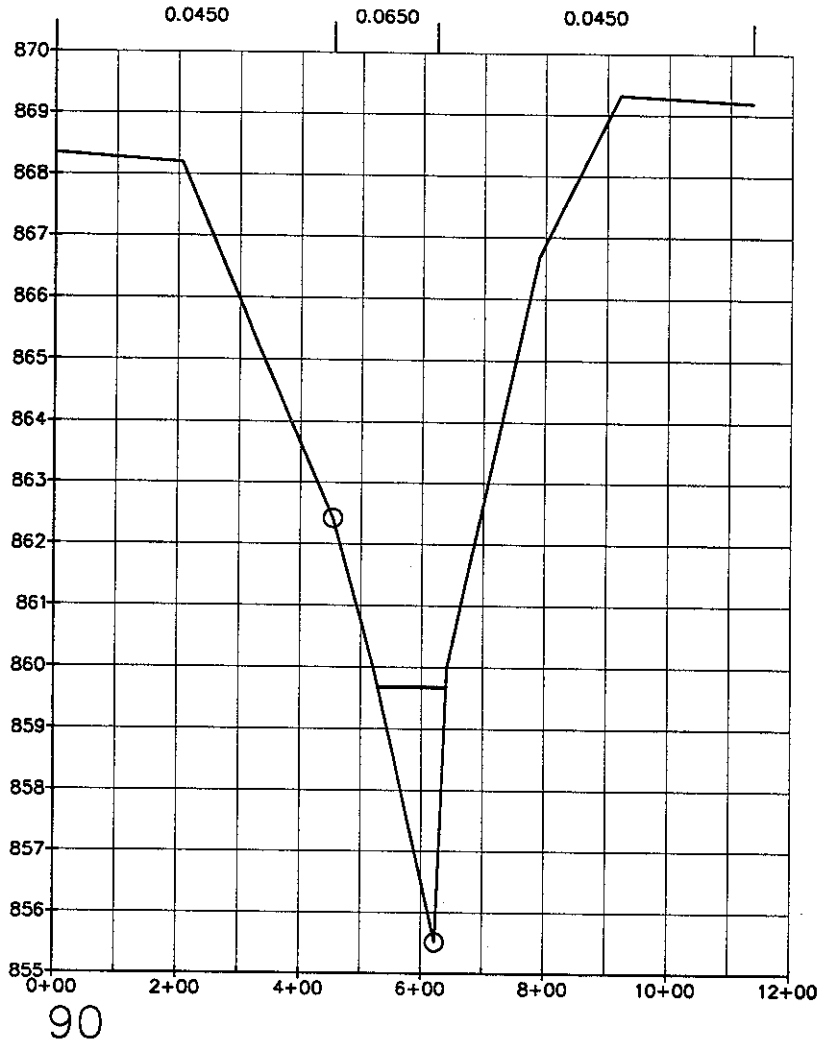
Cross-Section:	80	
Elevation:	848.69	ft MSL
Depth:	5.22	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2455	
Flow Regime:	Subcritical	
Flow Area:	213.59	sq ft
Average Velocity:	3.18	ft/s
Maximum Velocity:	3.18	ft/s
Composite n:	0.065	
Hydraulic Radius:	2.59	ft
Wetted Perimeter:	82.44	ft
Wetted Top Width:	81.76	ft
Critical Slope:	0.0898	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22S–80

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

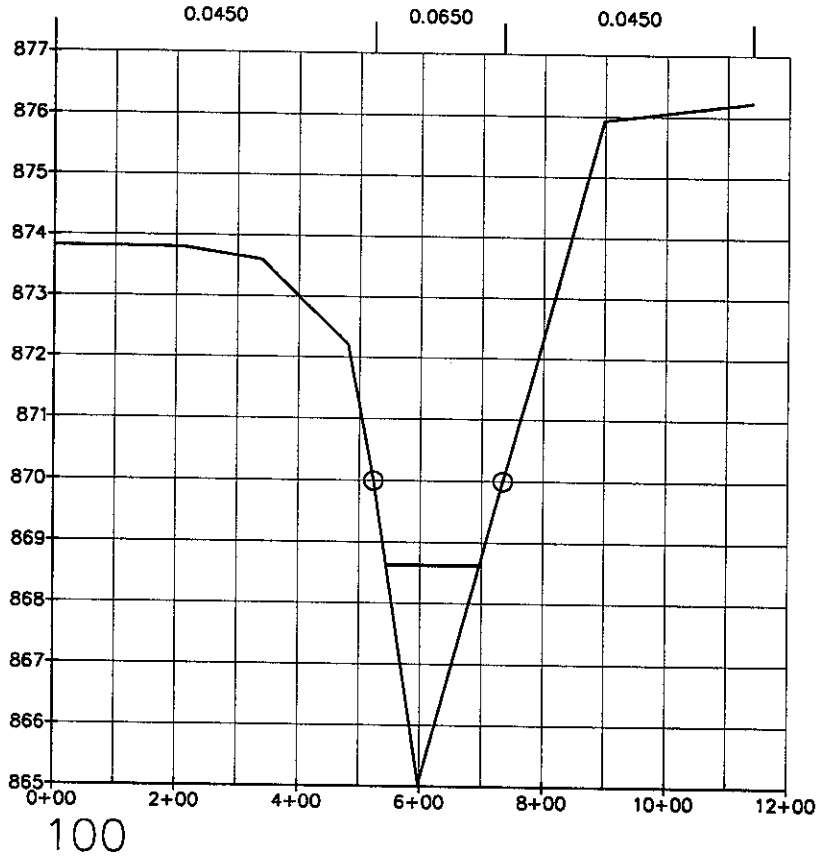
Cross-Section:	9	
Elevation:	859.68	ft MSL
Depth:	4.17	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2519	
Flow Regime:	Subcritical	
Flow Area:	233.04	sq ft
Average Velocity:	2.93	ft/s
Maximum Velocity:	3.90	ft/s
Composite n:	0.062	
Hydraulic Radius:	2.07	ft
Wetted Perimeter:	112.38	ft
Wetted Top Width:	111.80	ft
Critical Slope:	0.0879	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22S-90

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

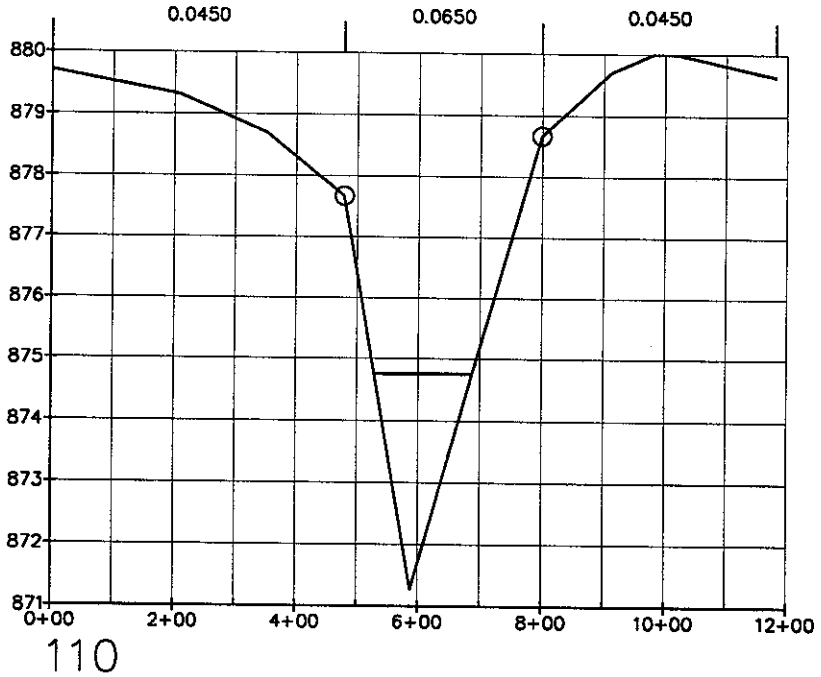
Cross-Section:	10	
Elevation:	868.62	ft MSL
Depth:	3.58	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2314	
Flow Regime:	Subcritical	
Flow Area:	273.61	sq ft
Average Velocity:	2.48	ft/s
Maximum Velocity:	2.48	ft/s
Composite n:	0.065	
Hydraulic Radius:	1.79	ft
Wetted Perimeter:	152.86	ft
Wetted Top Width:	152.68	ft
Critical Slope:	0.1009	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22S–100

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

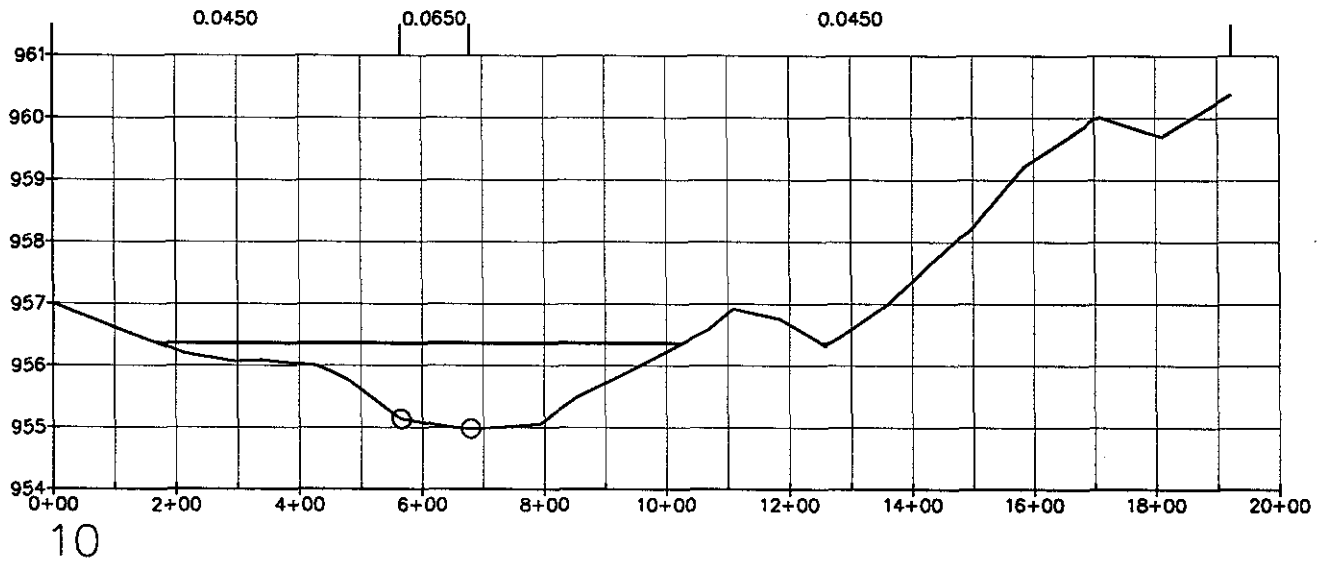
Cross-Section:	11	
Elevation:	874.76	ft MSL
Depth:	3.49	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0054	ft/ft
Froude Number:	0.2311	
Flow Regime:	Subcritical	
Flow Area:	277.75	sq ft
Average Velocity:	2.44	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.065	
Hydraulic Radius:	1.74	ft
Wetted Perimeter:	159.40	ft
Wetted Top Width:	159.23	ft
Critical Slope:	0.1018	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22S-110

Entellus™

File: WASH-T1S-R5W-S22S_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

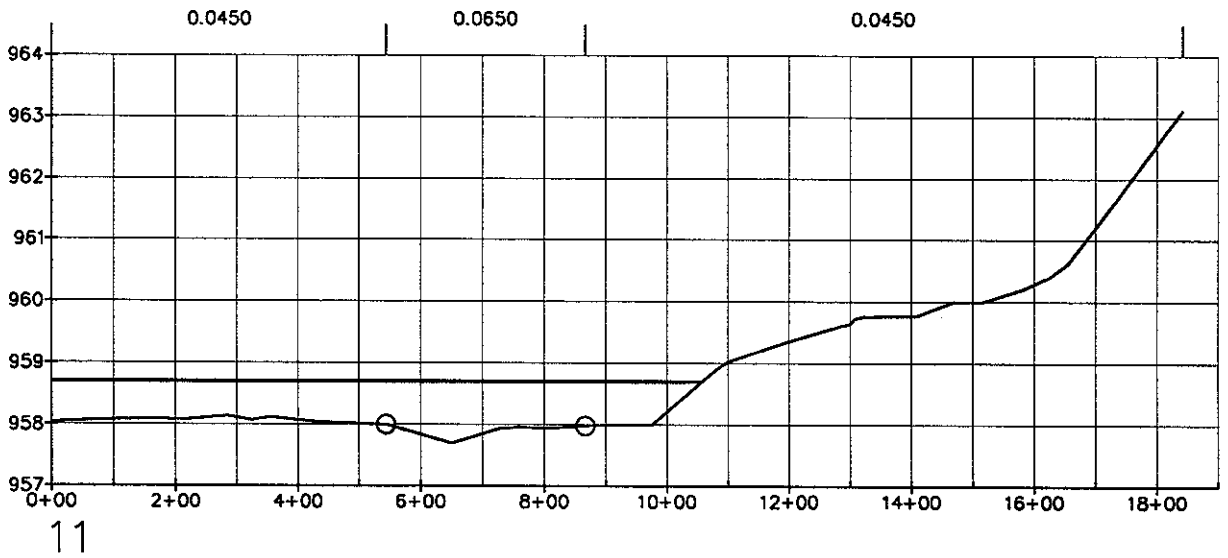
Cross-Section:	10	
Elevation:	956.37	ft MSL
Depth:	1.39	ft
Discharge:	1450.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3536	
Flow Regime:	Subcritical	
Flow Area:	613.92	sq ft
Average Velocity:	2.38	ft/s
Maximum Velocity:	2.68	ft/s
Composite n:	0.0478	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	872.48	ft
Wetted Top Width:	872.47	ft
Critical Slope:	0.0734	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–10

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

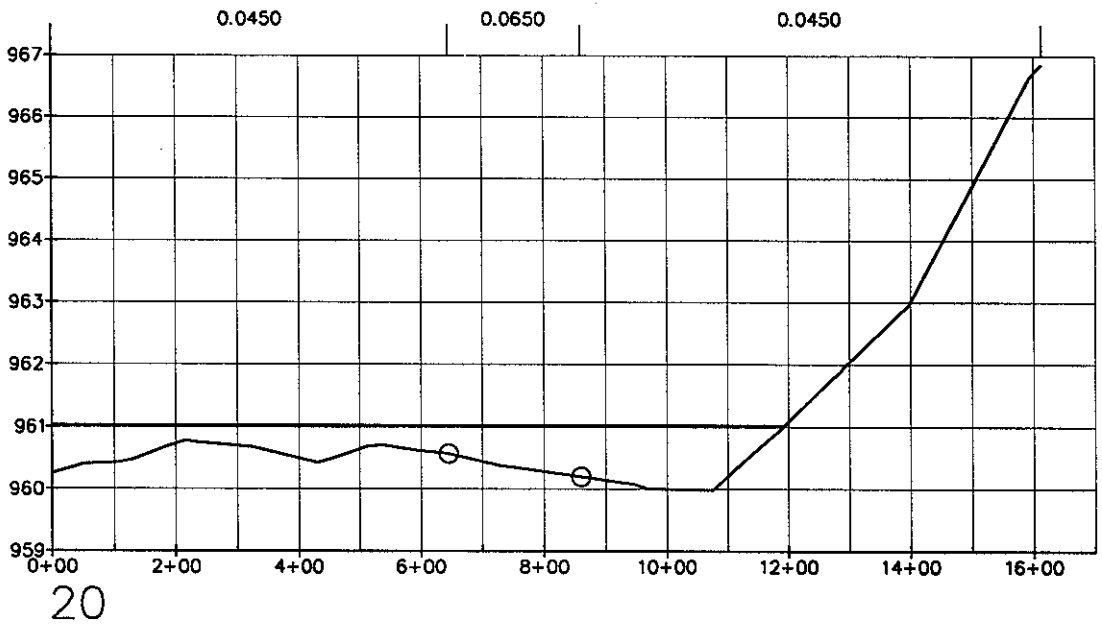
Cross-Section:	11	
Elevation:	958.70	ft MSL
Depth:	1.00	ft
Discharge:	1450.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3601	
Flow Regime:	Subcritical	
Flow Area:	709.78	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0515	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	1057.37	ft
Wetted Top Width:	1057.37	ft
Critical Slope:	0.0654	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–11

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

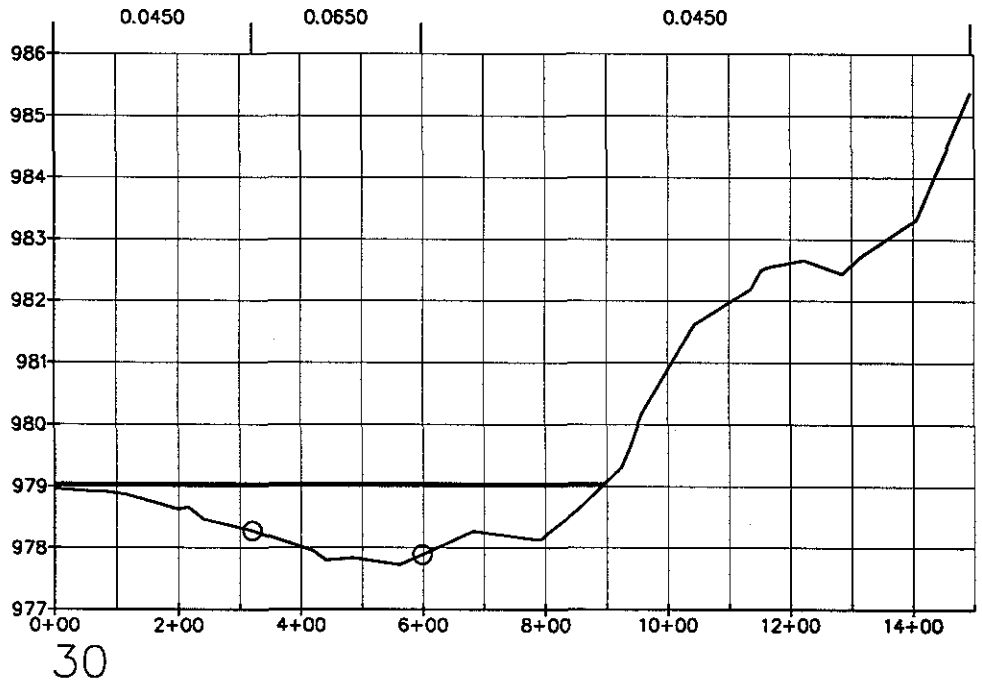
Cross-Section:	20	
Elevation:	961.02	ft MSL
Depth:	1.03	ft
Discharge:	1450.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3659	
Flow Regime:	Subcritical	
Flow Area:	689.39	sq ft
Average Velocity:	2.06	ft/s
Maximum Velocity:	2.63	ft/s
Composite n:	0.0489	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	1191.74	ft
Wetted Top Width:	1191.73	ft
Critical Slope:	0.0738	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–20

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

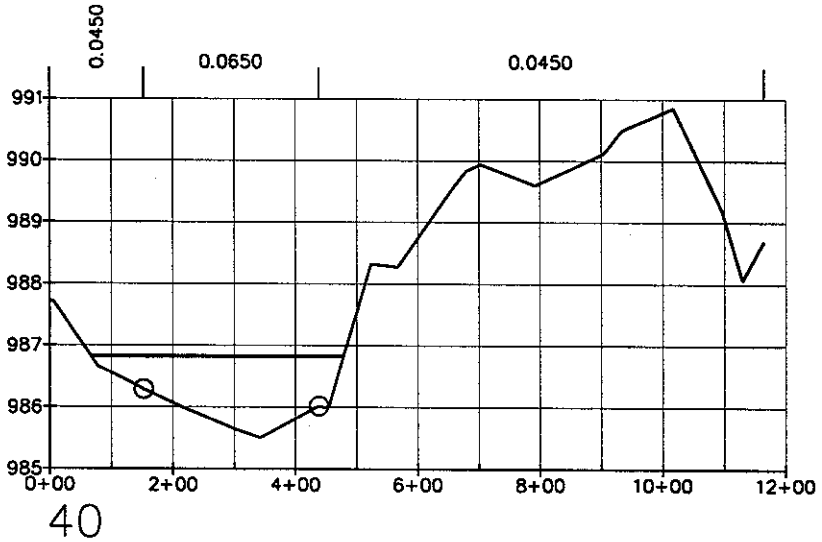
Cross-Section:	30	
Elevation:	979.04	ft MSL
Depth:	1.31	ft
Discharge:	1450.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3476	
Flow Regime:	Subcritical	
Flow Area:	642.38	sq ft
Average Velocity:	2.22	ft/s
Maximum Velocity:	2.50	ft/s
Composite n:	0.0516	
Hydraulic Radius:	0.72	ft
Wetted Perimeter:	896.00	ft
Wetted Top Width:	895.99	ft
Critical Slope:	0.0788	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–30

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

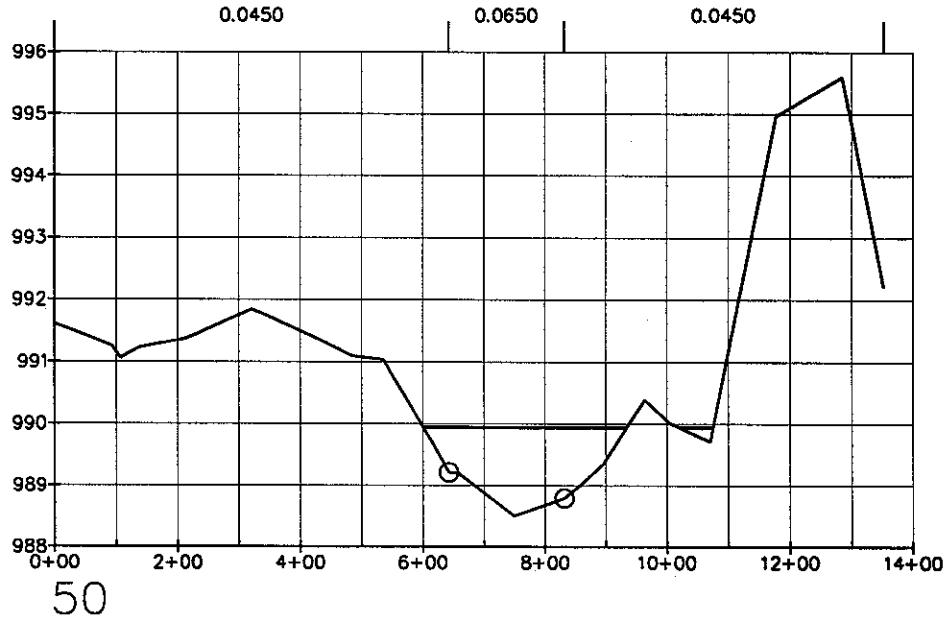
Cross-Section:	40	
Elevation:	986.83	ft MSL
Depth:	1.32	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3103	
Flow Regime:	Subcritical	
Flow Area:	331.88	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.10	ft/s
Composite n:	0.0592	
Hydraulic Radius:	0.81	ft
Wetted Perimeter:	412.16	ft
Wetted Top Width:	412.14	ft
Critical Slope:	0.0893	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–40

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

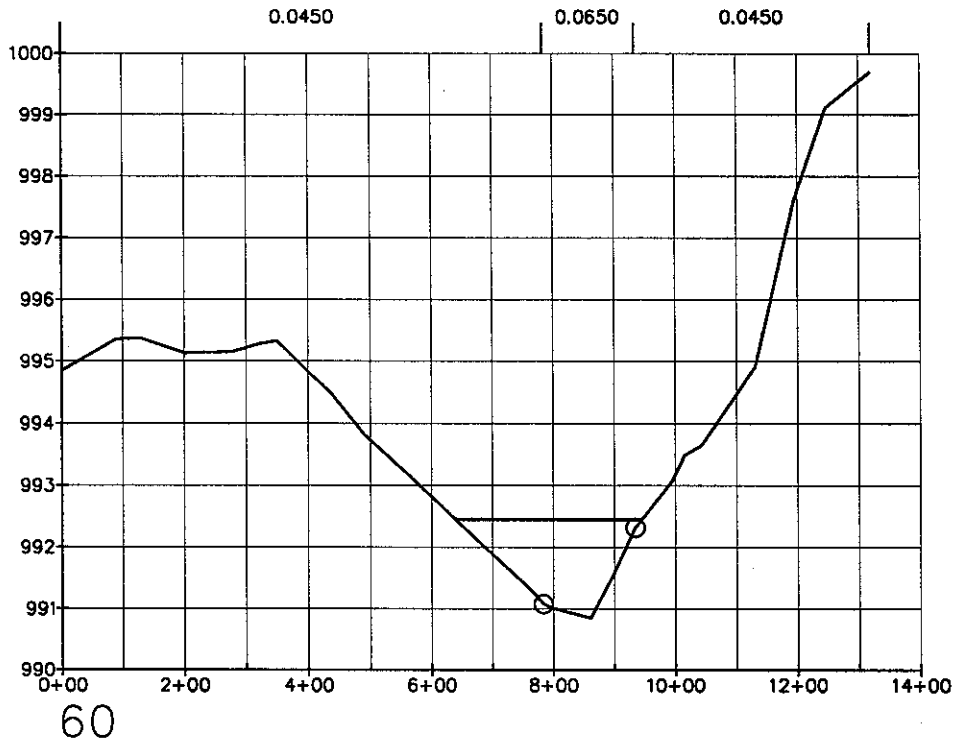
Cross-Section:	50	
Elevation:	989.94	ft MSL
Depth:	1.44	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3213	
Flow Regime:	Subcritical	
Flow Area:	306.52	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0552	
Hydraulic Radius:	0.79	ft
Wetted Perimeter:	387.67	ft
Wetted Top Width:	387.65	ft
Critical Slope:	0.0869	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–50

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

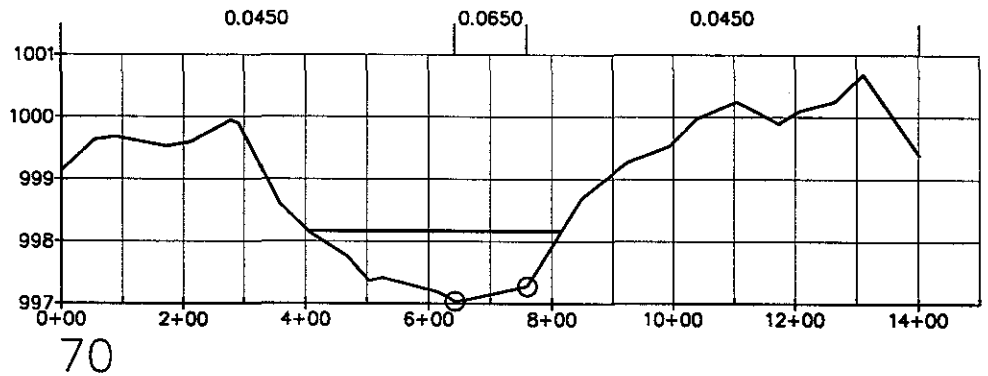
Cross-Section:	60	
Elevation:	992.45	ft MSL
Depth:	1.60	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.333	
Flow Regime:	Subcritical	
Flow Area:	279.97	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.39	ft/s
Composite n:	0.0552	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	306.51	ft
Wetted Top Width:	306.49	ft
Critical Slope:	0.0802	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–60

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

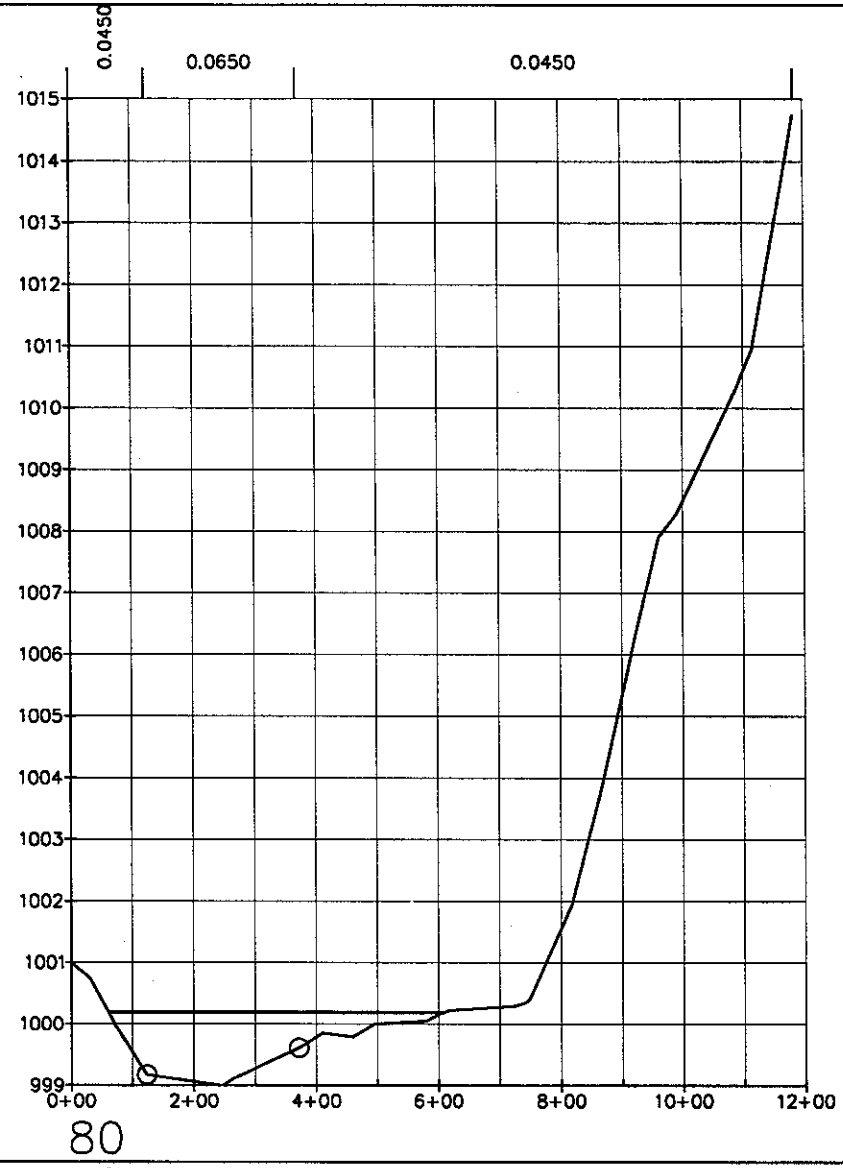
Cross-Section:	70	
Elevation:	998.17	ft MSL
Depth:	1.13	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3701	
Flow Regime:	Subcritical	
Flow Area:	300.71	sq ft
Average Velocity:	2.20	ft/s
Maximum Velocity:	2.31	ft/s
Composite n:	0.0511	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	411.00	ft
Wetted Top Width:	410.99	ft
Critical Slope:	0.0646	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–70

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

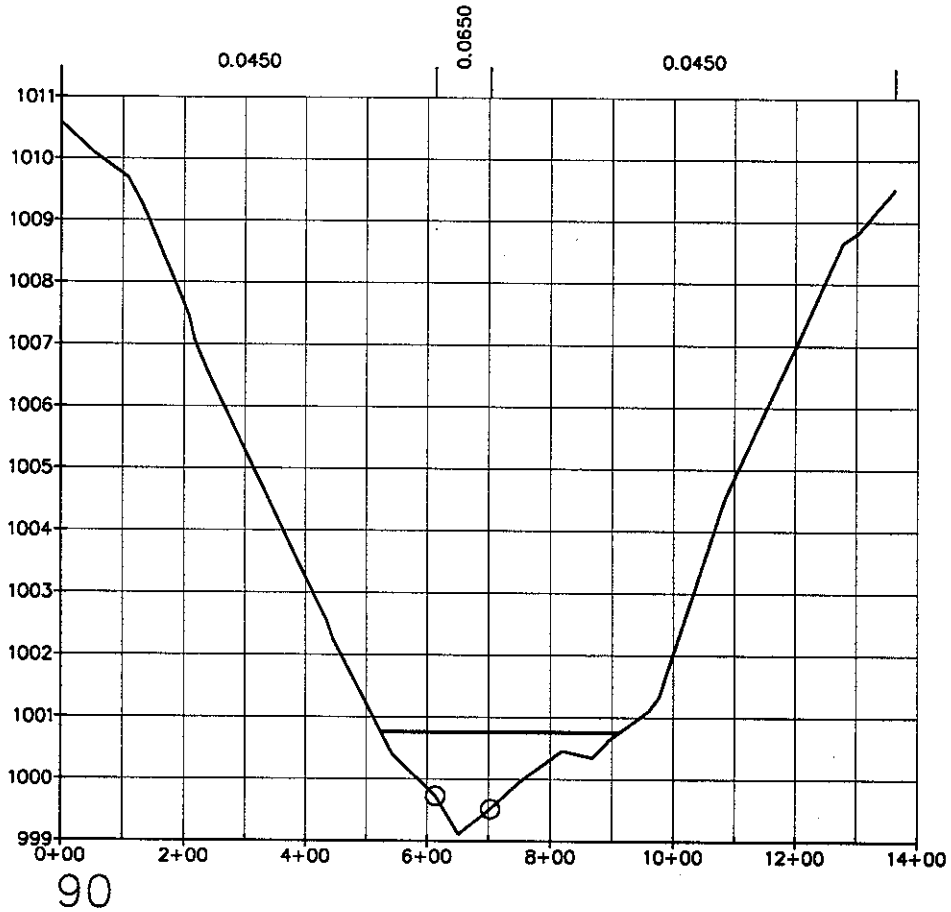
Cross-Section:	80	
Elevation:	1000.19	ft MSL
Depth:	1.19	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3181	
Flow Regime:	Subcritical	
Flow Area:	340.57	sq ft
Average Velocity:	1.93	ft/s
Maximum Velocity:	2.10	ft/s
Composite n:	0.0544	
Hydraulic Radius:	0.62	ft
Wetted Perimeter:	548.45	ft
Wetted Top Width:	548.44	ft
Critical Slope:	0.0965	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–80

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

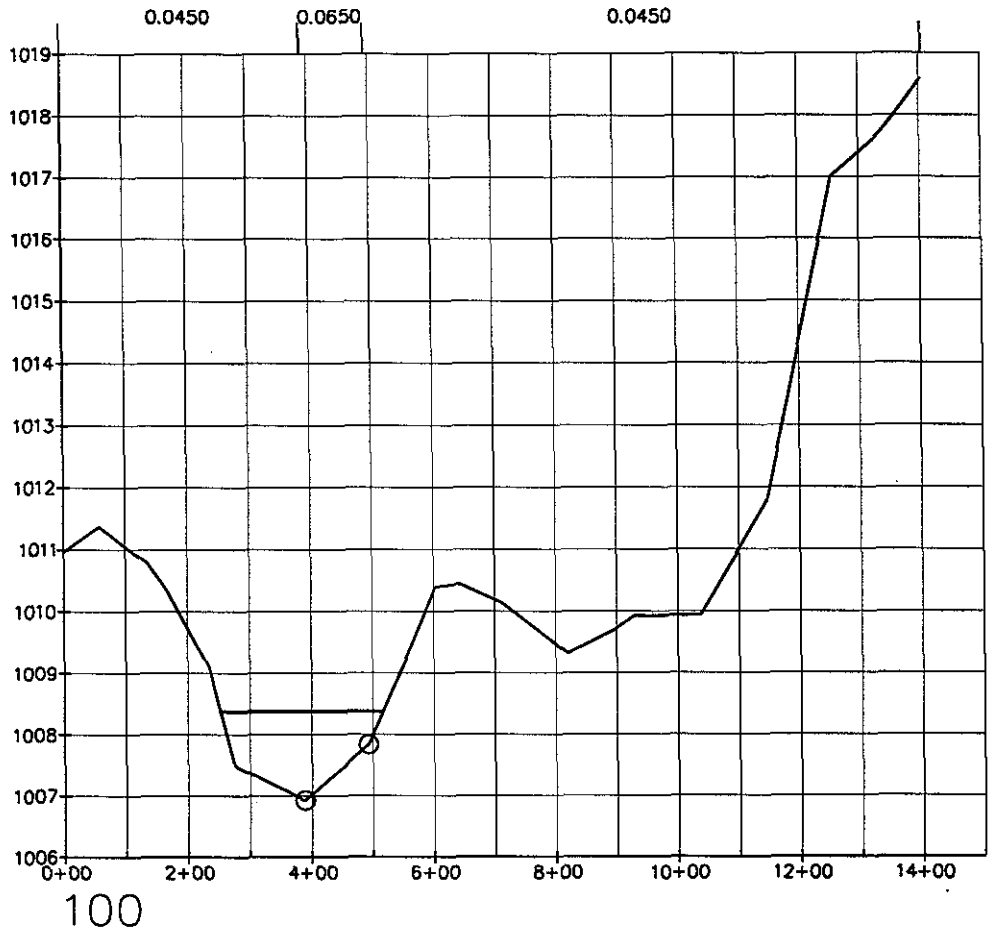
Cross-Section:	90	
Elevation:	1000.76	ft MSL
Depth:	1.65	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3162	
Flow Regime:	Subcritical	
Flow Area:	290.58	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.65	ft/s
Composite n:	0.0499	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	388.89	ft
Wetted Top Width:	388.87	ft
Critical Slope:	0.088	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–90

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

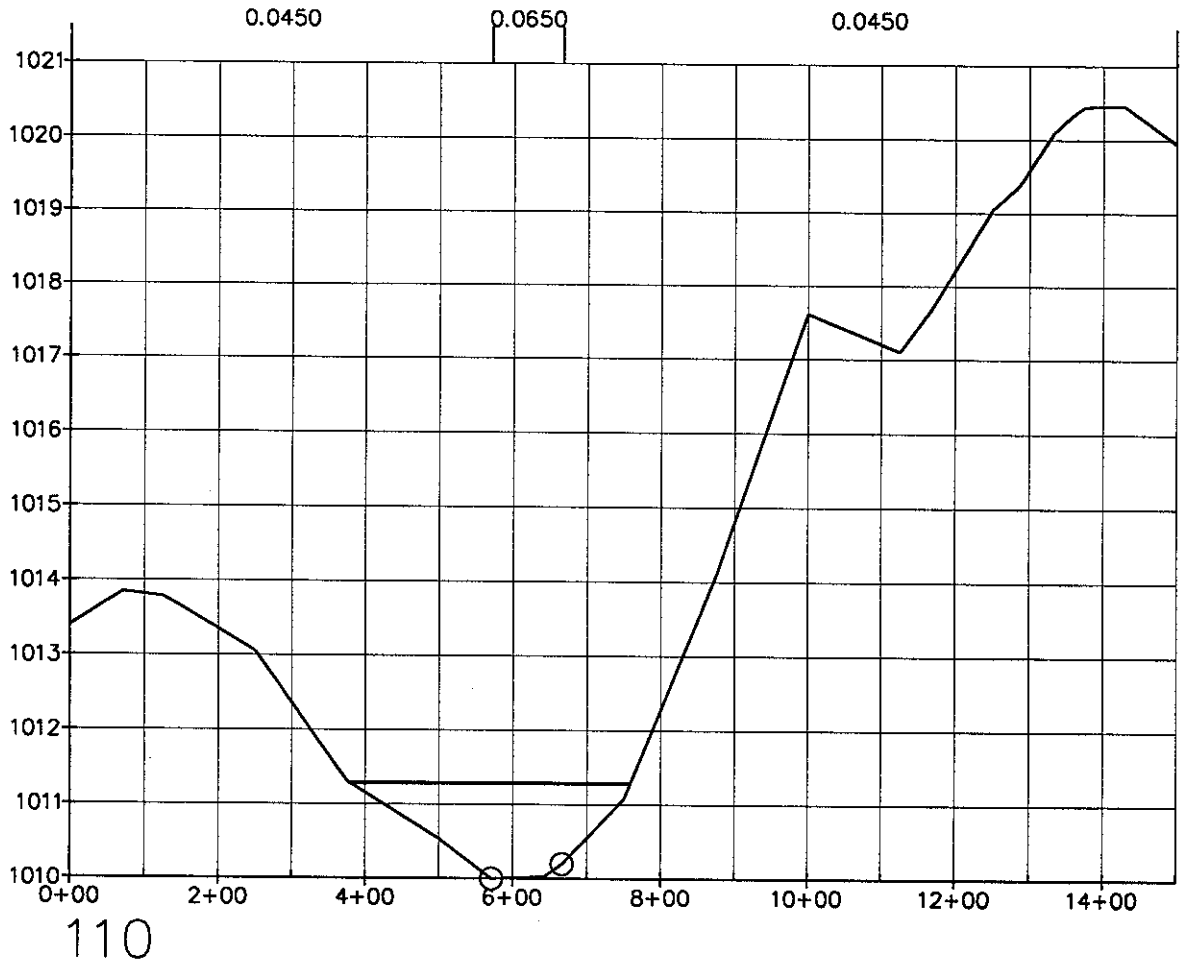
Cross-Section:	100	
Elevation:	1008.38	ft MSL
Depth:	1.45	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3893	
Flow Regime:	Subcritical	
Flow Area:	252.41	sq ft
Average Velocity:	2.67	ft/s
Maximum Velocity:	3.15	ft/s
Composite n:	0.0533	
Hydraulic Radius:	0.95	ft
Wetted Perimeter:	264.34	ft
Wetted Top Width:	264.31	ft
Critical Slope:	0.0634	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–100

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

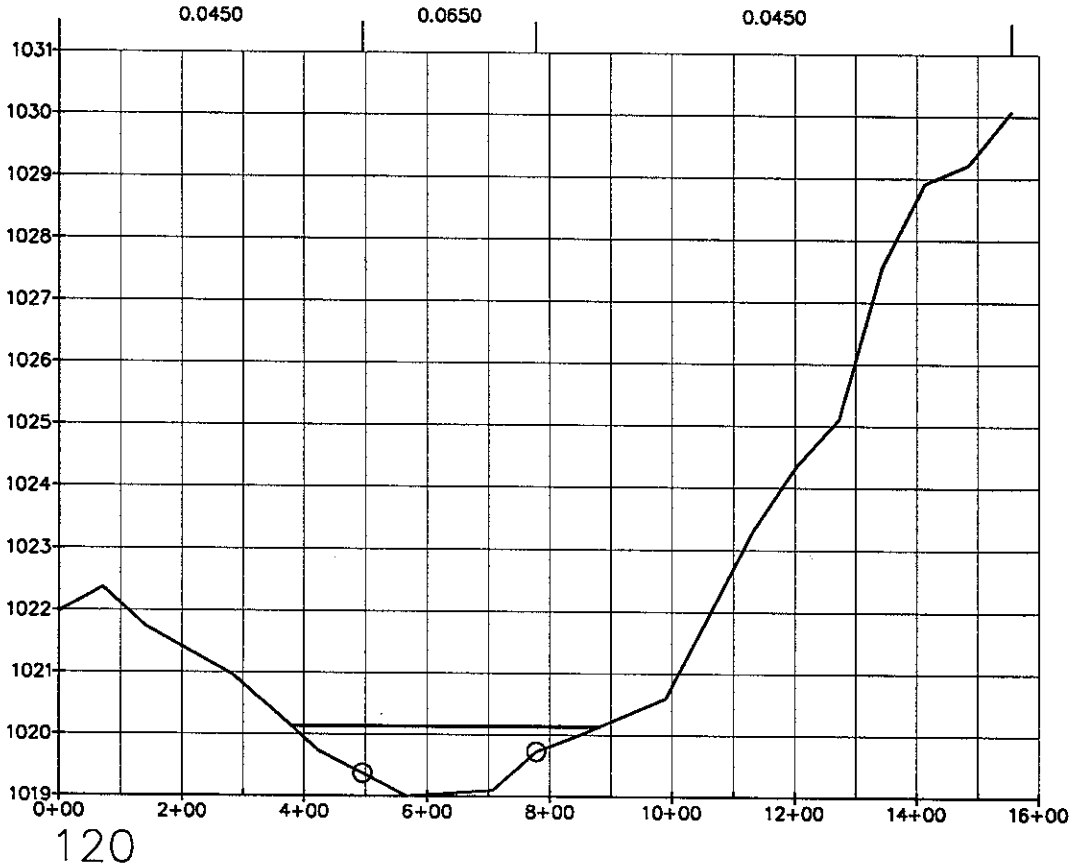
Cross-Section:	110	
Elevation:	1011.29	ft MSL
Depth:	1.29	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3579	
Flow Regime:	Subcritical	
Flow Area:	291.03	sq ft
Average Velocity:	2.29	ft/s
Maximum Velocity:	2.45	ft/s
Composite n:	0.0503	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	379.56	ft
Wetted Top Width:	379.55	ft
Critical Slope:	0.0673	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–110

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

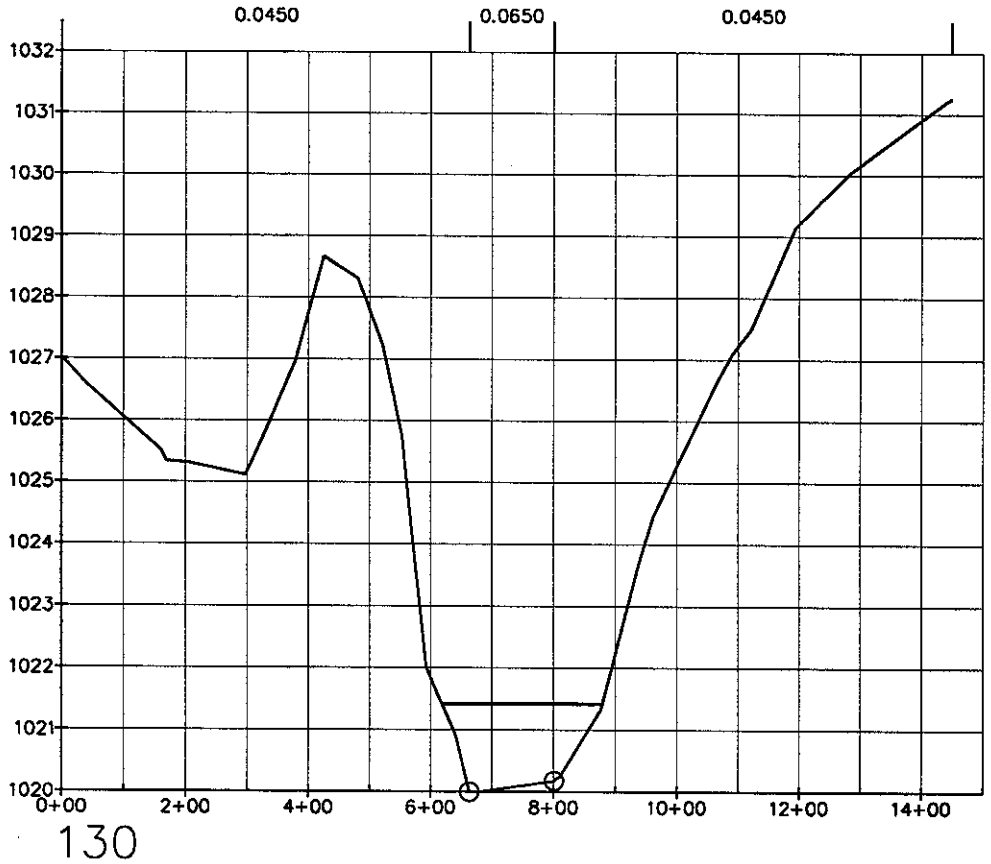
Cross-Section:	120	
Elevation:	1020.14	ft MSL
Depth:	1.14	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3221	
Flow Regime:	Subcritical	
Flow Area:	343.97	sq ft
Average Velocity:	1.95	ft/s
Maximum Velocity:	2.06	ft/s
Composite n:	0.0567	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	501.99	ft
Wetted Top Width:	501.98	ft
Critical Slope:	0.0876	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–120

Entellus™

File: WASH–T1N–R5W–S22_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

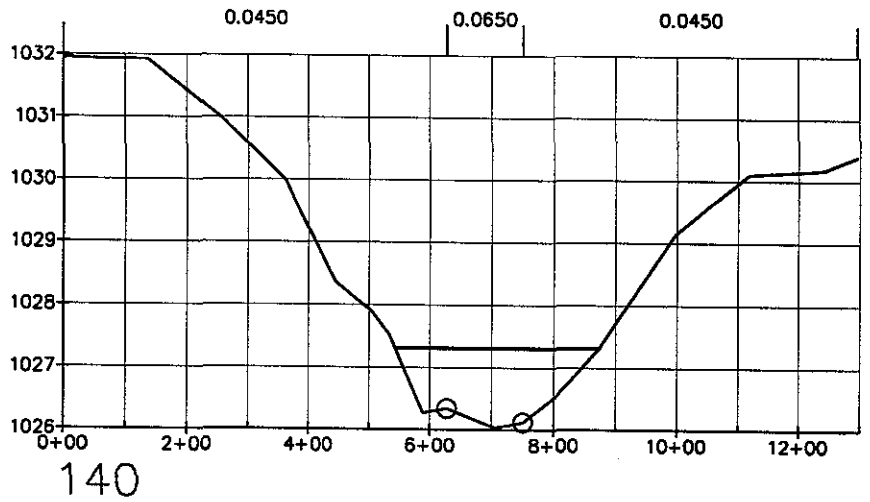
Cross-Section:	130	
Elevation:	1021.42	ft MSL
Depth:	1.42	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.372	
Flow Regime:	Subcritical	
Flow Area:	266.17	sq ft
Average Velocity:	2.49	ft/s
Maximum Velocity:	2.57	ft/s
Composite n:	0.056	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	260.88	ft
Wetted Top Width:	260.84	ft
Critical Slope:	0.0629	ft/ft

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N-R5W-S22-130

Entellus™



Normal Depth Results

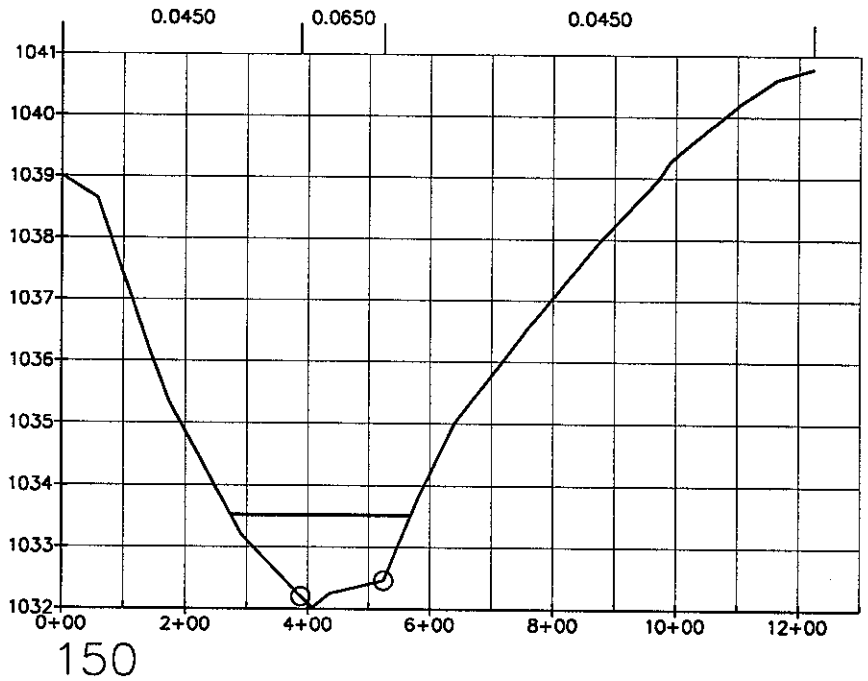
Cross-Section:	140	
Elevation:	1027.31	ft MSL
Depth:	1.28	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.364	
Flow Regime:	Subcritical	
Flow Area:	286.41	sq ft
Average Velocity:	2.36	ft/s
Maximum Velocity:	2.51	ft/s
Composite n:	0.0528	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	331.15	ft
Wetted Top Width:	331.13	ft
Critical Slope:	0.063	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–140

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

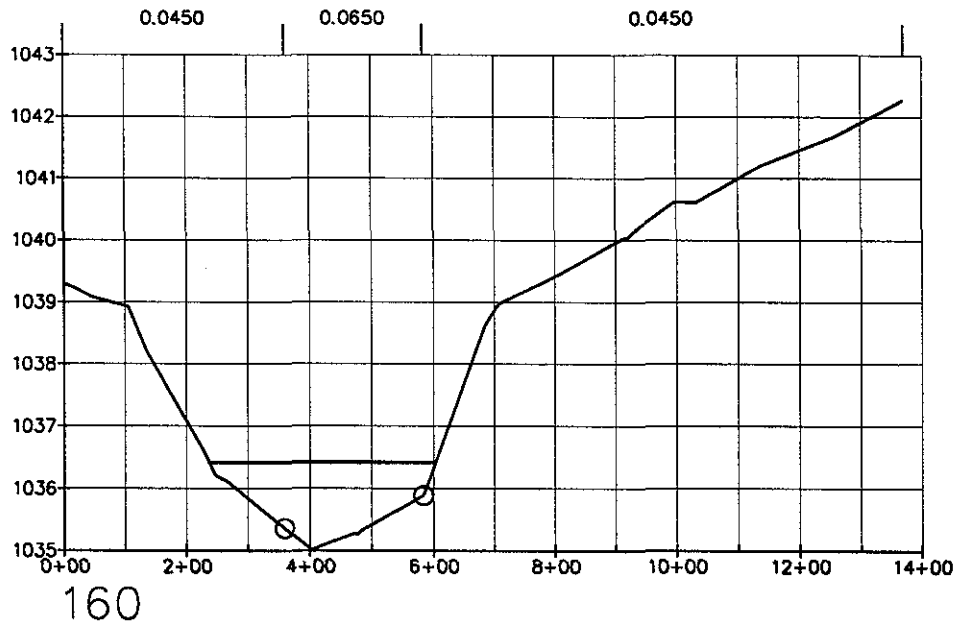
Cross-Section:	150	
Elevation:	1033.52	ft MSL
Depth:	1.50	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3507	
Flow Regime:	Subcritical	
Flow Area:	275.19	sq ft
Average Velocity:	2.41	ft/s
Maximum Velocity:	2.45	ft/s
Composite n:	0.0546	
Hydraulic Radius:	0.93	ft
Wetted Perimeter:	295.40	ft
Wetted Top Width:	295.38	ft
Critical Slope:	0.0712	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–150

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

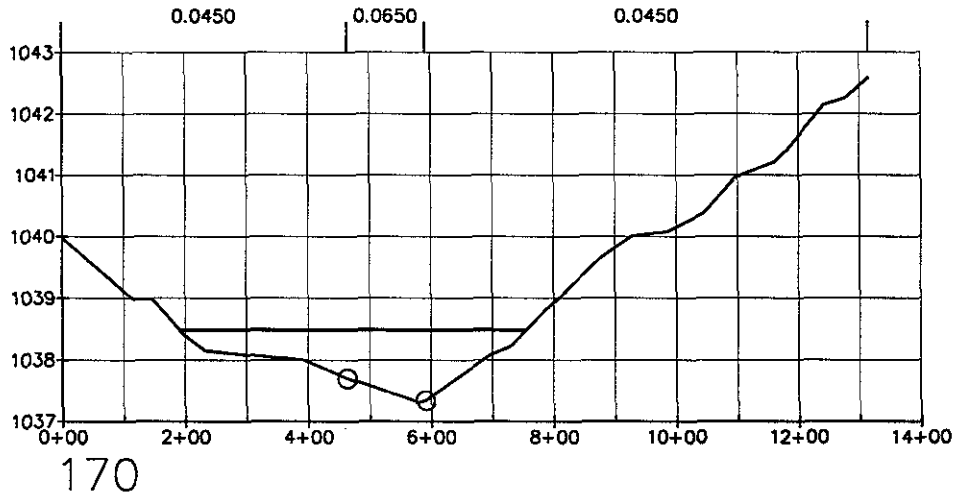
Cross-Section:	160	
Elevation:	1036.42	ft MSL
Depth:	1.41	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3193	
Flow Regime:	Subcritical	
Flow Area:	311.40	sq ft
Average Velocity:	2.15	ft/s
Maximum Velocity:	2.19	ft/s
Composite n:	0.0576	
Hydraulic Radius:	0.85	ft
Wetted Perimeter:	366.47	ft
Wetted Top Width:	366.45	ft
Critical Slope:	0.0844	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–160

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

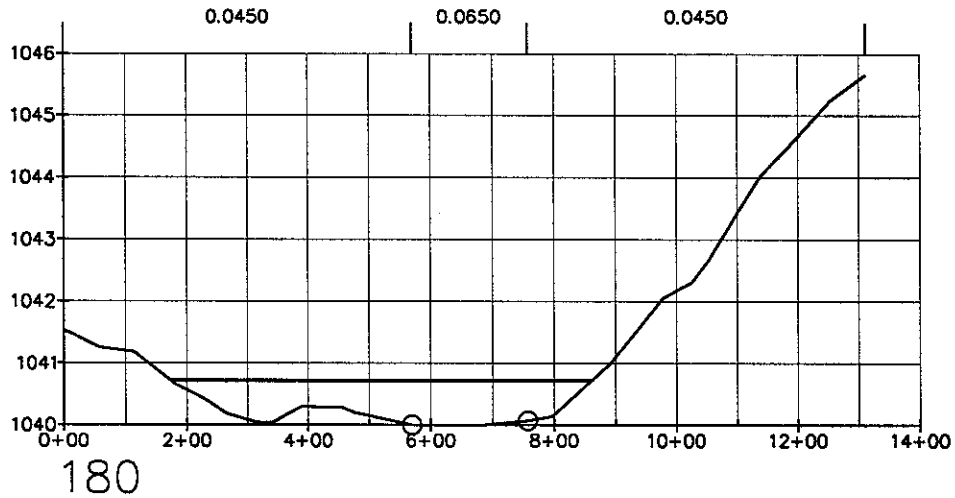
Cross-Section:	170	
Elevation:	1038.48	ft MSL
Depth:	1.17	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3197	
Flow Regime:	Subcritical	
Flow Area:	340.83	sq ft
Average Velocity:	1.99	ft/s
Maximum Velocity:	2.13	ft/s
Composite n:	0.0498	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	565.22	ft
Wetted Top Width:	565.21	ft
Critical Slope:	0.083	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–170

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

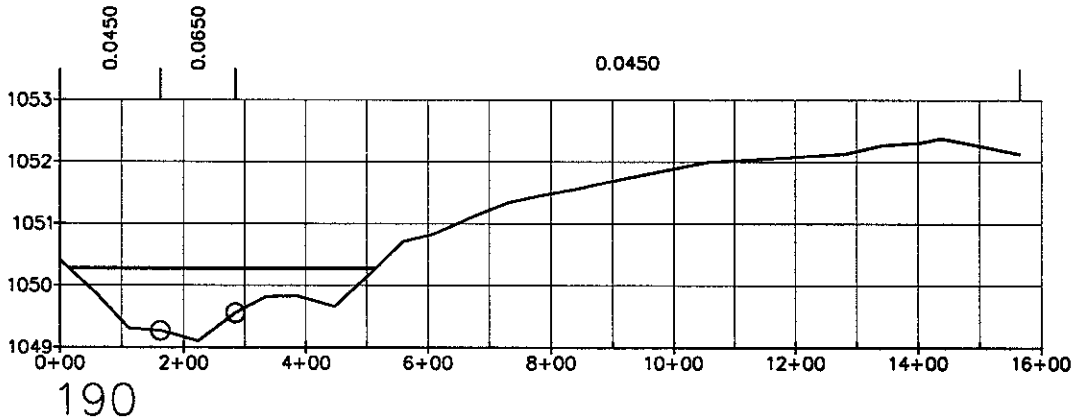
Cross-Section:	180	
Elevation:	1040.72	ft MSL
Depth:	0.72	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3737	
Flow Regime:	Subcritical	
Flow Area:	371.89	sq ft
Average Velocity:	1.80	ft/s
Maximum Velocity:	1.91	ft/s
Composite n:	0.0508	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	687.65	ft
Wetted Top Width:	687.65	ft
Critical Slope:	0.0614	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–180

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

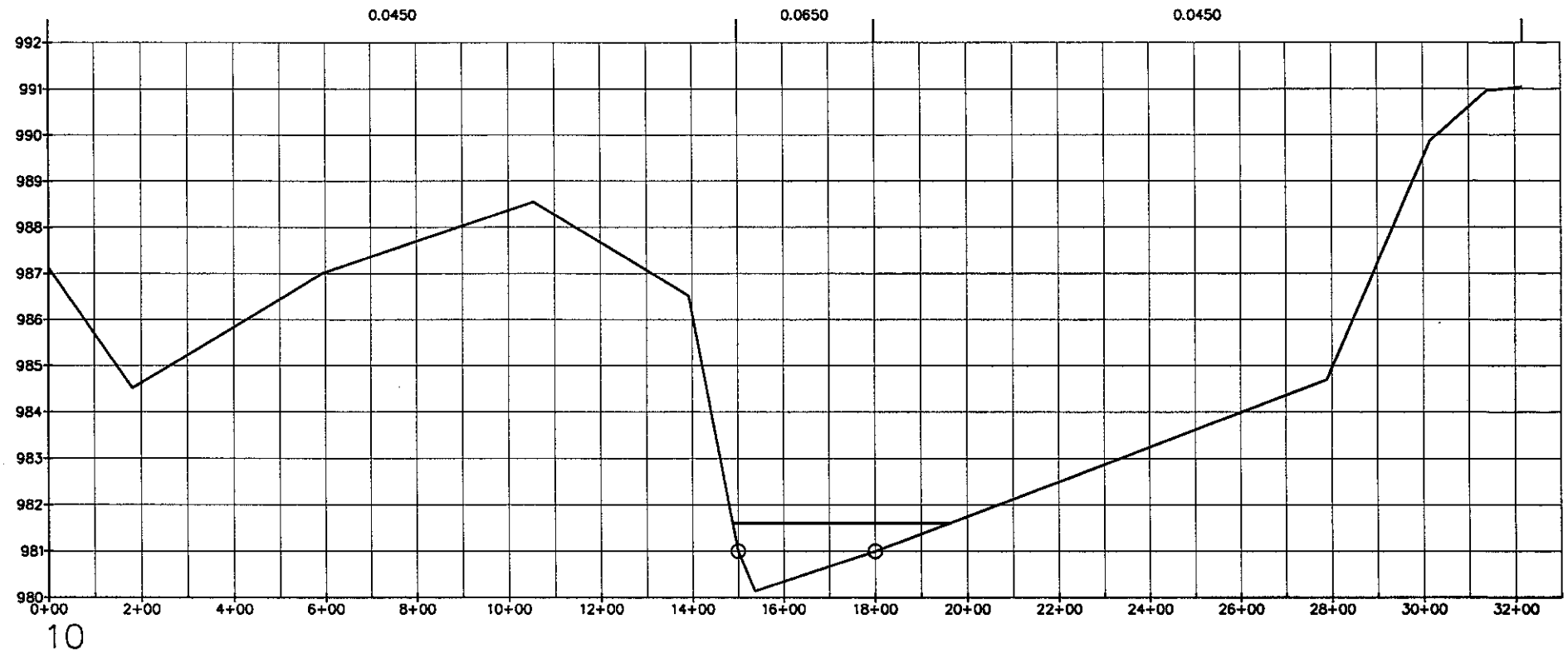
Cross-Section:	190	
Elevation:	1050.28	ft MSL
Depth:	1.18	ft
Discharge:	670.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3333	
Flow Regime:	Subcritical	
Flow Area:	326.51	sq ft
Average Velocity:	2.08	ft/s
Maximum Velocity:	2.28	ft/s
Composite n:	0.0502	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	500.72	ft
Wetted Top Width:	500.71	ft
Critical Slope:	0.0761	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S22–190

Entellus™

File: WASH-T1N-R5W-S22_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

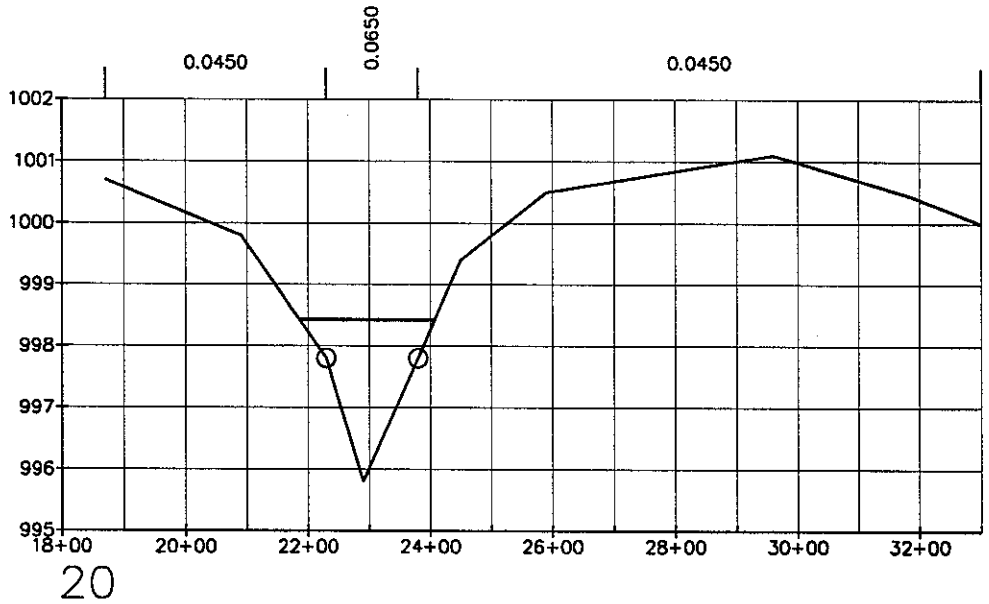
Cross-Section:	10		Flow Area:	361.88	sq ft
Elevation:	981.60	ft MSL	Average Velocity:	2.15	ft/s
Depth:	1.46	ft	Maximum Velocity:	2.27	ft/s
Discharge:	780.00	cfs	Composite n:	0.0581	
Energy Gradient:	0.0094	ft/ft	Hydraulic Radius:	0.77	ft
Froude Number:	0.3142		Wetted Perimeter:	472.80	ft
Flow Regime:	Subcritical		Wetted Top Width:	472.78	ft
			Critical Slope:	0.1022	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S15–10

Entellus™

File: WASH-T1N-R5W-S15_X-SECTION-R14.dwg Date: 10/02/00



Normal Depth Results

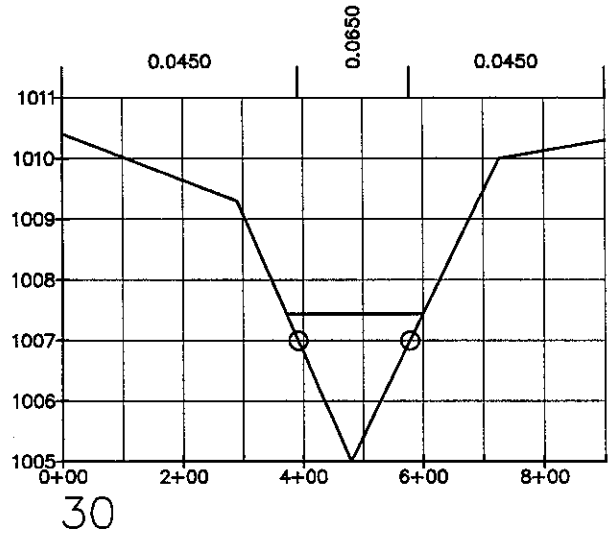
Cross-Section:	20	
Elevation:	998.43	ft MSL
Depth:	2.63	ft
Discharge:	780.00	cfs
Energy Gradient:	0.0094	ft/ft
Froude Number:	0.3178	
Flow Regime:	Subcritical	
Flow Area:	266.84	sq ft
Average Velocity:	2.94	ft/s
Maximum Velocity:	3.08	ft/s
Composite n:	0.0589	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	221.61	ft
Wetted Top Width:	221.54	ft
Critical Slope:	0.1032	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S15–20

Entellus™

File: WASH-T1N-R5W-S15_X-SECTION-R14.dwg Date: 10/02/00



Normal Depth Results

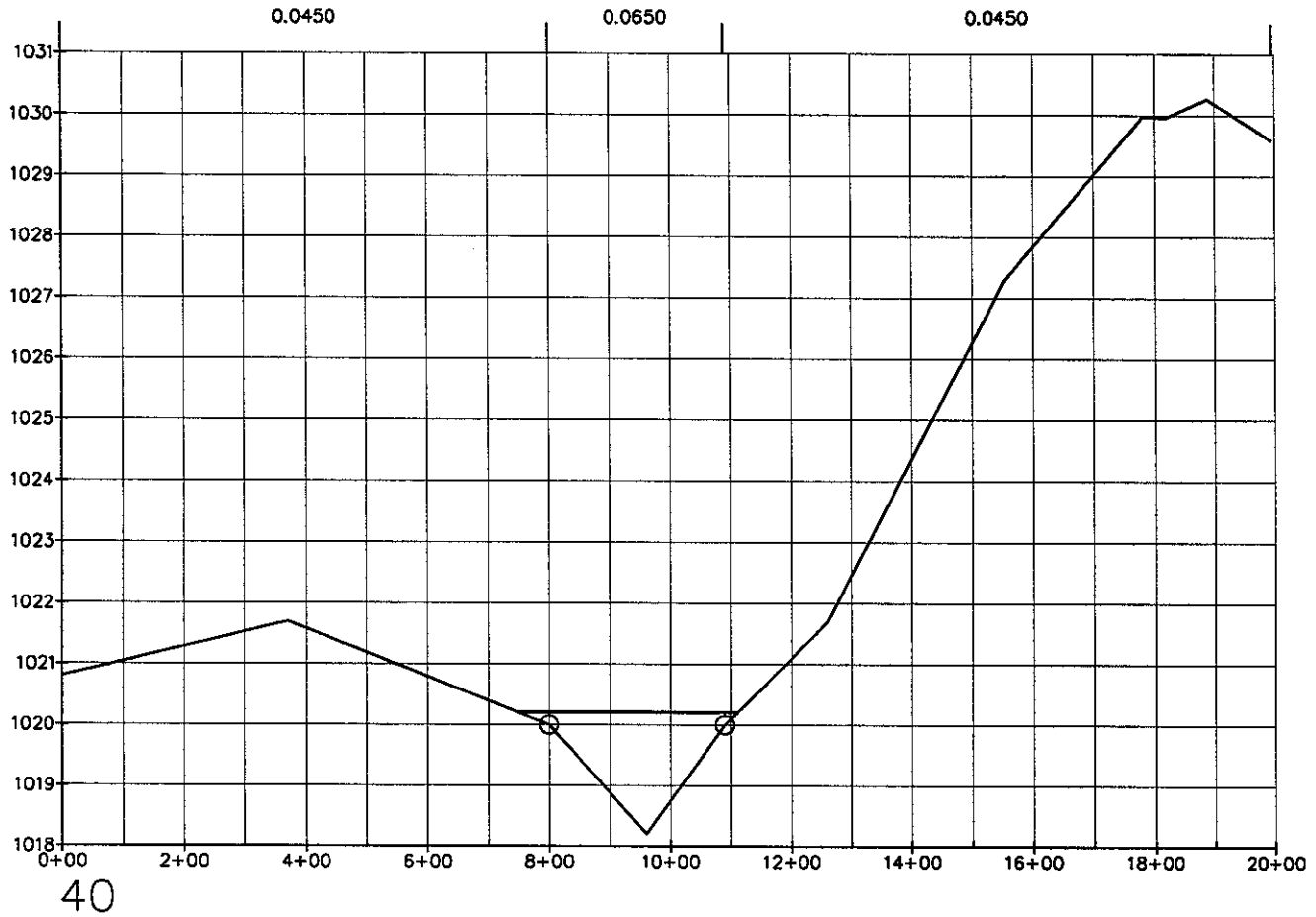
Cross-Section:	30	
Elevation:	1007.44	ft MSL
Depth:	2.44	ft
Discharge:	780.00	cfs
Energy Gradient:	0.0094	ft/ft
Froude Number:	0.3162	
Flow Regime:	Subcritical	
Flow Area:	278.33	sq ft
Average Velocity:	2.78	ft/s
Maximum Velocity:	2.84	ft/s
Composite n:	0.0616	
Hydraulic Radius:	1.22	ft
Wetted Perimeter:	228.05	ft
Wetted Top Width:	228.00	ft
Critical Slope:	0.103	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S15–30

Entellus™

File: WASH-T1N-R5W-S15_X-SECTION-R14.dwg Date: 5/29/03



Normal Depth Results

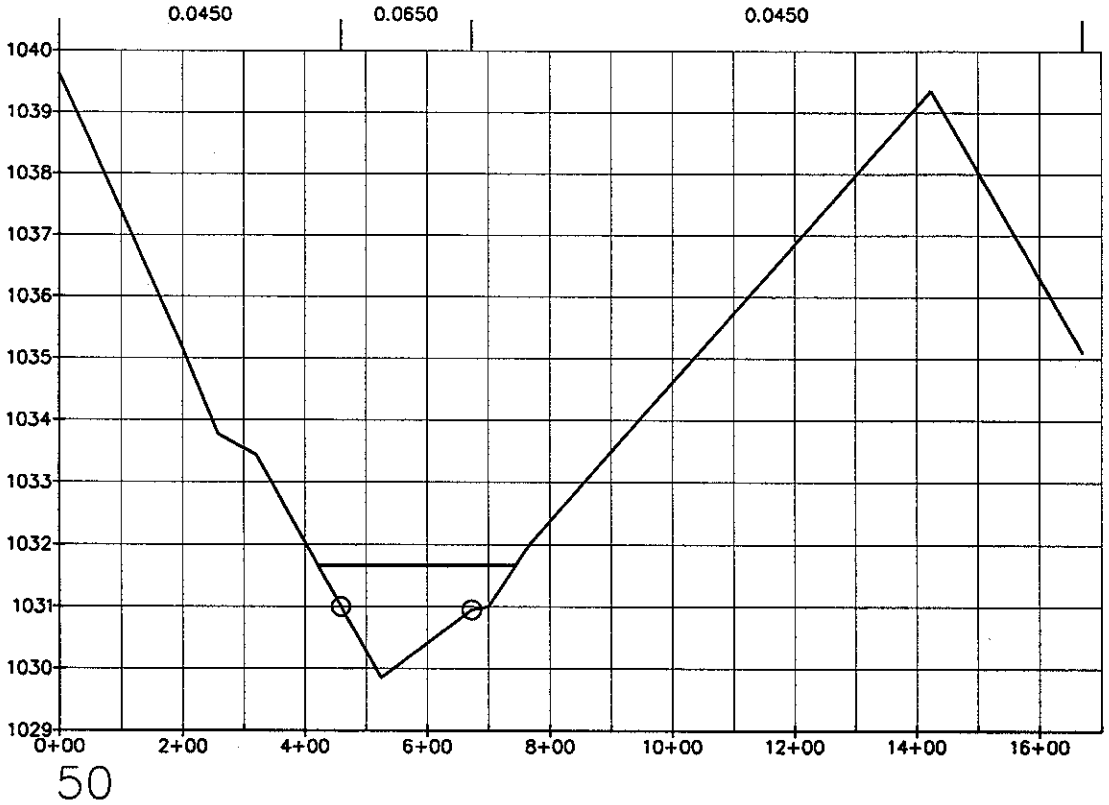
Cross-Section:	40	
Elevation:	1020.21	ft MSL
Depth:	2.01	ft
Discharge:	780.00	cfs
Energy Gradient:	0.0094	ft/ft
Froude Number:	0.2942	
Flow Regime:	Subcritical	
Flow Area:	329.67	sq ft
Average Velocity:	2.34	ft/s
Maximum Velocity:	2.38	ft/s
Composite n:	0.0612	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	364.13	ft
Wetted Top Width:	364.10	ft
Critical Slope:	0.1245	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S15–40

Entellus™

File: WASH-T1N-R5W-S15_X-SECTION-R14.dwg Date: 10/02/00



Normal Depth Results

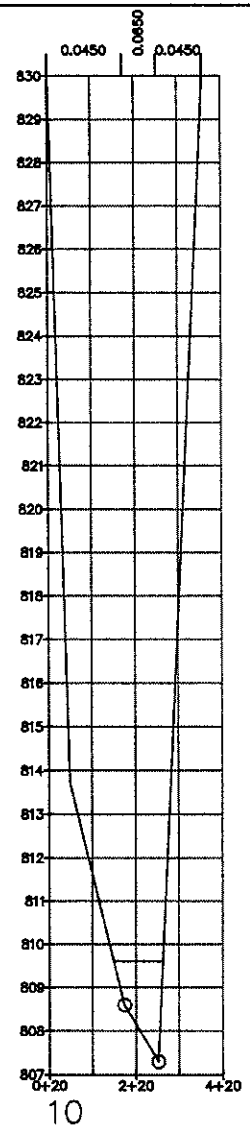
Cross-Section:	50	
Elevation:	1031.67	ft MSL
Depth:	1.82	ft
Discharge:	780.00	cfs
Energy Gradient:	0.0094	ft/ft
Froude Number:	0.3242	
Flow Regime:	Subcritical	
Flow Area:	314.78	sq ft
Average Velocity:	2.48	ft/s
Maximum Velocity:	2.59	ft/s
Composite n:	0.0586	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	322.94	ft
Wetted Top Width:	322.92	ft
Critical Slope:	0.0935	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S15–50

Entellus™

File: WASH-T1N-R5W-S15_X-SECTION-R14.dwg Date: 10/02/00



Normal Depth Results

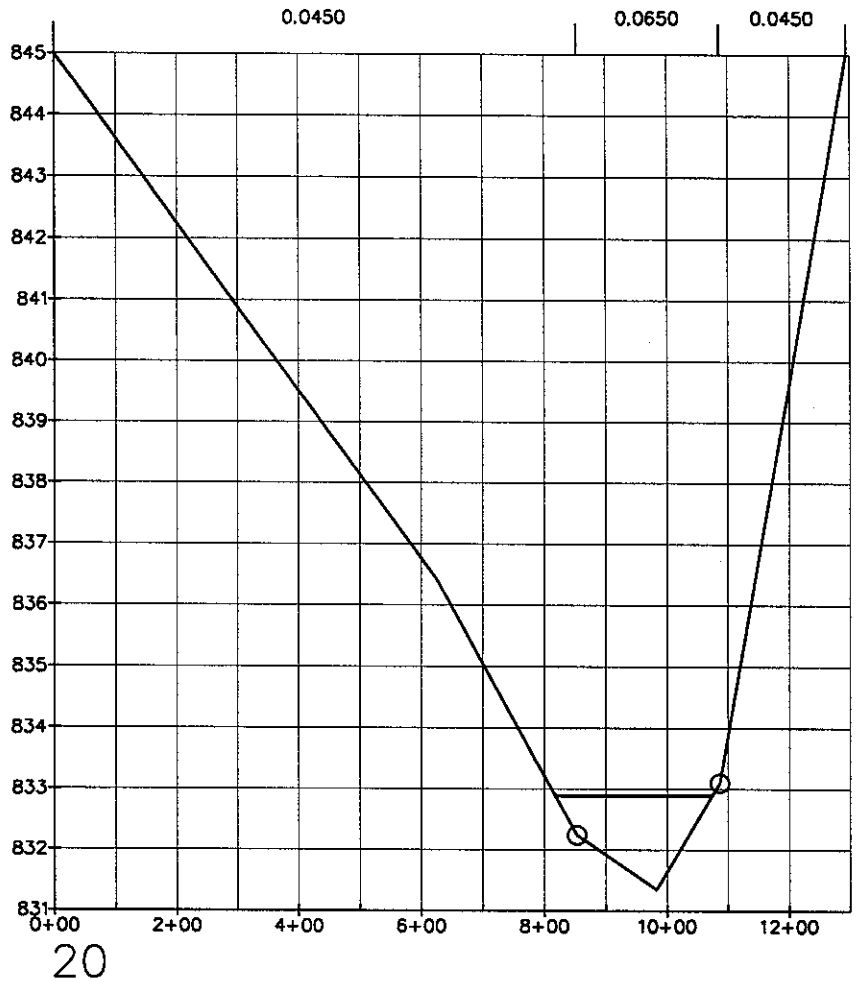
Cross-Section:	10	
Elevation:	809.61	ft MSL
Depth:	2.31	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.4516	
Flow Regime:	Subcritical	
Flow Area:	154.11	sq ft
Average Velocity:	3.89	ft/s
Maximum Velocity:	4.43	ft/s
Composite n:	0.059	
Hydraulic Radius:	1.36	ft
Wetted Perimeter:	113.53	ft
Wetted Top Width:	113.25	ft
Critical Slope:	0.0777	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22N-10

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 6/2/03



Normal Depth Results

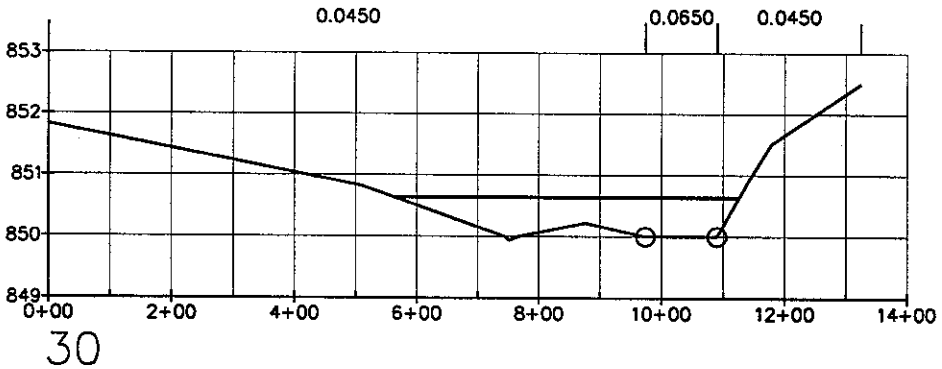
Cross-Section:	20	
Elevation:	832.89	ft MSL
Depth:	1.54	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3818	
Flow Regime:	Subcritical	
Flow Area:	223.33	sq ft
Average Velocity:	2.71	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0624	
Hydraulic Radius:	0.87	ft
Wetted Perimeter:	256.04	ft
Wetted Top Width:	256.01	ft
Critical Slope:	0.1043	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–20

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

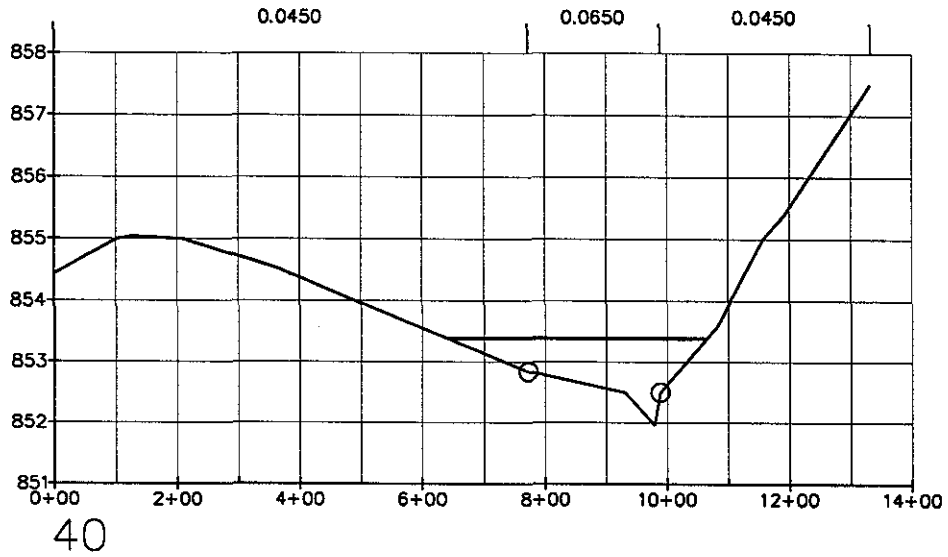
Cross-Section:	30	
Elevation:	850.64	ft MSL
Depth:	0.70	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.4726	
Flow Regime:	Subcritical	
Flow Area:	267.95	sq ft
Average Velocity:	2.28	ft/s
Maximum Velocity:	2.37	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.48	ft
Wetted Perimeter:	563.54	ft
Wetted Top Width:	563.53	ft
Critical Slope:	0.0665	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–30

Entellus™

File: WASH–T1S–R5W–S22N_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

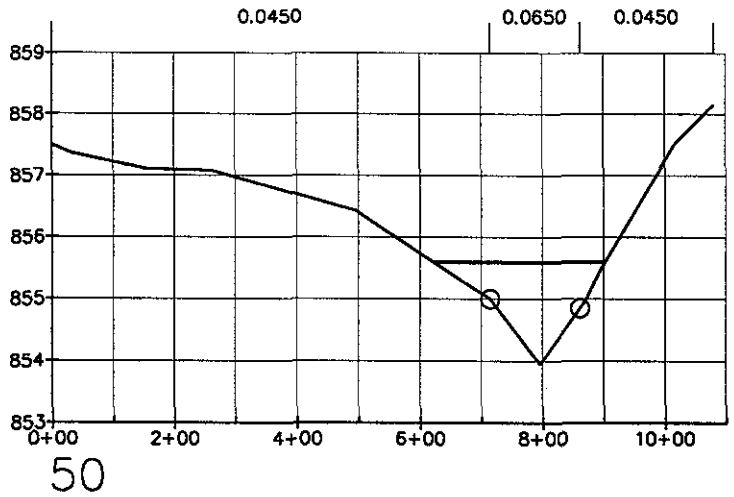
Cross-Section:	40	
Elevation:	853.39	ft MSL
Depth:	1.43	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3514	
Flow Regime:	Subcritical	
Flow Area:	251.72	sq ft
Average Velocity:	2.38	ft/s
Maximum Velocity:	2.51	ft/s
Composite n:	0.0556	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	425.65	ft
Wetted Top Width:	425.62	ft
Critical Slope:	0.129	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–40

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

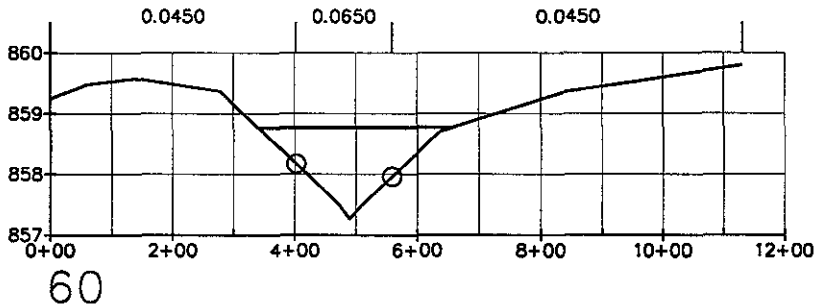
Cross-Section:	50	
Elevation:	855.59	ft MSL
Depth:	1.64	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3882	
Flow Regime:	Subcritical	
Flow Area:	212.43	sq ft
Average Velocity:	2.87	ft/s
Maximum Velocity:	3.11	ft/s
Composite n:	0.0559	
Hydraulic Radius:	0.76	ft
Wetted Perimeter:	279.67	ft
Wetted Top Width:	279.65	ft
Critical Slope:	0.1076	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–50

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

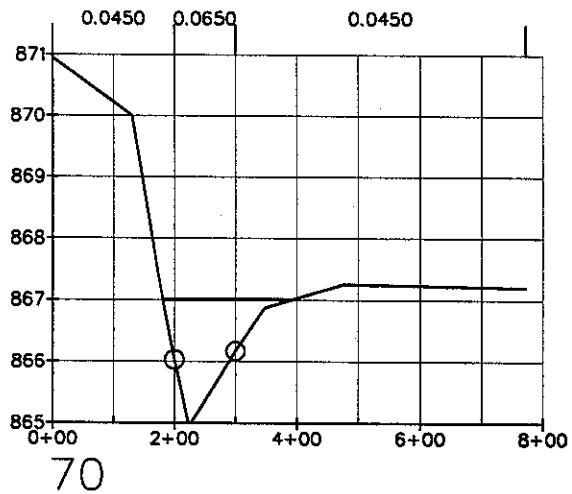
Cross-Section:	60	
Elevation:	858.77	ft MSL
Depth:	1.51	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3899	
Flow Regime:	Subcritical	
Flow Area:	221.10	sq ft
Average Velocity:	2.73	ft/s
Maximum Velocity:	2.96	ft/s
Composite n:	0.0553	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	315.89	ft
Wetted Top Width:	315.88	ft
Critical Slope:	0.1076	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–60

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

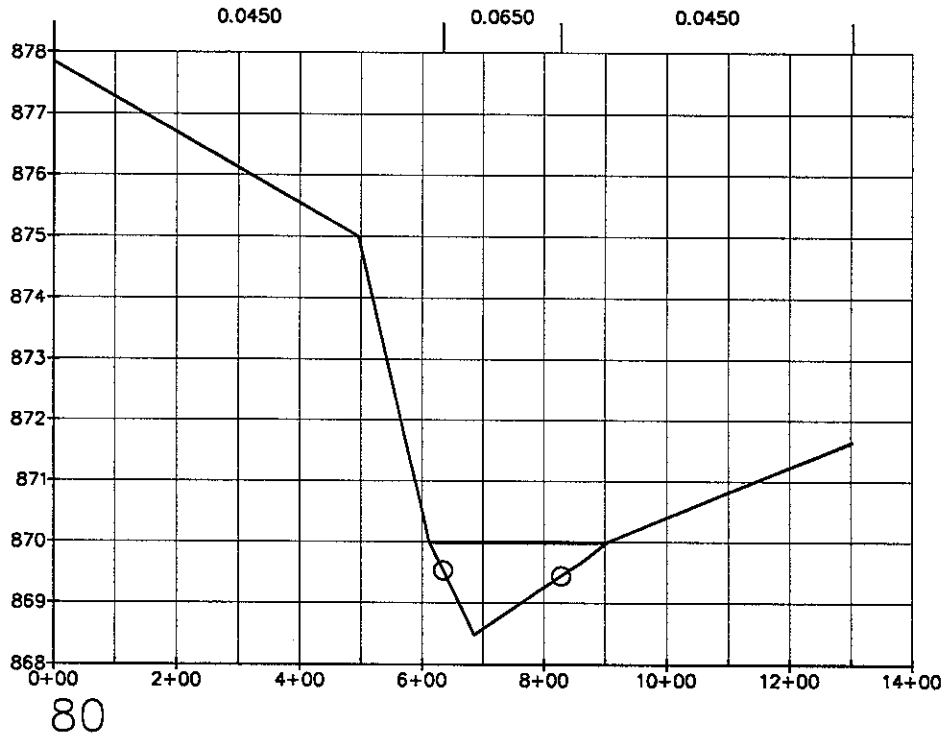
Cross-Section:	70	
Elevation:	867.01	ft MSL
Depth:	2.01	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.4103	
Flow Regime:	Subcritical	
Flow Area:	181.98	sq ft
Average Velocity:	3.32	ft/s
Maximum Velocity:	3.64	ft/s
Composite n:	0.0549	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	211.70	ft
Wetted Top Width:	211.64	ft
Critical Slope:	0.1072	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–70

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

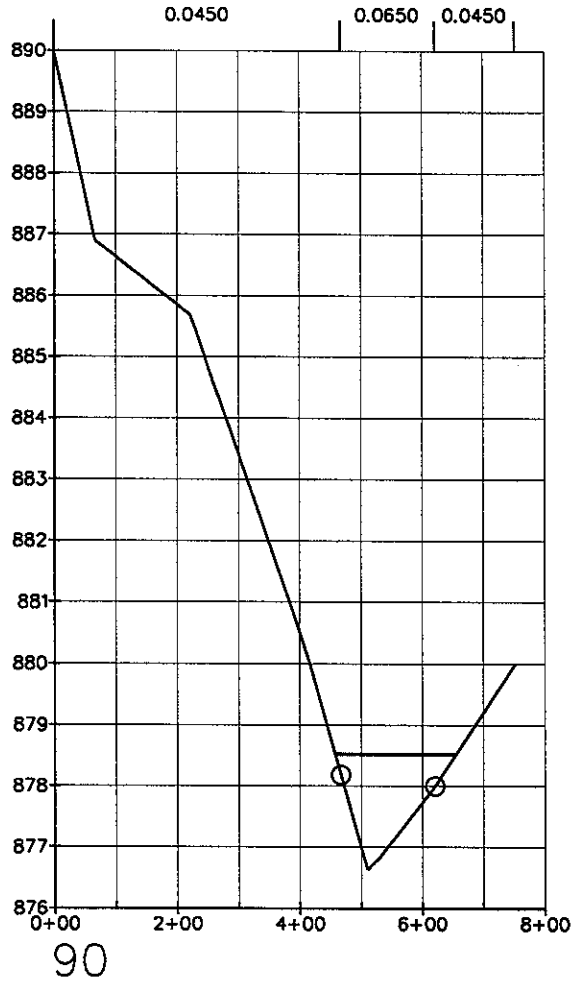
Cross-Section:	80	
Elevation:	869.99	ft MSL
Depth:	1.51	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3871	
Flow Regime:	Subcritical	
Flow Area:	222.59	sq ft
Average Velocity:	2.72	ft/s
Maximum Velocity:	2.85	ft/s
Composite n:	0.0587	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	290.07	ft
Wetted Top Width:	290.05	ft
Critical Slope:	0.1072	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–80

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

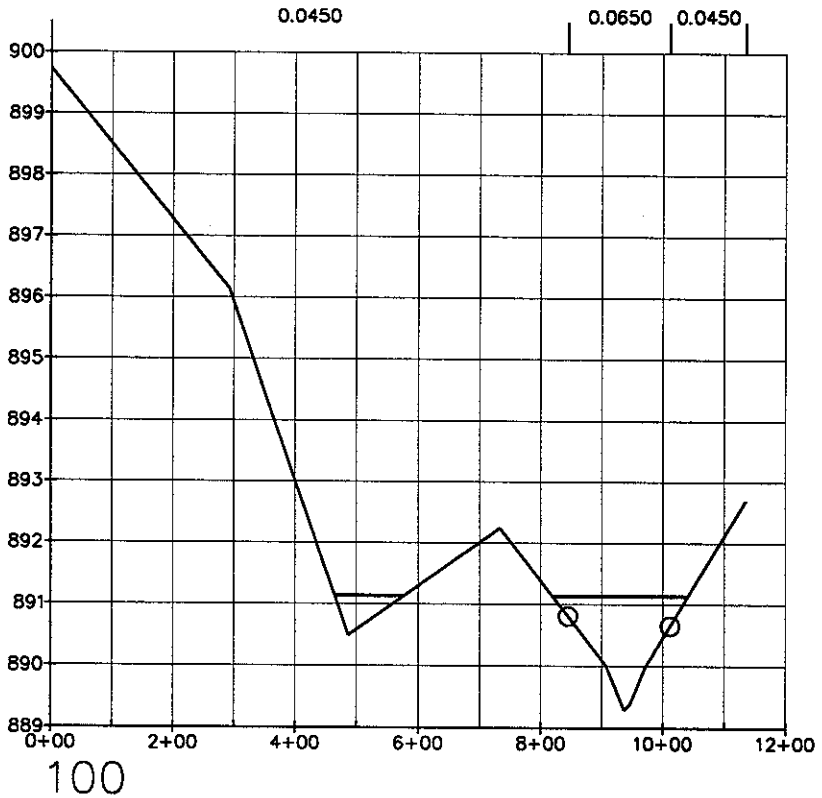
Cross-Section:	90	
Elevation:	878.52	ft MSL
Depth:	1.89	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3945	
Flow Regime:	Subcritical	
Flow Area:	194.98	sq ft
Average Velocity:	3.10	ft/s
Maximum Velocity:	3.19	ft/s
Composite n:	0.0608	
Hydraulic Radius:	0.99	ft
Wetted Perimeter:	197.72	ft
Wetted Top Width:	197.67	ft
Critical Slope:	0.1034	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–90

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

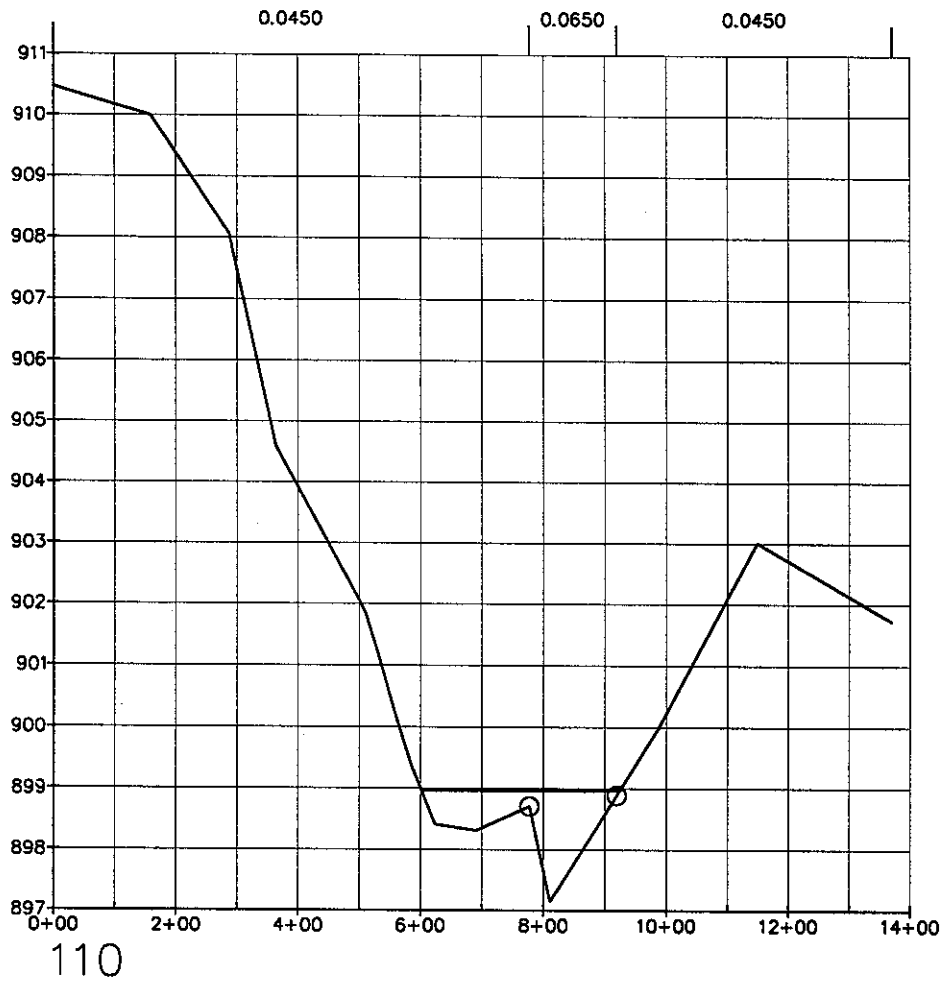
Cross-Section:	100	
Elevation:	891.13	ft MSL
Depth:	1.83	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.35	
Flow Regime:	Subcritical	
Flow Area:	223.14	sq ft
Average Velocity:	2.68	ft/s
Maximum Velocity:	2.92	ft/s
Composite n:	0.0554	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	334.16	ft
Wetted Top Width:	334.12	ft
Critical Slope:	0.14	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22N-100

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

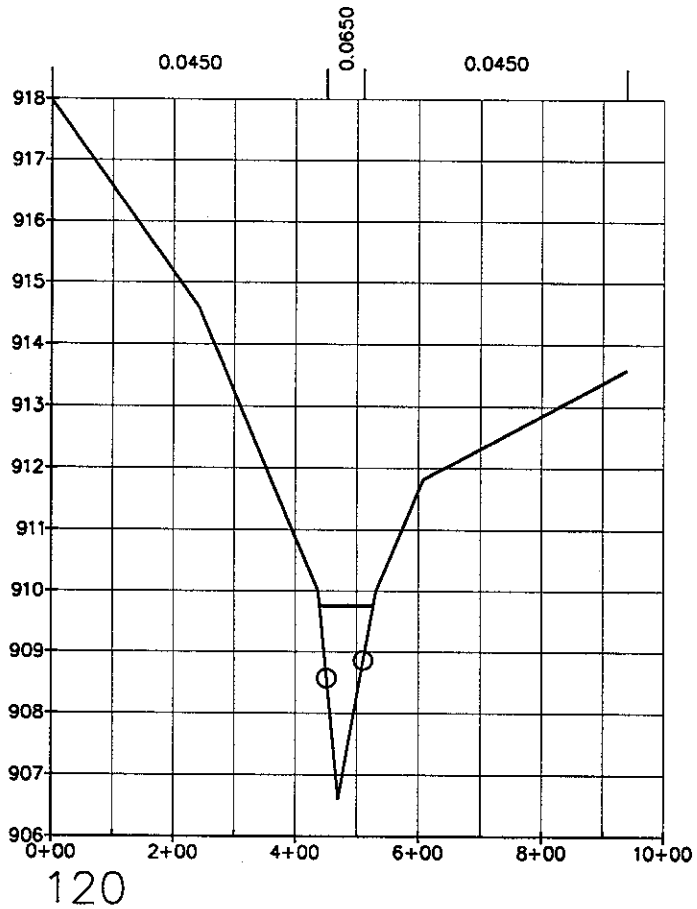
Cross-Section:	110	
Elevation:	898.97	ft MSL
Depth:	1.83	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3464	
Flow Regime:	Subcritical	
Flow Area:	225.67	sq ft
Average Velocity:	2.69	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.0542	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	323.13	ft
Wetted Top Width:	323.07	ft
Critical Slope:	0.126	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S22N-110

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

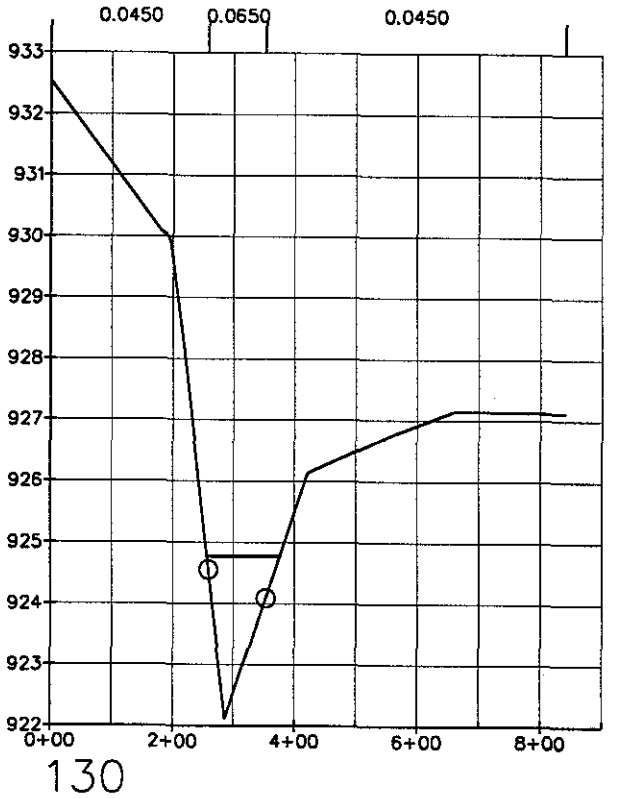
Cross-Section:	120	
Elevation:	909.76	ft MSL
Depth:	3.16	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.4318	
Flow Regime:	Subcritical	
Flow Area:	137.80	sq ft
Average Velocity:	4.39	ft/s
Maximum Velocity:	4.59	ft/s
Composite n:	0.059	
Hydraulic Radius:	1.58	ft
Wetted Perimeter:	87.41	ft
Wetted Top Width:	87.16	ft
Critical Slope:	0.087	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–120

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

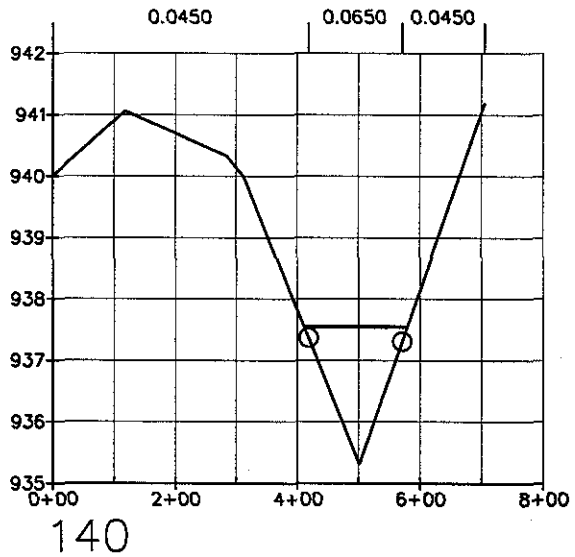
Cross-Section:	130	
Elevation:	924.78	ft MSL
Depth:	2.67	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.4049	
Flow Regime:	Subcritical	
Flow Area:	159.89	sq ft
Average Velocity:	3.78	ft/s
Maximum Velocity:	3.88	ft/s
Composite n:	0.0609	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	119.93	ft
Wetted Top Width:	119.77	ft
Critical Slope:	0.098	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–130

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

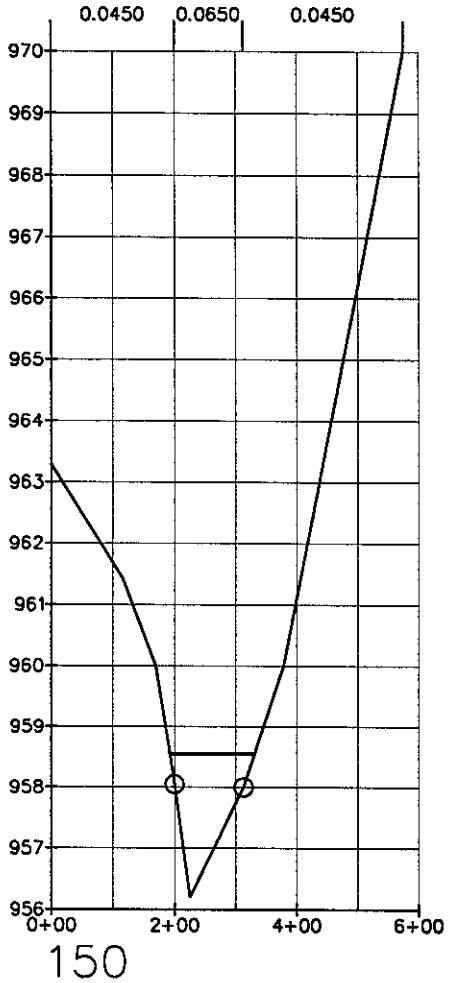
Cross-Section:	140	
Elevation:	937.55	ft MSL
Depth:	2.24	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.3768	
Flow Regime:	Subcritical	
Flow Area:	187.70	sq ft
Average Velocity:	3.21	ft/s
Maximum Velocity:	3.23	ft/s
Composite n:	0.0633	
Hydraulic Radius:	1.12	ft
Wetted Perimeter:	167.92	ft
Wetted Top Width:	167.86	ft
Critical Slope:	0.1119	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–140

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

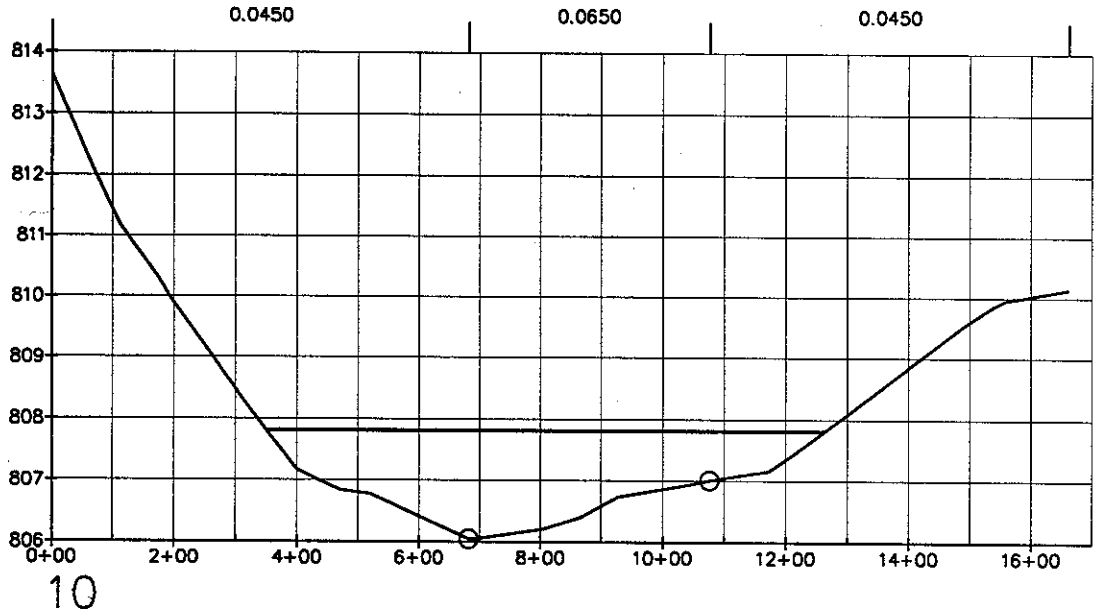
Cross-Section:	150	
Elevation:	958.55	ft MSL
Depth:	2.35	ft
Discharge:	600.00	cfs
Energy Gradient:	0.0152	ft/ft
Froude Number:	0.4084	
Flow Regime:	Subcritical	
Flow Area:	169.10	sq ft
Average Velocity:	3.53	ft/s
Maximum Velocity:	3.60	ft/s
Composite n:	0.0615	
Hydraulic Radius:	1.22	ft
Wetted Perimeter:	138.37	ft
Wetted Top Width:	138.26	ft
Critical Slope:	0.0985	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S22N–150

Entellus™

File: WASH-T1S-R5W-S22N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	807.81	ft MSL
Depth:	1.76	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2977	
Flow Regime:	Subcritical	
Flow Area:	963.99	sq ft
Average Velocity:	2.23	ft/s
Maximum Velocity:	2.61	ft/s
Composite n:	0.054	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	912.63	ft
Wetted Top Width:	912.62	ft
Critical Slope:	0.0693	ft/ft

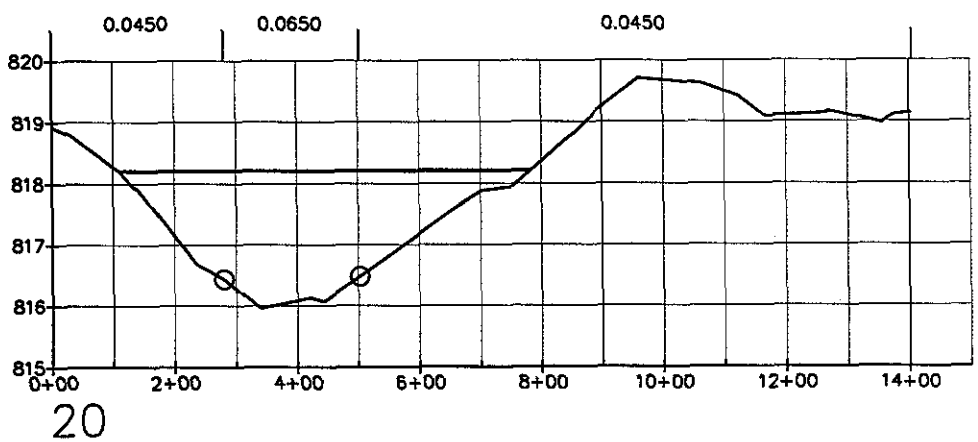
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–10

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

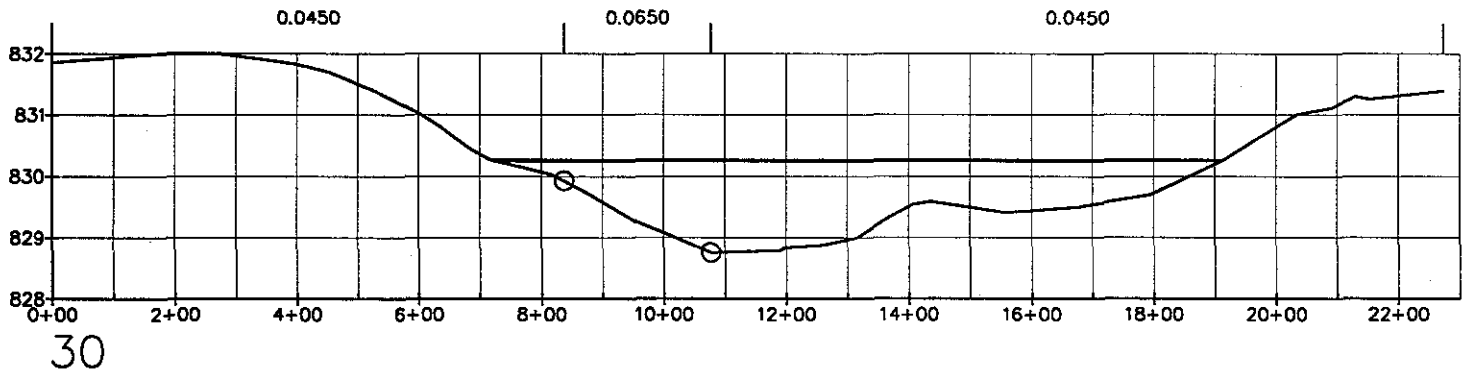
Cross-Section:	20	
Elevation:	818.21	ft MSL
Depth:	2.25	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3021	
Flow Regime:	Subcritical	
Flow Area:	841.08	sq ft
Average Velocity:	2.58	ft/s
Maximum Velocity:	2.82	ft/s
Composite n:	0.052	
Hydraulic Radius:	1.25	ft
Wetted Perimeter:	671.94	ft
Wetted Top Width:	671.92	ft
Critical Slope:	0.0652	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–20

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

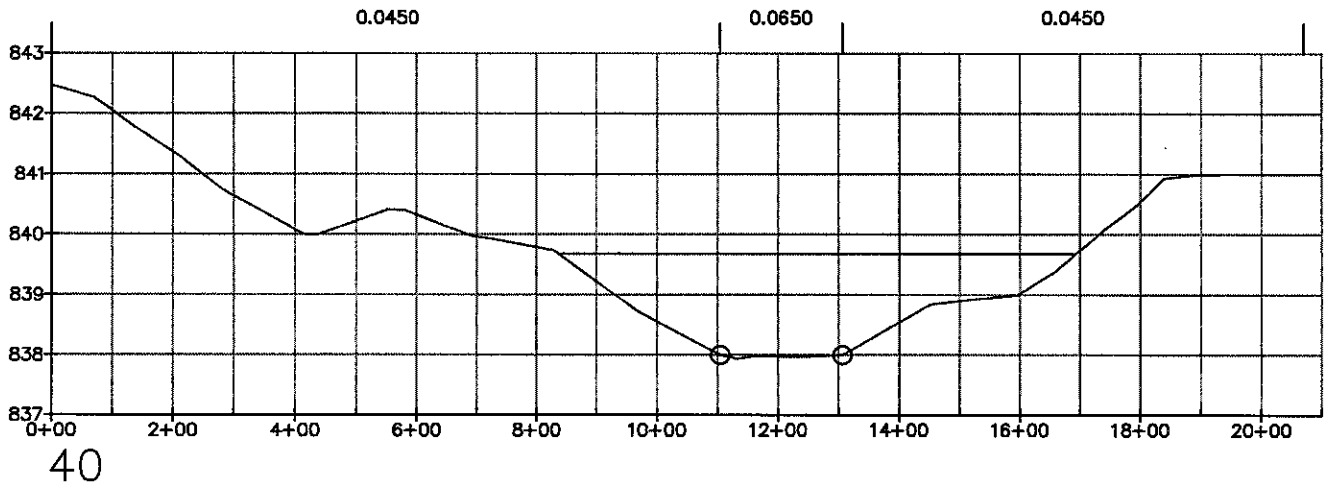
Cross-Section:	30	
Elevation:	830.26	ft MSL
Depth:	1.50	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.3125	
Flow Regime:	Subcritical	
Flow Area:	994.78	sq ft
Average Velocity:	2.15	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0493	
Hydraulic Radius:	0.84	ft
Wetted Perimeter:	1190.75	ft
Wetted Top Width:	1190.75	ft
Critical Slope:	0.0672	ft/ft

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29E-30

Entellus™



Normal Depth Results

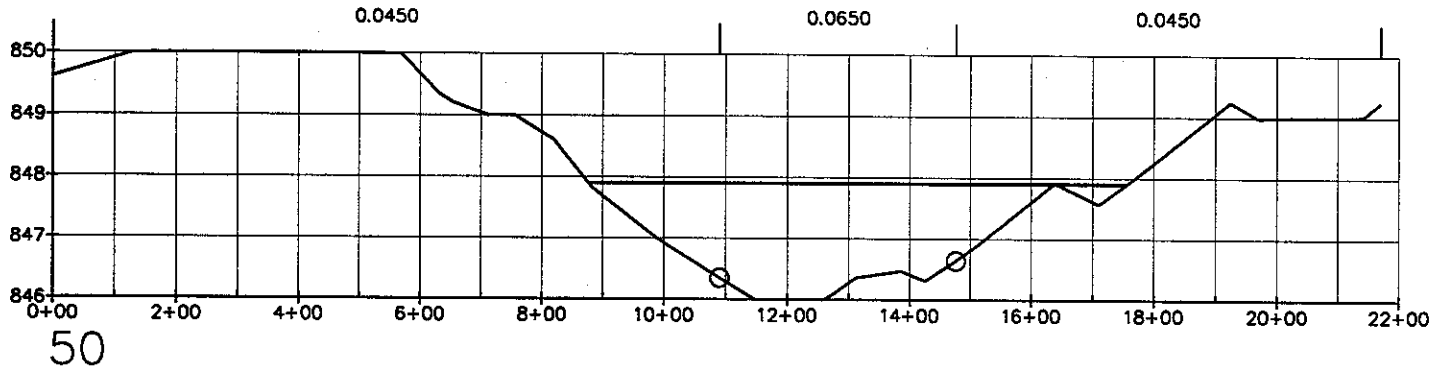
Cross-Section:	40	
Elevation:	839.67	ft MSL
Depth:	1.73	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3179	
Flow Regime:	Subcritical	
Flow Area:	909.45	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.05	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	855.05	ft
Wetted Top Width:	855.04	ft
Critical Slope:	0.058	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–40

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

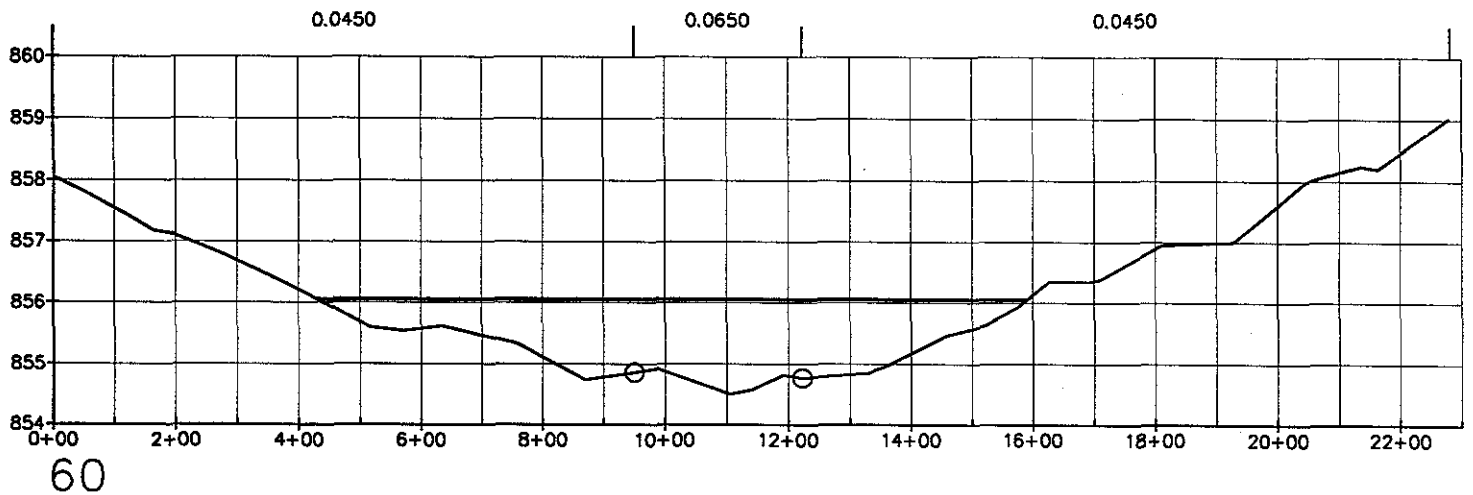
Cross-Section:	50	
Elevation:	847.90	ft MSL
Depth:	1.90	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2924	
Flow Regime:	Subcritical	
Flow Area:	944.27	sq ft
Average Velocity:	2.28	ft/s
Maximum Velocity:	2.46	ft/s
Composite n:	0.0542	
Hydraulic Radius:	1.07	ft
Wetted Perimeter:	879.79	ft
Wetted Top Width:	879.77	ft
Critical Slope:	0.0737	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–50

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

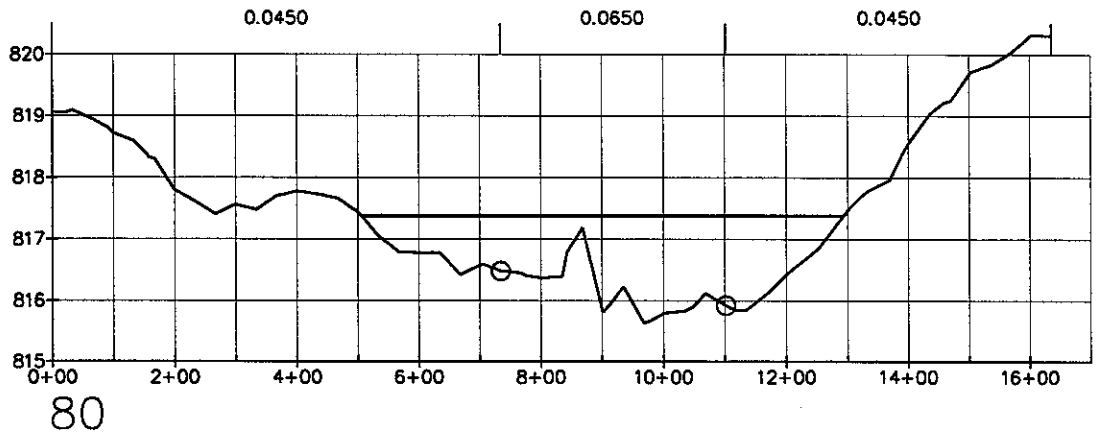
Cross-Section:	60	
Elevation:	856.06	ft MSL
Depth:	1.56	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2974	
Flow Regime:	Subcritical	
Flow Area:	1025.83	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.19	ft/s
Composite n:	0.05	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	1160.37	ft
Wetted Top Width:	1160.36	ft
Critical Slope:	0.0666	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–60

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

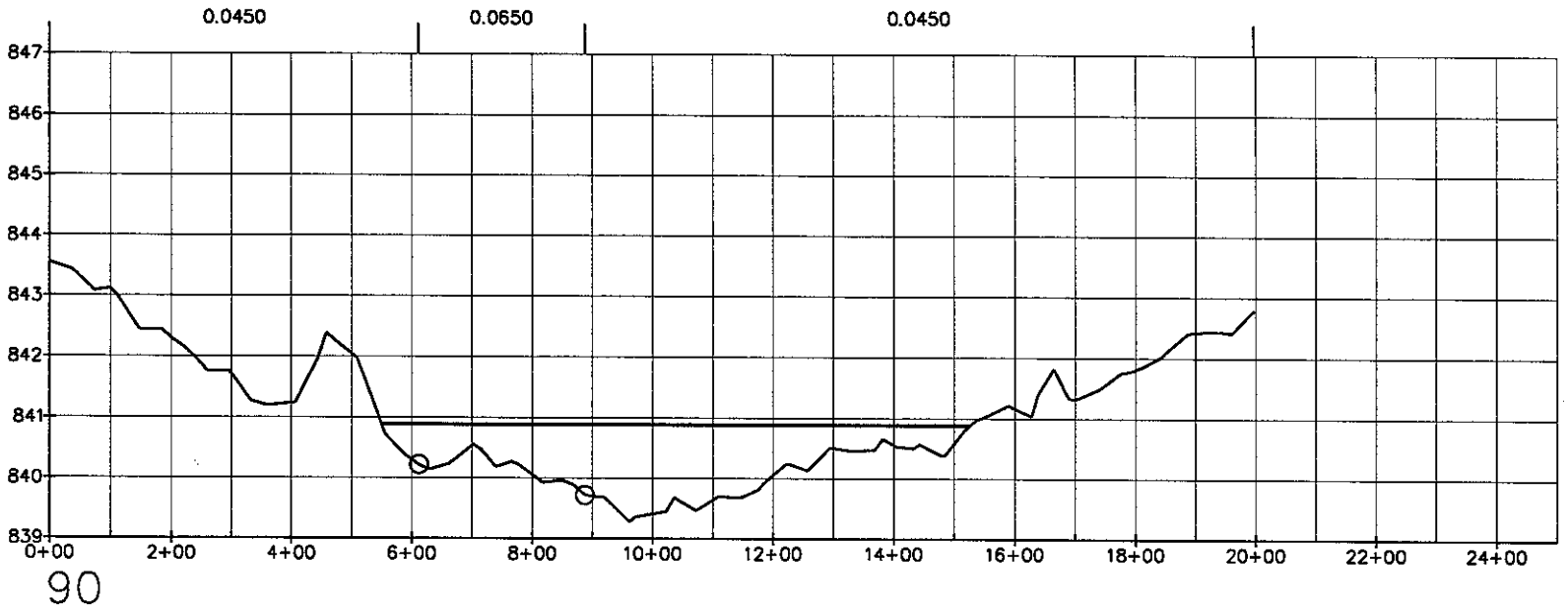
Cross-Section:	80	
Elevation:	868.38	ft MSL
Depth:	1.75	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2697	
Flow Regime:	Subcritical	
Flow Area:	765.27	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.42	ft/s
Composite n:	0.0547	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	787.63	ft
Wetted Top Width:	787.56	ft
Critical Slope:	0.0792	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–80

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

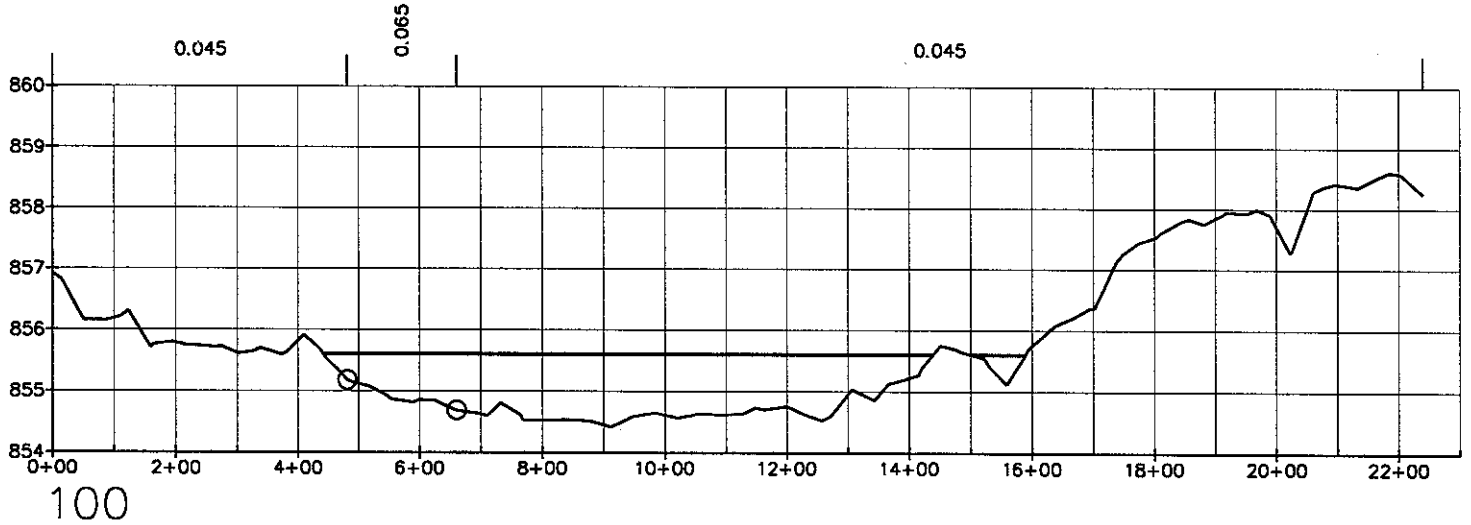
Cross-Section:	90	
Elevation:	875.88	ft MSL
Depth:	1.60	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2818	
Flow Regime:	Subcritical	
Flow Area:	766.14	sq ft
Average Velocity:	2.00	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.051	
Hydraulic Radius:	0.79	ft
Wetted Perimeter:	975.52	ft
Wetted Top Width:	975.49	ft
Critical Slope:	0.0834	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–90

Entellus™

File: WASH–T1S–R5W–S29E_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

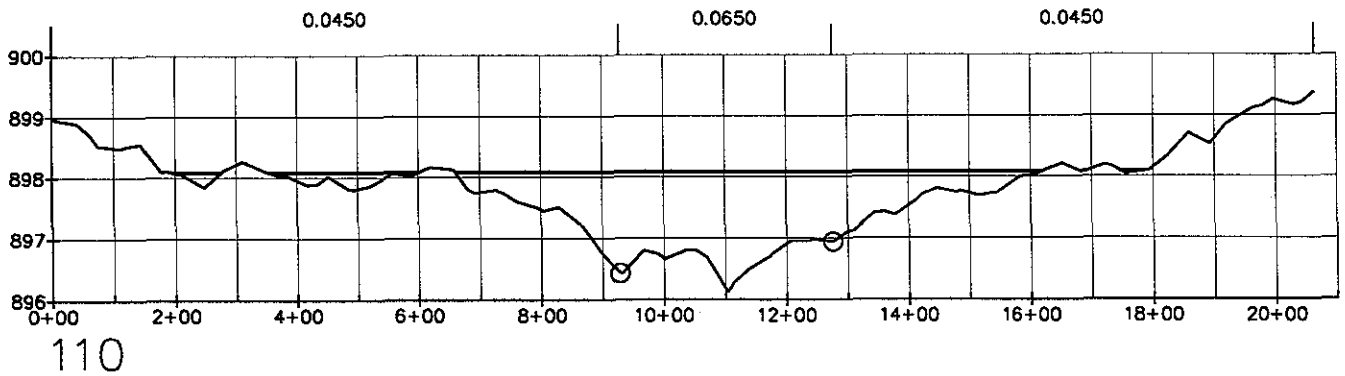
Cross-Section:	100	
Elevation:	887.60	ft MSL
Depth:	1.18	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2975	
Flow Regime:	Subcritical	
Flow Area:	844.59	sq ft
Average Velocity:	1.86	ft/s
Maximum Velocity:	1.98	ft/s
Composite n:	0.0535	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	1091.56	ft
Wetted Top Width:	1091.54	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–100

Entellus™

File: WASH–T1S–R5W–S29E_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

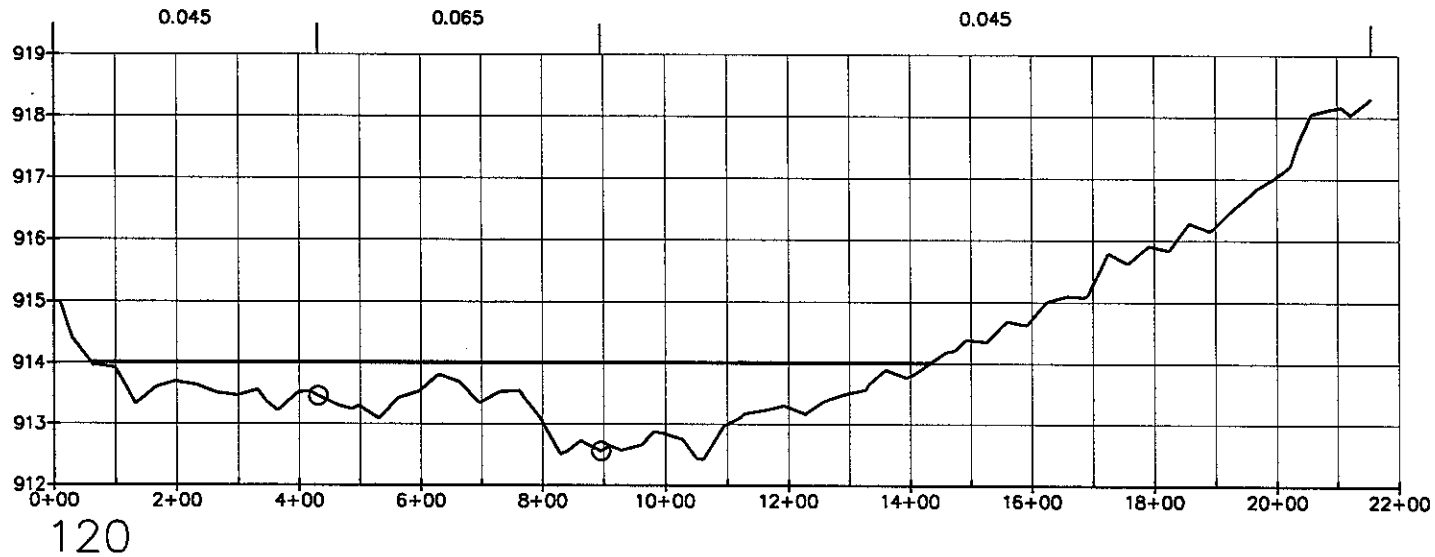
Cross-Section:	110	
Elevation:	898.08	ft MSL
Depth:	1.96	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.226	
Flow Regime:	Subcritical	
Flow Area:	862.62	sq ft
Average Velocity:	1.79	ft/s
Maximum Velocity:	2.16	ft/s
Composite n:	0.0505	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	1329.38	ft
Wetted Top Width:	1329.35	ft
Critical Slope:	0.1296	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–110

Entellus™

File: WASH–T1S–R5W–S29E_X-SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

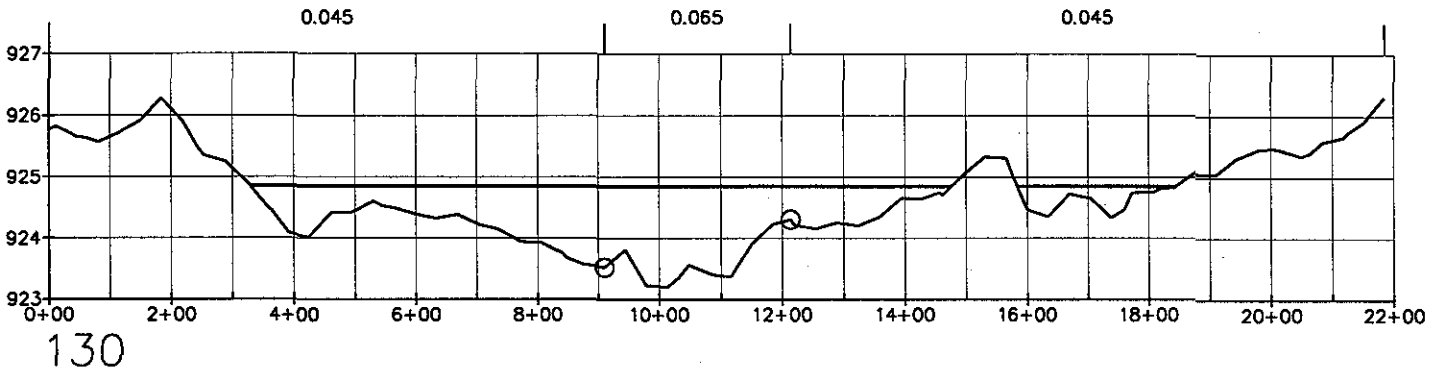
Cross-Section:	120	
Elevation:	914.01	ft MSL
Depth:	1.59	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2278	
Flow Regime:	Subcritical	
Flow Area:	951.89	sq ft
Average Velocity:	1.63	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0571	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	1372.49	ft
Wetted Top Width:	1372.45	ft
Critical Slope:	0.1224	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–120

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

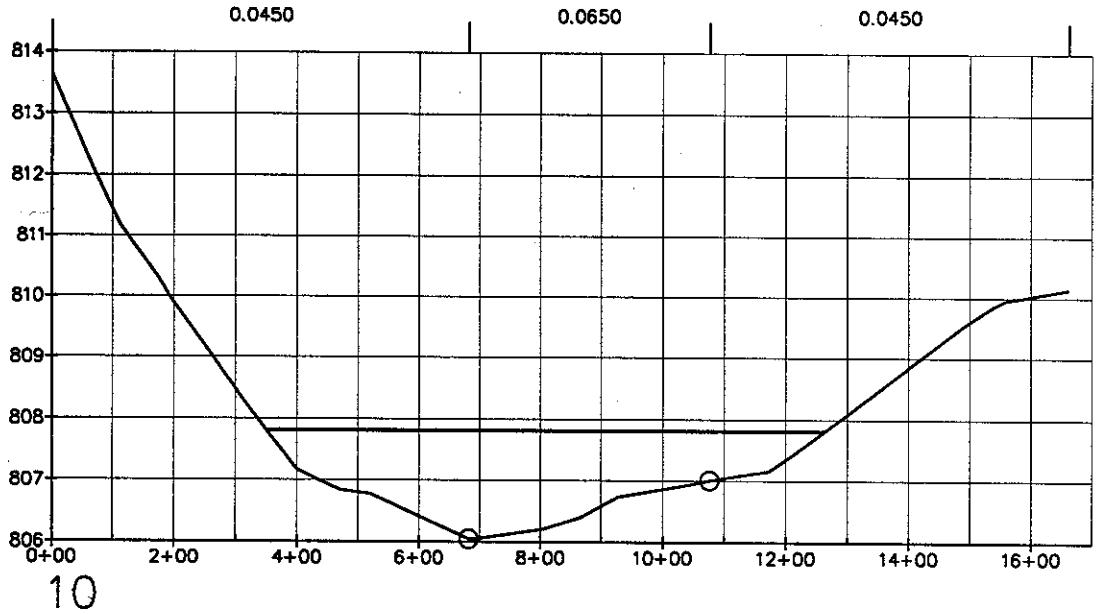
Cross-Section:	130	
Elevation:	924.85	ft MSL
Depth:	1.65	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2273	
Flow Regime:	Subcritical	
Flow Area:	935.48	sq ft
Average Velocity:	1.65	ft/s
Maximum Velocity:	1.86	ft/s
Composite n:	0.0546	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	1407.88	ft
Wetted Top Width:	1407.84	ft
Critical Slope:	0.1231	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29E-130

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	807.81	ft MSL
Depth:	1.76	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2977	
Flow Regime:	Subcritical	
Flow Area:	963.99	sq ft
Average Velocity:	2.23	ft/s
Maximum Velocity:	2.61	ft/s
Composite n:	0.054	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	912.63	ft
Wetted Top Width:	912.62	ft
Critical Slope:	0.0693	ft/ft

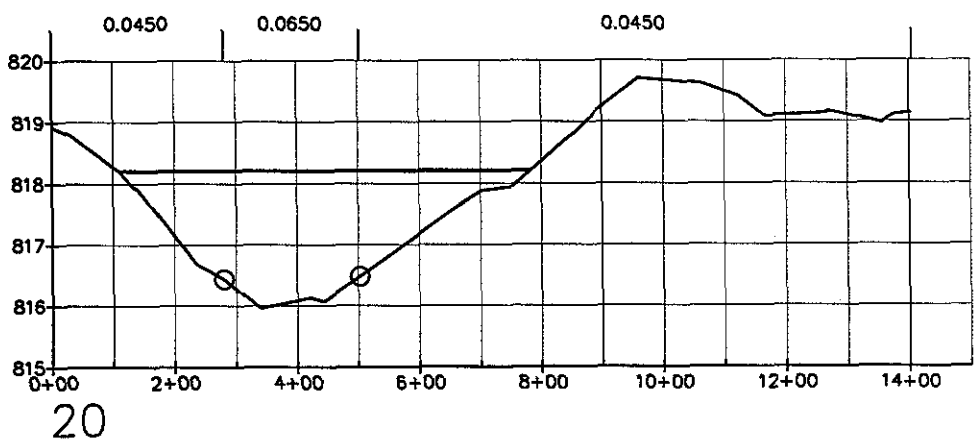
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–10

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

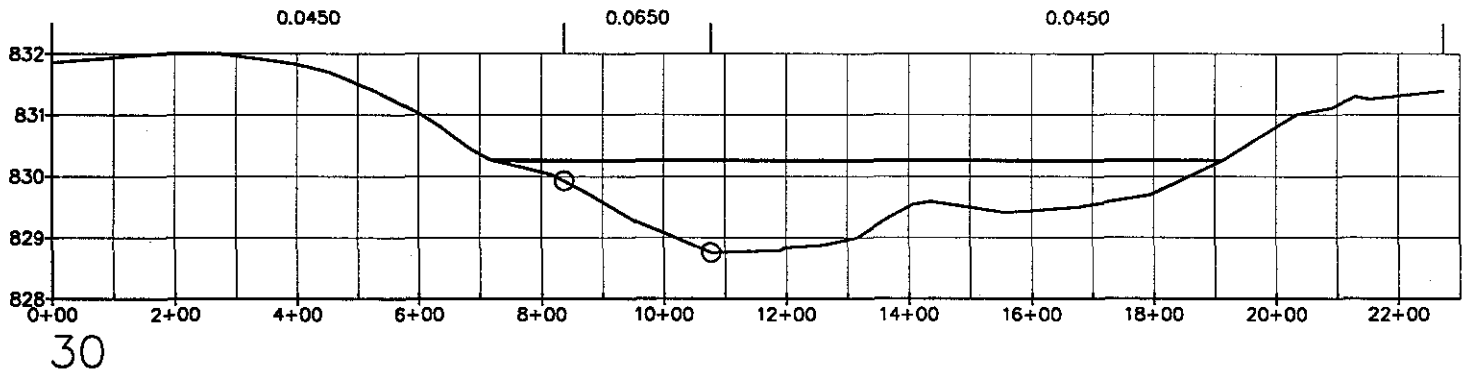
Cross-Section:	20	
Elevation:	818.21	ft MSL
Depth:	2.25	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3021	
Flow Regime:	Subcritical	
Flow Area:	841.08	sq ft
Average Velocity:	2.58	ft/s
Maximum Velocity:	2.82	ft/s
Composite n:	0.052	
Hydraulic Radius:	1.25	ft
Wetted Perimeter:	671.94	ft
Wetted Top Width:	671.92	ft
Critical Slope:	0.0652	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–20

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

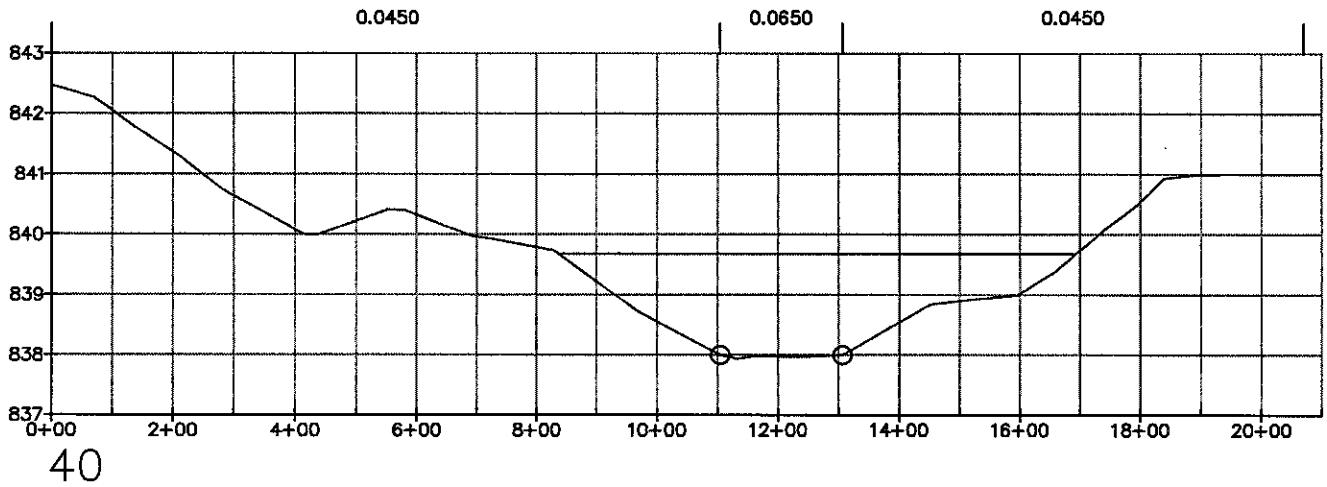
Cross-Section:	30	
Elevation:	830.26	ft MSL
Depth:	1.50	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.3125	
Flow Regime:	Subcritical	
Flow Area:	994.78	sq ft
Average Velocity:	2.15	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0493	
Hydraulic Radius:	0.84	ft
Wetted Perimeter:	1190.75	ft
Wetted Top Width:	1190.75	ft
Critical Slope:	0.0672	ft/ft

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29E-30

Entellus™



Normal Depth Results

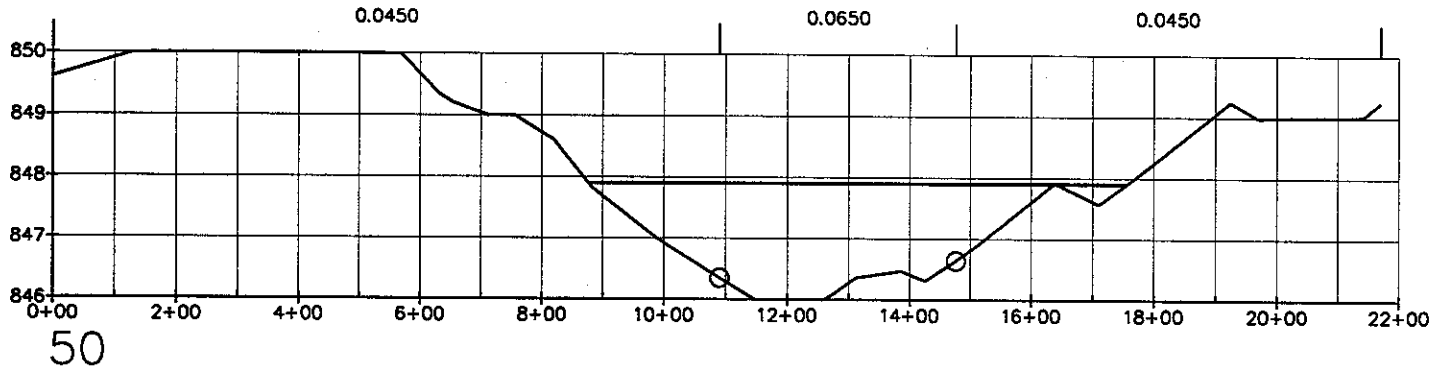
Cross-Section:	40	
Elevation:	839.67	ft MSL
Depth:	1.73	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3179	
Flow Regime:	Subcritical	
Flow Area:	909.45	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.05	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	855.05	ft
Wetted Top Width:	855.04	ft
Critical Slope:	0.058	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–40

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

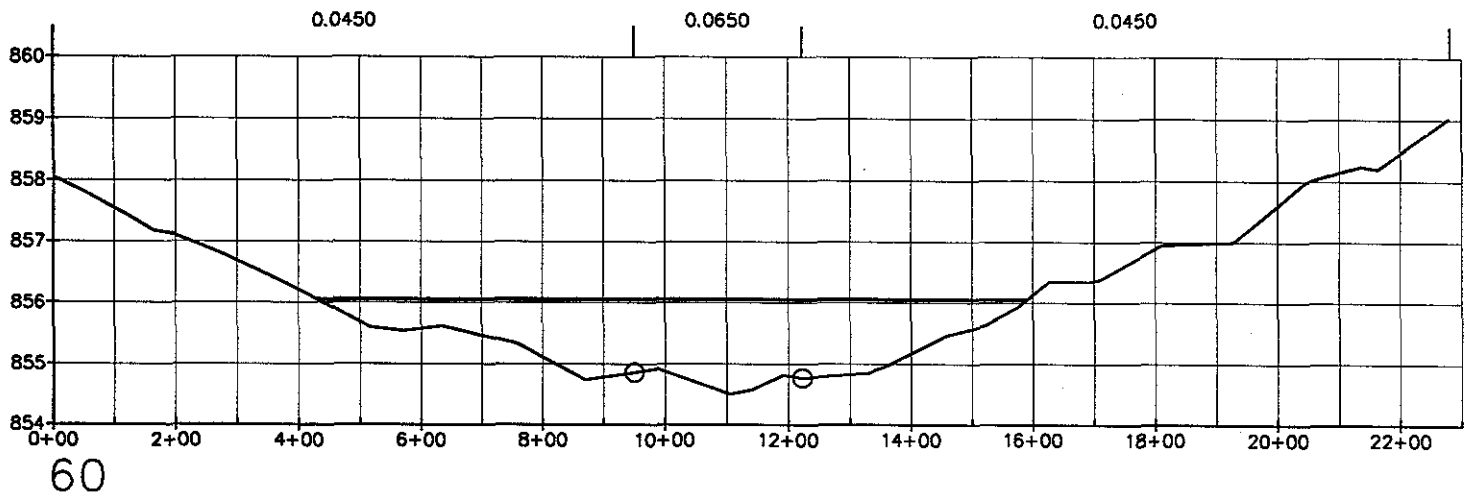
Cross-Section:	50	
Elevation:	847.90	ft MSL
Depth:	1.90	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2924	
Flow Regime:	Subcritical	
Flow Area:	944.27	sq ft
Average Velocity:	2.28	ft/s
Maximum Velocity:	2.46	ft/s
Composite n:	0.0542	
Hydraulic Radius:	1.07	ft
Wetted Perimeter:	879.79	ft
Wetted Top Width:	879.77	ft
Critical Slope:	0.0737	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–50

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

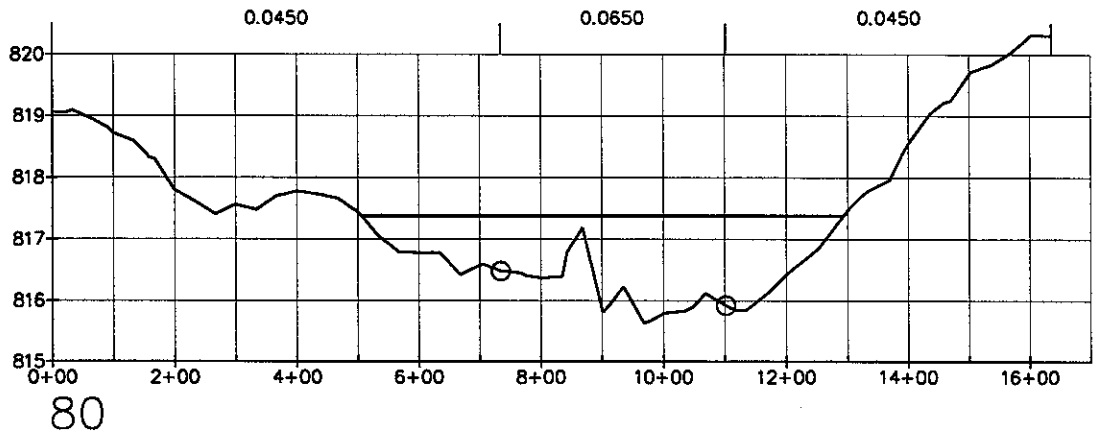
Cross-Section:	60	
Elevation:	856.06	ft MSL
Depth:	1.56	ft
Discharge:	2160.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2974	
Flow Regime:	Subcritical	
Flow Area:	1025.83	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.19	ft/s
Composite n:	0.05	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	1160.37	ft
Wetted Top Width:	1160.36	ft
Critical Slope:	0.0666	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–60

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

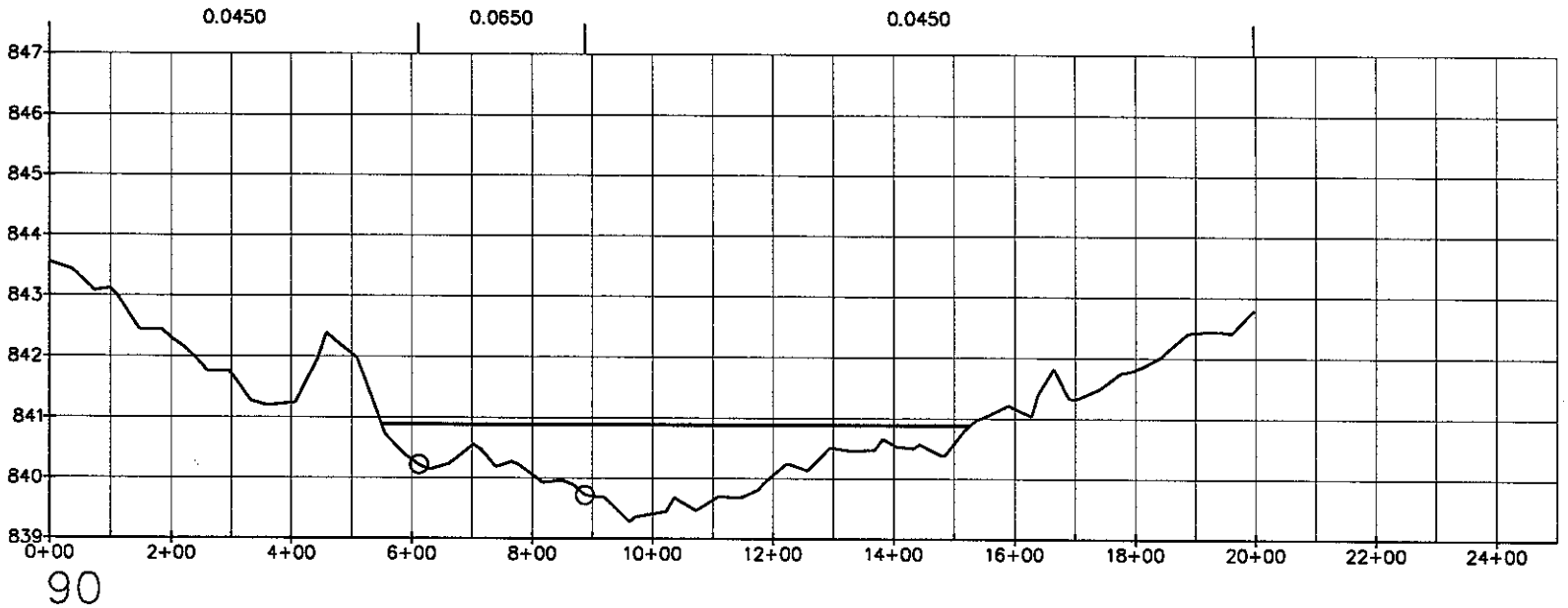
Cross-Section:	80	
Elevation:	868.38	ft MSL
Depth:	1.75	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2697	
Flow Regime:	Subcritical	
Flow Area:	765.27	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.42	ft/s
Composite n:	0.0547	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	787.63	ft
Wetted Top Width:	787.56	ft
Critical Slope:	0.0792	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–80

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

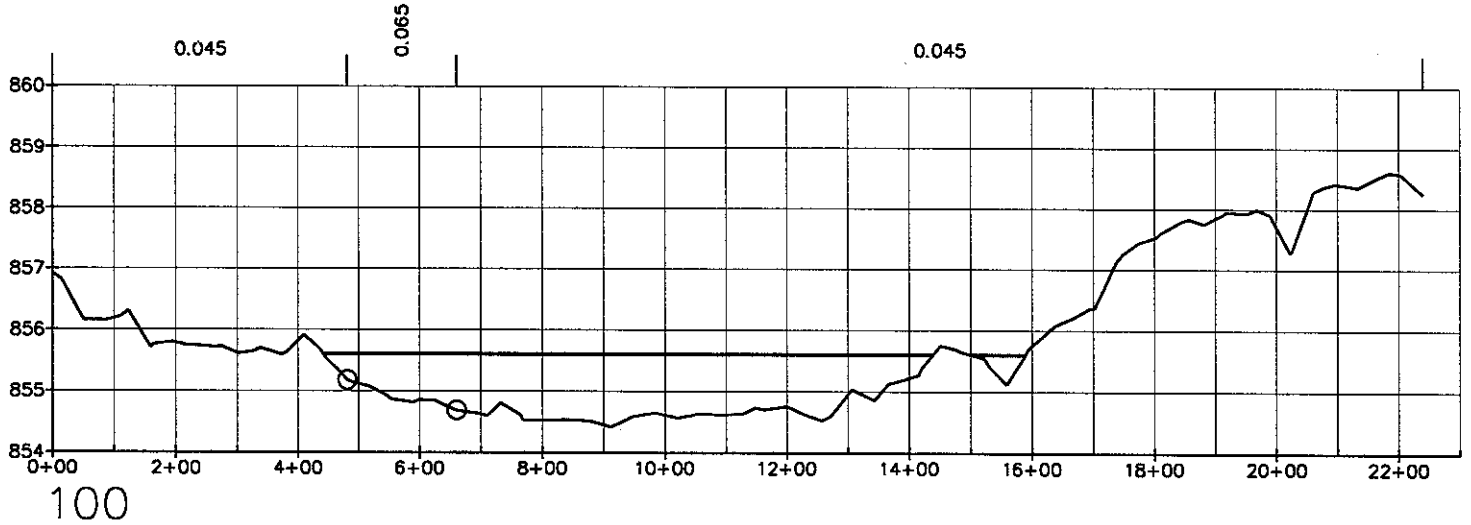
Cross-Section:	90	
Elevation:	875.88	ft MSL
Depth:	1.60	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2818	
Flow Regime:	Subcritical	
Flow Area:	766.14	sq ft
Average Velocity:	2.00	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.051	
Hydraulic Radius:	0.79	ft
Wetted Perimeter:	975.52	ft
Wetted Top Width:	975.49	ft
Critical Slope:	0.0834	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–90

Entellus™

File: WASH–T1S–R5W–S29E_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

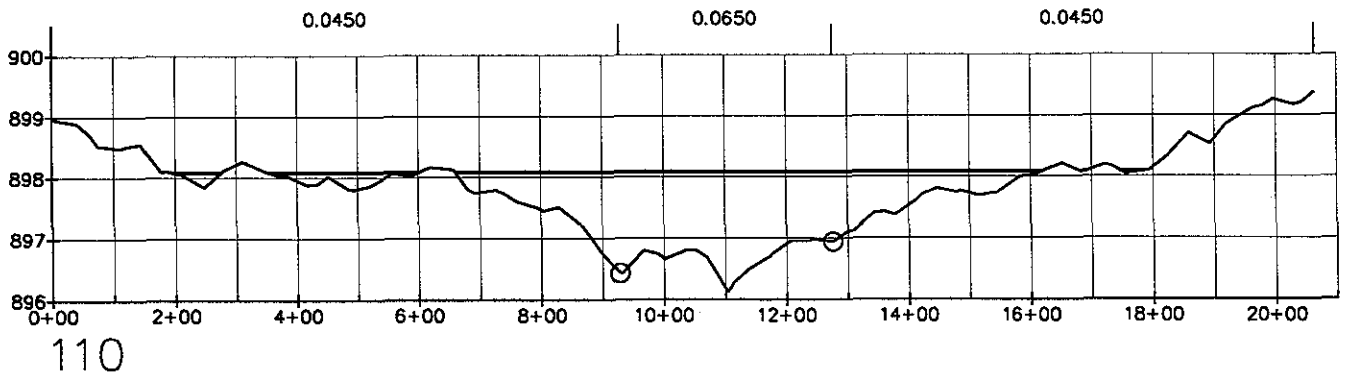
Cross-Section:	100	
Elevation:	887.60	ft MSL
Depth:	1.18	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2975	
Flow Regime:	Subcritical	
Flow Area:	844.59	sq ft
Average Velocity:	1.86	ft/s
Maximum Velocity:	1.98	ft/s
Composite n:	0.0535	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	1091.56	ft
Wetted Top Width:	1091.54	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–100

Entellus™

File: WASH–T1S–R5W–S29E_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

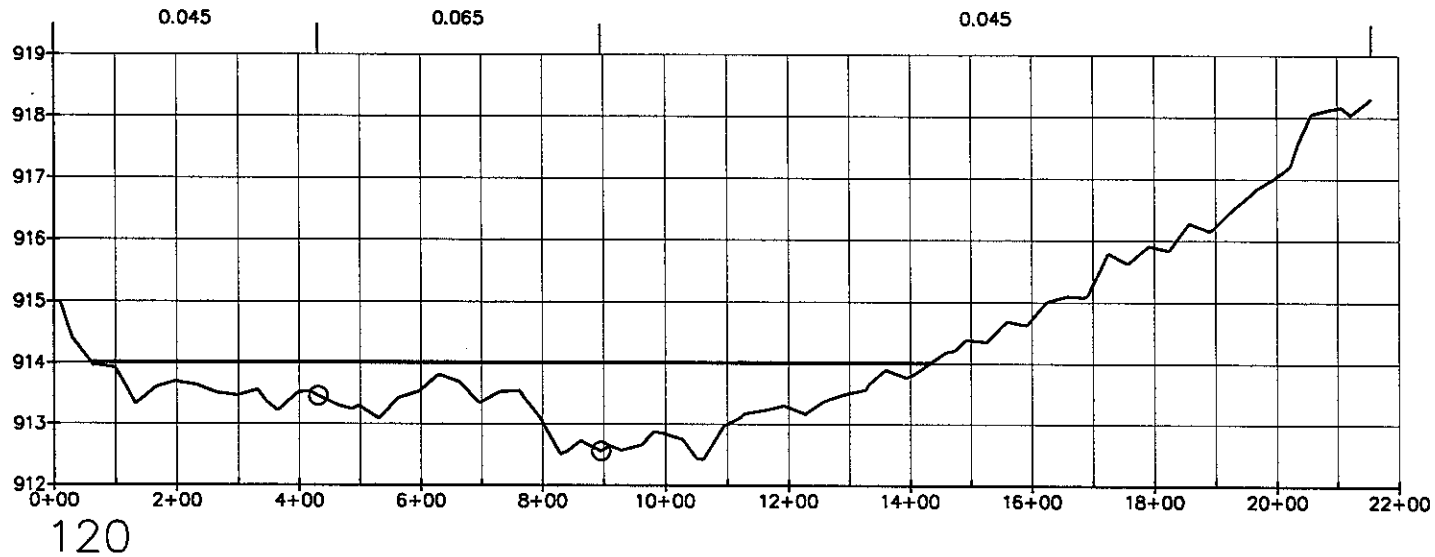
Cross-Section:	110	
Elevation:	898.08	ft MSL
Depth:	1.96	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.226	
Flow Regime:	Subcritical	
Flow Area:	862.62	sq ft
Average Velocity:	1.79	ft/s
Maximum Velocity:	2.16	ft/s
Composite n:	0.0505	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	1329.38	ft
Wetted Top Width:	1329.35	ft
Critical Slope:	0.1296	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–110

Entellus™

File: WASH–T1S–R5W–S29E_X-SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

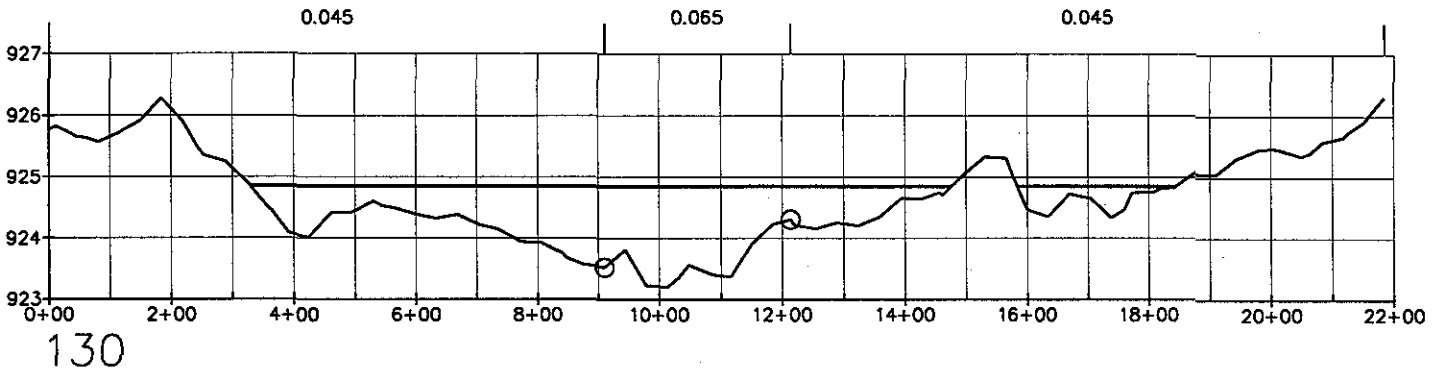
Cross-Section:	120	
Elevation:	914.01	ft MSL
Depth:	1.59	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2278	
Flow Regime:	Subcritical	
Flow Area:	951.89	sq ft
Average Velocity:	1.63	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0571	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	1372.49	ft
Wetted Top Width:	1372.45	ft
Critical Slope:	0.1224	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S29E–120

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

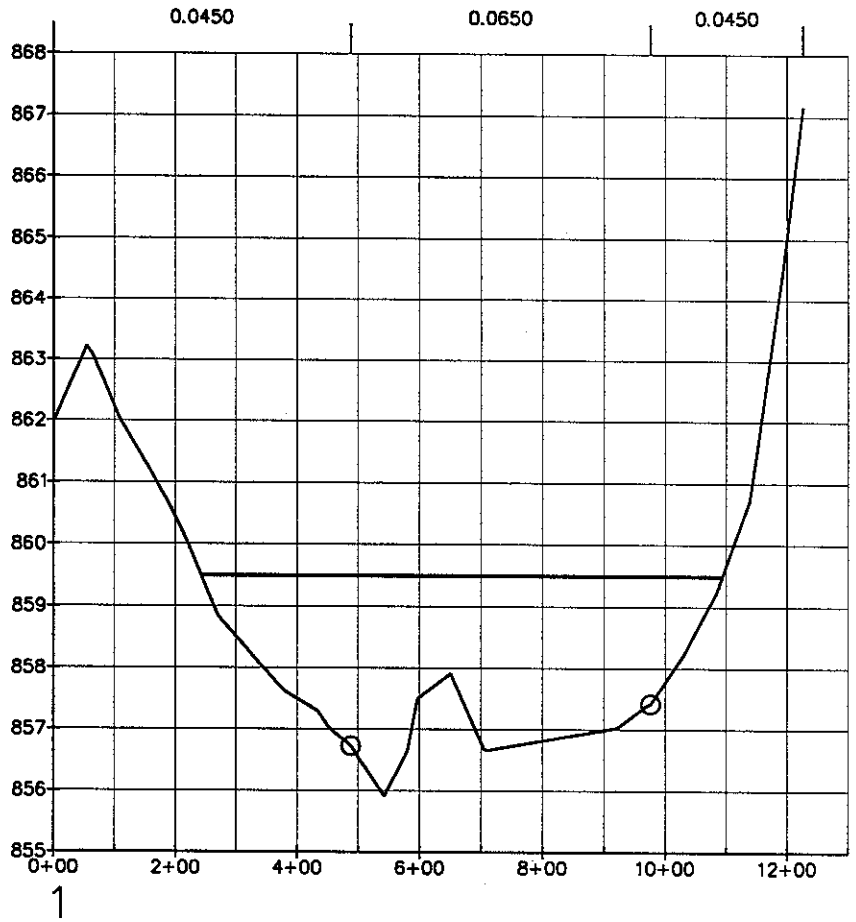
Cross-Section:	130	
Elevation:	924.85	ft MSL
Depth:	1.65	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2273	
Flow Regime:	Subcritical	
Flow Area:	935.48	sq ft
Average Velocity:	1.65	ft/s
Maximum Velocity:	1.86	ft/s
Composite n:	0.0546	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	1407.88	ft
Wetted Top Width:	1407.84	ft
Critical Slope:	0.1231	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S29E-130

Entellus™

File: WASH-T1S-R5W-S29E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	1	
Elevation:	859.50	ft MSL
Depth:	3.59	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2565	
Flow Regime:	Subcritical	
Flow Area:	1777.79	sq ft
Average Velocity:	2.75	ft/s
Maximum Velocity:	2.91	ft/s
Composite n:	0.0569	
Hydraulic Radius:	2.09	ft
Wetted Perimeter:	850.69	ft
Wetted Top Width:	850.60	ft
Critical Slope:	0.063	ft/ft

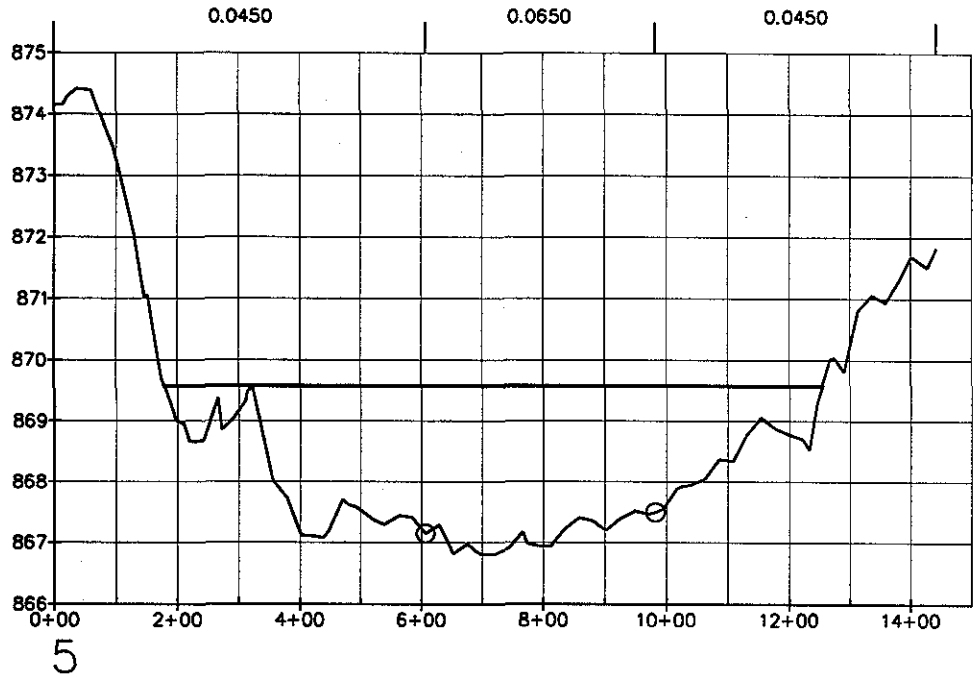
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–1

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

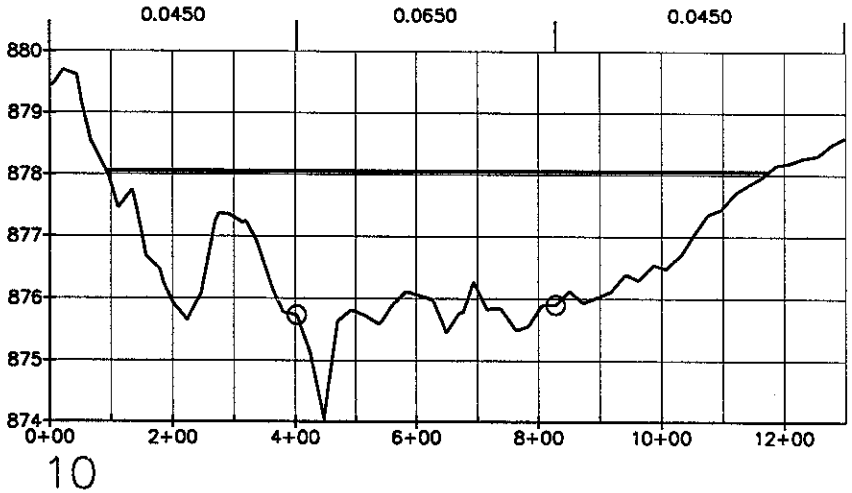
Cross-Section:	5	
Elevation:	869.57	ft MSL
Depth:	2.76	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2787	
Flow Regime:	Subcritical	
Flow Area:	1865.04	sq ft
Average Velocity:	2.64	ft/s
Maximum Velocity:	2.79	ft/s
Composite n:	0.0524	
Hydraulic Radius:	1.73	ft
Wetted Perimeter:	1075.28	ft
Wetted Top Width:	1075.11	ft
Critical Slope:	0.0527	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–5

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

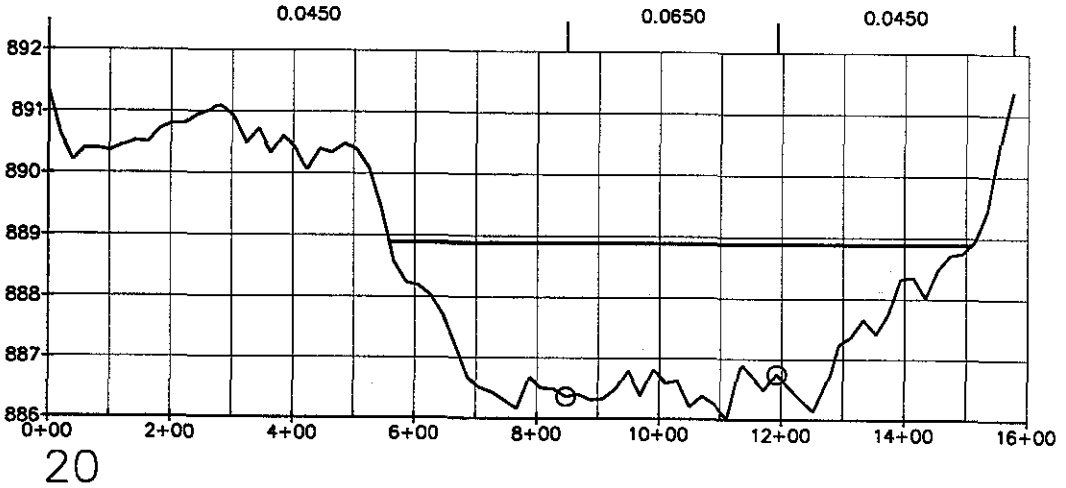
Cross-Section:	10	
Elevation:	878.05	ft MSL
Depth:	4.01	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.229	
Flow Regime:	Subcritical	
Flow Area:	1882.45	sq ft
Average Velocity:	2.59	ft/s
Maximum Velocity:	2.62	ft/s
Composite n:	0.0533	
Hydraulic Radius:	1.74	ft
Wetted Perimeter:	1082.17	ft
Wetted Top Width:	1081.94	ft
Critical Slope:	0.079	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–10

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

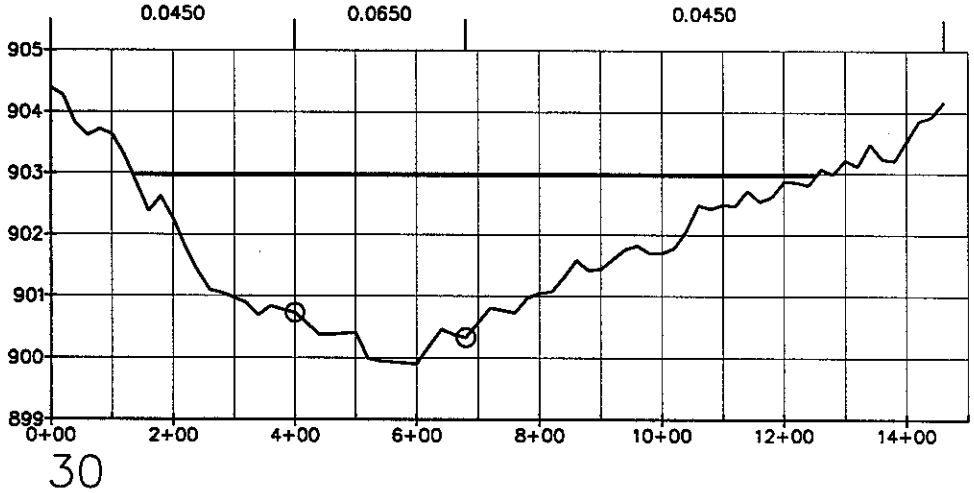
Cross-Section:	20	
Elevation:	888.89	ft MSL
Depth:	2.89	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2866	
Flow Regime:	Subcritical	
Flow Area:	1771.83	sq ft
Average Velocity:	2.77	ft/s
Maximum Velocity:	3.15	ft/s
Composite n:	0.0526	
Hydraulic Radius:	1.86	ft
Wetted Perimeter:	950.32	ft
Wetted Top Width:	950.20	ft
Critical Slope:	0.0506	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–20

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

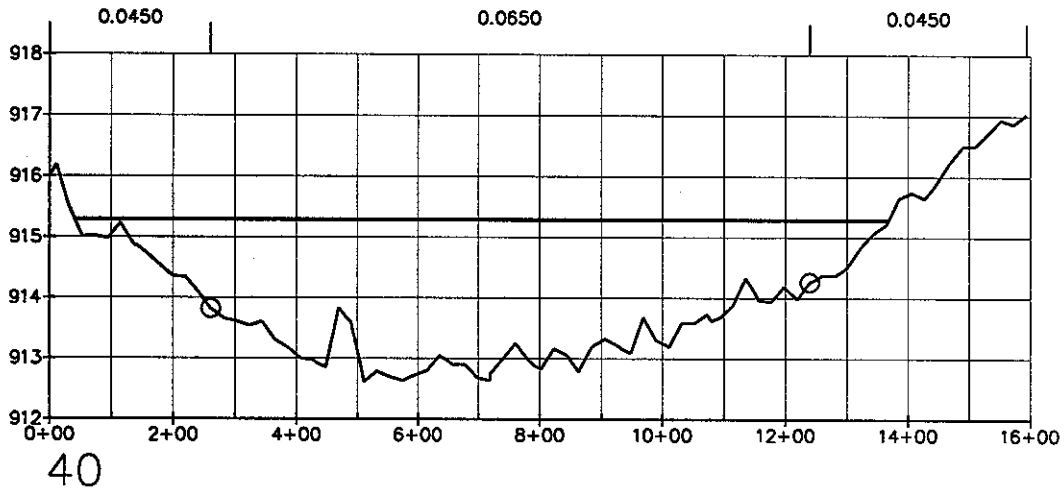
Cross-Section:	30	
Elevation:	902.97	ft MSL
Depth:	3.07	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2672	
Flow Regime:	Subcritical	
Flow Area:	1845.43	sq ft
Average Velocity:	2.67	ft/s
Maximum Velocity:	2.87	ft/s
Composite n:	0.0503	
Hydraulic Radius:	1.65	ft
Wetted Perimeter:	1118.13	ft
Wetted Top Width:	1118.08	ft
Critical Slope:	0.0578	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–30

Entellus™

File: WASH–T1S–R5W–S17–B_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

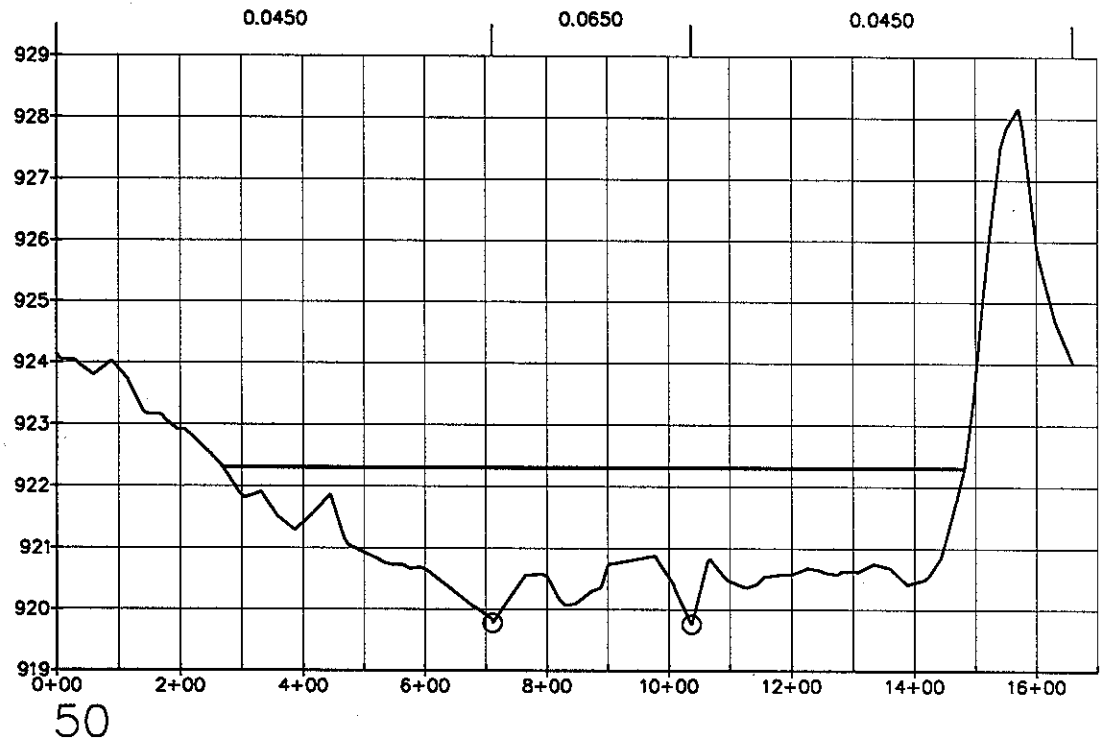
Cross-Section:	40	
Elevation:	915.29	ft MSL
Depth:	2.68	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2434	
Flow Regime:	Subcritical	
Flow Area:	2169.00	sq ft
Average Velocity:	2.25	ft/s
Maximum Velocity:	2.33	ft/s
Composite n:	0.06	
Hydraulic Radius:	1.63	ft
Wetted Perimeter:	1327.00	ft
Wetted Top Width:	1326.86	ft
Critical Slope:	0.0727	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–40

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

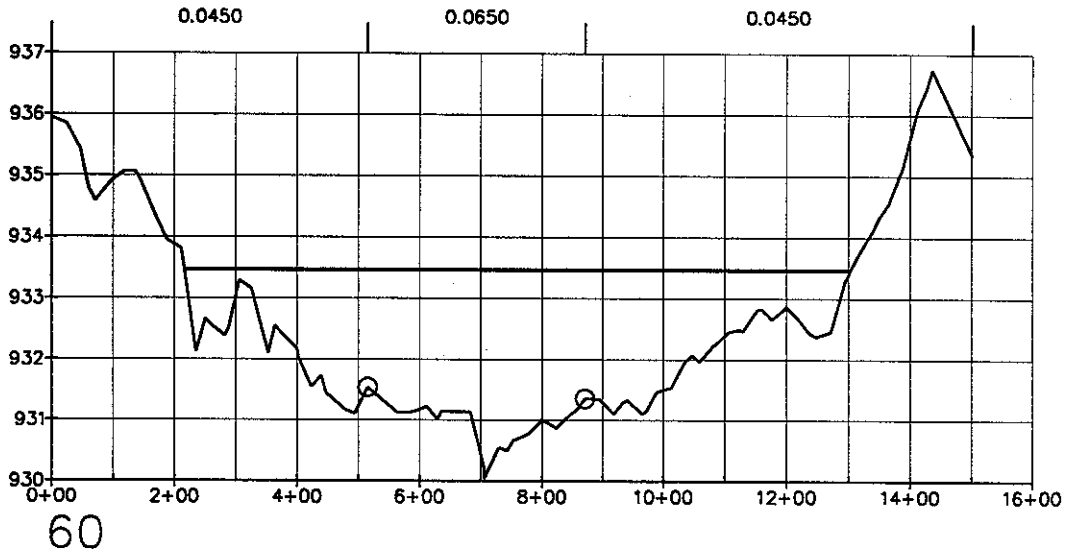
Cross-Section:	50	
Elevation:	922.31	ft MSL
Depth:	2.55	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2853	
Flow Regime:	Subcritical	
Flow Area:	1897.80	sq ft
Average Velocity:	2.58	ft/s
Maximum Velocity:	2.97	ft/s
Composite n:	0.0507	
Hydraulic Radius:	1.57	ft
Wetted Perimeter:	1212.31	ft
Wetted Top Width:	1212.20	ft
Critical Slope:	0.0522	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–50

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

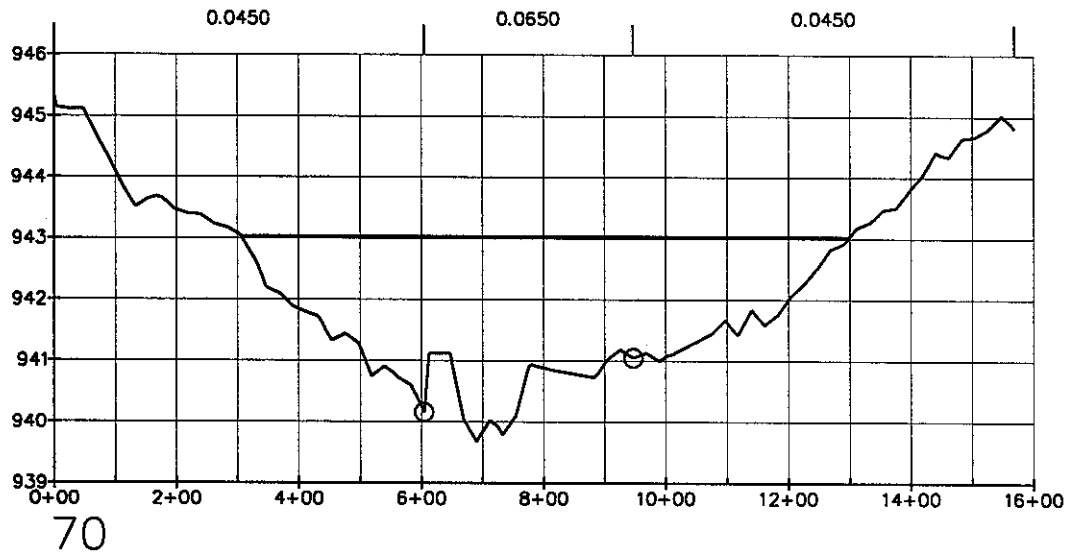
Cross-Section:	60	
Elevation:	933.46	ft MSL
Depth:	3.42	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.251	
Flow Regime:	Subcritical	
Flow Area:	1860.46	sq ft
Average Velocity:	2.63	ft/s
Maximum Velocity:	2.69	ft/s
Composite n:	0.0519	
Hydraulic Radius:	1.71	ft
Wetted Perimeter:	1086.83	ft
Wetted Top Width:	1086.60	ft
Critical Slope:	0.0653	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–60

Entellus™

File: WASH-T1S-R5W-S17-B_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

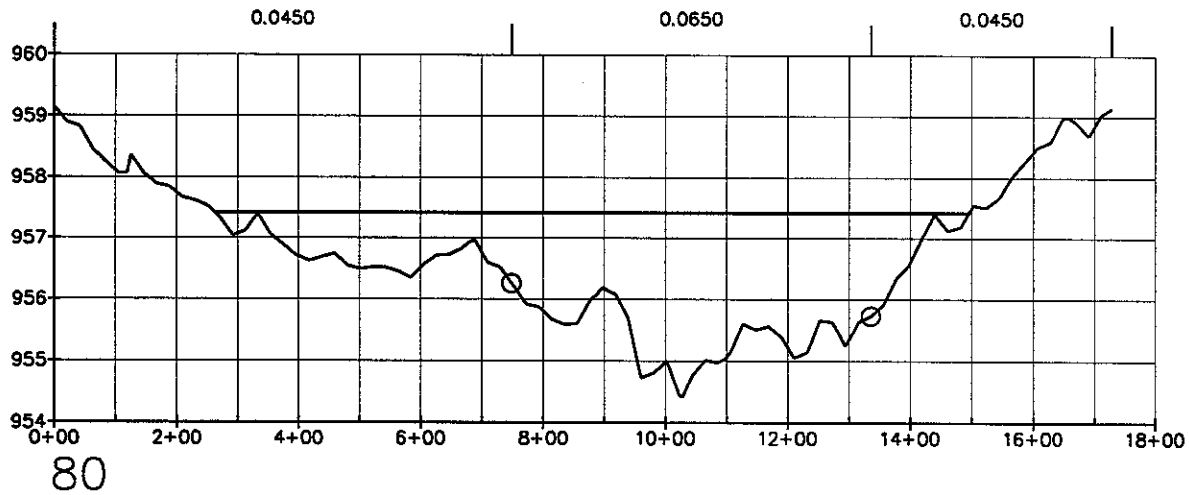
Cross-Section:	70	
Elevation:	943.03	ft MSL
Depth:	3.35	ft
Discharge:	4900.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2715	
Flow Regime:	Subcritical	
Flow Area:	1738.46	sq ft
Average Velocity:	2.84	ft/s
Maximum Velocity:	3.02	ft/s
Composite n:	0.0523	
Hydraulic Radius:	1.75	ft
Wetted Perimeter:	993.01	ft
Wetted Top Width:	992.85	ft
Critical Slope:	0.063	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–70

Entellus™

File: WASH-T1S-R5W-S17-C_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

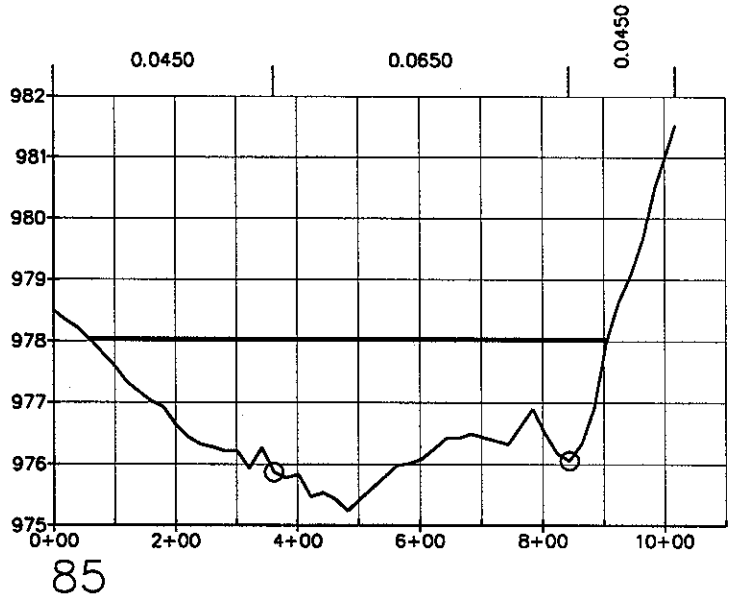
Cross-Section:	80	
Elevation:	957.41	ft MSL
Depth:	2.99	ft
Discharge:	3620.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2309	
Flow Regime:	Subcritical	
Flow Area:	1597.48	sq ft
Average Velocity:	2.28	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0549	
Hydraulic Radius:	1.3	ft
Wetted Perimeter:	1231.86	ft
Wetted Top Width:	1231.75	ft
Critical Slope:	0.0927	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–80

Entellus™

File: WASH-T1S-R5W-S17-C_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

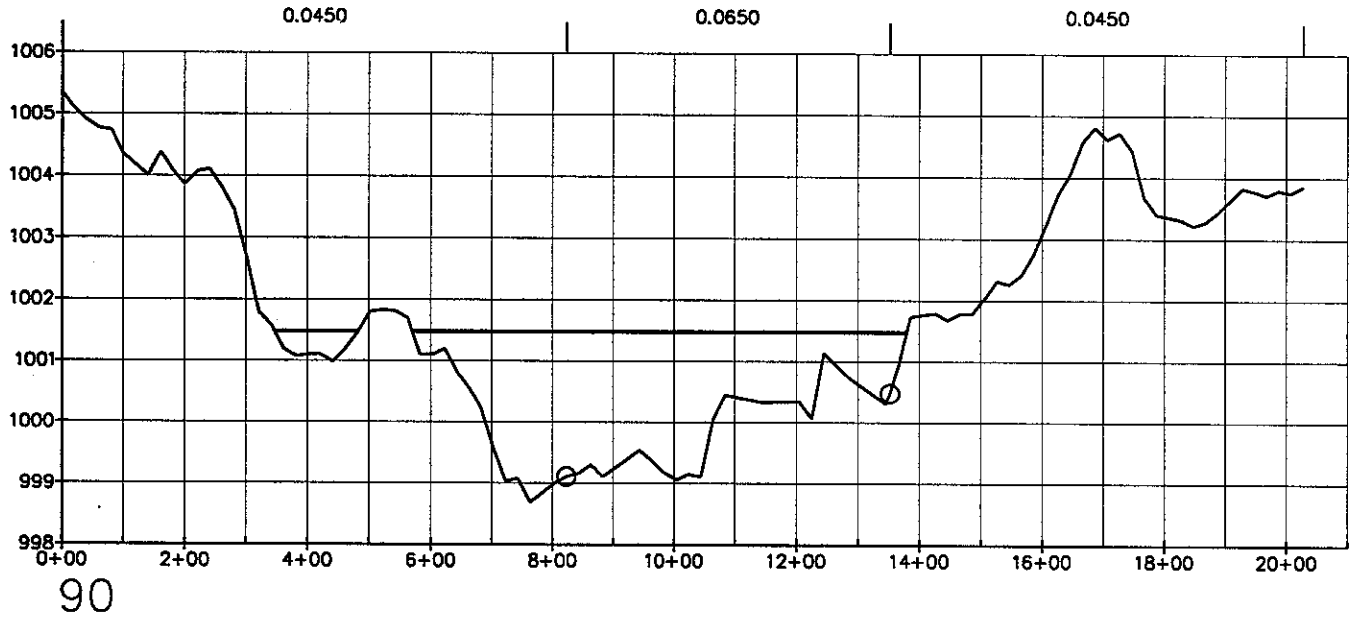
Cross-Section:	85	
Elevation:	978.04	ft MSL
Depth:	2.80	ft
Discharge:	3620.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2673	
Flow Regime:	Subcritical	
Flow Area:	1427.49	sq ft
Average Velocity:	2.55	ft/s
Maximum Velocity:	2.68	ft/s
Composite n:	0.0568	
Hydraulic Radius:	1.68	ft
Wetted Perimeter:	848.60	ft
Wetted Top Width:	848.52	ft
Critical Slope:	0.0653	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–85

Entellus™

File: WASH-T1S-R5W-S17-C_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

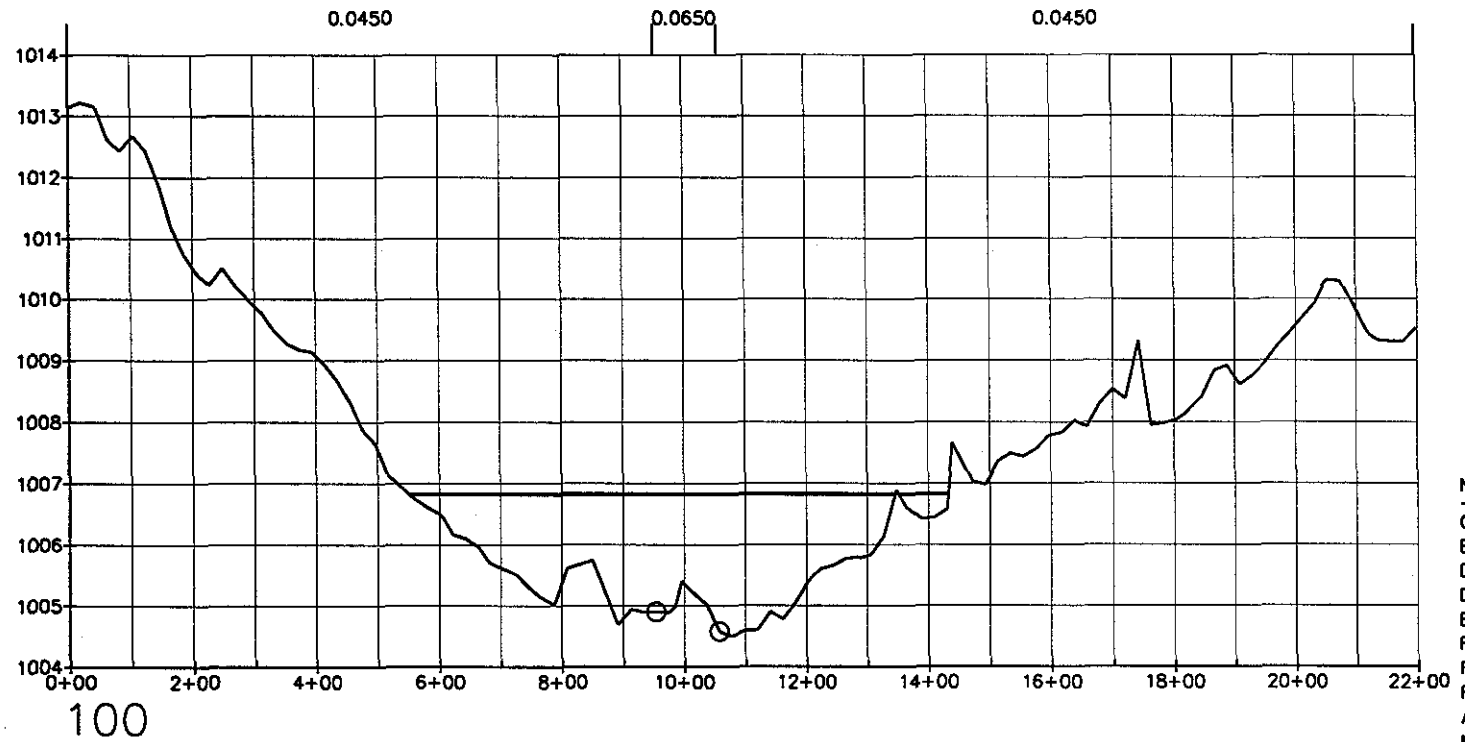
Cross-Section:	90	
Elevation:	1001.48	ft MSL
Depth:	2.79	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2623	
Flow Regime:	Subcritical	
Flow Area:	1272.18	sq ft
Average Velocity:	2.49	ft/s
Maximum Velocity:	2.66	ft/s
Composite n:	0.0543	
Hydraulic Radius:	1.35	ft
Wetted Perimeter:	945.19	ft
Wetted Top Width:	945.06	ft
Critical Slope:	0.0803	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–90

Entellus™

File: WASH–T1S–R5W–S17–A_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

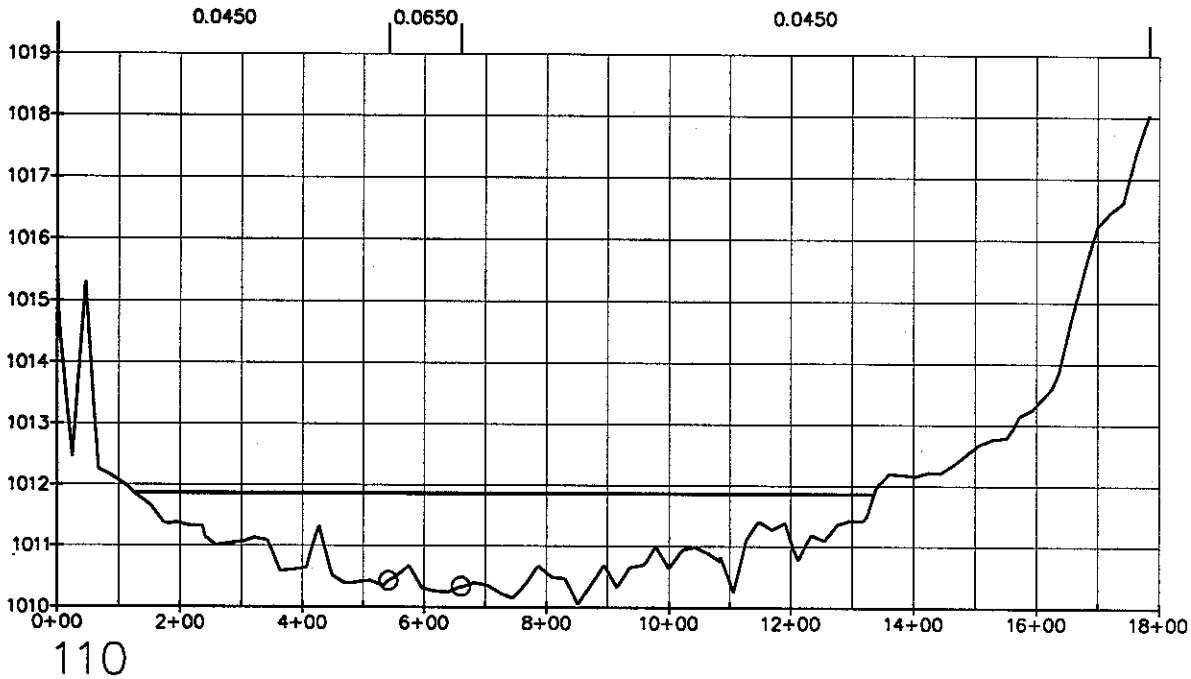
Cross-Section:	100	
Elevation:	1006.83	ft MSL
Depth:	2.33	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.32	
Flow Regime:	Subcritical	
Flow Area:	1140.64	sq ft
Average Velocity:	2.77	ft/s
Maximum Velocity:	2.86	ft/s
Composite n:	0.0475	
Hydraulic Radius:	1.3	ft
Wetted Perimeter:	876.99	ft
Wetted Top Width:	876.90	ft
Critical Slope:	0.0538	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–100

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

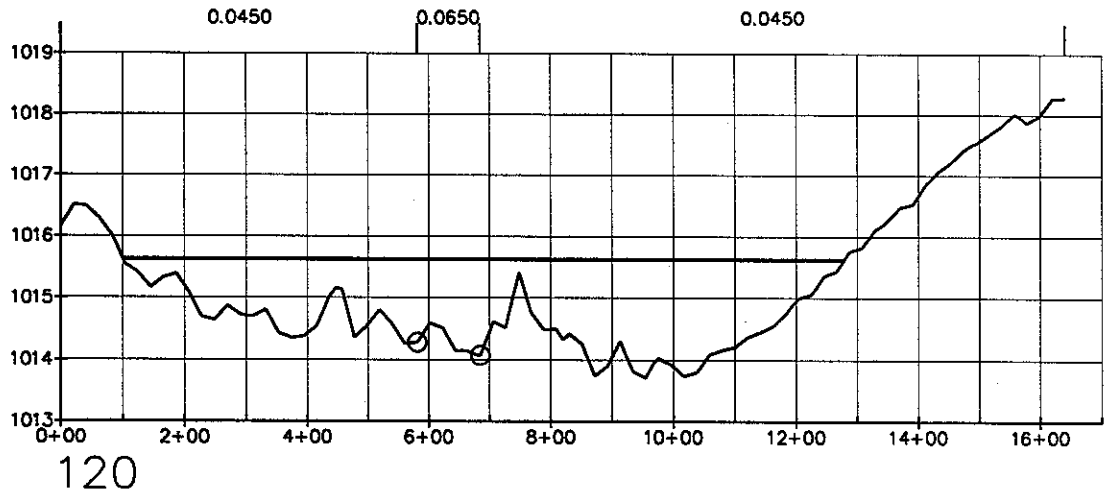
Cross-Section:	110	
Elevation:	1011.86	ft MSL
Depth:	1.81	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3218	
Flow Regime:	Subcritical	
Flow Area:	1284.88	sq ft
Average Velocity:	2.45	ft/s
Maximum Velocity:	2.60	ft/s
Composite n:	0.0471	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	1210.23	ft
Wetted Top Width:	1210.10	ft
Critical Slope:	0.0539	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–110

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

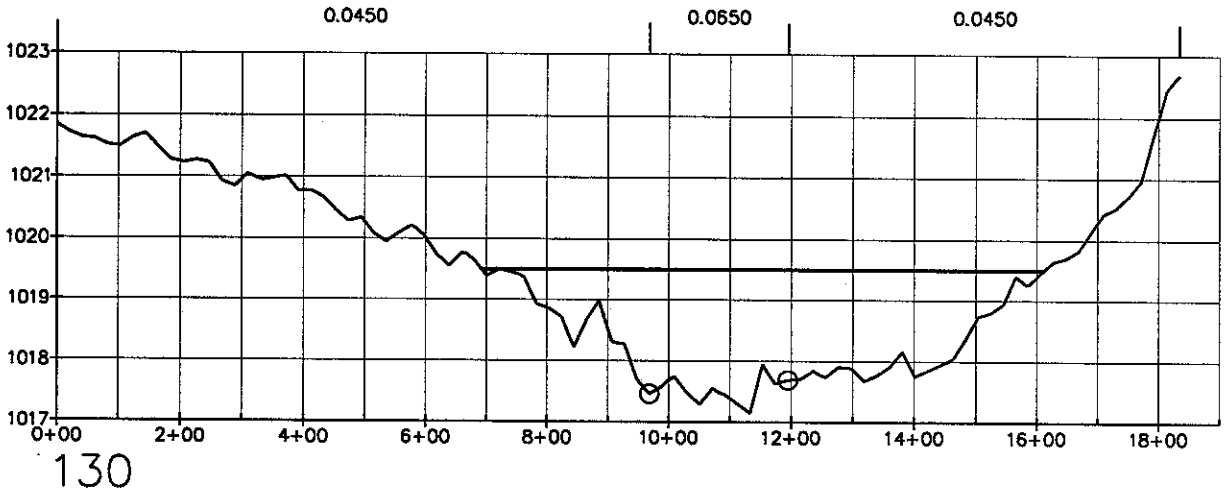
Cross-Section:	120	
Elevation:	1015.62	ft MSL
Depth:	1.91	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3196	
Flow Regime:	Subcritical	
Flow Area:	1259.53	sq ft
Average Velocity:	2.52	ft/s
Maximum Velocity:	2.81	ft/s
Composite n:	0.0469	
Hydraulic Radius:	1.07	ft
Wetted Perimeter:	1177.94	ft
Wetted Top Width:	1177.82	ft
Critical Slope:	0.0558	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–120

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

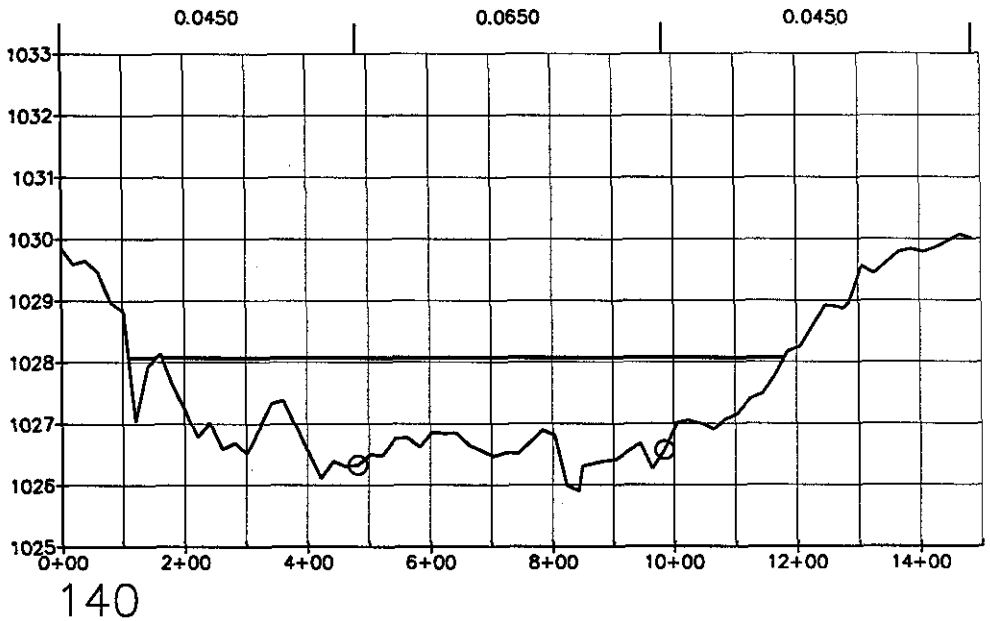
Cross-Section:	130	
Elevation:	1019.50	ft MSL
Depth:	2.35	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3053	
Flow Regime:	Subcritical	
Flow Area:	1189.81	sq ft
Average Velocity:	2.66	ft/s
Maximum Velocity:	2.89	ft/s
Composite n:	0.0502	
Hydraulic Radius:	1.29	ft
Wetted Perimeter:	920.30	ft
Wetted Top Width:	920.21	ft
Critical Slope:	0.0612	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–130

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

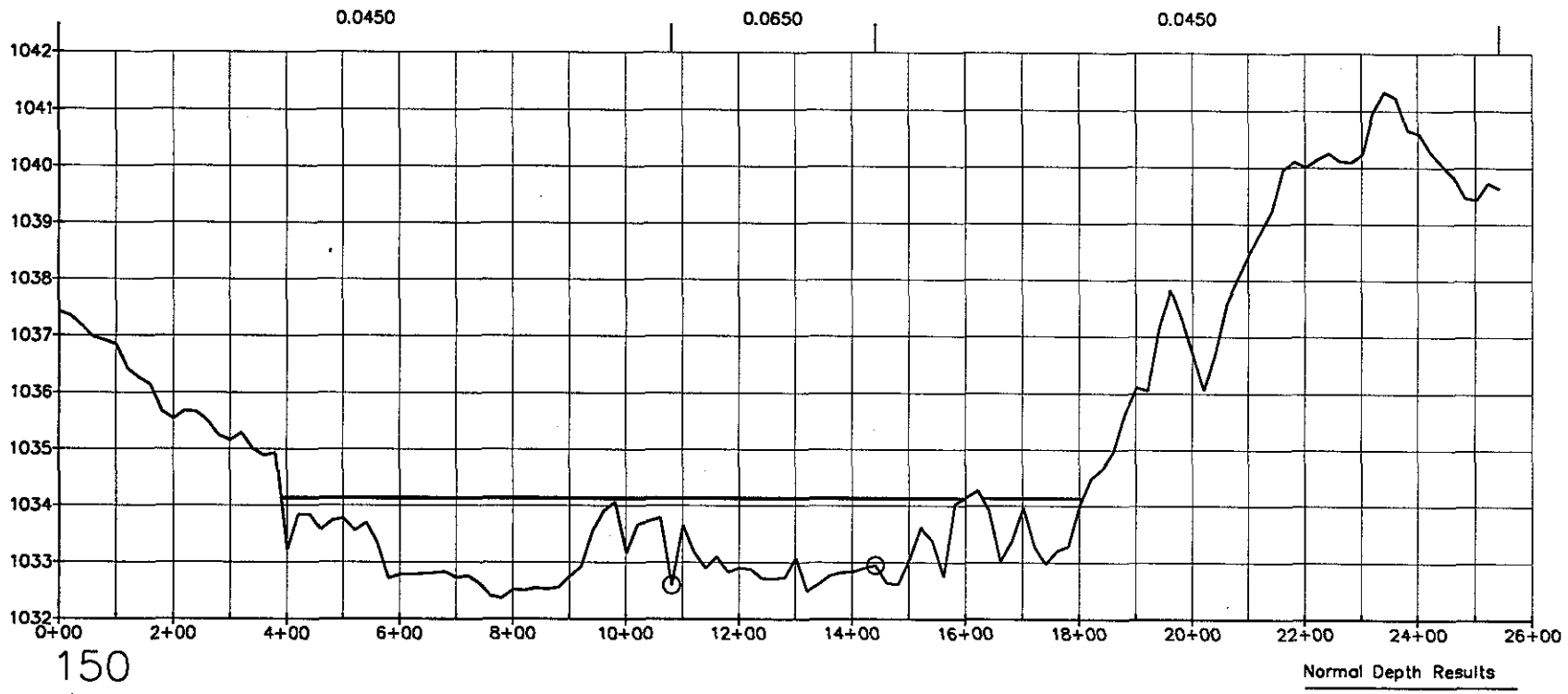
Cross-Section:	140	
Elevation:	1028.07	ft MSL
Depth:	2.16	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2821	
Flow Regime:	Subcritical	
Flow Area:	1342.97	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.66	ft/s
Composite n:	0.0549	
Hydraulic Radius:	1.26	ft
Wetted Perimeter:	1062.35	ft
Wetted Top Width:	1062.18	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–140

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

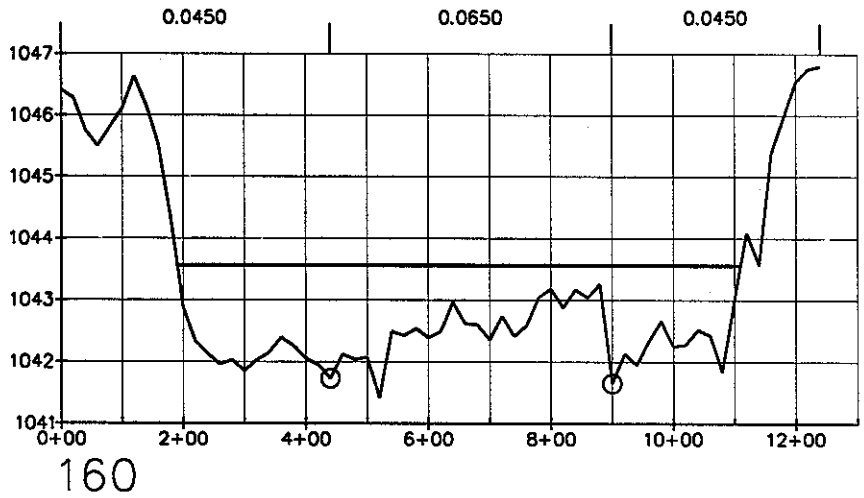
Cross-Section:	150	
Elevation:	1034.13	ft MSL
Depth:	1.76	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2984	
Flow Regime:	Subcritical	
Flow Area:	1407.26	sq ft
Average Velocity:	2.24	ft/s
Maximum Velocity:	2.45	ft/s
Composite n:	0.0505	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	1385.00	ft
Wetted Top Width:	1384.67	ft
Critical Slope:	0.0638	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–150

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

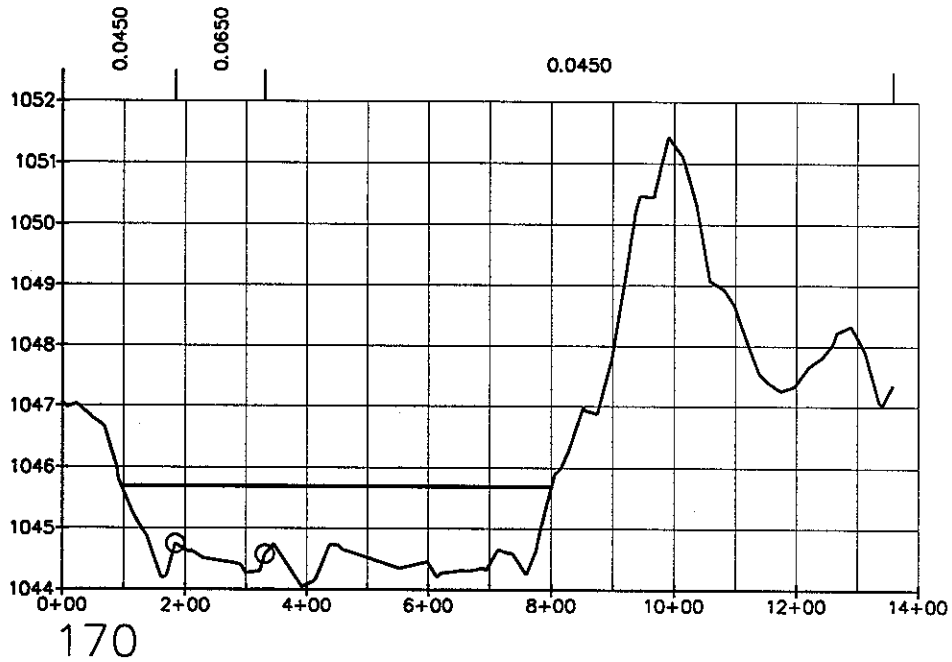
Cross-Section:	160	
Elevation:	1043.56	ft MSL
Depth:	2.14	ft
Discharge:	2590.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2912	
Flow Regime:	Subcritical	
Flow Area:	1072.56	sq ft
Average Velocity:	2.42	ft/s
Maximum Velocity:	3.07	ft/s
Composite n:	0.0554	
Hydraulic Radius:	1.17	ft
Wetted Perimeter:	919.80	ft
Wetted Top Width:	919.54	ft
Critical Slope:	0.0776	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–160

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

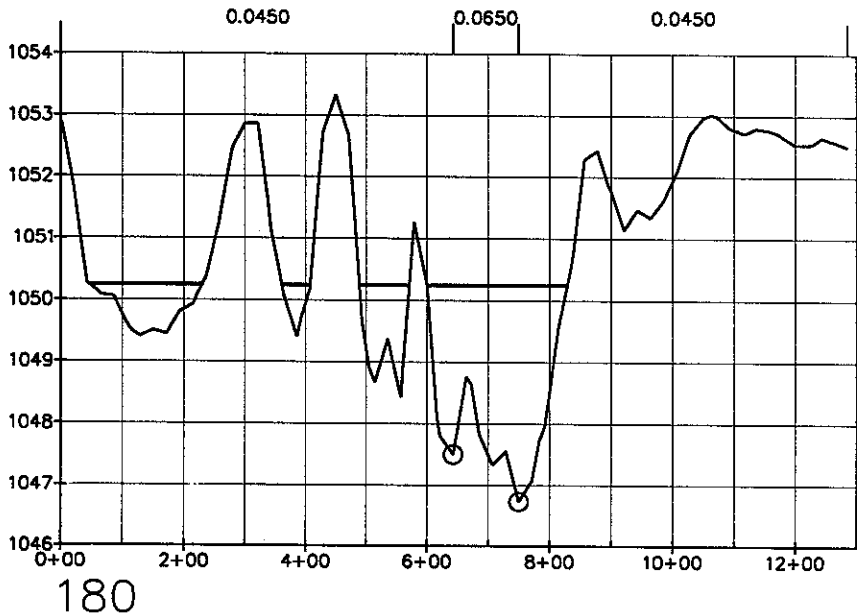
Cross-Section:	170	
Elevation:	1045.69	ft MSL
Depth:	1.64	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3525	
Flow Regime:	Subcritical	
Flow Area:	821.33	sq ft
Average Velocity:	2.55	ft/s
Maximum Velocity:	2.79	ft/s
Composite n:	0.0494	
Hydraulic Radius:	1.17	ft
Wetted Perimeter:	704.15	ft
Wetted Top Width:	704.06	ft
Critical Slope:	0.0472	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–170

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

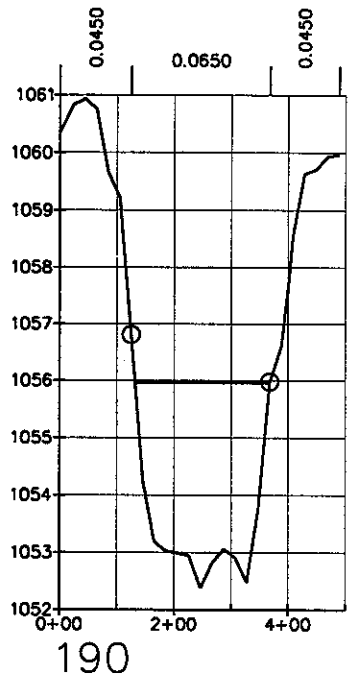
Cross-Section:	180	
Elevation:	1050.25	ft MSL
Depth:	3.52	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2748	
Flow Regime:	Subcritical	
Flow Area:	718.42	sq ft
Average Velocity:	2.94	ft/s
Maximum Velocity:	4.02	ft/s
Composite n:	0.0492	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	541.40	ft
Wetted Top Width:	540.80	ft
Critical Slope:	0.0848	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–180

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

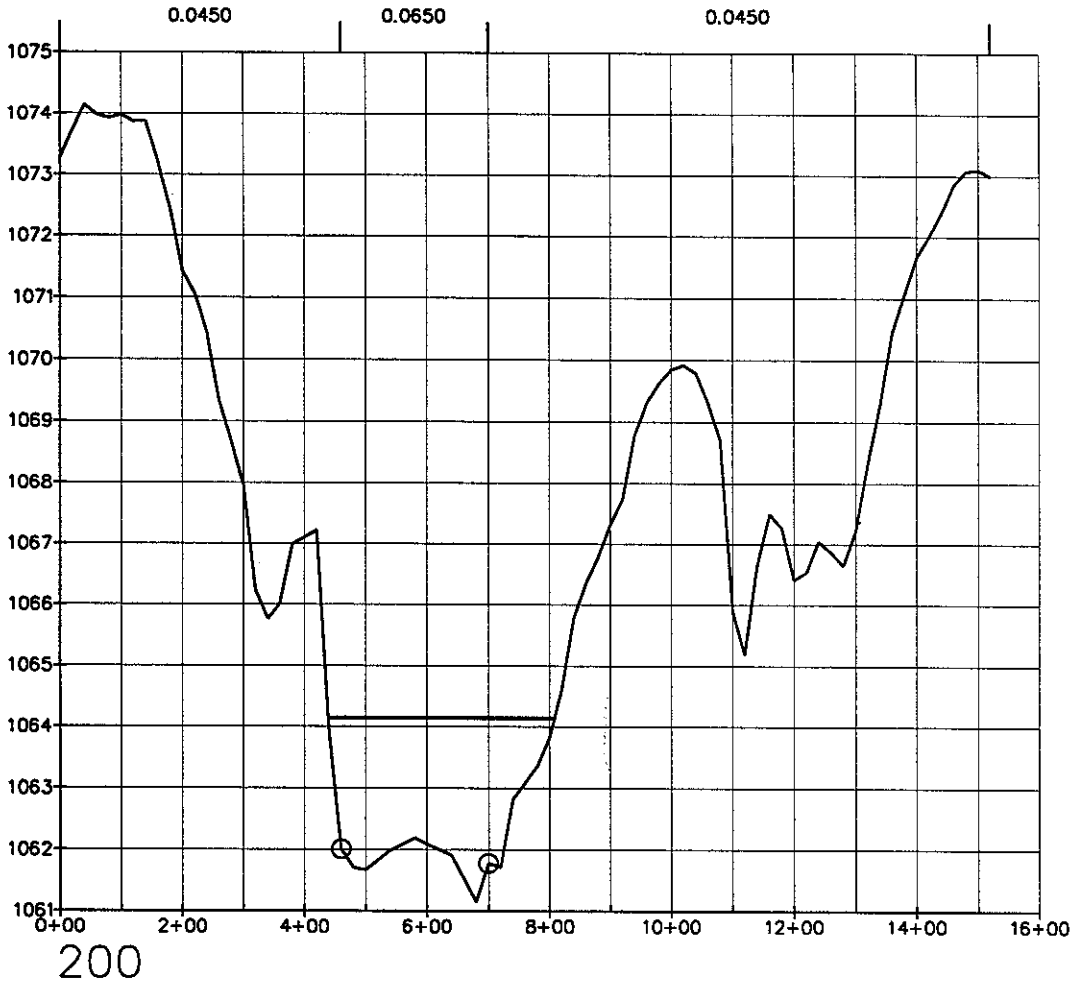
Cross-Section:	190	
Elevation:	1055.96	ft MSL
Depth:	3.58	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3073	
Flow Regime:	Subcritical	
Flow Area:	636.40	sq ft
Average Velocity:	3.29	ft/s
Maximum Velocity:	3.29	ft/s
Composite n:	0.065	
Hydraulic Radius:	2.7	ft
Wetted Perimeter:	236.06	ft
Wetted Top Width:	235.74	ft
Critical Slope:	0.0584	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–190

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

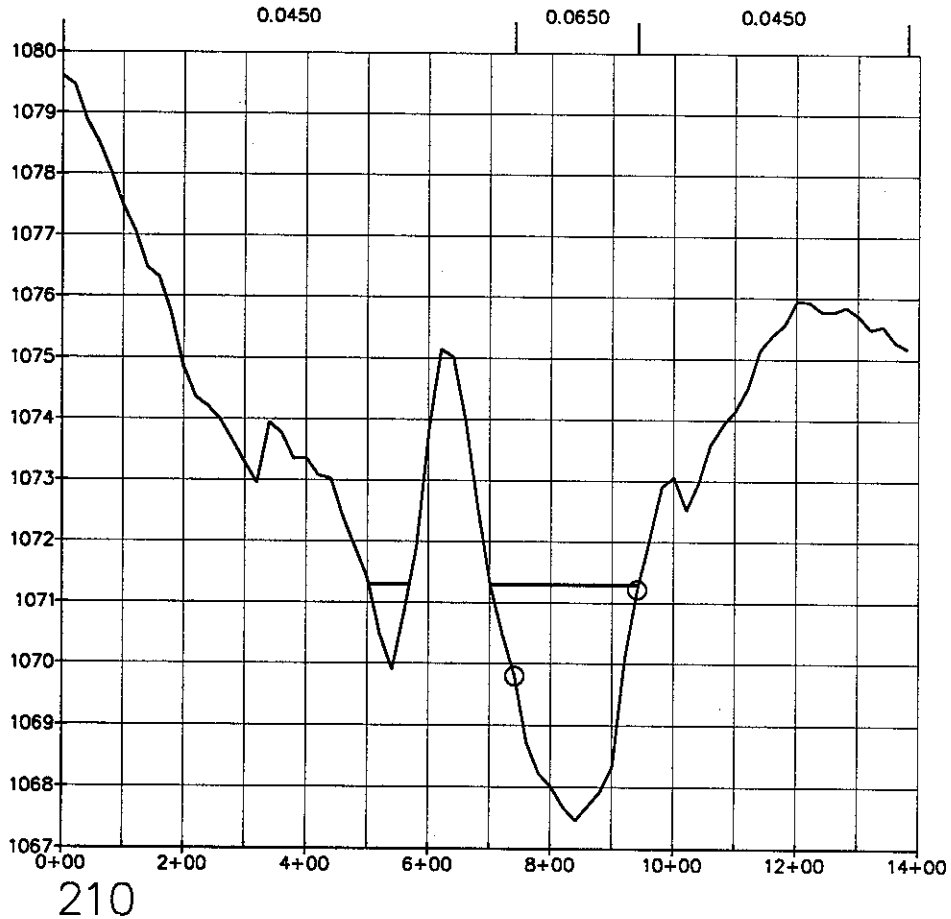
Cross-Section:	200	
Elevation:	1064.14	ft MSL
Depth:	2.99	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2987	
Flow Regime:	Subcritical	
Flow Area:	716.27	sq ft
Average Velocity:	2.95	ft/s
Maximum Velocity:	2.97	ft/s
Composite n:	0.0584	
Hydraulic Radius:	1.94	ft
Wetted Perimeter:	369.28	ft
Wetted Top Width:	369.10	ft
Critical Slope:	0.0611	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–200

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

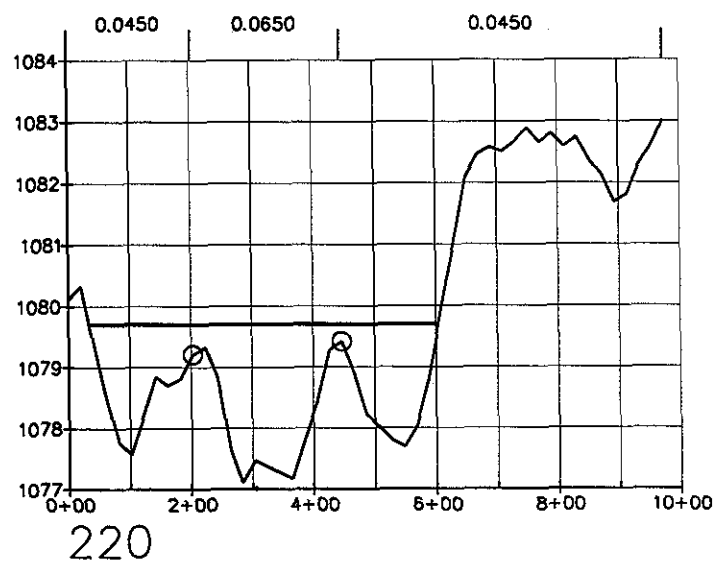
Cross-Section:	210	
Elevation:	1071.29	ft MSL
Depth:	3.83	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2919	
Flow Regime:	Subcritical	
Flow Area:	647.59	sq ft
Average Velocity:	3.23	ft/s
Maximum Velocity:	3.40	ft/s
Composite n:	0.0583	
Hydraulic Radius:	2.1	ft
Wetted Perimeter:	308.55	ft
Wetted Top Width:	308.30	ft
Critical Slope:	0.0704	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–210

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

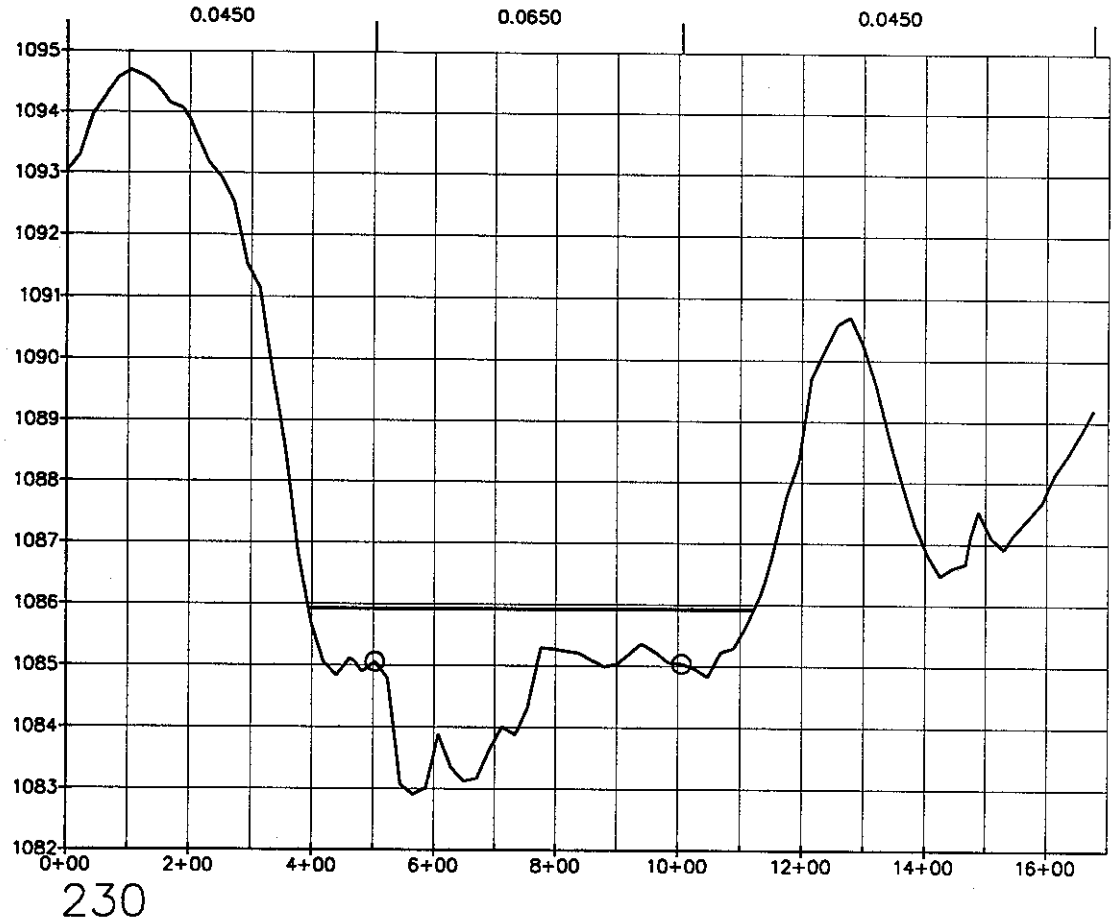
Cross-Section:	220	
Elevation:	1079.70	ft MSL
Depth:	2.59	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2847	
Flow Regime:	Subcritical	
Flow Area:	807.49	sq ft
Average Velocity:	2.62	ft/s
Maximum Velocity:	2.99	ft/s
Composite n:	0.054	
Hydraulic Radius:	1.42	ft
Wetted Perimeter:	569.97	ft
Wetted Top Width:	569.75	ft
Critical Slope:	0.0688	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–220

Entellus™

File: WASH–T1S–R5W–S17–A_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

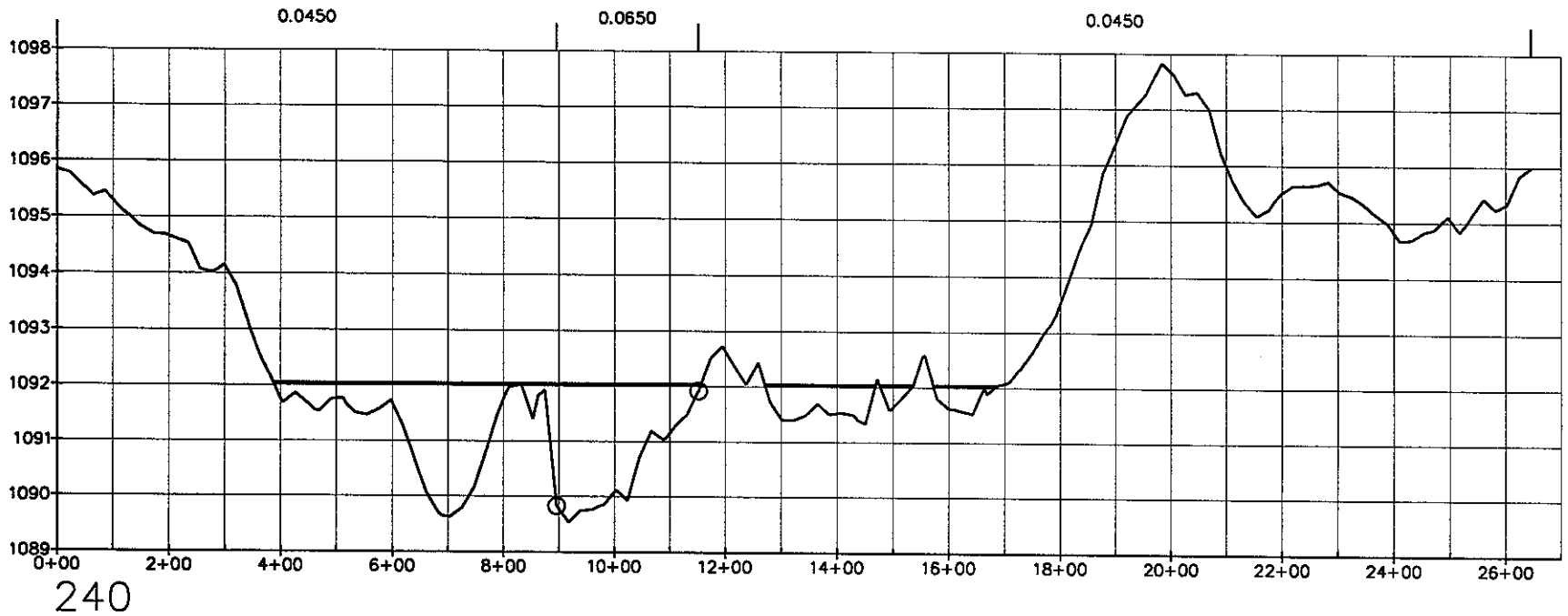
Cross-Section:	230	
Elevation:	1085.92	ft MSL
Depth:	3.01	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2255	
Flow Regime:	Subcritical	
Flow Area:	946.63	sq ft
Average Velocity:	2.23	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.0591	
Hydraulic Radius:	1.3	ft
Wetted Perimeter:	728.42	ft
Wetted Top Width:	728.25	ft
Critical Slope:	0.1076	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–230

Entellus™

File: WASH–T1S–R5W–S17–A_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

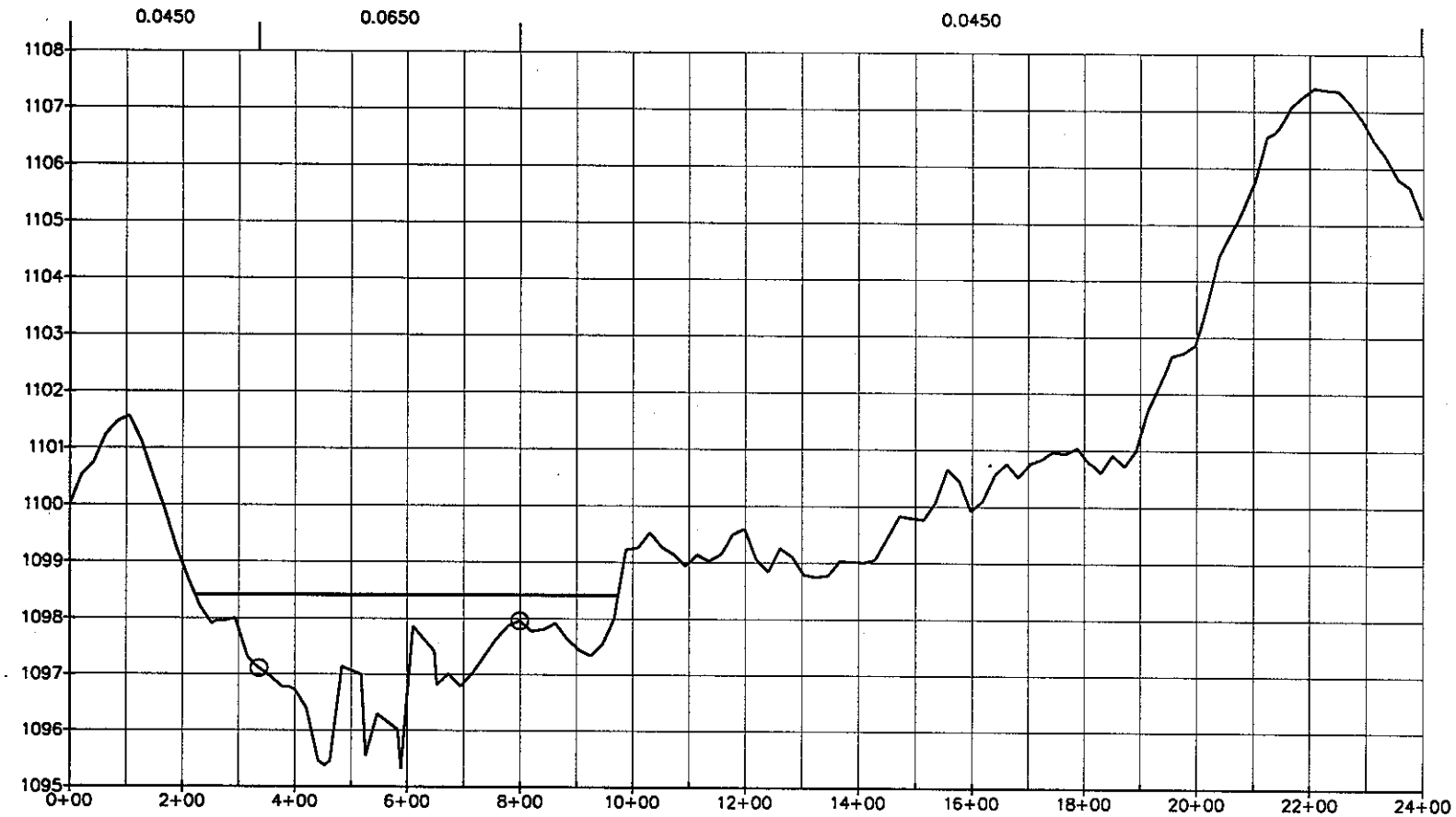
Cross-Section:	240	
Elevation:	1092.04	ft MSL
Depth:	2.50	ft
Discharge:	2100.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2384	
Flow Regime:	Subcritical	
Flow Area:	983.14	sq ft
Average Velocity:	2.11	ft/s
Maximum Velocity:	2.30	ft/s
Composite n:	0.0498	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	1139.41	ft
Wetted Top Width:	1139.14	ft
Critical Slope:	0.1093	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–240

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



250

Normal Depth Results

Cross-Section:	250		Flow Area:	937.17	sq ft
Elevation:	1098.41	ft MSL	Average Velocity:	2.24	ft/s
Depth:	3.09	ft	Maximum Velocity:	2.33	ft/s
Discharge:	2100.00	cfs	Composite n:	0.0577	
Energy Gradient:	0.0055	ft/ft	Hydraulic Radius:	1.25	ft
Froude Number:	0.2246		Wetted Perimeter:	751.76	ft
Flow Regime:	Subcritical		Wetted Top Width:	751.22	ft
			Critical Slope:	0.1113	ft/ft

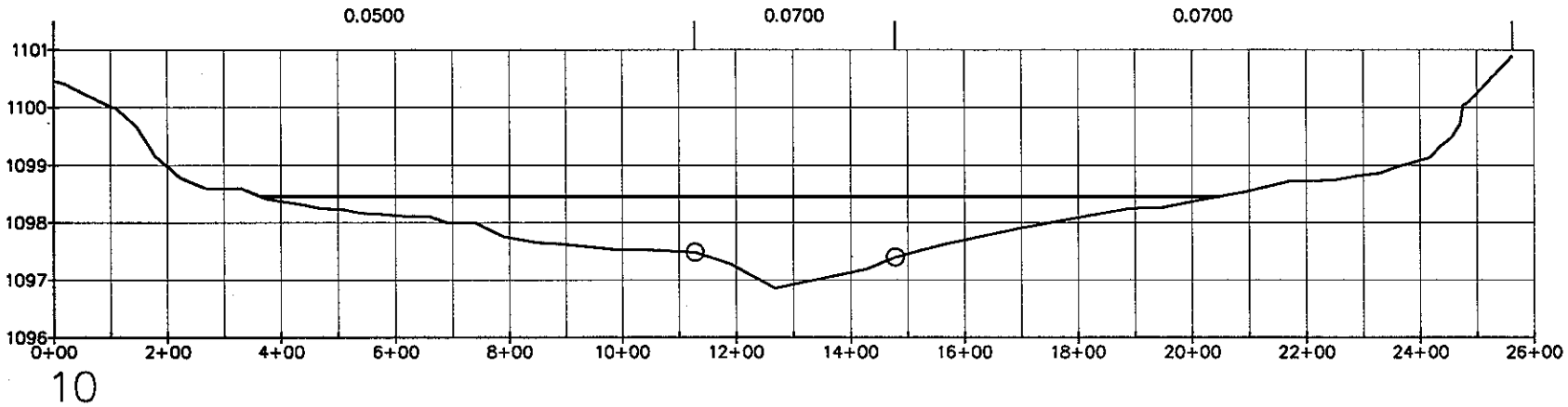
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S17–250

Entellus™

File: WASH-T1S-R5W-S17-A_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1098.46	ft MSL
Depth:	1.60	ft
Discharge:	1860.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2242	
Flow Regime:	Subcritical	
Flow Area:	1155.76	sq ft
Average Velocity:	1.60	ft/s
Maximum Velocity:	1.98	ft/s
Composite n:	0.0613	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	1683.15	ft
Wetted Top Width:	1683.15	ft
Critical Slope:	0.144	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–10

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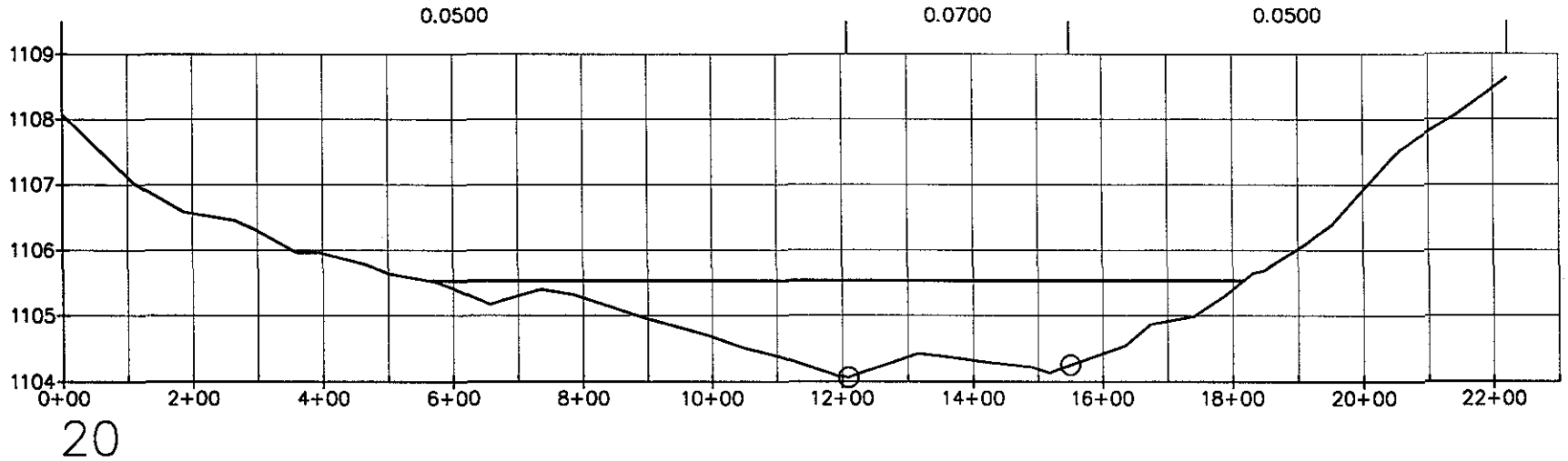
File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1105.53	ft MSL
Depth:	1.47	ft
Discharge:	1860.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2634	
Flow Regime:	Subcritical	
Flow Area:	1026.10	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	1.93	ft/s
Composite n:	0.0557	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	1255.53	ft
Wetted Top Width:	1255.52	ft
Critical Slope:	0.0868	ft/ft

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R6W-S35-20

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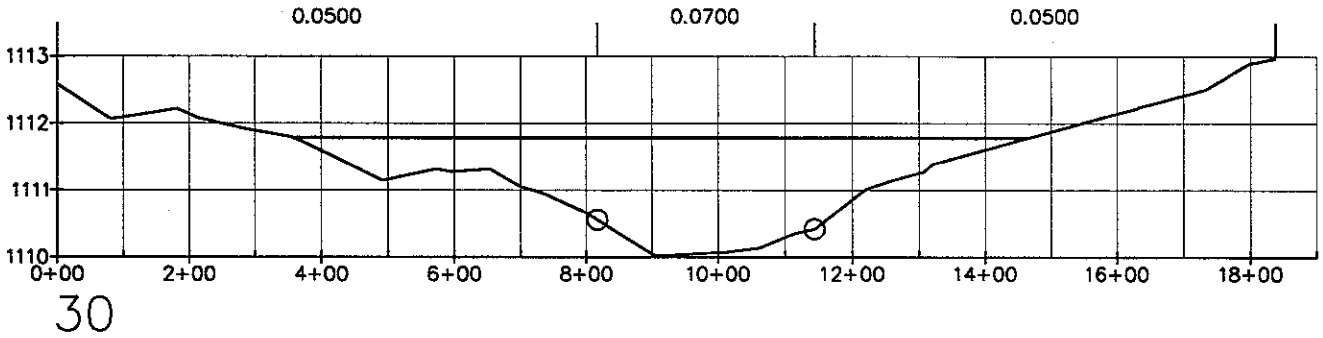


Normal Depth Results

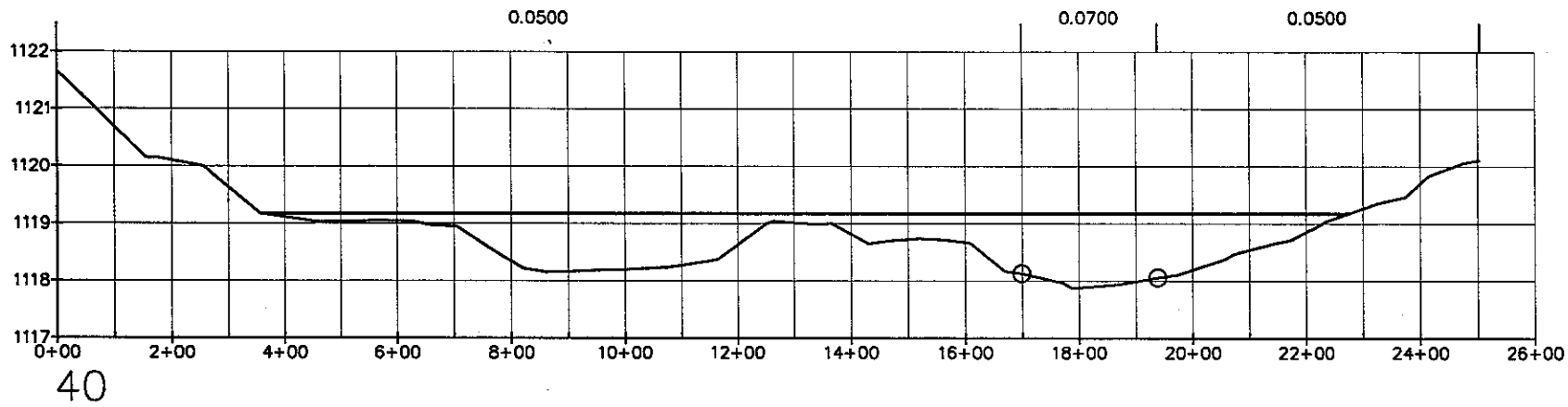
Cross-Section:	30	
Elevation:	1111.79	ft MSL
Depth:	1.77	ft
Discharge:	1860.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2568	
Flow Regime:	Subcritical	
Flow Area:	960.40	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.0562	
Hydraulic Radius:	0.87	ft
Wetted Perimeter:	1109.17	ft
Wetted Top Width:	1109.16	ft
Critical Slope:	0.0982	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–30

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

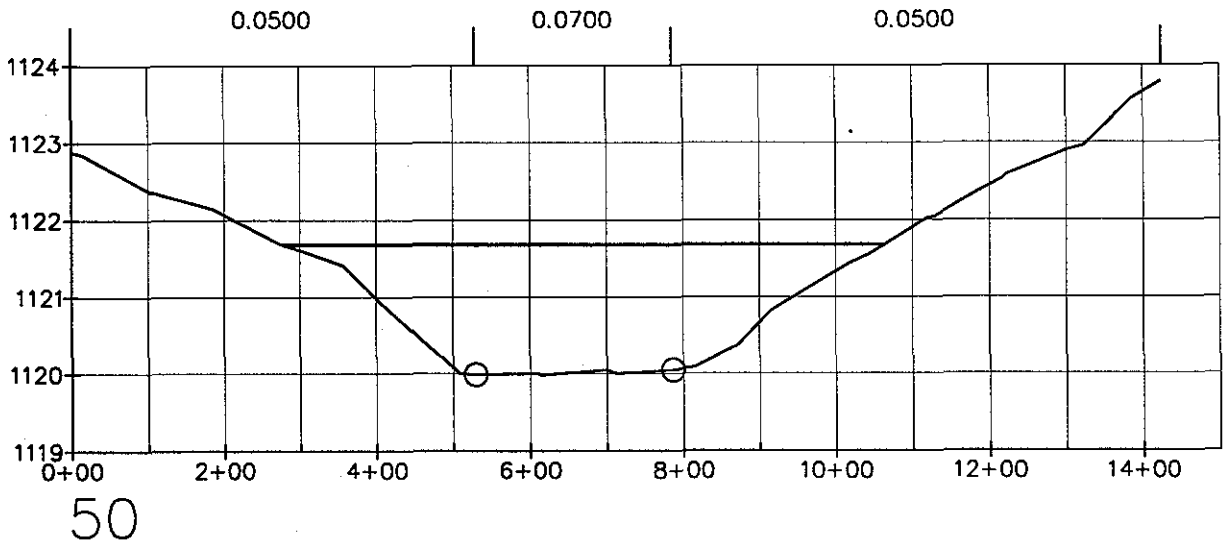
Cross-Section:	40	
Elevation:	1119.17	ft MSL
Depth:	1.30	ft
Discharge:	1860.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2447	
Flow Regime:	Subcritical	
Flow Area:	1174.82	sq ft
Average Velocity:	1.60	ft/s
Maximum Velocity:	1.86	ft/s
Composite n:	0.0527	
Hydraulic Radius:	0.61	ft
Wetted Perimeter:	1915.96	ft
Wetted Top Width:	1915.95	ft
Critical Slope:	0.1005	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–40

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

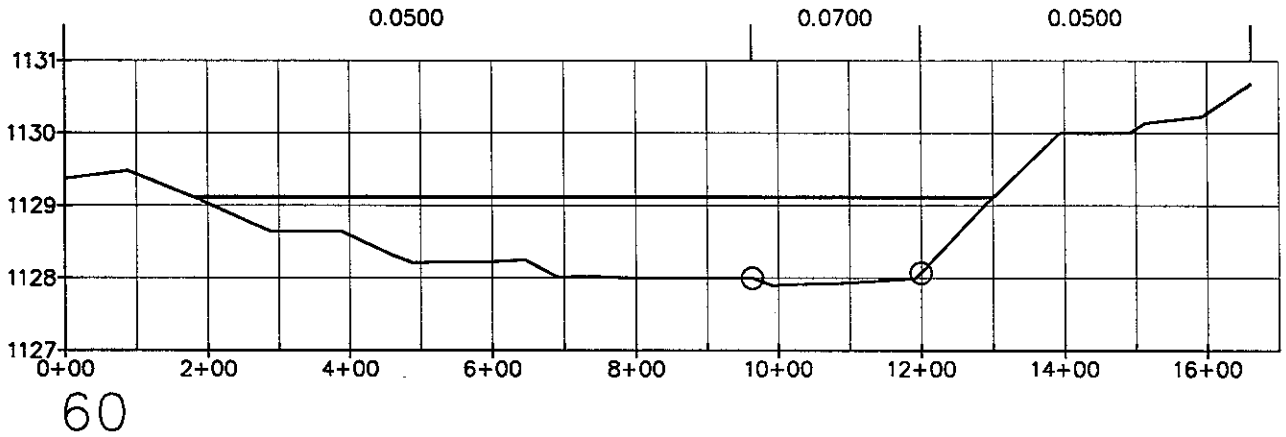
Cross-Section:	50	
Elevation:	1121.68	ft MSL
Depth:	1.70	ft
Discharge:	1860.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2928	
Flow Regime:	Subcritical	
Flow Area:	859.69	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0569	
Hydraulic Radius:	1.1	ft
Wetted Perimeter:	785.03	ft
Wetted Top Width:	785.02	ft
Critical Slope:	0.0706	ft/ft

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R6W-S35-50

Entellus™



Normal Depth Results

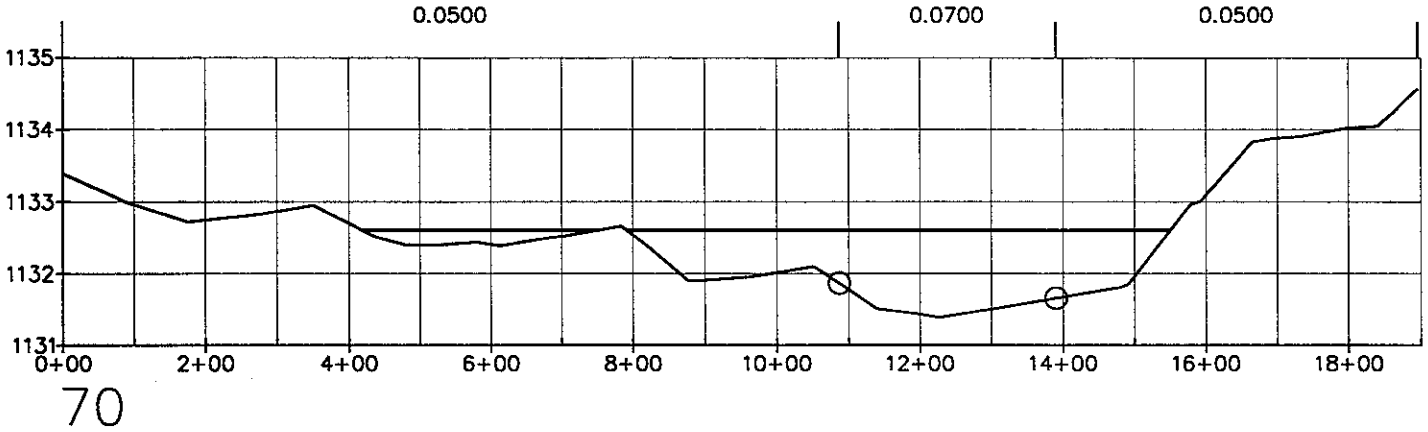
Cross-Section:	60	
Elevation:	1129.12	ft MSL
Depth:	1.22	ft
Discharge:	1860.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.3095	
Flow Regime:	Subcritical	
Flow Area:	960.41	sq ft
Average Velocity:	1.92	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0545	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	1120.28	ft
Wetted Top Width:	1120.27	ft
Critical Slope:	0.0643	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–60

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	70	
Elevation:	1132.60	ft MSL
Depth:	1.21	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2465	
Flow Regime:	Subcritical	
Flow Area:	642.44	sq ft
Average Velocity:	1.54	ft/s
Maximum Velocity:	1.79	ft/s
Composite n:	0.0559	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	1089.18	ft
Wetted Top Width:	1089.17	ft
Critical Slope:	0.1112	ft/ft

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R6W-S35-70

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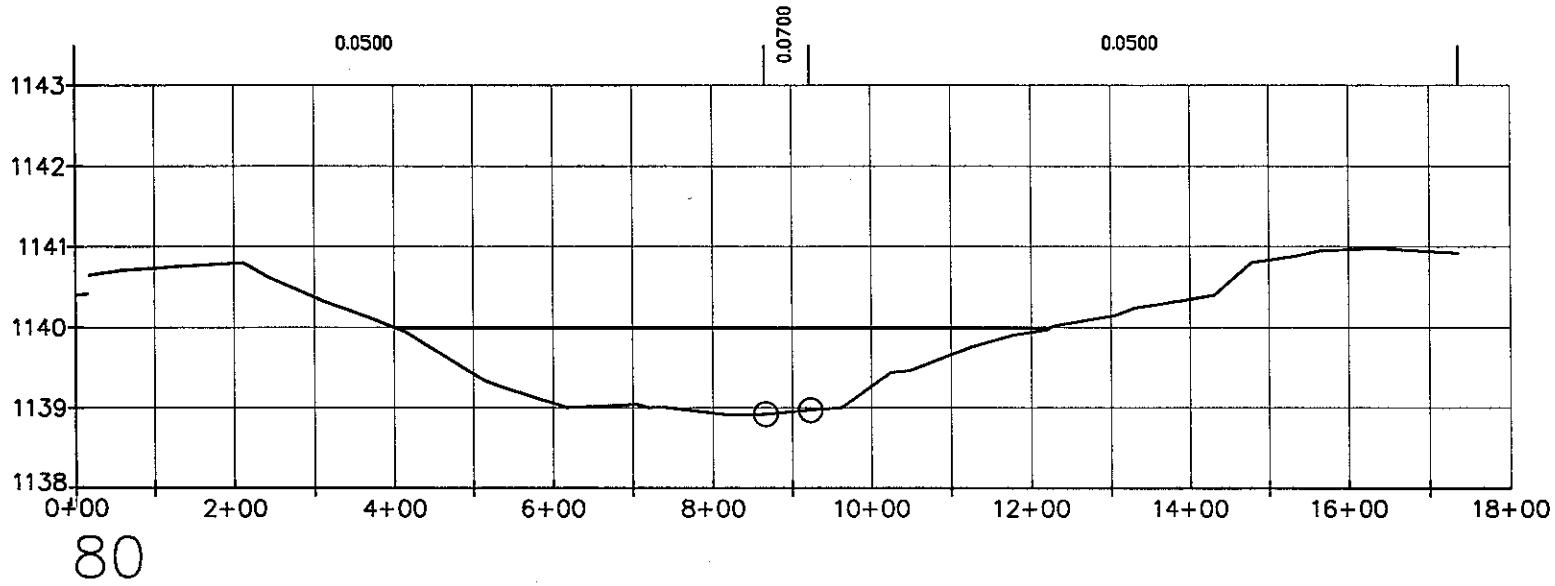


Normal Depth Results

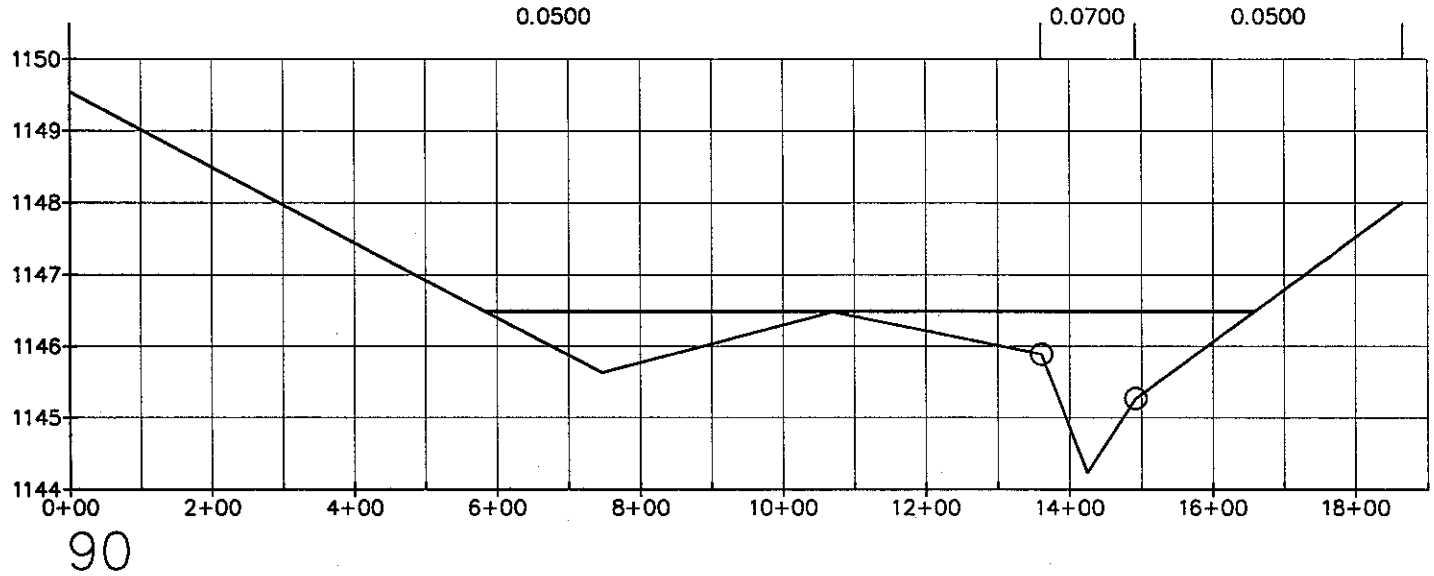
Cross-Section:	80	
Elevation:	1139.99	ft MSL
Depth:	1.08	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2916	
Flow Regime:	Subcritical	
Flow Area:	574.78	sq ft
Average Velocity:	1.72	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0591	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	822.51	ft
Wetted Top Width:	822.50	ft
Critical Slope:	0.0884	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–80

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

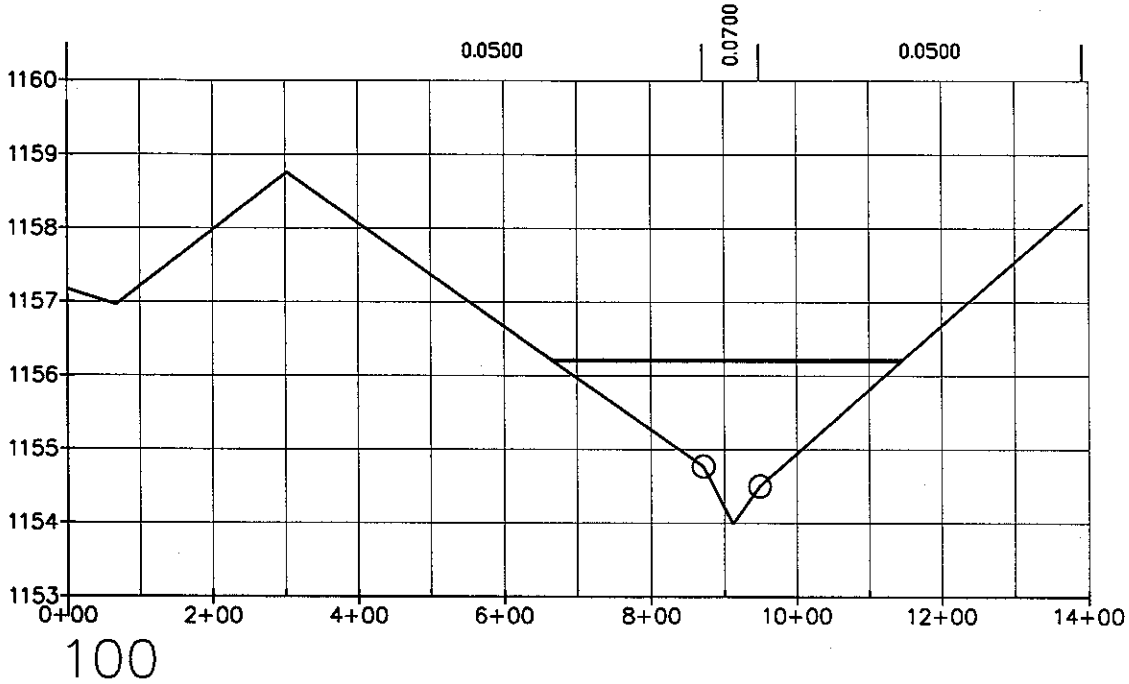
Cross-Section:	90	
Elevation:	1146.49	ft MSL
Depth:	2.26	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.1913	
Flow Regime:	Subcritical	
Flow Area:	607.15	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0526	
Hydraulic Radius:	0.56	ft
Wetted Perimeter:	1075.41	ft
Wetted Top Width:	1075.37	ft
Critical Slope:	0.1942	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–90

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

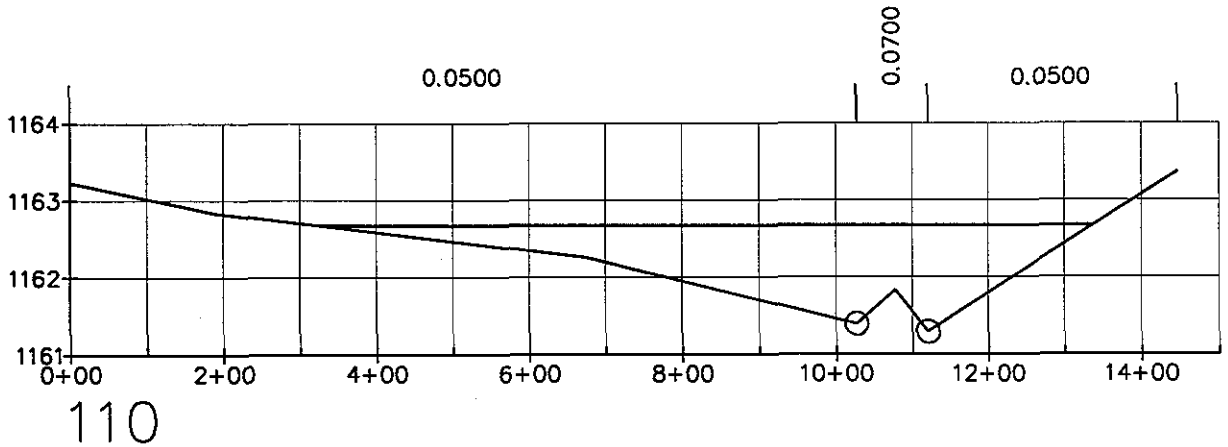
Cross-Section:	100	
Elevation:	1156.20	ft MSL
Depth:	2.21	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.256	
Flow Regime:	Subcritical	
Flow Area:	458.41	sq ft
Average Velocity:	2.14	ft/s
Maximum Velocity:	2.52	ft/s
Composite n:	0.0534	
Hydraulic Radius:	0.96	ft
Wetted Perimeter:	477.54	ft
Wetted Top Width:	477.52	ft
Critical Slope:	0.0967	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–100

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

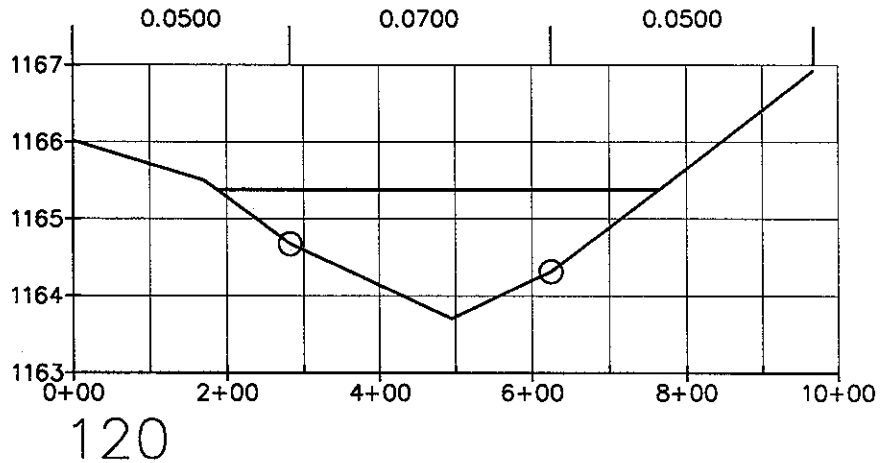
Cross-Section:	110	
Elevation:	1162.67	ft MSL
Depth:	1.38	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2392	
Flow Regime:	Subcritical	
Flow Area:	620.64	sq ft
Average Velocity:	1.62	ft/s
Maximum Velocity:	1.80	ft/s
Composite n:	0.052	
Hydraulic Radius:	0.62	ft
Wetted Perimeter:	1008.29	ft
Wetted Top Width:	1008.28	ft
Critical Slope:	0.1034	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–110

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

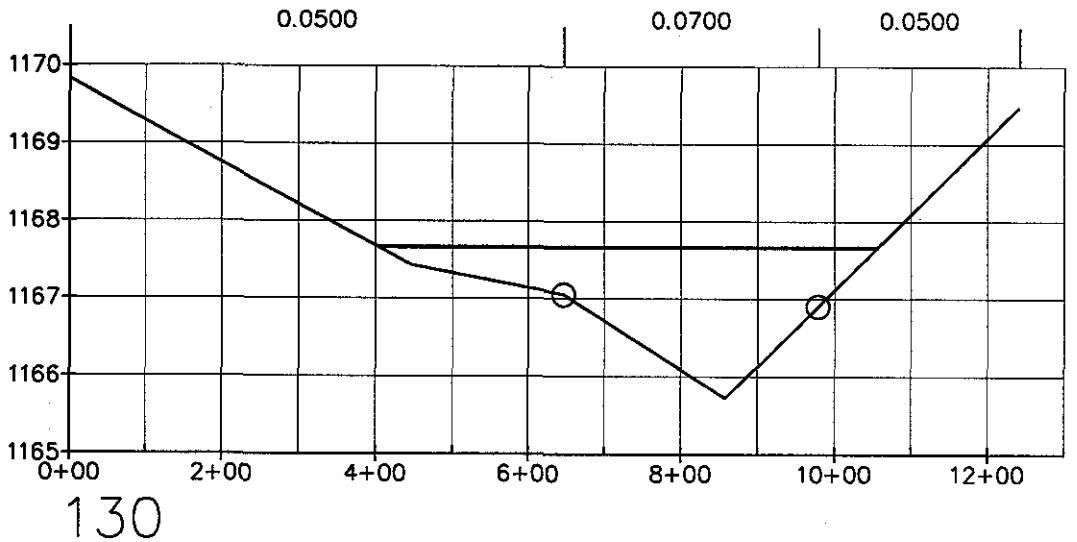
Cross-Section:	120	
Elevation:	1165.38	ft MSL
Depth:	1.68	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.25	
Flow Regime:	Subcritical	
Flow Area:	538.98	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	1.92	ft/s
Composite n:	0.0622	
Hydraulic Radius:	0.93	ft
Wetted Perimeter:	577.36	ft
Wetted Top Width:	577.35	ft
Critical Slope:	0.1031	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–120

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

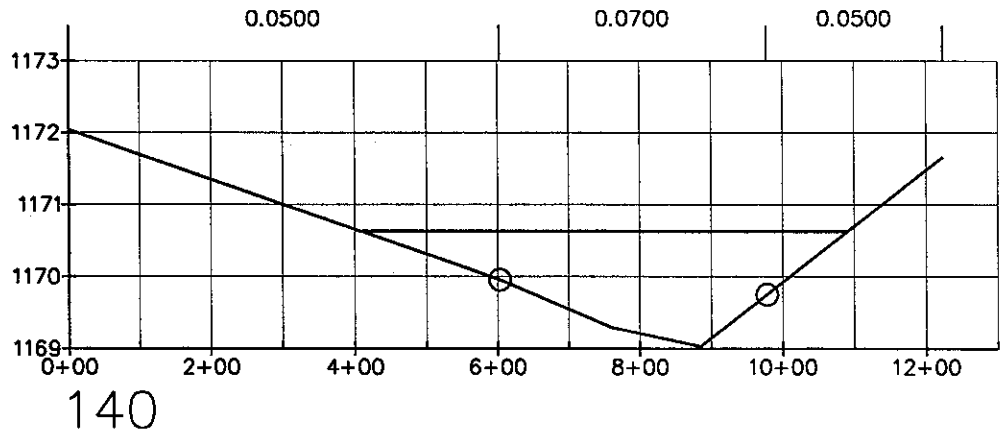
Cross-Section:	130	
Elevation:	1167.66	ft MSL
Depth:	1.93	ft
Discharge:	990.00	cfs
Energy Gradient:	*0.006*	*ft/ft*
Froude Number:	0.2284	
Flow Regime:	Subcritical	
Flow Area:	549.51	sq ft
Average Velocity:	1.80	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0606	
Hydraulic Radius:	0.84	ft
Wetted Perimeter:	651.44	ft
Wetted Top Width:	651.43	ft
Critical Slope:	0.1291	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–130

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

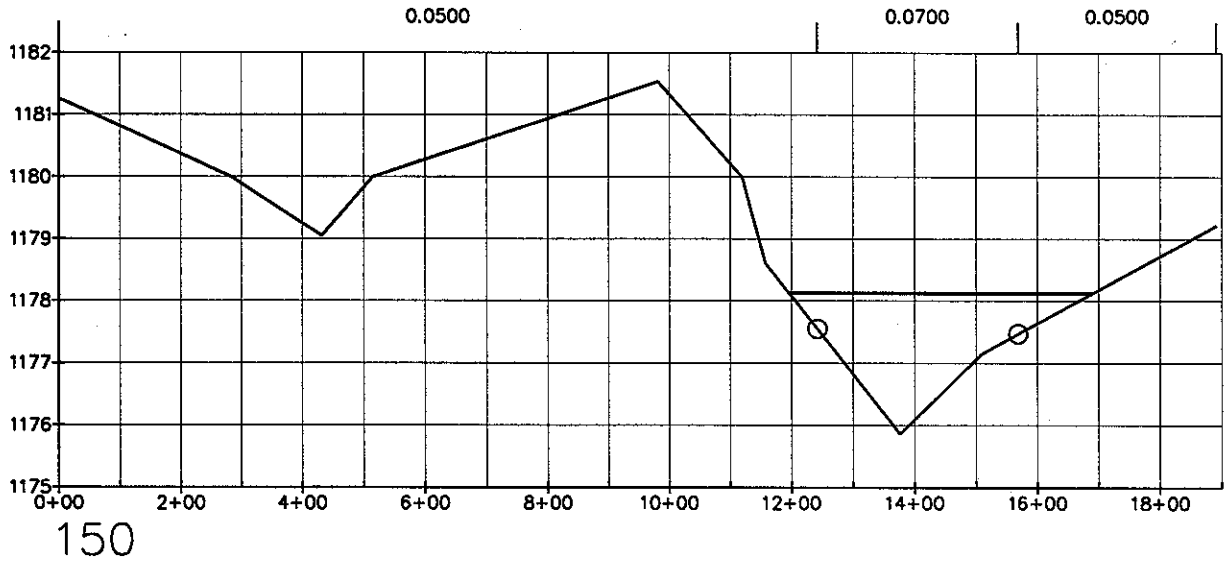
Cross-Section:	140	
Elevation:	1170.62	ft MSL
Depth:	1.60	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2428	
Flow Regime:	Subcritical	
Flow Area:	569.06	sq ft
Average Velocity:	1.74	ft/s
Maximum Velocity:	1.88	ft/s
Composite n:	0.0614	
Hydraulic Radius:	0.84	ft
Wetted Perimeter:	681.16	ft
Wetted Top Width:	681.15	ft
Critical Slope:	0.1109	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–140

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

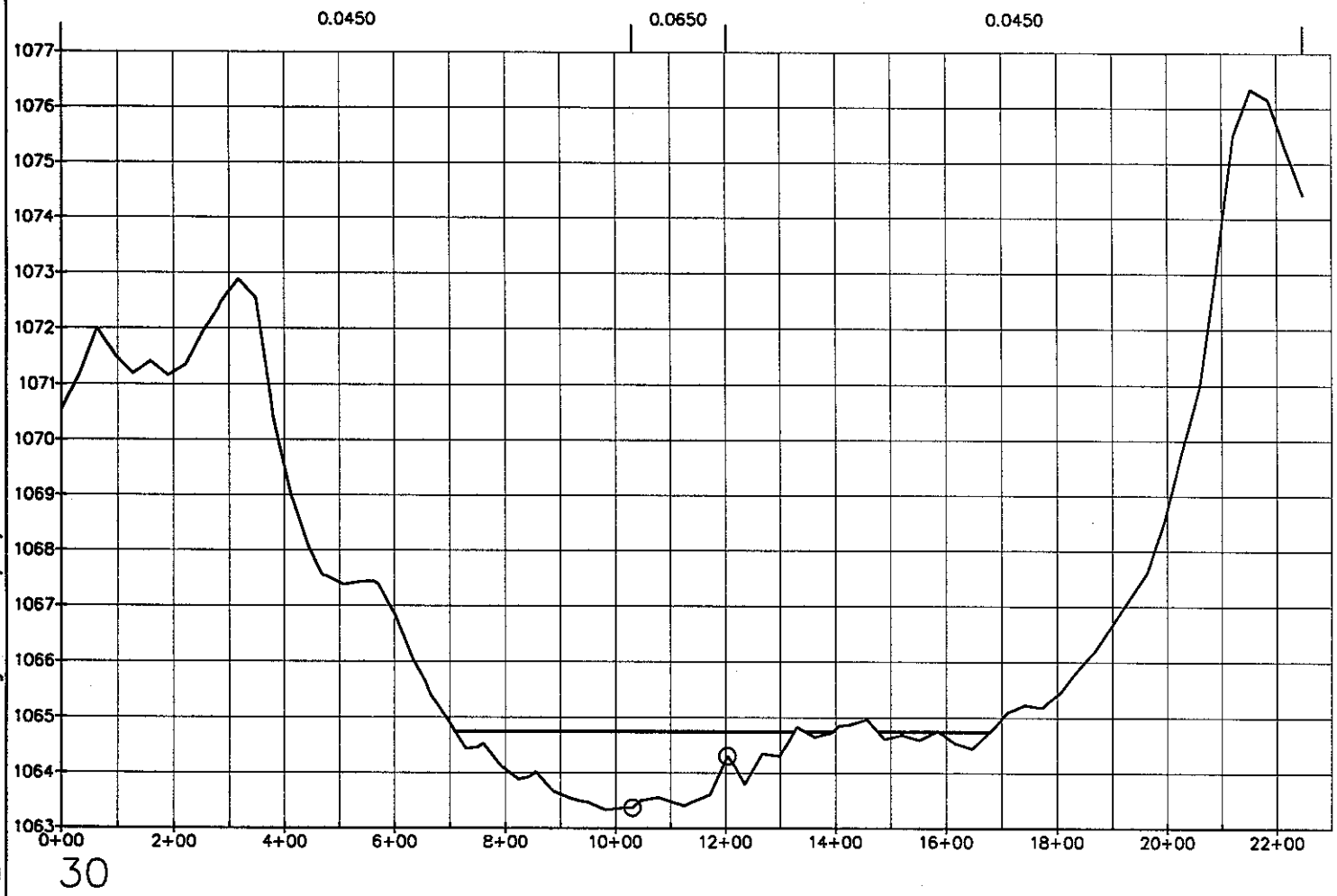
Cross-Section:	150	
Elevation:	1178.13	ft MSL
Depth:	2.26	ft
Discharge:	990.00	cfs
Energy Gradient:	0.006	ft/ft
Froude Number:	0.2282	
Flow Regime:	Subcritical	
Flow Area:	508.15	sq ft
Average Velocity:	1.96	ft/s
Maximum Velocity:	2.06	ft/s
Composite n:	0.0635	
Hydraulic Radius:	1.03	ft
Wetted Perimeter:	493.57	ft
Wetted Top Width:	493.55	ft
Critical Slope:	0.1276	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S35–150

Entellus™

File: WASH-T2N-R6W-S35_X-SECTION-R14-NEW.dwg Date: 9/28/00



Normal Depth Results

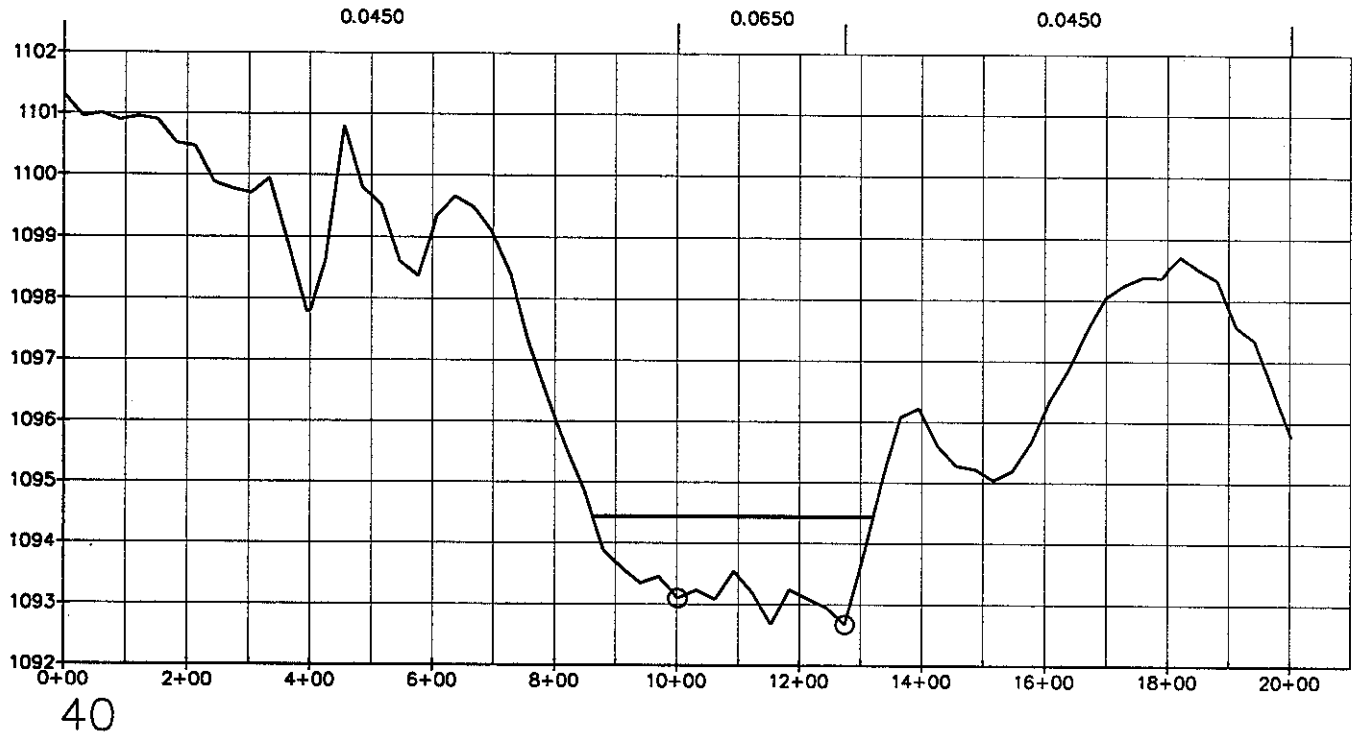
Cross-Section:	30	
Elevation:	1064.75	ft MSL
Depth:	1.42	ft
Discharge:	1090.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2796	
Flow Regime:	Subcritical	
Flow Area:	577.72	sq ft
Average Velocity:	1.90	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0493	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	860.68	ft
Wetted Top Width:	860.65	ft
Critical Slope:	0.0849	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S11–30

Entellus™

File: WASH–T1N–R6W–S11_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

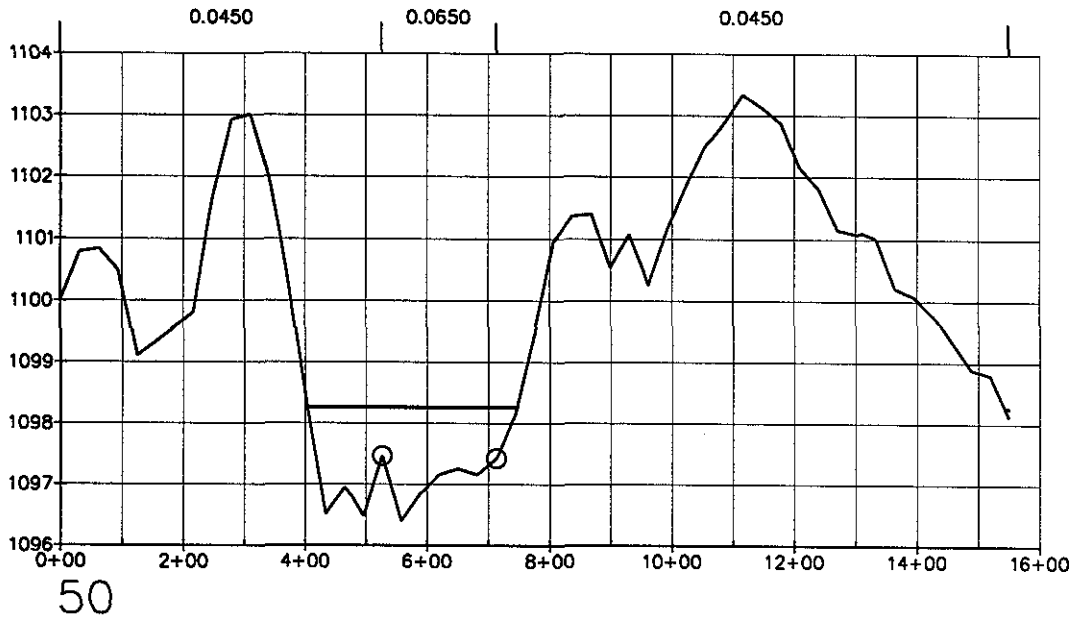
Cross-Section:	40	
Elevation:	1094.43	ft MSL
Depth:	1.76	ft
Discharge:	1090.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2748	
Flow Regime:	Subcritical	
Flow Area:	526.85	sq ft
Average Velocity:	2.08	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0573	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	457.94	ft
Wetted Top Width:	457.88	ft
Critical Slope:	0.0696	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S11–40

Entellus™

File: WASH-T1N-R6W-S11_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	50	
Elevation:	1097.77	ft MSL
Depth:	1.37	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2559	
Flow Regime:	Subcritical	
Flow Area:	240.95	sq ft
Average Velocity:	1.72	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0572	
Hydraulic Radius:	0.76	ft
Wetted Perimeter:	315.64	ft
Wetted Top Width:	315.55	ft
Critical Slope:	0.0934	ft/ft

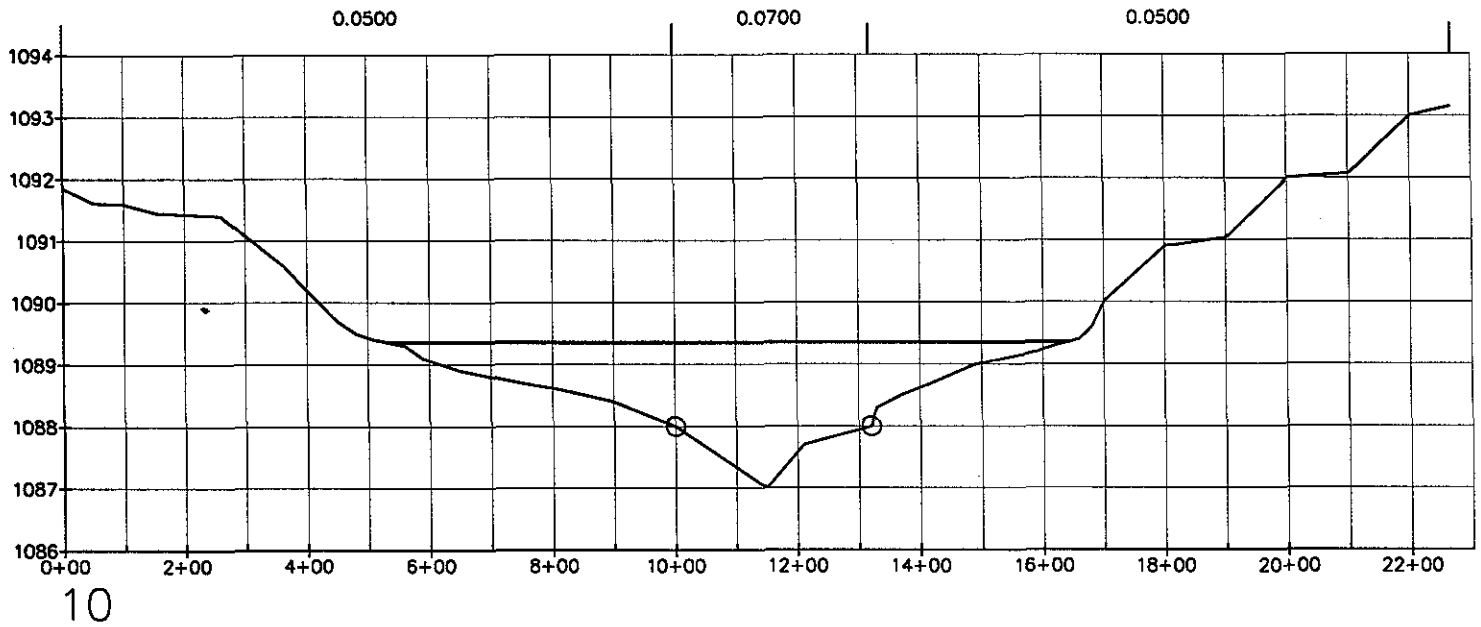
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S11–50

Entellus™

File: WASH-T1N-R6W-S11_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1089.36	ft MSL
Depth:	2.36	ft
Discharge:	2010.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2223	
Flow Regime:	Subcritical	
Flow Area:	1037.82	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.0561	
Hydraulic Radius:	0.93	ft
Wetted Perimeter:	1112.88	ft
Wetted Top Width:	1112.87	ft
Critical Slope:	0.1181	ft/ft

Note: X-section not used for delineation

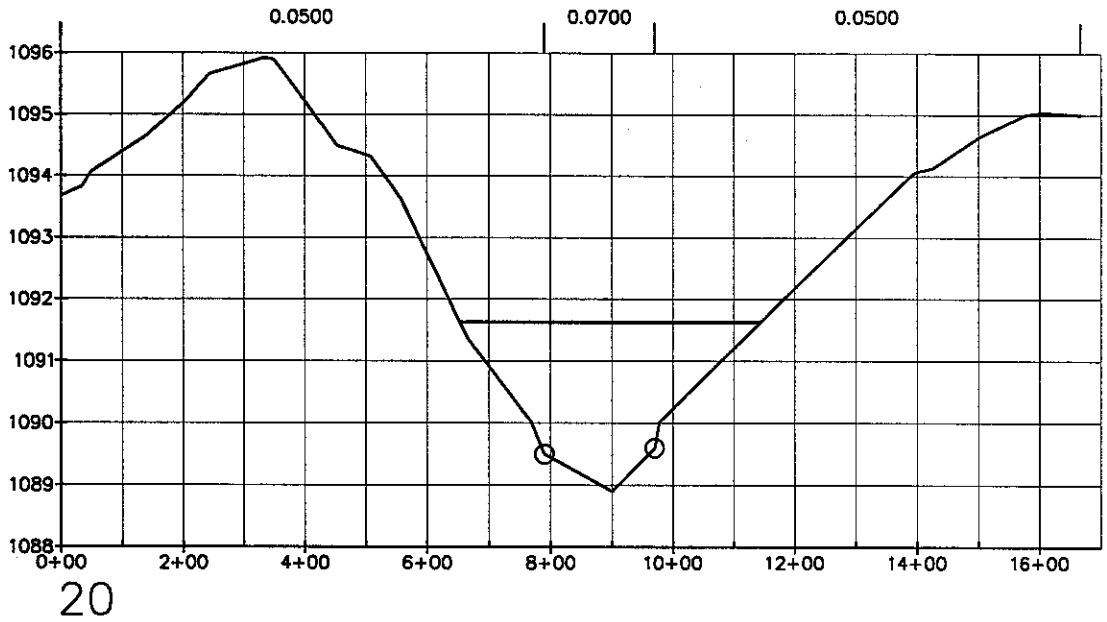
ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–10

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

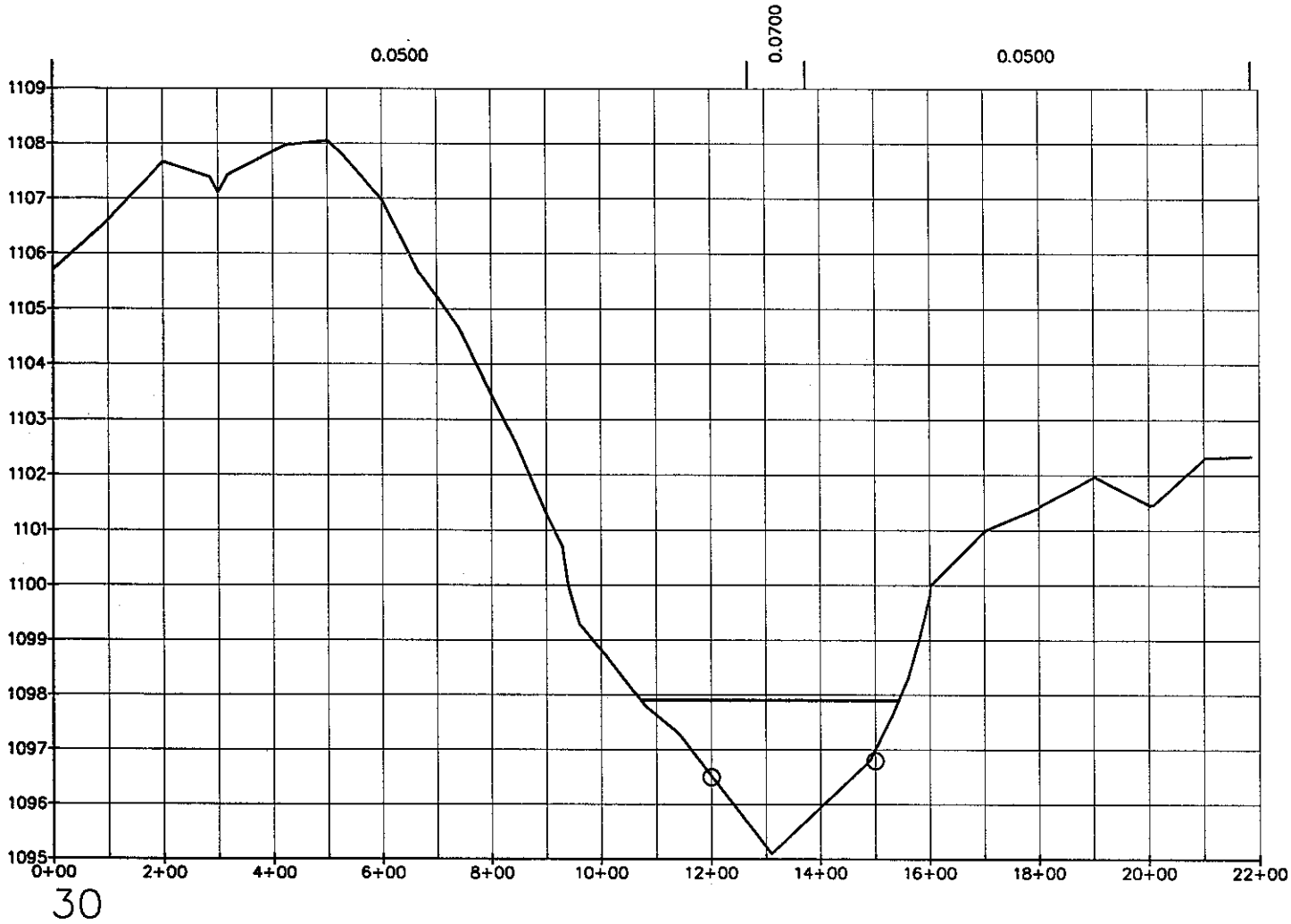
Cross-Section:	20	
Elevation:	1091.62	ft MSL
Depth:	2.72	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2681	
Flow Regime:	Subcritical	
Flow Area:	717.29	sq ft
Average Velocity:	2.49	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.0577	
Hydraulic Radius:	1.46	ft
Wetted Perimeter:	490.63	ft
Wetted Top Width:	490.59	ft
Critical Slope:	0.0792	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–20

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

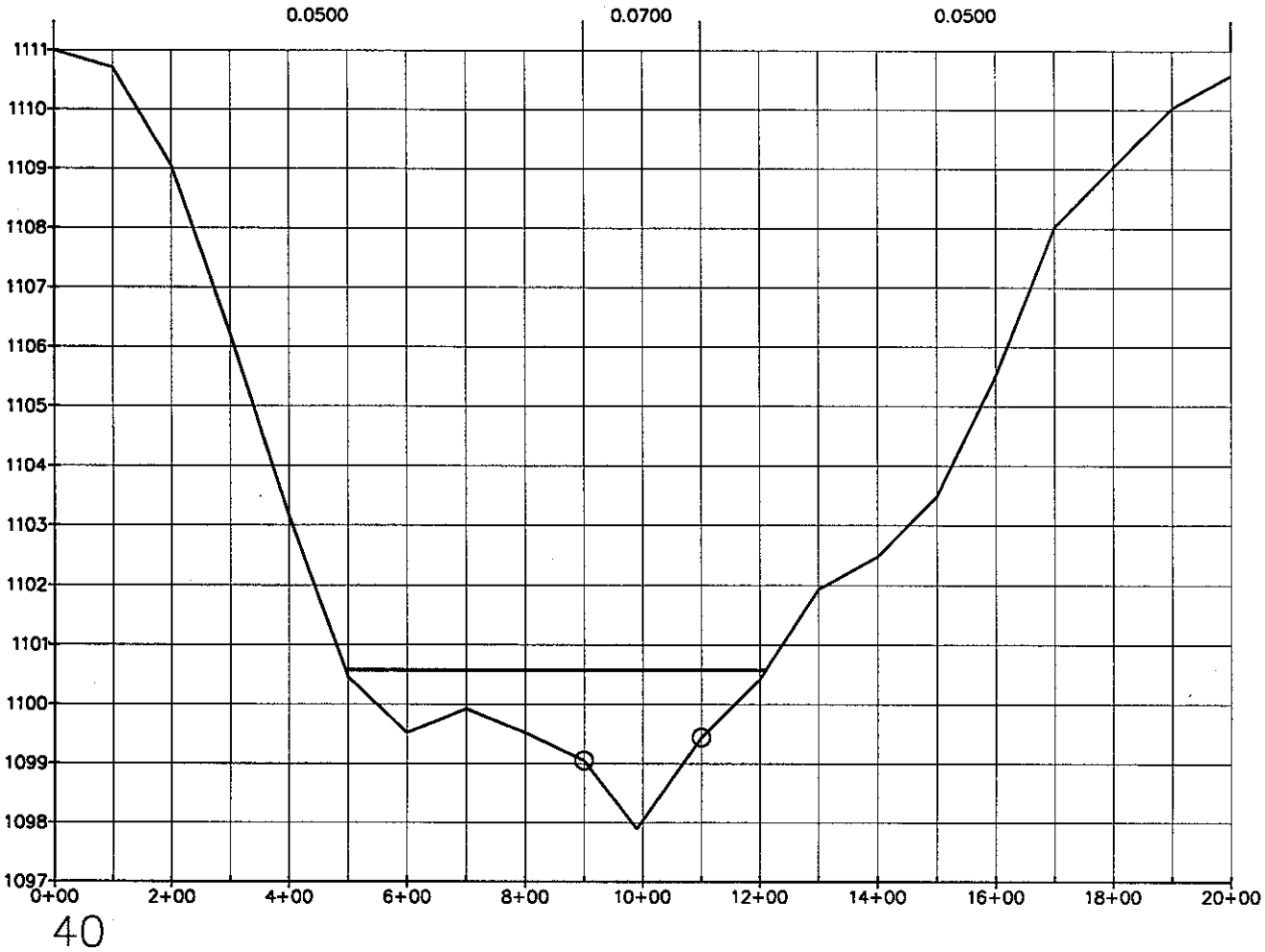
Cross-Section:	30	
Elevation:	1097.90	ft MSL
Depth:	2.80	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2735	
Flow Regime:	Subcritical	
Flow Area:	692.82	sq ft
Average Velocity:	2.62	ft/s
Maximum Velocity:	3.01	ft/s
Composite n:	0.0576	
Hydraulic Radius:	1.47	ft
Wetted Perimeter:	471.28	ft
Wetted Top Width:	471.25	ft
Critical Slope:	0.0806	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–30

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



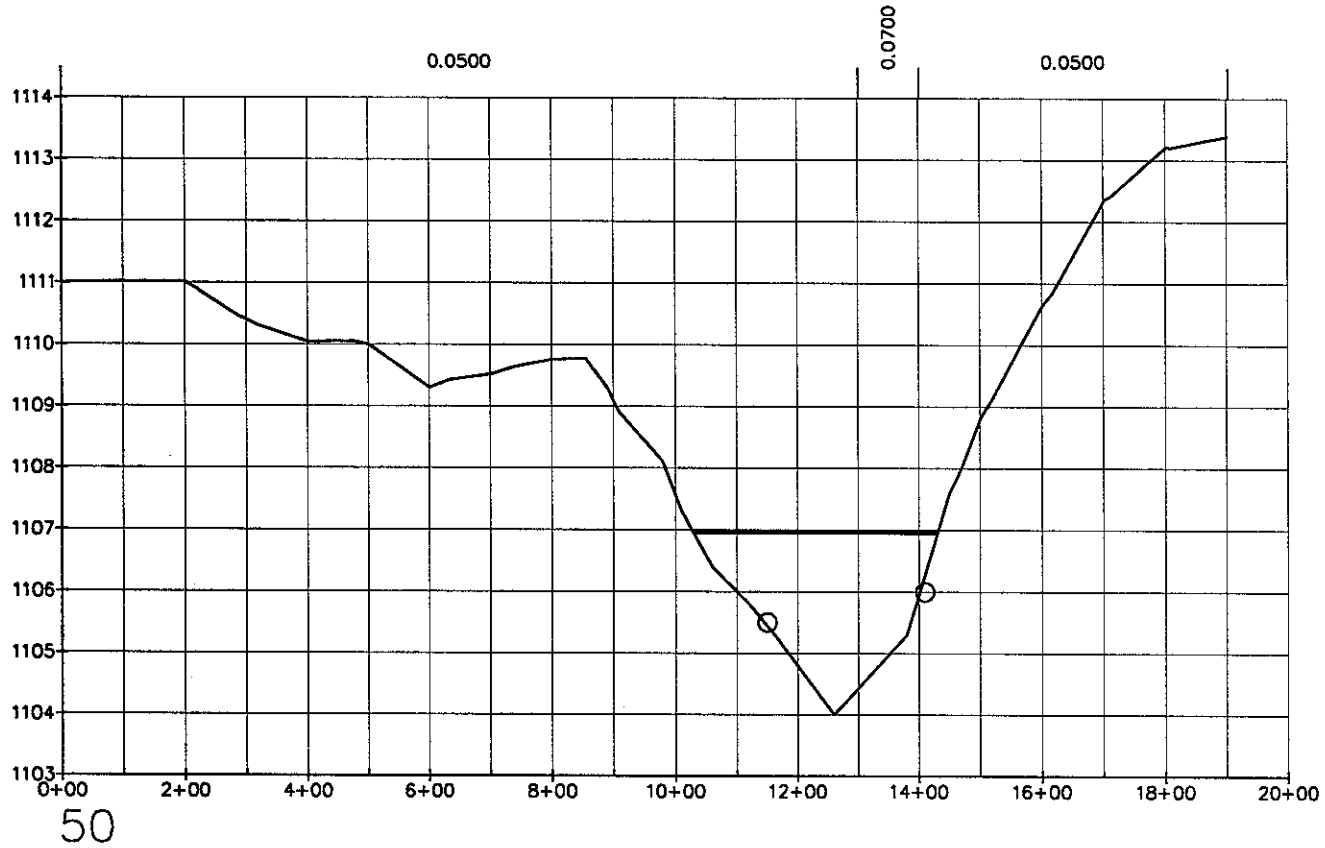
Normal Depth Results

Cross-Section:	40	
Elevation:	1100.57	ft MSL
Depth:	2.67	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2373	
Flow Regime:	Subcritical	
Flow Area:	818.42	sq ft
Average Velocity:	2.18	ft/s
Maximum Velocity:	2.45	ft/s
Composite n:	0.0559	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	714.23	ft
Wetted Top Width:	714.20	ft
Critical Slope:	0.1009	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–40

Entellus™



Normal Depth Results

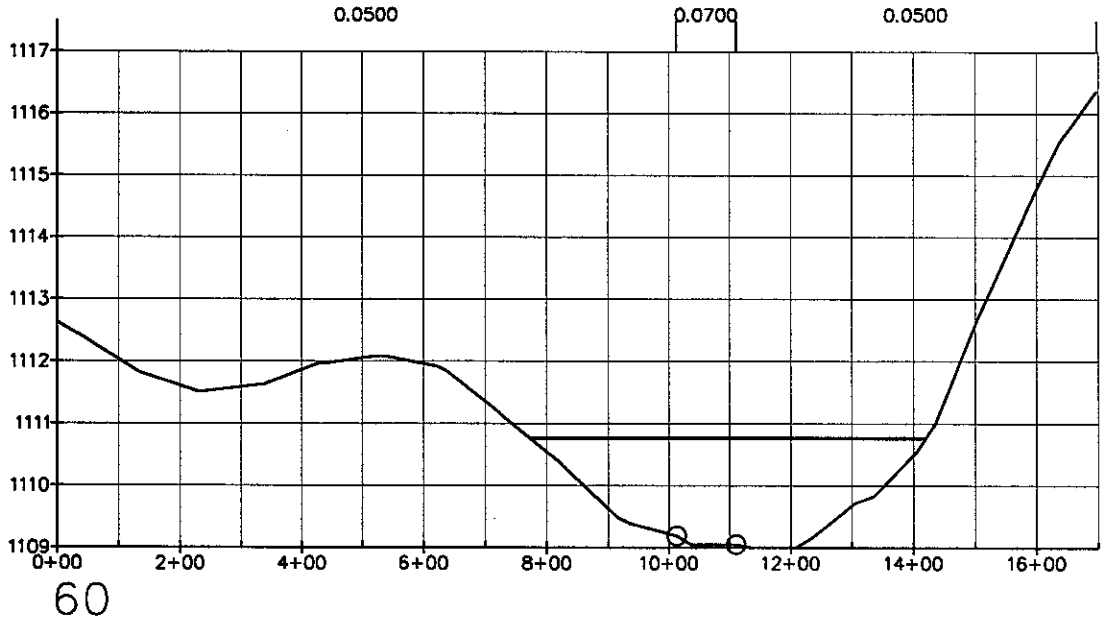
Cross-Section:	50	
Elevation:	1106.95	ft MSL
Depth:	2.95	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2786	
Flow Regime:	Subcritical	
Flow Area:	662.71	sq ft
Average Velocity:	2.72	ft/s
Maximum Velocity:	2.83	ft/s
Composite n:	0.0563	
Hydraulic Radius:	1.65	ft
Wetted Perimeter:	401.42	ft
Wetted Top Width:	401.37	ft
Critical Slope:	0.0696	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–50

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

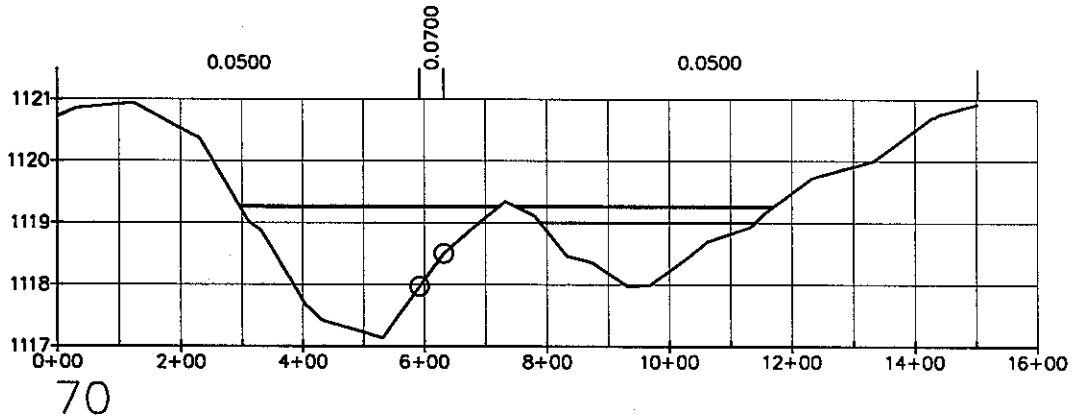
Cross-Section:	60	
Elevation:	1110.76	ft MSL
Depth:	1.76	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.3077	
Flow Regime:	Subcritical	
Flow Area:	776.58	sq ft
Average Velocity:	2.32	ft/s
Maximum Velocity:	2.50	ft/s
Composite n:	0.0532	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	646.95	ft
Wetted Top Width:	646.94	ft
Critical Slope:	0.0568	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–60

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

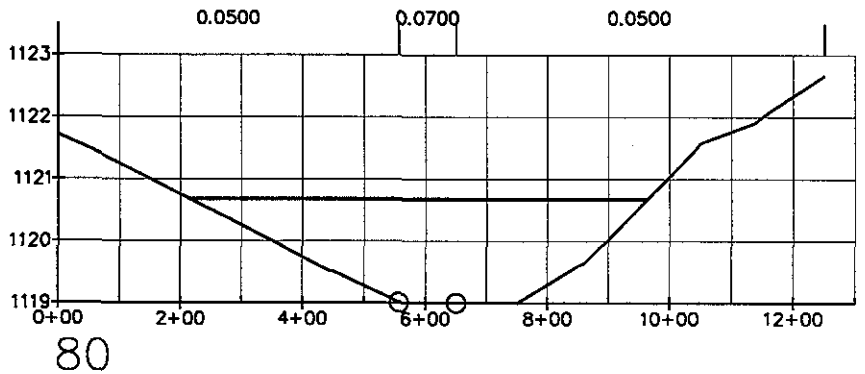
Cross-Section:	70	
Elevation:	1119.26	ft MSL
Depth:	2.13	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2712	
Flow Regime:	Subcritical	
Flow Area:	801.41	sq ft
Average Velocity:	2.24	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.051	
Hydraulic Radius:	0.95	ft
Wetted Perimeter:	847.43	ft
Wetted Top Width:	847.39	ft
Critical Slope:	0.0865	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–70

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

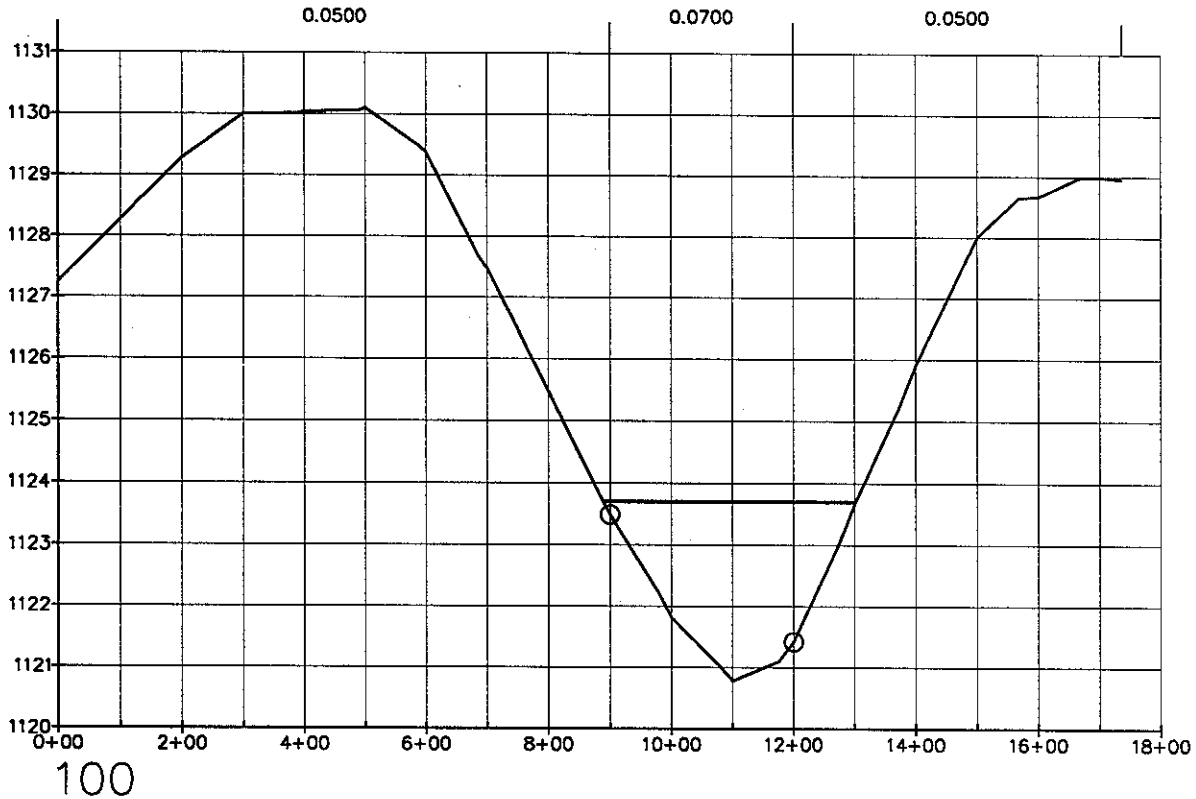
Cross-Section:	80	
Elevation:	1120.67	ft MSL
Depth:	1.67	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.3015	
Flow Regime:	Subcritical	
Flow Area:	813.52	sq ft
Average Velocity:	2.20	ft/s
Maximum Velocity:	2.42	ft/s
Composite n:	0.0527	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	748.38	ft
Wetted Top Width:	748.37	ft
Critical Slope:	0.0602	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–80

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

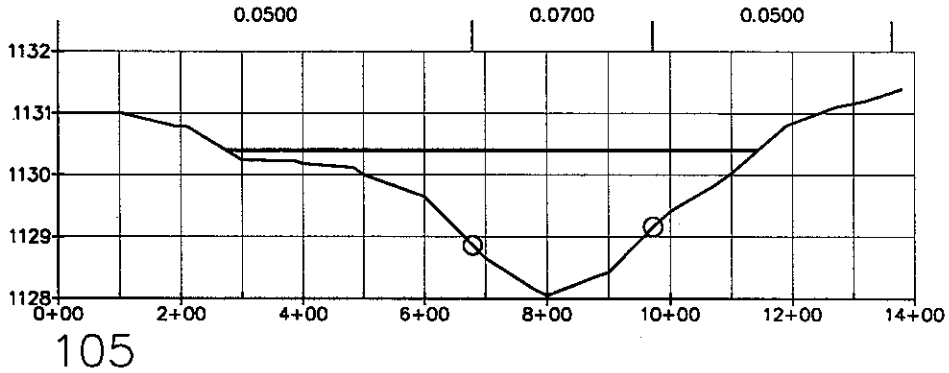
Cross-Section:	100	
Elevation:	1123.70	ft MSL
Depth:	2.92	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2536	
Flow Regime:	Subcritical	
Flow Area:	731.80	sq ft
Average Velocity:	2.47	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0648	
Hydraulic Radius:	1.77	ft
Wetted Perimeter:	412.73	ft
Wetted Top Width:	412.68	ft
Critical Slope:	0.083	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–100

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

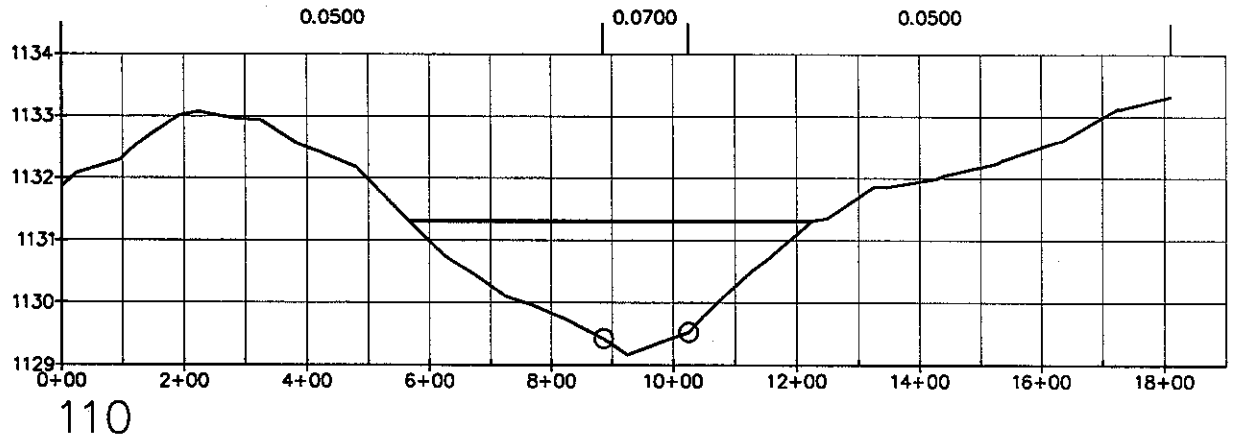
Cross-Section:	105	
Elevation:	1130.39	ft MSL
Depth:	2.34	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2386	
Flow Regime:	Subcritical	
Flow Area:	868.56	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.41	ft/s
Composite n:	0.0571	
Hydraulic Radius:	1	ft
Wetted Perimeter:	868.20	ft
Wetted Top Width:	868.18	ft
Critical Slope:	0.1108	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–105

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

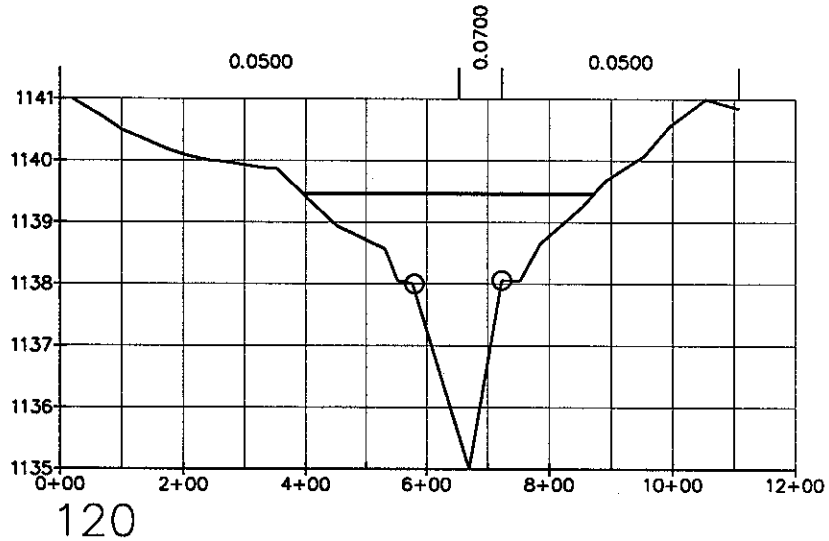
Cross-Section:	110	
Elevation:	1131.30	ft MSL
Depth:	2.13	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2752	
Flow Regime:	Subcritical	
Flow Area:	789.33	sq ft
Average Velocity:	2.27	ft/s
Maximum Velocity:	2.43	ft/s
Composite n:	0.0545	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	657.43	ft
Wetted Top Width:	657.41	ft
Critical Slope:	0.072	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–110

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

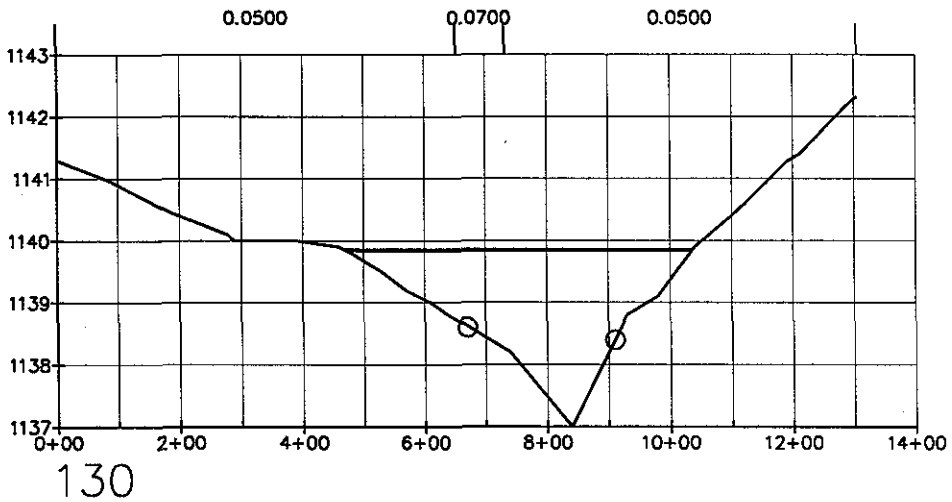
Cross-Section:	120	
Elevation:	1139.46	ft MSL
Depth:	4.46	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2223	
Flow Regime:	Subcritical	
Flow Area:	675.83	sq ft
Average Velocity:	2.67	ft/s
Maximum Velocity:	3.18	ft/s
Composite n:	0.0565	
Hydraulic Radius:	1.42	ft
Wetted Perimeter:	476.14	ft
Wetted Top Width:	475.98	ft
Critical Slope:	0.1294	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–120

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

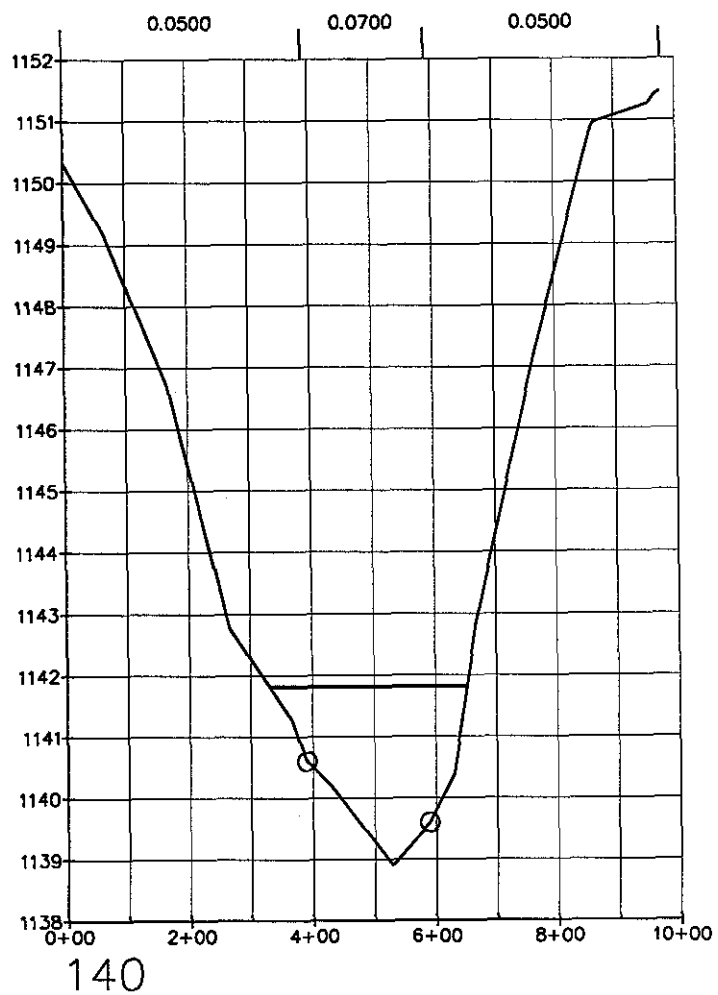
Cross-Section:	130	
Elevation:	1139.85	ft MSL
Depth:	2.85	ft
Discharge:	1800.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2723	
Flow Regime:	Subcritical	
Flow Area:	690.35	sq ft
Average Velocity:	2.63	ft/s
Maximum Velocity:	2.92	ft/s
Composite n:	0.0519	
Hydraulic Radius:	1.22	ft
Wetted Perimeter:	566.29	ft
Wetted Top Width:	566.25	ft
Critical Slope:	0.0854	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–130

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

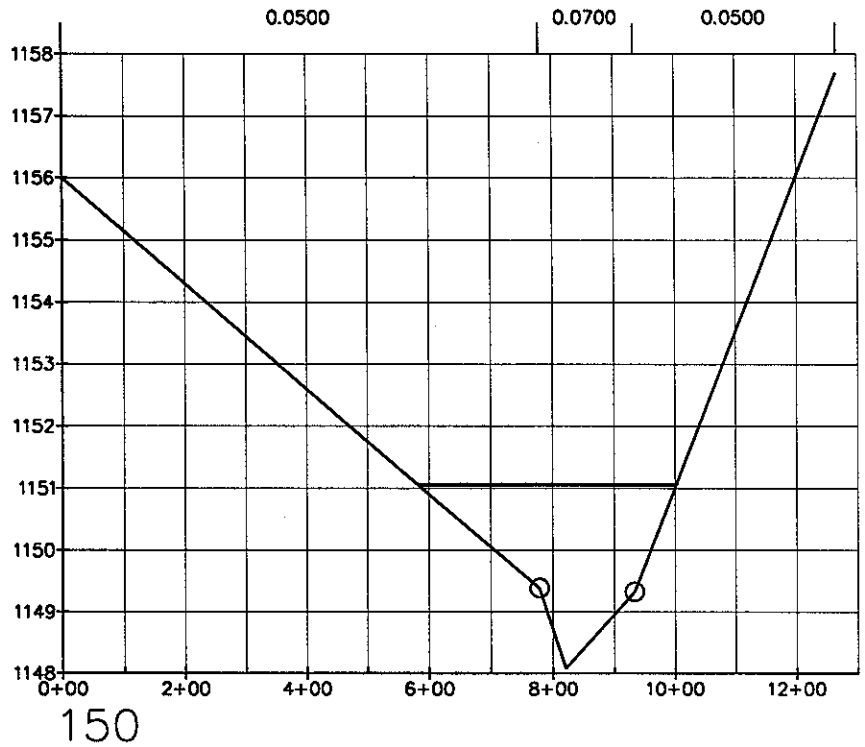
Cross-Section:	140	
Elevation:	1141.82	ft MSL
Depth:	2.92	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2658	
Flow Regime:	Subcritical	
Flow Area:	555.23	sq ft
Average Velocity:	2.57	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0628	
Hydraulic Radius:	1.73	ft
Wetted Perimeter:	320.92	ft
Wetted Top Width:	320.84	ft
Critical Slope:	0.0803	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–140

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

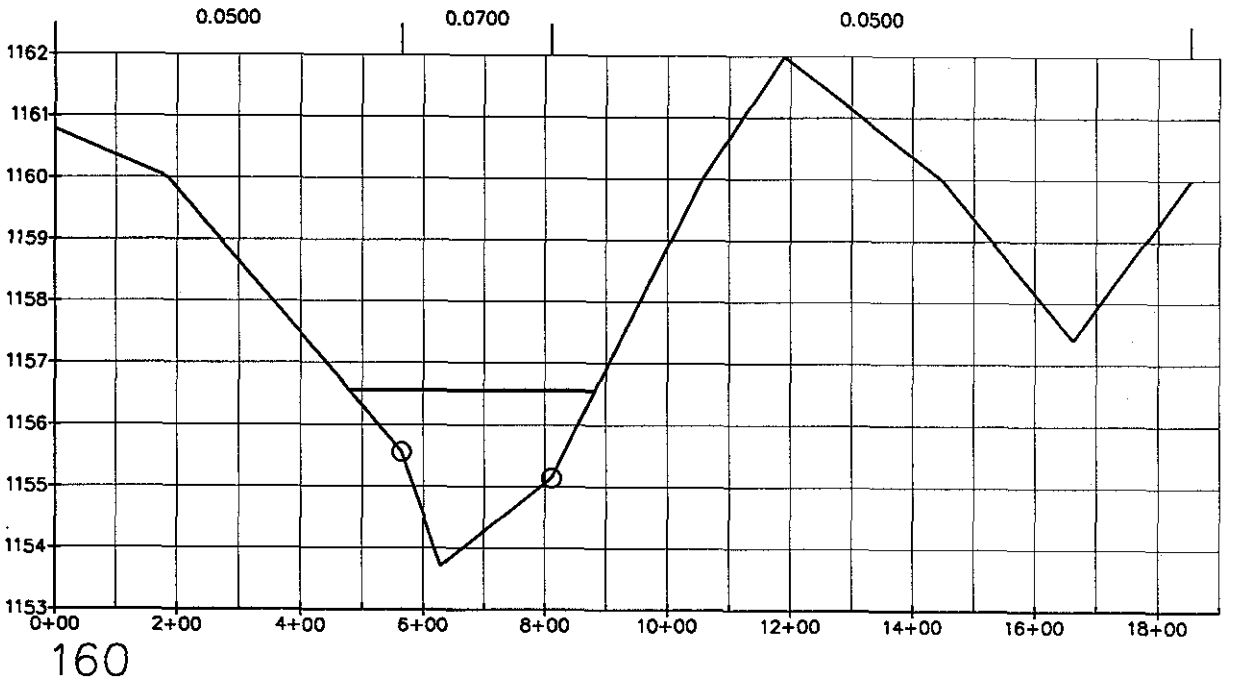
Cross-Section:	150	
Elevation:	1151.06	ft MSL
Depth:	2.98	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2484	
Flow Regime:	Subcritical	
Flow Area:	587.82	sq ft
Average Velocity:	2.43	ft/s
Maximum Velocity:	2.74	ft/s
Composite n:	0.0577	
Hydraulic Radius:	1.4	ft
Wetted Perimeter:	420.64	ft
Wetted Top Width:	420.58	ft
Critical Slope:	0.0922	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–150

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

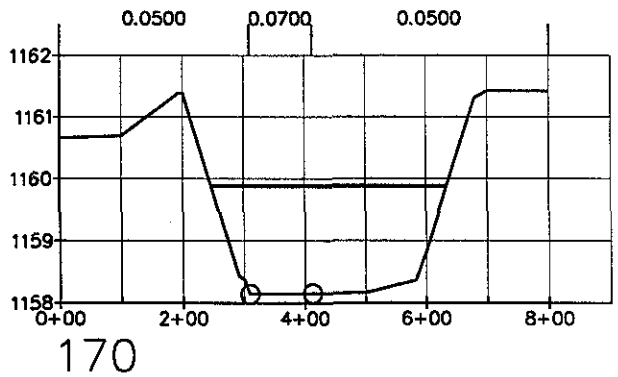
Cross-Section:	160	
Elevation:	1156.56	ft MSL
Depth:	2.85	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2471	
Flow Regime:	Subcritical	
Flow Area:	604.64	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.52	ft/s
Composite n:	*0.0625*	
Hydraulic Radius:	1.5	ft
Wetted Perimeter:	403.28	ft
Wetted Top Width:	403.23	ft
Critical Slope:	0.0942	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–160

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

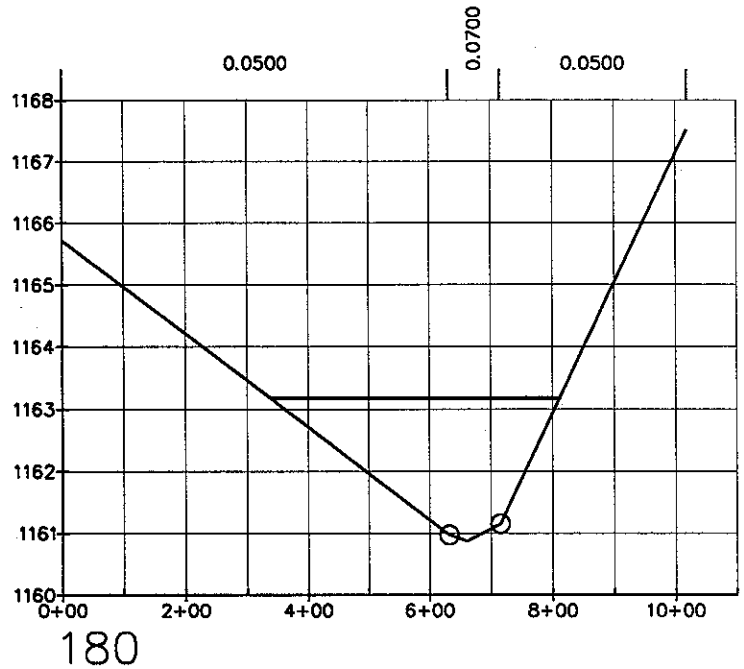
Cross-Section:	170	
Elevation:	1159.88	ft MSL
Depth:	1.74	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.3389	
Flow Regime:	Subcritical	
Flow Area:	564.04	sq ft
Average Velocity:	2.55	ft/s
Maximum Velocity:	2.80	ft/s
Composite n:	0.0556	
Hydraulic Radius:	1.46	ft
Wetted Perimeter:	387.03	ft
Wetted Top Width:	386.98	ft
Critical Slope:	0.0472	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–170

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

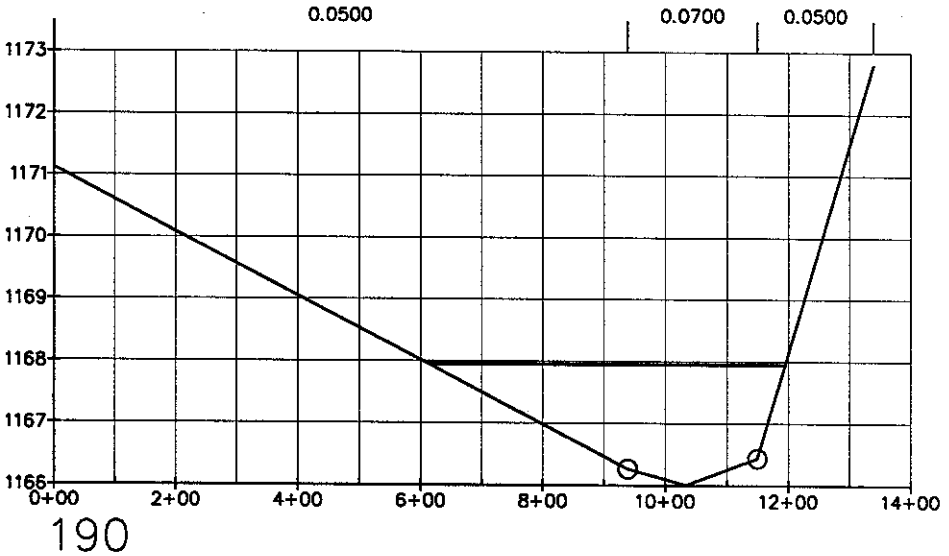
Cross-Section:	180	
Elevation:	1163.17	ft MSL
Depth:	2.30	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2751	
Flow Regime:	Subcritical	
Flow Area:	603.51	sq ft
Average Velocity:	2.39	ft/s
Maximum Velocity:	2.62	ft/s
Composite n:	0.0537	
Hydraulic Radius:	1.28	ft
Wetted Perimeter:	472.87	ft
Wetted Top Width:	472.84	ft
Critical Slope:	0.0697	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–180

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

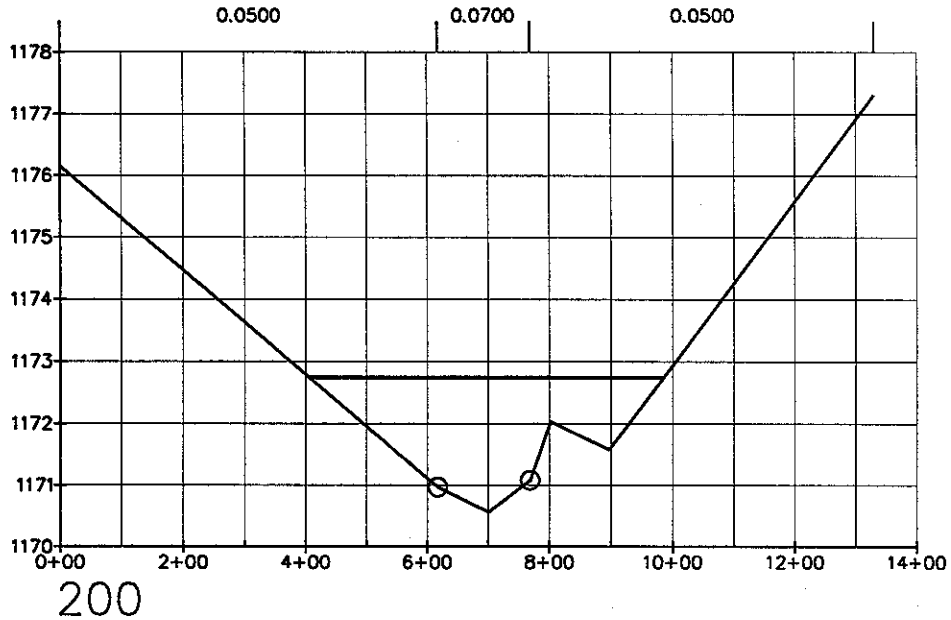
Cross-Section:	190	
Elevation:	1167.95	ft MSL
Depth:	1.94	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2675	
Flow Regime:	Subcritical	
Flow Area:	676.88	sq ft
Average Velocity:	2.10	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.0576	
Hydraulic Radius:	1.17	ft
Wetted Perimeter:	580.28	ft
Wetted Top Width:	580.25	ft
Critical Slope:	0.076	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–190

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

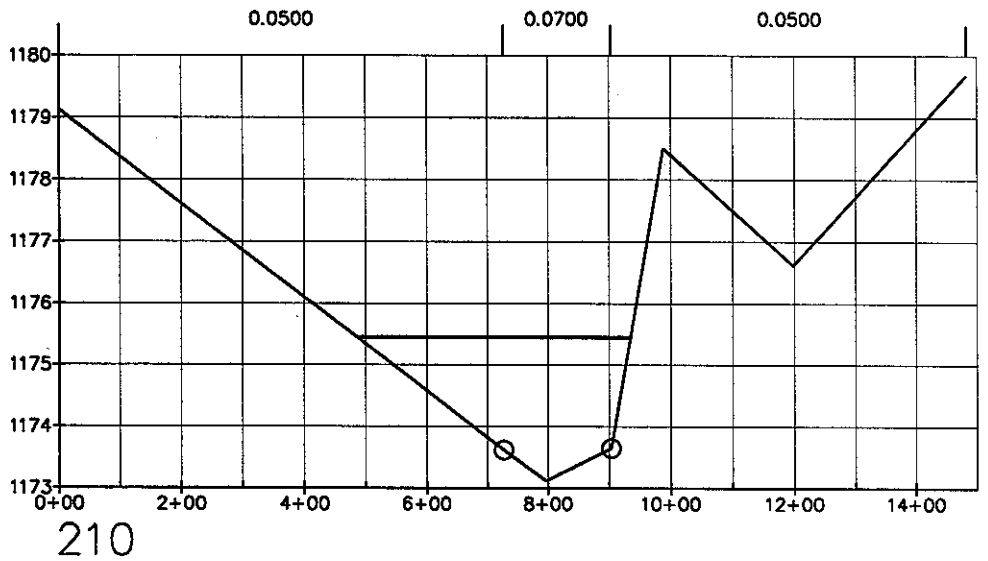
Cross-Section:	200	
Elevation:	1172.74	ft MSL
Depth:	2.18	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2569	
Flow Regime:	Subcritical	
Flow Area:	663.92	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.42	ft/s
Composite n:	0.0555	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	579.31	ft
Wetted Top Width:	579.28	ft
Critical Slope:	0.0815	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–200

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

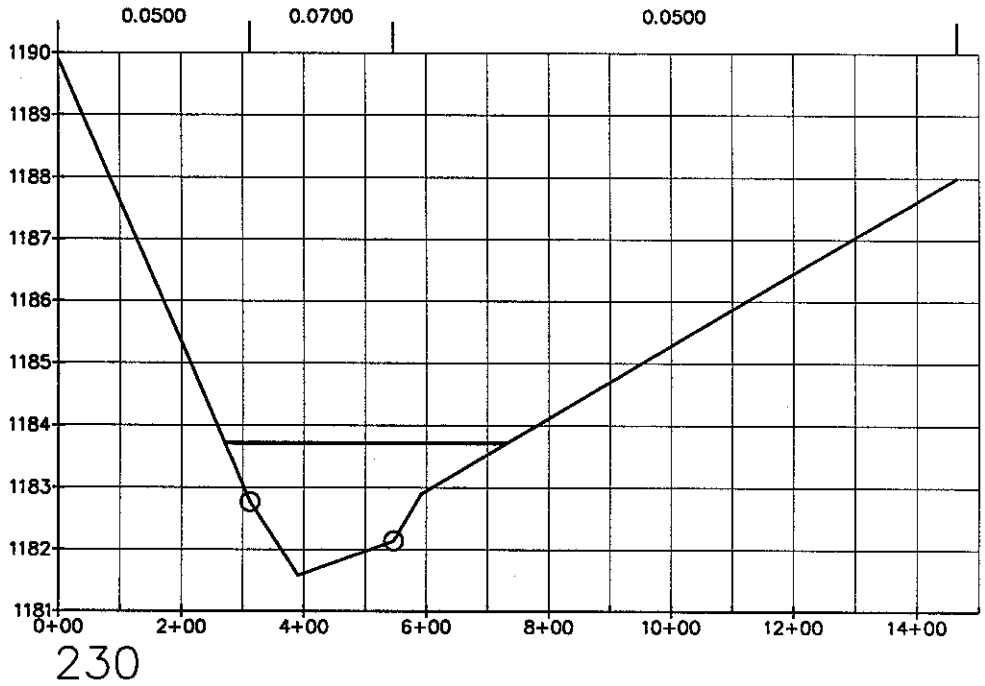
Cross-Section:	210	
Elevation:	1175.45	ft MSL
Depth:	2.33	ft
Discharge:	1430.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2682	
Flow Regime:	Subcritical	
Flow Area:	615.53	sq ft
Average Velocity:	2.33	ft/s
Maximum Velocity:	2.52	ft/s
Composite n:	0.0582	
Hydraulic Radius:	1.37	ft
Wetted Perimeter:	449.63	ft
Wetted Top Width:	449.57	ft
Critical Slope:	0.0754	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–210

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

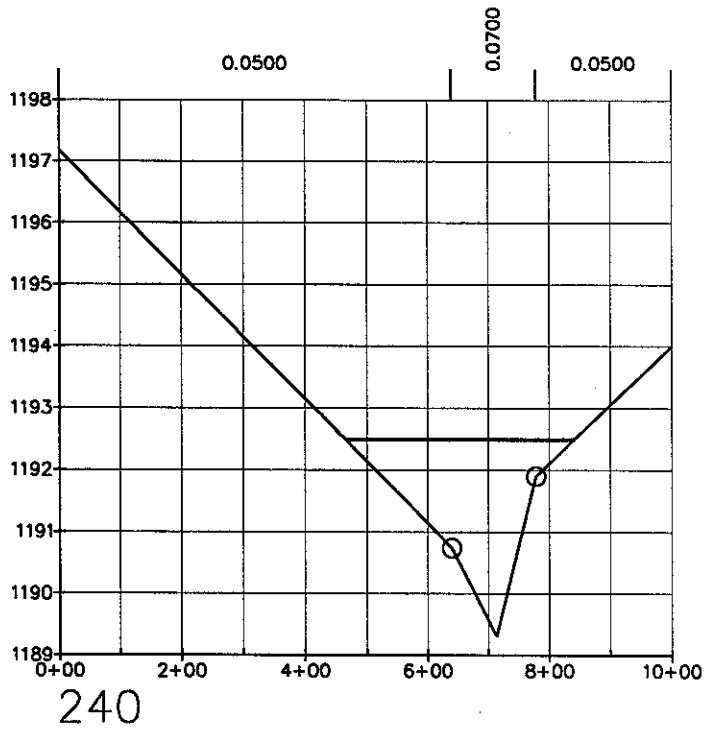
Cross-Section:	230	
Elevation:	1183.71	ft MSL
Depth:	2.13	ft
Discharge:	1240.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2772	
Flow Regime:	Subcritical	
Flow Area:	540.00	sq ft
Average Velocity:	2.29	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0606	
Hydraulic Radius:	1.17	ft
Wetted Perimeter:	460.40	ft
Wetted Top Width:	460.37	ft
Critical Slope:	0.0917	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–230

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

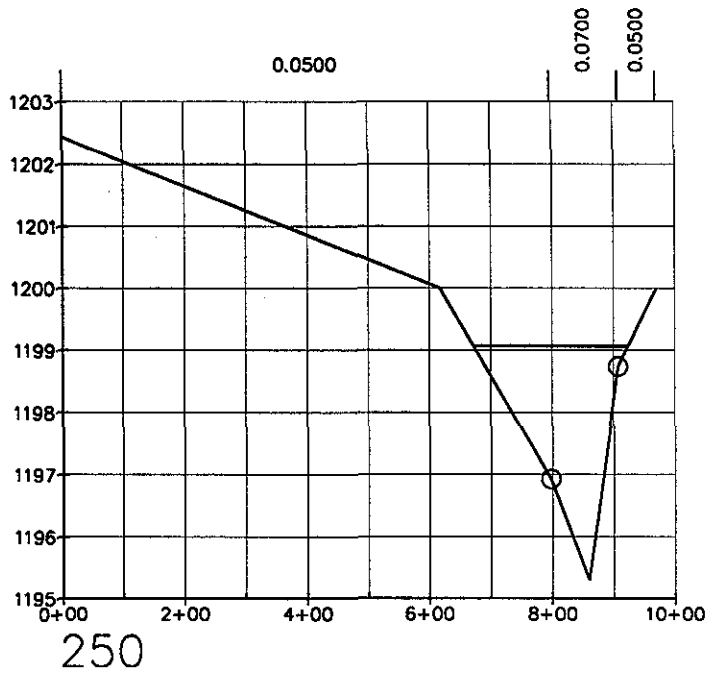
Cross-Section:	240	
Elevation:	1192.49	ft MSL
Depth:	3.18	ft
Discharge:	1240.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2589	
Flow Regime:	Subcritical	
Flow Area:	473.75	sq ft
Average Velocity:	2.60	ft/s
Maximum Velocity:	2.89	ft/s
Composite n:	0.0578	
Hydraulic Radius:	1.27	ft
Wetted Perimeter:	374.32	ft
Wetted Top Width:	374.25	ft
Critical Slope:	0.1124	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–240

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

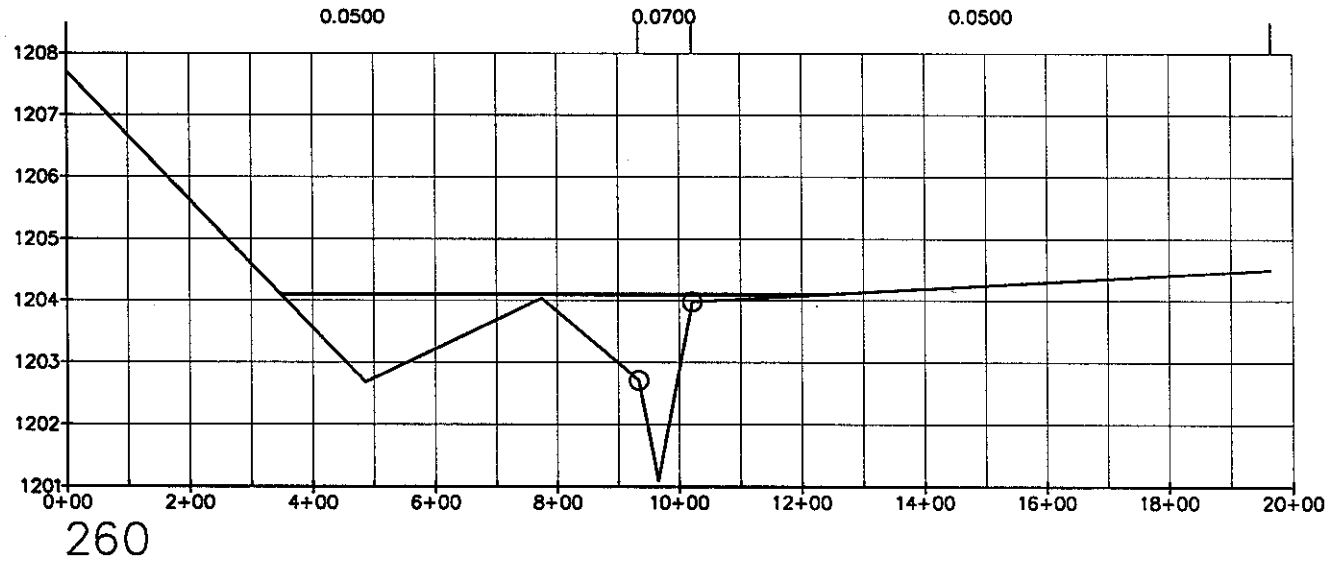
Cross-Section:	250	
Elevation:	1199.07	ft MSL
Depth:	3.77	ft
Discharge:	1240.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2694	
Flow Regime:	Subcritical	
Flow Area:	418.03	sq ft
Average Velocity:	2.97	ft/s
Maximum Velocity:	3.21	ft/s
Composite n:	0.0591	
Hydraulic Radius:	1.66	ft
Wetted Perimeter:	251.65	ft
Wetted Top Width:	251.48	ft
Critical Slope:	0.0971	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R6W-S36-250

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

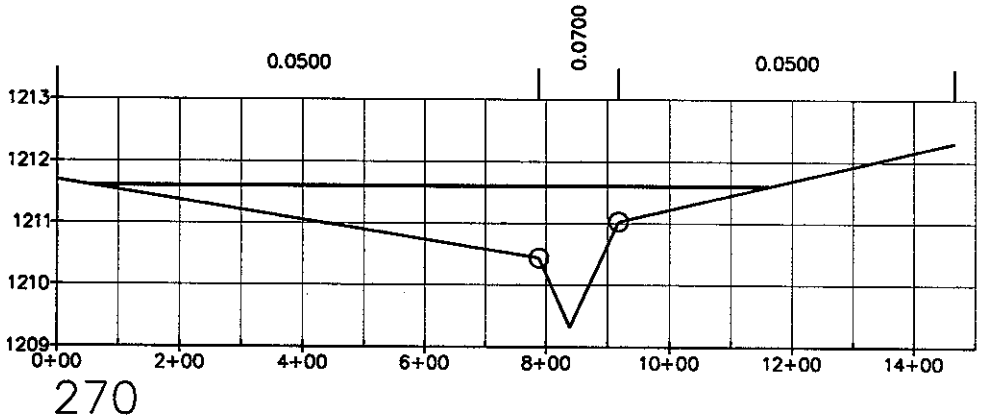
Cross-Section:	260	
Elevation:	1204.10	ft MSL
Depth:	3.01	ft
Discharge:	1240.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2106	
Flow Regime:	Subcritical	
Flow Area:	597.99	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.53	ft/s
Composite n:	0.0521	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	893.55	ft
Wetted Top Width:	893.42	ft
Critical Slope:	0.2025	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–260

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

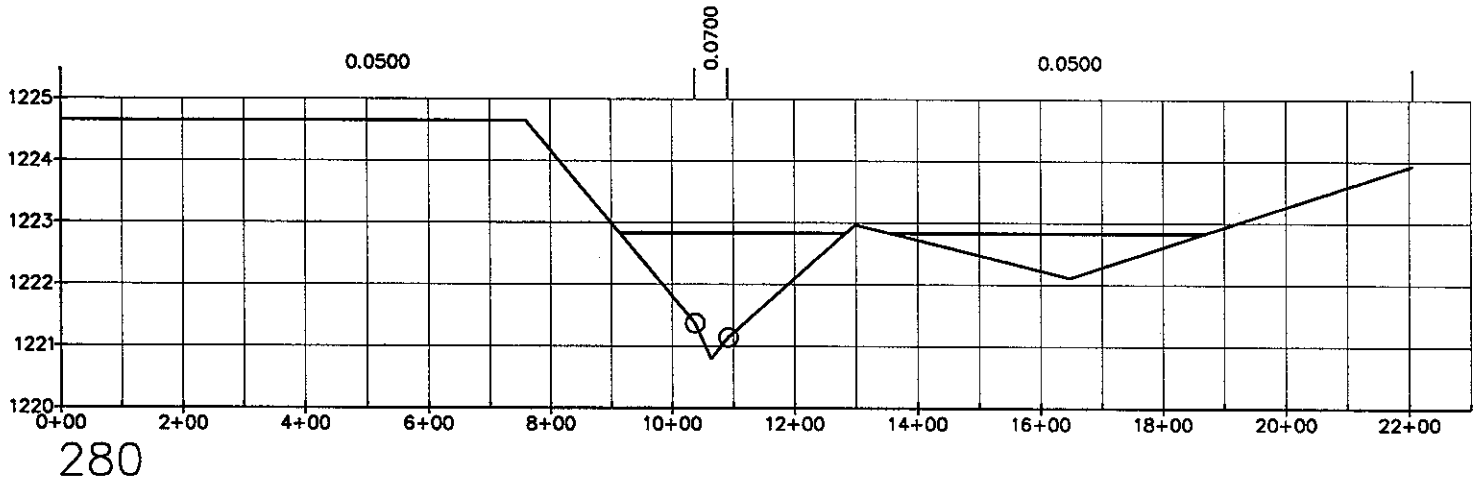
Cross-Section:	270	
Elevation:	1211.60	ft MSL
Depth:	2.28	ft
Discharge:	1240.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2093	
Flow Regime:	Subcritical	
Flow Area:	691.67	sq ft
Average Velocity:	1.78	ft/s
Maximum Velocity:	2.29	ft/s
Composite n:	0.0525	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	1103.94	ft
Wetted Top Width:	1103.91	ft
Critical Slope:	0.1699	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–270

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

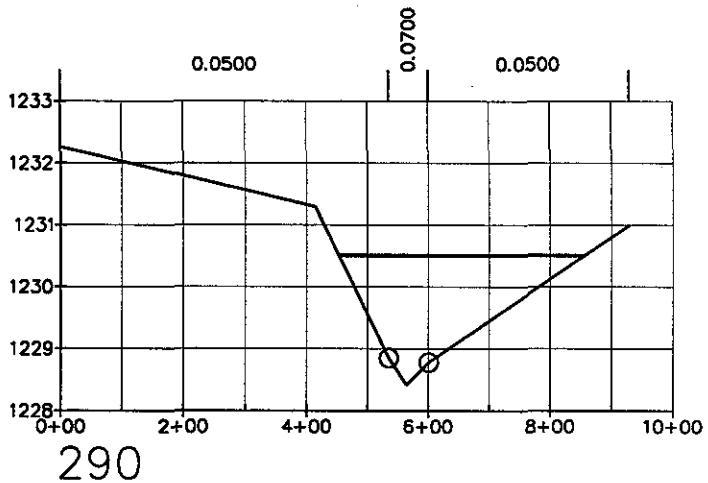
Cross-Section:	280	
Elevation:	1222.83	ft MSL
Depth:	2.04	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2203	
Flow Regime:	Subcritical	
Flow Area:	537.27	sq ft
Average Velocity:	1.77	ft/s
Maximum Velocity:	2.55	ft/s
Composite n:	0.0513	
Hydraulic Radius:	0.61	ft
Wetted Perimeter:	883.96	ft
Wetted Top Width:	883.93	ft
Critical Slope:	0.1515	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–280

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

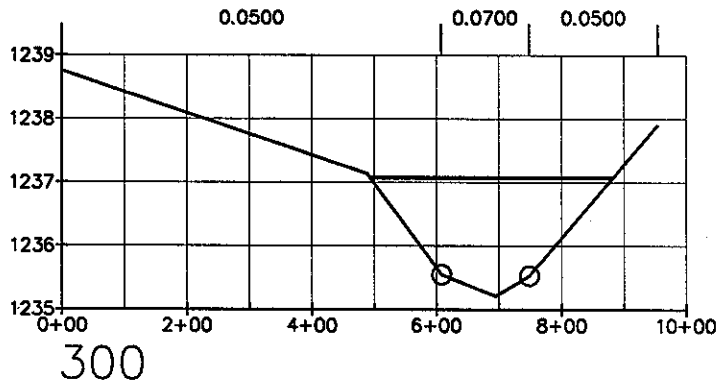
Cross-Section:	290	
Elevation:	1230.51	ft MSL
Depth:	2.09	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2833	
Flow Regime:	Subcritical	
Flow Area:	413.28	sq ft
Average Velocity:	2.30	ft/s
Maximum Velocity:	2.63	ft/s
Composite n:	0.0535	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	403.37	ft
Wetted Top Width:	403.34	ft
Critical Slope:	0.0838	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–290

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



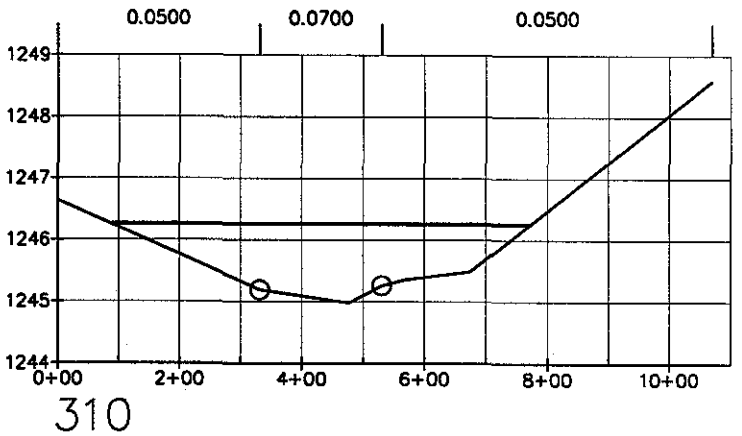
Normal Depth Results

Cross-Section:	300	
Elevation:	1237.07	ft MSL
Depth:	1.86	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.289	
Flow Regime:	Subcritical	
Flow Area:	428.82	sq ft
Average Velocity:	2.25	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.0576	
Hydraulic Radius:	1.1	ft
Wetted Perimeter:	388.69	ft
Wetted Top Width:	388.67	ft
Critical Slope:	0.0786	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–300

Entellus™



Normal Depth Results

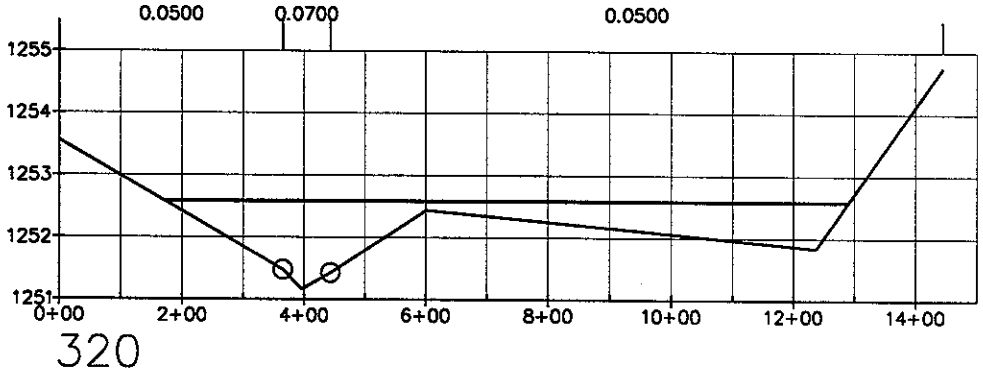
Cross-Section:	310	
Elevation:	1246.26	ft MSL
Depth:	1.28	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2849	
Flow Regime:	Subcritical	
Flow Area:	525.12	sq ft
Average Velocity:	1.80	ft/s
Maximum Velocity:	1.90	ft/s
Composite n:	0.0561	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	685.41	ft
Wetted Top Width:	685.40	ft
Critical Slope:	0.0834	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–310

Entellus™

File: WASH–T2N–R6W–S36_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

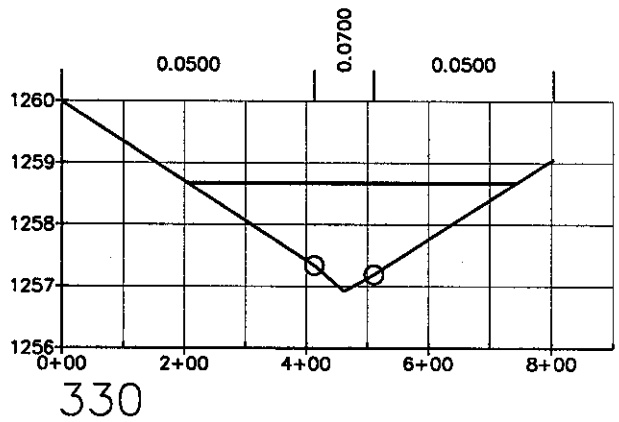
Cross-Section:	320	
Elevation:	1252.58	ft MSL
Depth:	1.42	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2332	
Flow Regime:	Subcritical	
Flow Area:	608.61	sq ft
Average Velocity:	1.58	ft/s
Maximum Velocity:	2.02	ft/s
Composite n:	0.0515	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	1118.48	ft
Wetted Top Width:	1118.46	ft
Critical Slope:	0.123	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–320

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

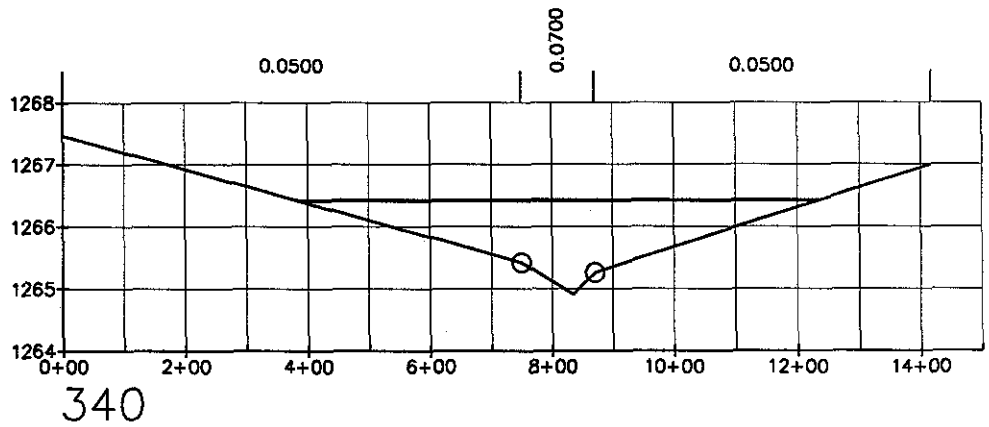
Cross-Section:	330	
Elevation:	1258.67	ft MSL
Depth:	1.75	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2744	
Flow Regime:	Subcritical	
Flow Area:	465.61	sq ft
Average Velocity:	2.05	ft/s
Maximum Velocity:	2.33	ft/s
Composite n:	0.0538	
Hydraulic Radius:	0.87	ft
Wetted Perimeter:	538.10	ft
Wetted Top Width:	538.09	ft
Critical Slope:	0.0895	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–330

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

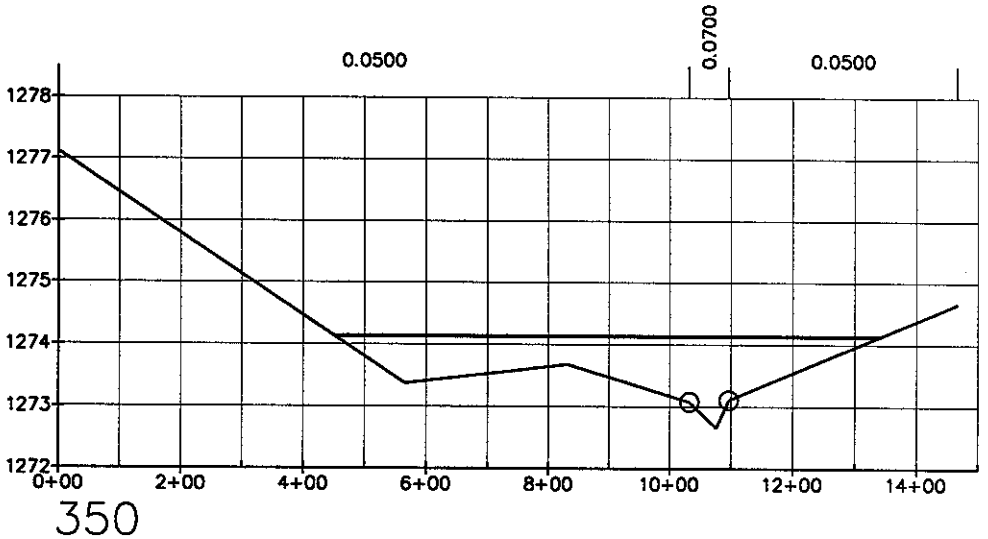
Cross-Section:	340	
Elevation:	1266.42	ft MSL
Depth:	1.51	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2492	
Flow Regime:	Subcritical	
Flow Area:	551.91	sq ft
Average Velocity:	1.72	ft/s
Maximum Velocity:	2.03	ft/s
Composite n:	0.053	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	853.60	ft
Wetted Top Width:	853.60	ft
Critical Slope:	0.1104	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–340

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

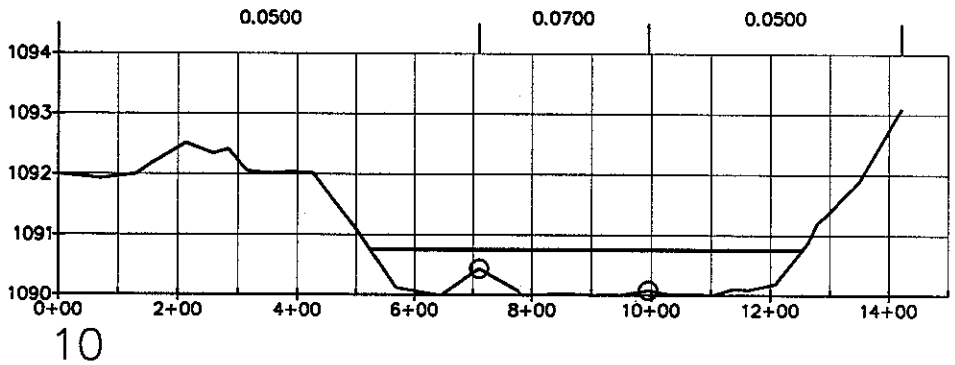
Cross-Section:	350	
Elevation:	1274.13	ft MSL
Depth:	1.47	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.25	
Flow Regime:	Subcritical	
Flow Area:	558.50	sq ft
Average Velocity:	1.72	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0515	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	888.80	ft
Wetted Top Width:	888.78	ft
Critical Slope:	0.1051	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36–350

Entellus™

File: WASH-T2N-R6W-S36_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1090.75	ft MSL
Depth:	0.75	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2704	
Flow Regime:	Subcritical	
Flow Area:	457.74	sq ft
Average Velocity:	1.31	ft/s
Maximum Velocity:	1.49	ft/s
Composite n:	0.0582	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	729.12	ft
Wetted Top Width:	729.11	ft
Critical Slope:	0.0689	ft/ft

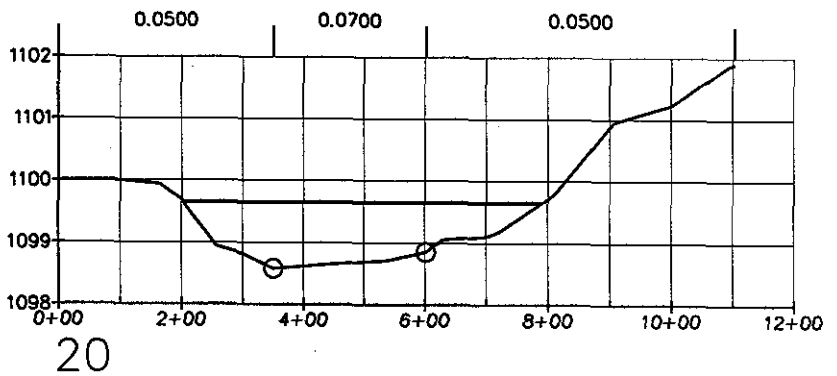
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36W–10

Entellus™

File: WASH-T2N-R6W-S36W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

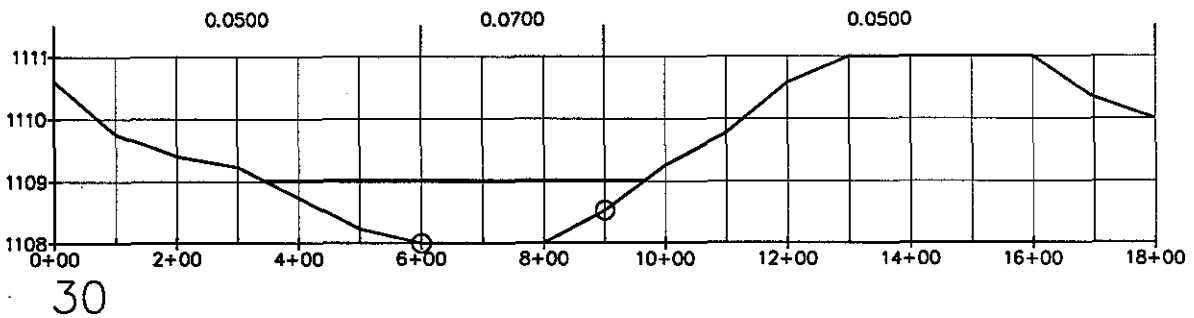
Cross-Section:	20	
Elevation:	1099.65	ft MSL
Depth:	1.07	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2415	
Flow Regime:	Subcritical	
Flow Area:	430.40	sq ft
Average Velocity:	1.42	ft/s
Maximum Velocity:	1.58	ft/s
Composite n:	0.0589	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	587.78	ft
Wetted Top Width:	587.77	ft
Critical Slope:	0.0817	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36W–20

Entellus™

File: WASH-T2N-R6W-S36W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

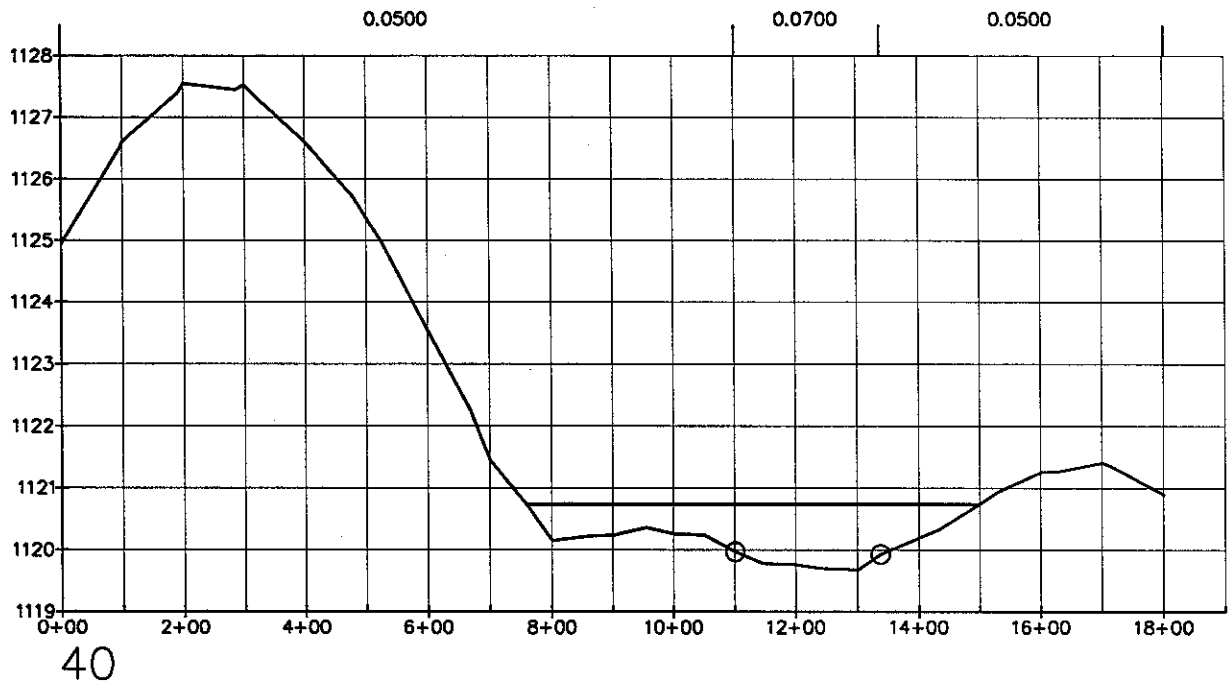
Cross-Section:	30	
Elevation:	1109.01	ft MSL
Depth:	1.01	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.242	
Flow Regime:	Subcritical	
Flow Area:	441.95	sq ft
Average Velocity:	1.38	ft/s
Maximum Velocity:	1.43	ft/s
Composite n:	0.06	
Hydraulic Radius:	0.71	ft
Wetted Perimeter:	620.99	ft
Wetted Top Width:	620.98	ft
Critical Slope:	0.0831	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36W–30

Entellus™

File: WASH-T2N-R6W-S36W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

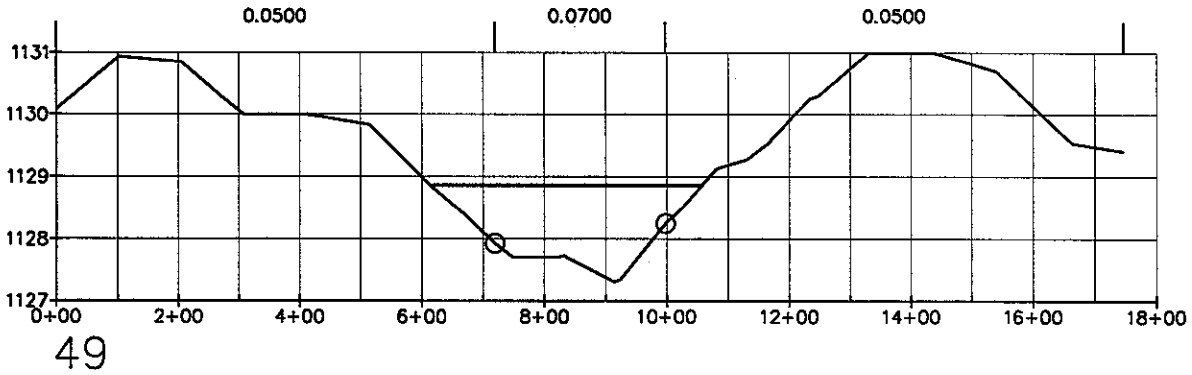
Cross-Section:	40	
Elevation:	1120.73	ft MSL
Depth:	1.05	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2274	
Flow Regime:	Subcritical	
Flow Area:	461.12	sq ft
Average Velocity:	1.32	ft/s
Maximum Velocity:	1.42	ft/s
Composite n:	0.0567	
Hydraulic Radius:	0.62	ft
Wetted Perimeter:	739.20	ft
Wetted Top Width:	739.19	ft
Critical Slope:	0.0921	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36W–40

Entellus™

File: WASH-T2N-R6W-S36W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

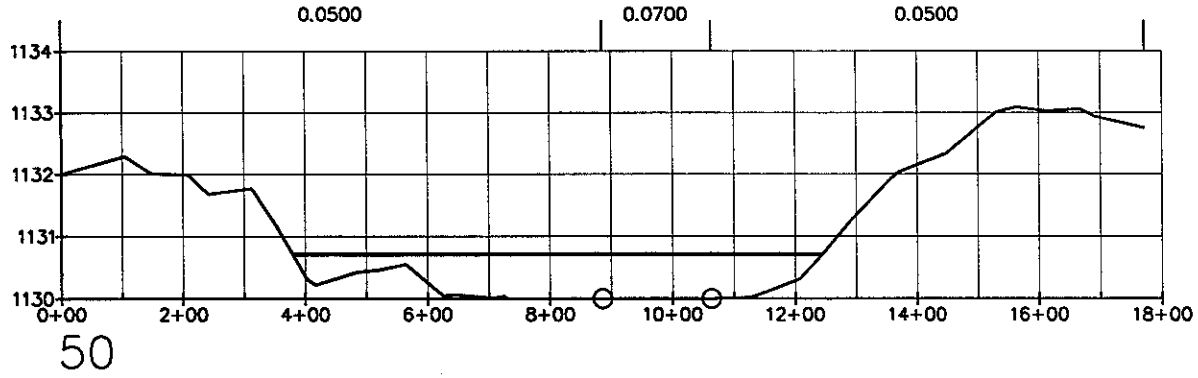
Cross-Section:	49	
Elevation:	1128.86	ft MSL
Depth:	1.55	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2175	
Flow Regime:	Subcritical	
Flow Area:	397.04	sq ft
Average Velocity:	1.55	ft/s
Maximum Velocity:	1.63	ft/s
Composite n:	0.0629	
Hydraulic Radius:	0.89	ft
Wetted Perimeter:	444.11	ft
Wetted Top Width:	444.10	ft
Critical Slope:	0.1033	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36W–49

Entellus™

File: WASH–T2N–R6W–S36W_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

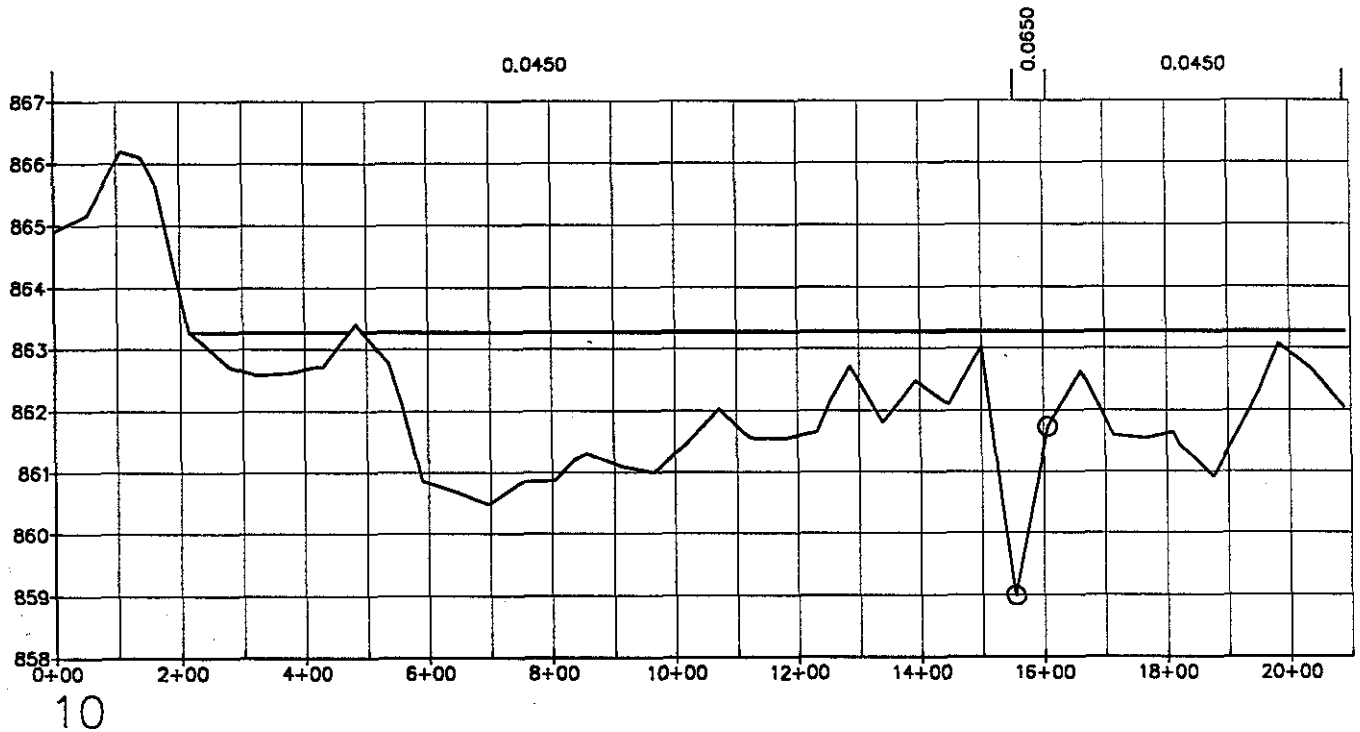
Cross-Section:	50	
Elevation:	1130.71	ft MSL
Depth:	0.71	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0047	ft/ft
Froude Number:	0.2658	
Flow Regime:	Subcritical	
Flow Area:	481.11	sq ft
Average Velocity:	1.28	ft/s
Maximum Velocity:	1.33	ft/s
Composite n:	0.0543	
Hydraulic Radius:	0.56	ft
Wetted Perimeter:	864.18	ft
Wetted Top Width:	864.17	ft
Critical Slope:	0.0661	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R6W–S36W–50

Entellus™

File: WASH-T2N-R6W-S36W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results		
Cross-Section:	10	
Elevation:	863.37	ft MSL
Depth:	4.38	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2429	
Flow Regime:	Subcritical	
Flow Area:	2910.28	sq ft
Average Velocity:	2.88	ft/s
Maximum Velocity:	3.13	ft/s
Composite n:	0.0456	
Hydraulic Radius:	1.56	ft
Wetted Perimeter:	1870.68	ft
Wetted Top Width:	1870.31	ft
Critical Slope:	0.0732	ft/ft

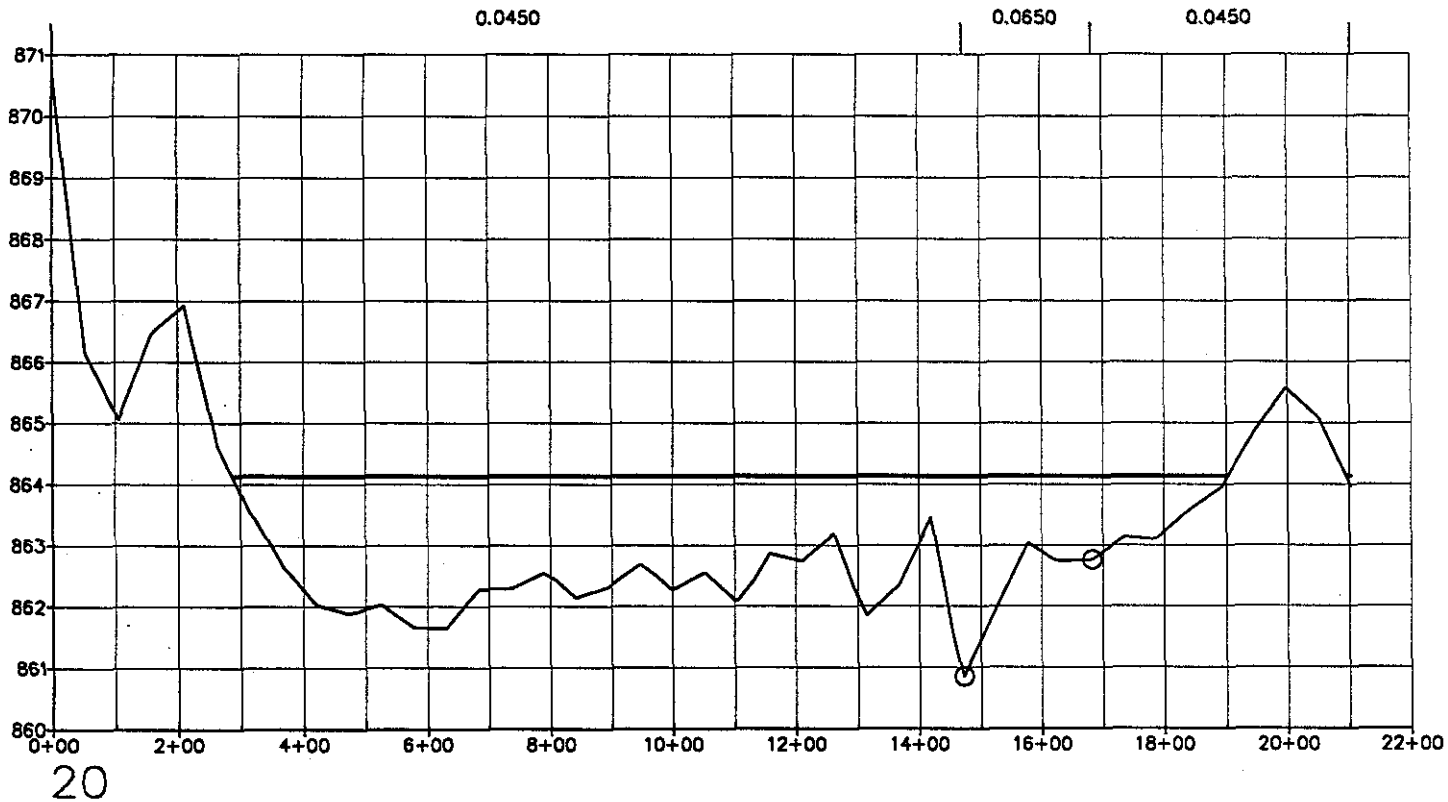
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–10

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	864.22	ft MSL
Depth:	3.37	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2906	
Flow Regime:	Subcritical	
Flow Area:	2770.51	sq ft
Average Velocity:	3.02	ft/s
Maximum Velocity:	3.25	ft/s
Composite n:	0.0477	
Hydraulic Radius:	1.69	ft
Wetted Perimeter:	1638.67	ft
Wetted Top Width:	1638.50	ft
Critical Slope:	0.0554	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–20

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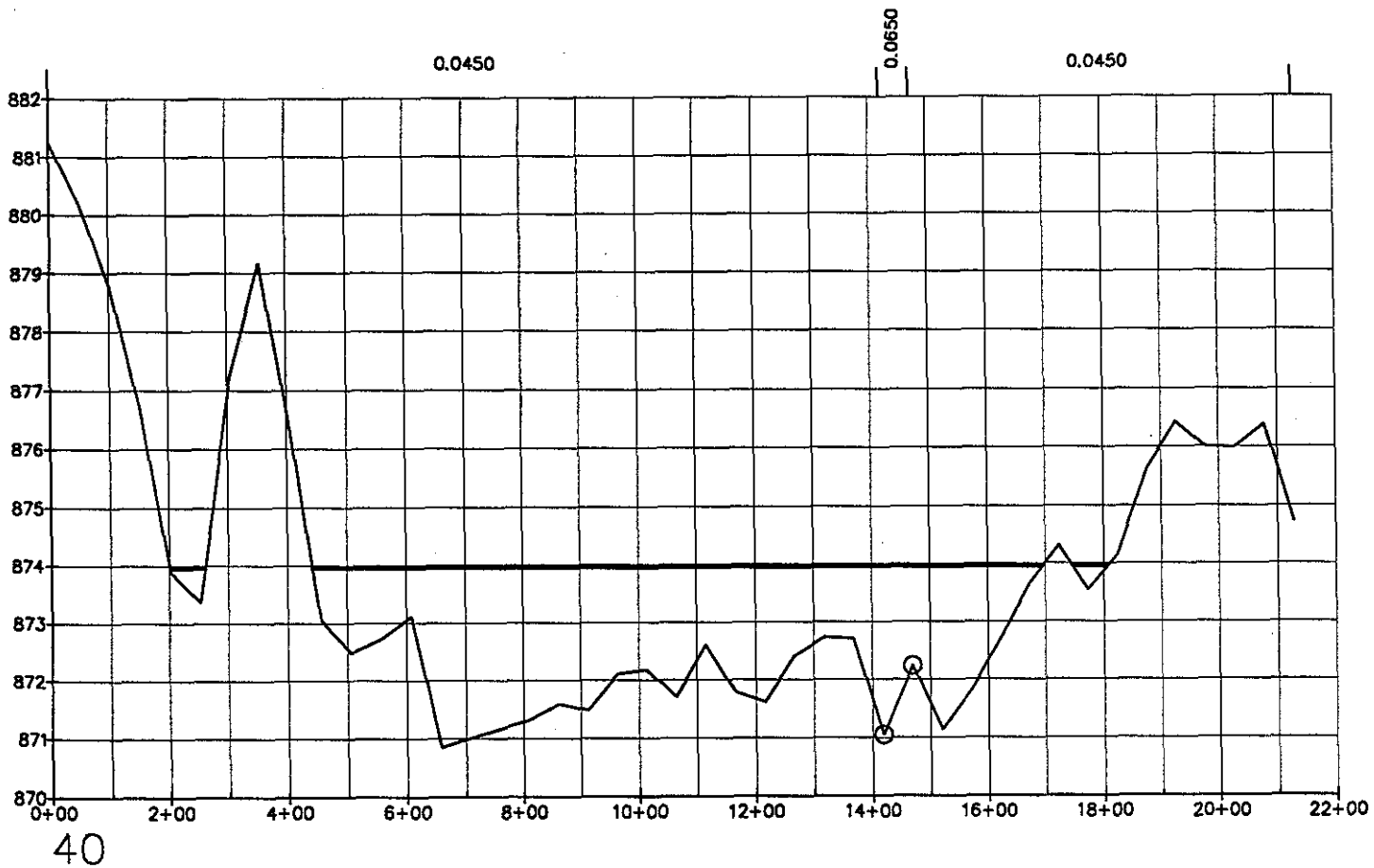


Normal Depth Results

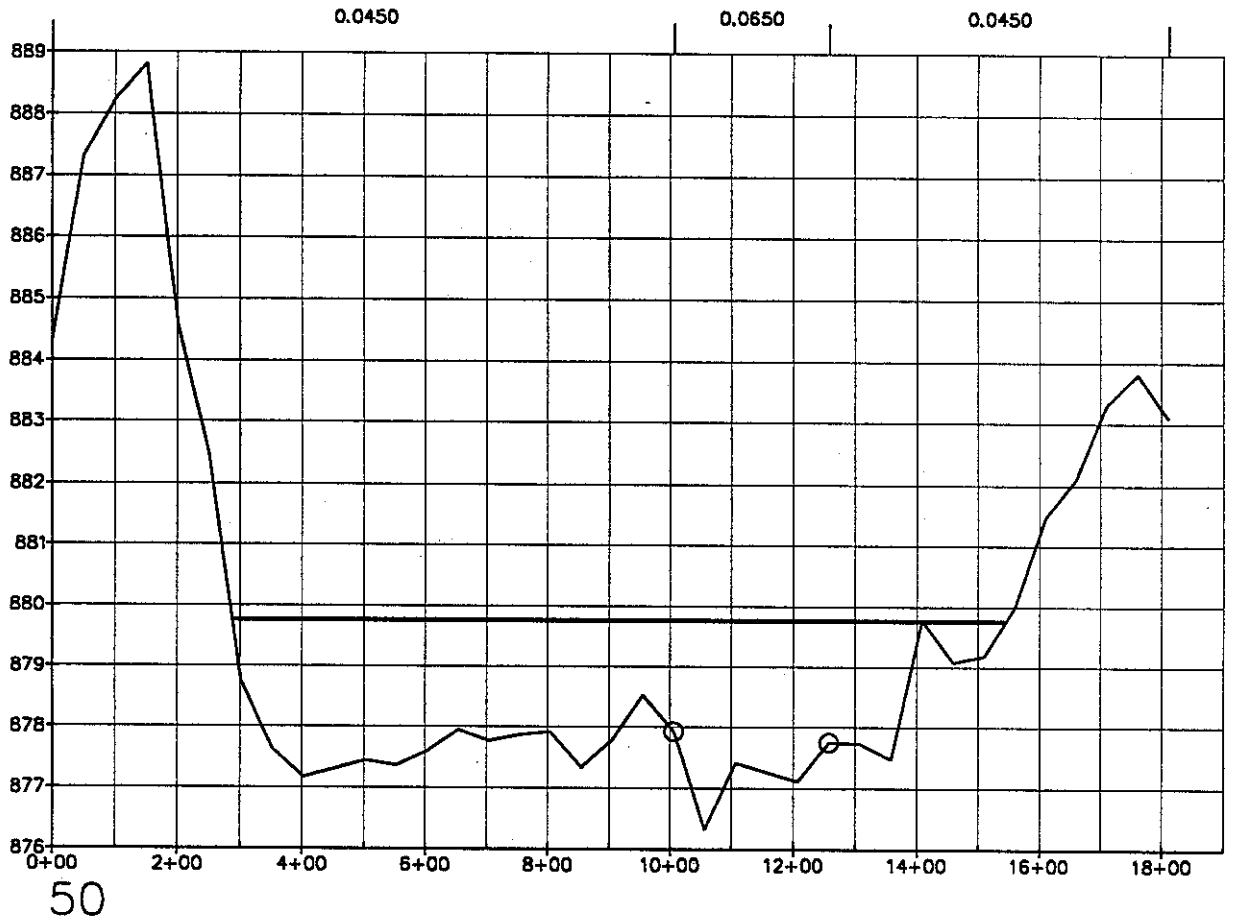
Cross-Section:	40	
Elevation:	874.07	ft MSL
Depth:	3.22	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3185	
Flow Regime:	Subcritical	
Flow Area:	2587.37	sq ft
Average Velocity:	3.25	ft/s
Maximum Velocity:	3.41	ft/s
Composite n:	0.0457	
Hydraulic Radius:	1.84	ft
Wetted Perimeter:	1405.98	ft
Wetted Top Width:	1405.75	ft
Critical Slope:	0.0434	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–40

Entellus™



Normal Depth Results

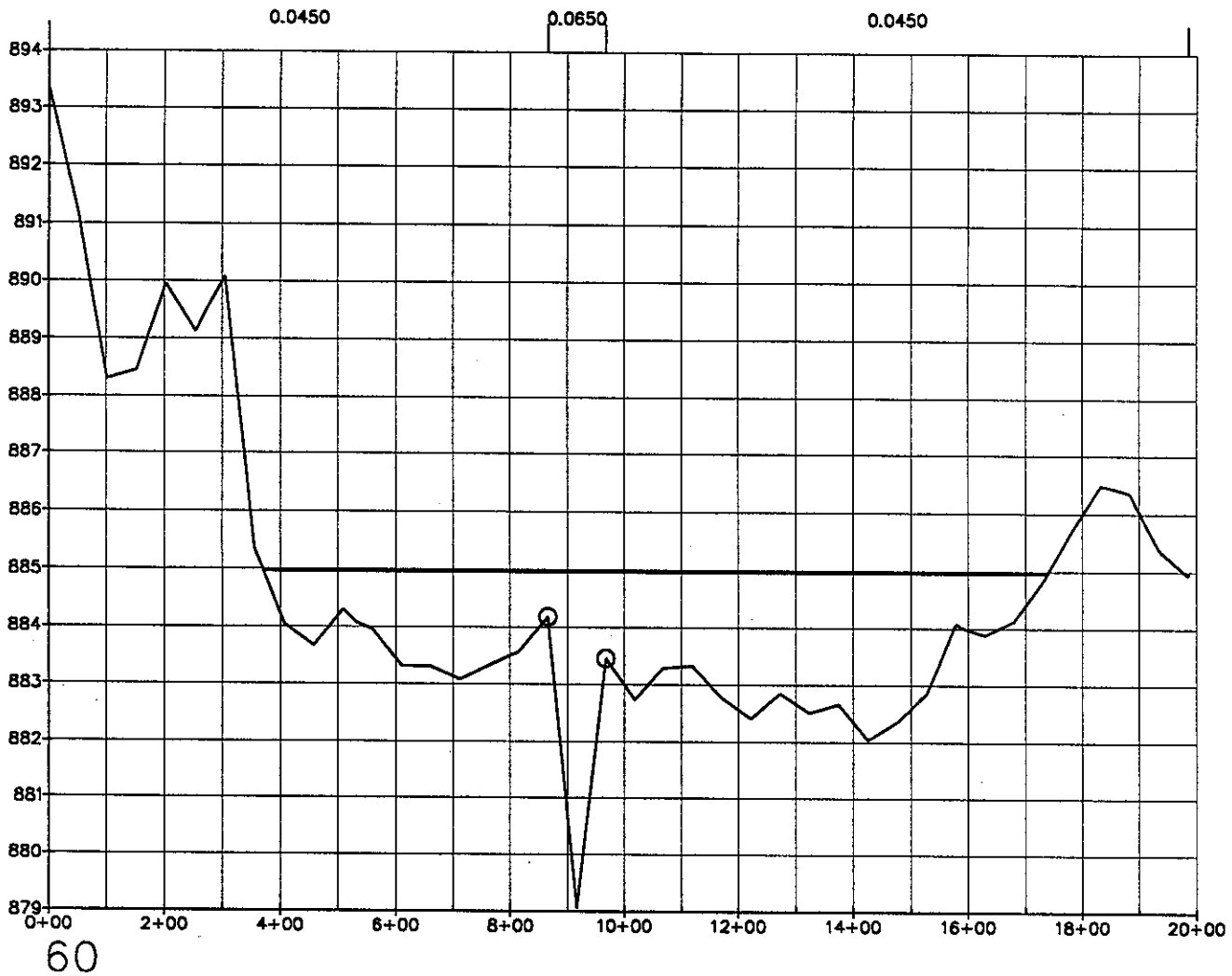
Cross-Section:	50	
Elevation:	879.88	ft MSL
Depth:	3.55	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3045	
Flow Regime:	Subcritical	
Flow Area:	2576.61	sq ft
Average Velocity:	3.26	ft/s
Maximum Velocity:	3.60	ft/s
Composite n:	0.0492	
Hydraulic Radius:	2.03	ft
Wetted Perimeter:	1266.72	ft
Wetted Top Width:	1266.54	ft
Critical Slope:	0.0485	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S32 (LUKE WASH)-50

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

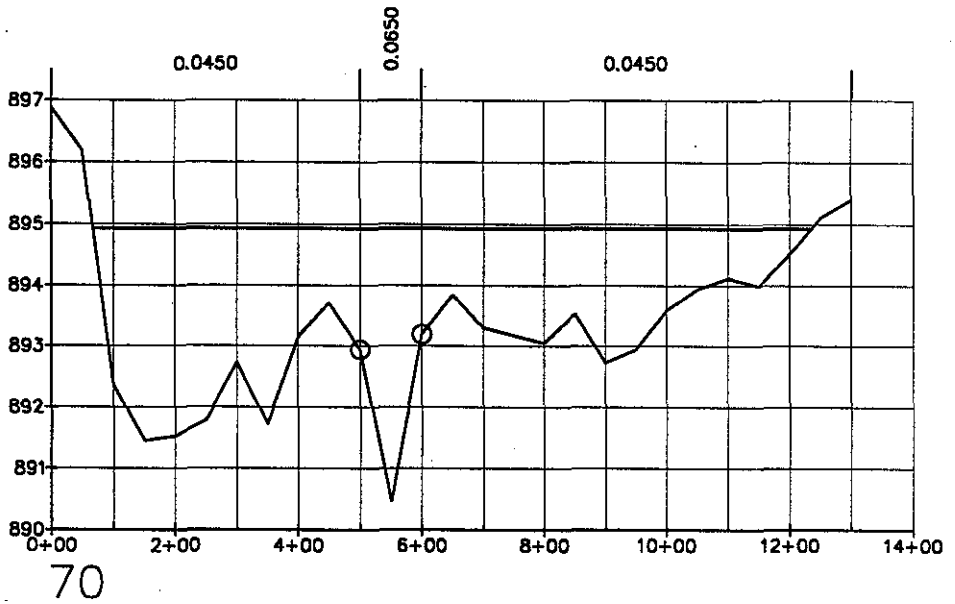
Cross-Section:	60	
Elevation:	885.09	ft MSL
Depth:	6.03	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2304	
Flow Regime:	Subcritical	
Flow Area:	2613.33	sq ft
Average Velocity:	3.23	ft/s
Maximum Velocity:	3.55	ft/s
Composite n:	0.0466	
Hydraulic Radius:	1.87	ft
Wetted Perimeter:	1397.74	ft
Wetted Top Width:	1397.22	ft
Critical Slope:	0.0824	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–60

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

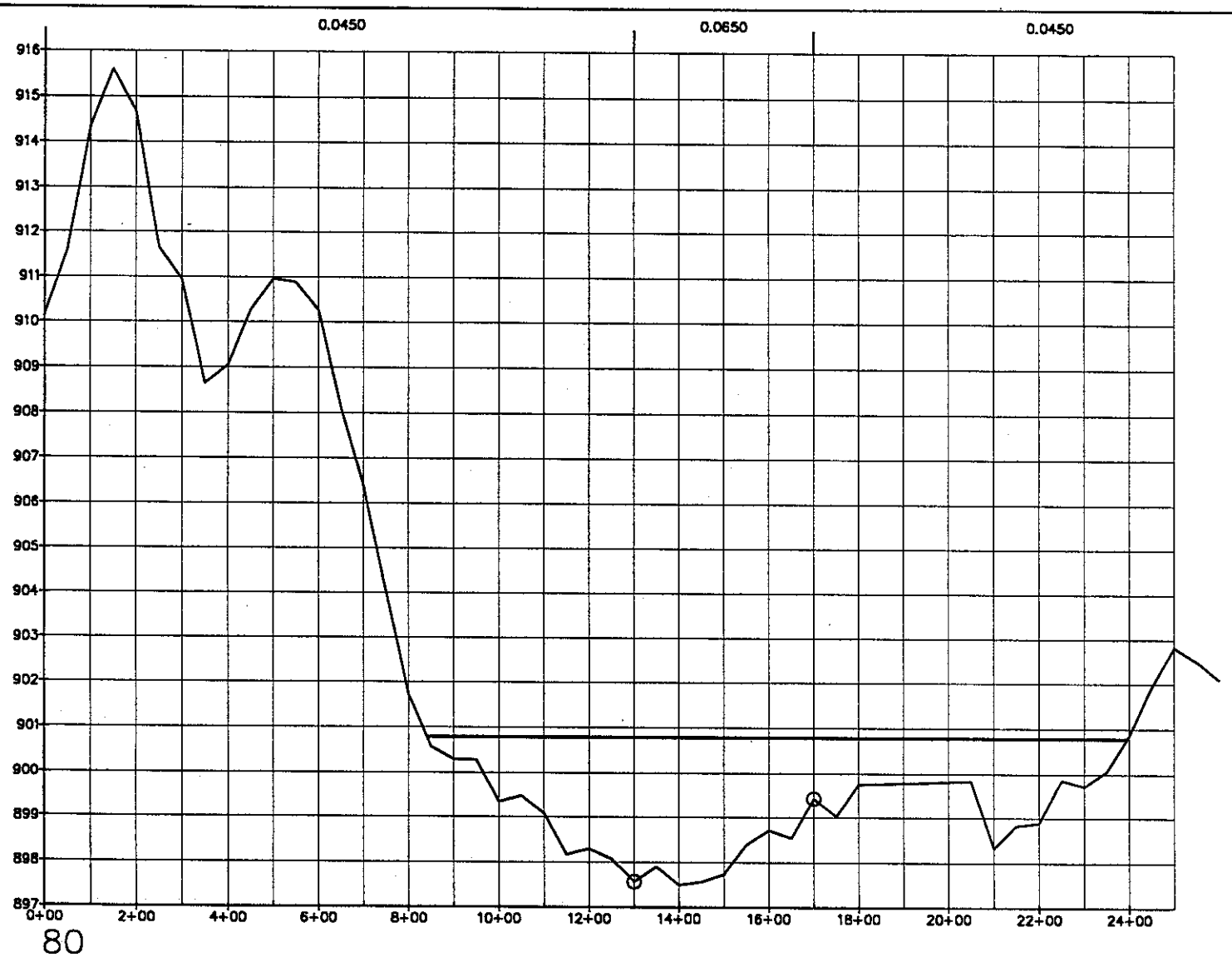
Cross-Section:	70	
Elevation:	895.05	ft MSL
Depth:	4.59	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2872	
Flow Regime:	Subcritical	
Flow Area:	2402.53	sq ft
Average Velocity:	3.49	ft/s
Maximum Velocity:	4.11	ft/s
Composite n:	0.0468	
Hydraulic Radius:	2.04	ft
Wetted Perimeter:	1180.10	ft
Wetted Top Width:	1179.77	ft
Critical Slope:	0.0566	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–70

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

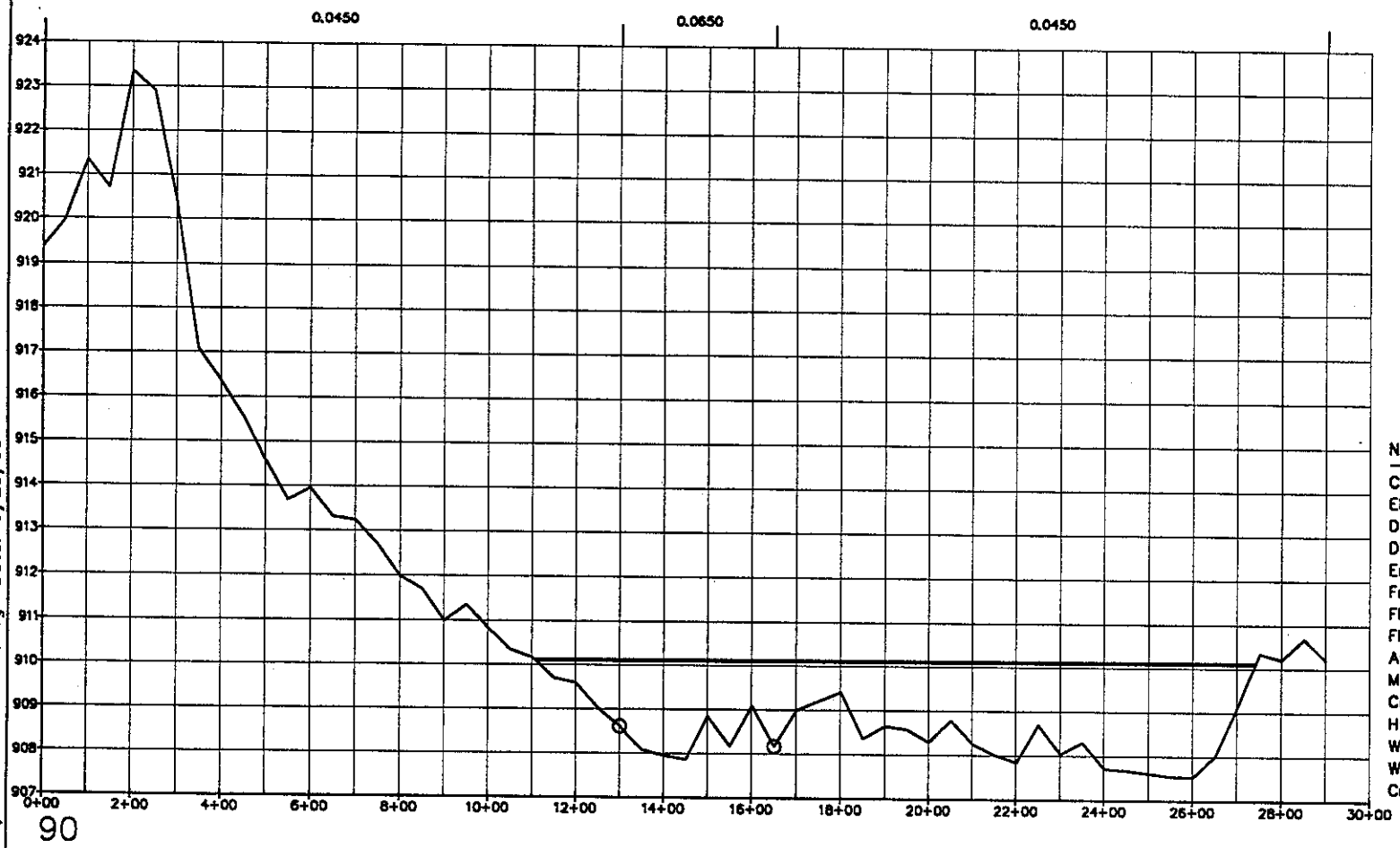
Cross-Section:	80	
Elevation:	900.91	ft MSL
Depth:	3.41	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2781	
Flow Regime:	Subcritical	
Flow Area:	2881.32	sq ft
Average Velocity:	2.92	ft/s
Maximum Velocity:	3.14	ft/s
Composite n:	0.0504	
Hydraulic Radius:	1.84	ft
Wetted Perimeter:	1566.82	ft
Wetted Top Width:	1566.72	ft
Critical Slope:	0.0558	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–80

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

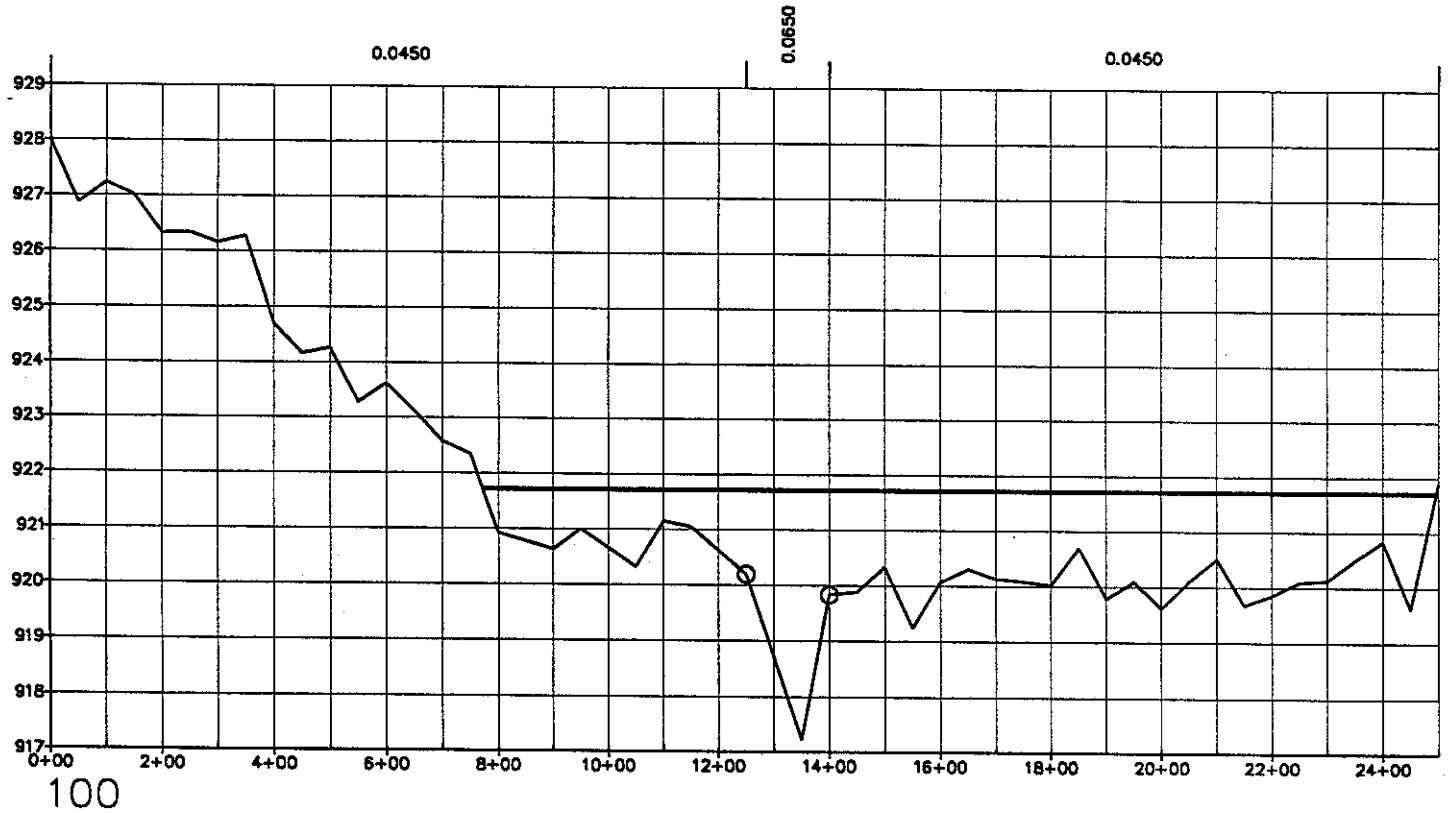
Cross-Section:	90	
Elevation:	910.21	ft MSL
Depth:	2.67	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3187	
Flow Regime:	Subcritical	
Flow Area:	2840.04	sq ft
Average Velocity:	2.96	ft/s
Maximum Velocity:	3.27	ft/s
Composite n:	0.0495	
Hydraulic Radius:	1.71	ft
Wetted Perimeter:	1663.40	ft
Wetted Top Width:	1663.29	ft
Critical Slope:	0.0465	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–90

Entellus™



Normal Depth Results

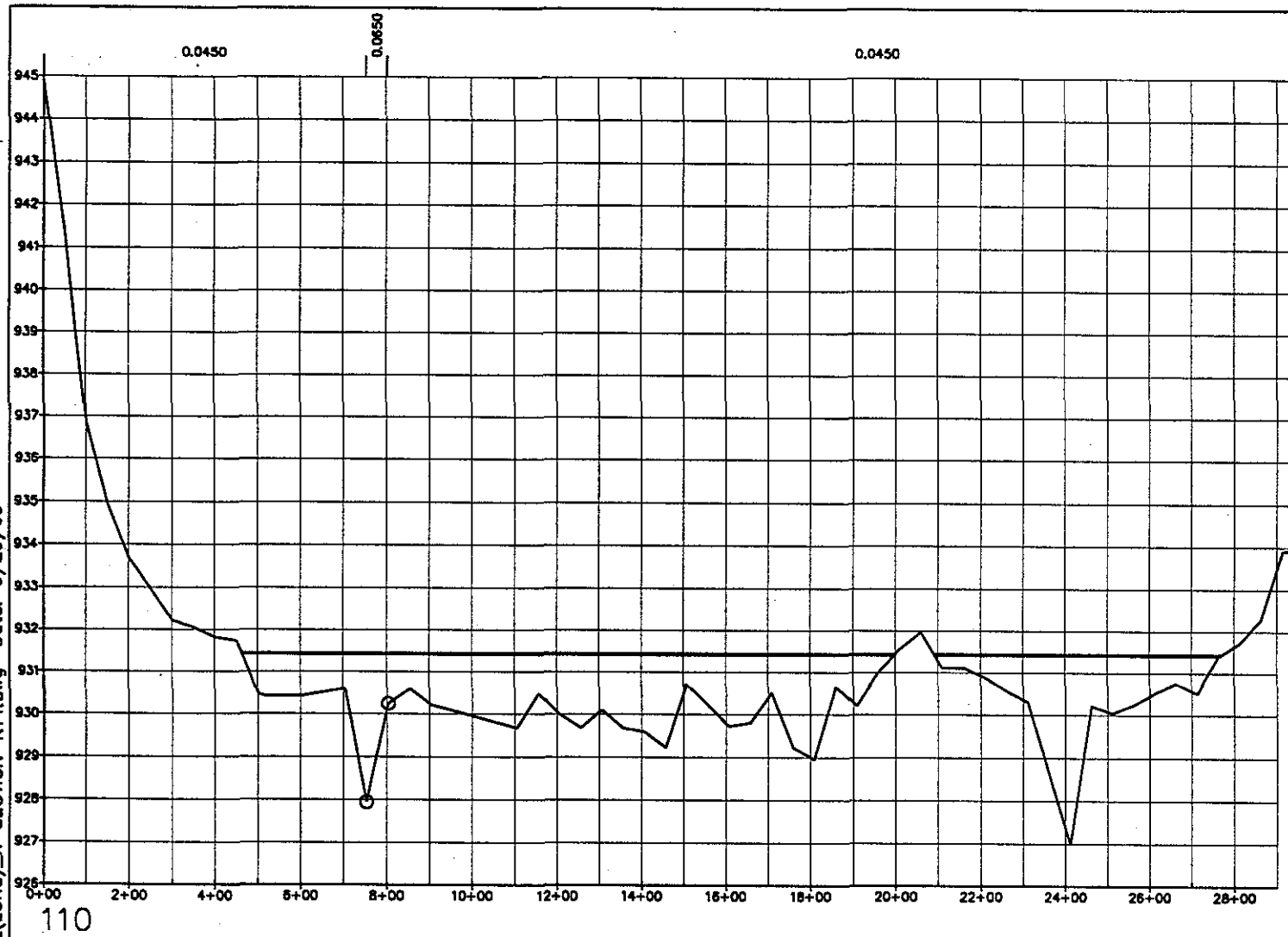
Cross-Section:	100	
Elevation:	921.81	ft MSL
Depth:	4.58	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2443	
Flow Regime:	Subcritical	
Flow Area:	2830.26	sq ft
Average Velocity:	2.96	ft/s
Maximum Velocity:	3.23	ft/s
Composite n:	0.0469	
Hydraulic Radius:	1.64	ft
Wetted Perimeter:	1729.34	ft
Wetted Top Width:	1729.09	ft
Critical Slope:	0.0756	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–100

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

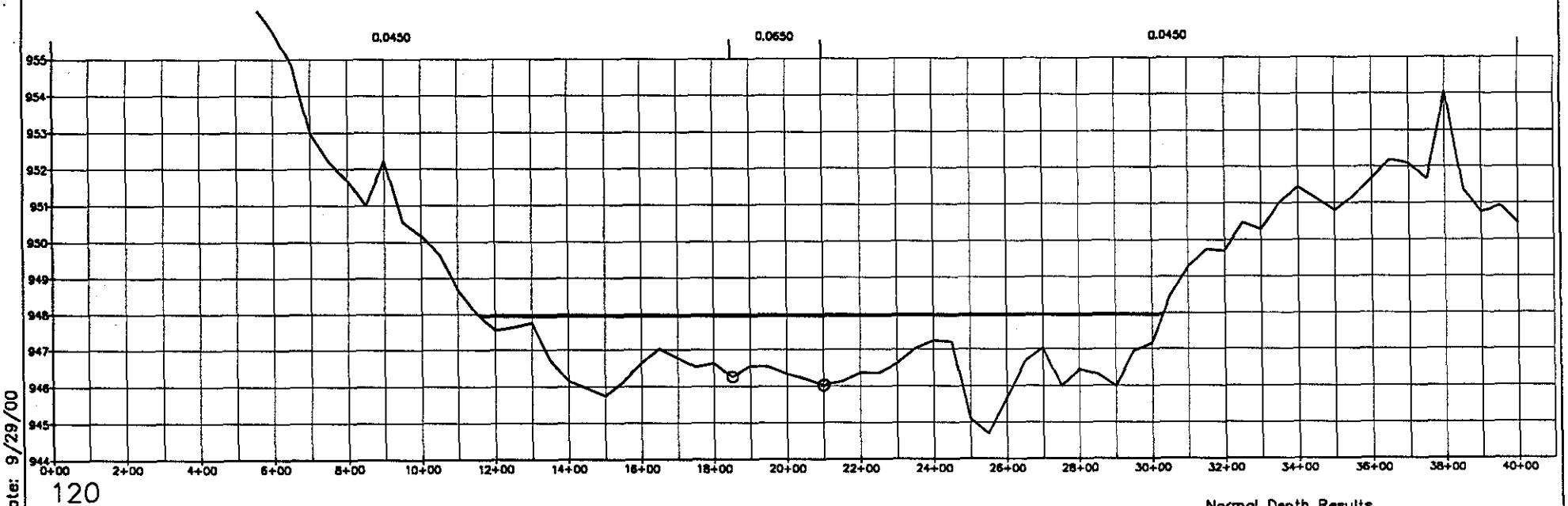
Cross-Section:	110	
Elevation:	931.52	ft MSL
Depth:	4.53	ft
Discharge:	8390.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2218	
Flow Regime:	Subcritical	
Flow Area:	3133.39	sq ft
Average Velocity:	2.69	ft/s
Maximum Velocity:	2.72	ft/s
Composite n:	0.0454	
Hydraulic Radius:	1.4	ft
Wetted Perimeter:	2242.84	ft
Wetted Top Width:	2242.42	ft
Critical Slope:	0.0869	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–110

Entellus™



Normal Depth Results

Cross-Section:	120	
Elevation:	948.03	ft MSL
Depth:	3.33	ft
Discharge:	7880.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2673	
Flow Regime:	Subcritical	
Flow Area:	2847.03	sq ft
Average Velocity:	2.74	ft/s
Maximum Velocity:	3.01	ft/s
Composite n:	0.0478	
Hydraulic Radius:	1.51	ft
Wetted Perimeter:	1884.57	ft
Wetted Top Width:	1884.44	ft
Critical Slope:	0.0638	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S32 (LUKE WASH)-120

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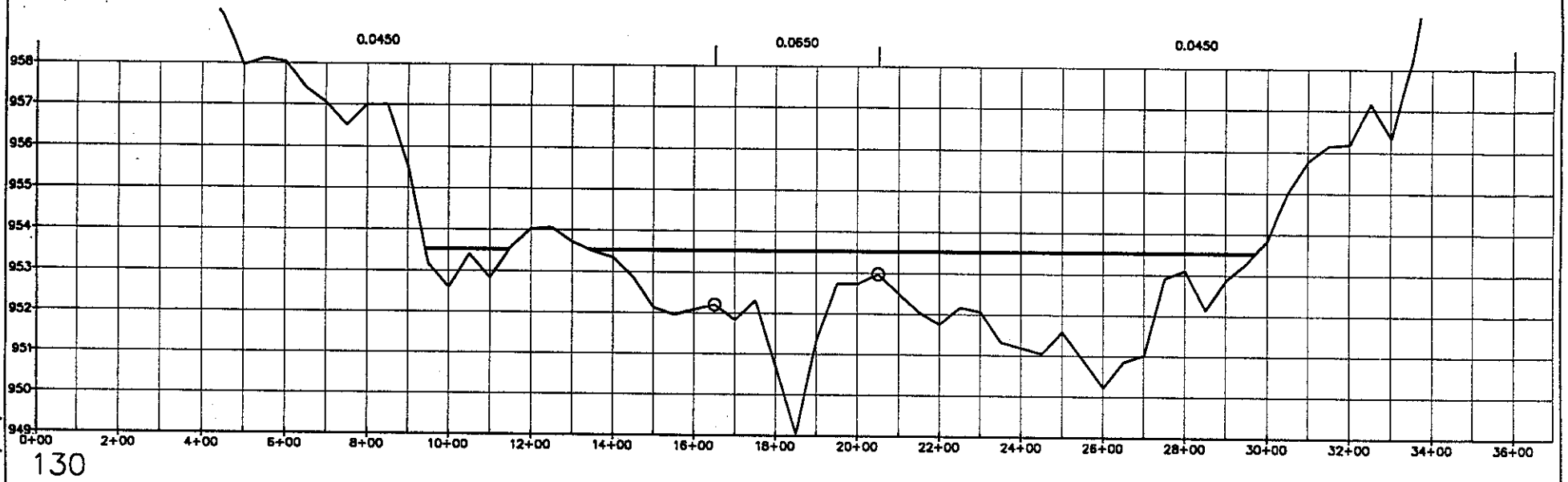


Normal Depth Results

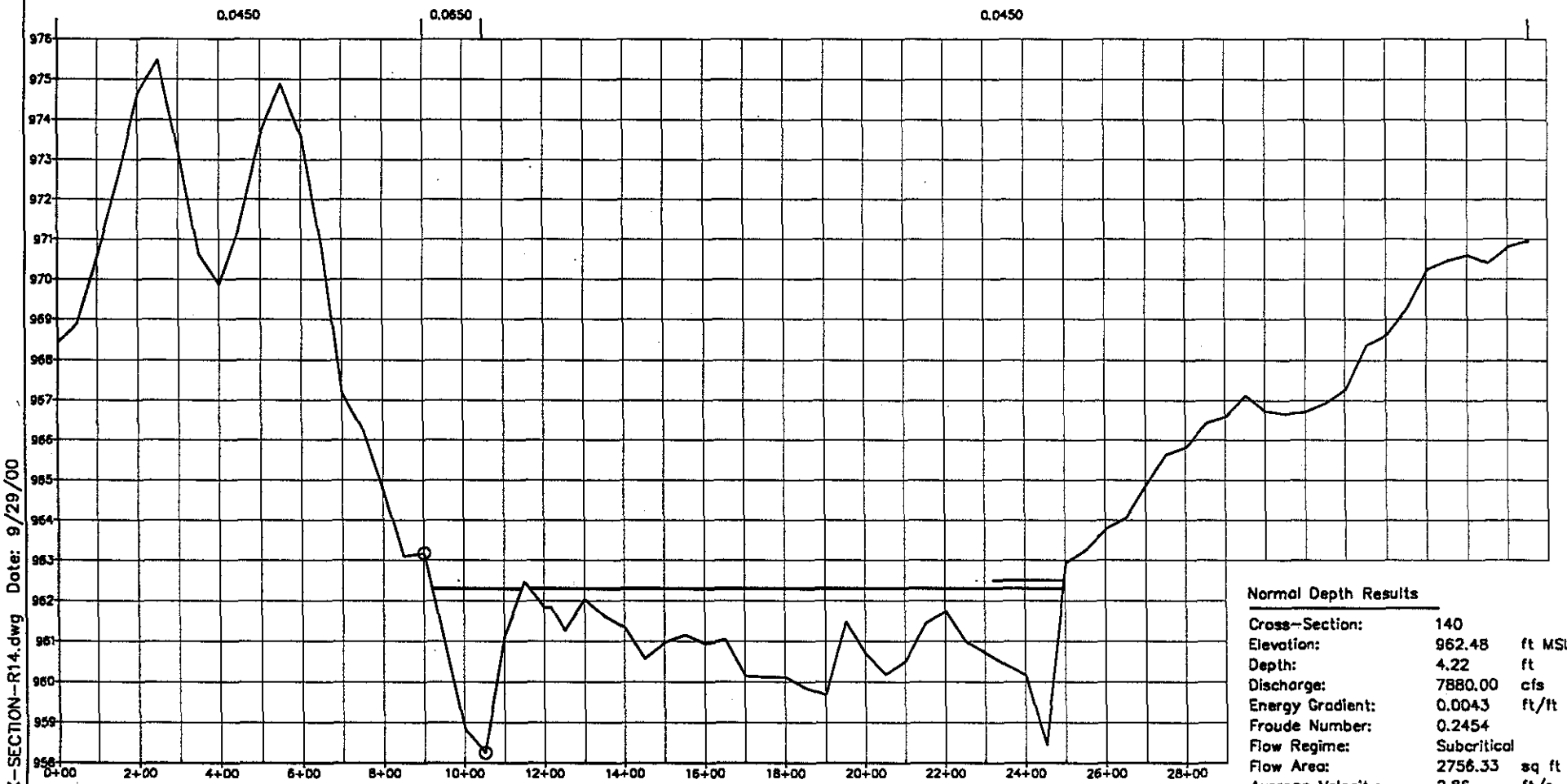
Cross-Section:	130	
Elevation:	953.64	ft MSL
Depth:	4.59	ft
Discharge:	7880.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2254	
Flow Regime:	Subcritical	
Flow Area:	2877.03	sq ft
Average Velocity:	2.74	ft/s
Maximum Velocity:	3.16	ft/s
Composite n:	0.0495	
Hydraulic Radius:	1.53	ft
Wetted Perimeter:	1881.73	ft
Wetted Top Width:	1881.48	ft
Critical Slope:	0.0928	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–130

Entellus™

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

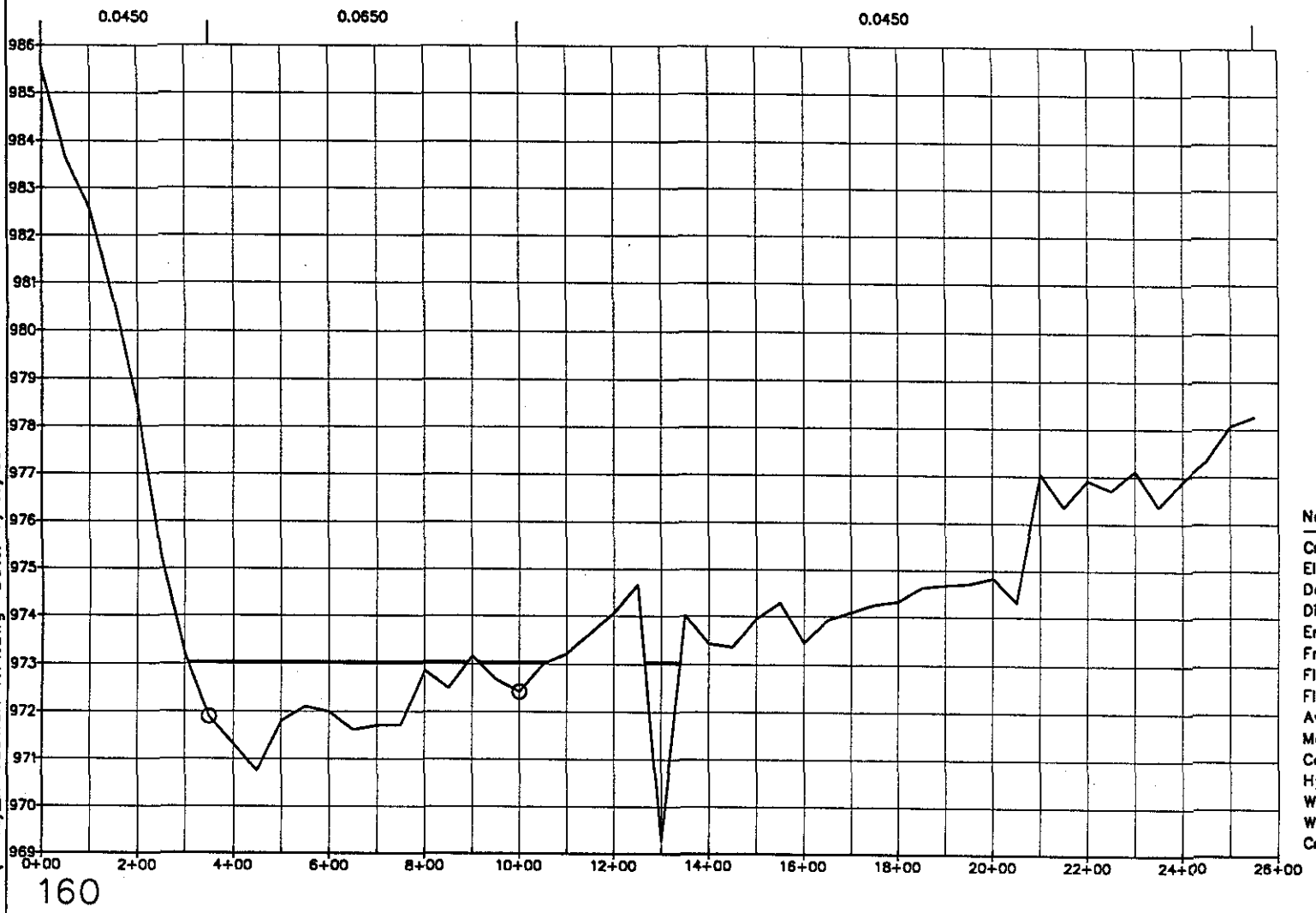
Cross-Section:	140	
Elevation:	962.48	ft MSL
Depth:	4.22	ft
Discharge:	7880.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2454	
Flow Regime:	Subcritical	
Flow Area:	2756.33	sq ft
Average Velocity:	2.86	ft/s
Maximum Velocity:	3.43	ft/s
Composite n:	0.0543	
Hydraulic Radius:	1.74	ft
Wetted Perimeter:	1580.57	ft
Wetted Top Width:	1580.08	ft
Critical Slope:	0.0859	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–140

Entellus™



Normal Depth Results

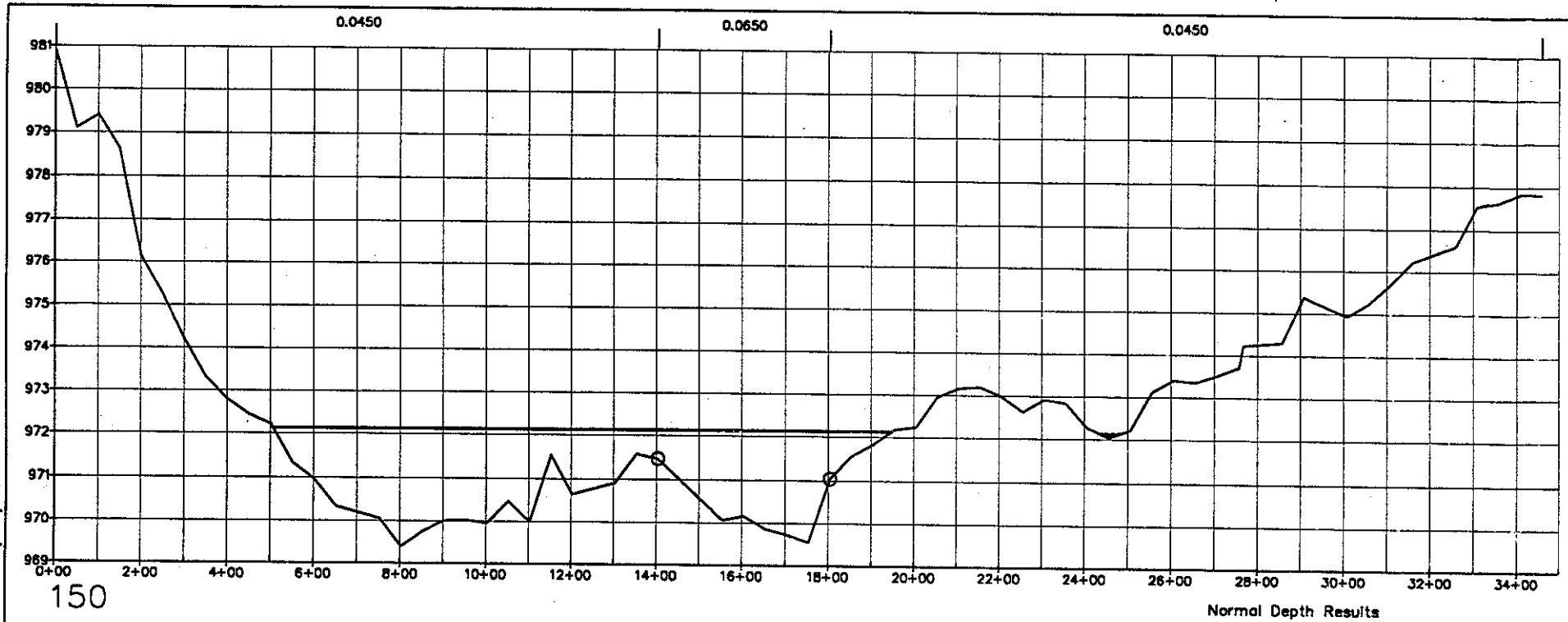
Cross-Section:	160	
Elevation:	974.59	ft MSL
Depth:	5.30	ft
Discharge:	6930.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.1995	
Flow Regime:	Subcritical	
Flow Area:	2660.45	sq ft
Average Velocity:	2.60	ft/s
Maximum Velocity:	2.83	ft/s
Composite n:	0.0535	
Hydraulic Radius:	1.66	ft
Wetted Perimeter:	1601.39	ft
Wetted Top Width:	1600.76	ft
Critical Slope:	0.1119	ft/ft

File: WASH-T1S-R5W-S32(LUKE)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S32 (LUKE WASH)-160

Entellus™



Normal Depth Results

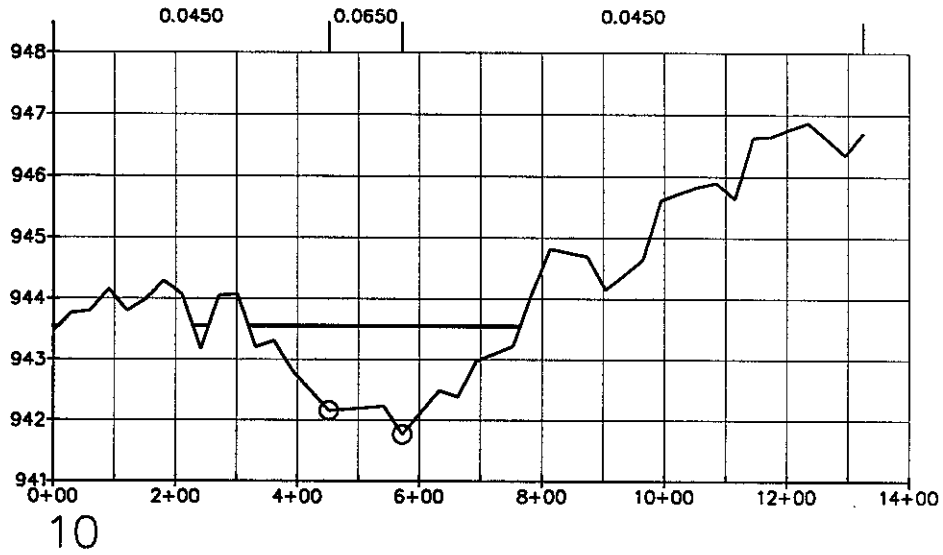
Cross-Section:	150	
Elevation:	972.43	ft MSL
Depth:	3.04	ft
Discharge:	7880.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2917	
Flow Regime:	Subcritical	
Flow Area:	2732.15	sq ft
Average Velocity:	2.88	ft/s
Maximum Velocity:	3.22	ft/s
Composite n:	0.0501	
Hydraulic Radius:	1.62	ft
Wetted Perimeter:	1688.31	ft
Wetted Top Width:	1688.20	ft
Critical Slope:	0.0581	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S32 (LUKE WASH)–150

Entellus™

File: WASH–T1S–R5W–S32(LUKE)_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	943.55	ft MSL
Depth:	1.78	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2944	
Flow Regime:	Subcritical	
Flow Area:	437.45	sq ft
Average Velocity:	2.23	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.0504	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	478.99	ft
Wetted Top Width:	478.95	ft
Critical Slope:	0.0739	ft/ft

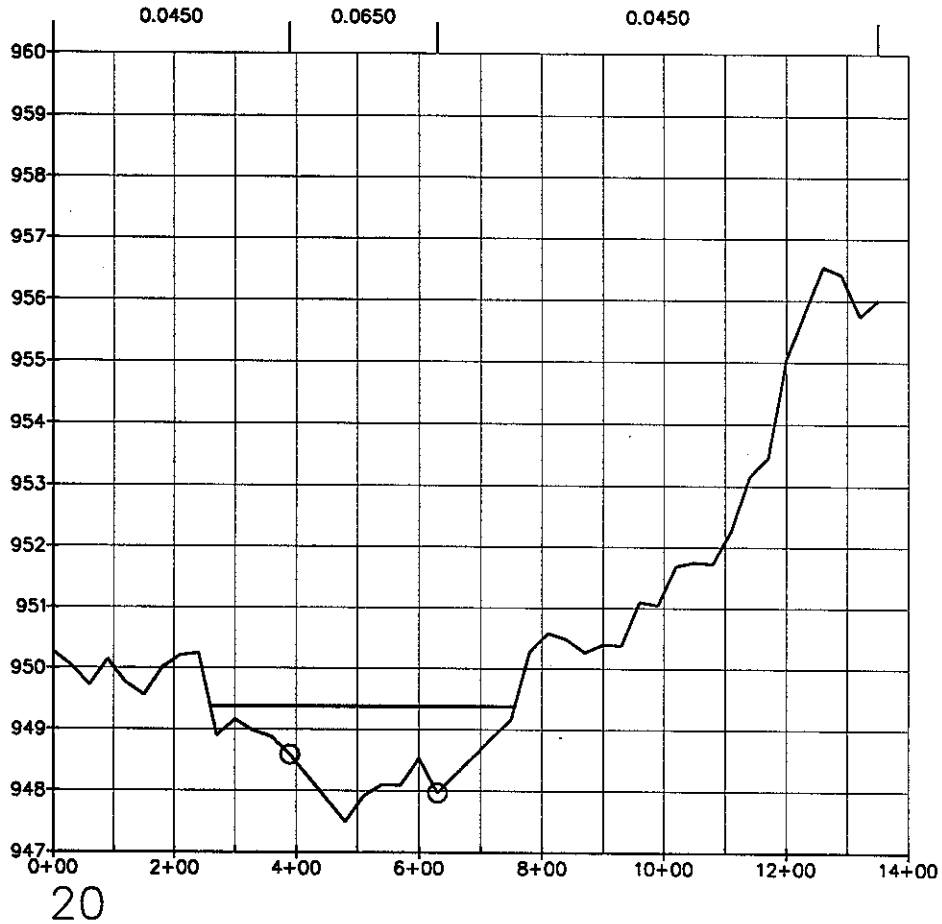
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–10

Entellus™

File: WASH-T1N-R5W-S32_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	949.38	ft MSL
Depth:	1.88	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2678	
Flow Regime:	Subcritical	
Flow Area:	468.08	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0551	
Hydraulic Radius:	0.94	ft
Wetted Perimeter:	496.16	ft
Wetted Top Width:	496.12	ft
Critical Slope:	0.0894	ft/ft

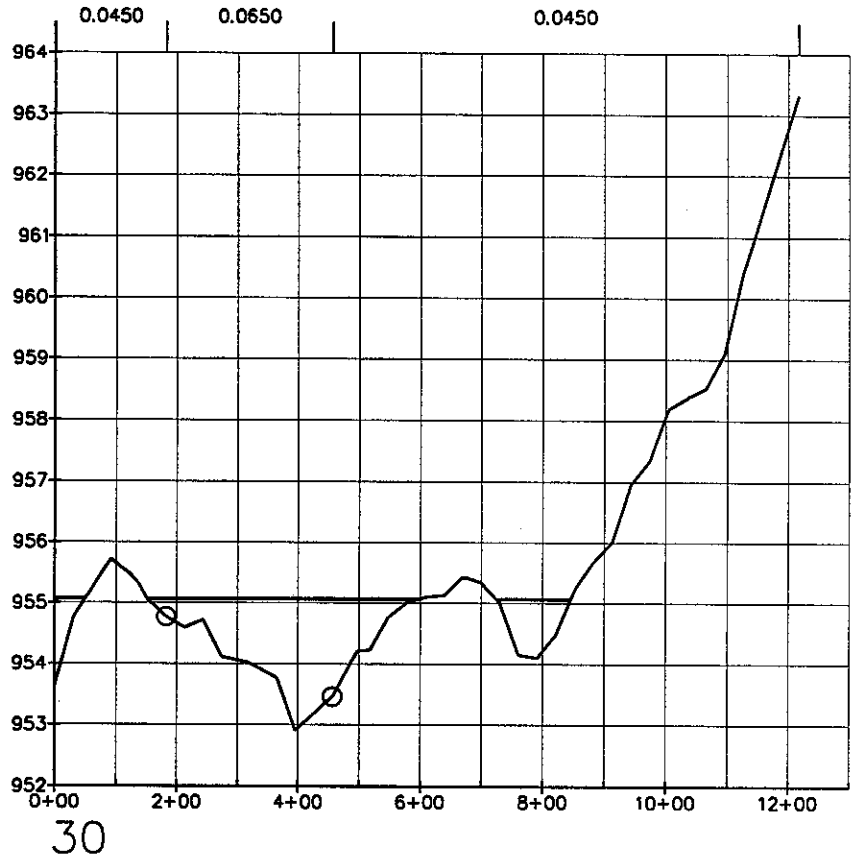
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–20

Entellus™

File: WASH-T1N-R5W-S32_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	30	
Elevation:	955.06	ft MSL
Depth:	2.15	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2311	
Flow Regime:	Subcritical	
Flow Area:	506.95	sq ft
Average Velocity:	1.91	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0543	
Hydraulic Radius:	0.83	ft
Wetted Perimeter:	613.12	ft
Wetted Top Width:	613.03	ft
Critical Slope:	0.1188	ft/ft

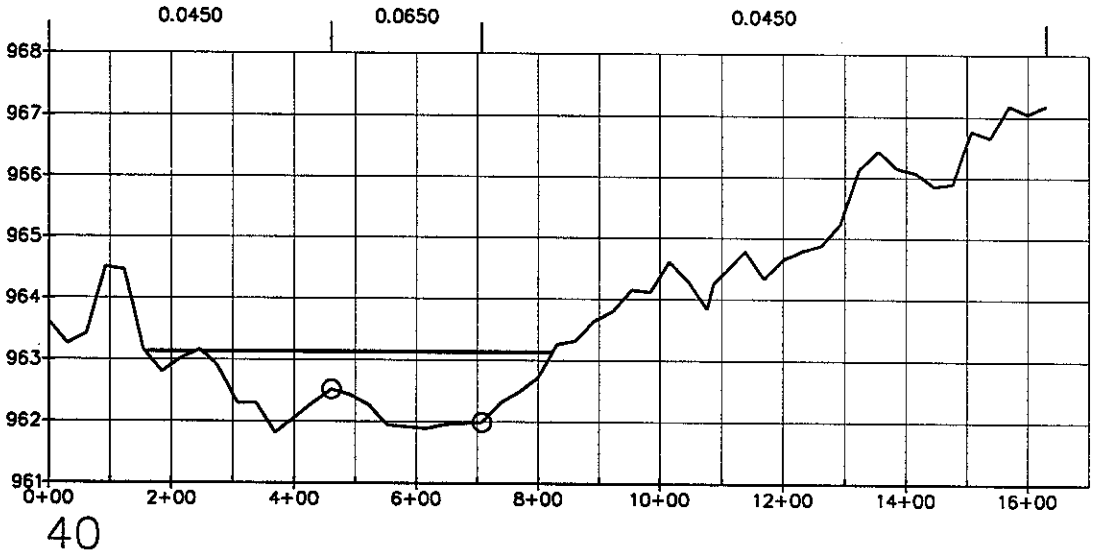
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–30

Entellus™

File: WASH-T1N-R5W-S32_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results		
Cross-Section:	40	
Elevation:	963.13	ft MSL
Depth:	1.32	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2901	
Flow Regime:	Subcritical	
Flow Area:	515.06	sq ft
Average Velocity:	1.88	ft/s
Maximum Velocity:	1.93	ft/s
Composite n:	0.0529	
Hydraulic Radius:	0.78	ft
Wetted Perimeter:	658.30	ft
Wetted Top Width:	658.28	ft
Critical Slope:	0.0744	ft/ft

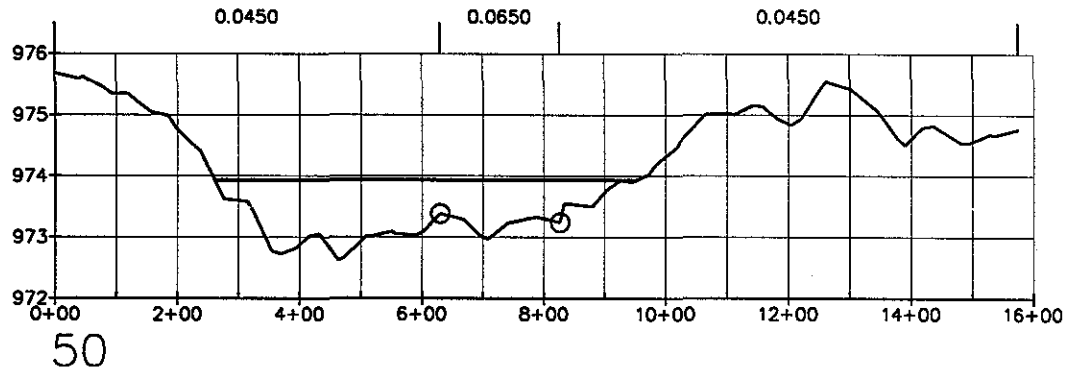
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–40

Entellus™

File: WASH-T1N-R5W-S32_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

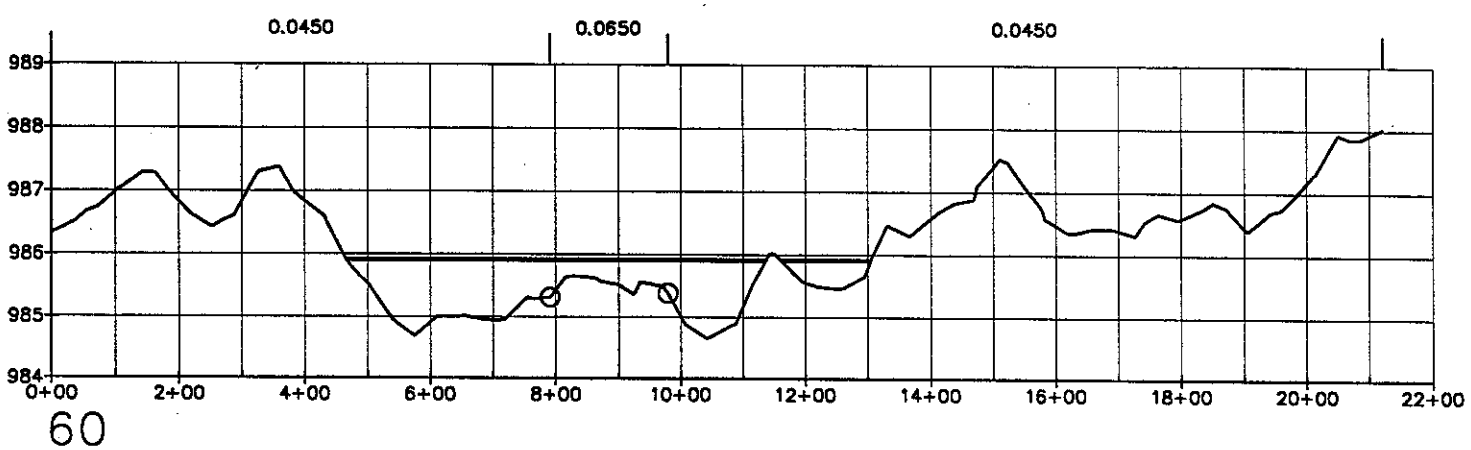
Cross-Section:	50	
Elevation:	973.93	ft MSL
Depth:	1.31	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.309	
Flow Regime:	Subcritical	
Flow Area:	485.61	sq ft
Average Velocity:	2.00	ft/s
Maximum Velocity:	2.34	ft/s
Composite n:	0.051	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	690.82	ft
Wetted Top Width:	690.79	ft
Critical Slope:	0.0793	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–50

Entellus™

File: WASH-T1N-R5W-S32_X-SECTION-R14.dwg Date: 9/29/00



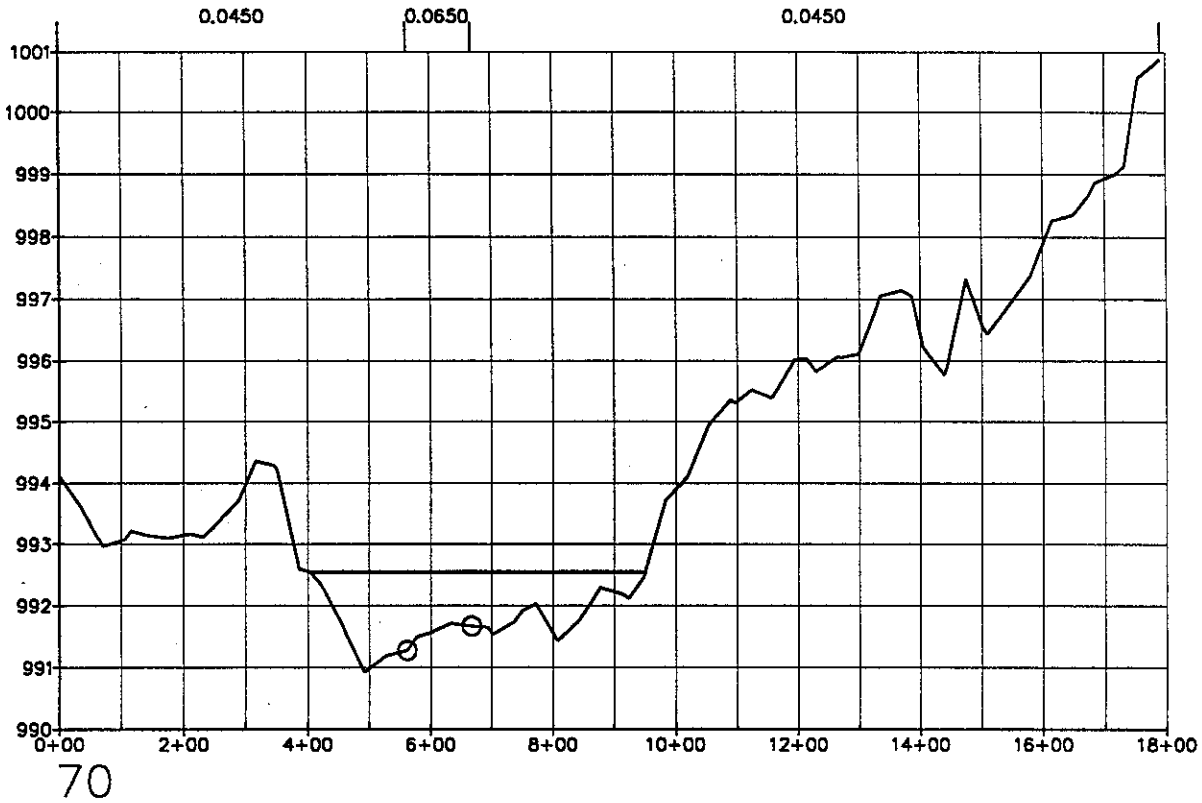
Normal Depth Results

Cross-Section:	60	
Elevation:	985.91	ft MSL
Depth:	1.25	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.3005	
Flow Regime:	Subcritical	
Flow Area:	511.20	sq ft
Average Velocity:	1.93	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0499	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	814.05	ft
Wetted Top Width:	814.01	ft
Critical Slope:	0.0842	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–60

Entellus™



Normal Depth Results

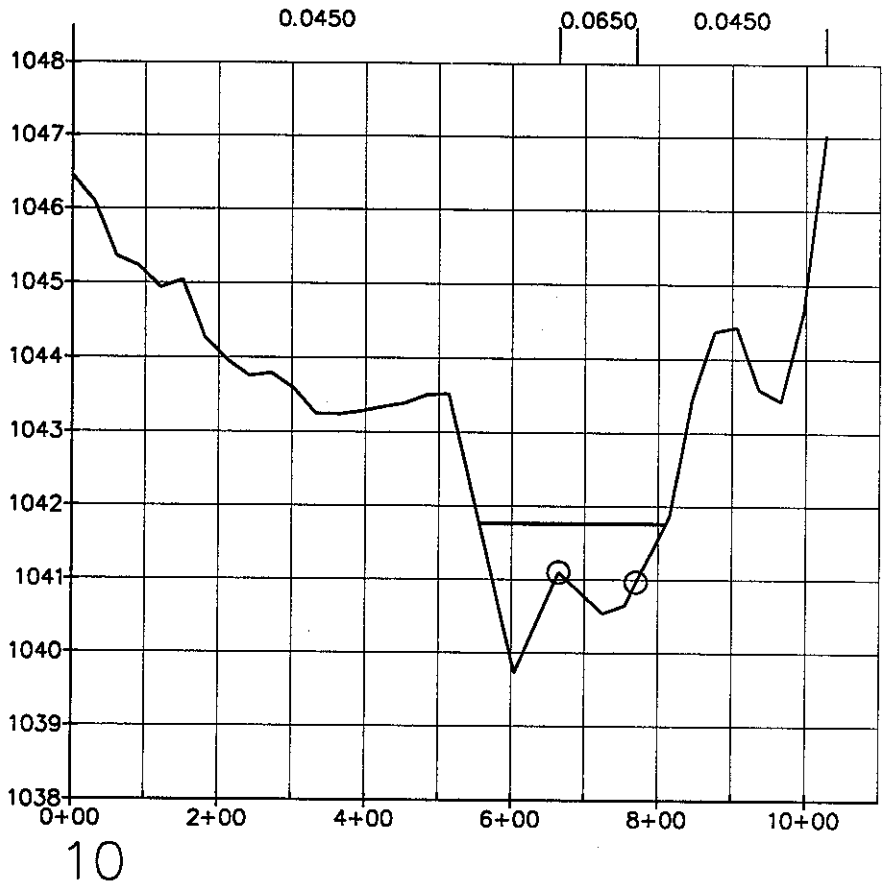
Cross-Section:	70	
Elevation:	992.54	ft MSL
Depth:	1.61	ft
Discharge:	975.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.3031	
Flow Regime:	Subcritical	
Flow Area:	446.82	sq ft
Average Velocity:	2.16	ft/s
Maximum Velocity:	2.65	ft/s
Composite n:	0.0491	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	546.17	ft
Wetted Top Width:	546.13	ft
Critical Slope:	0.0737	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S32–70

Entellus™

File: WASH-T1N-R5W-S32_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1041.76	ft MSL
Depth:	2.03	ft
Discharge:	660.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.3228	
Flow Regime:	Subcritical	
Flow Area:	252.95	sq ft
Average Velocity:	2.59	ft/s
Maximum Velocity:	3.21	ft/s
Composite n:	0.0537	
Hydraulic Radius:	0.99	ft
Wetted Perimeter:	255.04	ft
Wetted Top Width:	254.97	ft
Critical Slope:	0.0859	ft/ft

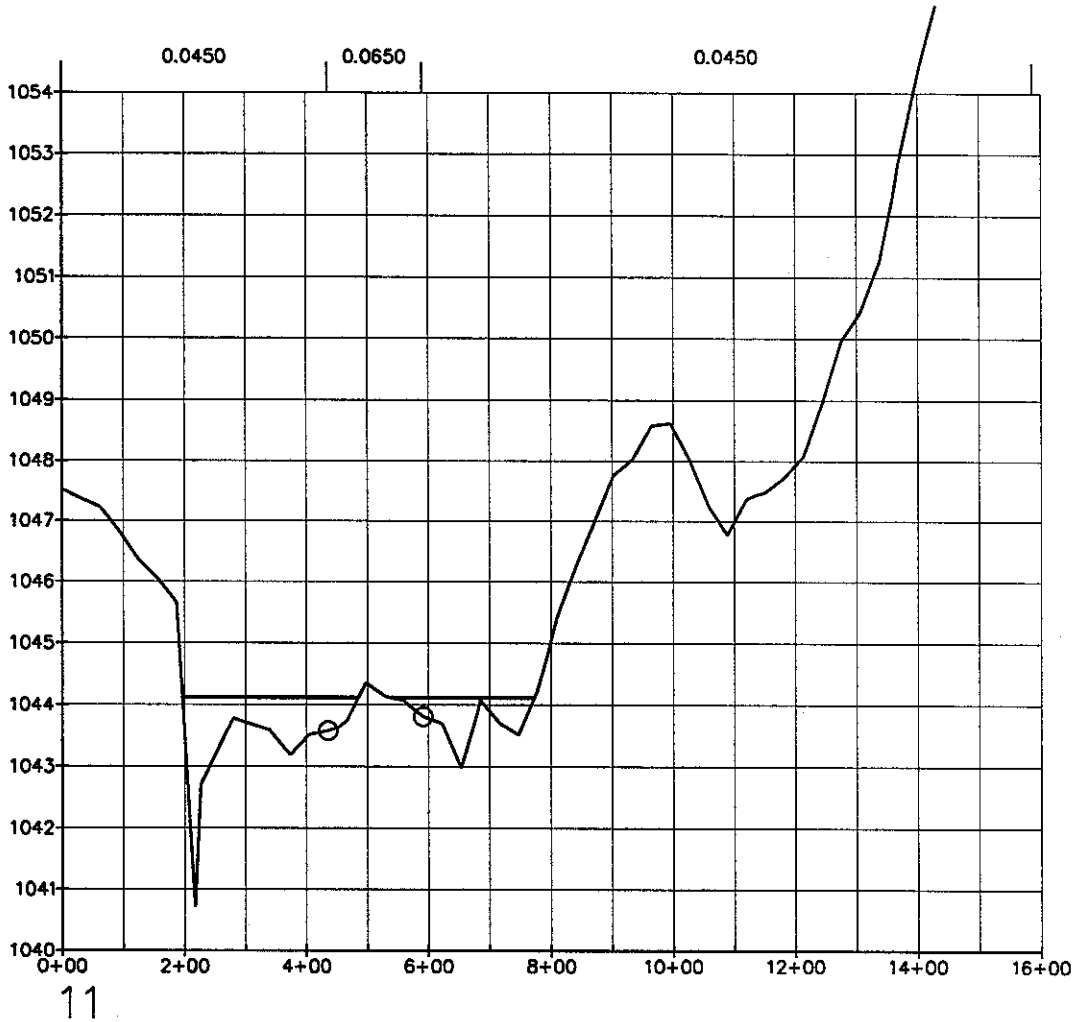
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S12–10

Entellus™

File: WASH-T1N-R6W-S12_X-SECTION-R14.dwg Date: 9/29/00



Note: X-section not used for delineation

Normal Depth Results

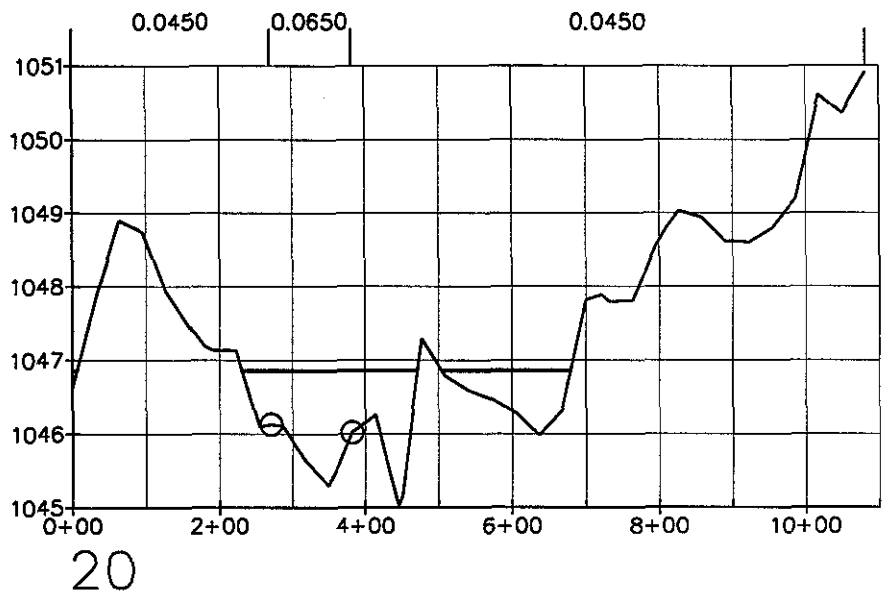
Cross-Section:	11	
Elevation:	1044.12	ft MSL
Depth:	3.41	ft
Discharge:	660.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.206	
Flow Regime:	Subcritical	
Flow Area:	305.86	sq ft
Average Velocity:	2.14	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0492	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	524.33	ft
Wetted Top Width:	523.78	ft
Critical Slope:	0.2456	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S12–11

Entellus™

File: WASH-T1N-R6W-S12_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1046.86	ft MSL
Depth:	1.84	ft
Discharge:	660.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.2721	
Flow Regime:	Subcritical	
Flow Area:	315.48	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.14	ft/s
Composite n:	0.0506	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	421.61	ft
Wetted Top Width:	421.46	ft
Critical Slope:	0.1005	ft/ft

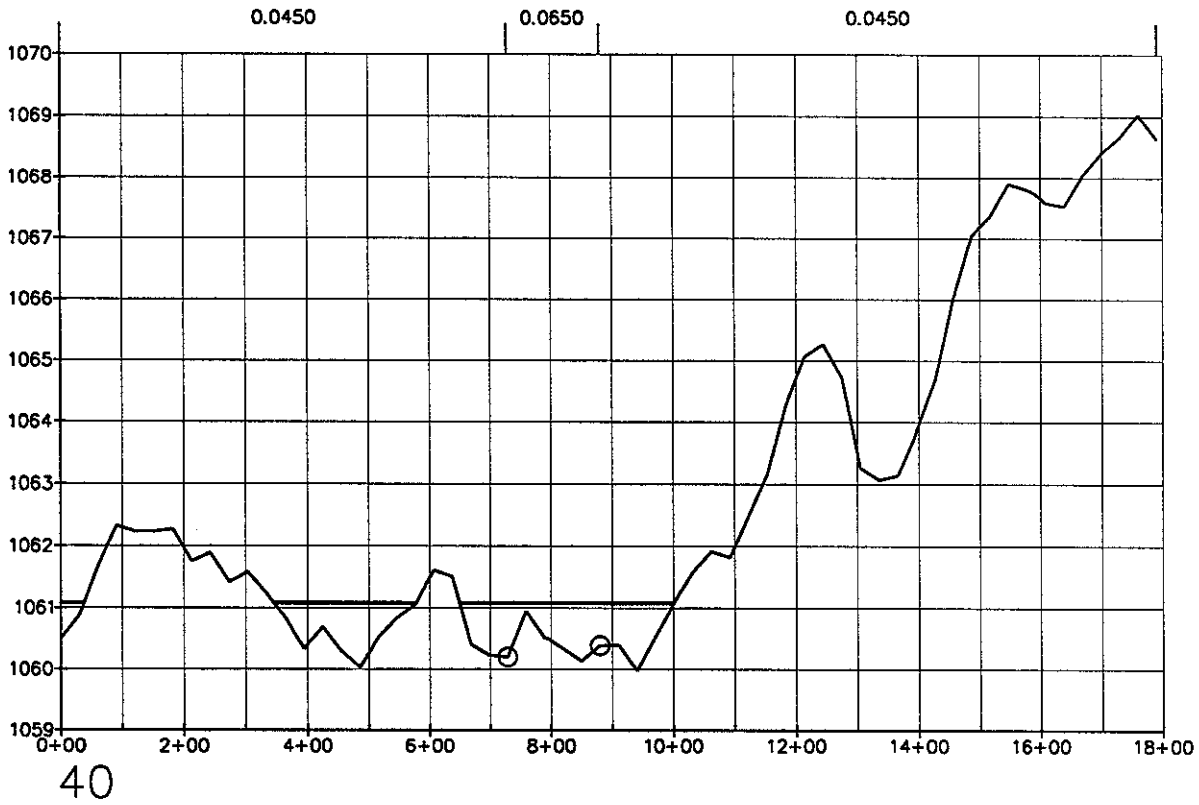
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S12–20

Entellus™

File: WASH-T1N-R6W-S12_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	40	
Elevation:	1061.08	ft MSL
Depth:	1.10	ft
Discharge:	660.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.3063	
Flow Regime:	Subcritical	
Flow Area:	362.73	sq ft
Average Velocity:	1.83	ft/s
Maximum Velocity:	2.18	ft/s
Composite n:	0.0502	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	620.67	ft
Wetted Top Width:	620.60	ft
Critical Slope:	0.0821	ft/ft

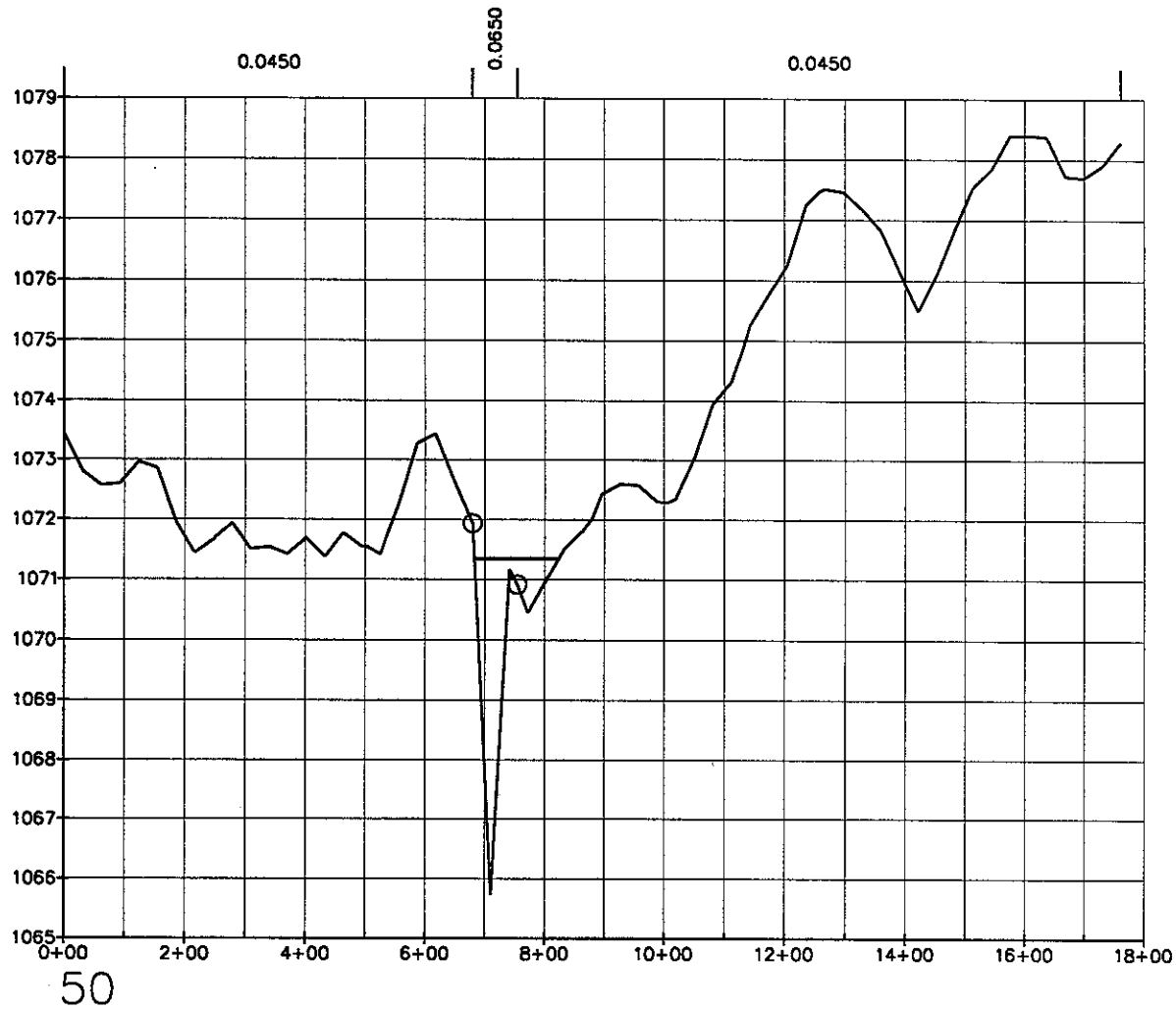
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S12–40

Entellus™

File: WASH-T1N-R6W-S12_X-SECTION-R14.dwg Date: 9/29/00



Note: X-section not used for delineation

Normal Depth Results

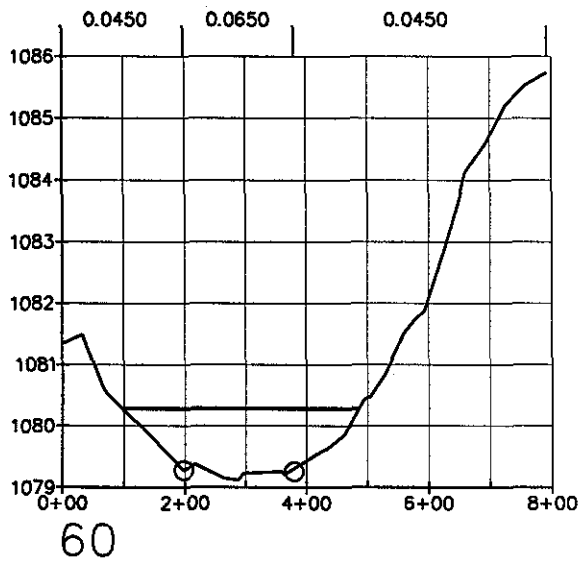
Cross-Section:	50	
Elevation:	1071.35	ft MSL
Depth:	5.63	ft
Discharge:	660.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.2375	
Flow Regime:	Subcritical	
Flow Area:	206.51	sq ft
Average Velocity:	3.21	ft/s
Maximum Velocity:	3.49	ft/s
Composite n:	0.0557	
Hydraulic Radius:	1.45	ft
Wetted Perimeter:	142.18	ft
Wetted Top Width:	141.12	ft
Critical Slope:	0.1539	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S12–50

Entellus™

File: WASH-T1N-R6W-S12_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

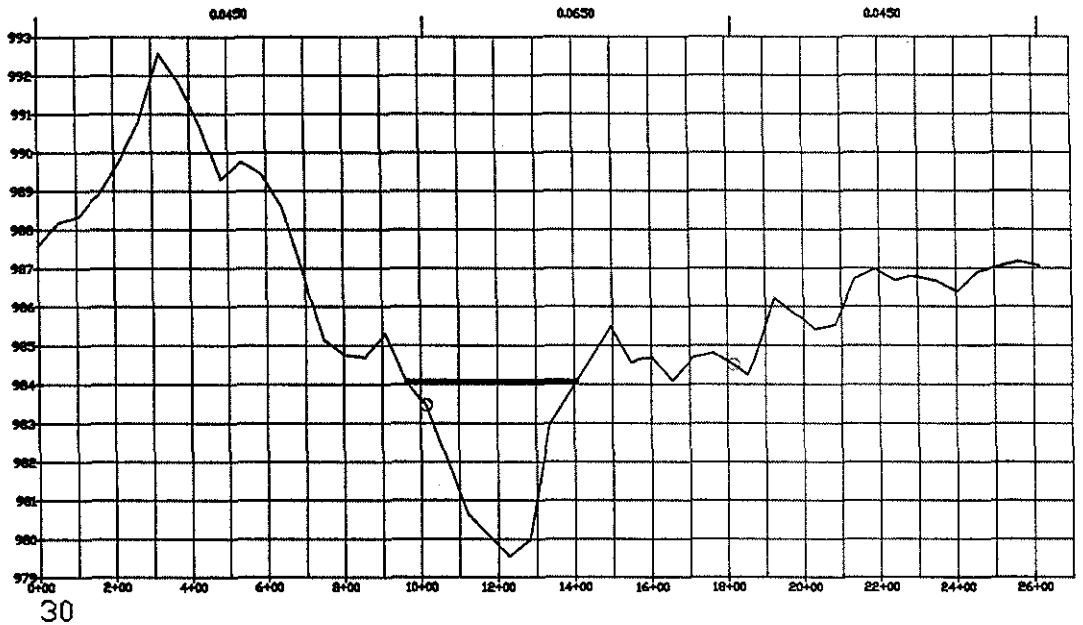
Cross-Section:	60	
Elevation:	1080.28	ft MSL
Depth:	1.16	ft
Discharge:	660.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.3563	
Flow Regime:	Subcritical	
Flow Area:	302.85	sq ft
Average Velocity:	2.19	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.0504	
Hydraulic Radius:	0.78	ft
Wetted Perimeter:	389.40	ft
Wetted Top Width:	389.39	ft
Critical Slope:	0.0599	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S12–60

Entellus™

File: WASH-T1N-R6W-S12_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	30	
Elevation:	984.07	ft MSL
Depth:	4.52	ft
Discharge:	3550.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2774	
Flow Regime:	Subcritical	
Flow Area:	1061.73	sq ft
Average Velocity:	3.33	ft/s
Maximum Velocity:	3.37	ft/s
Composite n:	0.0628	
Hydraulic Radius:	2.41	ft
Wetted Perimeter:	441.25	ft
Wetted Top Width:	441.11	ft
Critical Slope:	0.0802	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

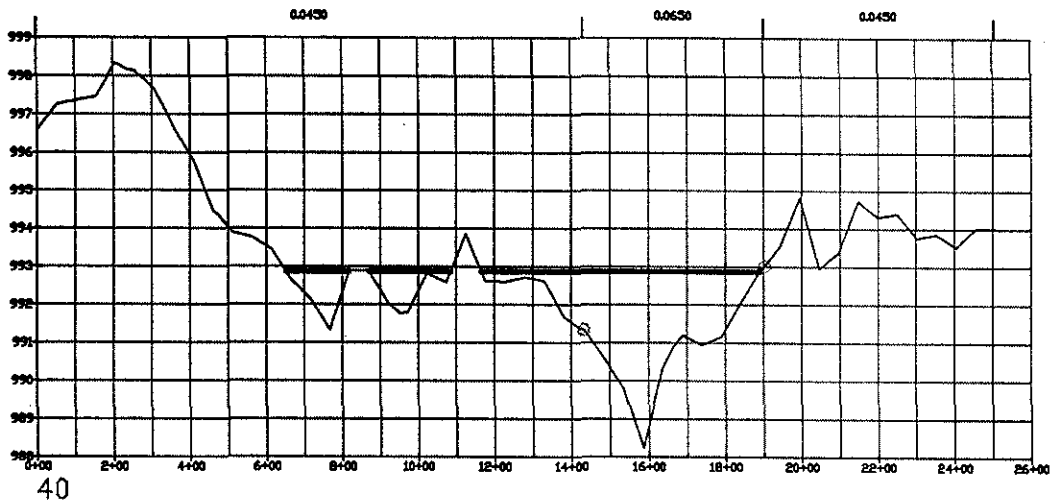
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–30

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/06/03



Normal Depth Results

Cross-Section:	40	
Elevation:	992.87	ft MSL
Depth:	4.62	ft
Discharge:	3520.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2125	
Flow Regime:	Subcritical	
Flow Area:	1358.48	sq ft
Average Velocity:	2.59	ft/s
Maximum Velocity:	2.91	ft/s
Composite n:	0.0537	
Hydraulic Radius:	1.23	ft
Wetted Perimeter:	1104.13	ft
Wetted Top Width:	1103.96	ft
Critical Slope:	0.1466	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

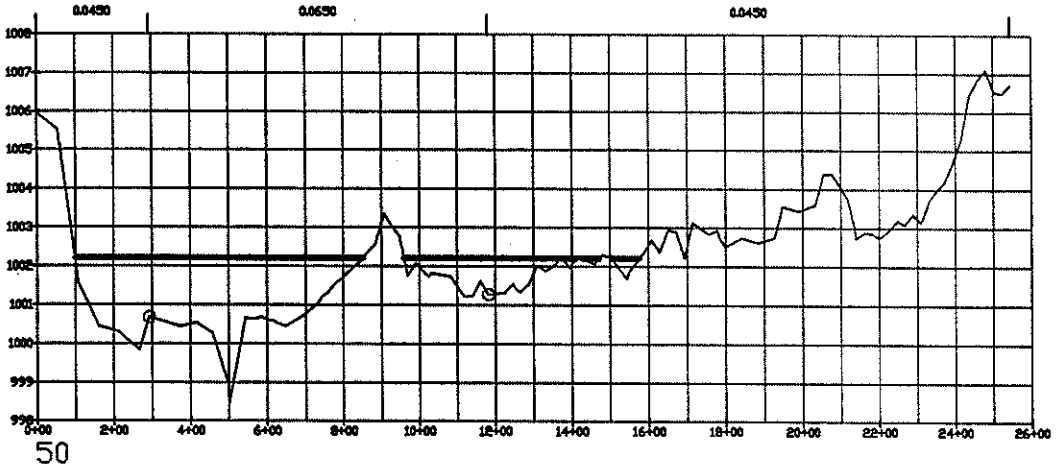
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–40

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	50	
Elevation:	1002.21	ft MSL
Depth:	3.74	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.0045	ft/ft
Froude Number:	0.1868	
Flow Regime:	Subcritical	
Flow Area:	1458.36	sq ft
Average Velocity:	2.05	ft/s
Maximum Velocity:	3.15	ft/s
Composite n:	0.0572	
Hydraulic Radius:	1.11	ft
Wetted Perimeter:	1319.72	ft
Wetted Top Width:	1319.50	ft
Critical Slope:	0.1558	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

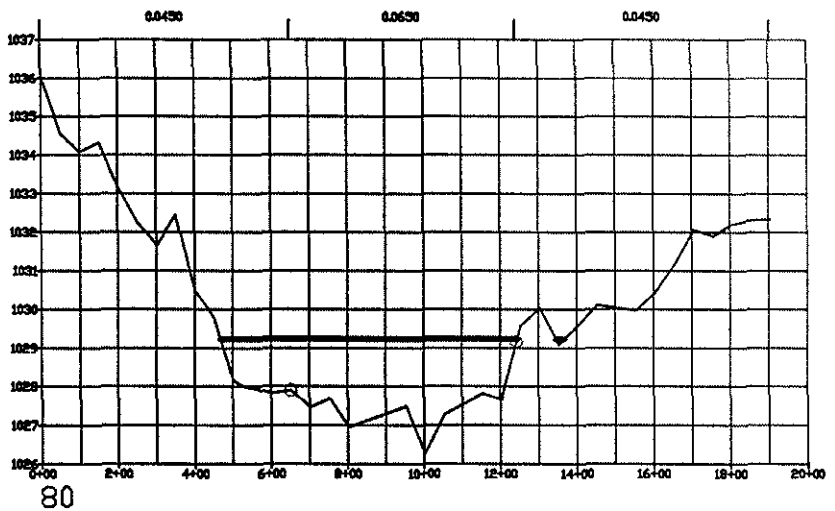
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–50

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	80	
Elevation:	1029.23	ft MSL
Depth:	2.96	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.0045	ft/ft
Froude Number:	0.237	
Flow Regime:	Subcritical	
Flow Area:	1291.39	sq ft
Average Velocity:	2.32	ft/s
Maximum Velocity:	2.46	ft/s
Composite n:	0.0601	
Hydraulic Radius:	1.62	ft
Wetted Perimeter:	798.02	ft
Wetted Top Width:	797.94	ft
Critical Slope:	0.0817	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

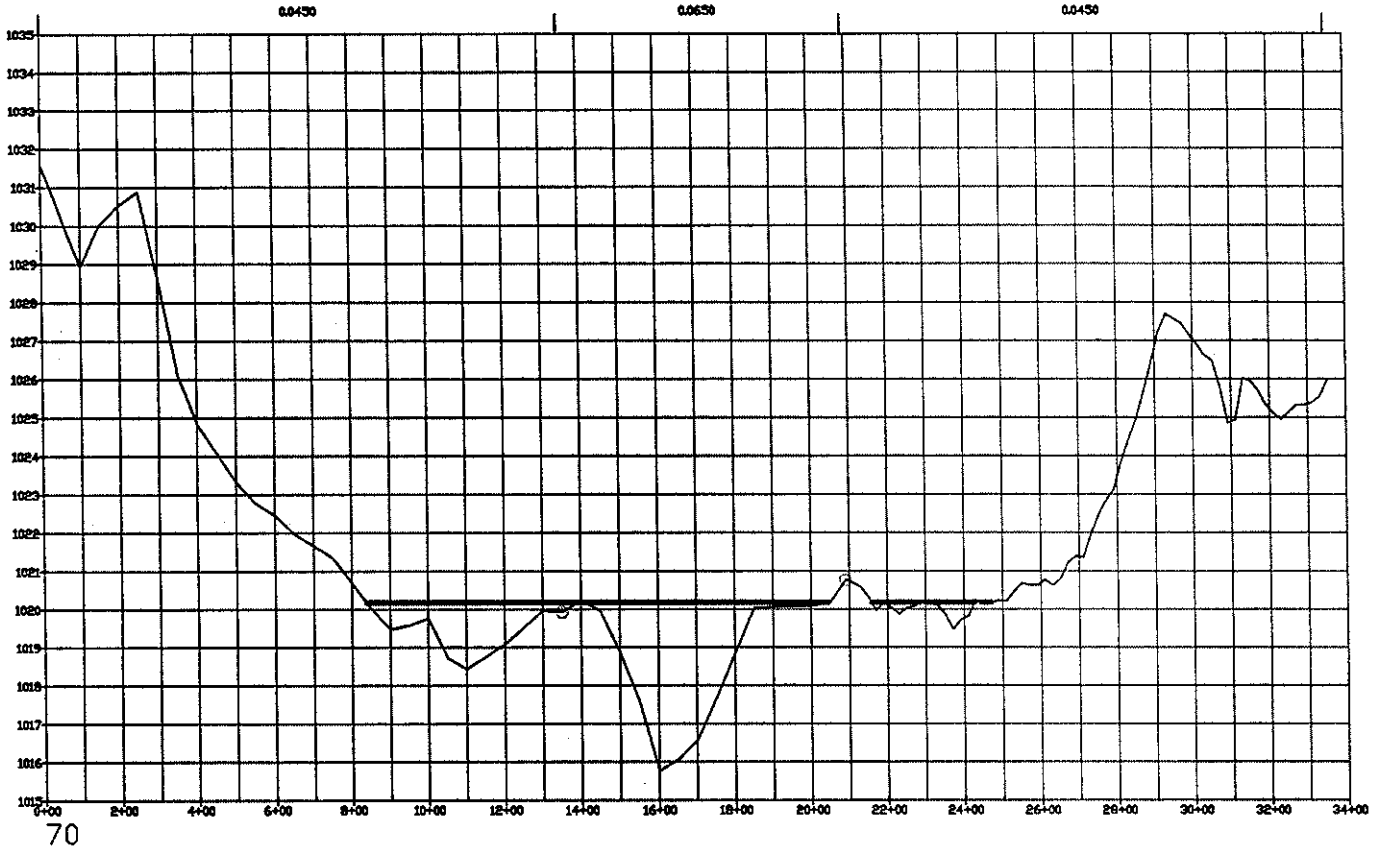
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–80

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	70	
Elevation:	1020.18	ft MSL
Depth:	4.41	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.0045	ft/ft
Froude Number:	0.1657	
Flow Regime:	Subcritical	
Flow Area:	1514.74	sq ft
Average Velocity:	1.97	ft/s
Maximum Velocity:	2.03	ft/s
Composite n:	0.0547	
Hydraulic Radius:	1.03	ft
Wetted Perimeter:	1473.23	ft
Wetted Top Width:	1473.09	ft
Critical Slope:	0.1842	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

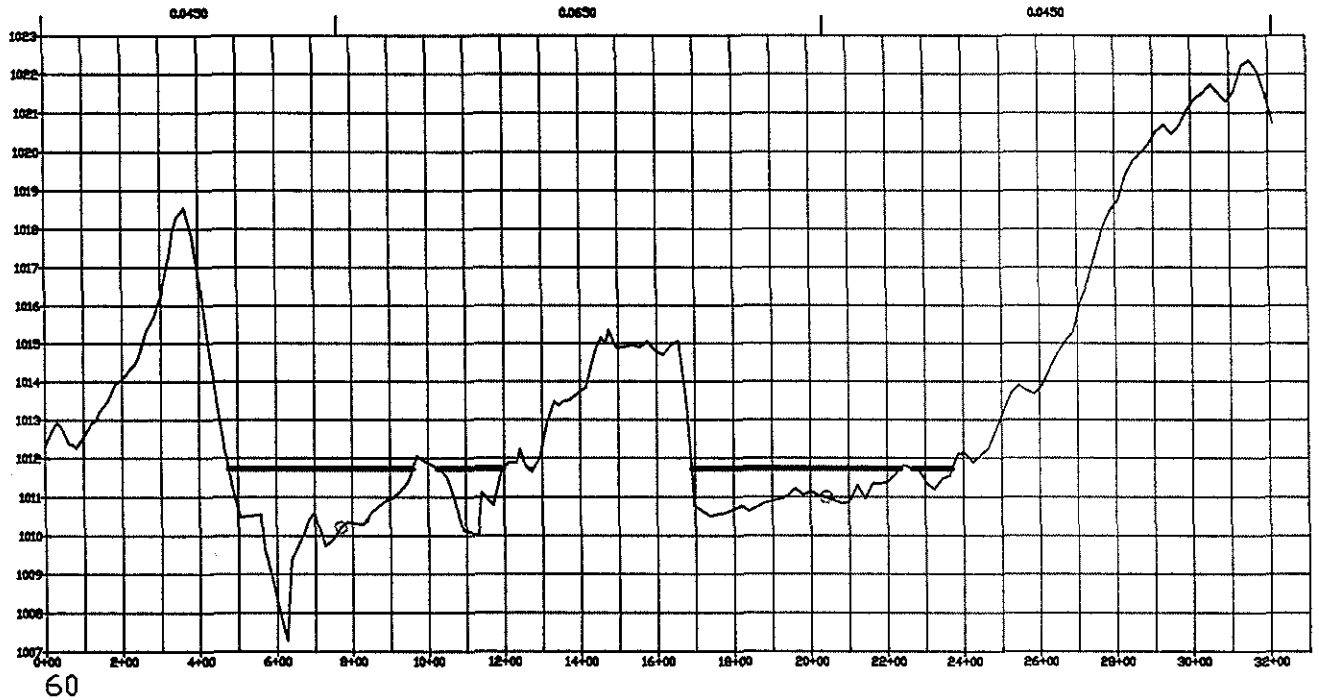
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–70

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	60	
Elevation:	1011.74	ft MSL
Depth:	4.45	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.0045	ft/ft
Froude Number:	0.1855	
Flow Regime:	Subcritical	
Flow Area:	1347.06	sq ft
Average Velocity:	2.22	ft/s
Maximum Velocity:	3.39	ft/s
Composite n:	0.0564	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	1321.15	ft
Wetted Top Width:	1320.57	ft
Critical Slope:	0.2004	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

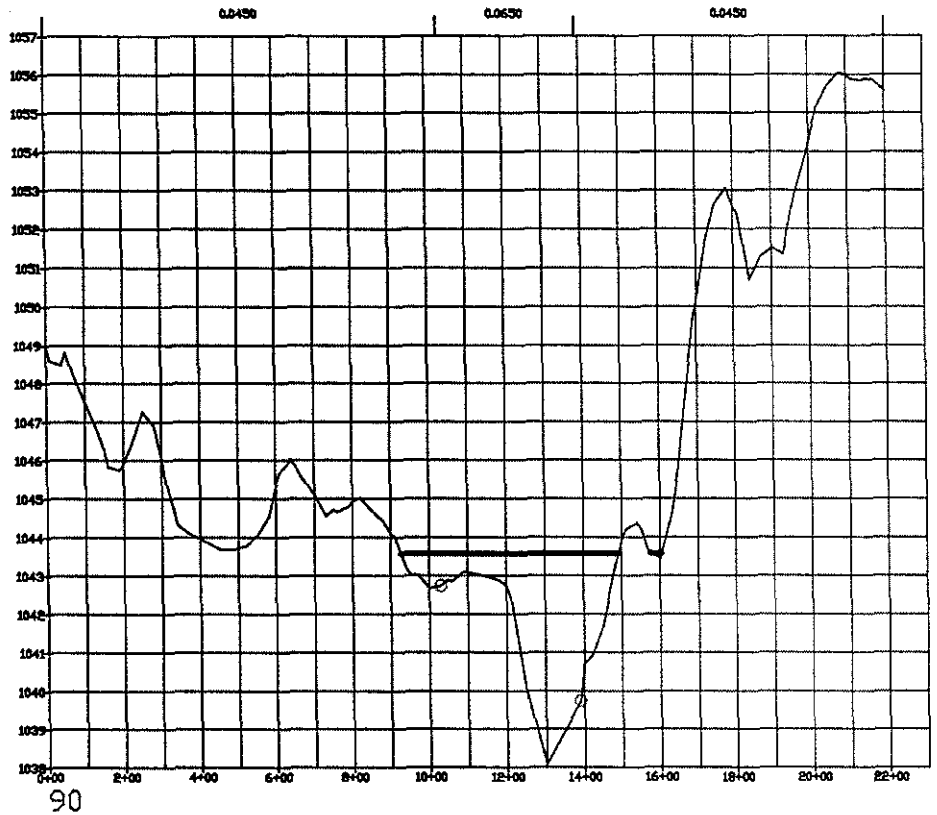
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–60

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	90	
Elevation:	1043.57	ft MSL
Depth:	5.49	ft
Discharge:	2990.00	cfs
Energy Gradient:	0.0045	ft/ft
Froude Number:	0.2021	
Flow Regime:	Subcritical	
Flow Area:	1113.17	sq ft
Average Velocity:	2.70	ft/s
Maximum Velocity:	2.91	ft/s
Composite n:	0.0575	
Hydraulic Radius:	1.87	ft
Wetted Perimeter:	593.80	ft
Wetted Top Width:	593.55	ft
Critical Slope:	0.114	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

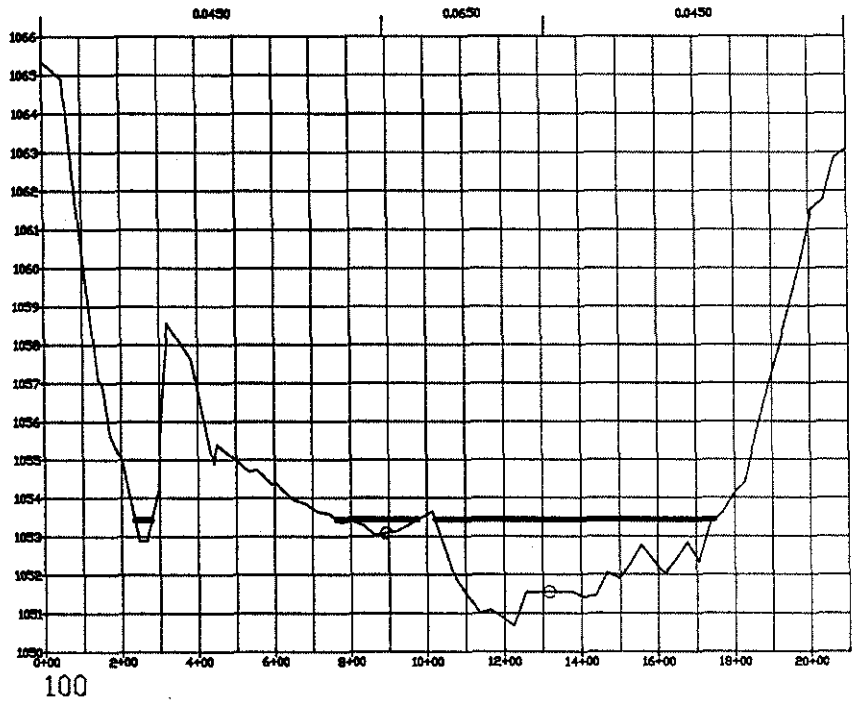
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–90

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	100	
Elevation:	1053.44	ft MSL
Depth:	2.76	ft
Discharge:	2910.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2586	
Flow Regime:	Subcritical	
Flow Area:	1194.19	sq ft
Average Velocity:	2.43	ft/s
Maximum Velocity:	2.80	ft/s
Composite n:	0.0531	
Hydraulic Radius:	1.21	ft
Wetted Perimeter:	983.86	ft
Wetted Top Width:	983.74	ft
Critical Slope:	0.087	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

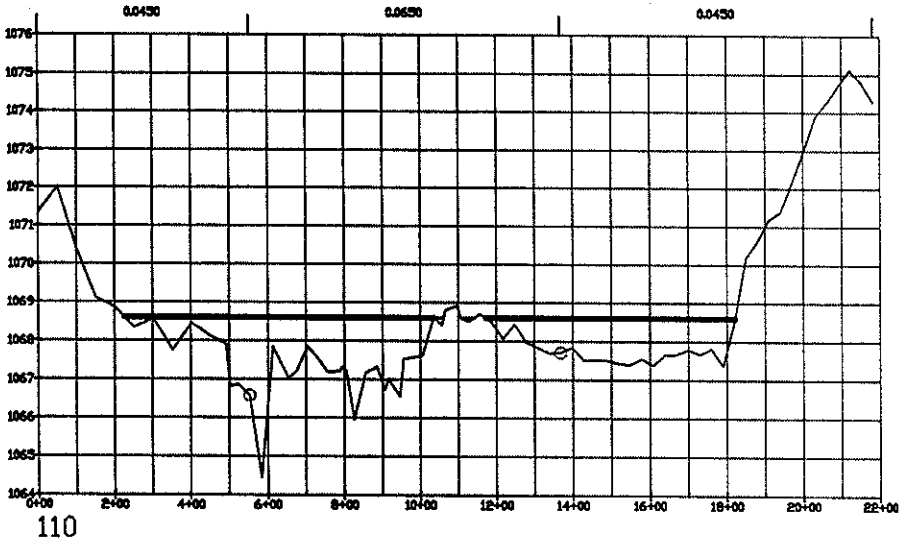
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2-WASH: T1S-R6W-S13(PHILLIPS-SOUTH)-100

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	110	
Elevation:	1068.61	ft MSL
Depth:	4.17	ft
Discharge:	2910.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.168	
Flow Regime:	Subcritical	
Flow Area:	1494.95	sq ft
Average Velocity:	1.93	ft/s
Maximum Velocity:	2.33	ft/s
Composite n:	0.0551	
Hydraulic Radius:	0.99	ft
Wetted Perimeter:	1516.65	ft
Wetted Top Width:	1516.09	ft
Critical Slope:	0.1873	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

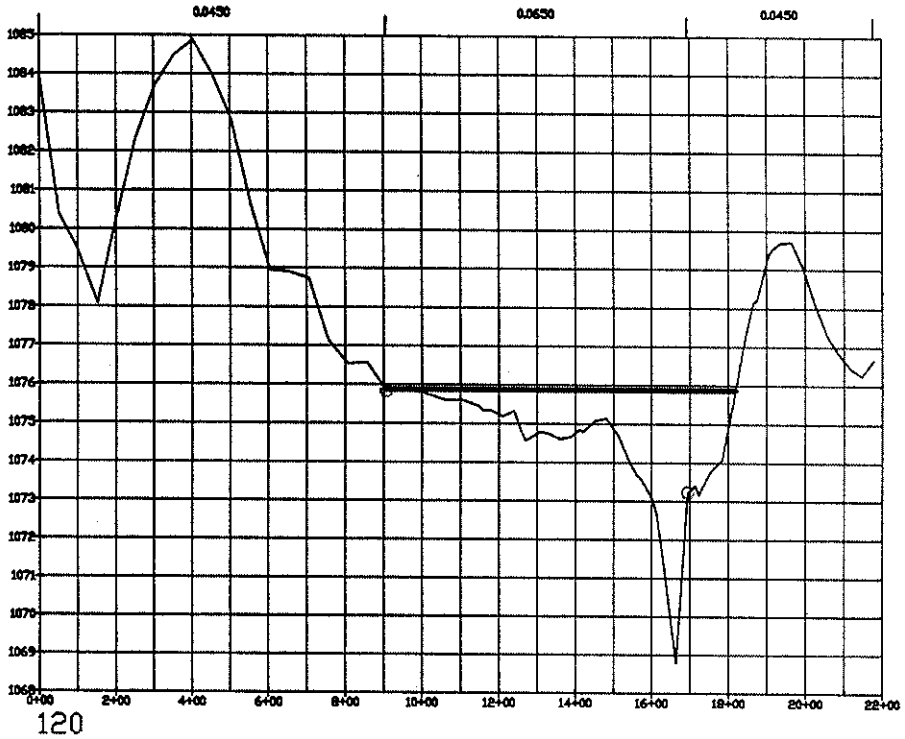
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–110

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	120	
Elevation:	1075.88	ft MSL
Depth:	7.08	ft
Discharge:	2780.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.1482	
Flow Regime:	Subcritical	
Flow Area:	1242.52	sq ft
Average Velocity:	2.24	ft/s
Maximum Velocity:	3.62	ft/s
Composite n:	0.0623	
Hydraulic Radius:	1.36	ft
Wetted Perimeter:	915.52	ft
Wetted Top Width:	914.95	ft
Critical Slope:	0.2658	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

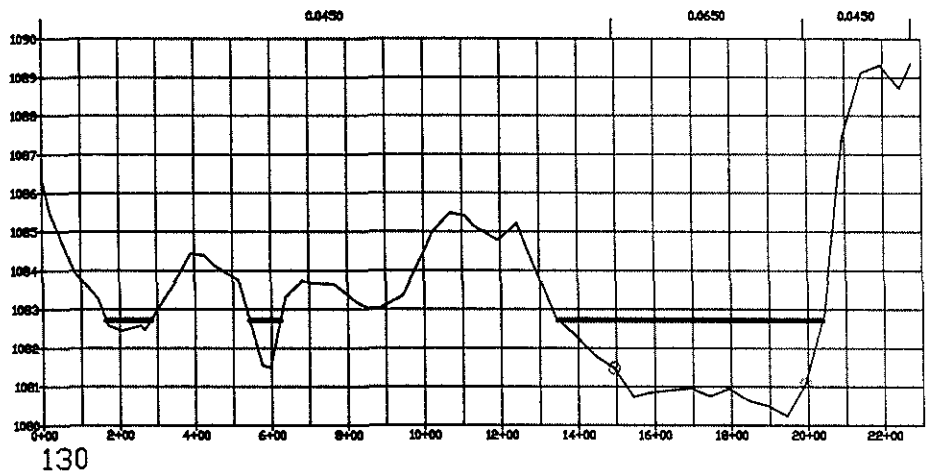
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–120

Entellus™

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

Cross-Section:	130	
Elevation:	1082.72	ft MSL
Depth:	2.47	ft
Discharge:	2780.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2629	
Flow Regime:	Subcritical	
Flow Area:	1185.23	sq ft
Average Velocity:	2.35	ft/s
Maximum Velocity:	2.52	ft/s
Composite n:	0.0566	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	890.44	ft
Wetted Top Width:	890.34	ft
Critical Slope:	0.0786	ft/ft

File: T1S-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03

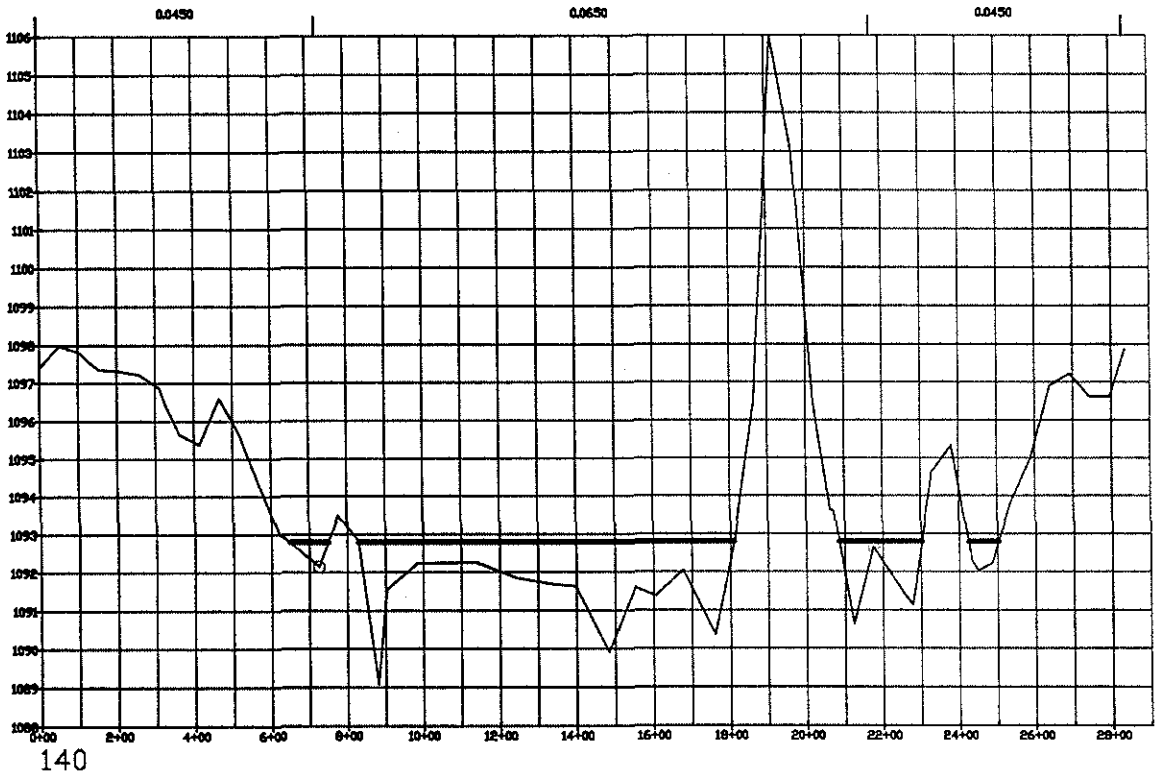
ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–130

Entellus™



Normal Depth Results

Cross-Section:	140	
Elevation:	1092.80	ft MSL
Depth:	3.72	ft
Discharge:	2780.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.169	
Flow Regime:	Subcritical	
Flow Area:	1504.18	sq ft
Average Velocity:	1.84	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0611	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	1380.35	ft
Wetted Top Width:	1379.77	ft
Critical Slope:	0.1796	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

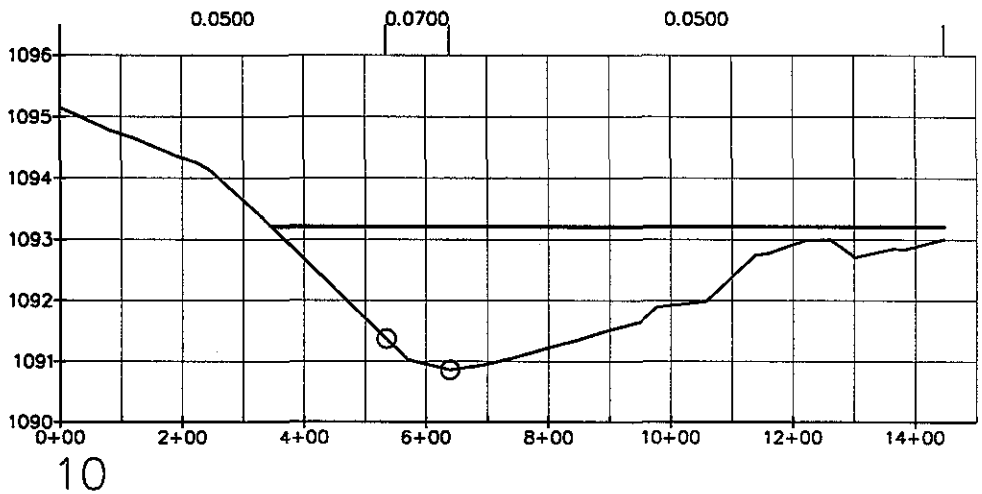
LUKE WASH FCD 99-03

AMMENDED WITH FCD 2002C033-1

FIGURE E2–WASH: T1S–R6W–S13(PHILLIPS–SOUTH)–140

Entellus™

File: T13-R6W-S13(PHILLIPS-SOUTH)_X_Section.dwg Date: 05/08/03



Normal Depth Results

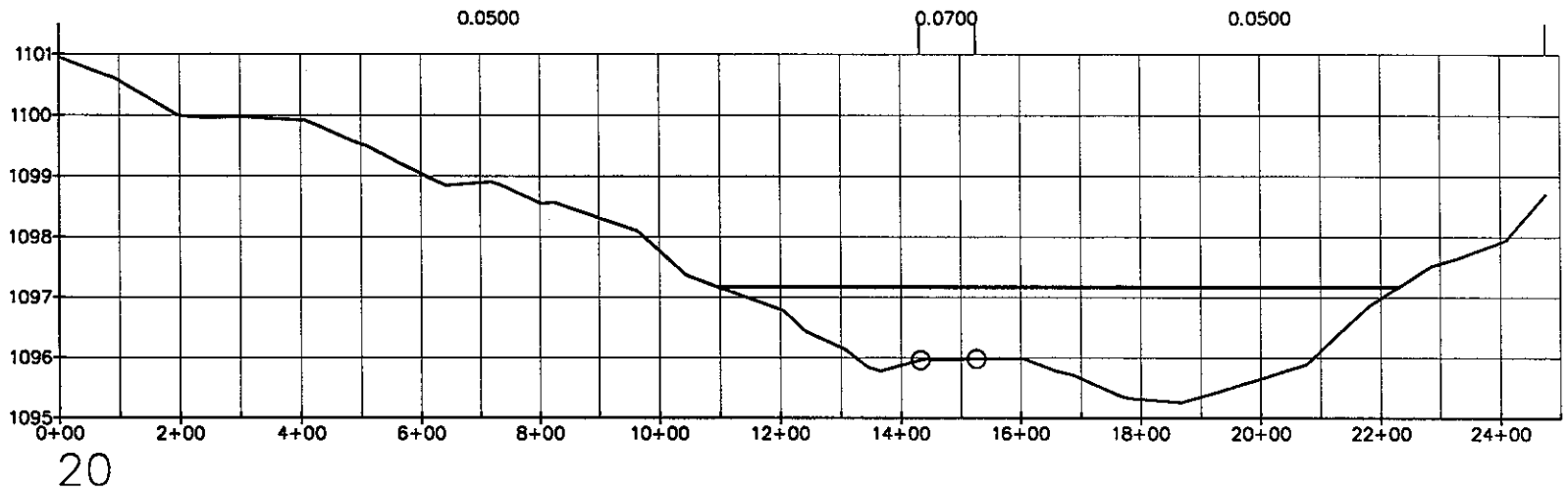
Cross-Section:	10	
Elevation:	1093.21	ft MSL
Depth:	2.35	ft
Discharge:	3470.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2984	
Flow Regime:	Subcritical	
Flow Area:	1336.46	sq ft
Average Velocity:	2.62	ft/s
Maximum Velocity:	2.87	ft/s
Composite n:	0.052	
Hydraulic Radius:	1.21	ft
Wetted Perimeter:	1101.61	ft
Wetted Top Width:	1101.60	ft
Critical Slope:	0.0713	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–10

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

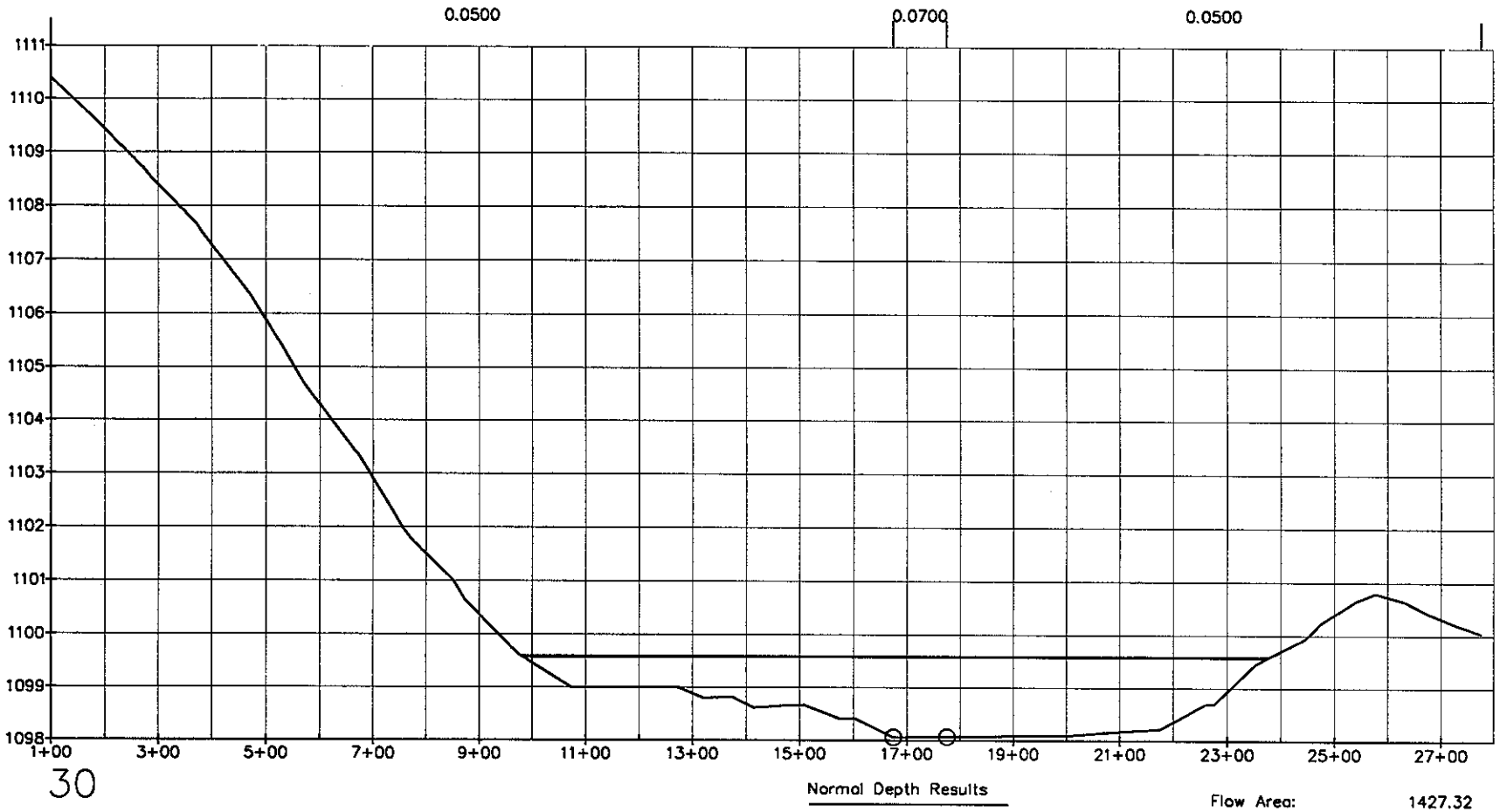
Cross-Section:	20	
Elevation:	1097.17	ft MSL
Depth:	1.91	ft
Discharge:	3470.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3364	
Flow Regime:	Subcritical	
Flow Area:	1315.98	sq ft
Average Velocity:	2.64	ft/s
Maximum Velocity:	2.90	ft/s
Composite n:	0.0517	
Hydraulic Radius:	1.16	ft
Wetted Perimeter:	1131.49	ft
Wetted Top Width:	1131.48	ft
Critical Slope:	0.0606	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–20

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

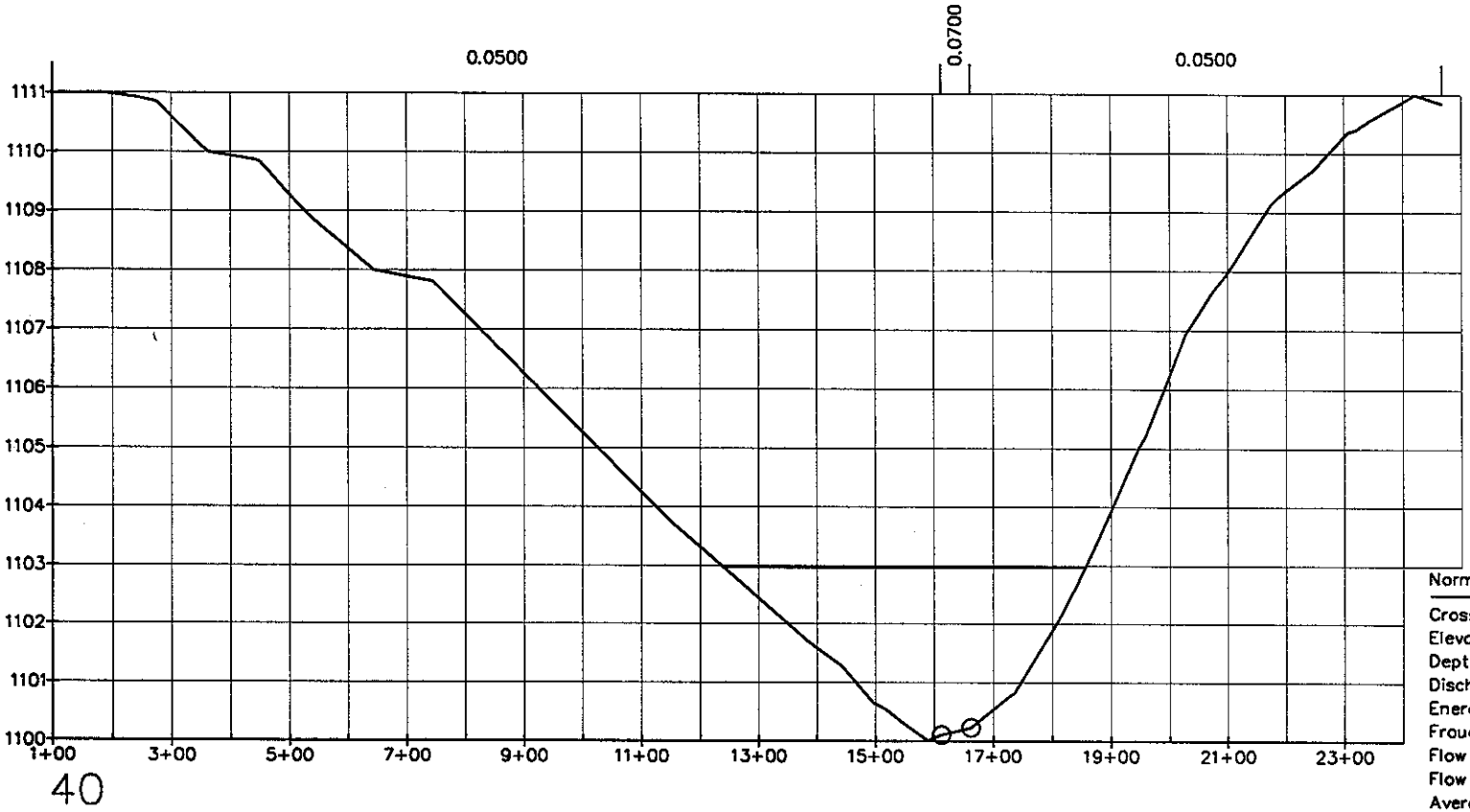
Cross-Section:	30		Flow Area:	1427.32	sq ft
Elevation:	1099.58	ft MSL	Average Velocity:	2.41	ft/s
Depth:	1.52	ft	Maximum Velocity:	2.73	ft/s
Discharge:	3470.00	cfs	Composite n:	0.0515	
Energy Gradient:	0.0064	ft/ft	Hydraulic Radius:	1.02	ft
Froude Number:	0.3472		Wetted Perimeter:	1396.43	ft
Flow Regime:	Subcritical		Wetted Top Width:	1396.42	ft
			Critical Slope:	0.0569	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–30

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

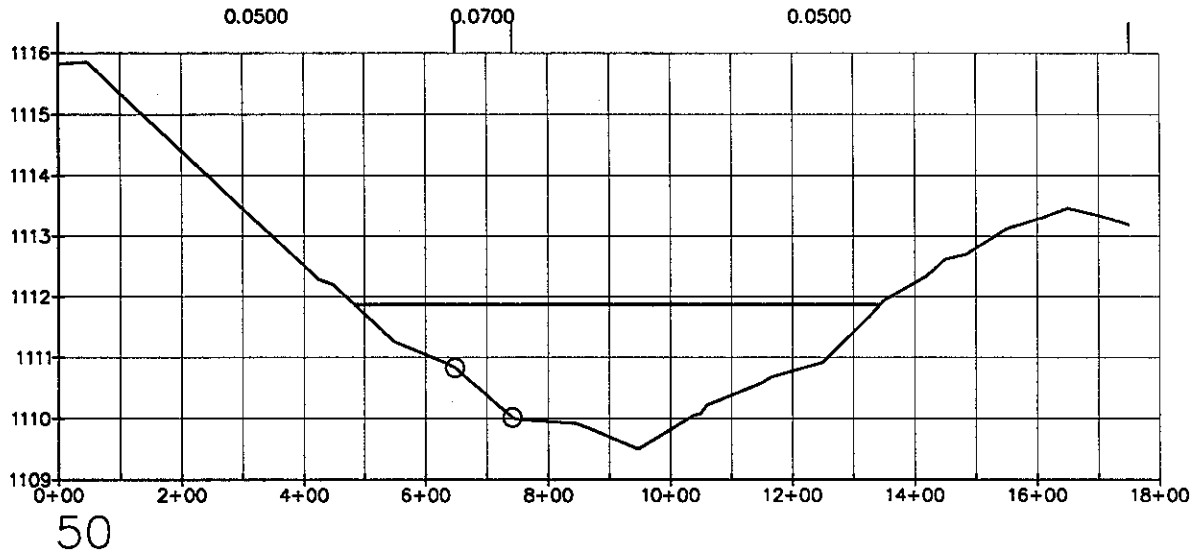
Cross-Section:	40	
Elevation:	1102.98	ft MSL
Depth:	2.97	ft
Discharge:	3470.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3362	
Flow Regime:	Subcritical	
Flow Area:	1056.09	sq ft
Average Velocity:	3.29	ft/s
Maximum Velocity:	3.39	ft/s
Composite n:	0.0517	
Hydraulic Radius:	1.71	ft
Wetted Perimeter:	617.96	ft
Wetted Top Width:	617.93	ft
Critical Slope:	0.0563	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–40

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

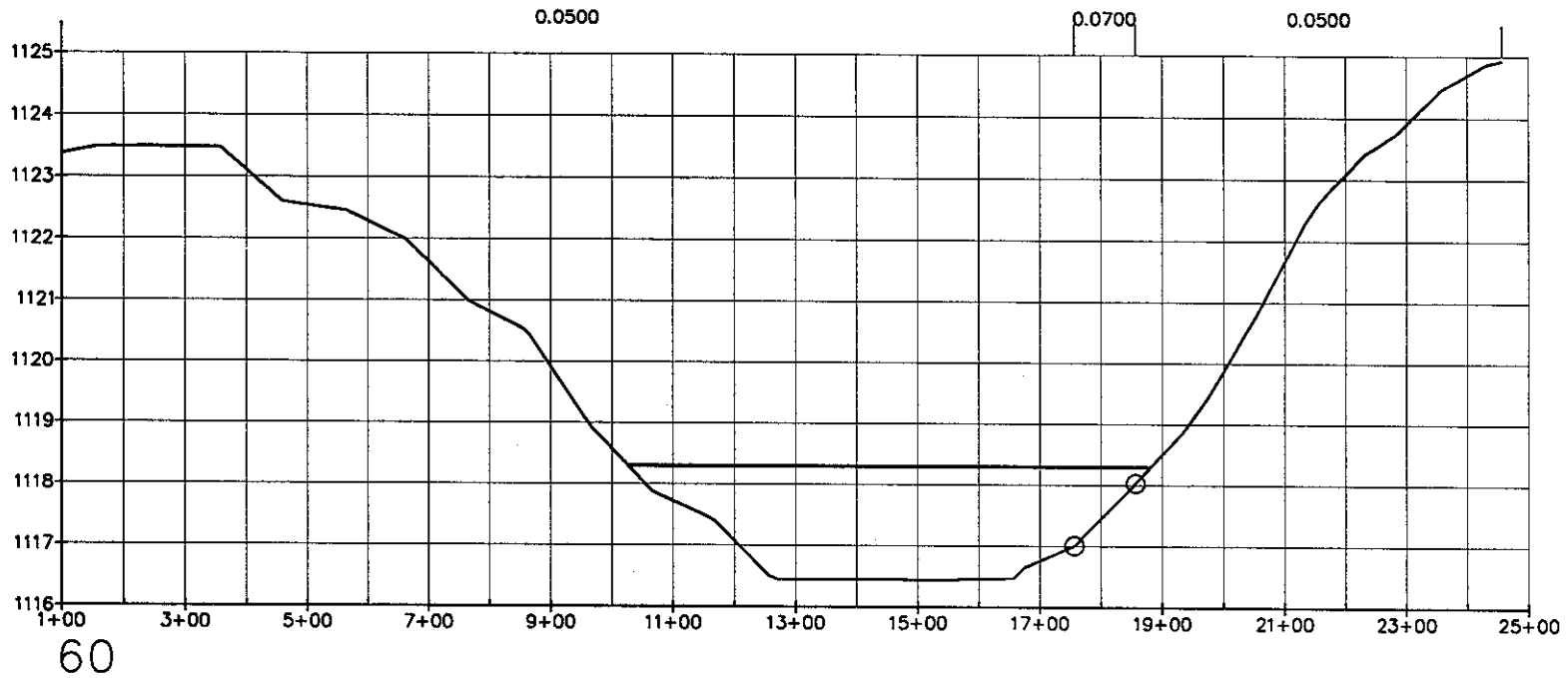
Cross-Section:	50	
Elevation:	1111.87	ft MSL
Depth:	2.36	ft
Discharge:	3470.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3408	
Flow Regime:	Subcritical	
Flow Area:	1168.48	sq ft
Average Velocity:	2.95	ft/s
Maximum Velocity:	3.19	ft/s
Composite n:	0.0523	
Hydraulic Radius:	1.36	ft
Wetted Perimeter:	859.47	ft
Wetted Top Width:	859.45	ft
Critical Slope:	0.0622	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–50

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

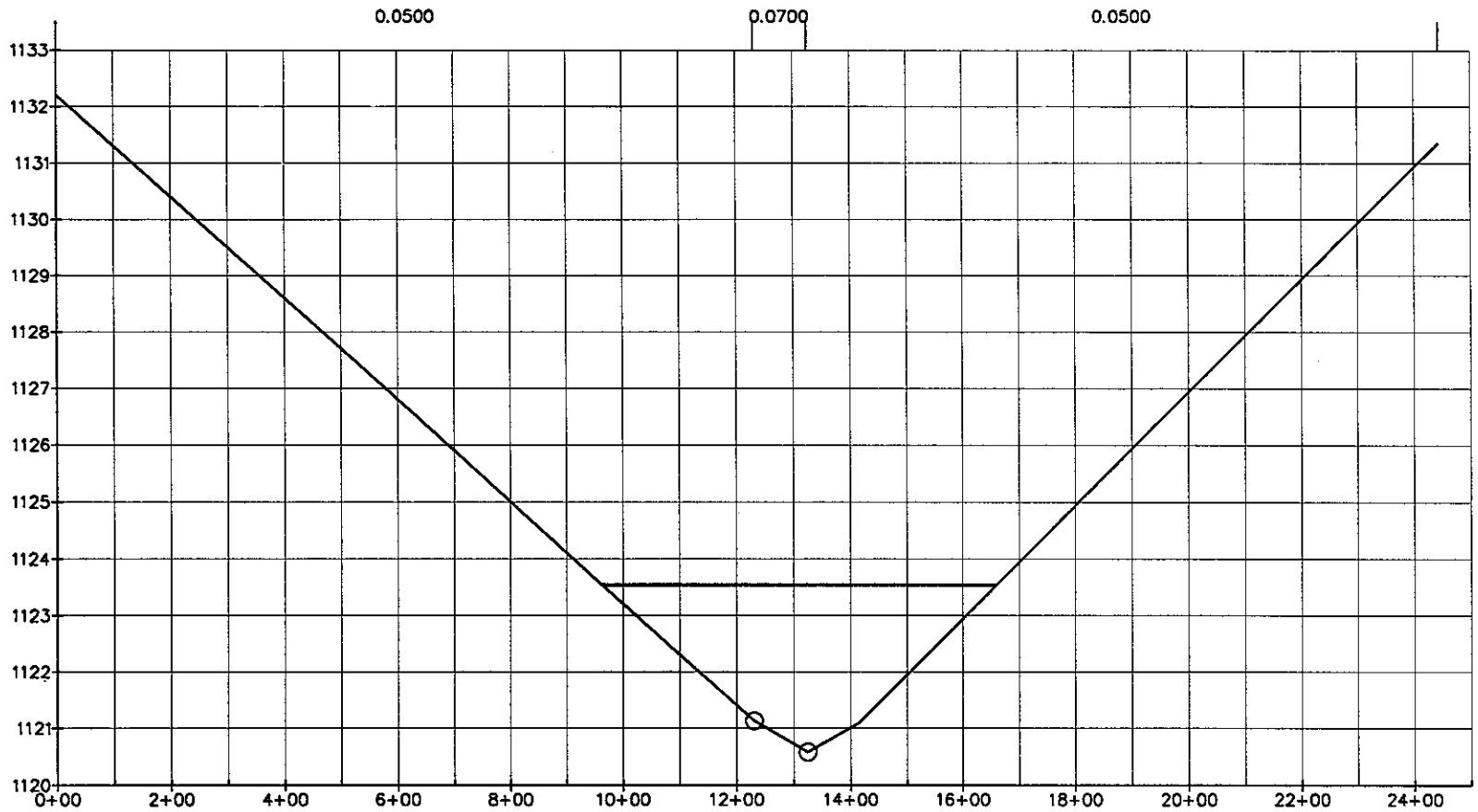
Cross-Section:	60	
Elevation:	1118.29	ft MSL
Depth:	1.85	ft
Discharge:	3470.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3863	
Flow Regime:	Subcritical	
Flow Area:	1162.72	sq ft
Average Velocity:	2.98	ft/s
Maximum Velocity:	3.10	ft/s
Composite n:	0.0525	
Hydraulic Radius:	1.36	ft
Wetted Perimeter:	854.34	ft
Wetted Top Width:	854.32	ft
Critical Slope:	0.0491	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–60

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



70

Normal Depth Results

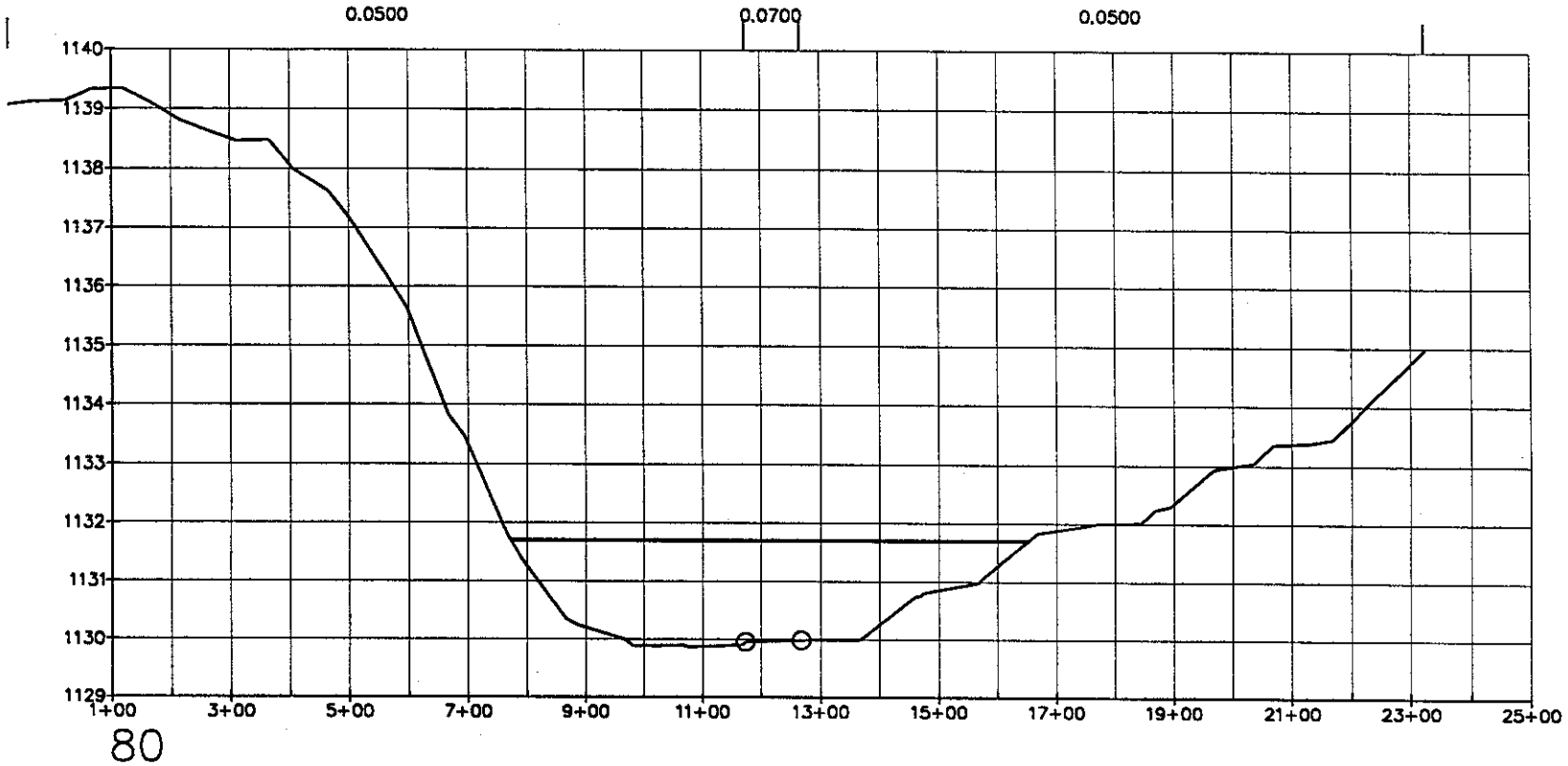
Cross-Section:	70		Flow Area:	1118.72	sq ft
Elevation:	1123.54	ft MSL	Average Velocity:	3.12	ft/s
Depth:	2.96	ft	Maximum Velocity:	3.29	ft/s
Discharge:	3470.00	cfs	Composite n:	0.0529	
Energy Gradient:	0.0064	ft/ft	Hydraulic Radius:	1.61	ft
Froude Number:	0.3177		Wetted Perimeter:	697.01	ft
Flow Regime:	Subcritical		Wetted Top Width:	696.99	ft
			Critical Slope:	0.0639	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–70

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



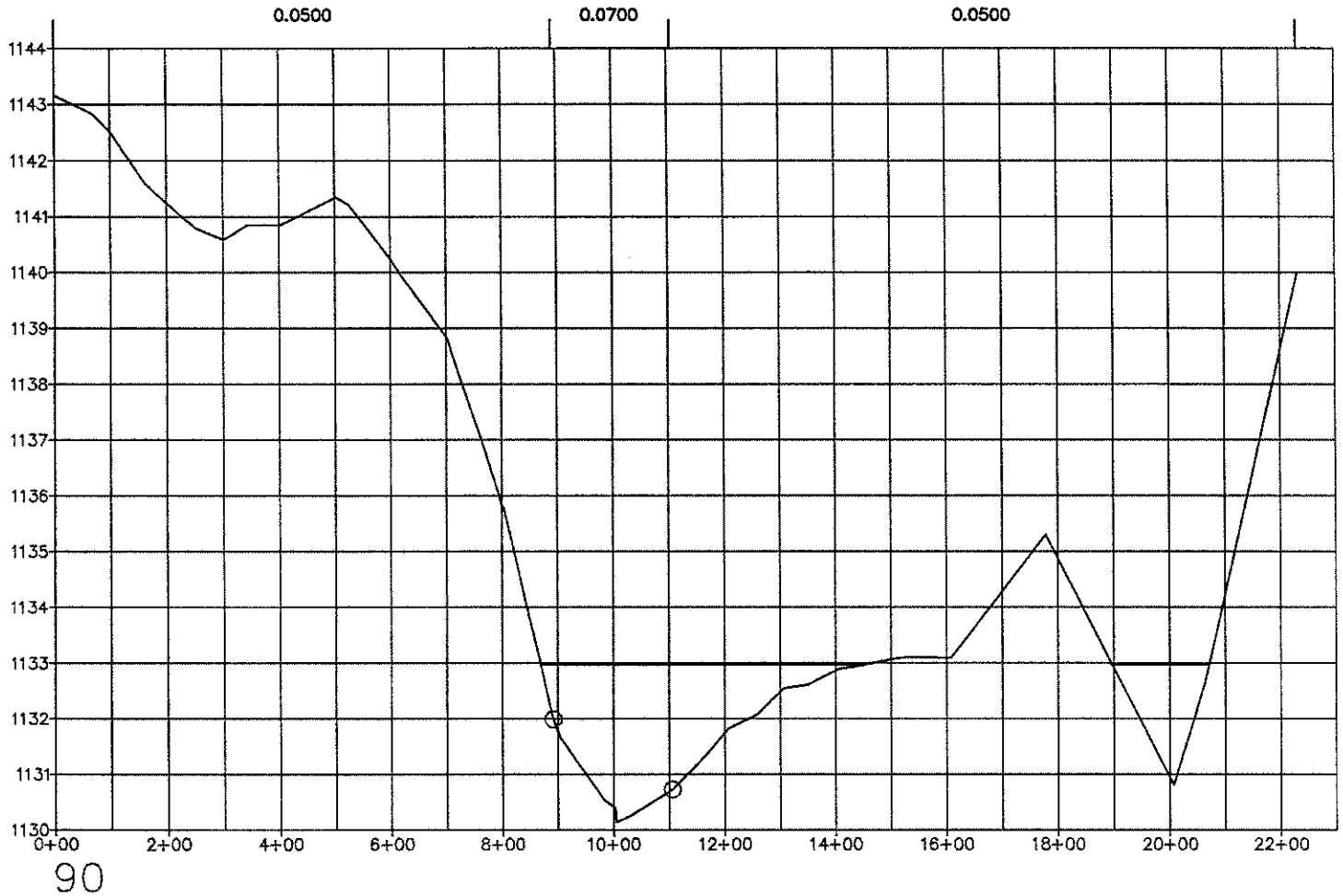
Normal Depth Results					
Cross-Section:	80		Flow Area:	1164.29	sq ft
Elevation:	1131.70	ft MSL	Average Velocity:	2.79	ft/s
Depth:	1.83	ft	Maximum Velocity:	3.09	ft/s
Discharge:	3240.00	cfs	Composite n:	0.0523	
Energy Gradient:	0.0064	ft/ft	Hydraulic Radius:	1.32	ft
Froude Number:	0.3629		Wetted Perimeter:	879.51	ft
Flow Regime:	Subcritical		Wetted Top Width:	879.49	ft
			Critical Slope:	0.0498	ft/ft

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-80

Entellus™



Normal Depth Results

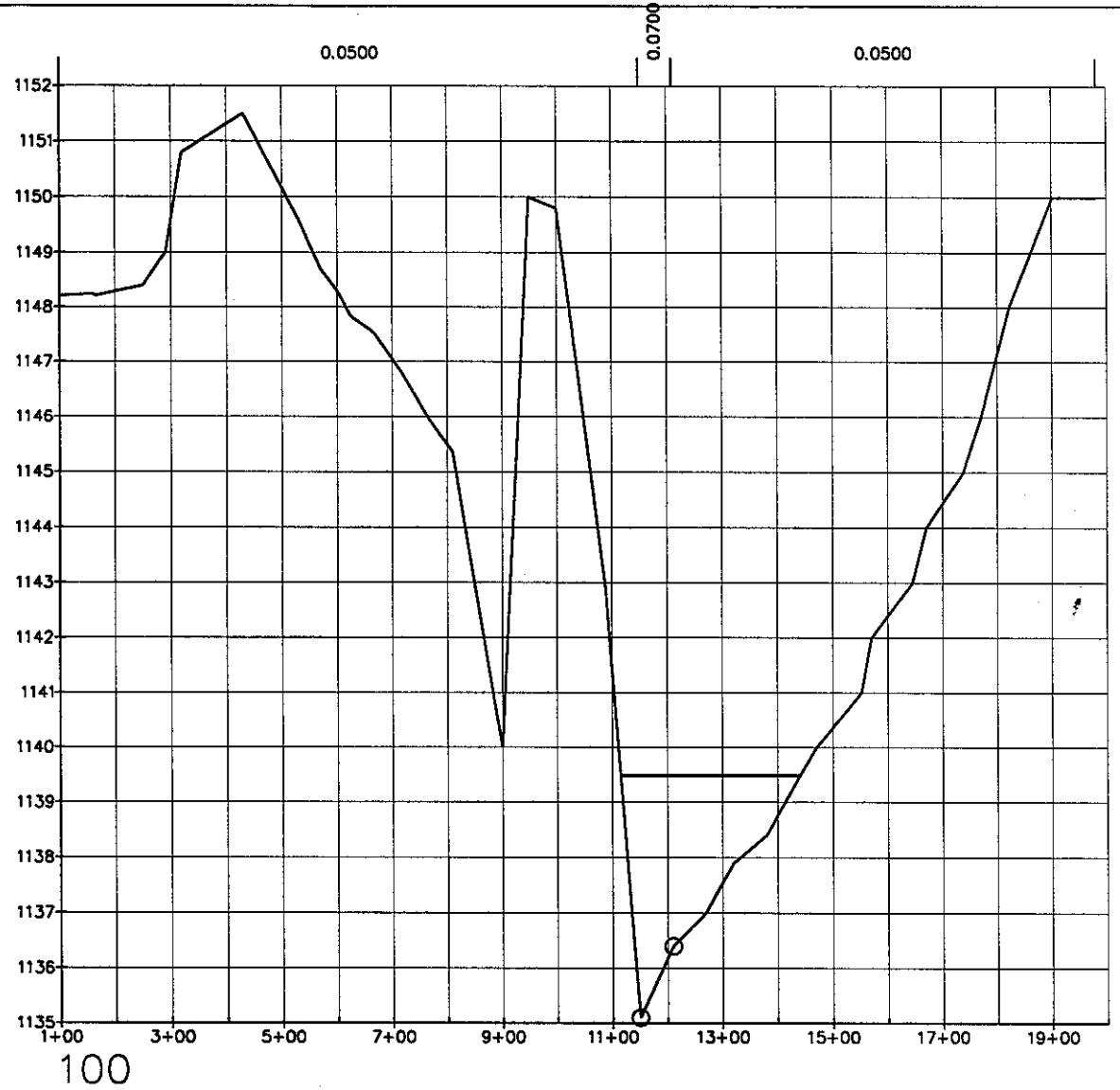
Cross-Section:	90	
Elevation:	1132.97	ft MSL
Depth:	2.83	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2695	
Flow Regime:	Subcritical	
Flow Area:	968.19	sq ft
Average Velocity:	2.57	ft/s
Maximum Velocity:	2.90	ft/s
Composite n:	0.0559	
Hydraulic Radius:	1.28	ft
Wetted Perimeter:	757.77	ft
Wetted Top Width:	757.65	ft
Critical Slope:	0.0927	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–90

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 5/28/03



Normal Depth Results

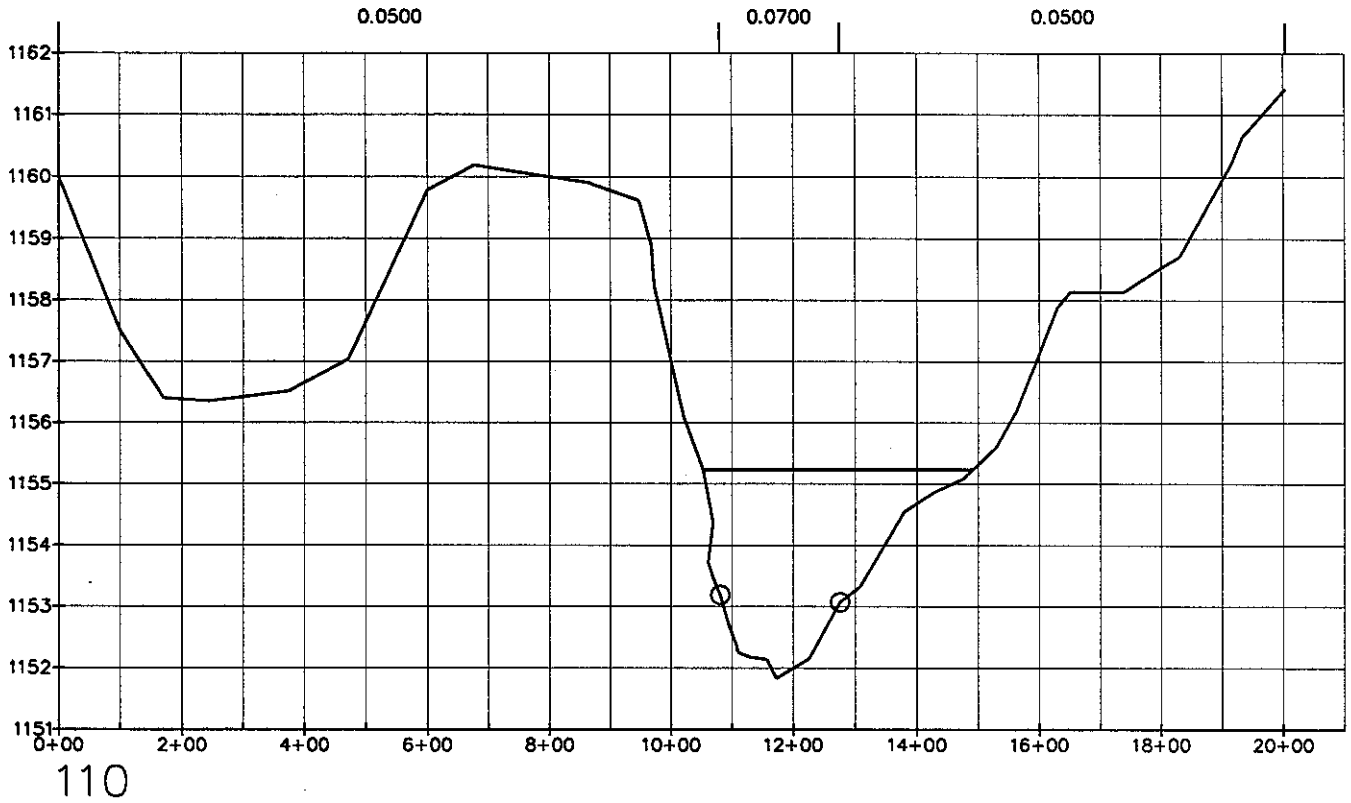
Cross-Section:	100	
Elevation:	1139.48	ft MSL
Depth:	4.38	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3082	
Flow Regime:	Subcritical	
Flow Area:	680.55	sq ft
Average Velocity:	3.66	ft/s
Maximum Velocity:	4.10	ft/s
Composite n:	0.0539	
Hydraulic Radius:	2.09	ft
Wetted Perimeter:	325.62	ft
Wetted Top Width:	325.31	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–100

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

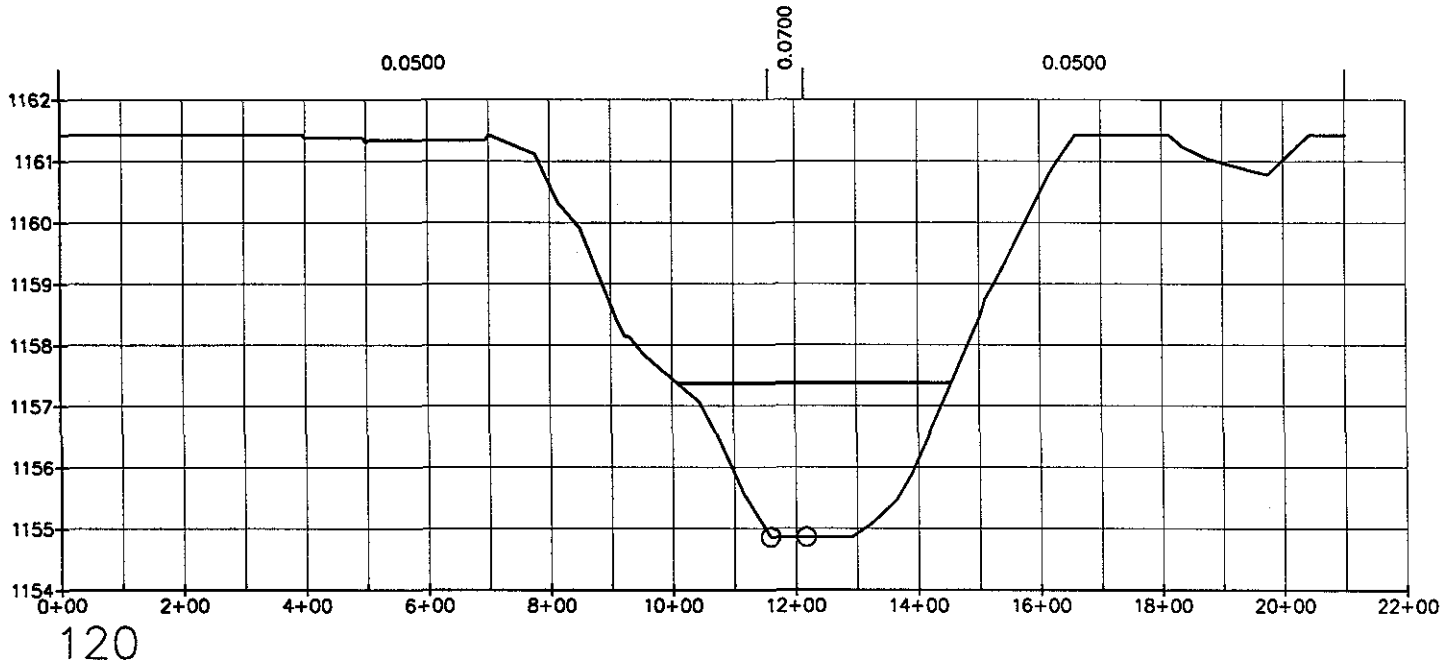
Cross-Section:	110	
Elevation:	1155.23	ft MSL
Depth:	3.40	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.297	
Flow Regime:	Subcritical	
Flow Area:	801.38	sq ft
Average Velocity:	3.12	ft/s
Maximum Velocity:	3.49	ft/s
Composite n:	0.0589	
Hydraulic Radius:	1.76	ft
Wetted Perimeter:	454.38	ft
Wetted Top Width:	438.13	ft
Critical Slope:	0.0805	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–110

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

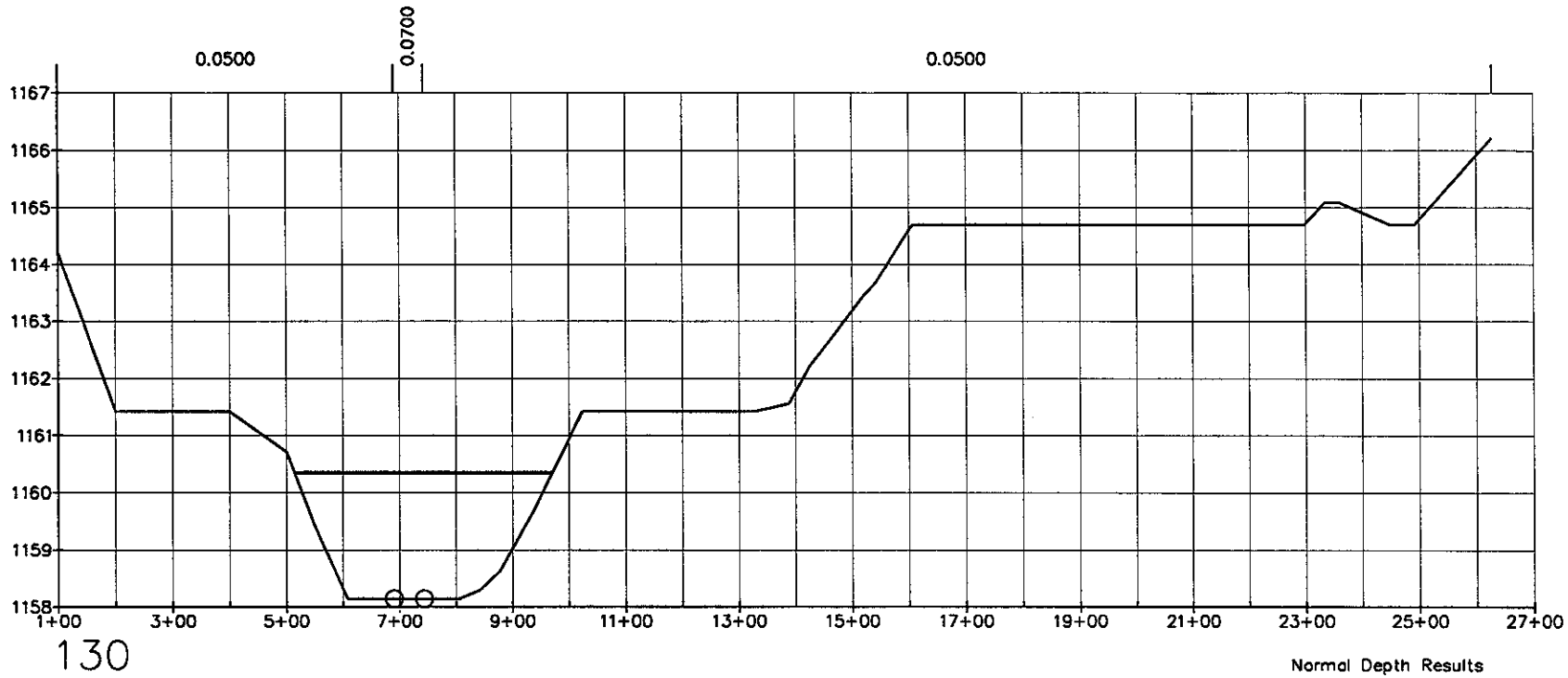
Cross-Section:	120	
Elevation:	1157.37	ft MSL
Depth:	2.51	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3644	
Flow Regime:	Subcritical	
Flow Area:	759.70	sq ft
Average Velocity:	3.29	ft/s
Maximum Velocity:	3.60	ft/s
Composite n:	0.0528	
Hydraulic Radius:	1.7	ft
Wetted Perimeter:	446.09	ft
Wetted Top Width:	446.04	ft
Critical Slope:	0.0499	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–120

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

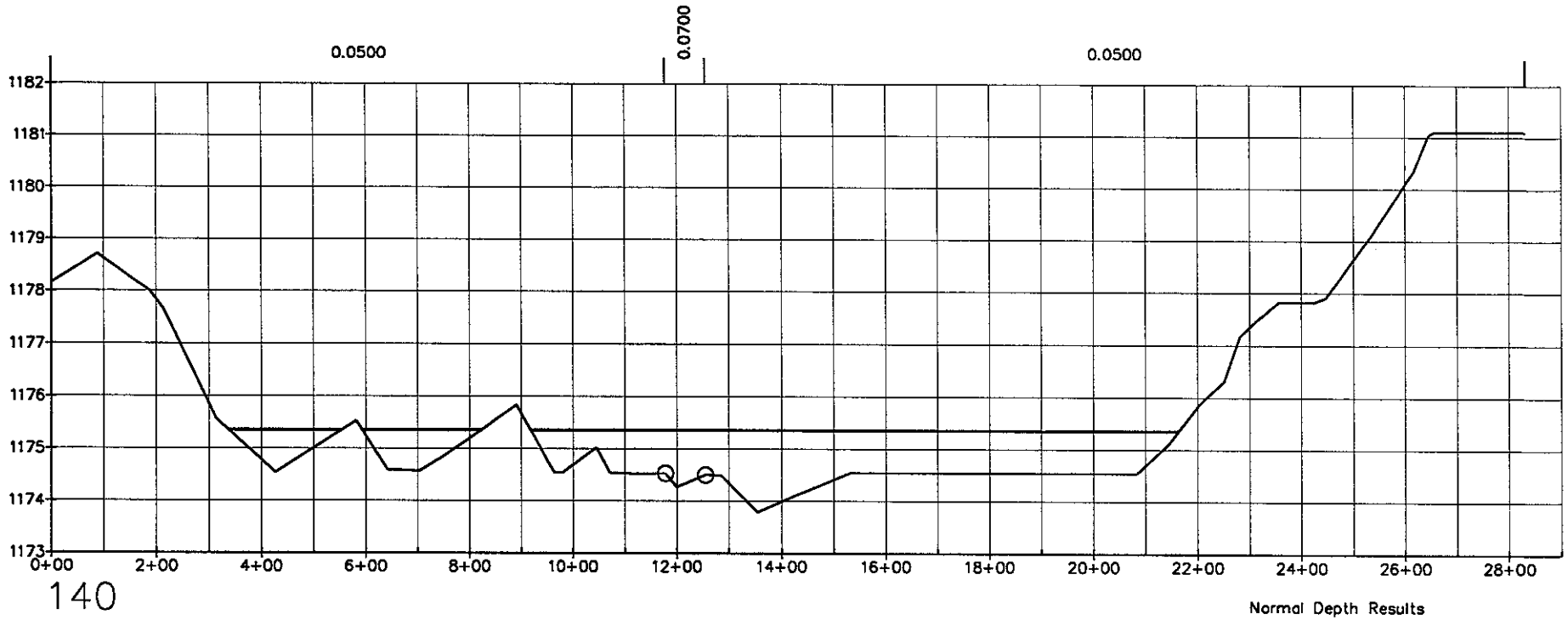
Cross-Section:	130	
Elevation:	1160.35	ft MSL
Depth:	2.21	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.3822	
Flow Regime:	Subcritical	
Flow Area:	771.97	sq ft
Average Velocity:	3.23	ft/s
Maximum Velocity:	3.32	ft/s
Composite n:	0.0525	
Hydraulic Radius:	1.69	ft
Wetted Perimeter:	456.22	ft
Wetted Top Width:	456.18	ft
Critical Slope:	0.0438	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–130

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

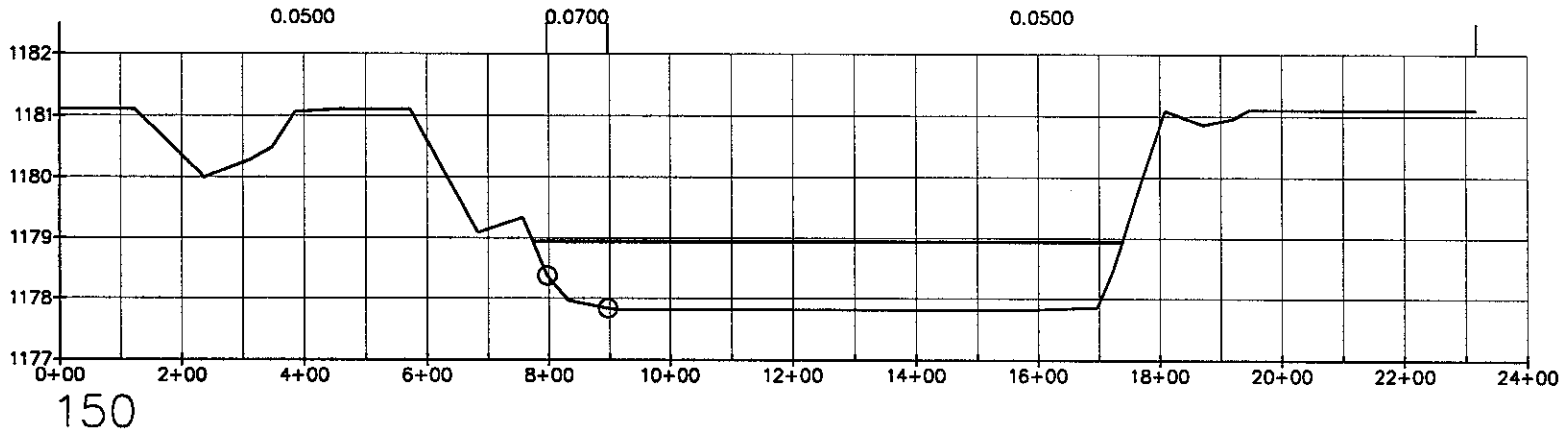
Cross-Section:	140	
Elevation:	1175.36	ft MSL
Depth:	1.57	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2785	
Flow Regime:	Subcritical	
Flow Area:	1258.74	sq ft
Average Velocity:	1.98	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0509	
Hydraulic Radius:	0.74	ft
Wetted Perimeter:	1693.61	ft
Wetted Top Width:	1693.57	ft
Critical Slope:	0.0877	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–140

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

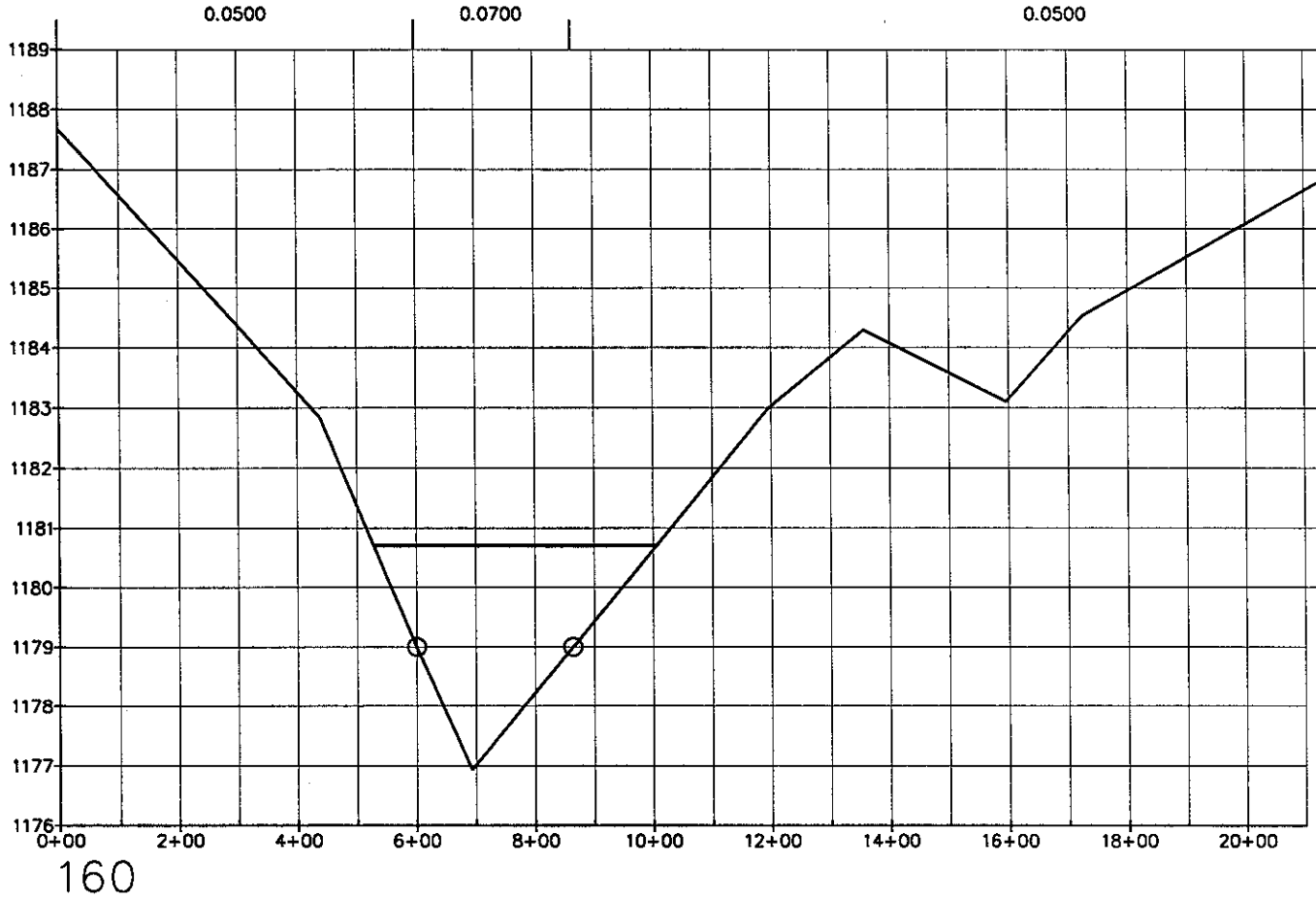
Cross-Section:	150	
Elevation:	1178.94	ft MSL
Depth:	1.12	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.4069	
Flow Regime:	Subcritical	
Flow Area:	1018.76	sq ft
Average Velocity:	2.44	ft/s
Maximum Velocity:	2.53	ft/s
Composite n:	0.0522	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	964.41	ft
Wetted Top Width:	964.39	ft
Critical Slope:	0.0412	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–150

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

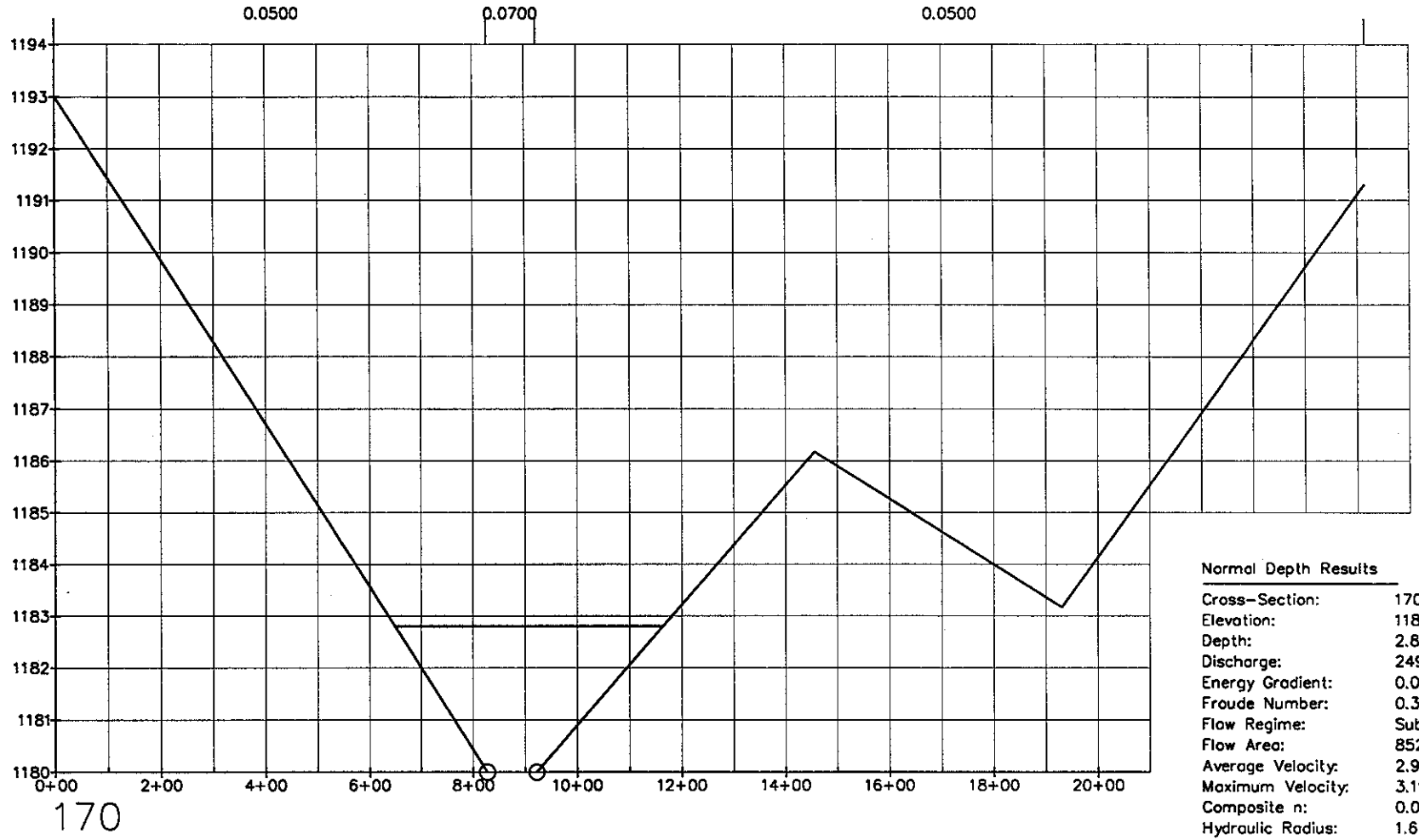
Cross-Section:	160	
Elevation:	1180.70	ft MSL
Depth:	3.77	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.2527	
Flow Regime:	Subcritical	
Flow Area:	894.74	sq ft
Average Velocity:	2.79	ft/s
Maximum Velocity:	3.43	ft/s
Composite n:	0.0635	
Hydraulic Radius:	1.88	ft
Wetted Perimeter:	475.06	ft
Wetted Top Width:	475.00	ft
Critical Slope:	0.0946	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–160

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

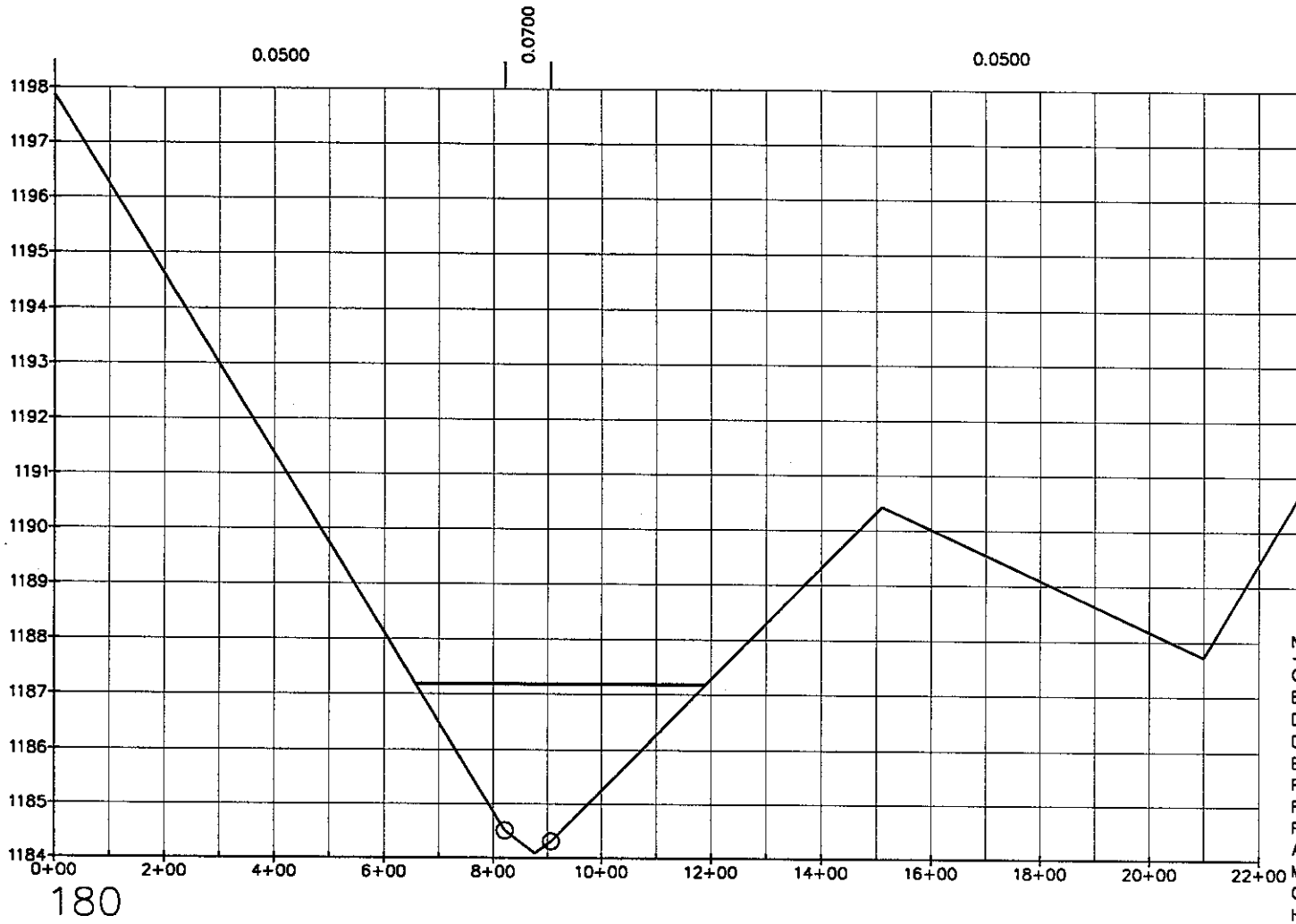
Cross-Section:	170	
Elevation:	1182.80	ft MSL
Depth:	2.80	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0057	ft/ft
Froude Number:	0.3077	
Flow Regime:	Subcritical	
Flow Area:	852.72	sq ft
Average Velocity:	2.93	ft/s
Maximum Velocity:	3.19	ft/s
Composite n:	0.0539	
Hydraulic Radius:	1.66	ft
Wetted Perimeter:	514.61	ft
Wetted Top Width:	514.57	ft
Critical Slope:	0.0602	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–170

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

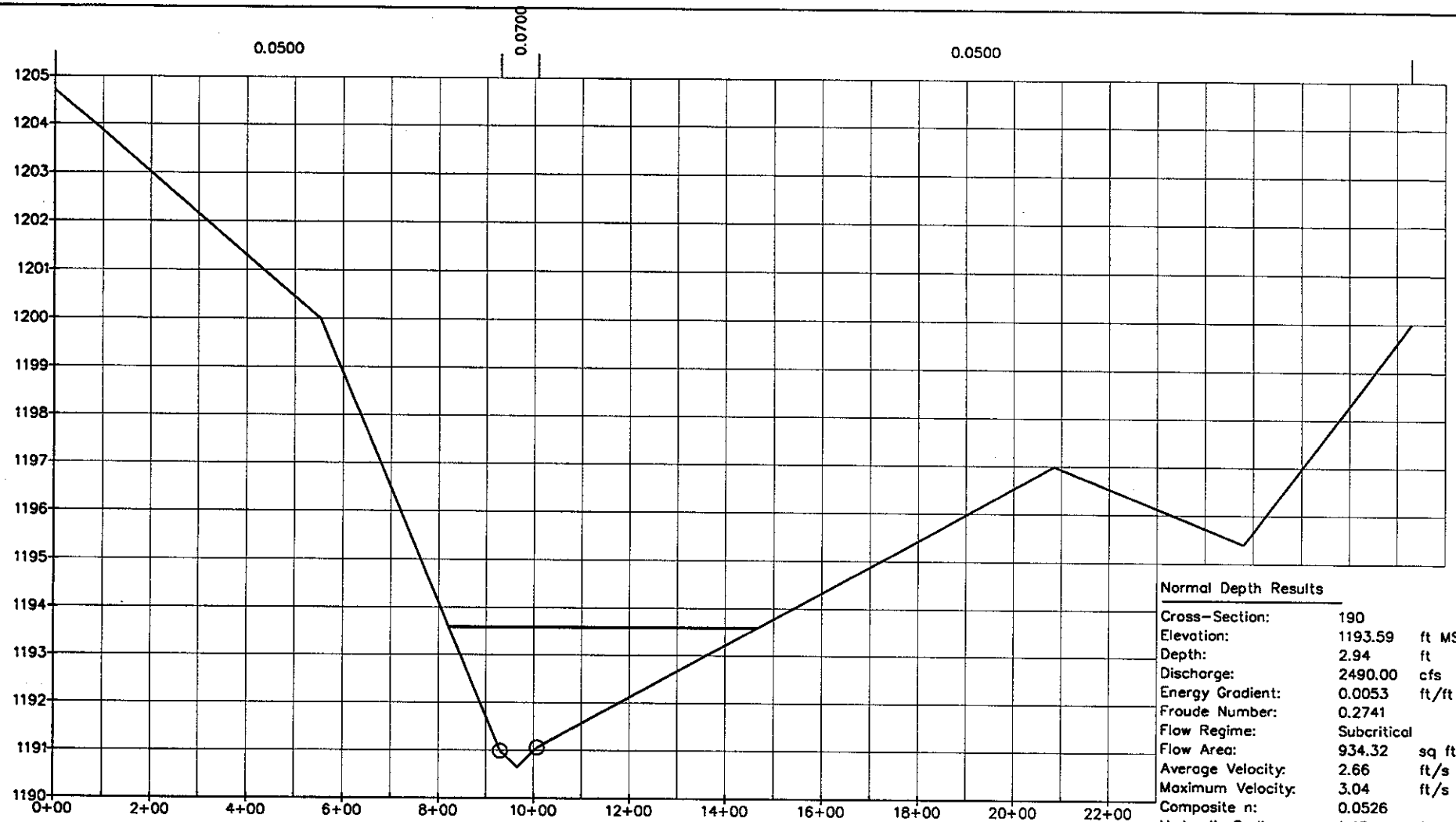
Cross-Section:	180	
Elevation:	1187.18	ft MSL
Depth:	3.09	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2854	
Flow Regime:	Subcritical	
Flow Area:	874.30	sq ft
Average Velocity:	2.84	ft/s
Maximum Velocity:	3.16	ft/s
Composite n:	0.0534	
Hydraulic Radius:	1.64	ft
Wetted Perimeter:	532.51	ft
Wetted Top Width:	532.47	ft
Critical Slope:	0.066	ft/ft

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-180

Entellus™



Normal Depth Results

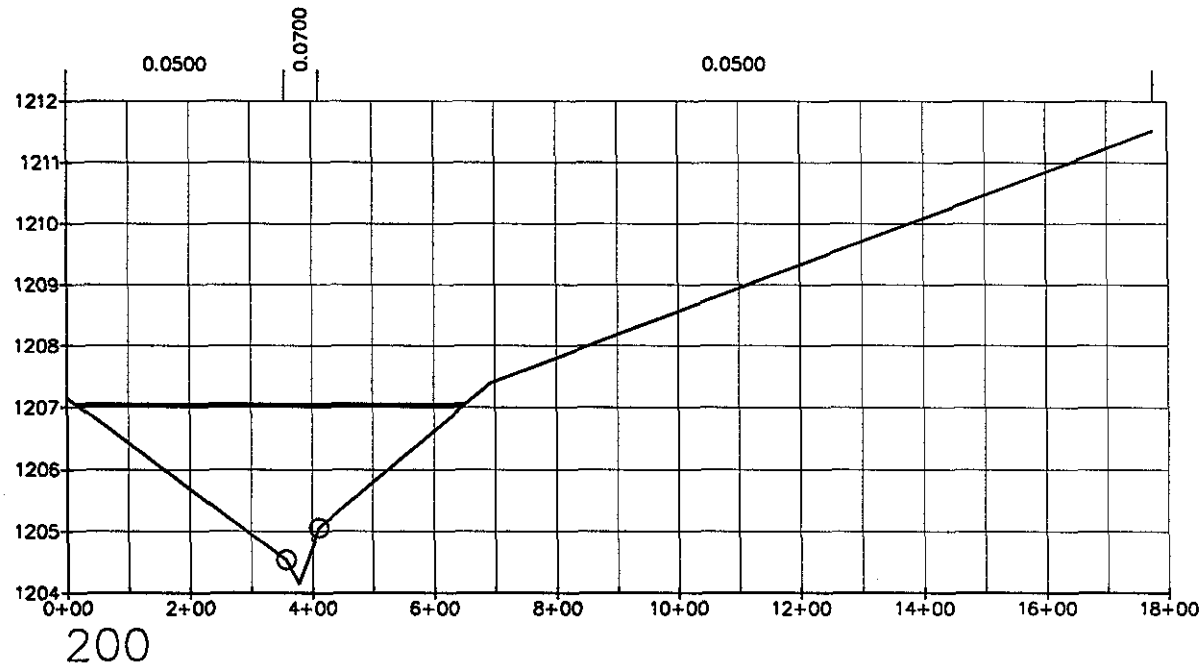
Cross-Section:	190	
Elevation:	1193.59	ft MSL
Depth:	2.94	ft
Discharge:	2490.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2741	
Flow Regime:	Subcritical	
Flow Area:	934.32	sq ft
Average Velocity:	2.66	ft/s
Maximum Velocity:	3.04	ft/s
Composite n:	0.0526	
Hydraulic Radius:	1.45	ft
Wetted Perimeter:	645.21	ft
Wetted Top Width:	645.17	ft
Critical Slope:	0.0718	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–190

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

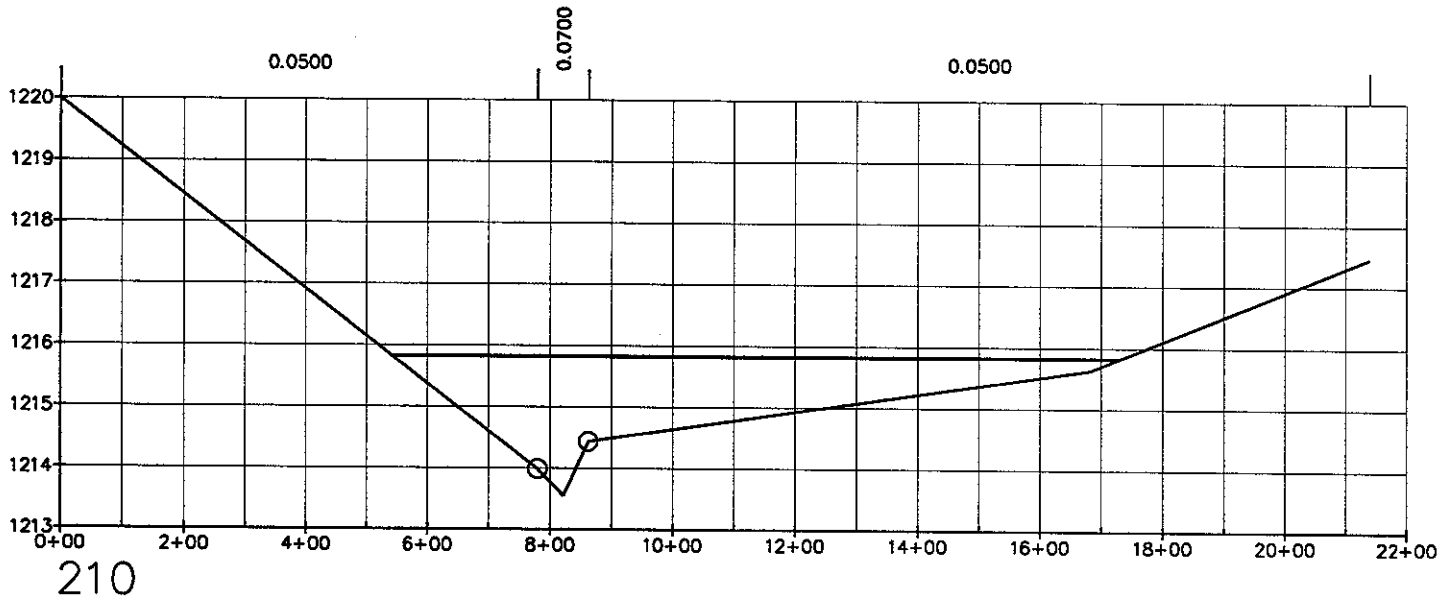
Cross-Section:	200	
Elevation:	1207.04	ft MSL
Depth:	2.89	ft
Discharge:	2000.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2586	
Flow Regime:	Subcritical	
Flow Area:	801.91	sq ft
Average Velocity:	2.47	ft/s
Maximum Velocity:	2.88	ft/s
Composite n:	0.0518	
Hydraulic Radius:	1.26	ft
Wetted Perimeter:	634.22	ft
Wetted Top Width:	634.18	ft
Critical Slope:	0.0824	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-200

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

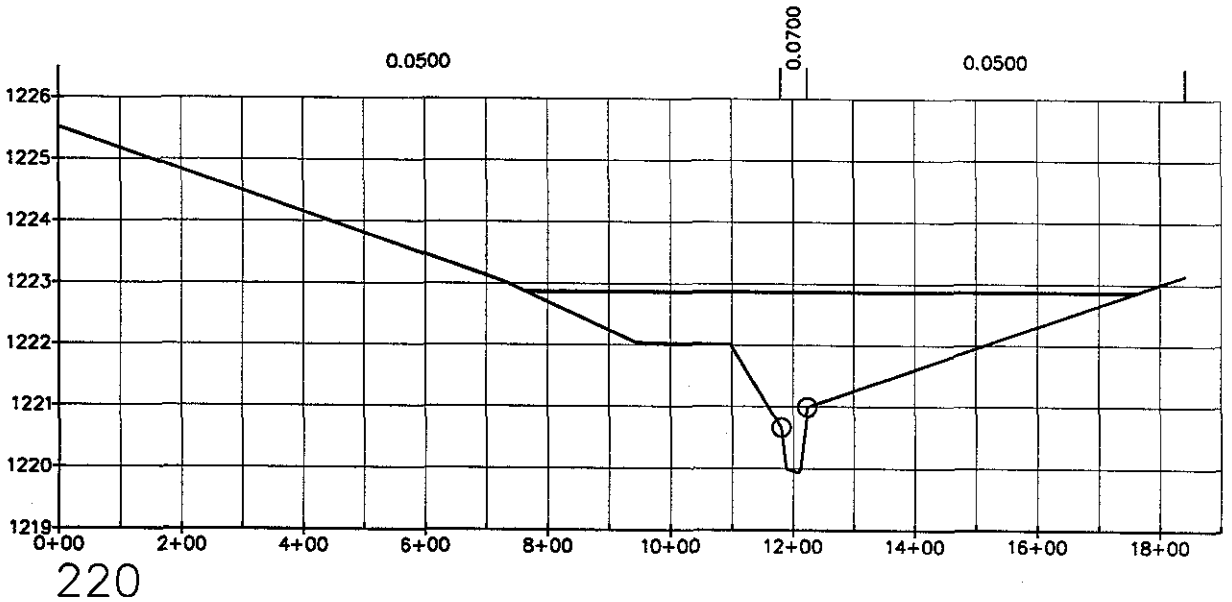
Cross-Section:	210	
Elevation:	1215.82	ft MSL
Depth:	2.27	ft
Discharge:	2000.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2275	
Flow Regime:	Subcritical	
Flow Area:	1028.11	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.41	ft/s
Composite n:	0.0515	
Hydraulic Radius:	0.87	ft
Wetted Perimeter:	1187.88	ft
Wetted Top Width:	1187.86	ft
Critical Slope:	0.1059	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–210

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

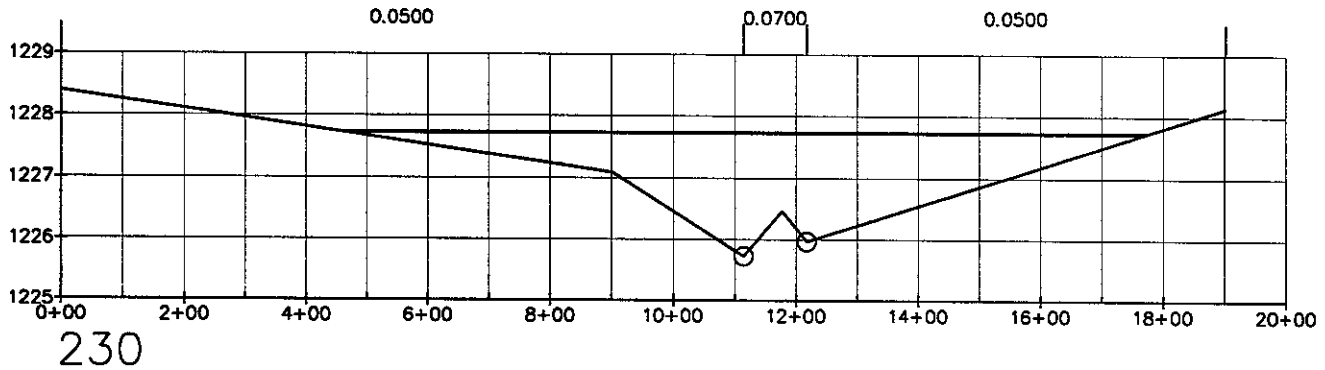
Cross-Section:	220	
Elevation:	1222.87	ft MSL
Depth:	2.94	ft
Discharge:	2000.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2152	
Flow Regime:	Subcritical	
Flow Area:	955.12	sq ft
Average Velocity:	2.12	ft/s
Maximum Velocity:	3.00	ft/s
Composite n:	0.0509	
Hydraulic Radius:	0.96	ft
Wetted Perimeter:	997.77	ft
Wetted Top Width:	997.69	ft
Critical Slope:	0.1173	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–220

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

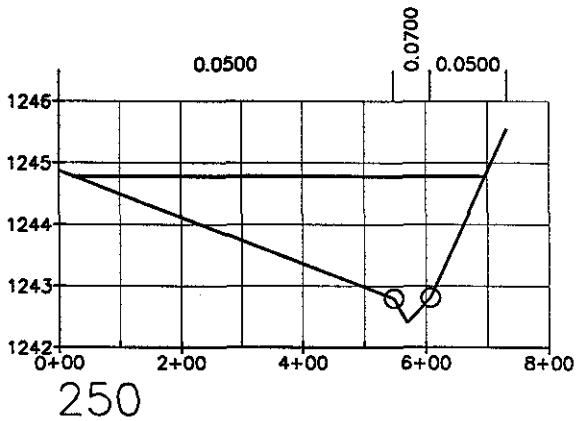
Cross-Section:	230	
Elevation:	1227.73	ft MSL
Depth:	2.00	ft
Discharge:	2000.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2322	
Flow Regime:	Subcritical	
Flow Area:	1073.56	sq ft
Average Velocity:	1.86	ft/s
Maximum Velocity:	2.11	ft/s
Composite n:	0.0517	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	1311.73	ft
Wetted Top Width:	1311.71	ft
Critical Slope:	0.1012	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–230

Entellus™

File: WASH–T2N–R5W–S31W(PHILLIPS–NORTH)_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

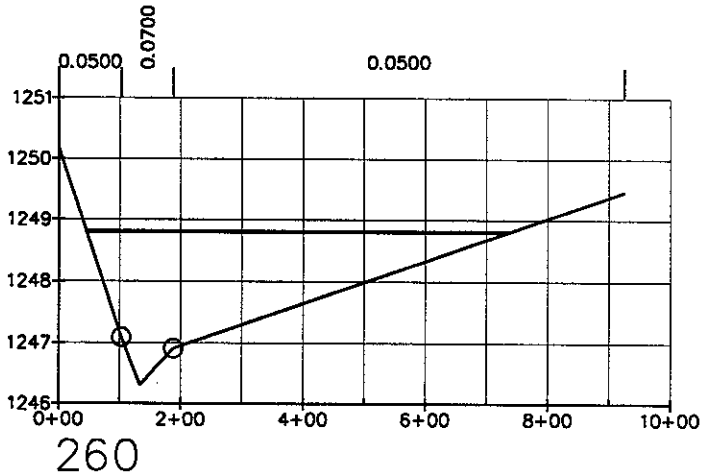
Cross-Section:	250	
Elevation:	1244.78	ft MSL
Depth:	2.38	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2555	
Flow Regime:	Subcritical	
Flow Area:	737.56	sq ft
Average Velocity:	2.23	ft/s
Maximum Velocity:	2.60	ft/s
Composite n:	0.0519	
Hydraulic Radius:	1.1	ft
Wetted Perimeter:	673.45	ft
Wetted Top Width:	673.42	ft
Critical Slope:	0.0824	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–250

Entellus™

File: WASH–T2N–R5W–S31W(PHILLIPS–NORTH)_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

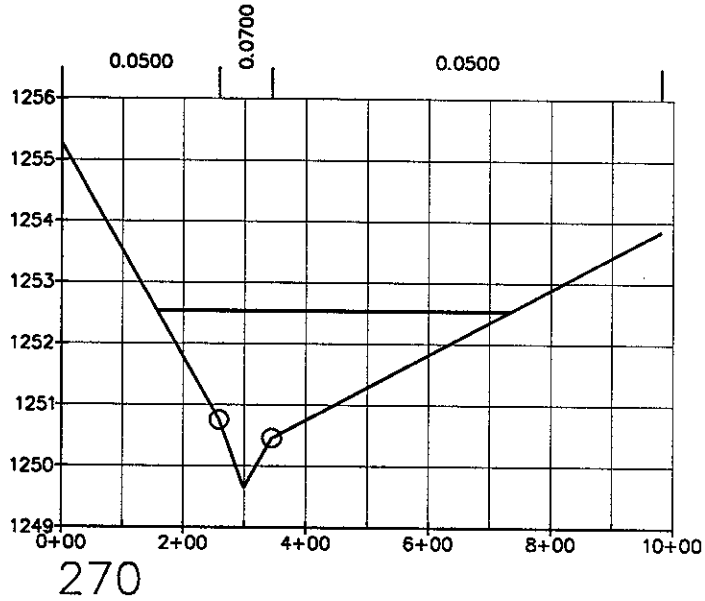
Cross-Section:	260	
Elevation:	1248.81	ft MSL
Depth:	2.50	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2443	
Flow Regime:	Subcritical	
Flow Area:	753.49	sq ft
Average Velocity:	2.21	ft/s
Maximum Velocity:	2.59	ft/s
Composite n:	0.0526	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	690.97	ft
Wetted Top Width:	690.93	ft
Critical Slope:	0.0893	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-260

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

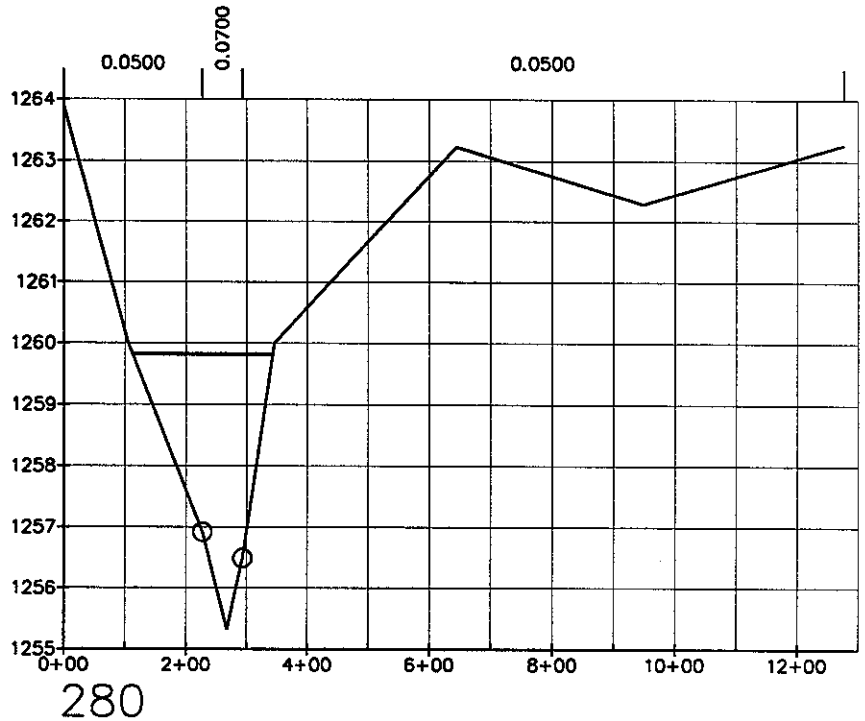
Cross-Section:	270	
Elevation:	1252.54	ft MSL
Depth:	2.89	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2438	
Flow Regime:	Subcritical	
Flow Area:	702.18	sq ft
Average Velocity:	2.36	ft/s
Maximum Velocity:	2.79	ft/s
Composite n:	0.0532	
Hydraulic Radius:	1.22	ft
Wetted Perimeter:	577.22	ft
Wetted Top Width:	577.18	ft
Critical Slope:	0.0912	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-270

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

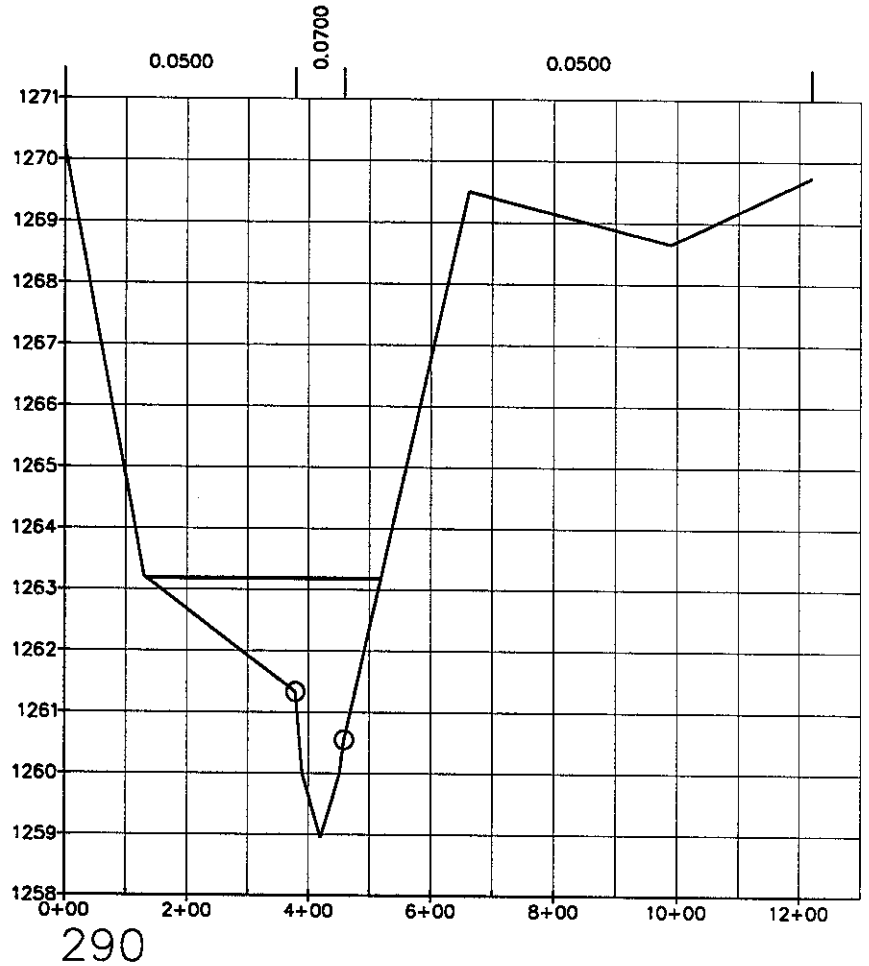
Cross-Section:	280	
Elevation:	1259.82	ft MSL
Depth:	4.50	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2746	
Flow Regime:	Subcritical	
Flow Area:	499.45	sq ft
Average Velocity:	3.31	ft/s
Maximum Velocity:	3.76	ft/s
Composite n:	0.056	
Hydraulic Radius:	2.16	ft
Wetted Perimeter:	231.19	ft
Wetted Top Width:	230.98	ft
Critical Slope:	0.0734	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-280

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

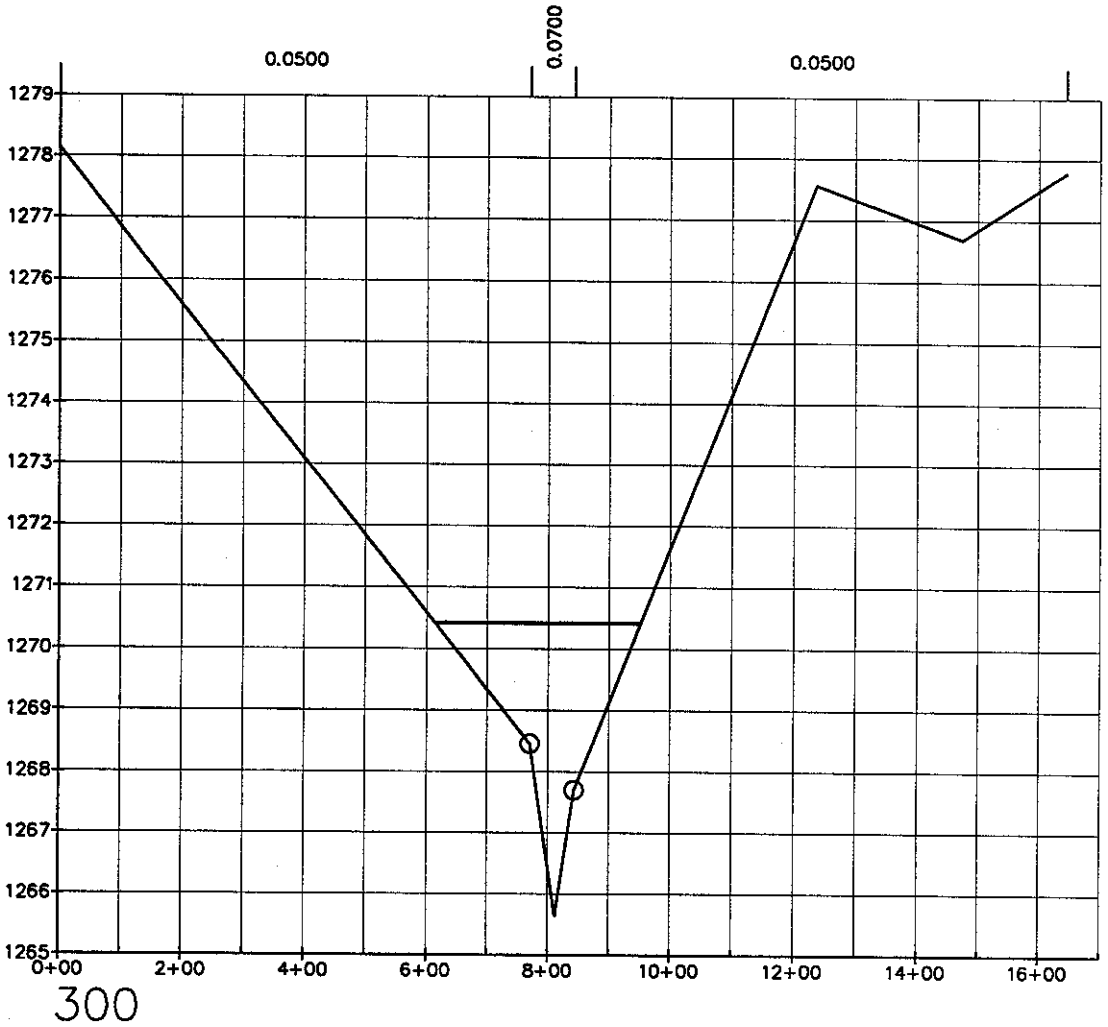
Cross-Section:	290	
Elevation:	1263.18	ft MSL
Depth:	4.23	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2435	
Flow Regime:	Subcritical	
Flow Area:	580.79	sq ft
Average Velocity:	2.84	ft/s
Maximum Velocity:	3.54	ft/s
Composite n:	0.0544	
Hydraulic Radius:	1.51	ft
Wetted Perimeter:	384.32	ft
Wetted Top Width:	384.12	ft
Critical Slope:	0.1048	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–290

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

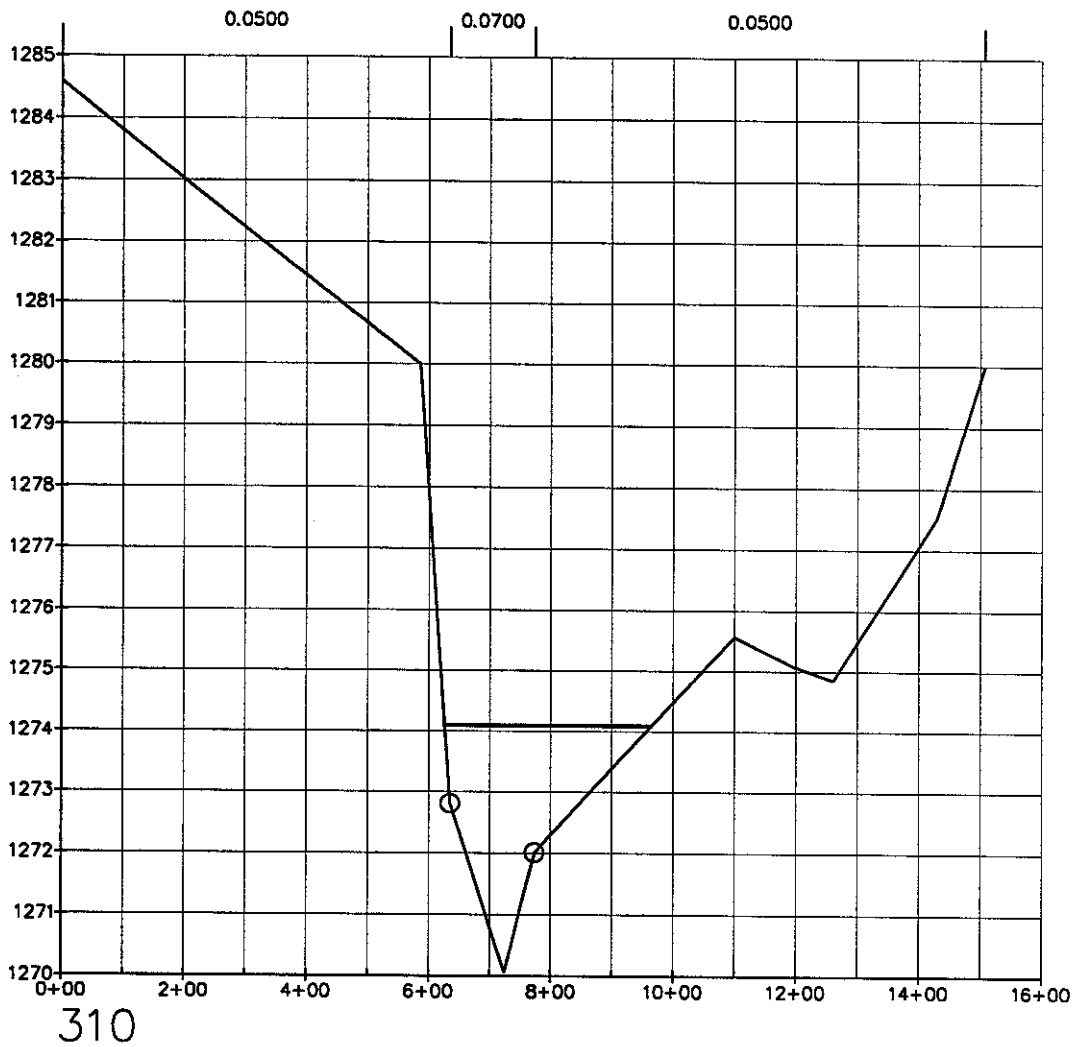
Cross-Section:	300	
Elevation:	1270.42	ft MSL
Depth:	4.78	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2383	
Flow Regime:	Subcritical	
Flow Area:	558.43	sq ft
Average Velocity:	2.95	ft/s
Maximum Velocity:	3.59	ft/s
Composite n:	0.0546	
Hydraulic Radius:	1.65	ft
Wetted Perimeter:	338.11	ft
Wetted Top Width:	337.90	ft
Critical Slope:	0.1058	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–300

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

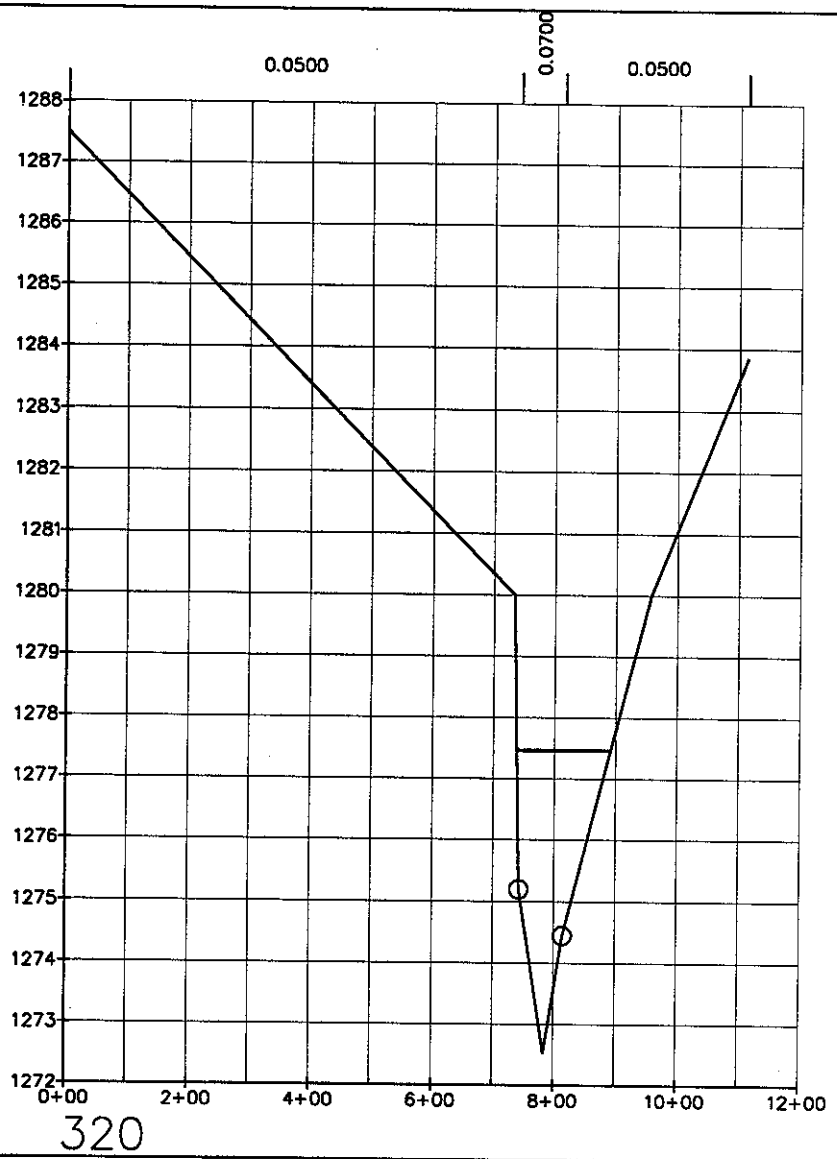
Cross-Section:	310	
Elevation:	1274.09	ft MSL
Depth:	4.03	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2448	
Flow Regime:	Subcritical	
Flow Area:	591.65	sq ft
Average Velocity:	2.78	ft/s
Maximum Velocity:	3.08	ft/s
Composite n:	0.0585	
Hydraulic Radius:	1.75	ft
Wetted Perimeter:	338.48	ft
Wetted Top Width:	338.29	ft
Critical Slope:	0.0952	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–310

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

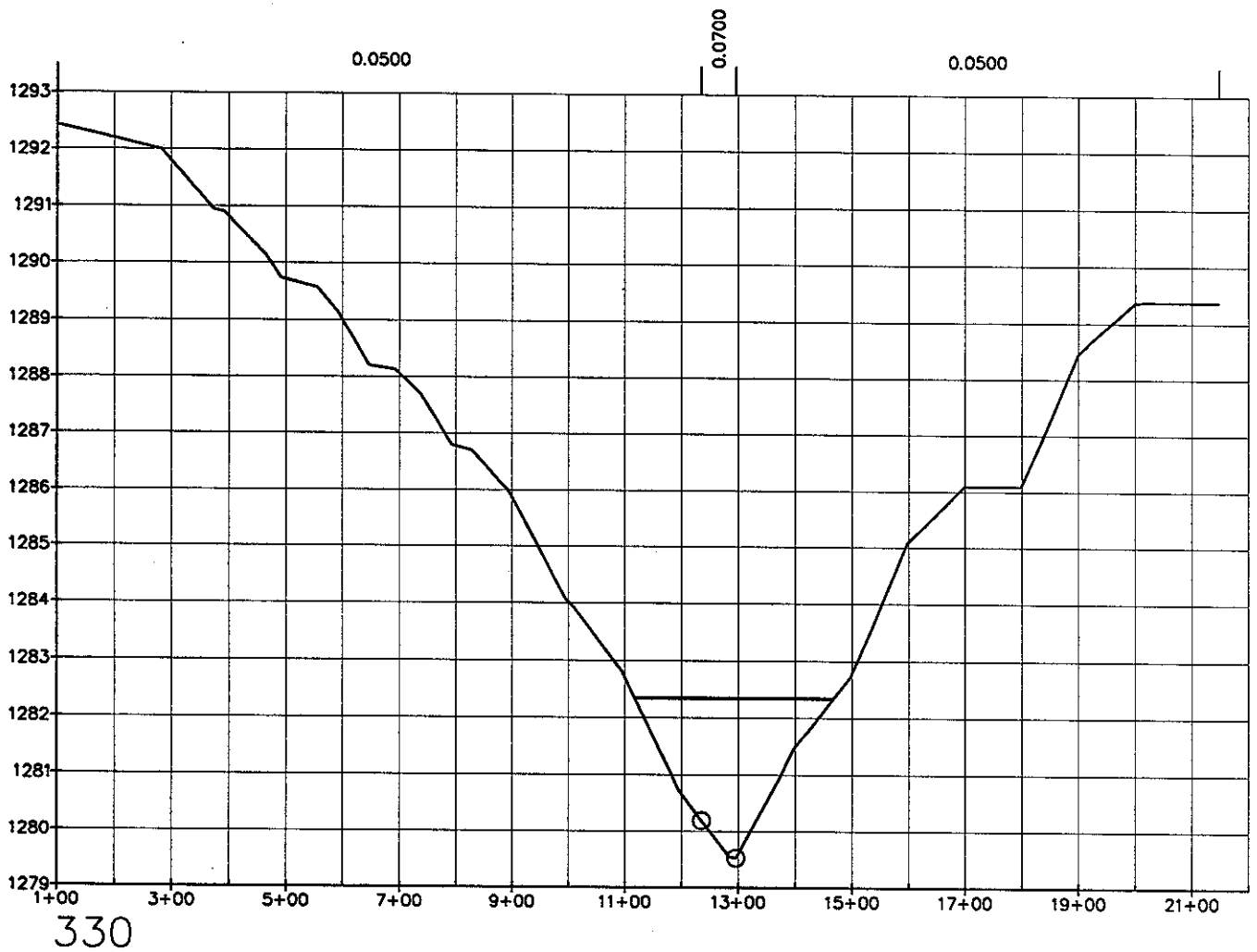
Cross-Section:	320	
Elevation:	1277.46	ft MSL
Depth:	4.93	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3356	
Flow Regime:	Subcritical	
Flow Area:	390.37	sq ft
Average Velocity:	4.24	ft/s
Maximum Velocity:	4.59	ft/s
Composite n:	0.0597	
Hydraulic Radius:	2.53	ft
Wetted Perimeter:	154.19	ft
Wetted Top Width:	153.42	ft
Critical Slope:	0.0738	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–320

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

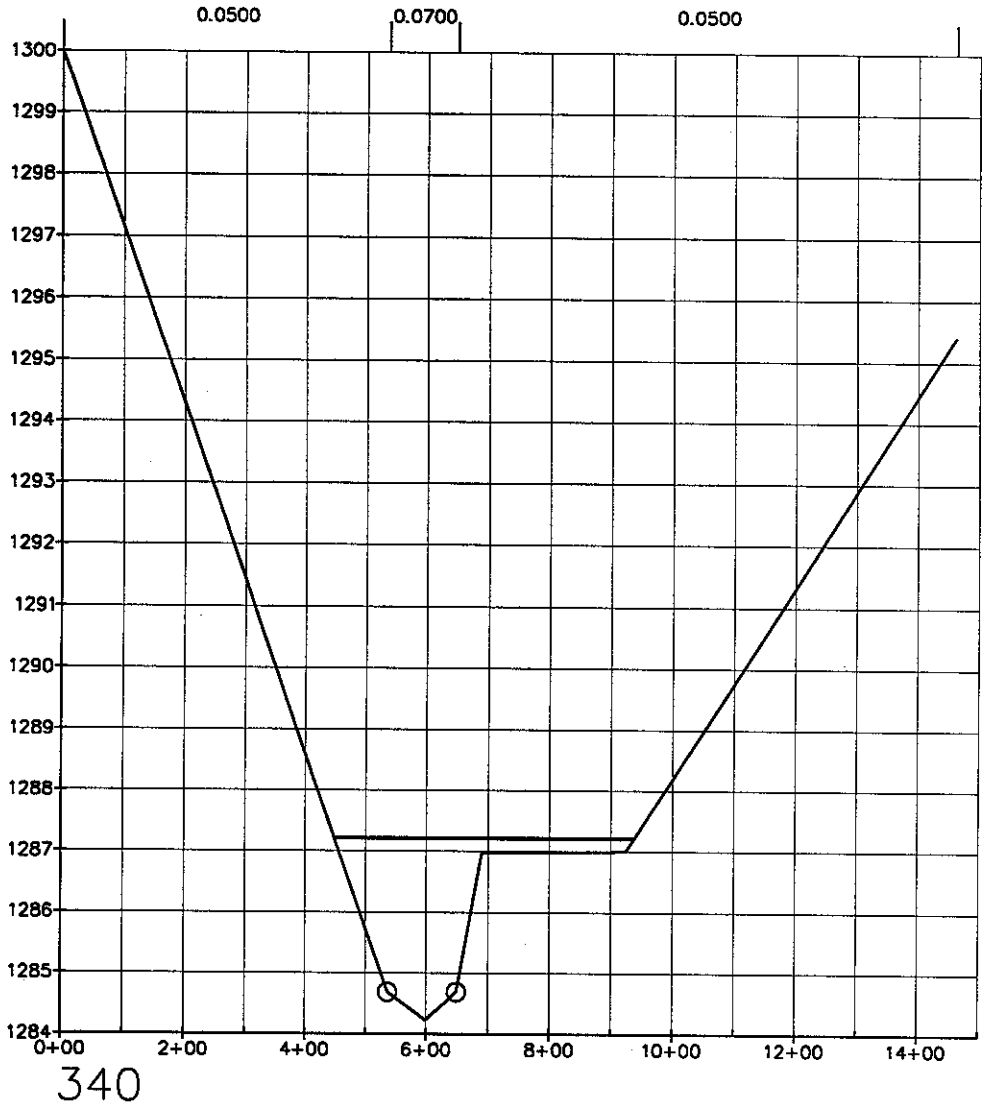
Cross-Section:	330	
Elevation:	1282.34	ft MSL
Depth:	2.81	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3402	
Flow Regime:	Subcritical	
Flow Area:	510.27	sq ft
Average Velocity:	3.21	ft/s
Maximum Velocity:	3.53	ft/s
Composite n:	0.0537	
Hydraulic Radius:	1.46	ft
Wetted Perimeter:	349.56	ft
Wetted Top Width:	349.51	ft
Critical Slope:	0.0708	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–330

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

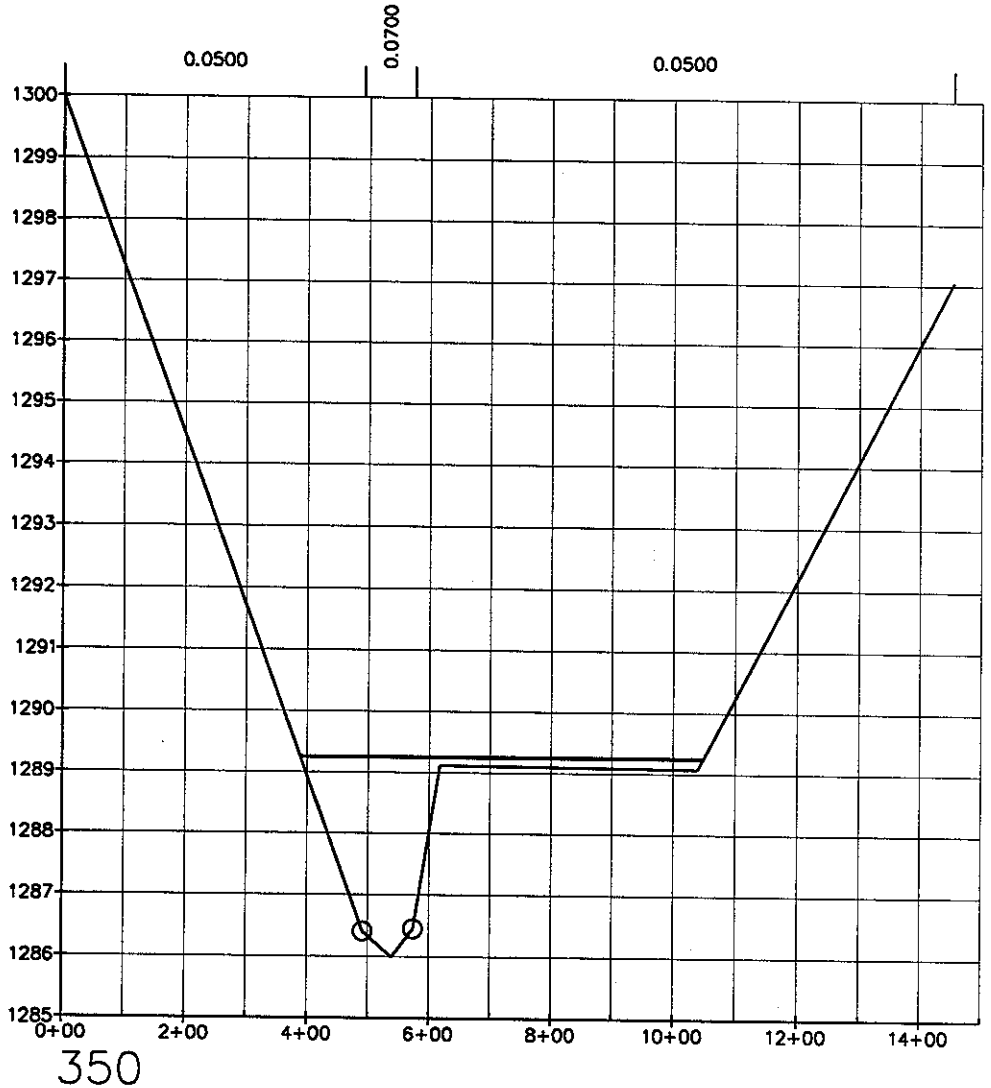
Cross-Section:	340	
Elevation:	1287.21	ft MSL
Depth:	2.98	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3168	
Flow Regime:	Subcritical	
Flow Area:	531.66	sq ft
Average Velocity:	3.12	ft/s
Maximum Velocity:	3.74	ft/s
Composite n:	0.0549	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	489.41	ft
Wetted Top Width:	489.31	ft
Critical Slope:	0.1166	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–340

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

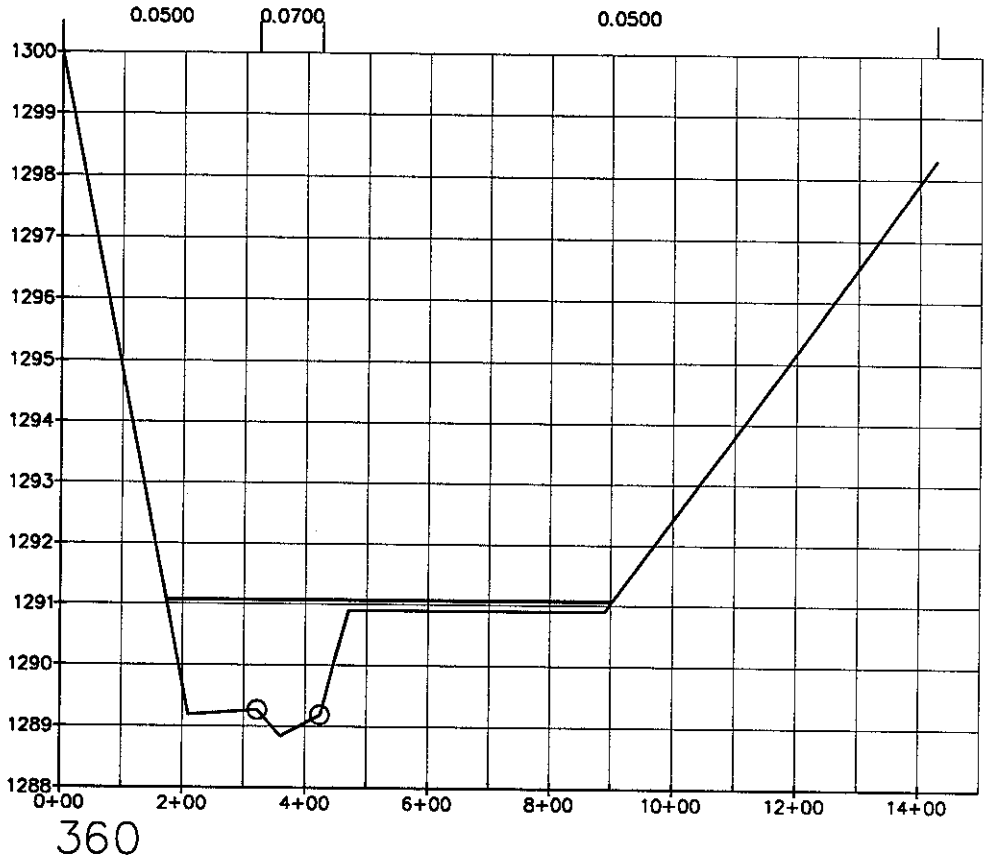
Cross-Section:	350	
Elevation:	1289.25	ft MSL
Depth:	3.26	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3055	
Flow Regime:	Subcritical	
Flow Area:	527.19	sq ft
Average Velocity:	3.12	ft/s
Maximum Velocity:	4.00	ft/s
Composite n:	0.0527	
Hydraulic Radius:	0.8	ft
Wetted Perimeter:	659.75	ft
Wetted Top Width:	659.62	ft
Critical Slope:	0.1771	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–350

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

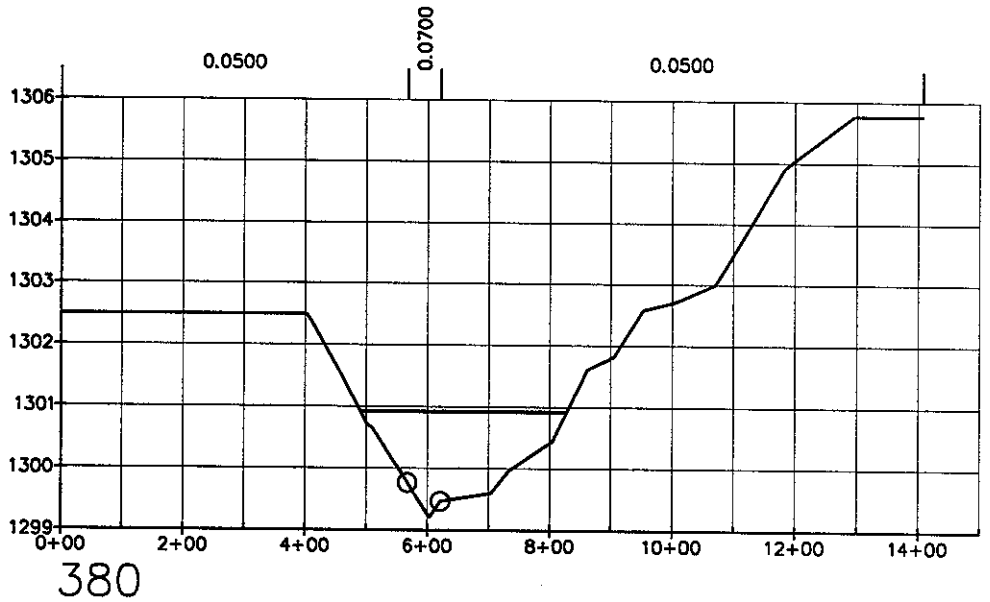
Cross-Section:	360	
Elevation:	1291.07	ft MSL
Depth:	2.23	ft
Discharge:	1650.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3418	
Flow Regime:	Subcritical	
Flow Area:	569.78	sq ft
Average Velocity:	2.90	ft/s
Maximum Velocity:	3.68	ft/s
Composite n:	0.053	
Hydraulic Radius:	0.78	ft
Wetted Perimeter:	729.52	ft
Wetted Top Width:	729.43	ft
Critical Slope:	0.1263	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–360

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

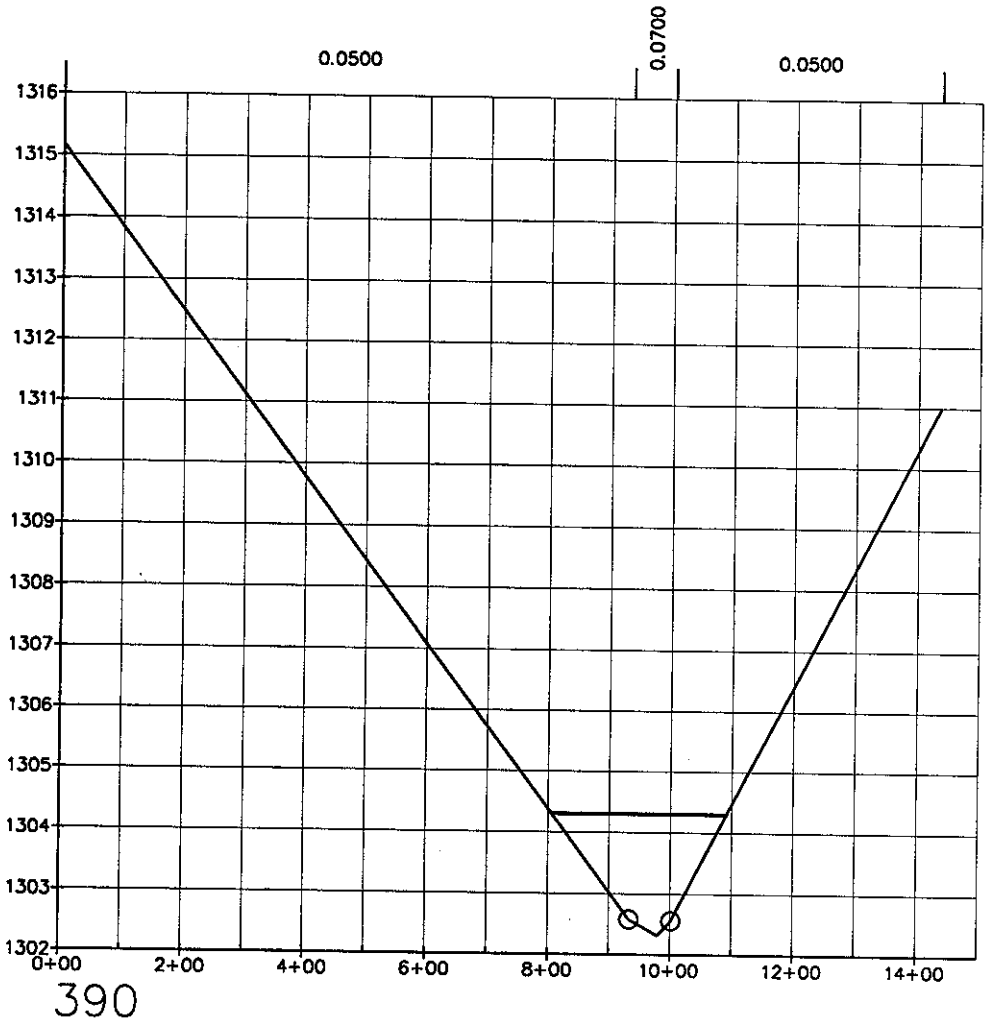
Cross-Section:	380	
Elevation:	1300.92	ft MSL
Depth:	1.71	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3366	
Flow Regime:	Subcritical	
Flow Area:	328.32	sq ft
Average Velocity:	2.50	ft/s
Maximum Velocity:	2.65	ft/s
Composite n:	0.0534	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	337.63	ft
Wetted Top Width:	337.60	ft
Critical Slope:	0.0734	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–380

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

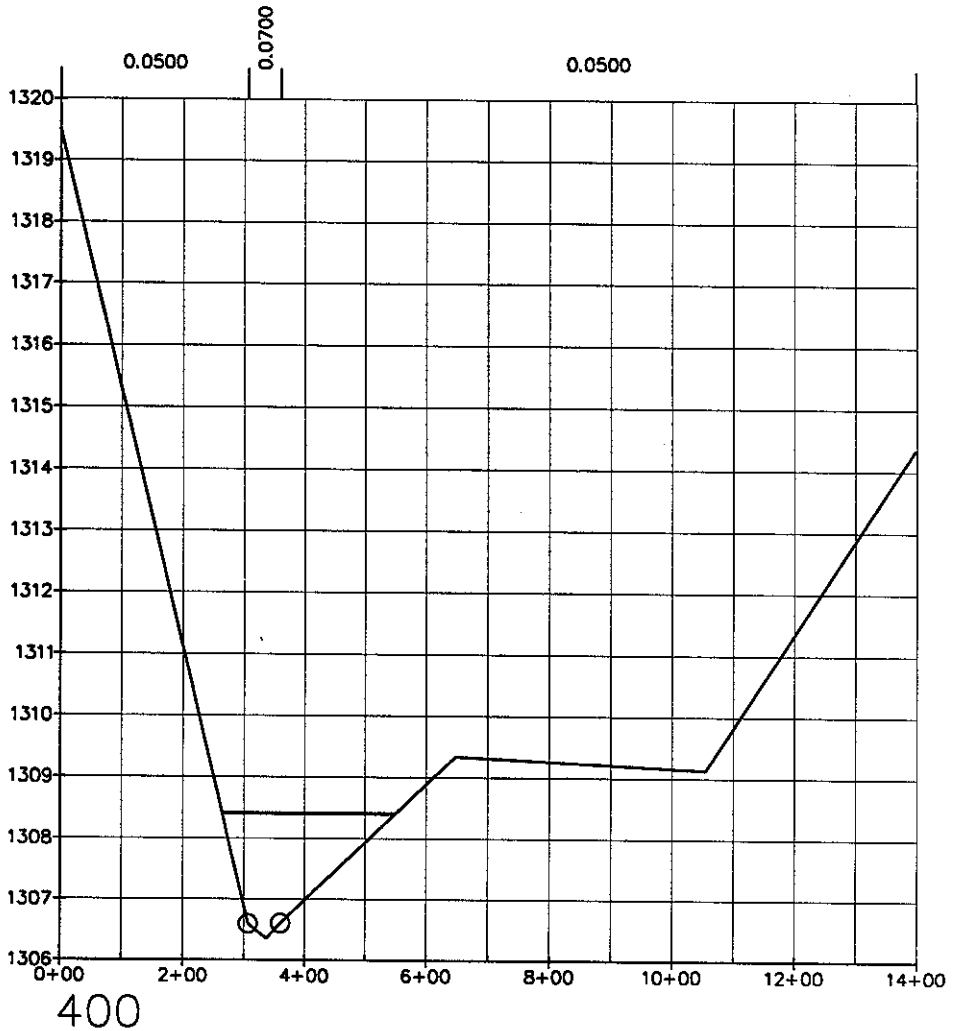
Cross-Section:	390	
Elevation:	1304.30	ft MSL
Depth:	1.98	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3256	
Flow Regime:	Subcritical	
Flow Area:	315.29	sq ft
Average Velocity:	2.60	ft/s
Maximum Velocity:	2.88	ft/s
Composite n:	0.0551	
Hydraulic Radius:	1.1	ft
Wetted Perimeter:	285.92	ft
Wetted Top Width:	285.89	ft
Critical Slope:	0.0766	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–390

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

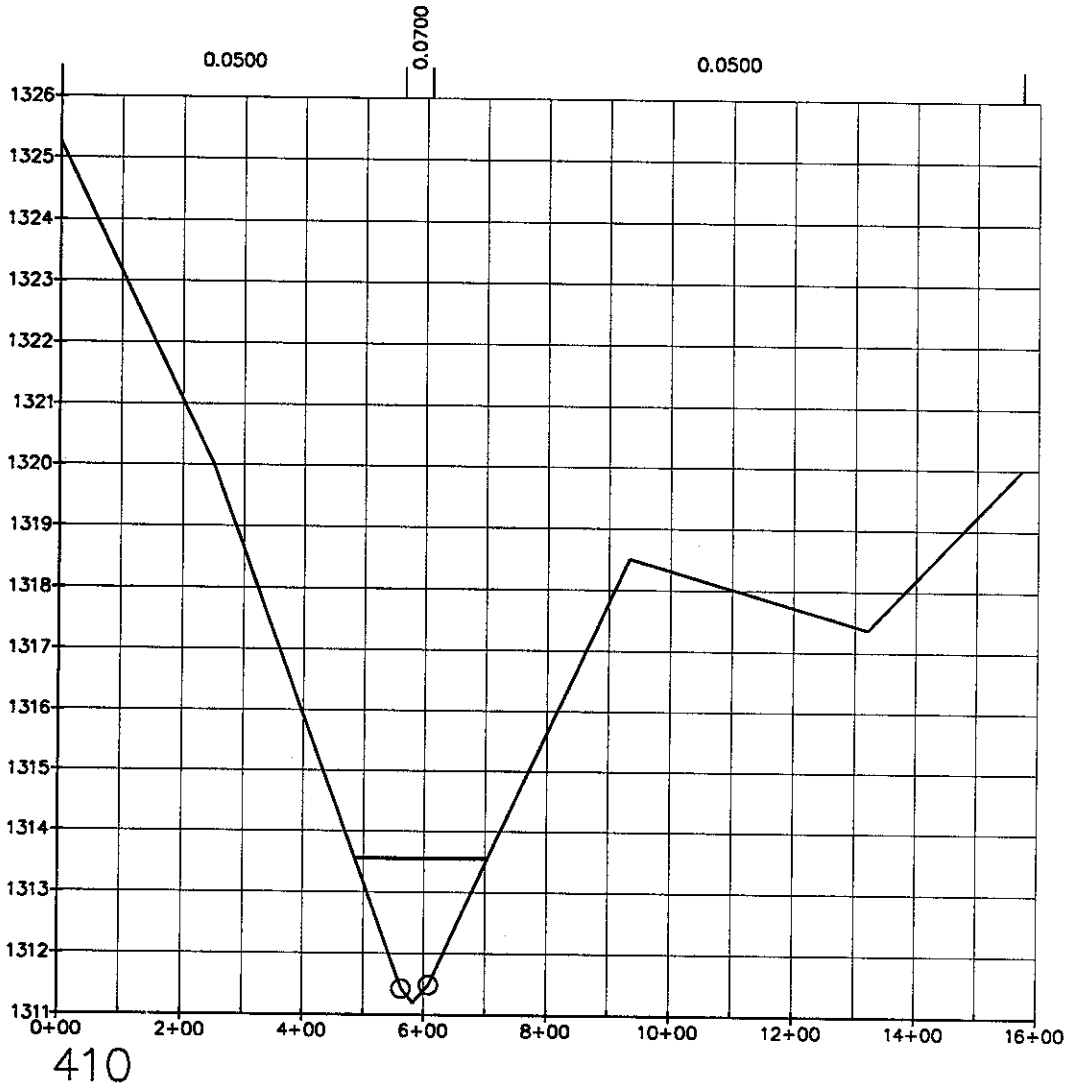
Cross-Section:	400	
Elevation:	1308.41	ft MSL
Depth:	2.05	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3244	
Flow Regime:	Subcritical	
Flow Area:	311.44	sq ft
Average Velocity:	2.64	ft/s
Maximum Velocity:	2.95	ft/s
Composite n:	0.054	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	285.50	ft
Wetted Top Width:	285.45	ft
Critical Slope:	0.077	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-400

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

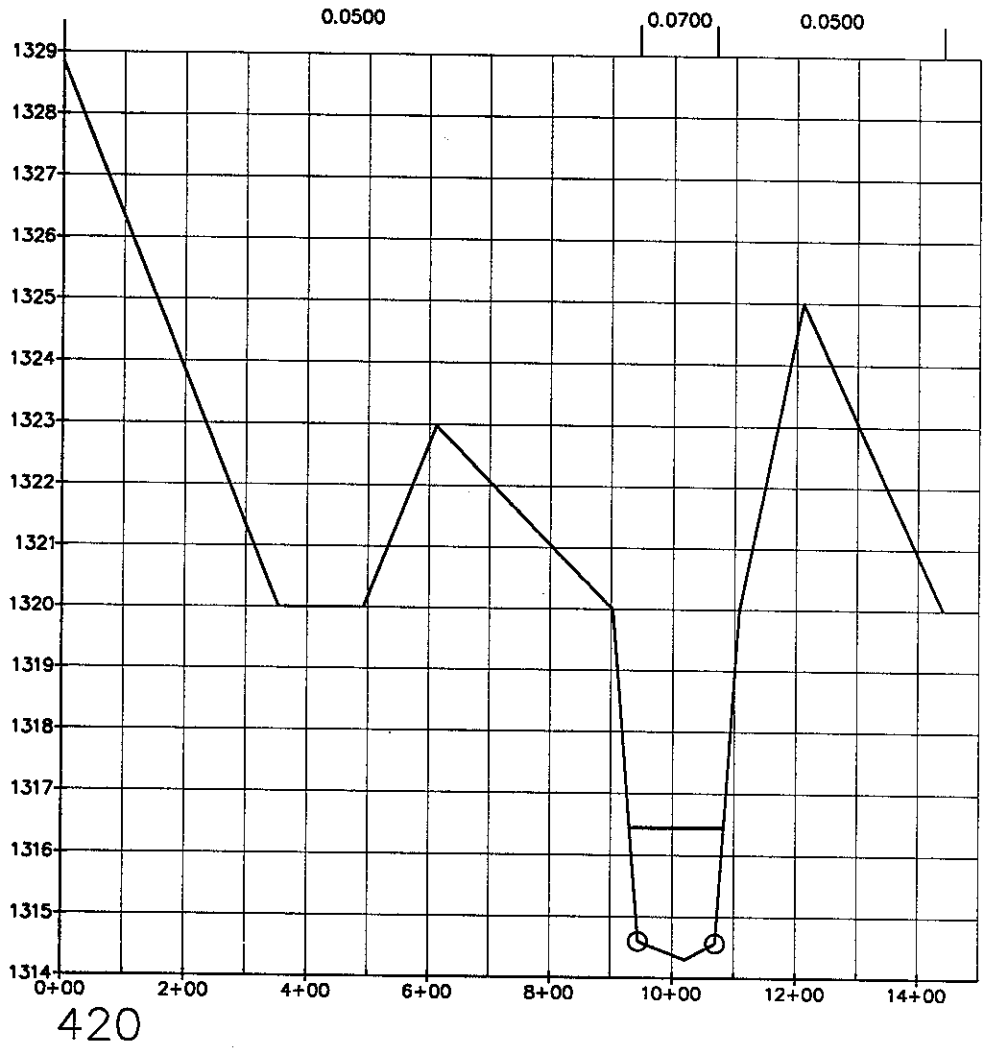
Cross-Section:	410	
Elevation:	1313.55	ft MSL
Depth:	2.35	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3351	
Flow Regime:	Subcritical	
Flow Area:	281.09	sq ft
Average Velocity:	2.92	ft/s
Maximum Velocity:	3.24	ft/s
Composite n:	0.0544	
Hydraulic Radius:	1.29	ft
Wetted Perimeter:	218.11	ft
Wetted Top Width:	218.05	ft
Critical Slope:	0.072	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–410

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

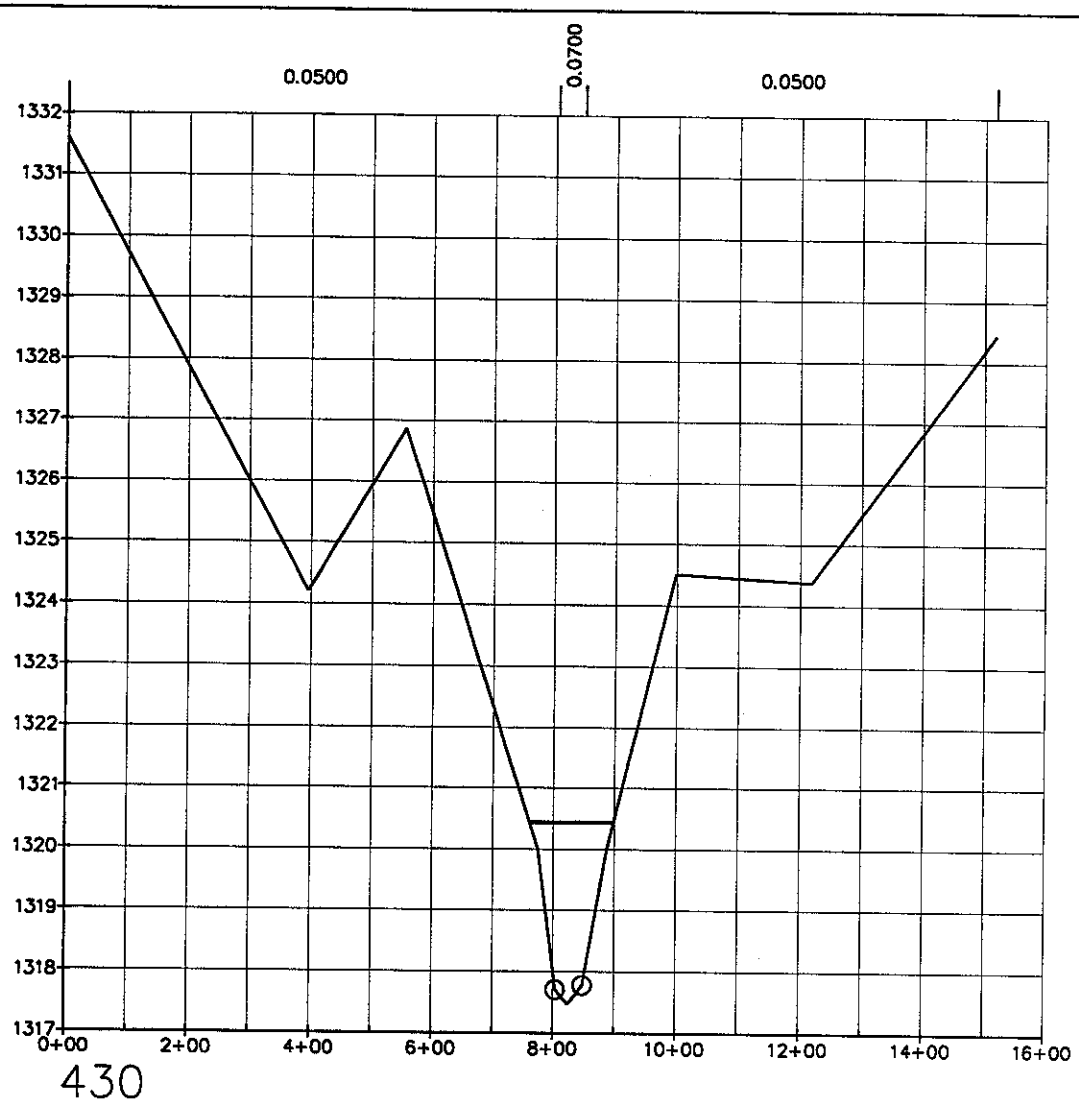
Cross-Section:	420	
Elevation:	1316.44	ft MSL
Depth:	2.14	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3593	
Flow Regime:	Subcritical	
Flow Area:	274.75	sq ft
Average Velocity:	2.98	ft/s
Maximum Velocity:	3.02	ft/s
Composite n:	0.0665	
Hydraulic Radius:	1.8	ft
Wetted Perimeter:	152.44	ft
Wetted Top Width:	152.19	ft
Critical Slope:	0.0627	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31W(PHILLIPS-NORTH)-420

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

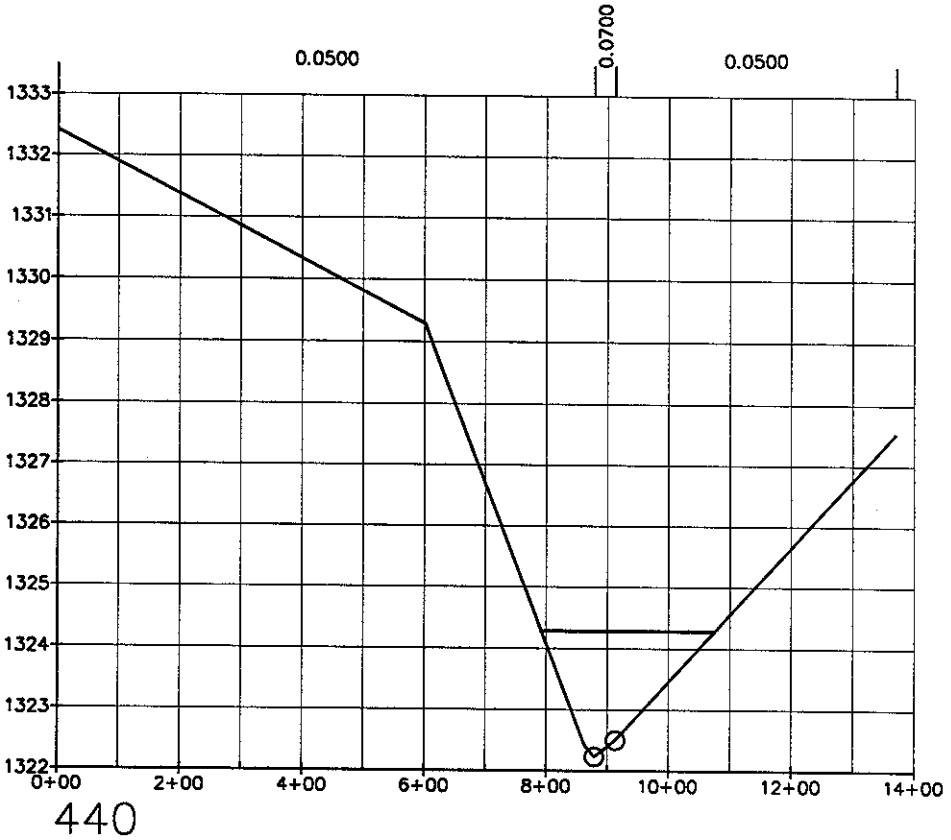
Cross-Section:	430	
Elevation:	1320.44	ft MSL
Depth:	2.97	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3534	
Flow Regime:	Subcritical	
Flow Area:	237.50	sq ft
Average Velocity:	3.44	ft/s
Maximum Velocity:	3.81	ft/s
Composite n:	0.0568	
Hydraulic Radius:	1.73	ft
Wetted Perimeter:	137.49	ft
Wetted Top Width:	137.32	ft
Critical Slope:	0.067	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–430

Entellus™

File: WASH–T2N–R5W–S31W(PHILLIPS–NORTH)_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

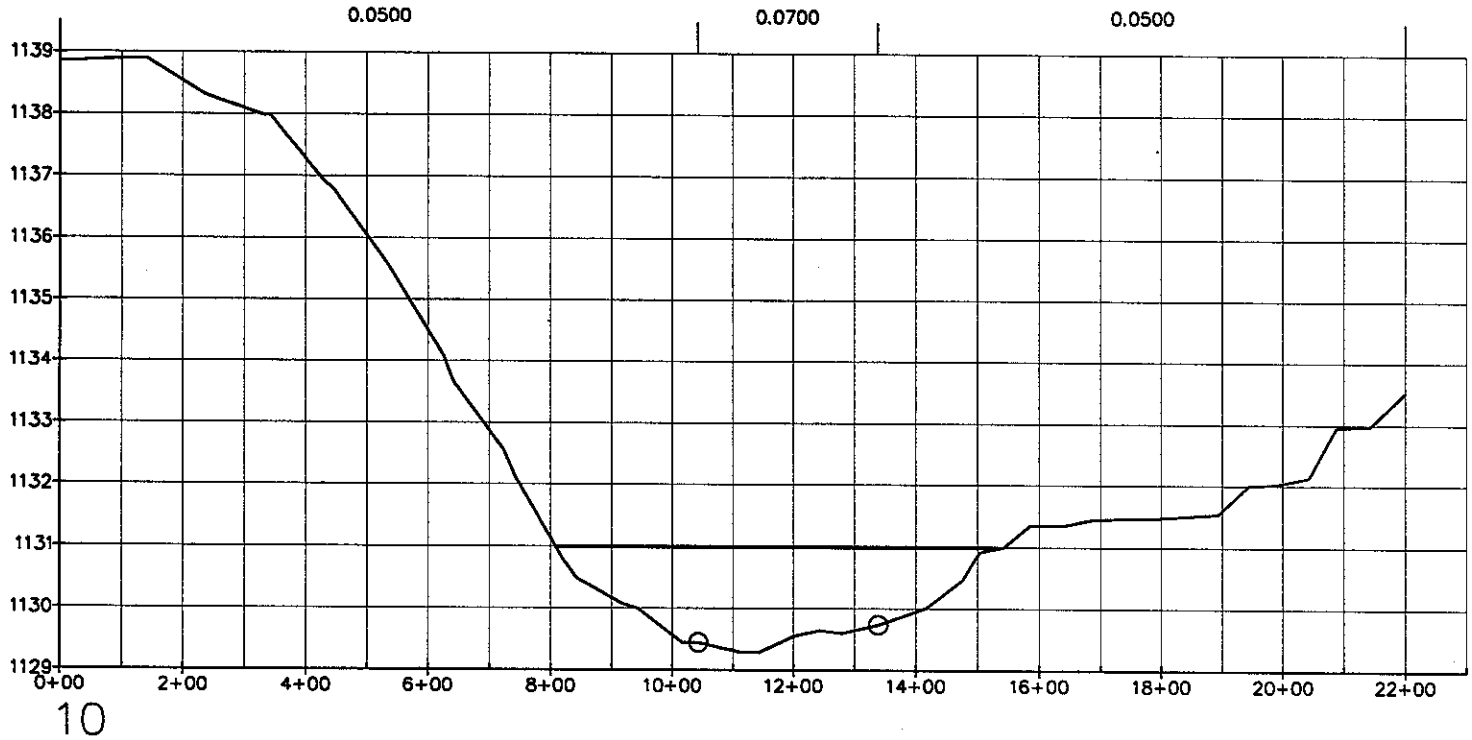
Cross-Section:	440	
Elevation:	1324.28	ft MSL
Depth:	2.05	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3295	
Flow Regime:	Subcritical	
Flow Area:	306.45	sq ft
Average Velocity:	2.69	ft/s
Maximum Velocity:	2.94	ft/s
Composite n:	0.0526	
Hydraulic Radius:	1.08	ft
Wetted Perimeter:	282.79	ft
Wetted Top Width:	282.75	ft
Critical Slope:	0.0739	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–440

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1130.99	ft MSL
Depth:	1.70	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2617	
Flow Regime:	Subcritical	
Flow Area:	801.14	sq ft
Average Velocity:	1.93	ft/s
Maximum Velocity:	2.02	ft/s
Composite n:	0.0585	
Hydraulic Radius:	1.1	ft
Wetted Perimeter:	728.60	ft
Wetted Top Width:	728.59	ft
Critical Slope:	0.0743	ft/ft

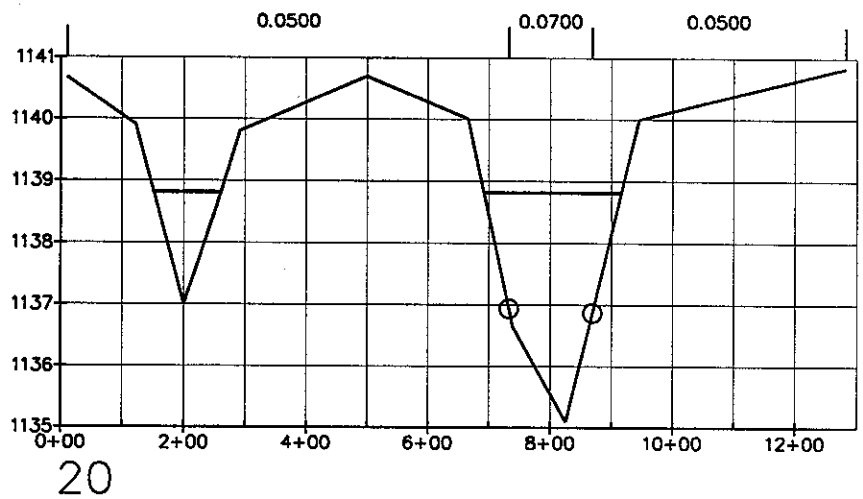
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–10

Entellus™

File: WASH-T2N-R5W-S19_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

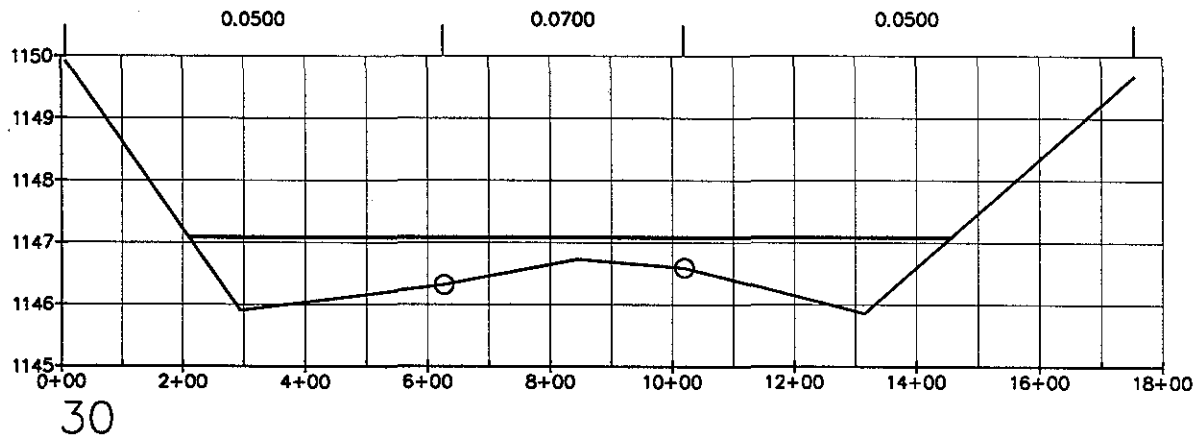
Cross-Section:	20	
Elevation:	1138.81	ft MSL
Depth:	3.72	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2471	
Flow Regime:	Subcritical	
Flow Area:	573.52	sq ft
Average Velocity:	2.71	ft/s
Maximum Velocity:	3.03	ft/s
Composite n:	0.0585	
Hydraulic Radius:	1.72	ft
Wetted Perimeter:	333.76	ft
Wetted Top Width:	333.56	ft
Critical Slope:	0.0898	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–20

Entellus™

File: WASH–T2N–R5W–S19_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

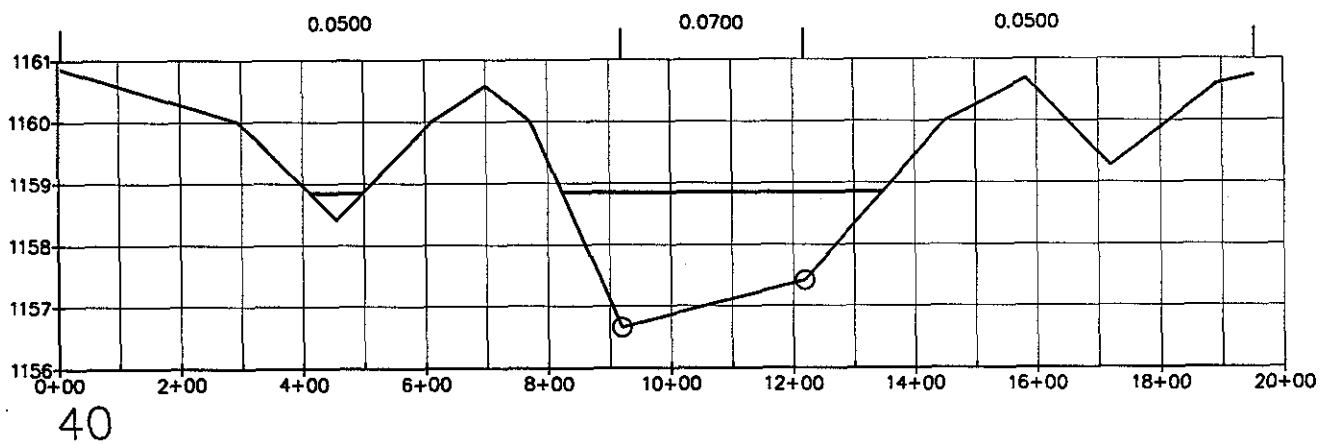
Cross-Section:	30	
Elevation:	1147.09	ft MSL
Depth:	1.23	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2707	
Flow Regime:	Subcritical	
Flow Area:	910.49	sq ft
Average Velocity:	1.68	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0566	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	1246.31	ft
Wetted Top Width:	1246.29	ft
Critical Slope:	0.0869	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–30

Entellus™

File: WASH-T2N-R5W-S19_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

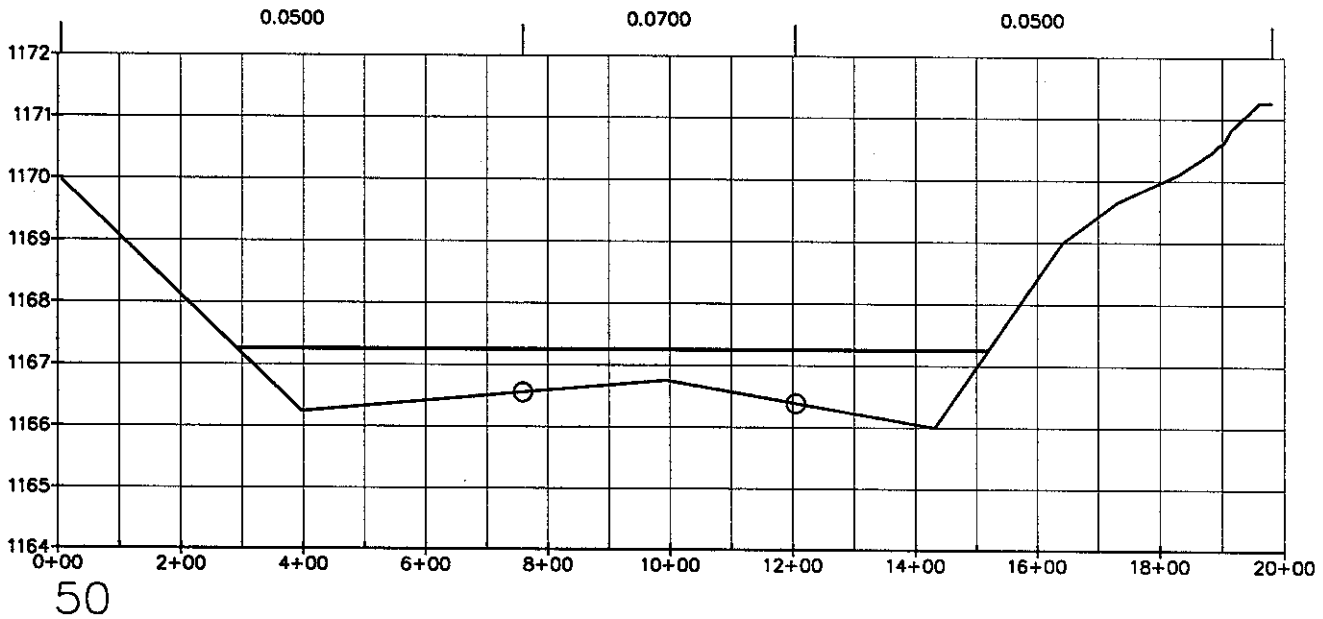
Cross-Section:	40	
Elevation:	1158.85	ft MSL
Depth:	2.18	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.245	
Flow Regime:	Subcritical	
Flow Area:	754.64	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.23	ft/s
Composite n:	0.0602	
Hydraulic Radius:	1.24	ft
Wetted Perimeter:	609.56	ft
Wetted Top Width:	609.52	ft
Critical Slope:	0.0863	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–40

Entellus™

File: WASH-T2N-R5W-S19_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

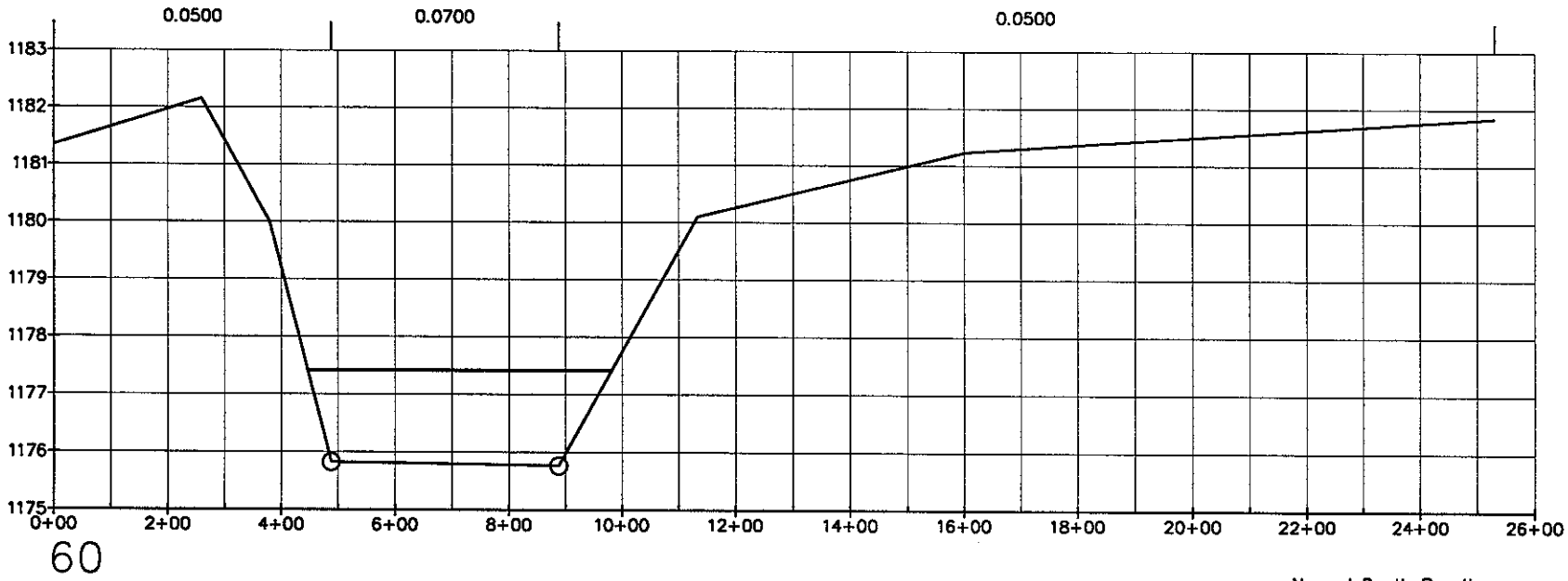
Cross-Section:	50	
Elevation:	1167.25	ft MSL
Depth:	1.25	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2601	
Flow Regime:	Subcritical	
Flow Area:	938.45	sq ft
Average Velocity:	1.65	ft/s
Maximum Velocity:	2.02	ft/s
Composite n:	0.0576	
Hydraulic Radius:	0.76	ft
Wetted Perimeter:	1227.87	ft
Wetted Top Width:	1227.85	ft
Critical Slope:	0.0863	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–50

Entellus™

File: WASH-T2N-R5W-S19_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

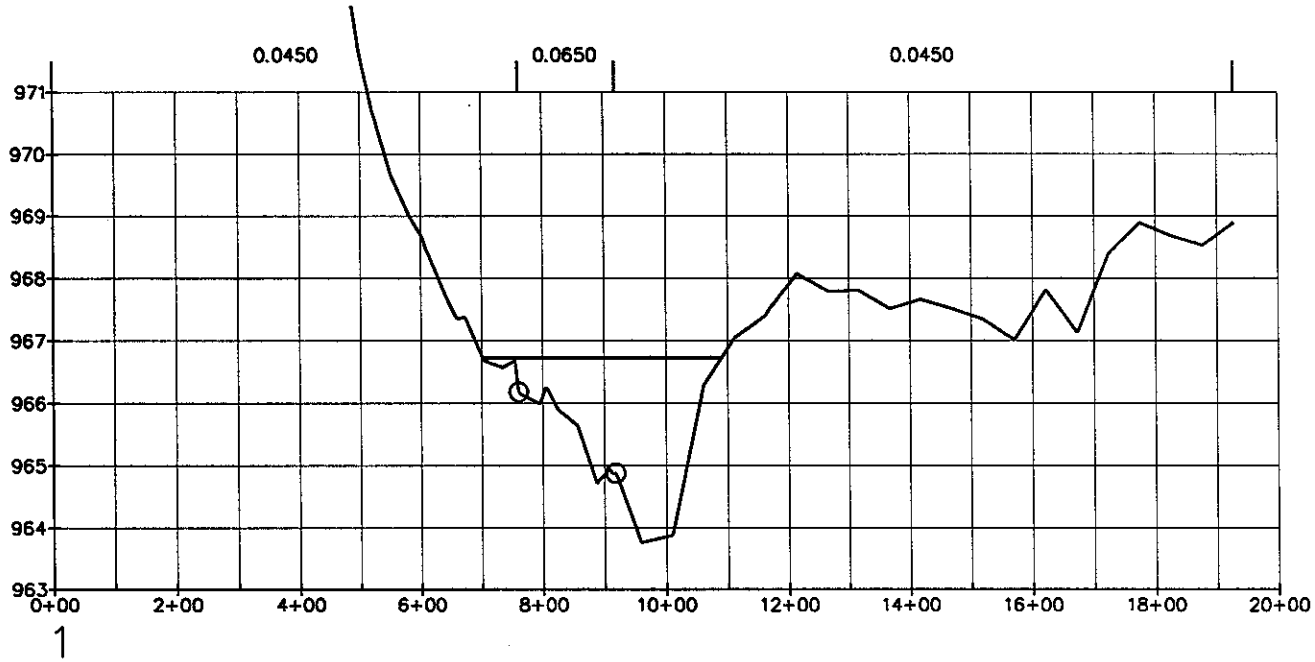
Cross-Section:	60	
Elevation:	1177.42	ft MSL
Depth:	1.65	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.2804	
Flow Regime:	Subcritical	
Flow Area:	758.49	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.08	ft/s
Composite n:	0.0652	
Hydraulic Radius:	1.42	ft
Wetted Perimeter:	534.89	ft
Wetted Top Width:	534.85	ft
Critical Slope:	0.0639	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–60

Entellus™

File: WASH-T2N-R5W-S19_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	1	
Elevation:	966.72	ft MSL
Depth:	2.96	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.3361	
Flow Regime:	Subcritical	
Flow Area:	517.92	sq ft
Average Velocity:	3.30	ft/s
Maximum Velocity:	4.07	ft/s
Composite n:	0.0535	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	388.09	ft
Wetted Top Width:	387.96	ft
Critical Slope:	0.0837	ft/ft

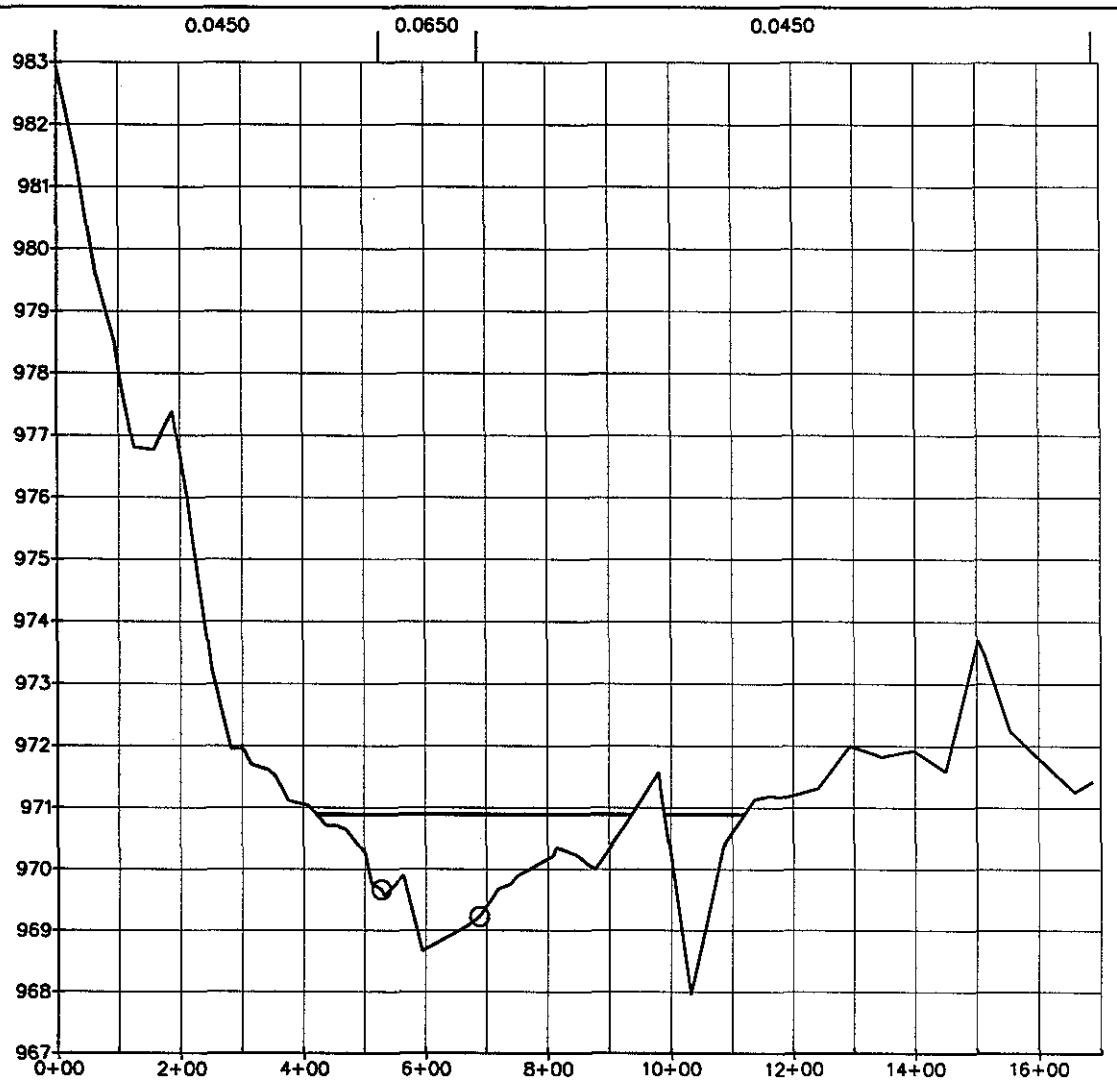
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–1

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



4

Note: X-section not used for delineation

Normal Depth Results

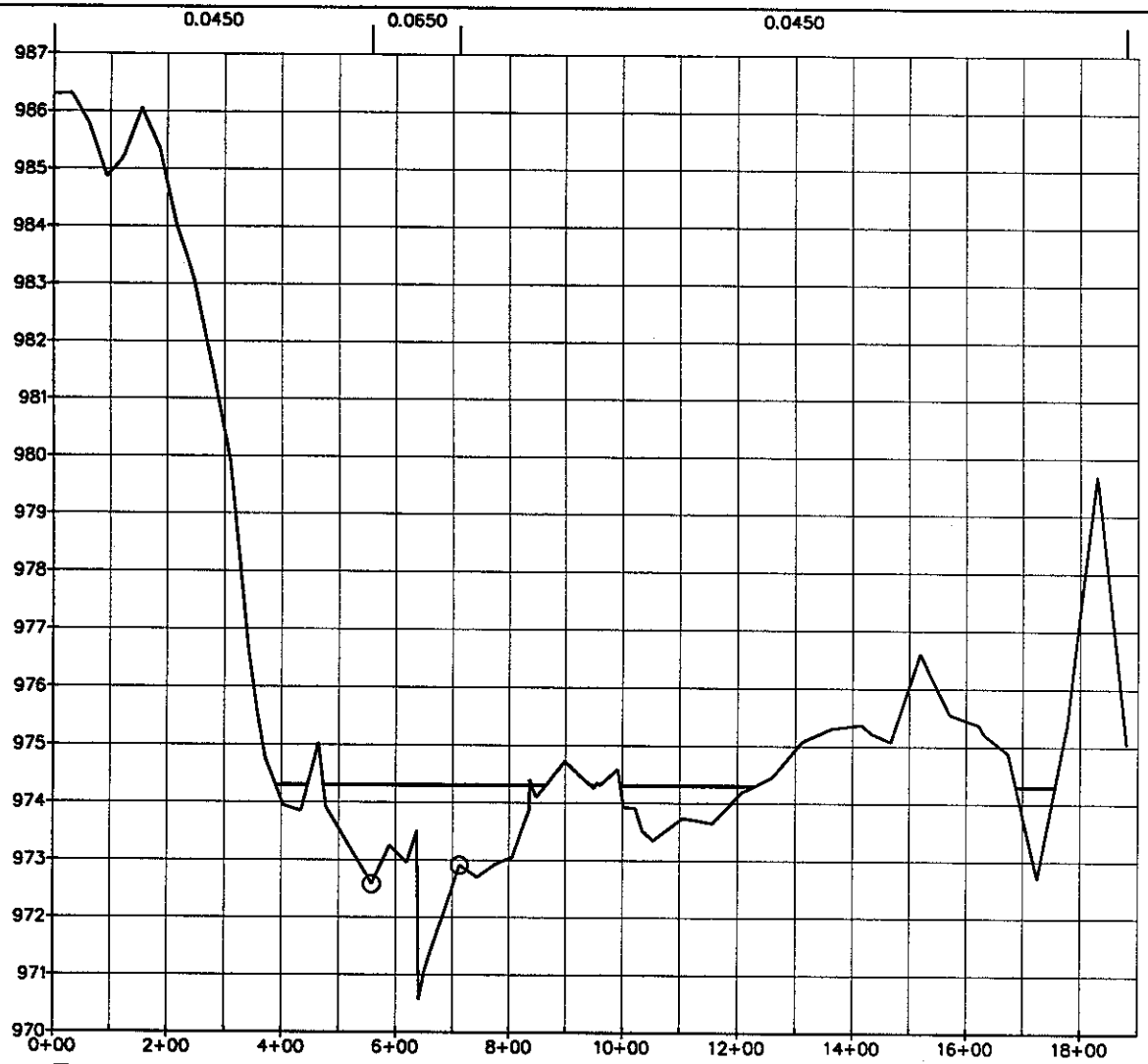
Cross-Section:	4	
Elevation:	970.89	ft MSL
Depth:	2.93	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2547	
Flow Regime:	Subcritical	
Flow Area:	687.52	sq ft
Average Velocity:	2.48	ft/s
Maximum Velocity:	2.58	ft/s
Composite n:	0.0503	
Hydraulic Radius:	1.07	ft
Wetted Perimeter:	645.25	ft
Wetted Top Width:	645.03	ft
Critical Slope:	0.0988	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–4

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



5

Note: X-section not used for delineation

Normal Depth Results

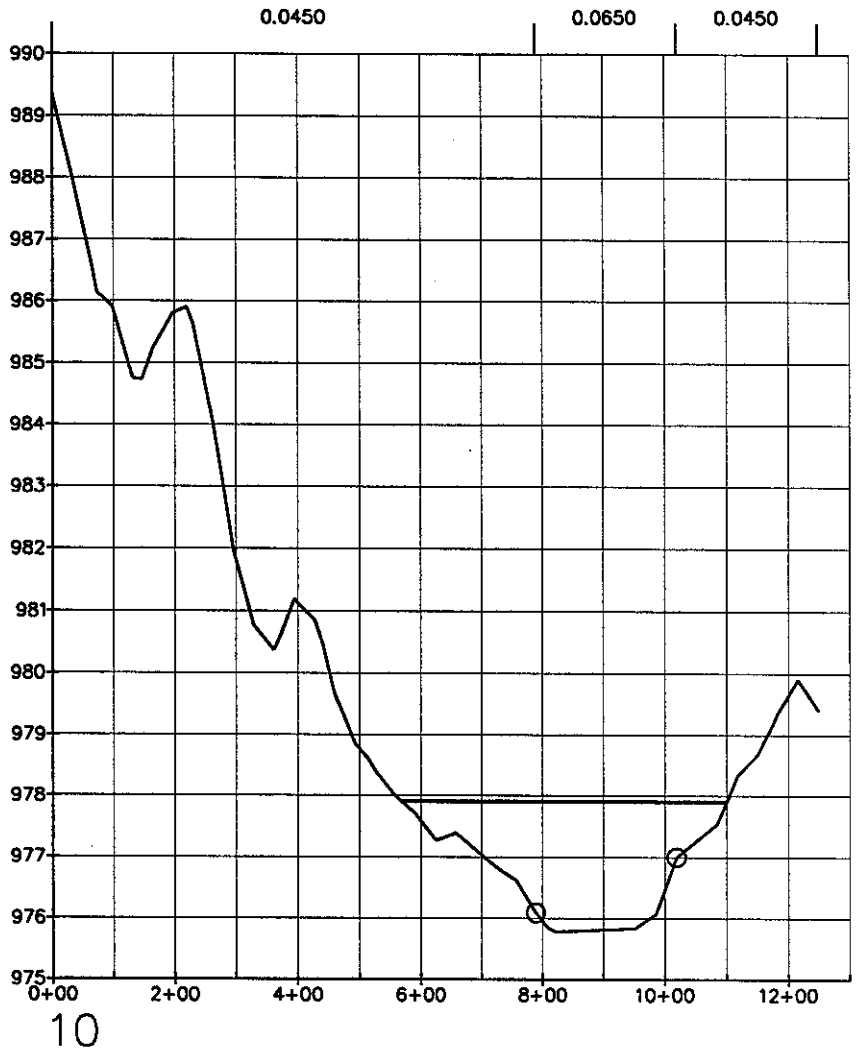
Cross-Section:	5	
Elevation:	974.30	ft MSL
Depth:	3.73	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2133	
Flow Regime:	Subcritical	
Flow Area:	727.24	sq ft
Average Velocity:	2.35	ft/s
Maximum Velocity:	2.70	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.96	ft
Wetted Perimeter:	755.94	ft
Wetted Top Width:	754.55	ft
Critical Slope:	0.1392	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–5

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

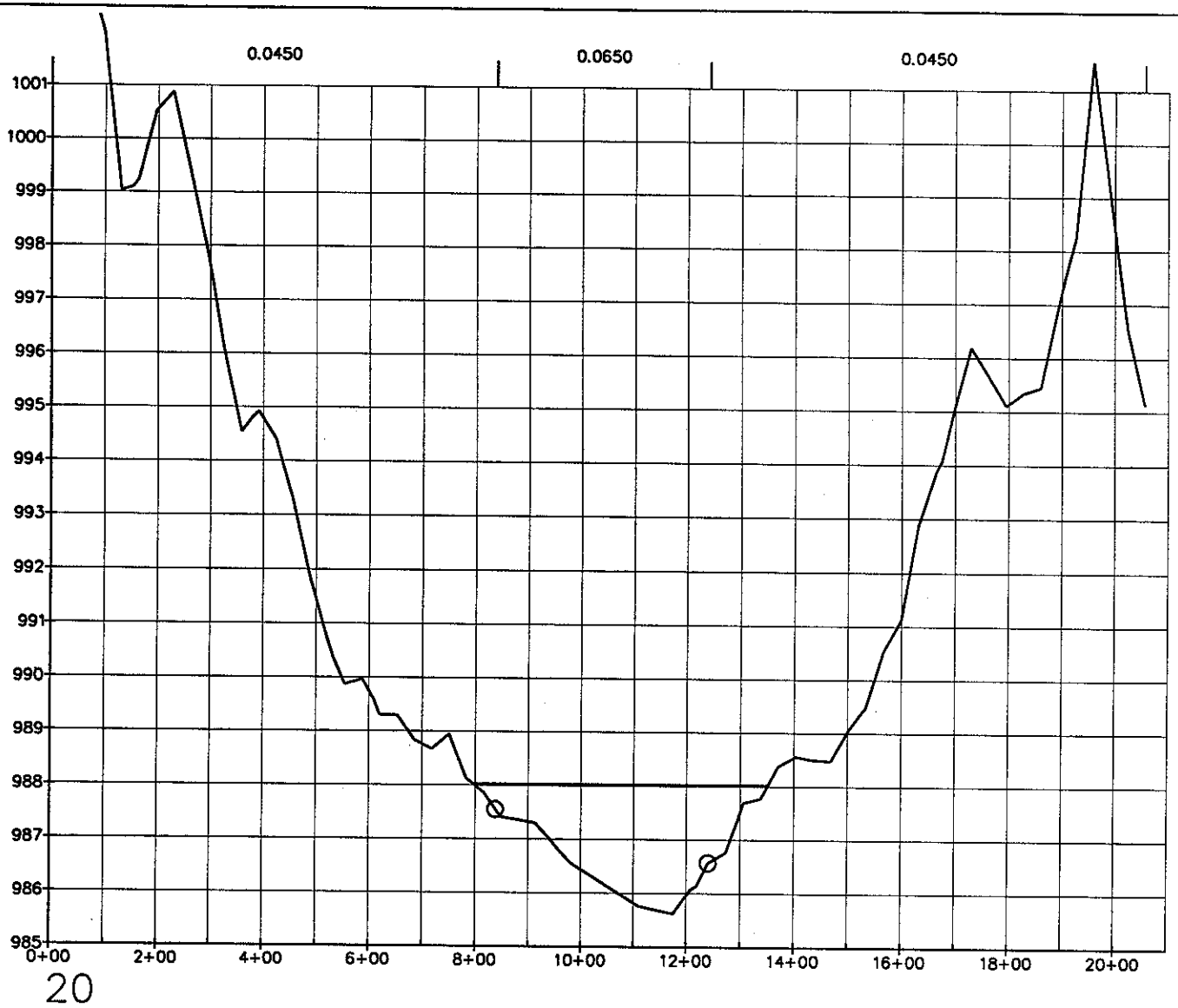
Cross-Section:	10	
Elevation:	977.91	ft MSL
Depth:	2.13	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.3182	
Flow Regime:	Subcritical	
Flow Area:	672.47	sq ft
Average Velocity:	2.64	ft/s
Maximum Velocity:	2.87	ft/s
Composite n:	0.054	
Hydraulic Radius:	1.26	ft
Wetted Perimeter:	532.52	ft
Wetted Top Width:	532.49	ft
Critical Slope:	0.066	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–10

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

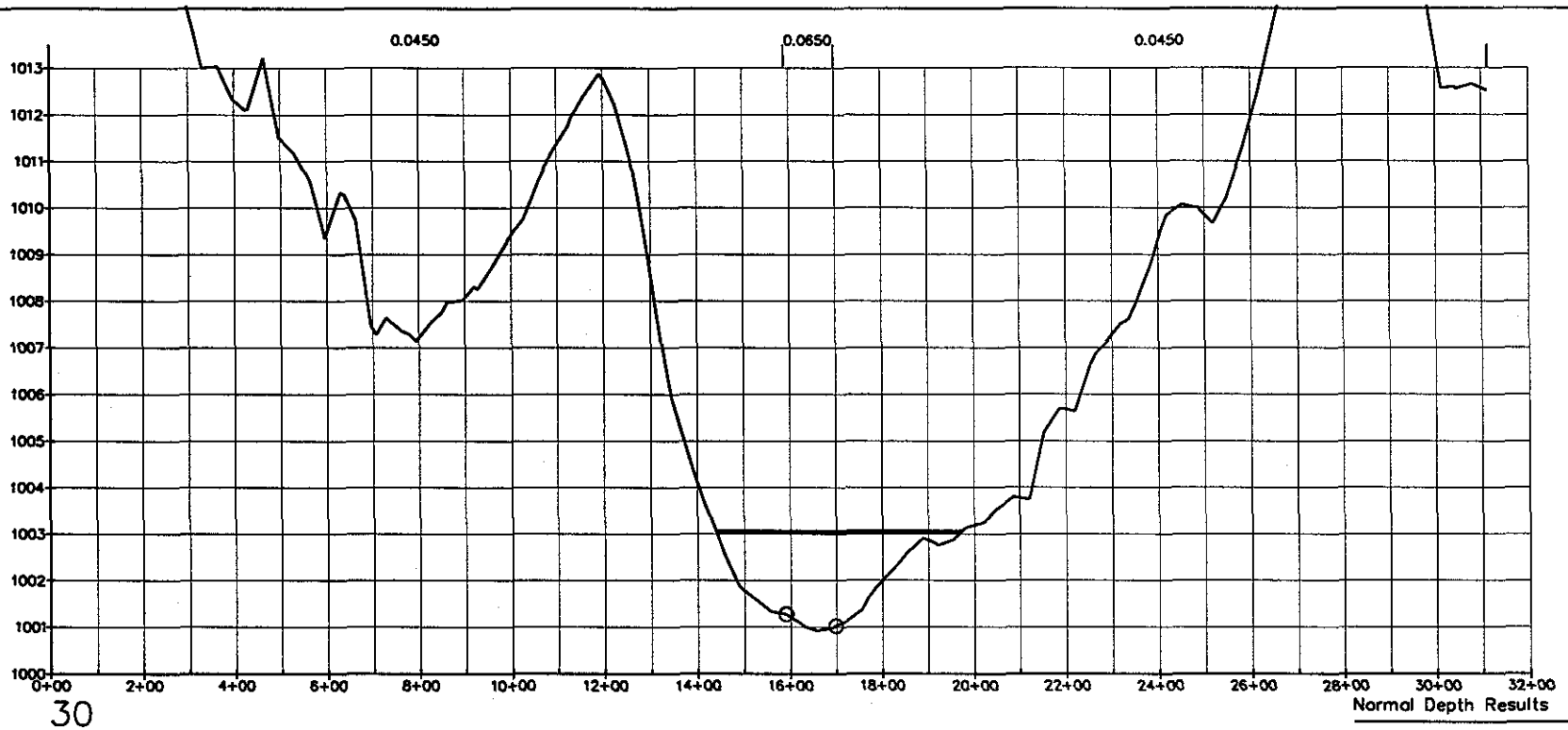
Cross-Section:	20	
Elevation:	988.02	ft MSL
Depth:	2.40	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2761	
Flow Regime:	Subcritical	
Flow Area:	730.24	sq ft
Average Velocity:	2.44	ft/s
Maximum Velocity:	2.50	ft/s
Composite n:	0.0598	
Hydraulic Radius:	1.32	ft
Wetted Perimeter:	554.17	ft
Wetted Top Width:	554.13	ft
Critical Slope:	0.0861	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–20

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

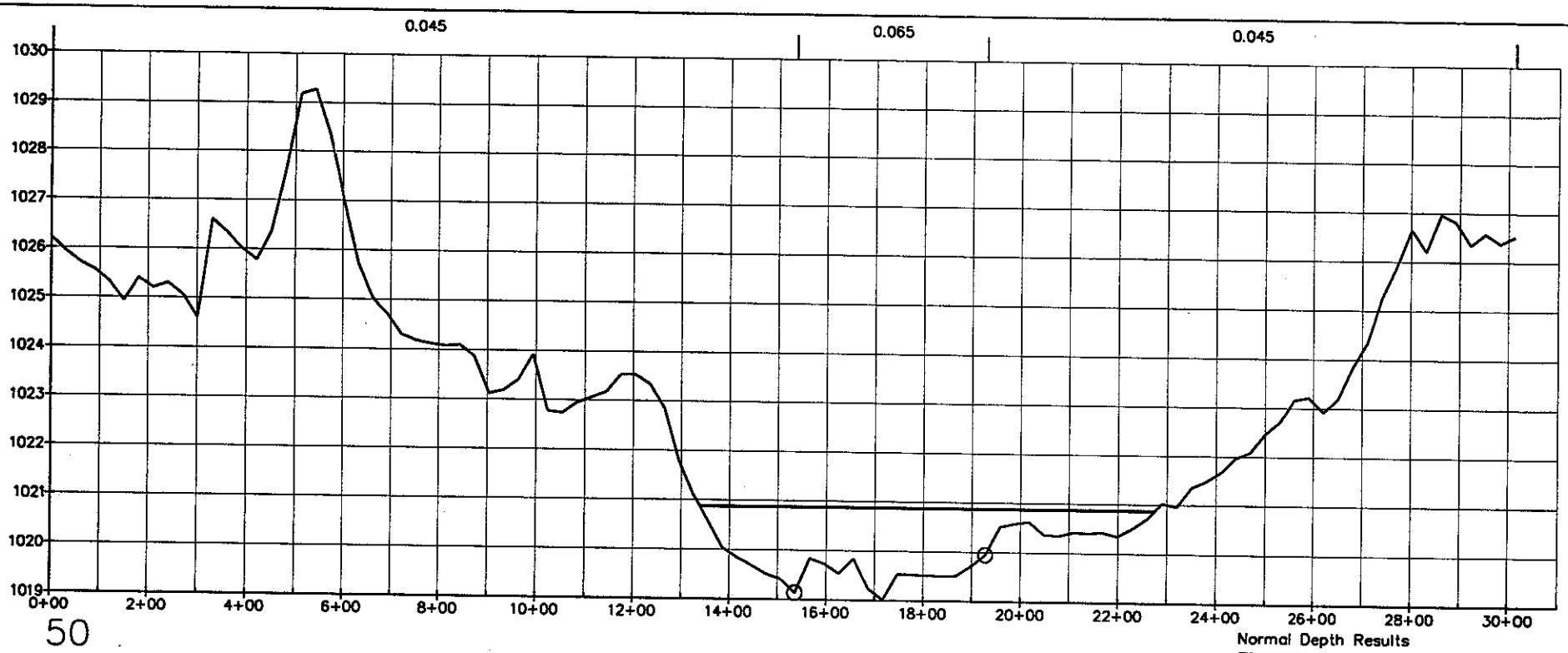
Cross-Section:	30	
Elevation:	1003.06	ft MSL
Depth:	2.13	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.3328	
Flow Regime:	Subcritical	
Flow Area:	642.54	sq ft
Average Velocity:	2.77	ft/s
Maximum Velocity:	3.06	ft/s
Composite n:	0.0493	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	534.29	ft
Wetted Top Width:	534.26	ft
Critical Slope:	0.0588	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–30

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	50	
Elevation:	1020.87	ft MSL
Depth:	1.85	ft
Discharge:	1770.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2623	
Flow Regime:	Subcritical	
Flow Area:	873.44	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.48	ft/s
Composite n:	0.0587	
Hydraulic Radius:	0.93	ft
Wetted Perimeter:	936.63	ft
Wetted Top Width:	936.59	ft
Critical Slope:	0.1019	ft/ft

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–50

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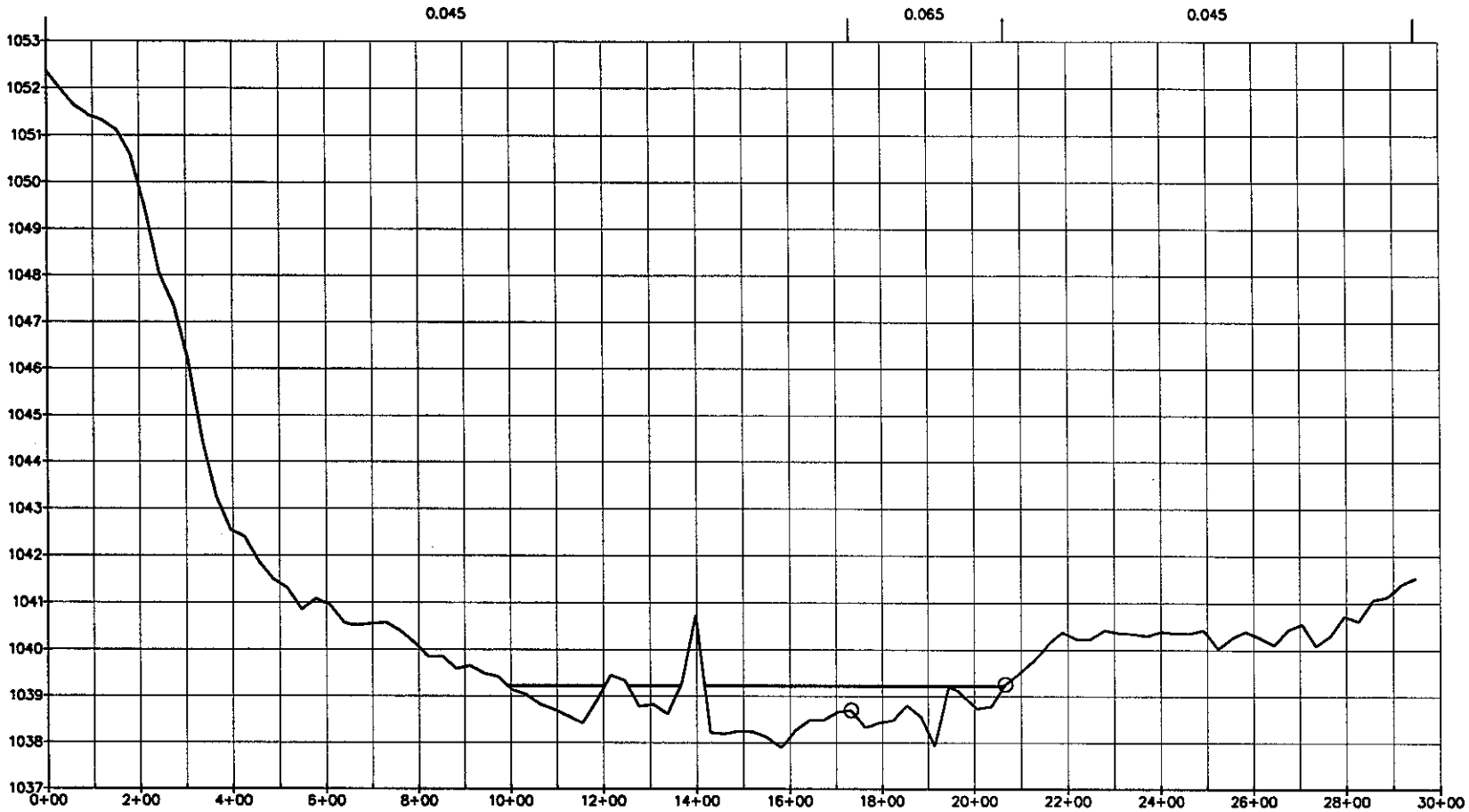


60

Normal Depth Results

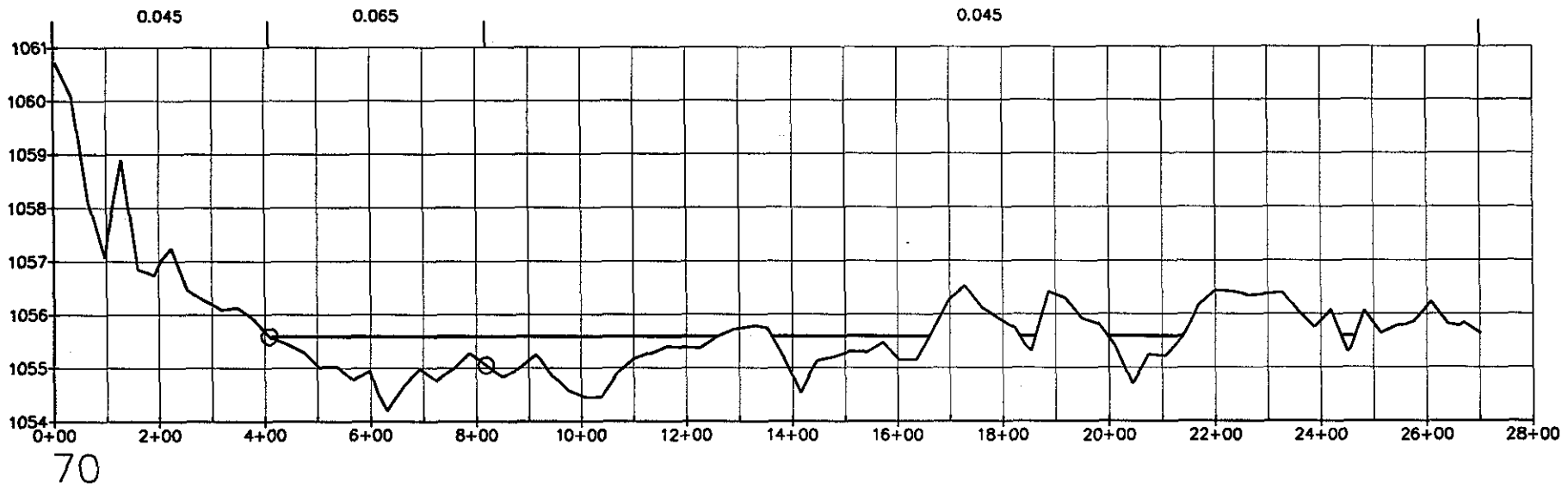
Cross-Section:	60		Flow Area:	599.69	sq ft
Elevation:	1039.22	ft MSL	Average Velocity:	1.56	ft/s
Depth:	1.32	ft	Maximum Velocity:	1.76	ft/s
Discharge:	930.00	cfs	Composite n:	0.0572	
Energy Gradient:	0.0062	ft/ft	Hydraulic Radius:	0.62	ft
Froude Number:	0.238		Wetted Perimeter:	969.40	ft
Flow Regime:	Subcritical		Wetted Top Width:	969.29	ft
			Critical Slope:	0.1188	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–60

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

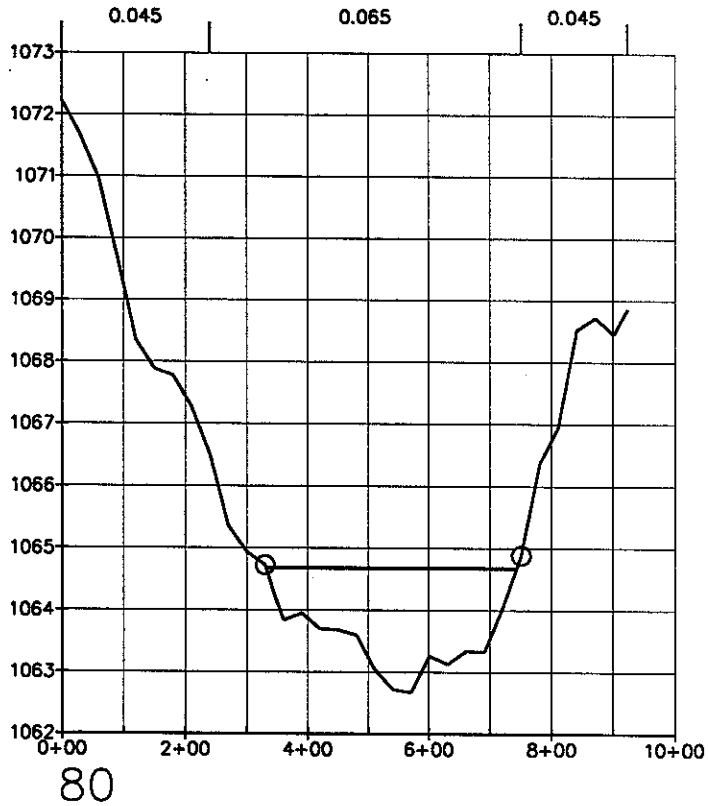
Cross-Section:	70	
Elevation:	1055.59	ft MSL
Depth:	1.39	ft
Discharge:	930.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2029	
Flow Regime:	Subcritical	
Flow Area:	686.12	sq ft
Average Velocity:	1.33	ft/s
Maximum Velocity:	1.41	ft/s
Composite n:	0.0564	
Hydraulic Radius:	0.51	ft
Wetted Perimeter:	1346.96	ft
Wetted Top Width:	1346.88	ft
Critical Slope:	0.1574	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–70

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

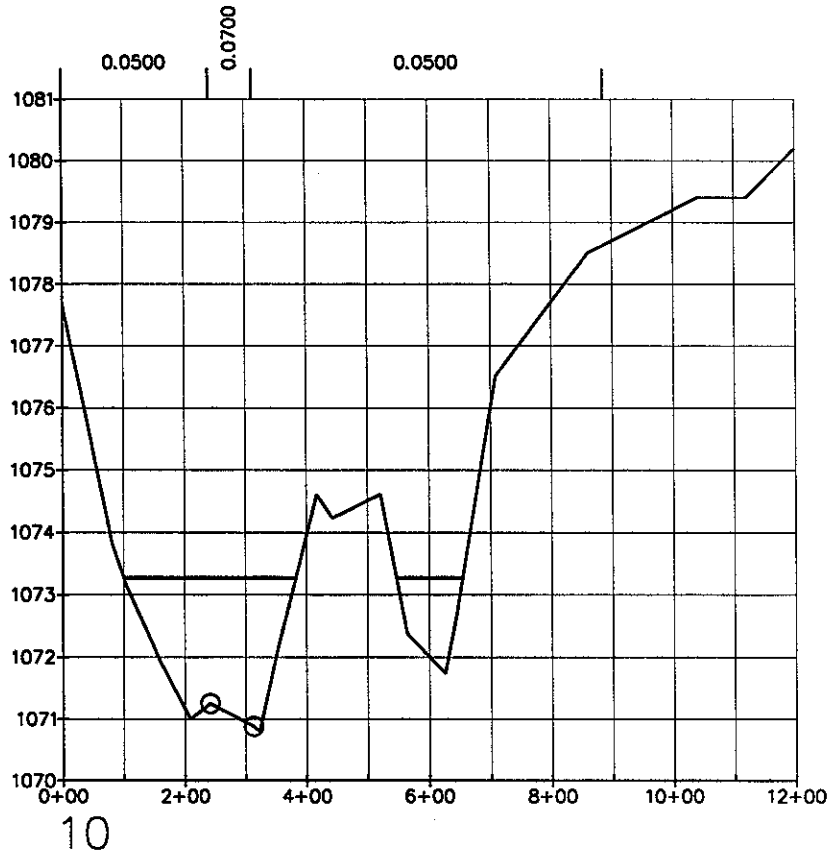
Cross-Section:	80	
Elevation:	1064.68	ft MSL
Depth:	2.01	ft
Discharge:	930.00	cfs
Energy Gradient:	0.0062	ft/ft
Froude Number:	0.2346	
Flow Regime:	Subcritical	
Flow Area:	493.20	sq ft
Average Velocity:	1.89	ft/s
Maximum Velocity:	1.89	ft/s
Composite n:	0.07	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	411.40	ft
Wetted Top Width:	411.35	ft
Critical Slope:	0.1119	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S30–80

Entellus™

File: WASH-T1N-R5W-S33_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1073.27	ft MSL
Depth:	2.47	ft
Discharge:	1750.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3525	
Flow Regime:	Subcritical	
Flow Area:	557.00	sq ft
Average Velocity:	3.13	ft/s
Maximum Velocity:	3.33	ft/s
Composite n:	0.0539	
Hydraulic Radius:	1.43	ft
Wetted Perimeter:	390.08	ft
Wetted Top Width:	389.94	ft
Critical Slope:	0.0646	ft/ft

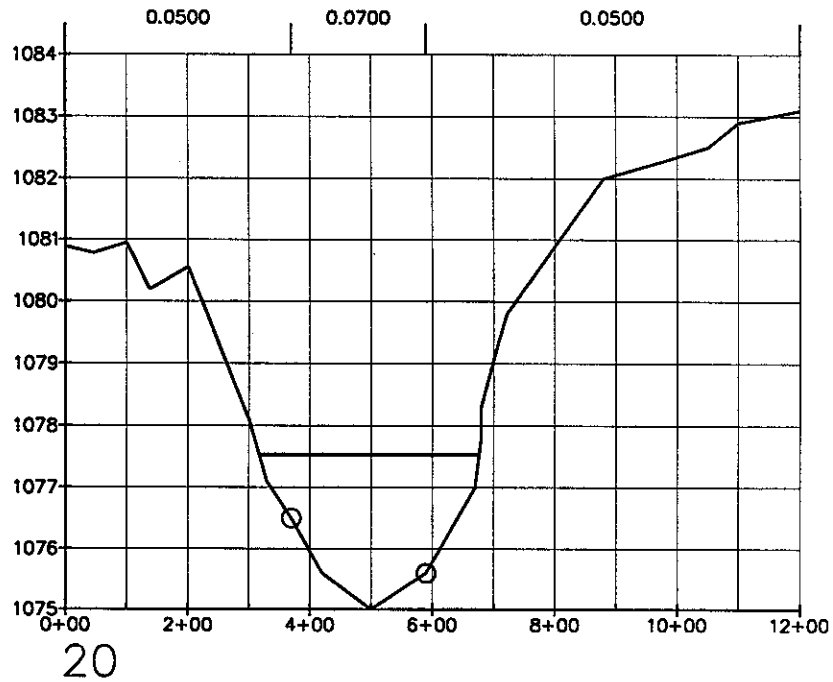
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–10

Entellus™

File: WASH–T2N–R5W–S32_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1077.53	ft MSL
Depth:	2.53	ft
Discharge:	1750.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.331	
Flow Regime:	Subcritical	
Flow Area:	585.73	sq ft
Average Velocity:	2.98	ft/s
Maximum Velocity:	3.06	ft/s
Composite n:	0.0626	
Hydraulic Radius:	1.63	ft
Wetted Perimeter:	359.32	ft
Wetted Top Width:	359.26	ft
Critical Slope:	0.075	ft/ft

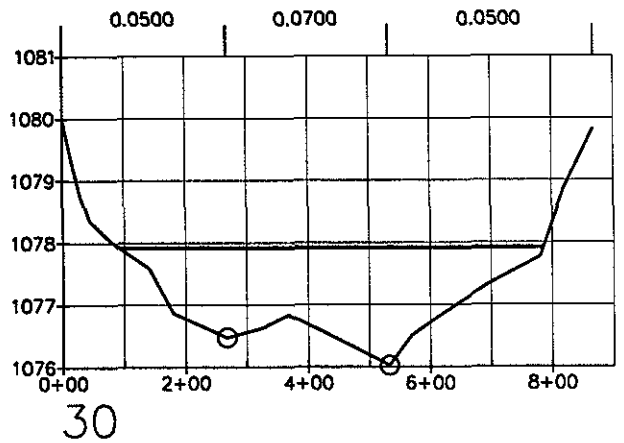
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–20

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

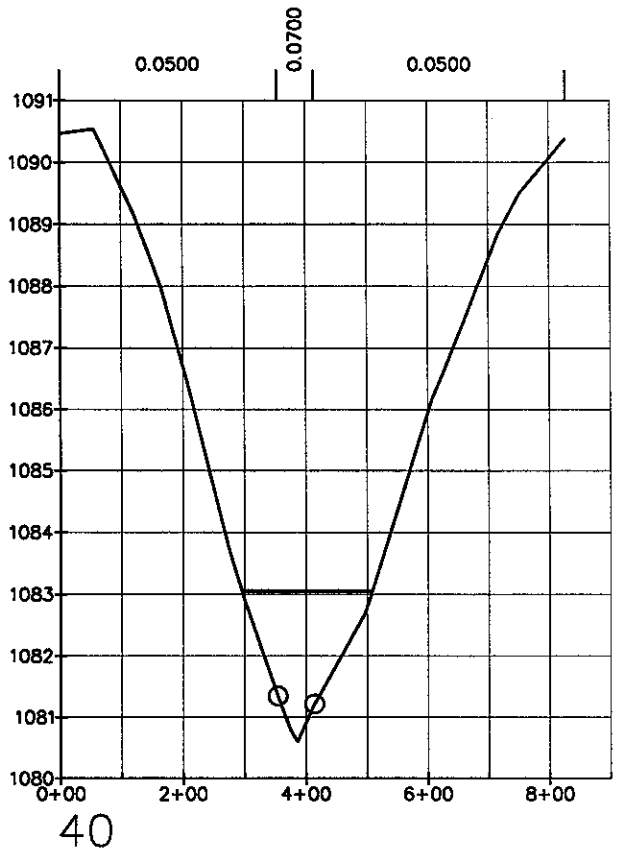
Cross-Section:	30	
Elevation:	1077.92	ft MSL
Depth:	1.89	ft
Discharge:	1750.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3057	
Flow Regime:	Subcritical	
Flow Area:	733.60	sq ft
Average Velocity:	2.37	ft/s
Maximum Velocity:	2.38	ft/s
Composite n:	0.058	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	693.90	ft
Wetted Top Width:	693.88	ft
Critical Slope:	0.0858	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–30

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

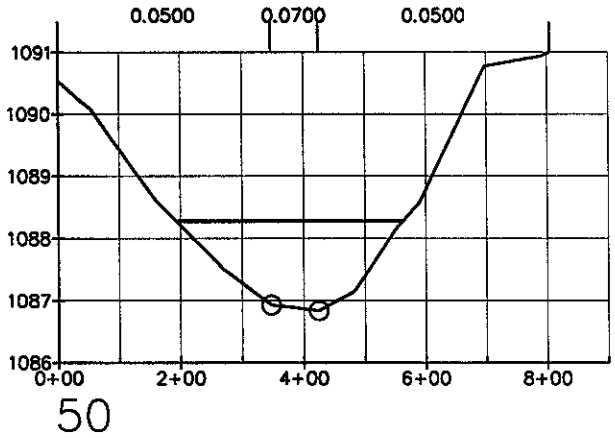
Cross-Section:	40	
Elevation:	1083.05	ft MSL
Depth:	2.45	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3189	
Flow Regime:	Subcritical	
Flow Area:	268.26	sq ft
Average Velocity:	2.81	ft/s
Maximum Velocity:	3.13	ft/s
Composite n:	0.0559	
Hydraulic Radius:	1.27	ft
Wetted Perimeter:	211.79	ft
Wetted Top Width:	211.73	ft
Critical Slope:	0.0811	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–40

Entellus™

File: WASH–T2N–R5W–S32_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

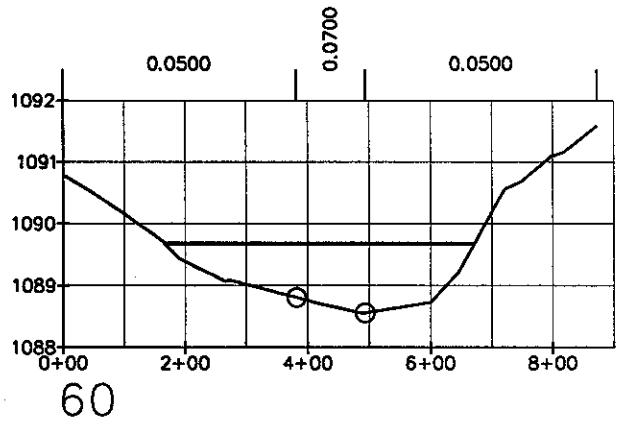
Cross-Section:	50	
Elevation:	1088.27	ft MSL
Depth:	1.43	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.334	
Flow Regime:	Subcritical	
Flow Area:	335.01	sq ft
Average Velocity:	2.29	ft/s
Maximum Velocity:	2.39	ft/s
Composite n:	0.0544	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	368.13	ft
Wetted Top Width:	368.11	ft
Critical Slope:	0.0699	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–50

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

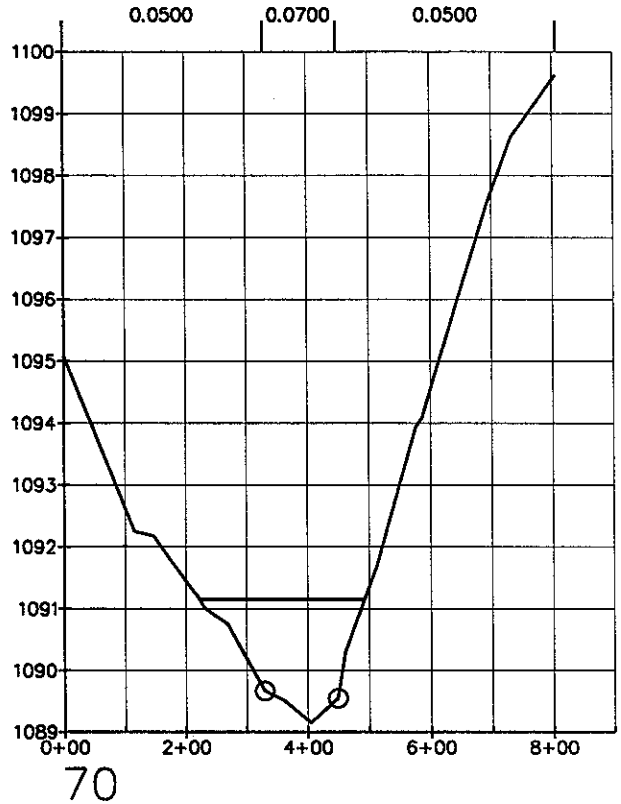
Cross-Section:	60	
Elevation:	1089.68	ft MSL
Depth:	1.13	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3338	
Flow Regime:	Subcritical	
Flow Area:	378.15	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.34	ft/s
Composite n:	0.0547	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	503.29	ft
Wetted Top Width:	503.28	ft
Critical Slope:	0.0716	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–60

Entellus™

File: WASH–T2N–R5W–S32_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

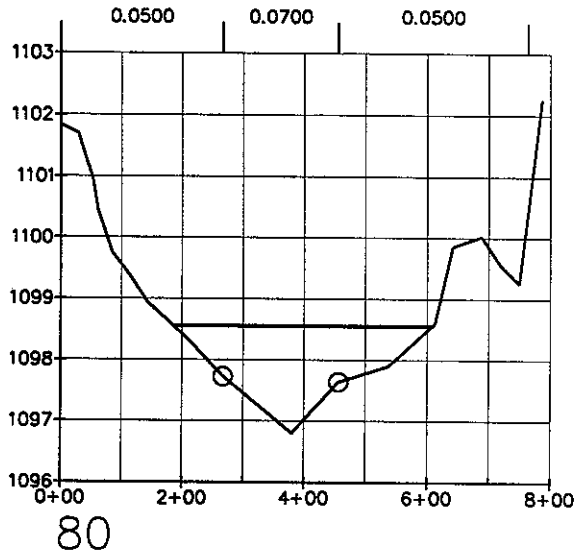
Cross-Section:	70	
Elevation:	1091.16	ft MSL
Depth:	2.00	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3097	
Flow Regime:	Subcritical	
Flow Area:	305.51	sq ft
Average Velocity:	2.50	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0592	
Hydraulic Radius:	1.13	ft
Wetted Perimeter:	270.54	ft
Wetted Top Width:	270.49	ft
Critical Slope:	0.0867	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–70

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

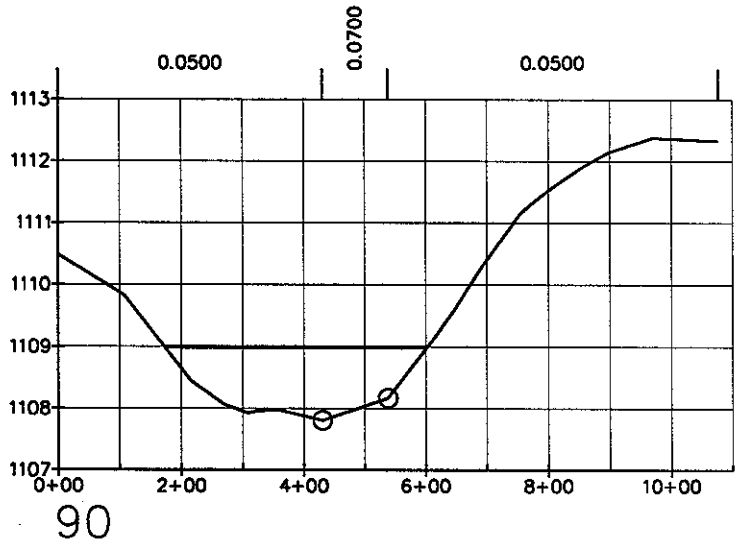
Cross-Section:	80	
Elevation:	1098.55	ft MSL
Depth:	1.75	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.2762	
Flow Regime:	Subcritical	
Flow Area:	366.34	sq ft
Average Velocity:	2.08	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.0593	
Hydraulic Radius:	0.87	ft
Wetted Perimeter:	422.72	ft
Wetted Top Width:	422.71	ft
Critical Slope:	0.1082	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–80

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

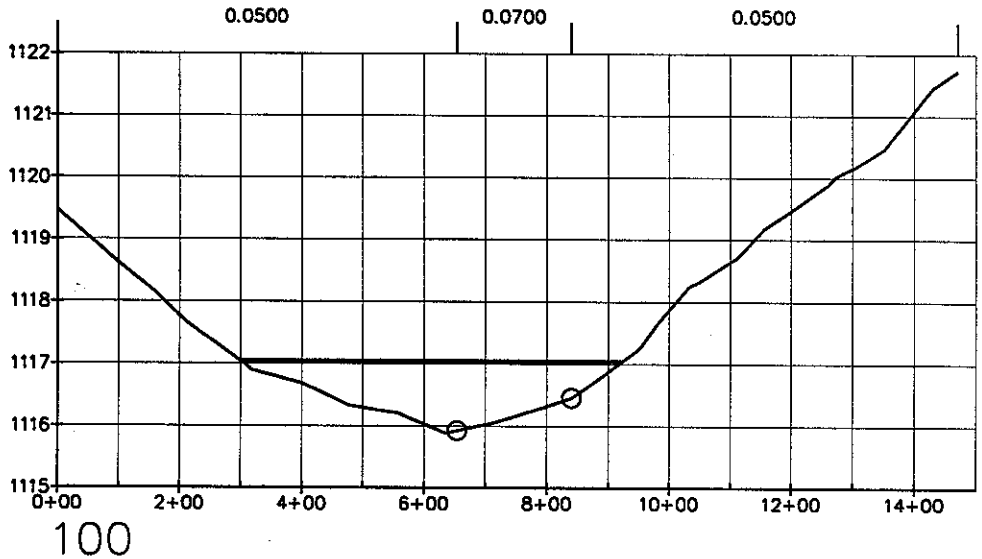
Cross-Section:	90	
Elevation:	1108.99	ft MSL
Depth:	1.18	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3511	
Flow Regime:	Subcritical	
Flow Area:	351.94	sq ft
Average Velocity:	2.16	ft/s
Maximum Velocity:	2.38	ft/s
Composite n:	0.0553	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	428.33	ft
Wetted Top Width:	428.32	ft
Critical Slope:	0.0678	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–90

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

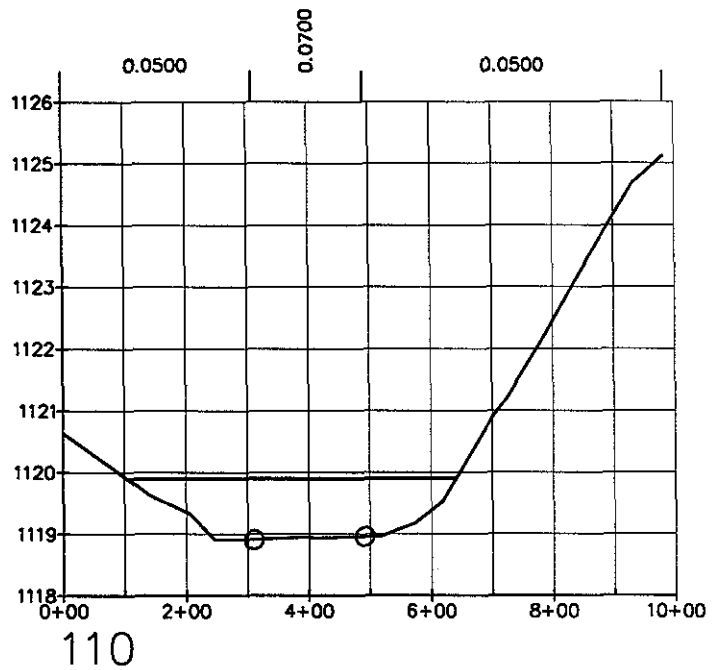
Cross-Section:	100	
Elevation:	1117.05	ft MSL
Depth:	1.16	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3013	
Flow Regime:	Subcritical	
Flow Area:	413.06	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	1.95	ft/s
Composite n:	0.0563	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	623.71	ft
Wetted Top Width:	623.70	ft
Critical Slope:	0.0923	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–100

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

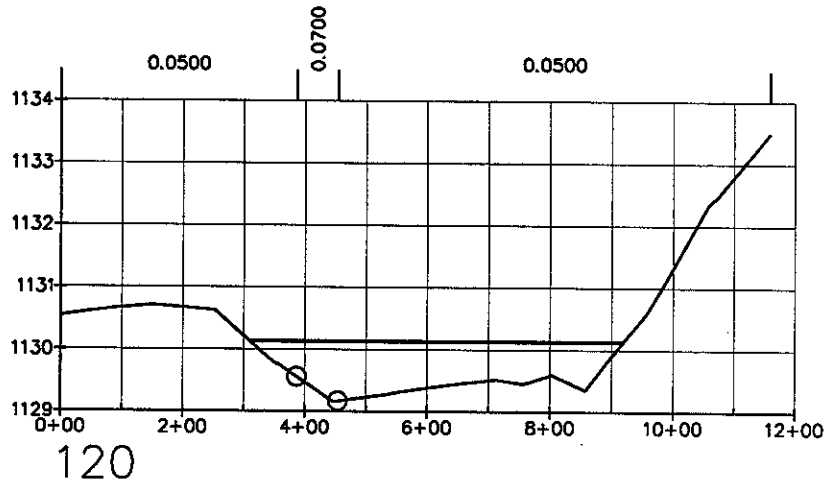
Cross-Section:	110	
Elevation:	1119.90	ft MSL
Depth:	0.99	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3369	
Flow Regime:	Subcritical	
Flow Area:	399.90	sq ft
Average Velocity:	1.91	ft/s
Maximum Velocity:	2.02	ft/s
Composite n:	0.0571	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	536.23	ft
Wetted Top Width:	536.22	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–110

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

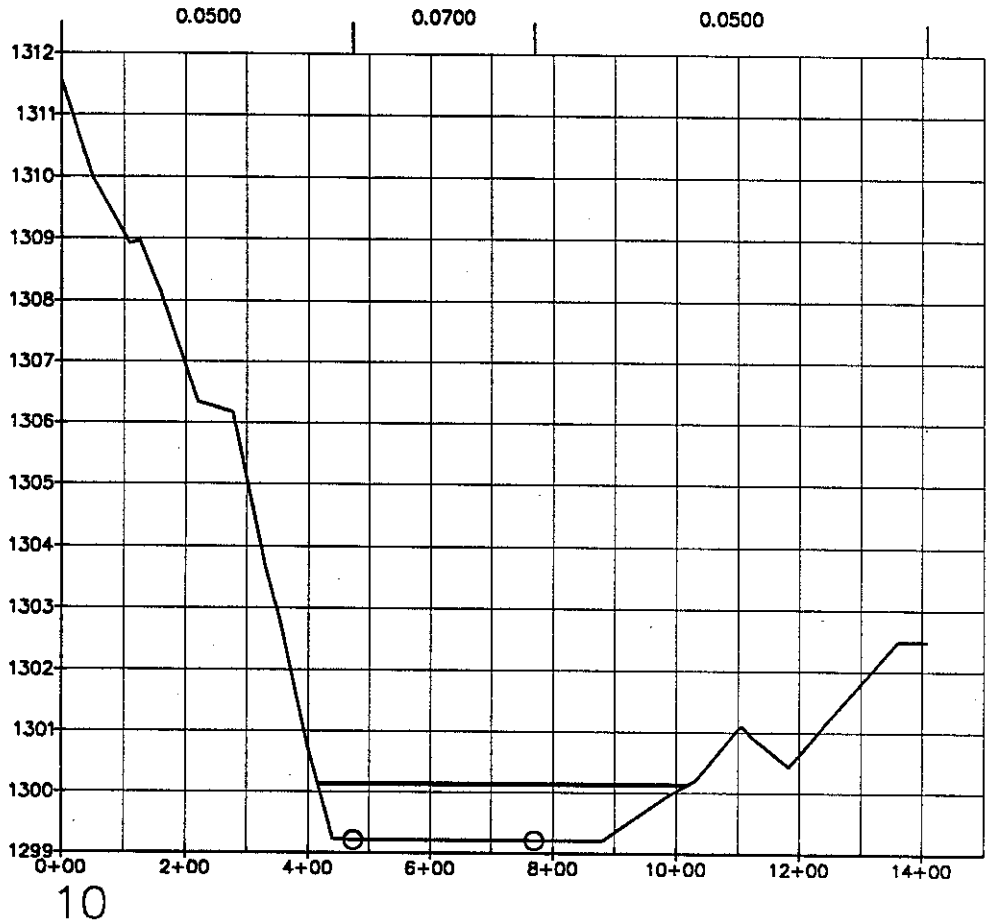
Cross-Section:	120	
Elevation:	1130.13	ft MSL
Depth:	0.97	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0079	ft/ft
Froude Number:	0.3465	
Flow Regime:	Subcritical	
Flow Area:	392.69	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.05	ft/s
Composite n:	0.0523	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	608.60	ft
Wetted Top Width:	608.59	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S32–120

Entellus™

File: WASH-T2N-R5W-S32_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1300.17	ft MSL
Depth:	0.96	ft
Discharge:	960.00	cfs
Energy Gradient:	0.0078	ft/ft
Froude Number:	0.3448	
Flow Regime:	Subcritical	
Flow Area:	500.71	sq ft
Average Velocity:	1.93	ft/s
Maximum Velocity:	2.16	ft/s
Composite n:	0.0601	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	609.23	ft
Wetted Top Width:	609.21	ft
Critical Slope:	0.0654	ft/ft

File: WASH-T3N-R5W-S30_X-SECTION-R14.dwg Date: 10/03/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S30–10

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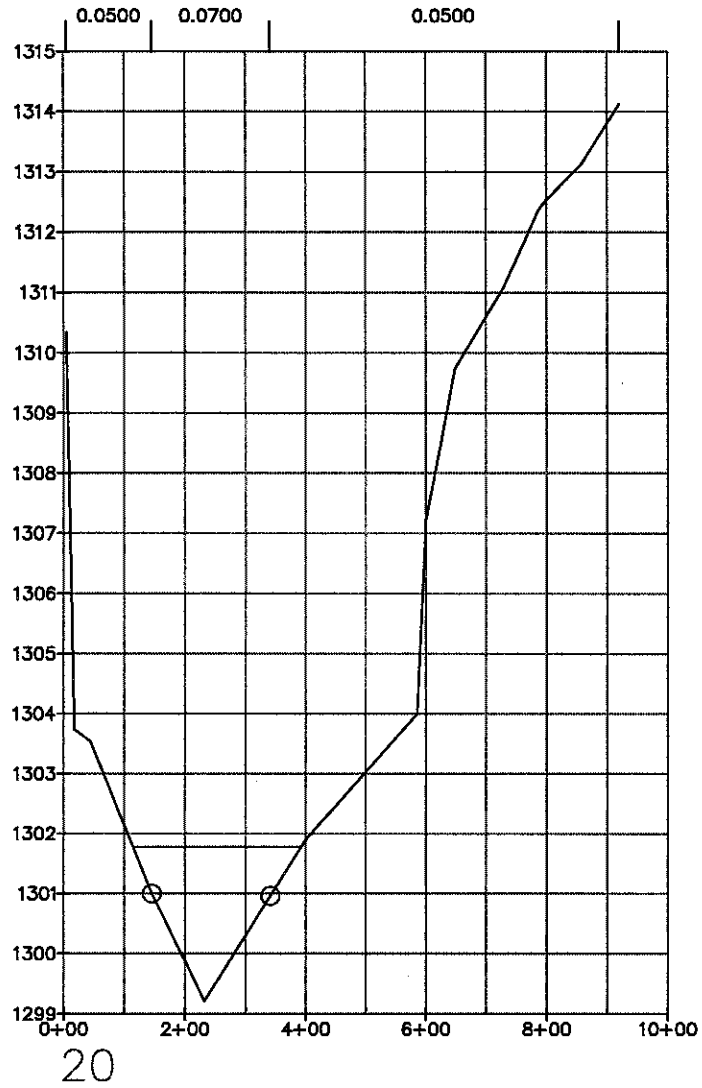


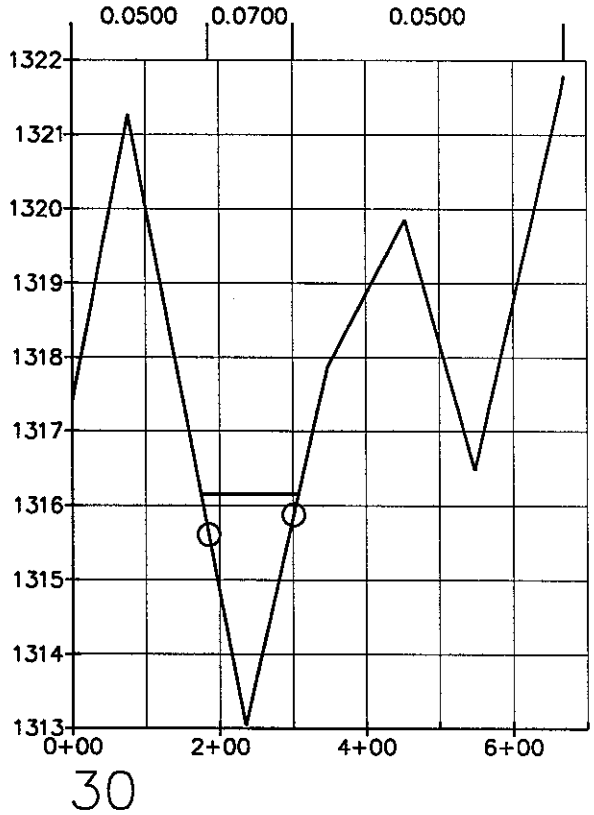
Normal Depth Results		
Cross-Section:	20	
Elevation:	1301.78	ft MSL
Depth:	2.56	ft
Discharge:	920.00	cfs
Energy Gradient:	0.0078	ft/ft
Froude Number:	0.2805	
Flow Regime:	Subcritical	
Flow Area:	361.24	sq ft
Average Velocity:	2.54	ft/s
Maximum Velocity:	2.66	ft/s
Composite n:	0.0644	
Hydraulic Radius:	1.3	ft
Wetted Perimeter:	277.57	ft
Wetted Top Width:	277.52	ft
Critical Slope:	0.1084	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S30–20

Entellus™

File: WASH–T3N–R5W–S30_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

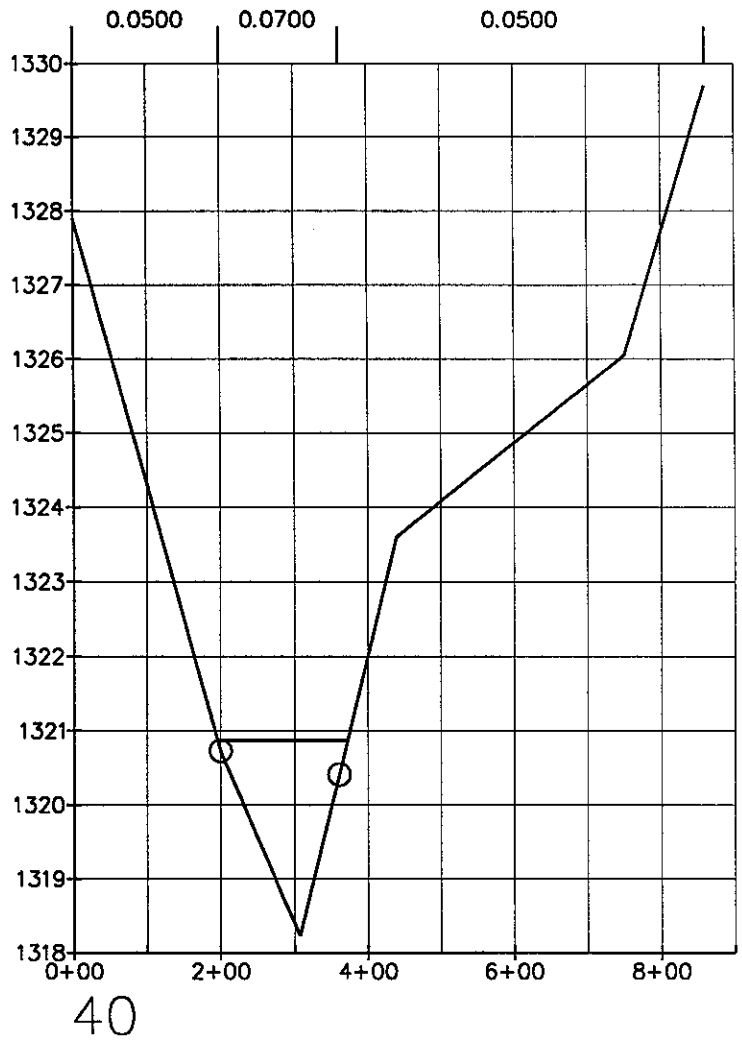
Cross-Section:	30	
Elevation:	1316.16	ft MSL
Depth:	3.12	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0078	ft/ft
Froude Number:	0.2698	
Flow Regime:	Subcritical	
Flow Area:	207.23	sq ft
Average Velocity:	2.70	ft/s
Maximum Velocity:	2.73	ft/s
Composite n:	0.0676	
Hydraulic Radius:	1.56	ft
Wetted Perimeter:	133.12	ft
Wetted Top Width:	132.97	ft
Critical Slope:	0.1144	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S30–30

Entellus™

File: WASH-T3N-R5W-S30_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

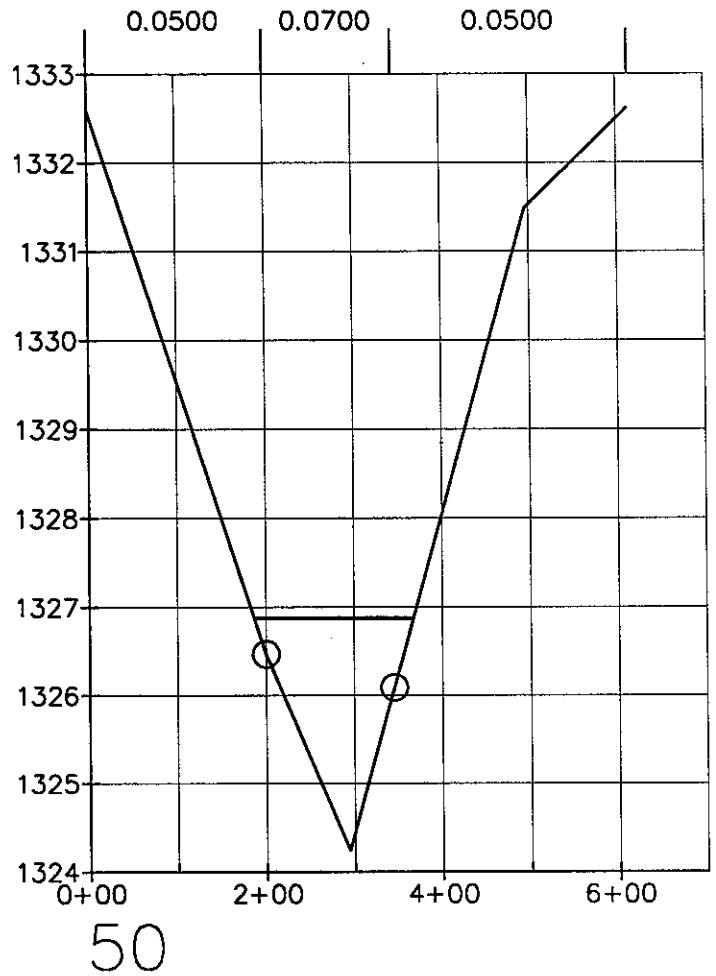
Cross-Section:	40	
Elevation:	1320.87	ft MSL
Depth:	2.64	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0078	ft/ft
Froude Number:	0.2584	
Flow Regime:	Subcritical	
Flow Area:	235.12	sq ft
Average Velocity:	2.38	ft/s
Maximum Velocity:	2.40	ft/s
Composite n:	0.0683	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	176.16	ft
Wetted Top Width:	176.07	ft
Critical Slope:	0.1218	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S30–40

Entellus™

File: WASH-T3N-R5W-S30_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

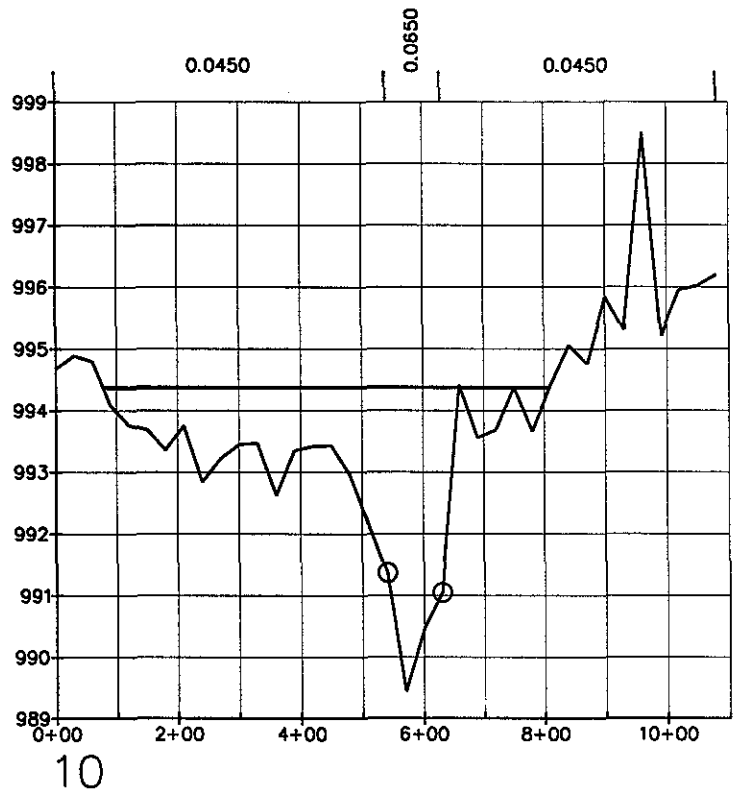
Cross-Section:	50	
Elevation:	1326.88	ft MSL
Depth:	2.64	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0078	ft/ft
Froude Number:	0.2508	
Flow Regime:	Subcritical	
Flow Area:	242.43	sq ft
Average Velocity:	2.32	ft/s
Maximum Velocity:	2.37	ft/s
Composite n:	0.0663	
Hydraulic Radius:	1.34	ft
Wetted Perimeter:	180.81	ft
Wetted Top Width:	180.73	ft
Critical Slope:	0.1137	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S30–50

Entellus™

File: WASH-T3N-R5W-S30_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	994.37	ft MSL
Depth:	4.93	ft
Discharge:	2820.00	cfs
Energy Gradient:	0.0044	ft/ft
Froude Number:	0.2249	
Flow Regime:	Subcritical	
Flow Area:	995.60	sq ft
Average Velocity:	2.82	ft/s
Maximum Velocity:	3.83	ft/s
Composite n:	0.0476	
Hydraulic Radius:	1.37	ft
Wetted Perimeter:	729.06	ft
Wetted Top Width:	728.68	ft
Critical Slope:	0.1072	ft/ft

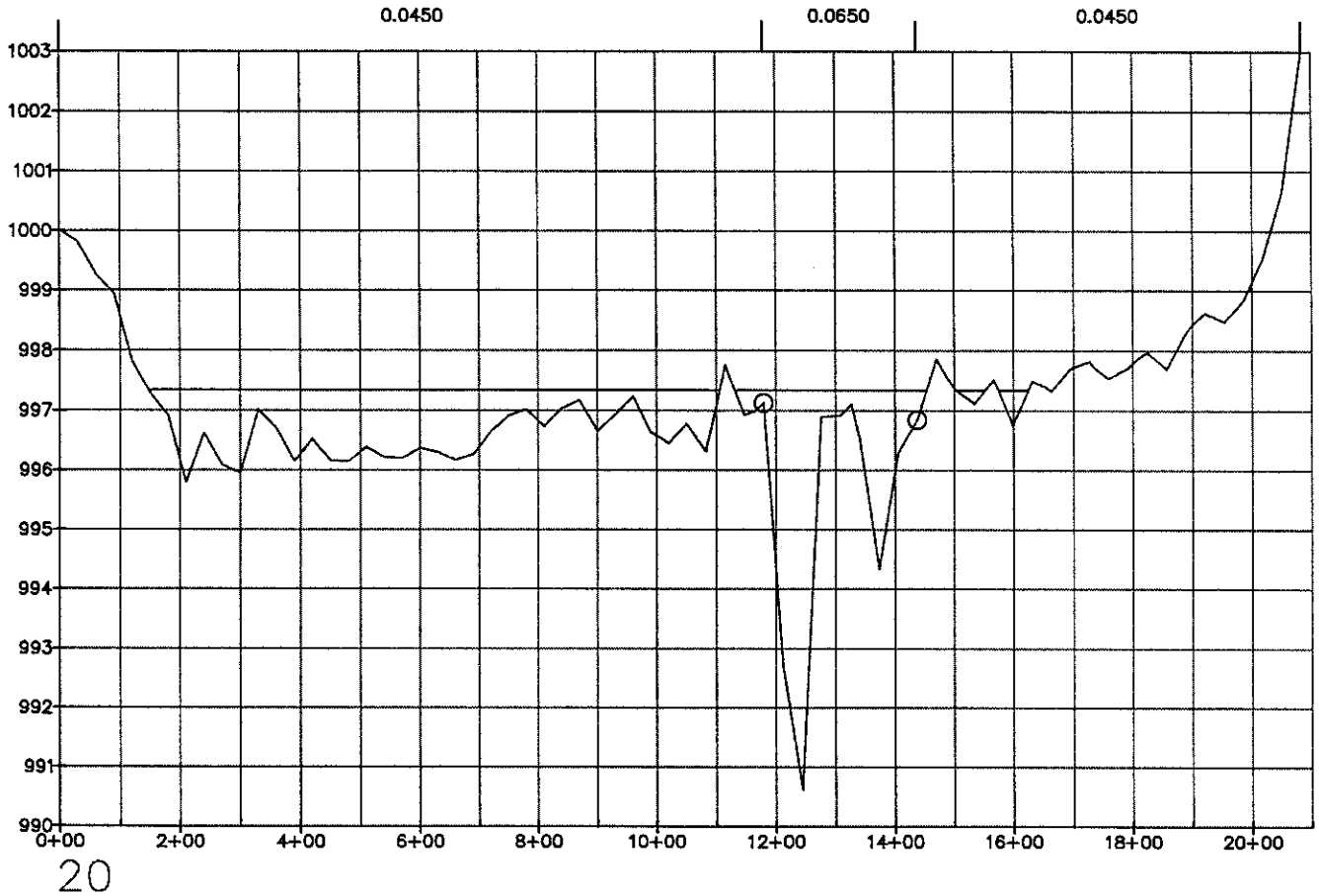
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–10

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

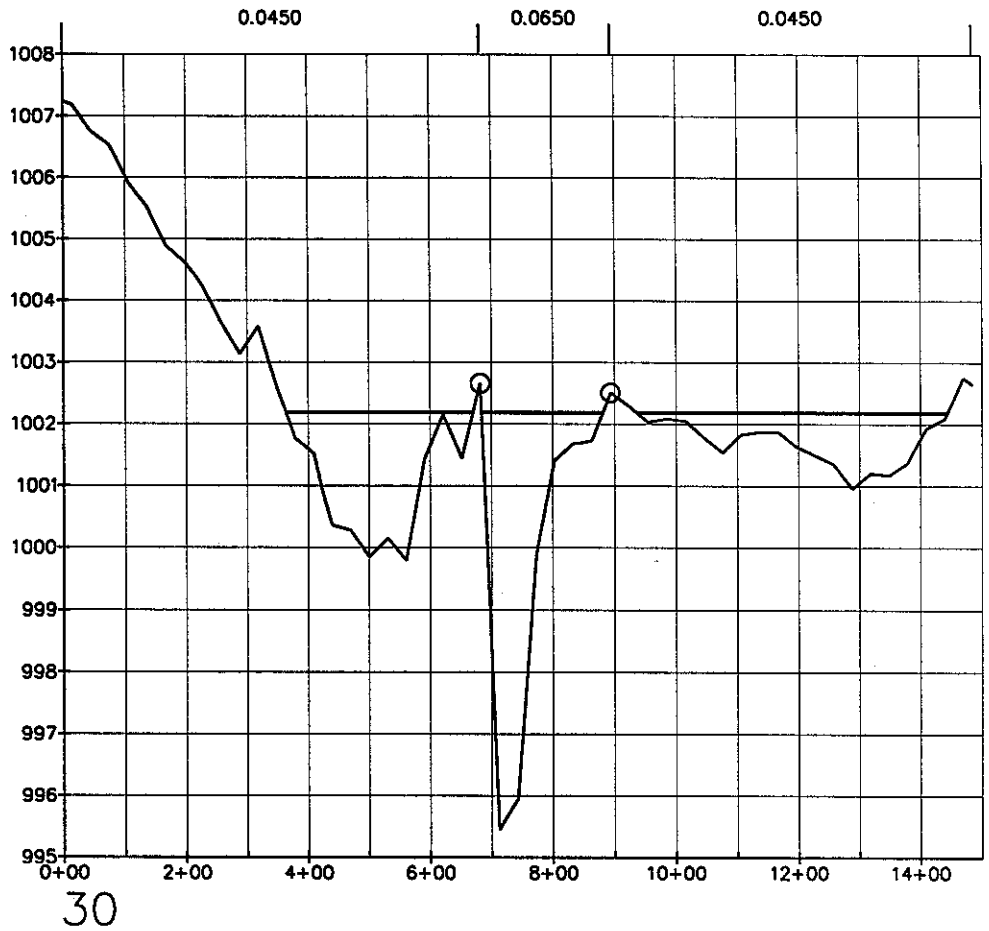
Cross-Section:	20	
Elevation:	997.34	ft MSL
Depth:	6.72	ft
Discharge:	2820.00	cfs
Energy Gradient:	0.0044	ft/ft
Froude Number:	0.1435	
Flow Regime:	Subcritical	
Flow Area:	1336.83	sq ft
Average Velocity:	2.10	ft/s
Maximum Velocity:	2.53	ft/s
Composite n:	0.049	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	1378.70	ft
Wetted Top Width:	1377.43	ft
Critical Slope:	0.2441	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–20

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 5/23/03



Normal Depth Results

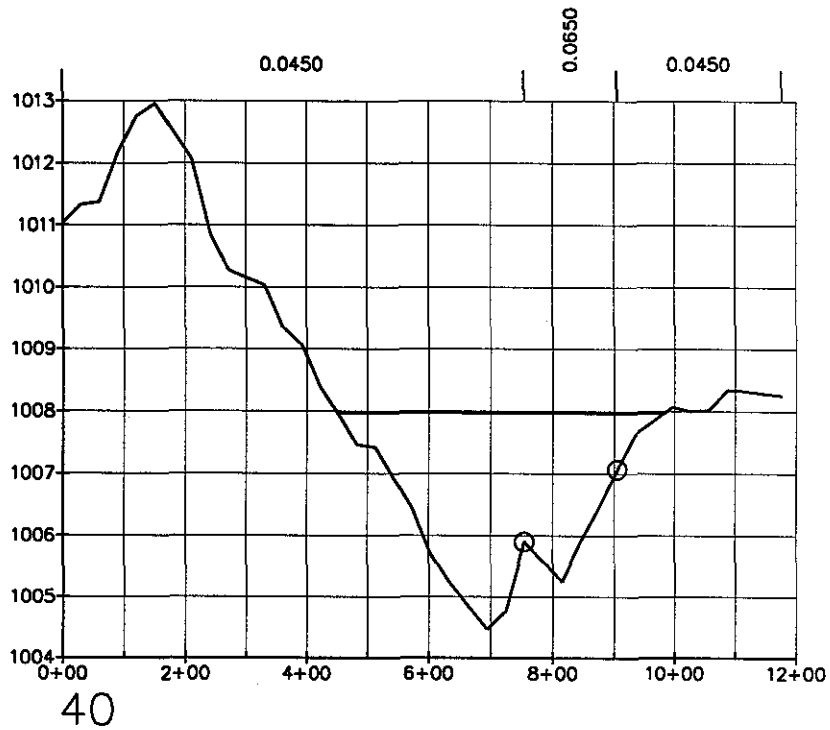
Cross-Section:	30	
Elevation:	1002.19	ft MSL
Depth:	6.74	ft
Discharge:	2820.00	cfs
Energy Gradient:	0.0044	ft/ft
Froude Number:	0.1644	
Flow Regime:	Subcritical	
Flow Area:	1165.15	sq ft
Average Velocity:	2.43	ft/s
Maximum Velocity:	2.84	ft/s
Composite n:	0.0492	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	1012.94	ft
Wetted Top Width:	1011.72	ft
Critical Slope:	0.1963	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–30

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

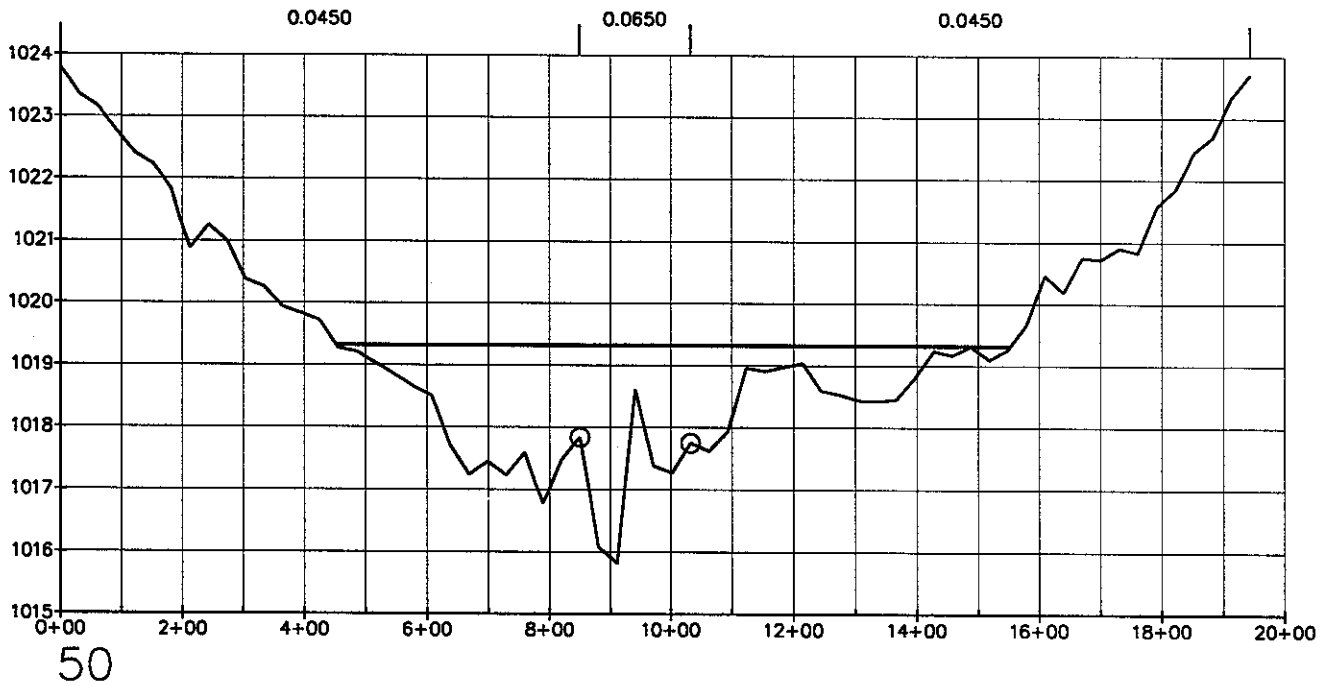
Cross-Section:	40	
Elevation:	1007.98	ft MSL
Depth:	3.51	ft
Discharge:	2820.00	cfs
Energy Gradient:	0.0044	ft/ft
Froude Number:	0.2864	
Flow Regime:	Subcritical	
Flow Area:	926.83	sq ft
Average Velocity:	3.03	ft/s
Maximum Velocity:	3.42	ft/s
Composite n:	0.051	
Hydraulic Radius:	1.74	ft
Wetted Perimeter:	532.33	ft
Wetted Top Width:	532.25	ft
Critical Slope:	0.0632	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–40

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

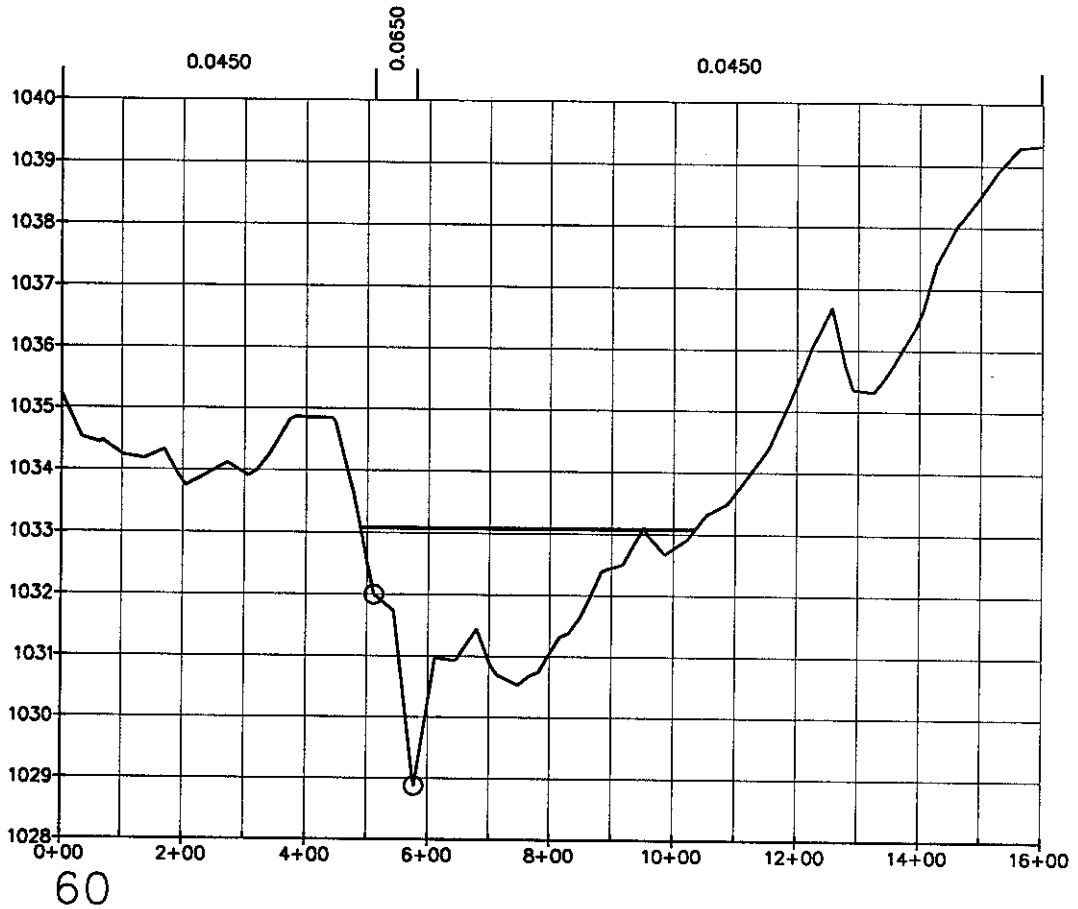
Cross-Section:	50	
Elevation:	1019.32	ft MSL
Depth:	3.50	ft
Discharge:	2820.00	cfs
Energy Gradient:	0.0044	ft/ft
Froude Number:	0.218	
Flow Regime:	Subcritical	
Flow Area:	1219.28	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.60	ft/s
Composite n:	0.0485	
Hydraulic Radius:	1.11	ft
Wetted Perimeter:	1100.95	ft
Wetted Top Width:	1100.67	ft
Critical Slope:	0.1044	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–50

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

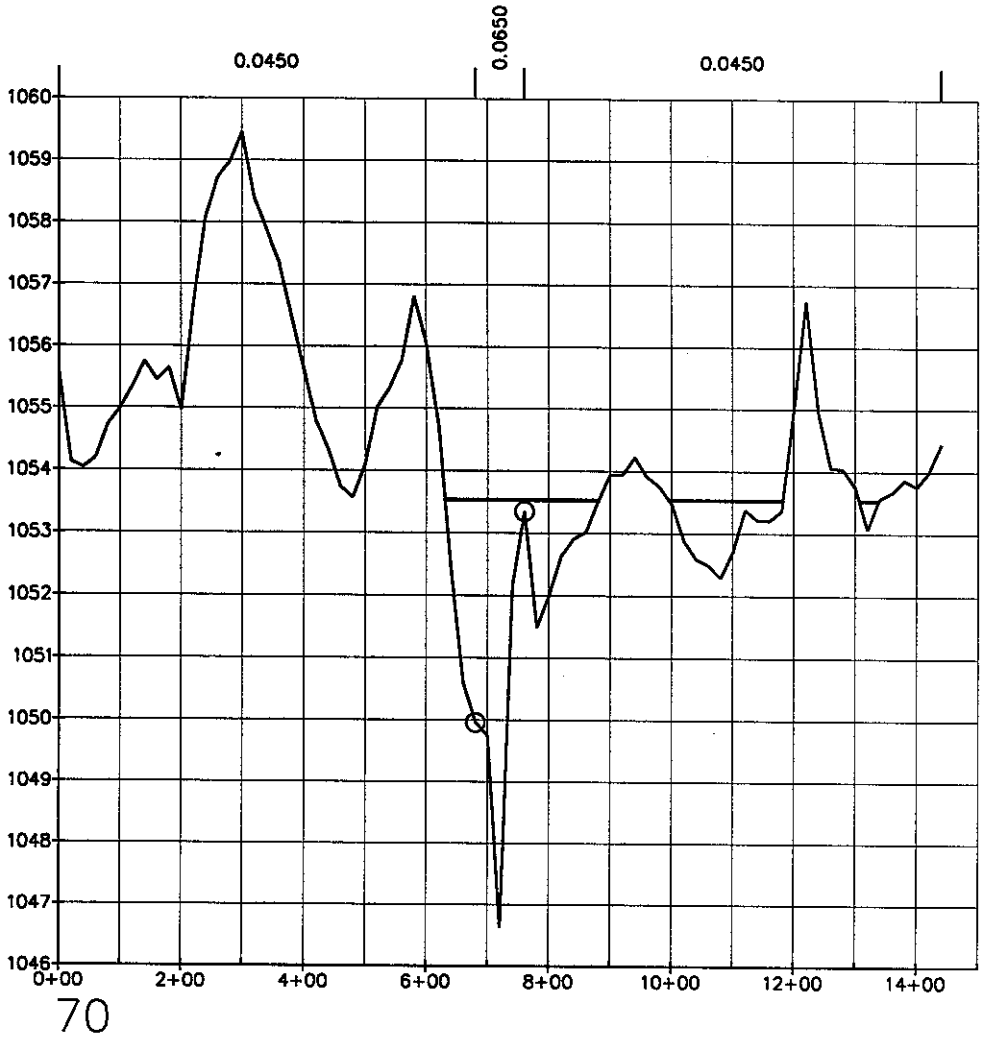
Cross-Section:	60	
Elevation:	1033.08	ft MSL
Depth:	4.20	ft
Discharge:	2440.00	cfs
Energy Gradient:	0.0048	ft/ft
Froude Number:	0.2509	
Flow Regime:	Subcritical	
Flow Area:	836.64	sq ft
Average Velocity:	2.93	ft/s
Maximum Velocity:	3.03	ft/s
Composite n:	0.0476	
Hydraulic Radius:	1.54	ft
Wetted Perimeter:	543.54	ft
Wetted Top Width:	543.29	ft
Critical Slope:	0.0778	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–60

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

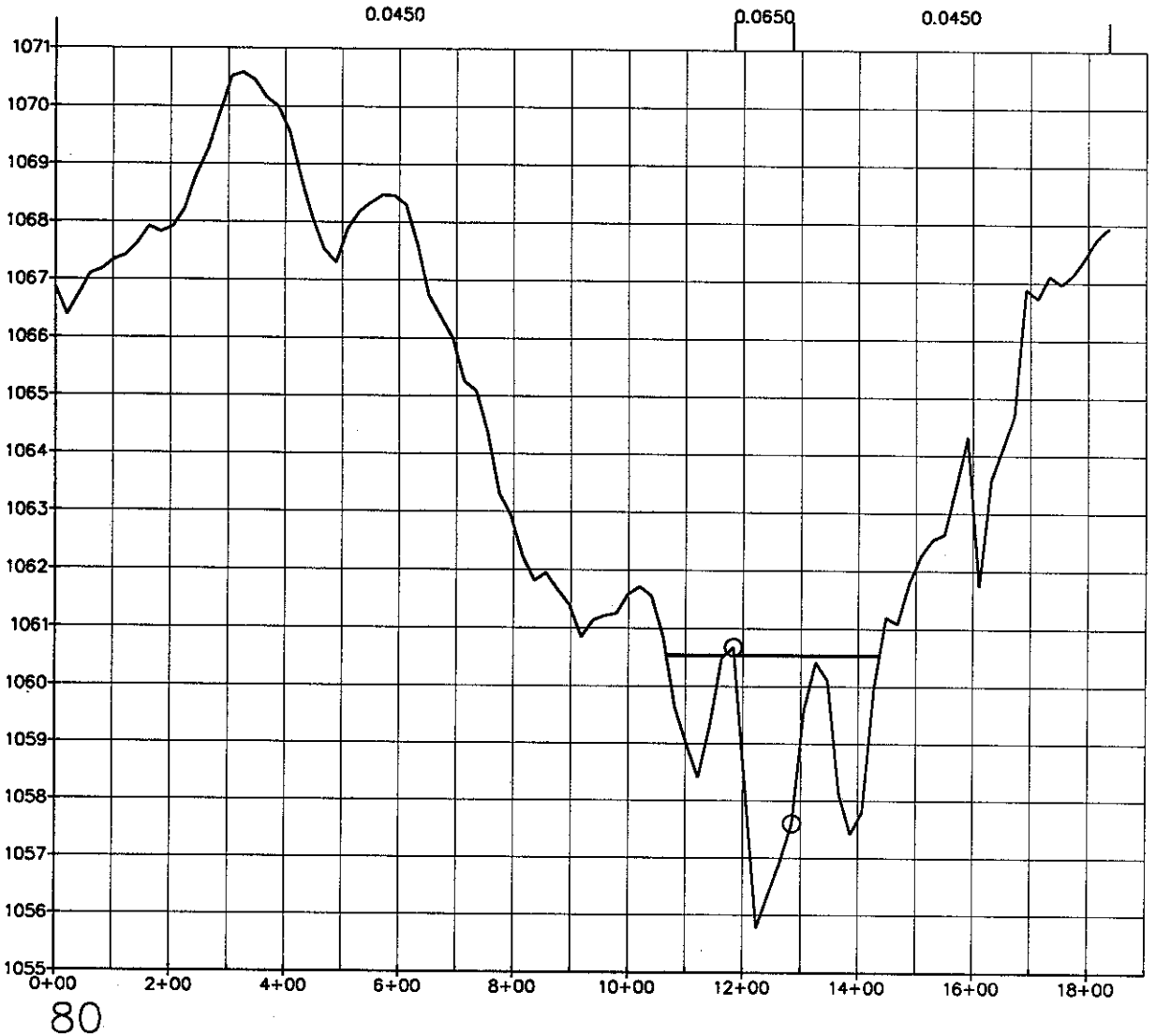
Cross-Section:	70	
Elevation:	1053.53	ft MSL
Depth:	6.91	ft
Discharge:	2180.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2341	
Flow Regime:	Subcritical	
Flow Area:	624.38	sq ft
Average Velocity:	3.48	ft/s
Maximum Velocity:	4.55	ft/s
Composite n:	0.0487	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	470.34	ft
Wetted Top Width:	469.00	ft
Critical Slope:	0.163	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–70

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

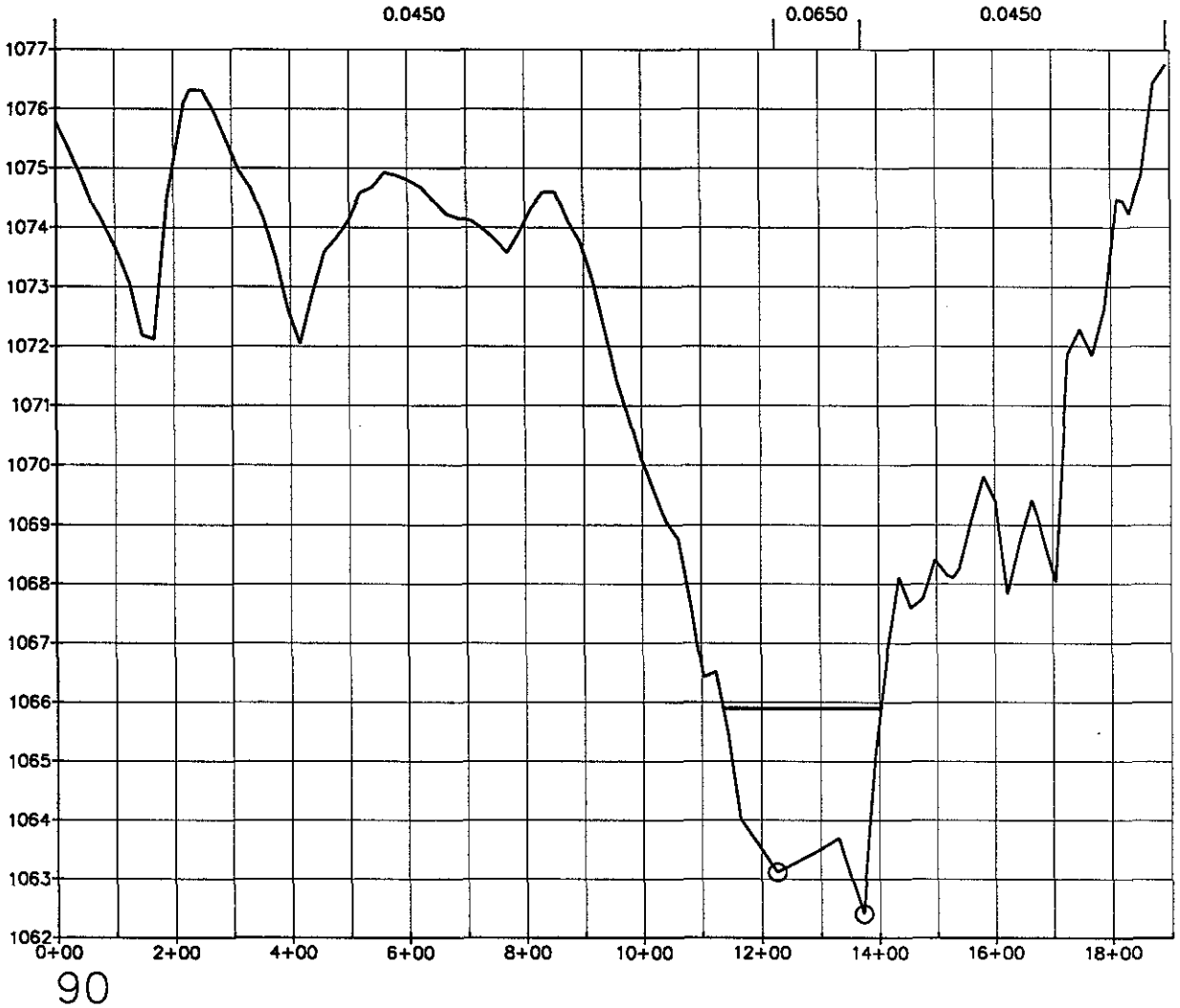
Cross-Section:	80	
Elevation:	1060.54	ft MSL
Depth:	4.76	ft
Discharge:	2180.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2809	
Flow Regime:	Subcritical	
Flow Area:	627.03	sq ft
Average Velocity:	3.49	ft/s
Maximum Velocity:	3.63	ft/s
Composite n:	0.051	
Hydraulic Radius:	1.78	ft
Wetted Perimeter:	352.59	ft
Wetted Top Width:	351.60	ft
Critical Slope:	0.0832	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–80

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

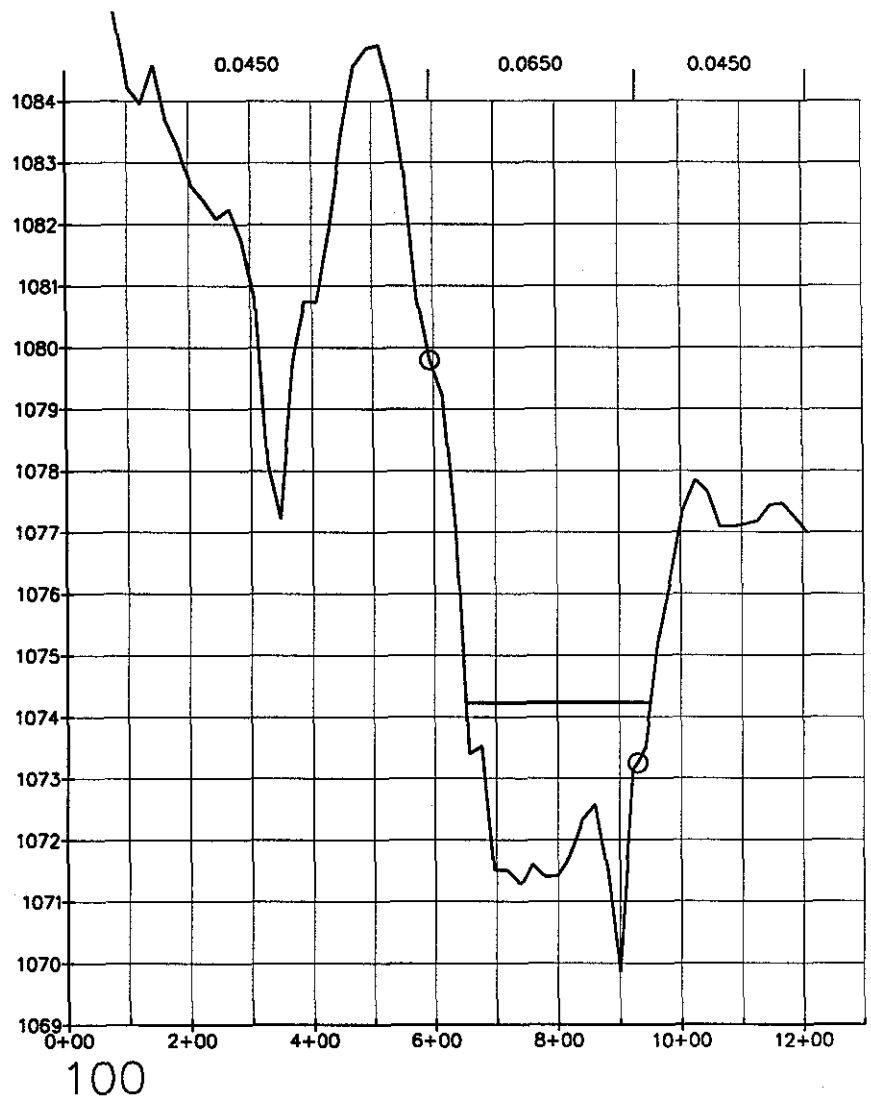
Cross-Section:	90	
Elevation:	1065.90	ft MSL
Depth:	3.49	ft
Discharge:	2180.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.3455	
Flow Regime:	Subcritical	
Flow Area:	595.68	sq ft
Average Velocity:	3.65	ft/s
Maximum Velocity:	4.04	ft/s
Composite n:	0.0563	
Hydraulic Radius:	2.23	ft
Wetted Perimeter:	267.58	ft
Wetted Top Width:	267.28	ft
Critical Slope:	0.0551	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–90

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

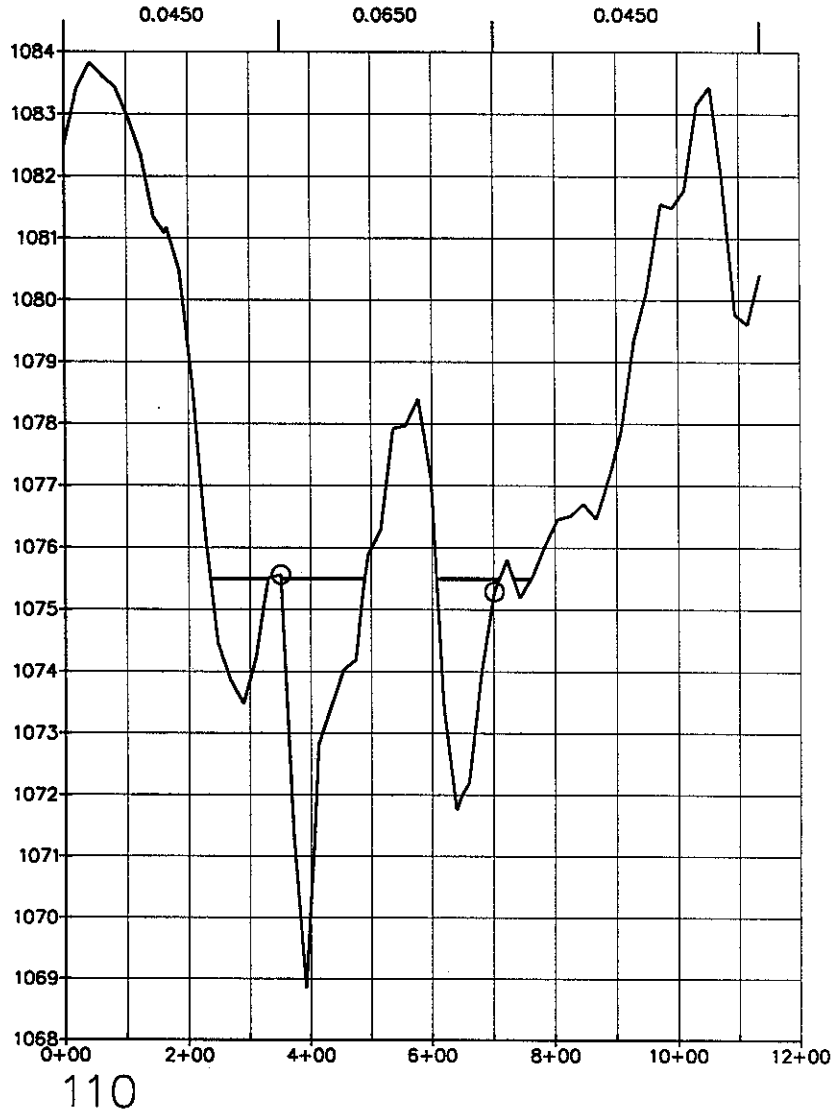
Cross-Section:	100	
Elevation:	1074.23	ft MSL
Depth:	4.37	ft
Discharge:	2180.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2739	
Flow Regime:	Subcritical	
Flow Area:	670.82	sq ft
Average Velocity:	3.24	ft/s
Maximum Velocity:	3.27	ft/s
Composite n:	0.0636	
Hydraulic Radius:	2.23	ft
Wetted Perimeter:	300.32	ft
Wetted Top Width:	299.73	ft
Critical Slope:	0.088	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–100

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

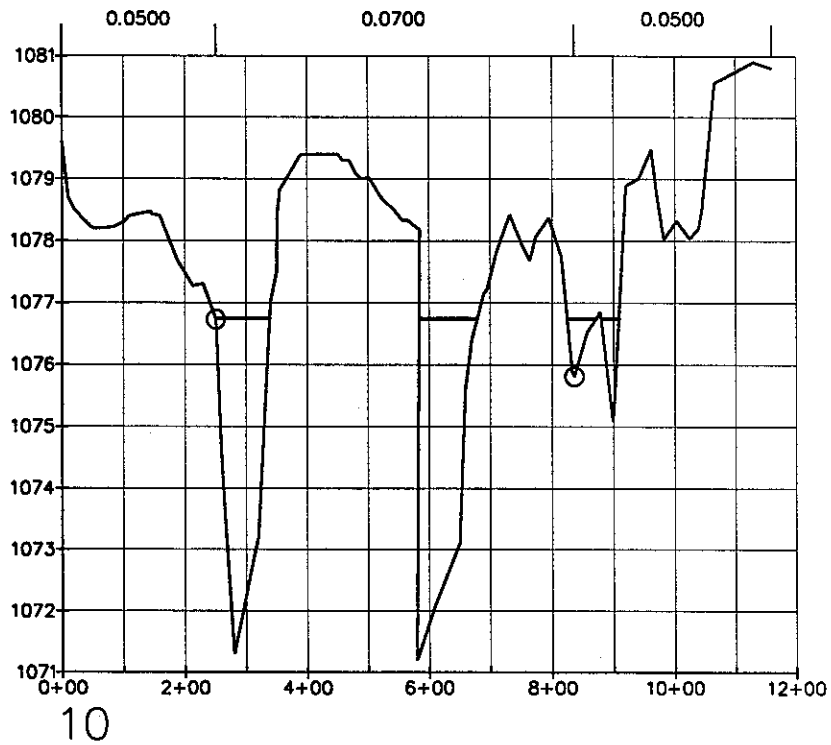
Cross-Section:	110	
Elevation:	1075.50	ft MSL
Depth:	6.66	ft
Discharge:	2180.00	cfs
Energy Gradient:	0.0065	ft/ft
Froude Number:	0.2199	
Flow Regime:	Subcritical	
Flow Area:	677.18	sq ft
Average Velocity:	3.23	ft/s
Maximum Velocity:	3.28	ft/s
Composite n:	0.0582	
Hydraulic Radius:	1.85	ft
Wetted Perimeter:	365.34	ft
Wetted Top Width:	363.68	ft
Critical Slope:	0.1435	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R6W–S05 (DICKEY SOUTH)–110

Entellus™

File: WASH-T1N-R6W-S05(DICKEY-SOUTH)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

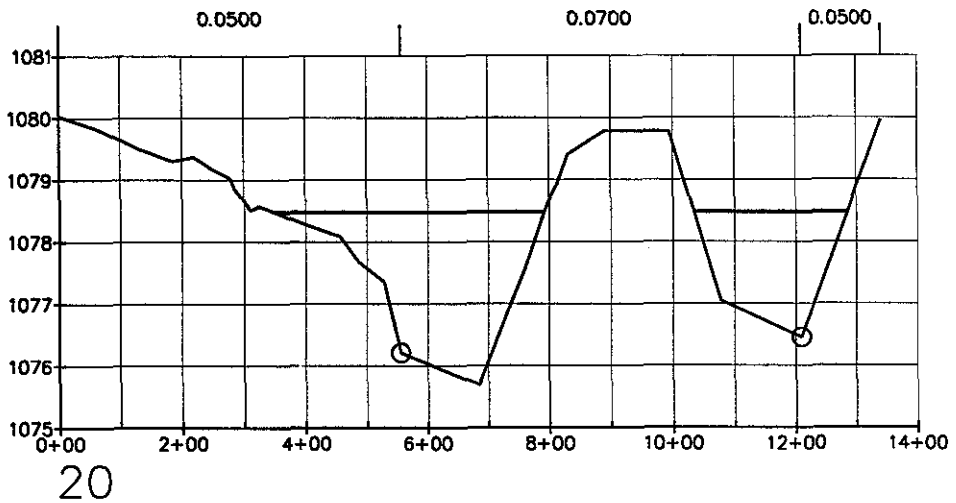
Cross-Section:	10	
Elevation:	1076.74	ft MSL
Depth:	5.54	ft
Discharge:	1750.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.192	
Flow Regime:	Subcritical	
Flow Area:	682.41	sq ft
Average Velocity:	2.56	ft/s
Maximum Velocity:	2.59	ft/s
Composite n:	0.0679	
Hydraulic Radius:	2.52	ft
Wetted Perimeter:	271.05	ft
Wetted Top Width:	258.39	ft
Critical Slope:	0.1082	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–10

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

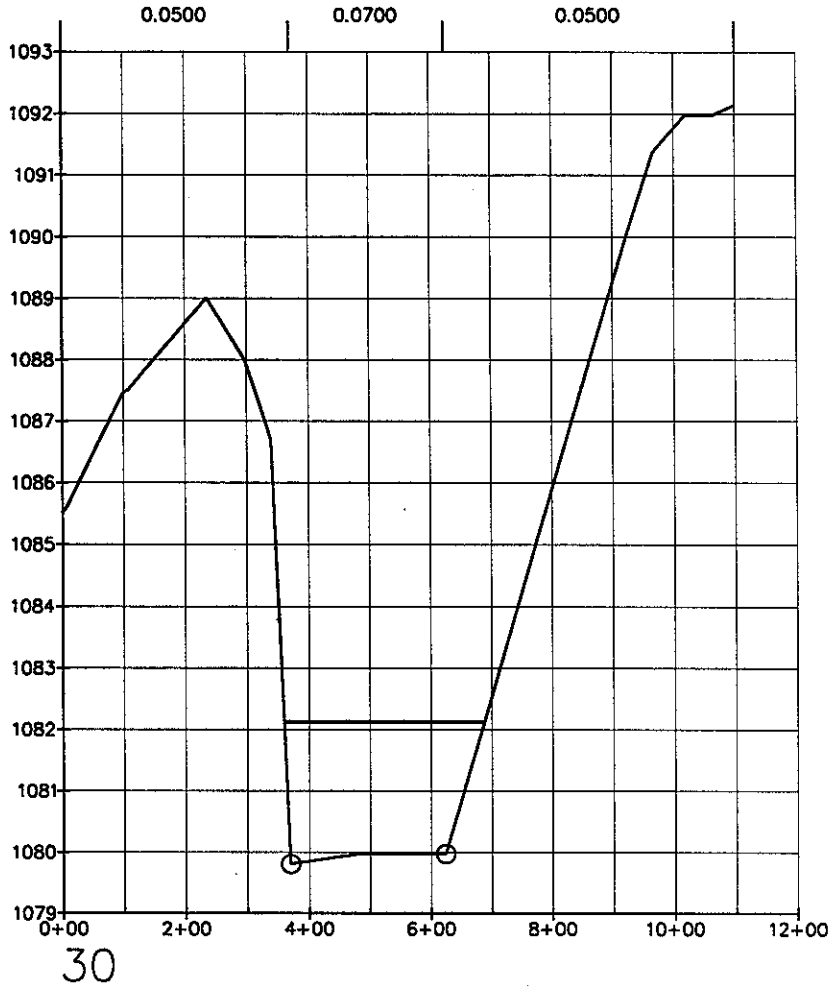
Cross-Section:	20	
Elevation:	1078.47	ft MSL
Depth:	2.78	ft
Discharge:	1750.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.1977	
Flow Regime:	Subcritical	
Flow Area:	936.15	sq ft
Average Velocity:	1.87	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0622	
Hydraulic Radius:	1.35	ft
Wetted Perimeter:	693.06	ft
Wetted Top Width:	692.94	ft
Critical Slope:	0.1044	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–20

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

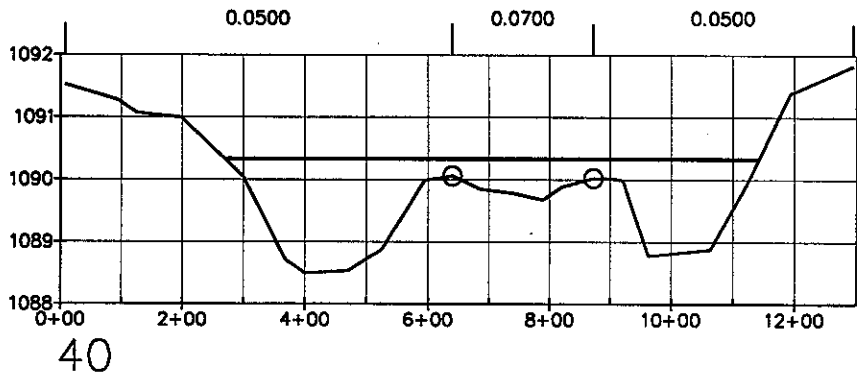
Cross-Section:	30	
Elevation:	1082.12	ft MSL
Depth:	2.32	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.2545	
Flow Regime:	Subcritical	
Flow Area:	637.07	sq ft
Average Velocity:	2.20	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0657	
Hydraulic Radius:	1.94	ft
Wetted Perimeter:	328.94	ft
Wetted Top Width:	328.65	ft
Critical Slope:	0.0601	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31 (DICKEY NORTH)-30

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

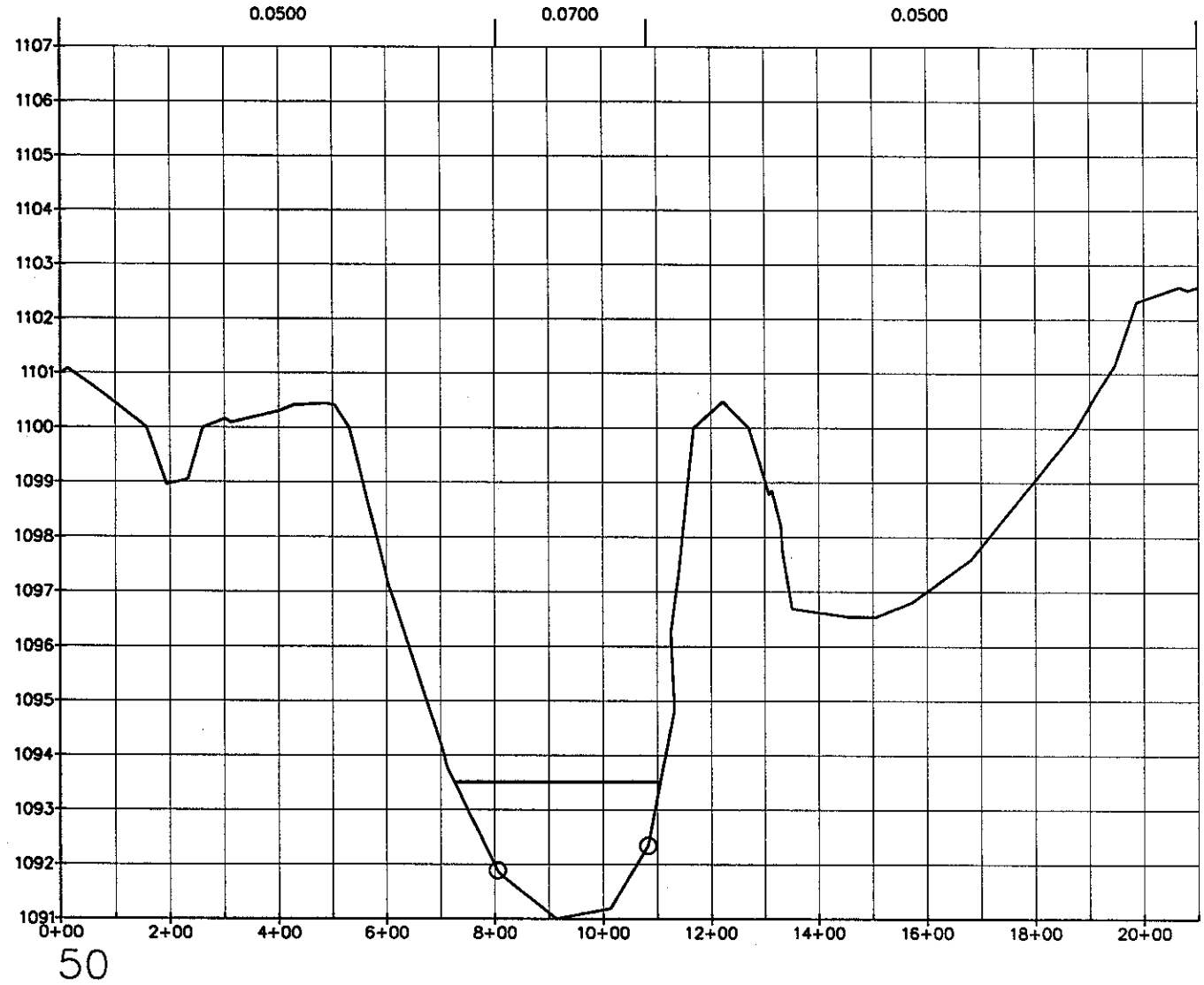
Cross-Section:	40	
Elevation:	1090.33	ft MSL
Depth:	1.83	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.2308	
Flow Regime:	Subcritical	
Flow Area:	790.33	sq ft
Average Velocity:	1.78	ft/s
Maximum Velocity:	2.01	ft/s
Composite n:	0.0556	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	872.94	ft
Wetted Top Width:	872.89	ft
Critical Slope:	0.0938	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–40

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	50	
Elevation:	1093.51	ft MSL
Depth:	2.51	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.2343	
Flow Regime:	Subcritical	
Flow Area:	664.88	sq ft
Average Velocity:	2.12	ft/s
Maximum Velocity:	2.19	ft/s
Composite n:	0.0649	
Hydraulic Radius:	1.75	ft
Wetted Perimeter:	380.28	ft
Wetted Top Width:	380.22	ft
Critical Slope:	0.0727	ft/ft

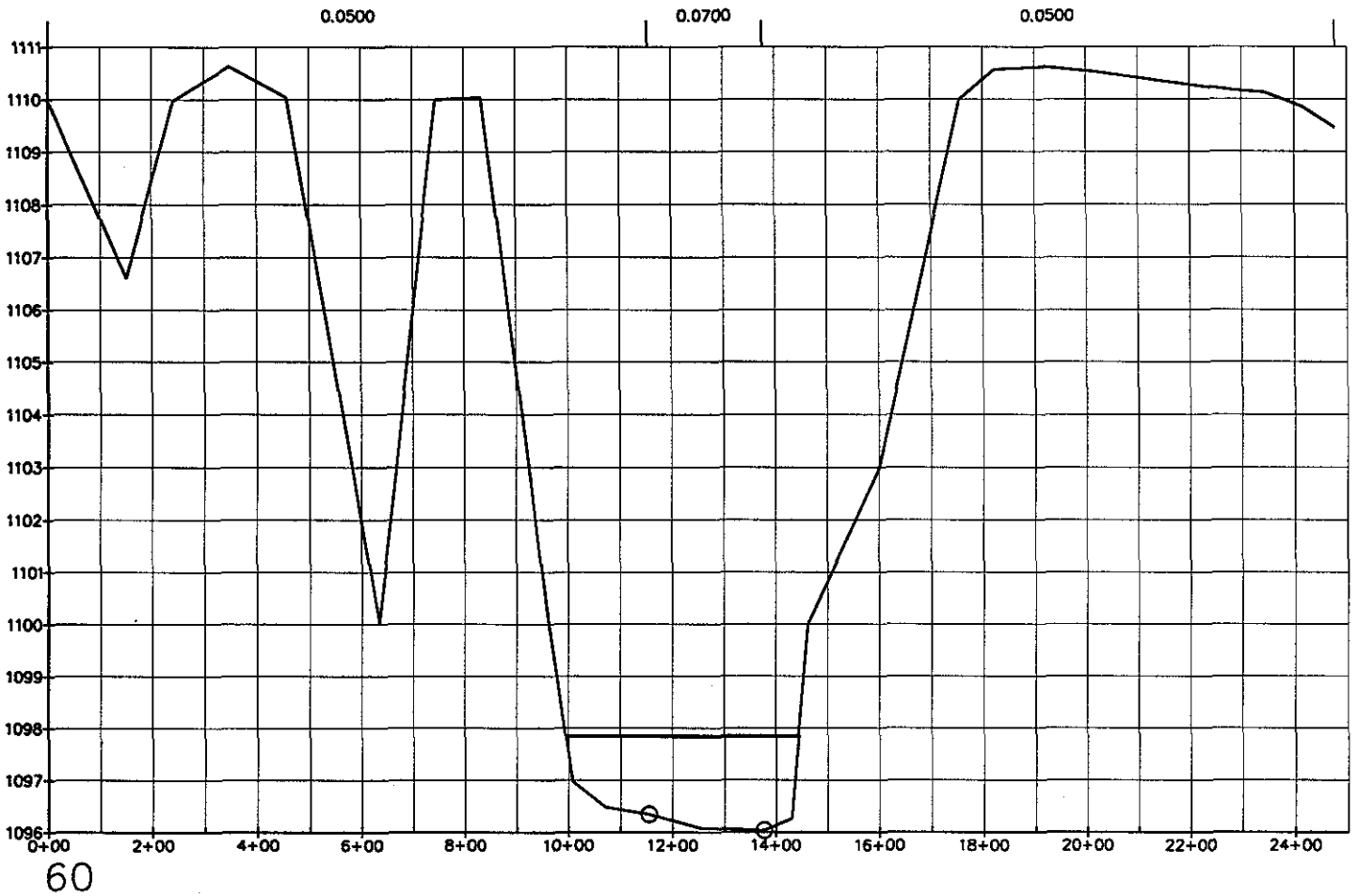
ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–50

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

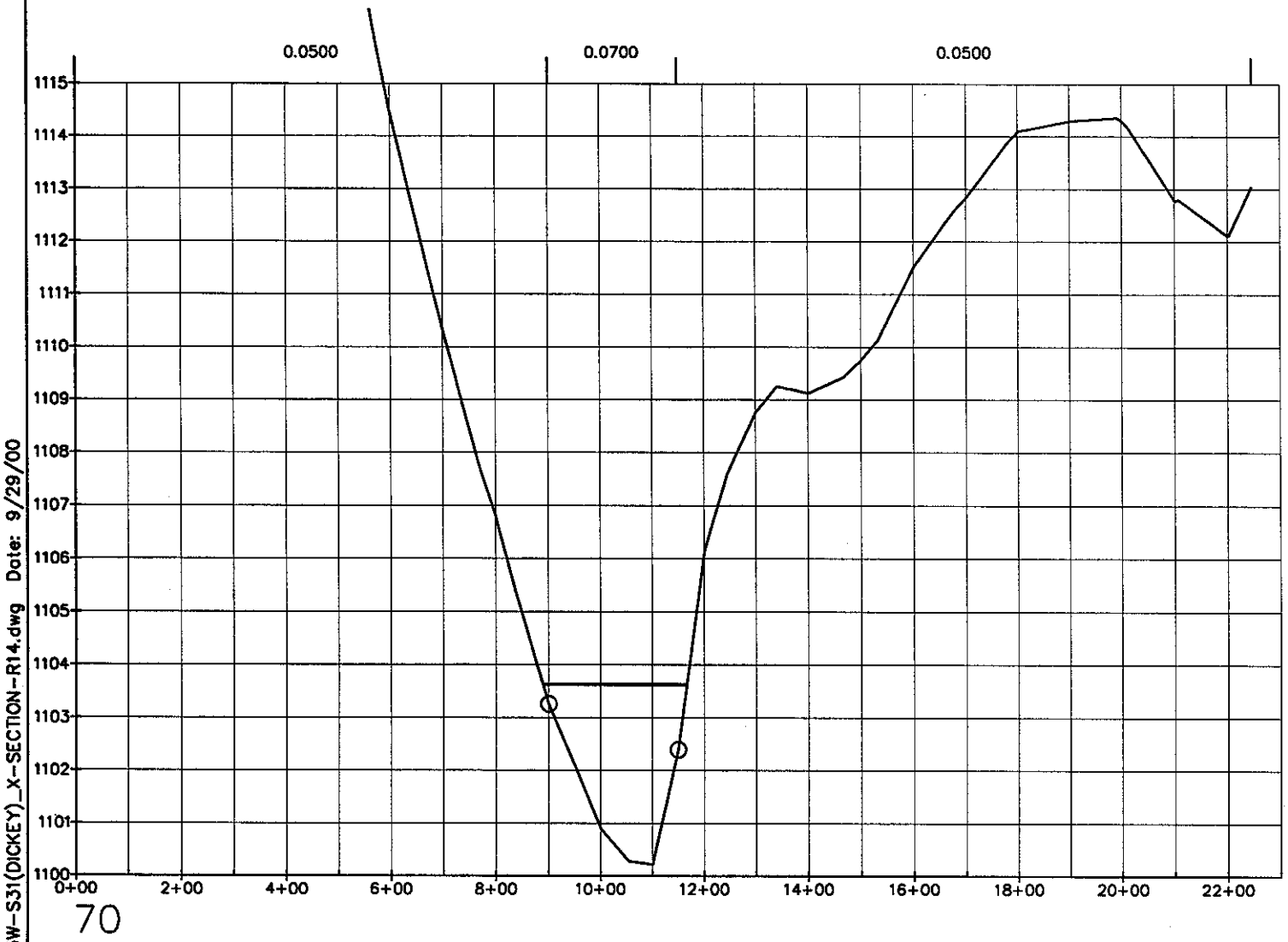
Cross-Section:	60	
Elevation:	1097.85	ft MSL
Depth:	1.81	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.2691	
Flow Regime:	Subcritical	
Flow Area:	681.14	sq ft
Average Velocity:	2.06	ft/s
Maximum Velocity:	2.46	ft/s
Composite n:	0.0603	
Hydraulic Radius:	1.52	ft
Wetted Perimeter:	449.22	ft
Wetted Top Width:	449.09	ft
Critical Slope:	0.0548	ft/ft

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31 (DICKEY NORTH)-60

Entellus™



Normal Depth Results

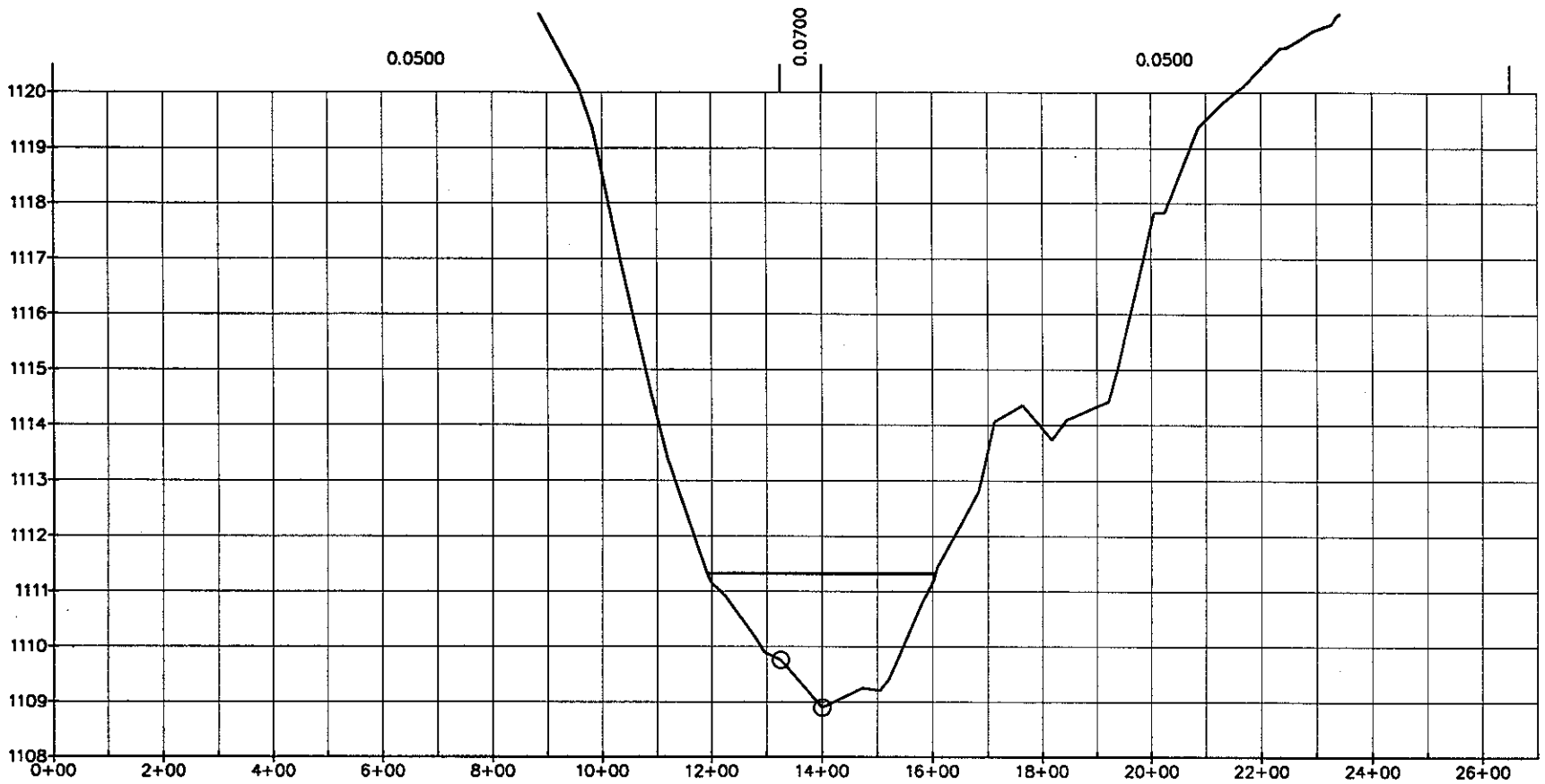
Cross-Section:	70	
Elevation:	1103.62	ft MSL
Depth:	3.40	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0039	ft/ft
Froude Number:	0.2231	
Flow Regime:	Subcritical	
Flow Area:	599.41	sq ft
Average Velocity:	2.33	ft/s
Maximum Velocity:	2.35	ft/s
Composite n:	0.0681	
Hydraulic Radius:	2.17	ft
Wetted Perimeter:	276.66	ft
Wetted Top Width:	276.53	ft
Critical Slope:	0.0817	ft/ft

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–70

Entellus™



80

Normal Depth Results

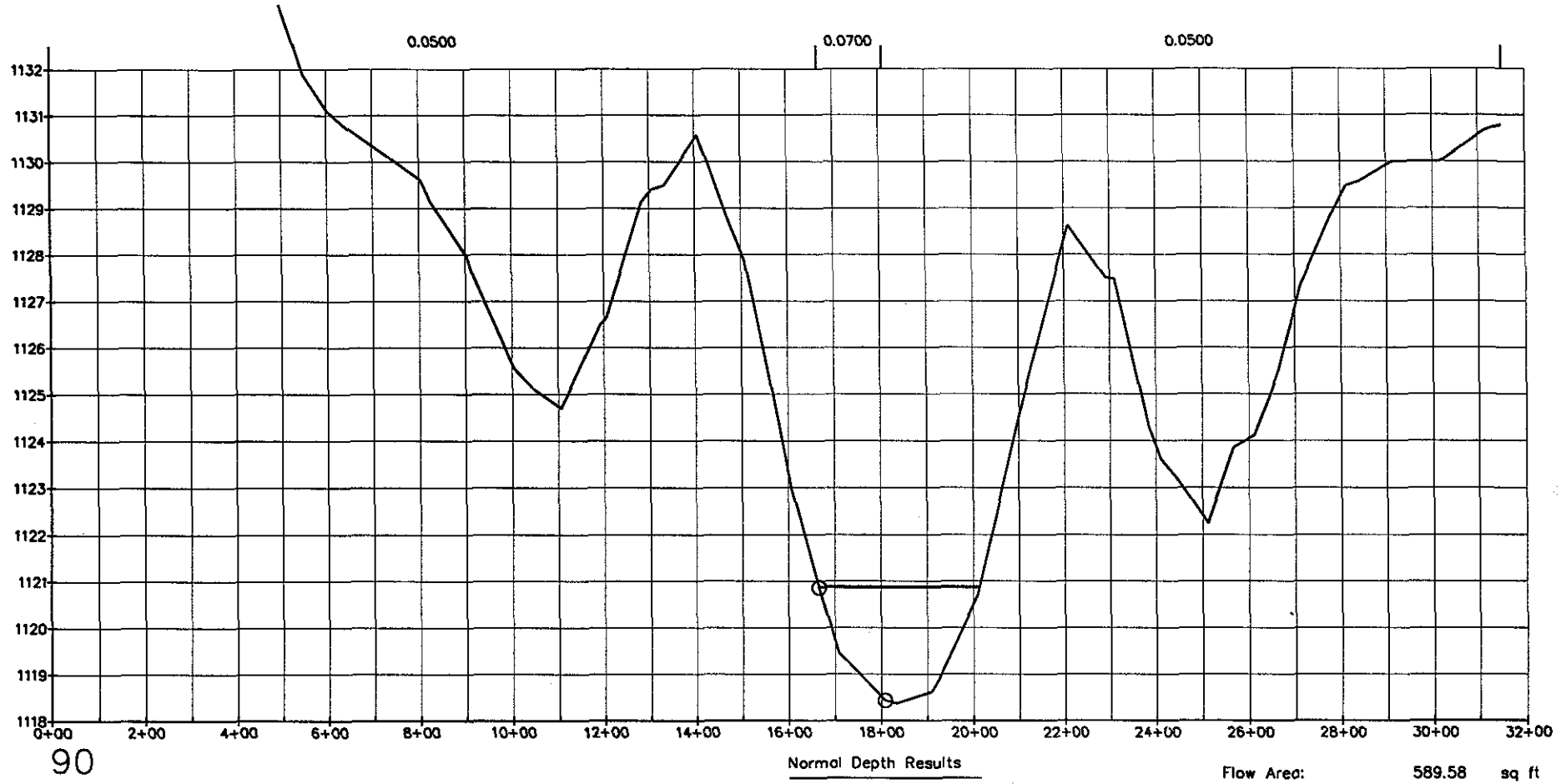
Cross-Section:	80		Flow Area:	607.45	sq ft
Elevation:	1111.32	ft MSL	Average Velocity:	2.32	ft/s
Depth:	2.42	ft	Maximum Velocity:	2.62	ft/s
Discharge:	1400.00	cfs	Composite n:	0.0538	
Energy Gradient:	0.0039	ft/ft	Hydraulic Radius:	1.47	ft
Froude Number:	0.2611		Wetted Perimeter:	414.03	ft
Flow Regime:	Subcritical		Wetted Top Width:	413.99	ft
			Critical Slope:	0.0611	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–80

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

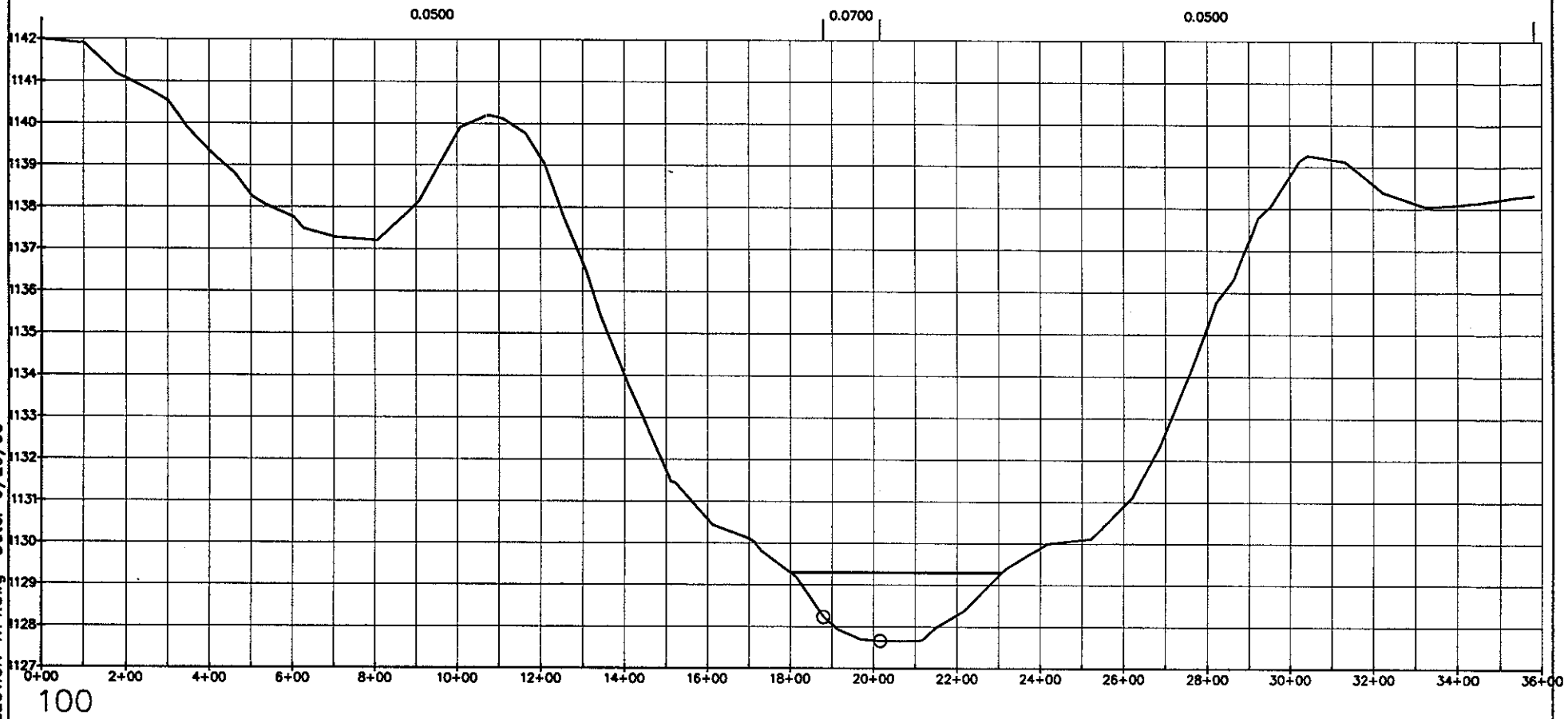
Cross-Section:	90		Flow Area:	589.58	sq ft
Elevation:	1120.87	ft MSL	Average Velocity:	2.38	ft/s
Depth:	2.50	ft	Maximum Velocity:	2.74	ft/s
Discharge:	1400.00	cfs	Composite n:	0.0585	
Energy Gradient:	0.0039	ft/ft	Hydraulic Radius:	1.7	ft
Froude Number:	0.2645		Wetted Perimeter:	347.32	ft
Flow Regime:	Subcritical		Wetted Top Width:	347.27	ft
			Critical Slope:	0.0615	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–90

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

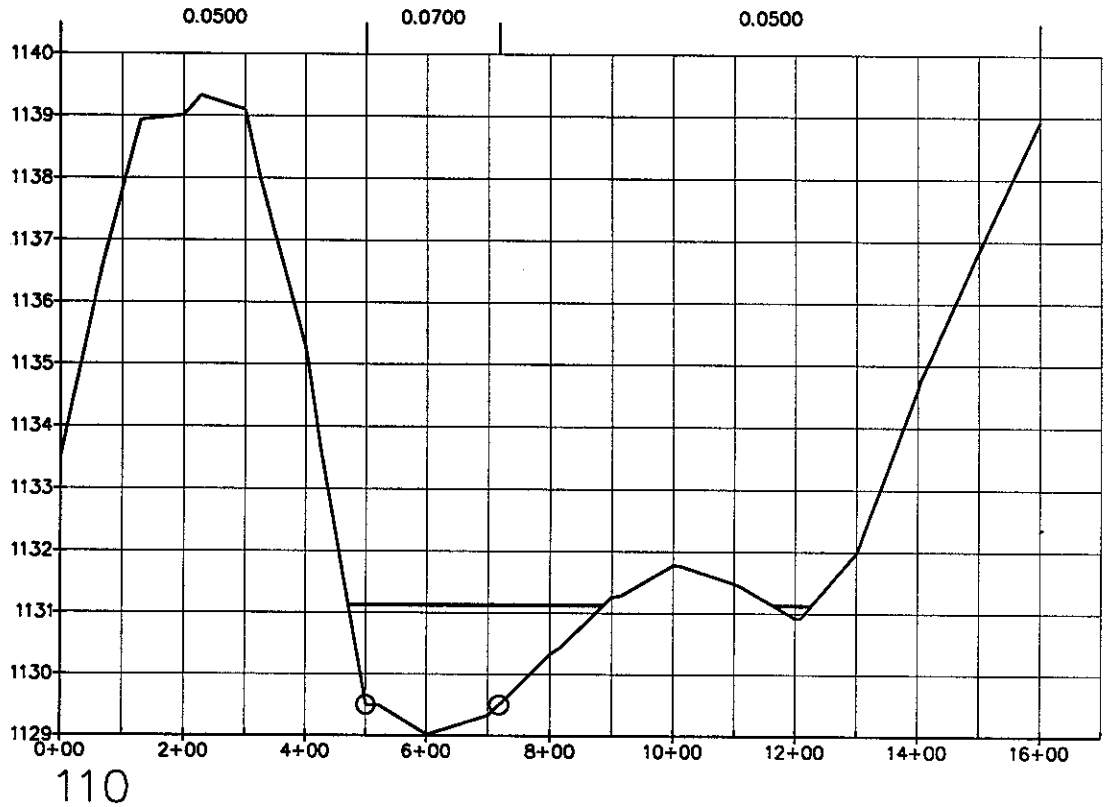
Cross-Section:	100		Flow Area:	569.79	sq ft
Elevation:	1129.30	ft MSL	Average Velocity:	2.47	ft/s
Depth:	1.65	ft	Maximum Velocity:	2.70	ft/s
Discharge:	1400.00	cfs	Composite n:	0.0557	
Energy Gradient:	0.0069	ft/ft	Hydraulic Radius:	1.12	ft
Froude Number:	0.3373		Wetted Perimeter:	507.57	ft
Flow Regime:	Subcritical		Wetted Top Width:	507.55	ft
			Critical Slope:	0.0635	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–100

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

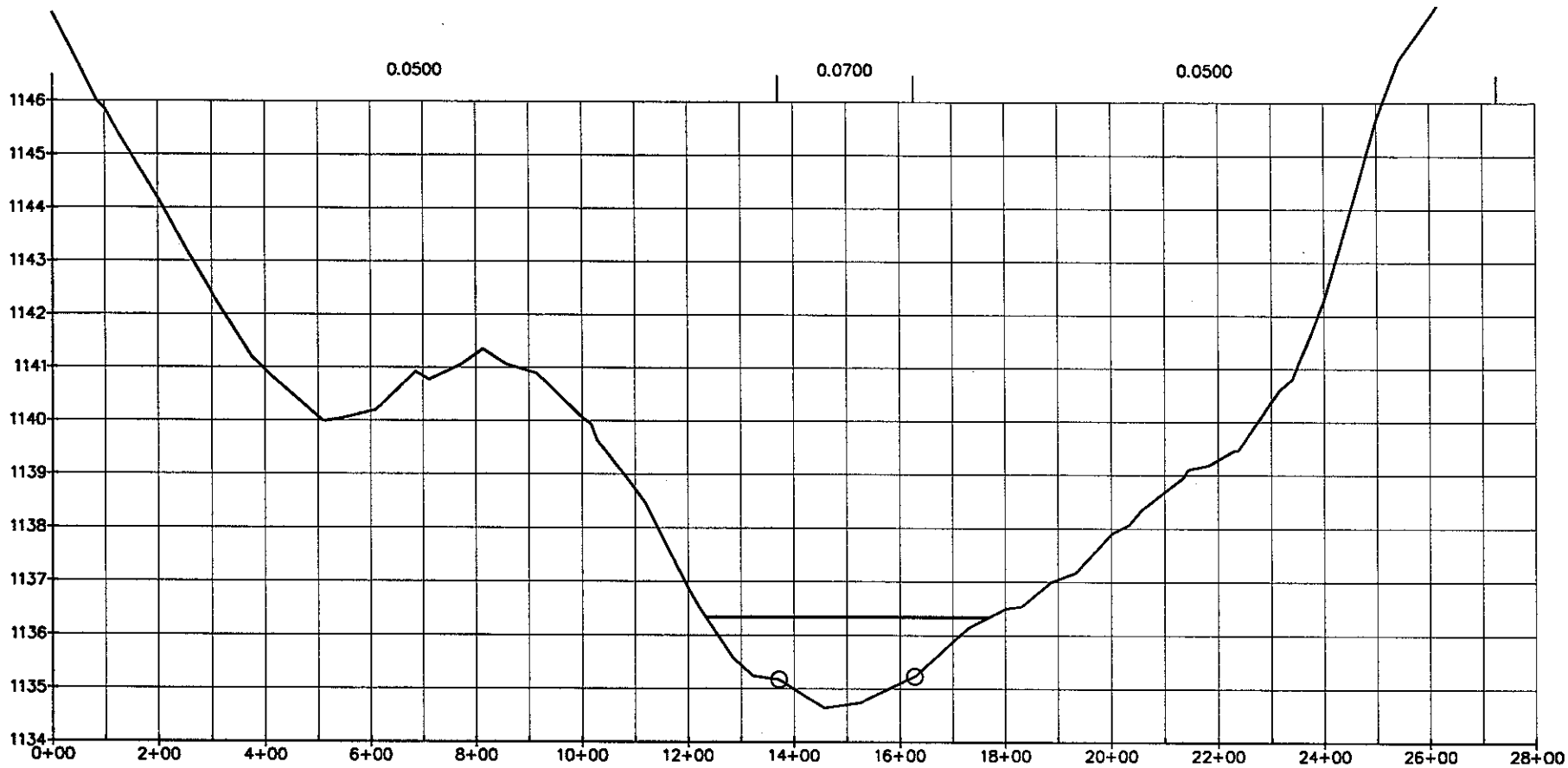
Cross-Section:	110	
Elevation:	1131.12	ft MSL
Depth:	2.10	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0069	ft/ft
Froude Number:	0.2971	
Flow Regime:	Subcritical	
Flow Area:	572.89	sq ft
Average Velocity:	2.44	ft/s
Maximum Velocity:	2.68	ft/s
Composite n:	0.0595	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	475.73	ft
Wetted Top Width:	475.68	ft
Critical Slope:	0.0844	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–110

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

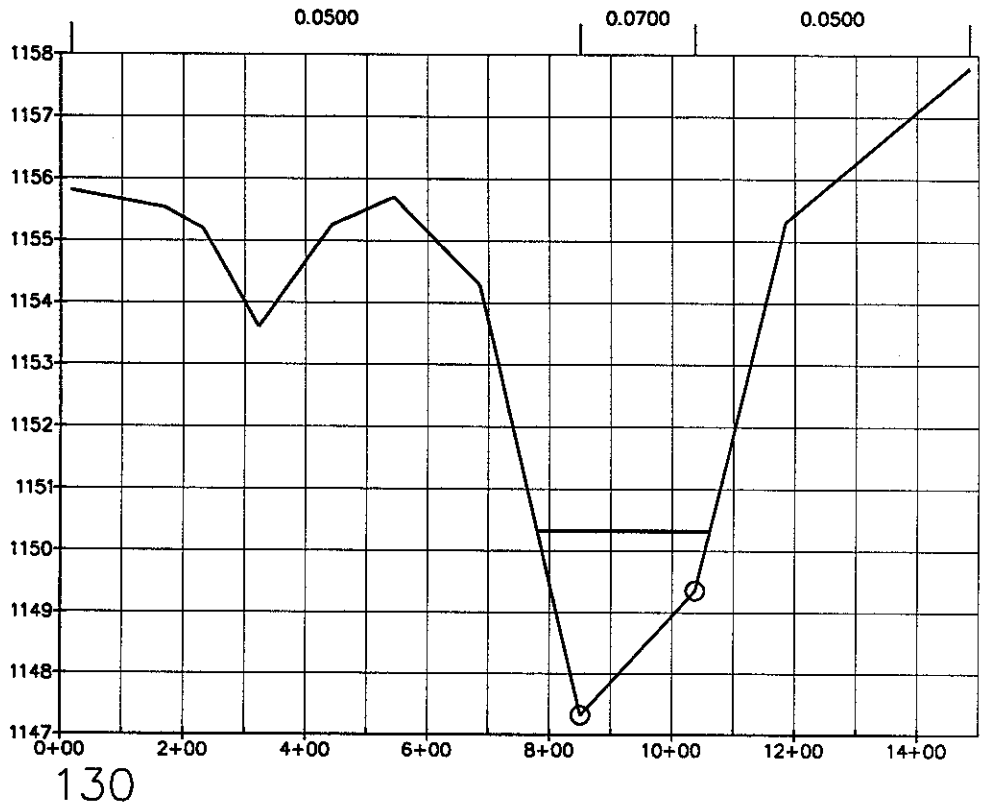
Cross-Section:	120		Flow Area:	552.20	sq ft
Elevation:	1136.33	ft MSL	Average Velocity:	2.53	ft/s
Depth:	1.69	ft	Maximum Velocity:	2.67	ft/s
Discharge:	1400.00	cfs	Composite n:	0.0535	
Energy Gradient:	0.0069	ft/ft	Hydraulic Radius:	1.03	ft
Froude Number:	0.3434		Wetted Perimeter:	534.31	ft
Flow Regime:	Subcritical		Wetted Top Width:	534.30	ft
			Critical Slope:	0.0674	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–120

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

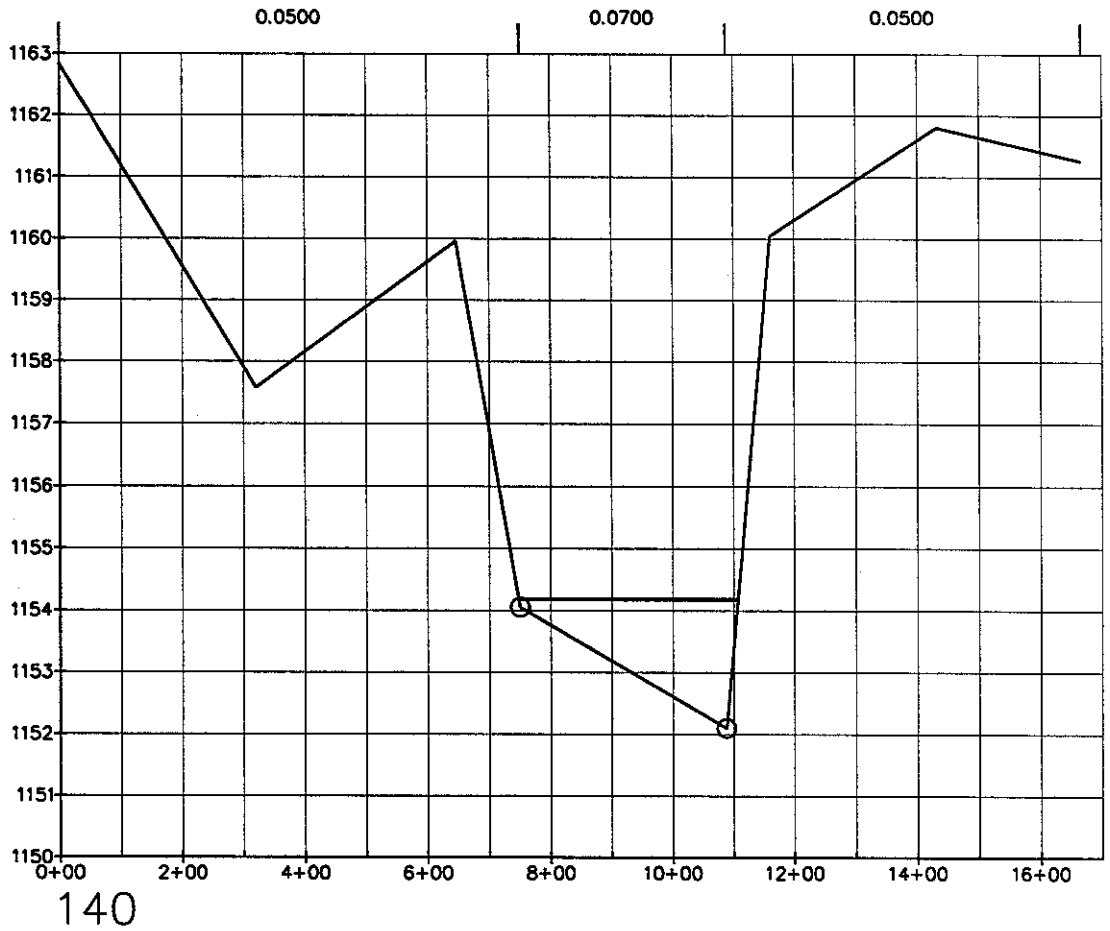
Cross-Section:	130	
Elevation:	1150.33	ft MSL
Depth:	3.00	ft
Discharge:	1400.00	cfs
Energy Gradient:	0.0069	ft/ft
Froude Number:	0.291	
Flow Regime:	Subcritical	
Flow Area:	489.33	sq ft
Average Velocity:	2.86	ft/s
Maximum Velocity:	3.24	ft/s
Composite n:	0.0636	
Hydraulic Radius:	1.73	ft
Wetted Perimeter:	282.07	ft
Wetted Top Width:	281.97	ft
Critical Slope:	0.0845	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–130

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

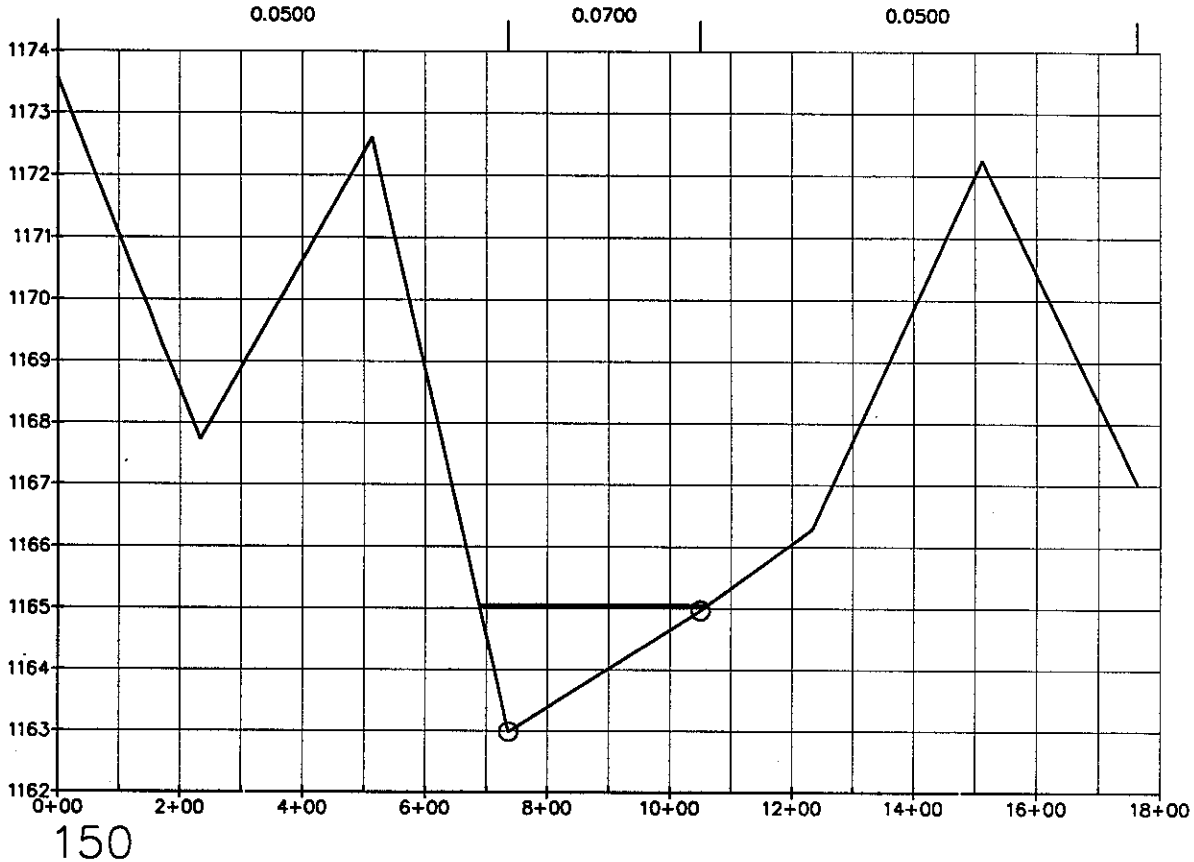
Cross-Section:	140	
Elevation:	1154.18	ft MSL
Depth:	2.08	ft
Discharge:	770.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.2406	
Flow Regime:	Subcritical	
Flow Area:	391.50	sq ft
Average Velocity:	1.98	ft/s
Maximum Velocity:	2.62	ft/s
Composite n:	0.0689	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	359.19	ft
Wetted Top Width:	359.07	ft
Critical Slope:	0.1273	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–140

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

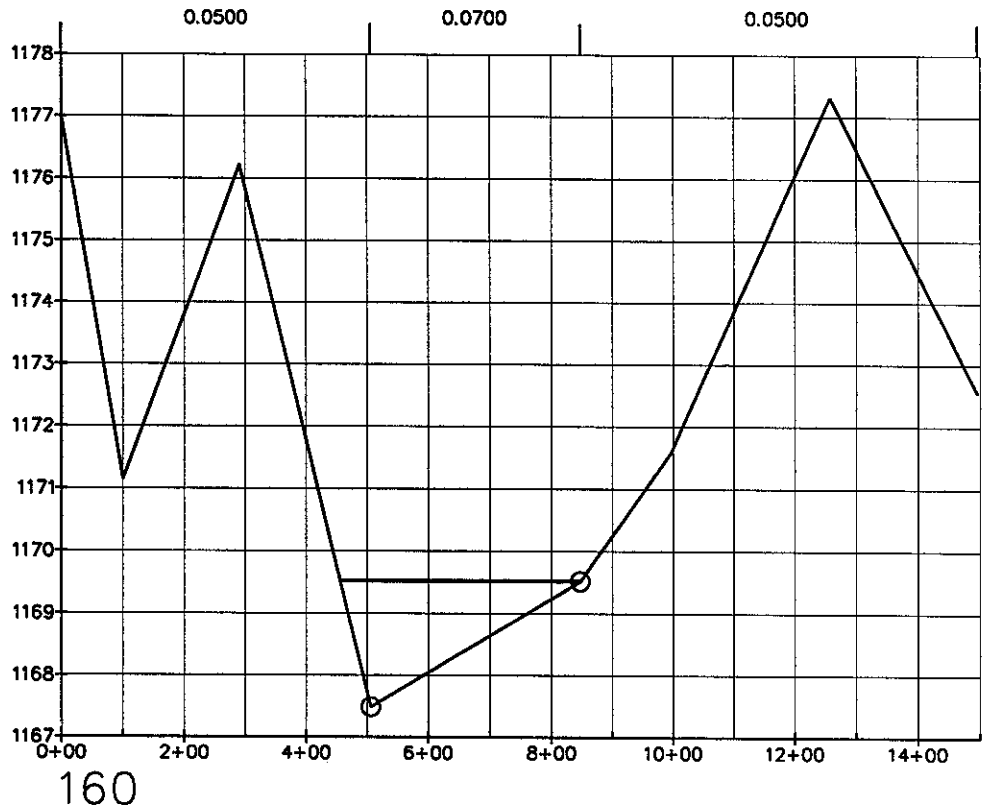
Cross-Section:	150	
Elevation:	1165.05	ft MSL
Depth:	2.06	ft
Discharge:	770.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.2473	
Flow Regime:	Subcritical	
Flow Area:	382.92	sq ft
Average Velocity:	2.00	ft/s
Maximum Velocity:	2.61	ft/s
Composite n:	0.067	
Hydraulic Radius:	1.03	ft
Wetted Perimeter:	371.31	ft
Wetted Top Width:	371.26	ft
Critical Slope:	0.1286	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31 (DICKEY NORTH)–150

Entellus™

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	160	
Elevation:	1169.52	ft MSL
Depth:	2.03	ft
Discharge:	770.00	cfs
Energy Gradient:	0.0074	ft/ft
Froude Number:	0.2398	
Flow Regime:	Subcritical	
Flow Area:	397.23	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.59	ft/s
Composite n:	0.0676	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	391.28	ft
Wetted Top Width:	391.23	ft
Critical Slope:	0.1318	ft/ft

File: WASH-T2N-R5W-S31(DICKEY)_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S31 (DICKEY NORTH)-160

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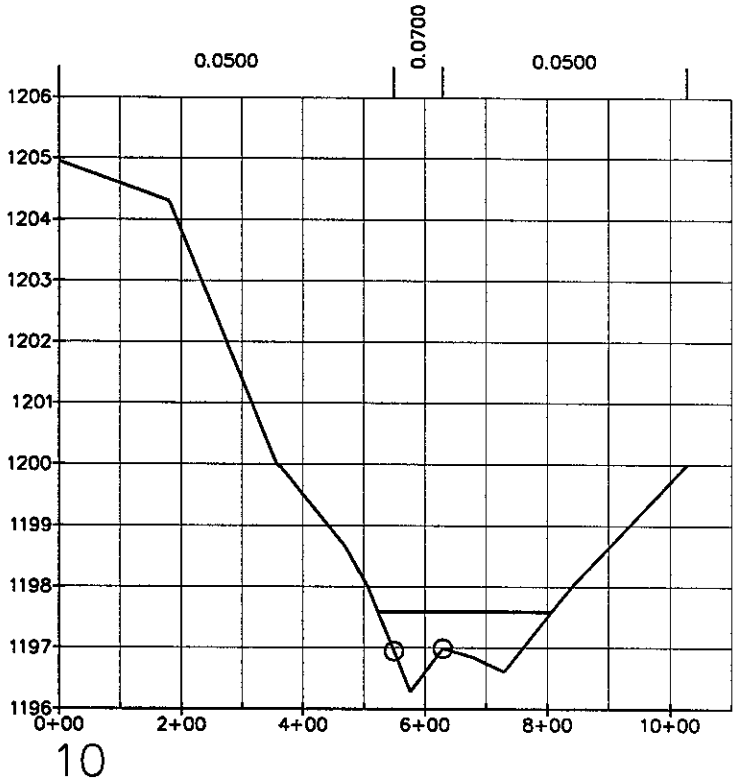


Normal Depth Results

Cross-Section:	10	
Elevation:	1197.59	ft MSL
Depth:	1.30	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.3182	
Flow Regime:	Subcritical	
Flow Area:	199.32	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.17	ft/s
Composite n:	0.056	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	283.78	ft
Wetted Top Width:	283.76	ft
Critical Slope:	0.0945	ft/ft

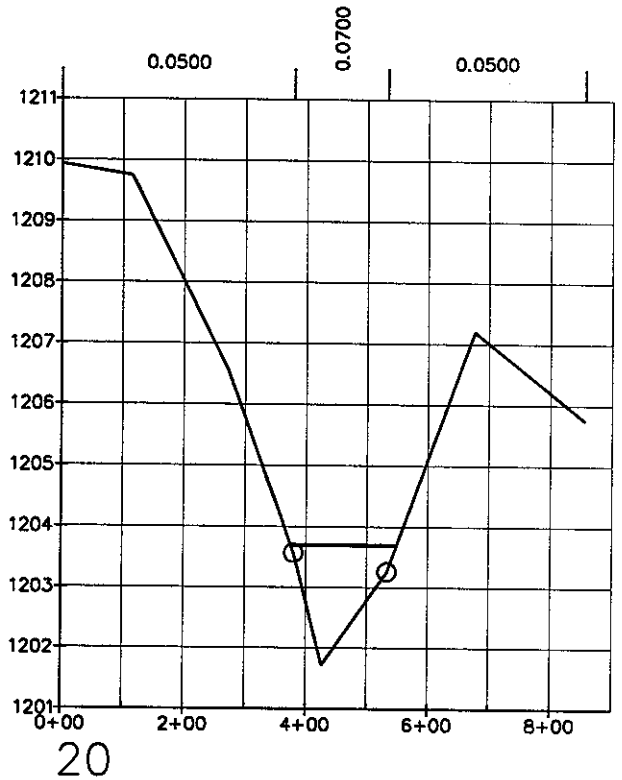
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–10

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

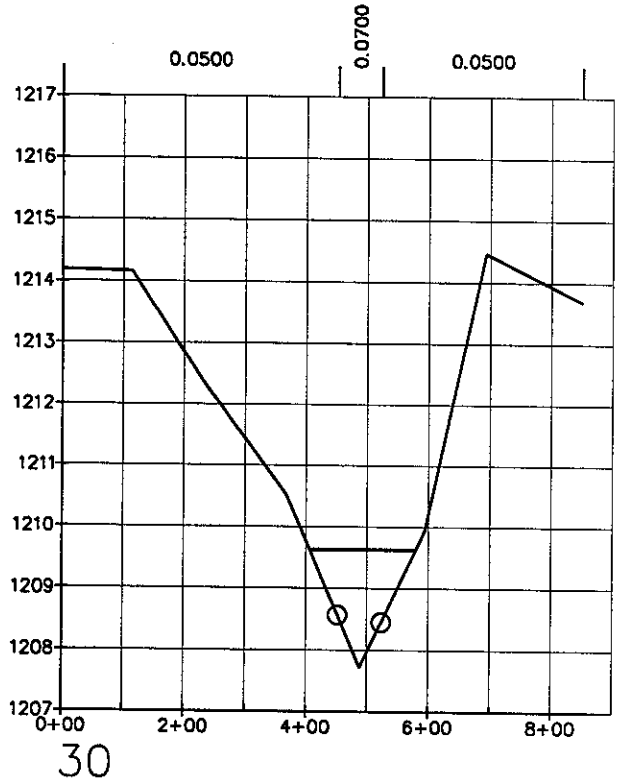
Cross-Section:	20	
Elevation:	1203.69	ft MSL
Depth:	1.97	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.2837	
Flow Regime:	Subcritical	
Flow Area:	181.29	sq ft
Average Velocity:	2.26	ft/s
Maximum Velocity:	2.29	ft/s
Composite n:	0.0678	
Hydraulic Radius:	1.04	ft
Wetted Perimeter:	173.78	ft
Wetted Top Width:	173.72	ft
Critical Slope:	0.1244	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–20

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

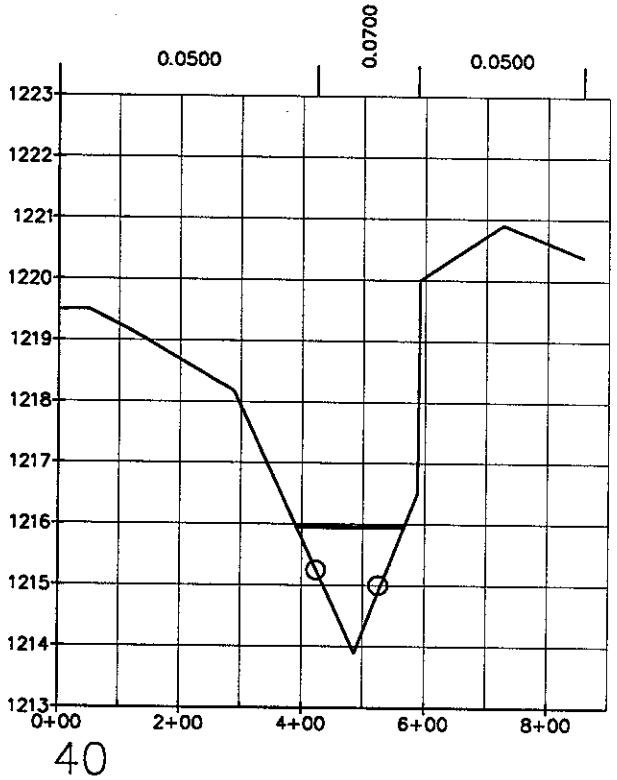
Cross-Section:	30	
Elevation:	1209.63	ft MSL
Depth:	1.91	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.3172	
Flow Regime:	Subcritical	
Flow Area:	165.10	sq ft
Average Velocity:	2.47	ft/s
Maximum Velocity:	2.73	ft/s
Composite n:	0.0586	
Hydraulic Radius:	0.95	ft
Wetted Perimeter:	173.32	ft
Wetted Top Width:	173.28	ft
Critical Slope:	0.1014	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–30

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

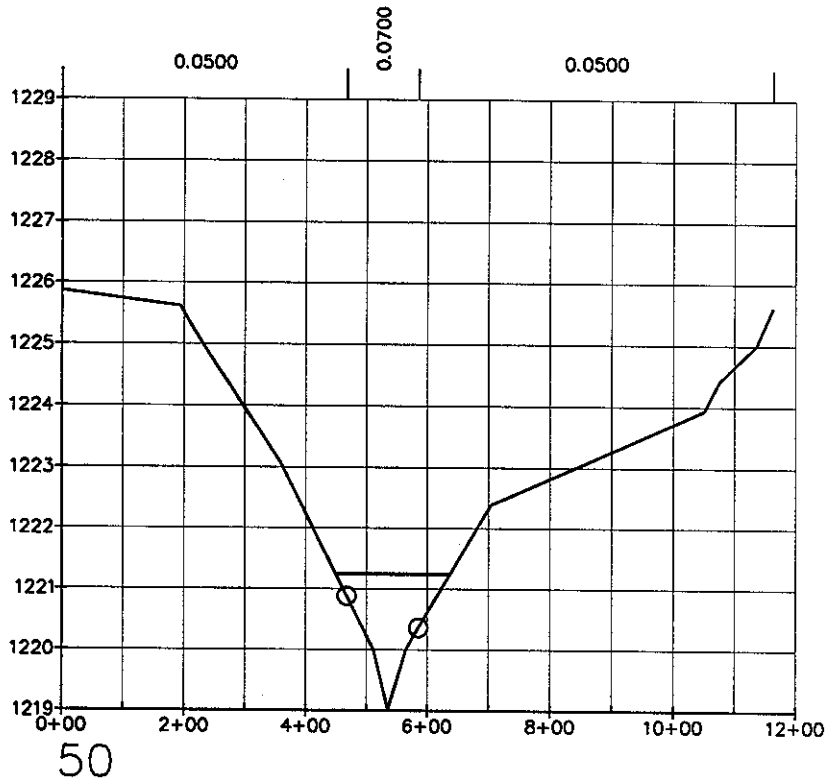
Cross-Section:	40	
Elevation:	1215.95	ft MSL
Depth:	2.06	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.2796	
Flow Regime:	Subcritical	
Flow Area:	180.13	sq ft
Average Velocity:	2.26	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0665	
Hydraulic Radius:	1.03	ft
Wetted Perimeter:	175.13	ft
Wetted Top Width:	175.09	ft
Critical Slope:	0.1273	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–40

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

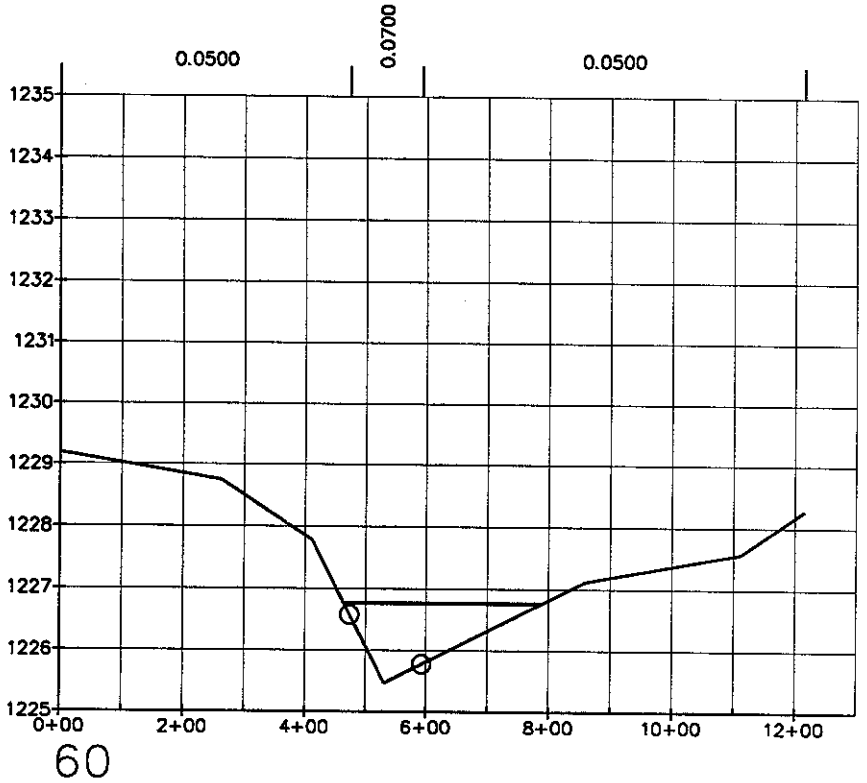
Cross-Section:	50	
Elevation:	1221.24	ft MSL
Depth:	2.22	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.275	
Flow Regime:	Subcritical	
Flow Area:	176.26	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.43	ft/s
Composite n:	0.0629	
Hydraulic Radius:	0.94	ft
Wetted Perimeter:	187.87	ft
Wetted Top Width:	187.81	ft
Critical Slope:	0.1391	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–50

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

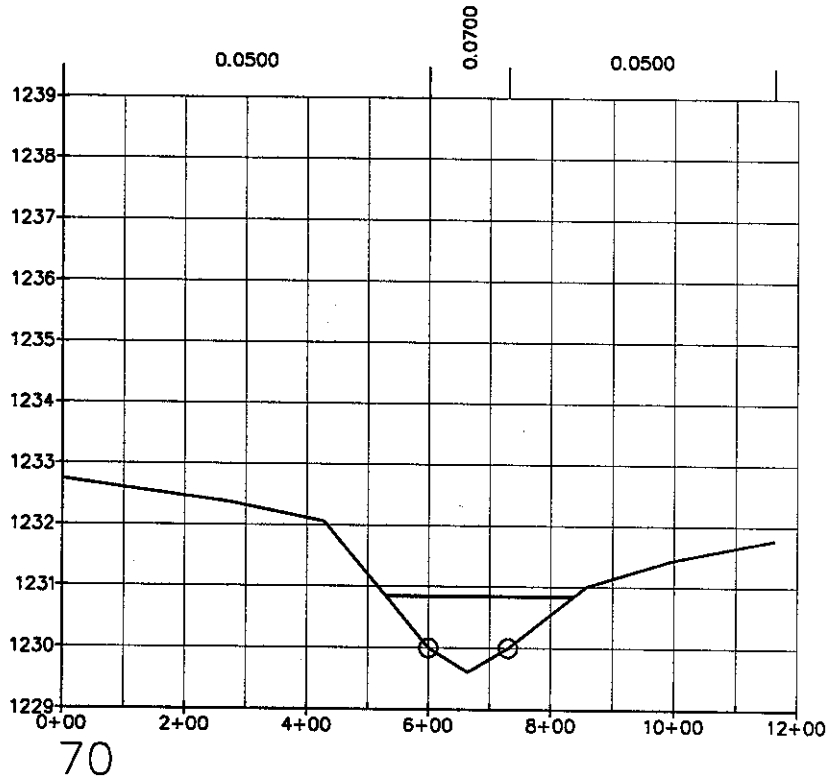
Cross-Section:	60	
Elevation:	1226.77	ft MSL
Depth:	1.30	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.3009	
Flow Regime:	Subcritical	
Flow Area:	210.85	sq ft
Average Velocity:	1.91	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0576	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	325.29	ft
Wetted Top Width:	325.27	ft
Critical Slope:	0.1116	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S08-60

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

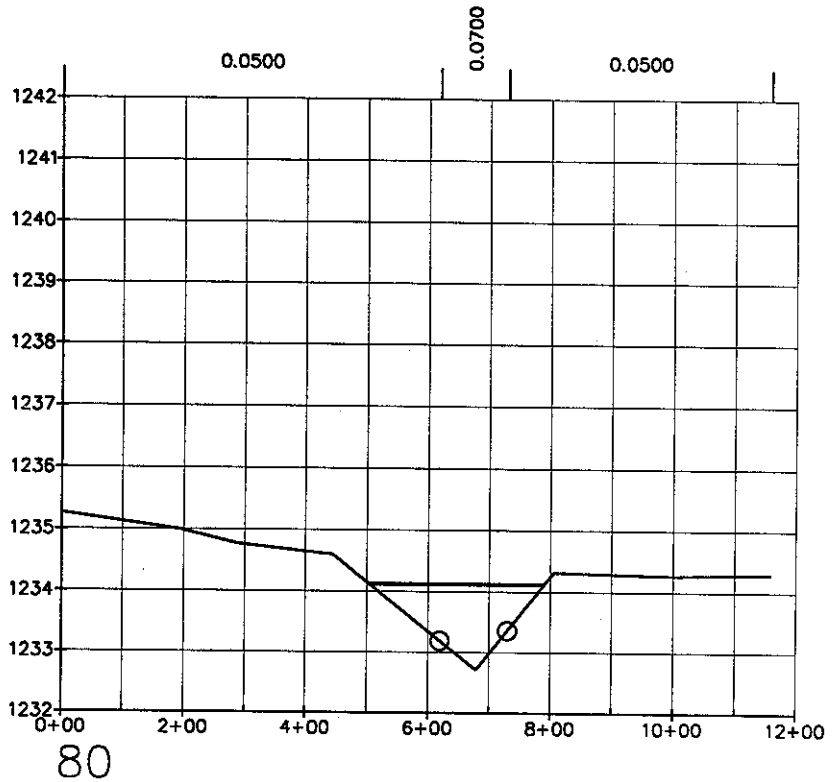
Cross-Section:	70	
Elevation:	1230.84	ft MSL
Depth:	1.23	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.31	
Flow Regime:	Subcritical	
Flow Area:	209.97	sq ft
Average Velocity:	1.95	ft/s
Maximum Velocity:	2.13	ft/s
Composite n:	0.0588	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	307.57	ft
Wetted Top Width:	307.56	ft
Critical Slope:	0.103	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–70

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

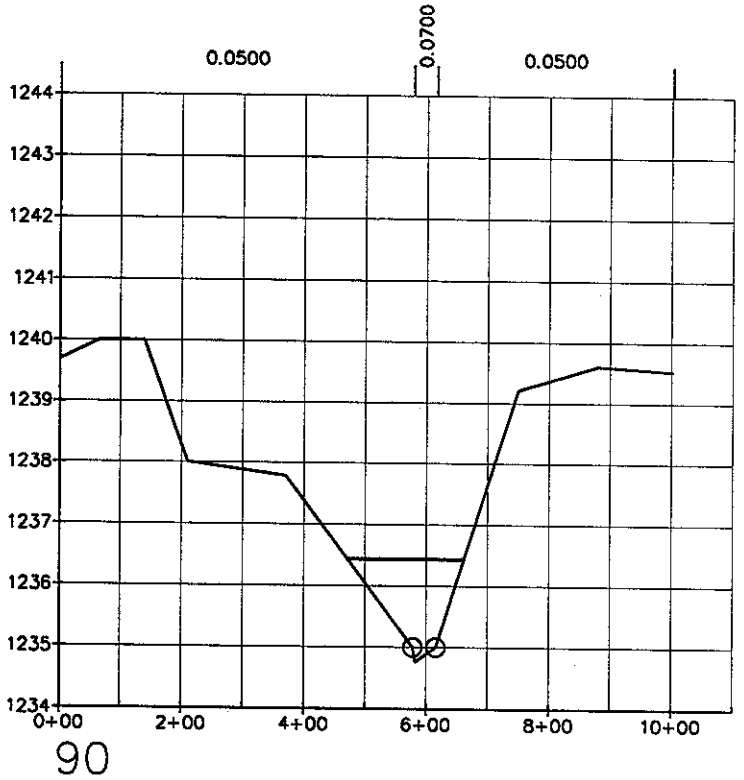
Cross-Section:	80	
Elevation:	1234.12	ft MSL
Depth:	1.41	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.3021	
Flow Regime:	Subcritical	
Flow Area:	201.46	sq ft
Average Velocity:	2.03	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.0581	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	285.88	ft
Wetted Top Width:	285.86	ft
Critical Slope:	0.1101	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–80

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

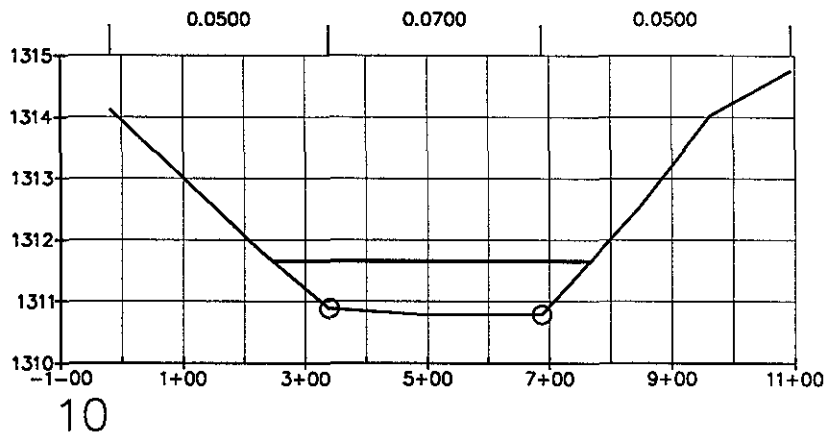
Cross-Section:	90	
Elevation:	1236.43	ft MSL
Depth:	1.67	ft
Discharge:	410.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.336	
Flow Regime:	Subcritical	
Flow Area:	166.57	sq ft
Average Velocity:	2.48	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.0542	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	189.48	ft
Wetted Top Width:	189.44	ft
Critical Slope:	0.0844	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S08–90

Entellus™

File: WASH-T2N-R5W-S08_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

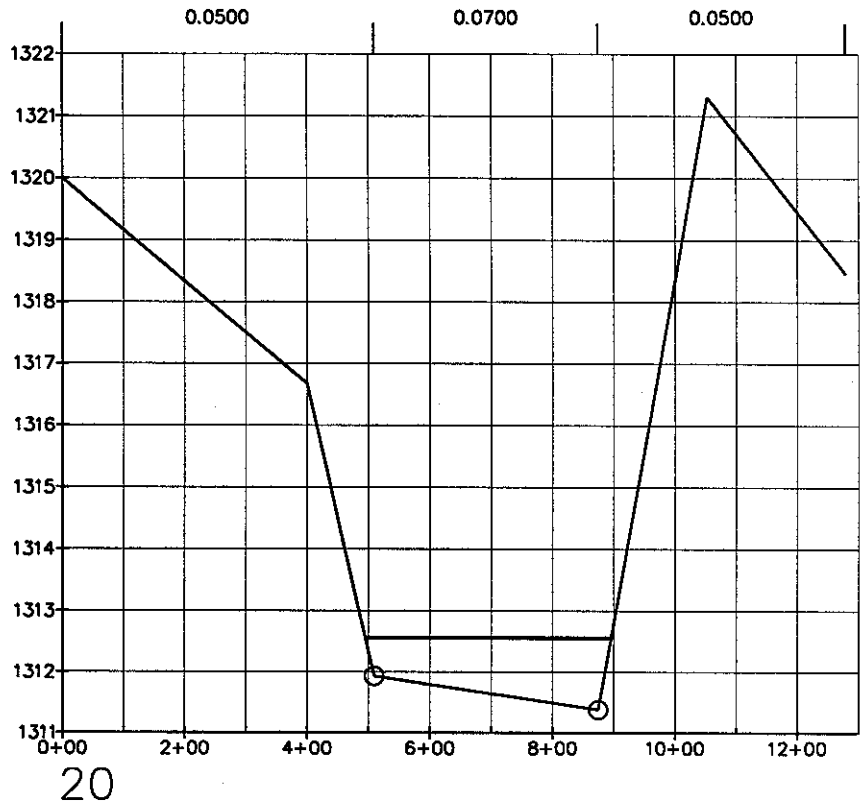
Cross-Section:	10	
Elevation:	1311.66	ft MSL
Depth:	0.87	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3141	
Flow Regime:	Subcritical	
Flow Area:	366.87	sq ft
Average Velocity:	1.66	ft/s
Maximum Velocity:	1.71	ft/s
Composite n:	0.0637	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	521.27	ft
Wetted Top Width:	521.26	ft
Critical Slope:	0.0818	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S31–10

Entellus™

File: WASH-T3N-R5W-S31_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

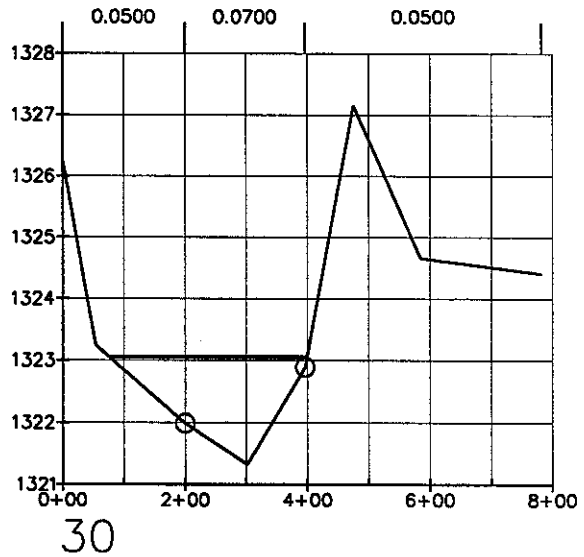
Cross-Section:	20	
Elevation:	1312.56	ft MSL
Depth:	1.17	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.287	
Flow Regime:	Subcritical	
Flow Area:	345.66	sq ft
Average Velocity:	1.77	ft/s
Maximum Velocity:	1.87	ft/s
Composite n:	0.0683	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	400.96	ft
Wetted Top Width:	400.91	ft
Critical Slope:	0.0969	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S31–20

Entellus™

File: WASH-T3N-R5W-S31_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

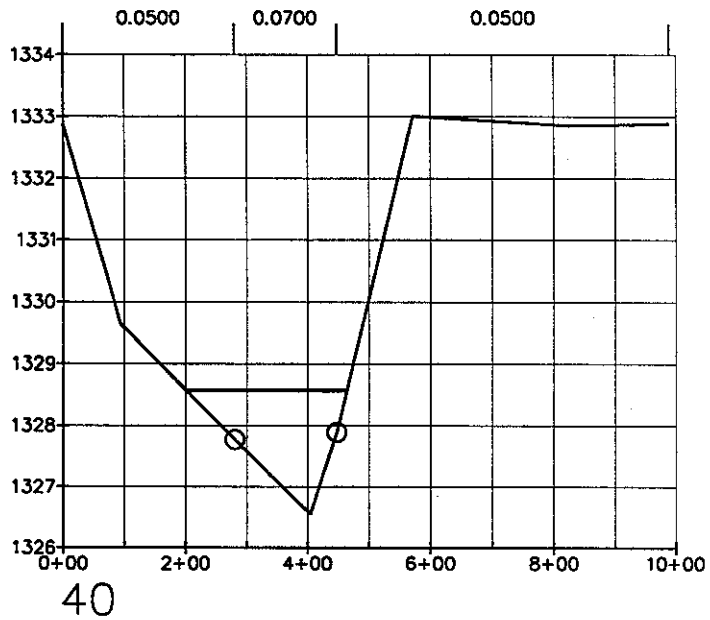
Cross-Section:	30	
Elevation:	1323.05	ft MSL
Depth:	1.73	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2755	
Flow Regime:	Subcritical	
Flow Area:	296.83	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.12	ft/s
Composite n:	0.0625	
Hydraulic Radius:	0.92	ft
Wetted Perimeter:	322.62	ft
Wetted Top Width:	322.59	ft
Critical Slope:	0.1094	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S31–30

Entellus™

File: WASH-T3N-R5W-S31_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

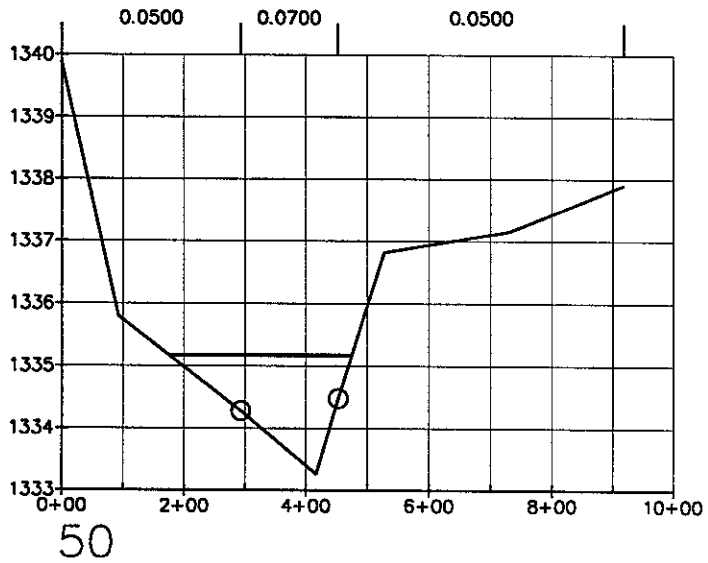
Cross-Section:	40	
Elevation:	1328.57	ft MSL
Depth:	2.02	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2803	
Flow Regime:	Subcritical	
Flow Area:	270.03	sq ft
Average Velocity:	2.24	ft/s
Maximum Velocity:	2.37	ft/s
Composite n:	0.063	
Hydraulic Radius:	1.03	ft
Wetted Perimeter:	263.25	ft
Wetted Top Width:	263.21	ft
Critical Slope:	0.1124	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S31–40

Entellus™

File: WASH-T3N-R5W-S31_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

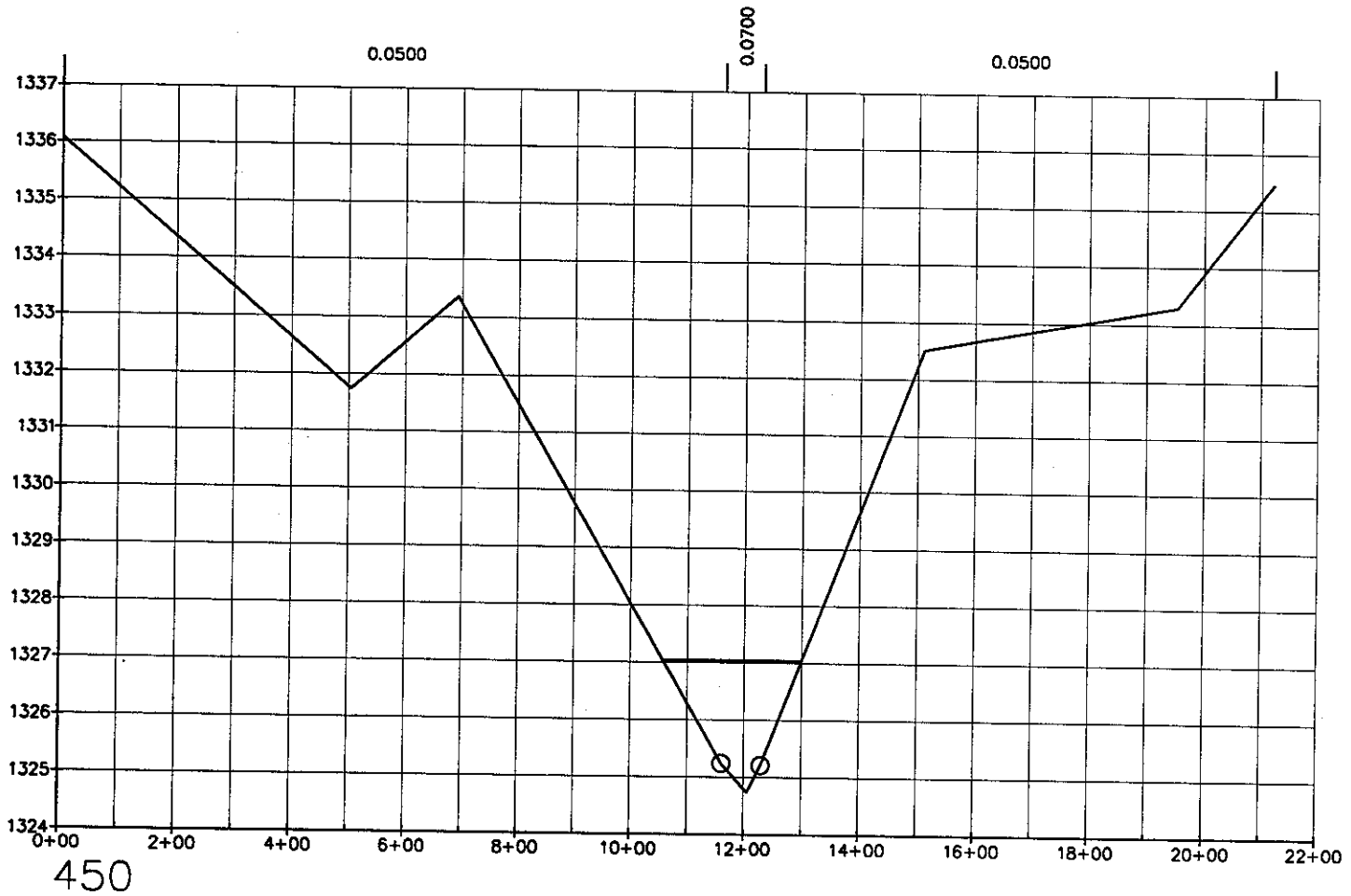
Cross-Section:	50	
Elevation:	1335.17	ft MSL
Depth:	1.91	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2784	
Flow Regime:	Subcritical	
Flow Area:	279.60	sq ft
Average Velocity:	2.18	ft/s
Maximum Velocity:	2.36	ft/s
Composite n:	0.061	
Hydraulic Radius:	0.93	ft
Wetted Perimeter:	299.61	ft
Wetted Top Width:	299.57	ft
Critical Slope:	0.1131	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S31–50

Entellus™

File: WASH-T3N-R5W-S31_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

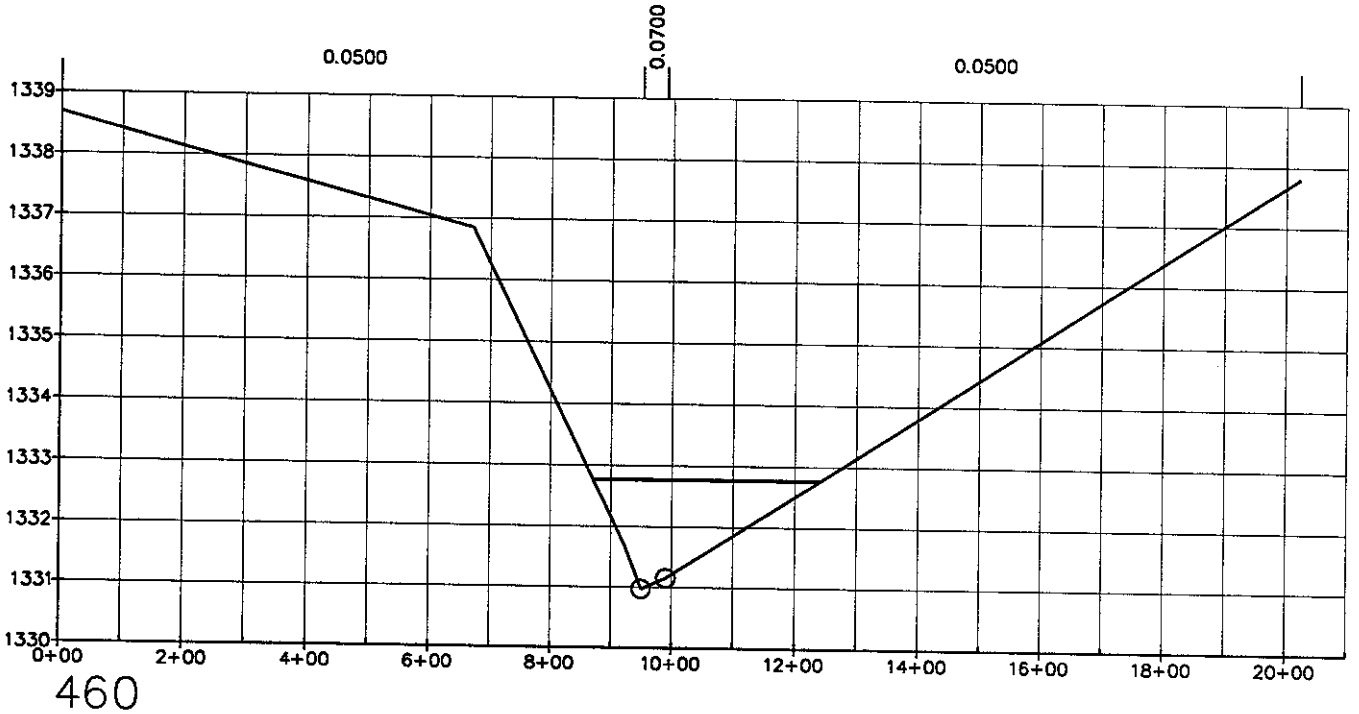
Cross-Section:	450	
Elevation:	1327.03	ft MSL
Depth:	2.29	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3214	
Flow Regime:	Subcritical	
Flow Area:	297.09	sq ft
Average Velocity:	2.76	ft/s
Maximum Velocity:	3.07	ft/s
Composite n:	0.056	
Hydraulic Radius:	1.23	ft
Wetted Perimeter:	242.19	ft
Wetted Top Width:	242.15	ft
Critical Slope:	0.0794	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–450

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

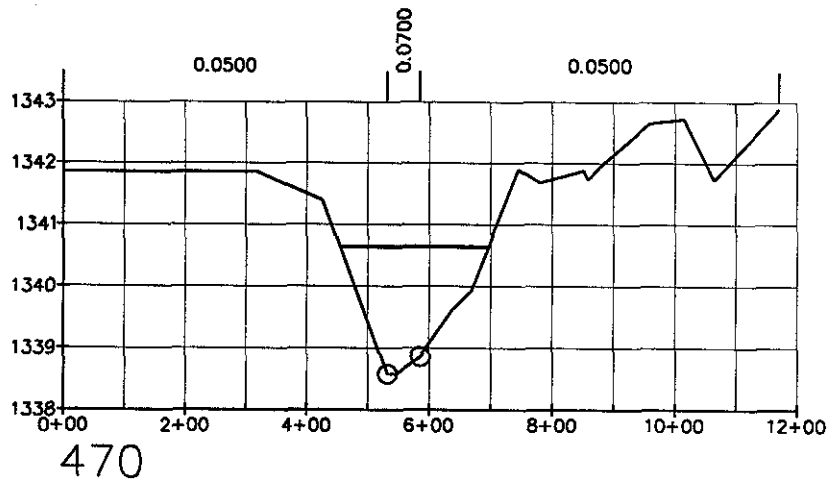
Cross-Section:	460	
Elevation:	1332.77	ft MSL
Depth:	1.80	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3172	
Flow Regime:	Subcritical	
Flow Area:	339.64	sq ft
Average Velocity:	2.41	ft/s
Maximum Velocity:	2.72	ft/s
Composite n:	0.0523	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	371.19	ft
Wetted Top Width:	371.17	ft
Critical Slope:	0.0804	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–460

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

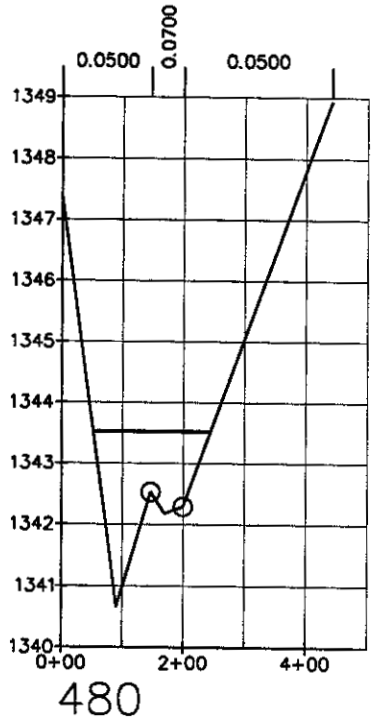
Cross-Section:	470	
Elevation:	1340.64	ft MSL
Depth:	2.06	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3421	
Flow Regime:	Subcritical	
Flow Area:	294.32	sq ft
Average Velocity:	2.79	ft/s
Maximum Velocity:	2.98	ft/s
Composite n:	0.0547	
Hydraulic Radius:	1.22	ft
Wetted Perimeter:	241.89	ft
Wetted Top Width:	241.84	ft
Critical Slope:	0.0688	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–470

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

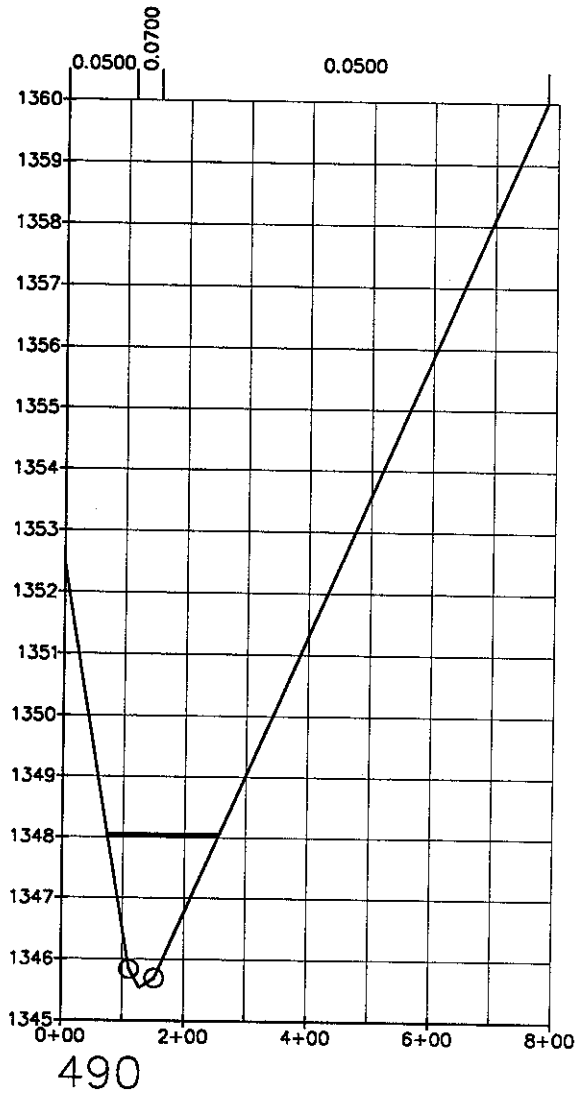
Cross-Section:	480	
Elevation:	1343.52	ft MSL
Depth:	2.86	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3333	
Flow Regime:	Subcritical	
Flow Area:	256.35	sq ft
Average Velocity:	3.20	ft/s
Maximum Velocity:	3.83	ft/s
Composite n:	0.0558	
Hydraulic Radius:	1.33	ft
Wetted Perimeter:	192.78	ft
Wetted Top Width:	192.62	ft
Critical Slope:	0.0885	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–480

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

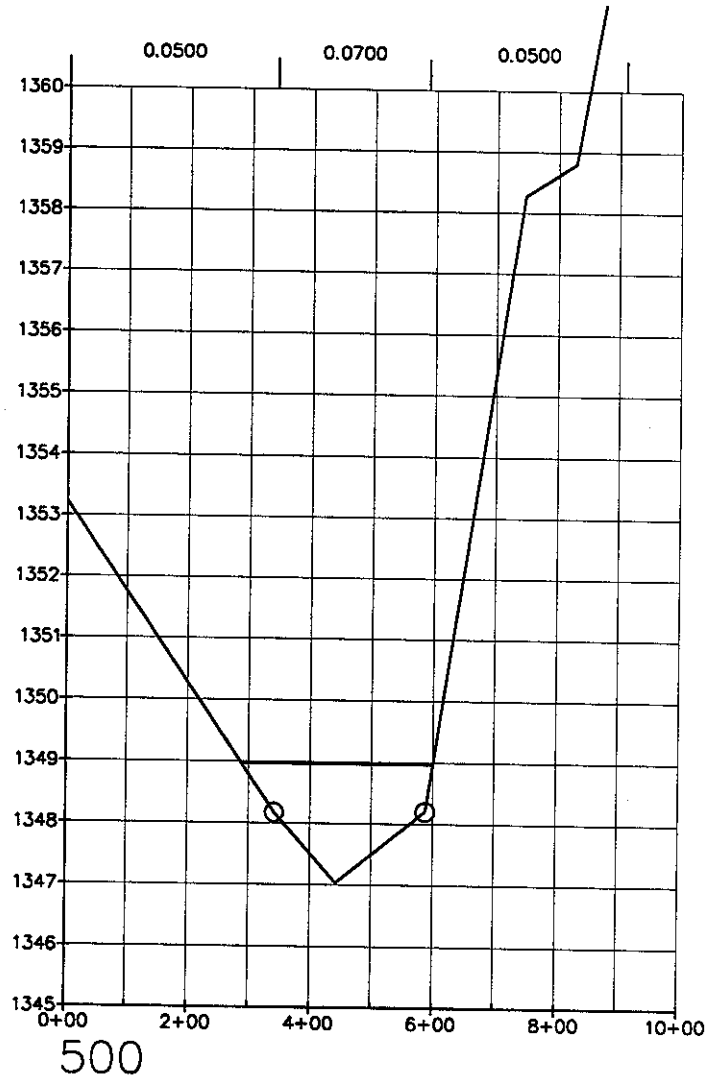
Cross-Section:	490	
Elevation:	1348.04	ft MSL
Depth:	2.51	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3488	
Flow Regime:	Subcritical	
Flow Area:	261.40	sq ft
Average Velocity:	3.12	ft/s
Maximum Velocity:	3.42	ft/s
Composite n:	0.0548	
Hydraulic Radius:	1.44	ft
Wetted Perimeter:	181.81	ft
Wetted Top Width:	181.72	ft
Critical Slope:	0.0674	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–490

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

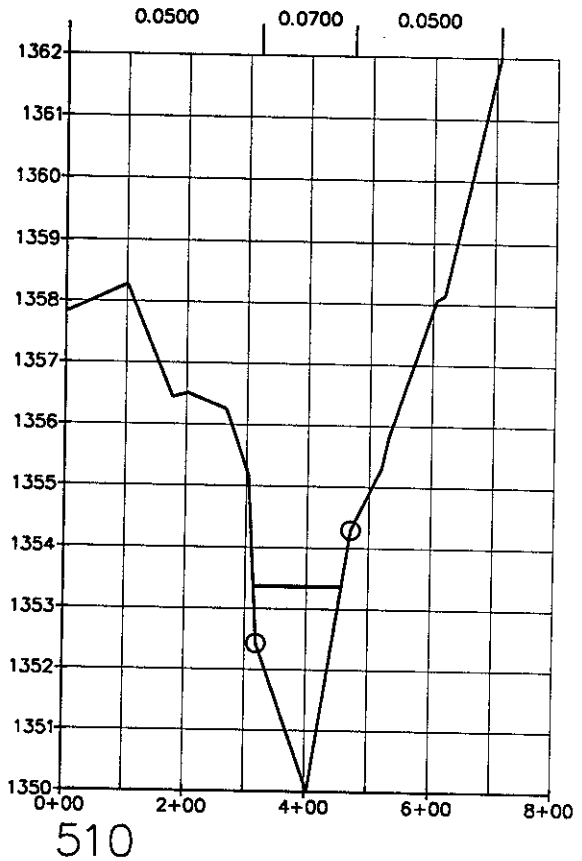
Cross-Section:	500	
Elevation:	1349.34	ft MSL
Depth:	1.94	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2869	
Flow Regime:	Subcritical	
Flow Area:	361.80	sq ft
Average Velocity:	2.27	ft/s
Maximum Velocity:	2.34	ft/s
Composite n:	0.066	
Hydraulic Radius:	1.16	ft
Wetted Perimeter:	312.54	ft
Wetted Top Width:	312.50	ft
Critical Slope:	0.1007	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–500

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

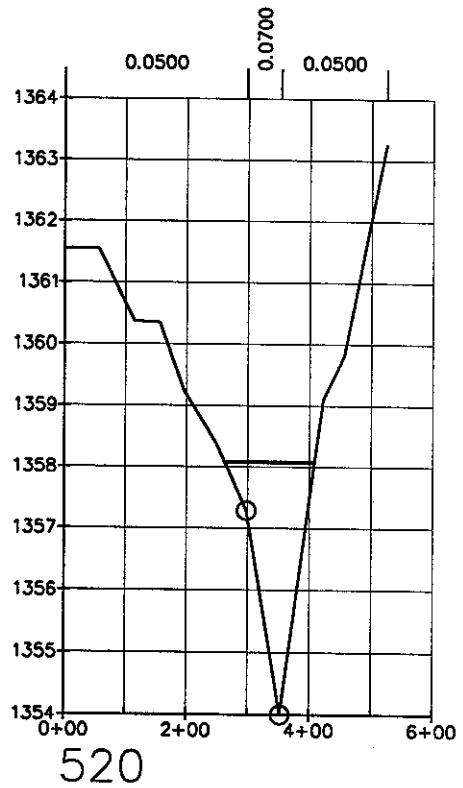
Cross-Section:	510	
Elevation:	1353.37	ft MSL
Depth:	3.37	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.287	
Flow Regime:	Subcritical	
Flow Area:	274.50	sq ft
Average Velocity:	2.98	ft/s
Maximum Velocity:	2.99	ft/s
Composite n:	0.0693	
Hydraulic Radius:	1.92	ft
Wetted Perimeter:	143.25	ft
Wetted Top Width:	143.02	ft
Critical Slope:	0.0984	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–510

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

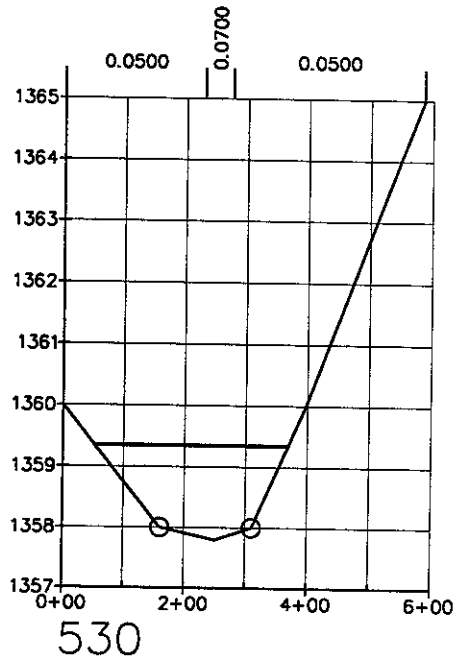
Cross-Section:	520	
Elevation:	1358.08	ft MSL
Depth:	4.08	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2753	
Flow Regime:	Subcritical	
Flow Area:	260.08	sq ft
Average Velocity:	3.15	ft/s
Maximum Velocity:	3.25	ft/s
Composite n:	0.0654	
Hydraulic Radius:	1.78	ft
Wetted Perimeter:	145.75	ft
Wetted Top Width:	145.49	ft
Critical Slope:	0.1168	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–520

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

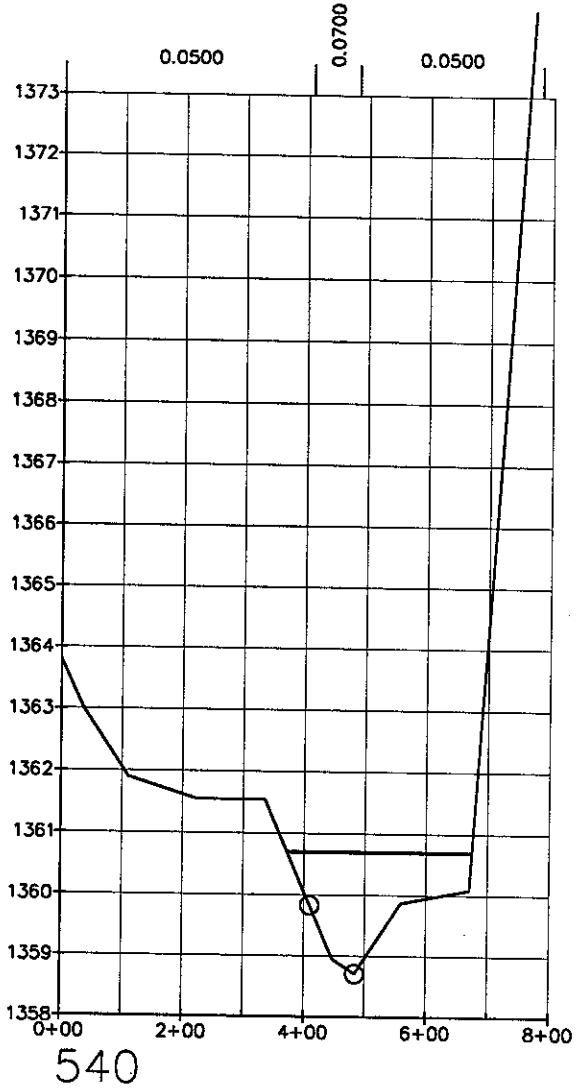
Cross-Section:	530	
Elevation:	1359.35	ft MSL
Depth:	1.55	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3513	
Flow Regime:	Subcritical	
Flow Area:	330.42	sq ft
Average Velocity:	2.48	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.056	
Hydraulic Radius:	1.04	ft
Wetted Perimeter:	317.15	ft
Wetted Top Width:	317.13	ft
Critical Slope:	0.0667	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–530

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

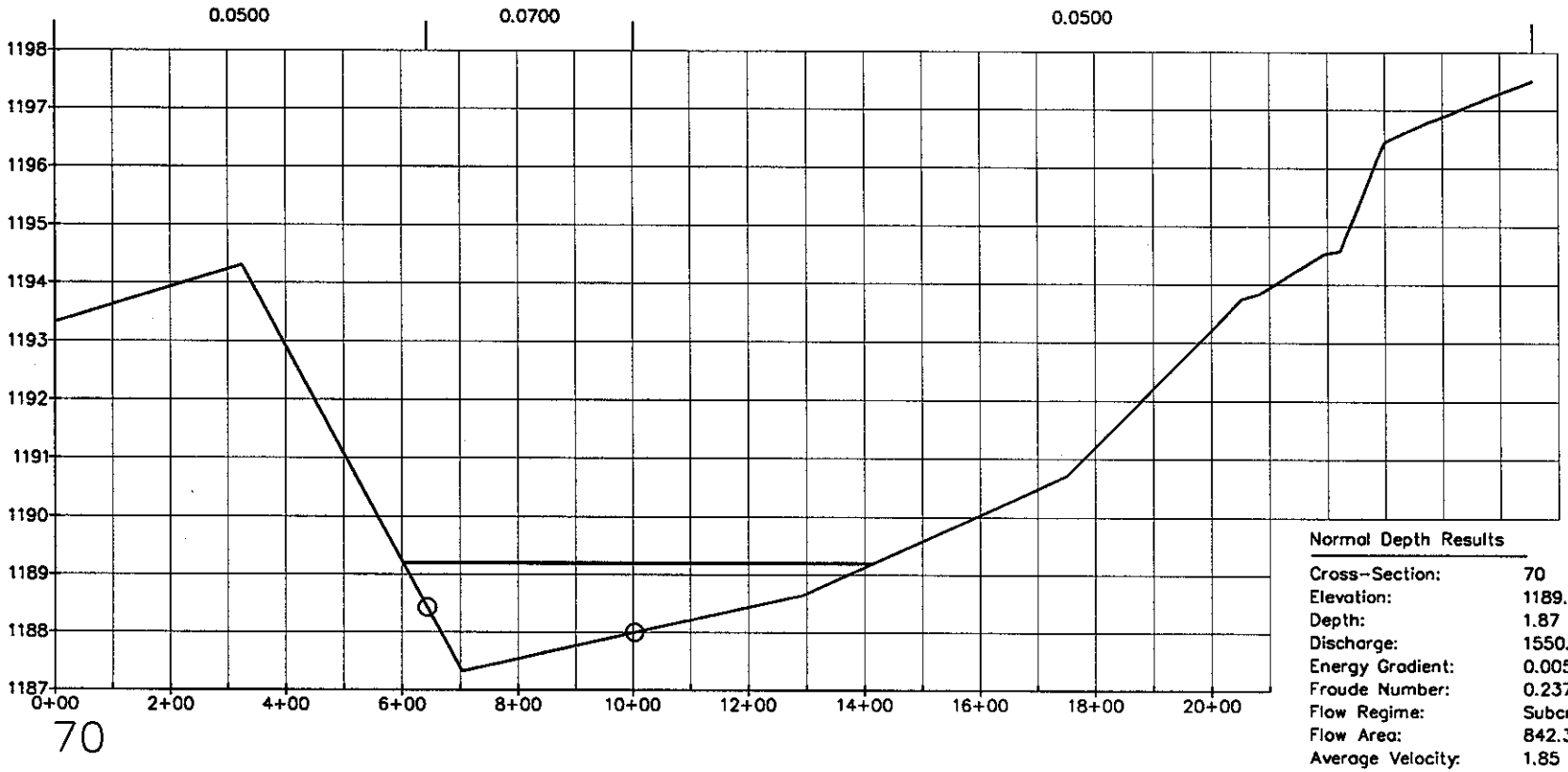
Cross-Section:	540	
Elevation:	1360.70	ft MSL
Depth:	1.99	ft
Discharge:	820.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3191	
Flow Regime:	Subcritical	
Flow Area:	321.28	sq ft
Average Velocity:	2.56	ft/s
Maximum Velocity:	2.63	ft/s
Composite n:	0.0552	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	302.86	ft
Wetted Top Width:	302.79	ft
Critical Slope:	0.0812	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S31W(PHILLIPS–NORTH)–540

Entellus™

File: WASH-T2N-R5W-S31W(PHILLIPS-NORTH)_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

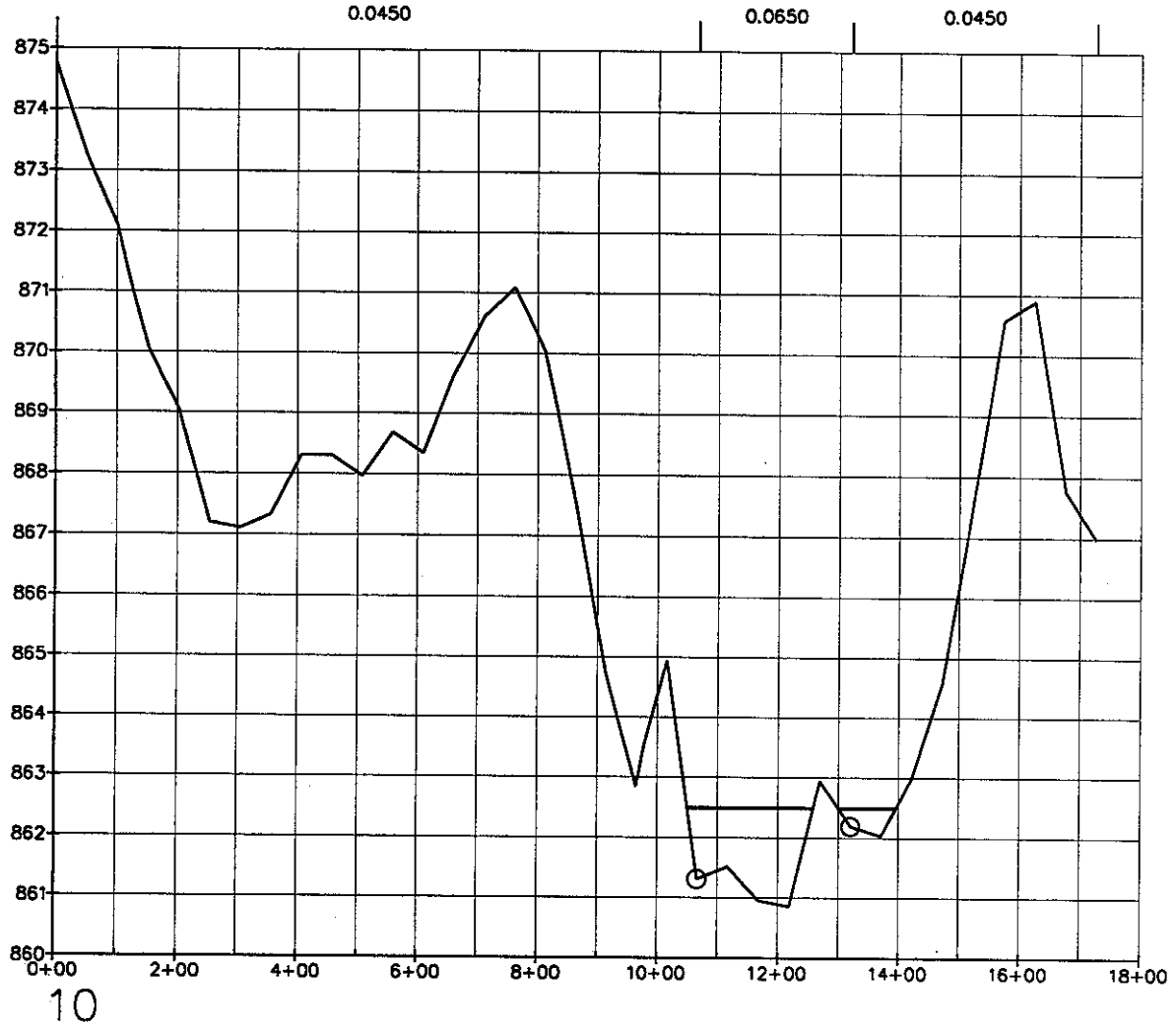
Cross-Section:	70	
Elevation:	1189.20	ft MSL
Depth:	1.87	ft
Discharge:	1550.00	cfs
Energy Gradient:	0.005	ft/ft
Froude Number:	0.237	
Flow Regime:	Subcritical	
Flow Area:	842.38	sq ft
Average Velocity:	1.85	ft/s
Maximum Velocity:	1.97	ft/s
Composite n:	0.0592	
Hydraulic Radius:	1.04	ft
Wetted Perimeter:	813.11	ft
Wetted Top Width:	813.09	ft
Critical Slope:	0.0909	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S19–70

Entellus™

File: WASH-T2N-R5W-S19_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

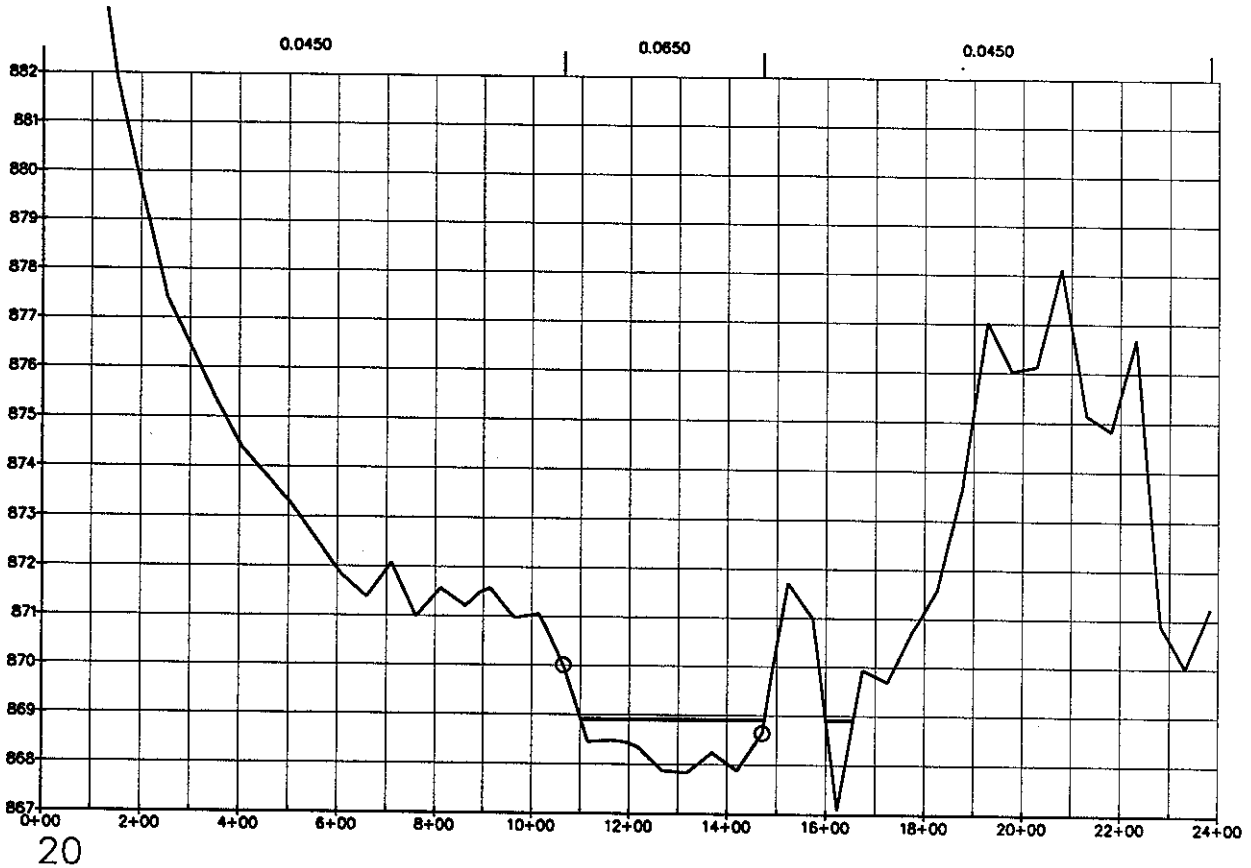
Cross-Section:	10	
Elevation:	862.49	ft MSL
Depth:	1.63	ft
Discharge:	530.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2723	
Flow Regime:	Subcritical	
Flow Area:	268.67	sq ft
Average Velocity:	1.98	ft/s
Maximum Velocity:	2.05	ft/s
Composite n:	0.0593	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	303.78	ft
Wetted Top Width:	303.70	ft
Critical Slope:	0.0979	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S08–10

Entellus™

File: WASH–T1S–R5W–S08_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

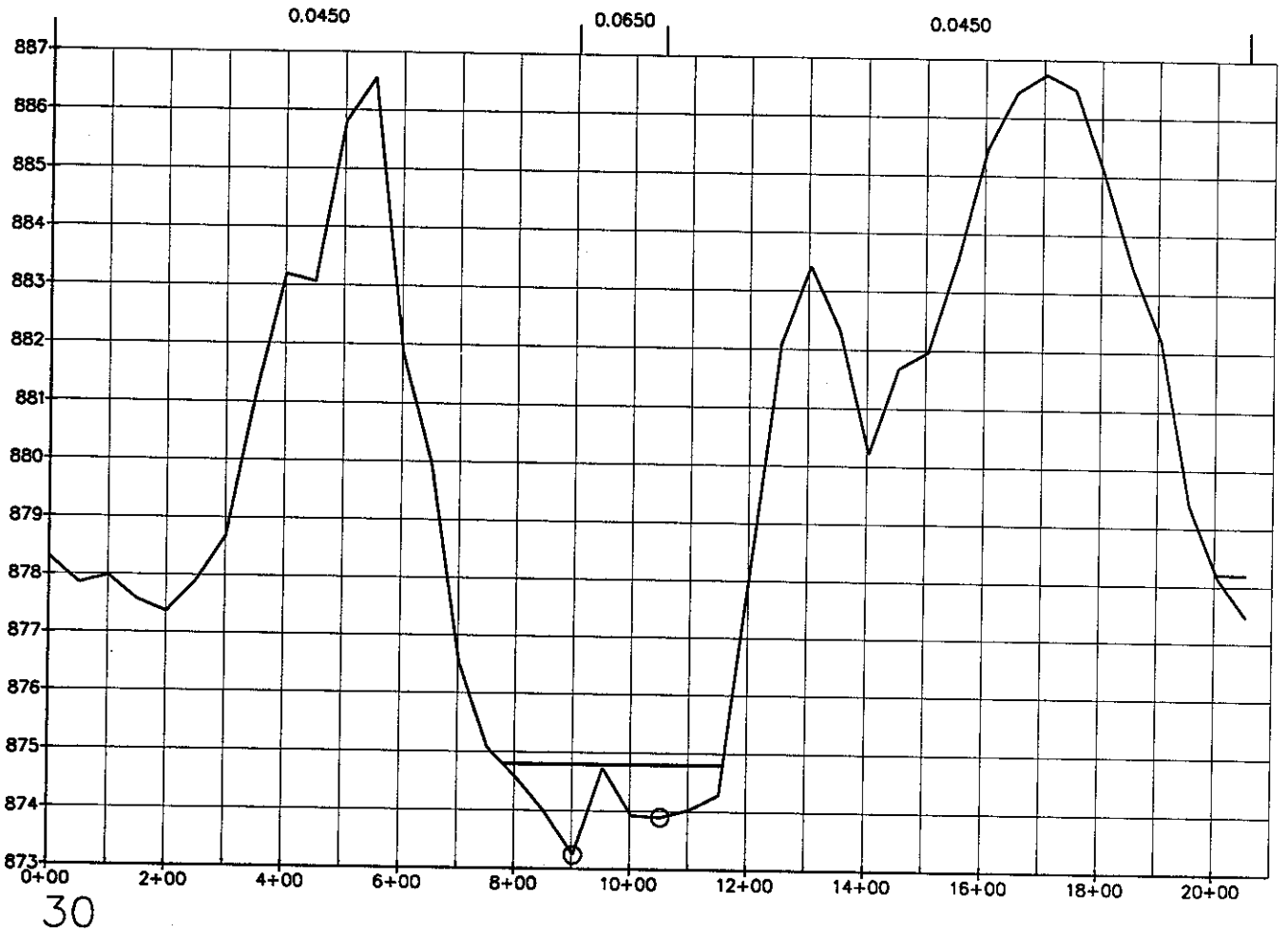
Cross-Section:	20	
Elevation:	868.90	ft MSL
Depth:	1.80	ft
Discharge:	530.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2228	
Flow Regime:	Subcritical	
Flow Area:	312.40	sq ft
Average Velocity:	1.68	ft/s
Maximum Velocity:	2.48	ft/s
Composite n:	0.0624	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	429.49	ft
Wetted Top Width:	429.35	ft
Critical Slope:	0.1554	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S08–20

Entellus™

File: WASH-T1S-R5W-S08_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

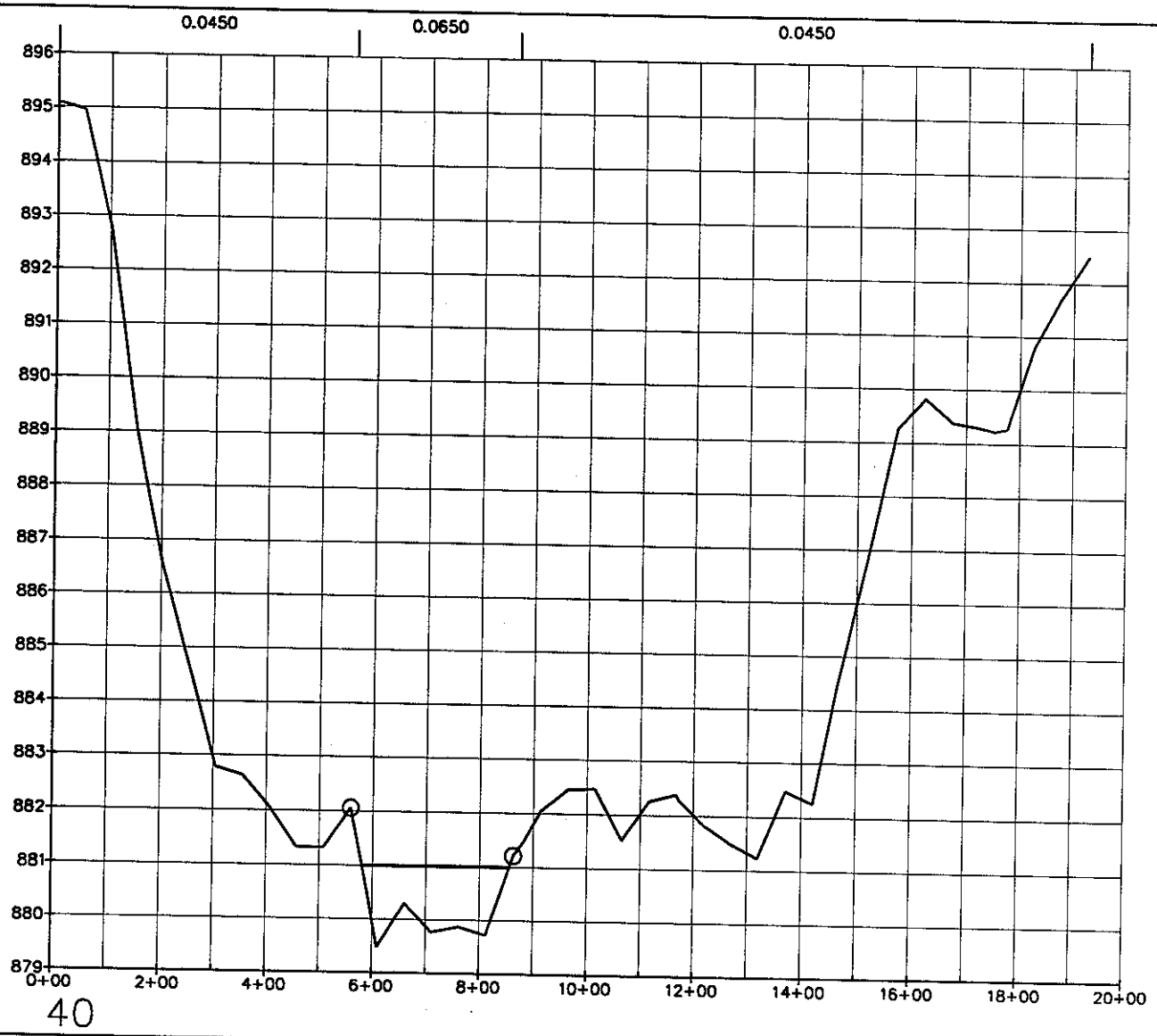
Cross-Section:	30	
Elevation:	874.80	ft MSL
Depth:	1.56	ft
Discharge:	530.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2755	
Flow Regime:	Subcritical	
Flow Area:	271.68	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.23	ft/s
Composite n:	0.0533	
Hydraulic Radius:	0.72	ft
Wetted Perimeter:	379.90	ft
Wetted Top Width:	379.84	ft
Critical Slope:	0.1005	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S08–30

Entellus™

File: WASH-T1S-R5W-S08_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

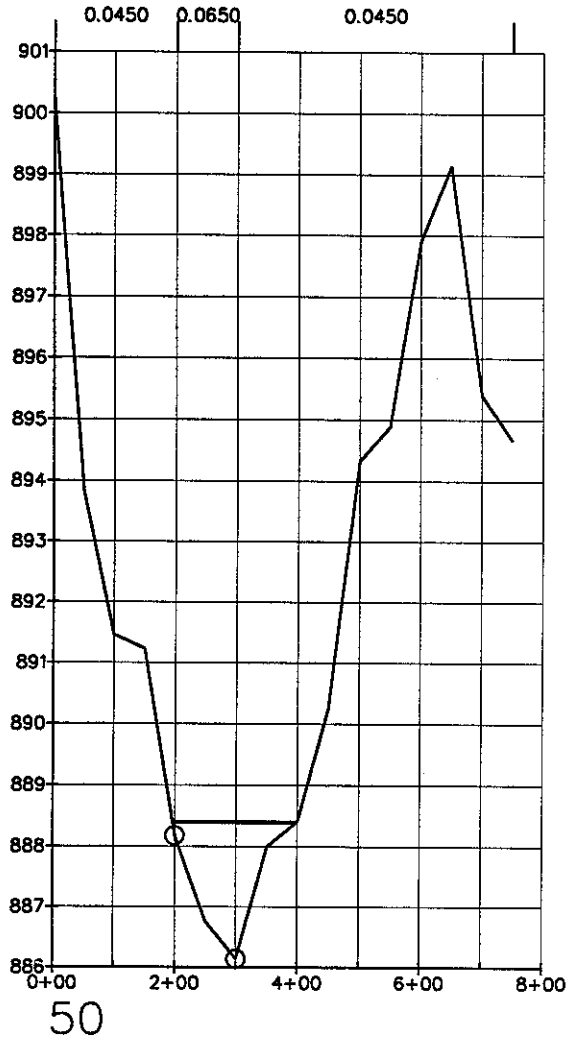
Cross-Section:	40	
Elevation:	881.00	ft MSL
Depth:	1.52	ft
Discharge:	530.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2742	
Flow Regime:	Subcritical	
Flow Area:	276.35	sq ft
Average Velocity:	1.92	ft/s
Maximum Velocity:	1.92	ft/s
Composite n:	0.065	
Hydraulic Radius:	1	ft
Wetted Perimeter:	276.08	ft
Wetted Top Width:	276.01	ft
Critical Slope:	0.0929	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S08–40

Entellus™

File: WASH–T1S–R5W–S08_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

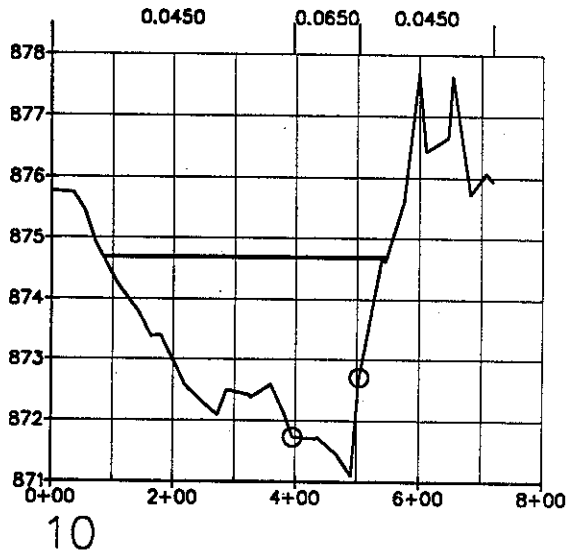
Cross-Section:	50	
Elevation:	888.40	ft MSL
Depth:	2.26	ft
Discharge:	530.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2829	
Flow Regime:	Subcritical	
Flow Area:	219.84	sq ft
Average Velocity:	2.40	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.0553	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	201.94	ft
Wetted Top Width:	201.87	ft
Critical Slope:	0.0894	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S08–50

Entellus™

File: WASH-T1S-R5W-S08_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	874.69	ft MSL
Depth:	3.59	ft
Discharge:	3250.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3291	
Flow Regime:	Subcritical	
Flow Area:	919.14	sq ft
Average Velocity:	3.54	ft/s
Maximum Velocity:	3.60	ft/s
Composite n:	0.05	
Hydraulic Radius:	1.99	ft
Wetted Perimeter:	462.86	ft
Wetted Top Width:	462.66	ft
Critical Slope:	0.052	ft/ft

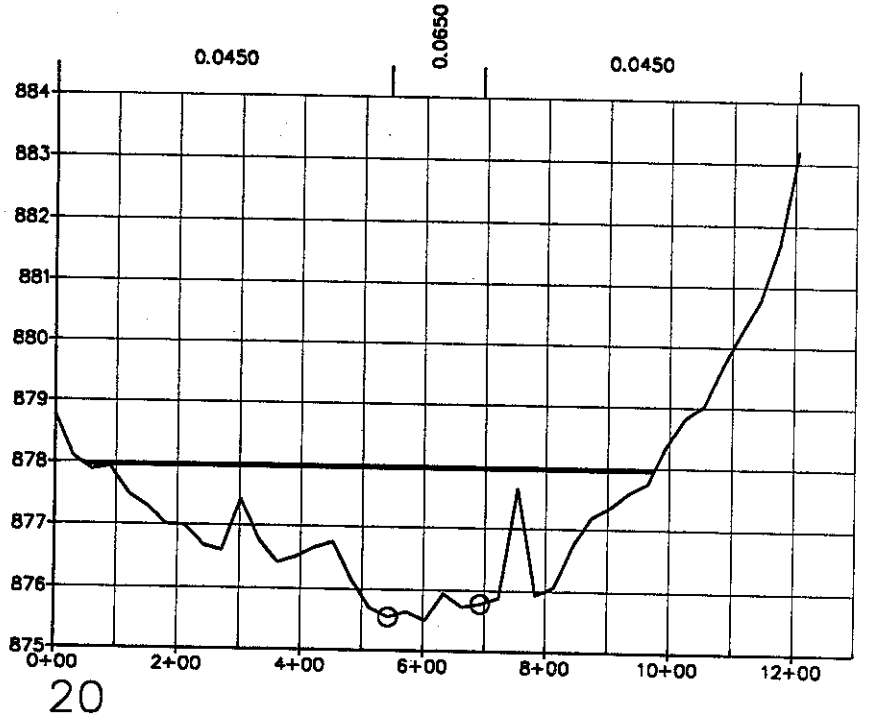
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–10

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

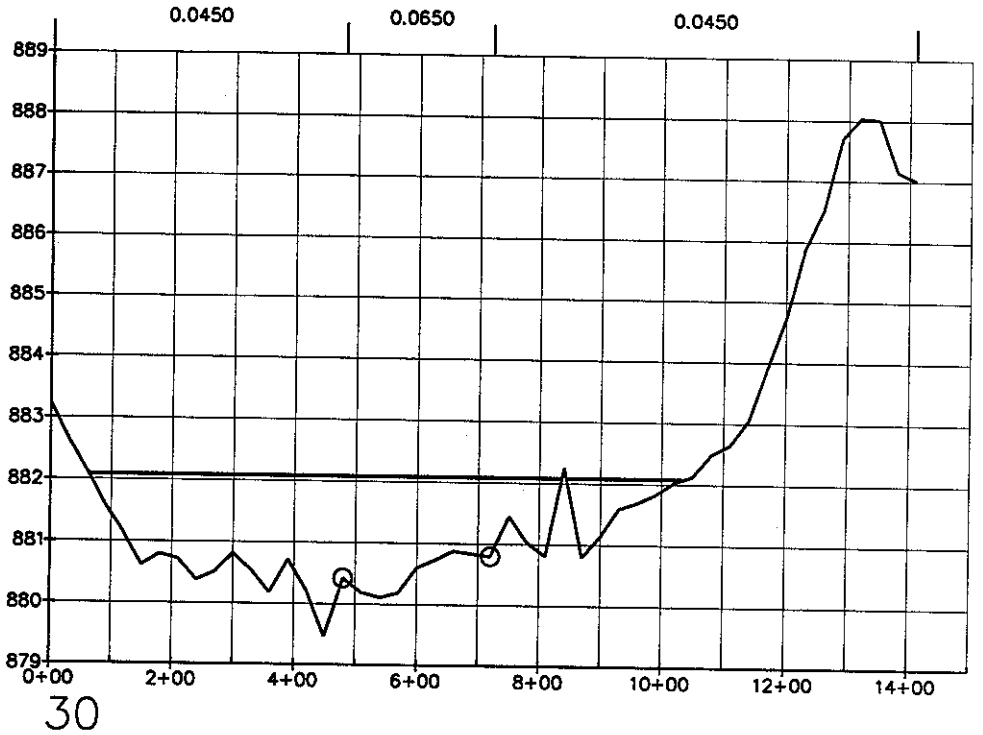
Cross-Section:	20	
Elevation:	877.95	ft MSL
Depth:	2.45	ft
Discharge:	3250.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3039	
Flow Regime:	Subcritical	
Flow Area:	1203.45	sq ft
Average Velocity:	2.72	ft/s
Maximum Velocity:	2.93	ft/s
Composite n:	0.0485	
Hydraulic Radius:	1.3	ft
Wetted Perimeter:	925.47	ft
Wetted Top Width:	925.31	ft
Critical Slope:	0.059	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–20

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

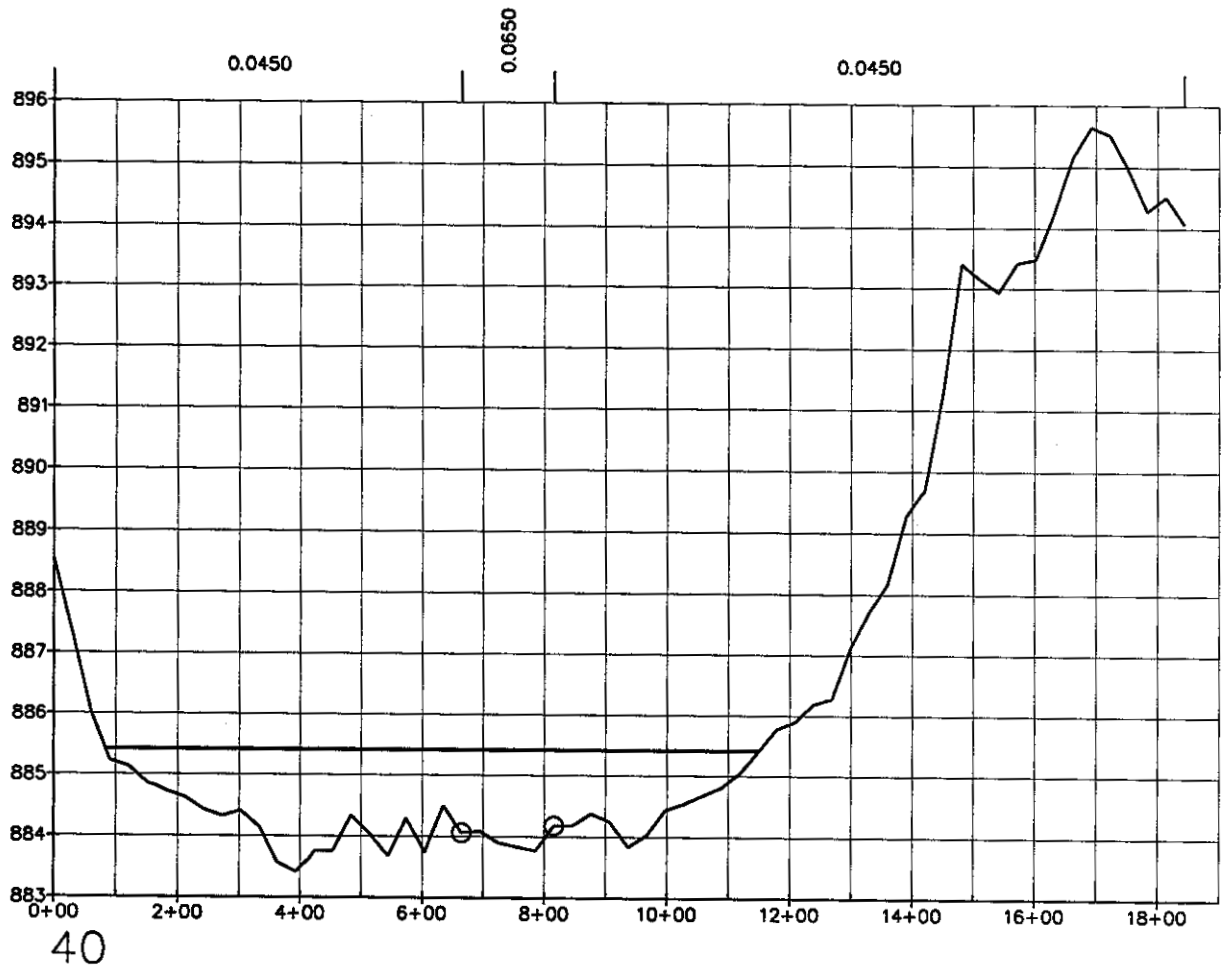
Cross-Section:	30	
Elevation:	882.09	ft MSL
Depth:	2.62	ft
Discharge:	3160.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2896	
Flow Regime:	Subcritical	
Flow Area:	1189.21	sq ft
Average Velocity:	2.66	ft/s
Maximum Velocity:	3.15	ft/s
Composite n:	0.0503	
Hydraulic Radius:	1.23	ft
Wetted Perimeter:	966.79	ft
Wetted Top Width:	966.65	ft
Critical Slope:	0.0728	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–30

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

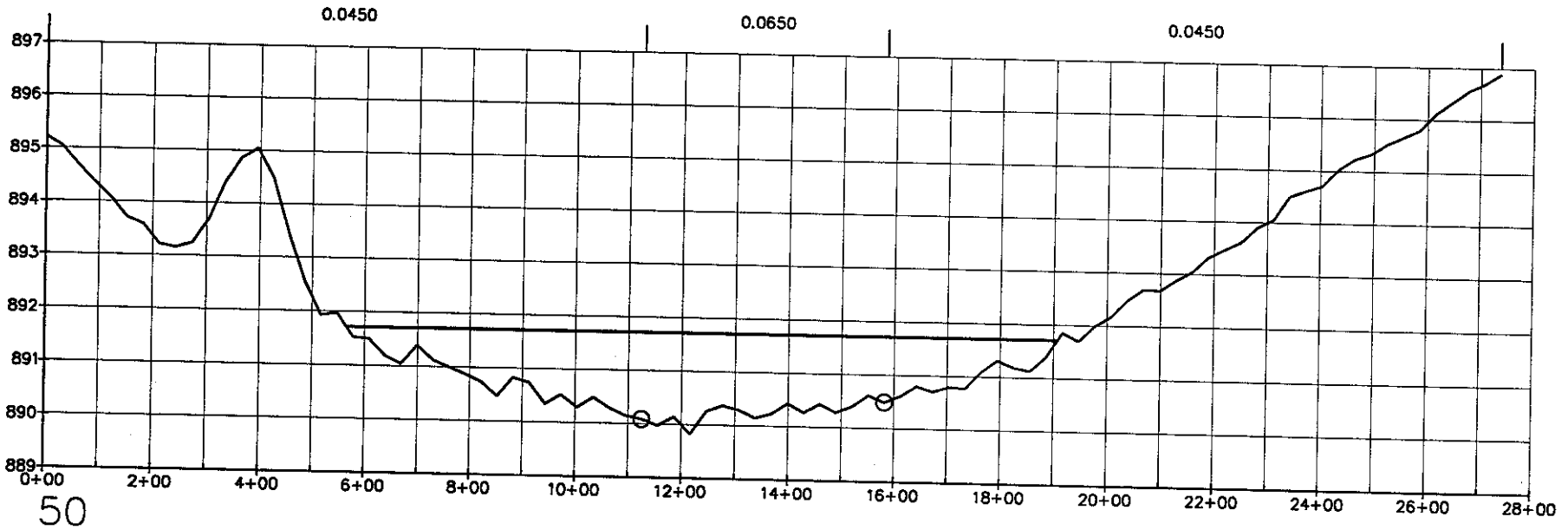
Cross-Section:	40	
Elevation:	885.42	ft MSL
Depth:	2.00	ft
Discharge:	3110.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3158	
Flow Regime:	Subcritical	
Flow Area:	1227.54	sq ft
Average Velocity:	2.55	ft/s
Maximum Velocity:	2.73	ft/s
Composite n:	0.048	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	1066.54	ft
Wetted Top Width:	1066.48	ft
Critical Slope:	0.0555	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–40

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

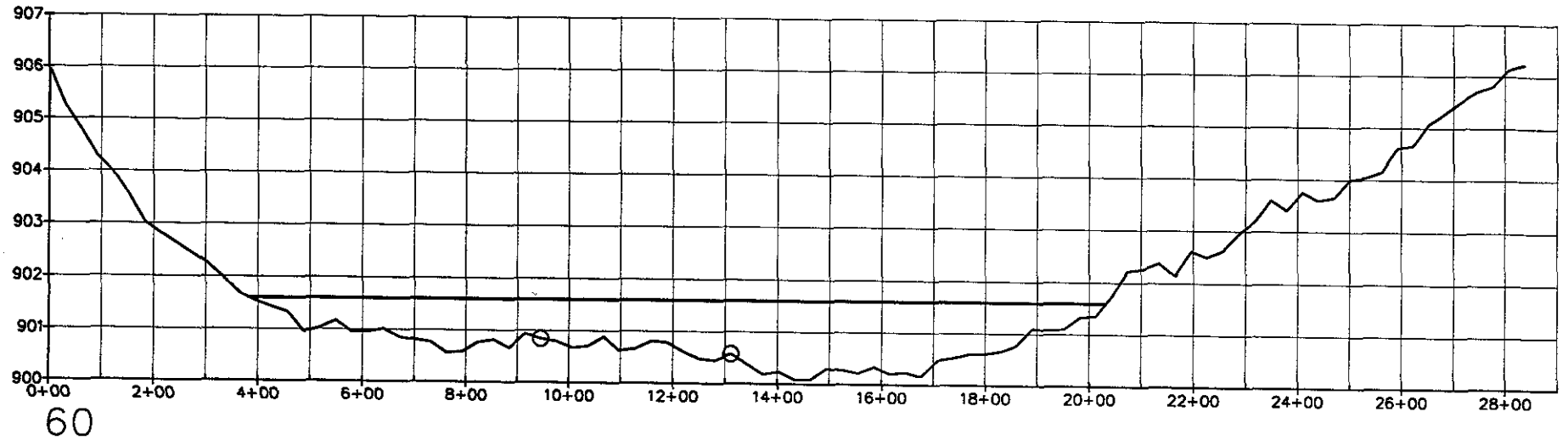
Cross-Section:	50	
Elevation:	891.71	ft MSL
Depth:	1.88	ft
Discharge:	3110.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2821	
Flow Regime:	Subcritical	
Flow Area:	1417.65	sq ft
Average Velocity:	2.20	ft/s
Maximum Velocity:	2.33	ft/s
Composite n:	0.0522	
Hydraulic Radius:	1.05	ft
Wetted Perimeter:	1344.41	ft
Wetted Top Width:	1344.37	ft
Critical Slope:	0.0691	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–50

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

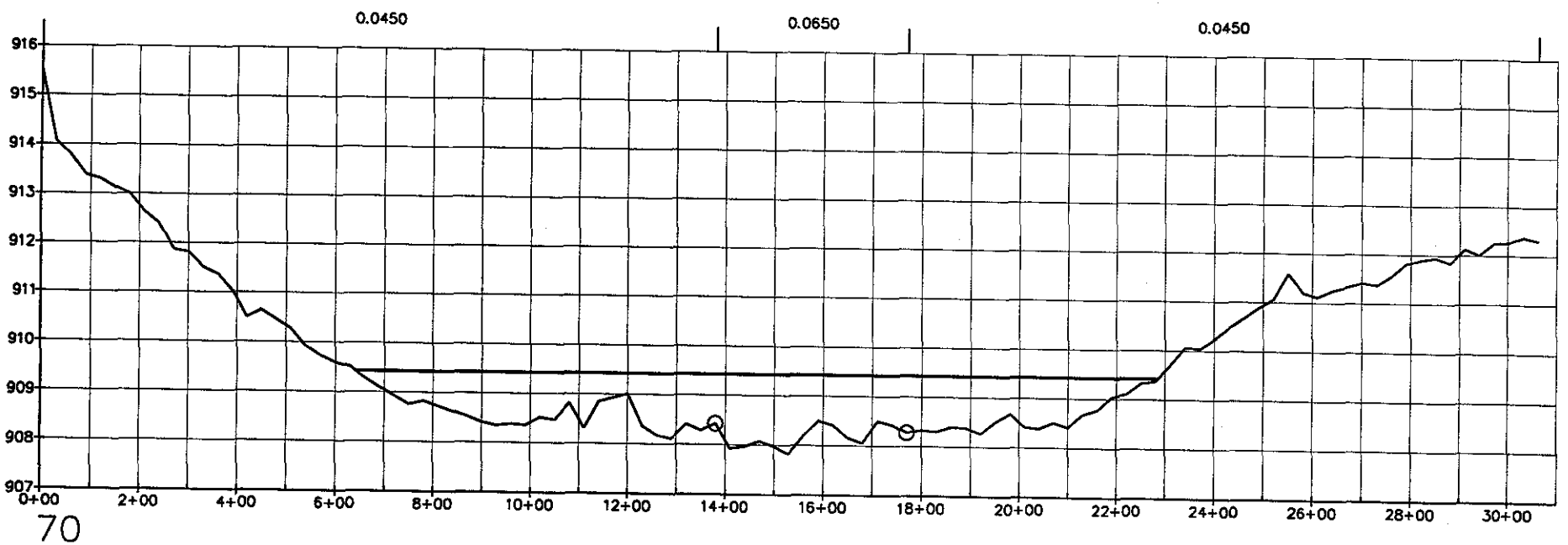
Cross-Section:	60	
Elevation:	901.60	ft MSL
Depth:	1.51	ft
Discharge:	3110.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.3077	
Flow Regime:	Subcritical	
Flow Area:	1451.34	sq ft
Average Velocity:	2.15	ft/s
Maximum Velocity:	2.54	ft/s
Composite n:	0.0497	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	1647.20	ft
Wetted Top Width:	1647.18	ft
Critical Slope:	0.064	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–60

Entellus™

File: WASH–T1S–R5W–S09_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	70	
Elevation:	909.43	ft MSL
Depth:	1.60	ft
Discharge:	3110.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.288	
Flow Regime:	Subcritical	
Flow Area:	1506.23	sq ft
Average Velocity:	2.08	ft/s
Maximum Velocity:	2.15	ft/s
Composite n:	0.0501	
Hydraulic Radius:	0.92	ft
Wetted Perimeter:	1644.62	ft
Wetted Top Width:	1644.57	ft
Critical Slope:	0.0653	ft/ft

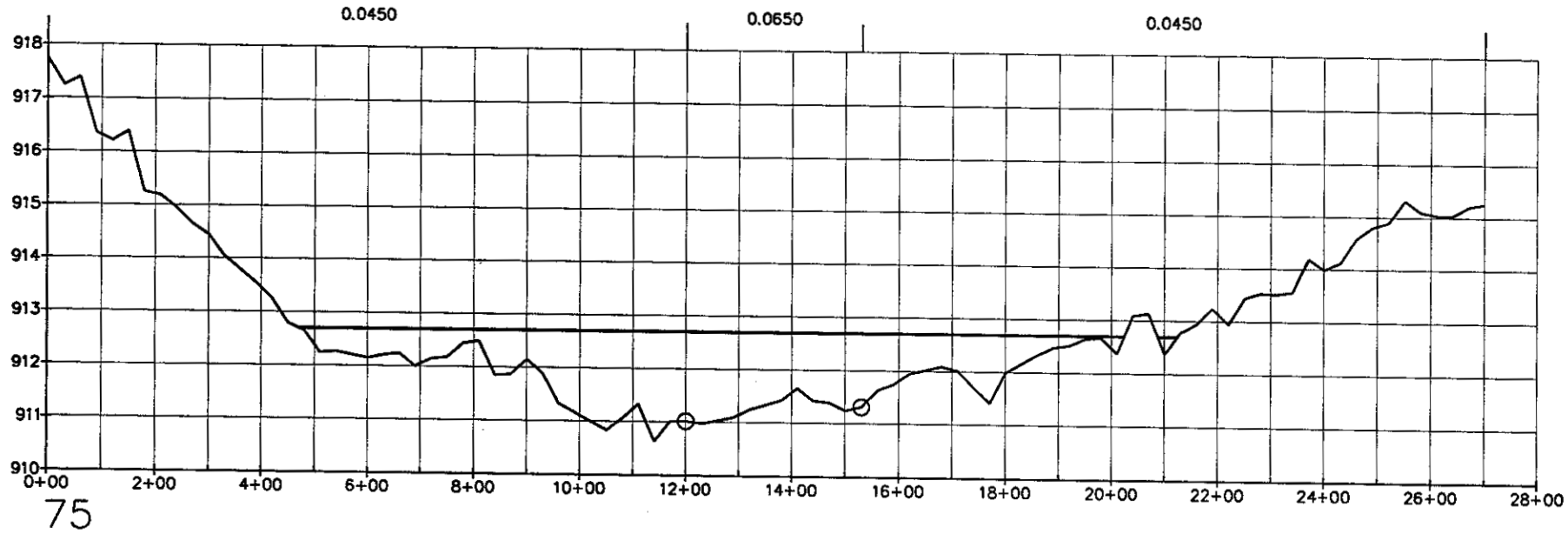
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09-70

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	75	
Elevation:	912.70	ft MSL
Depth:	2.07	ft
Discharge:	3110.00	cfs
Energy Grodient:	0.0055	ft/ft
Froude Number:	0.263	
Flow Regime:	Subcritical	
Flow Area:	1449.46	sq ft
Average Velocity:	2.14	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	1589.88	ft
Wetted Top Width:	1589.82	ft
Critical Slope:	0.0829	ft/ft

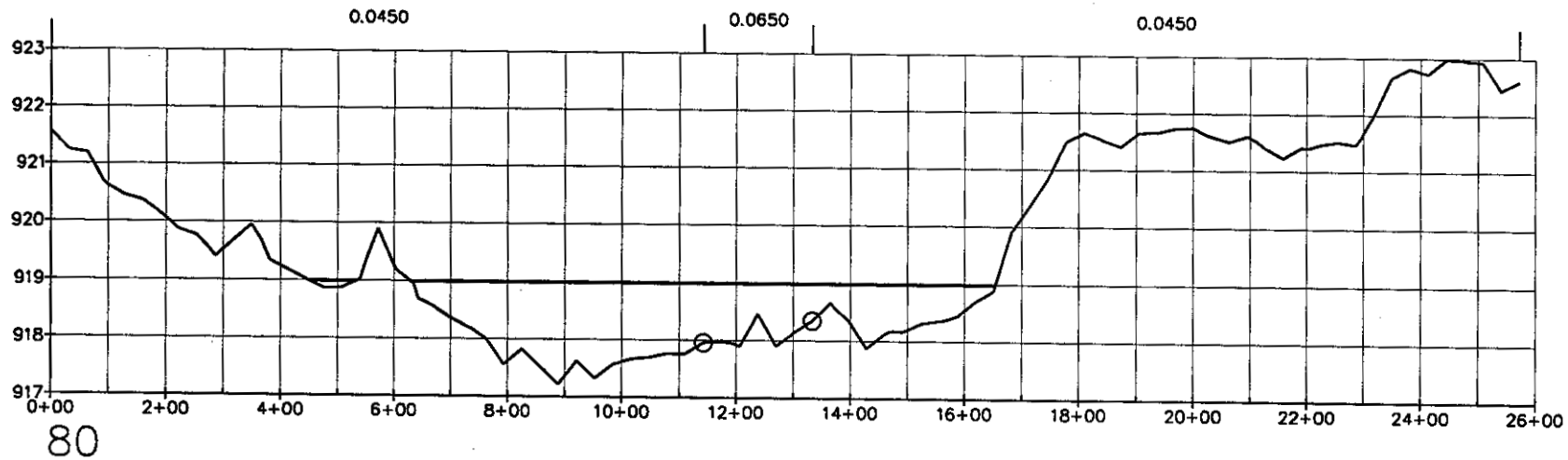
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–75

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

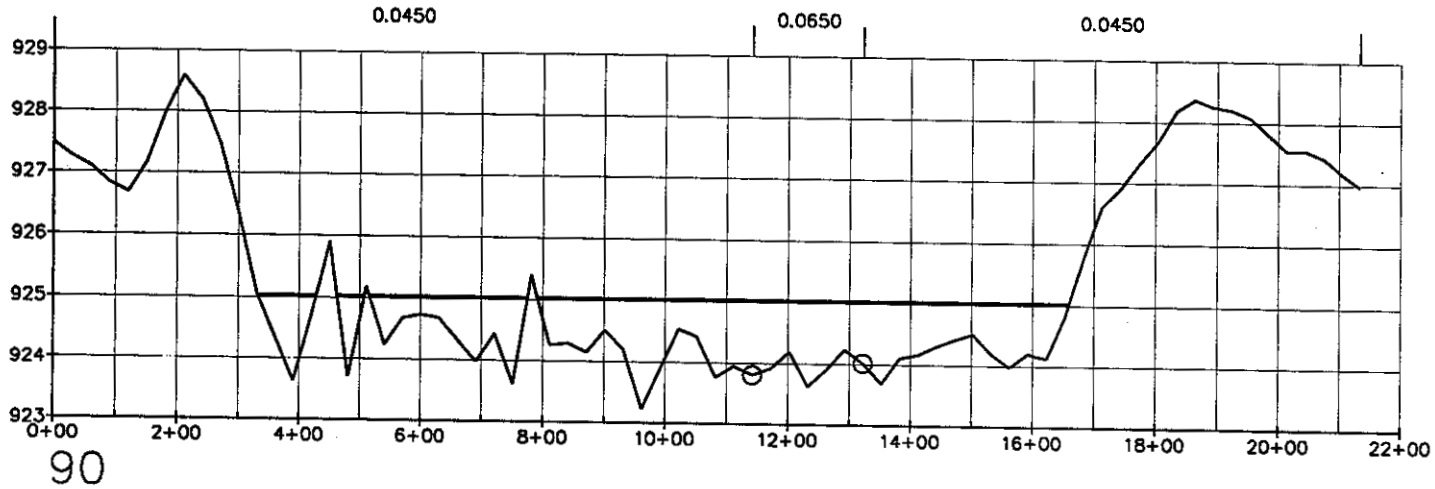
Cross-Section:	80	
Elevation:	918.99	ft MSL
Depth:	1.77	ft
Discharge:	2120.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2892	
Flow Regime:	Subcritical	
Flow Area:	971.37	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.47	ft/s
Composite n:	0.0487	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	1108.48	ft
Wetted Top Width:	1108.43	ft
Critical Slope:	0.0726	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–80

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

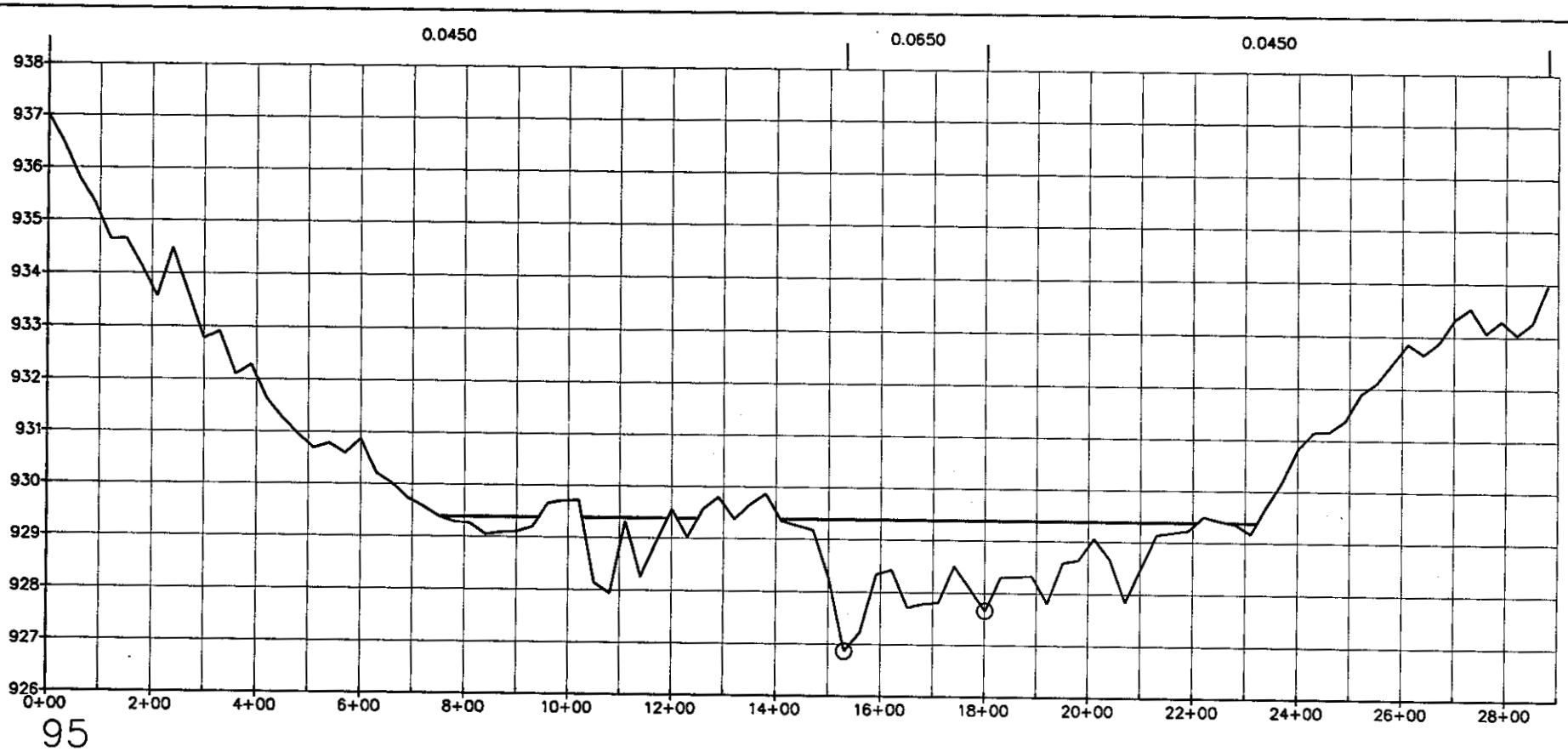
Cross-Section:	90	
Elevation:	925.03	ft MSL
Depth:	1.80	ft
Discharge:	2120.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2678	
Flow Regime:	Subcritical	
Flow Area:	1040.70	sq ft
Average Velocity:	2.02	ft/s
Maximum Velocity:	2.15	ft/s
Composite n:	0.048	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	1269.19	ft
Wetted Top Width:	1268.91	ft
Critical Slope:	0.0784	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–90

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	95	
Elevation:	929.38	ft MSL
Depth:	2.51	ft
Discharge:	1930.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2165	
Flow Regime:	Subcritical	

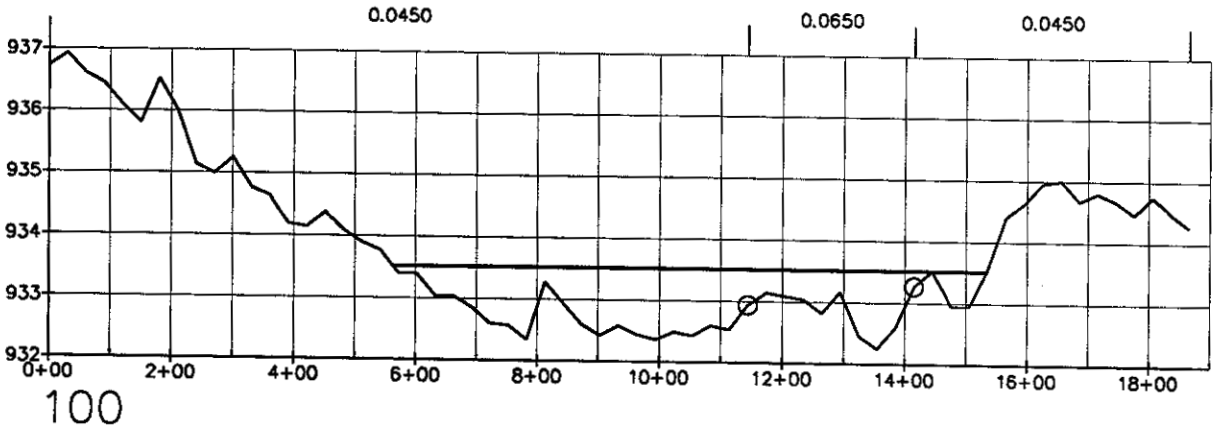
Flow Area:	991.07	sq ft
Average Velocity:	1.96	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0496	
Hydraulic Radius:	0.79	ft
Wetted Perimeter:	1249.63	ft
Wetted Top Width:	1249.38	ft
Critical Slope:	0.1223	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–95

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

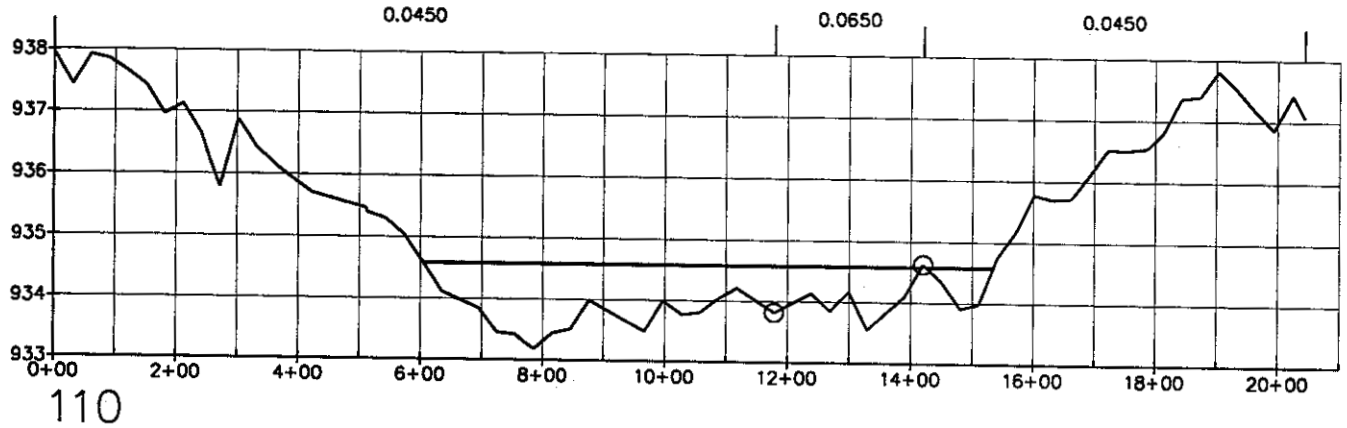
Cross-Section:	100	
Elevation:	933.52	ft MSL
Depth:	1.27	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2842	
Flow Regime:	Subcritical	
Flow Area:	672.61	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	2.09	ft/s
Composite n:	0.0509	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	970.32	ft
Wetted Top Width:	970.26	ft
Critical Slope:	0.0776	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–100

Entellus™

File: WASH–T1S–R5W–S09_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

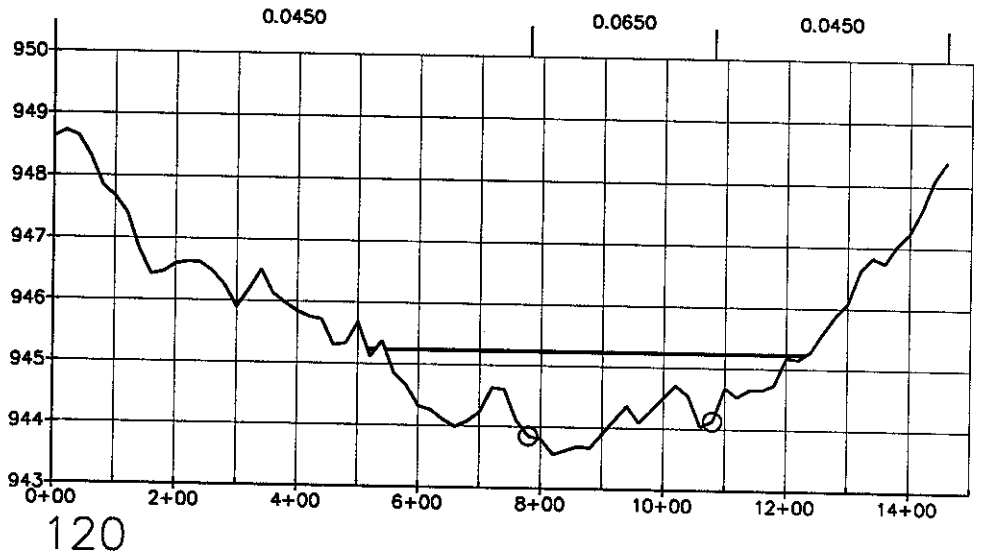
Cross-Section:	110	
Elevation:	934.58	ft MSL
Depth:	1.40	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2807	
Flow Regime:	Subcritical	
Flow Area:	646.61	sq ft
Average Velocity:	1.86	ft/s
Maximum Velocity:	2.11	ft/s
Composite n:	0.0505	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	921.82	ft
Wetted Top Width:	921.77	ft
Critical Slope:	0.0834	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–110

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

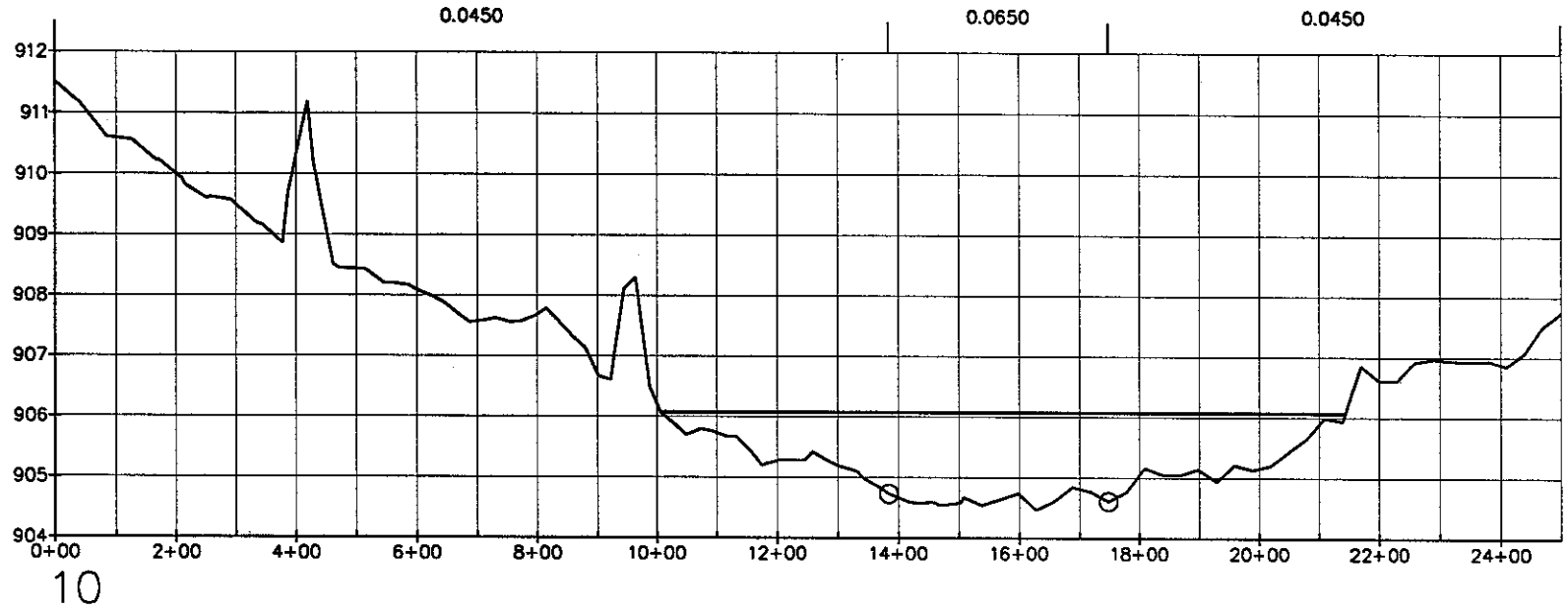
Cross-Section:	120	
Elevation:	945.24	ft MSL
Depth:	1.68	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2617	
Flow Regime:	Subcritical	
Flow Area:	634.54	sq ft
Average Velocity:	1.95	ft/s
Maximum Velocity:	2.19	ft/s
Composite n:	0.054	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	699.63	ft
Wetted Top Width:	699.57	ft
Critical Slope:	0.0808	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09–120

Entellus™

File: WASH-T1S-R5W-S09_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	906.08	ft MSL
Depth:	1.61	ft
Discharge:	2350.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.295	
Flow Regime:	Subcritical	
Flow Area:	1108.13	sq ft
Average Velocity:	2.11	ft/s
Maximum Velocity:	2.18	ft/s
Composite n:	0.0518	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	1137.61	ft
Wetted Top Width:	1137.58	ft
Critical Slope:	0.0647	ft/ft

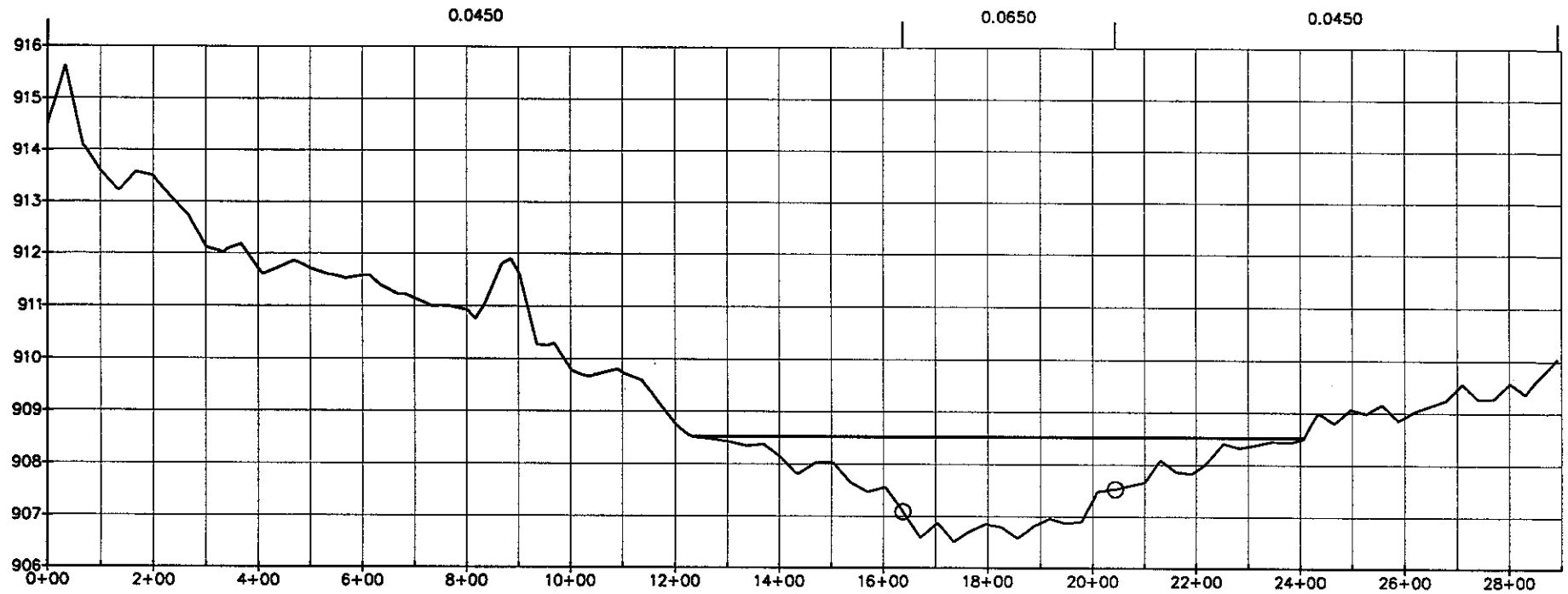
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–10

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



20

Normal Depth Results

Cross-Section:	20	
Elevation:	908.52	ft MSL
Depth:	2.01	ft
Discharge:	2350.00	cfs
Energy Gradient:	0.0055	ft/ft
Froude Number:	0.2825	
Flow Regime:	Subcritical	
Flow Area:	1033.12	sq ft
Average Velocity:	2.26	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.045	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	1171.69	ft
Wetted Top Width:	1171.66	ft
Critical Slope:	0.0699	ft/ft

Note: X-section not used for delineation

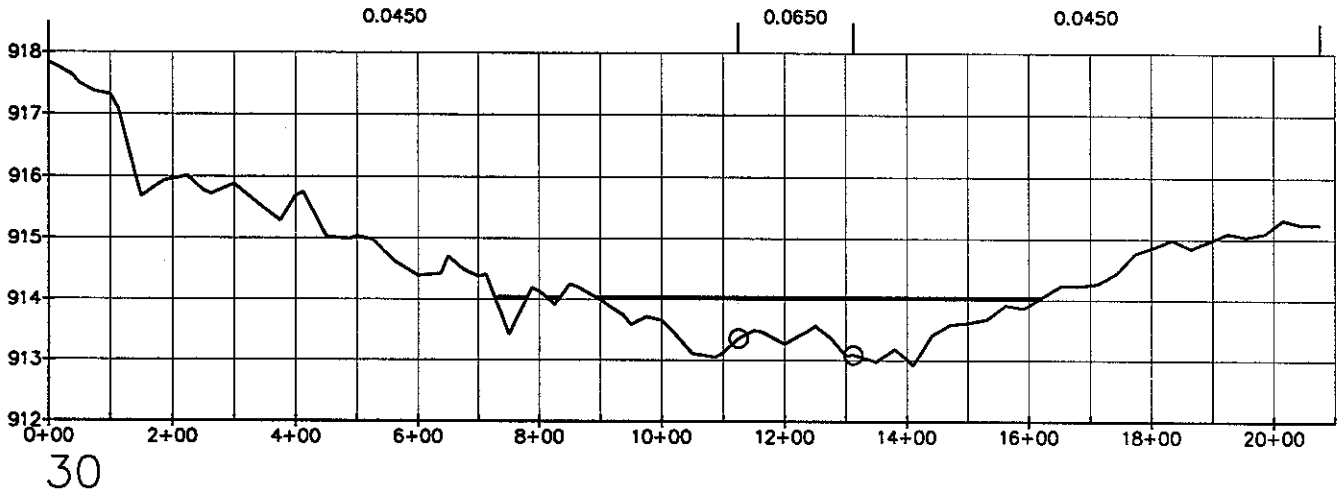
ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–20

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	30	
Elevation:	914.03	ft MSL
Depth:	1.11	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2844	
Flow Regime:	Subcritical	
Flow Area:	446.49	sq ft
Average Velocity:	1.68	ft/s
Maximum Velocity:	1.88	ft/s
Composite n:	0.05	
Hydraulic Radius:	0.56	ft
Wetted Perimeter:	800.02	ft
Wetted Top Width:	799.98	ft
Critical Slope:	0.0879	ft/ft

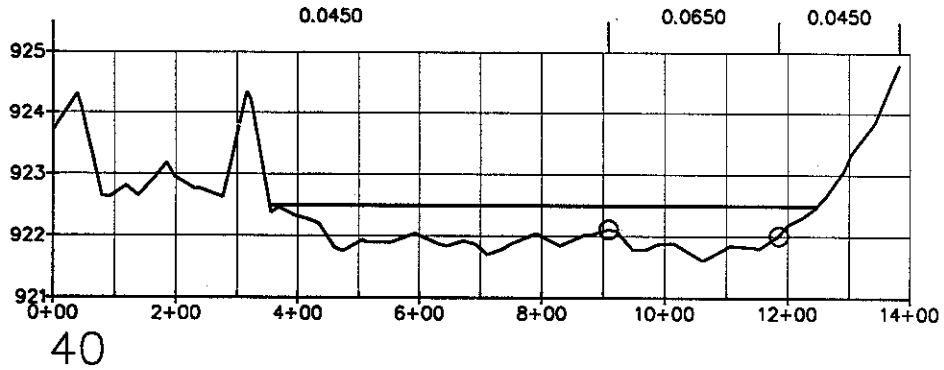
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–30

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

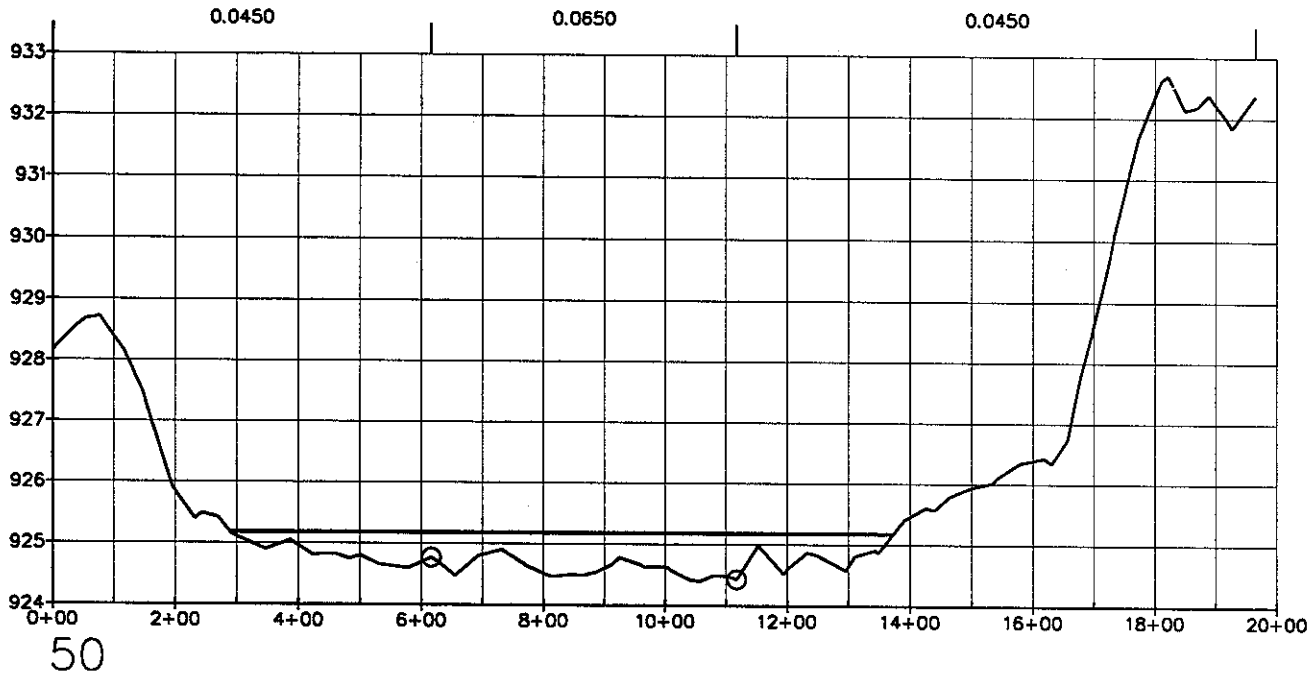
Cross-Section:	40	
Elevation:	922.49	ft MSL
Depth:	0.88	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2983	
Flow Regime:	Subcritical	
Flow Area:	479.09	sq ft
Average Velocity:	1.59	ft/s
Maximum Velocity:	1.73	ft/s
Composite n:	0.0516	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	893.60	ft
Wetted Top Width:	893.58	ft
Critical Slope:	0.0778	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–40

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

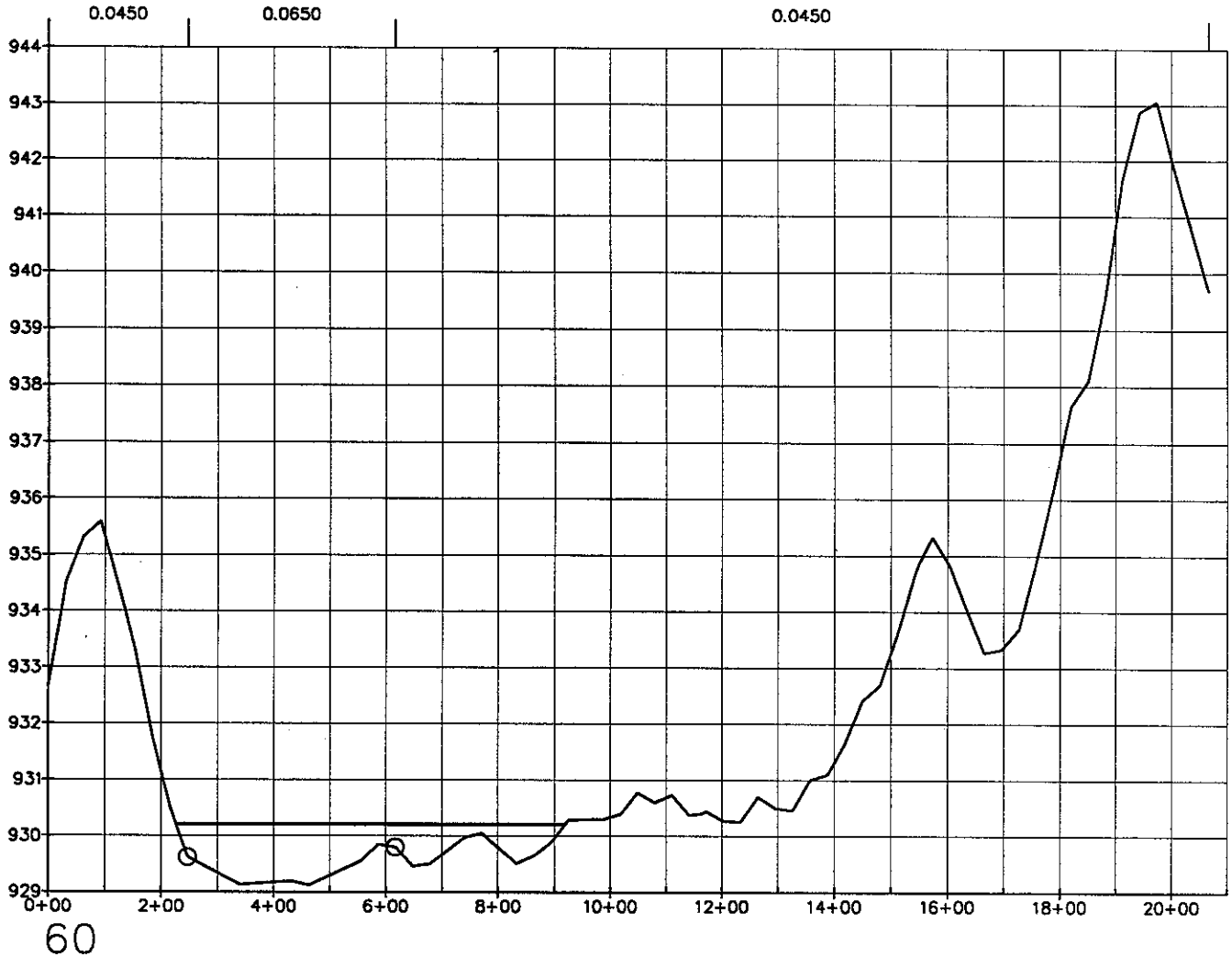
Cross-Section:	50	
Elevation:	925.18	ft MSL
Depth:	0.78	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.3023	
Flow Regime:	Subcritical	
Flow Area:	502.57	sq ft
Average Velocity:	1.50	ft/s
Maximum Velocity:	1.75	ft/s
Composite n:	0.0534	
Hydraulic Radius:	0.46	ft
Wetted Perimeter:	1083.35	ft
Wetted Top Width:	1083.33	ft
Critical Slope:	0.0896	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–50

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

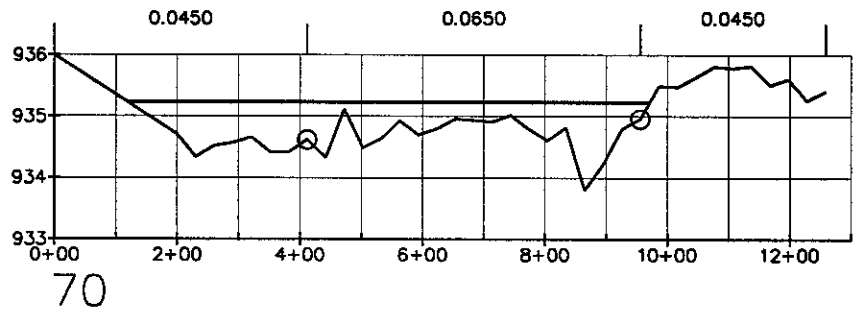
Cross-Section:	60	
Elevation:	930.21	ft MSL
Depth:	1.09	ft
Discharge:	760.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2788	
Flow Regime:	Subcritical	
Flow Area:	460.37	sq ft
Average Velocity:	1.66	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.0561	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	692.68	ft
Wetted Top Width:	692.66	ft
Critical Slope:	0.0857	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–60

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

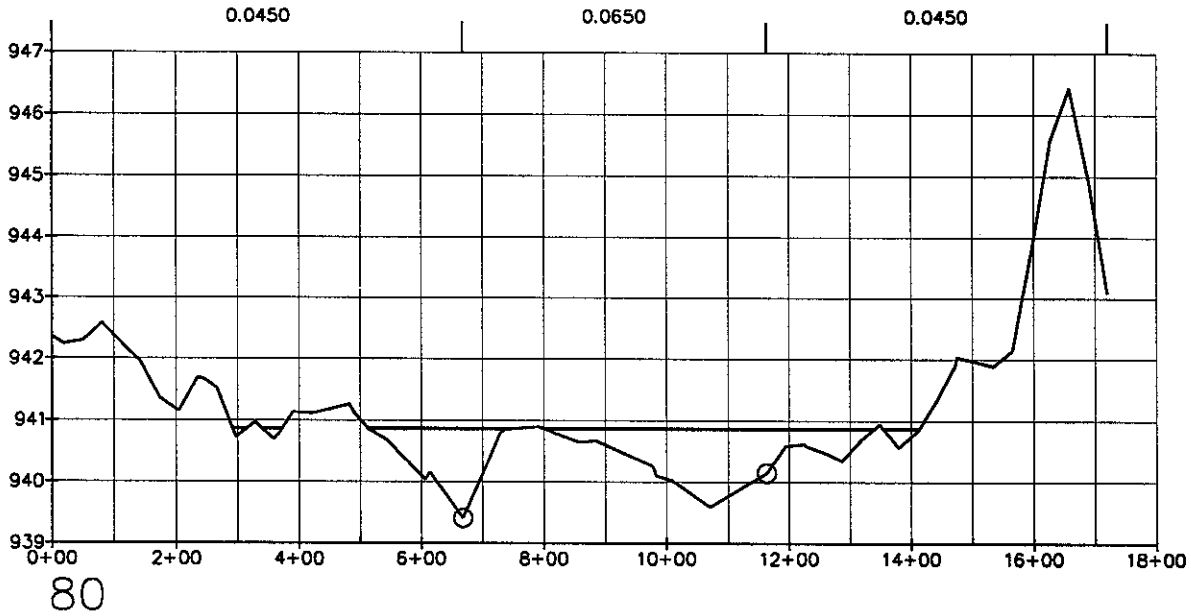
Cross-Section:	70	
Elevation:	935.23	ft MSL
Depth:	1.43	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2165	
Flow Regime:	Subcritical	
Flow Area:	462.75	sq ft
Average Velocity:	1.48	ft/s
Maximum Velocity:	1.91	ft/s
Composite n:	0.0581	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	852.05	ft
Wetted Top Width:	851.99	ft
Critical Slope:	0.1585	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–70

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

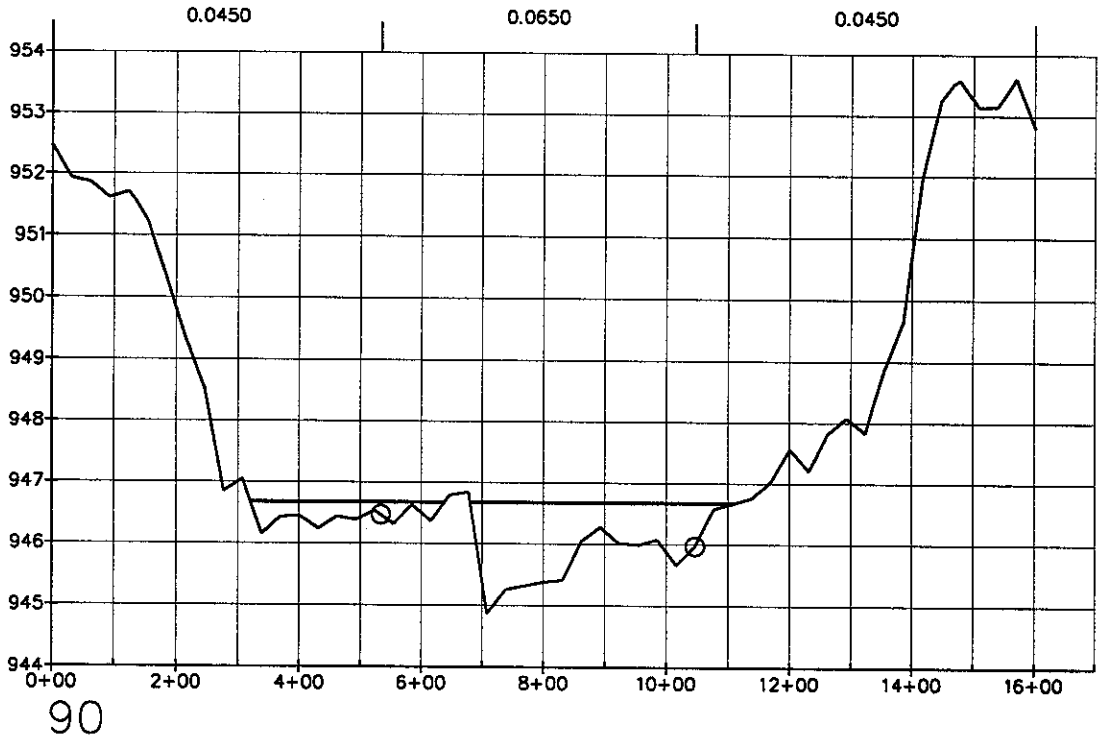
Cross-Section:	80	
Elevation:	940.87	ft MSL
Depth:	1.46	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2203	
Flow Regime:	Subcritical	
Flow Area:	450.75	sq ft
Average Velocity:	1.50	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.0532	
Hydraulic Radius:	0.51	ft
Wetted Perimeter:	887.58	ft
Wetted Top Width:	887.53	ft
Critical Slope:	0.1479	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–80

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

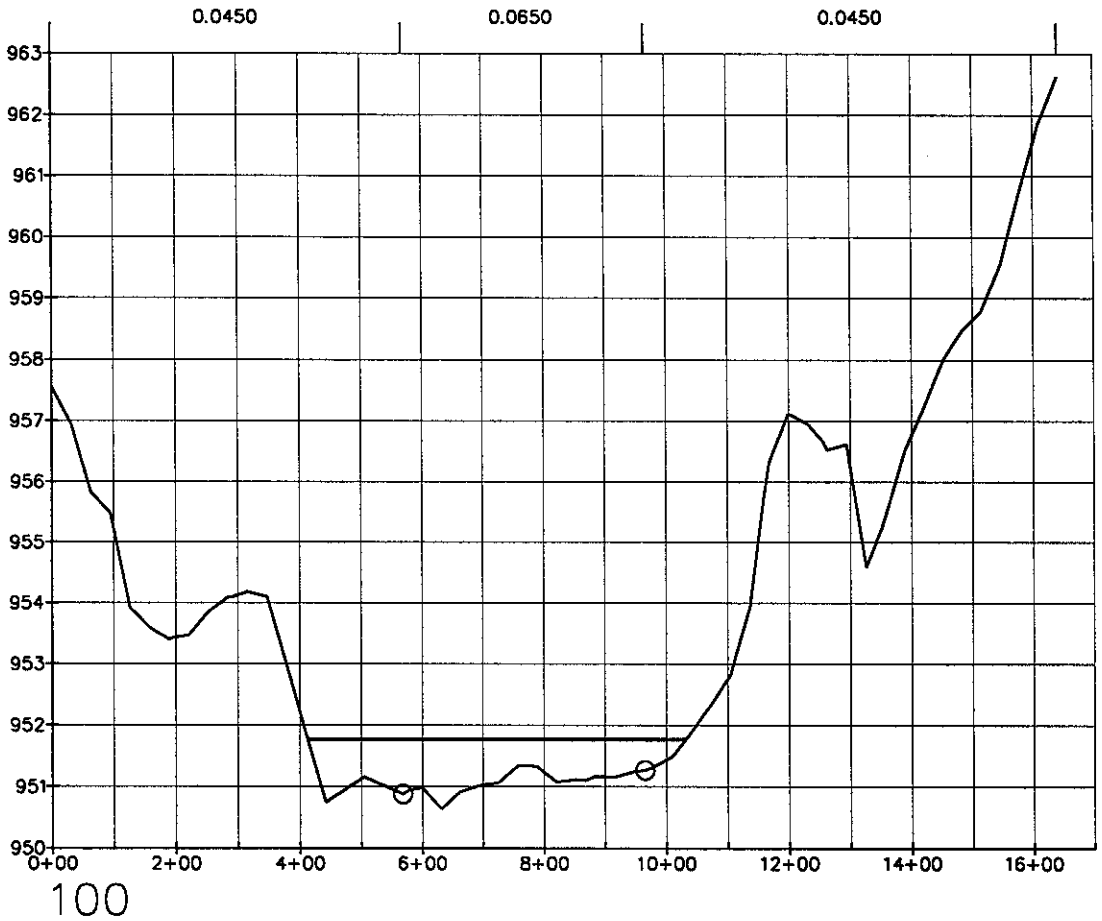
Cross-Section:	90	
Elevation:	946.67	ft MSL
Depth:	1.80	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2007	
Flow Regime:	Subcritical	
Flow Area:	444.65	sq ft
Average Velocity:	1.52	ft/s
Maximum Velocity:	1.60	ft/s
Composite n:	0.058	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	747.26	ft
Wetted Top Width:	747.16	ft
Critical Slope:	0.1758	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–90

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

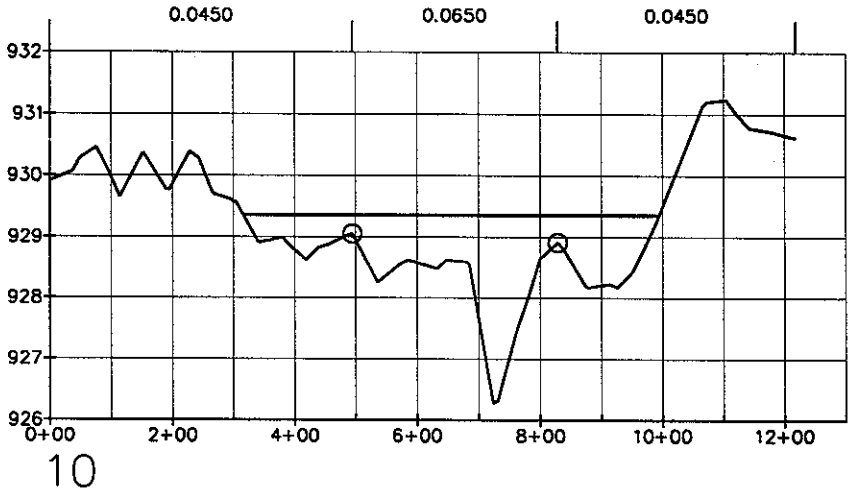
Cross-Section:	100	
Elevation:	951.77	ft MSL
Depth:	1.13	ft
Discharge:	680.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2783	
Flow Regime:	Subcritical	
Flow Area:	405.52	sq ft
Average Velocity:	1.65	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0582	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	618.50	ft
Wetted Top Width:	618.47	ft
Critical Slope:	0.0973	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33W–100

Entellus™

File: WASH-T1N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results		
Cross-Section:	10	
Elevation:	929.36	ft MSL
Depth:	3.08	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.1987	
Flow Regime:	Subcritical	
Flow Area:	616.84	sq ft
Average Velocity:	1.97	ft/s
Maximum Velocity:	2.28	ft/s
Composite n:	0.0552	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	678.74	ft
Wetted Top Width:	678.60	ft
Critical Slope:	0.1549	ft/ft

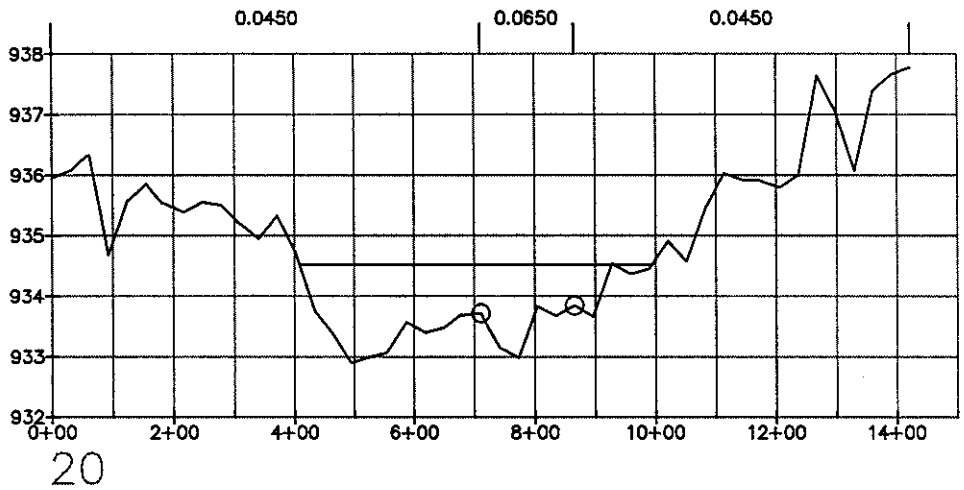
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33N–10

Entellus™

File: WASH-T1N-R5W-S33N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

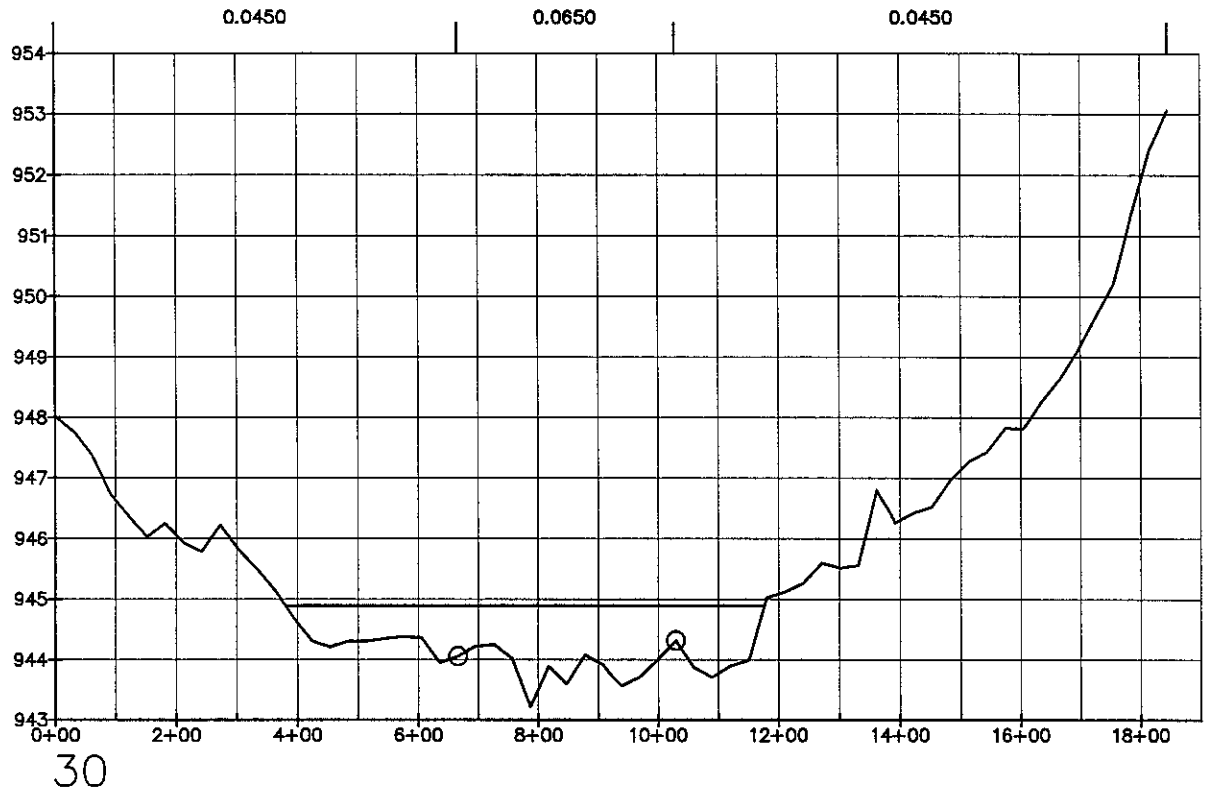
Cross-Section:	20	
Elevation:	934.52	ft MSL
Depth:	1.62	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3183	
Flow Regime:	Subcritical	
Flow Area:	531.23	sq ft
Average Velocity:	2.29	ft/s
Maximum Velocity:	2.67	ft/s
Composite n:	0.0507	
Hydraulic Radius:	0.92	ft
Wetted Perimeter:	580.02	ft
Wetted Top Width:	579.96	ft
Critical Slope:	0.0677	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33N–20

Entellus™

File: WASH-T1N-R5W-S33N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

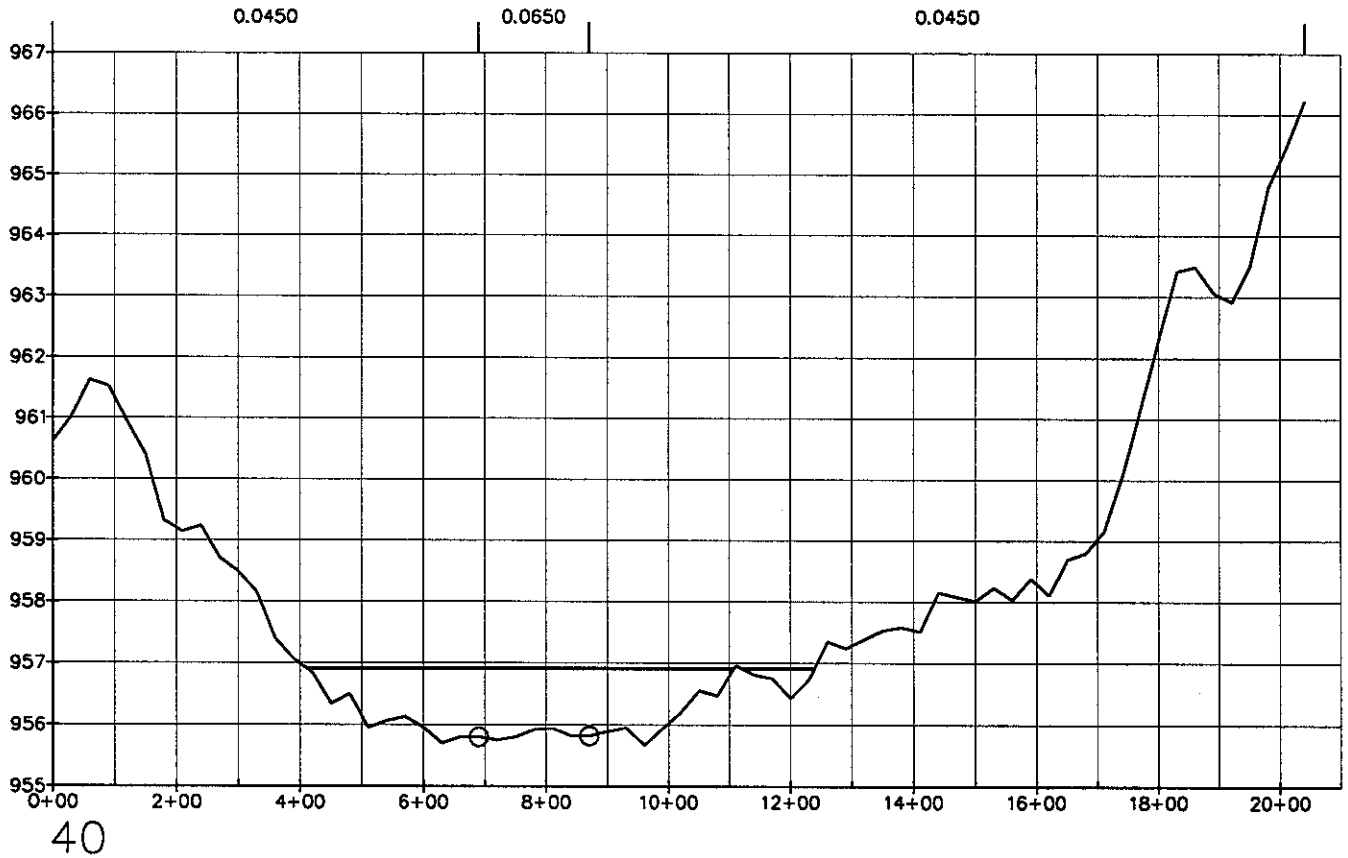
Cross-Section:	30	
Elevation:	944.89	ft MSL
Depth:	1.67	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2508	
Flow Regime:	Subcritical	
Flow Area:	663.03	sq ft
Average Velocity:	1.87	ft/s
Maximum Velocity:	2.33	ft/s
Composite n:	0.0545	
Hydraulic Radius:	0.83	ft
Wetted Perimeter:	796.47	ft
Wetted Top Width:	796.41	ft
Critical Slope:	0.0922	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33N–30

Entellus™

File: WASH-T1N-R5W-S33N_X-SECTION-R14.dwg Date: 5/28/03



Normal Depth Results

Cross-Section:	40	
Elevation:	956.91	ft MSL
Depth:	1.24	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3066	
Flow Regime:	Subcritical	
Flow Area:	629.53	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.17	ft/s
Composite n:	0.0497	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	816.18	ft
Wetted Top Width:	816.16	ft
Critical Slope:	0.0629	ft/ft

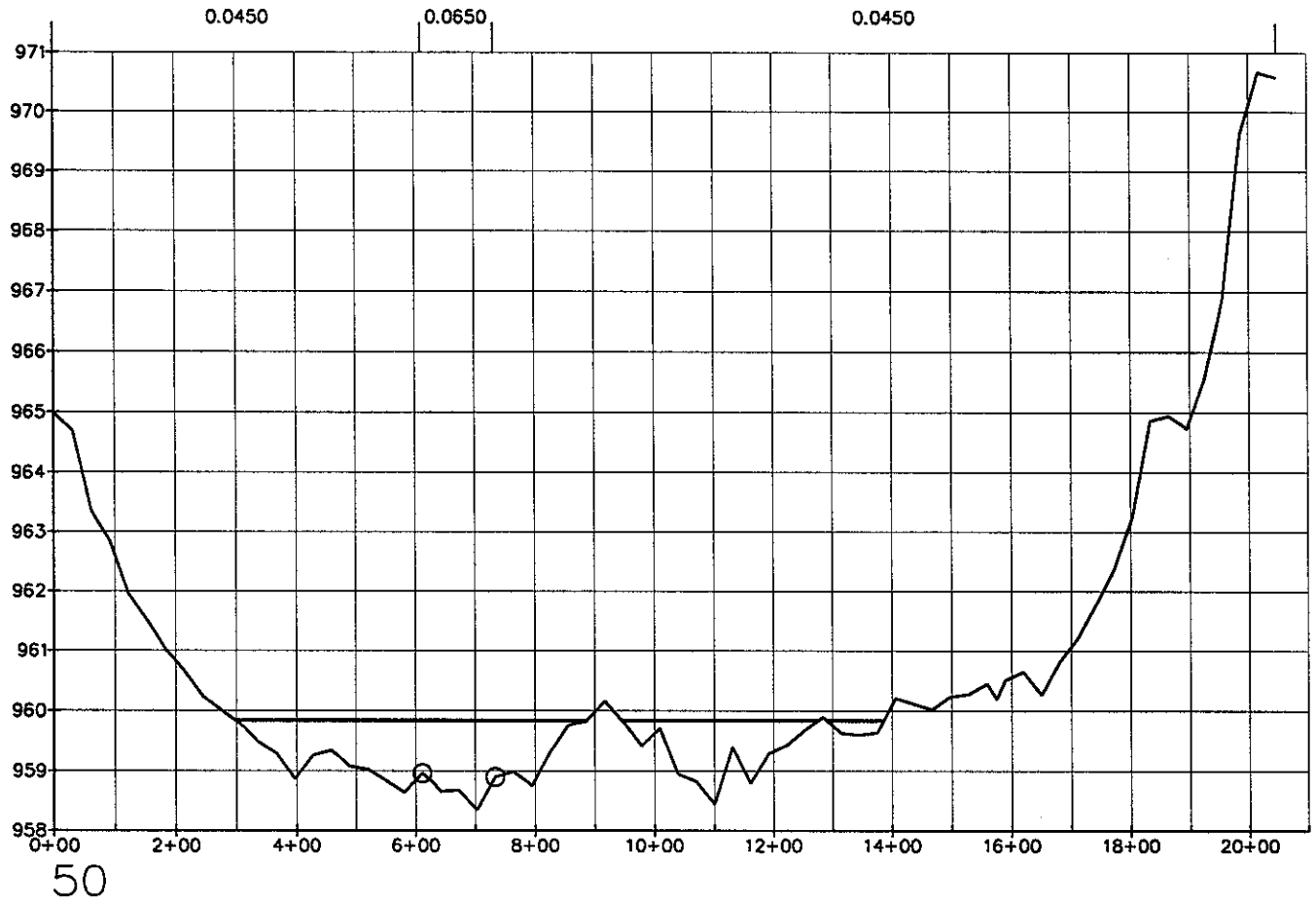
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33N–40

Entellus™

File: WASH-T1N-R5W-S33N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

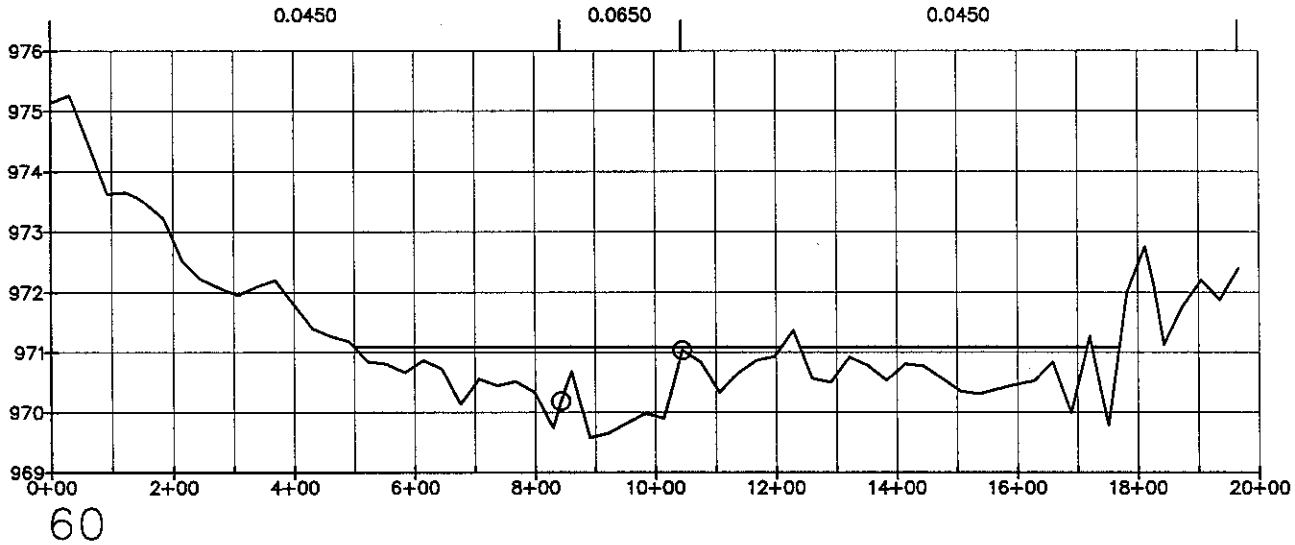
Cross-Section:	50	
Elevation:	959.84	ft MSL
Depth:	1.49	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2652	
Flow Regime:	Subcritical	
Flow Area:	665.32	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	1.99	ft/s
Composite n:	0.0476	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	1010.18	ft
Wetted Top Width:	1010.10	ft
Critical Slope:	0.0852	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33N–50

Entellus™

File: WASH-T1N-R5W-S33N_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

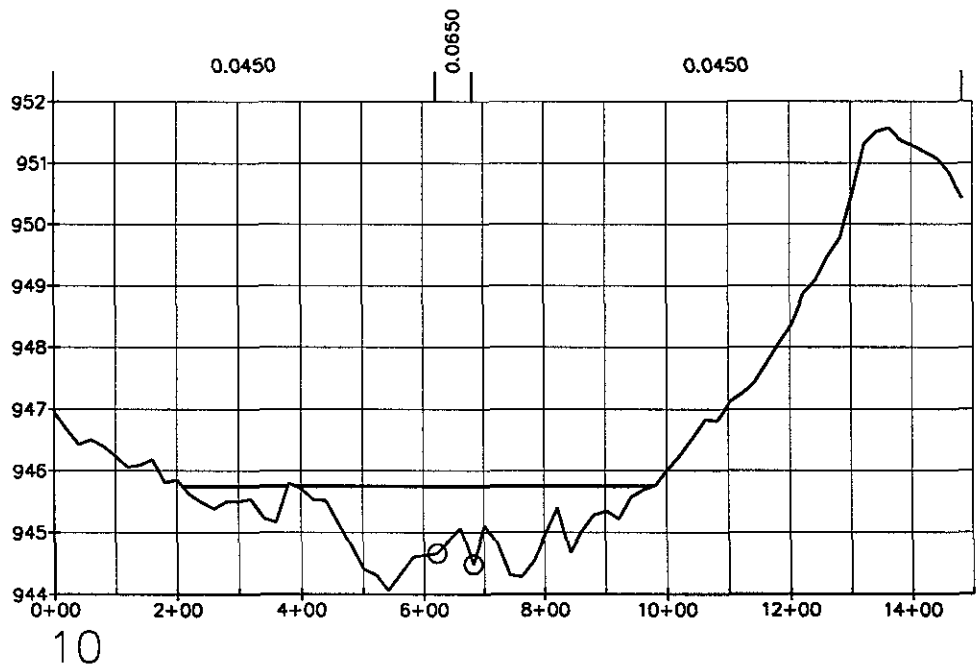
Cross-Section:	60	
Elevation:	971.09	ft MSL
Depth:	1.51	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2396	
Flow Regime:	Subcritical	
Flow Area:	730.22	sq ft
Average Velocity:	1.66	ft/s
Maximum Velocity:	1.84	ft/s
Composite n:	0.0485	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	1230.72	ft
Wetted Top Width:	1230.51	ft
Critical Slope:	0.1035	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33N–60

Entellus™

File: WASH-T1N-R5W-S33N_X-SECTION-R14.dwg Date: 5/28/03



Normal Depth Results		
Cross-Section:	10	
Elevation:	945.75	ft MSL
Depth:	1.69	ft
Discharge:	1070.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.269	
Flow Regime:	Subcritical	
Flow Area:	539.34	sq ft
Average Velocity:	2.00	ft/s
Maximum Velocity:	2.11	ft/s
Composite n:	0.0467	
Hydraulic Radius:	0.71	ft
Wetted Perimeter:	755.33	ft
Wetted Top Width:	755.23	ft
Critical Slope:	0.0838	ft/ft

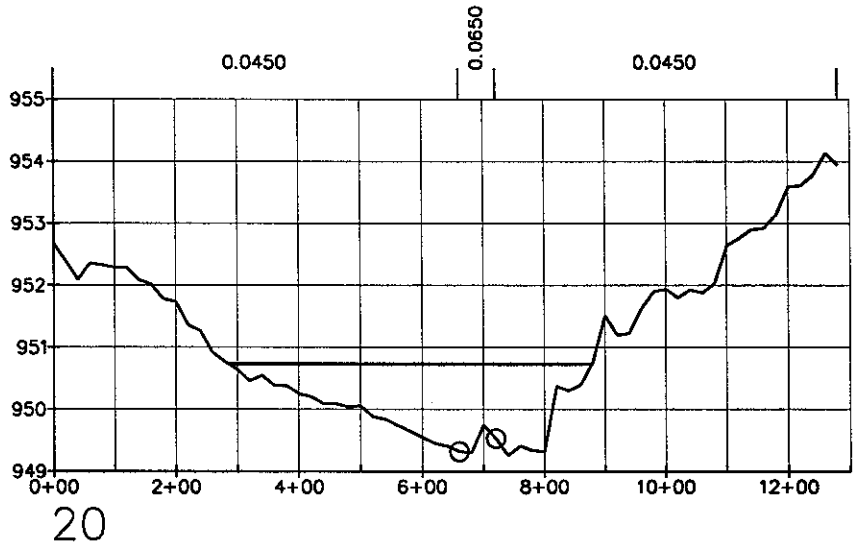
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–10

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

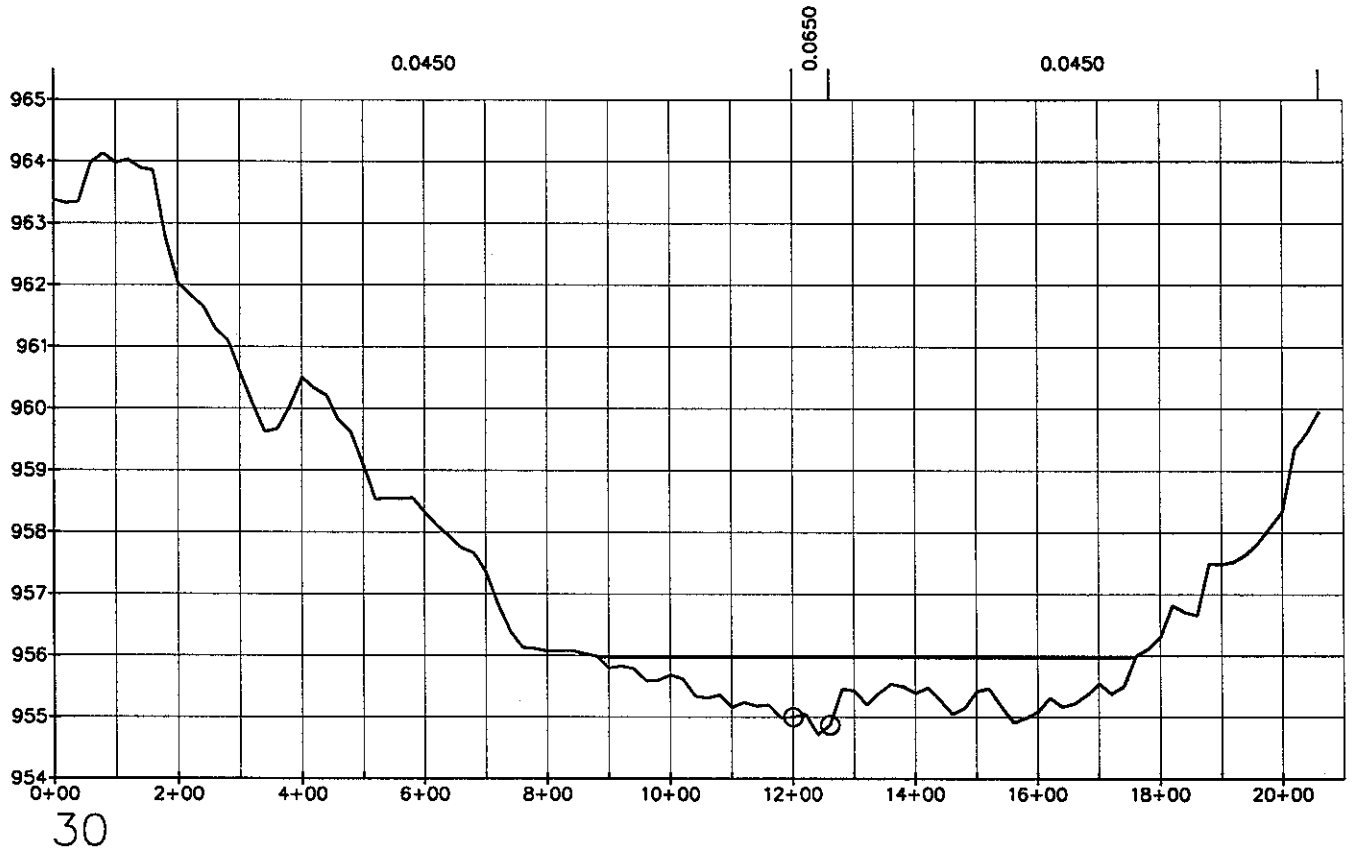
Cross-Section:	20	
Elevation:	950.73	ft MSL
Depth:	1.47	ft
Discharge:	1070.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.3207	
Flow Regime:	Subcritical	
Flow Area:	484.78	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.46	ft/s
Composite n:	0.0472	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	592.39	ft
Wetted Top Width:	592.35	ft
Critical Slope:	0.0621	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–20

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

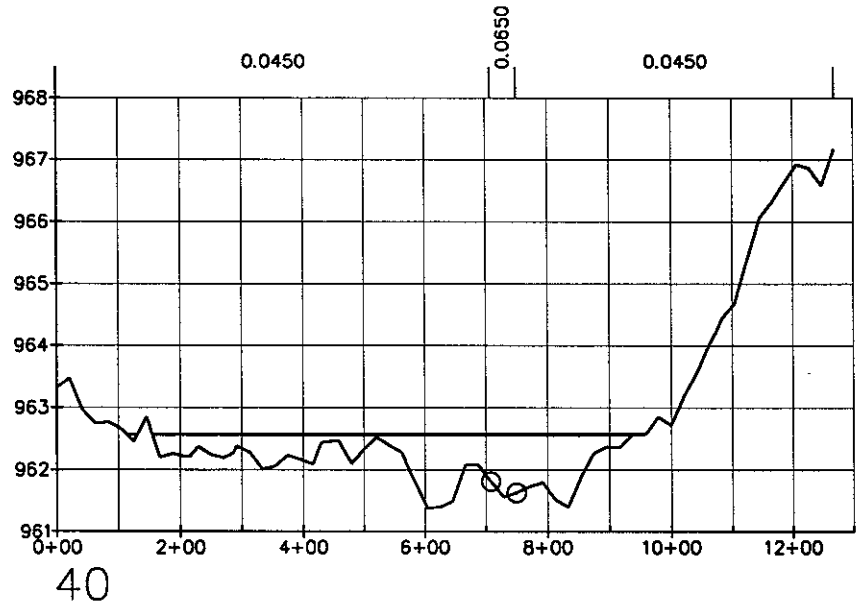
Cross-Section:	30	
Elevation:	955.98	ft MSL
Depth:	1.26	ft
Discharge:	1070.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.295	
Flow Regime:	Subcritical	
Flow Area:	569.27	sq ft
Average Velocity:	1.88	ft/s
Maximum Velocity:	1.98	ft/s
Composite n:	0.0465	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	878.81	ft
Wetted Top Width:	878.77	ft
Critical Slope:	0.0705	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–30

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

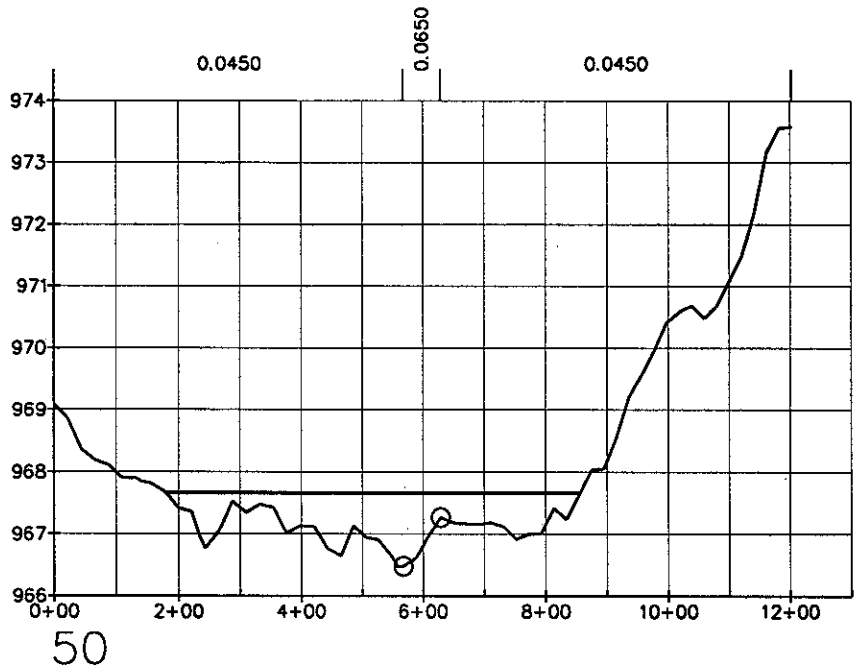
Cross-Section:	40	
Elevation:	962.57	ft MSL
Depth:	1.19	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.2602	
Flow Regime:	Subcritical	
Flow Area:	398.18	sq ft
Average Velocity:	1.59	ft/s
Maximum Velocity:	1.82	ft/s
Composite n:	0.0461	
Hydraulic Radius:	0.49	ft
Wetted Perimeter:	812.13	ft
Wetted Top Width:	812.07	ft
Critical Slope:	0.0945	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–40

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

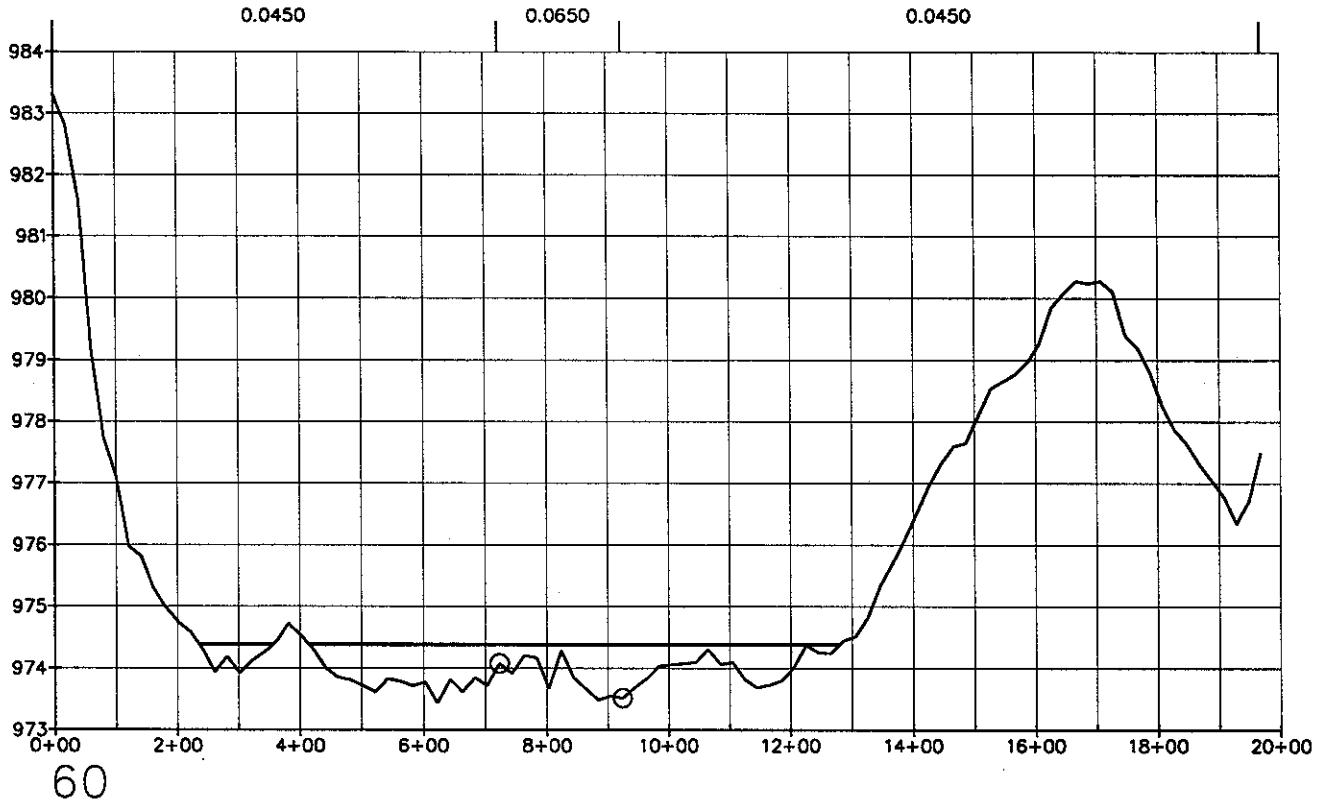
Cross-Section:	50	
Elevation:	967.67	ft MSL
Depth:	1.20	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.269	
Flow Regime:	Subcritical	
Flow Area:	383.49	sq ft
Average Velocity:	1.70	ft/s
Maximum Velocity:	1.77	ft/s
Composite n:	0.0469	
Hydraulic Radius:	0.57	ft
Wetted Perimeter:	676.63	ft
Wetted Top Width:	676.58	ft
Critical Slope:	0.0815	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–50

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

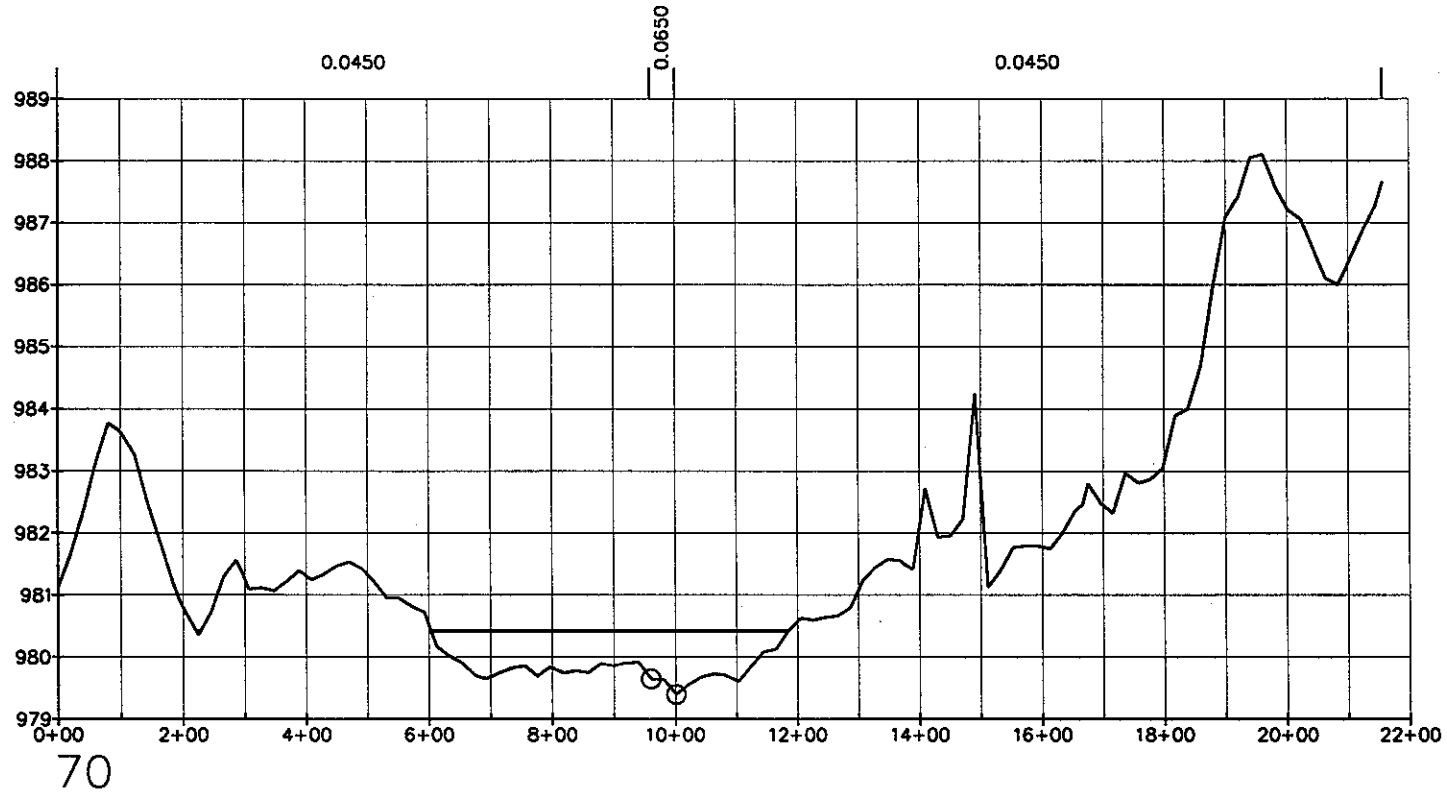
Cross-Section:	60	
Elevation:	974.39	ft MSL
Depth:	0.95	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.2556	
Flow Regime:	Subcritical	
Flow Area:	453.61	sq ft
Average Velocity:	1.44	ft/s
Maximum Velocity:	1.62	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.46	ft
Wetted Perimeter:	985.05	ft
Wetted Top Width:	984.99	ft
Critical Slope:	0.0941	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–60

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

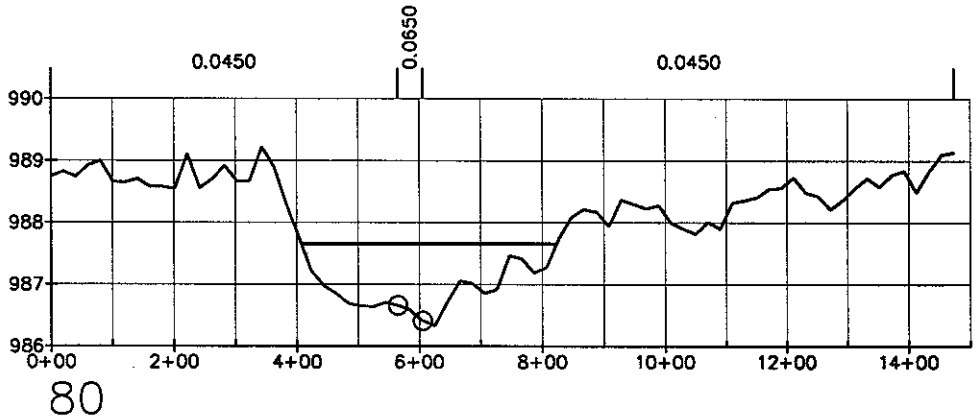
Cross-Section:	70	
Elevation:	980.43	ft MSL
Depth:	1.03	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.3112	
Flow Regime:	Subcritical	
Flow Area:	357.92	sq ft
Average Velocity:	1.80	ft/s
Maximum Velocity:	1.88	ft/s
Composite n:	0.0465	
Hydraulic Radius:	0.61	ft
Wetted Perimeter:	588.56	ft
Wetted Top Width:	588.54	ft
Critical Slope:	0.0624	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–70

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

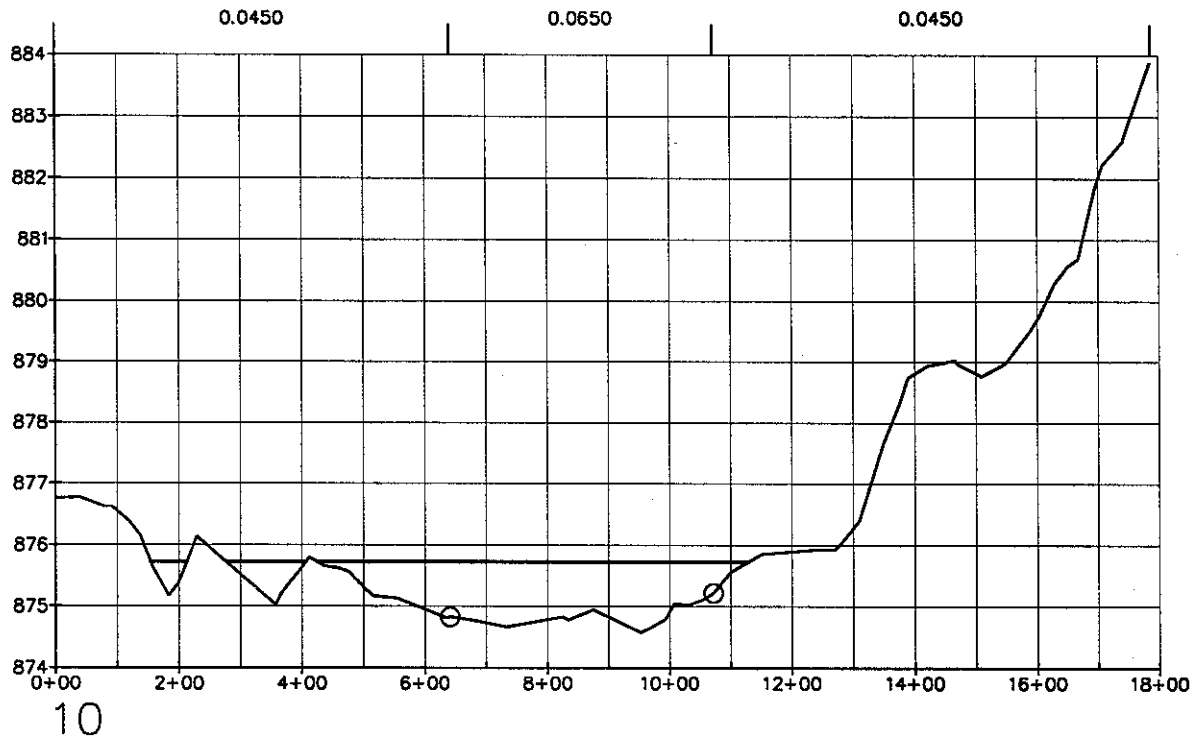
Cross-Section:	80	
Elevation:	987.66	ft MSL
Depth:	1.33	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0061	ft/ft
Froude Number:	0.3132	
Flow Regime:	Subcritical	
Flow Area:	312.29	sq ft
Average Velocity:	2.05	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.0471	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	416.42	ft
Wetted Top Width:	416.39	ft
Critical Slope:	0.0628	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28W–80

Entellus™

File: WASH-T1N-R5W-S28W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	875.73	ft MSL
Depth:	1.15	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.2771	
Flow Regime:	Subcritical	
Flow Area:	575.77	sq ft
Average Velocity:	1.66	ft/s
Maximum Velocity:	1.75	ft/s
Composite n:	0.0551	
Hydraulic Radius:	0.64	ft
Wetted Perimeter:	893.02	ft
Wetted Top Width:	892.99	ft
Critical Slope:	0.0907	ft/ft

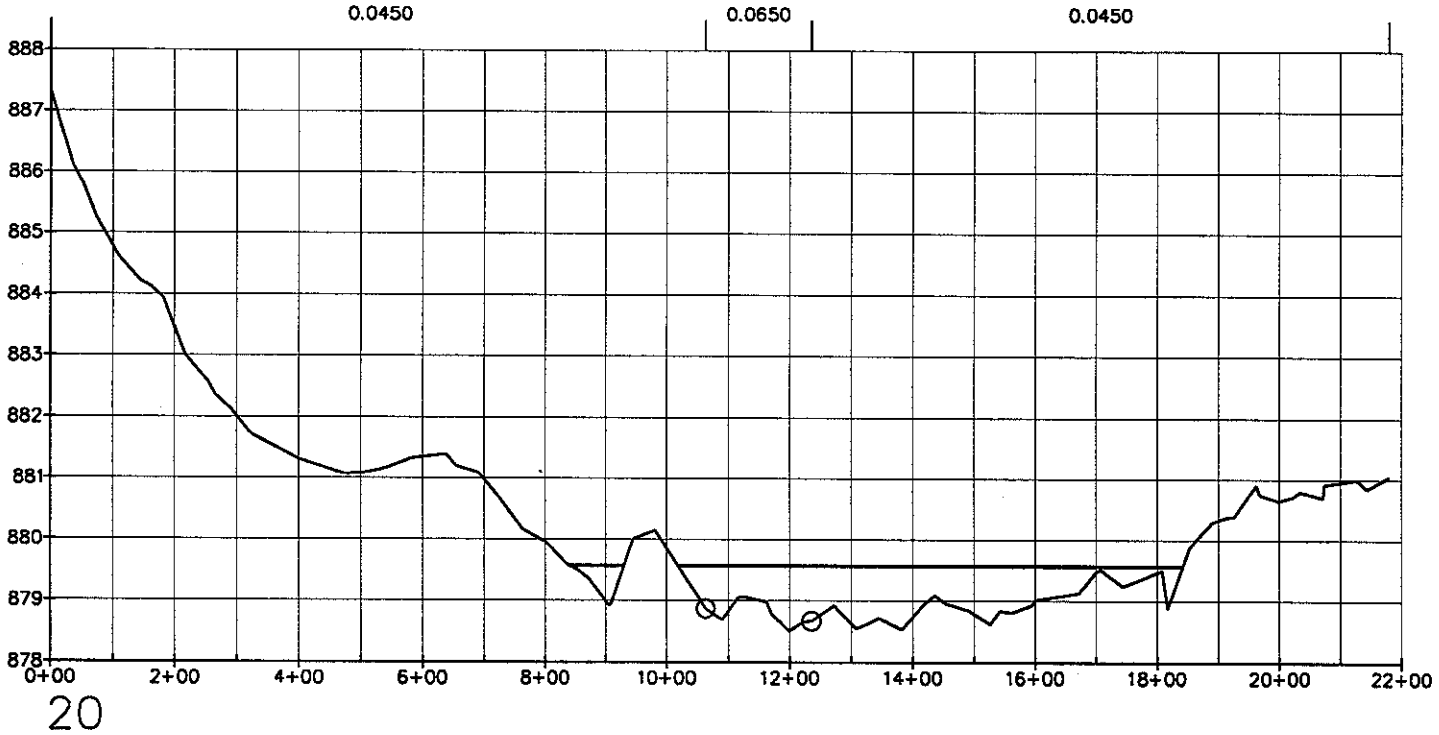
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09W-10

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	879.57	ft MSL
Depth:	1.06	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.3082	
Flow Regime:	Subcritical	
Flow Area:	538.20	sq ft
Average Velocity:	1.77	ft/s
Maximum Velocity:	1.91	ft/s
Composite n:	0.049	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	913.02	ft
Wetted Top Width:	912.95	ft
Critical Slope:	0.075	ft/ft

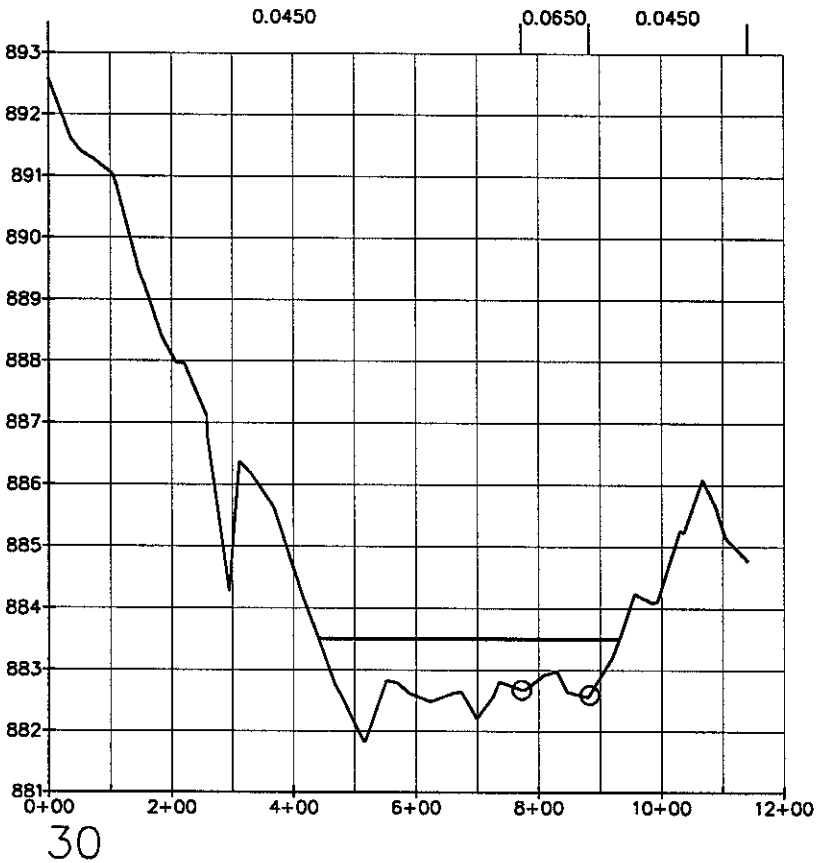
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09W–20

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

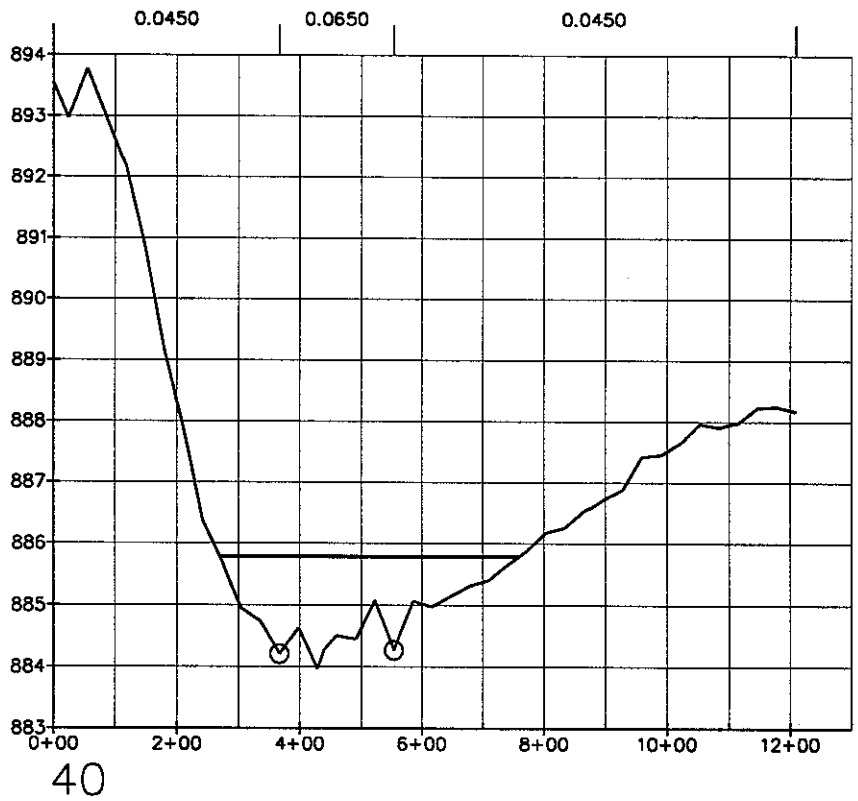
Cross-Section:	30	
Elevation:	883.51	ft MSL
Depth:	1.69	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.3142	
Flow Regime:	Subcritical	
Flow Area:	418.93	sq ft
Average Velocity:	2.33	ft/s
Maximum Velocity:	2.59	ft/s
Composite n:	0.0498	
Hydraulic Radius:	0.85	ft
Wetted Perimeter:	489.99	ft
Wetted Top Width:	489.93	ft
Critical Slope:	0.0748	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09W-30

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

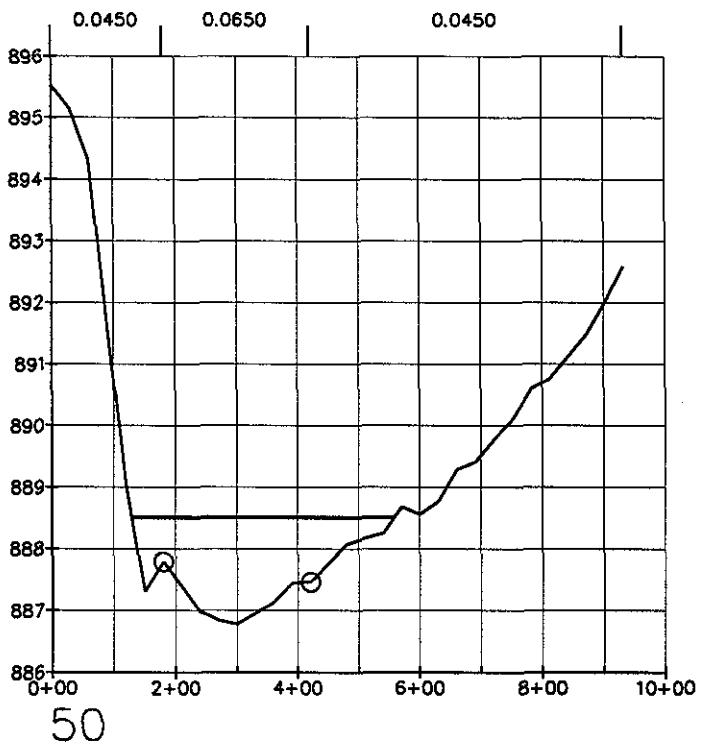
Cross-Section:	40	
Elevation:	885.79	ft MSL
Depth:	1.82	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.282	
Flow Regime:	Subcritical	
Flow Area:	449.36	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.45	ft/s
Composite n:	0.053	
Hydraulic Radius:	0.92	ft
Wetted Perimeter:	490.03	ft
Wetted Top Width:	489.97	ft
Critical Slope:	0.0834	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09W–40

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

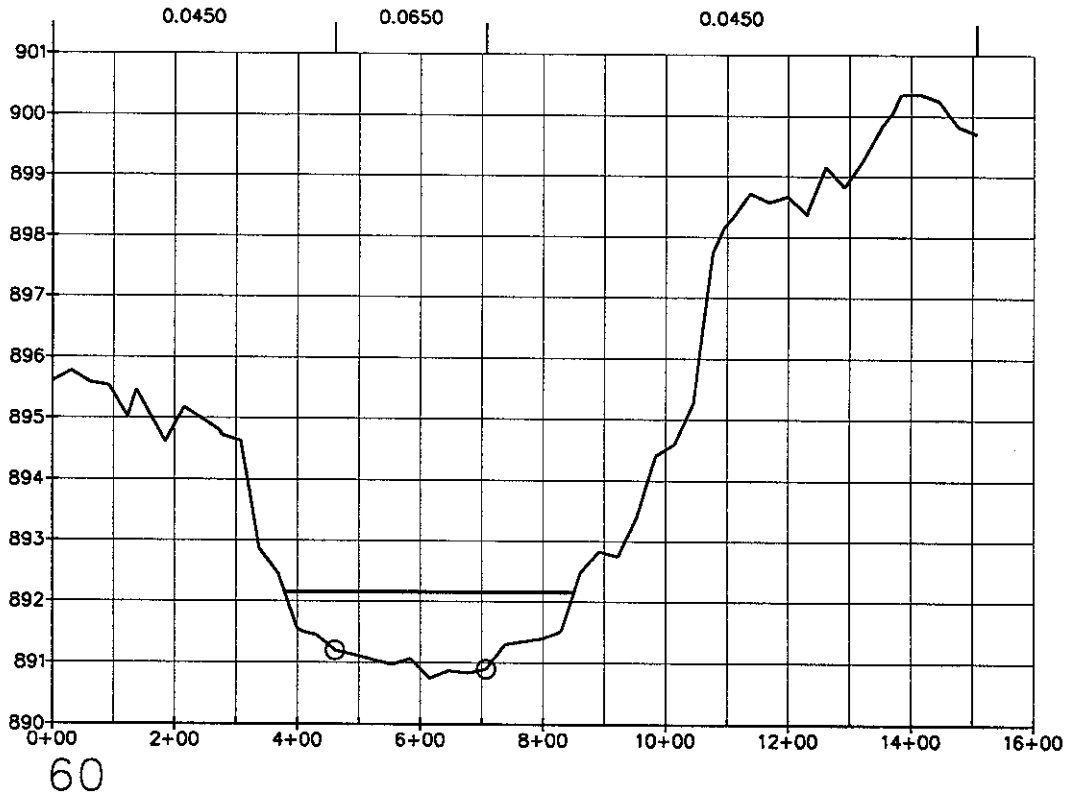
Cross-Section:	50	
Elevation:	888.51	ft MSL
Depth:	1.73	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.2956	
Flow Regime:	Subcritical	
Flow Area:	439.41	sq ft
Average Velocity:	2.21	ft/s
Maximum Velocity:	2.35	ft/s
Composite n:	0.0566	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	430.07	ft
Wetted Top Width:	430.02	ft
Critical Slope:	0.0782	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09W-50

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

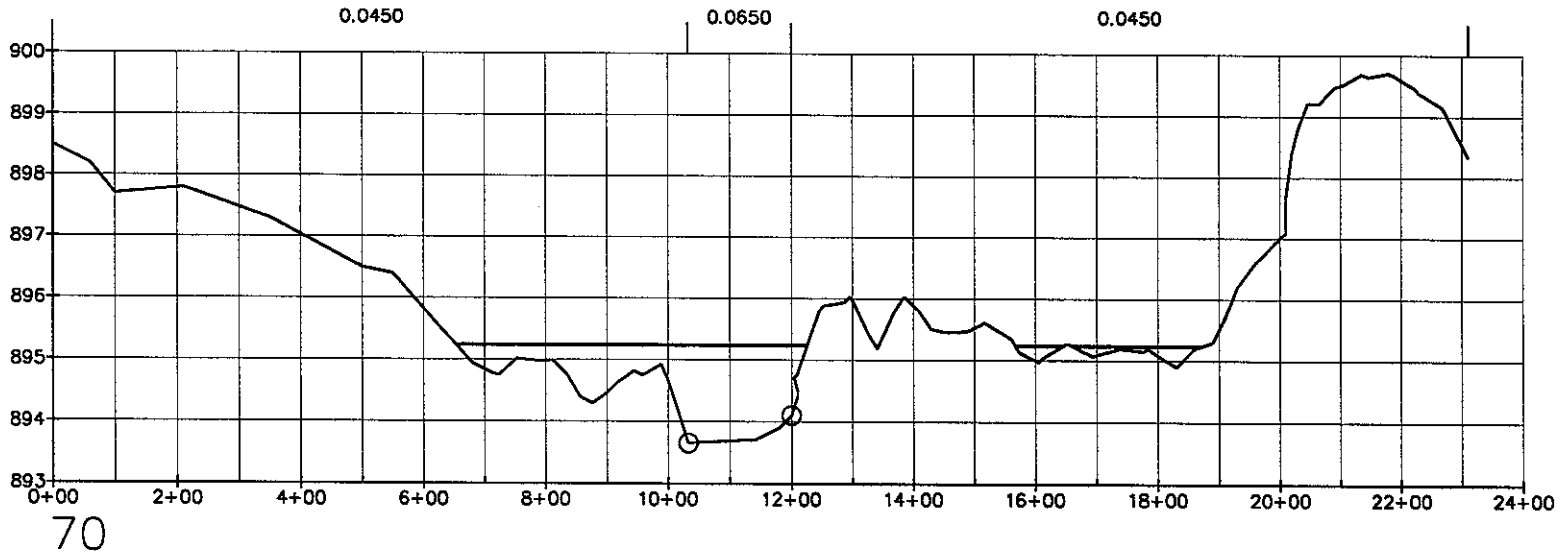
Cross-Section:	60	
Elevation:	892.15	ft MSL
Depth:	1.40	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.3182	
Flow Regime:	Subcritical	
Flow Area:	453.56	sq ft
Average Velocity:	2.12	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.0558	
Hydraulic Radius:	0.96	ft
Wetted Perimeter:	471.30	ft
Wetted Top Width:	471.28	ft
Critical Slope:	0.0668	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09W-60

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

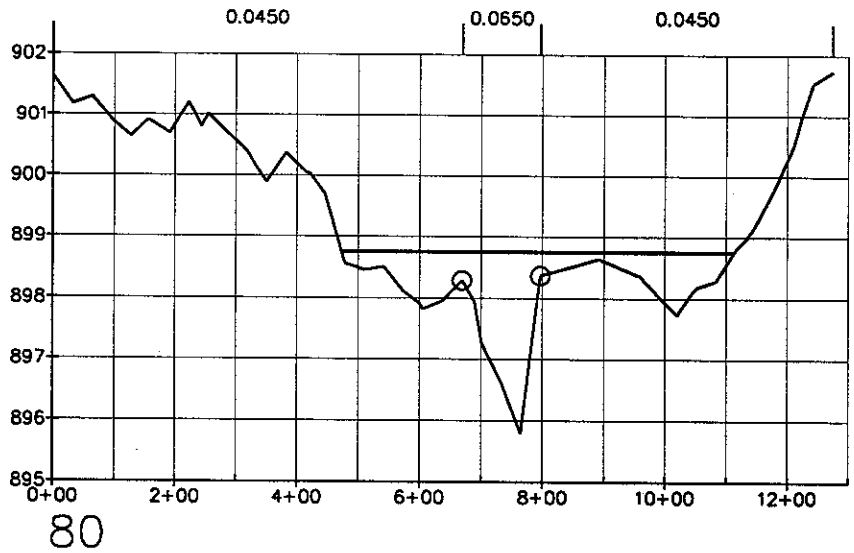
Cross-Section:	70	
Elevation:	895.23	ft MSL
Depth:	1.58	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.278	
Flow Regime:	Subcritical	
Flow Area:	488.61	sq ft
Average Velocity:	1.98	ft/s
Maximum Velocity:	2.43	ft/s
Composite n:	0.0491	
Hydraulic Radius:	0.56	ft
Wetted Perimeter:	877.10	ft
Wetted Top Width:	865.70	ft
Critical Slope:	0.1209	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09W-70

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

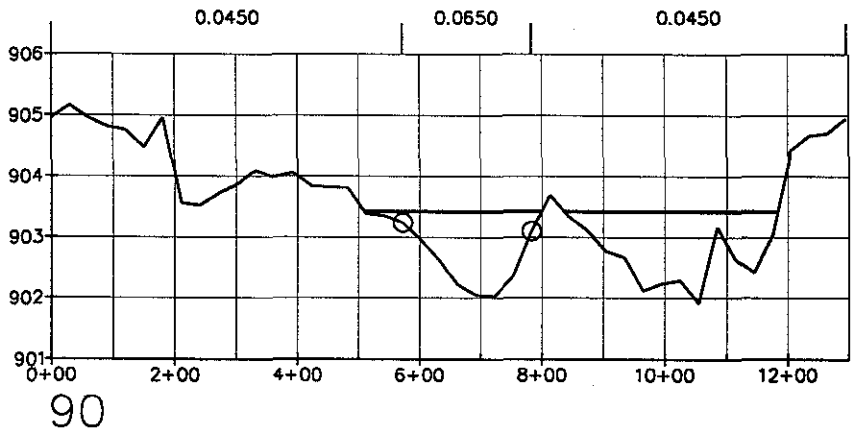
Cross-Section:	80	
Elevation:	898.75	ft MSL
Depth:	2.96	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.2191	
Flow Regime:	Subcritical	
Flow Area:	453.12	sq ft
Average Velocity:	2.12	ft/s
Maximum Velocity:	2.66	ft/s
Composite n:	0.0493	
Hydraulic Radius:	0.71	ft
Wetted Perimeter:	640.28	ft
Wetted Top Width:	640.11	ft
Critical Slope:	0.1655	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S-R5W-S09W-80

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

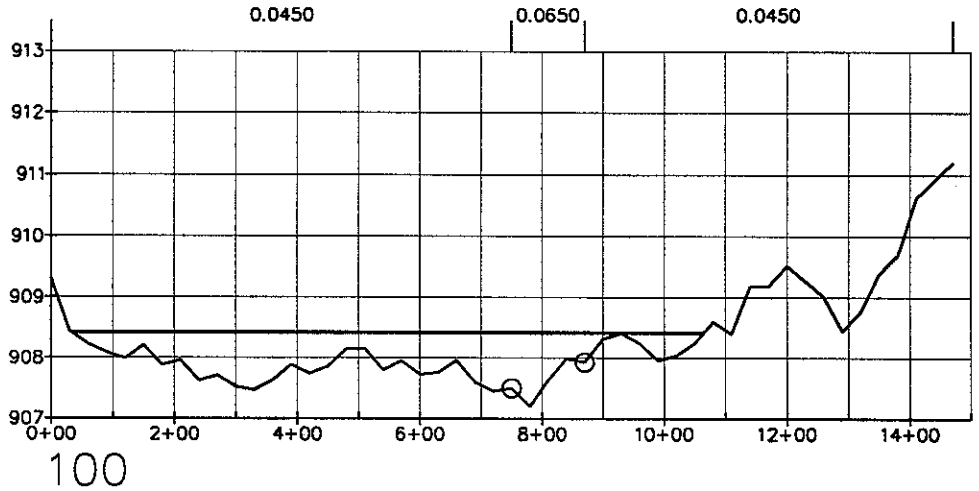
Cross-Section:	90	
Elevation:	903.42	ft MSL
Depth:	1.50	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.2906	
Flow Regime:	Subcritical	
Flow Area:	480.35	sq ft
Average Velocity:	2.04	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.052	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	636.80	ft
Wetted Top Width:	636.72	ft
Critical Slope:	0.0857	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09W–90

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

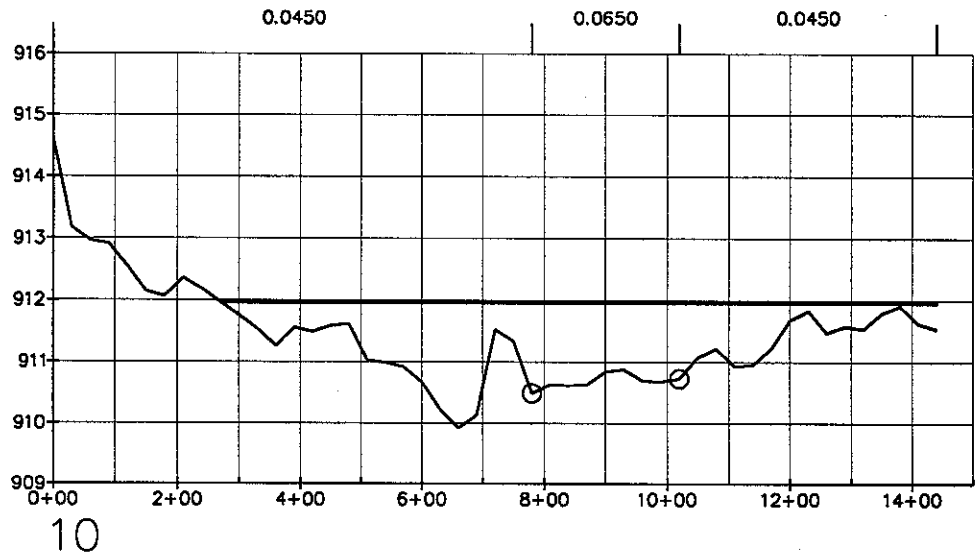
Cross-Section:	100	
Elevation:	908.42	ft MSL
Depth:	1.22	ft
Discharge:	970.00	cfs
Energy Gradient:	0.0066	ft/ft
Froude Number:	0.2787	
Flow Regime:	Subcritical	
Flow Area:	554.79	sq ft
Average Velocity:	1.75	ft/s
Maximum Velocity:	1.87	ft/s
Composite n:	0.0475	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	1036.94	ft
Wetted Top Width:	1036.91	ft
Critical Slope:	0.0921	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S09W–100

Entellus™

File: WASH-T1S-R5W-S09W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	911.96	ft MSL
Depth:	2.04	ft
Discharge:	2350.00	cfs
Energy Gradient:	0.0082	ft/ft
Froude Number:	0.3004	
Flow Regime:	Subcritical	
Flow Area:	964.89	sq ft
Average Velocity:	2.45	ft/s
Maximum Velocity:	2.71	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.83	ft
Wetted Perimeter:	1169.50	ft
Wetted Top Width:	1169.42	ft
Critical Slope:	0.0934	ft/ft

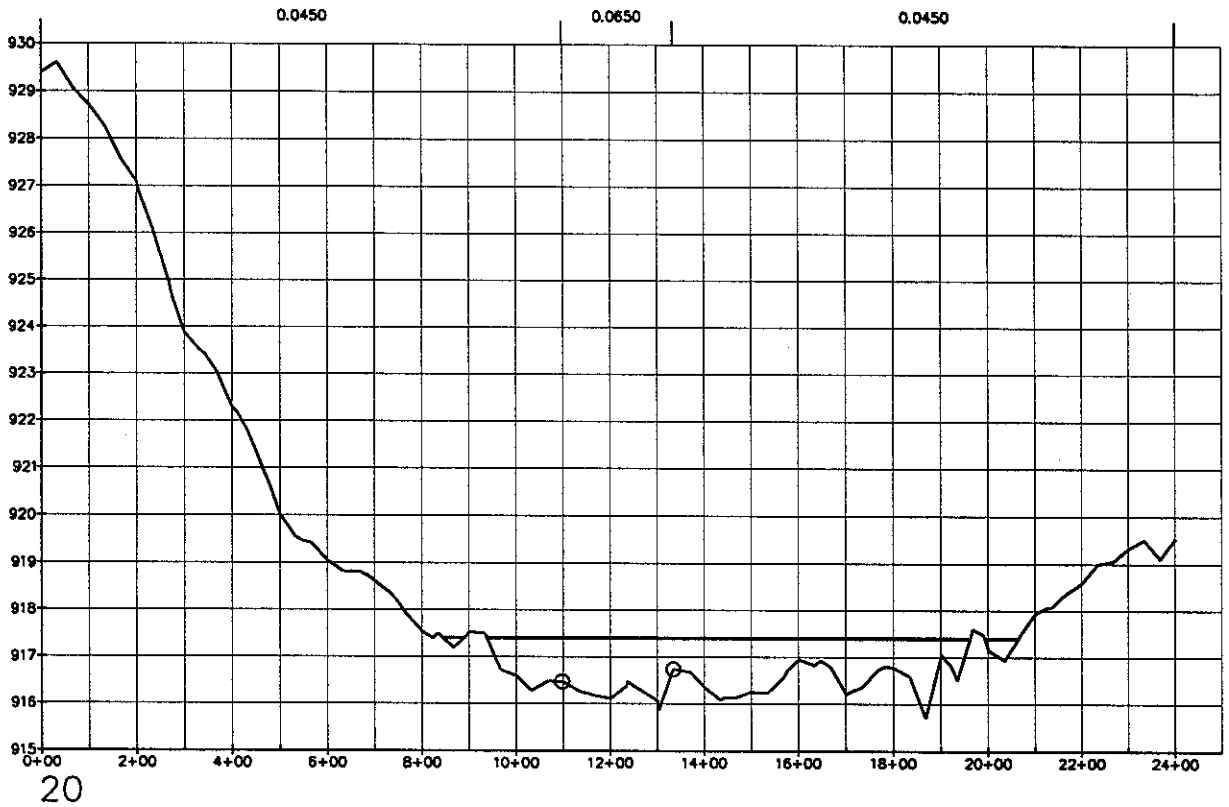
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33E–10

Entellus™

File: WASH-T1N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	917.40	ft MSL
Depth:	1.69	ft
Discharge:	2350.00	cfs
Energy Gradient:	0.0082	ft/ft
Froude Number:	0.3285	
Flow Regime:	Subcritical	
Flow Area:	970.80	sq ft
Average Velocity:	2.46	ft/s
Maximum Velocity:	2.61	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.85	ft
Wetted Perimeter:	1142.24	ft
Wetted Top Width:	1142.11	ft
Critical Slope:	0.0743	ft/ft

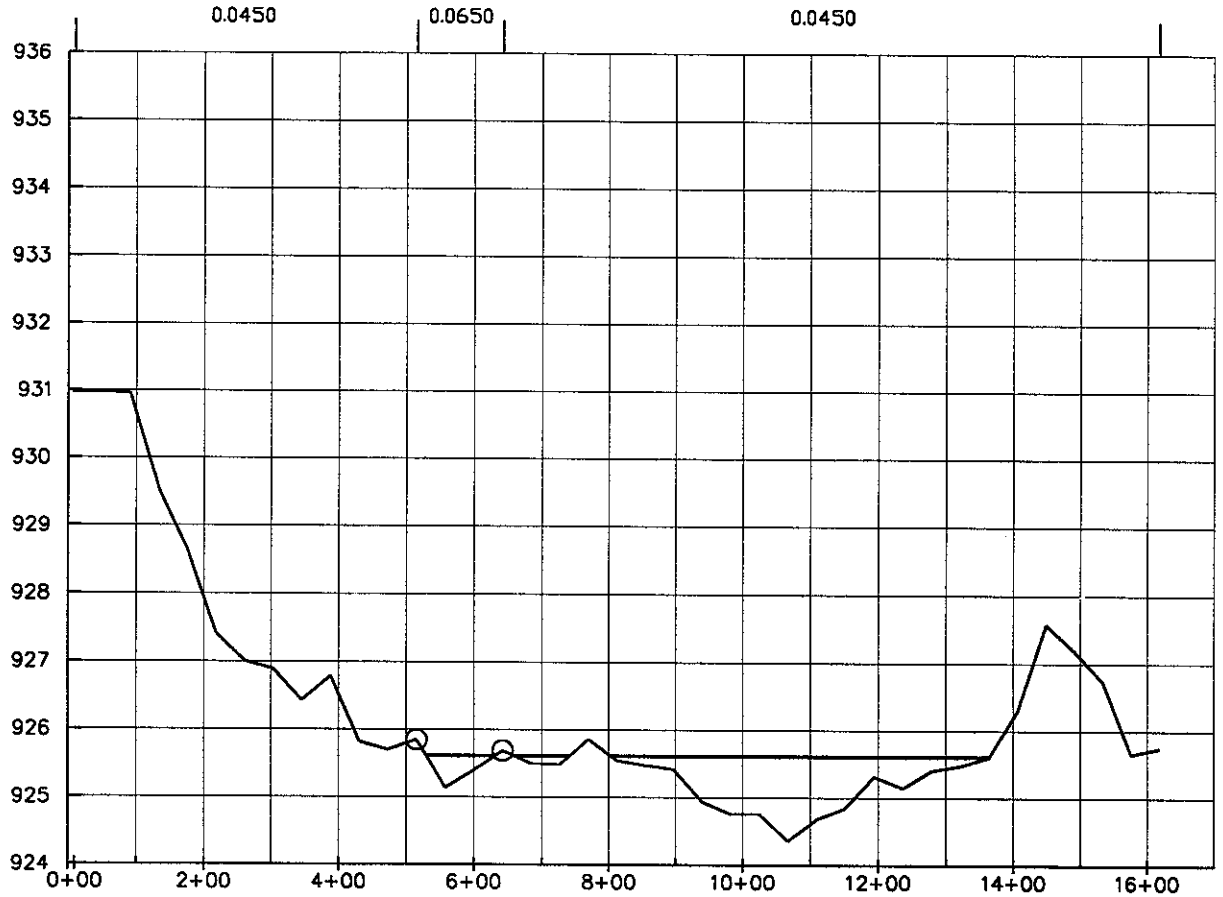
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33E–20

Entellus™

File: WASH-T1N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



30

Normal Depth Results

Cross-Section:	30	
Elevation:	925.61	ft MSL
Depth:	1.25	ft
Discharge:	550.00	cfs
Energy Gradient:	0.0082	ft/ft
Froude Number:	0.2705	
Flow Regime:	Subcritical	
Flow Area:	320.17	sq ft
Average Velocity:	1.71	ft/s
Maximum Velocity:	1.79	ft/s
Composite n:	0.0479	
Hydraulic Radius:	0.43	ft
Wetted Perimeter:	744.43	ft
Wetted Top Width:	744.41	ft
Critical Slope:	0.1288	ft/ft

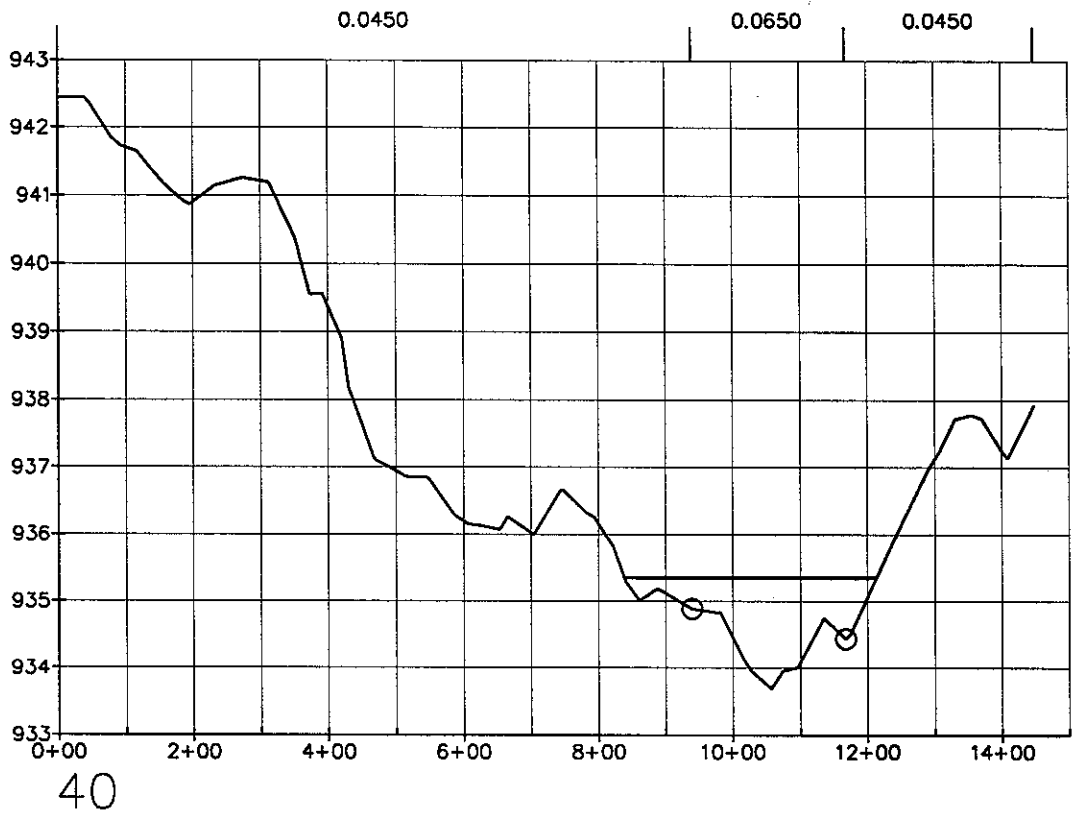
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33E–30

Entellus™

File: WASH-T1N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results		
Cross-Section:	40	
Elevation:	935.35	ft MSL
Depth:	1.66	ft
Discharge:	550.00	cfs
Energy Gradient:	0.0082	ft/ft
Froude Number:	0.2691	
Flow Regime:	Subcritical	
Flow Area:	279.38	sq ft
Average Velocity:	1.99	ft/s
Maximum Velocity:	2.09	ft/s
Composite n:	0.0576	
Hydraulic Radius:	0.75	ft
Wetted Perimeter:	374.84	ft
Wetted Top Width:	374.80	ft
Critical Slope:	0.1183	ft/ft

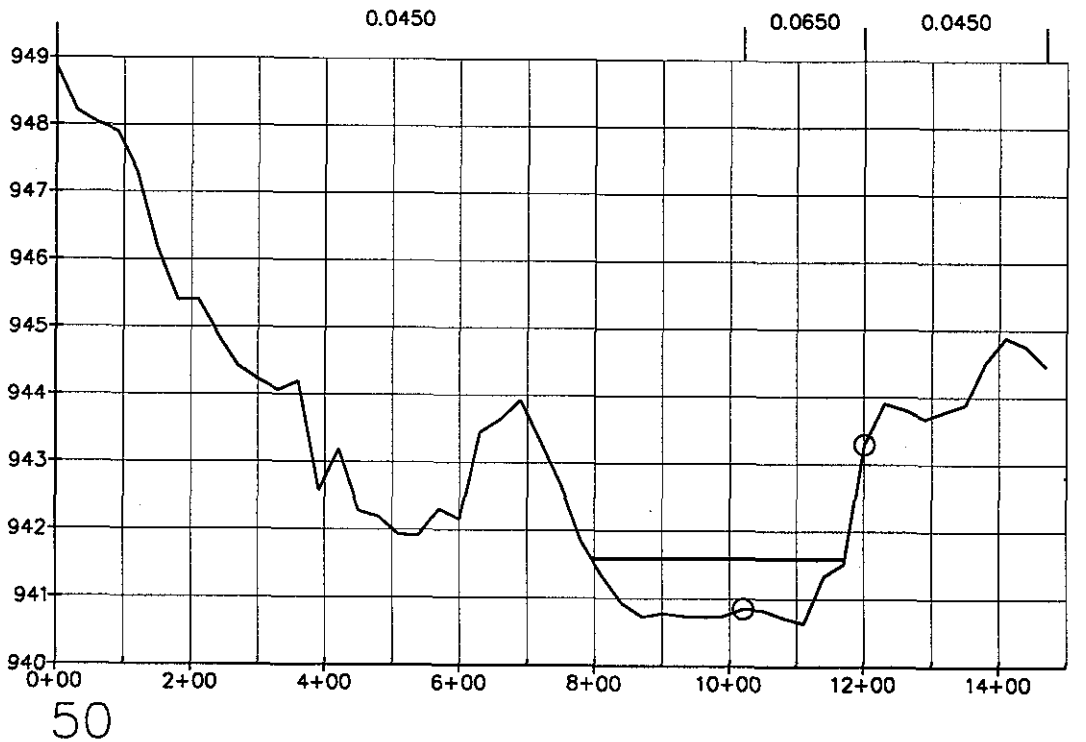
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33E–40

Entellus™

File: WASH-T1N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

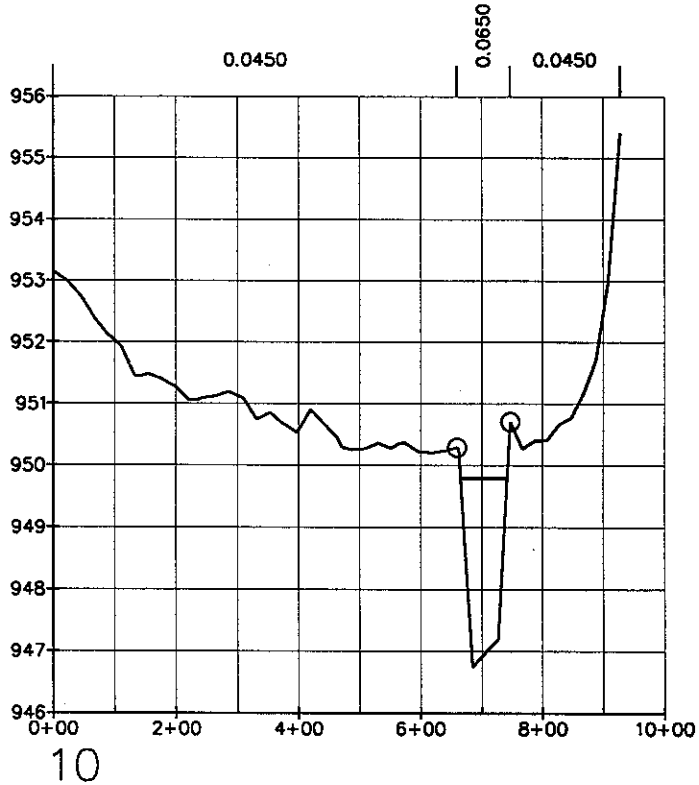
Cross-Section:	50	
Elevation:	941.59	ft MSL
Depth:	0.95	ft
Discharge:	550.00	cfs
Energy Gradient:	0.0082	ft/ft
Froude Number:	0.3787	
Flow Regime:	Subcritical	
Flow Area:	262.20	sq ft
Average Velocity:	2.10	ft/s
Maximum Velocity:	2.43	ft/s
Composite n:	0.0534	
Hydraulic Radius:	0.7	ft
Wetted Perimeter:	376.54	ft
Wetted Top Width:	376.53	ft
Critical Slope:	0.064	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S33E–50

Entellus™

File: WASH-T1N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	949.80	ft MSL
Depth:	3.05	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.4283	
Flow Regime:	Subcritical	
Flow Area:	167.43	sq ft
Average Velocity:	4.24	ft/s
Maximum Velocity:	4.24	ft/s
Composite n:	0.045	
Hydraulic Radius:	2.18	ft
Wetted Perimeter:	76.66	ft
Wetted Top Width:	76.19	ft
Critical Slope:	0.0315	ft/ft

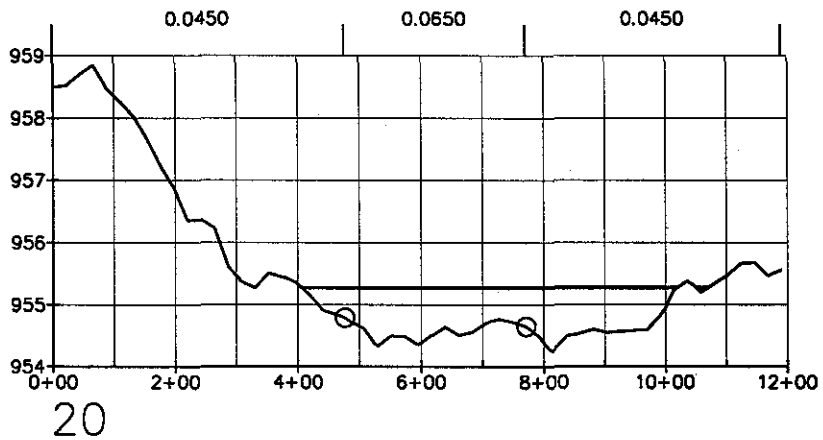
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28E–10

Entellus™

File: WASH-T1N-R5W-S28E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	955.28	ft MSL
Depth:	1.03	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3103	
Flow Regime:	Subcritical	
Flow Area:	398.13	sq ft
Average Velocity:	1.76	ft/s
Maximum Velocity:	1.91	ft/s
Composite n:	0.0499	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	635.17	ft
Wetted Top Width:	635.15	ft
Critical Slope:	0.069	ft/ft

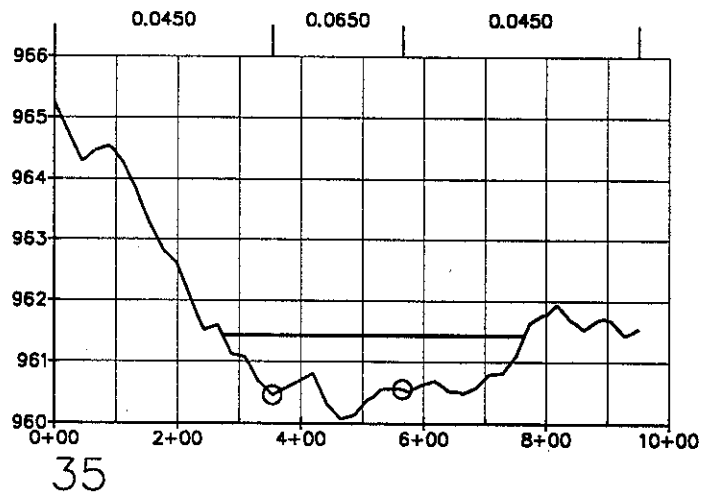
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28E–20

Entellus™

File: WASH-T1N-R5W-S28E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

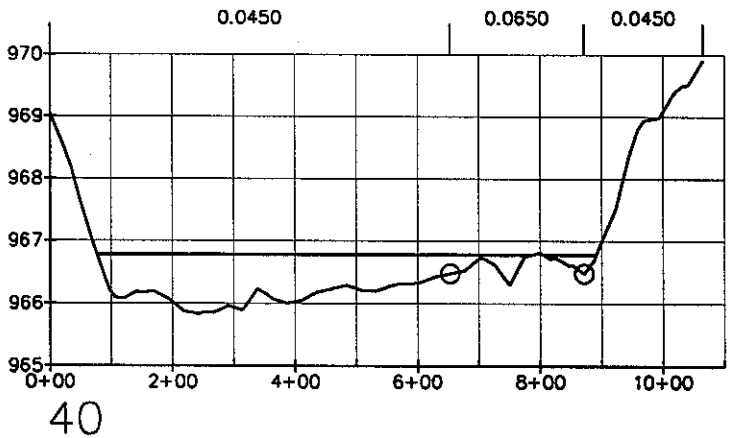
Cross-Section:	30	
Elevation:	961.43	ft MSL
Depth:	1.36	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2754	
Flow Regime:	Subcritical	
Flow Area:	389.97	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	2.03	ft/s
Composite n:	0.054	
Hydraulic Radius:	0.79	ft
Wetted Perimeter:	491.39	ft
Wetted Top Width:	491.37	ft
Critical Slope:	0.0782	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28E–30

Entellus™

File: WASH-T1N-R5W-S28E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

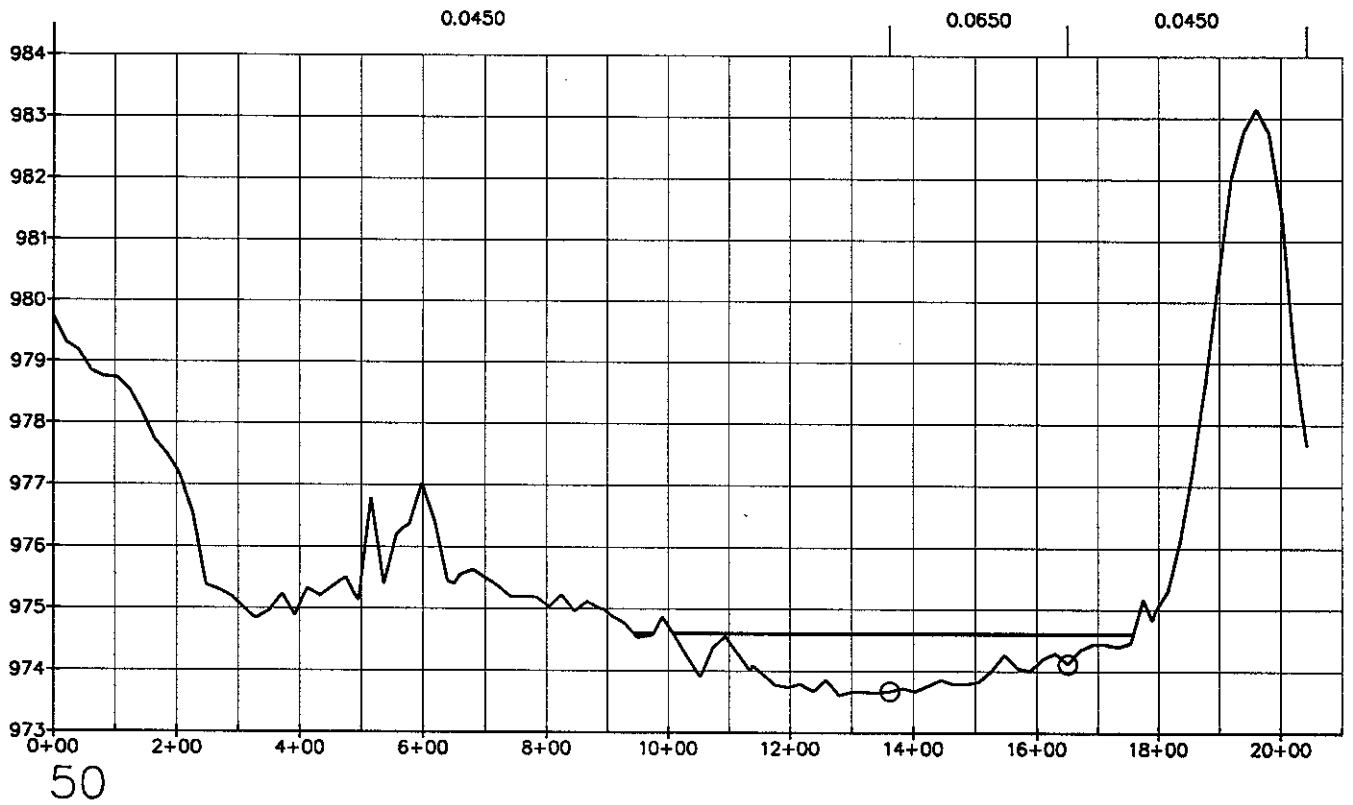
Cross-Section:	40	
Elevation:	966.78	ft MSL
Depth:	0.95	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.3158	
Flow Regime:	Subcritical	
Flow Area:	406.04	sq ft
Average Velocity:	1.74	ft/s
Maximum Velocity:	1.86	ft/s
Composite n:	0.0504	
Hydraulic Radius:	0.51	ft
Wetted Perimeter:	797.50	ft
Wetted Top Width:	797.48	ft
Critical Slope:	0.0862	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28E–40

Entellus™

File: WASH-T1N-R5W-S28E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

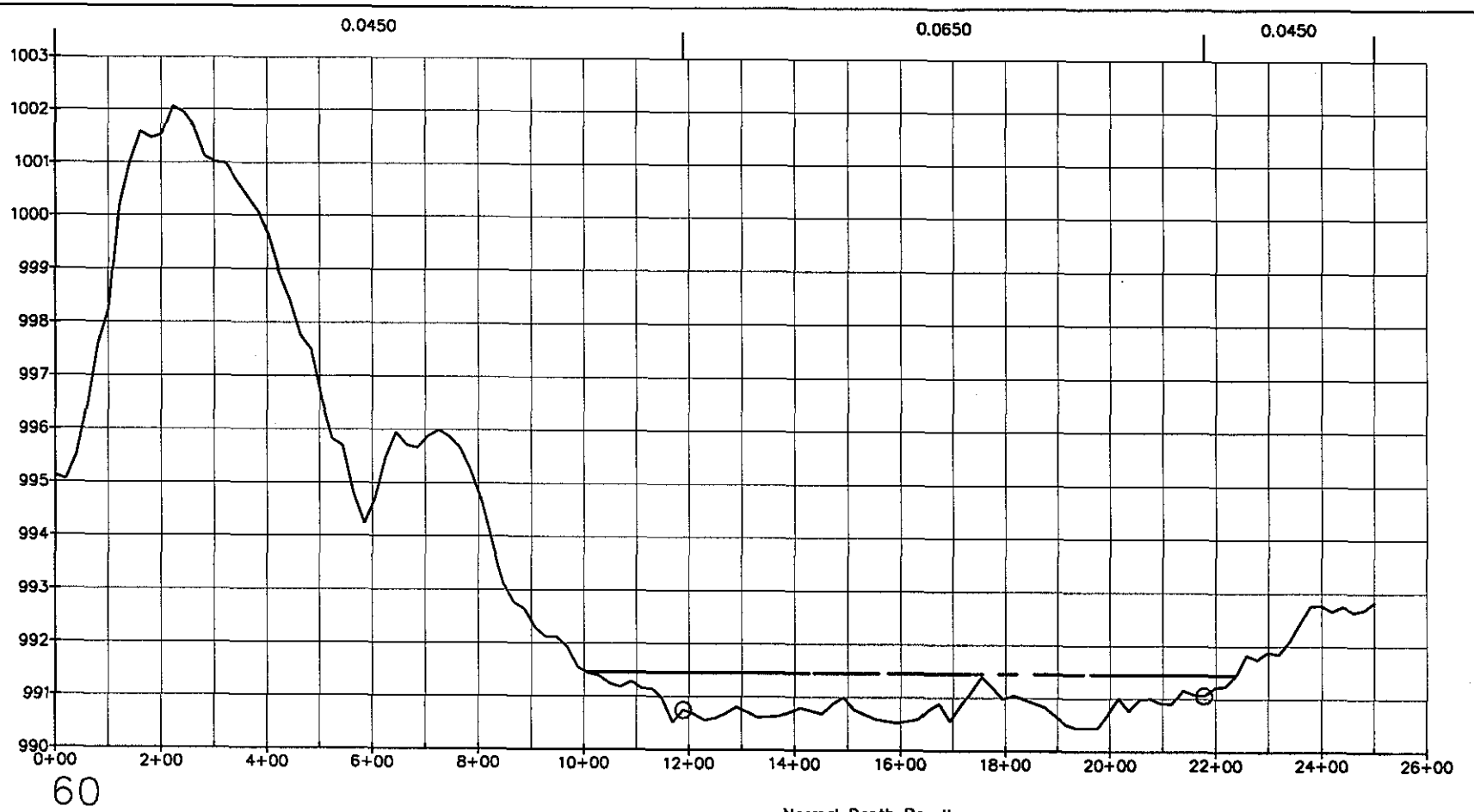
Cross-Section:	50	
Elevation:	974.60	ft MSL
Depth:	0.99	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0058	ft/ft
Froude Number:	0.2774	
Flow Regime:	Subcritical	
Flow Area:	452.35	sq ft
Average Velocity:	1.56	ft/s
Maximum Velocity:	1.82	ft/s
Composite n:	0.0528	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	783.98	ft
Wetted Top Width:	783.95	ft
Critical Slope:	0.0836	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N-R5W-S28E-50

Entellus™

File: WASH-T1N-R5W-S28E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

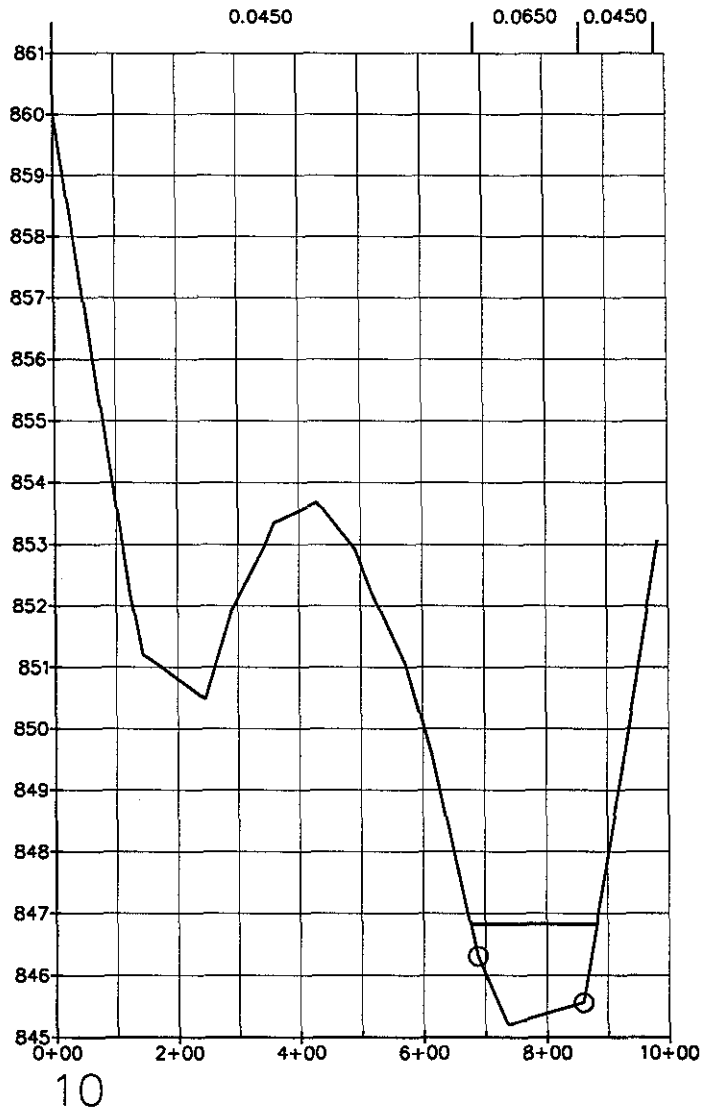
Cross-Section:	60		Flow Area:	583.03	sq ft
Elevation:	991.46	ft MSL	Average Velocity:	1.20	ft/s
Depth:	1.02	ft	Maximum Velocity:	1.24	ft/s
Discharge:	710.00	cfs	Composite n:	0.0609	
Energy Gradient:	0.0058	ft/ft	Hydraulic Radius:	0.52	ft
Froude Number:	0.2129		Wetted Perimeter:	1128.37	ft
Flow Regime:	Subcritical		Wetted Top Width:	1128.03	ft
			Critical Slope:	0.132	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S28E–60

Entellus™

File: WASH-T1N-R5W-S28E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

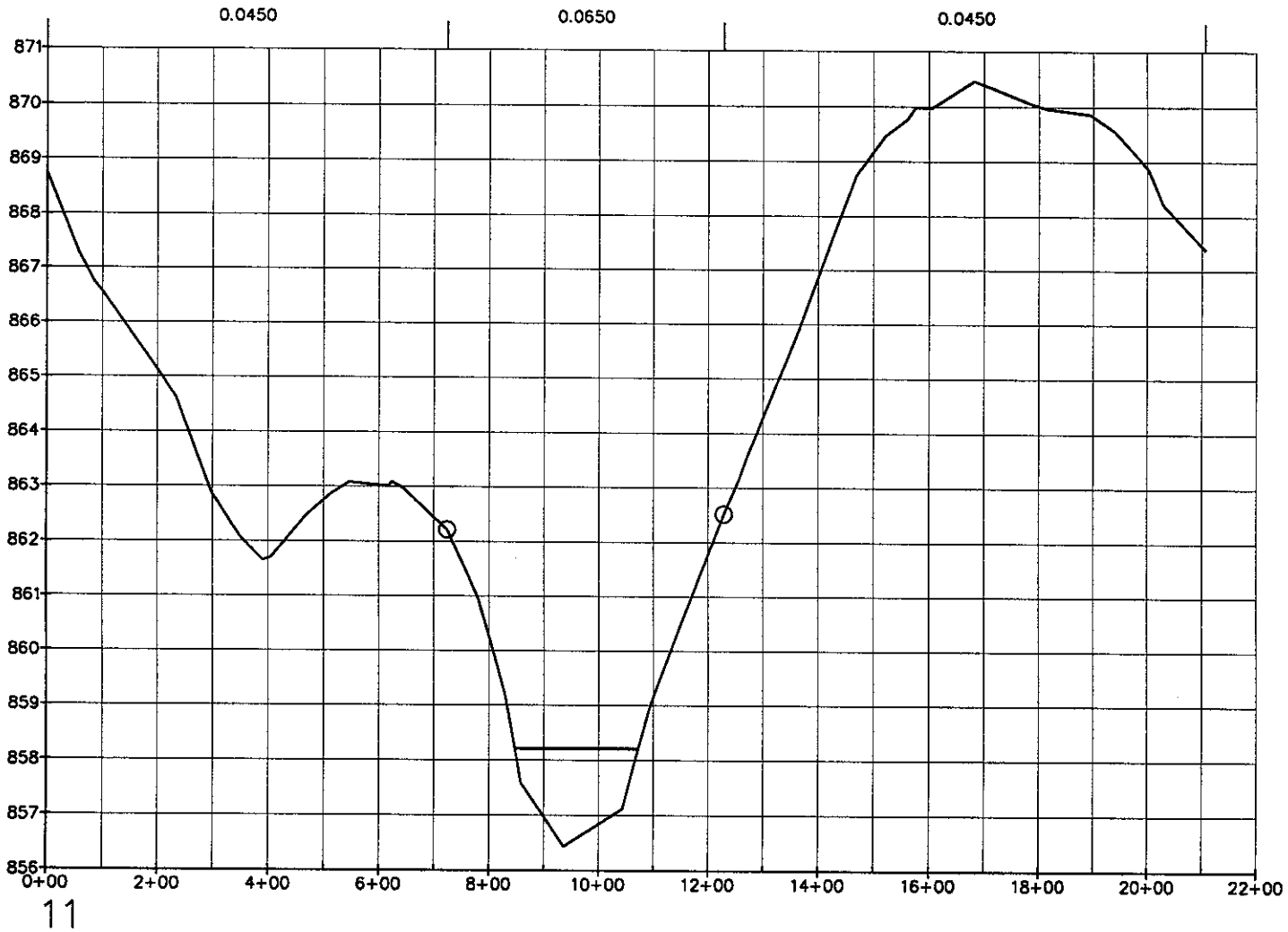
Cross-Section:	10	
Elevation:	846.83	ft MSL
Depth:	1.63	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3402	
Flow Regime:	Subcritical	
Flow Area:	247.60	sq ft
Average Velocity:	2.46	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0619	
Hydraulic Radius:	1.21	ft
Wetted Perimeter:	205.28	ft
Wetted Top Width:	205.22	ft
Critical Slope:	0.0706	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S16–10

Entellus™

File: WASH-T1S-R5W-S16_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

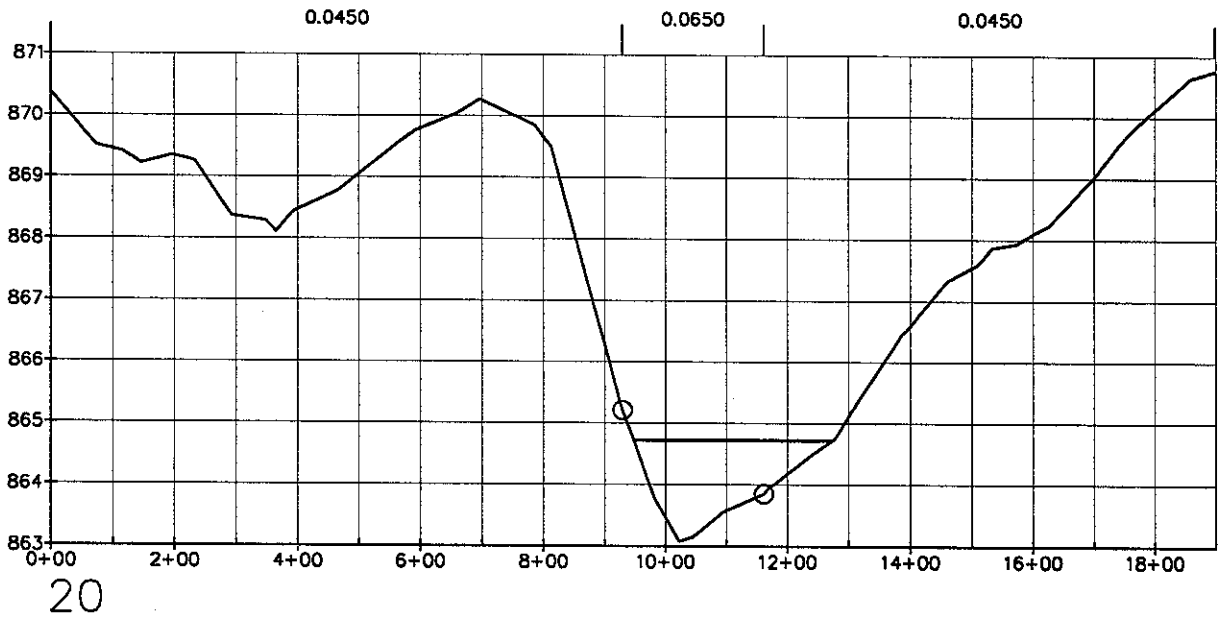
Cross-Section:	11	
Elevation:	858.21	ft MSL
Depth:	1.77	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3032	
Flow Regime:	Subcritical	
Flow Area:	266.30	sq ft
Average Velocity:	2.29	ft/s
Maximum Velocity:	2.29	ft/s
Composite n:	0.065	
Hydraulic Radius:	1.18	ft
Wetted Perimeter:	225.22	ft
Wetted Top Width:	225.17	ft
Critical Slope:	0.0868	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S16–11

Entellus™

File: WASH-T1S-R5W-S16_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

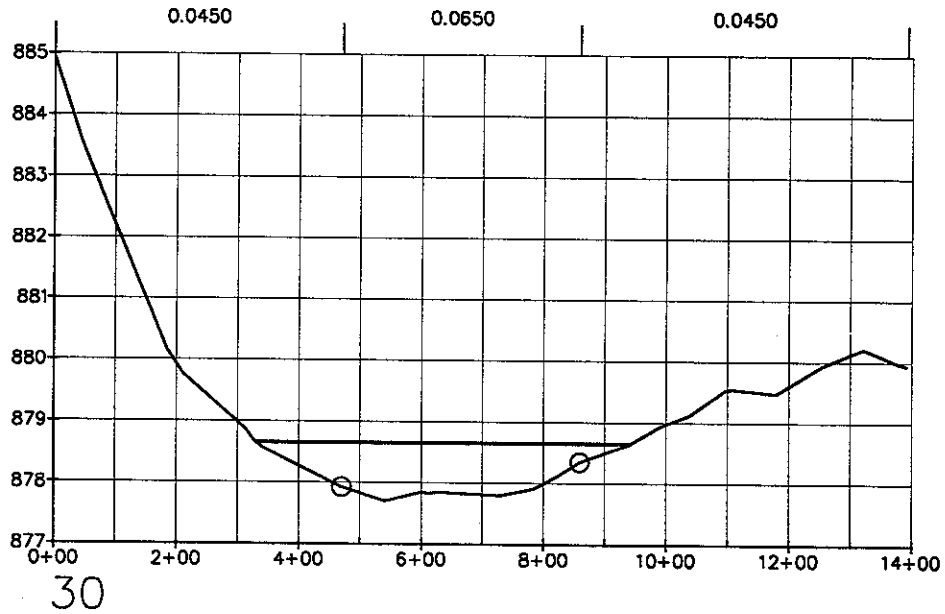
Cross-Section:	20	
Elevation:	864.72	ft MSL
Depth:	1.64	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2916	
Flow Regime:	Subcritical	
Flow Area:	287.79	sq ft
Average Velocity:	2.13	ft/s
Maximum Velocity:	2.22	ft/s
Composite n:	0.0585	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	326.55	ft
Wetted Top Width:	326.53	ft
Critical Slope:	0.0964	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S16–20

Entellus™

File: WASH-T1S-R5W-S16_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

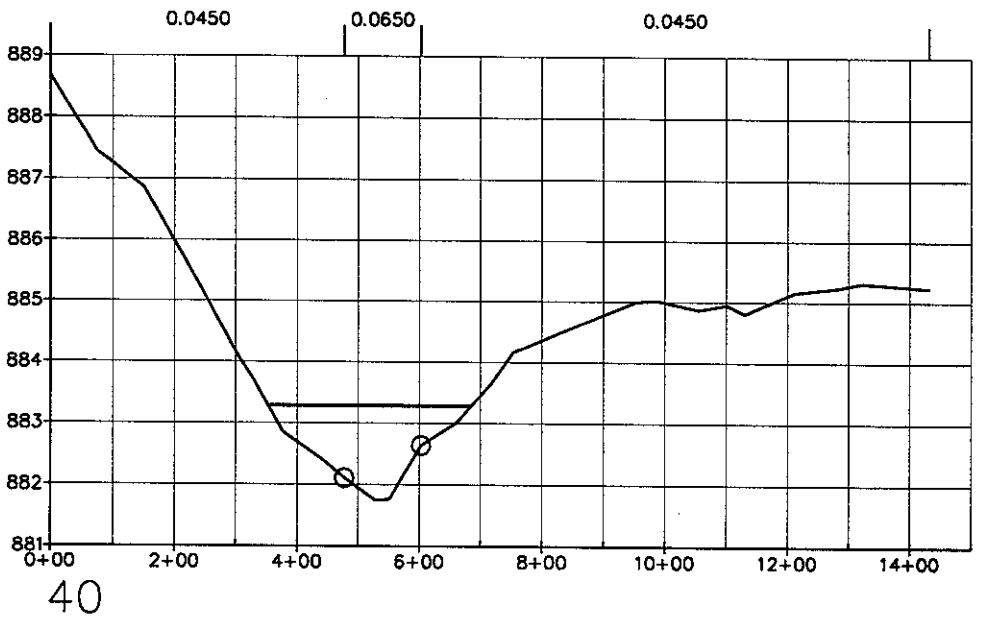
Cross-Section:	30	
Elevation:	878.65	ft MSL
Depth:	0.95	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3002	
Flow Regime:	Subcritical	
Flow Area:	366.83	sq ft
Average Velocity:	1.67	ft/s
Maximum Velocity:	1.73	ft/s
Composite n:	0.0581	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	611.64	ft
Wetted Top Width:	611.63	ft
Critical Slope:	0.0922	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S16–30

Entellus™

File: WASH–T1S–R5W–S16_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

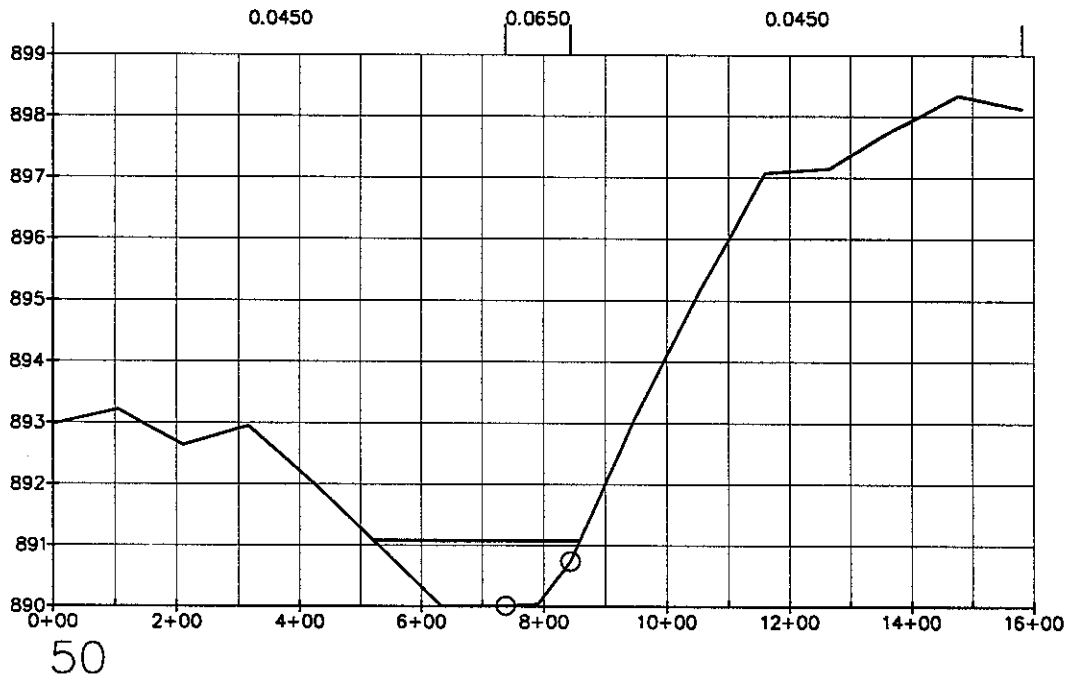
Cross-Section:	40	
Elevation:	883.28	ft MSL
Depth:	1.53	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3195	
Flow Regime:	Subcritical	
Flow Area:	272.21	sq ft
Average Velocity:	2.27	ft/s
Maximum Velocity:	2.40	ft/s
Composite n:	0.053	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	331.32	ft
Wetted Top Width:	331.31	ft
Critical Slope:	0.0809	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S16–40

Entellus™

File: WASH-T1S-R5W-S16_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

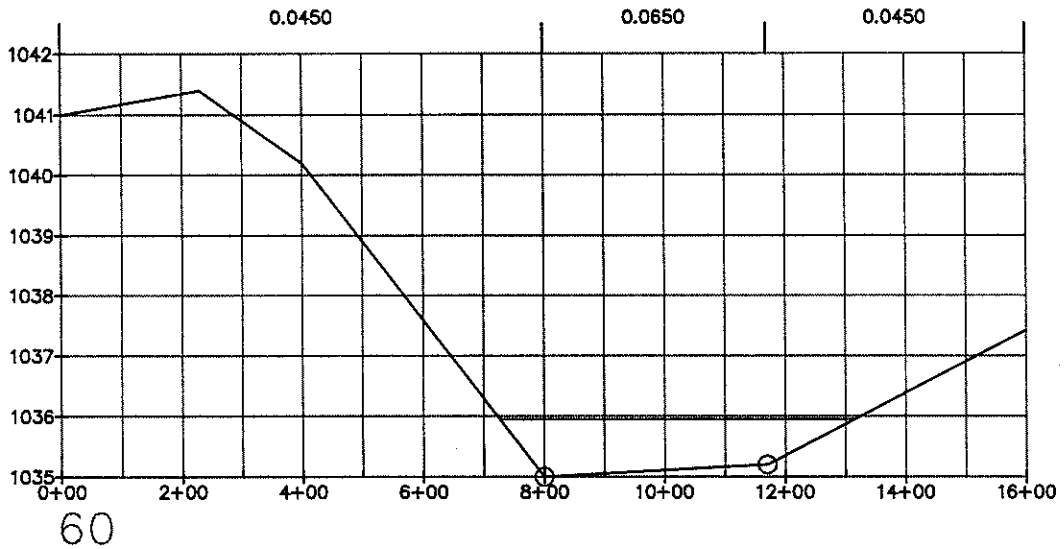
Cross-Section:	50	
Elevation:	891.08	ft MSL
Depth:	1.07	ft
Discharge:	610.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3912	
Flow Regime:	Subcritical	
Flow Area:	266.08	sq ft
Average Velocity:	2.29	ft/s
Maximum Velocity:	2.54	ft/s
Composite n:	0.0516	
Hydraulic Radius:	0.79	ft
Wetted Perimeter:	337.18	ft
Wetted Top Width:	337.17	ft
Critical Slope:	0.0565	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1S–R5W–S16–50

Entellus™

File: WASH–T1S–R5W–S16_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

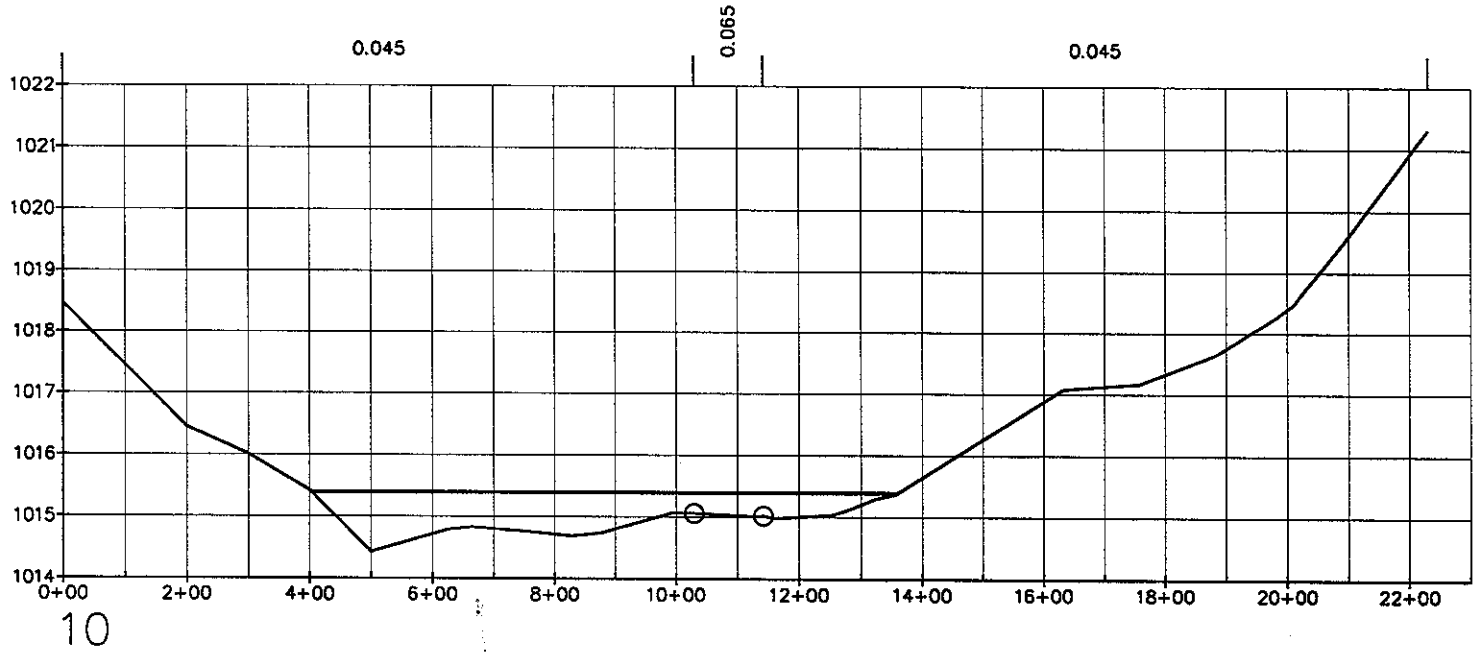
Cross-Section:	60	
Elevation:	1035.95	ft MSL
Depth:	0.95	ft
Discharge:	780.00	cfs
Energy Gradient:	0.0094	ft/ft
Froude Number:	0.3516	
Flow Regime:	Subcritical	
Flow Area:	401.84	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	1.99	ft/s
Composite n:	0.058	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	586.97	ft
Wetted Top Width:	586.96	ft
Critical Slope:	0.0765	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S15–60

Entellus™

File: WASH-T1N-R5W-S15_X-SECTION-R14.dwg Date: 5/29/03



Normal Depth Results

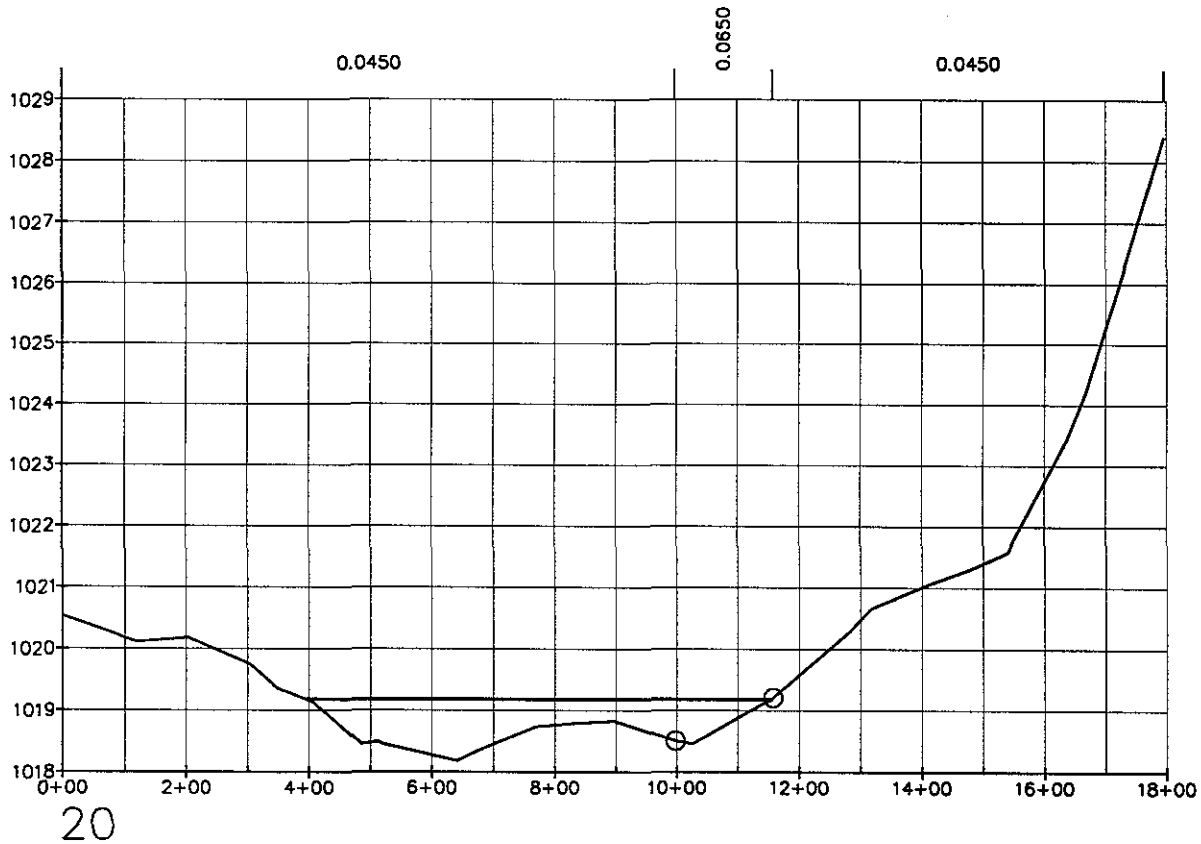
Cross-Section:	10	
Elevation:	1015.39	ft MSL
Depth:	0.96	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.2696	
Flow Regime:	Subcritical	
Flow Area:	473.45	sq ft
Average Velocity:	1.52	ft/s
Maximum Velocity:	1.67	ft/s
Composite n:	0.0525	
Hydraulic Radius:	0.49	ft
Wetted Perimeter:	956.74	ft
Wetted Top Width:	956.74	ft
Critical Slope:	0.0982	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N-R5W-S10-10

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

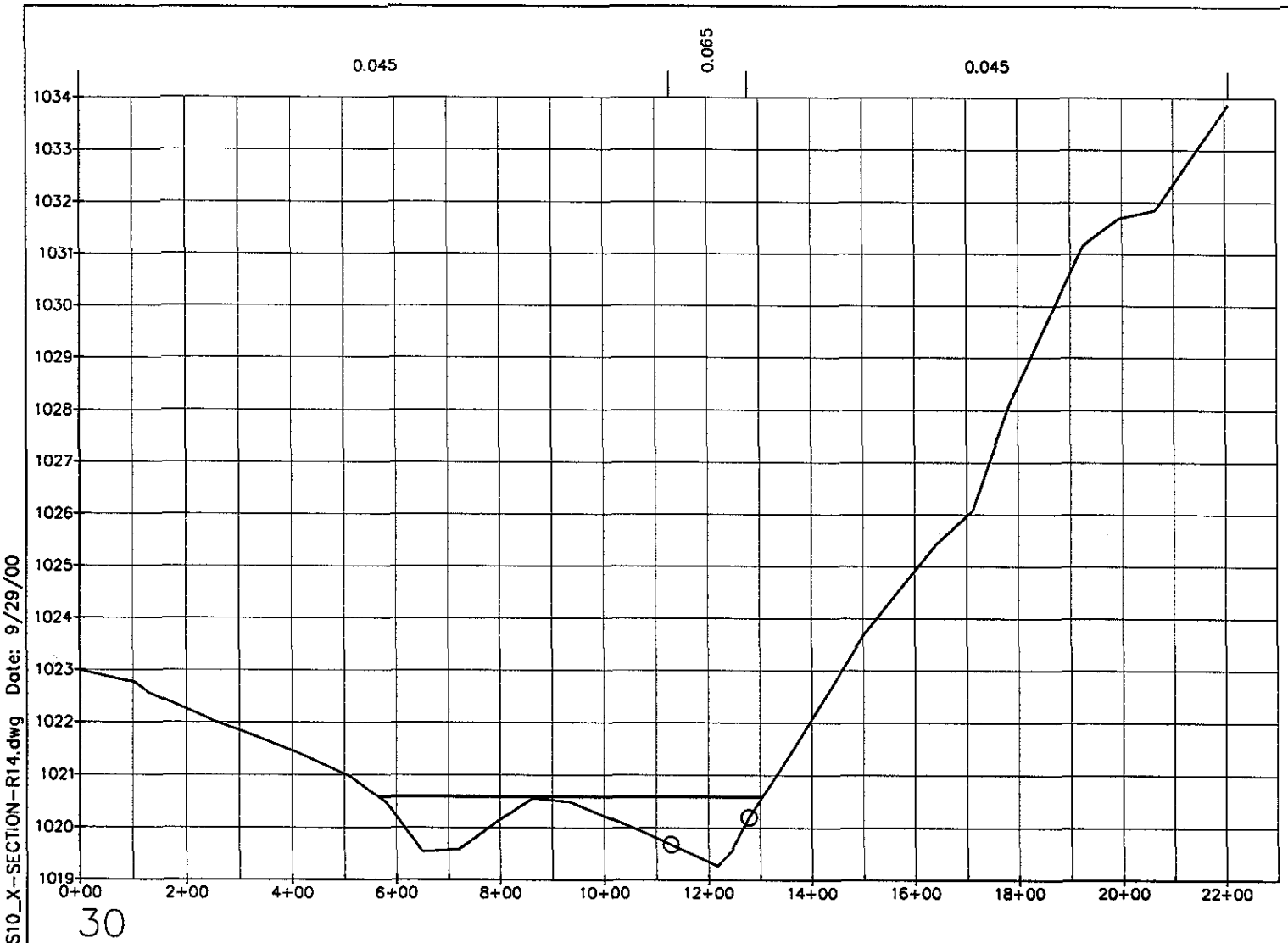
Cross-Section:	20	
Elevation:	1019.18	ft MSL
Depth:	0.99	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.3025	
Flow Regime:	Subcritical	
Flow Area:	415.77	sq ft
Average Velocity:	1.70	ft/s
Maximum Velocity:	1.83	ft/s
Composite n:	0.0494	
Hydraulic Radius:	0.55	ft
Wetted Perimeter:	760.15	ft
Wetted Top Width:	760.14	ft
Critical Slope:	0.0784	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–20

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

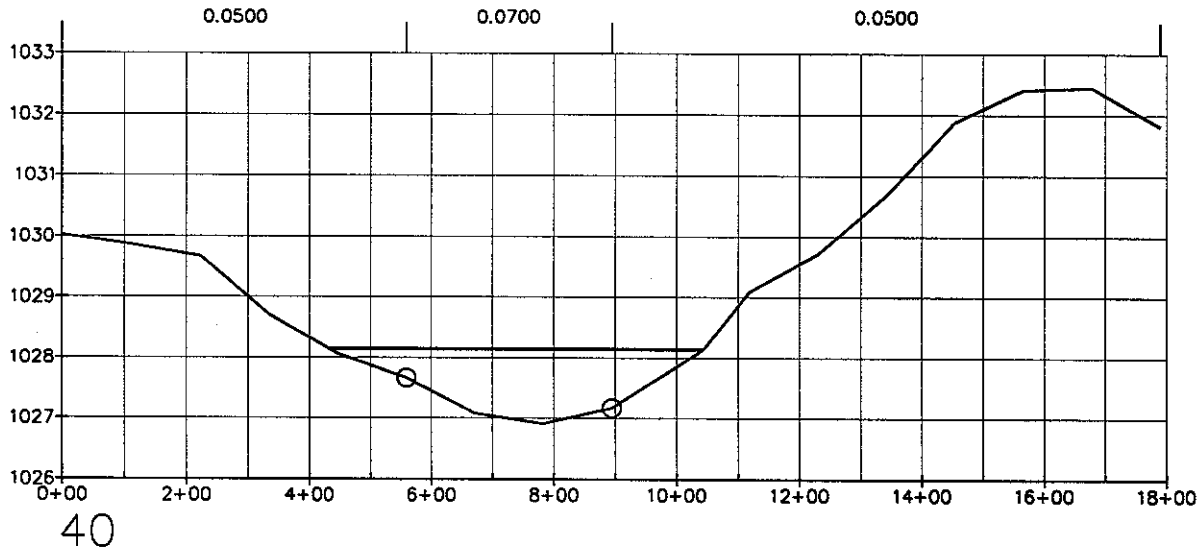
Cross-Section:	30	
Elevation:	1020.59	ft MSL
Depth:	1.32	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.2443	
Flow Regime:	Subcritical	
Flow Area:	446.01	sq ft
Average Velocity:	1.57	ft/s
Maximum Velocity:	1.73	ft/s
Composite n:	0.0543	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	739.48	ft
Wetted Top Width:	739.46	ft
Critical Slope:	0.1108	ft/ft

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N-R5W-S10-30

Entellus™



Normal Depth Results

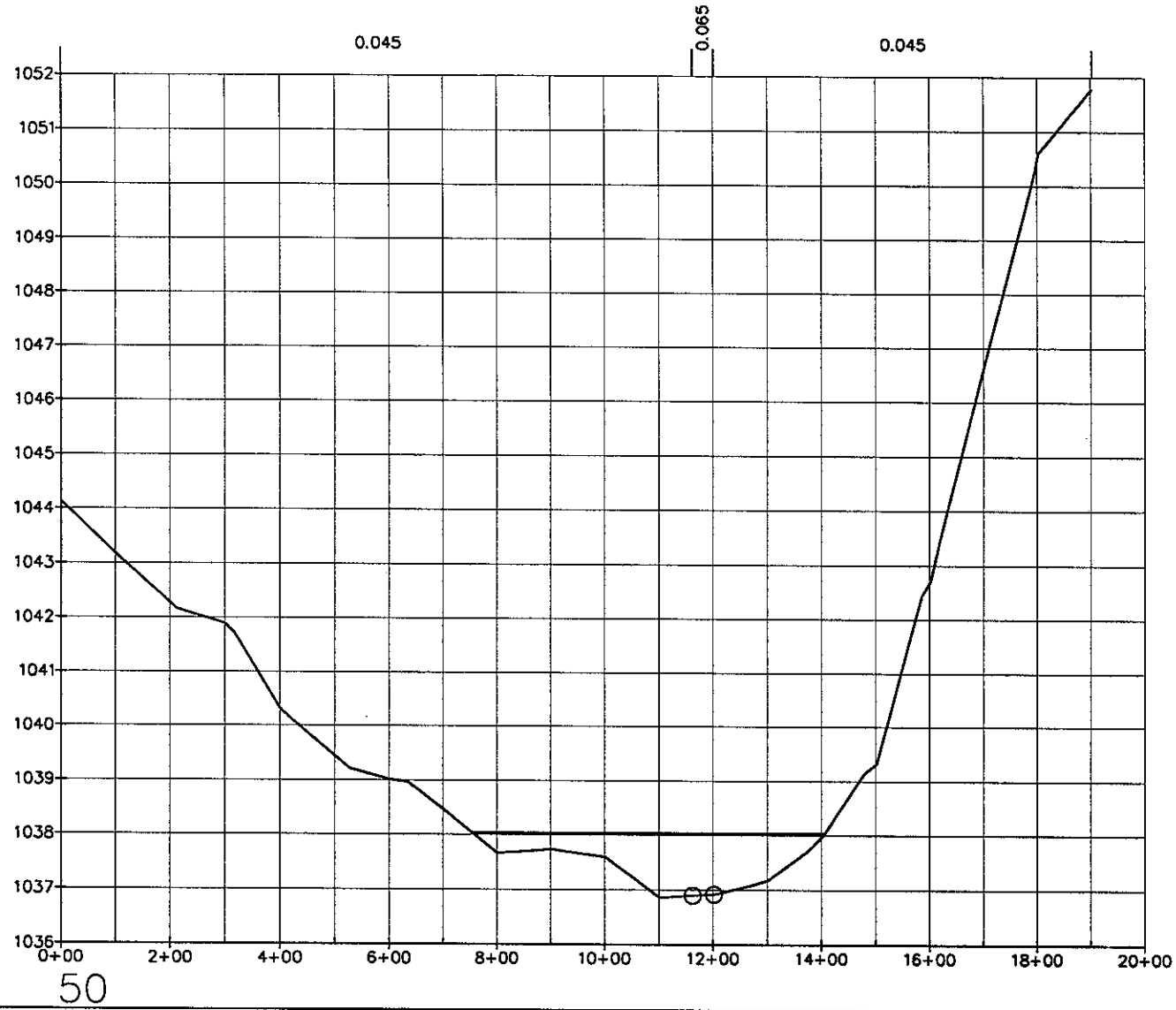
Cross-Section:	40	
Elevation:	1028.15	ft MSL
Depth:	1.24	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.253	
Flow Regime:	Subcritical	
Flow Area:	445.10	sq ft
Average Velocity:	1.61	ft/s
Maximum Velocity:	1.70	ft/s
Composite n:	0.0613	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	611.63	ft
Wetted Top Width:	611.63	ft
Critical Slope:	0.103	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–40

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

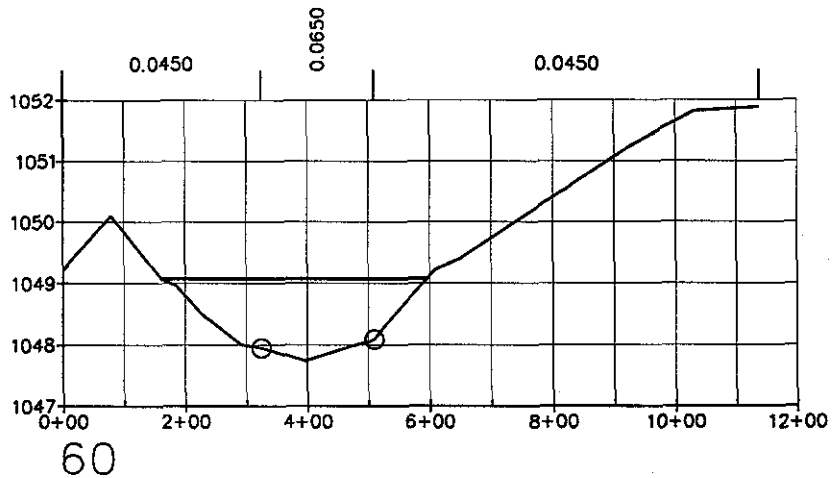
Cross-Section:	50	
Elevation:	1038.03	ft MSL
Depth:	1.17	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.2788	
Flow Regime:	Subcritical	
Flow Area:	415.49	sq ft
Average Velocity:	1.73	ft/s
Maximum Velocity:	1.89	ft/s
Composite n:	0.0513	
Hydraulic Radius:	0.64	ft
Wetted Perimeter:	649.53	ft
Wetted Top Width:	649.52	ft
Critical Slope:	0.0807	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–50

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

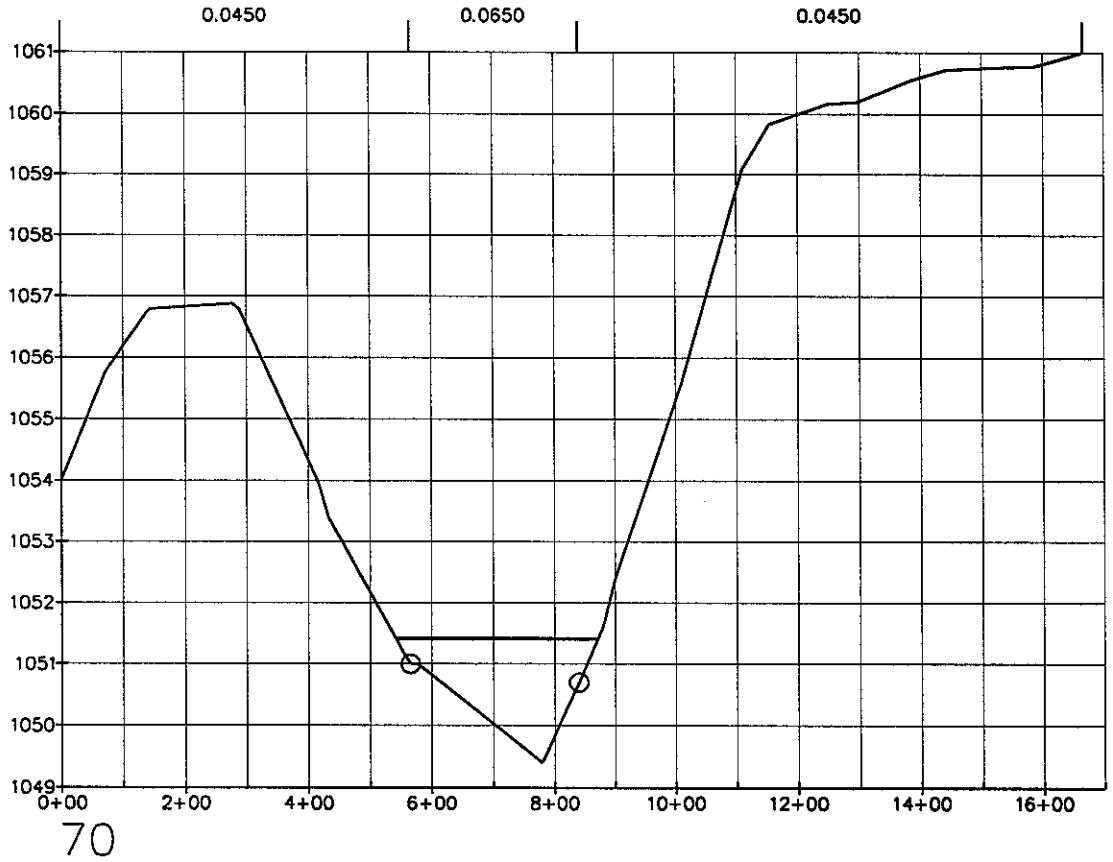
Cross-Section:	60	
Elevation:	1049.07	ft MSL
Depth:	1.33	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.2962	
Flow Regime:	Subcritical	
Flow Area:	365.72	sq ft
Average Velocity:	1.97	ft/s
Maximum Velocity:	2.04	ft/s
Composite n:	0.0539	
Hydraulic Radius:	0.84	ft
Wetted Perimeter:	433.66	ft
Wetted Top Width:	433.65	ft
Critical Slope:	0.0707	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–60

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

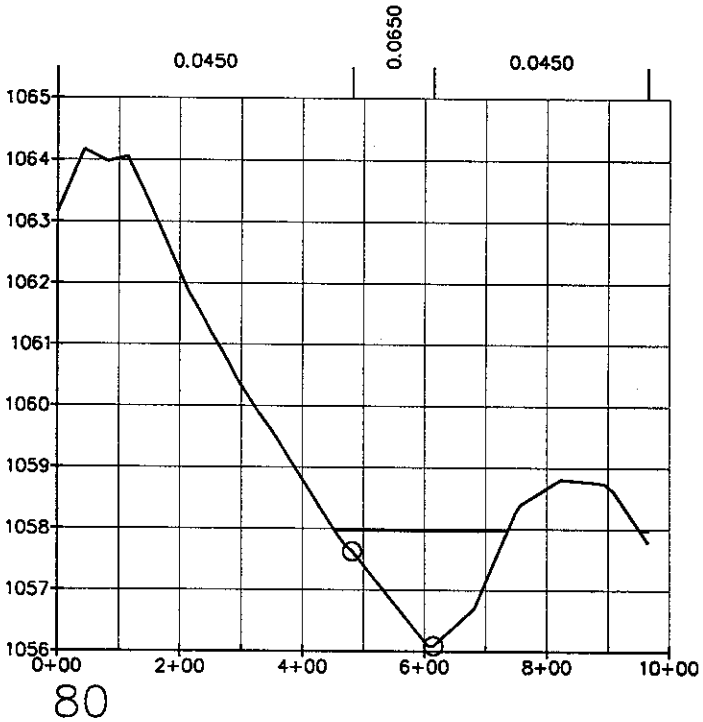
Cross-Section:	70	
Elevation:	1051.41	ft MSL
Depth:	2.01	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.253	
Flow Regime:	Subcritical	
Flow Area:	348.79	sq ft
Average Velocity:	2.03	ft/s
Maximum Velocity:	2.07	ft/s
Composite n:	0.0618	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	329.89	ft
Wetted Top Width:	329.86	ft
Critical Slope:	0.1036	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–70

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

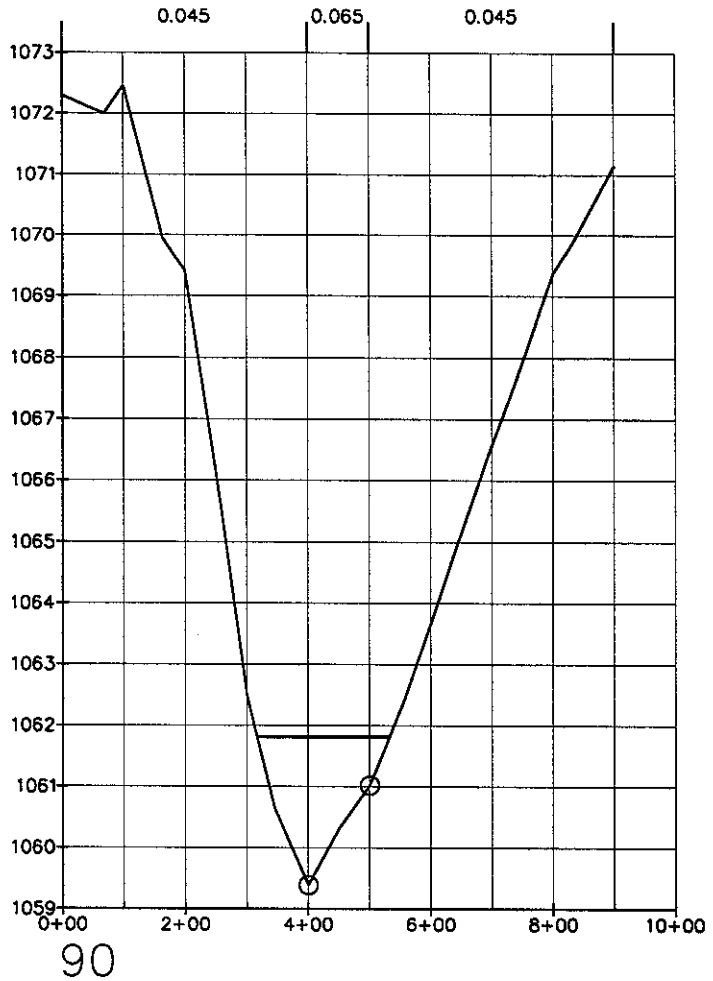
Cross-Section:	80	
Elevation:	1057.98	ft MSL
Depth:	1.89	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.2995	
Flow Regime:	Subcritical	
Flow Area:	304.00	sq ft
Average Velocity:	2.33	ft/s
Maximum Velocity:	2.72	ft/s
Composite n:	0.0544	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	297.83	ft
Wetted Top Width:	297.80	ft
Critical Slope:	0.0788	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–80

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

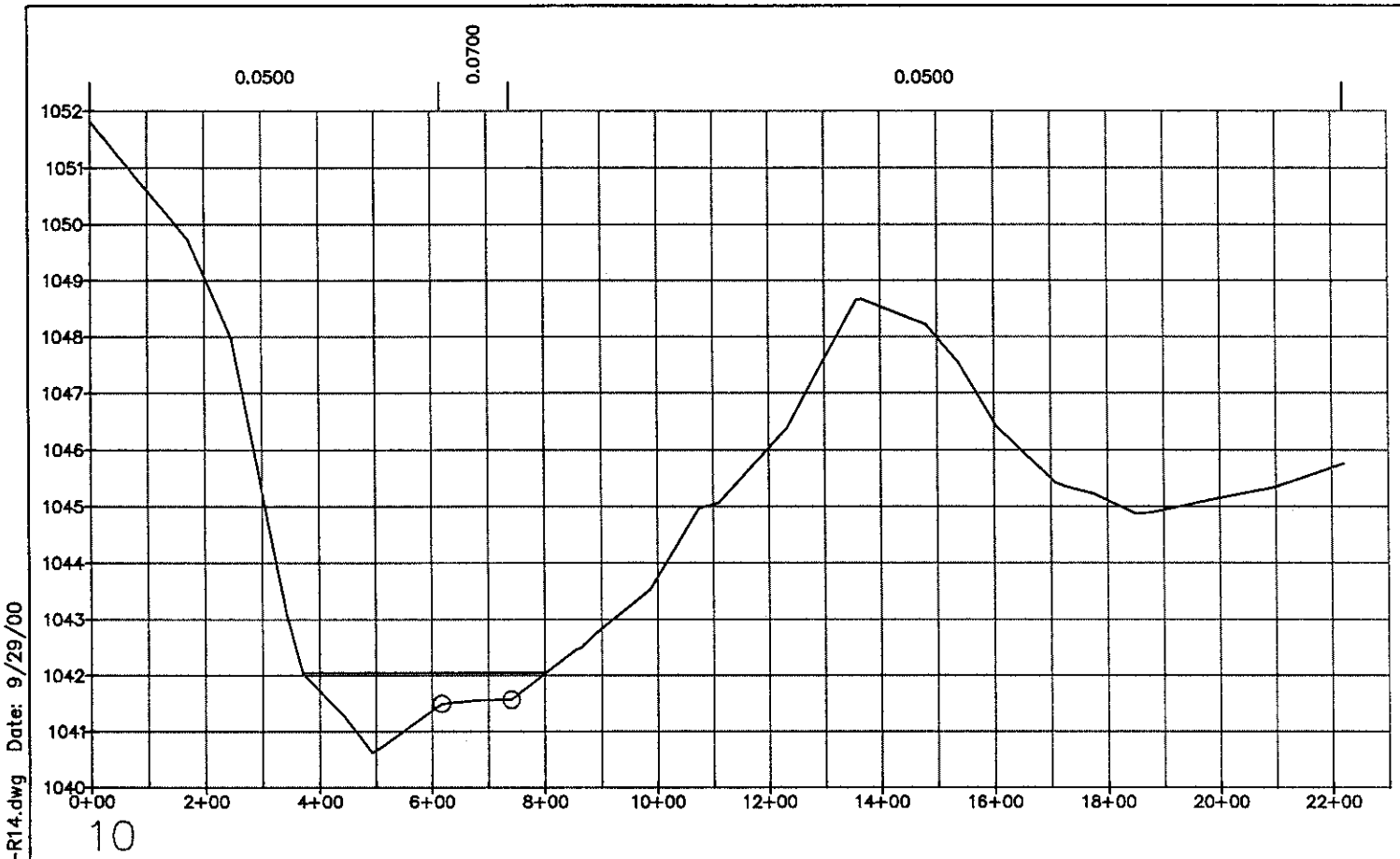
Cross-Section:	90	
Elevation:	1061.81	ft MSL
Depth:	2.42	ft
Discharge:	710.00	cfs
Energy Gradient:	0.0063	ft/ft
Froude Number:	0.2831	
Flow Regime:	Subcritical	
Flow Area:	283.92	sq ft
Average Velocity:	2.50	ft/s
Maximum Velocity:	2.94	ft/s
Composite n:	0.0597	
Hydraulic Radius:	1.32	ft
Wetted Perimeter:	215.62	ft
Wetted Top Width:	215.56	ft
Critical Slope:	0.0867	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S10–90

Entellus™

File: WASH-T1N-R5W-S10_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1042.05	ft MSL
Depth:	1.43	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0091	ft/ft
Froude Number:	0.316	
Flow Regime:	Subcritical	
Flow Area:	284.52	sq ft
Average Velocity:	2.18	ft/s
Maximum Velocity:	2.53	ft/s
Composite n:	0.056	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	431.82	ft
Wetted Top Width:	431.81	ft
Critical Slope:	0.1136	ft/ft

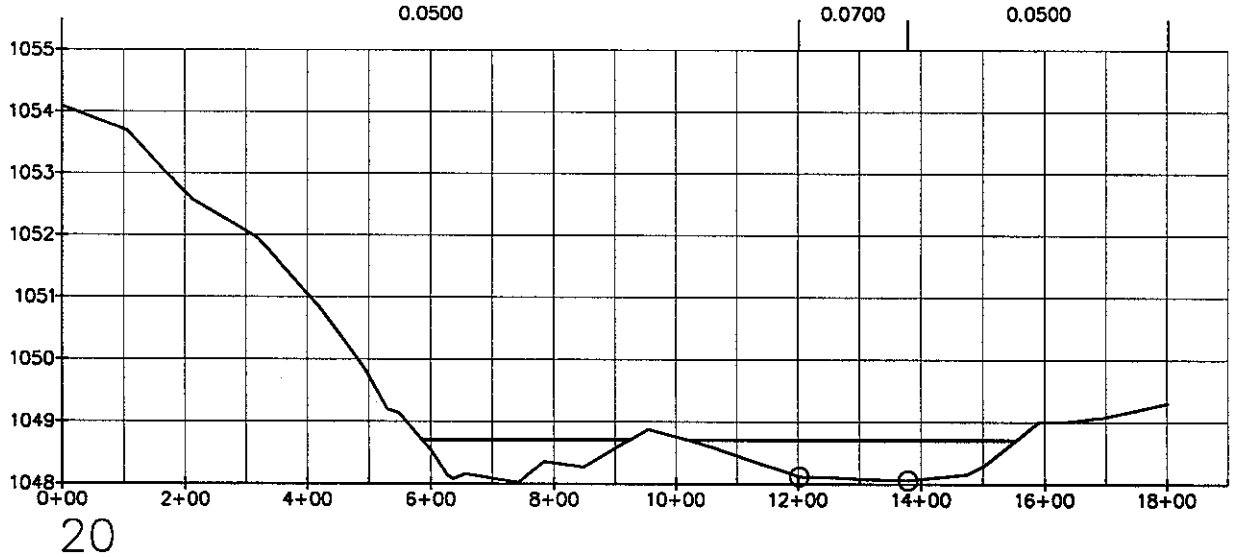
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S04–10

Entellus™

File: WASH-T1N-R5W-S04_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1048.71	ft MSL
Depth:	0.69	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0091	ft/ft
Froude Number:	0.3314	
Flow Regime:	Subcritical	
Flow Area:	390.27	sq ft
Average Velocity:	1.53	ft/s
Maximum Velocity:	1.71	ft/s
Composite n:	0.0543	
Hydraulic Radius:	0.45	ft
Wetted Perimeter:	874.79	ft
Wetted Top Width:	874.78	ft
Critical Slope:	0.0867	ft/ft

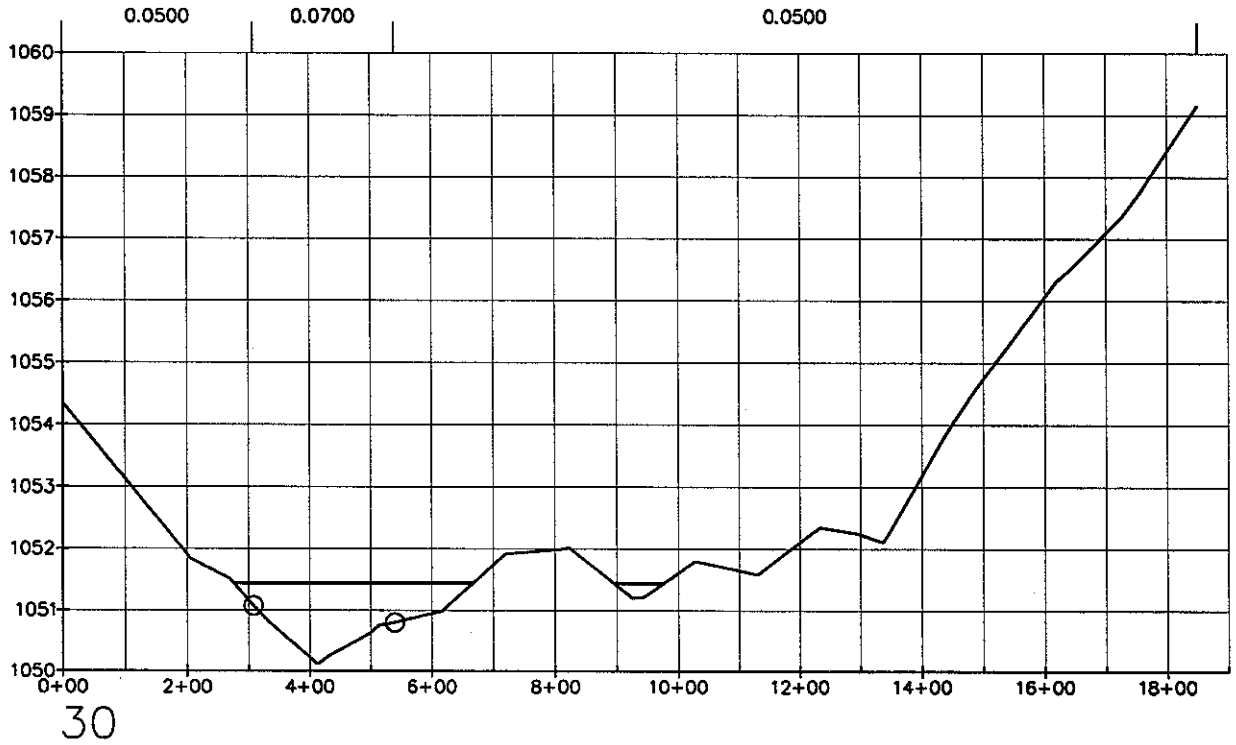
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S04–20

Entellus™

File: WASH-T1N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results		
Cross-Section:	30	
Elevation:	1051.44	ft MSL
Depth:	1.31	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0091	ft/ft
Froude Number:	0.3355	
Flow Regime:	Subcritical	
Flow Area:	280.08	sq ft
Average Velocity:	2.15	ft/s
Maximum Velocity:	2.21	ft/s
Composite n:	0.0536	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	471.71	ft
Wetted Top Width:	471.70	ft
Critical Slope:	0.1096	ft/ft

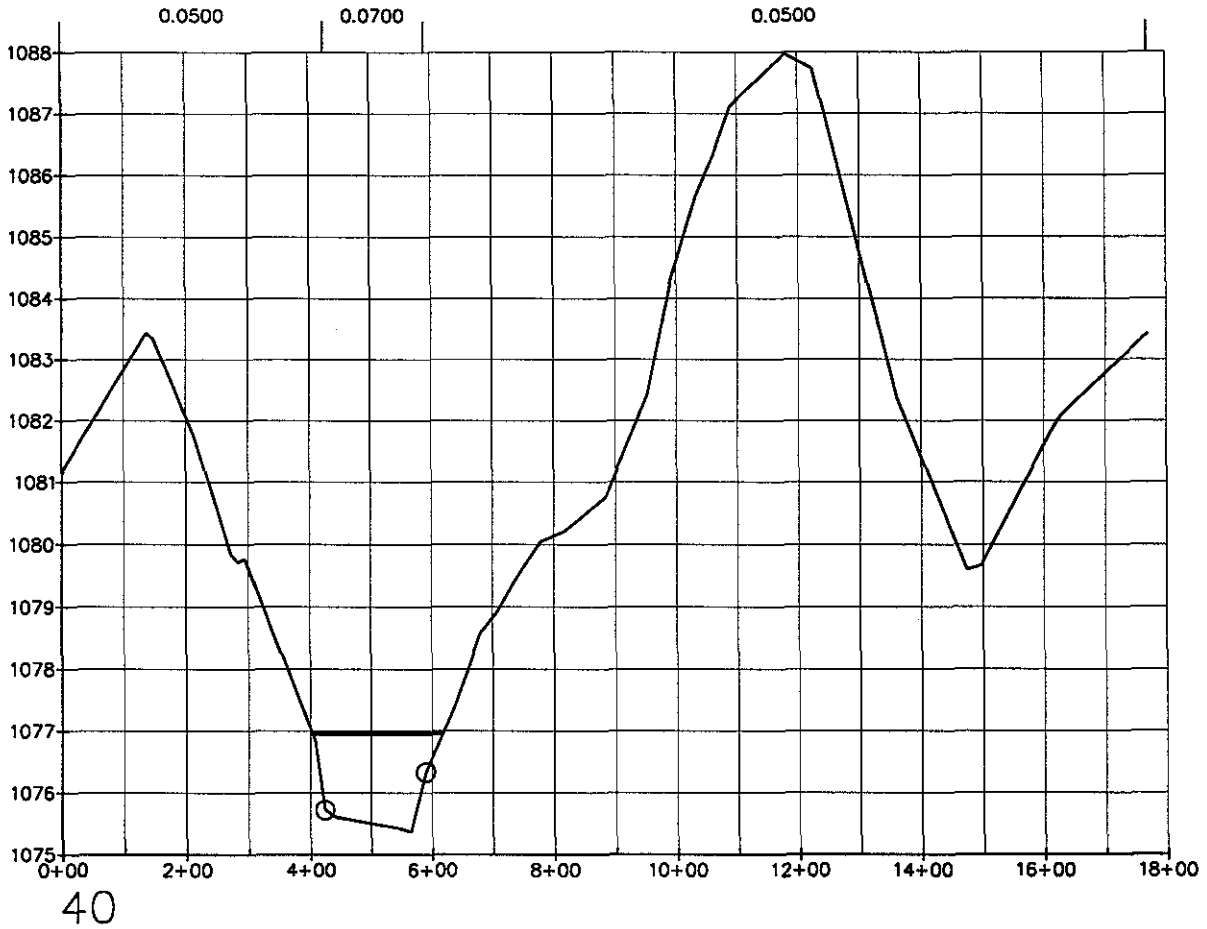
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S04–30

Entellus™

File: WASH-T1N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

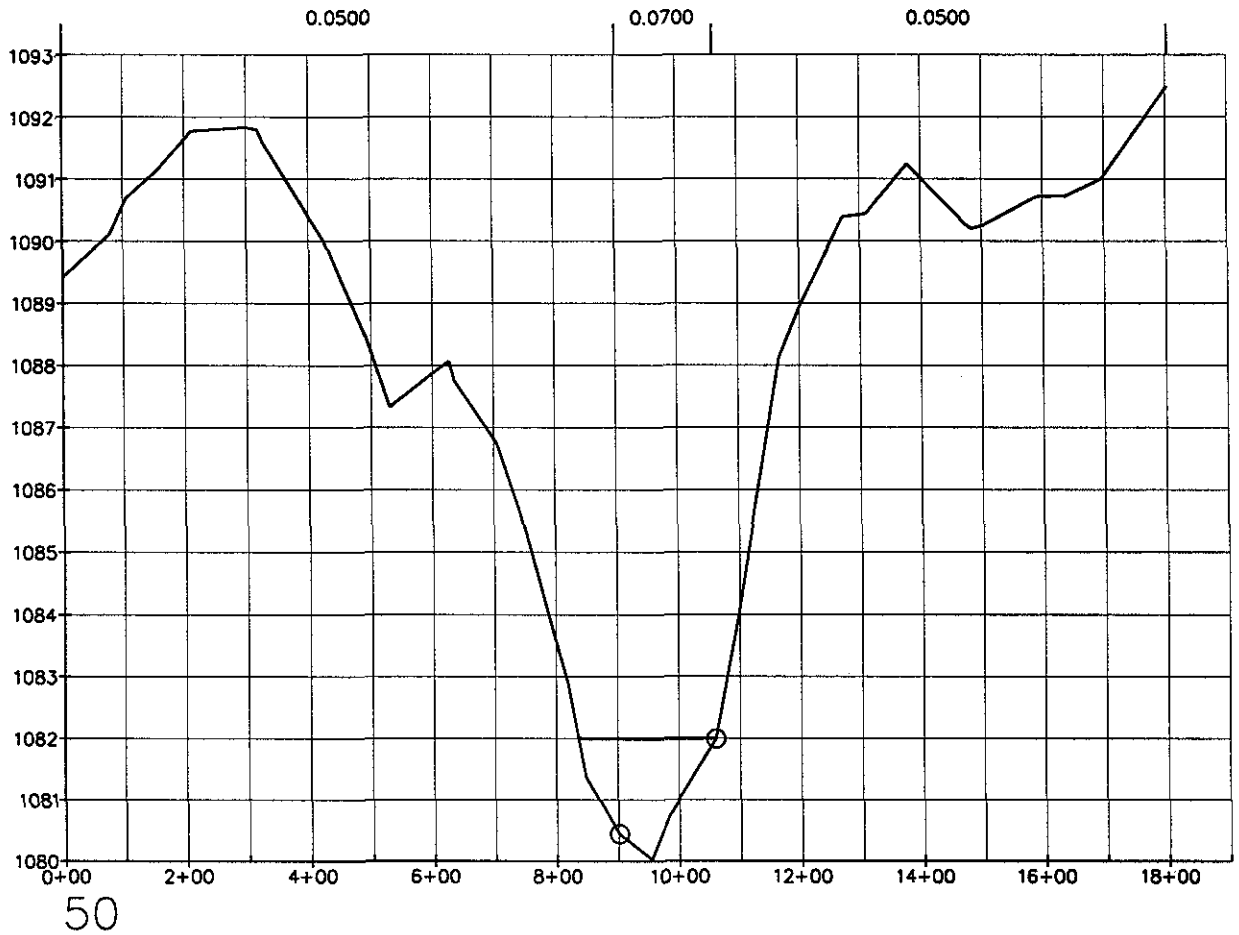
Cross-Section:	40	
Elevation:	1076.95	ft MSL
Depth:	1.58	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0091	ft/ft
Froude Number:	0.3432	
Flow Regime:	Subcritical	
Flow Area:	249.03	sq ft
Average Velocity:	2.45	ft/s
Maximum Velocity:	2.52	ft/s
Composite n:	0.0656	
Hydraulic Radius:	1.16	ft
Wetted Perimeter:	214.29	ft
Wetted Top Width:	214.22	ft
Critical Slope:	0.081	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S04–40

Entellus™

File: WASH-T1N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

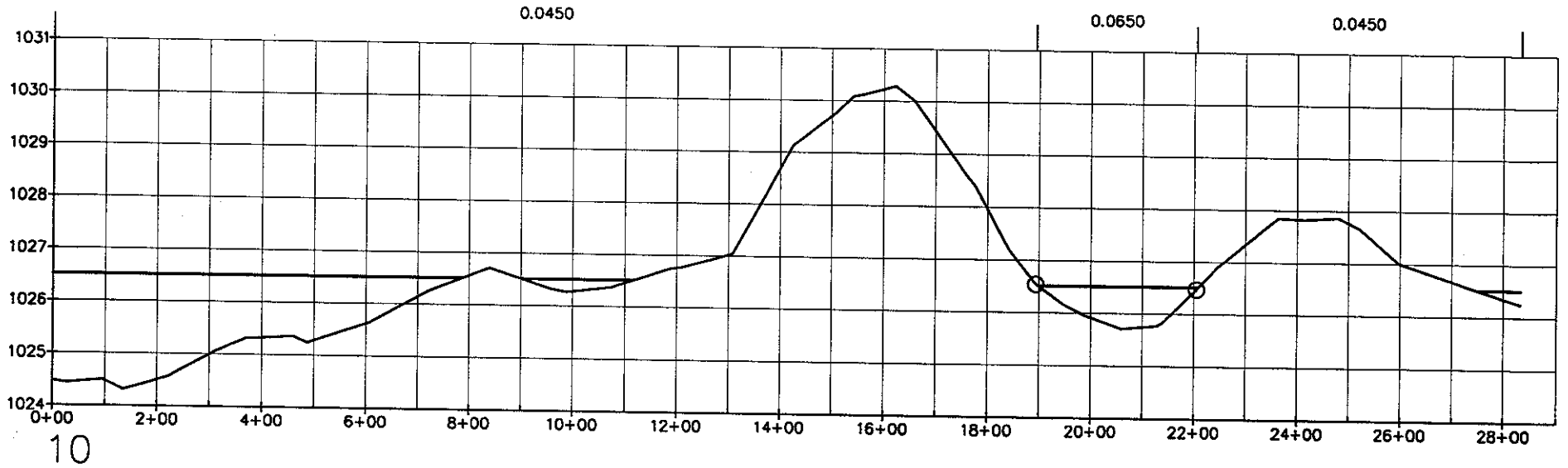
Cross-Section:	50	
Elevation:	1082.00	ft MSL
Depth:	1.98	ft
Discharge:	610.00	cfs
Energy Gradient:	0.0091	ft/ft
Froude Number:	0.3026	
Flow Regime:	Subcritical	
Flow Area:	252.44	sq ft
Average Velocity:	2.40	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0645	
Hydraulic Radius:	1.12	ft
Wetted Perimeter:	224.46	ft
Wetted Top Width:	224.41	ft
Critical Slope:	0.1022	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T1N–R5W–S04–50

Entellus™

File: WASH-T1N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



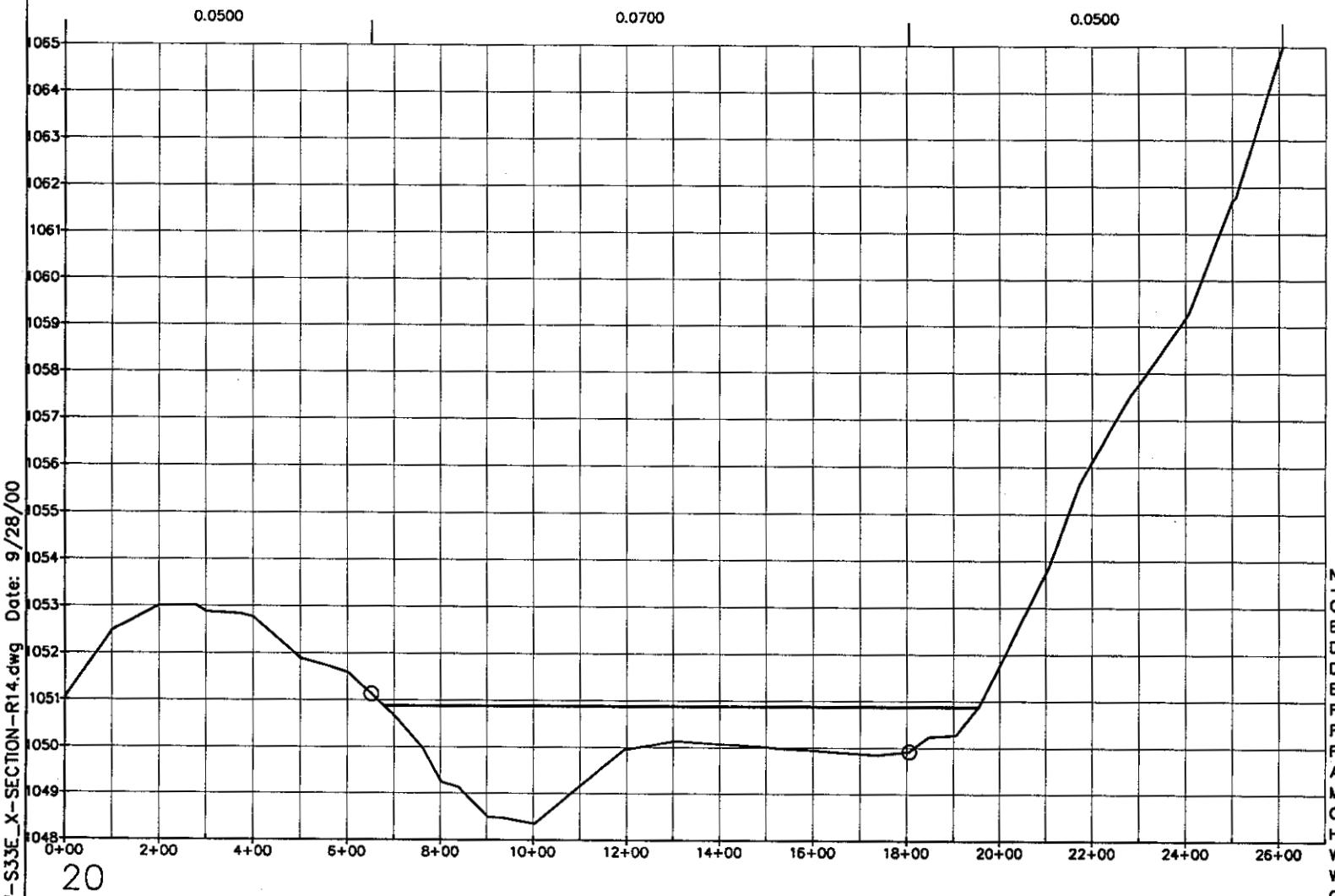
Normal Depth Results

Cross-Section:	10	
Elevation:	1026.51	ft MSL
Depth:	2.20	ft
Discharge:	3250.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3138	
Flow Regime:	Subcritical	
Flow Area:	1230.47	sq ft
Average Velocity:	2.64	ft/s
Maximum Velocity:	2.88	ft/s
Composite n:	0.0497	
Hydraulic Radius:	0.88	ft
Wetted Perimeter:	1395.07	ft
Wetted Top Width:	1395.06	ft
Critical Slope:	0.0933	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–10

Entellus™



Normal Depth Results

Cross-Section:	20	
Elevation:	1050.88	ft MSL
Depth:	2.53	ft
Discharge:	3250.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2429	
Flow Regime:	Subcritical	
Flow Area:	1483.41	sq ft
Average Velocity:	2.20	ft/s
Maximum Velocity:	2.22	ft/s
Composite n:	0.0628	
Hydraulic Radius:	1.16	ft
Wetted Perimeter:	1275.25	ft
Wetted Top Width:	1275.23	ft
Critical Slope:	0.1182	ft/ft

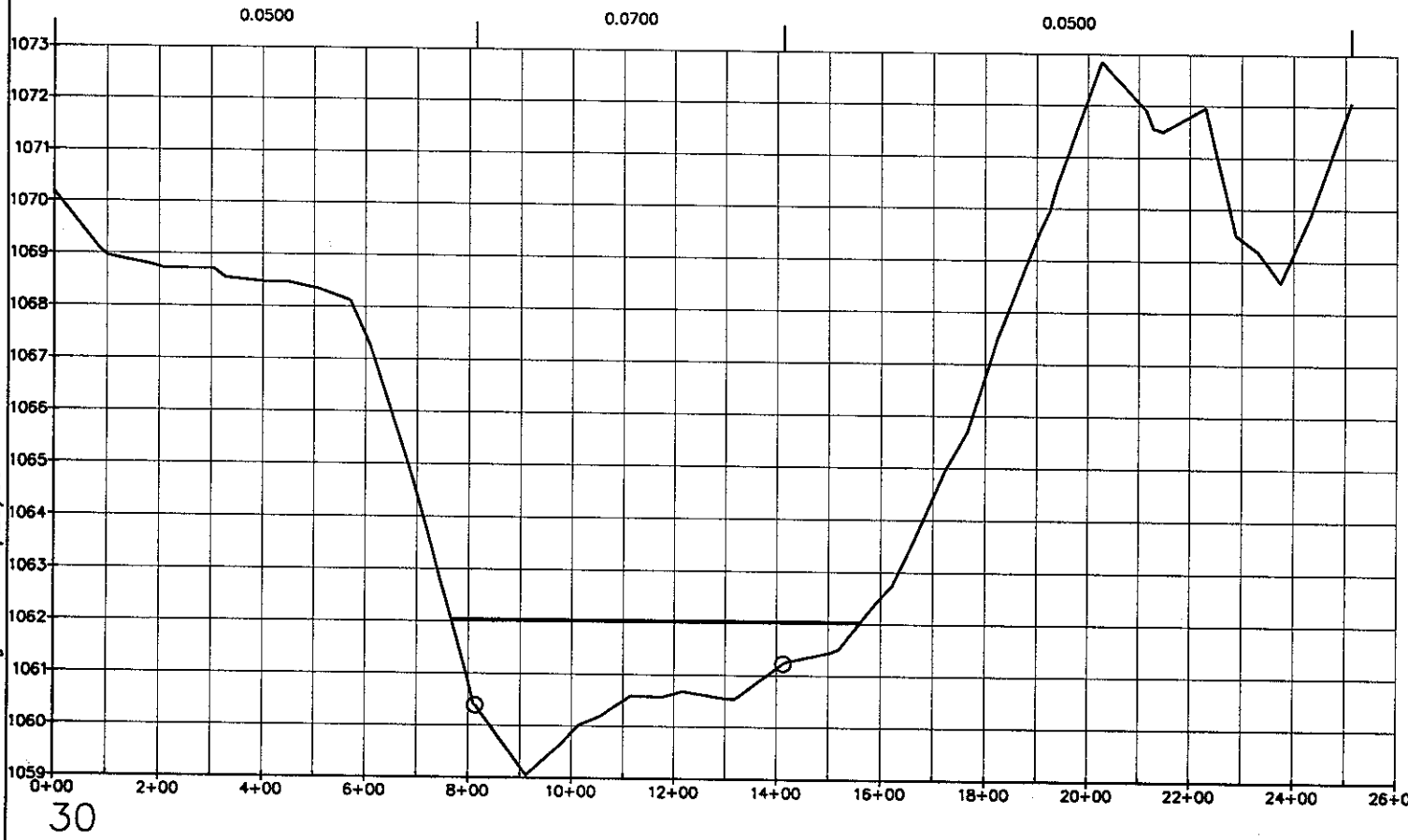
File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33E-20

Entellus™



Normal Depth Results

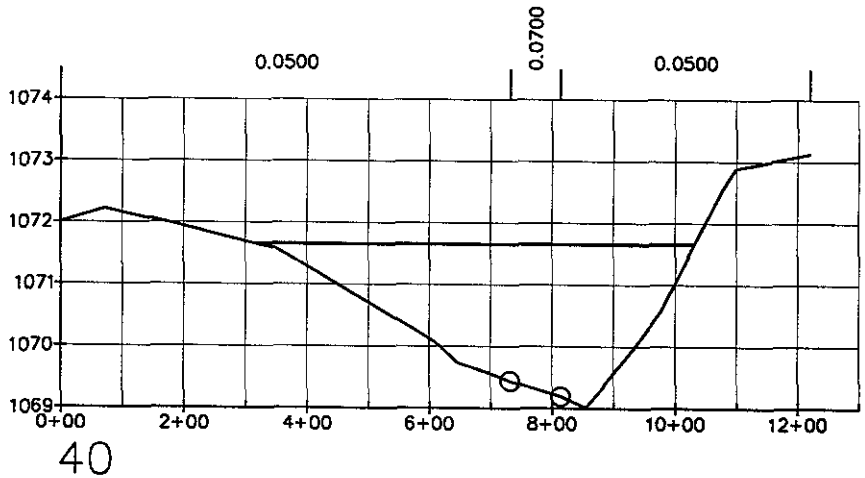
Cross-Section:	30	
Elevation:	1062.04	ft MSL
Depth:	2.99	ft
Discharge:	3250.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2797	
Flow Regime:	Subcritical	
Flow Area:	1185.38	sq ft
Average Velocity:	2.73	ft/s
Maximum Velocity:	2.81	ft/s
Composite n:	0.0604	
Hydraulic Radius:	1.49	ft
Wetted Perimeter:	794.75	ft
Wetted Top Width:	794.70	ft
Critical Slope:	0.0926	ft/ft

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33E-30

Entellus™



Normal Depth Results

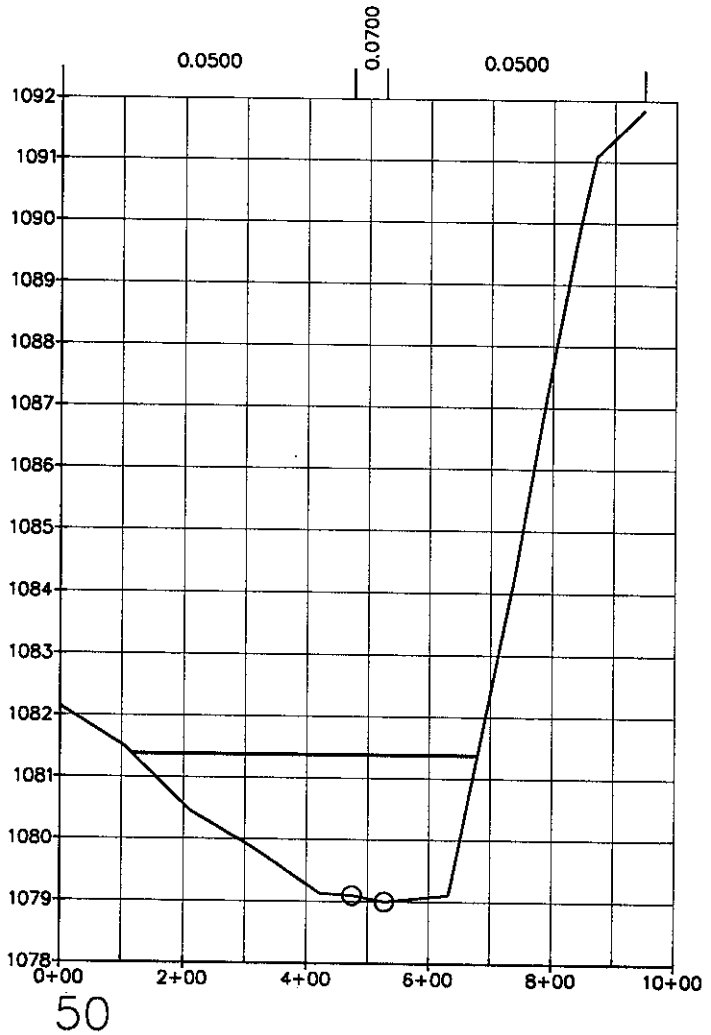
Cross-Section:	40	
Elevation:	1071.66	ft MSL
Depth:	2.65	ft
Discharge:	3080.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3297	
Flow Regime:	Subcritical	
Flow Area:	1012.29	sq ft
Average Velocity:	3.06	ft/s
Maximum Velocity:	3.51	ft/s
Composite n:	0.0524	
Hydraulic Radius:	1.42	ft
Wetted Perimeter:	714.40	ft
Wetted Top Width:	714.37	ft
Critical Slope:	0.0663	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–40

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

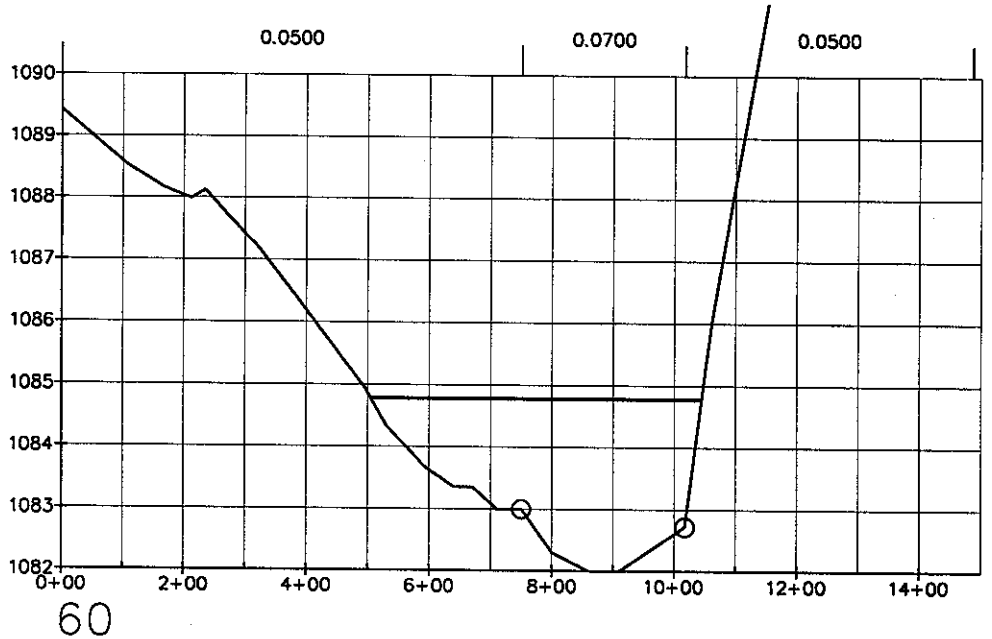
Cross-Section:	50	
Elevation:	1081.38	ft MSL
Depth:	2.38	ft
Discharge:	3080.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3853	
Flow Regime:	Subcritical	
Flow Area:	913.11	sq ft
Average Velocity:	3.36	ft/s
Maximum Velocity:	3.90	ft/s
Composite n:	0.052	
Hydraulic Radius:	1.63	ft
Wetted Perimeter:	561.73	ft
Wetted Top Width:	561.66	ft
Critical Slope:	0.0488	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–50

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

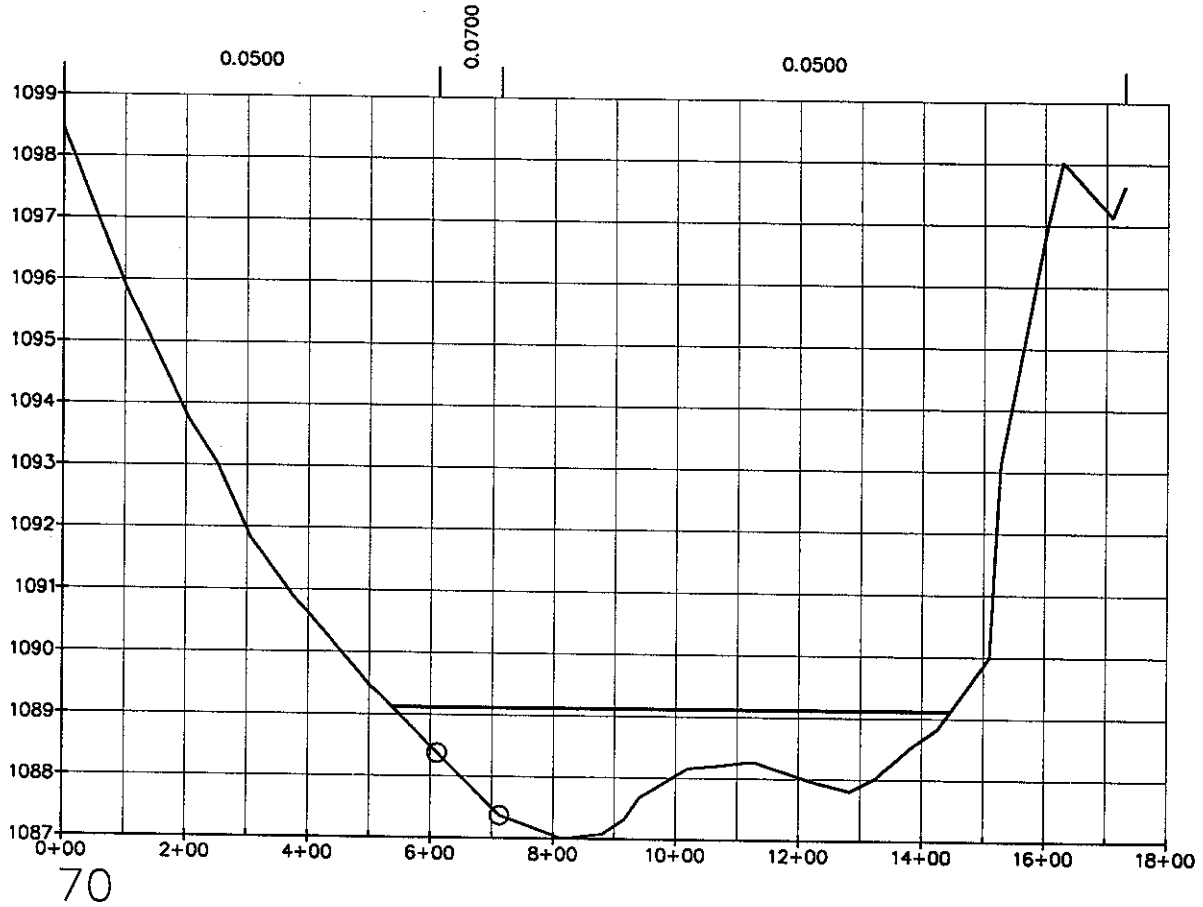
Cross-Section:	60	
Elevation:	1084.78	ft MSL
Depth:	2.78	ft
Discharge:	3080.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3306	
Flow Regime:	Subcritical	
Flow Area:	984.36	sq ft
Average Velocity:	3.11	ft/s
Maximum Velocity:	3.27	ft/s
Composite n:	0.0603	
Hydraulic Radius:	1.82	ft
Wetted Perimeter:	540.35	ft
Wetted Top Width:	540.25	ft
Critical Slope:	0.0659	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–60

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

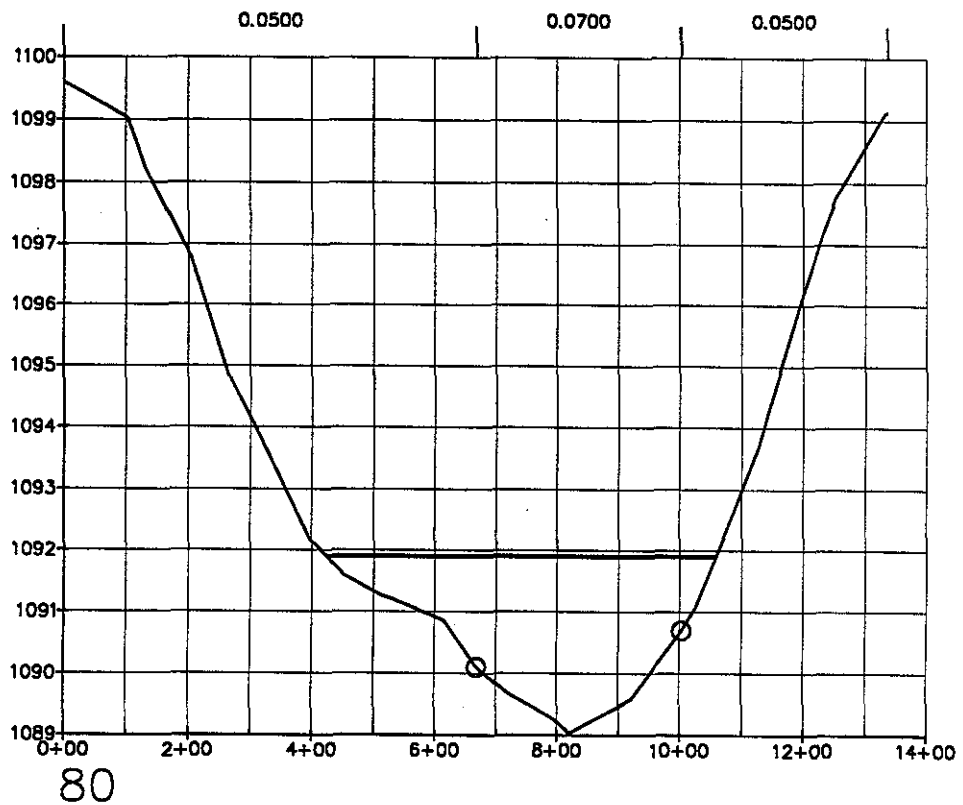
Cross-Section:	70	
Elevation:	1089.12	ft MSL
Depth:	2.12	ft
Discharge:	3010.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3378	
Flow Regime:	Subcritical	
Flow Area:	1078.93	sq ft
Average Velocity:	2.77	ft/s
Maximum Velocity:	2.91	ft/s
Composite n:	0.0524	
Hydraulic Radius:	1.19	ft
Wetted Perimeter:	908.78	ft
Wetted Top Width:	908.76	ft
Critical Slope:	0.0671	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–70

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

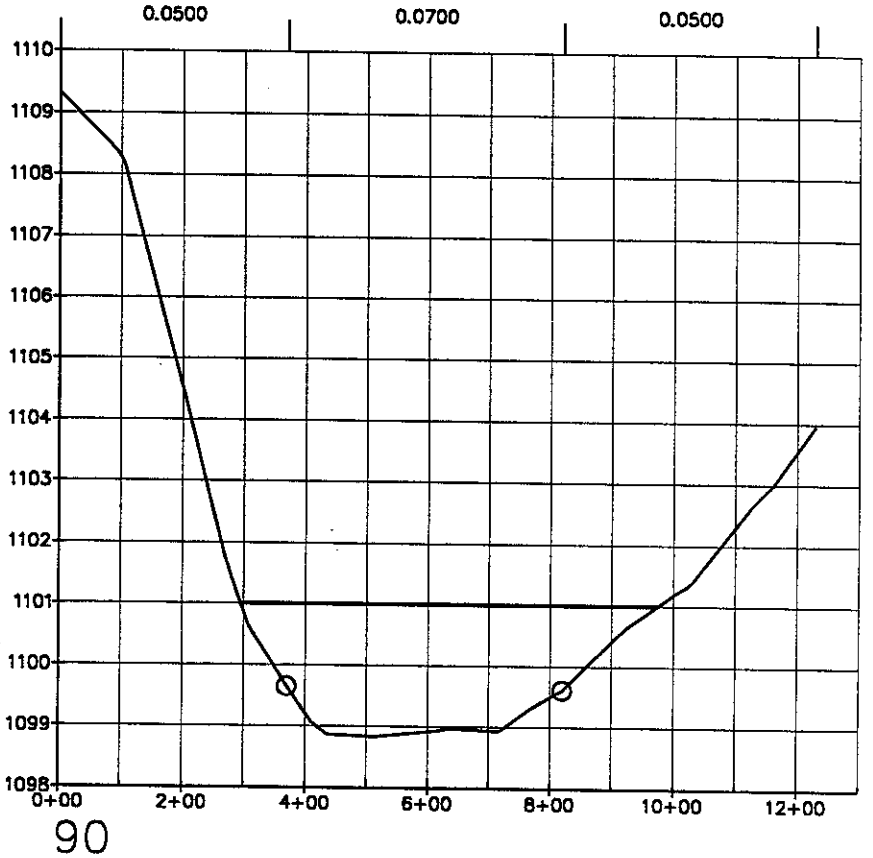
Cross-Section:	80	
Elevation:	1091.90	ft MSL
Depth:	2.87	ft
Discharge:	2840.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2976	
Flow Regime:	Subcritical	
Flow Area:	992.90	sq ft
Average Velocity:	2.85	ft/s
Maximum Velocity:	3.08	ft/s
Composite n:	0.0609	
Hydraulic Radius:	1.56	ft
Wetted Perimeter:	636.08	ft
Wetted Top Width:	636.05	ft
Critical Slope:	0.0852	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–80

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

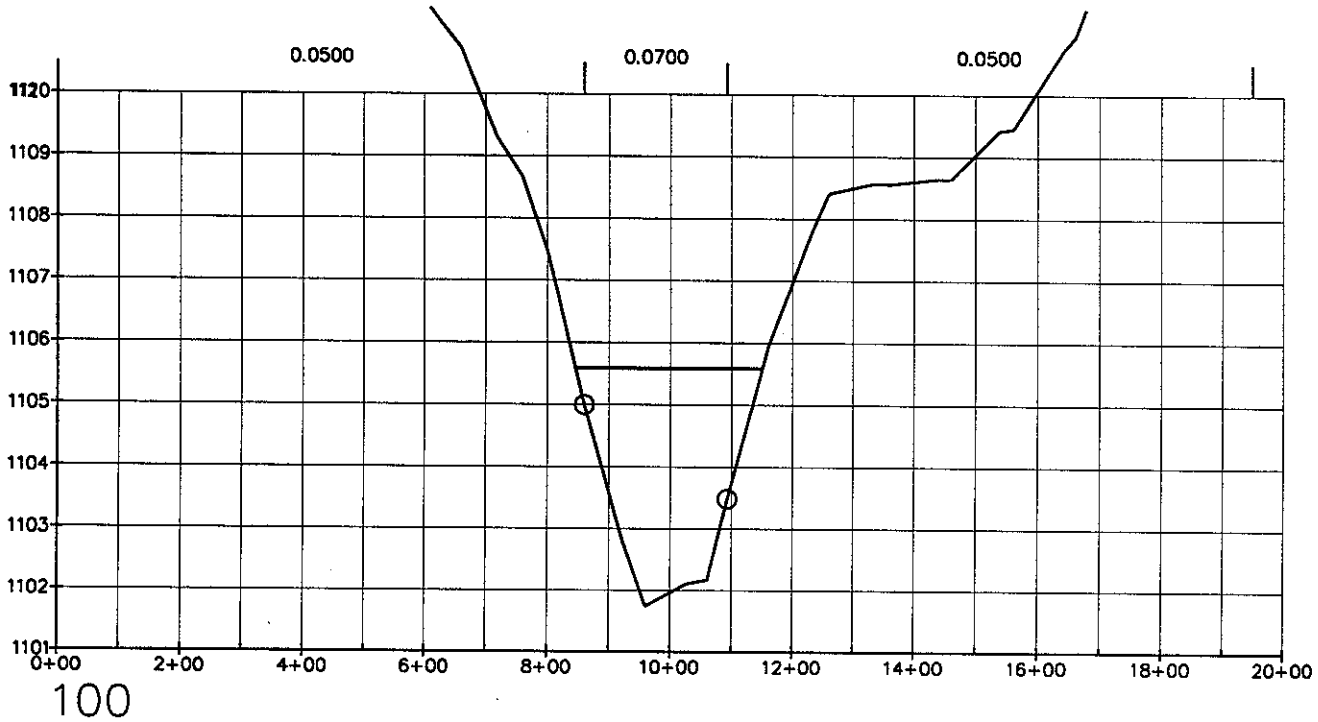
Cross-Section:	90	
Elevation:	1101.03	ft MSL
Depth:	2.20	ft
Discharge:	2840.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3187	
Flow Regime:	Subcritical	
Flow Area:	1059.56	sq ft
Average Velocity:	2.69	ft/s
Maximum Velocity:	2.82	ft/s
Composite n:	0.0635	
Hydraulic Radius:	1.55	ft
Wetted Perimeter:	683.66	ft
Wetted Top Width:	683.63	ft
Critical Slope:	0.0716	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–90

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	100	
Elevation:	1105.59	ft MSL
Depth:	3.85	ft
Discharge:	2840.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3436	
Flow Regime:	Subcritical	
Flow Area:	742.93	sq ft
Average Velocity:	3.81	ft/s
Maximum Velocity:	3.91	ft/s
Composite n:	0.0605	
Hydraulic Radius:	2.44	ft
Wetted Perimeter:	304.45	ft
Wetted Top Width:	304.32	ft
Critical Slope:	0.0622	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–100

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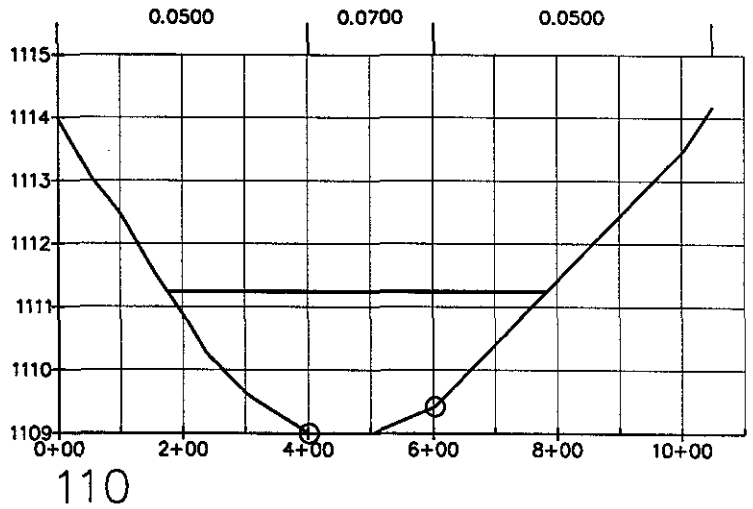
File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



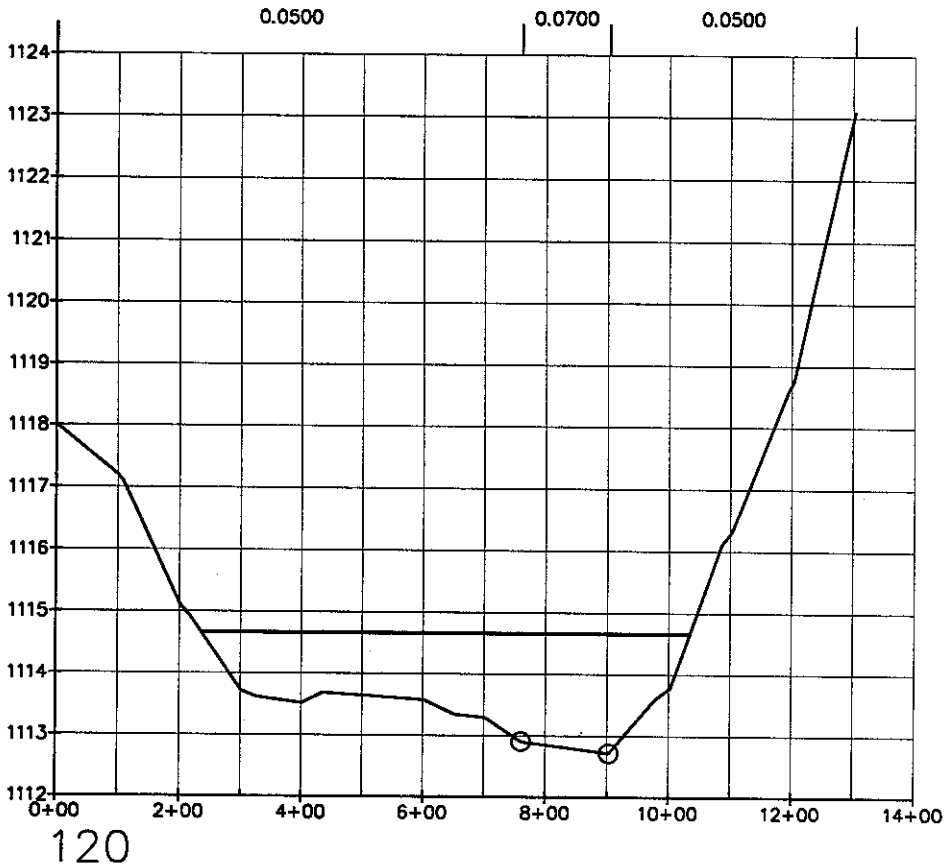
Normal Depth Results

Cross-Section:	110	
Elevation:	1111.24	ft MSL
Depth:	2.24	ft
Discharge:	2840.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3724	
Flow Regime:	Subcritical	
Flow Area:	898.21	sq ft
Average Velocity:	3.14	ft/s
Maximum Velocity:	3.39	ft/s
Composite n:	0.052	
Hydraulic Radius:	1.48	ft
Wetted Perimeter:	607.53	ft
Wetted Top Width:	607.51	ft
Critical Slope:	0.0521	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–110

Entellus™



Normal Depth Results

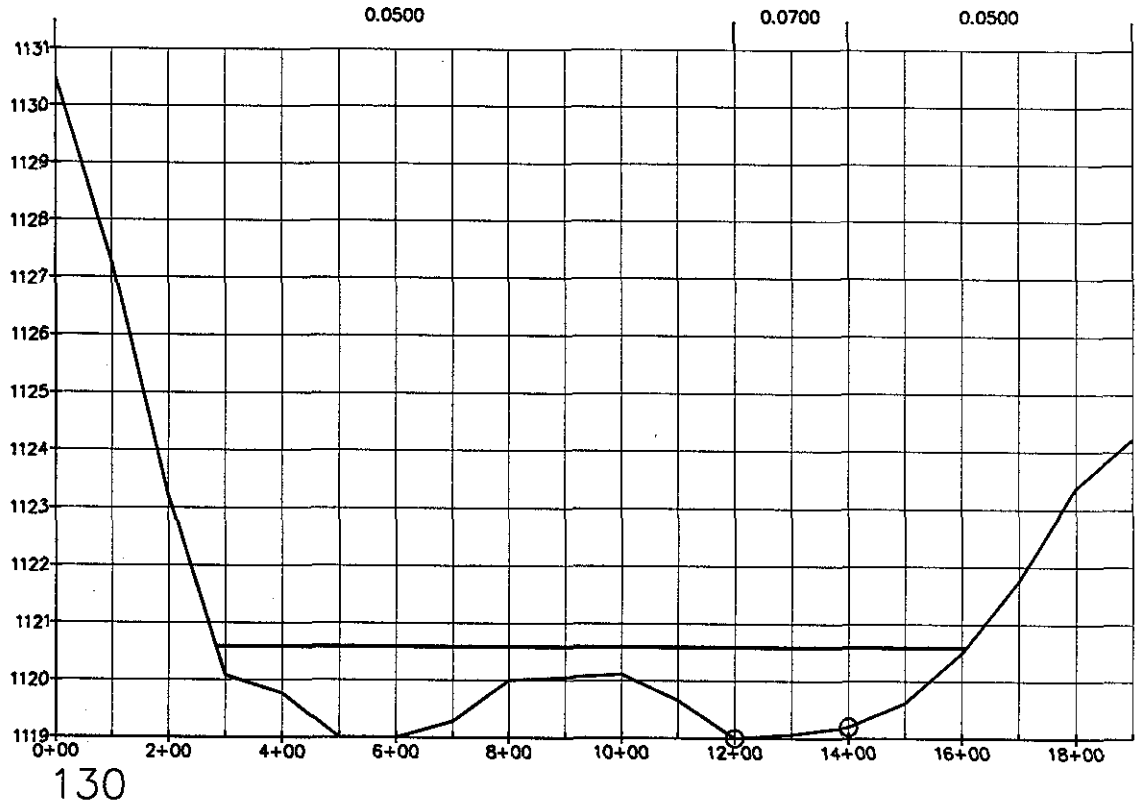
Cross-Section:	120	
Elevation:	1114.66	ft MSL
Depth:	1.94	ft
Discharge:	2840.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3675	
Flow Regime:	Subcritical	
Flow Area:	977.23	sq ft
Average Velocity:	2.92	ft/s
Maximum Velocity:	3.04	ft/s
Composite n:	0.0488	
Hydraulic Radius:	1.22	ft
Wetted Perimeter:	798.56	ft
Wetted Top Width:	798.53	ft
Critical Slope:	0.0513	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–120

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

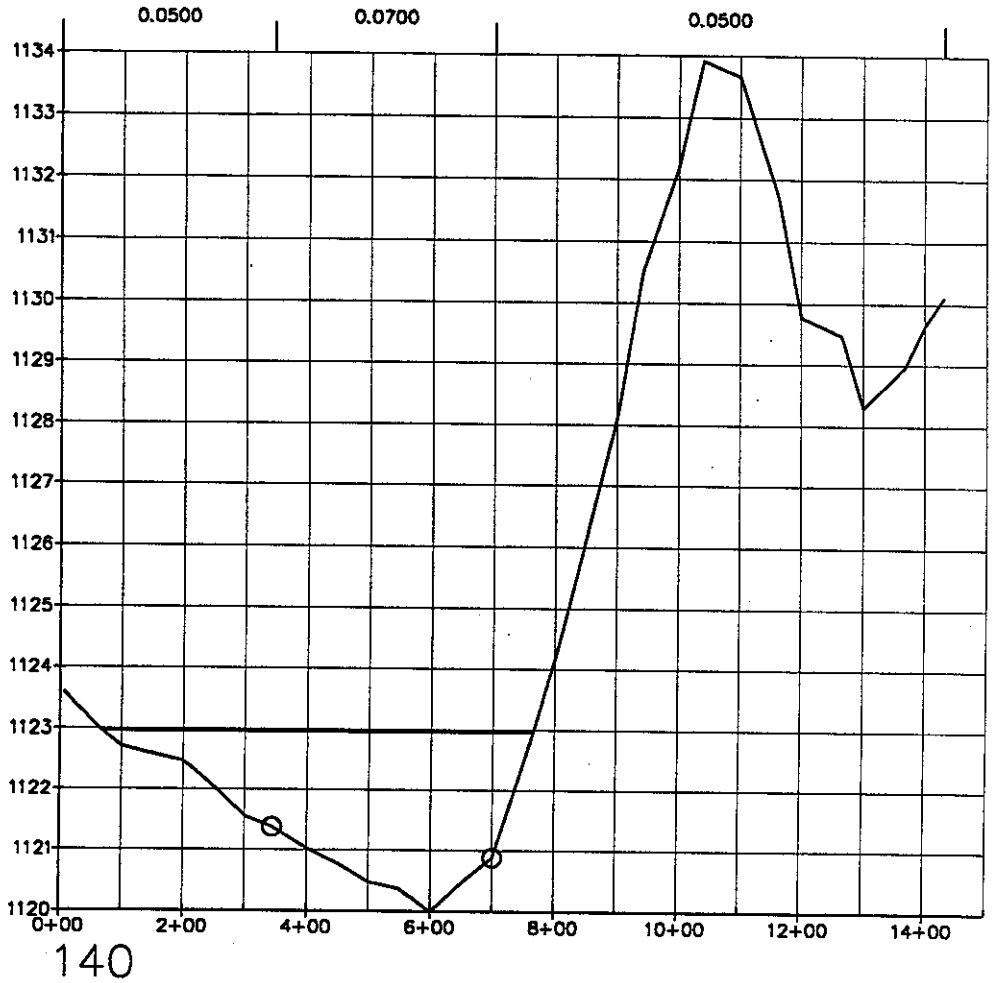
Cross-Section:	130	
Elevation:	1120.59	ft MSL
Depth:	1.59	ft
Discharge:	2840.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2917	
Flow Regime:	Subcritical	
Flow Area:	1362.23	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.13	ft/s
Composite n:	0.0482	
Hydraulic Radius:	1.03	ft
Wetted Perimeter:	1323.10	ft
Wetted Top Width:	1323.08	ft
Critical Slope:	0.0515	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–130

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

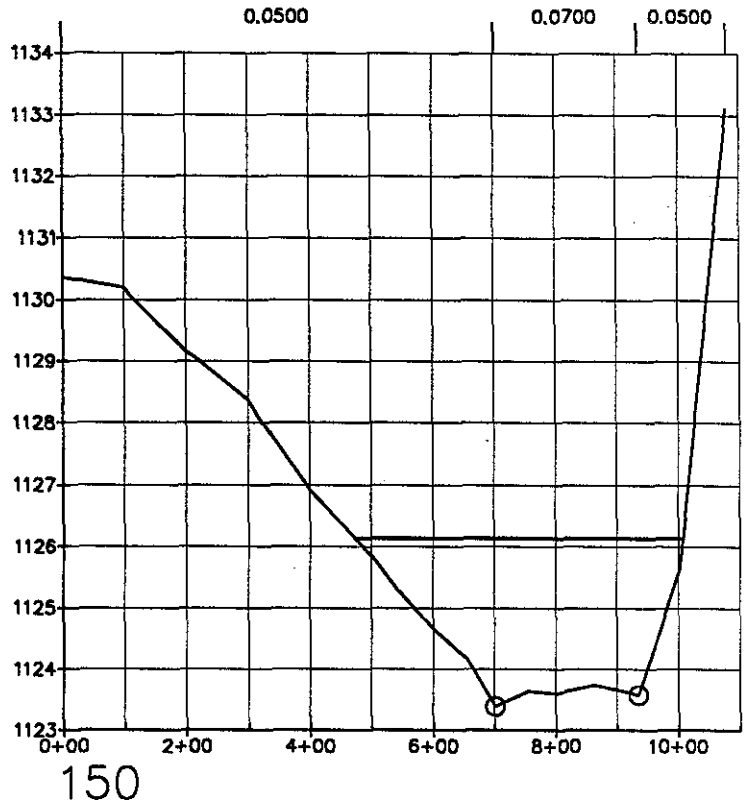
Cross-Section:	140	
Elevation:	1122.97	ft MSL
Depth:	2.97	ft
Discharge:	2550.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2344	
Flow Regime:	Subcritical	
Flow Area:	1112.11	sq ft
Average Velocity:	2.28	ft/s
Maximum Velocity:	2.47	ft/s
Composite n:	0.0606	
Hydraulic Radius:	1.59	ft
Wetted Perimeter:	697.93	ft
Wetted Top Width:	697.88	ft
Critical Slope:	0.085	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–140

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

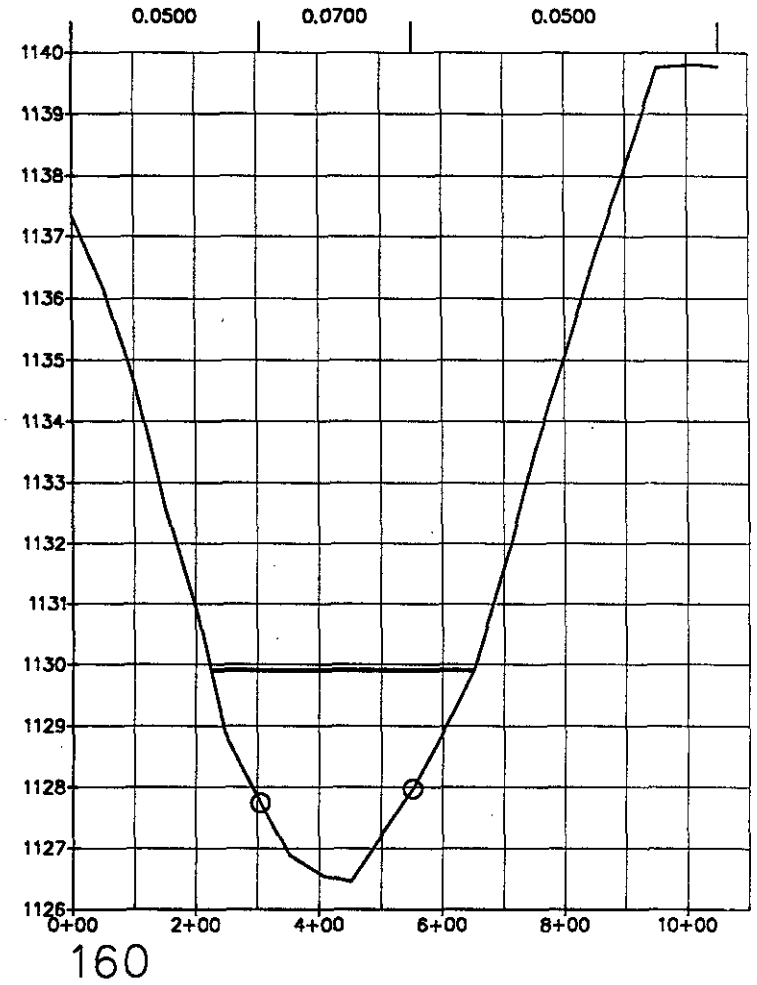
Cross-Section:	150	
Elevation:	1126.17	ft MSL
Depth:	2.78	ft
Discharge:	2550.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2679	
Flow Regime:	Subcritical	
Flow Area:	1006.69	sq ft
Average Velocity:	2.52	ft/s
Maximum Velocity:	2.60	ft/s
Composite n:	0.0591	
Hydraulic Radius:	1.87	ft
Wetted Perimeter:	537.19	ft
Wetted Top Width:	537.12	ft
Critical Slope:	0.0609	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–150

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

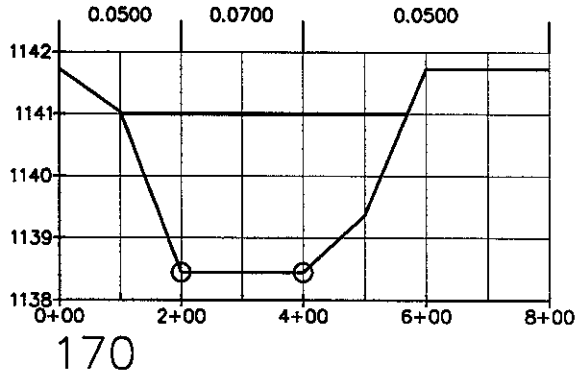
Cross-Section:	160	
Elevation:	1129.81	ft MSL
Depth:	3.35	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2531	
Flow Regime:	Subcritical	
Flow Area:	879.00	sq ft
Average Velocity:	2.63	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.0621	
Hydraulic Radius:	2.09	ft
Wetted Perimeter:	420.11	ft
Wetted Top Width:	420.04	ft
Critical Slope:	0.07	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–160

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

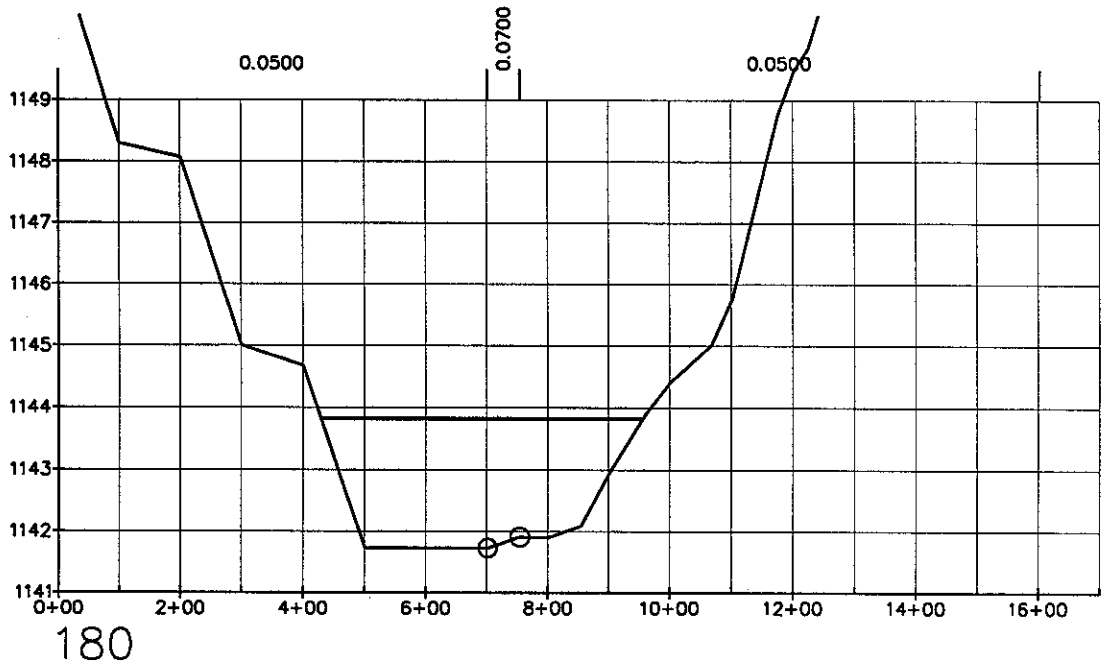
Cross-Section:	170	
Elevation:	1141.00	ft MSL
Depth:	2.55	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2828	
Flow Regime:	Subcritical	
Flow Area:	901.90	sq ft
Average Velocity:	2.57	ft/s
Maximum Velocity:	2.64	ft/s
Composite n:	0.0589	
Hydraulic Radius:	1.93	ft
Wetted Perimeter:	468.03	ft
Wetted Top Width:	467.97	ft
Critical Slope:	0.0535	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–170

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

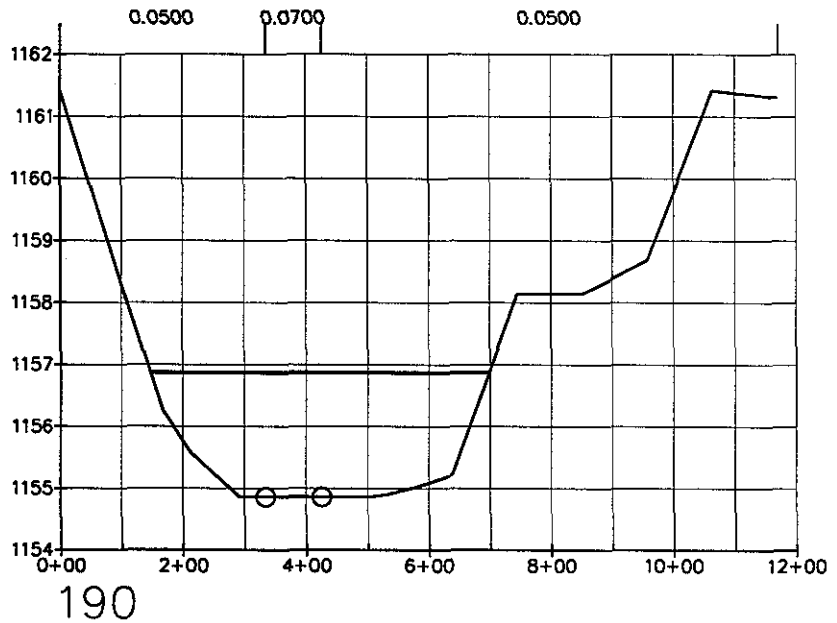
Cross-Section:	180	
Elevation:	1143.82	ft MSL
Depth:	2.09	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3233	
Flow Regime:	Subcritical	
Flow Area:	871.16	sq ft
Average Velocity:	2.66	ft/s
Maximum Velocity:	2.91	ft/s
Composite n:	0.0521	
Hydraulic Radius:	1.66	ft
Wetted Perimeter:	526.33	ft
Wetted Top Width:	526.29	ft
Critical Slope:	0.0421	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–180

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

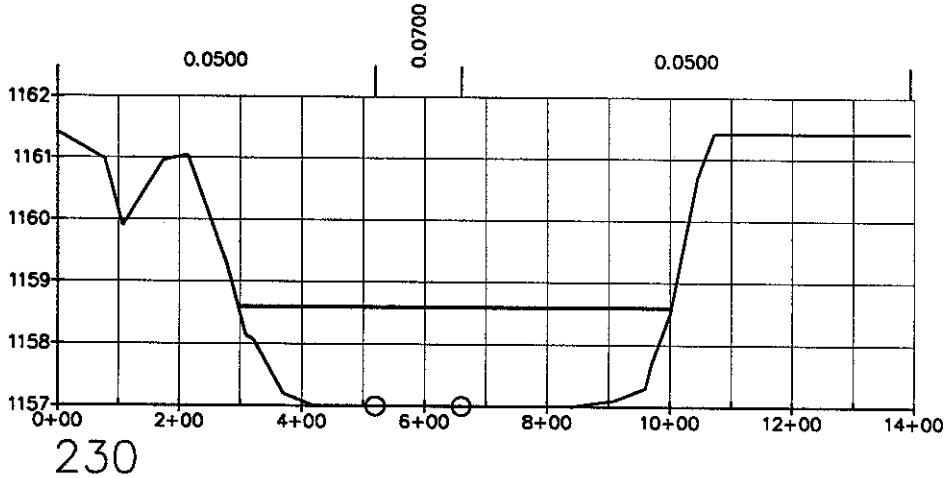
Cross-Section:	190	
Elevation:	1156.87	ft MSL
Depth:	2.01	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3179	
Flow Regime:	Subcritical	
Flow Area:	903.94	sq ft
Average Velocity:	2.56	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0535	
Hydraulic Radius:	1.64	ft
Wetted Perimeter:	551.38	ft
Wetted Top Width:	551.34	ft
Critical Slope:	0.0431	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–190

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

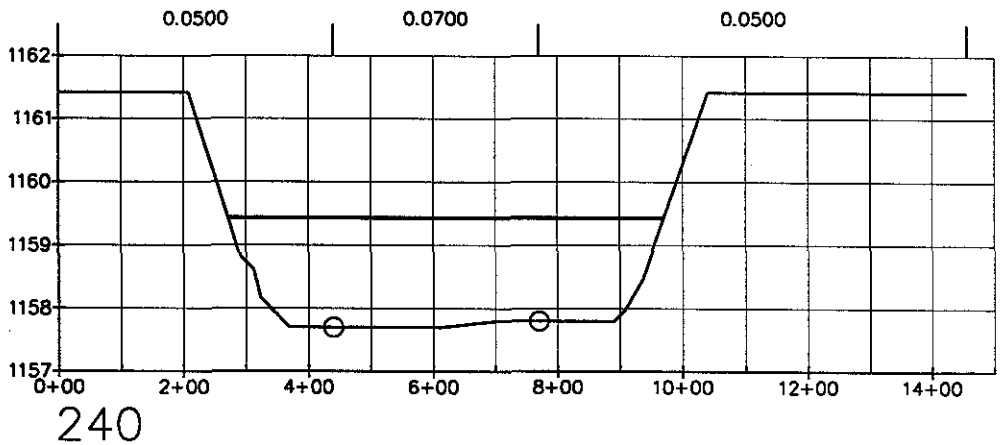
Cross-Section:	230	
Elevation:	1158.59	ft MSL
Depth:	1.59	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3213	
Flow Regime:	Subcritical	
Flow Area:	1003.66	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0542	
Hydraulic Radius:	1.42	ft
Wetted Perimeter:	705.15	ft
Wetted Top Width:	705.12	ft
Critical Slope:	0.0424	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–230

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



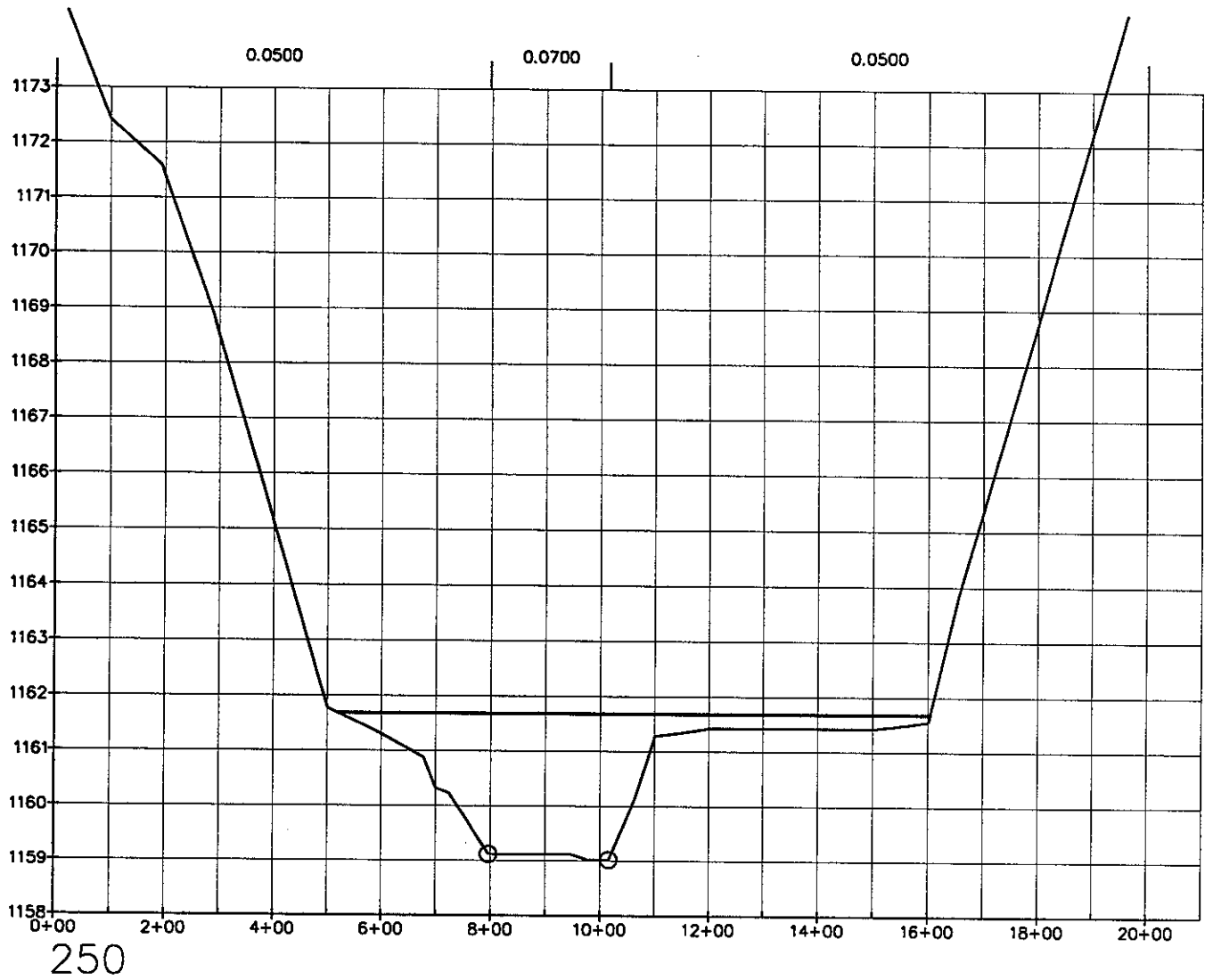
Normal Depth Results

Cross-Section:	240	
Elevation:	1159.43	ft MSL
Depth:	1.73	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2921	
Flow Regime:	Subcritical	
Flow Area:	1058.89	sq ft
Average Velocity:	2.18	ft/s
Maximum Velocity:	2.41	ft/s
Composite n:	0.0598	
Hydraulic Radius:	1.52	ft
Wetted Perimeter:	698.59	ft
Wetted Top Width:	698.55	ft
Critical Slope:	0.0517	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–240

Entellus™



Normal Depth Results

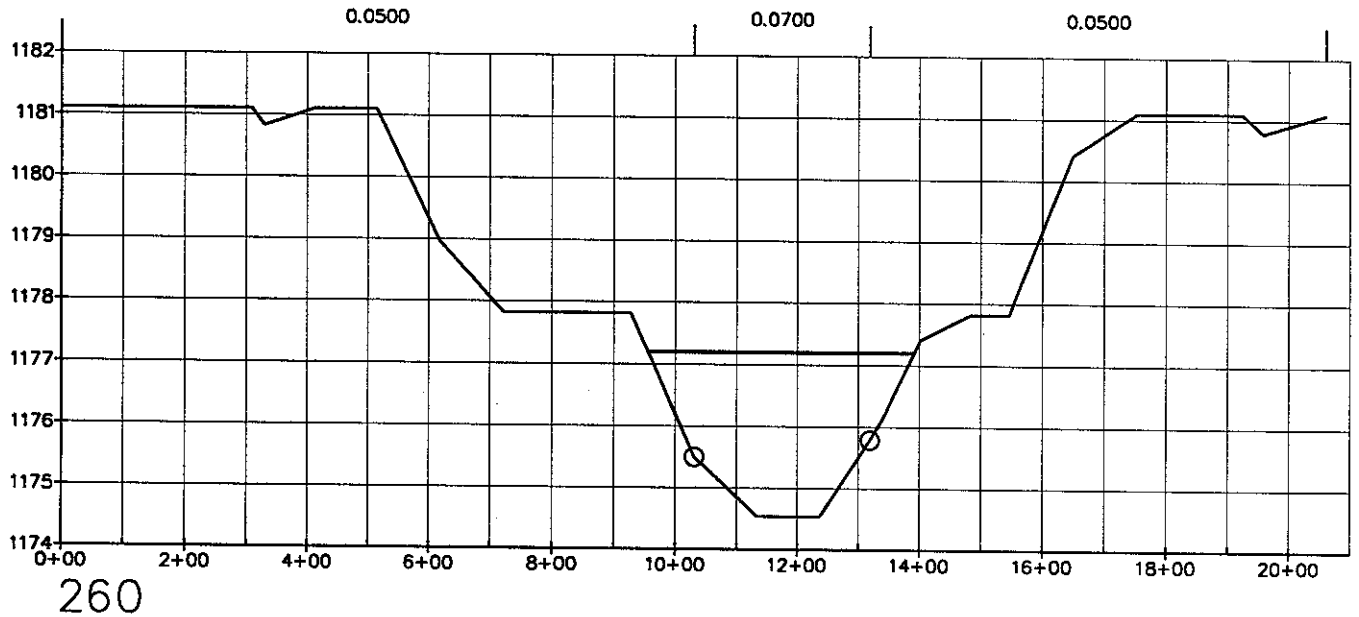
Cross-Section:	250	
Elevation:	1161.68	ft MSL
Depth:	2.66	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2279	
Flow Regime:	Subcritical	
Flow Area:	1096.00	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.63	ft/s
Composite n:	0.0543	
Hydraulic Radius:	1.01	ft
Wetted Perimeter:	1083.57	ft
Wetted Top Width:	1083.51	ft
Critical Slope:	0.112	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–250

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

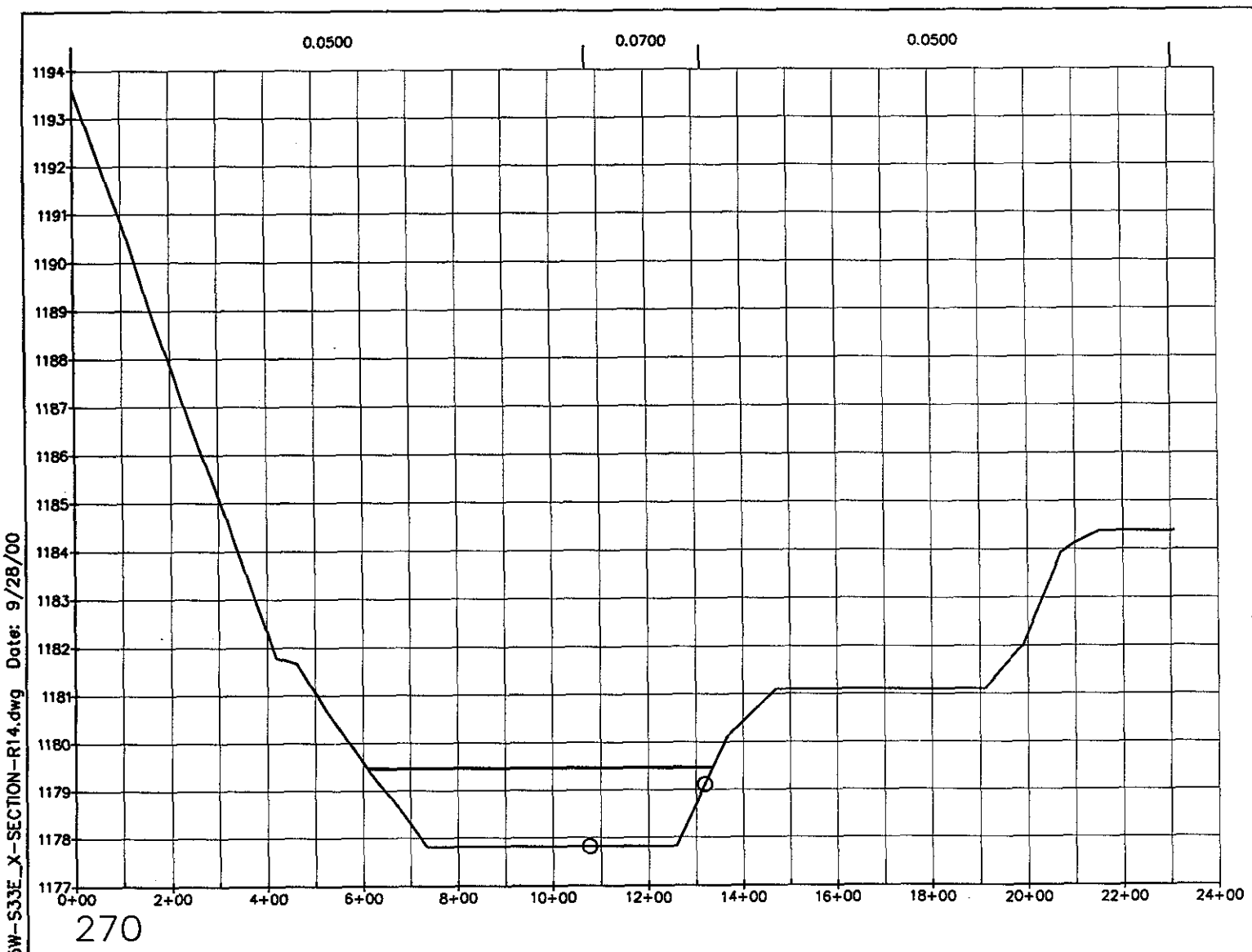
Cross-Section:	260	
Elevation:	1177.20	ft MSL
Depth:	2.66	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3193	
Flow Regime:	Subcritical	
Flow Area:	782.43	sq ft
Average Velocity:	2.94	ft/s
Maximum Velocity:	3.09	ft/s
Composite n:	0.0537	
Hydraulic Radius:	1.79	ft
Wetted Perimeter:	436.06	ft
Wetted Top Width:	436.01	ft
Critical Slope:	0.0509	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–260

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	270	
Elevation:	1179.47	ft MSL
Depth:	1.65	ft
Discharge:	2310.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3087	
Flow Regime:	Subcritical	
Flow Area:	1027.73	sq ft
Average Velocity:	2.24	ft/s
Maximum Velocity:	2.47	ft/s
Composite n:	0.057	
Hydraulic Radius:	1.41	ft
Wetted Perimeter:	726.34	ft
Wetted Top Width:	726.31	ft
Critical Slope:	0.0489	ft/ft

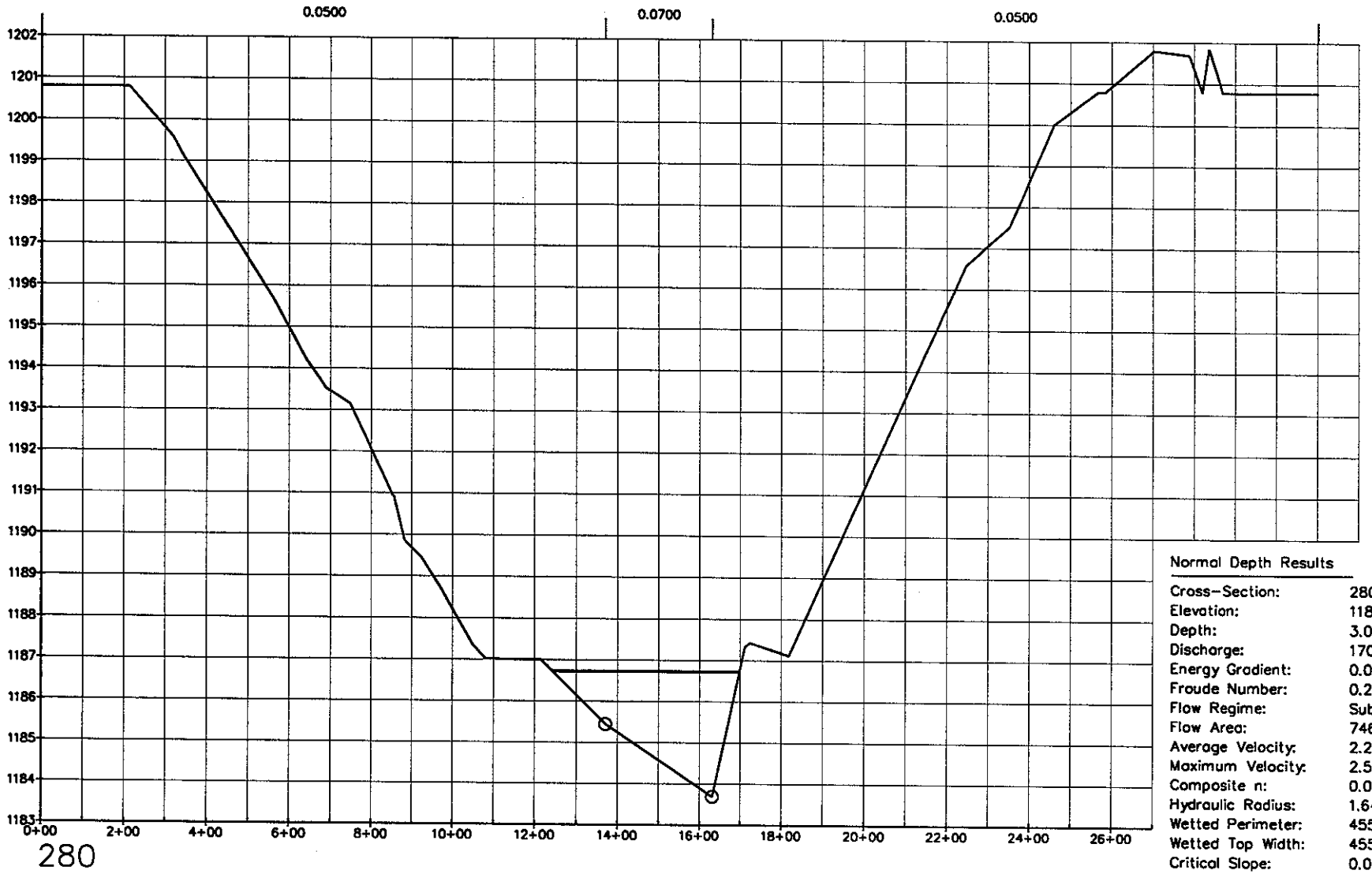
File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33E-270

Entellus™



Normal Depth Results

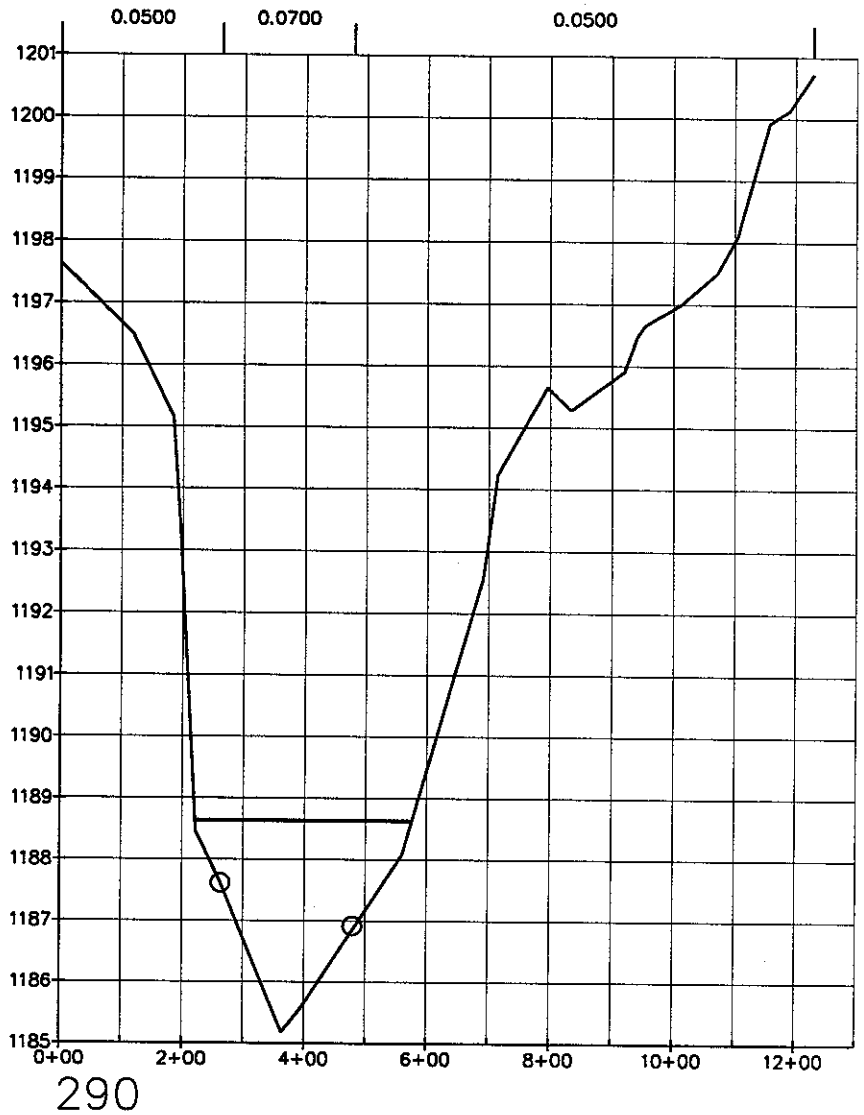
Cross-Section:	280	
Elevation:	1186.73	ft MSL
Depth:	3.04	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2303	
Flow Regime:	Subcritical	
Flow Area:	746.61	sq ft
Average Velocity:	2.27	ft/s
Maximum Velocity:	2.58	ft/s
Composite n:	0.0618	
Hydraulic Radius:	1.64	ft
Wetted Perimeter:	455.79	ft
Wetted Top Width:	455.71	ft
Critical Slope:	0.0872	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–280

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

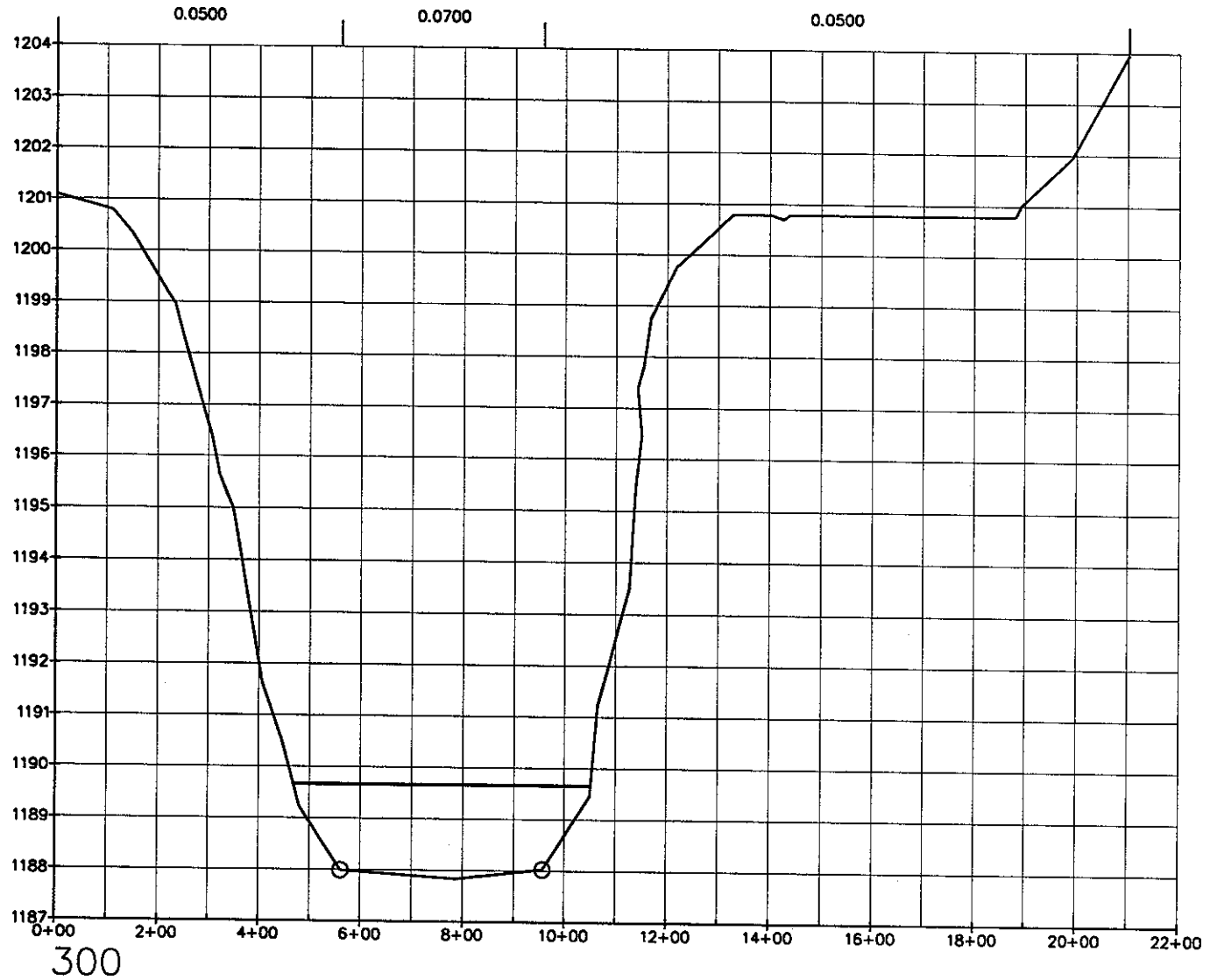
Cross-Section:	290	
Elevation:	1188.63	ft MSL
Depth:	3.46	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2461	
Flow Regime:	Subcritical	
Flow Area:	654.44	sq ft
Average Velocity:	2.60	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0578	
Hydraulic Radius:	1.84	ft
Wetted Perimeter:	354.72	ft
Wetted Top Width:	354.63	ft
Critical Slope:	0.0741	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–290

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

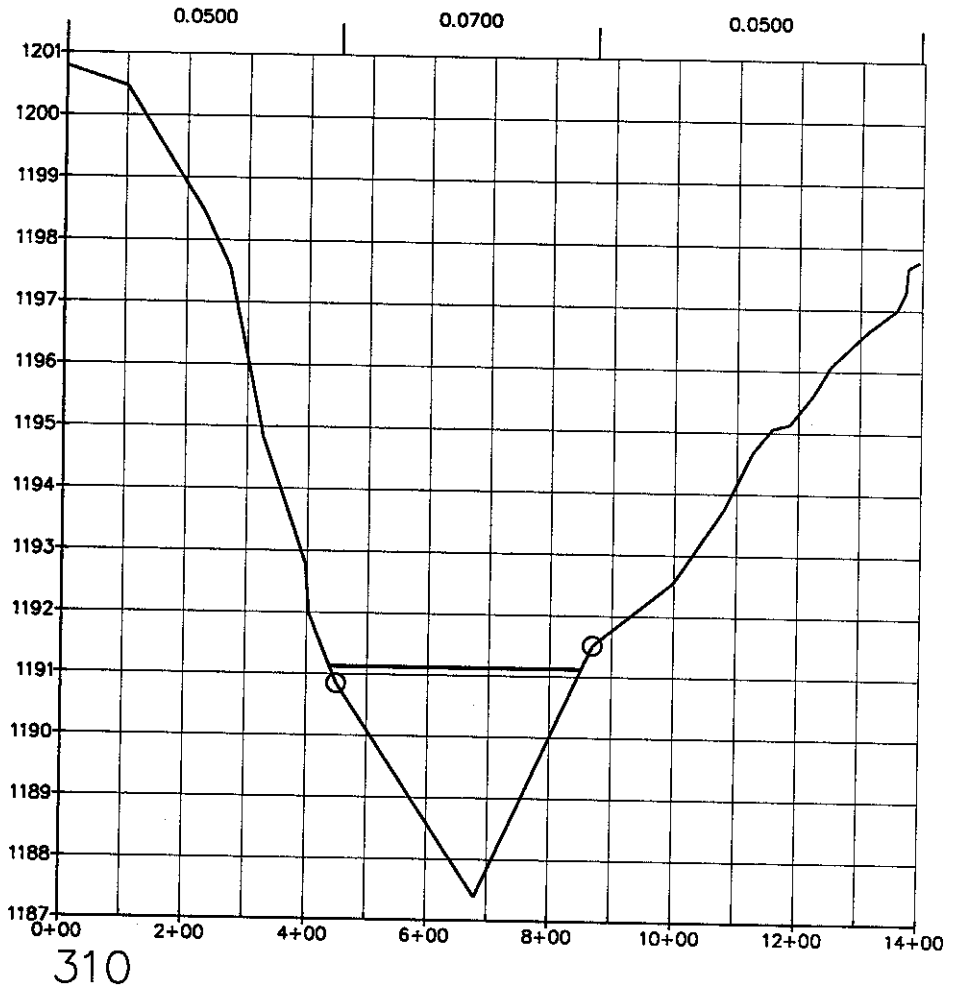
Cross-Section:	300	
Elevation:	1189.66	ft MSL
Depth:	1.82	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2584	
Flow Regime:	Subcritical	
Flow Area:	859.61	sq ft
Average Velocity:	1.98	ft/s
Maximum Velocity:	2.02	ft/s
Composite n:	0.0639	
Hydraulic Radius:	1.48	ft
Wetted Perimeter:	582.75	ft
Wetted Top Width:	582.71	ft
Critical Slope:	0.0641	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–300

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

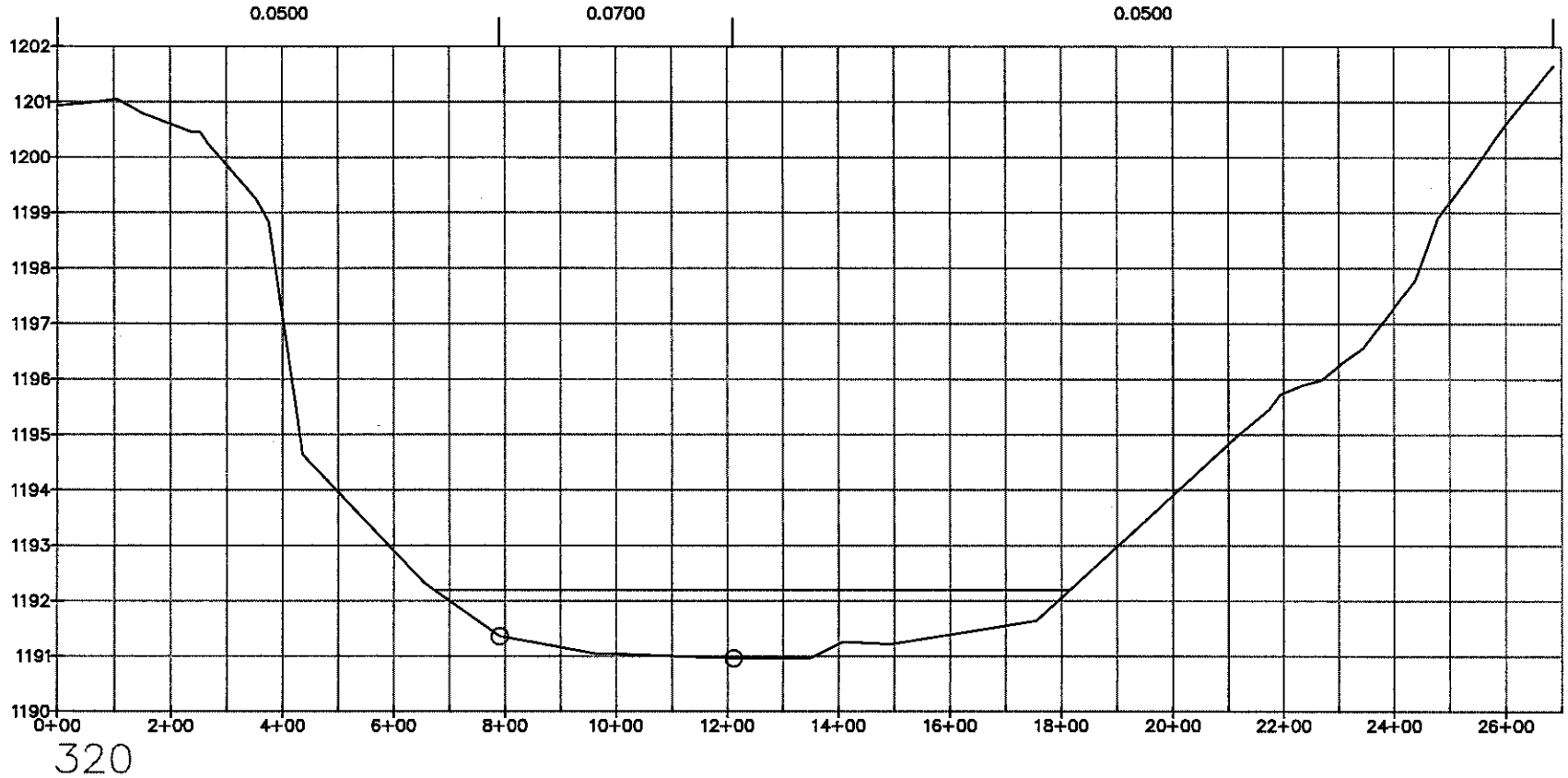
Cross-Section:	310	
Elevation:	1191.13	ft MSL
Depth:	3.74	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.198	
Flow Regime:	Subcritical	
Flow Area:	782.70	sq ft
Average Velocity:	2.17	ft/s
Maximum Velocity:	2.18	ft/s
Composite n:	0.0695	
Hydraulic Radius:	1.9	ft
Wetted Perimeter:	412.00	ft
Wetted Top Width:	411.93	ft
Critical Slope:	0.1112	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–310

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

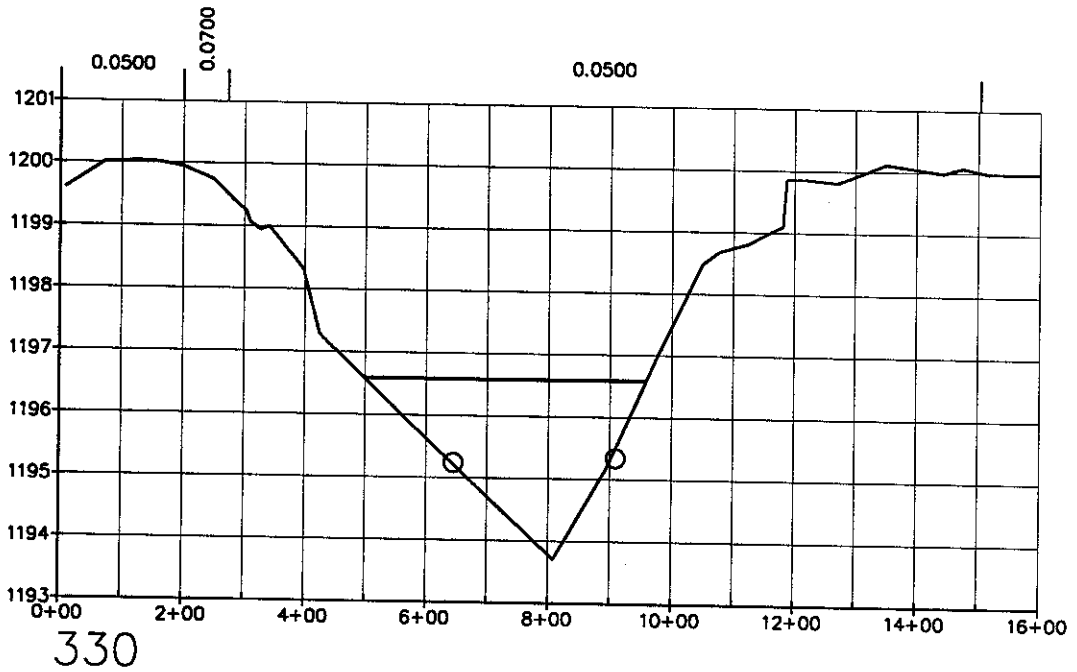
Cross-Section:	320		Flow Area:	1043.50	sq ft
Elevation:	1192.19	ft MSL	Average Velocity:	1.63	ft/s
Depth:	1.23	ft	Maximum Velocity:	1.79	ft/s
Discharge:	1700.00	cfs	Composite n:	0.0577	
Energy Gradient:	0.0043	ft/ft	Hydraulic Radius:	0.91	ft
Froude Number:	0.2587		Wetted Perimeter:	1140.52	ft
Flow Regime:	Subcritical		Wetted Top Width:	1140.51	ft
			Critical Slope:	0.067	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–320

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

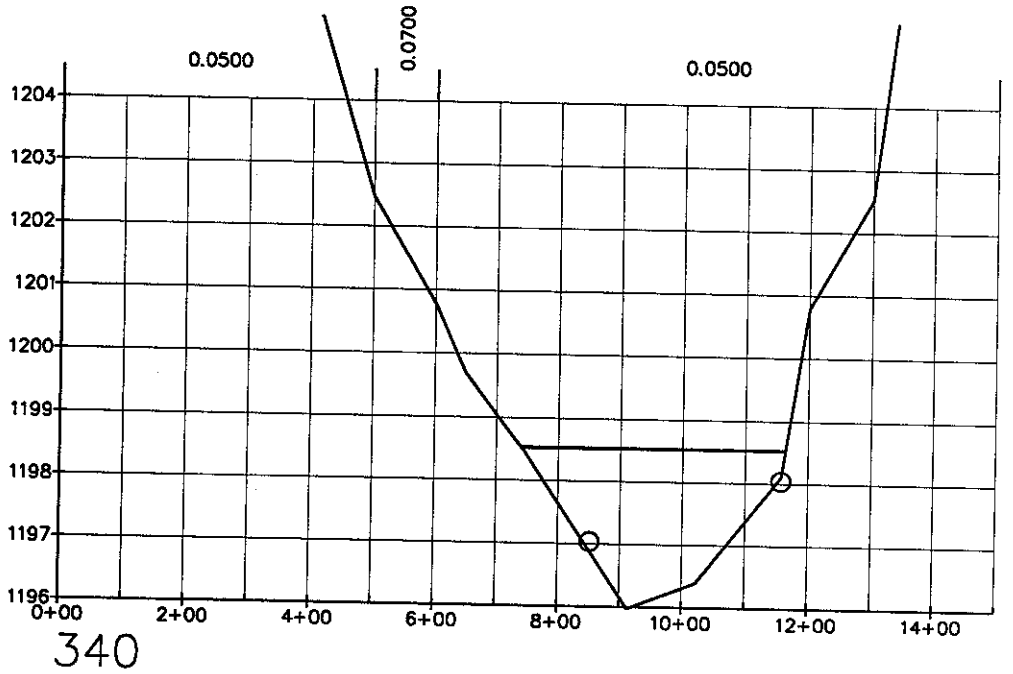
Cross-Section:	330	
Elevation:	1196.58	ft MSL
Depth:	2.88	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2611	
Flow Regime:	Subcritical	
Flow Area:	676.72	sq ft
Average Velocity:	2.53	ft/s
Maximum Velocity:	2.53	ft/s
Composite n:	0.05	
Hydraulic Radius:	1.47	ft
Wetted Perimeter:	459.89	ft
Wetted Top Width:	459.85	ft
Critical Slope:	0.0622	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–330

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

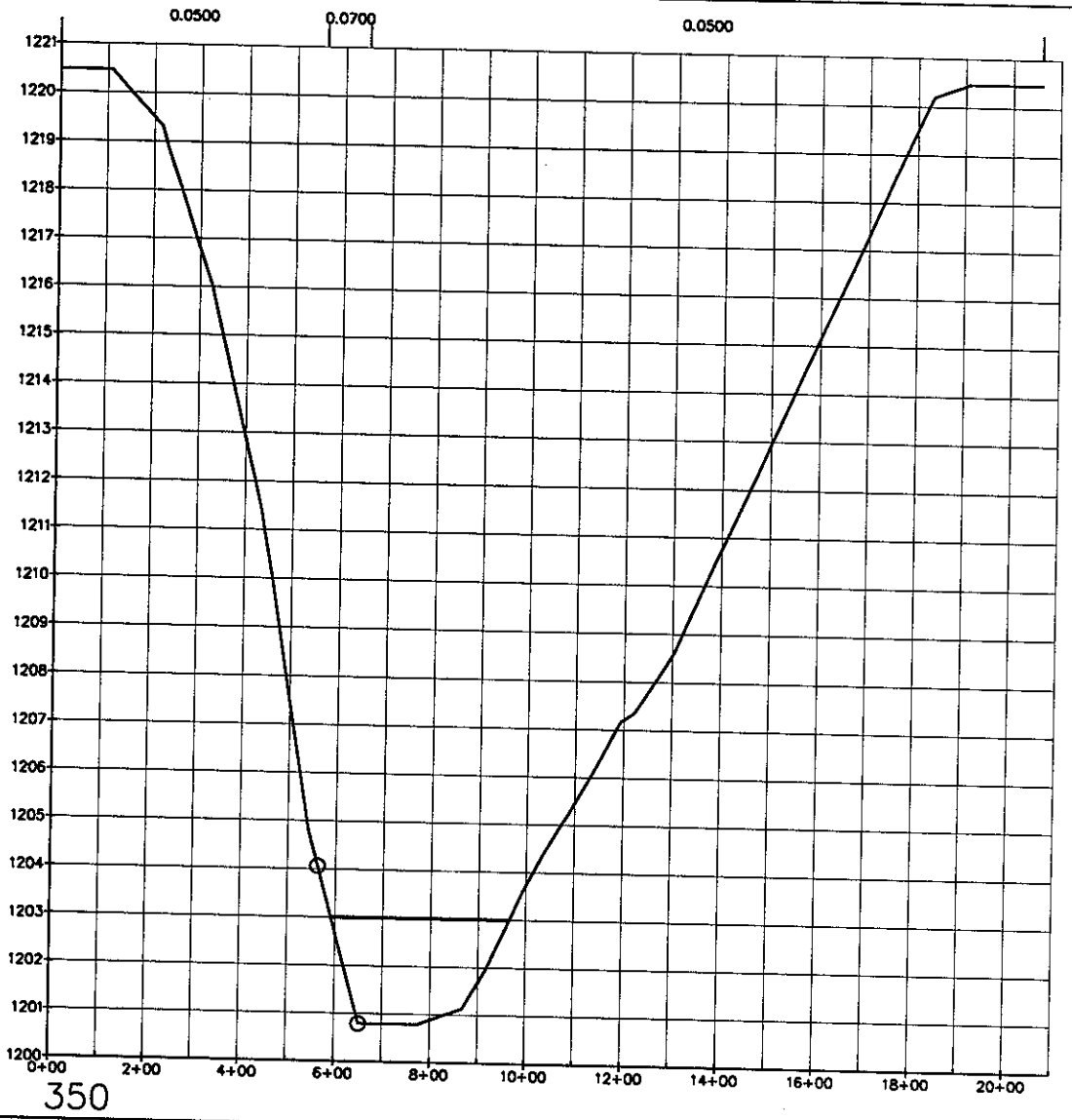
Cross-Section:	340	
Elevation:	1198.53	ft MSL
Depth:	2.56	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2878	
Flow Regime:	Subcritical	
Flow Area:	651.31	sq ft
Average Velocity:	2.60	ft/s
Maximum Velocity:	2.60	ft/s
Composite n:	0.05	
Hydraulic Radius:	1.54	ft
Wetted Perimeter:	424.02	ft
Wetted Top Width:	423.98	ft
Critical Slope:	0.0522	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–340

Entellus™



Normal Depth Results

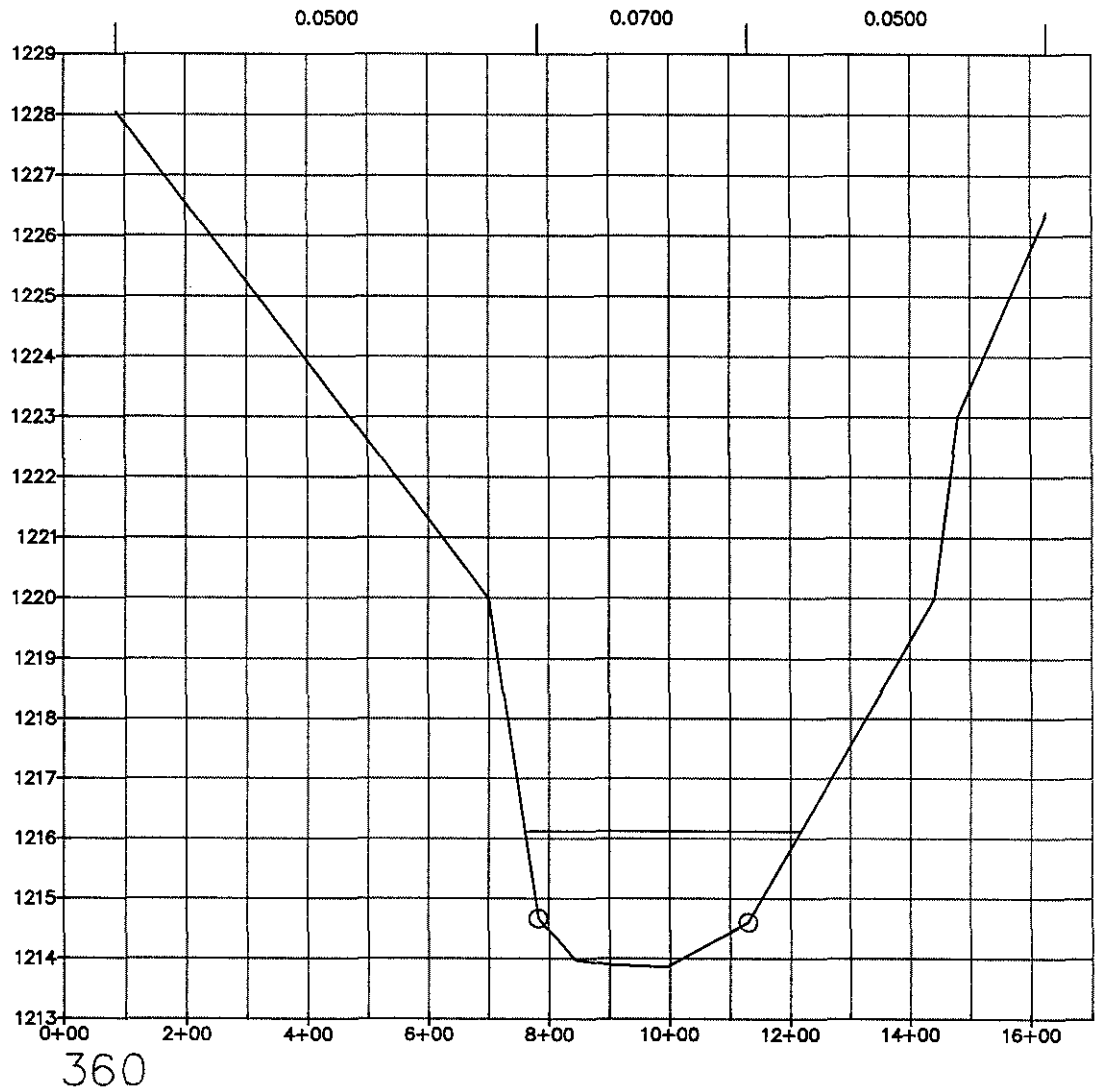
Cross-Section:	350	
Elevation:	1203.00	ft MSL
Depth:	2.21	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3227	
Flow Regime:	Subcritical	
Flow Area:	624.60	sq ft
Average Velocity:	2.72	ft/s
Maximum Velocity:	2.87	ft/s
Composite n:	0.0534	
Hydraulic Radius:	1.67	ft
Wetted Perimeter:	373.92	ft
Wetted Top Width:	373.86	ft
Critical Slope:	0.0461	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–350

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

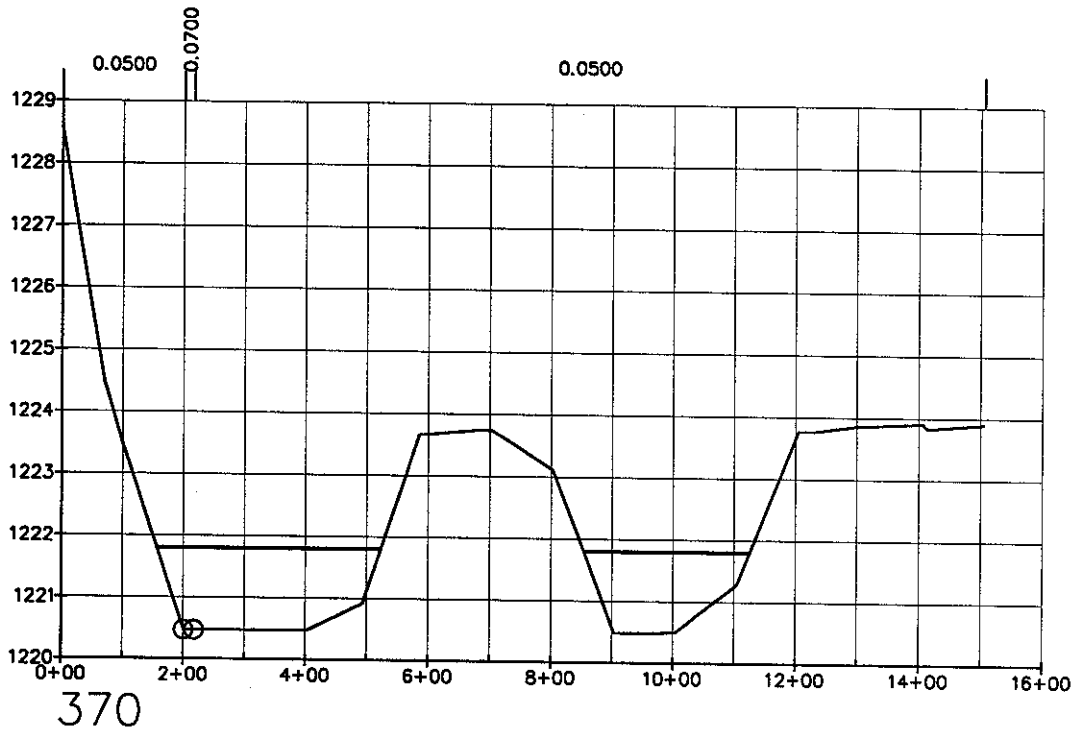
Cross-Section:	360	
Elevation:	1216.12	ft MSL
Depth:	2.26	ft
Discharge:	1700.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2542	
Flow Regime:	Subcritical	
Flow Area:	784.33	sq ft
Average Velocity:	2.16	ft/s
Maximum Velocity:	2.23	ft/s
Composite n:	0.0654	
Hydraulic Radius:	1.71	ft
Wetted Perimeter:	457.57	ft
Wetted Top Width:	457.50	ft
Critical Slope:	0.0684	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–360

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

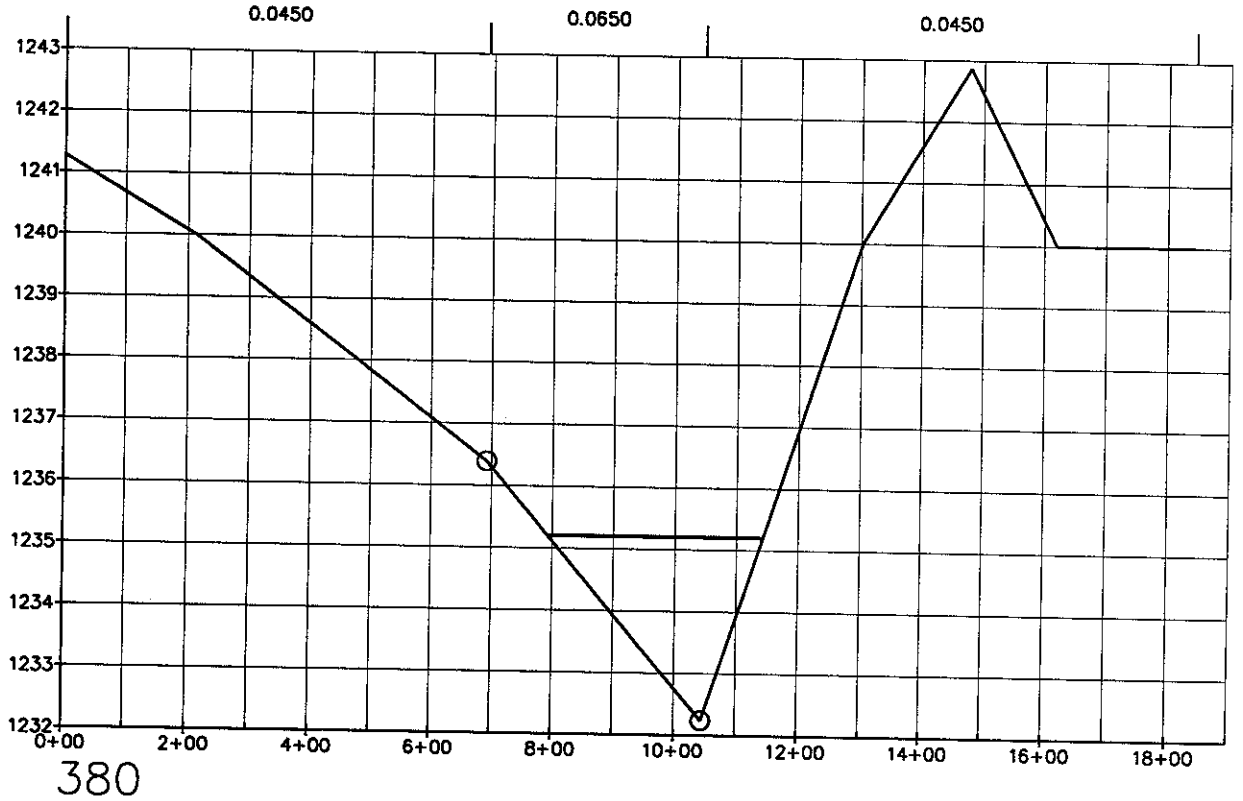
Cross-Section:	370	
Elevation:	1221.80	ft MSL
Depth:	1.33	ft
Discharge:	1360.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.3077	
Flow Regime:	Subcritical	
Flow Area:	674.80	sq ft
Average Velocity:	2.02	ft/s
Maximum Velocity:	2.05	ft/s
Composite n:	0.0505	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	639.02	ft
Wetted Top Width:	638.96	ft
Critical Slope:	0.0459	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–370

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

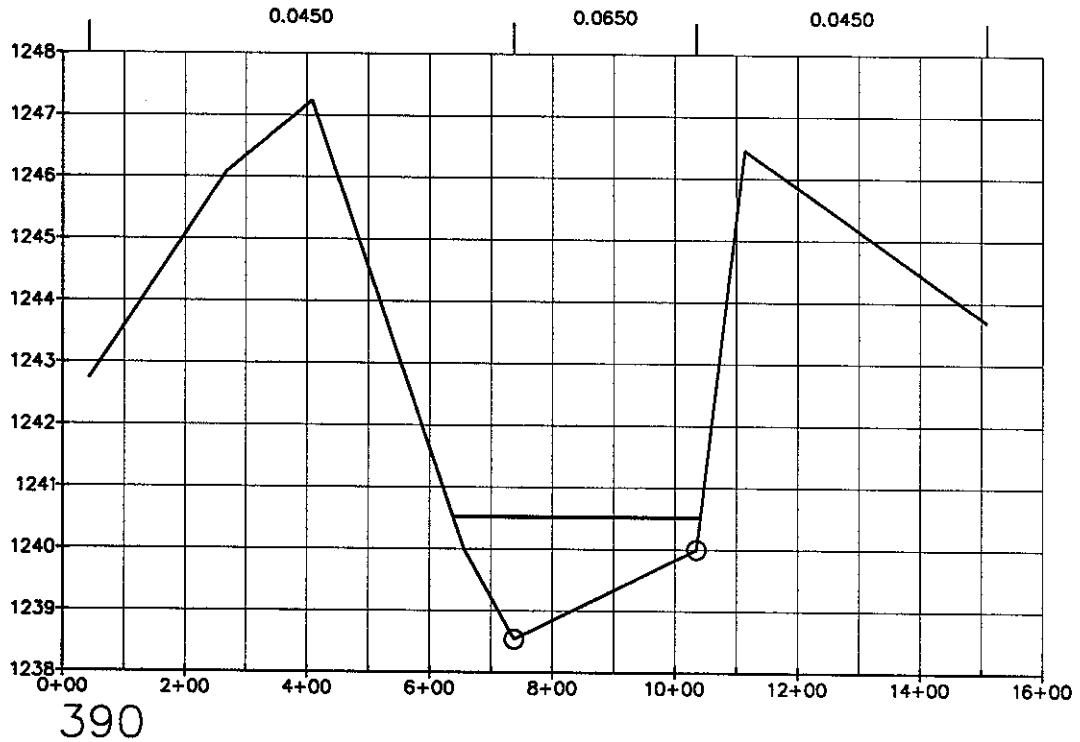
Cross-Section:	380	
Elevation:	1235.21	ft MSL
Depth:	2.97	ft
Discharge:	1140.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2246	
Flow Regime:	Subcritical	
Flow Area:	519.49	sq ft
Average Velocity:	2.20	ft/s
Maximum Velocity:	2.82	ft/s
Composite n:	0.0597	
Hydraulic Radius:	1.48	ft
Wetted Perimeter:	350.35	ft
Wetted Top Width:	350.29	ft
Critical Slope:	0.0906	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–380

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

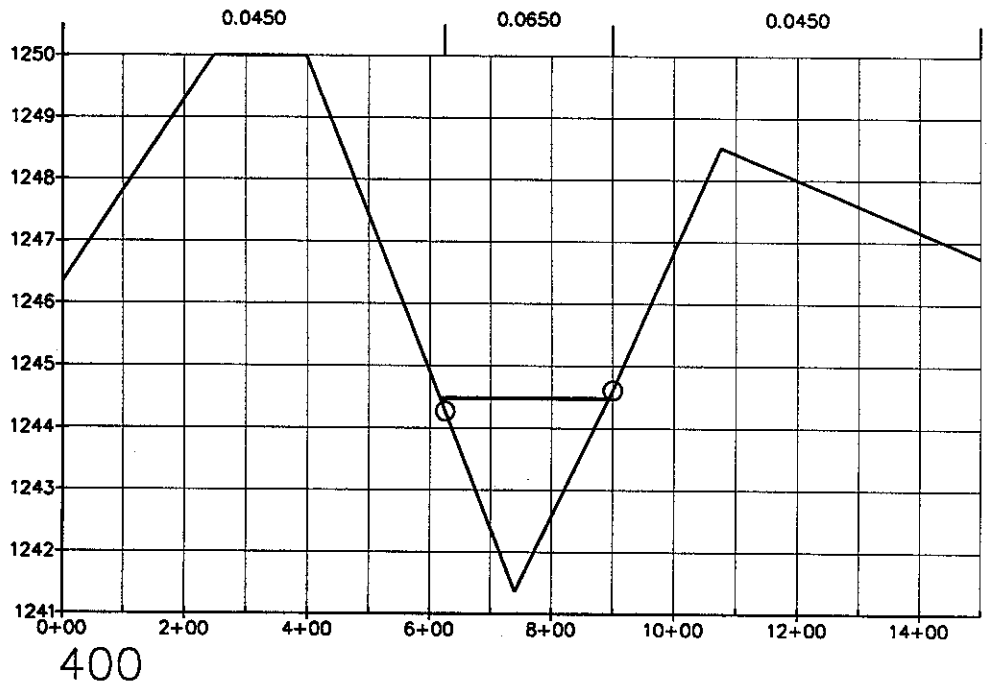
Cross-Section:	390	
Elevation:	1240.52	ft MSL
Depth:	1.98	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2315	
Flow Regime:	Subcritical	
Flow Area:	481.28	sq ft
Average Velocity:	1.86	ft/s
Maximum Velocity:	2.28	ft/s
Composite n:	0.06	
Hydraulic Radius:	1.19	ft
Wetted Perimeter:	403.57	ft
Wetted Top Width:	403.53	ft
Critical Slope:	0.0819	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–390

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

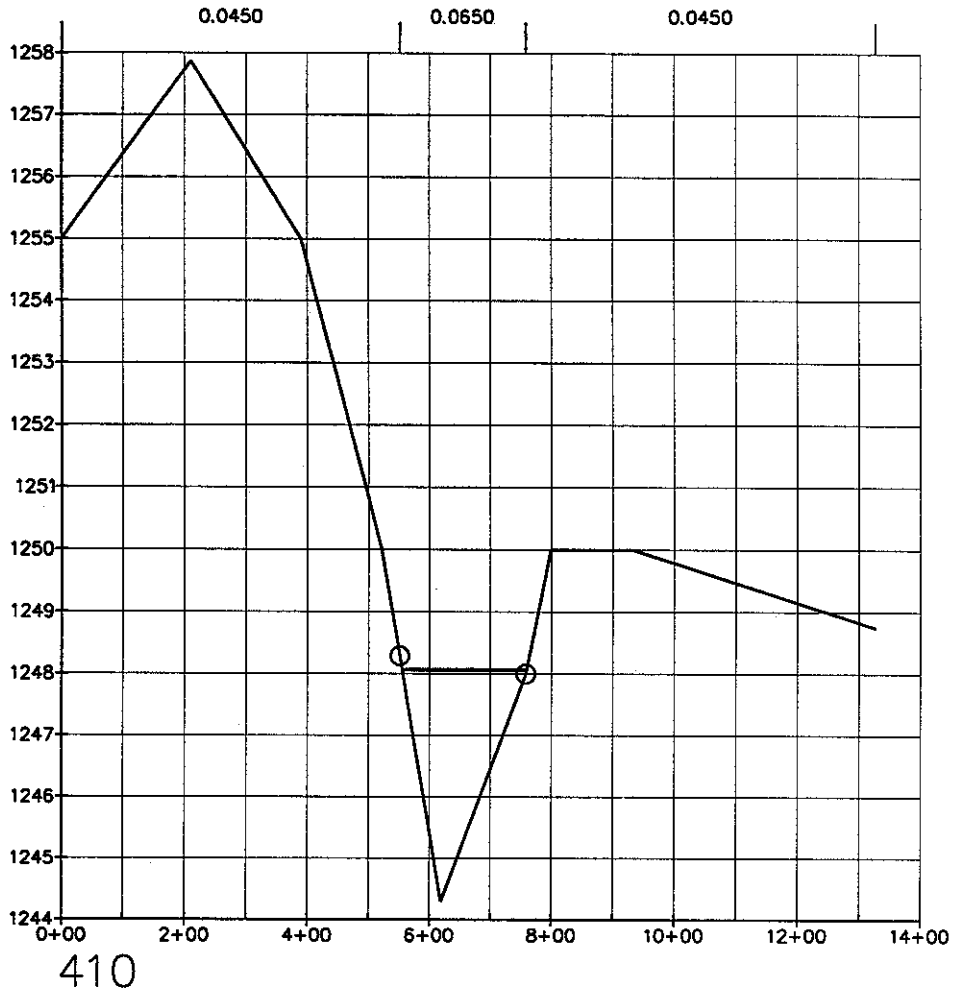
Cross-Section:	400	
Elevation:	1244.48	ft MSL
Depth:	3.12	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2059	
Flow Regime:	Subcritical	
Flow Area:	431.39	sq ft
Average Velocity:	2.06	ft/s
Maximum Velocity:	2.06	ft/s
Composite n:	0.0644	
Hydraulic Radius:	1.56	ft
Wetted Perimeter:	276.78	ft
Wetted Top Width:	276.70	ft
Critical Slope:	0.1038	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–400

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

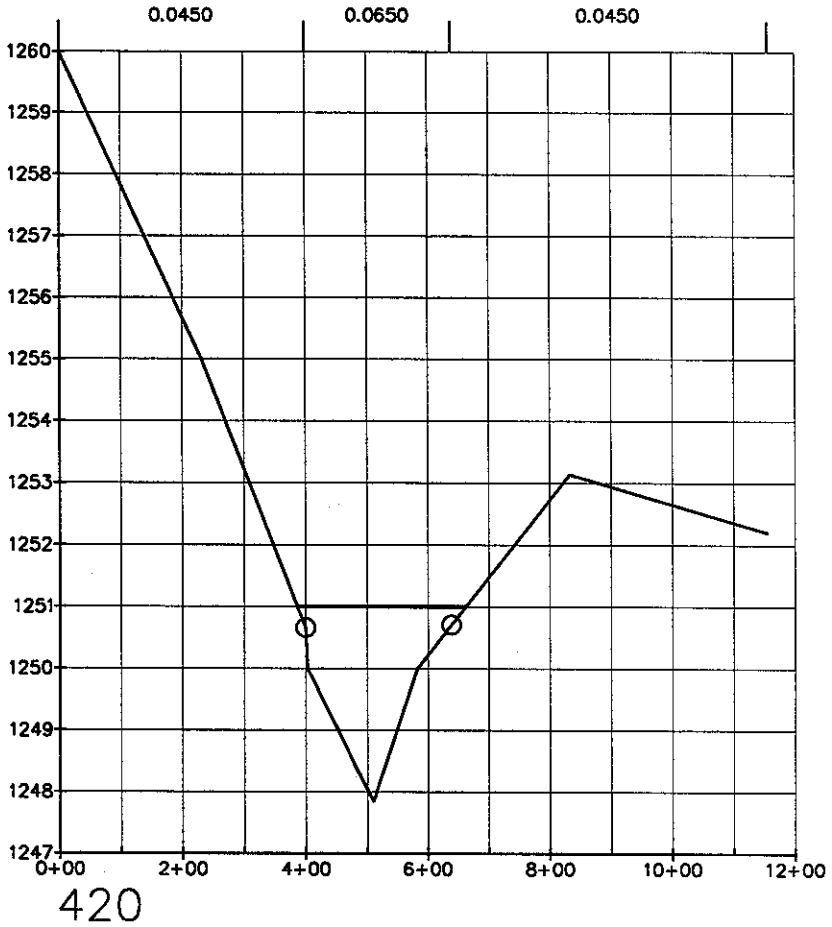
Cross-Section:	410	
Elevation:	1248.06	ft MSL
Depth:	3.76	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.209	
Flow Regime:	Subcritical	
Flow Area:	386.95	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.31	ft/s
Composite n:	0.0648	
Hydraulic Radius:	1.89	ft
Wetted Perimeter:	204.63	ft
Wetted Top Width:	204.47	ft
Critical Slope:	0.0982	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–410

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

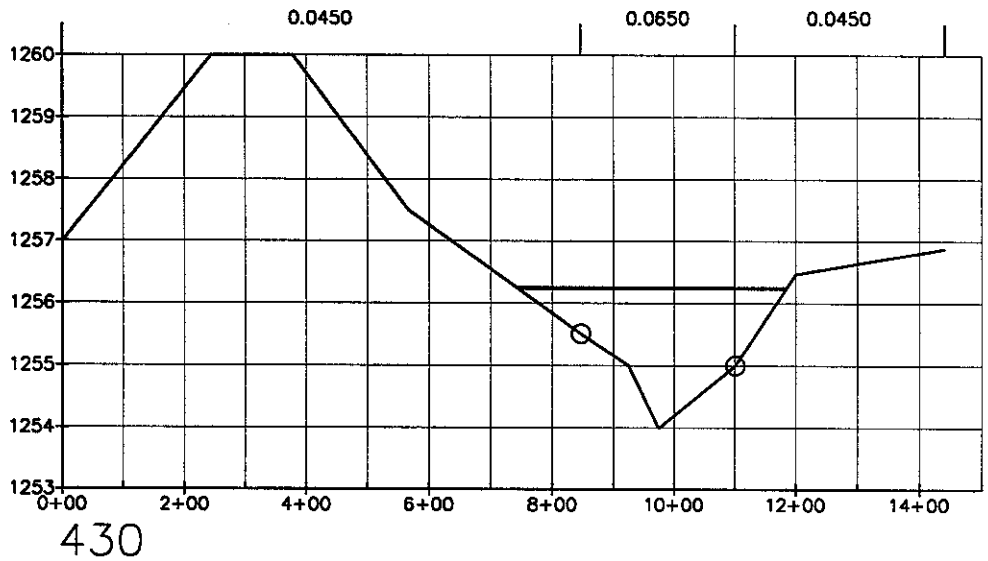
Cross-Section:	420	
Elevation:	1251.00	ft MSL
Depth:	3.16	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2112	
Flow Regime:	Subcritical	
Flow Area:	417.77	sq ft
Average Velocity:	2.14	ft/s
Maximum Velocity:	2.16	ft/s
Composite n:	0.0625	
Hydraulic Radius:	1.52	ft
Wetted Perimeter:	275.33	ft
Wetted Top Width:	275.19	ft
Critical Slope:	0.1027	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–420

Entellus™

File: WASH–T2N–R5W–S33E_X-SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

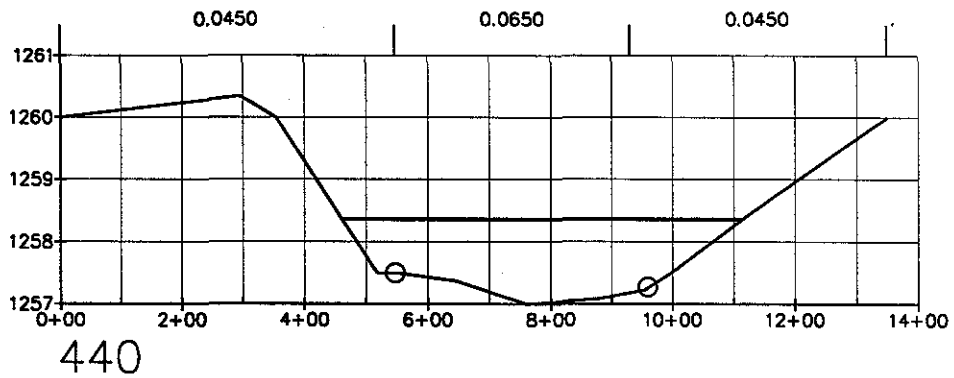
Cross-Section:	430	
Elevation:	1256.24	ft MSL
Depth:	2.25	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.221	
Flow Regime:	Subcritical	
Flow Area:	473.19	sq ft
Average Velocity:	1.87	ft/s
Maximum Velocity:	1.98	ft/s
Composite n:	0.0569	
Hydraulic Radius:	1.07	ft
Wetted Perimeter:	440.44	ft
Wetted Top Width:	440.42	ft
Critical Slope:	0.0961	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–430

Entellus™

File: WASH–T2N–R5W–S33E_X-SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

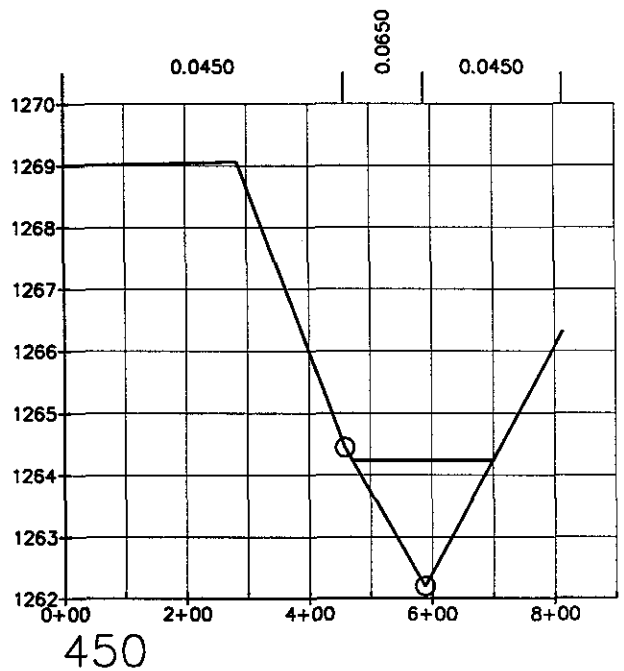
Cross-Section:	440	
Elevation:	1258.36	ft MSL
Depth:	1.36	ft
Discharge:	780.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.225	
Flow Regime:	Subcritical	
Flow Area:	524.10	sq ft
Average Velocity:	1.48	ft/s
Maximum Velocity:	1.52	ft/s
Composite n:	0.0571	
Hydraulic Radius:	0.8	ft
Wetted Perimeter:	652.74	ft
Wetted Top Width:	652.72	ft
Critical Slope:	0.0863	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–440

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

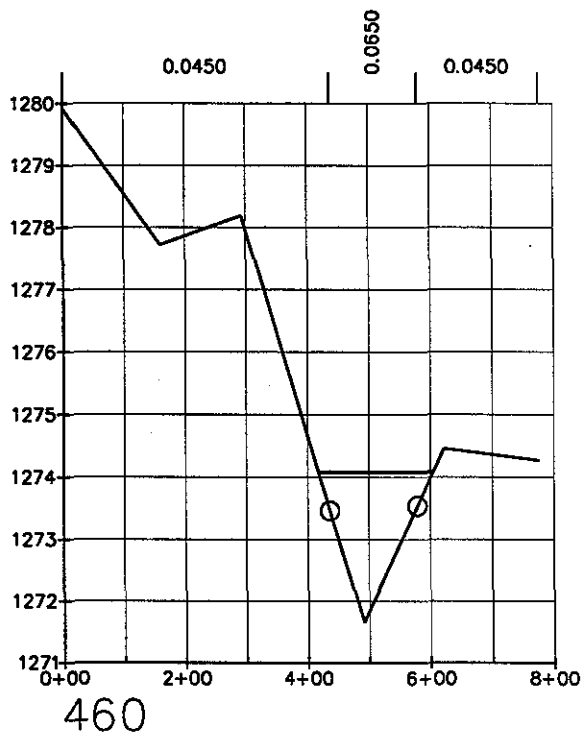
Cross-Section:	450	
Elevation:	1264.24	ft MSL
Depth:	2.04	ft
Discharge:	430.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2275	
Flow Regime:	Subcritical	
Flow Area:	233.28	sq ft
Average Velocity:	1.85	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0557	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	228.78	ft
Wetted Top Width:	228.74	ft
Critical Slope:	0.0894	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–450

Entellus™

File: WASH–T2N–R5W–S33E_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

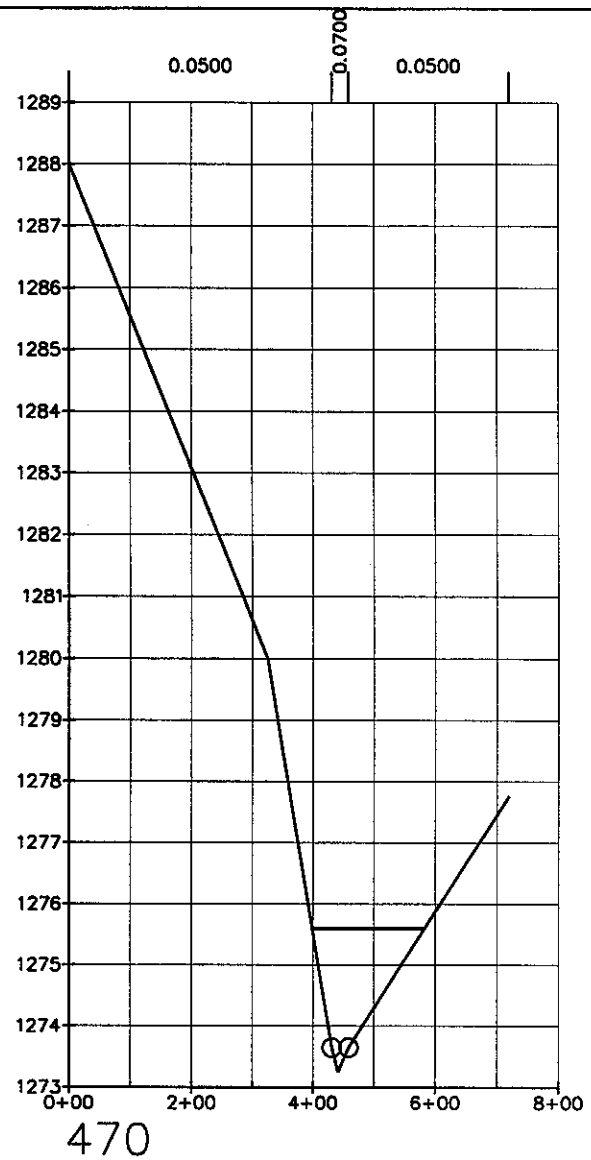
Cross-Section:	460	
Elevation:	1274.08	ft MSL
Depth:	2.42	ft
Discharge:	430.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2163	
Flow Regime:	Subcritical	
Flow Area:	225.29	sq ft
Average Velocity:	1.91	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0606	
Hydraulic Radius:	1.21	ft
Wetted Perimeter:	186.36	ft
Wetted Top Width:	186.30	ft
Critical Slope:	0.0999	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–460

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

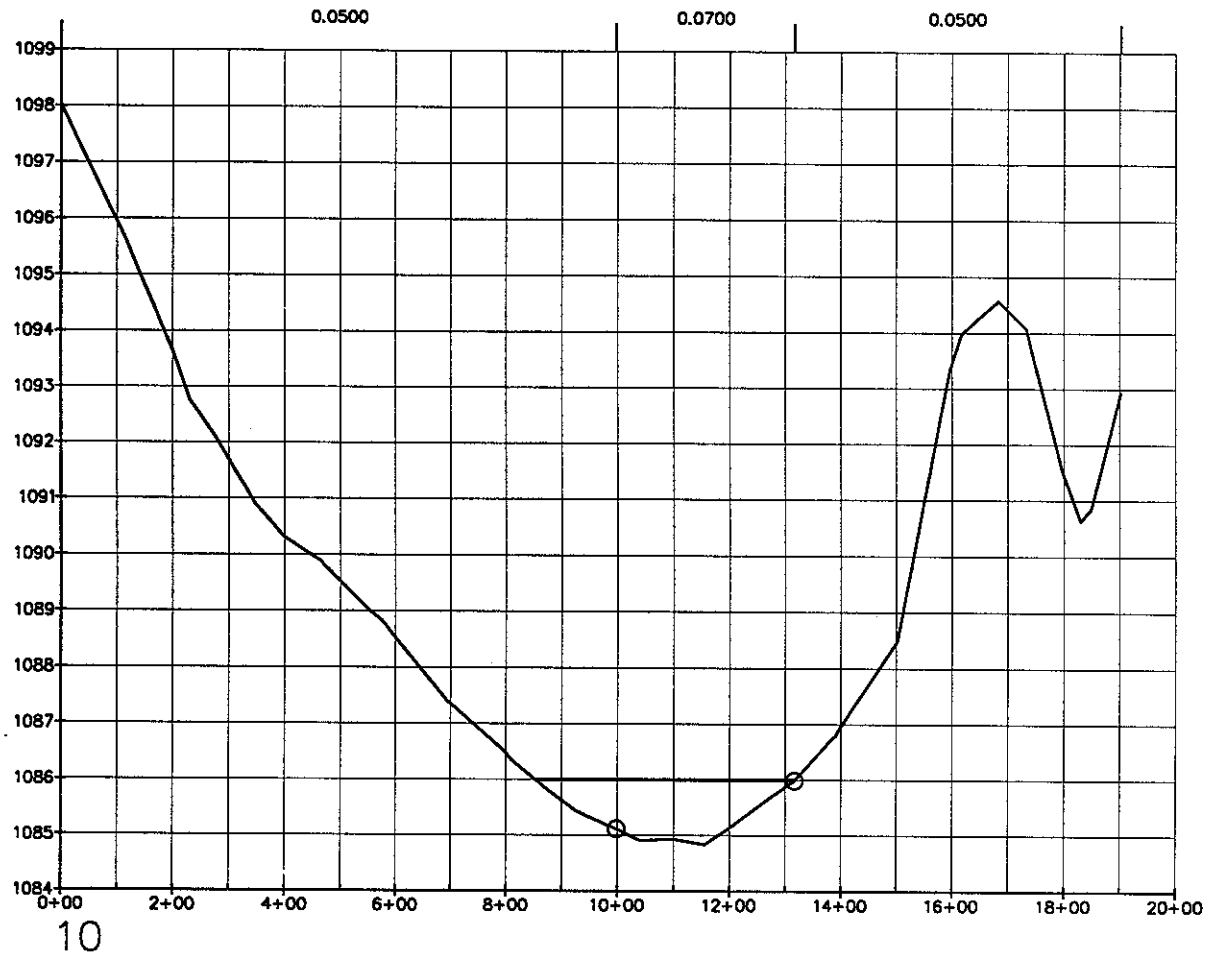
Cross-Section:	470	
Elevation:	1275.60	ft MSL
Depth:	2.35	ft
Discharge:	430.00	cfs
Energy Gradient:	0.0043	ft/ft
Froude Number:	0.2342	
Flow Regime:	Subcritical	
Flow Area:	211.28	sq ft
Average Velocity:	2.03	ft/s
Maximum Velocity:	2.32	ft/s
Composite n:	0.0532	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	183.81	ft
Wetted Top Width:	183.73	ft
Critical Slope:	0.08	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33E–470

Entellus™

File: WASH-T2N-R5W-S33E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1086.00	ft MSL
Depth:	1.16	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.272	
Flow Regime:	Subcritical	
Flow Area:	336.65	sq ft
Average Velocity:	1.68	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.064	
Hydraulic Radius:	0.72	ft
Wetted Perimeter:	465.25	ft
Wetted Top Width:	465.24	ft
Critical Slope:	0.1064	ft/ft

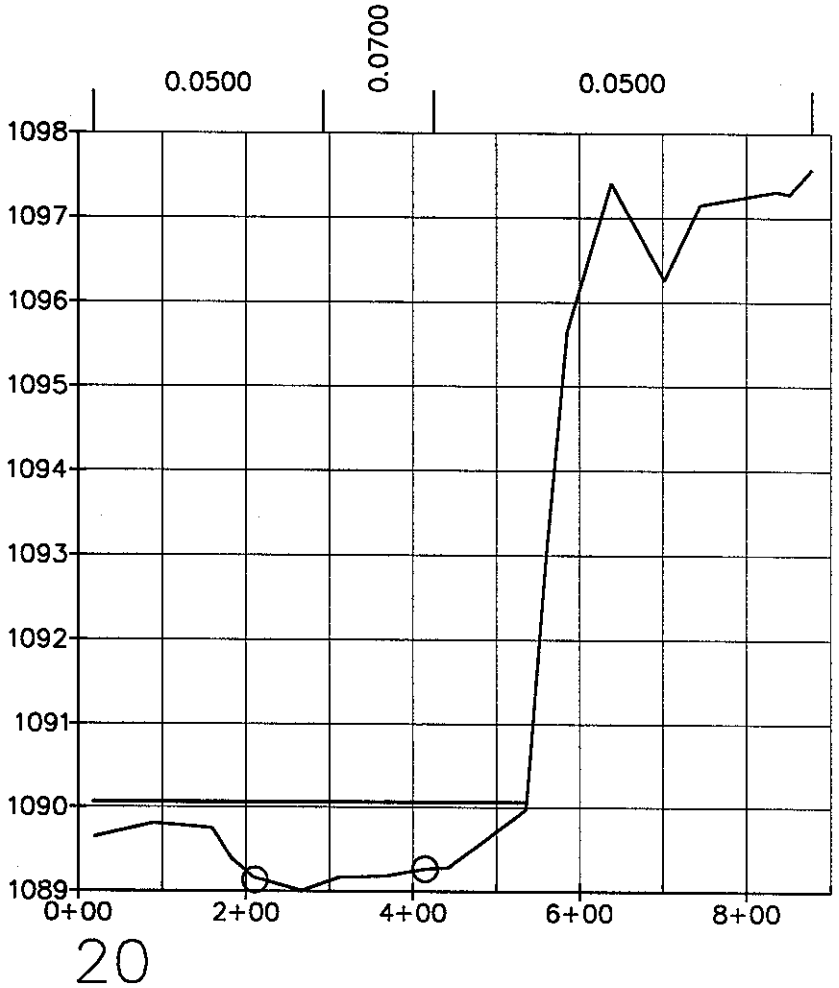
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–10

Entellus™

File: WASH–T2N–R5W–S33W_X-SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1090.06	ft MSL
Depth:	1.05	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2943	
Flow Regime:	Subcritical	
Flow Area:	326.61	sq ft
Average Velocity:	1.75	ft/s
Maximum Velocity:	1.77	ft/s
Composite n:	0.056	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	518.08	ft
Wetted Top Width:	518.07	ft
Critical Slope:	0.0888	ft/ft

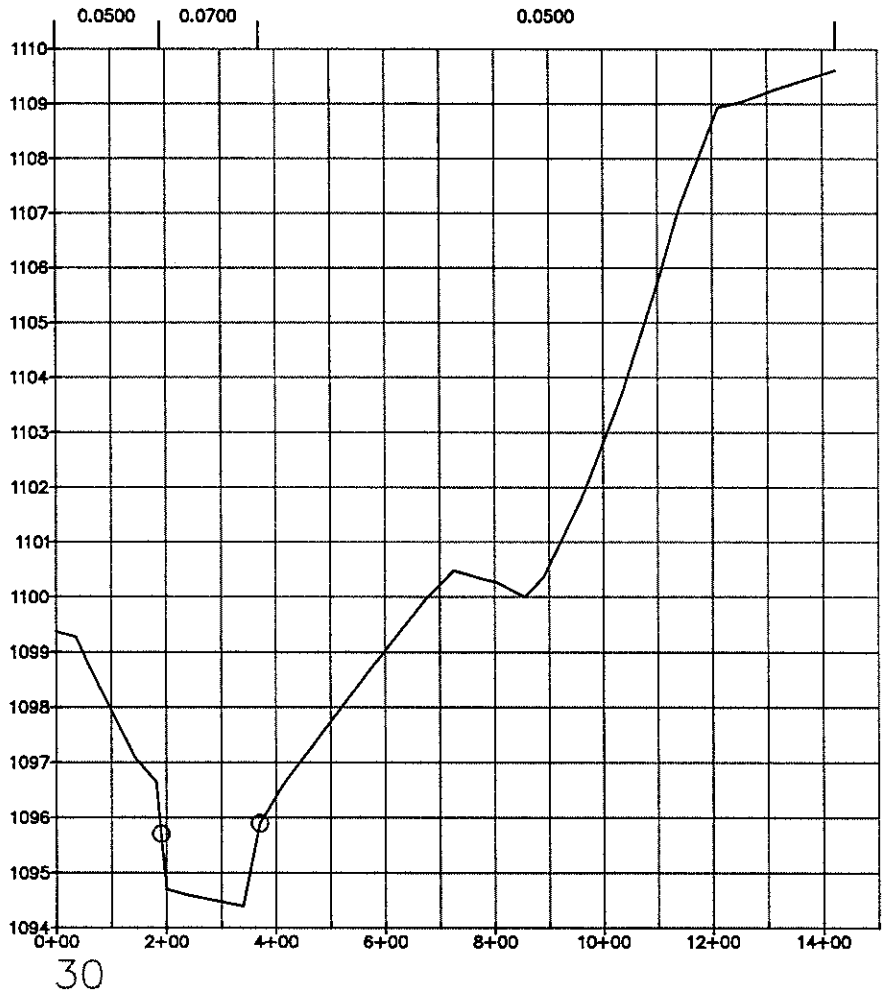
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–20

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

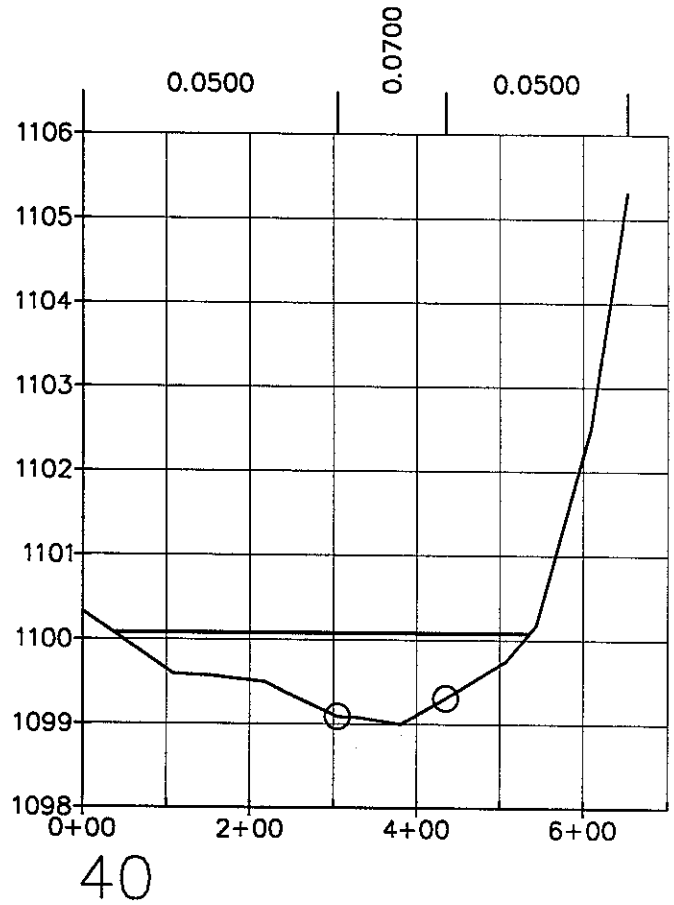
Cross-Section:	30	
Elevation:	1096.00	ft MSL
Depth:	1.60	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3284	
Flow Regime:	Subcritical	
Flow Area:	237.70	sq ft
Average Velocity:	2.34	ft/s
Maximum Velocity:	2.37	ft/s
Composite n:	0.0664	
Hydraulic Radius:	1.26	ft
Wetted Perimeter:	188.67	ft
Wetted Top Width:	188.56	ft
Critical Slope:	0.0751	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–30

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

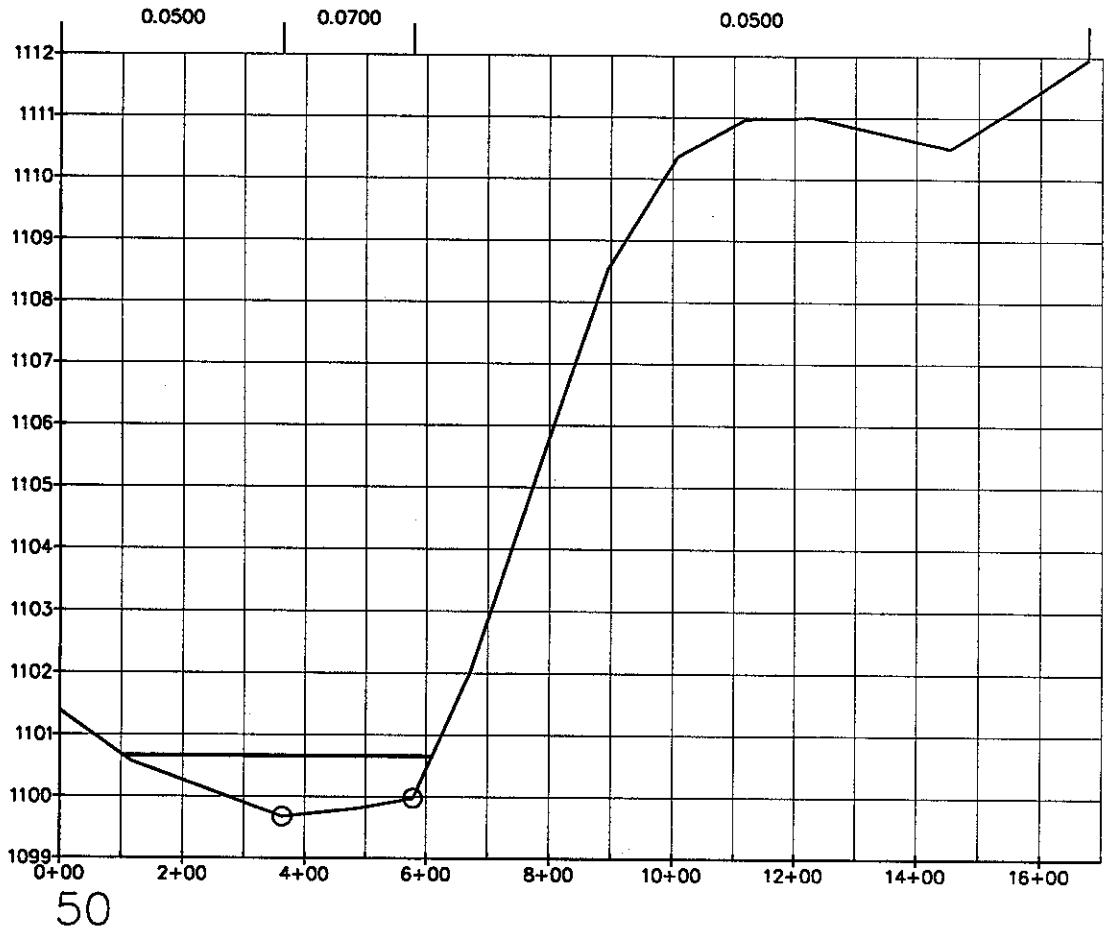
Cross-Section:	40	
Elevation:	1100.08	ft MSL
Depth:	1.08	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3009	
Flow Regime:	Subcritical	
Flow Area:	315.95	sq ft
Average Velocity:	1.78	ft/s
Maximum Velocity:	1.88	ft/s
Composite n:	0.0555	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	498.44	ft
Wetted Top Width:	498.44	ft
Critical Slope:	0.0886	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–40

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

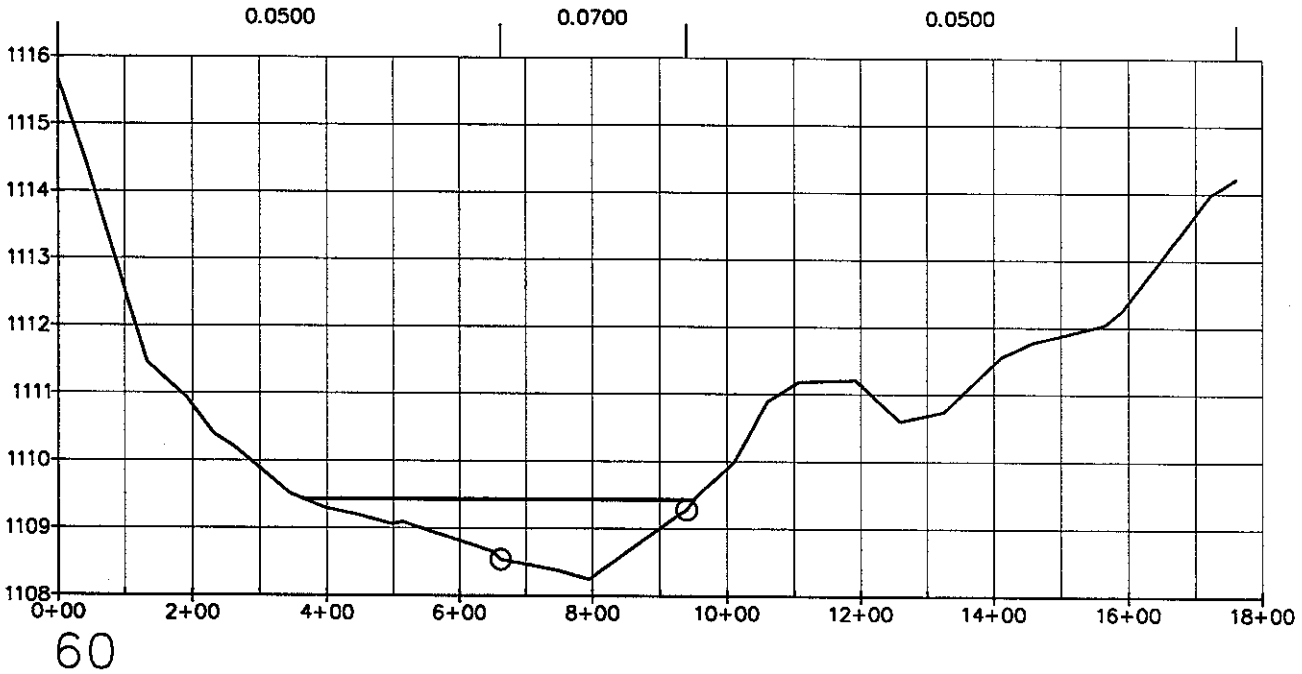
Cross-Section:	50	
Elevation:	1100.66	ft MSL
Depth:	0.98	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.304	
Flow Regime:	Subcritical	
Flow Area:	327.26	sq ft
Average Velocity:	1.70	ft/s
Maximum Velocity:	1.71	ft/s
Composite n:	0.0589	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	505.82	ft
Wetted Top Width:	505.81	ft
Critical Slope:	0.0884	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–50

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

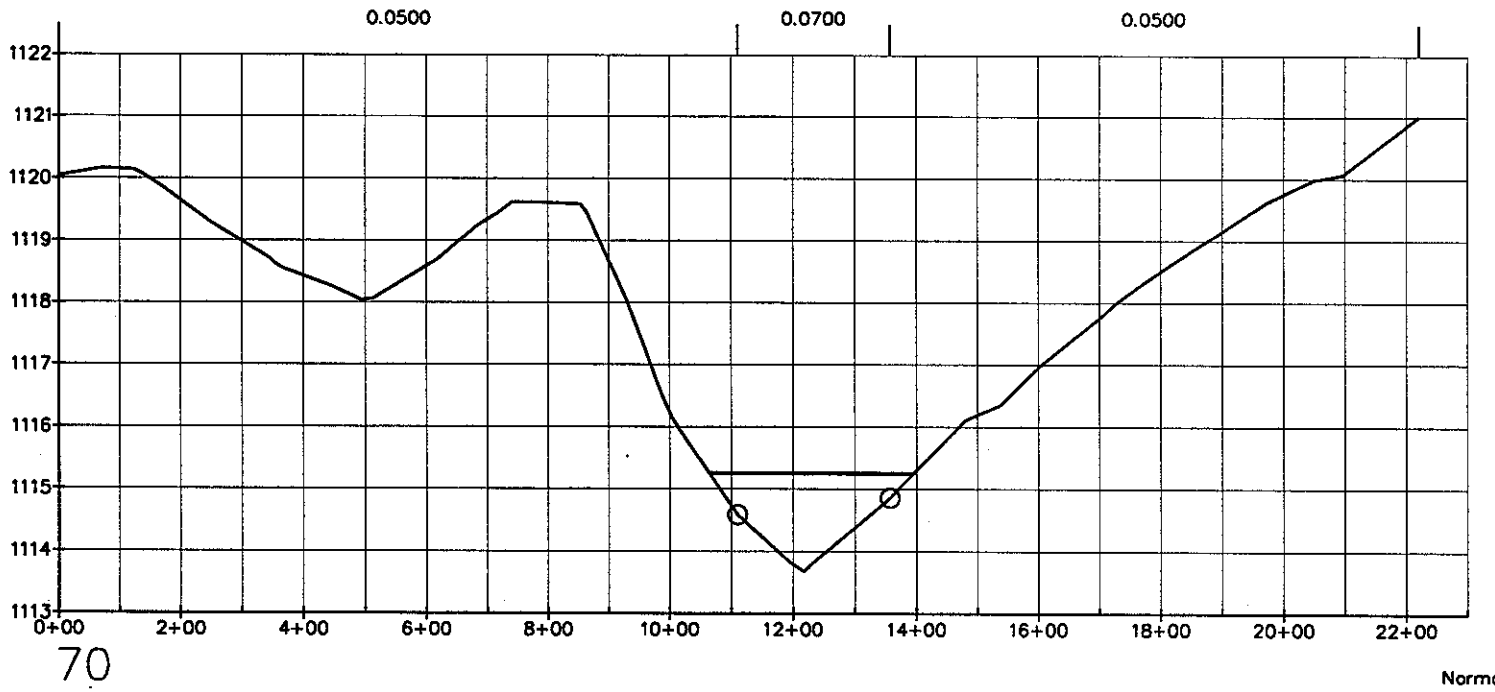
Cross-Section:	60	
Elevation:	1109.43	ft MSL
Depth:	1.18	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2576	
Flow Regime:	Subcritical	
Flow Area:	352.25	sq ft
Average Velocity:	1.60	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.0598	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	587.11	ft
Wetted Top Width:	587.11	ft
Critical Slope:	0.1214	ft/ft

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33W-60

Entellus™



Normal Depth Results

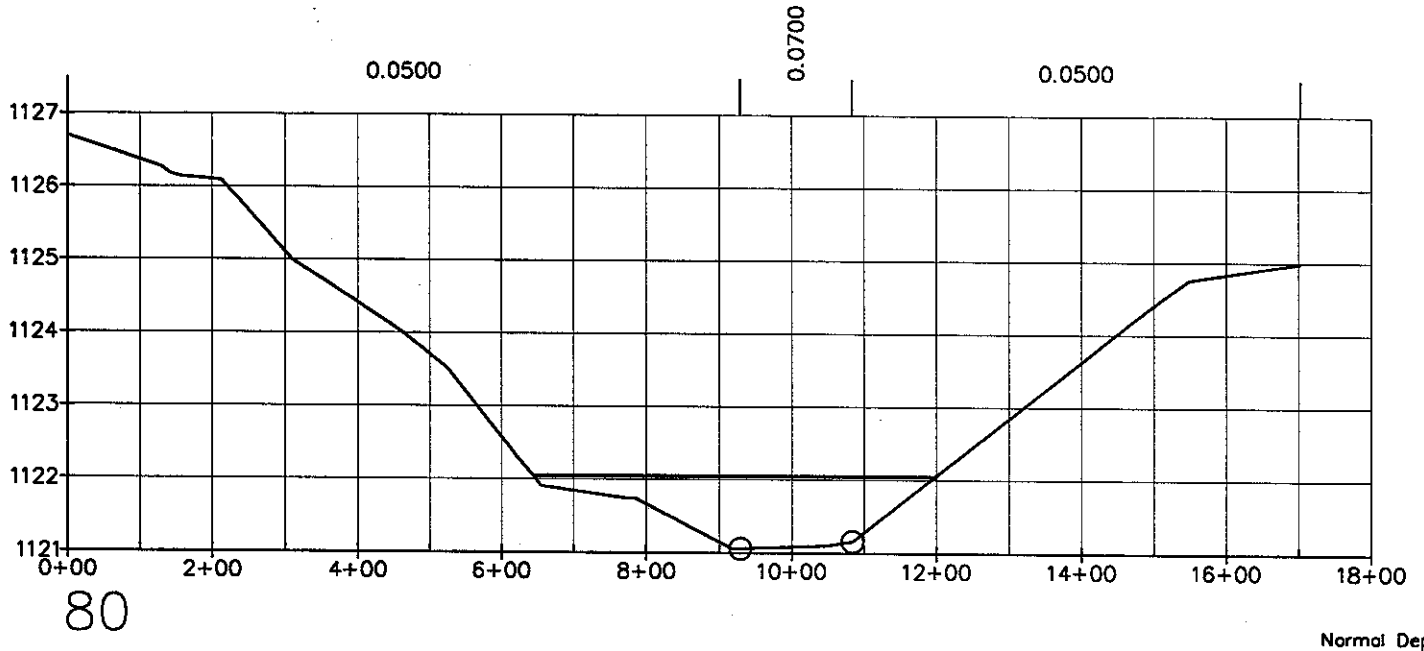
Cross-Section:	70	
Elevation:	1115.25	ft MSL
Depth:	1.57	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2803	
Flow Regime:	Subcritical	
Flow Area:	280.94	sq ft
Average Velocity:	1.99	ft/s
Maximum Velocity:	2.18	ft/s
Composite n:	0.0606	
Hydraulic Radius:	0.85	ft
Wetted Perimeter:	330.67	ft
Wetted Top Width:	330.66	ft
Critical Slope:	0.104	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–70

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

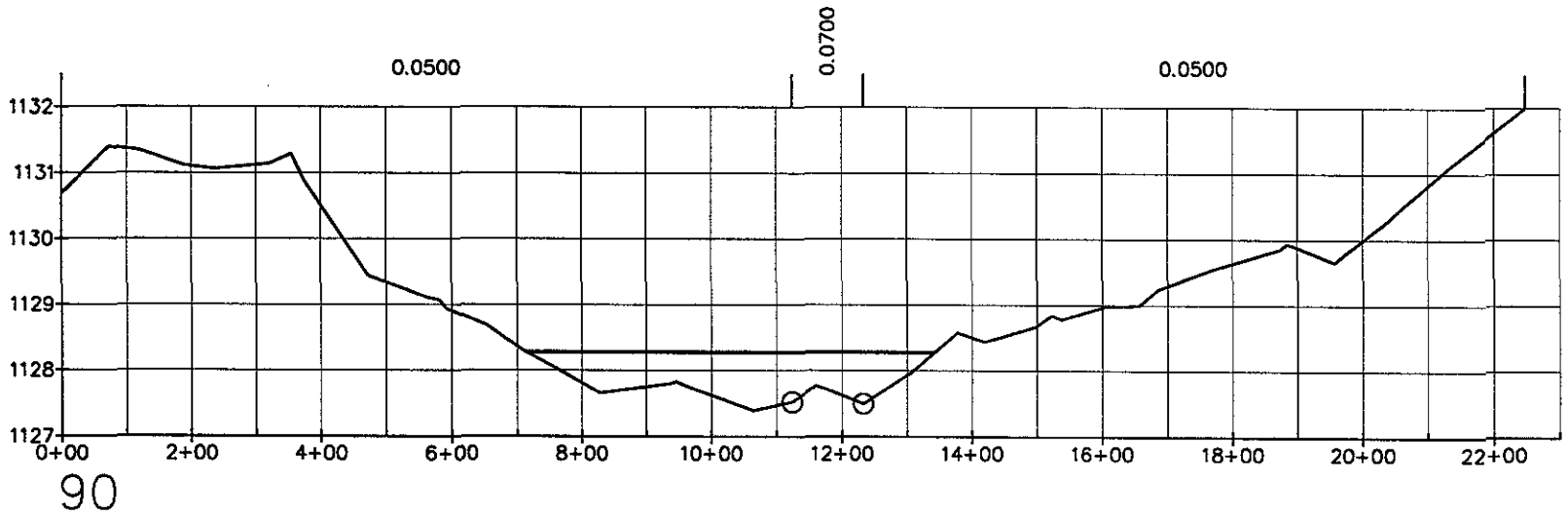
Cross-Section:	80	
Elevation:	1122.05	ft MSL
Depth:	0.99	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3036	
Flow Regime:	Subcritical	
Flow Area:	326.99	sq ft
Average Velocity:	1.69	ft/s
Maximum Velocity:	1.85	ft/s
Composite n:	0.0559	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	554.80	ft
Wetted Top Width:	554.79	ft
Critical Slope:	0.0907	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–80

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

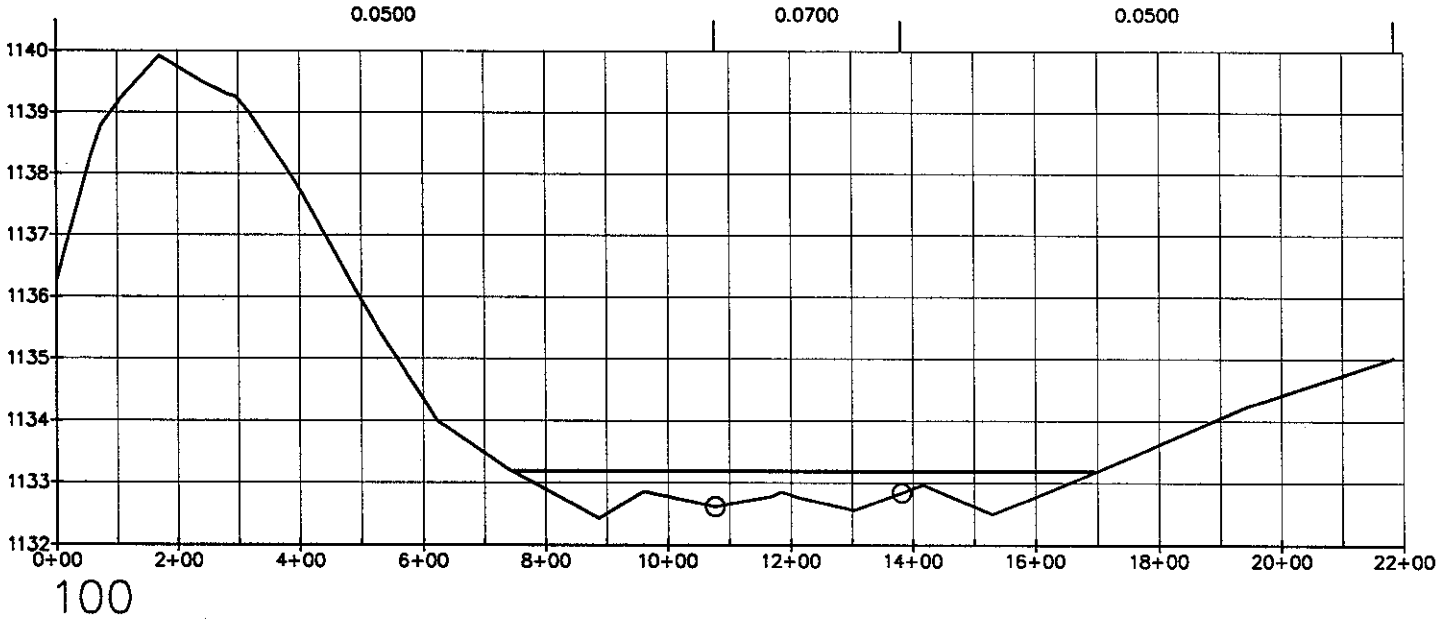
Cross-Section:	90	
Elevation:	1128.28	ft MSL
Depth:	0.88	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3106	
Flow Regime:	Subcritical	
Flow Area:	339.56	sq ft
Average Velocity:	1.67	ft/s
Maximum Velocity:	1.79	ft/s
Composite n:	0.0537	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	627.70	ft
Wetted Top Width:	627.69	ft
Critical Slope:	0.0831	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–90

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

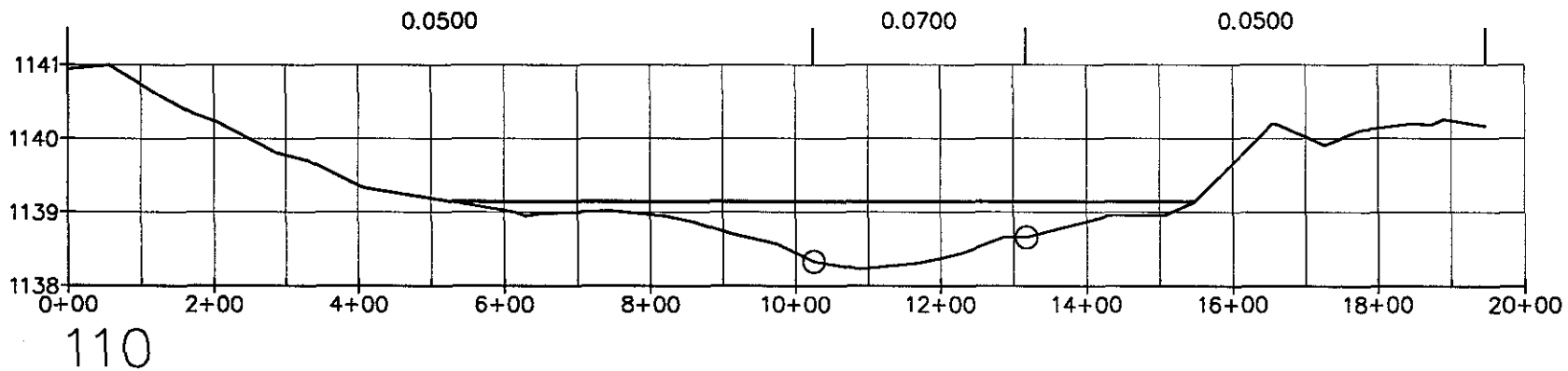
Cross-Section:	100	
Elevation:	1133.19	ft MSL
Depth:	0.76	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2742	
Flow Regime:	Subcritical	
Flow Area:	413.51	sq ft
Average Velocity:	1.37	ft/s
Maximum Velocity:	1.54	ft/s
Composite n:	0.0567	
Hydraulic Radius:	0.43	ft
Wetted Perimeter:	954.50	ft
Wetted Top Width:	954.49	ft
Critical Slope:	0.1079	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–100

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

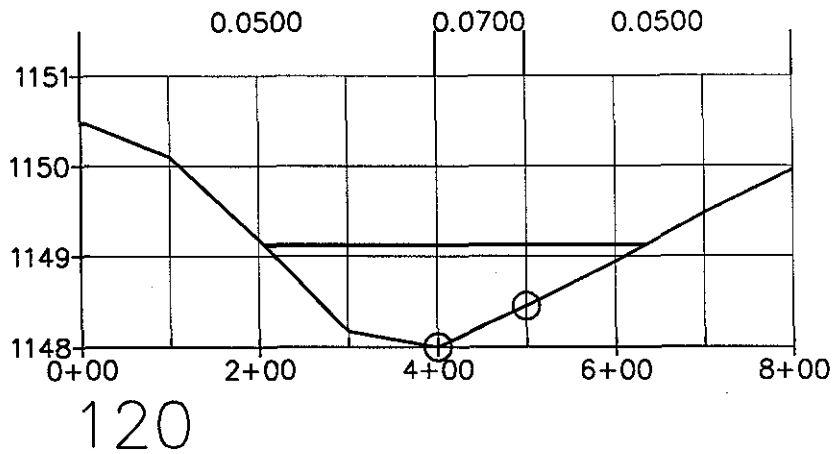
Cross-Section:	110	
Elevation:	1139.15	ft MSL
Depth:	0.92	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2506	
Flow Regime:	Subcritical	
Flow Area:	411.45	sq ft
Average Velocity:	1.35	ft/s
Maximum Velocity:	1.58	ft/s
Composite n:	0.0561	
Hydraulic Radius:	0.4	ft
Wetted Perimeter:	1018.86	ft
Wetted Top Width:	1018.86	ft
Critical Slope:	0.14	ft/ft

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33W-110

Entellus™



Normal Depth Results

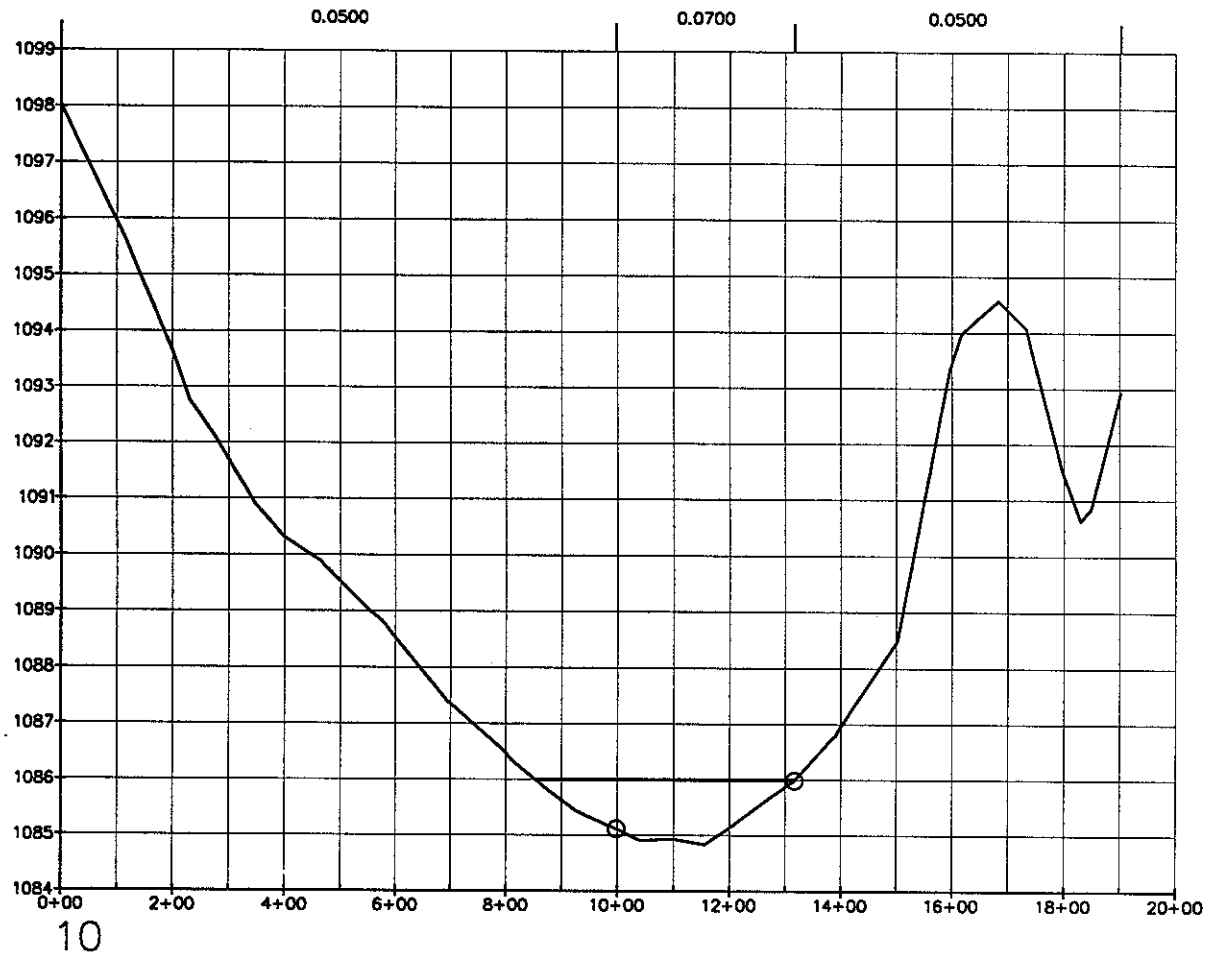
Cross-Section:	120	
Elevation:	1149.13	ft MSL
Depth:	1.13	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3262	
Flow Regime:	Subcritical	
Flow Area:	285.20	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0549	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	428.11	ft
Wetted Top Width:	428.10	ft
Critical Slope:	0.0847	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–120

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1086.00	ft MSL
Depth:	1.16	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.272	
Flow Regime:	Subcritical	
Flow Area:	336.65	sq ft
Average Velocity:	1.68	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.064	
Hydraulic Radius:	0.72	ft
Wetted Perimeter:	465.25	ft
Wetted Top Width:	465.24	ft
Critical Slope:	0.1064	ft/ft

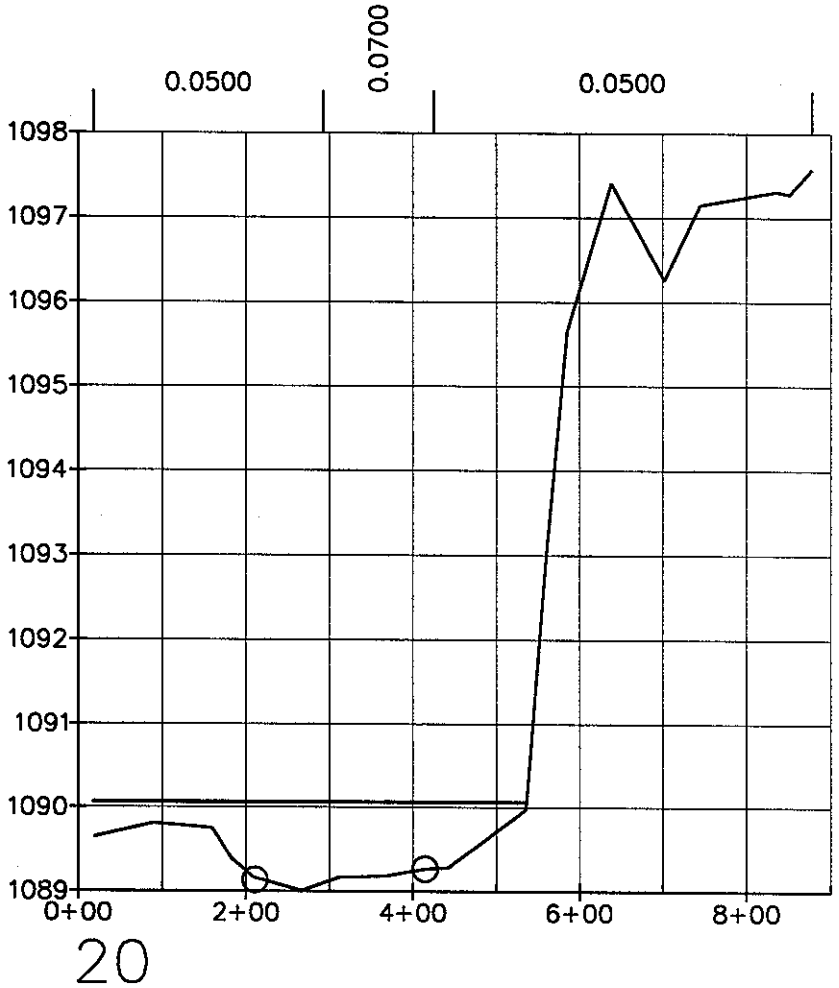
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–10

Entellus™

File: WASH–T2N–R5W–S33W_X-SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1090.06	ft MSL
Depth:	1.05	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2943	
Flow Regime:	Subcritical	
Flow Area:	326.61	sq ft
Average Velocity:	1.75	ft/s
Maximum Velocity:	1.77	ft/s
Composite n:	0.056	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	518.08	ft
Wetted Top Width:	518.07	ft
Critical Slope:	0.0888	ft/ft

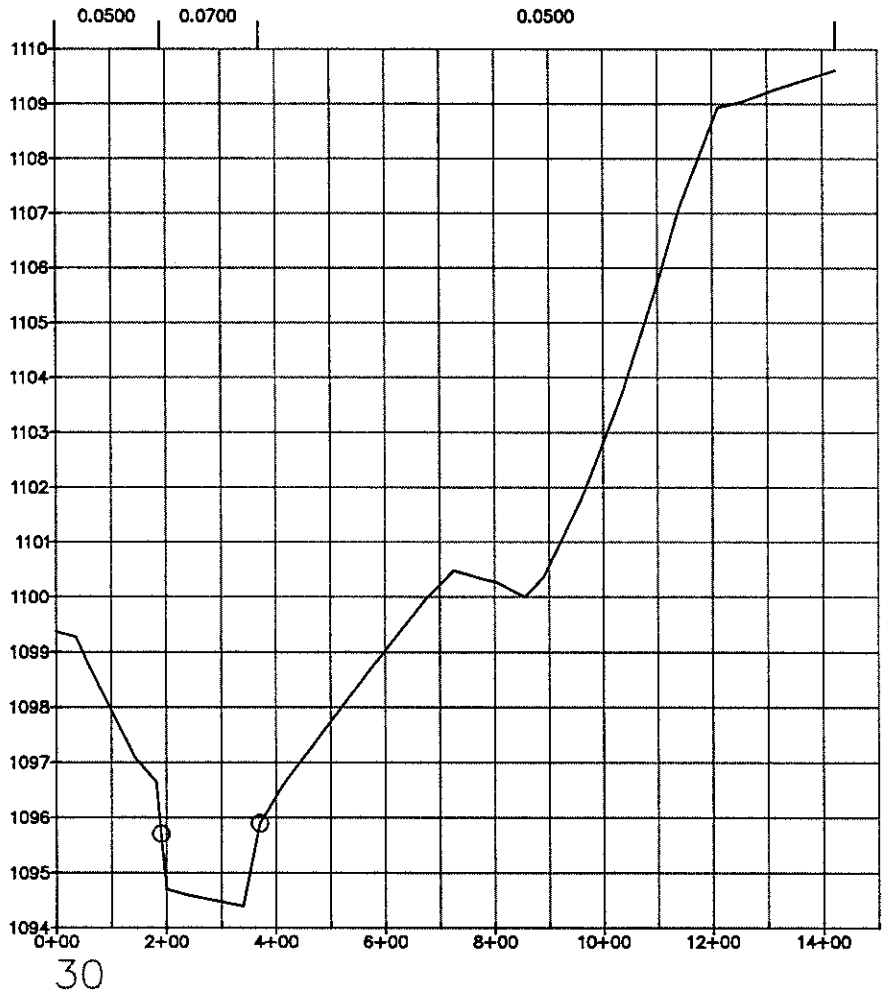
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–20

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

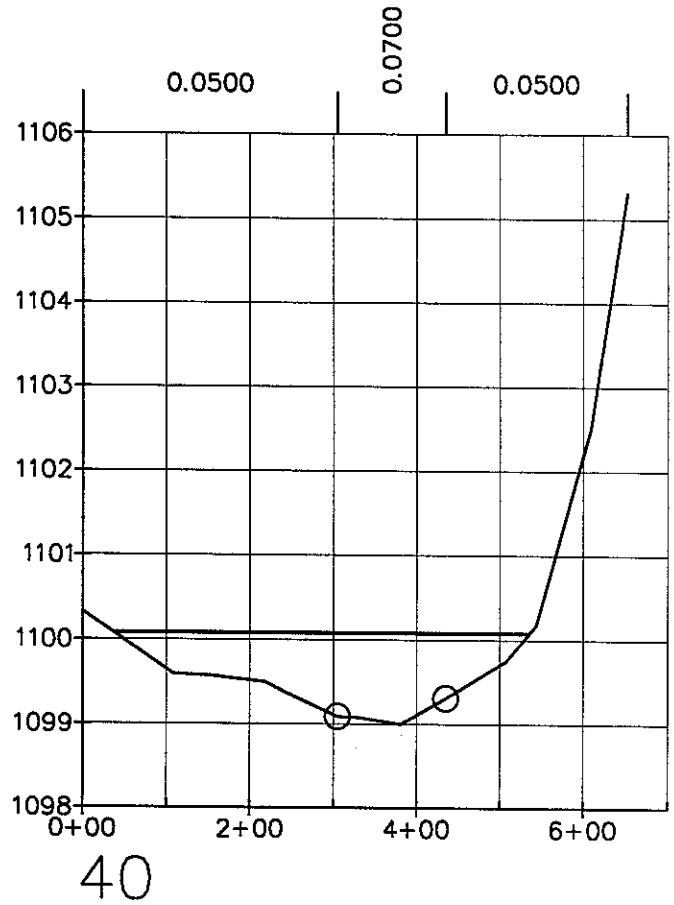
Cross-Section:	30	
Elevation:	1096.00	ft MSL
Depth:	1.60	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3284	
Flow Regime:	Subcritical	
Flow Area:	237.70	sq ft
Average Velocity:	2.34	ft/s
Maximum Velocity:	2.37	ft/s
Composite n:	0.0664	
Hydraulic Radius:	1.26	ft
Wetted Perimeter:	188.67	ft
Wetted Top Width:	188.56	ft
Critical Slope:	0.0751	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–30

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/29/00



Normal Depth Results

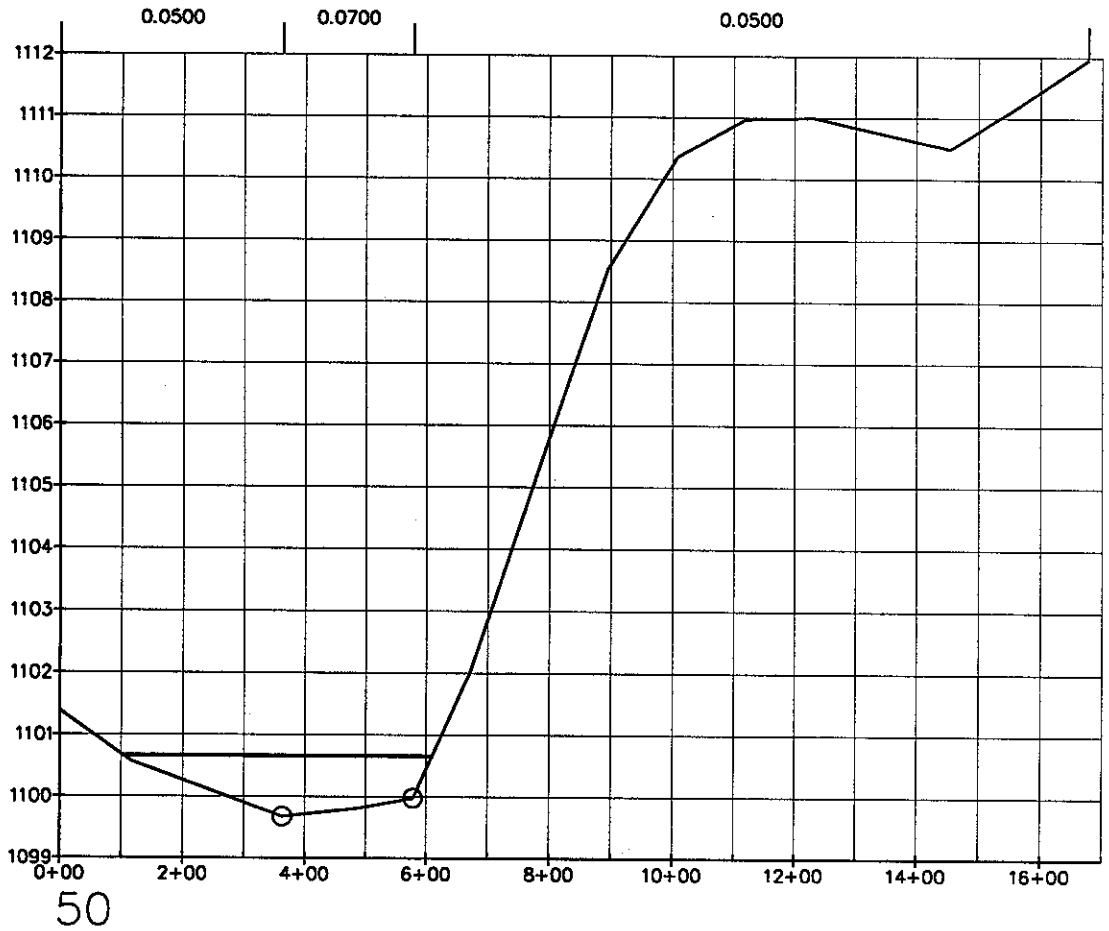
Cross-Section:	40	
Elevation:	1100.08	ft MSL
Depth:	1.08	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3009	
Flow Regime:	Subcritical	
Flow Area:	315.95	sq ft
Average Velocity:	1.78	ft/s
Maximum Velocity:	1.88	ft/s
Composite n:	0.0555	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	498.44	ft
Wetted Top Width:	498.44	ft
Critical Slope:	0.0886	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–40

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

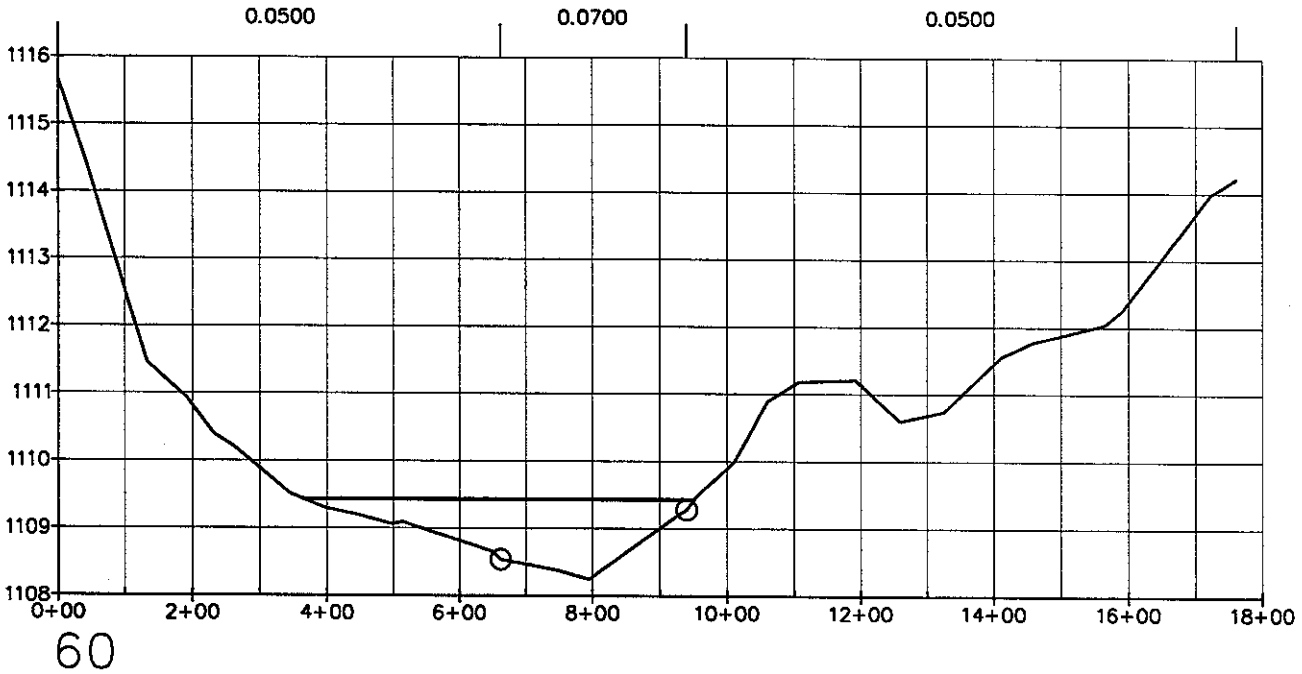
Cross-Section:	50	
Elevation:	1100.66	ft MSL
Depth:	0.98	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.304	
Flow Regime:	Subcritical	
Flow Area:	327.26	sq ft
Average Velocity:	1.70	ft/s
Maximum Velocity:	1.71	ft/s
Composite n:	0.0589	
Hydraulic Radius:	0.65	ft
Wetted Perimeter:	505.82	ft
Wetted Top Width:	505.81	ft
Critical Slope:	0.0884	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–50

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

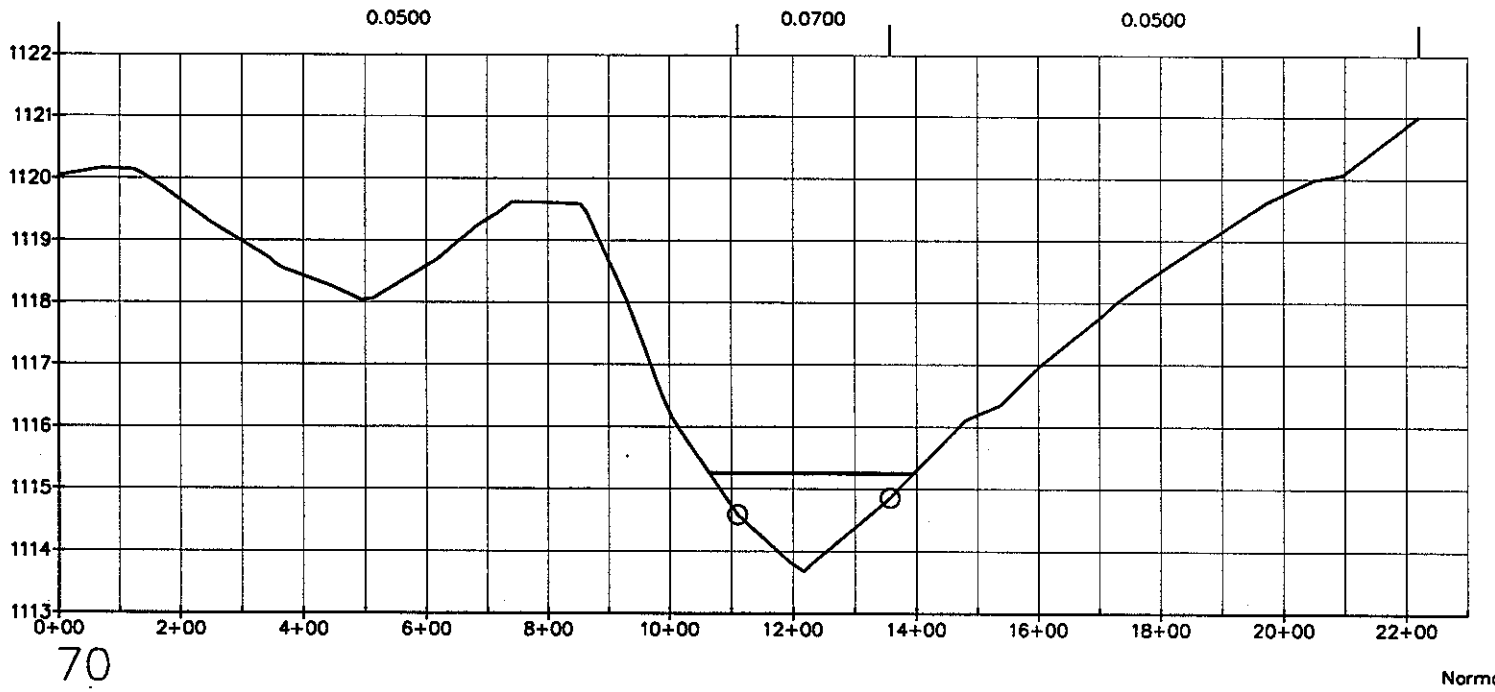
Cross-Section:	60	
Elevation:	1109.43	ft MSL
Depth:	1.18	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2576	
Flow Regime:	Subcritical	
Flow Area:	352.25	sq ft
Average Velocity:	1.60	ft/s
Maximum Velocity:	1.69	ft/s
Composite n:	0.0598	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	587.11	ft
Wetted Top Width:	587.11	ft
Critical Slope:	0.1214	ft/ft

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33W-60

Entellus™



Normal Depth Results

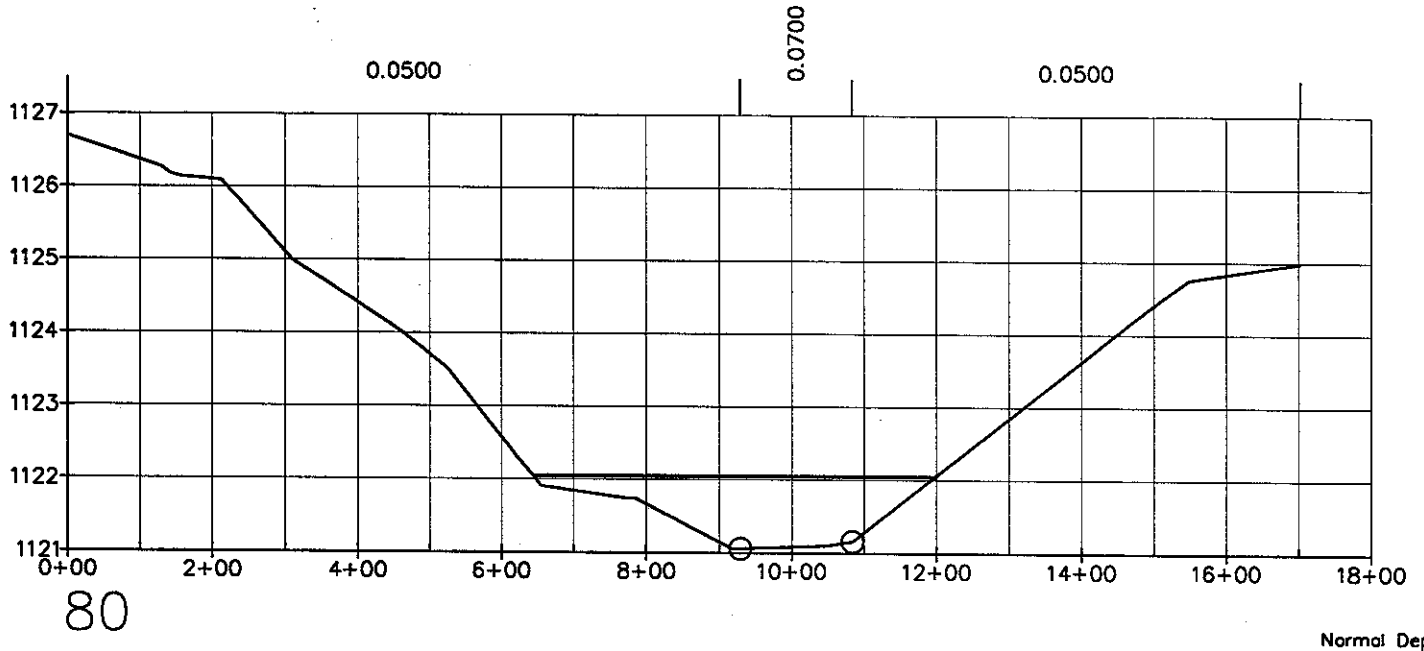
Cross-Section:	70	
Elevation:	1115.25	ft MSL
Depth:	1.57	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2803	
Flow Regime:	Subcritical	
Flow Area:	280.94	sq ft
Average Velocity:	1.99	ft/s
Maximum Velocity:	2.18	ft/s
Composite n:	0.0606	
Hydraulic Radius:	0.85	ft
Wetted Perimeter:	330.67	ft
Wetted Top Width:	330.66	ft
Critical Slope:	0.104	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–70

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

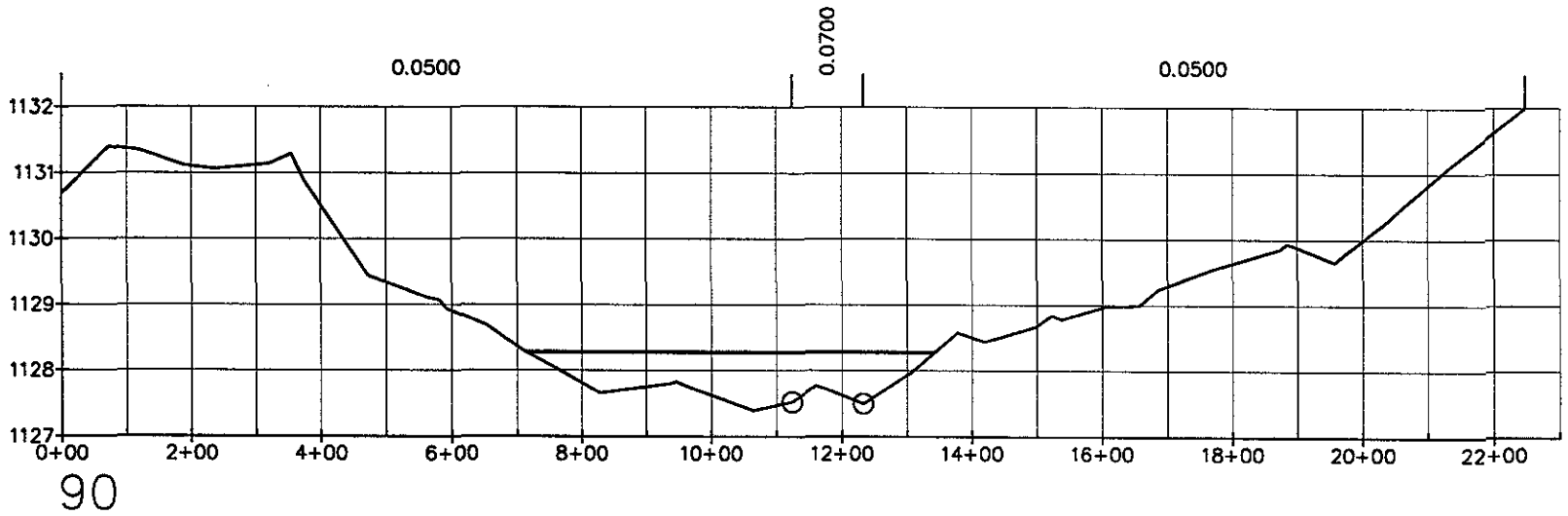
Cross-Section:	80	
Elevation:	1122.05	ft MSL
Depth:	0.99	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3036	
Flow Regime:	Subcritical	
Flow Area:	326.99	sq ft
Average Velocity:	1.69	ft/s
Maximum Velocity:	1.85	ft/s
Composite n:	0.0559	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	554.80	ft
Wetted Top Width:	554.79	ft
Critical Slope:	0.0907	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–80

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

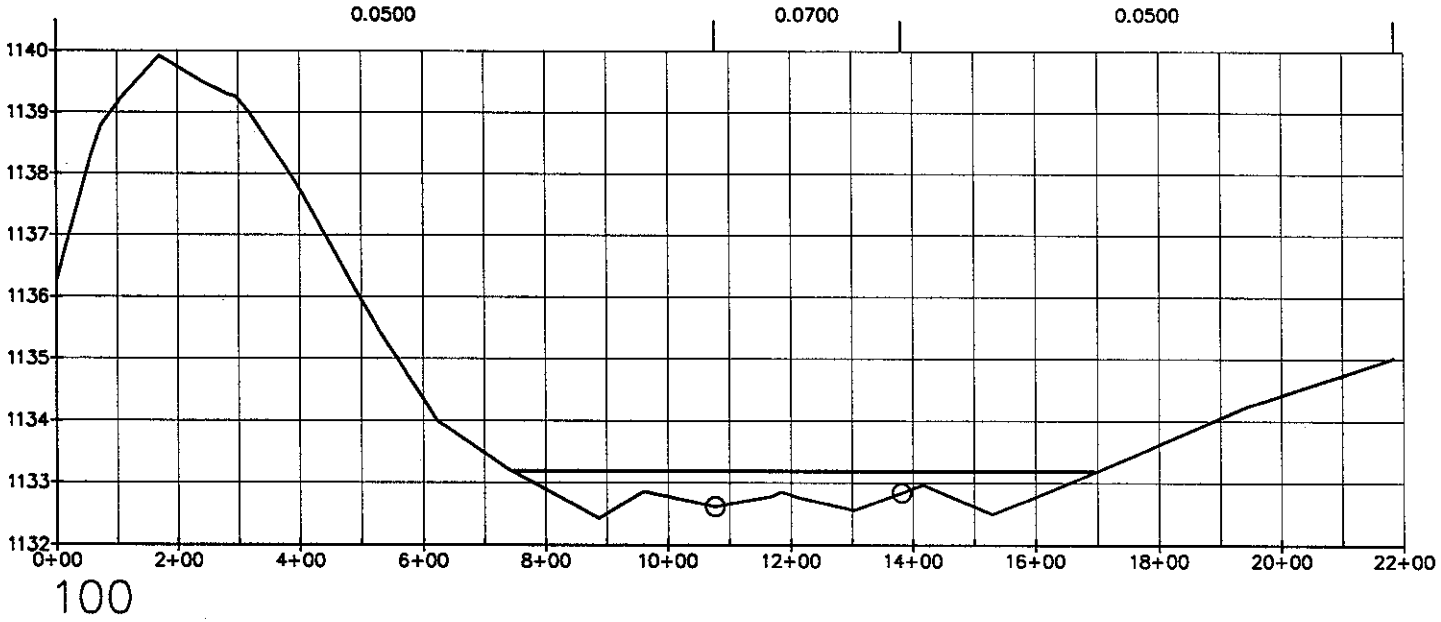
Cross-Section:	90	
Elevation:	1128.28	ft MSL
Depth:	0.88	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3106	
Flow Regime:	Subcritical	
Flow Area:	339.56	sq ft
Average Velocity:	1.67	ft/s
Maximum Velocity:	1.79	ft/s
Composite n:	0.0537	
Hydraulic Radius:	0.54	ft
Wetted Perimeter:	627.70	ft
Wetted Top Width:	627.69	ft
Critical Slope:	0.0831	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–90

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

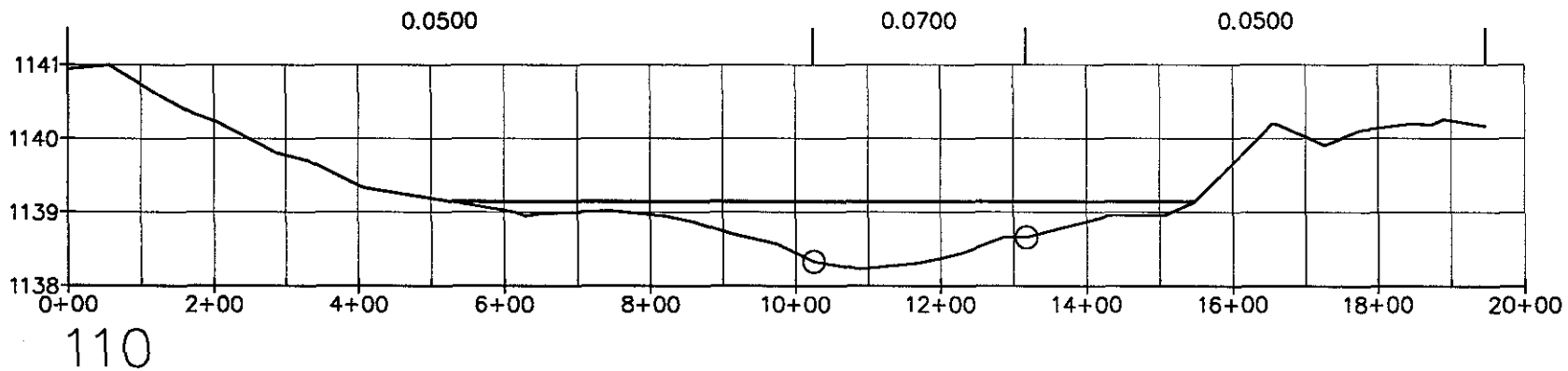
Cross-Section:	100	
Elevation:	1133.19	ft MSL
Depth:	0.76	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2742	
Flow Regime:	Subcritical	
Flow Area:	413.51	sq ft
Average Velocity:	1.37	ft/s
Maximum Velocity:	1.54	ft/s
Composite n:	0.0567	
Hydraulic Radius:	0.43	ft
Wetted Perimeter:	954.50	ft
Wetted Top Width:	954.49	ft
Critical Slope:	0.1079	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–100

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

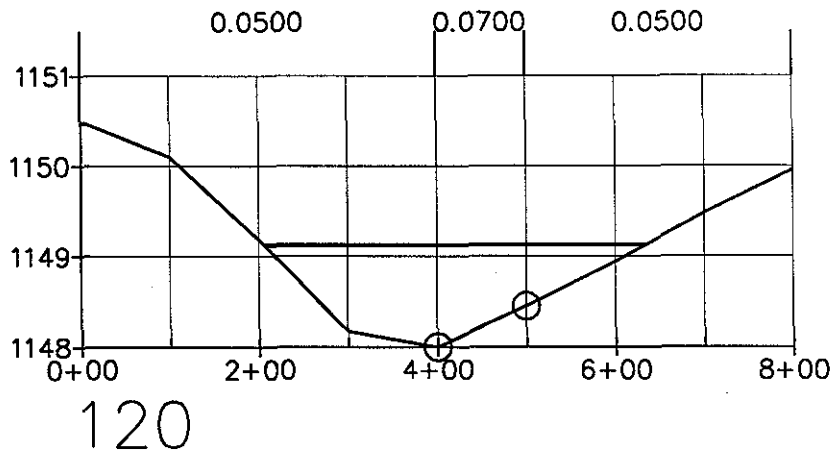
Cross-Section:	110	
Elevation:	1139.15	ft MSL
Depth:	0.92	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.2506	
Flow Regime:	Subcritical	
Flow Area:	411.45	sq ft
Average Velocity:	1.35	ft/s
Maximum Velocity:	1.58	ft/s
Composite n:	0.0561	
Hydraulic Radius:	0.4	ft
Wetted Perimeter:	1018.86	ft
Wetted Top Width:	1018.86	ft
Critical Slope:	0.14	ft/ft

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S33W-110

Entellus™



Normal Depth Results

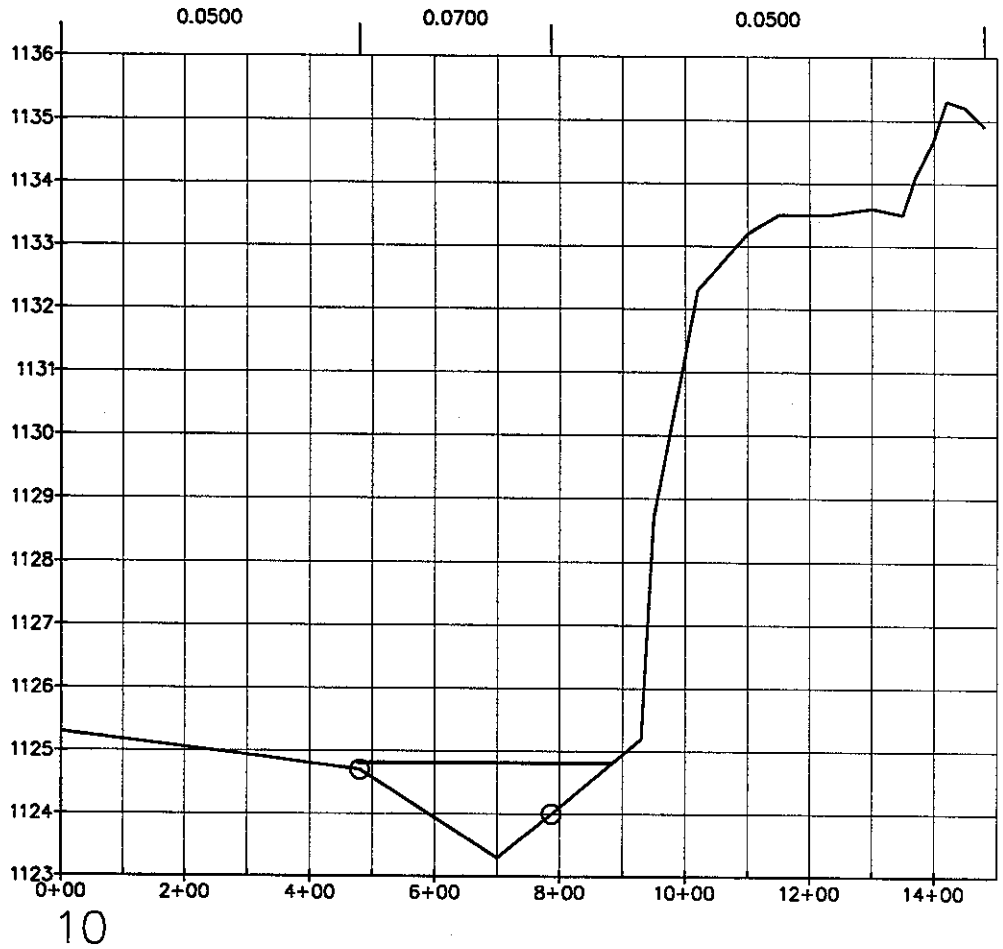
Cross-Section:	120	
Elevation:	1149.13	ft MSL
Depth:	1.13	ft
Discharge:	560.00	cfs
Energy Gradient:	0.008	ft/ft
Froude Number:	0.3262	
Flow Regime:	Subcritical	
Flow Area:	285.20	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.24	ft/s
Composite n:	0.0549	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	428.11	ft
Wetted Top Width:	428.10	ft
Critical Slope:	0.0847	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S33W–120

Entellus™

File: WASH-T2N-R5W-S33W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

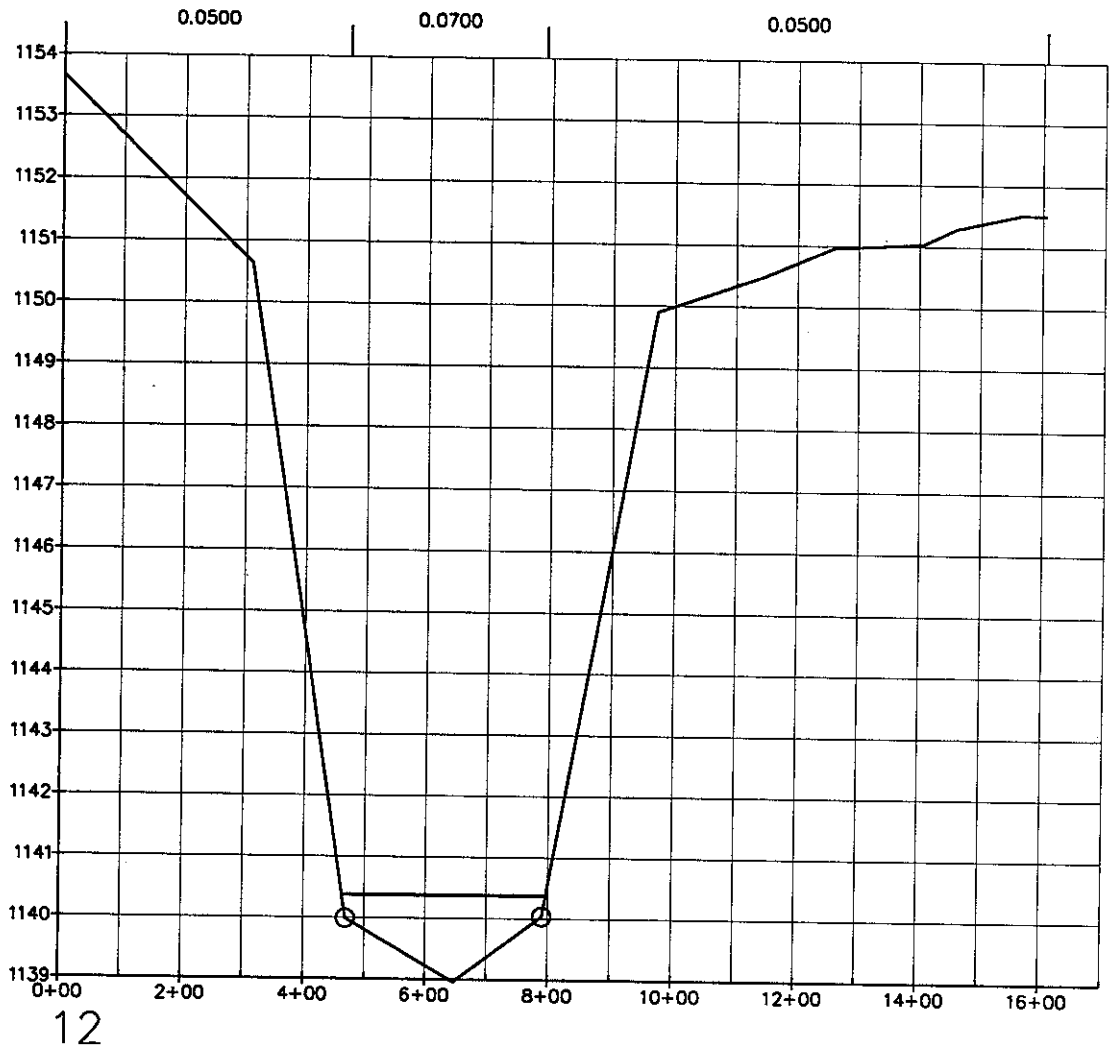
Cross-Section:	10	
Elevation:	1124.81	ft MSL
Depth:	1.51	ft
Discharge:	530.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.2393	
Flow Regime:	Subcritical	
Flow Area:	317.42	sq ft
Average Velocity:	1.67	ft/s
Maximum Velocity:	1.67	ft/s
Composite n:	0.0698	
Hydraulic Radius:	0.78	ft
Wetted Perimeter:	406.65	ft
Wetted Top Width:	406.64	ft
Critical Slope:	0.1487	ft/ft

Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S21–10

Entellus™



Normal Depth Results

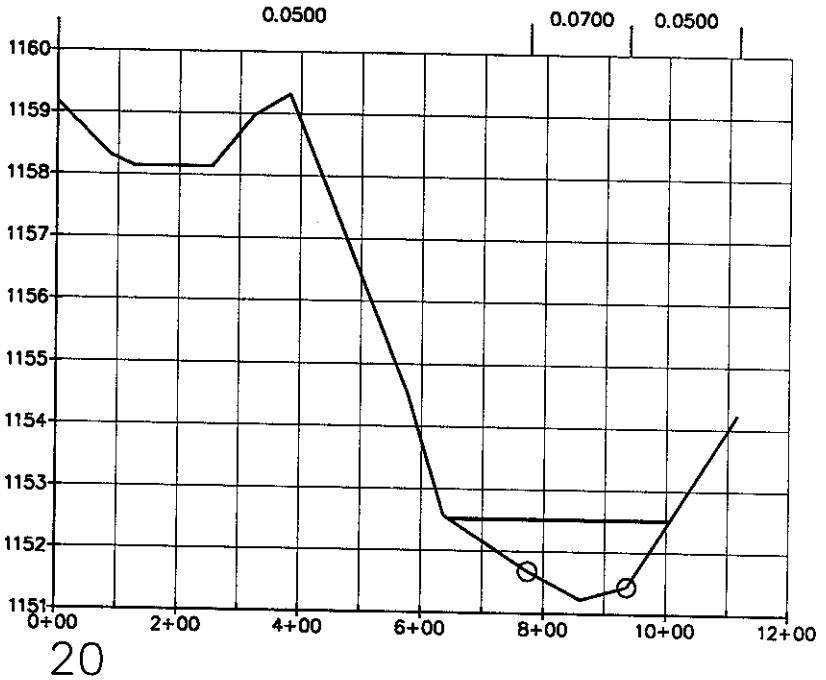
Cross-Section:	12	
Elevation:	1140.38	ft MSL
Depth:	1.42	ft
Discharge:	530.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.2715	
Flow Regime:	Subcritical	
Flow Area:	288.92	sq ft
Average Velocity:	1.81	ft/s
Maximum Velocity:	1.82	ft/s
Composite n:	0.0693	
Hydraulic Radius:	0.87	ft
Wetted Perimeter:	333.30	ft
Wetted Top Width:	333.27	ft
Critical Slope:	0.1195	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S21–12

Entellus™

File: WASH-T2N-R5W-S21_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

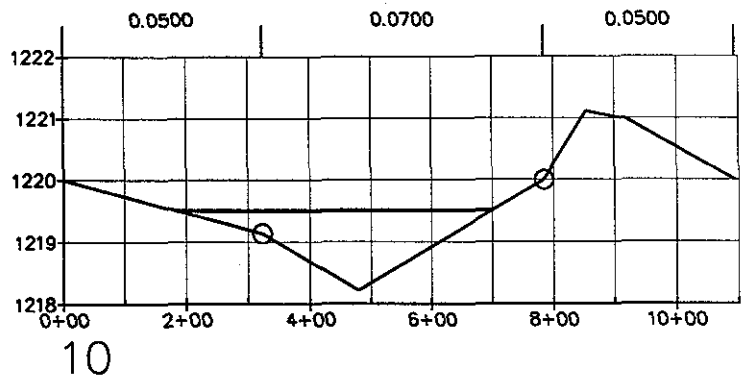
Cross-Section:	20	
Elevation:	1152.52	ft MSL
Depth:	1.29	ft
Discharge:	530.00	cfs
Energy Gradient:	0.0085	ft/ft
Froude Number:	0.3002	
Flow Regime:	Subcritical	
Flow Area:	273.81	sq ft
Average Velocity:	1.96	ft/s
Maximum Velocity:	2.12	ft/s
Composite n:	0.0594	
Hydraulic Radius:	0.76	ft
Wetted Perimeter:	360.90	ft
Wetted Top Width:	360.89	ft
Critical Slope:	0.0955	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S21–20

Entellus™

File: WASH–T2N–R5W–S21_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1219.51	ft MSL
Depth:	1.29	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2034	
Flow Regime:	Subcritical	
Flow Area:	297.70	sq ft
Average Velocity:	1.32	ft/s
Maximum Velocity:	1.37	ft/s
Composite n:	0.0649	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	516.12	ft
Wetted Top Width:	516.11	ft
Critical Slope:	0.1641	ft/ft

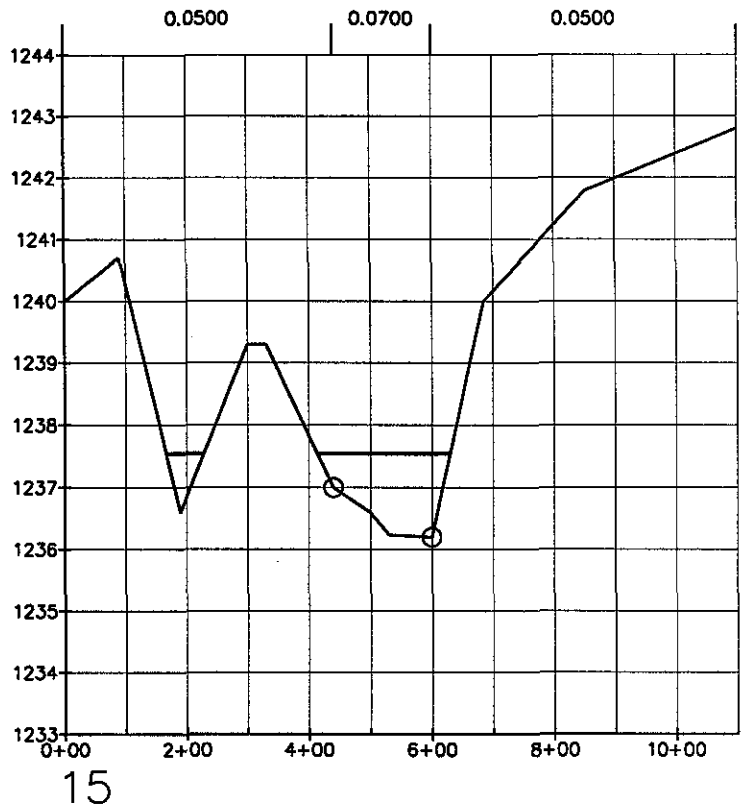
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S05E-10

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

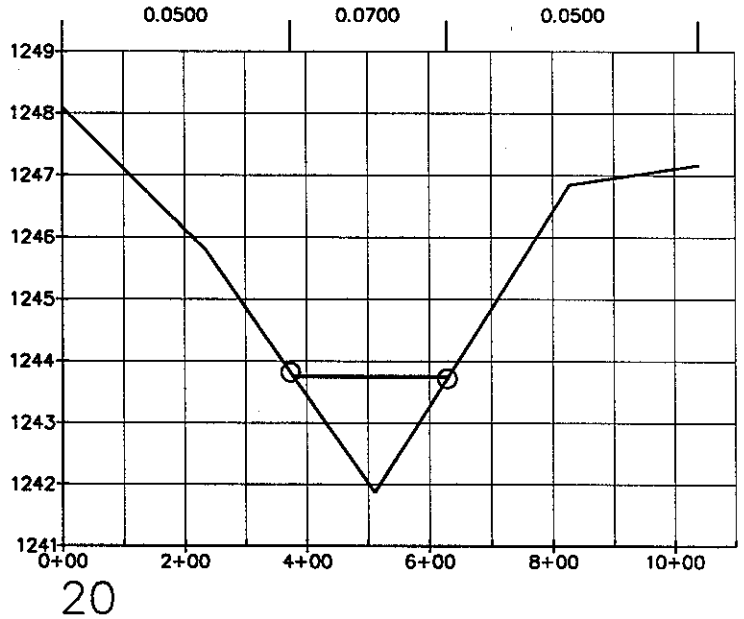
Cross-Section:	15	
Elevation:	1237.54	ft MSL
Depth:	1.34	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2608	
Flow Regime:	Subcritical	
Flow Area:	227.33	sq ft
Average Velocity:	1.71	ft/s
Maximum Velocity:	1.83	ft/s
Composite n:	0.0619	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	277.37	ft
Wetted Top Width:	277.30	ft
Critical Slope:	0.0974	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–15

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

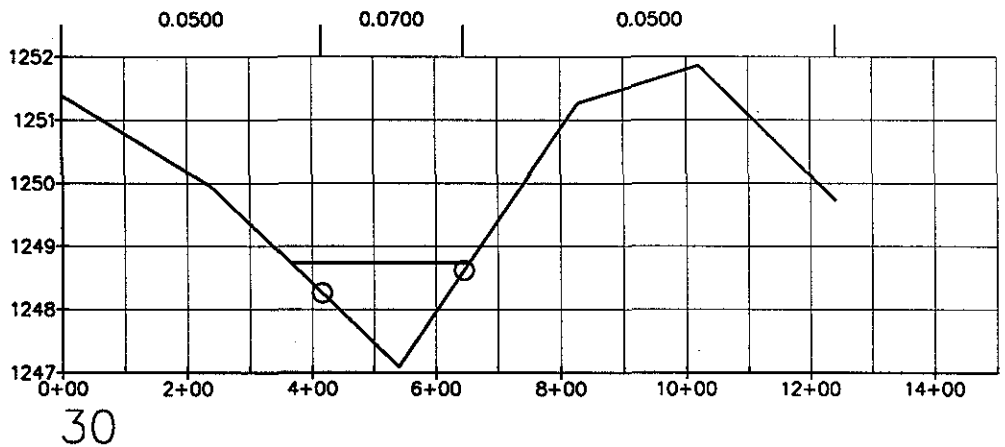
Cross-Section:	20	
Elevation:	1243.75	ft MSL
Depth:	1.88	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2116	
Flow Regime:	Subcritical	
Flow Area:	236.89	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	1.64	ft/s
Composite n:	0.0698	
Hydraulic Radius:	0.94	ft
Wetted Perimeter:	252.01	ft
Wetted Top Width:	251.98	ft
Critical Slope:	0.1444	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–20

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



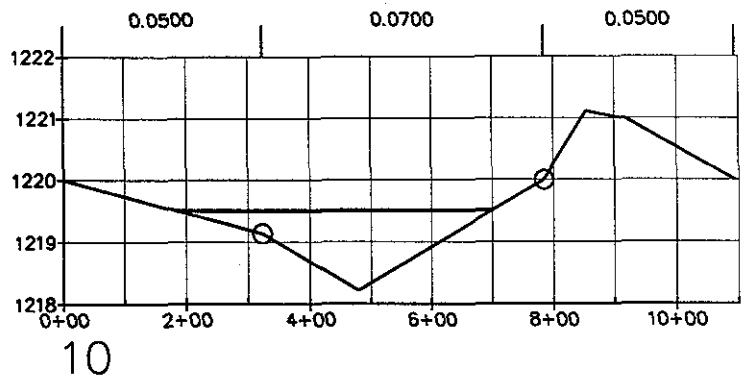
Normal Depth Results

Cross-Section:	30	
Elevation:	1248.74	ft MSL
Depth:	1.65	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2259	
Flow Regime:	Subcritical	
Flow Area:	237.09	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	1.68	ft/s
Composite n:	0.0662	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	287.79	ft
Wetted Top Width:	287.77	ft
Critical Slope:	0.1354	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–30

Entellus™



Normal Depth Results

Cross-Section:	10	
Elevation:	1219.51	ft MSL
Depth:	1.29	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2034	
Flow Regime:	Subcritical	
Flow Area:	297.70	sq ft
Average Velocity:	1.32	ft/s
Maximum Velocity:	1.37	ft/s
Composite n:	0.0649	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	516.12	ft
Wetted Top Width:	516.11	ft
Critical Slope:	0.1641	ft/ft

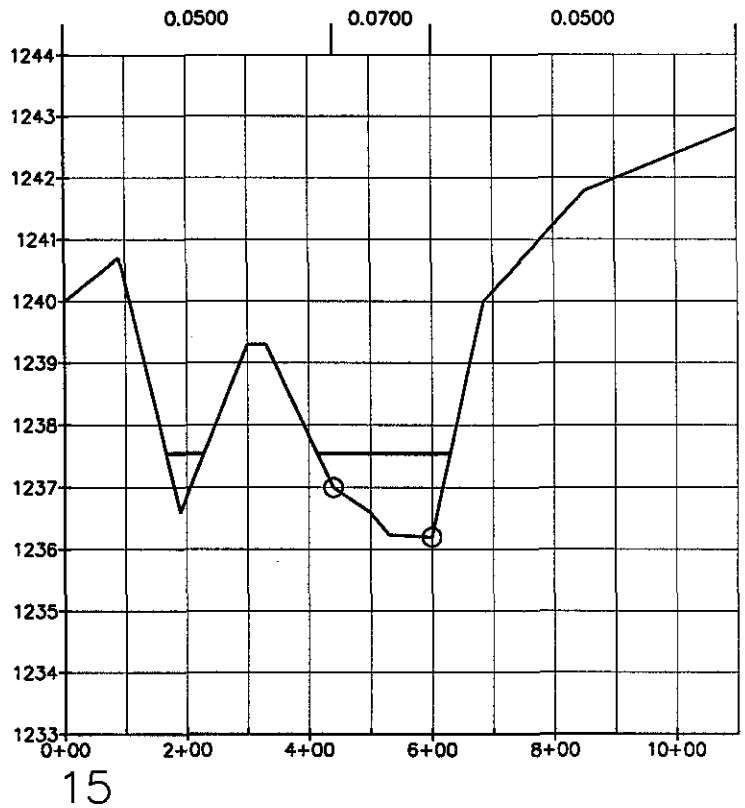
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S05E-10

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

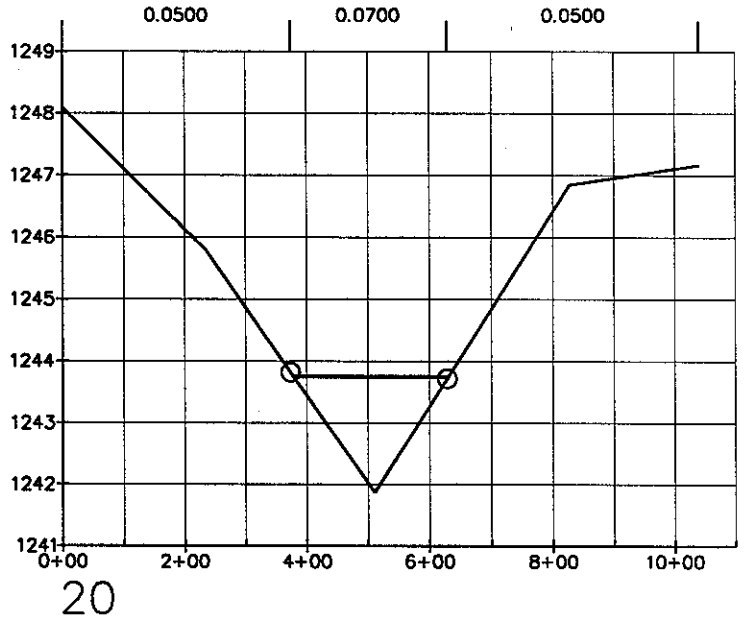
Cross-Section:	15	
Elevation:	1237.54	ft MSL
Depth:	1.34	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2608	
Flow Regime:	Subcritical	
Flow Area:	227.33	sq ft
Average Velocity:	1.71	ft/s
Maximum Velocity:	1.83	ft/s
Composite n:	0.0619	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	277.37	ft
Wetted Top Width:	277.30	ft
Critical Slope:	0.0974	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–15

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

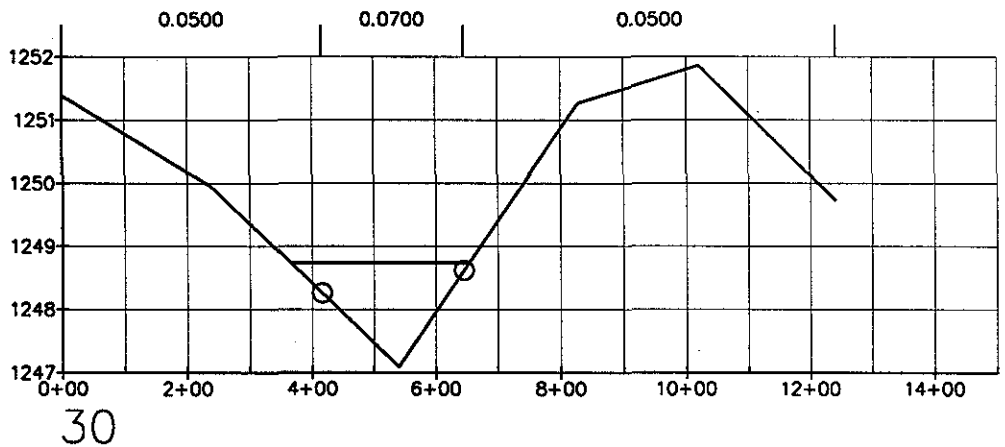
Cross-Section:	20	
Elevation:	1243.75	ft MSL
Depth:	1.88	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2116	
Flow Regime:	Subcritical	
Flow Area:	236.89	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	1.64	ft/s
Composite n:	0.0698	
Hydraulic Radius:	0.94	ft
Wetted Perimeter:	252.01	ft
Wetted Top Width:	251.98	ft
Critical Slope:	0.1444	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–20

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



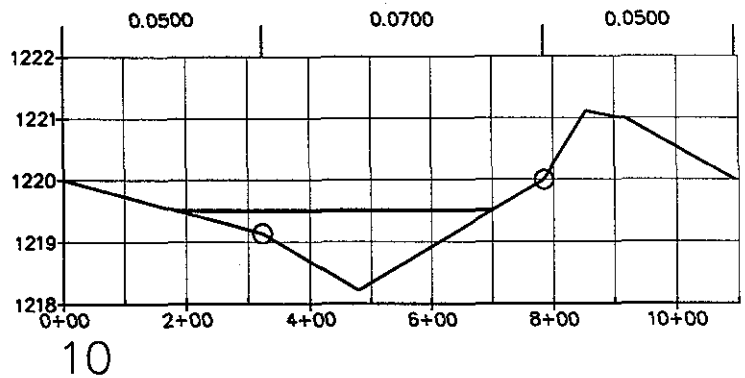
Normal Depth Results

Cross-Section:	30	
Elevation:	1248.74	ft MSL
Depth:	1.65	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2259	
Flow Regime:	Subcritical	
Flow Area:	237.09	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	1.68	ft/s
Composite n:	0.0662	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	287.79	ft
Wetted Top Width:	287.77	ft
Critical Slope:	0.1354	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–30

Entellus™



Normal Depth Results

Cross-Section:	10	
Elevation:	1219.51	ft MSL
Depth:	1.29	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2034	
Flow Regime:	Subcritical	
Flow Area:	297.70	sq ft
Average Velocity:	1.32	ft/s
Maximum Velocity:	1.37	ft/s
Composite n:	0.0649	
Hydraulic Radius:	0.58	ft
Wetted Perimeter:	516.12	ft
Wetted Top Width:	516.11	ft
Critical Slope:	0.1641	ft/ft

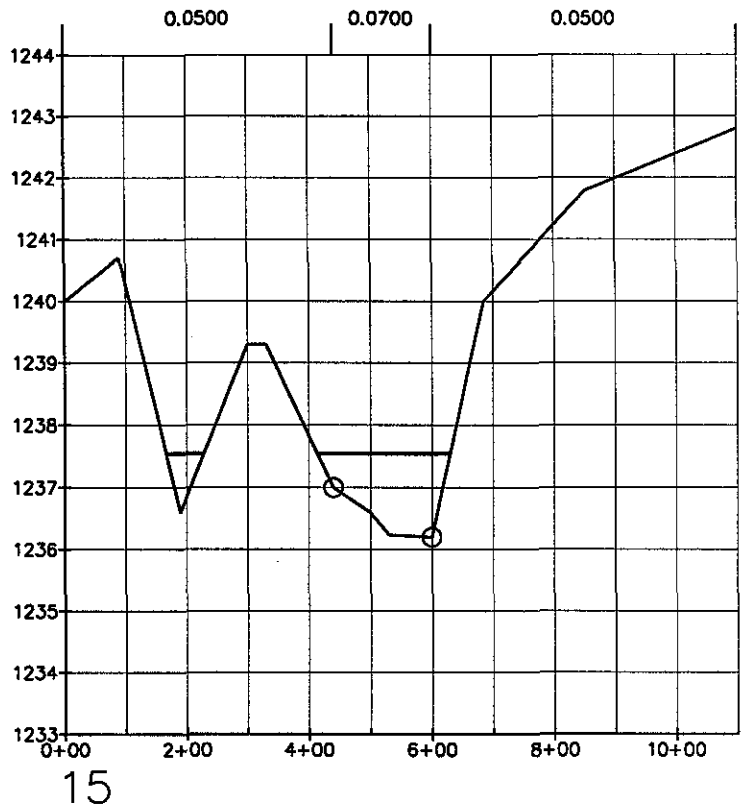
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S05E-10

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

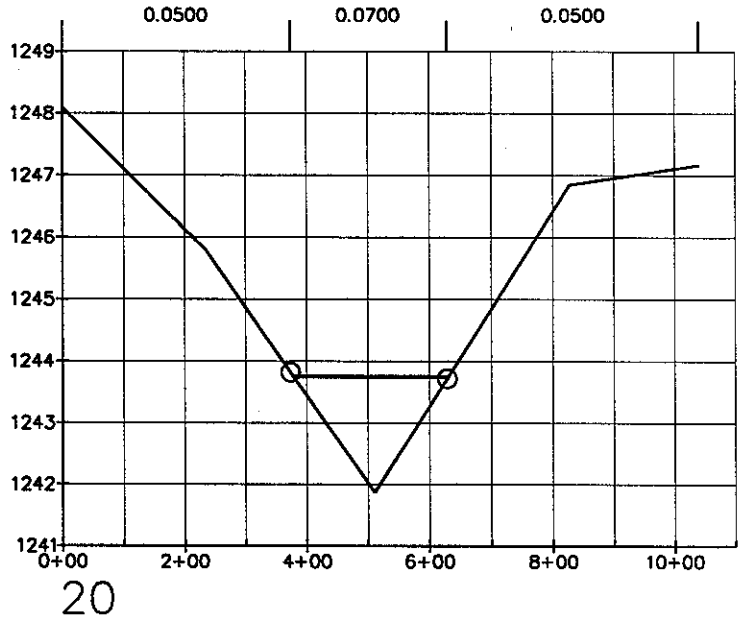
Cross-Section:	15	
Elevation:	1237.54	ft MSL
Depth:	1.34	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2608	
Flow Regime:	Subcritical	
Flow Area:	227.33	sq ft
Average Velocity:	1.71	ft/s
Maximum Velocity:	1.83	ft/s
Composite n:	0.0619	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	277.37	ft
Wetted Top Width:	277.30	ft
Critical Slope:	0.0974	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–15

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

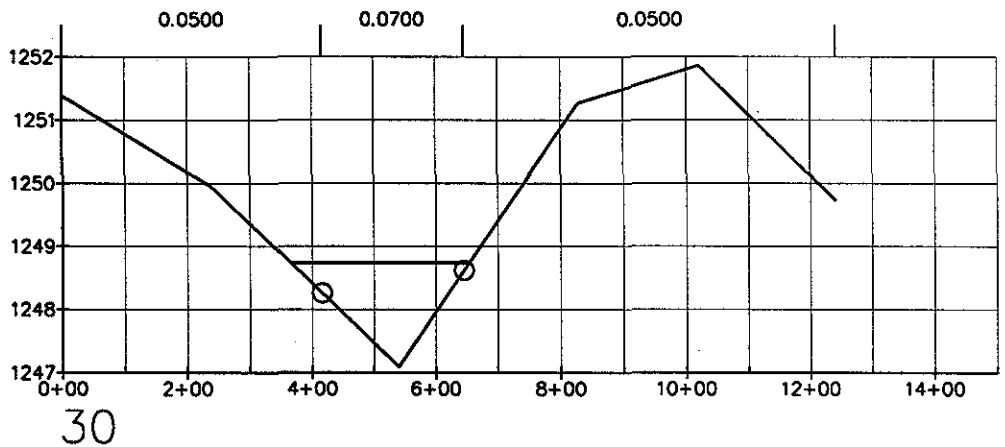
Cross-Section:	20	
Elevation:	1243.75	ft MSL
Depth:	1.88	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2116	
Flow Regime:	Subcritical	
Flow Area:	236.89	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	1.64	ft/s
Composite n:	0.0698	
Hydraulic Radius:	0.94	ft
Wetted Perimeter:	252.01	ft
Wetted Top Width:	251.98	ft
Critical Slope:	0.1444	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–20

Entellus™

File: WASH-T2N-R5W-S05E_X-SECTION-R14.dwg Date: 9/28/00



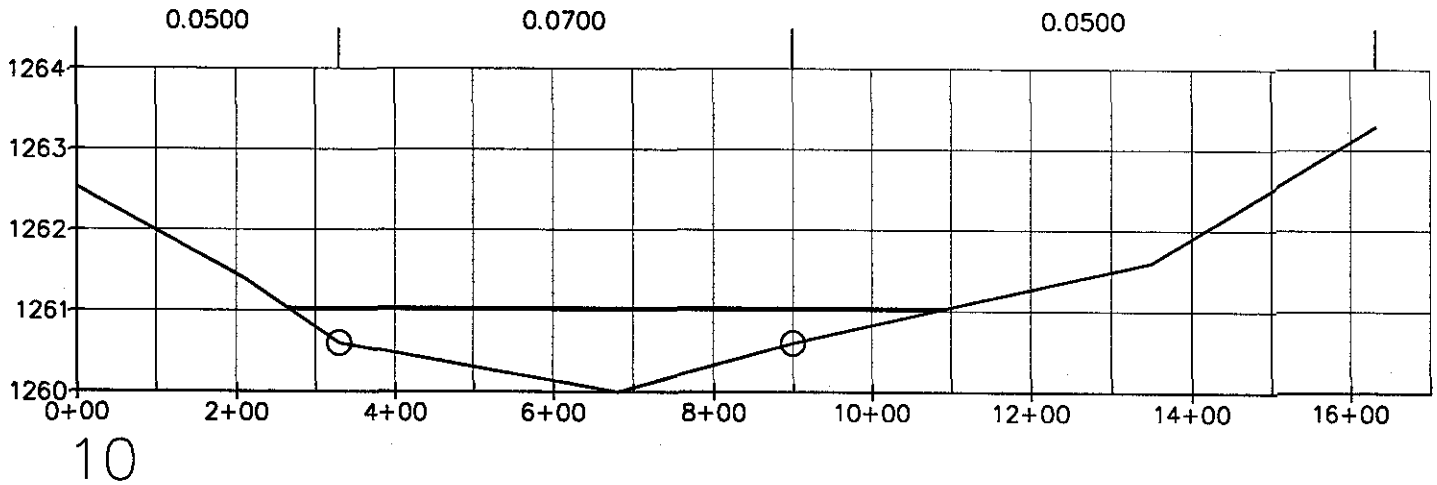
Normal Depth Results

Cross-Section:	30	
Elevation:	1248.74	ft MSL
Depth:	1.65	ft
Discharge:	390.00	cfs
Energy Gradient:	0.0064	ft/ft
Froude Number:	0.2259	
Flow Regime:	Subcritical	
Flow Area:	237.09	sq ft
Average Velocity:	1.64	ft/s
Maximum Velocity:	1.68	ft/s
Composite n:	0.0662	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	287.79	ft
Wetted Top Width:	287.77	ft
Critical Slope:	0.1354	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05E–30

Entellus™



Normal Depth Results

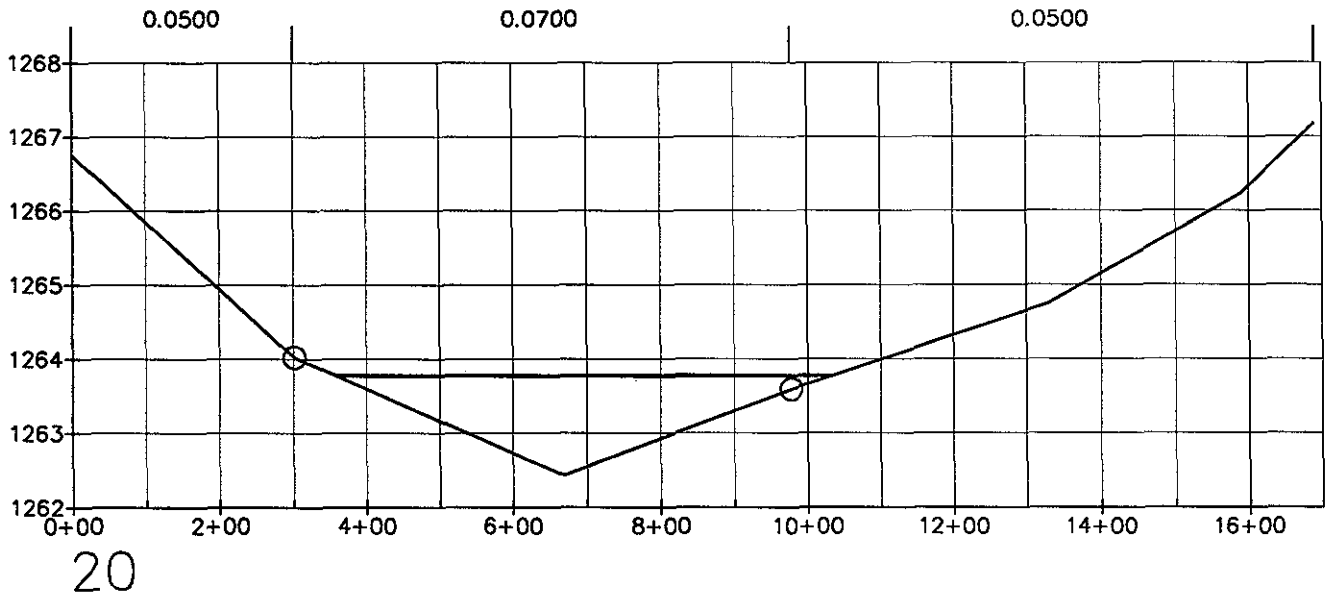
Cross-Section:	10	
Elevation:	1261.03	ft MSL
Depth:	1.03	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2071	
Flow Regime:	Subcritical	
Flow Area:	470.04	sq ft
Average Velocity:	1.20	ft/s
Maximum Velocity:	1.25	ft/s
Composite n:	0.0641	
Hydraulic Radius:	0.57	ft
Wetted Perimeter:	826.90	ft
Wetted Top Width:	826.89	ft
Critical Slope:	0.1301	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S32E–10

Entellus™

File: WASH-T3N-R5W-S32E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

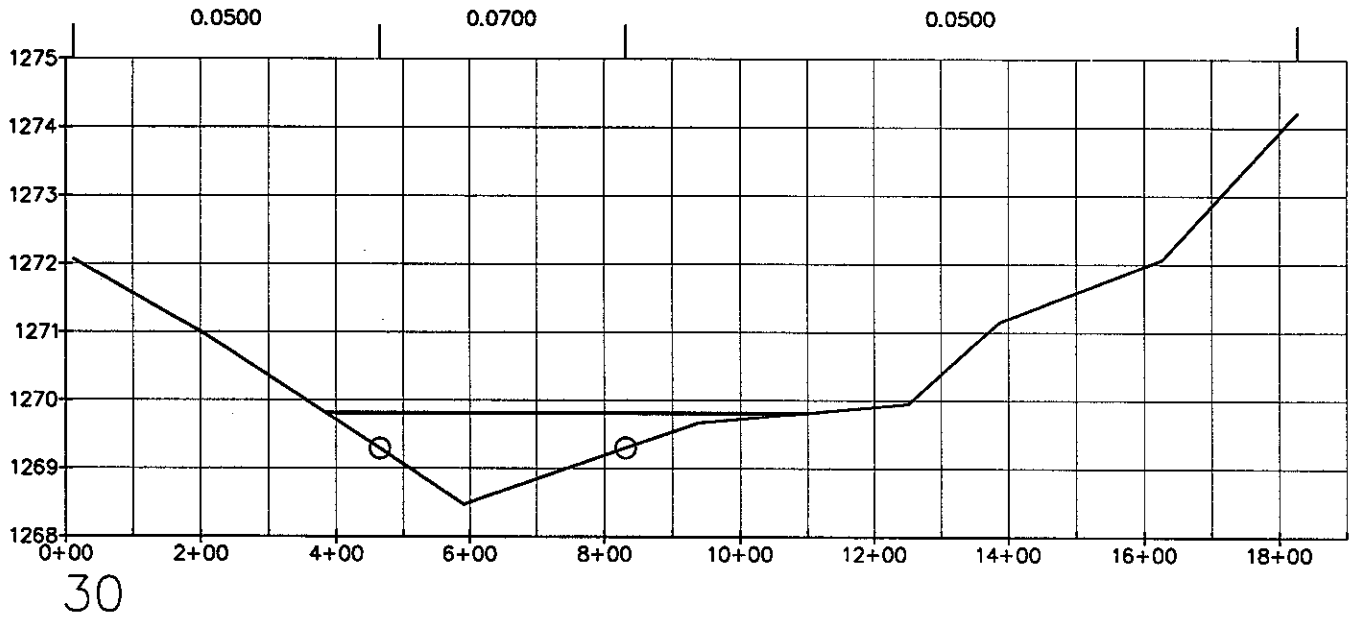
Cross-Section:	20	
Elevation:	1263.77	ft MSL
Depth:	1.34	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.1905	
Flow Regime:	Subcritical	
Flow Area:	447.57	sq ft
Average Velocity:	1.23	ft/s
Maximum Velocity:	1.24	ft/s
Composite n:	0.0684	
Hydraulic Radius:	0.66	ft
Wetted Perimeter:	673.93	ft
Wetted Top Width:	673.92	ft
Critical Slope:	0.1571	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S32E–20

Entellus™

File: WASH-T3N-R5W-S32E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

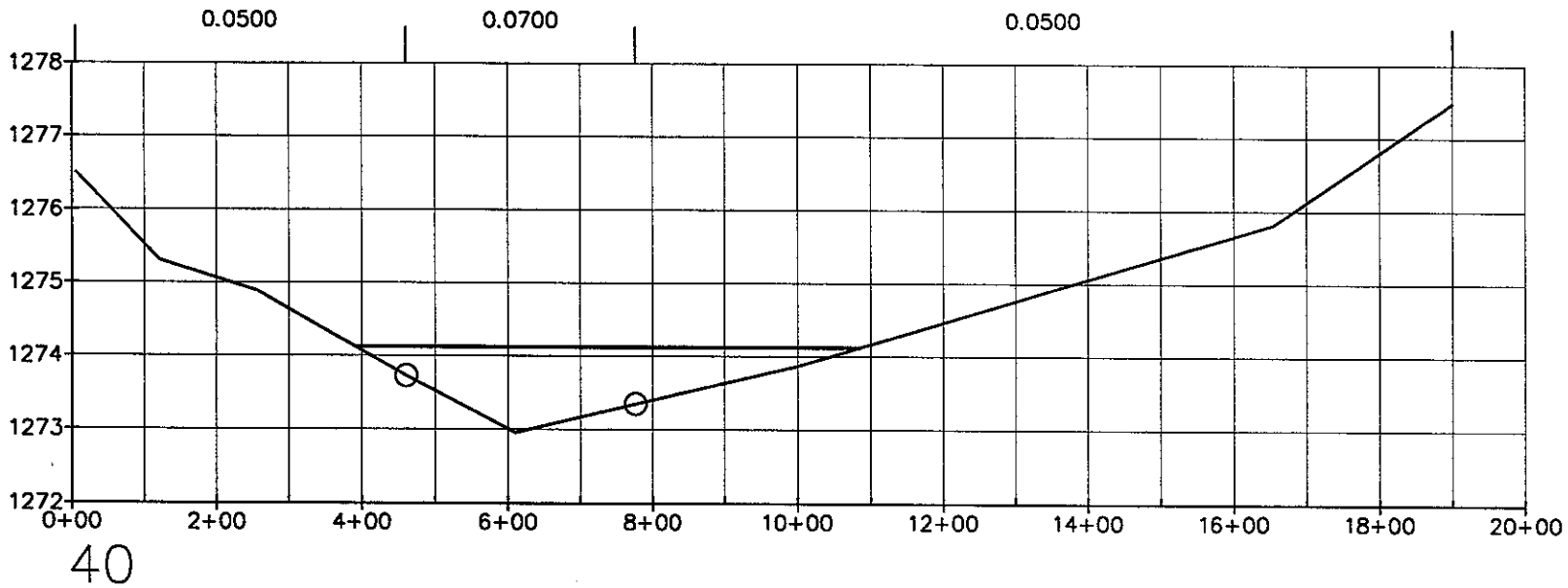
Cross-Section:	30	
Elevation:	1269.81	ft MSL
Depth:	1.34	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2094	
Flow Regime:	Subcritical	
Flow Area:	407.46	sq ft
Average Velocity:	1.35	ft/s
Maximum Velocity:	1.47	ft/s
Composite n:	0.0607	
Hydraulic Radius:	0.57	ft
Wetted Perimeter:	712.50	ft
Wetted Top Width:	712.49	ft
Critical Slope:	0.1505	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S32E–30

Entellus™

File: WASH-T3N-R5W-S32E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	40	
Elevation:	1274.12	ft MSL
Depth:	1.17	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2187	
Flow Regime:	Subcritical	
Flow Area:	417.49	sq ft
Average Velocity:	1.33	ft/s
Maximum Velocity:	1.42	ft/s
Composite n:	0.0595	
Hydraulic Radius:	0.6	ft
Wetted Perimeter:	693.78	ft
Wetted Top Width:	693.77	ft
Critical Slope:	0.1181	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S32E–40

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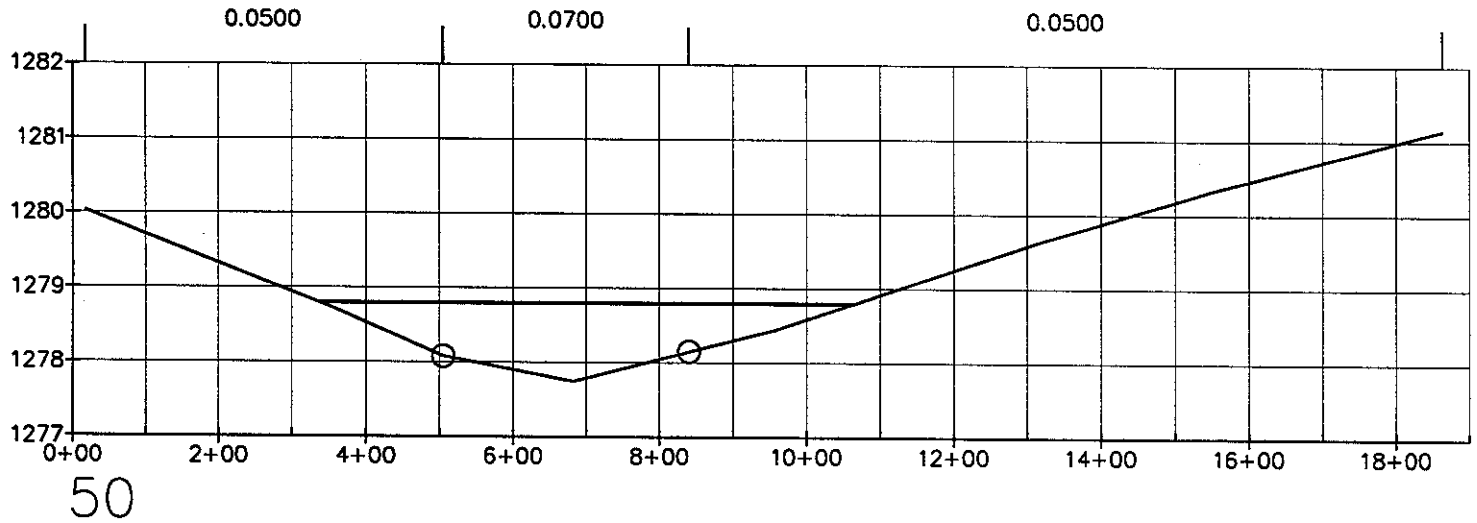


Normal Depth Results

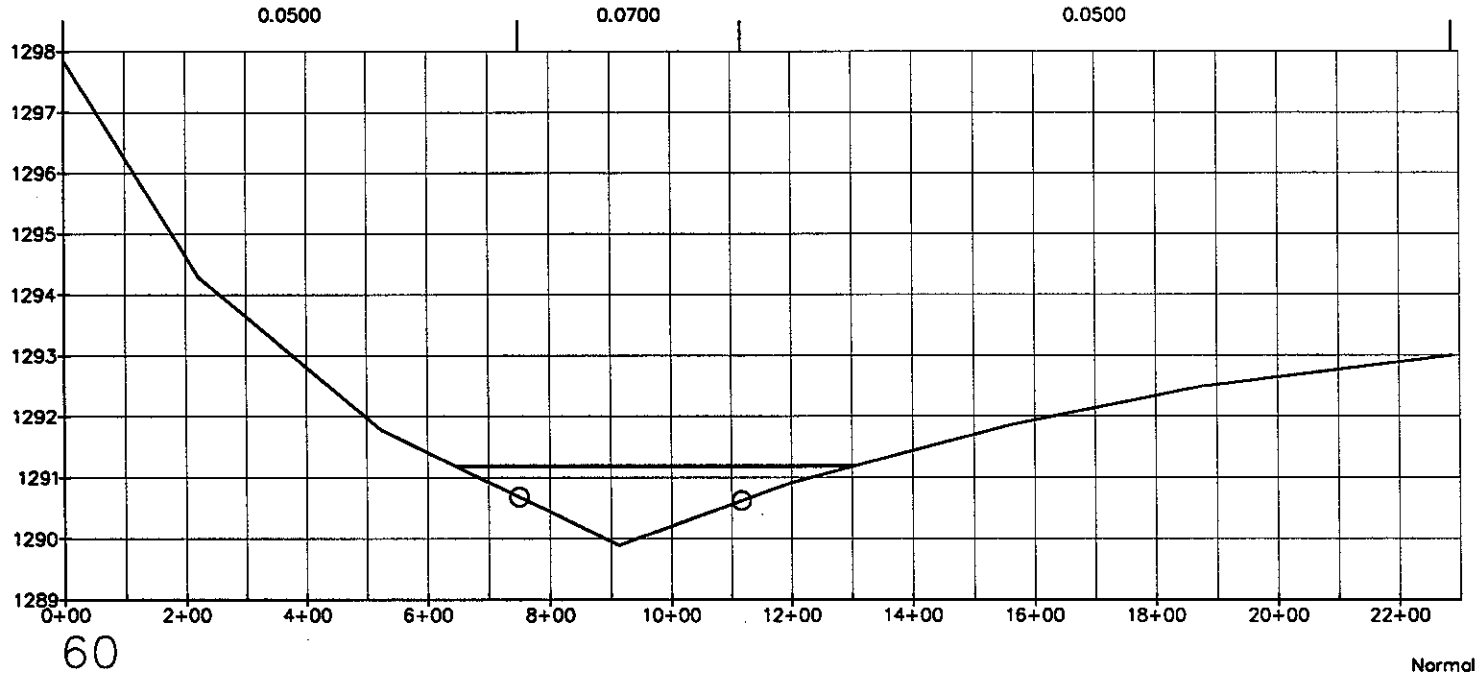
Cross-Section:	50	
Elevation:	1278.80	ft MSL
Depth:	1.05	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2236	
Flow Regime:	Subcritical	
Flow Area:	430.04	sq ft
Average Velocity:	1.31	ft/s
Maximum Velocity:	1.41	ft/s
Composite n:	0.0596	
Hydraulic Radius:	0.59	ft
Wetted Perimeter:	727.14	ft
Wetted Top Width:	727.14	ft
Critical Slope:	0.1095	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S32E–50

Entellus™

File: WASH-T3N-R5W-S32E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

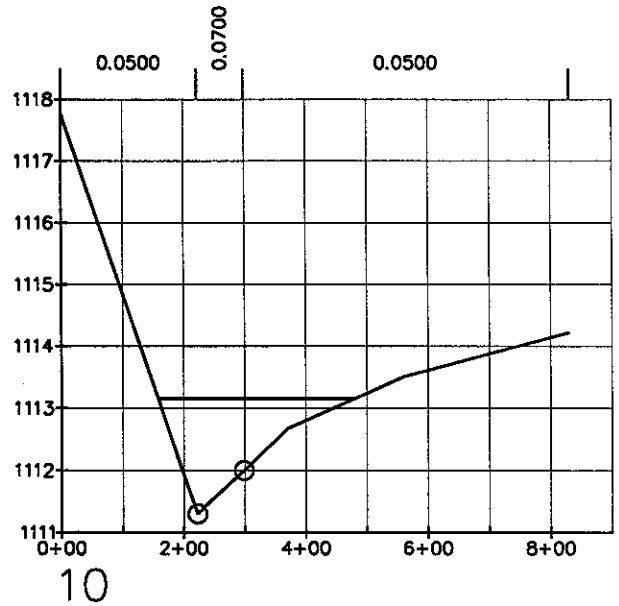
Cross-Section:	60	
Elevation:	1291.19	ft MSL
Depth:	1.29	ft
Discharge:	560.00	cfs
Energy Gradient:	0.0053	ft/ft
Froude Number:	0.2107	
Flow Regime:	Subcritical	
Flow Area:	411.76	sq ft
Average Velocity:	1.36	ft/s
Maximum Velocity:	1.46	ft/s
Composite n:	0.0615	
Hydraulic Radius:	0.63	ft
Wetted Perimeter:	658.23	ft
Wetted Top Width:	658.22	ft
Critical Slope:	0.1328	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S32E–60

Entellus™

File: WASH-T3N-R5W-S32E_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1113.16	ft MSL
Depth:	1.86	ft
Discharge:	535.00	cfs
Energy Gradient:	0.0068	ft/ft
Froude Number:	0.2661	
Flow Regime:	Subcritical	
Flow Area:	260.11	sq ft
Average Velocity:	2.05	ft/s
Maximum Velocity:	2.35	ft/s
Composite n:	0.055	
Hydraulic Radius:	0.81	ft
Wetted Perimeter:	322.30	ft
Wetted Top Width:	322.27	ft
Critical Slope:	0.1084	ft/ft

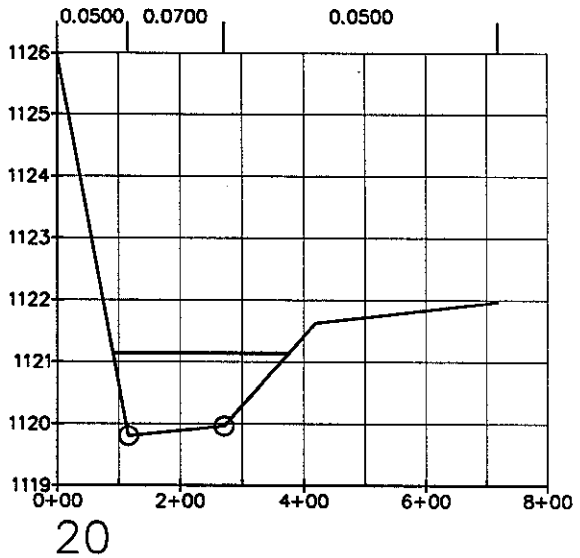
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S28–10

Entellus™

File: WASH–T2N–R5W–S28_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

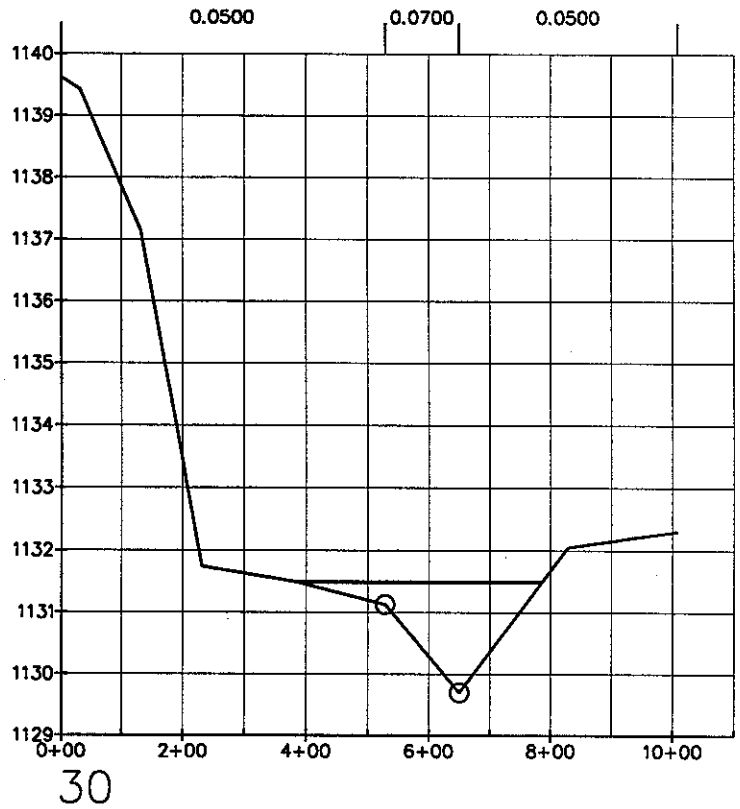
Cross-Section:	20	
Elevation:	1121.14	ft MSL
Depth:	1.34	ft
Discharge:	535.00	cfs
Energy Gradient:	0.0068	ft/ft
Froude Number:	0.2976	
Flow Regime:	Subcritical	
Flow Area:	273.88	sq ft
Average Velocity:	1.96	ft/s
Maximum Velocity:	2.05	ft/s
Composite n:	0.0613	
Hydraulic Radius:	0.96	ft
Wetted Perimeter:	285.00	ft
Wetted Top Width:	284.96	ft
Critical Slope:	0.0768	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S28–20

Entellus™

File: WASH-T2N-R5W-S28_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

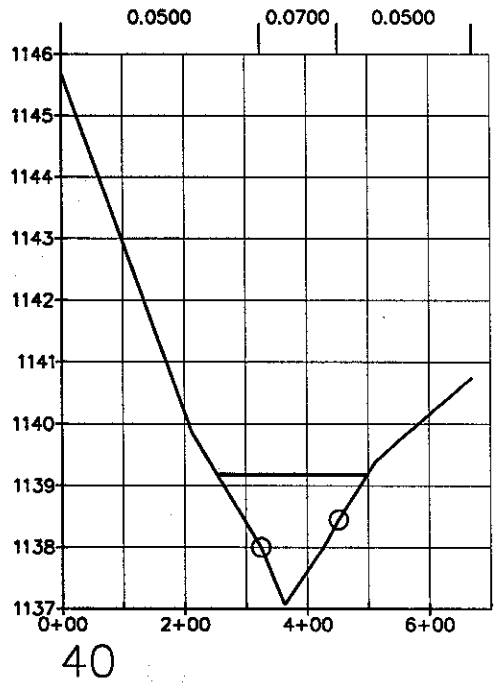
Cross-Section:	30	
Elevation:	1131.49	ft MSL
Depth:	1.79	ft
Discharge:	535.00	cfs
Energy Gradient:	0.0068	ft/ft
Froude Number:	0.2538	
Flow Regime:	Subcritical	
Flow Area:	277.79	sq ft
Average Velocity:	1.93	ft/s
Maximum Velocity:	2.28	ft/s
Composite n:	0.0564	
Hydraulic Radius:	0.69	ft
Wetted Perimeter:	401.53	ft
Wetted Top Width:	401.51	ft
Critical Slope:	0.1348	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S28–30

Entellus™

File: WASH–T2N–R5W–S28_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

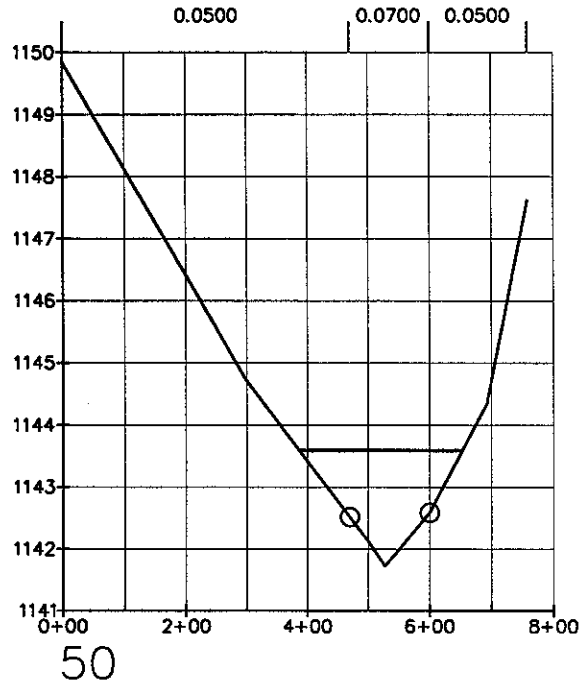
Cross-Section:	40	
Elevation:	1139.18	ft MSL
Depth:	2.11	ft
Discharge:	535.00	cfs
Energy Gradient:	0.0068	ft/ft
Froude Number:	0.2582	
Flow Regime:	Subcritical	
Flow Area:	251.30	sq ft
Average Velocity:	2.14	ft/s
Maximum Velocity:	2.31	ft/s
Composite n:	0.0607	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	245.17	ft
Wetted Top Width:	245.13	ft
Critical Slope:	0.1093	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S28–40

Entellus™

File: WASH-T2N-R5W-S28_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

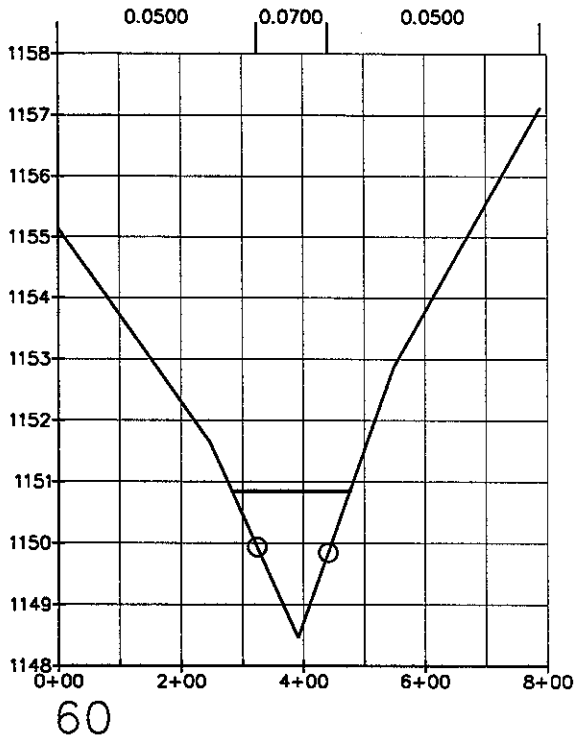
Cross-Section:	50	
Elevation:	1143.59	ft MSL
Depth:	1.87	ft
Discharge:	535.00	cfs
Energy Gradient:	0.0068	ft/ft
Froude Number:	0.265	
Flow Regime:	Subcritical	
Flow Area:	260.04	sq ft
Average Velocity:	2.07	ft/s
Maximum Velocity:	2.25	ft/s
Composite n:	0.0601	
Hydraulic Radius:	0.97	ft
Wetted Perimeter:	266.86	ft
Wetted Top Width:	266.83	ft
Critical Slope:	0.1018	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S28–50

Entellus™

File: WASH–T2N–R5W–S28_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

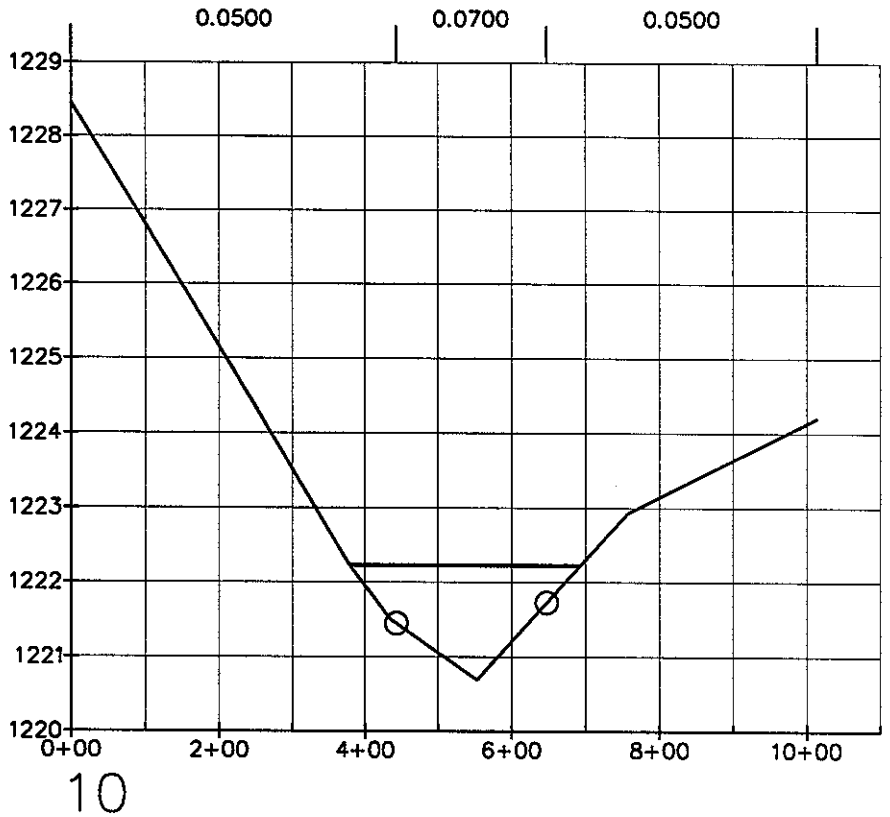
Cross-Section:	60	
Elevation:	1150.85	ft MSL
Depth:	2.39	ft
Discharge:	535.00	cfs
Energy Gradient:	0.0068	ft/ft
Froude Number:	0.2652	
Flow Regime:	Subcritical	
Flow Area:	230.26	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.46	ft/s
Composite n:	0.0624	
Hydraulic Radius:	1.19	ft
Wetted Perimeter:	193.21	ft
Wetted Top Width:	193.15	ft
Critical Slope:	0.1067	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S28–60

Entellus™

File: WASH-T2N-R5W-S28_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1222.22	ft MSL
Depth:	1.53	ft
Discharge:	540.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.2953	
Flow Regime:	Subcritical	
Flow Area:	260.32	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0634	
Hydraulic Radius:	0.83	ft
Wetted Perimeter:	313.92	ft
Wetted Top Width:	313.90	ft
Critical Slope:	0.1147	ft/ft

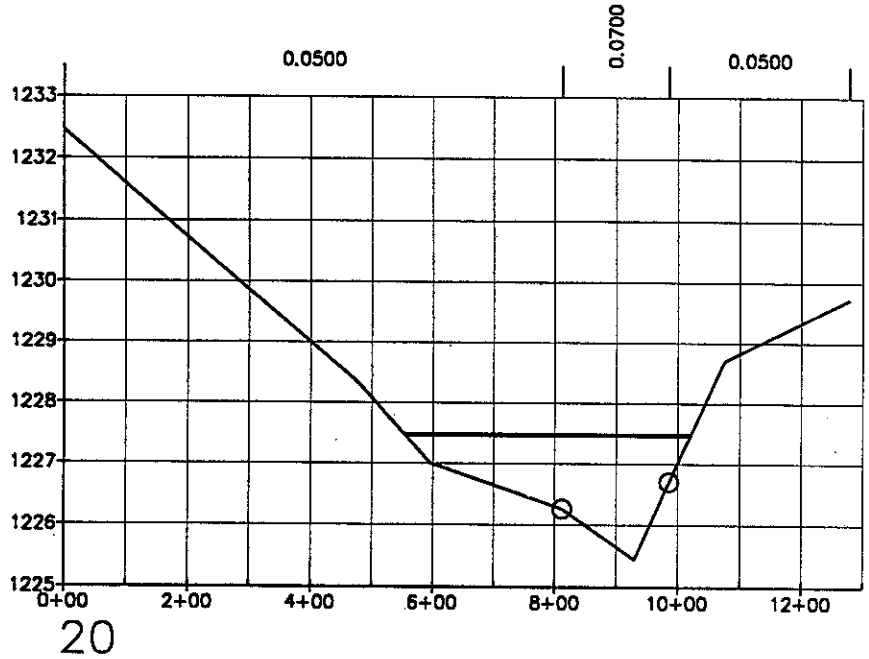
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05W–10

Entellus™

File: WASH-T2N-R5W-S05W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results		
Cross-Section:	20	
Elevation:	1227.47	ft MSL
Depth:	2.03	ft
Discharge:	1220.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.3189	
Flow Regime:	Subcritical	
Flow Area:	473.32	sq ft
Average Velocity:	2.58	ft/s
Maximum Velocity:	2.78	ft/s
Composite n:	0.0578	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	465.74	ft
Wetted Top Width:	465.71	ft
Critical Slope:	0.0963	ft/ft

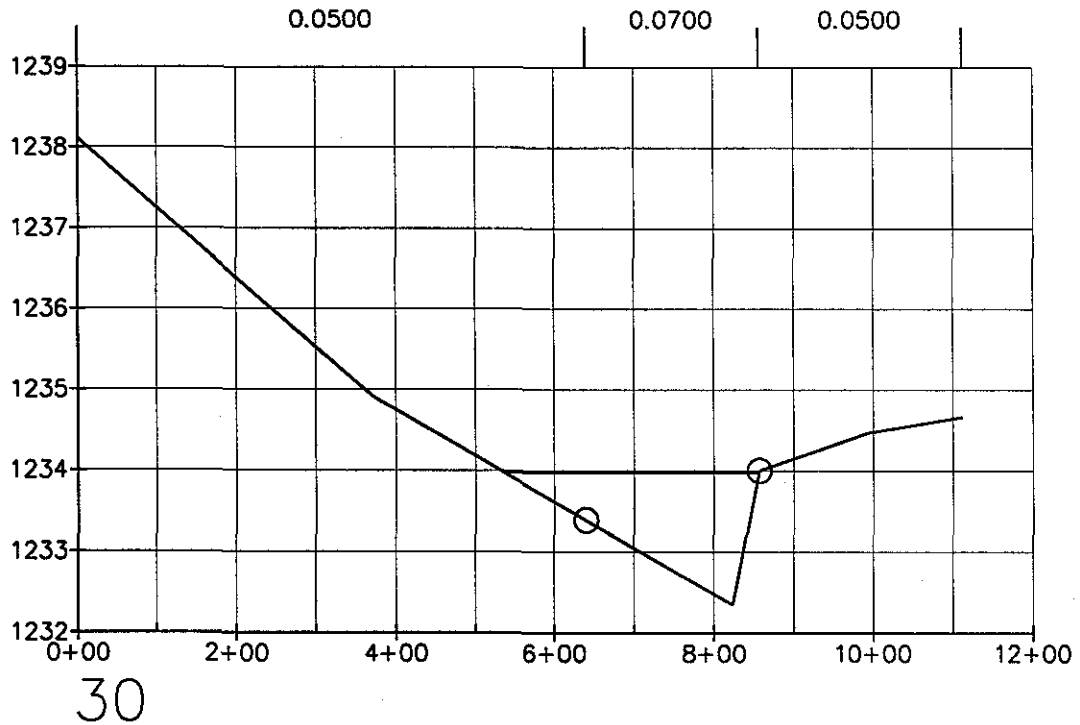
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05W–20

Entellus™

File: WASH–T2N–R5W–S05W_X–SECTION–R14.dwg Date: 9/29/00



Normal Depth Results

Cross-Section:	30	
Elevation:	1233.98	ft MSL
Depth:	1.63	ft
Discharge:	540.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.2847	
Flow Regime:	Subcritical	
Flow Area:	261.78	sq ft
Average Velocity:	2.06	ft/s
Maximum Velocity:	2.16	ft/s
Composite n:	0.0638	
Hydraulic Radius:	0.82	ft
Wetted Perimeter:	320.81	ft
Wetted Top Width:	320.76	ft
Critical Slope:	0.1264	ft/ft

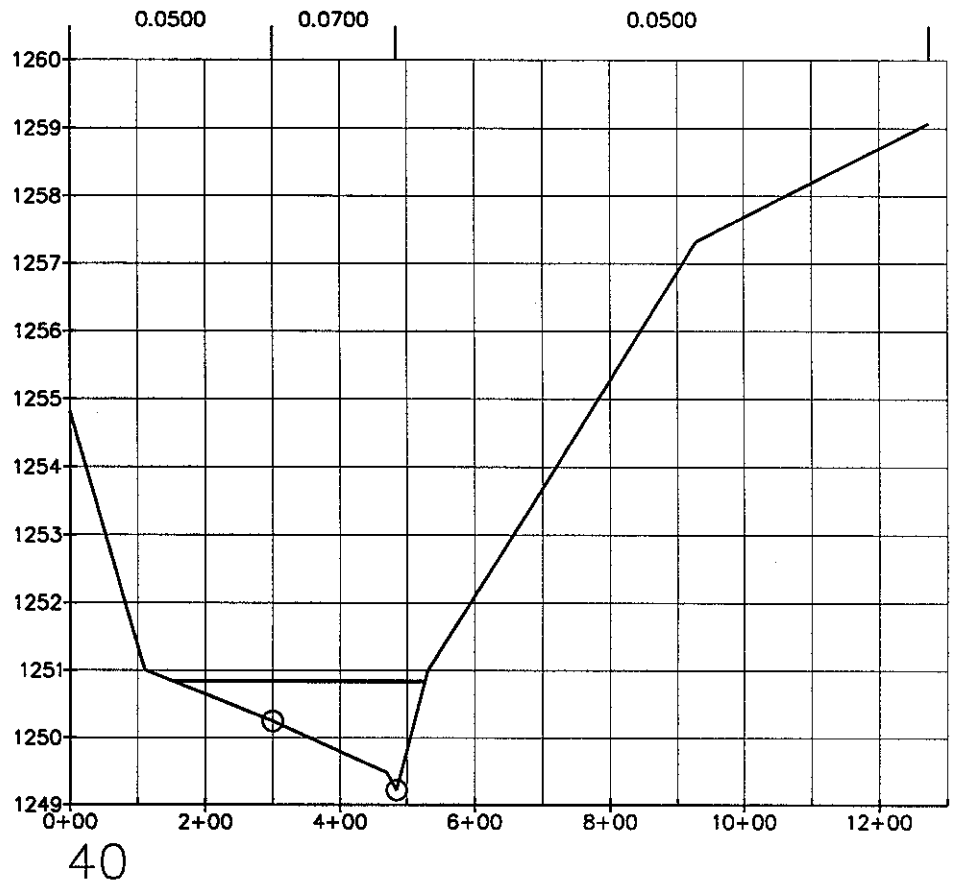
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05W–30

Entellus™

File: WASH-T2N-R5W-S05W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

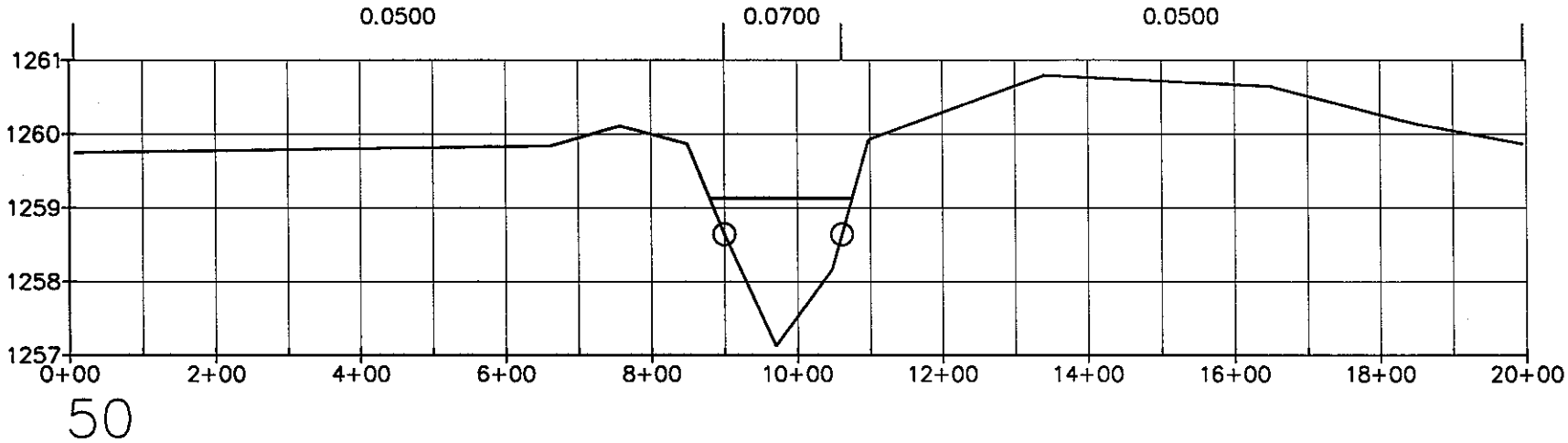
Cross-Section:	40	
Elevation:	1250.84	ft MSL
Depth:	1.62	ft
Discharge:	540.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.2832	
Flow Regime:	Subcritical	
Flow Area:	264.34	sq ft
Average Velocity:	2.02	ft/s
Maximum Velocity:	2.52	ft/s
Composite n:	0.0602	
Hydraulic Radius:	0.71	ft
Wetted Perimeter:	373.75	ft
Wetted Top Width:	373.71	ft
Critical Slope:	0.1351	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05W–40

Entellus™

File: WASH-T2N-R5W-S05W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

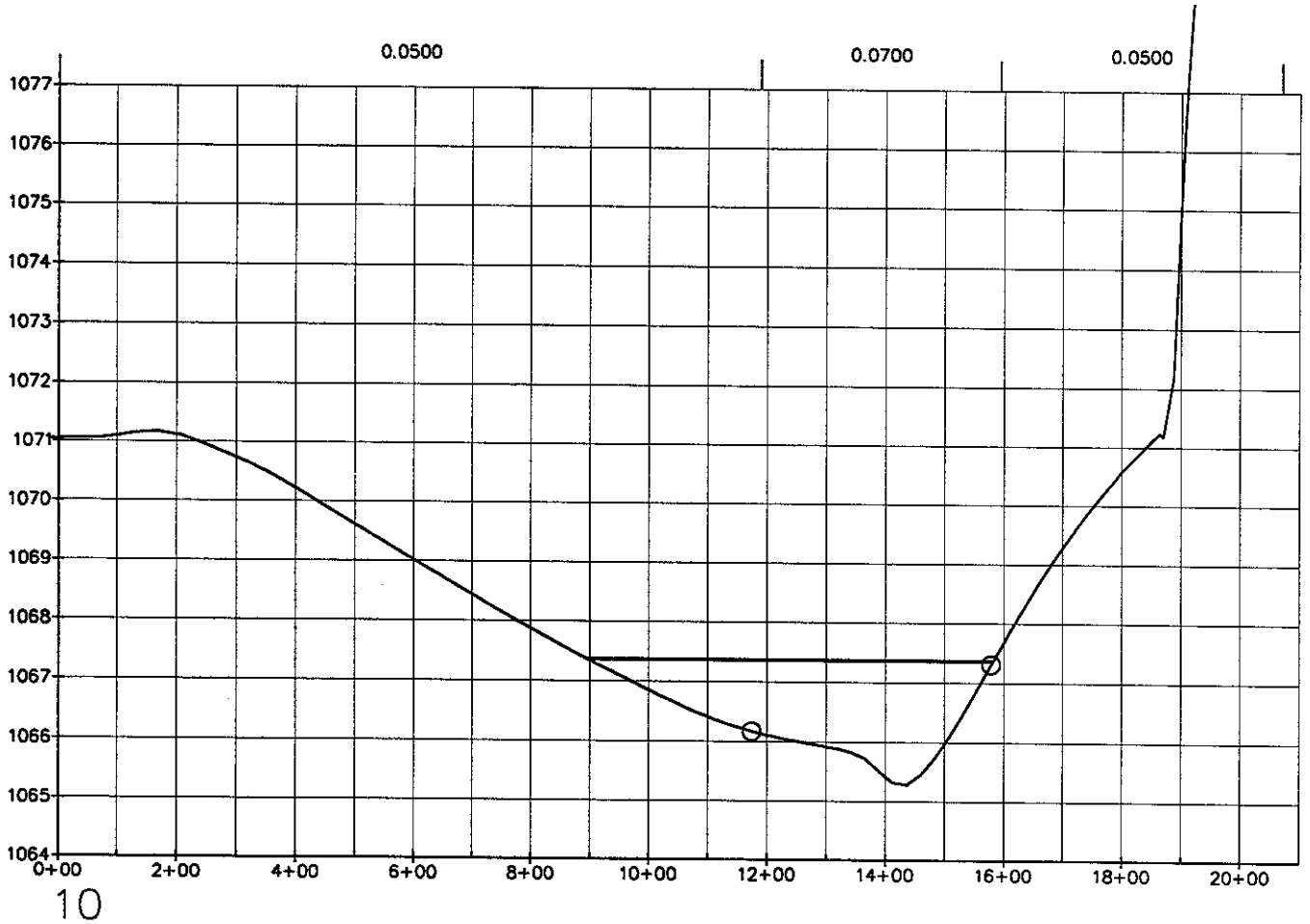
Cross-Section:	50	
Elevation:	1259.13	ft MSL
Depth:	2.01	ft
Discharge:	540.00	cfs
Energy Gradient:	0.0095	ft/ft
Froude Number:	0.3047	
Flow Regime:	Subcritical	
Flow Area:	220.52	sq ft
Average Velocity:	2.44	ft/s
Maximum Velocity:	2.49	ft/s
Composite n:	0.0667	
Hydraulic Radius:	1.13	ft
Wetted Perimeter:	195.06	ft
Wetted Top Width:	195.01	ft
Critical Slope:	0.11	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S05W–50

Entellus™

File: WASH-T2N-R5W-S05W_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

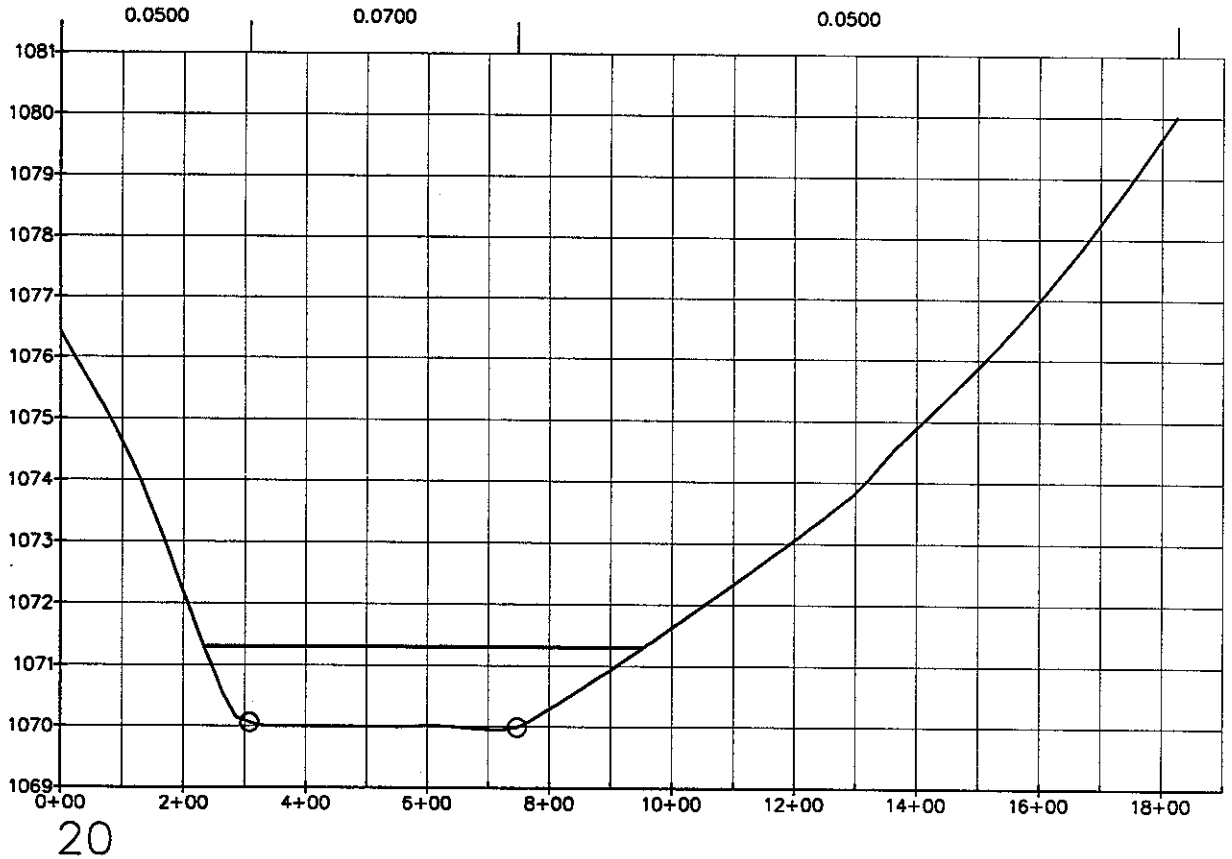
Cross-Section:	10	
Elevation:	1066.33	ft MSL
Depth:	2.09	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2583	
Flow Regime:	Subcritical	
Flow Area:	756.15	sq ft
Average Velocity:	2.11	ft/s
Maximum Velocity:	2.20	ft/s
Composite n:	0.0621	
Hydraulic Radius:	1.1	ft
Wetted Perimeter:	686.24	ft
Wetted Top Width:	686.22	ft
Critical Slope:	0.1027	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–10

Entellus™

File: WASH-T2N-R5W-S27S_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1071.30	ft MSL
Depth:	1.35	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.3122	
Flow Regime:	Subcritical	
Flow Area:	776.35	sq ft
Average Velocity:	2.05	ft/s
Maximum Velocity:	2.09	ft/s
Composite n:	0.0626	
Hydraulic Radius:	1.08	ft
Wetted Perimeter:	720.26	ft
Wetted Top Width:	720.24	ft
Critical Slope:	0.0696	ft/ft

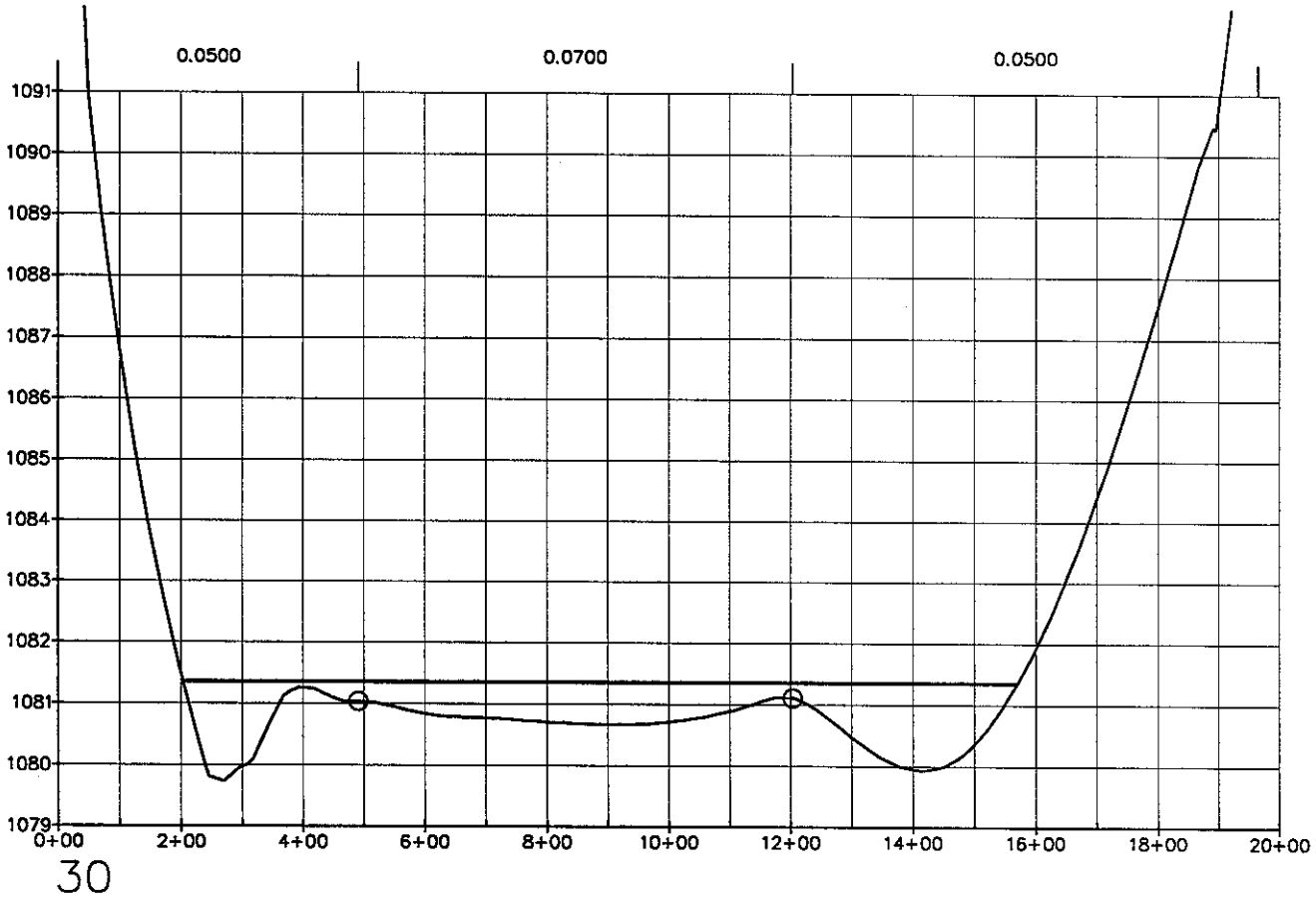
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–20

Entellus™

File: WASH–T2N–R5W–S27S_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

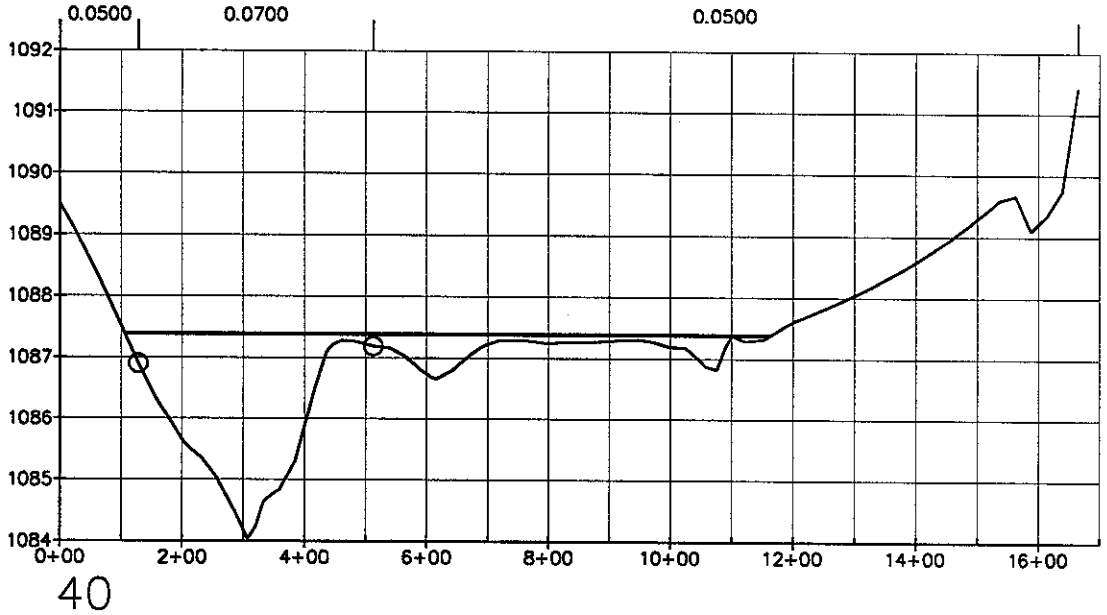
Cross-Section:	30	
Elevation:	1081.36	ft MSL
Depth:	1.63	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2386	
Flow Regime:	Subcritical	
Flow Area:	926.82	sq ft
Average Velocity:	1.75	ft/s
Maximum Velocity:	2.31	ft/s
Composite n:	0.0608	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	1366.28	ft
Wetted Top Width:	1366.23	ft
Critical Slope:	0.1463	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–30

Entellus™

File: WASH-T2N-R5W-S27S_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

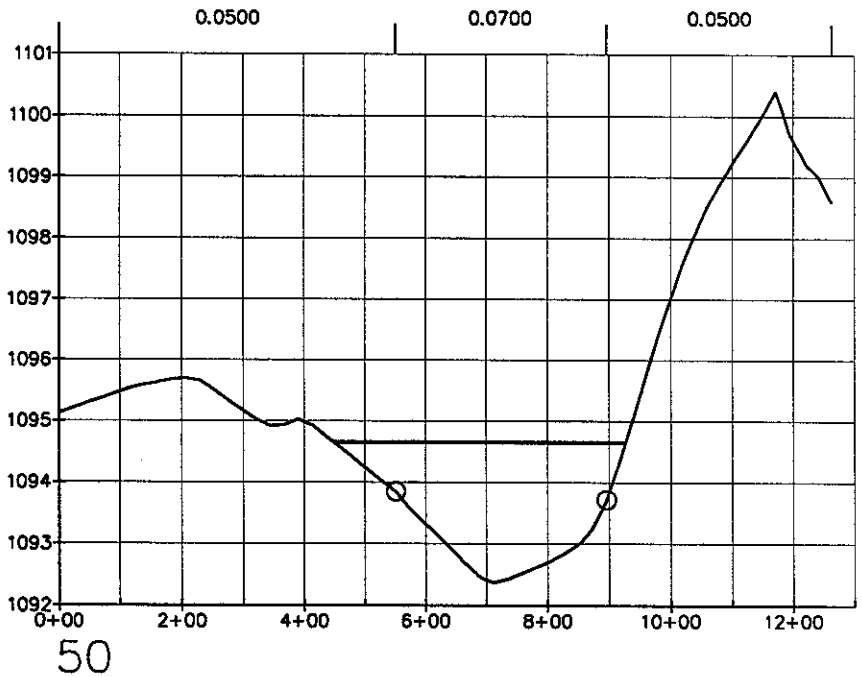
Cross-Section:	40	
Elevation:	1087.39	ft MSL
Depth:	3.35	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.1994	
Flow Regime:	Subcritical	
Flow Area:	773.40	sq ft
Average Velocity:	2.09	ft/s
Maximum Velocity:	2.39	ft/s
Composite n:	0.0576	
Hydraulic Radius:	0.73	ft
Wetted Perimeter:	1056.36	ft
Wetted Top Width:	1056.28	ft
Critical Slope:	0.2444	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–40

Entellus™

File: WASH–T2N–R5W–S27S_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	50	
Elevation:	1094.66	ft MSL
Depth:	2.29	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2826	
Flow Regime:	Subcritical	
Flow Area:	660.01	sq ft
Average Velocity:	2.43	ft/s
Maximum Velocity:	2.53	ft/s
Composite n:	0.0647	
Hydraulic Radius:	1.38	ft
Wetted Perimeter:	478.48	ft
Wetted Top Width:	478.45	ft
Critical Slope:	0.0904	ft/ft

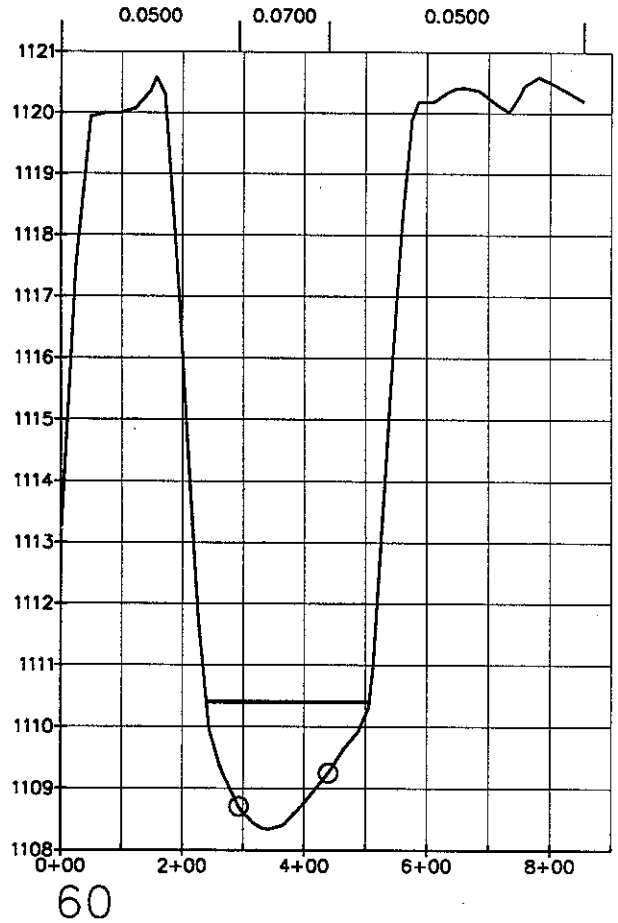
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–50

Entellus™

File: WASH–T2N–R5W–S27S_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	60	
Elevation:	1110.40	ft MSL
Depth:	2.06	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.3042	
Flow Regime:	Subcritical	
Flow Area:	359.53	sq ft
Average Velocity:	2.46	ft/s
Maximum Velocity:	2.55	ft/s
Composite n:	0.0613	
Hydraulic Radius:	1.35	ft
Wetted Perimeter:	266.91	ft
Wetted Top Width:	266.86	ft
Critical Slope:	0.0755	ft/ft

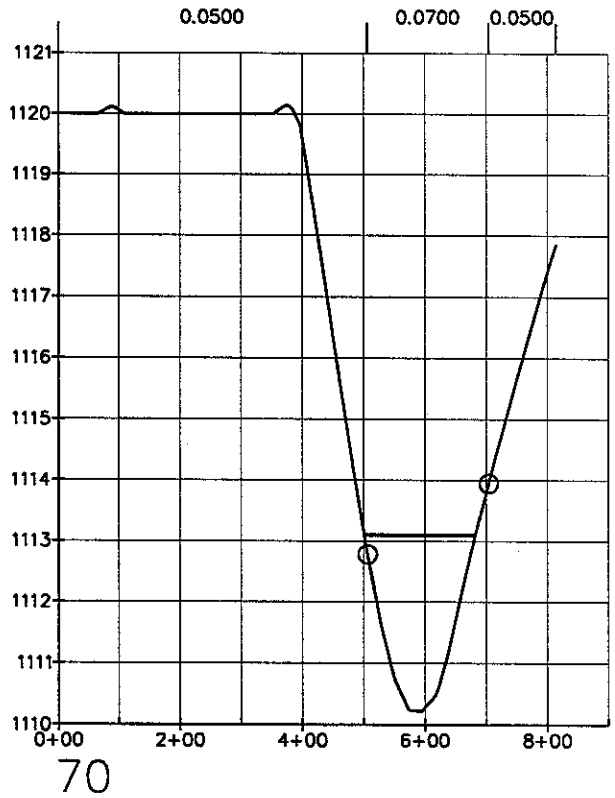
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–60

Entellus™

File: WASH–T2N–R5W–S27S_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	70	
Elevation:	1113.09	ft MSL
Depth:	2.87	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2763	
Flow Regime:	Subcritical	
Flow Area:	334.95	sq ft
Average Velocity:	2.67	ft/s
Maximum Velocity:	2.67	ft/s
Composite n:	0.0694	
Hydraulic Radius:	1.85	ft
Wetted Perimeter:	181.22	ft
Wetted Top Width:	181.10	ft
Critical Slope:	0.0886	ft/ft

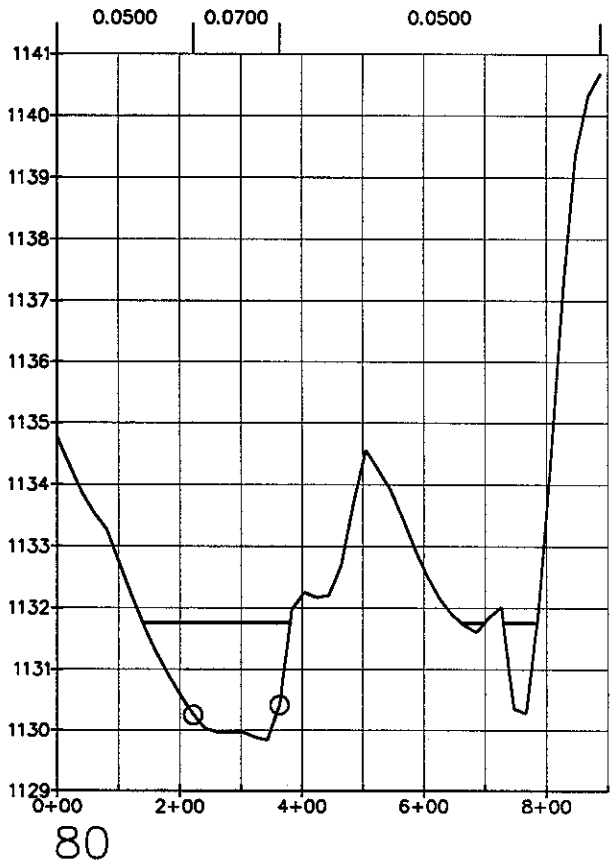
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–70

Entellus™

File: WASH–T2N–R5W–S27S_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

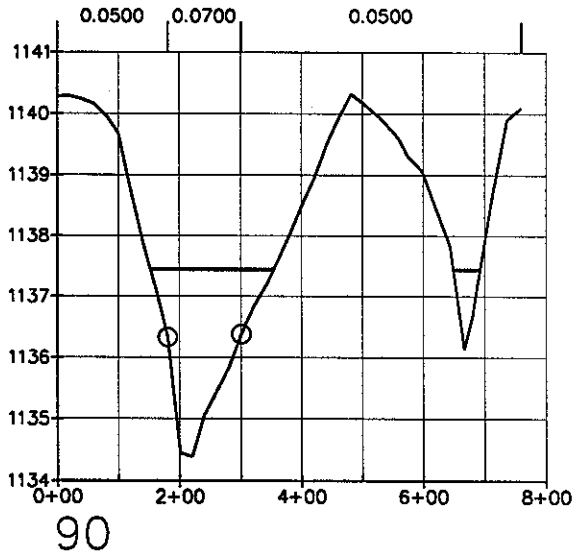
Cross-Section:	80	
Elevation:	1131.76	ft MSL
Depth:	1.92	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2953	
Flow Regime:	Subcritical	
Flow Area:	383.73	sq ft
Average Velocity:	2.33	ft/s
Maximum Velocity:	2.54	ft/s
Composite n:	0.0589	
Hydraulic Radius:	1.15	ft
Wetted Perimeter:	332.85	ft
Wetted Top Width:	332.65	ft
Critical Slope:	0.0797	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–80

Entellus™

File: WASH–T2N–R5W–S27S_X-SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

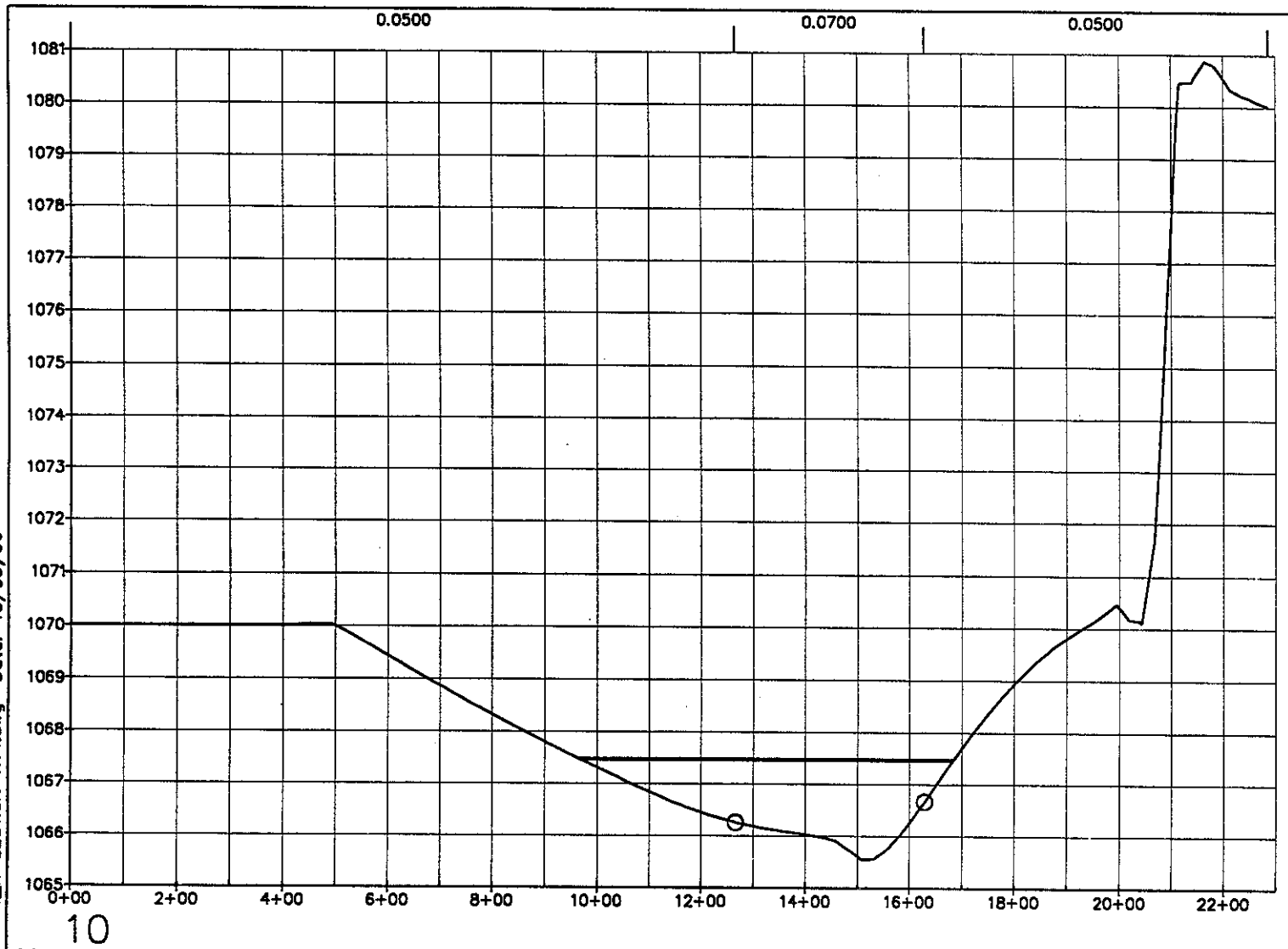
Cross-Section:	90	
Elevation:	1137.44	ft MSL
Depth:	3.05	ft
Discharge:	890.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.268	
Flow Regime:	Subcritical	
Flow Area:	335.13	sq ft
Average Velocity:	2.67	ft/s
Maximum Velocity:	2.93	ft/s
Composite n:	0.0602	
Hydraulic Radius:	1.37	ft
Wetted Perimeter:	244.75	ft
Wetted Top Width:	244.52	ft
Critical Slope:	0.1056	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27S–90

Entellus™

File: WASH–T2N–R5W–S27S_X–SECTION–R14.dwg Date: 10/03/00



10

Note: X-section not used for delineation

Normal Depth Results

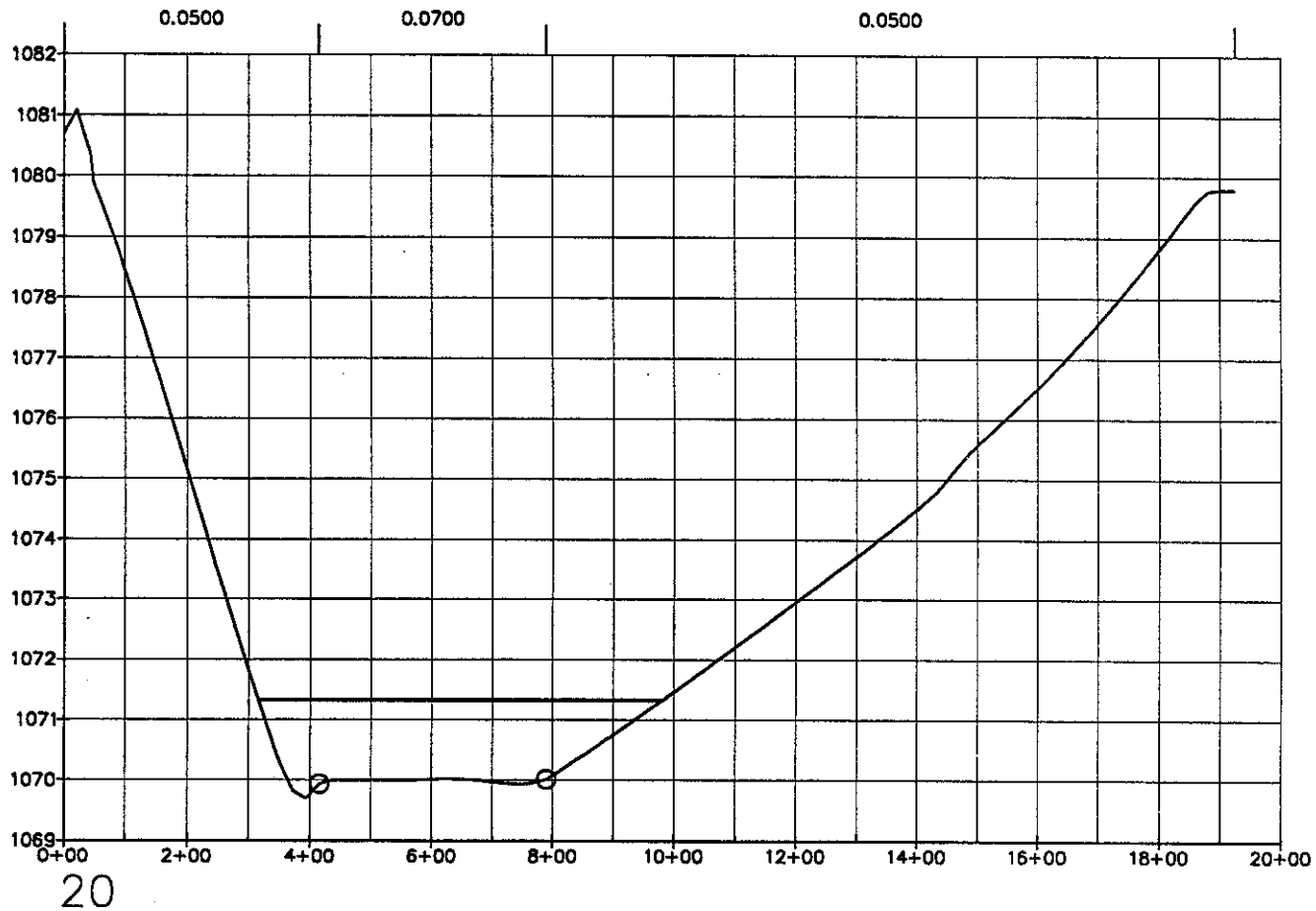
Cross-Section:	100	
Elevation:	1067.47	ft MSL
Depth:	1.92	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2694	
Flow Regime:	Subcritical	
Flow Area:	755.92	sq ft
Average Velocity:	2.13	ft/s
Maximum Velocity:	2.26	ft/s
Composite n:	0.0605	
Hydraulic Radius:	1.06	ft
Wetted Perimeter:	716.33	ft
Wetted Top Width:	716.32	ft
Critical Slope:	0.0949	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–10

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

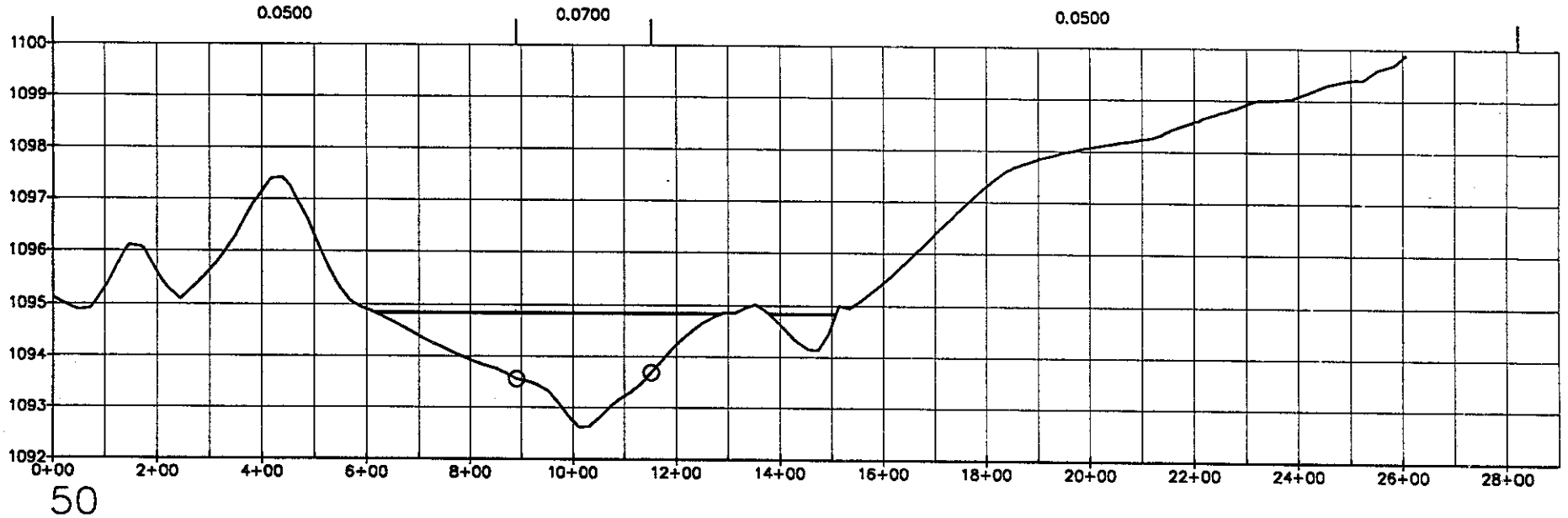
Cross-Section:	110	
Elevation:	1071.32	ft MSL
Depth:	1.62	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.3001	
Flow Regime:	Subcritical	
Flow Area:	737.43	sq ft
Average Velocity:	2.15	ft/s
Maximum Velocity:	2.64	ft/s
Composite n:	0.0616	
Hydraulic Radius:	1.11	ft
Wetted Perimeter:	664.31	ft
Wetted Top Width:	664.28	ft
Critical Slope:	0.0778	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–20

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

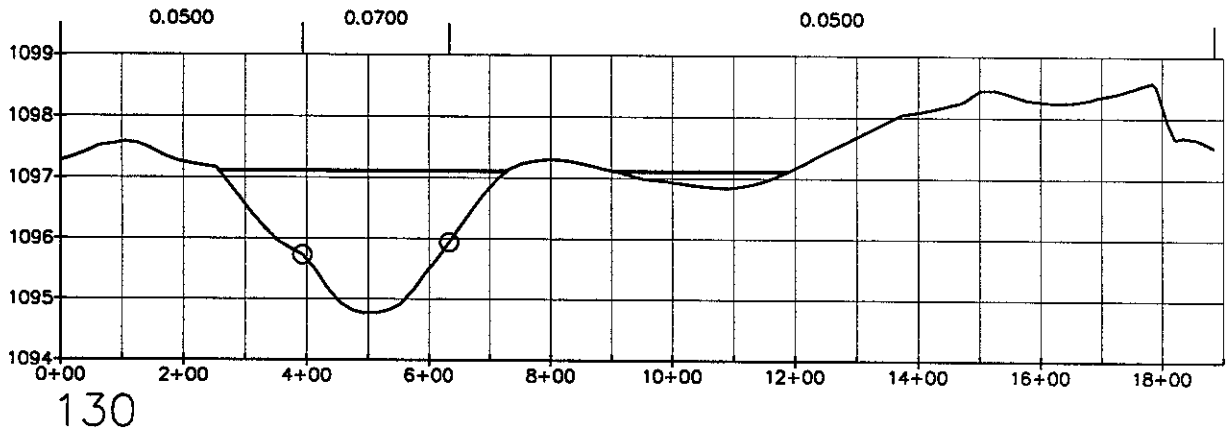
Cross-Section:	120	
Elevation:	1094.84	ft MSL
Depth:	2.22	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2554	
Flow Regime:	Subcritical	
Flow Area:	741.76	sq ft
Average Velocity:	2.16	ft/s
Maximum Velocity:	2.47	ft/s
Composite n:	0.0569	
Hydraulic Radius:	0.93	ft
Wetted Perimeter:	798.34	ft
Wetted Top Width:	798.31	ft
Critical Slope:	0.1147	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–50

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	130	
Elevation:	1097.11	ft MSL
Depth:	2.34	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2721	
Flow Regime:	Subcritical	
Flow Area:	677.31	sq ft
Average Velocity:	2.38	ft/s
Maximum Velocity:	2.73	ft/s
Composite n:	0.0567	
Hydraulic Radius:	0.9	ft
Wetted Perimeter:	751.38	ft
Wetted Top Width:	751.35	ft
Critical Slope:	0.1256	ft/ft

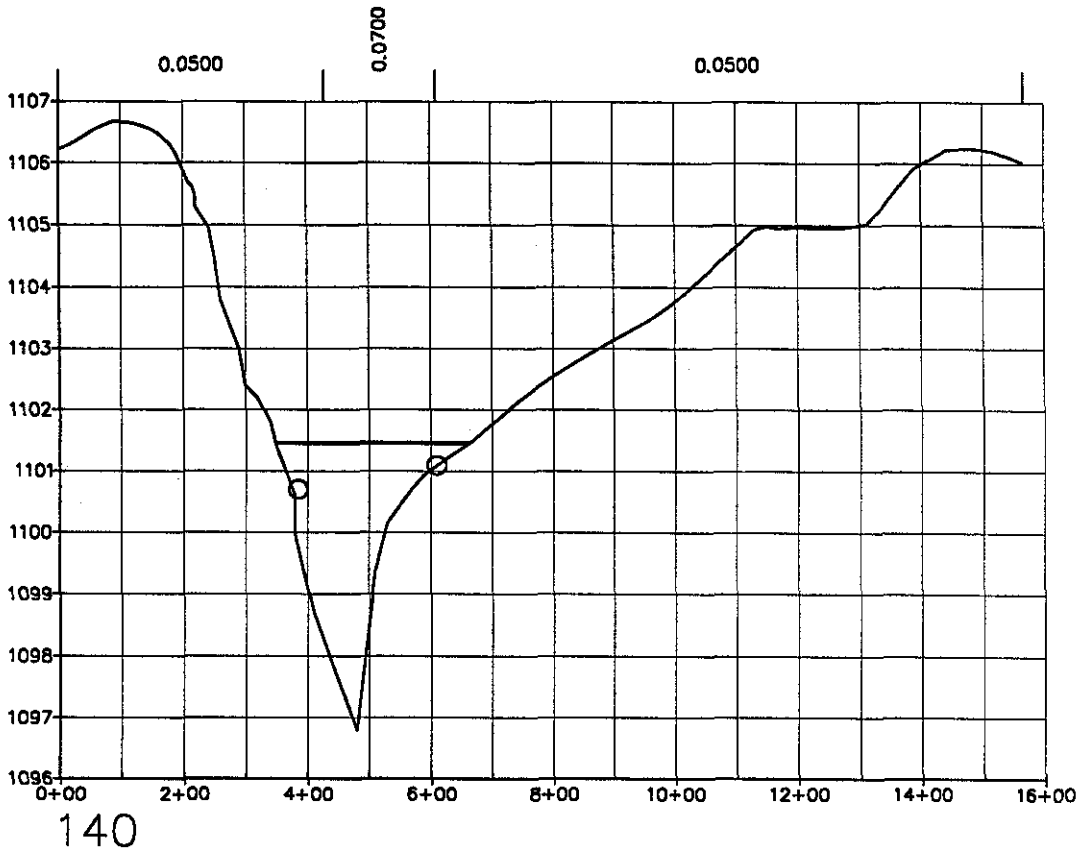
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–130

Entellus™

File: WASH–T2N–R5W–S27N_X–SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

Cross-Section:	140	
Elevation:	1101.45	ft MSL
Depth:	4.65	ft
Discharge:	1600.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2417	
Flow Regime:	Subcritical	
Flow Area:	540.86	sq ft
Average Velocity:	2.95	ft/s
Maximum Velocity:	3.02	ft/s
Composite n:	0.063	
Hydraulic Radius:	1.72	ft
Wetted Perimeter:	313.98	ft
Wetted Top Width:	313.18	ft
Critical Slope:	0.1299	ft/ft

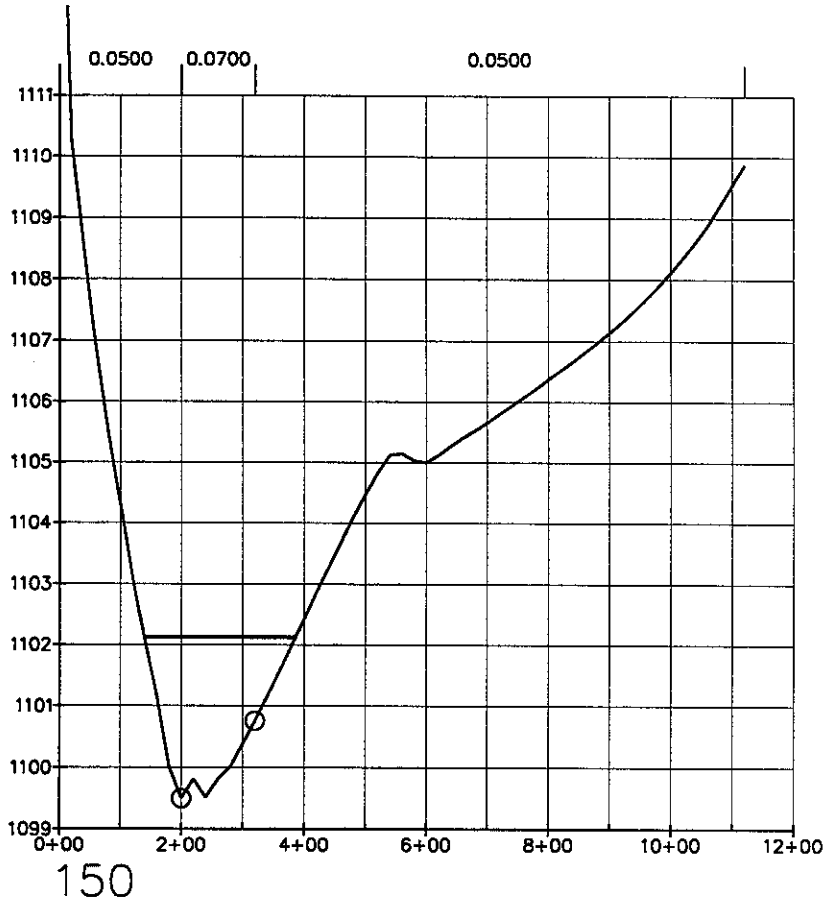
Note: X-section not used for delineation

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–140

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

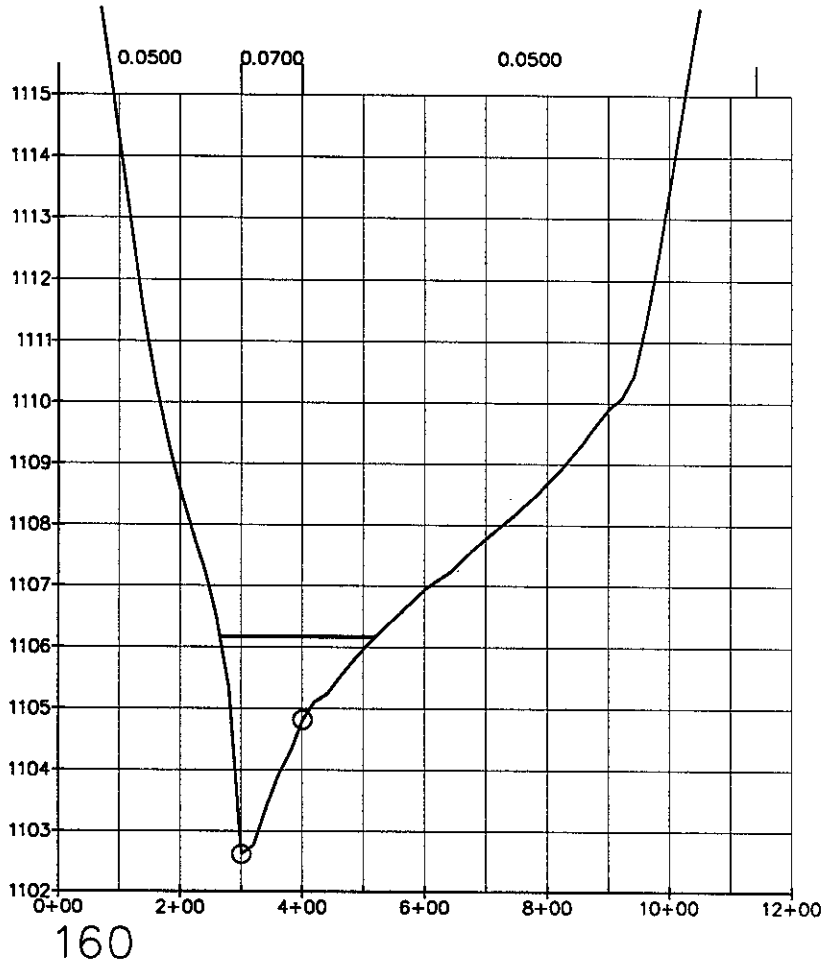
Cross-Section:	150	
Elevation:	1102.12	ft MSL
Depth:	2.62	ft
Discharge:	1130.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.3116	
Flow Regime:	Subcritical	
Flow Area:	394.69	sq ft
Average Velocity:	2.85	ft/s
Maximum Velocity:	3.12	ft/s
Composite n:	0.0601	
Hydraulic Radius:	1.6	ft
Wetted Perimeter:	246.99	ft
Wetted Top Width:	246.90	ft
Critical Slope:	0.0735	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–150

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

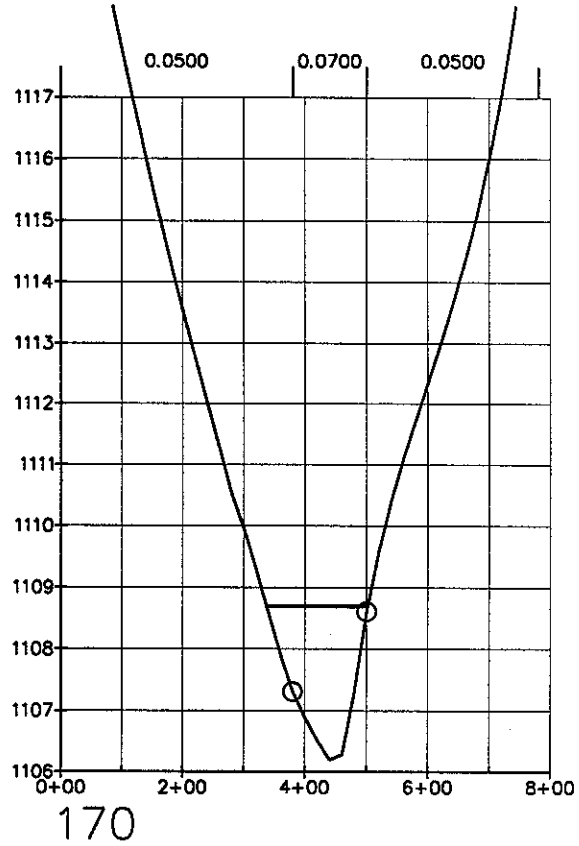
Cross-Section:	160	
Elevation:	1106.17	ft MSL
Depth:	3.55	ft
Discharge:	1130.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2749	
Flow Regime:	Subcritical	
Flow Area:	384.80	sq ft
Average Velocity:	2.95	ft/s
Maximum Velocity:	3.26	ft/s
Composite n:	0.0582	
Hydraulic Radius:	1.51	ft
Wetted Perimeter:	254.31	ft
Wetted Top Width:	254.06	ft
Critical Slope:	0.1005	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–160

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

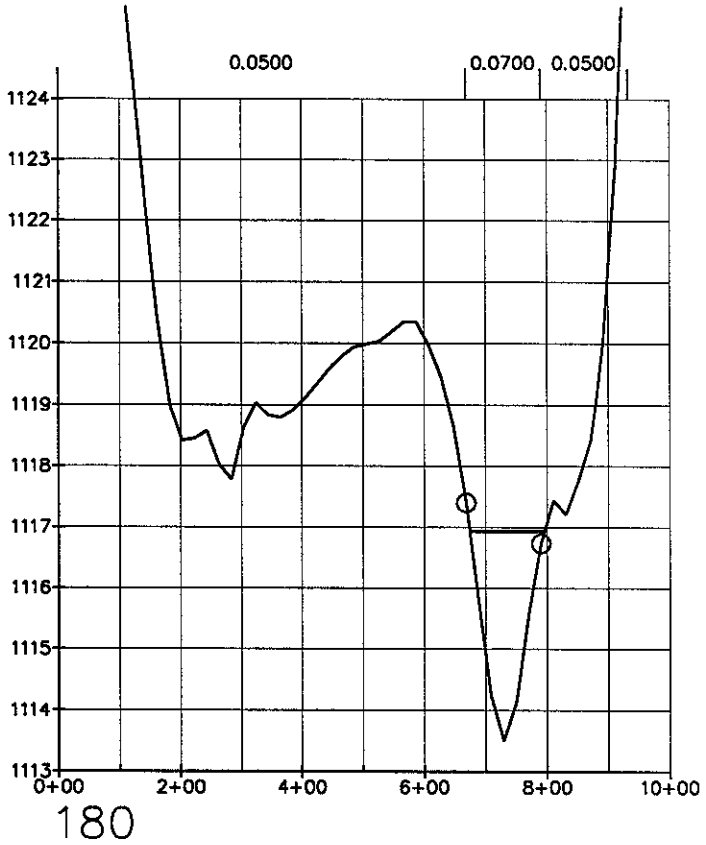
Cross-Section:	170	
Elevation:	1108.70	ft MSL
Depth:	2.50	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2839	
Flow Regime:	Subcritical	
Flow Area:	251.54	sq ft
Average Velocity:	2.53	ft/s
Maximum Velocity:	2.61	ft/s
Composite n:	0.0649	
Hydraulic Radius:	1.53	ft
Wetted Perimeter:	164.48	ft
Wetted Top Width:	164.37	ft
Critical Slope:	0.0865	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–170

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

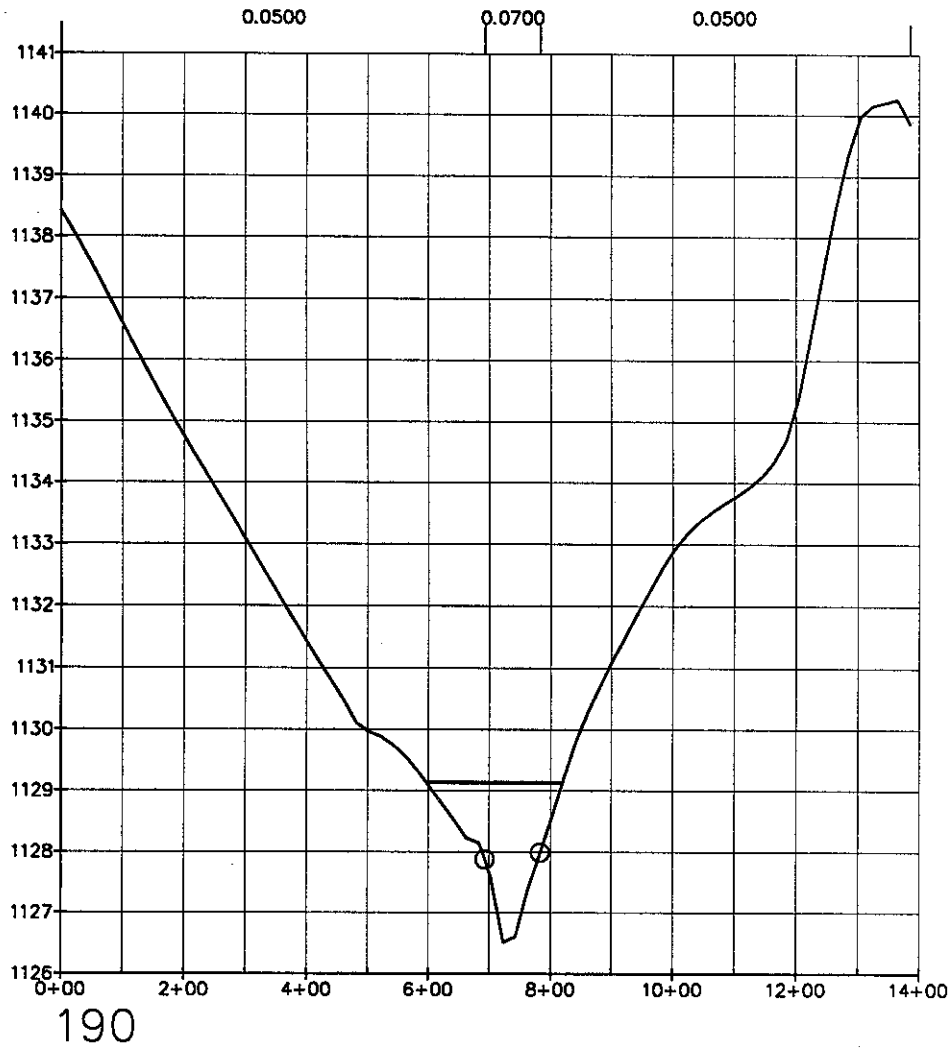
Cross-Section:	180	
Elevation:	1116.93	ft MSL
Depth:	3.43	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.263	
Flow Regime:	Subcritical	
Flow Area:	231.45	sq ft
Average Velocity:	2.75	ft/s
Maximum Velocity:	2.76	ft/s
Composite n:	0.0691	
Hydraulic Radius:	1.9	ft
Wetted Perimeter:	121.83	ft
Wetted Top Width:	121.61	ft
Critical Slope:	0.101	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–180

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

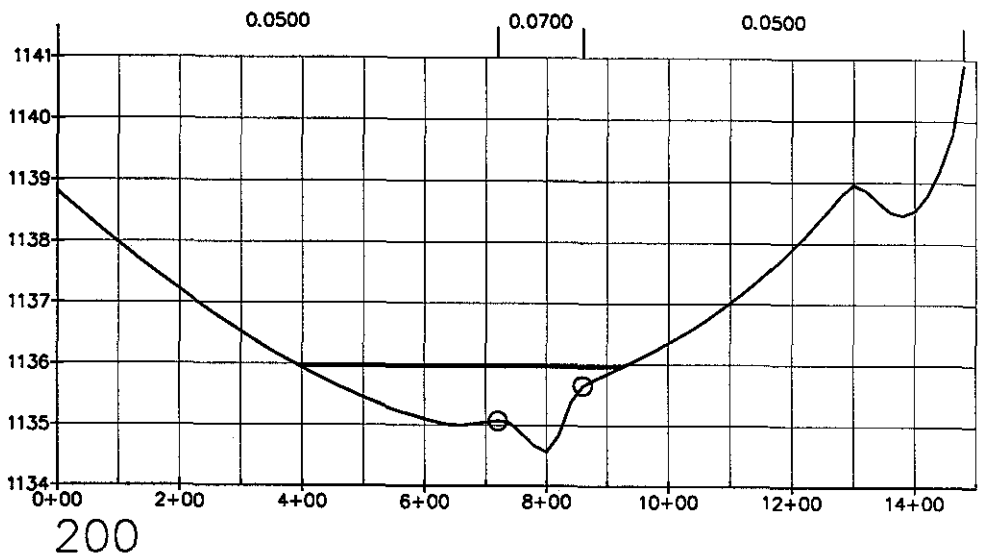
Cross-Section:	190	
Elevation:	1129.13	ft MSL
Depth:	2.61	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.268	
Flow Regime:	Subcritical	
Flow Area:	260.42	sq ft
Average Velocity:	2.44	ft/s
Maximum Velocity:	2.75	ft/s
Composite n:	0.0585	
Hydraulic Radius:	1.17	ft
Wetted Perimeter:	223.04	ft
Wetted Top Width:	222.95	ft
Critical Slope:	0.1054	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–190

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

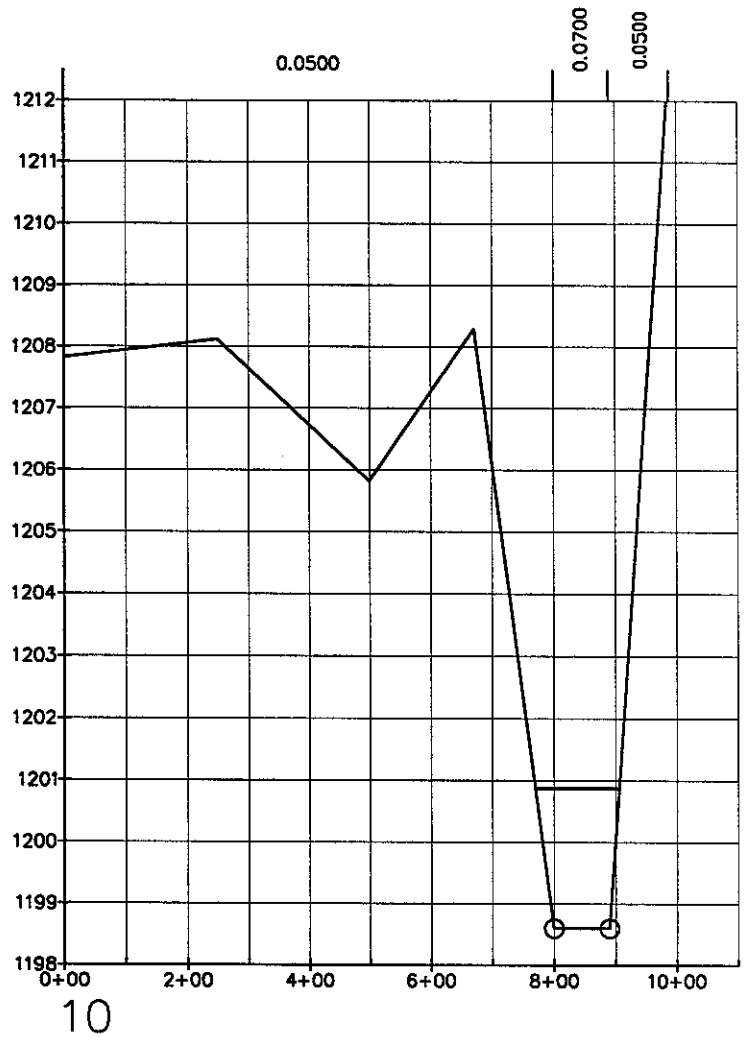
Cross-Section:	200	
Elevation:	1135.96	ft MSL
Depth:	1.40	ft
Discharge:	640.00	cfs
Energy Gradient:	0.0067	ft/ft
Froude Number:	0.2653	
Flow Regime:	Subcritical	
Flow Area:	359.31	sq ft
Average Velocity:	1.76	ft/s
Maximum Velocity:	1.82	ft/s
Composite n:	0.0556	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	528.04	ft
Wetted Top Width:	528.02	ft
Critical Slope:	0.105	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S27N–200

Entellus™

File: WASH-T2N-R5W-S27N_X-SECTION-R14.dwg Date: 10/03/00



Normal Depth Results

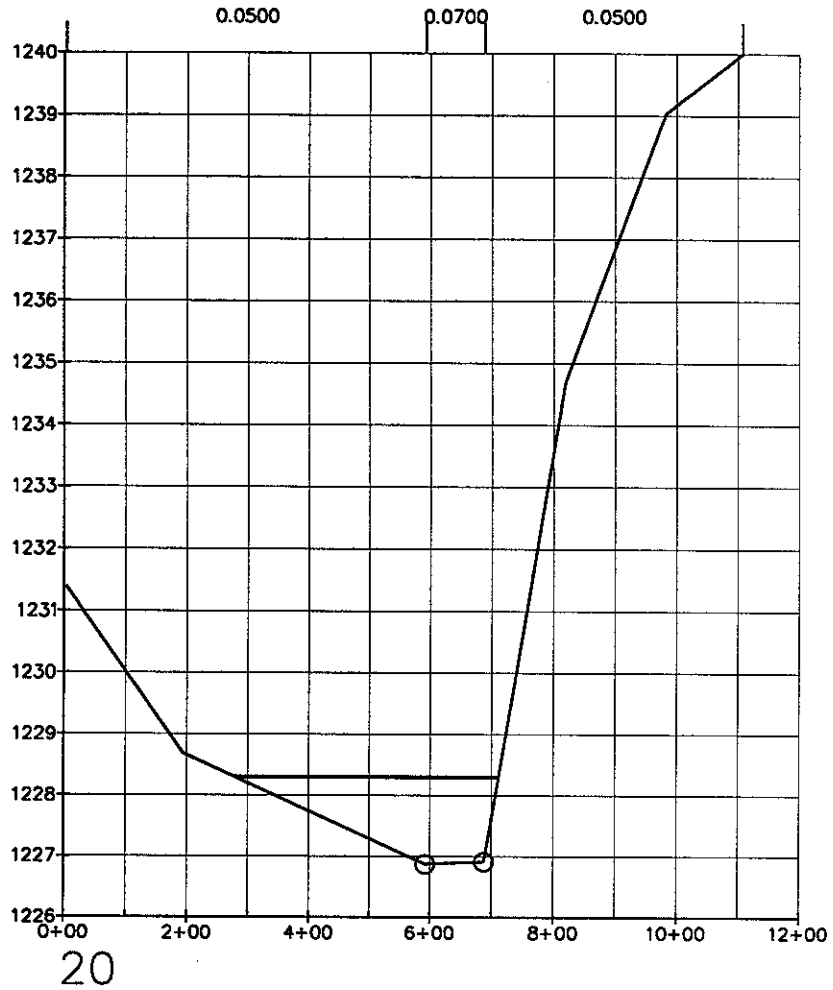
Cross-Section:	10	
Elevation:	1200.87	ft MSL
Depth:	2.27	ft
Discharge:	870.00	cfs
Energy Gradient:	0.0088	ft/ft
Froude Number:	0.3954	
Flow Regime:	Subcritical	
Flow Area:	257.22	sq ft
Average Velocity:	3.37	ft/s
Maximum Velocity:	3.45	ft/s
Composite n:	0.0635	
Hydraulic Radius:	1.88	ft
Wetted Perimeter:	136.52	ft
Wetted Top Width:	136.28	ft
Critical Slope:	0.0571	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S04–10

Entellus™

File: WASH-T2N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

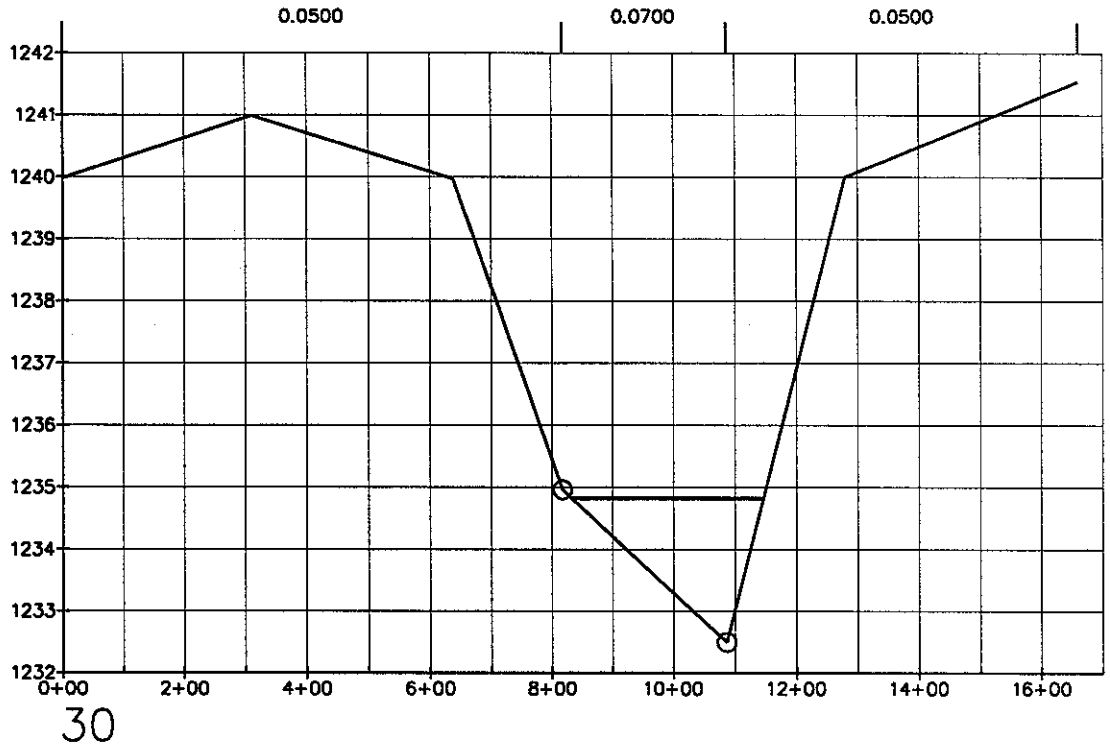
Cross-Section:	20	
Elevation:	1228.30	ft MSL
Depth:	1.42	ft
Discharge:	870.00	cfs
Energy Gradient:	0.0088	ft/ft
Froude Number:	0.3433	
Flow Regime:	Subcritical	
Flow Area:	374.25	sq ft
Average Velocity:	2.33	ft/s
Maximum Velocity:	2.51	ft/s
Composite n:	0.0547	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	432.84	ft
Wetted Top Width:	432.80	ft
Critical Slope:	0.075	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S04–20

Entellus™

File: WASH-T2N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

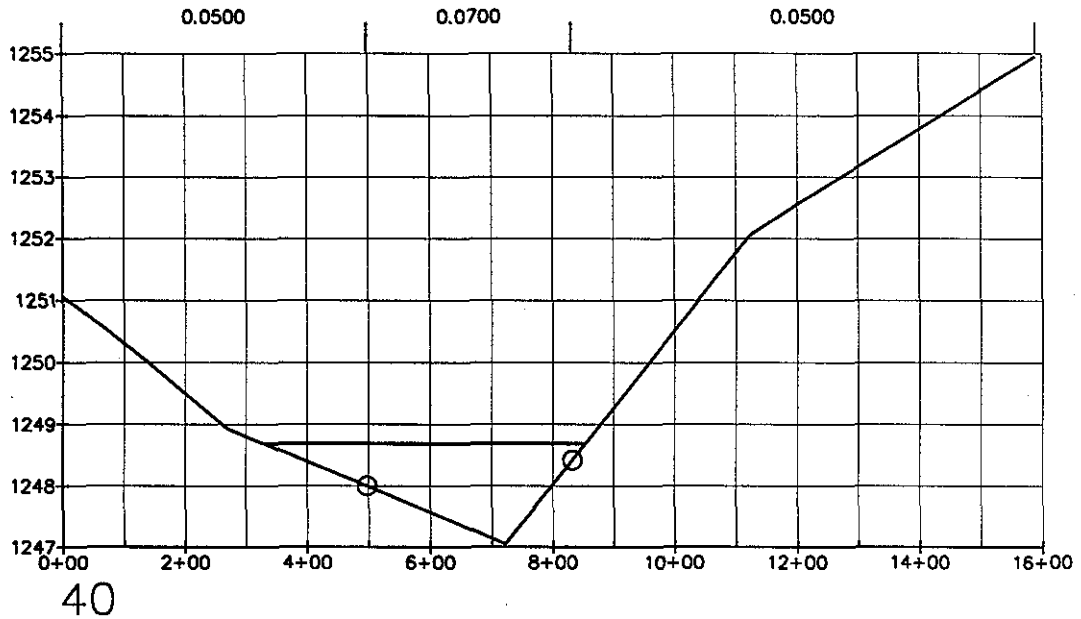
Cross-Section:	30	
Elevation:	1234.82	ft MSL
Depth:	2.32	ft
Discharge:	870.00	cfs
Energy Gradient:	0.0088	ft/ft
Froude Number:	0.2757	
Flow Regime:	Subcritical	
Flow Area:	364.90	sq ft
Average Velocity:	2.38	ft/s
Maximum Velocity:	3.09	ft/s
Composite n:	0.0664	
Hydraulic Radius:	1.16	ft
Wetted Perimeter:	314.02	ft
Wetted Top Width:	313.96	ft
Critical Slope:	0.1216	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S04–30

Entellus™

File: WASH-T2N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

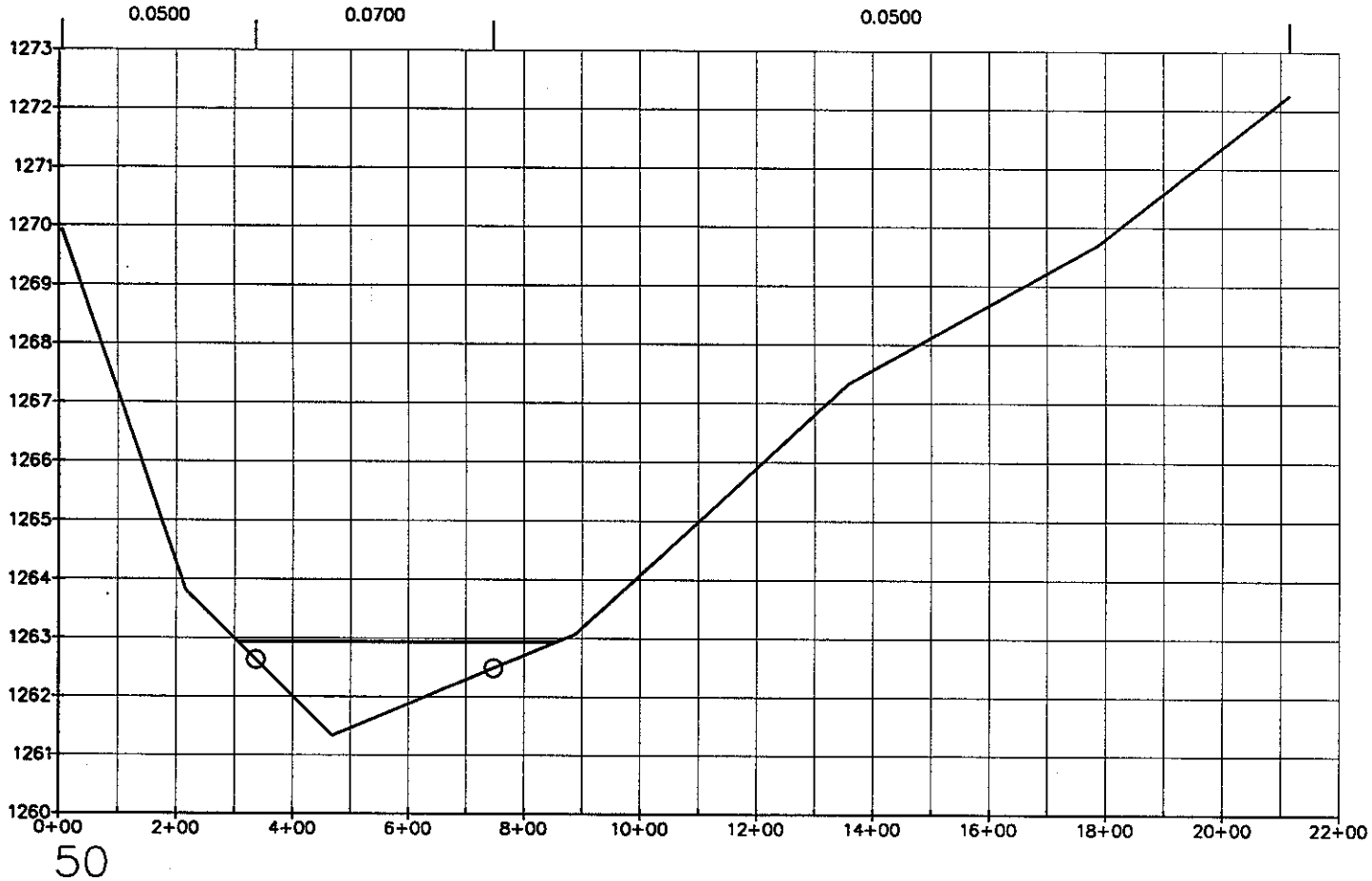
Cross-Section:	40	
Elevation:	1248.69	ft MSL
Depth:	1.64	ft
Discharge:	870.00	cfs
Energy Gradient:	0.0088	ft/ft
Froude Number:	0.281	
Flow Regime:	Subcritical	
Flow Area:	426.31	sq ft
Average Velocity:	2.01	ft/s
Maximum Velocity:	2.12	ft/s
Composite n:	0.0631	
Hydraulic Radius:	0.81	ft
Wetted Perimeter:	524.81	ft
Wetted Top Width:	524.80	ft
Critical Slope:	0.1248	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N–R5W–S04–40

Entellus™

File: WASH-T2N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

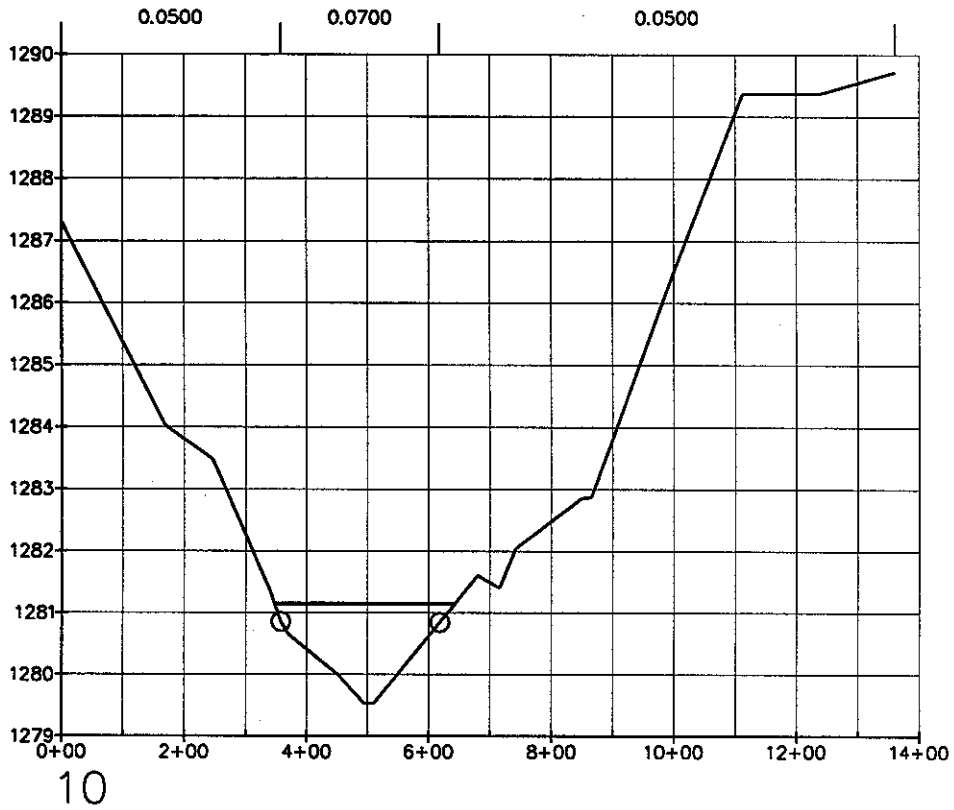
Cross-Section:	50	
Elevation:	1262.94	ft MSL
Depth:	1.61	ft
Discharge:	870.00	cfs
Energy Gradient:	0.0088	ft/ft
Froude Number:	0.2737	
Flow Regime:	Subcritical	
Flow Area:	442.08	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	2.00	ft/s
Composite n:	0.0652	
Hydraulic Radius:	0.8	ft
Wetted Perimeter:	550.67	ft
Wetted Top Width:	550.66	ft
Critical Slope:	0.1327	ft/ft

File: WASH-T2N-R5W-S04_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T2N-R5W-S04-50

Entellus™



Normal Depth Results

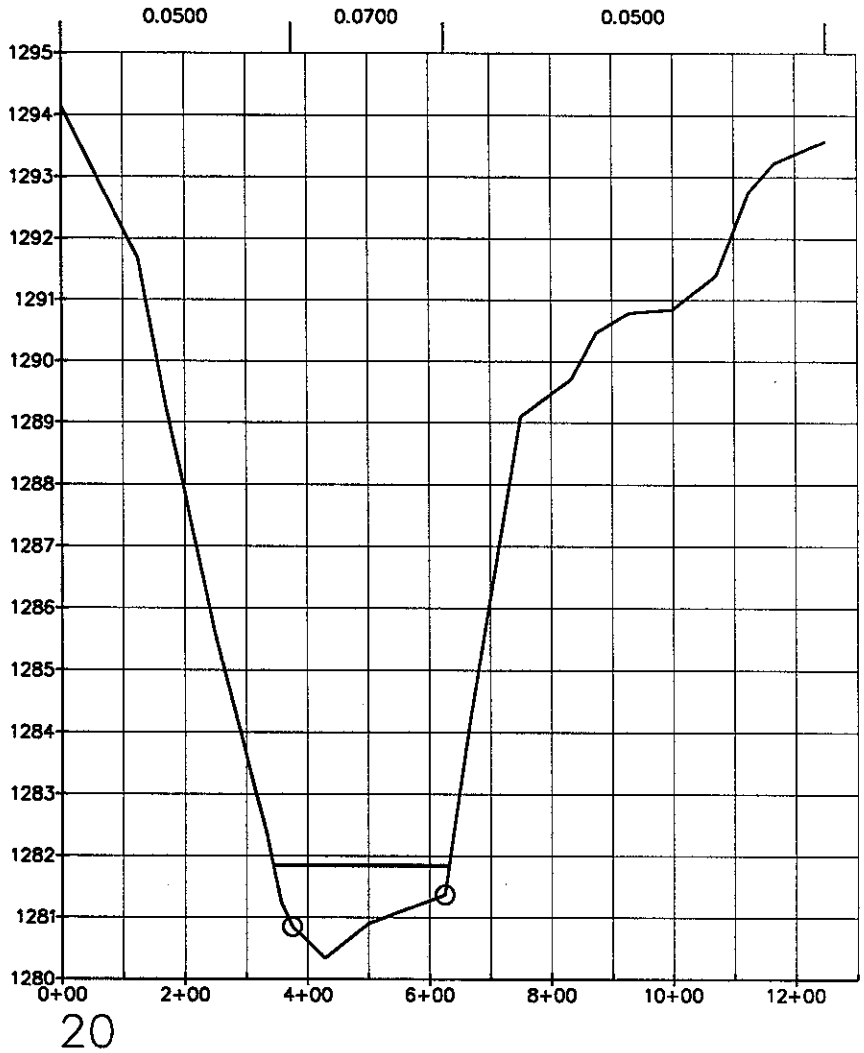
Cross-Section:	10	
Elevation:	1281.15	ft MSL
Depth:	1.62	ft
Discharge:	510.00	cfs
Energy Gradient:	0.0087	ft/ft
Froude Number:	0.2673	
Flow Regime:	Subcritical	
Flow Area:	264.51	sq ft
Average Velocity:	1.96	ft/s
Maximum Velocity:	1.98	ft/s
Composite n:	0.0678	
Hydraulic Radius:	0.9	ft
Wetted Perimeter:	294.52	ft
Wetted Top Width:	294.50	ft
Critical Slope:	0.1244	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28S–10

Entellus™

File: WASH-T3N-R5W-S28S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

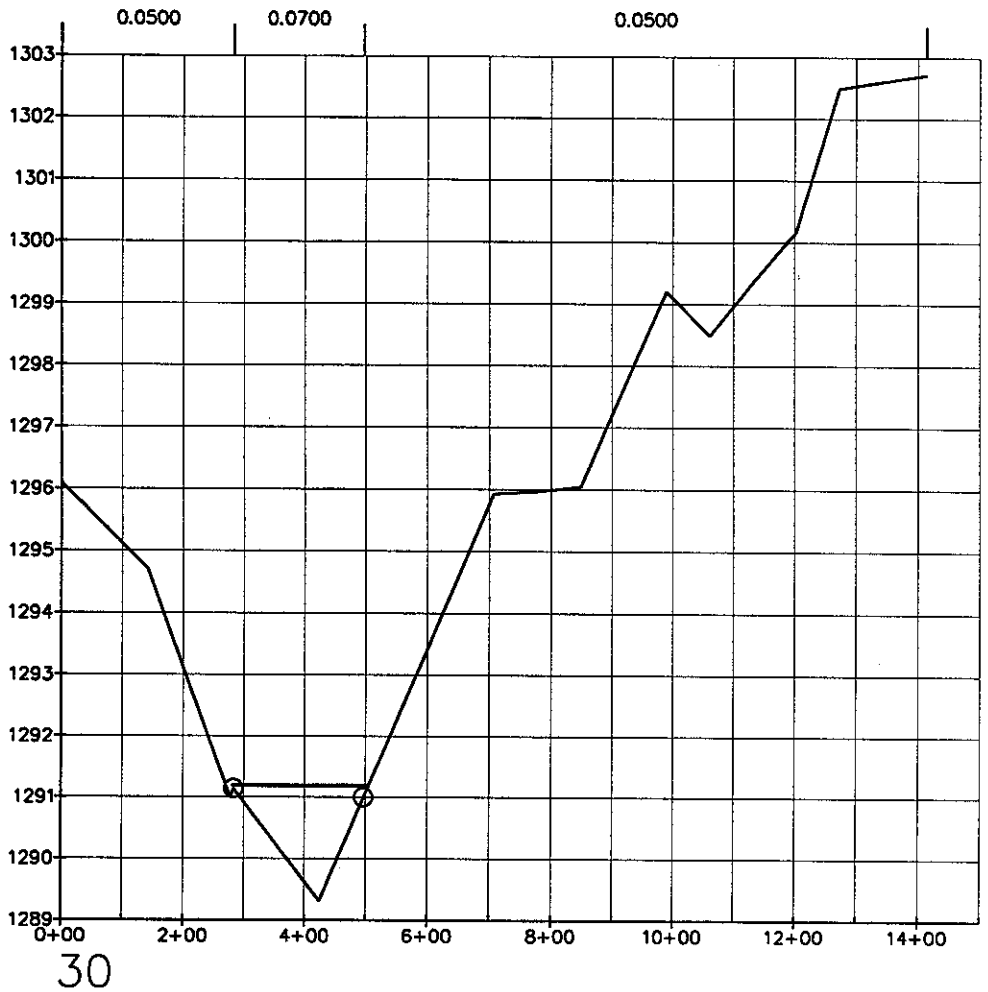
Cross-Section:	20	
Elevation:	1281.84	ft MSL
Depth:	1.50	ft
Discharge:	510.00	cfs
Energy Gradient:	0.0087	ft/ft
Froude Number:	0.2793	
Flow Regime:	Subcritical	
Flow Area:	262.58	sq ft
Average Velocity:	1.94	ft/s
Maximum Velocity:	1.95	ft/s
Composite n:	0.0675	
Hydraulic Radius:	0.91	ft
Wetted Perimeter:	287.86	ft
Wetted Top Width:	287.82	ft
Critical Slope:	0.1123	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28S–20

Entellus™

File: WASH-T3N-R5W-S28S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

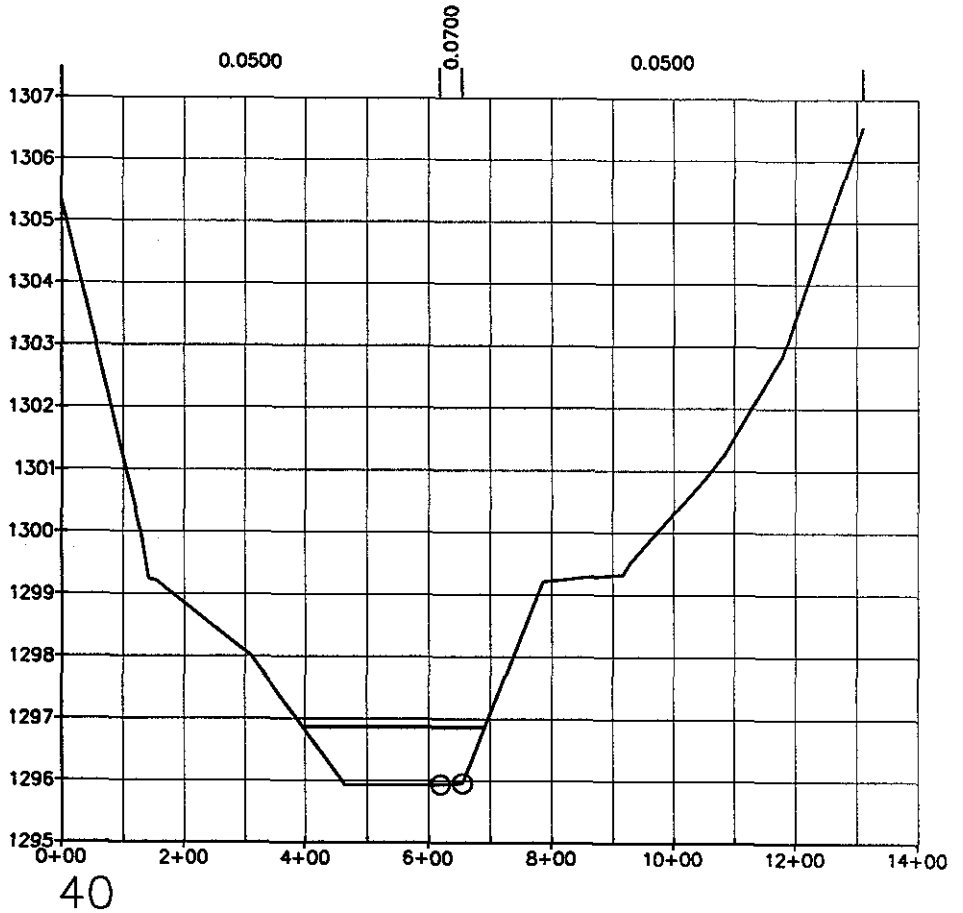
Cross-Section:	30	
Elevation:	1291.19	ft MSL
Depth:	1.88	ft
Discharge:	510.00	cfs
Energy Gradient:	0.0087	ft/ft
Froude Number:	0.3094	
Flow Regime:	Subcritical	
Flow Area:	211.96	sq ft
Average Velocity:	2.41	ft/s
Maximum Velocity:	2.69	ft/s
Composite n:	0.0575	
Hydraulic Radius:	0.95	ft
Wetted Perimeter:	223.74	ft
Wetted Top Width:	223.70	ft
Critical Slope:	0.097	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28S–30

Entellus™

File: WASH-T3N-R5W-S28S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

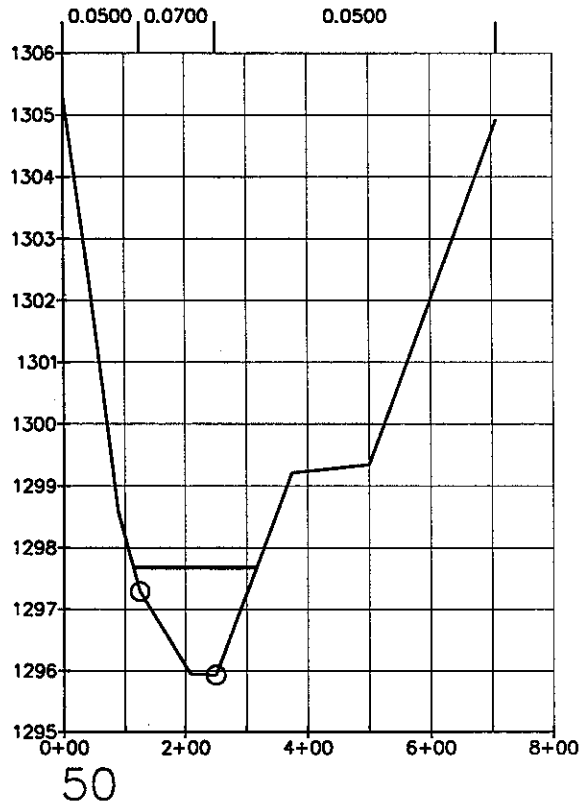
Cross-Section:	40	
Elevation:	1296.87	ft MSL
Depth:	0.94	ft
Discharge:	510.00	cfs
Energy Gradient:	0.0087	ft/ft
Froude Number:	0.4111	
Flow Regime:	Subcritical	
Flow Area:	226.07	sq ft
Average Velocity:	2.25	ft/s
Maximum Velocity:	2.38	ft/s
Composite n:	0.0526	
Hydraulic Radius:	0.76	ft
Wetted Perimeter:	295.92	ft
Wetted Top Width:	295.90	ft
Critical Slope:	0.0537	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N-R5W-S28S-40

Entellus™

File: WASH-T3N-R5W-S28S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

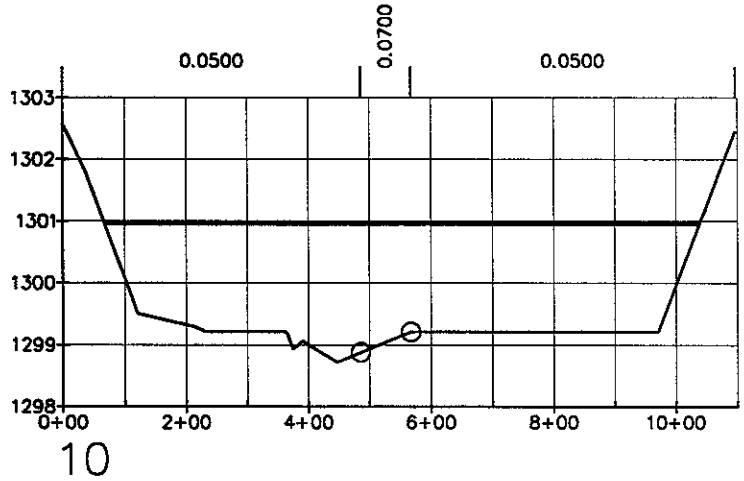
Cross-Section:	50	
Elevation:	1297.68	ft MSL
Depth:	1.75	ft
Discharge:	510.00	cfs
Energy Gradient:	0.0087	ft/ft
Froude Number:	0.3088	
Flow Regime:	Subcritical	
Flow Area:	220.36	sq ft
Average Velocity:	2.32	ft/s
Maximum Velocity:	2.54	ft/s
Composite n:	0.0637	
Hydraulic Radius:	1.09	ft
Wetted Perimeter:	202.22	ft
Wetted Top Width:	202.18	ft
Critical Slope:	0.0917	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28S–50

Entellus™

File: WASH-T3N-R5W-S28S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

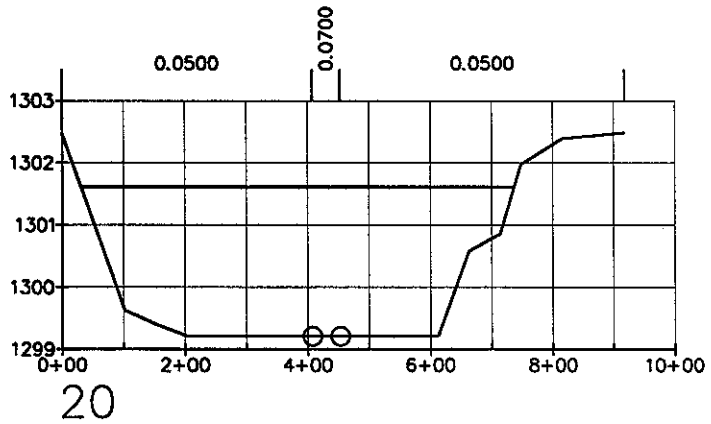
Cross-Section:	10	
Elevation:	1300.96	ft MSL
Depth:	2.24	ft
Discharge:	5500.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.4014	
Flow Regime:	Subcritical	
Flow Area:	1615.40	sq ft
Average Velocity:	3.40	ft/s
Maximum Velocity:	3.50	ft/s
Composite n:	0.0518	
Hydraulic Radius:	1.66	ft
Wetted Perimeter:	970.37	ft
Wetted Top Width:	970.32	ft
Critical Slope:	0.0441	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–10

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

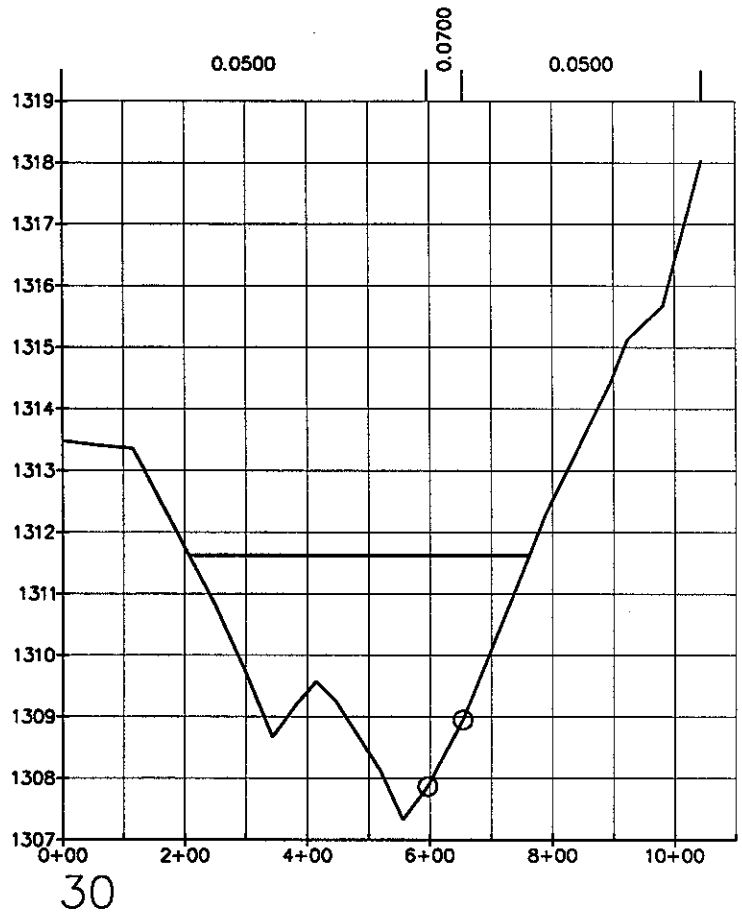
Cross-Section:	20	
Elevation:	1301.61	ft MSL
Depth:	2.40	ft
Discharge:	5500.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.4424	
Flow Regime:	Subcritical	
Flow Area:	1414.74	sq ft
Average Velocity:	3.88	ft/s
Maximum Velocity:	4.06	ft/s
Composite n:	0.0514	
Hydraulic Radius:	2	ft
Wetted Perimeter:	705.72	ft
Wetted Top Width:	705.66	ft
Critical Slope:	0.0363	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–20

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

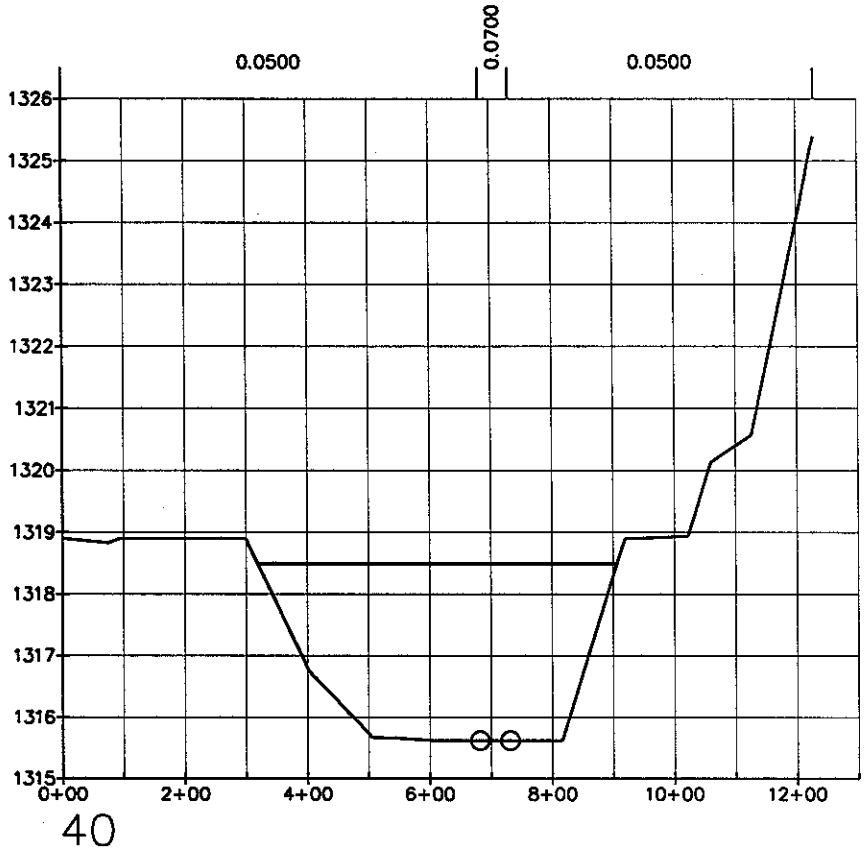
Cross-Section:	30	
Elevation:	1311.62	ft MSL
Depth:	4.29	ft
Discharge:	5500.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3631	
Flow Regime:	Subcritical	
Flow Area:	1288.49	sq ft
Average Velocity:	4.28	ft/s
Maximum Velocity:	4.55	ft/s
Composite n:	0.0522	
Hydraulic Radius:	2.32	ft
Wetted Perimeter:	555.10	ft
Wetted Top Width:	555.00	ft
Critical Slope:	0.0552	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–30

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

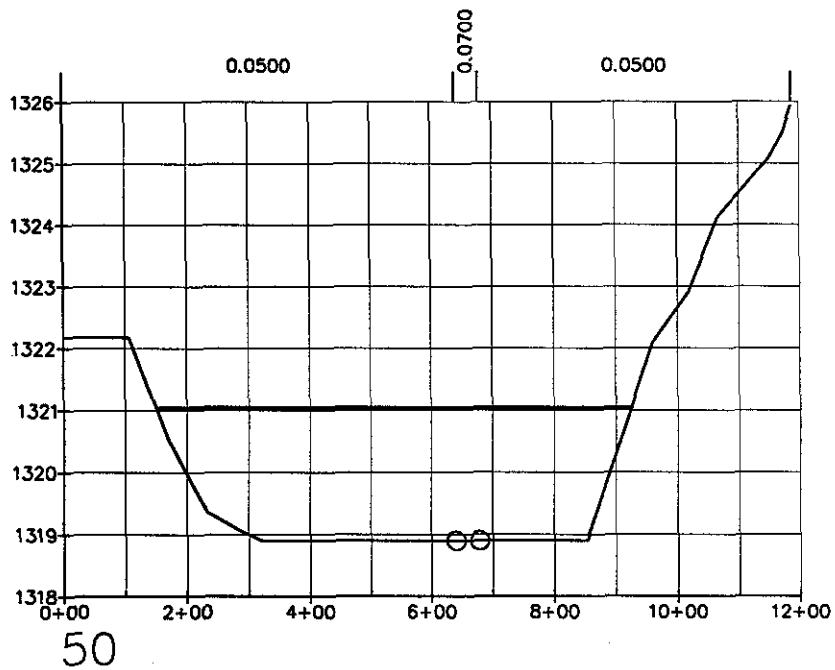
Cross-Section:	40	
Elevation:	1318.49	ft MSL
Depth:	2.87	ft
Discharge:	5500.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.433	
Flow Regime:	Subcritical	
Flow Area:	1322.29	sq ft
Average Velocity:	4.15	ft/s
Maximum Velocity:	4.26	ft/s
Composite n:	0.0518	
Hydraulic Radius:	2.25	ft
Wetted Perimeter:	586.77	ft
Wetted Top Width:	586.70	ft
Critical Slope:	0.0377	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–40

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

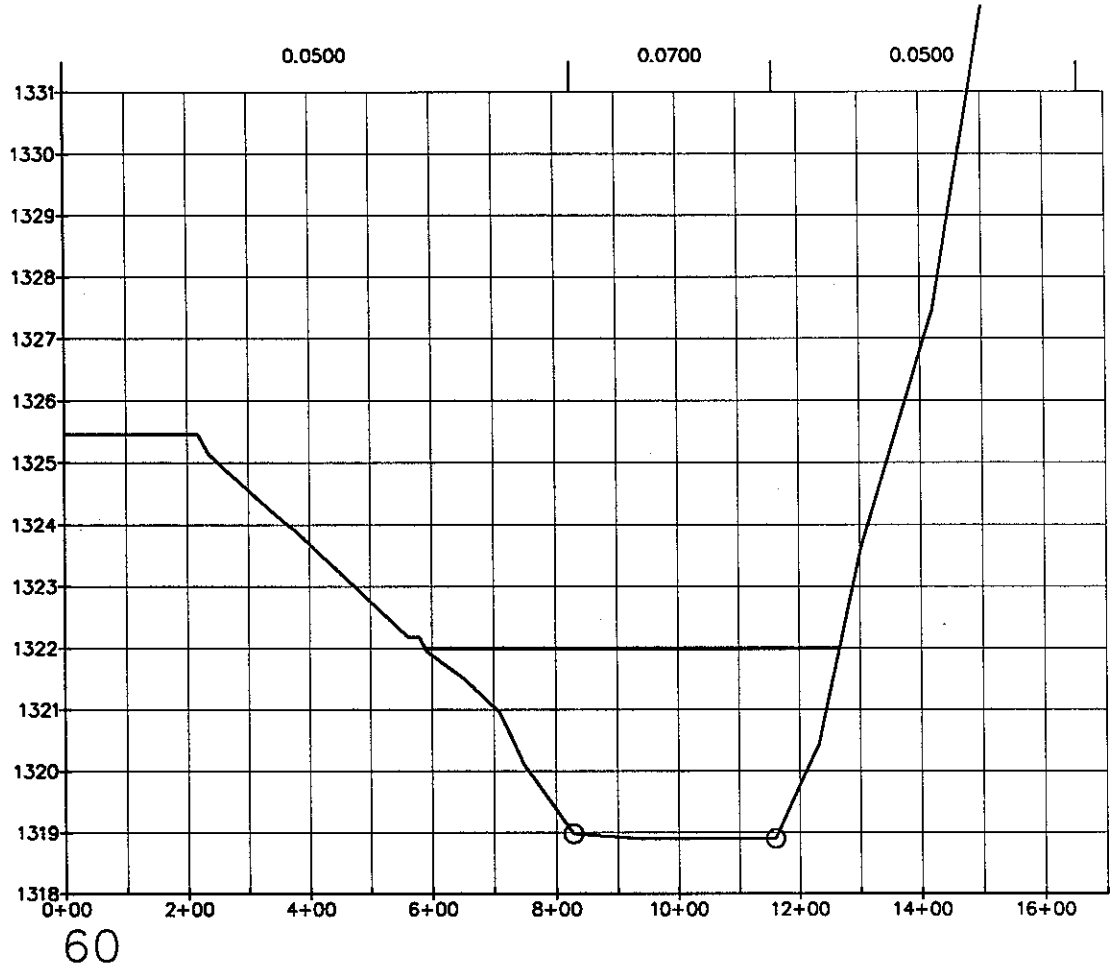
Cross-Section:	50	
Elevation:	1321.05	ft MSL
Depth:	2.15	ft
Discharge:	5500.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.4528	
Flow Regime:	Subcritical	
Flow Area:	1462.02	sq ft
Average Velocity:	3.74	ft/s
Maximum Velocity:	3.82	ft/s
Composite n:	0.051	
Hydraulic Radius:	1.89	ft
Wetted Perimeter:	774.87	ft
Wetted Top Width:	774.82	ft
Critical Slope:	0.0347	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N-R5W-S28N-50

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

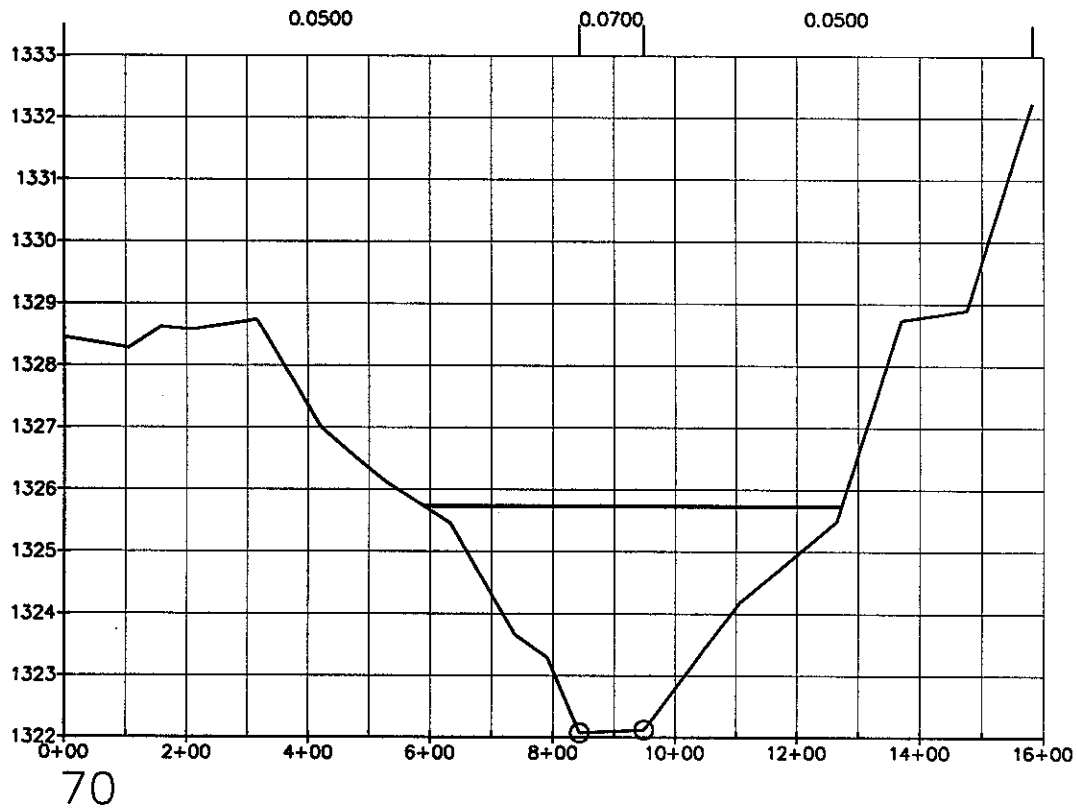
Cross-Section:	60	
Elevation:	1322.00	ft MSL
Depth:	3.10	ft
Discharge:	5500.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3602	
Flow Regime:	Subcritical	
Flow Area:	1529.85	sq ft
Average Velocity:	3.61	ft/s
Maximum Velocity:	3.77	ft/s
Composite n:	0.0602	
Hydraulic Radius:	2.26	ft
Wetted Perimeter:	677.17	ft
Wetted Top Width:	677.09	ft
Critical Slope:	0.0548	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–60

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

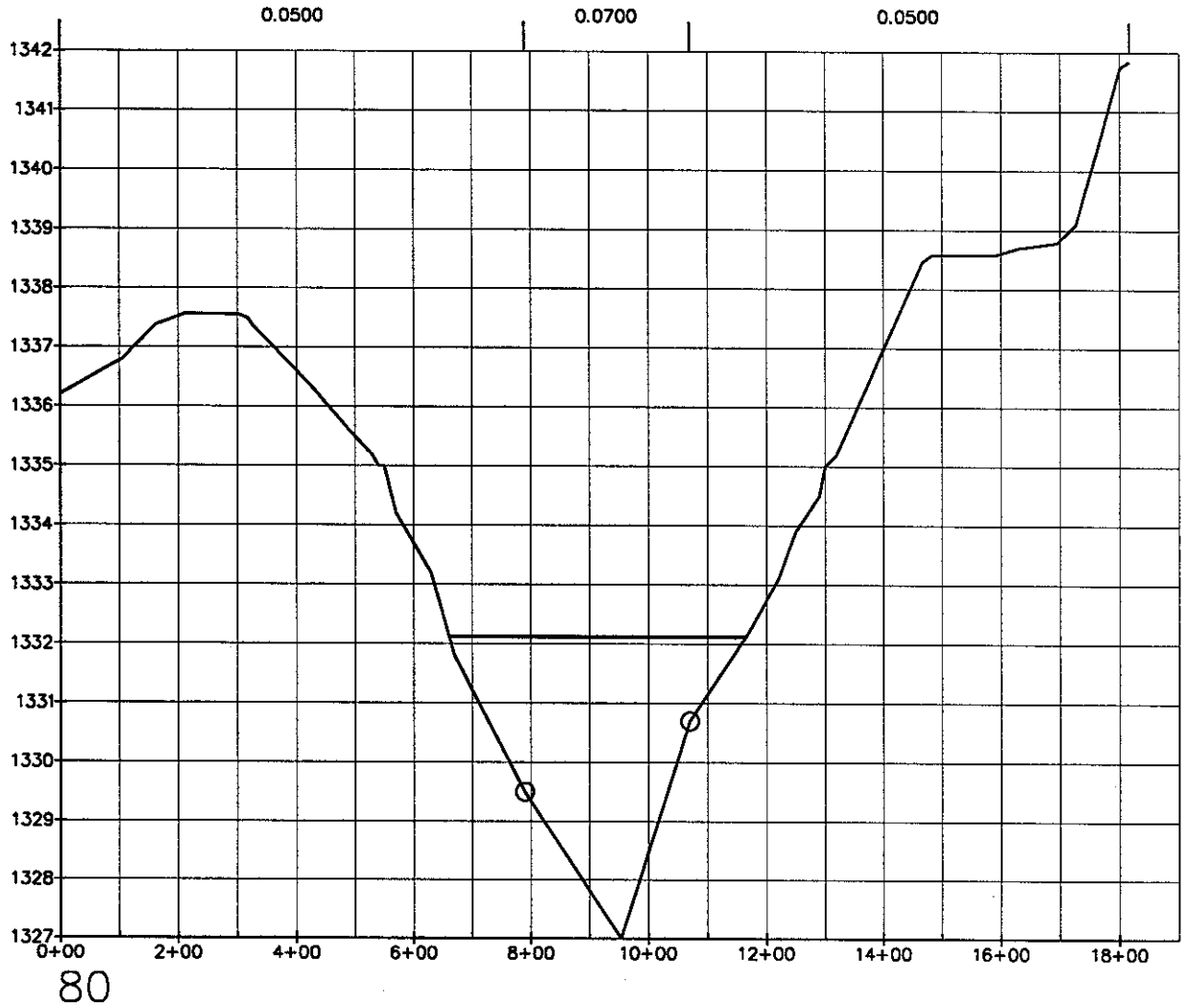
Cross-Section:	70	
Elevation:	1325.73	ft MSL
Depth:	3.66	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3406	
Flow Regime:	Subcritical	
Flow Area:	1339.46	sq ft
Average Velocity:	3.70	ft/s
Maximum Velocity:	4.21	ft/s
Composite n:	0.0533	
Hydraulic Radius:	1.96	ft
Wetted Perimeter:	682.59	ft
Wetted Top Width:	682.54	ft
Critical Slope:	0.0613	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–70

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

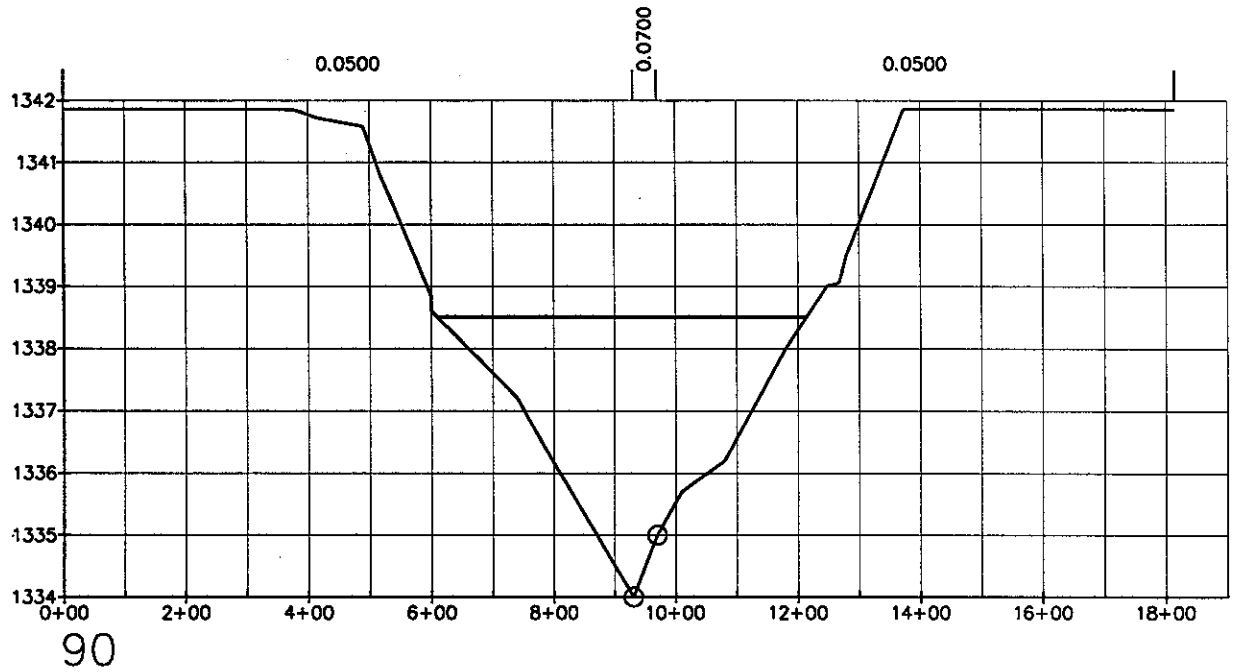
Cross-Section:	80	
Elevation:	1332.12	ft MSL
Depth:	5.12	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3059	
Flow Regime:	Subcritical	
Flow Area:	1260.29	sq ft
Average Velocity:	3.92	ft/s
Maximum Velocity:	4.20	ft/s
Composite n:	0.0615	
Hydraulic Radius:	2.5	ft
Wetted Perimeter:	504.21	ft
Wetted Top Width:	504.09	ft
Critical Slope:	0.0828	ft/ft

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N-R5W-S28N-80

Entellus™



Normal Depth Results

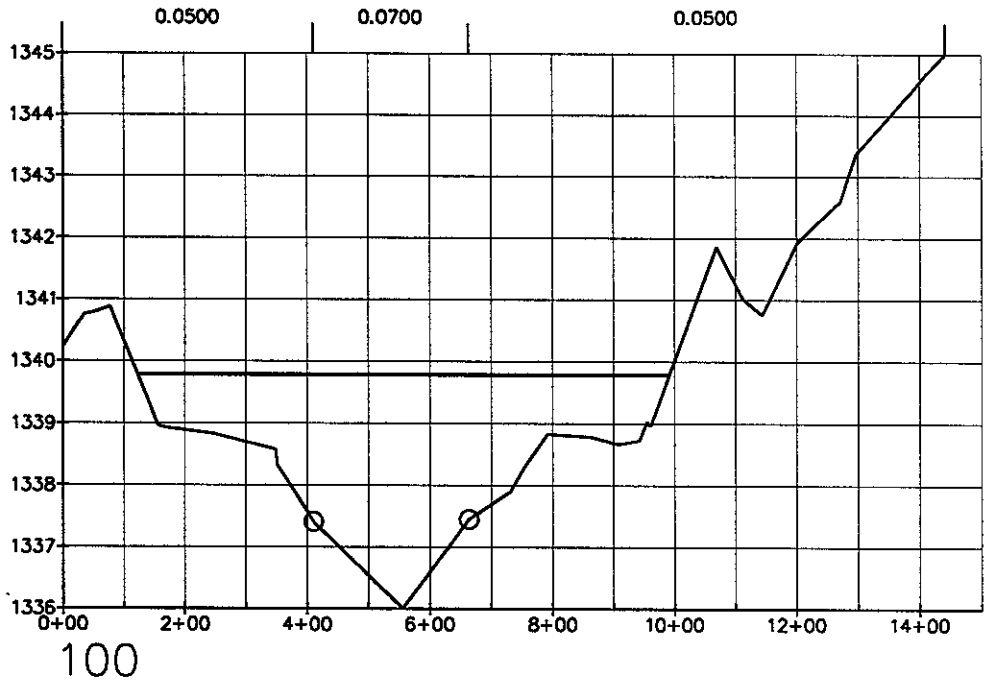
Cross-Section:	90	
Elevation:	1338.50	ft MSL
Depth:	4.50	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3281	
Flow Regime:	Subcritical	
Flow Area:	1252.91	sq ft
Average Velocity:	3.96	ft/s
Maximum Velocity:	4.49	ft/s
Composite n:	0.0514	
Hydraulic Radius:	2.07	ft
Wetted Perimeter:	604.43	ft
Wetted Top Width:	604.35	ft
Critical Slope:	0.0652	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–90

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

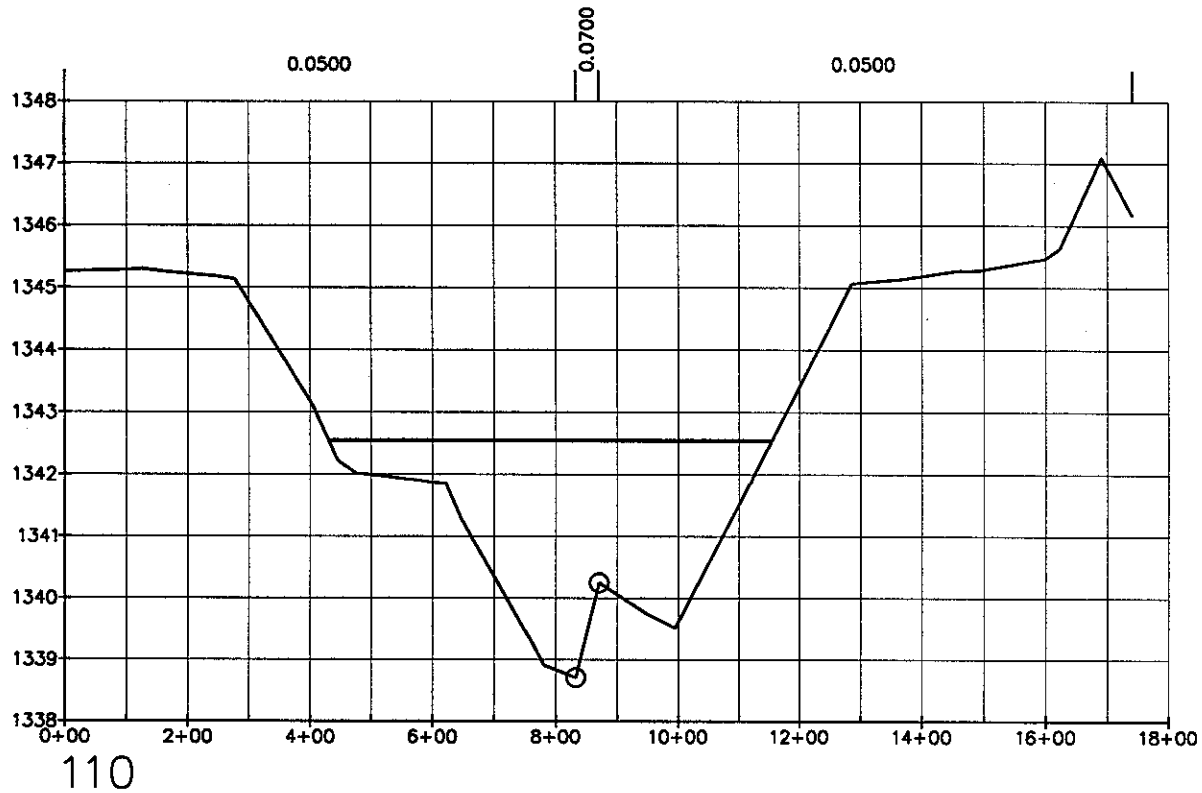
Cross-Section:	100	
Elevation:	1339.78	ft MSL
Depth:	3.78	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.2983	
Flow Regime:	Subcritical	
Flow Area:	1504.77	sq ft
Average Velocity:	3.29	ft/s
Maximum Velocity:	3.76	ft/s
Composite n:	0.0561	
Hydraulic Radius:	1.73	ft
Wetted Perimeter:	868.54	ft
Wetted Top Width:	868.47	ft
Critical Slope:	0.0831	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–100

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

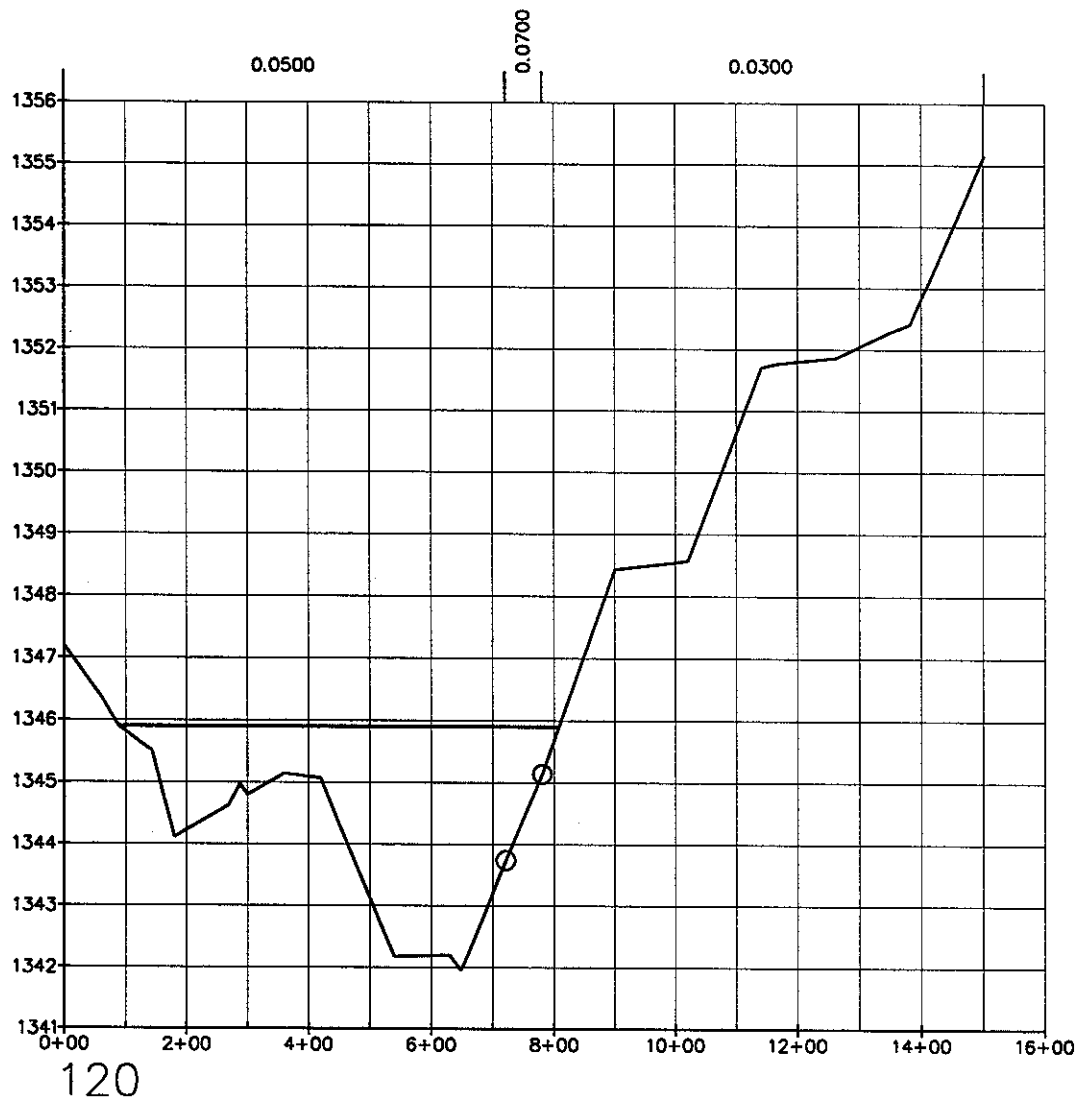
Cross-Section:	110	
Elevation:	1342.55	ft MSL
Depth:	3.84	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3324	
Flow Regime:	Subcritical	
Flow Area:	1340.08	sq ft
Average Velocity:	3.70	ft/s
Maximum Velocity:	3.99	ft/s
Composite n:	0.0511	
Hydraulic Radius:	1.85	ft
Wetted Perimeter:	723.95	ft
Wetted Top Width:	723.85	ft
Critical Slope:	0.0639	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–110

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	120	
Elevation:	1345.90	ft MSL
Depth:	3.94	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3325	
Flow Regime:	Subcritical	
Flow Area:	1322.06	sq ft
Average Velocity:	3.76	ft/s
Maximum Velocity:	3.87	ft/s
Composite n:	0.0511	
Hydraulic Radius:	1.84	ft
Wetted Perimeter:	719.66	ft
Wetted Top Width:	719.54	ft
Critical Slope:	0.0663	ft/ft

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N-R5W-S28N-120

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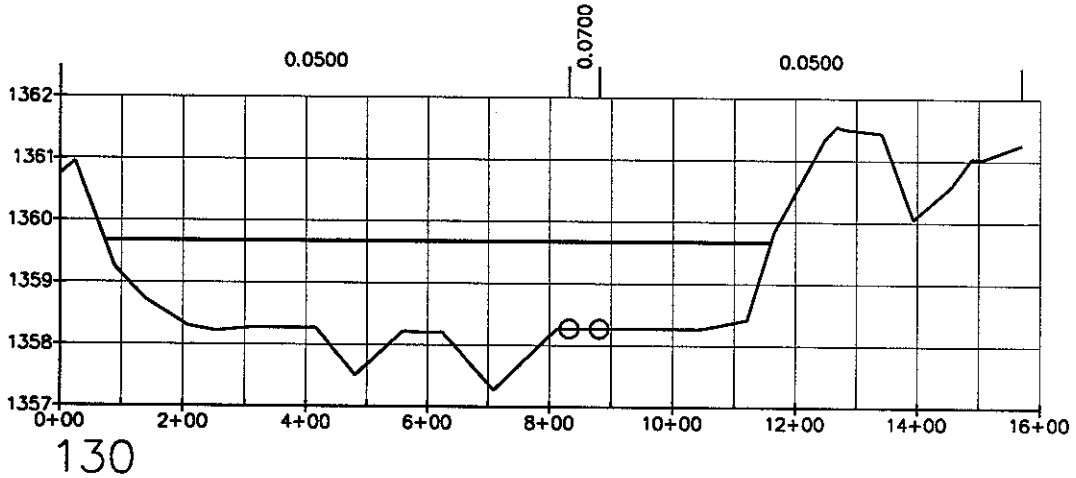


Normal Depth Results

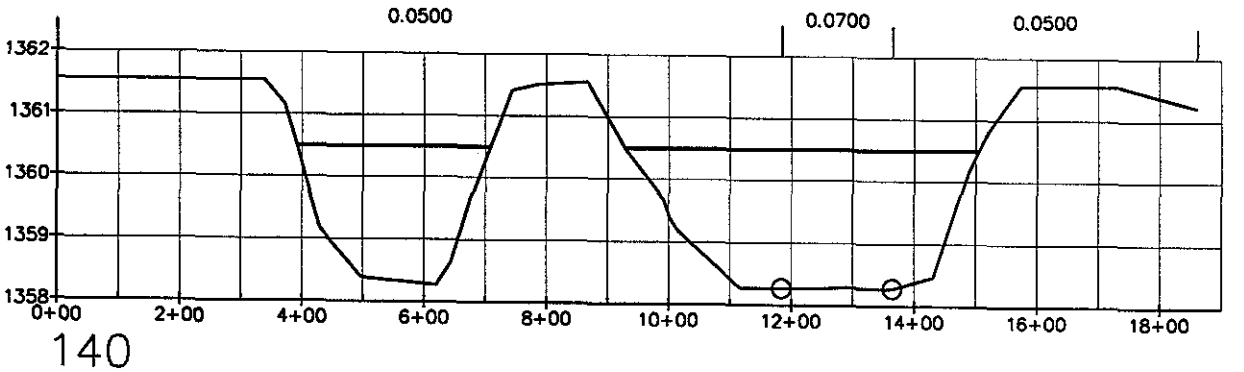
Cross-Section:	130	
Elevation:	1359.67	ft MSL
Depth:	2.40	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3583	
Flow Regime:	Subcritical	
Flow Area:	1572.34	sq ft
Average Velocity:	3.16	ft/s
Maximum Velocity:	3.29	ft/s
Composite n:	0.0509	
Hydraulic Radius:	1.45	ft
Wetted Perimeter:	1086.57	ft
Wetted Top Width:	1086.52	ft
Critical Slope:	0.0552	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–130

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

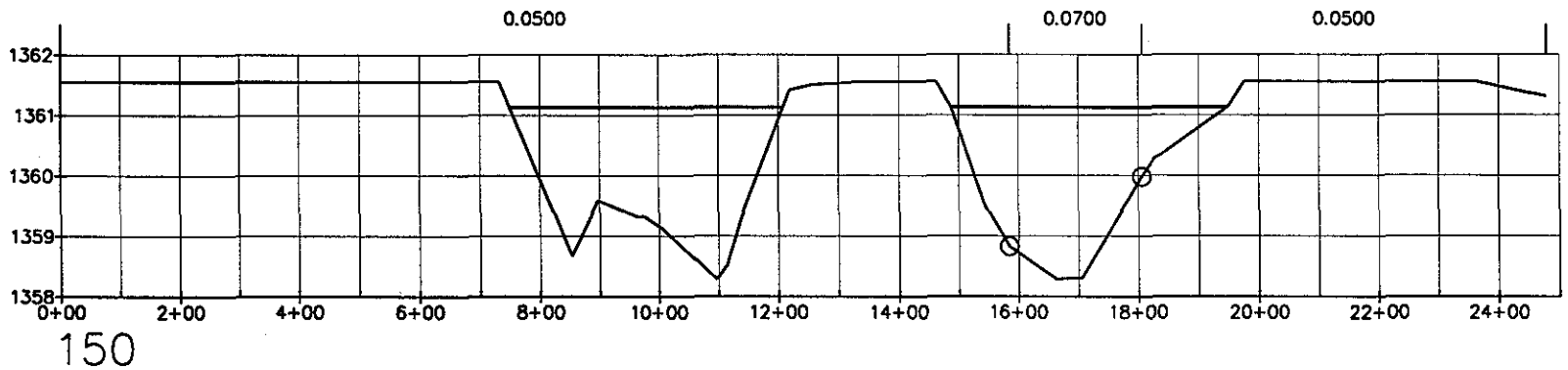
Cross-Section:	140	
Elevation:	1360.50	ft MSL
Depth:	2.23	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	*0.3864*	
Flow Regime:	Subcritical	
Flow Area:	1512.27	sq ft
Average Velocity:	3.27	ft/s
Maximum Velocity:	3.36	ft/s
Composite n:	0.0543	
Hydraulic Radius:	1.69	ft
Wetted Perimeter:	894.41	ft
Wetted Top Width:	894.31	ft
Critical Slope:	0.0473	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–140

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

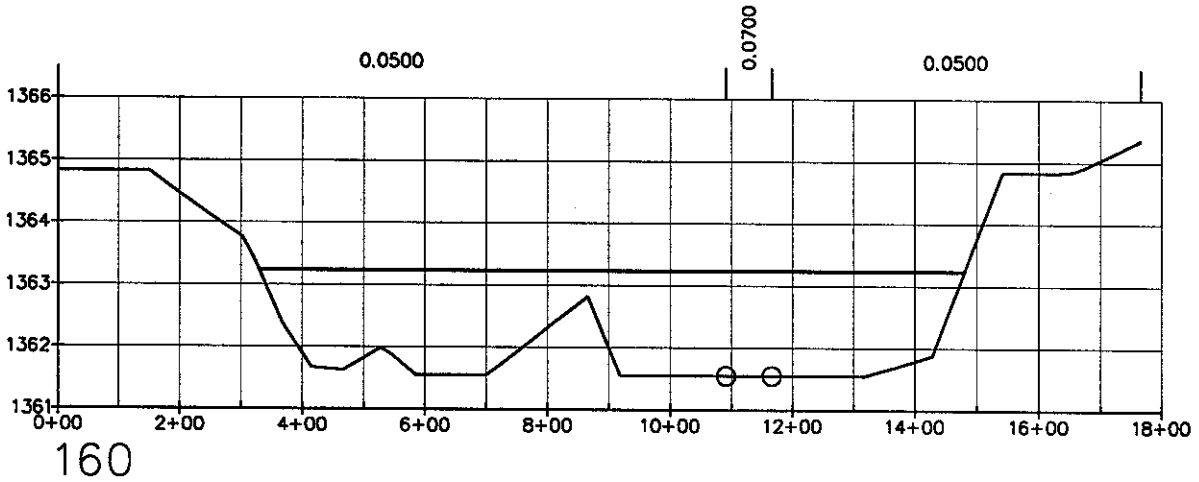
Cross-Section:	150	
Elevation:	1361.13	ft MSL
Depth:	2.84	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.3439	
Flow Regime:	Subcritical	
Flow Area:	1506.79	sq ft
Average Velocity:	3.27	ft/s
Maximum Velocity:	3.47	ft/s
Composite n:	0.0551	
Hydraulic Radius:	1.64	ft
Wetted Perimeter:	918.74	ft
Wetted Top Width:	918.61	ft
Critical Slope:	0.0646	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–150

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

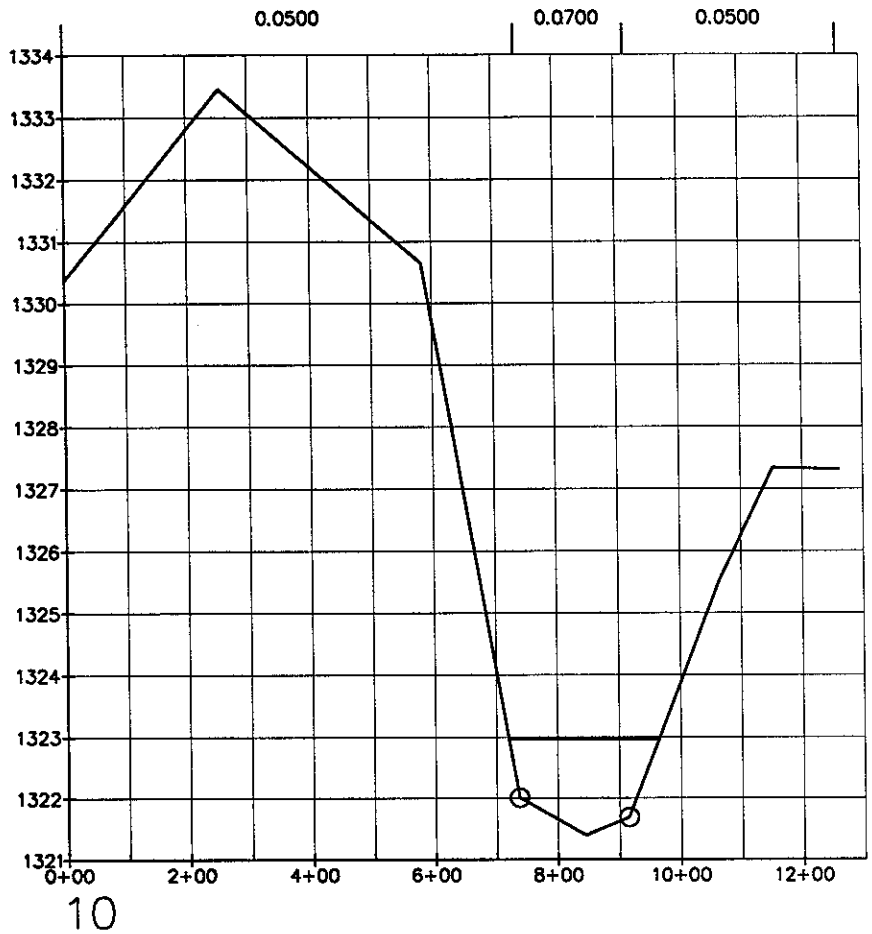
Cross-Section:	160	
Elevation:	1363.23	ft MSL
Depth:	1.68	ft
Discharge:	4950.00	cfs
Energy Gradient:	0.007	ft/ft
Froude Number:	0.4137	
Flow Regime:	Subcritical	
Flow Area:	1624.95	sq ft
Average Velocity:	3.07	ft/s
Maximum Velocity:	3.21	ft/s
Composite n:	0.0514	
Hydraulic Radius:	1.41	ft
Wetted Perimeter:	1150.44	ft
Wetted Top Width:	1150.38	ft
Critical Slope:	0.0407	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S28N–160

Entellus™

File: WASH-T3N-R5W-S28N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	10	
Elevation:	1322.97	ft MSL
Depth:	1.57	ft
Discharge:	580.00	cfs
Energy Gradient:	0.0071	ft/ft
Froude Number:	0.2962	
Flow Regime:	Subcritical	
Flow Area:	275.61	sq ft
Average Velocity:	2.11	ft/s
Maximum Velocity:	2.16	ft/s
Composite n:	0.0648	
Hydraulic Radius:	1.13	ft
Wetted Perimeter:	244.51	ft
Wetted Top Width:	244.47	ft
Critical Slope:	0.0814	ft/ft

Note: X-section not used for delineation

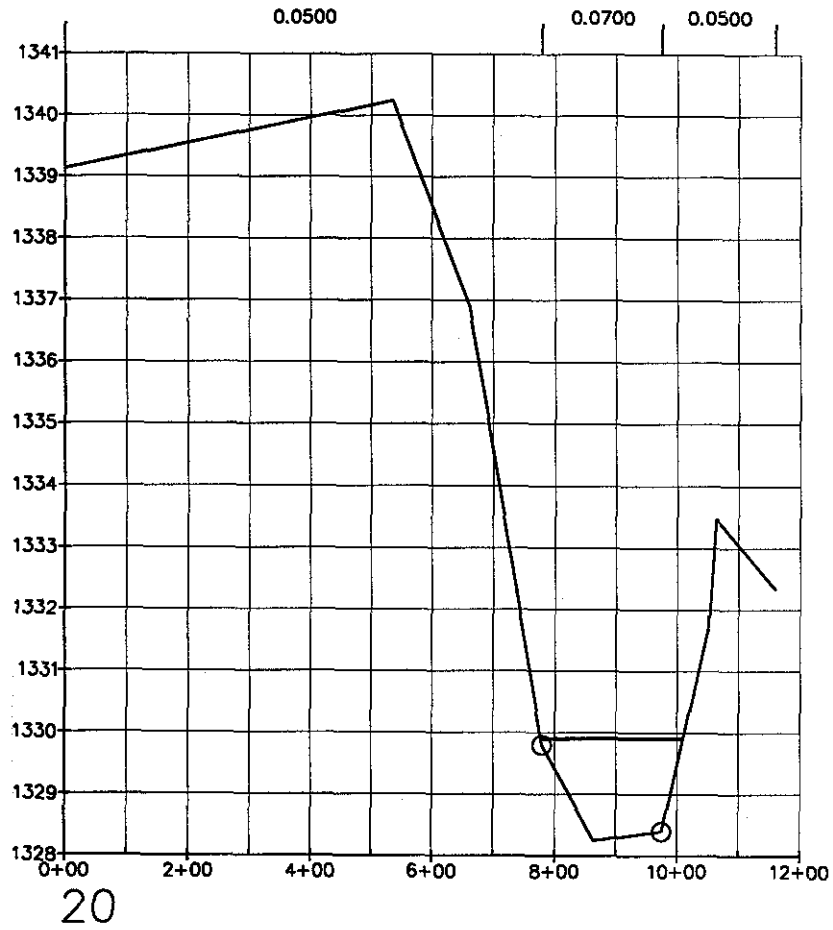
ZONE A - DELINEATION OF WATERSHED "PP"

LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S20–10

Entellus™

File: WASH-T3N-R5W-S20_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1329.90	ft MSL
Depth:	1.65	ft
Discharge:	580.00	cfs
Energy Gradient:	0.0071	ft/ft
Froude Number:	0.2894	
Flow Regime:	Subcritical	
Flow Area:	274.93	sq ft
Average Velocity:	2.10	ft/s
Maximum Velocity:	2.11	ft/s
Composite n:	0.067	
Hydraulic Radius:	1.19	ft
Wetted Perimeter:	231.53	ft
Wetted Top Width:	231.48	ft
Critical Slope:	0.0856	ft/ft

File: WASH-T3N-R5W-S20_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S20–20

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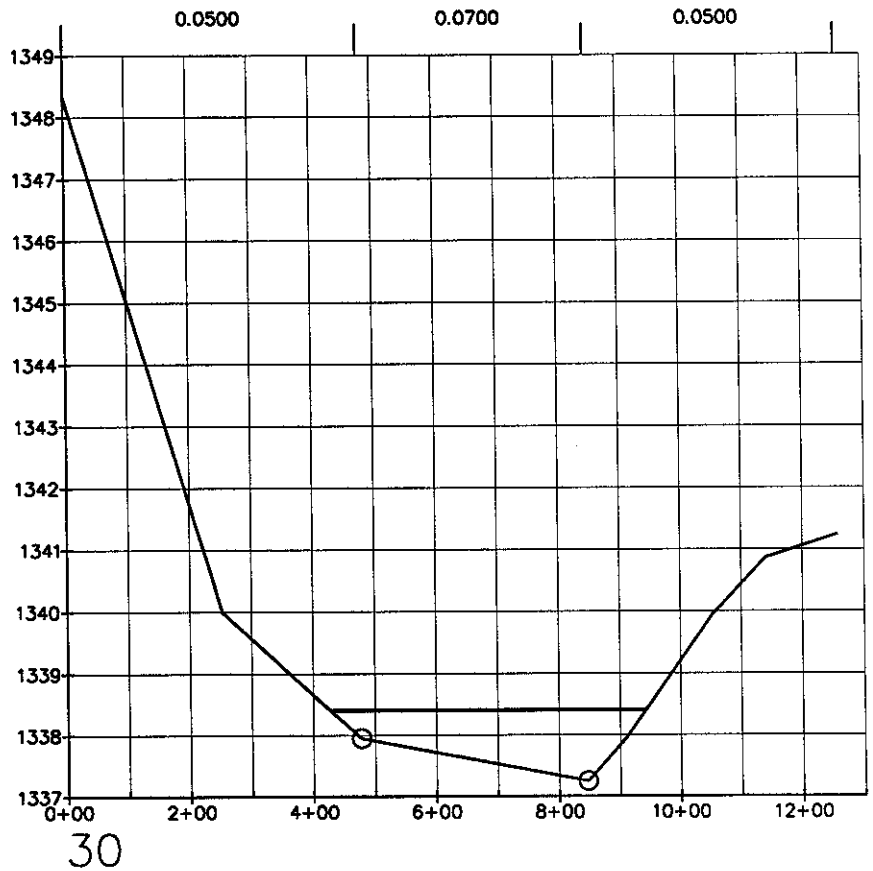

Normal Depth Results

Cross-Section:	30	
Elevation:	1338.40	ft MSL
Depth:	1.15	ft
Discharge:	580.00	cfs
Energy Gradient:	0.0071	ft/ft
Froude Number:	0.2599	
Flow Regime:	Subcritical	
Flow Area:	366.18	sq ft
Average Velocity:	1.57	ft/s
Maximum Velocity:	1.80	ft/s
Composite n:	0.0646	
Hydraulic Radius:	0.71	ft
Wetted Perimeter:	514.73	ft
Wetted Top Width:	514.73	ft
Critical Slope:	0.11	ft/ft

File: WASH-T3N-R5W-S20_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S20–30

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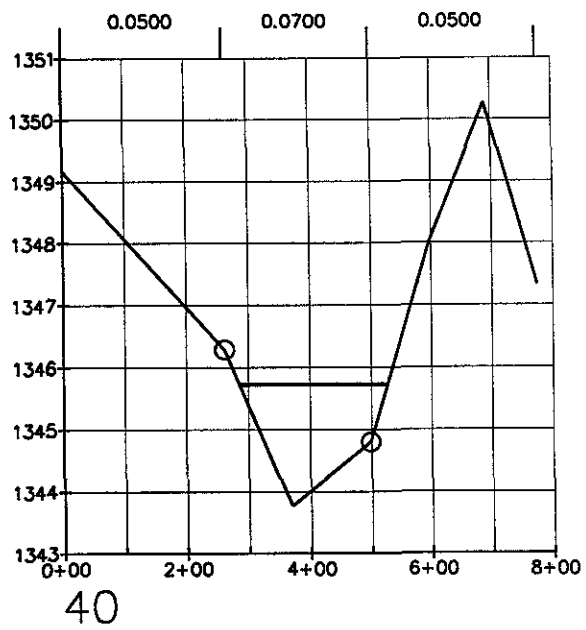


Normal Depth Results

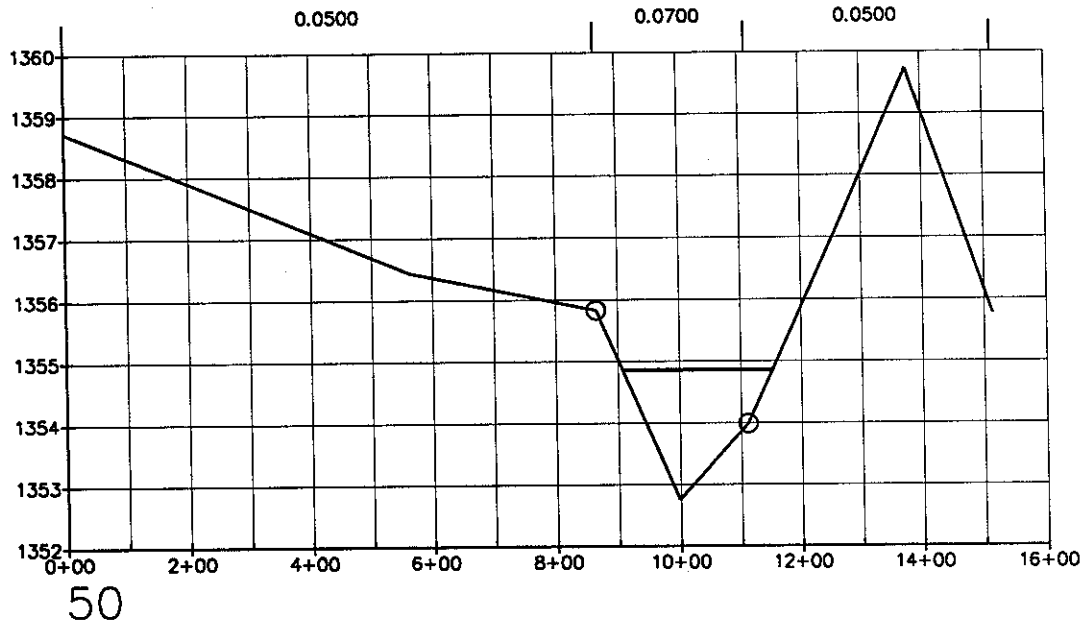
Cross-Section:	40	
Elevation:	1345.72	ft MSL
Depth:	1.95	ft
Discharge:	580.00	cfs
Energy Gradient:	0.0071	ft/ft
Froude Number:	0.2604	
Flow Regime:	Subcritical	
Flow Area:	280.91	sq ft
Average Velocity:	2.06	ft/s
Maximum Velocity:	2.09	ft/s
Composite n:	0.0678	
Hydraulic Radius:	1.17	ft
Wetted Perimeter:	240.92	ft
Wetted Top Width:	240.87	ft
Critical Slope:	0.1061	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S20–40

Entellus™

File: WASH-T3N-R5W-S20_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

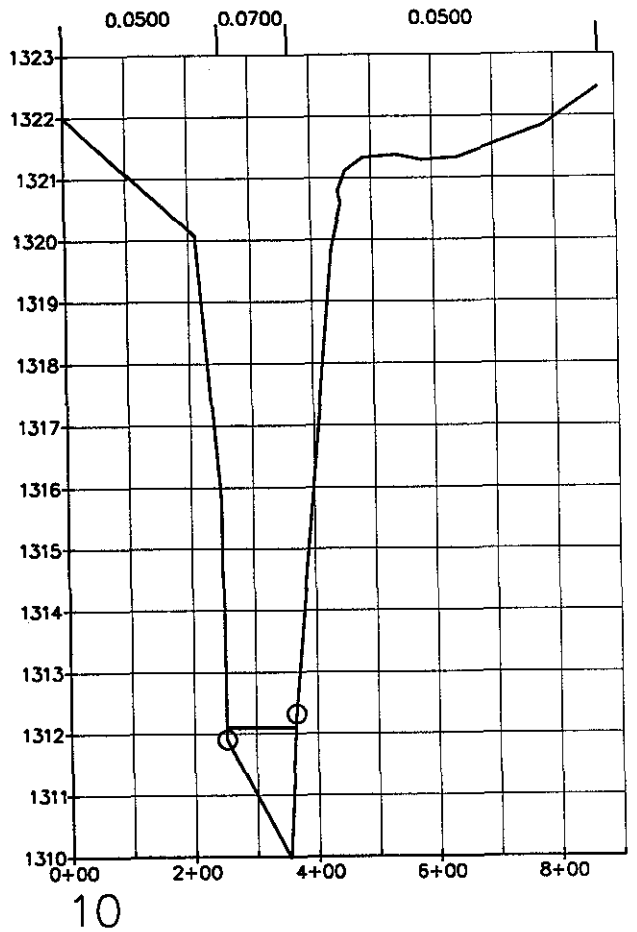
Cross-Section:	50	
Elevation:	1354.85	ft MSL
Depth:	2.09	ft
Discharge:	580.00	cfs
Energy Gradient:	0.0071	ft/ft
Froude Number:	0.2528	
Flow Regime:	Subcritical	
Flow Area:	279.53	sq ft
Average Velocity:	2.08	ft/s
Maximum Velocity:	2.12	ft/s
Composite n:	0.0669	
Hydraulic Radius:	1.14	ft
Wetted Perimeter:	244.18	ft
Wetted Top Width:	244.14	ft
Critical Slope:	0.1133	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S20–50

Entellus™

File: WASH–T3N–R5W–S20_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

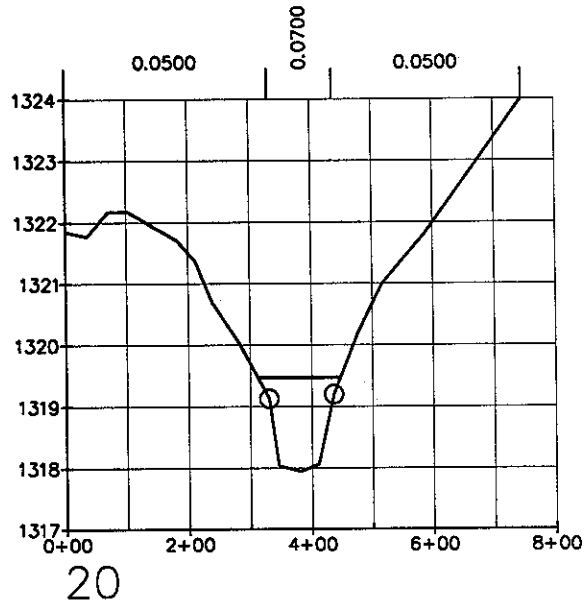
Cross-Section:	10	
Elevation:	1312.09	ft MSL
Depth:	2.12	ft
Discharge:	310.00	cfs
Energy Gradient:	0.0093	ft/ft
Froude Number:	0.2928	
Flow Regime:	Subcritical	
Flow Area:	128.22	sq ft
Average Velocity:	2.42	ft/s
Maximum Velocity:	2.42	ft/s
Composite n:	0.0649	
Hydraulic Radius:	1.14	ft
Wetted Perimeter:	112.48	ft
Wetted Top Width:	112.19	ft
Critical Slope:	0.1087	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21S–10

Entellus™

File: WASH-T3N-R5W-S21S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

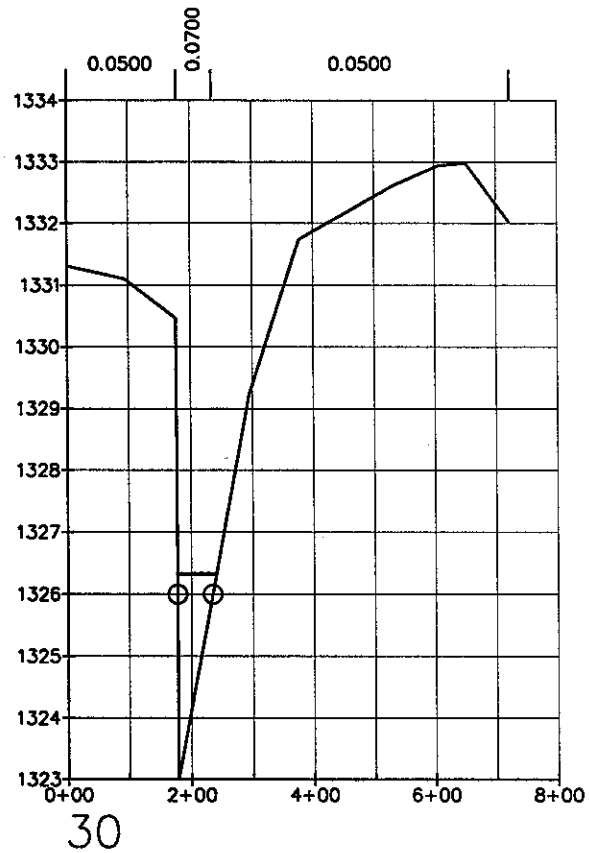
Cross-Section:	20	
Elevation:	1319.47	ft MSL
Depth:	1.52	ft
Discharge:	310.00	cfs
Energy Gradient:	0.0093	ft/ft
Froude Number:	0.3281	
Flow Regime:	Subcritical	
Flow Area:	135.00	sq ft
Average Velocity:	2.31	ft/s
Maximum Velocity:	2.36	ft/s
Composite n:	0.066	
Hydraulic Radius:	1	ft
Wetted Perimeter:	134.57	ft
Wetted Top Width:	134.50	ft
Critical Slope:	0.0956	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21S–20

Entellus™

File: WASH–T3N–R5W–S21S_X-SECTION–R14.dwg Date: 10/03/00



Normal Depth Results

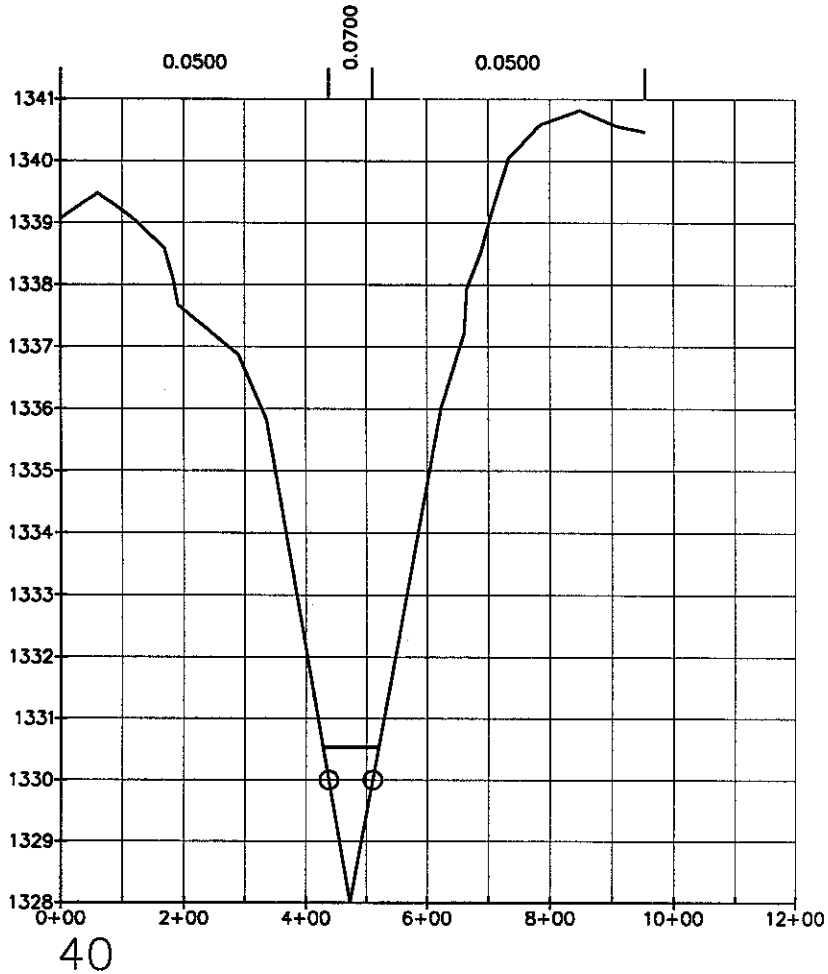
Cross-Section:	30	
Elevation:	1326.33	ft MSL
Depth:	3.33	ft
Discharge:	310.00	cfs
Energy Gradient:	0.0093	ft/ft
Froude Number:	0.2856	
Flow Regime:	Subcritical	
Flow Area:	104.92	sq ft
Average Velocity:	2.97	ft/s
Maximum Velocity:	2.99	ft/s
Composite n:	0.0681	
Hydraulic Radius:	1.6	ft
Wetted Perimeter:	65.65	ft
Wetted Top Width:	63.08	ft
Critical Slope:	0.1199	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21S–30

Entellus™

File: WASH-T3N-R5W-S21S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

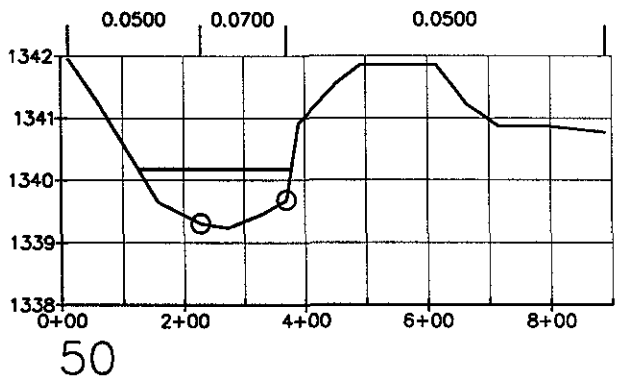
Cross-Section:	40	
Elevation:	1330.53	ft MSL
Depth:	2.53	ft
Discharge:	310.00	cfs
Energy Gradient:	0.0093	ft/ft
Froude Number:	0.2958	
Flow Regime:	Subcritical	
Flow Area:	116.16	sq ft
Average Velocity:	2.66	ft/s
Maximum Velocity:	2.72	ft/s
Composite n:	0.066	
Hydraulic Radius:	1.26	ft
Wetted Perimeter:	91.97	ft
Wetted Top Width:	91.83	ft
Critical Slope:	0.1172	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21S–40

Entellus™

File: WASH-T3N-R5W-S21S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

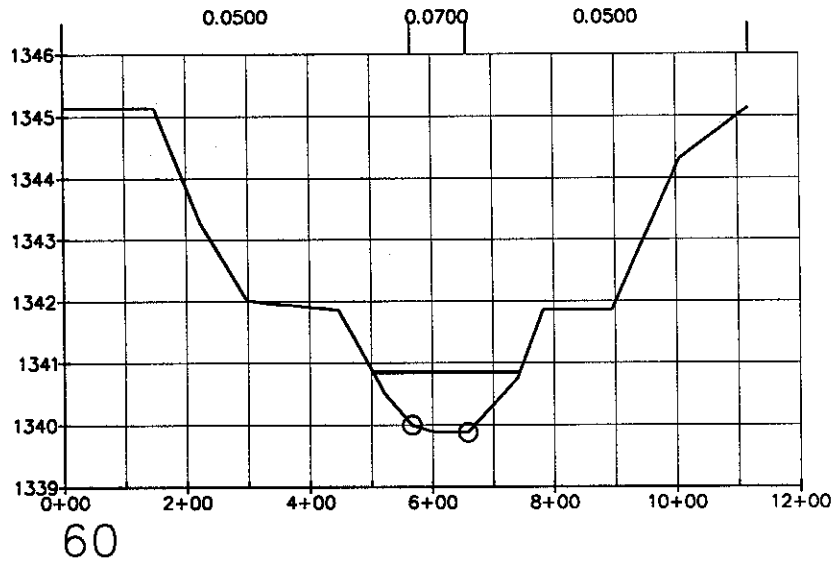
Cross-Section:	50	
Elevation:	1340.18	ft MSL
Depth:	0.94	ft
Discharge:	310.00	cfs
Energy Gradient:	0.0093	ft/ft
Froude Number:	0.3279	
Flow Regime:	Subcritical	
Flow Area:	171.75	sq ft
Average Velocity:	1.82	ft/s
Maximum Velocity:	1.96	ft/s
Composite n:	0.0616	
Hydraulic Radius:	0.68	ft
Wetted Perimeter:	252.51	ft
Wetted Top Width:	252.49	ft
Critical Slope:	0.0866	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21S–50

Entellus™

File: WASH-T3N-R5W-S21S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

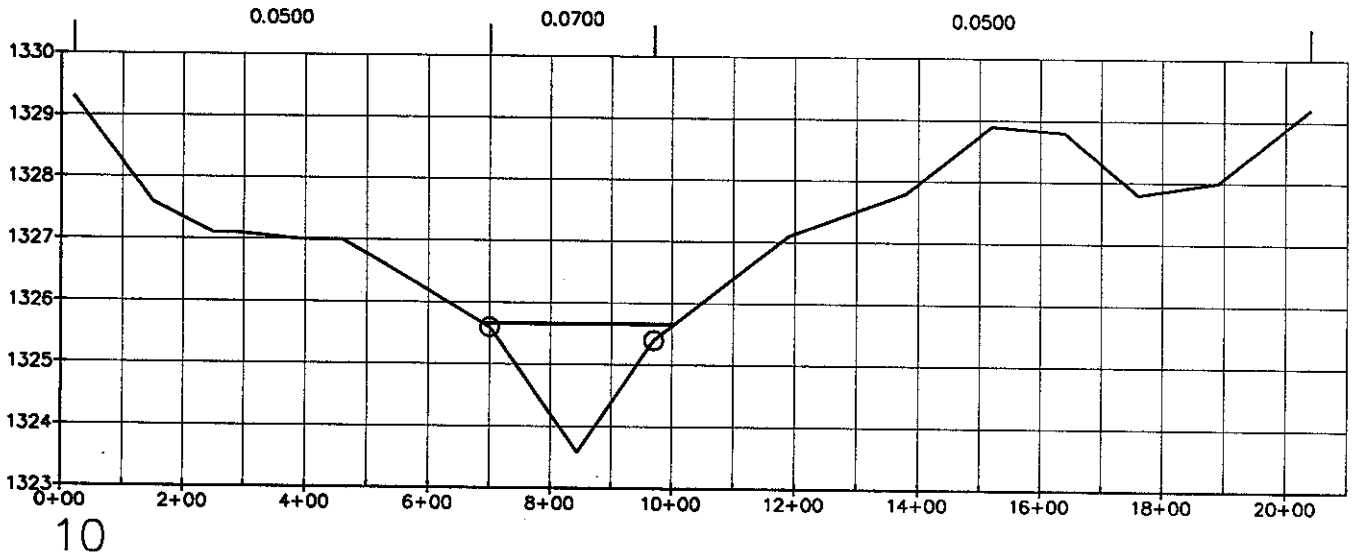
Cross-Section:	60	
Elevation:	1340.86	ft MSL
Depth:	0.98	ft
Discharge:	310.00	cfs
Energy Gradient:	0.0093	ft/ft
Froude Number:	0.3415	
Flow Regime:	Subcritical	
Flow Area:	161.94	sq ft
Average Velocity:	1.90	ft/s
Maximum Velocity:	1.99	ft/s
Composite n:	0.058	
Hydraulic Radius:	0.67	ft
Wetted Perimeter:	241.20	ft
Wetted Top Width:	241.19	ft
Critical Slope:	0.081	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21S–60

Entellus™

File: WASH-T3N-R5W-S21S_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

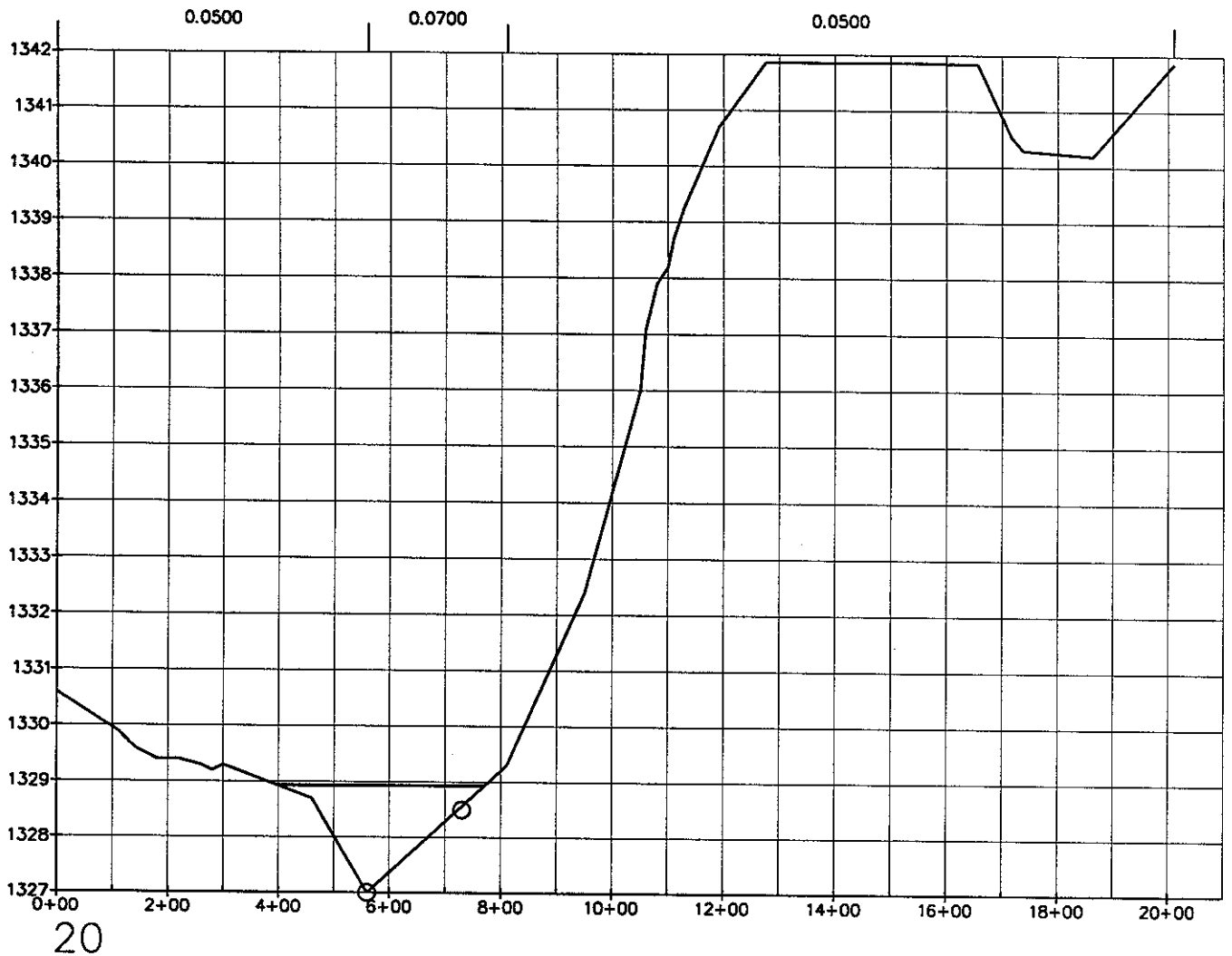
Cross-Section:	10	
Elevation:	1325.66	ft MSL
Depth:	2.08	ft
Discharge:	450.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.1787	
Flow Regime:	Subcritical	
Flow Area:	307.46	sq ft
Average Velocity:	1.45	ft/s
Maximum Velocity:	1.47	ft/s
Composite n:	0.0673	
Hydraulic Radius:	0.98	ft
Wetted Perimeter:	315.27	ft
Wetted Top Width:	315.24	ft
Critical Slope:	0.1415	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21N–10

Entellus™

File: WASH-T3N-R5W-S21N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	20	
Elevation:	1328.93	ft MSL
Depth:	1.93	ft
Discharge:	450.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.1787	
Flow Regime:	Subcritical	
Flow Area:	319.12	sq ft
Average Velocity:	1.40	ft/s
Maximum Velocity:	1.52	ft/s
Composite n:	0.0616	
Hydraulic Radius:	0.86	ft
Wetted Perimeter:	372.78	ft
Wetted Top Width:	372.75	ft
Critical Slope:	0.1312	ft/ft

File: WASH-T3N-R5W-S21N_X-SECTION-R14.dwg Date: 9/28/00

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N-R5W-S21N-20

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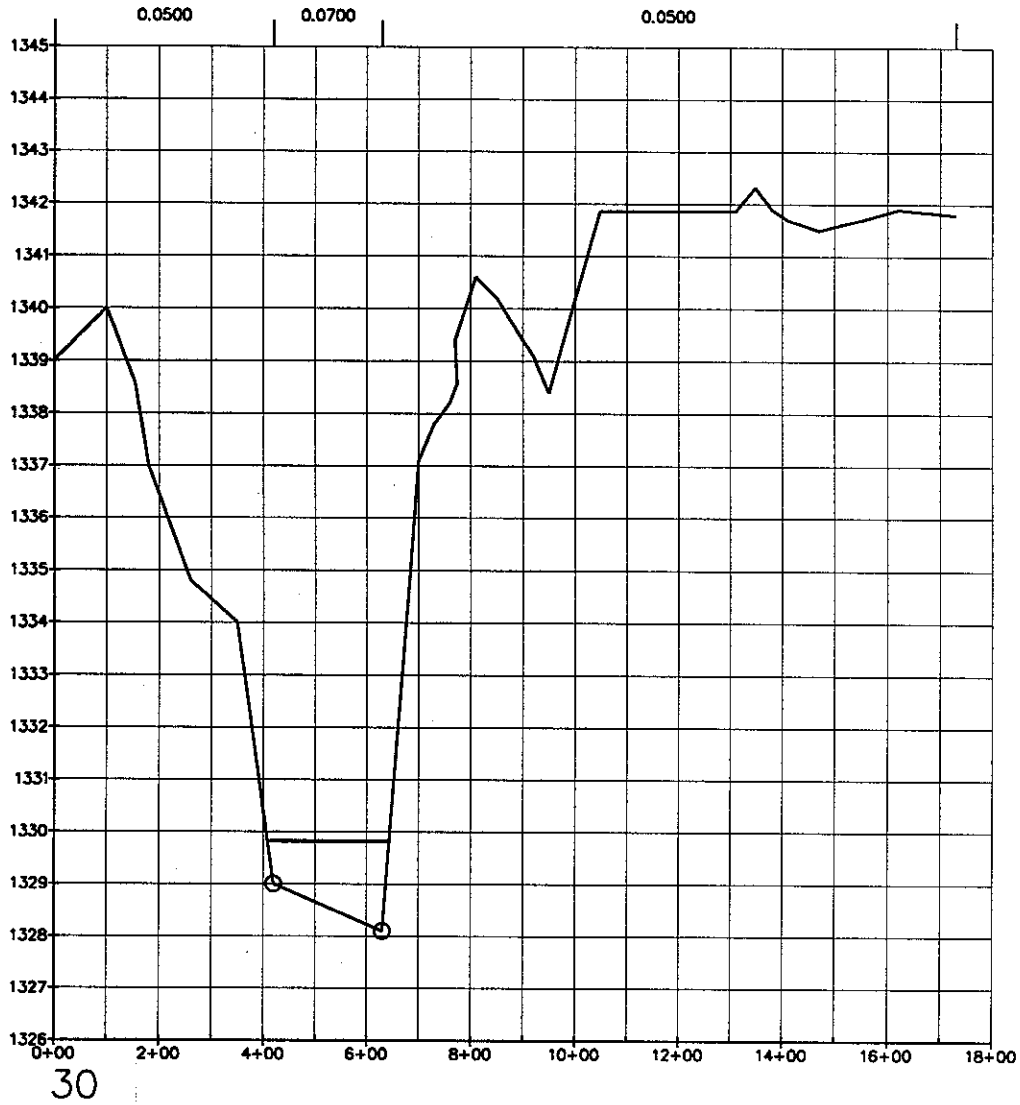


Normal Depth Results

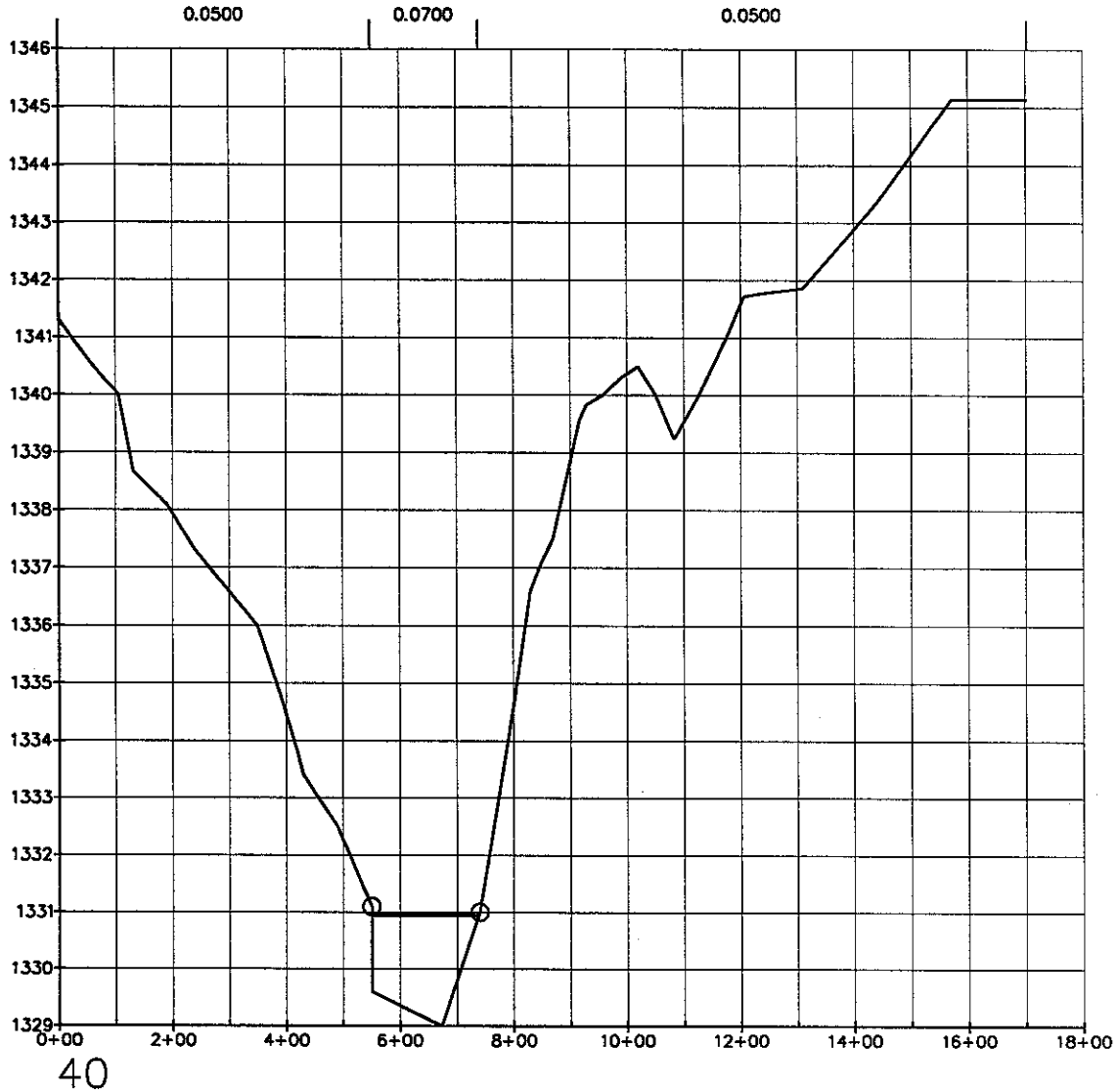
Cross-Section:	30	
Elevation:	1329.82	ft MSL
Depth:	1.72	ft
Discharge:	450.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2139	
Flow Regime:	Subcritical	
Flow Area:	282.76	sq ft
Average Velocity:	1.59	ft/s
Maximum Velocity:	1.72	ft/s
Composite n:	0.068	
Hydraulic Radius:	1.2	ft
Wetted Perimeter:	234.99	ft
Wetted Top Width:	234.84	ft
Critical Slope:	0.09	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21N–30

Entellus™

File: WASH–T3N–R5W–S21N_X–SECTION–R14.dwg Date: 9/28/00



Normal Depth Results

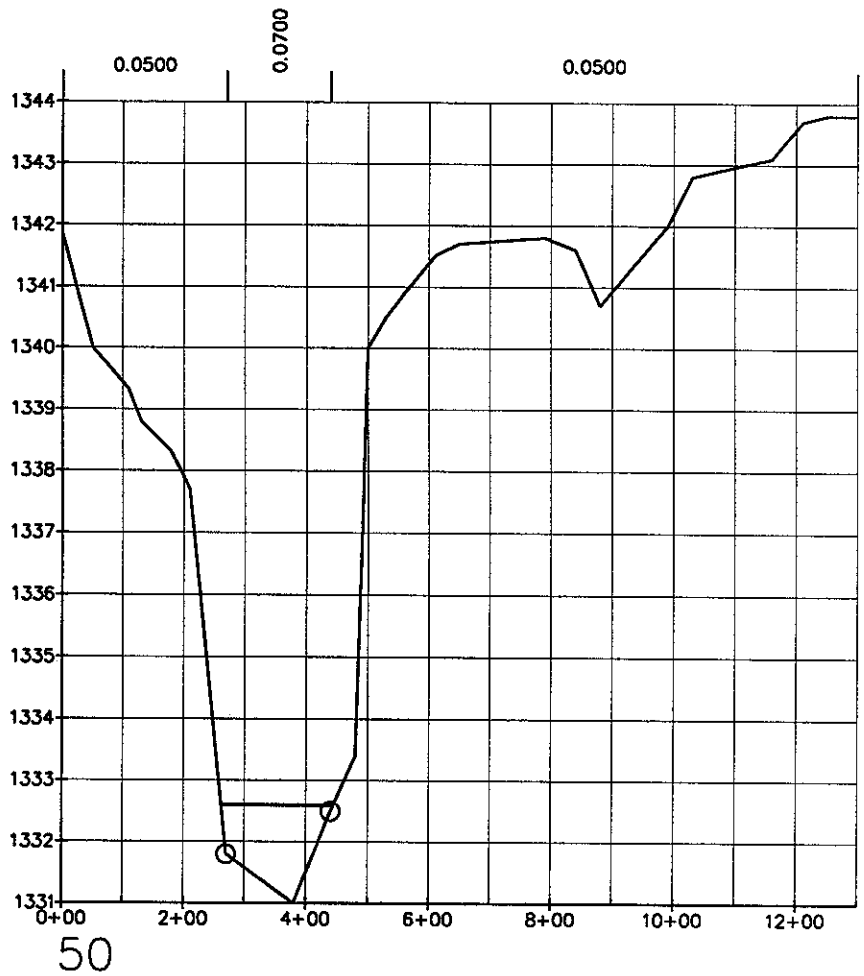
Cross-Section:	40	
Elevation:	1330.94	ft MSL
Depth:	1.94	ft
Discharge:	450.00	cfs
Energy Gradient:	0.0041	ft/ft
Froude Number:	0.2146	
Flow Regime:	Subcritical	
Flow Area:	265.21	sq ft
Average Velocity:	1.71	ft/s
Maximum Velocity:	1.71	ft/s
Composite n:	0.07	
Hydraulic Radius:	1.4	ft
Wetted Perimeter:	189.44	ft
Wetted Top Width:	188.07	ft
Critical Slope:	0.088	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21N–40

Entellus™

File: WASH-T3N-R5W-S21N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

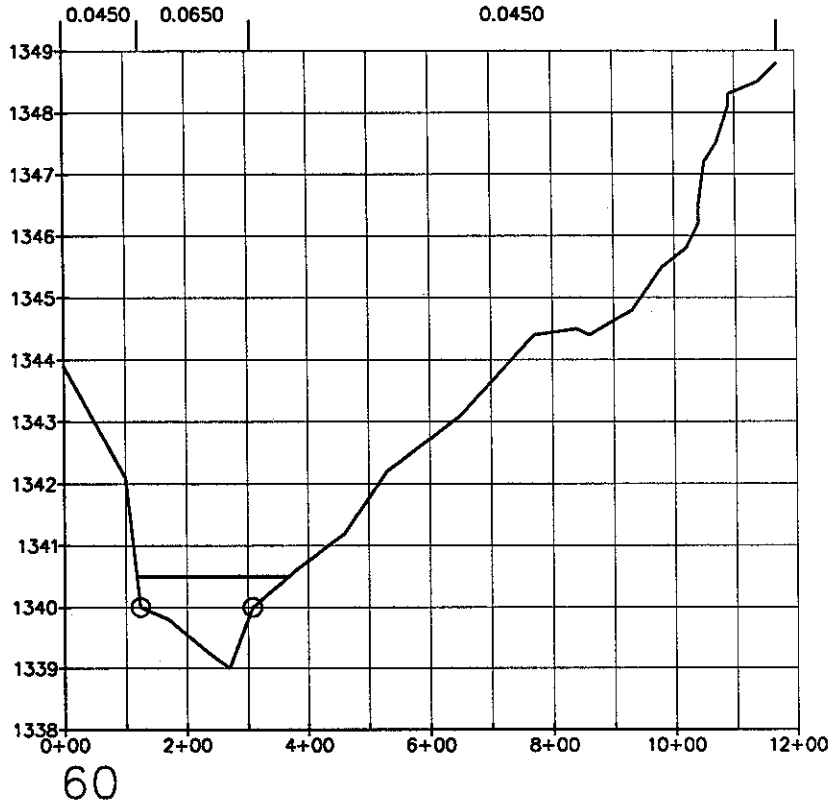
Cross-Section:	50	
Elevation:	1332.60	ft MSL
Depth:	1.60	ft
Discharge:	450.00	cfs
Energy Gradient:	0.012	ft/ft
Froude Number:	0.3381	
Flow Regime:	Subcritical	
Flow Area:	185.71	sq ft
Average Velocity:	2.43	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.0687	
Hydraulic Radius:	1.02	ft
Wetted Perimeter:	182.41	ft
Wetted Top Width:	182.35	ft
Critical Slope:	0.1067	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21N–50

Entellus™

File: WASH-T3N-R5W-S21N_X-SECTION-R14.dwg Date: 9/28/00



Normal Depth Results

Cross-Section:	60	
Elevation:	1340.50	ft MSL
Depth:	1.50	ft
Discharge:	450.00	cfs
Energy Gradient:	0.012	ft/ft
Froude Number:	0.3378	
Flow Regime:	Subcritical	
Flow Area:	191.99	sq ft
Average Velocity:	2.35	ft/s
Maximum Velocity:	2.44	ft/s
Composite n:	0.0601	
Hydraulic Radius:	0.77	ft
Wetted Perimeter:	249.21	ft
Wetted Top Width:	249.17	ft
Critical Slope:	0.1108	ft/ft

ZONE A - DELINEATION OF WATERSHED "PP"
LUKE WASH FCD 99-03

FIGURE E2 – WASH: T3N–R5W–S21N–60

Entellus™

File: WASH–T3N–R5W–S21N_X–SECTION–R14.dwg Date: 9/28/00

E.3 Expansion and Contraction Coefficients

Expansion and contraction coefficients are not required for approximated methods.

E.4 Analysis of Structures

Hydraulic structure calculations are included in the following pages

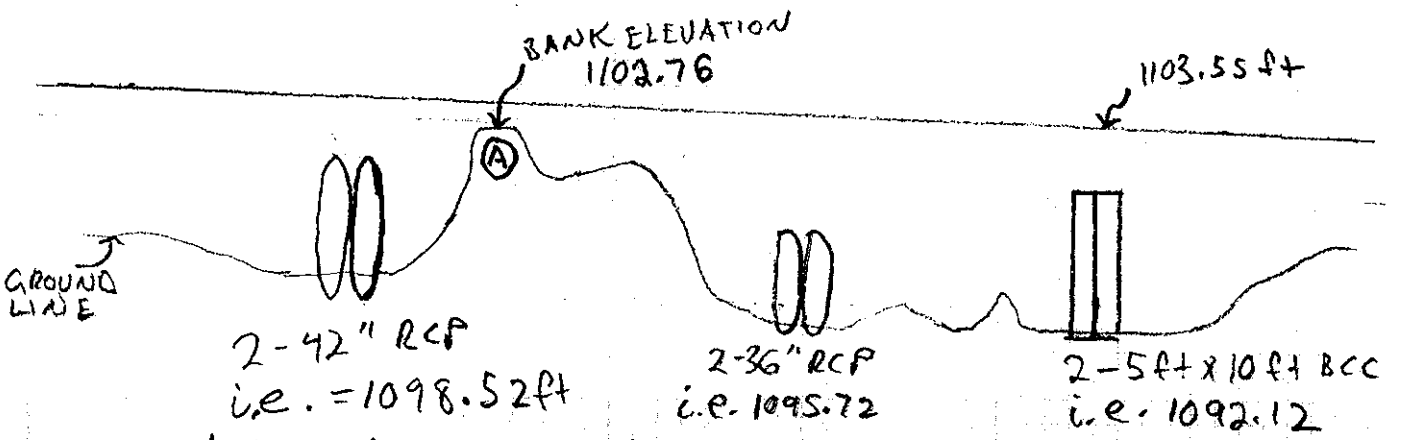
Entellus™

SHEET _____ OF _____
BY _____ DATE _____
CHECK _____ DATE _____

CLIENT _____

JOB NAME Zone A Delineation of Watershed "PP" JOB NO. _____

CP-26



Because of the existing bank, the analysis for the Hw was performed differently on either side of point A. The two culverts to the right of A were combined. (Same Hw used)

2-42" RCP

Hw = 1102.76' - 1098.52' = 4.24'
Hw/D = 4.24/3.5 = 1.21
Q(from chart 2) = 70cfs x 2 barrels
Q_1 = 140 cfs

2-36" RCP

Hw = 1103.55' - 1095.72'
= 7.83'
Hw/D = 7.83/3 = 2.61
Q(from chart 2) =
85cfs x 2 barrels
Q_2 = 170cfs

2-5'x10' BCC

Hw = 1103.55' - 1092.12' = 11.43
Hw/D = 11.43/5 = 2.29
Q(from chart 8) =
71 cfs/ft x 10ft x 2 =
Q_3 = 1420 cfs

Q in = 1856 cfs

$Q_{culverts} = Q_1 + Q_2 + Q_3 = 140 + 170 + 1420 = 1730$ cfs

- Weir equation

$Q = CLH^{3/2}$, where C = 2.7, L = 200ft, H = .38ft

and,

$Q = Q_{in} - Q_{culverts}$ = 1856 cfs - 1730 cfs = 126 cfs

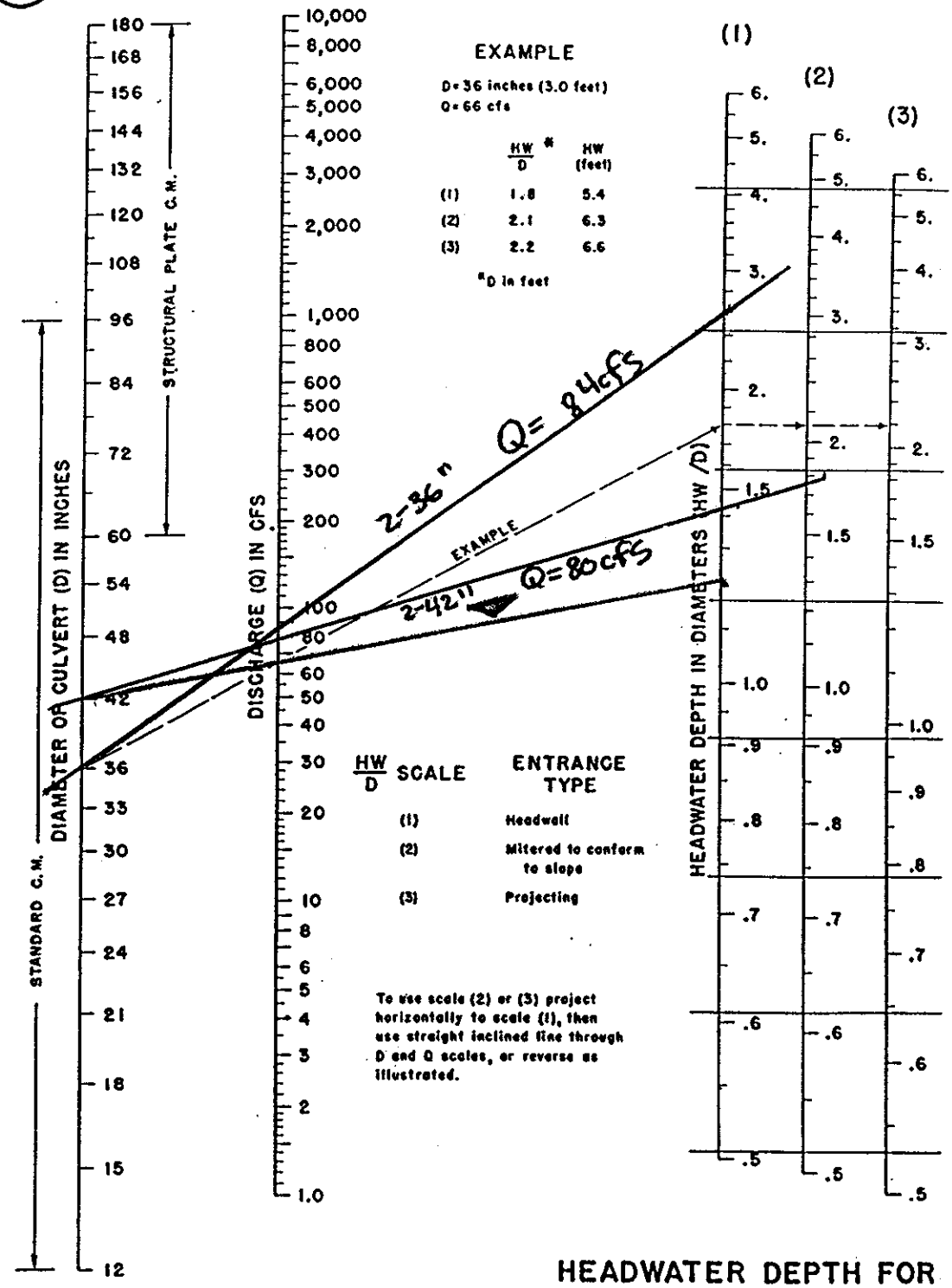
Hence,

$Q = (2.7)(200)(.38)^{3/2} = 126$ cfs

Elevation = 1103.55 + .38 = 1103.93 ft

CHART 2

CONCENTRATION POINT CP-26



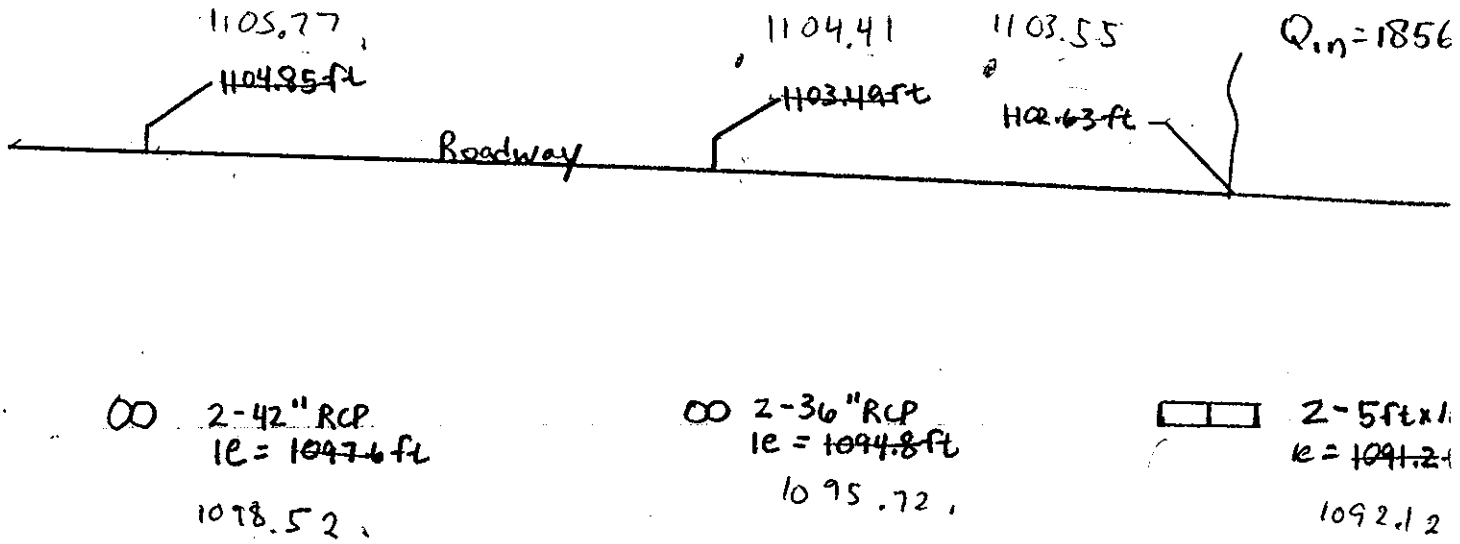
HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

CONCENTRATION POINT CP-26

ADOT + 1.76 (.92) = Project datum



CP-26

2- 42" RCP
HW= (1104.85 (+.92) - 1097.6 (+.92)) = 7.25'
Hw/D= 7.25/3.5 = 2.07

Q (from Chart 2)= 80cfs x 2 barrels =
Q= 160cfs

2- 36" RCP
Hw= 1103.49' -1094.8' = ~~7.82'~~ 8.69
Hw/D= ~~7.82~~ 8.69/3 = ~~2.61~~ 2.89

Q (from Chart 2) = 84 cfs x 2 barrels=
Q= 168cfs

2- 5ft x 10ft CBC
Hw=1102.6' -1091.2' = 11.4
Hw/D= 11.4/5 = 2.2

Q (from Chart 8) = 71cfs/ft
Q= 71cfs/ft x 10ft x 2 =
Q= 1420 cfs

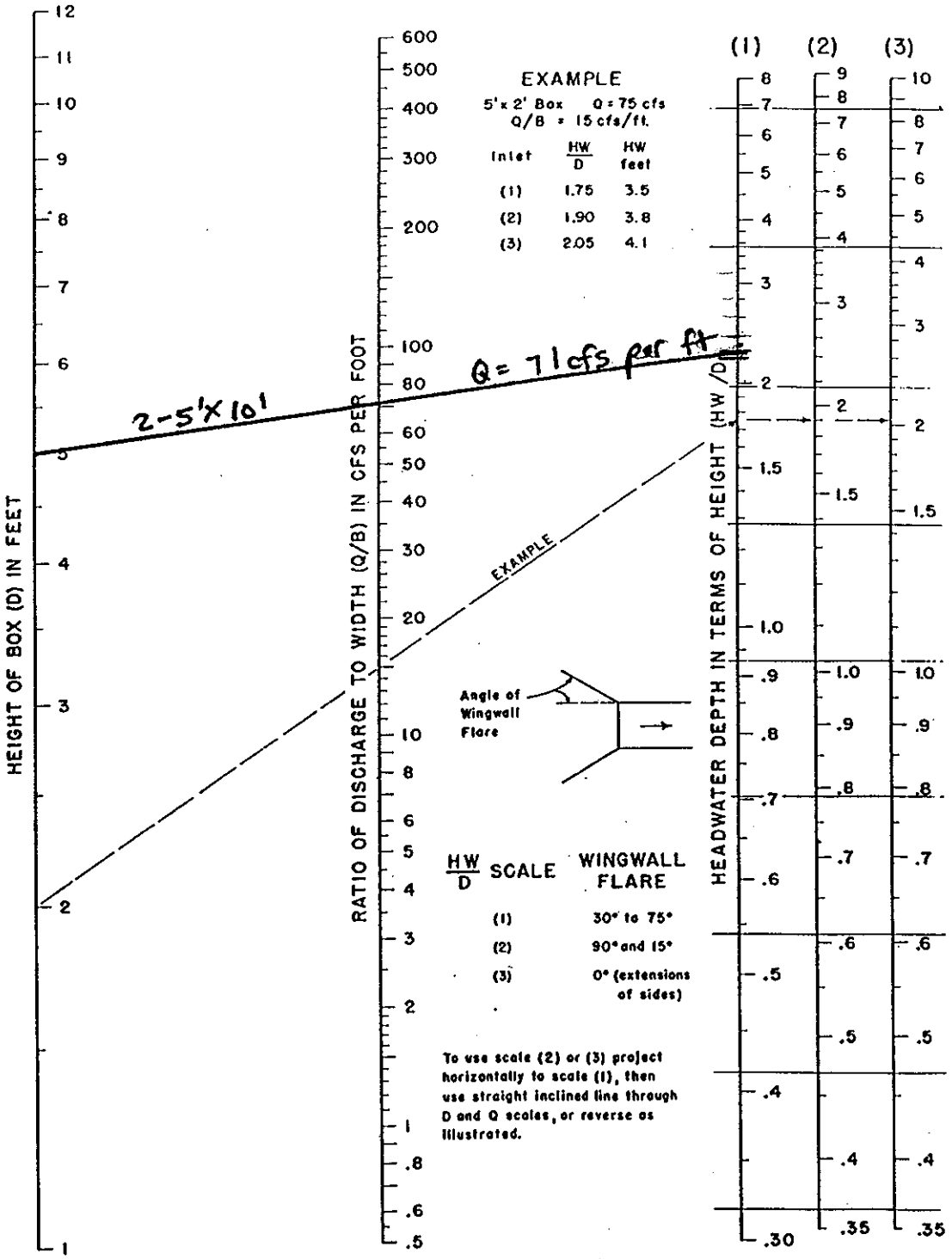
Q in = 1856 cfs Q culverts = 1748 cfs

Weir Equation $Q=CLH^{3/2}$ (C=2.7 L=200ft H=0.5ft)
$Q= 2.7 \times 200 \times (0.5)^{3/2} = 190$ cfs

ELEVATION = ~~1103.1~~ 1103.93 ft

CONCENTRATION POINT CP-26

CHART 8

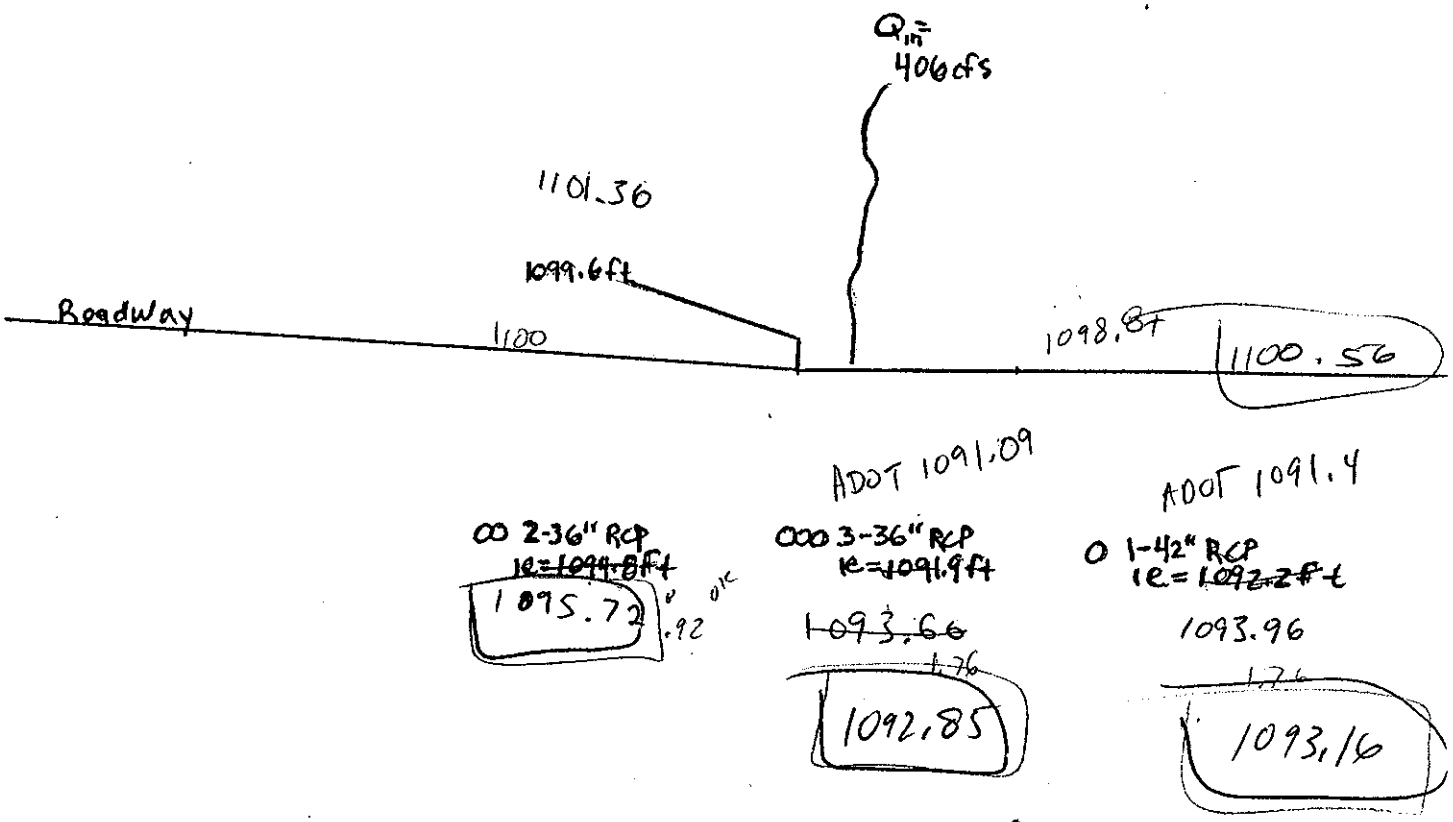


HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

CONCENTRATION POINT CP-63



$Hw/D = \frac{1100.56 - 1095.72}{3} = 1.61$

$Hw/D = \frac{1100.56 - 1092.85}{3}$

$Hw/D = \frac{1100.56 - 109}{3.5}$

$Hw/D = 2.1$

CP-63

2- 36" RCP 1095.72 5.89
HW= 1099.61'- ~~1094.8'~~ = ~~4.8'~~
Hw/D= 4.8/3 = 1.6

Q (from Chart 2)= 60cfs x 2 barrels =
Q= 120cfs

3- 36" RCP 1093.66 6.14
Hw= 1099.8' - ~~1091.9'~~ = ~~7.9'~~
Hw/D= ~~7.9~~/3 = 2.63
Hw/D = 2.6

Q (from Chart 2) = 83 cfs x 3barrels=
Q= 249cfs

1-42" RCP
Hw=1099.8' -1091.9' = 7.9'
Hw/D= 7.59/3.5 = 2.17
Hw/D = 2.1

Q (from Chart 2) = 108cfs

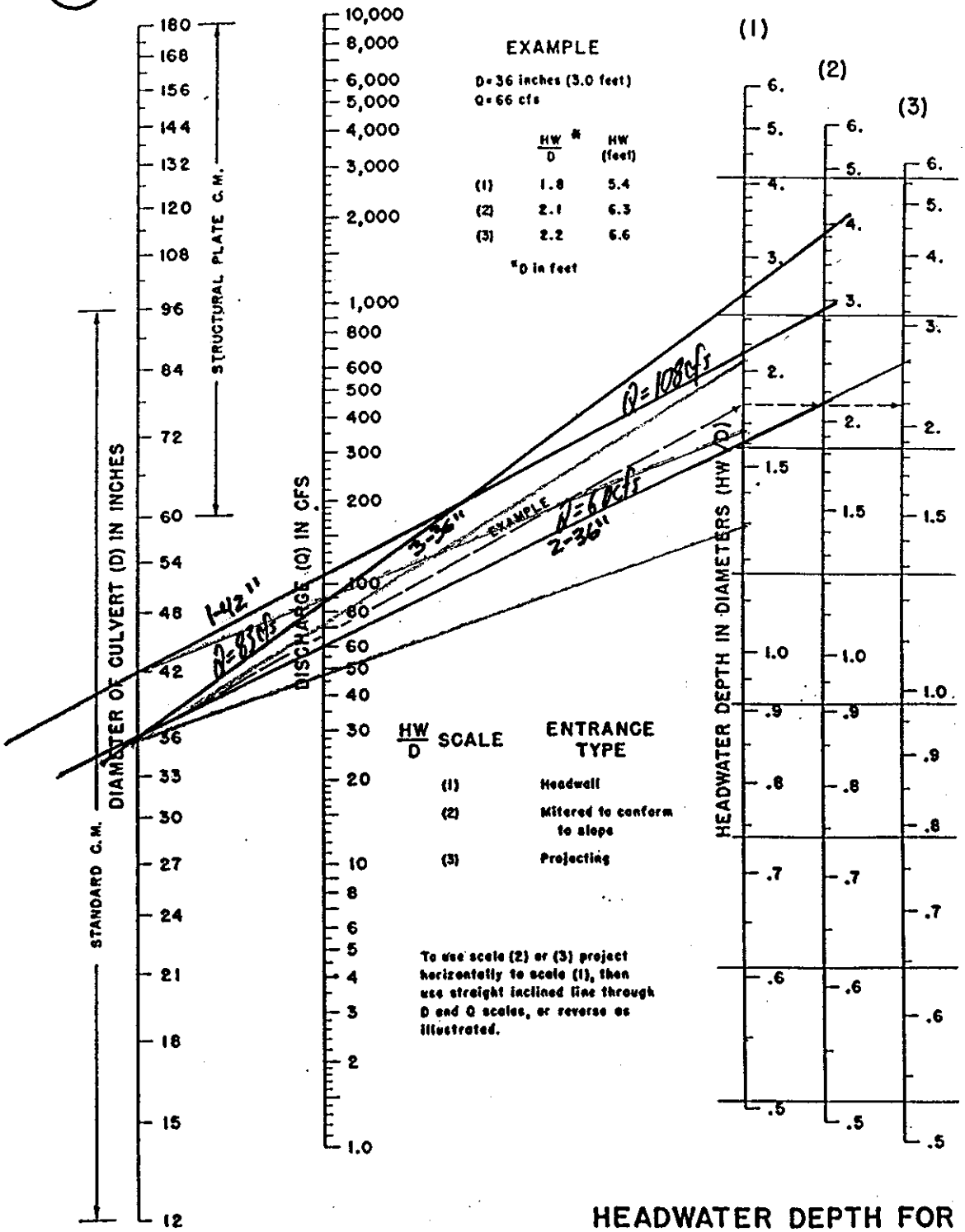
Q in = 406cfs Q culverts = 477 cfs

ELEVATION = 1099.6 ft

Elev = 1100.56

CHART 2

CONCENTRATION POINT CP-63



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

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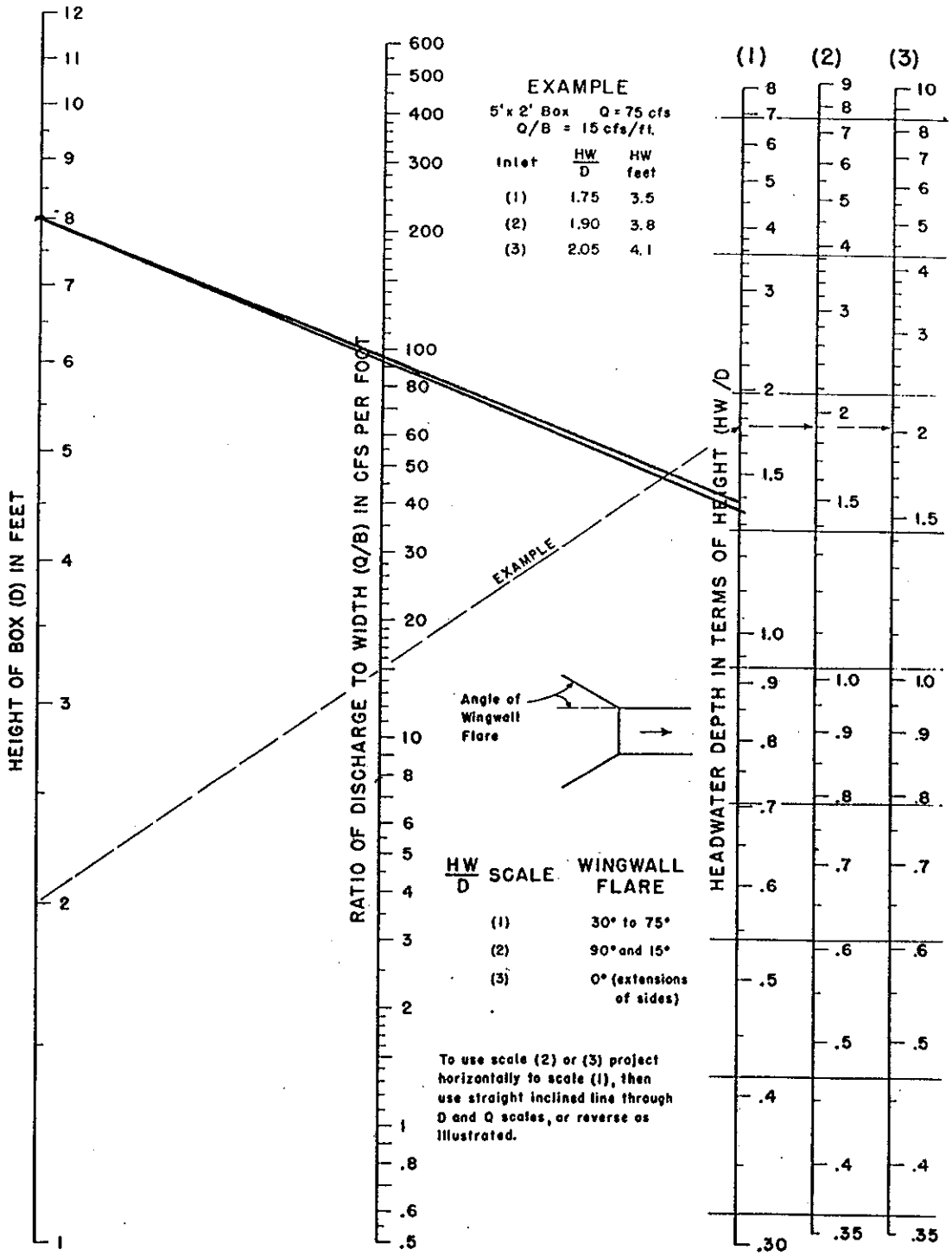
CHART 8



~~Q/B=92~~
Q/B=97

HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

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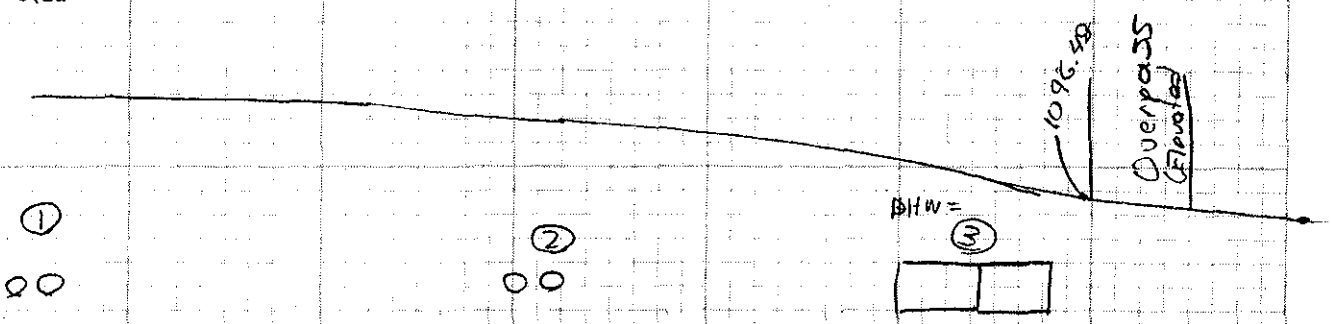
JOB NAME _____ JOB NO. _____

Concentration Point CP 24

$Q_{24} = 2010$



2 - 36"

IE = ~~1094.03~~
1094.~~95~~
.95

2 - 30"

IE. = ~~1093.80~~
1095.26

2 - 8ft x 10ft CBC

IE. = ~~1085.43~~ ←

assuming no overtopping:

HW = 1097.76 - 1094.95 = 2.81
Hw/D = 2.81/3 = .94
Q(from chart 2) = 34 x 2
Q = 68 cfs

HW = 1097.76 - 1095.26 = 2.5
Hw/D = 2.5/2.5 = 1
Q(from chart 2) = 22.5 x 2
Q = 45 cfs

HD = 1096.48 - 1085.43
HD/D = 11.05/8 1.38
From chart 8 Q/B = 97
Q = 97 x B
= 97 x 20
= 1940 cfs
2010 - 1940 = 70 cfs
overtop this flow will be pick up by the two other culverts
HW = 1096.5

$Q_{tot} = 68 + 45 = 113$ cfs

Culverts 1, 2 contribute to drainage area of 1,250,230 ft^2
Peak Flow for this area is 110 cfs

Elevation 1097.8 ft

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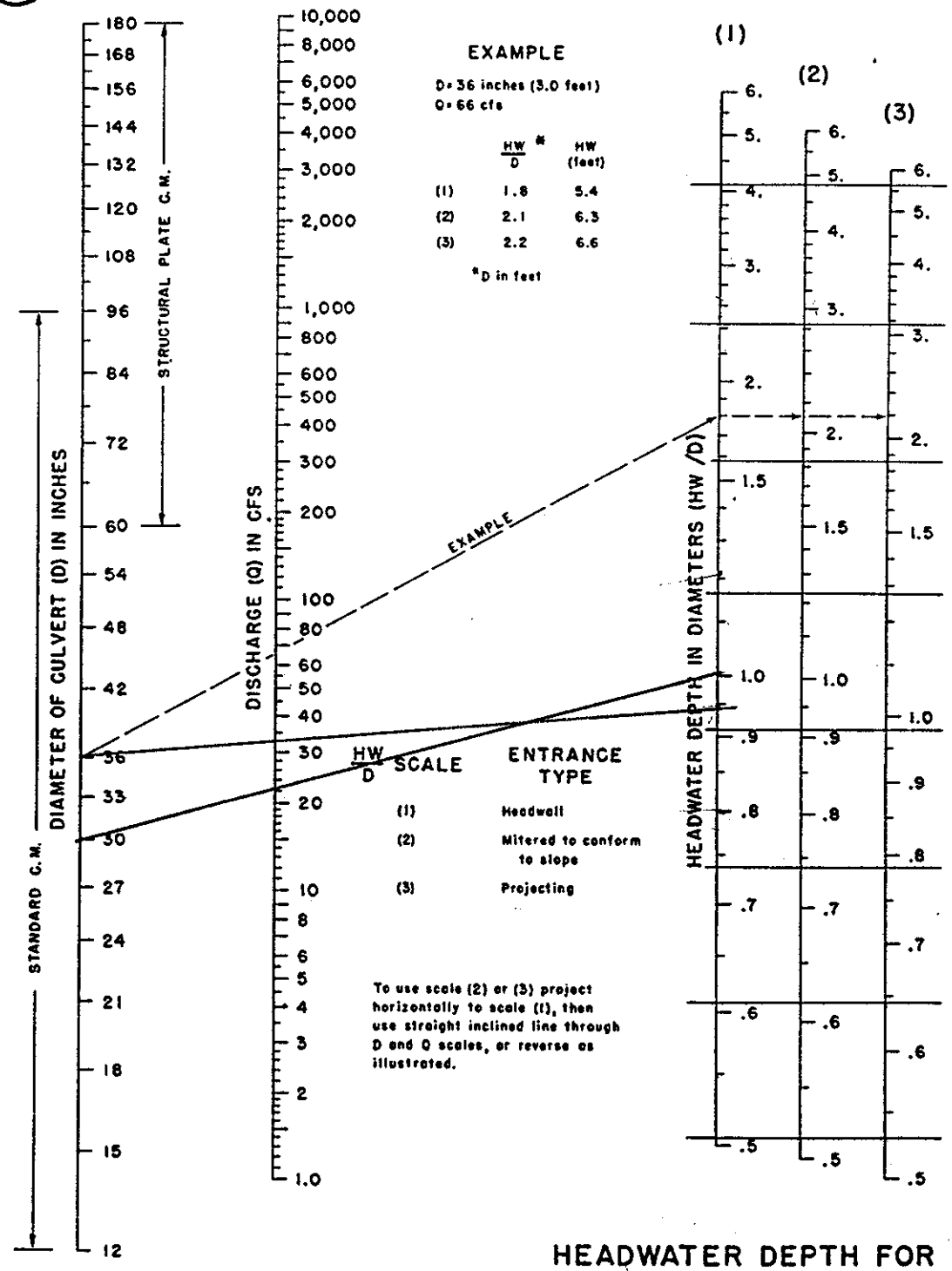
JOB NAME _____ JOB NO. _____

CHART 2

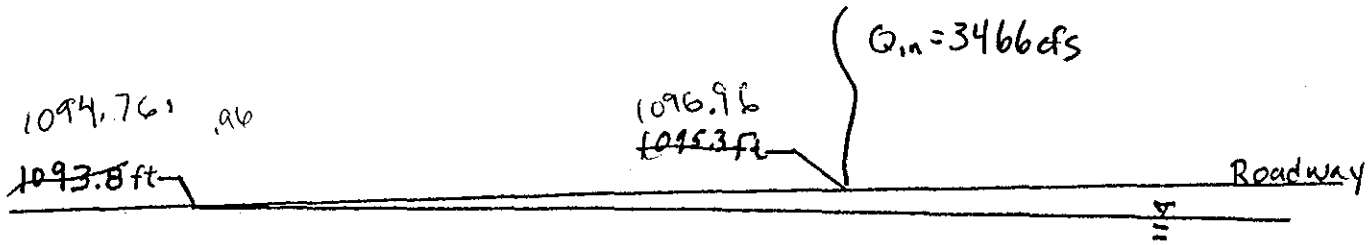


HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

CONCENTRATION POINT CP-20



2- 3ft x 10ft CBC
ie = 1085.3 ~~ft~~
good

ADOT 1084.52
ie 1086.28

$$\frac{1094.76 - 1086.28}{3}$$

Hw/D = 2.82

3 - 5ft x 10ft CBC
ie = ~~1085.8 ft~~
1086.7

ADOT 1084.97
ie 1086.73

$$Hw/D = \frac{1094.76 - 1086.73}{5}$$

1.61

CP-20

2- 3ft x 10ft CBC
Headwater Depth (Hw)= Road Surface- ie
1093.8 ft- 1085.33 ft = 8.47 ft
Hw/D= 8.47/3 = 2.82

Q (from Chart 8)= 38cfs/ft x 10ft x 2 barrels =
Q= 760cfs

3- 5ft x 10ft CBC
1094.76
Hw= ~~1093.8~~ ft - 1085.78 ft = ~~8.02~~ ft
Hw/D= 8.02/5 = 1.6

Q (from Chart 8) = 54cfs/ft x 10ft x 3 barr
Q= 1620 cfs

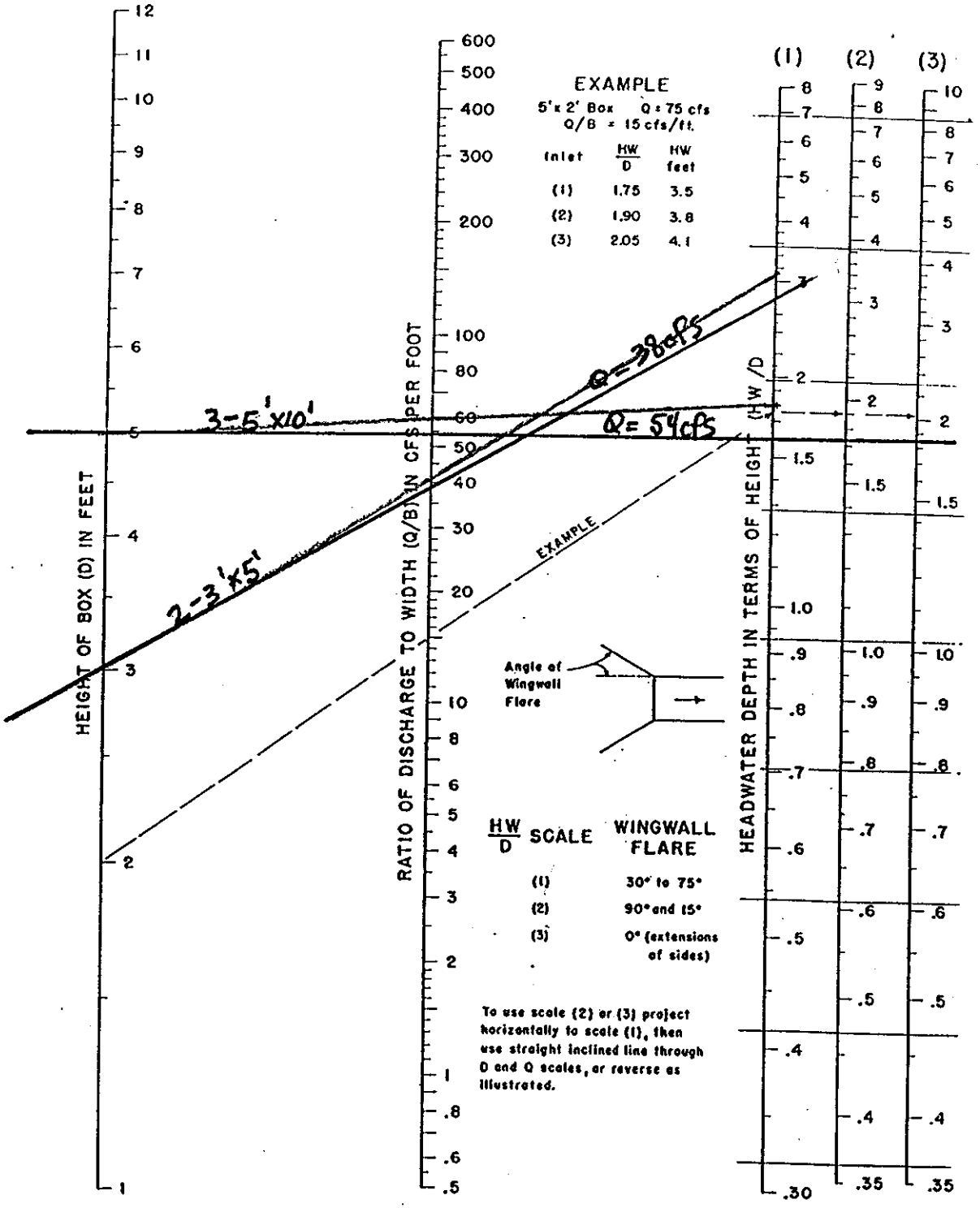
Q in = 3466cfs Q culverts = 2380 cfs

Weir Equation $Q=CLH^{3/2}$ (C=2.7 L=2000ft H=0.5ft)
$Q= 2.7 \times 2000 \times (0.5)^{3/2} = 1909$ cfs

ELEVATION = ~~1094.3~~ ft 1094.76 + .5 = 1095.2 DW
1095.1

CONCENTRATION POINT CP-20

CHART 8

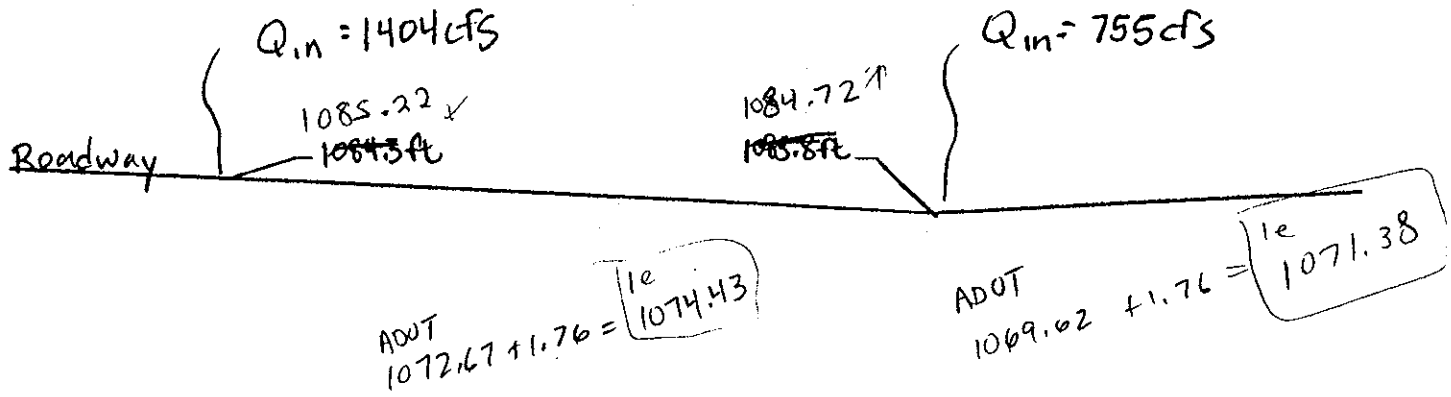


HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

CONCENTRATION POINT CP-28



1- 5ft x 10ft CBC
~~ie 1073.5 ft~~
1075.26

$HW/D = \frac{1084.72 - 1074.43}{5} = 2.06$

$HW/D = 2.1$

1-72" CMP
ie = ~~1070.43~~
1072.19

$\frac{1084.72 - 1071.38}{6}$

$HW/D = 2.22$

CP-28L

Headwater Depth (Hw)= Road Surface- ie
1085.22 ~~1084.3~~ ft- ~~1073.48~~ ft = ~~10.83~~ ft 9.96
Hw/D= ~~10.83~~/5 = ~~2.17~~
1.96

Q (from Chart 8 attached)= 70cfs/ft x 10ft= 700cfs

CP-28R

Hw= ~~1083.81~~ ft - ~~1070.43~~ ft = 13.38 ft
Hw/D= 13.38/6 = 2.23

Q (from Chart 2 attached) = 445 cfs

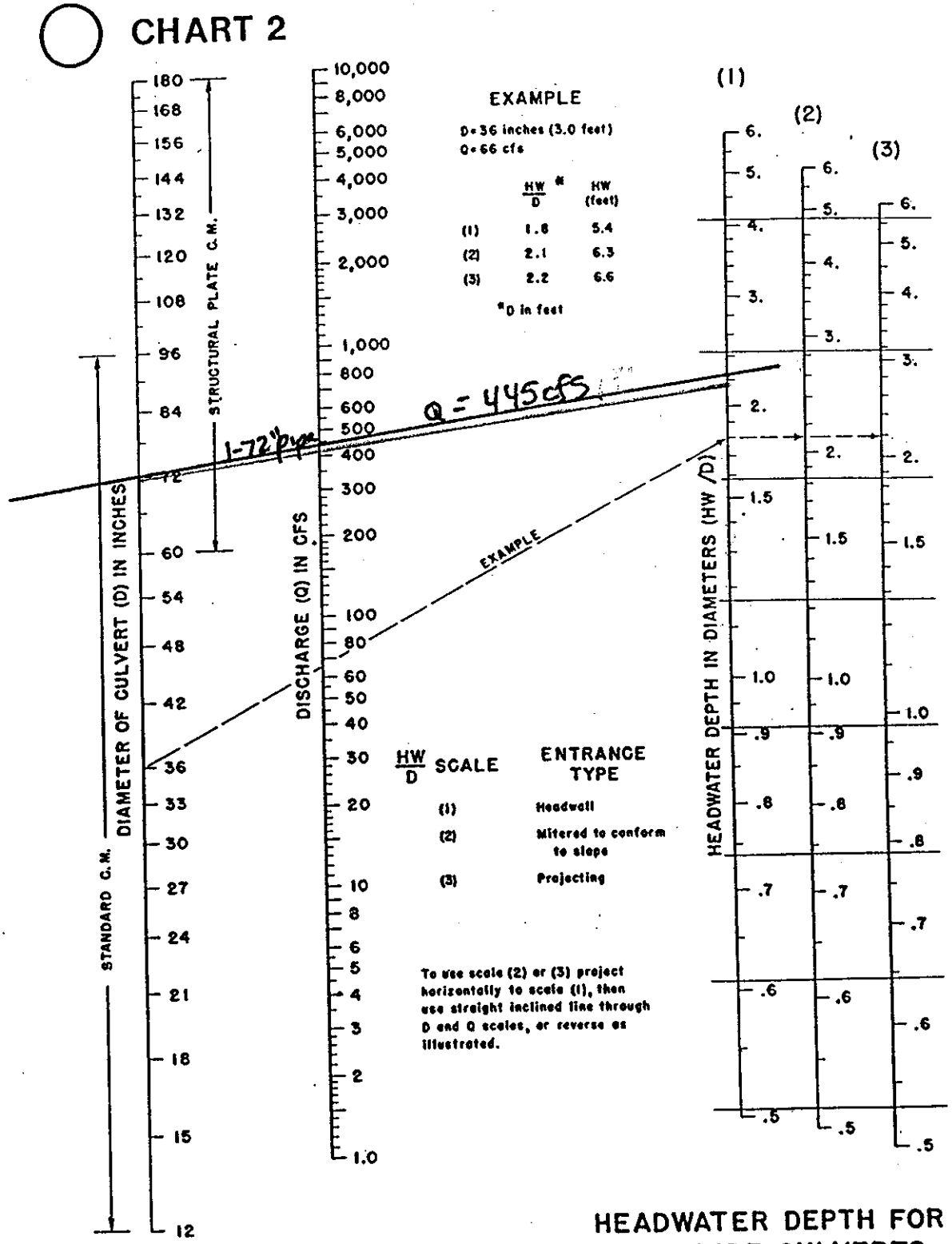
Q in = 2159cfs Q culverts = 1849 cfs

Weir Equation $Q=CLH^{3/2}$ (C=2.7 L=1000ft H=0.5ft)
$Q= 2.7 \times 1000 \times (0.5)^{3/2} = 955$ cfs

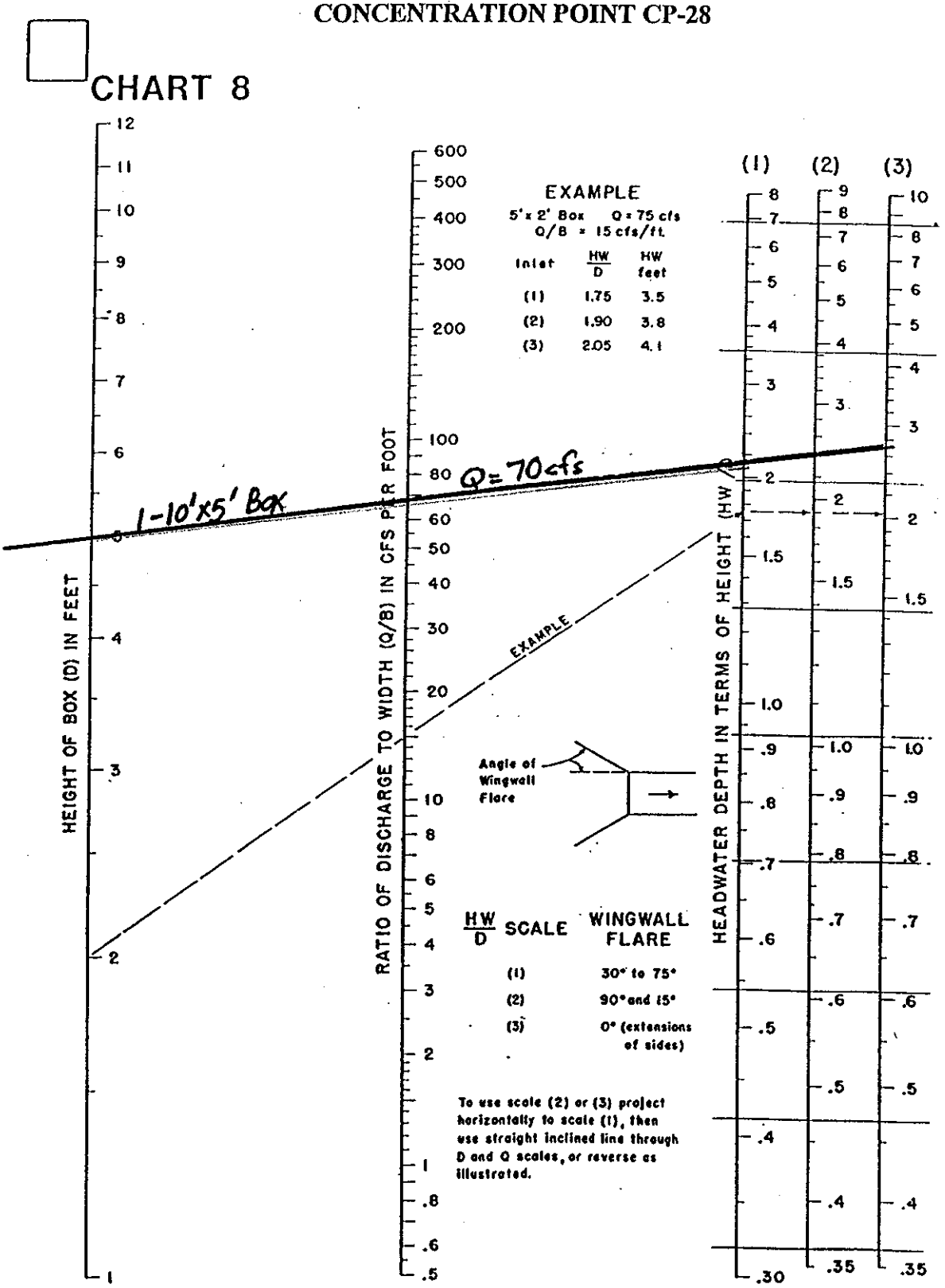
1084.72 + .5 = 1085.22 PW

ELEVATION = ~~1084.3 ft~~
1085.46

CONCENTRATION POINT CP-28



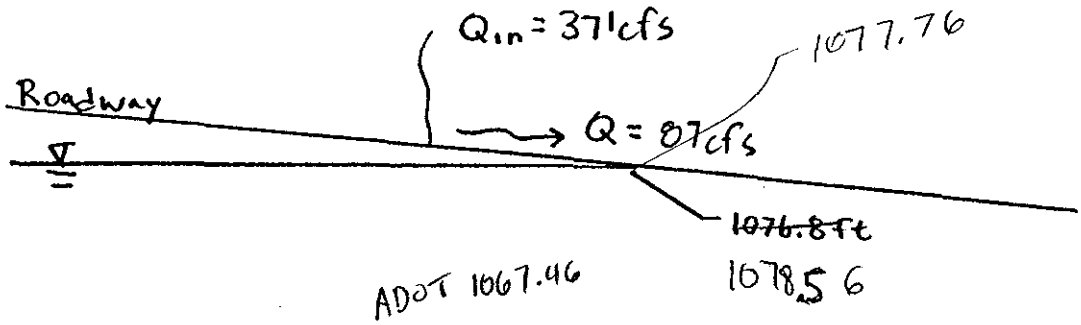
CONCENTRATION POINT CP-28



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

CONCENTRATION POINT CP-80



2-48" RCP
ie = 1069.05 ft
good

$$Hw/D = \frac{1077.76 - 1067.46}{4} = 2.6$$

CP-80

Headwater Depth (Hw)= Road Surface- ie
1076.8 ft- 1069.05 ft = ~~7.75~~ ft
Hw/D= ~~7.75~~/4 = ~~1.94~~ 2.6

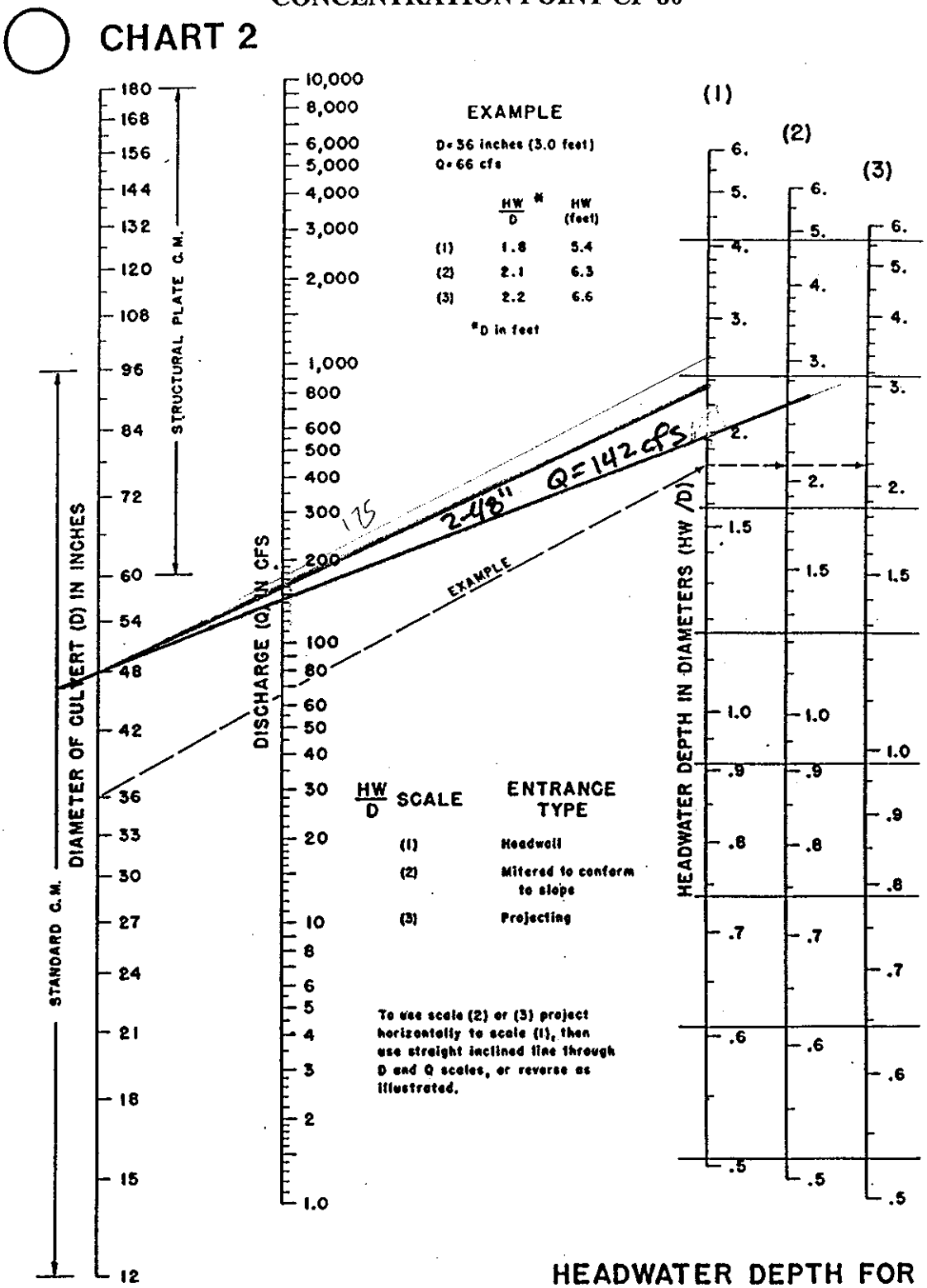
Q (from Chart 2 attached)= ~~142cfs~~ 175 x 2 barrels= ~~284cfs~~ 350

Q in = 371cfs Q culverts = 284 cfs

Steep slope along roadway, all excess flow goes east and not over roadway.
ELEVATION = ~~1076.8 ft~~ 1078.6

$\boxed{1077.76}$ NW

CONCENTRATION POINT CP-80



HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

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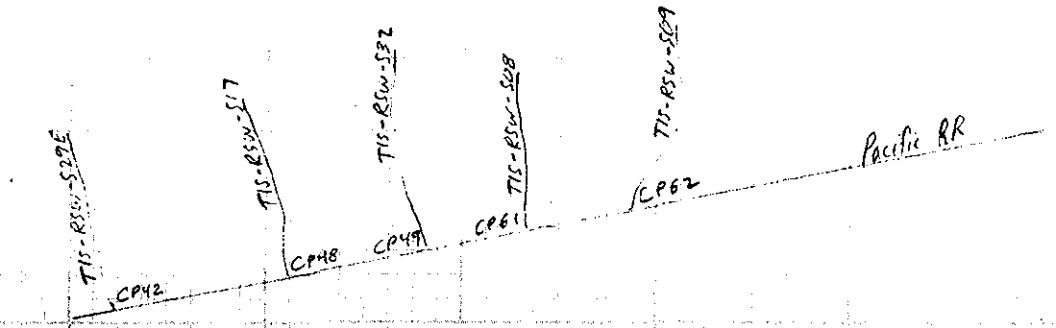
CLIENT FCD 99-03

JOB NAME Zone 6 Delineation of Watershed PP JOB NO. 3100100

Railroad Crossing Analysis/Backwater

N



Concentration Point	Wash	Flow (cfs)
42	TIS-RSW-529E	1550
48	TIS-RSW-517	4900
49	TIS-RSW-532	7620
61	TIS-RSW-508	580
62	TIS-RSW-509	3460
48 & 49	TIS-RSW-517 TIS-RSW-532	10050

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

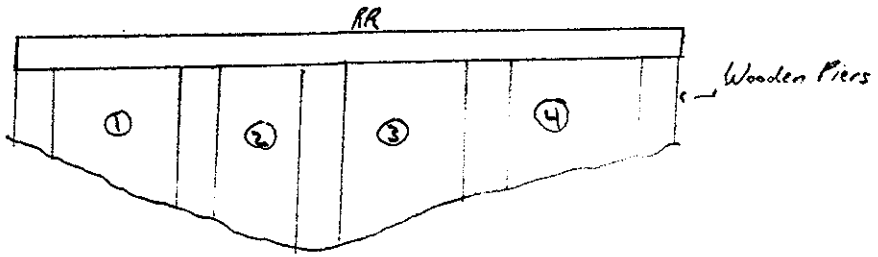
Concentration Point 42: Railroad Culvert Crossing

	Culvert 1			Culvert 2			Culvert 3			Culvert 4			
		Left	Right		Left	Right		Left	Right		Left	Right	
	Top El [ft]	865.53	865.5	Top El [ft]	865.5	865.48	Top El [ft]	865.48	865.36	Top El [ft]	865.36	865.46	
	Bottom El [ft]	863.34	860.7	Bottom El [ft]	860.7	860.34	Bottom El [ft]	860.34	860.47	Bottom El [ft]	860.47	861.82	
	height [ft]	3.495		height [ft]	4.97		height [ft]	5.015		height [ft]	4.265		
	width [ft]	13.1		width [ft]	14		width [ft]	13.8		width [ft]	13.3		
w/s elevation [ft]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	Q Total [cfs]
869.01	2.00	36	472	1.71	54	756	1.72	54	745	1.84	44	585	2558
868	1.71	32	419	1.51	47	658	1.51	47	649	1.61	40	532	2258
864	0.57	7	92	0.70	17	238	0.72	17	235	0.67	12	160	724
865	0.85	13	170	0.90	24	336	0.92	24	331	0.90	19	253	1090
866	1.14	20	262	1.10	33	462	1.12	33	455	1.14	26	346	1525
867	1.42	27	354	1.30	41	574	1.32	41	566	1.37	34	452	1946
Top Of Structure Elevation [ft]			869.01										

Overtopping Capacity

Target Q= 1550 reached when w/s = 866

$_1$ From Chart 8



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SHEET 2 OF 3

BY JS DATE 10/4/00

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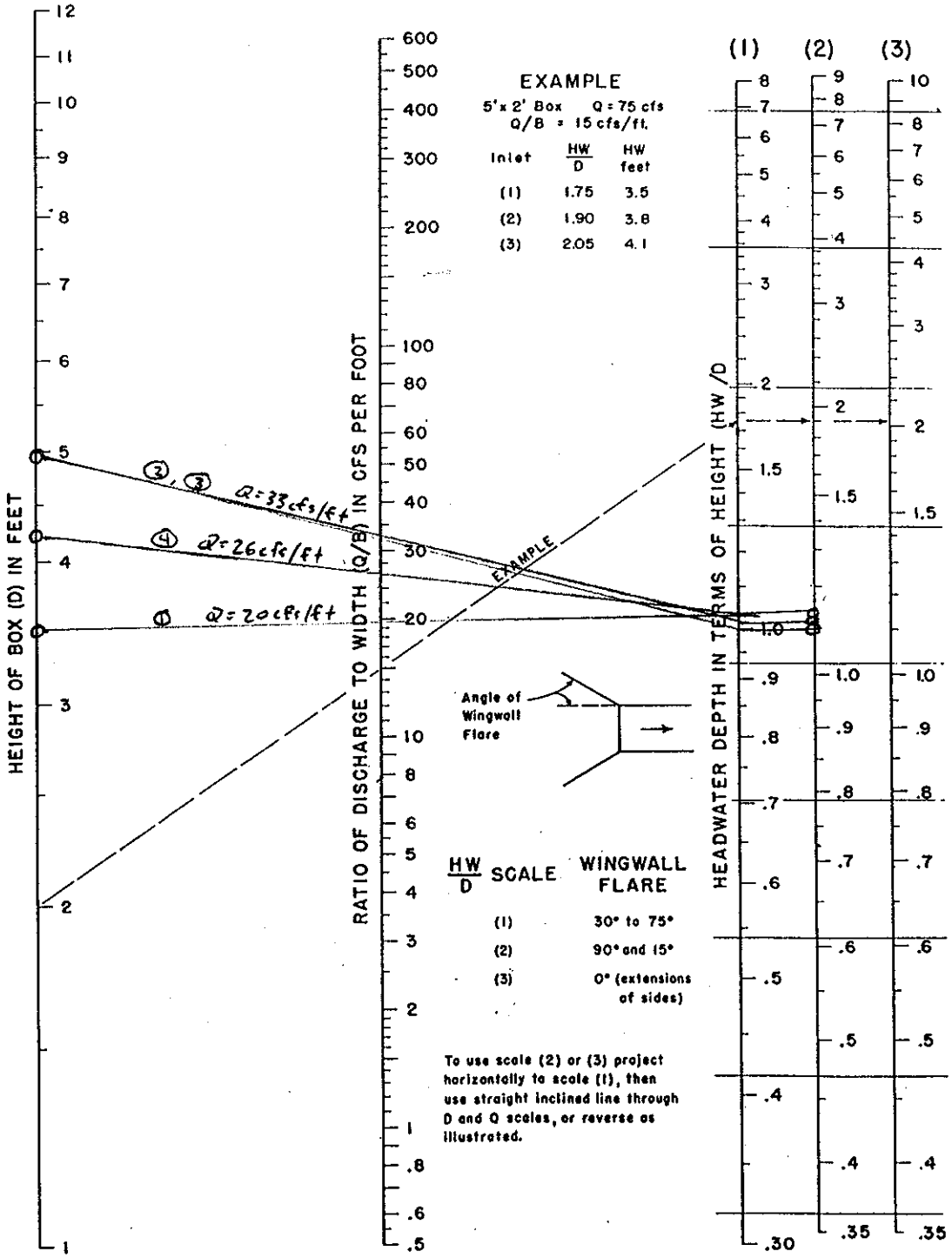
CLIENT FCD-99.03

W/S = 866, CP42

CHART 8



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

Concentration Point 48: Railroad Culvert Crossing

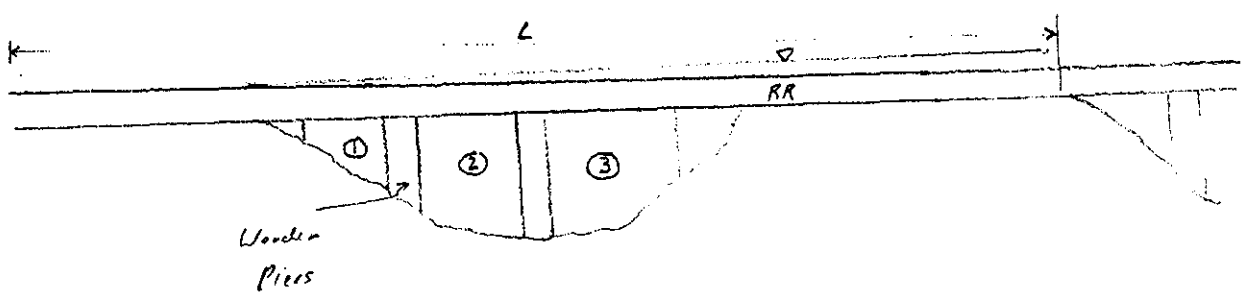
				Culvert 1			Culvert 2			Culvert 3			
					Left	Right		Left	Right		Left	Right	
				Top El [ft]	860.14	860.24	Top El [ft]	860.24	860.29	Top El [ft]	860.29	860.36	
				Bottom El [ft]	856.77	852.08	Bottom El [ft]	852.08	852.16	Bottom El [ft]	852.16	857.63	
				height [ft]	5.765		height [ft]	8.145		height [ft]	5.43		
Weir Flow Over RailRoad				width [ft]	13		width [ft]	14		width [ft]	13		
w/s elevation [ft]	H [ft]	L [ft]	Q_2 [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	Q Total [cfs]
864	0	45	0	1.66	62	806	1.46	96	1344	1.68	57	741	2891
866	2	1500	11455.1	2.01	78	1014	1.70	110	1540	2.05	68	884	14893
864.5	0.5	1250	1193.24	1.75	68	884	1.52	100	1400	1.77	58	754	4231
865	1	1300	3510	1.83	70	910	1.58	100	1400	1.86	63	819	6639
Top Of Structure Elevation [ft]						864							

Overtopping Capacity

Target Q = 4900
w/s = 864.6

[1] From Chart 8

[2] From $Q=CLH^{3/2}$, C = 2.7



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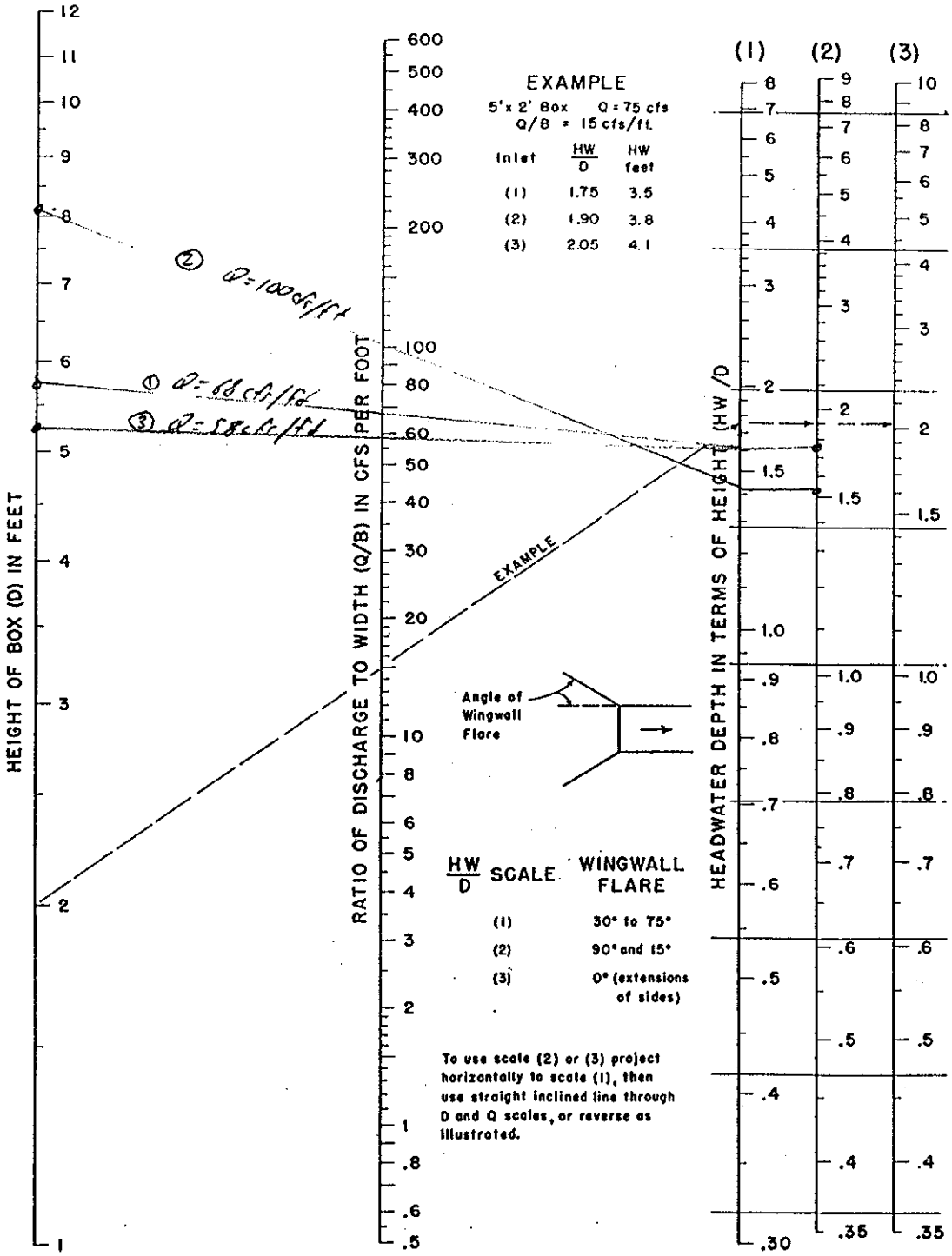
W/S = 864.5, CP48

CHART 8



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

Concentration Point 49: Railroad Culvert Crossing

	Culvert 1			Culvert 2			Culvert 3			Culvert 4			Culvert 5			
		Left	Right		Left	Right		Left	Right		Left	Right		Left	Right	
	Top El [ft]	859.85	859.89	Top El [ft]	859.89	859.82	Top El [ft]	859.82	859.87	Top El [ft]	859.87	859.93	Top El [ft]	859.93	859.97	
	Bottom El [ft]	859.03	857.64	Bottom El [ft]	857.64	856.93	Bottom El [ft]	856.93	856.62	Bottom El [ft]	856.62	856.62	ottom El [ft]	856.62	859.52	
	height [ft]	1.535		height [ft]	2.57		height [ft]	3.07		height [ft]	3.28		height [ft]	1.88		
	width [ft]	13.2		width [ft]	13.9		width [ft]	14		width [ft]	13		width [ft]	13		

Weir Flow Over RailRoad

w/s elevation [ft]	H [ft]	L [ft]	Q_2 [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	Q Total [cfs]
864	0	45	0	3.69	17	224.4	2.61	29	403.1	2.35	33	462	2.25	40	520	3.15	19	247	1856.5
865	1	1200	3240	4.34	20	264	3.00	30	417	2.68	35	490	2.55	40	520	3.69	22	286	5217
865.4	1.4	1290	5769.6	4.60	20	264	3.16	30	417	2.81	37	518	2.68	40	520	3.90	22	286	7774.6
Top Of Structure Elevation [ft]						864													

Overtopping Capacity

Target Q = 7620 reached when w/s = 865.4

[1] From Chart 8

[2] From $Q=CLH^{3/2}$, C = 2.7

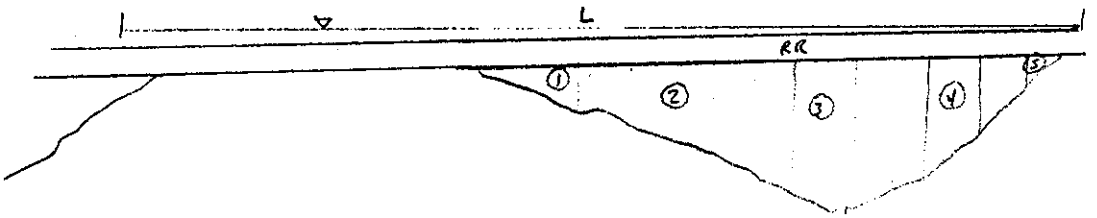


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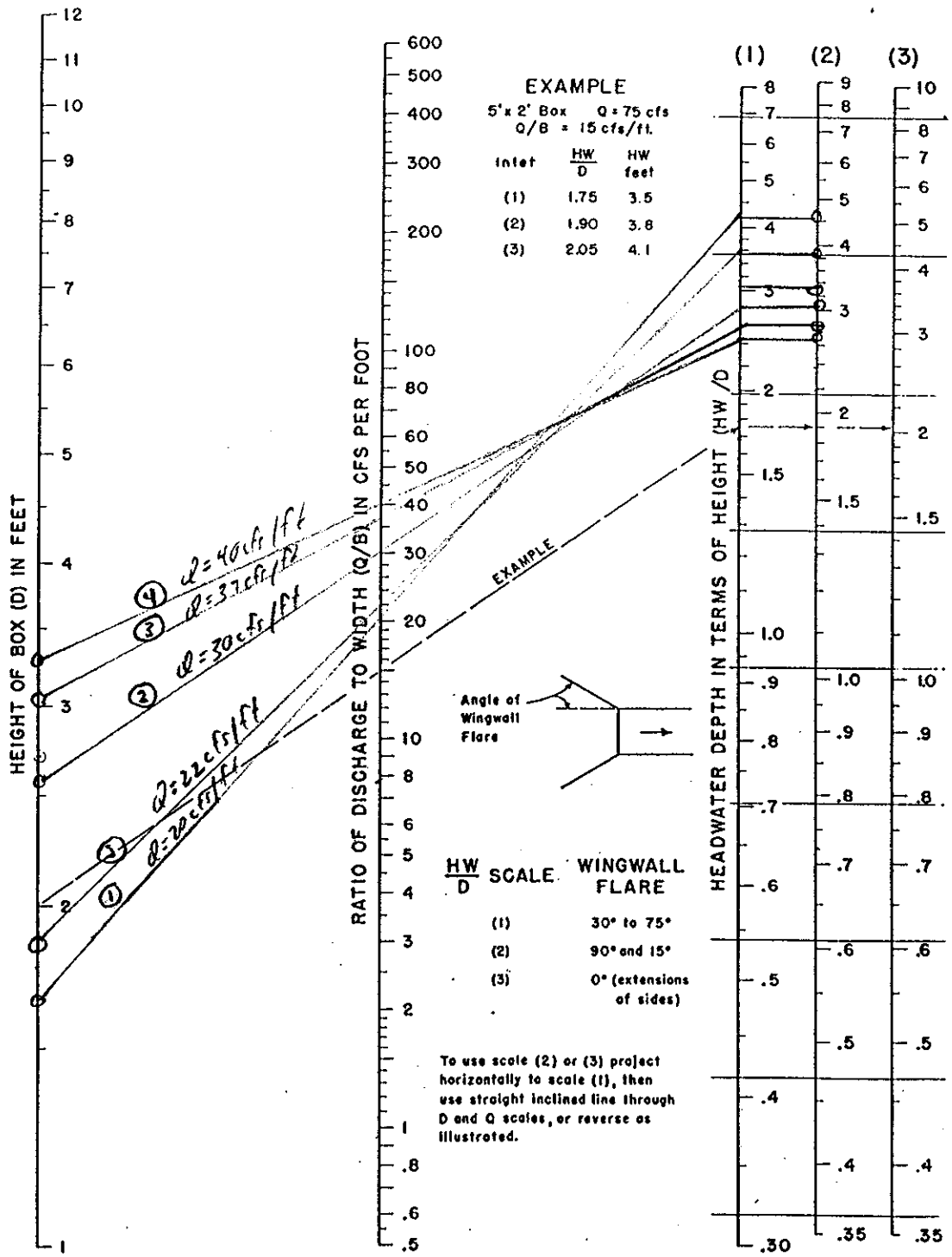
CHART 8

w/r=865.4, CP49



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

Concentration Point 61: Railroad Culvert Crossing

	Culvert 1			Culvert 2			Culvert 3			Culvert 4			Culvert 5		
		Left	Right		Left	Right		Left	Right		Left	Right		Left	Right
	Top El [ft]	868.04	868.04	Top El [ft]	868.04	867.85	Top El [ft]	867.85	867.75	Top El [ft]	867.75	867.83	Top El [ft]	867.83	867.8
	Bottom El [ft]	868.04	860.73	Bottom El [ft]	860.73	858.2	Bottom El [ft]	858.19	858.31	Bottom El [ft]	858.31	865.46	Bottom El [ft]	865.5	867.8
	height [ft]	3.655		height [ft]	8.48		height [ft]	9.55		height [ft]	5.905		height [ft]	1.165	
	width [ft]	13.4		width [ft]	13.5		width [ft]	13.9		width [ft]	13.8		width [ft]	12.9	

w/s elevation [ft]	H [ft]	L [ft]	Q_2 [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	Q Total [cfs]
863	0	74	0	0.00	0	0	0.42	18	243	0.50	33	458.7	0.19	5	69	0.00	0	0	770.7
867	0	74	0	0.72	13	174.2	0.89	62	837	0.92	82	1139.8	0.87	37	510.6	0.30	0	0	2661.6
871.4	0	74	0	1.92	40	536	1.41	109	1471.5	1.38	140	1946	1.61	70	966	4.08	10	129	5048.5
Top Of Structure Elevation [ft]						871.4													

Target Q = 530cfs

$_1$ From Chart 8

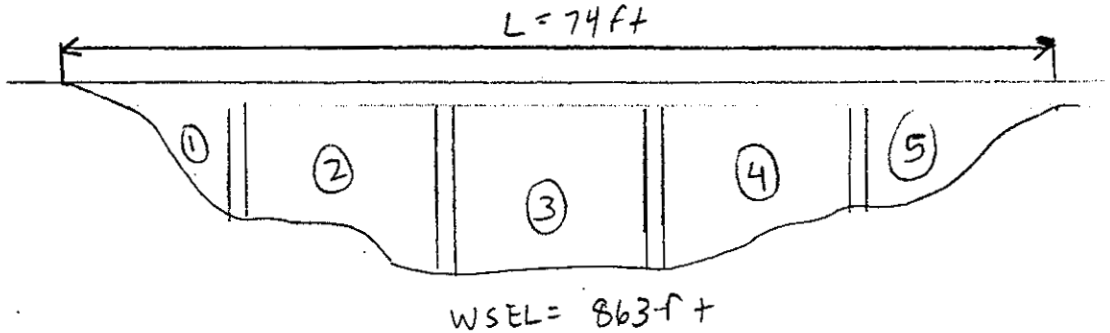


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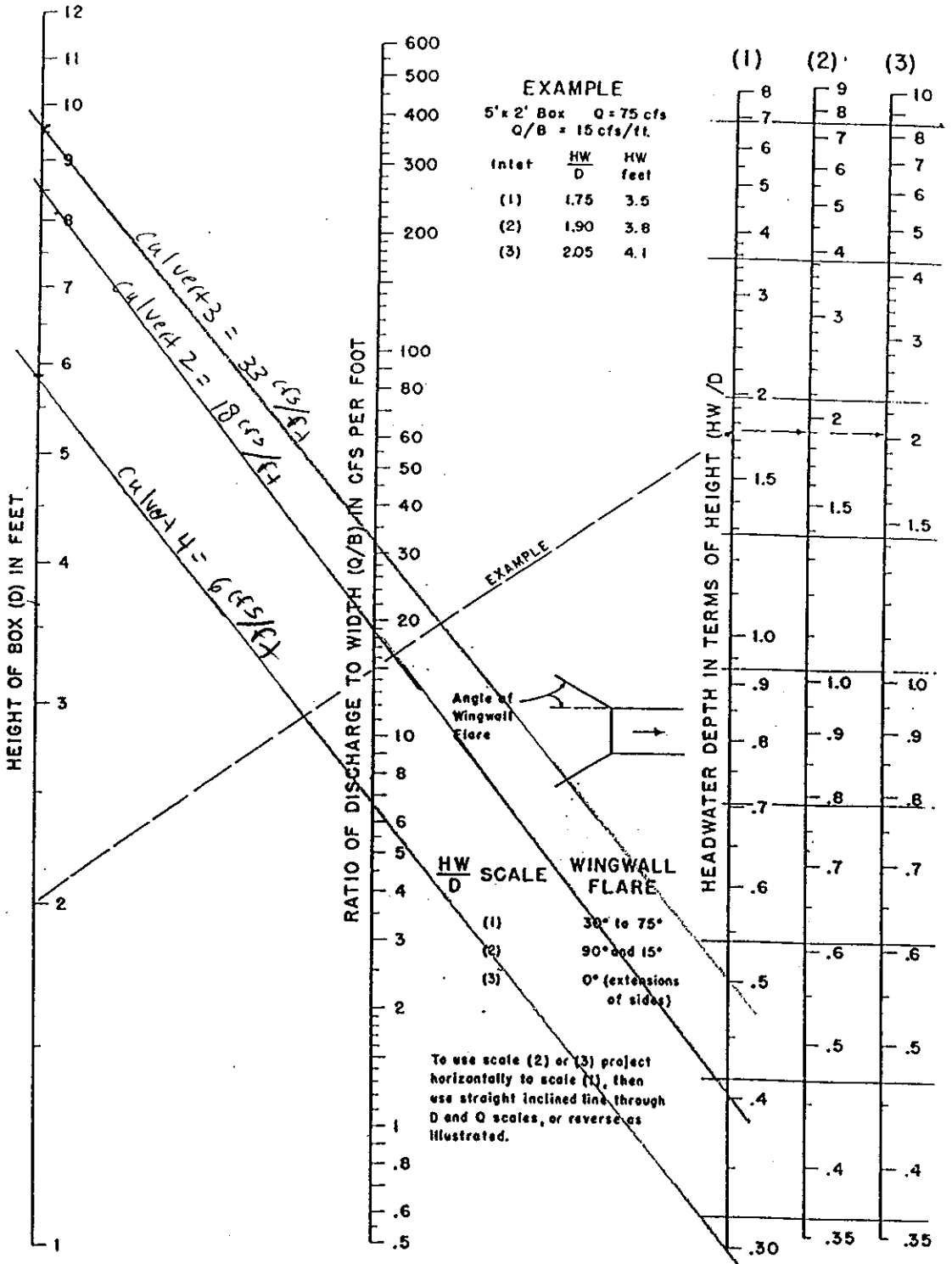
CHART 8



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

Concentration Point 62: Railroad Culvert Crossing

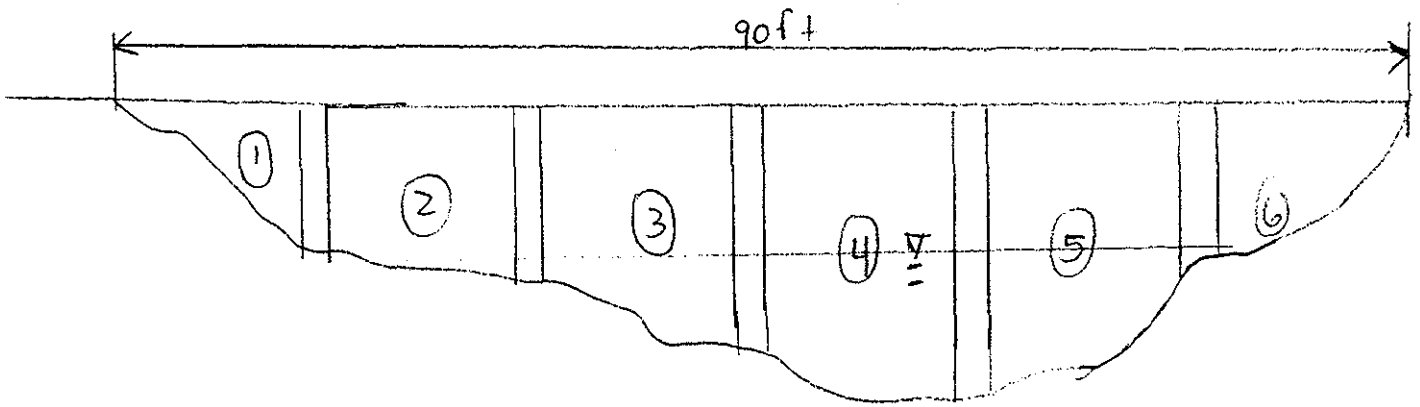
	Culvert 1		Culvert 2		Culvert 3		Culvert 4		Culvert 5		Culvert 6	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Top El [ft]	874.98	875	875	875.13	875.13	875.11	875.11	875.14	875.14	875.03	875.03	874.89
Bottom El [ft]	874.98	867.23	867.23	856.65	856.65	853.13	853.13	852.43	852.43	867.75	867.75	873.74
height [ft]	3.885		13.125		20.23		22.345		14.995		4.215	
width [ft]	13.2		13.7		13.7		14.1		13.6		13.1	

W/S elevation [ft]	H [ft]	L [ft]	Q_2 [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	Q Total [cfs]
864	0	90	0	0.00	0	0	0.16	22	301.4	0.45	38	520.6	0.50	45	634.5	0.26	21	285.6	0.00	0	0	1742.1
866	0	90	0	0.00	0	0	0.31	22	301.4	0.55	52	712.4	0.59	60	846	0.39	32	435.2	0.00	0	0	2295
868	0	90	0	0.00	0	0	0.46	38	520.6	0.65	68	931.6	0.68	72	1015.2	0.53	47	639.2	0.00	0	0	3106.6
869	0	90	0	0.00	0	0	0.54	52	712.4	0.70	76	1041.2	0.73	80	1128	0.59	60	816	0.00	0	0	3697.6

Target Q = 3460cfs

Top Of Structure Elevation [ft]	878.8

, From Chart 8



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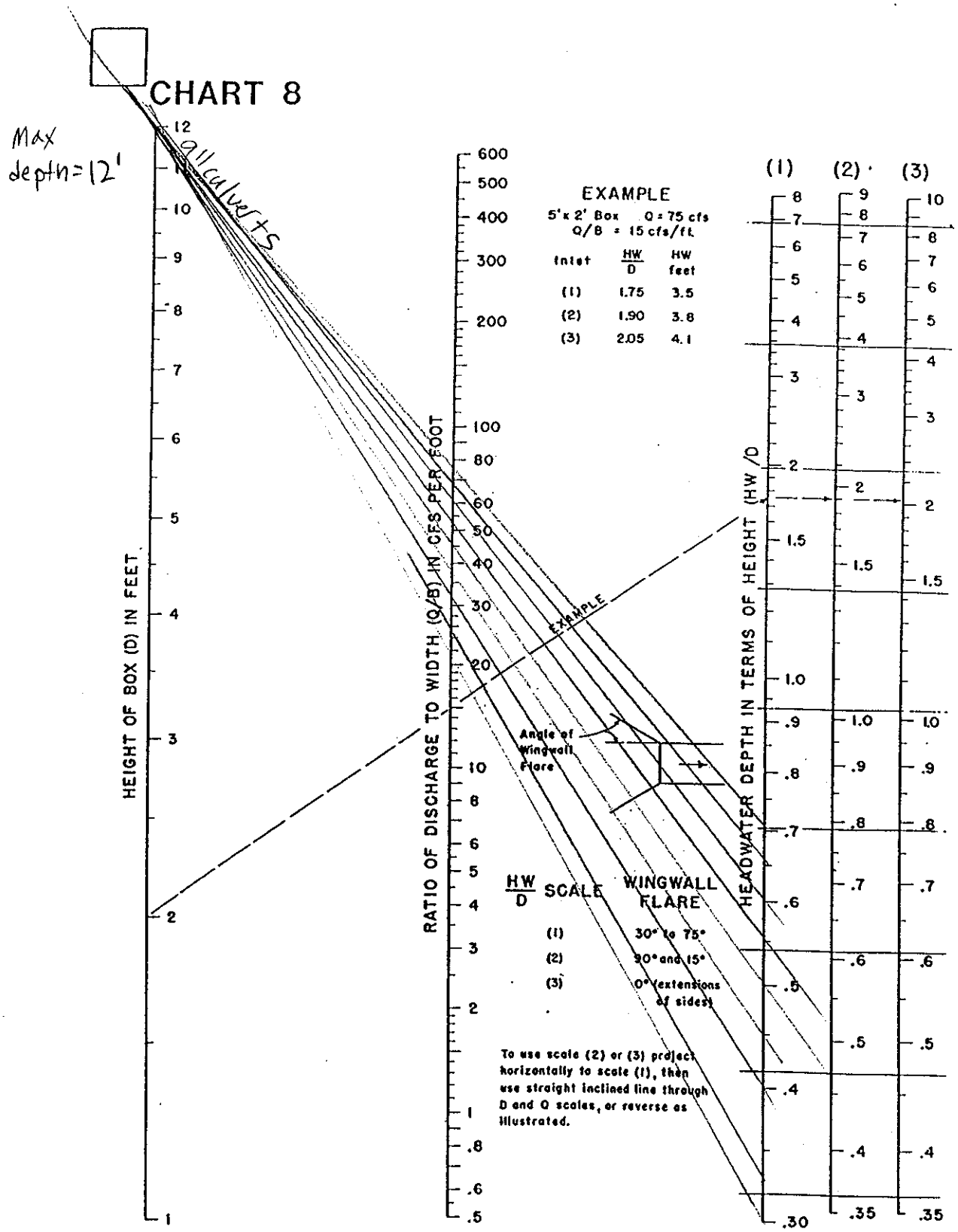


HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

Concentration Point 48 and 49 Combined: Railroad Culvert Crossing

	Culvert 1		Culvert 2		Culvert 3		Culvert 4		Culvert 5	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
Top El [ft]	859.85	859.89	859.89	859.82	859.82	859.87	859.87	859.93	859.93	859.97
Bottom El [ft]	859.03	857.64	857.64	856.93	856.93	856.62	856.62	856.62	856.62	859.52
height [ft]	1.535		2.57		3.07		3.28		1.88	
width [ft]	13.2		13.9		14		13		13	

Weir Flow Over RailRoad

w/s elevation [ft]	H [ft]	L [ft]	Q_2 [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	Q Total [cfs]
864	0	45	0	3.69	17	224.4	2.61	29	403.1	2.35	33	462	2.25	40	520	3.15	19	247	4747.5
865	1	1850	4995	4.34	20	264	3.00	30	417	2.68	35	490	2.55	40	520	3.69	22	286	10101
864.6	0.6	1840	2308.92	4.08	18	237.6	2.85	30	417	2.55	34	476	2.43	38	494	3.47	20	260	7298.52
Top Of Structure Elevation [ft]						864													

Overtopping Capacity

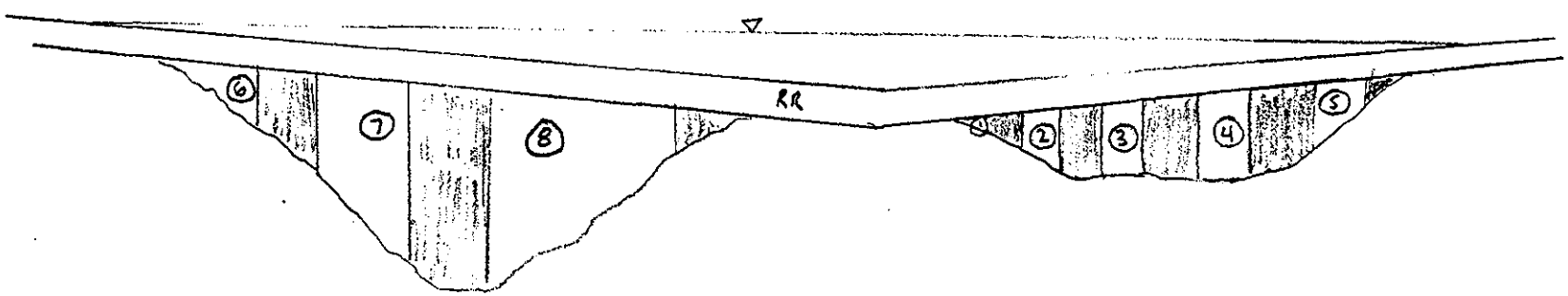
Target Q = 10030 reached when w/s = 865

$_1$ From Chart 8

$_2$ From $Q=CLH^{3/2}$, C = 2.7

	Culvert 6		Culvert 7		Culvert 8	
	Left	Right	Left	Right	Left	Right
Top El [ft]	860.14	860.24	860.24	860.29	860.29	860.36
Bottom El [ft]	856.77	852.08	852.08	852.16	852.16	857.63
height [ft]	5.765		8.145		5.43	
width [ft]	13		14		13	

HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]	HW/D [ft/ft]	Q/B_1 [cfs/ft]	Q [cfs]
1.72	62	806	1.51	96	1344	1.77	57	741
1.89	70	910	1.63	100	1400	1.95	63	819
1.82	69	897	1.58	102	1428	1.88	60	780



Appendix E-4: Culvert Calculations
Zone A Delineation of Watershed "PP"
Luke Wash FCD 99-03

Concentration Point 15: I-10 Overtopping Analysis

w/s elevation [ft]	Culvert HW/D [ft/ft]	Q/B[1] [cfs/ft]	Q [cfs]	Roadway Surface as a Weir H [ft]	L [ft]	Q_2 [cfs]	Dyke as a Weir H [ft]	L [ft]	Q_2 [cfs]	Q Total [cfs]
1042.1	1.26	36	1440	-0.815	-229.95	#NUM!	-1.76	125	#NUM!	#NUM!
1042.3	1.31	38	1520	-0.715	-211.254	#NUM!	-1.56	125	#NUM!	#NUM!
1042.5	1.36	39	1560	-0.615	-192.559	#NUM!	-1.36	125	#NUM!	#NUM!
1042.7	1.41	40	1600	-0.515	-173.864	#NUM!	-1.16	125	#NUM!	#NUM!
1043	1.485	44	1760	-0.365	-145.822	#NUM!	-0.86	125	#NUM!	#NUM!
1045	1.985	46	1840	0.635	41.1292	56.192	1.14	125	410.801	2306.99
1045.5	2.11	49	1960	0.885	87.8669	197.517	1.64	125	708.826	2866.34
1046	2.235	52	2080	1.135	134.605	439.458	2.14	125	1056.66	3576.02
1044.3	1.81	50	2000	0.285	-24.3036	-9.98394	0.44	125	98.5036	2088.52
1044.4	1.835	50	2000	0.335	-14.9561	-7.82976	0.54	125	133.926	2126.1
1044.5	1.86	50	2000	0.385	-5.60852	-3.61746	0.64	125	172.8	2169.18
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99
1045	1.985	51	2040	0.635	41.1292	56.192	1.14	125	410.801	2506.99

Target Q = 3250 cfs
Reached when W/S
elevation = 1045.7

[1] From Chart 8

[2] From $Q=CLH^{3/2}$, C = 2.7

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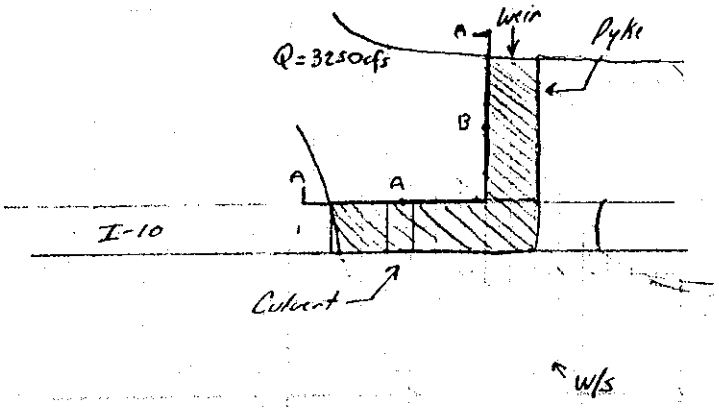
JOB NAME Delineation of Watershed "P" 99-03

JOB NO. 310.010a

Culvert Crossing at I-10 and CP-15

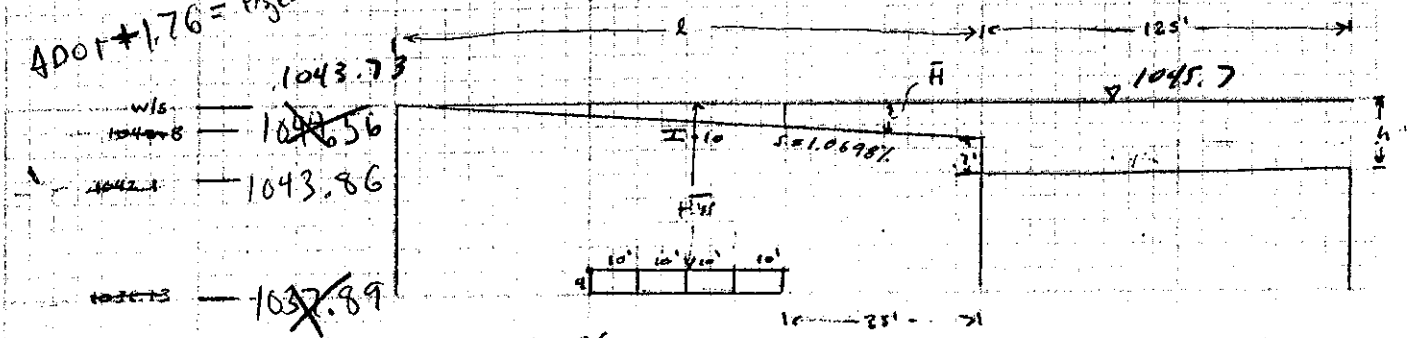


Final WSEL 1045.7 ft

Since I-10 is overtopped, weir analysis is warranted
Assume A and B are at the same w/s elevation

Section A-A

ADOT+1.76 = Project datum



1037.06

$h = w/s - 1042.1$ (1043.86)

$\ell = (h - .7)/.010698$

$\bar{H} = (W/s - 1042.8)/2 =$ (1043.86)

$\overline{HW} = (1042.8 - 1036.13) + (W/s - 1042.8) = W/s - 1036.13$ (1043.86, 1037.06)

Iterate w/s elevation until 3250 cfs is reached.

See spreadsheet attached.

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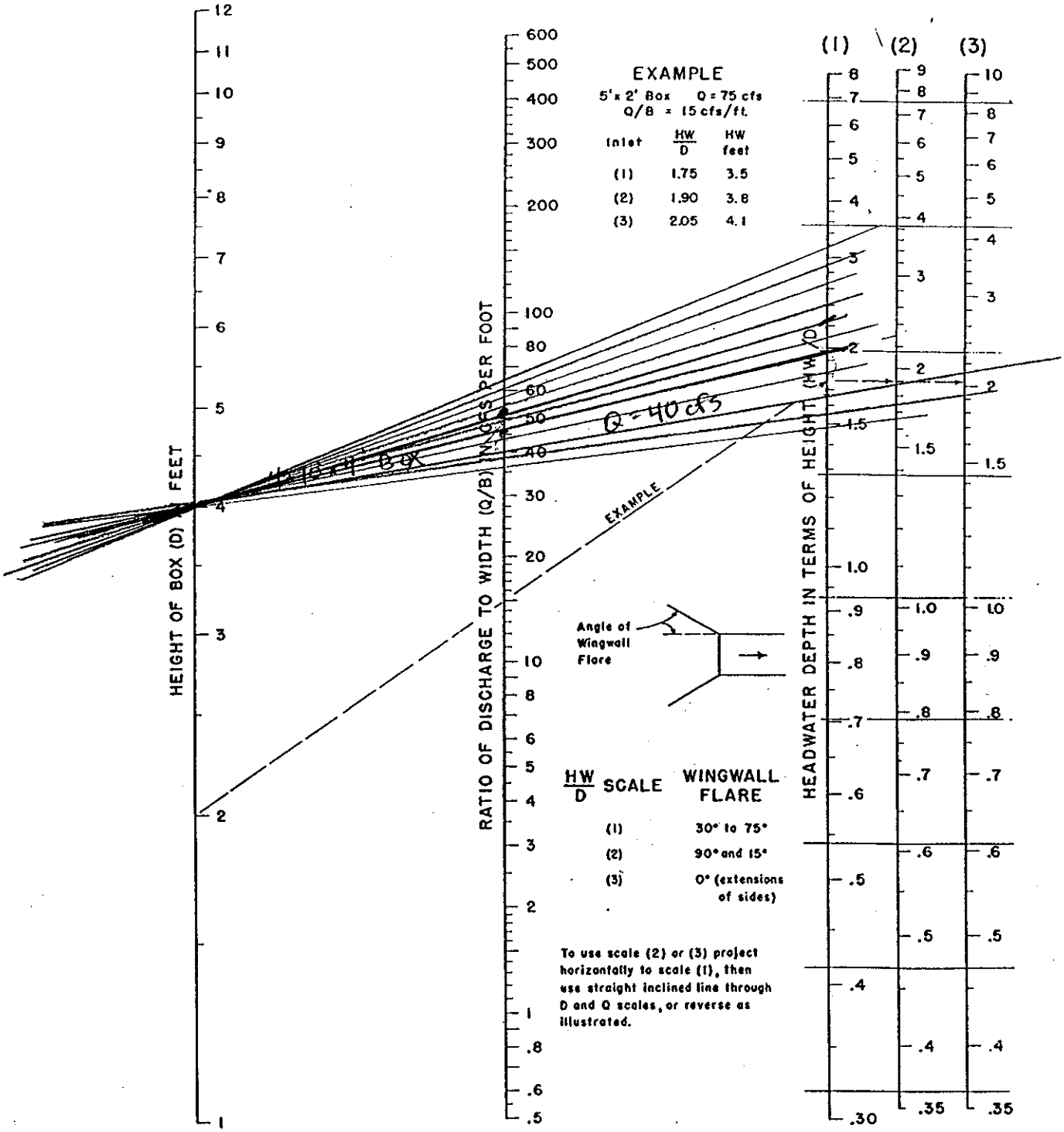
CHART 8



HEADWATER DEPTH FOR BOX CULVERTS WITH INLET CONTROL

BUREAU OF PUBLIC ROADS JAN. 1963

E.5 Hydraulic Calculations

Hydraulic calculations were performed using normal depth at each cross-section. The normal depth calculations are included in **Section E.2 – Cross-Section Plots**. The slope calculations are included in **Table E.5-1.**

Table E.5-1
Slope Calculations

(listed from south to north, west to east)

Wash	Reach	Cross Sections	Reach Length [ft]	Interval Length [ft]	Change in Elevation [ft]	Slope
T1S-R5W-S29	1	10 – 40	4004	4004	20	0.0049
T1S-R5W-S29W	1	10 – 50	6401	6401	40	0.0075
T1S-R5W-S29E	1	80 – 130	8912	1755	10	0.0057
	2	10 – 60	11016	6858	40	0.0058
T1S-R5W-S17	1	90 – 250	17924	17924	40	0.0055
	2	70 – 85	13312	13312	40	0.0047
	3	1 – 60	19123	19123	40	0.0041
T2N-R6W-S35	1	10 – 160	16558	3333	20	0.0060
T1N-R6W-S11	1	10 – 40	9373	1891	10	0.0053
T2N-R6W-S36	1	220 – 350	14146	9231	60	0.0065
	2	10 – 210	17344	7547	40	0.0053
T2N-R6W-S36W	1	10 – 50	7490	4255	20	0.0047
T1S-R5W-S32	1	10 – 160	22855	22855	30	0.0043
(LUKE WASH)						
T1N-R5W-S32	1	10 – 70	9558	1611	10	0.0062
T1N-R6W-S12	1	10 – 60	6626	1358	10	0.0074
T1S-R6W-S13	5	140	2603	1514	10	0.0066
(Phillips Wash South)	6	100 – 130	7092	3974	20	0.0050
	7	50 – 90	12120	6657	30	0.0045
	8	10 – 40	4605	3437	20	0.0058
T3N-R5W-S19	1	320 – 540	13008	13008	60	0.0080
(Phillips Wash North)	2	180 – 310	17298	11321	60	0.0053
	3	140 – 170	4524	10487	60	0.0057
	4	10 – 130	15509	15509	50	0.0064
T2N-R5W-S19	1	10 – 70	10783	3974	20	0.0050
T2N-R5W-S08	1	10 – 90	5812	2100	20	0.0095
T3N-R5W-S31	1	10 – 50	3643	2500	20	0.0080
T3N-R5W-S30	1	1 – 50	2659	2557	20	0.0078
T1N-R6W-S05	1	70 – 110	9847	1534	10	0.0065
(Dickey Wash South)	2	60	3315	2065	10	0.0048
	3	10 – 50	5458	2287	10	0.0044
T2N-R5W-S31	1	140 – 160	5242	2710	20	0.0074
(Dickey Wash North)	2	100 – 130	2686	2686	30	0.0069
	3	10 – 90	8225	8225	30	0.0039
T1N-R5W-S30	1	10 – 80	16876	16876	40	0.0062
T2N-R5W-S32	1	10 – 120	7127	7127	30	0.0079
T1S-R5W-S08	1	10 – 50	4293	4293	30	0.0070
T1S-R5W-S09	1	10 – 130	15063	1817	10	0.0055
T1N-R5W-S33W	1	30 – 100	6596	1488	10	0.0067

Table E.5-1
Slope Calculations

(listed from south to north, west to east)

Wash	Reach	Cross Sections	Reach Length [ft]	Interval Length [ft]	Change in Elevation [ft]	Slope
	2	10 – 20	660	1818	10	0.0055
T1N-R5W-S33N	1	10 – 60	7121	1713	10	0.0058
T1N-R5W-S28W	1	10 – 80	6267	6267	40	0.0061
T1S-R5W-S09W	1	10 – 100	6228	1525	10	0.0066
T1N-R5W-S33E	1	10 – 50	4954	1214	10	0.0082
T1N-R5W-S28E	1	10 – 60	6544	6557	40	0.0058
T1S-R5W-S16	1	10 – 50	5720	5720	30	0.0088
T1S-R5W-S22N	1	10 – 150	8976	658	10	0.0152
T1S-R5W-S22S	1	1 – 110	6872	1843	10	0.0054
T1N-R5W-S22	1	10 – 190	9039	9039	50	0.0085
T1N-R5W-S15	1	10 – 60	6426	1068	10	0.0094
T1N-R5W-S10	1	10 – 90	6554	6554	30	0.0063
T1N-R5W-S04	1	10 – 50	6232	1095	10	0.0091
T2N-R5W-S33E	1	130 – 470	28656	28656	60	0.0043
	2	10 – 120	15395	5714	40	0.0070
T2N-R5W-S33W	1	10 – 120	8095	8095	40	0.0080
T2N-R5W-S21	1	10 – 20	2800	2354	20	0.0085
T2N-R5W-S05E	1	10 – 30	4414	3136	20	0.0064
T3N-R5W-S32E	1	10 – 60	3749	3757	20	0.0053
T2N-R5W-S28	1	10 – 60	5818	2941	20	0.0068
T2N-R5W-S05W	1	10 – 50	4685	2097	20	0.0095
T2N-R5W-S27S	1	10 – 100	10446	3024	20	0.0067
T2N-R5W-S27N	1	110 – 200	10791	2974	20	0.0067
T2N-R5W-S04	1	10 – 50	7772	2268	20	0.0088
T3N-R5W-S28S	1	10 – 50	3393	2293	20	0.0087
T3N-R5W-S28N	1	10 – 160	11103	11103	60	0.0070
T3N-R5W-S20	1	10 – 50	4409	2800	20	0.0071
T3N-R5W-S21S	1	10 – 60	3958	2143	20	0.0093
T3N-R5W-S21N	1	50 – 60	877	832	10	0.0120
	2	10 – 40	2030	4832	20	0.0041

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