SEDIMENTATION STUDY OF THE YAZOO RIVER BASIN

PHASE II GENERAL REPORT

VOLUME II APPENDICES

CONTRACT NO. DACW 38-76-C-0193

Prepared for

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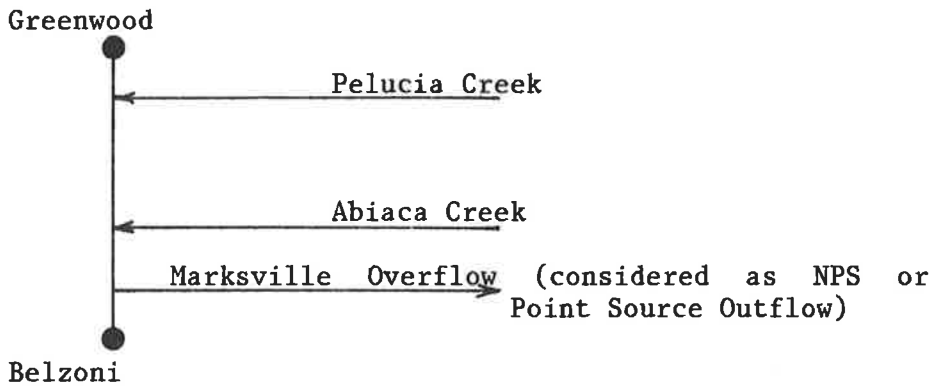
Appendix A

Temporal Design

REACH 1

Belzoni to Greenwood



Belzoni = Greenwood + Abiaca + Pelucia + *NPS1 (including Marksville Overflow)

Station (1)	R.M. (2)	Area (3)	Flow Records (4)	Remarks
Belzoni	116.2	7830	Yes, SD	Downstream Station
Abiaca Creek	140.34	112	Yes, SD	Planimetered Area
Pelucia Creek	155.7	64	Yes, SD	Area at Gaging St.
Greenwood	166.0	7450	Yes	Key Station

Change in area = 7830 - 7450 = 380 sq. mi.

Gaged streams = 176 sq. mi. = 46.3% of change in area

Non-Point Sources = 204 sq. mi. = 53.7%

1) Name of gaging station or tributary stream

2) River Mile

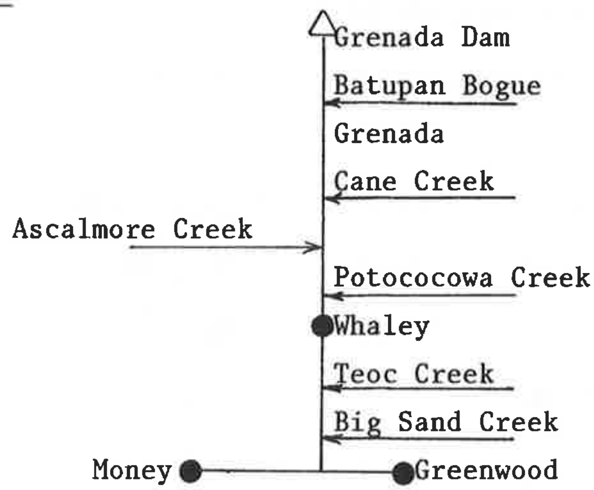
3) Drainage area above gaging station or area of tributaries, in square miles.

4) Availability of flow records and source
   SD - COE stage records converted to discharge
   USGS - United States Geological Survey Daily Flow Records

*NPS - Non-point source inflows

REACH 2

Greenwood to Money includes Yalobusha River from Enid Dam to Greenwood. There are three subsections in this reach.



Subsection 1

Greenwood = Money + Whaley + Big Sand + Teoc + NPS2

Station	R.M.	Area	Flow Records	Remarks
Greenwood	166	7450	Yes	Key Station
Big Sand Creek	1.05*	110	Yes, SD	
Teoc Creek	7.65*	40	No	
Yalobusha at Whaley	9.05*	1960	Yes, SD	
Yalobusha at Money	192.9	5221	Yes, SD	

*Upstream on Yalobusha from confluence with Yazoo River

Change in area = 7450 - 5221 - 1960 = 269 sq. mi.

Gaged Streams = 108 sq. mi. = 40.9%

Ungaged streams = 40 sq. mi. = 14.9%

Non-Point Sources = 119 sq. mi. = 44.2%

Subsection 2

Yalobusha River

Whaley to Grenada town (Highway 51)

Whaley = Grenada town + Cane Creek + Potococowa + Ascalmore + NPS3

Station	R.M.	Area	Flow Records	Remarks
Whaley	9.05	1960	Yes, SD	
Potococowa	9.55	78	No	
Ascalmore	13.30	32	Yes, SD	
Cane Creek	21.74	25	No	
Grenada Town	45.59	1570	Yes, SD	

Change in area = 1960 - 1570 = 390 sq. mi.

Gaged stream = 32 sq. mi. = 8.2%

Ungaged streams = 103 sq. mi. = 26.4%

Non-point sources = 255 sq. mi. = 65.4%

Subsection 3

Grenada town to Grenada Dam

Grenada town = Grenada Dam + Batupan Bogue + NPS4

Station	R.M.	Area	Flow Records	Remarks
Grenada town	45.59	1570	Yes, SD	
Batupan Bogue	46.60	162	No	
Grenada Dam	47	1320	Yes, USGS	

Change in area = 1570 - 1320 = 250 sq. mi.

Ungaged streams = 162 sq. mi. = 64.8%

Non-point sources = 88 sq. mi. = 35.2%

REACH 3

Money to Swan Lake

Money = Swan Lake + NPS5

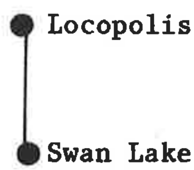
Station	R.M.	Area	Flow Records
Money	192.90	5221	Yes, SD
Swan Lake	219.08	5130	Yes, USGS

Change in area = 5221 5130 = 91 sq. mi.

Non-point sources = 91 sq. mi. = 100%

REACH 4

Swan Lake to Locopolis



Swan Lake = Locopolis + NPS6

Station	R.M.	Area	Flow Records
Swan Lake	219.08	5130	Yes, USGS
Locopolis	230.65	4920	Yes, SD

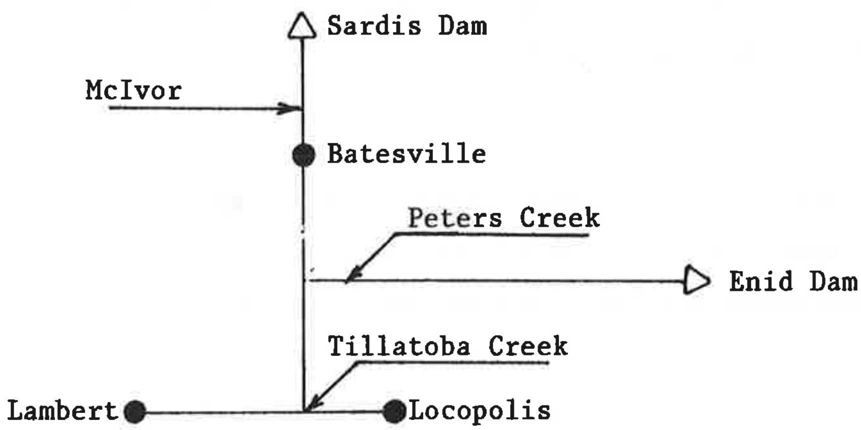
Change in area = 5130 - 4920 = 210 sq. mi.

Non-point sources = 210 sq. mi. = 100%

REACH 5

Locopolis to Lambert includes P-Q Floodway

There are two subsections in this reach



Subsection 1

Locopolis = Lambert + Batesville + Enid Dam + Peters Creek

+ Tillatoba Creek + NPS7

Station	R.M.	Area	Flow Records
Locopolis	230.65	4920	Yes, SD
Batesville	23.30*	1802	Yes, SD
Enid Dam	13.5*	560	Yes, USGS
Peters Creek	6.1*	71	No
Tillatoba Creek	234.65	157	No
Lambert	253.19	1980	Yes, USGS

Change in area = 4920 - 1802 - 560 - 1980 = 578 sq. mi.

Ungaged streams = 228 sq. mi. = 39.4%

Non-point sources = 350 sq. mi. = 60.6%

*R.M. on P-Q, Yocona, or Lt. Tallahatchie

Subsection 2

Batesville = Sardis Dam + McIvor Drainage + NPS8

Station	R.M.	Area	Flow Records
Batesville	23.30	1802	Yes, SD
McIvor Drainage	24.74	76	No
Sardis Dam	49.70	1545	Yes, USGS

Change in area = 1802 - 1545 = 257 sq. mi.

Ungaged streams = 76 sq. mi. = 29.6%

Non-point sources = 181 sq. mi. = 70.4%

REACH 6

Lambert to Marks

Lambert = Marks + NPS9

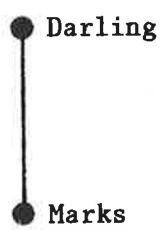
Station	R.M.	Area	Flow Records
Lambert	253.19	1980	Yes, USGS
Marks	261.4	1810	Yes, SD

Change in area - 1980 - 1810 = 170 sq. mi.

Non-point sources = 170 sq. mi. = 100% NPS9

REACH 7

Marks to Darling



Marks = Darling + NPS10

Station	R.M.	Area	Flow Records
Marks	261.4	1810	Yes, SD
Darling	272.5	1620	Yes, SD

Change in area - 1810 - 1620 = 190 sq. mi.

Non-point sources = 190 sq. mi. = 100% NPS10

REACH 8

Darling to Sledge

Darling = Sledge + NPS11

Station	R.M.	Area	Flow Records
Darling	272.5	1620	Yes, SD
Sledge	278.84	1404	Yes, SD

Change in area = 1620 - 1404 = 216 sq. mi.

Non-point source = 216 sq. mi. = 100% NPS11

REACH 9

Sledge to Crenshaw

Sledge = Crenshaw + NPS12

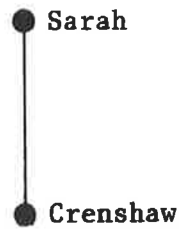
Station	R.M.	Area	Flow Records
Sledge	278.84	1404	Yes, SD
Crenshaw	284.00	1403	Yes, SD

Change in area = 1404 - 1403 = 1 sq. mi.

Non-point sources = 1 sq. mi. = 100% NPS12

REACH 10

Crenshaw to Sarah



Crenshaw = Sarah + NPS13

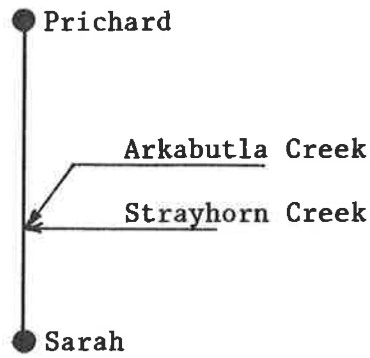
Station	R.M.	Area	Flow Records
Crenshaw	284.0	1403	Yes, SD
Sarah	288.7	1395	Yes, SD

Change in area = 1403 - 1395 = 8 sq. mi.

Non-point sources = 8 sq. mi. = 100% NPS13

REACH 11

Sarah to Prichard



Sarah = Prichard + Arkubutla Creek + Strayhorn Creek + NPS14

Station	R.M.	Area	Flow Records	Remarks
Sarah	288.7	1395	Yes, SD	
Arkubutla Creek	291.2	104	Yes, SD	
Strayhorn Creek		47	No	Location not fixed
Prichard	299.54	1214	Yes, SD	

Change in area = 1395 - 1214 = 181 sq. mi.

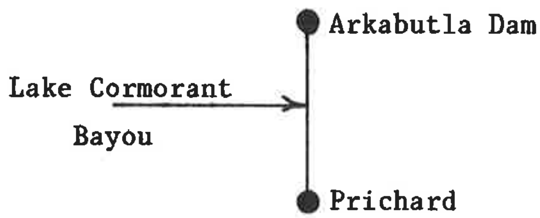
Gaged streams = 104 sq. mi. = 57.5%

Ungaged streams = 47 sq. mi. = 26.0%

Non-point sources = 30 sq. mi. = 16.5%

REACH 12

Prichard to Arkabutla Dam



Prichard = Arkabutla Dam + Lake Cormorant Bayou + NPS15

Station	R.M.	Area	Flow Records	Remarks
Prichard	299.54	1214	Yes, SD	
Lake Cormorant Bayou	301.8	101	No	
Arkabutla Dam	307.5	1000	Yes, USGS	Upstream Sta.

Change in area = 1214 - 1000 = 214 sq. mi.

Ungaged streams 101 sq. mi. = 47.2%

Non-point sources = 113 sq. mi. = 52.8%

Appendix B

Flow Statistics

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
BELZONI				
64	3506.20	11474.73	21357.19	4472.54
65	1466.92	9045.62	20213.81	5761.44
66	2011.48	6468.84	20733.72	4062.55
67	2143.87	6641.68	15985.18	2512.48
68	4385.35	12390.80	21783.88	4708.33
69	3668.27	11020.94	18704.44	3819.51
70	8117.92	12213.28	20754.32	3228.24
71	4304.28	10043.88	19300.70	3812.90
72	3131.72	8926.63	20016.23	3584.43
73	10942.39	18779.56	28114.91	5831.57
74	11212.49	17614.81	26824.78	5111.61
75	7777.43	15741.30	25245.88	5810.22
76	2836.79	9174.62	19258.12	4016.66
77	1934.55	7738.09	18963.56	4071.83
64-77	1466.92	11233.91	28114.91	5761.01
ABIACA CREEK				
64	98.66	317.36	1726.57	300.40
65	149.23	264.60	1780.73	290.61
66	73.76	173.48	1979.96	302.37
67	68.35	142.93	926.61	155.08
68	112.13	245.28	1244.71	234.97
69	108.39	205.92	1163.22	188.42
70	108.39	269.37	1436.63	325.11
71	110.19	247.54	1076.74	212.72
72	108.39	223.57	1486.46	223.19
73	67.06	273.97	1312.52	282.64
74	48.35	219.12	1293.39	266.50
75	51.27	242.18	1051.84	254.54
76	63.52	152.77	592.27	131.98
77	51.27	156.86	1138.29	219.94
64-77	48.35	223.93	1979.96	251.15
PELUCIA CREEK				
64	2.68	175.19	1989.65	398.02
65	15.99	84.70	1216.55	217.62
66	9.08	69.76	1978.13	278.19
67	9.08	39.17	327.57	57.45
68	15.09	120.49	2078.91	305.96
69	20.32	73.27	825.46	117.69
70	6.88	70.55	908.25	173.43
71	16.14	68.68	666.37	111.78
72	19.74	73.20	906.76	137.90
73	33.83	135.63	851.45	171.23
74	81.38	188.95	794.86	148.99
75	37.19	151.75	1021.19	176.82
76	59.28	106.45	377.00	59.59
77	47.02	156.90	924.23	179.04
64-77	2.68	108.19	2078.91	205.65

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
GREENWOOOD				
64	2088.57	11048.19	24142.86	4740.61
65	1065.71	8833.41	20328.57	5903.27
66	1787.14	6744.97	24042.86	4545.28
67	1718.57	7229.07	15785.71	2858.47
68	3508.57	13598.24	25828.57	5001.66
69	3660.00	12000.11	20842.86	3975.36
70	7478.57	13173.60	21671.43	3262.03
71	3024.29	9627.64	19928.57	4082.49
72	2511.43	7448.57	19014.29	3579.75
73	11428.57	19848.90	40857.14	6748.81
74	9974.29	19400.33	34185.71	6297.66
75	7800.00	16659.75	28885.71	6060.41
76	2347.14	9625.44	21000.00	4855.63
77	1487.43	7235.61	18342.86	3661.58
64-77	1065.71	11605.27	40857.14	6416.29
NPS-1				
64	-4056.54	-66.00	3934.57	1588.51
65	-3338.88	-137.09	1843.28	892.37
66	-7522.21	-519.36	1479.94	1277.37
67	-3562.68	-769.48	2649.21	994.45
68	-6671.78	-1573.22	1819.28	1683.24
69	-4445.76	-1258.35	535.23	918.08
70	-4830.29	-1300.25	2689.78	1452.72
71	-2825.51	100.02	3192.67	1184.89
72	-1716.43	1181.29	6873.62	1317.78
73	-14363.26	-1478.94	4774.08	3025.08
74	-9845.83	-2193.59	2469.95	2196.14
75	-4567.03	-1312.39	2888.53	1650.52
76	-5145.93	-710.04	1577.08	1429.79
77	-2802.24	188.72	4682.13	1382.38
64-77	-14363.26	-703.48	6873.62	1798.26
MONEY				
64	1766.01	7062.05	16305.62	3380.32
65	561.57	6560.73	16196.96	4777.44
66	1079.57	4160.67	15740.26	3037.28
67	1153.95	4699.29	10063.57	2140.94
68	1319.02	8803.71	18236.80	3996.30
69	2475.60	8372.99	15827.30	3288.55
70	4971.79	9452.04	15898.17	2633.74
71	2372.69	7101.03	15376.92	3123.45
72	1782.18	5581.76	15569.18	3133.48
73	6609.08	14355.61	22419.91	4880.00
74	7449.08	13407.60	21254.87	4056.83
75	6010.75	11627.51	19481.50	4288.23
76	1704.61	6461.54	14790.43	3219.69
77	1213.87	5570.09	15056.04	2947.52
64-77	561.57	8086.90	22419.91	4668.61

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
BIG SAND CREEK				
64	13.14	268.62	2447.32	540.32
65	15.36	147.15	1792.13	378.81
66	17.05	123.91	3935.25	541.68
67	26.16	87.81	571.99	108.14
68	18.43	147.58	1507.70	264.17
69	24.07	96.44	740.89	120.62
70	27.43	195.10	1412.19	332.61
71	29.28	140.82	1016.28	177.15
72	25.82	144.40	1309.94	220.04
73	27.43	229.60	2189.28	359.97
74	32.97	193.97	1165.44	243.40
75	25.67	250.50	1019.09	278.56
76	12.81	113.75	934.06	193.96
77	4.49	73.53	655.49	120.34
64-77	4.49	158.08	3935.25	311.48
TEOC CREEK				
64	24.16	79.36	519.03	108.11
65	22.97	55.87	522.26	89.20
66	23.83	50.25	832.98	112.07
67	25.17	41.66	135.01	24.52
68	21.66	65.77	407.55	78.88
69	23.15	45.47	199.30	33.30
70	25.17	75.23	530.19	97.98
71	19.97	57.82	343.47	60.24
72	15.97	44.93	288.64	46.94
73	14.60	76.77	712.44	111.84
74	11.89	56.90	309.04	64.71
75	26.78	83.04	287.30	64.44
76	19.51	45.57	198.05	41.97
77	15.79	37.70	251.49	36.13
64-77	11.89	58.31	832.98	76.10
POTOCOCOWA CREEK				
64	47.12	154.75	1012.11	210.81
65	44.79	108.95	1018.40	173.94
66	46.46	97.98	1624.30	218.54
67	49.07	81.23	263.27	47.82
68	42.23	128.25	794.71	153.82
69	45.14	88.66	388.64	64.94
70	49.07	146.71	1033.88	191.07
71	38.93	112.74	669.78	117.46
72	31.15	87.61	562.84	91.54
73	28.48	149.69	1389.26	218.09
74	23.19	110.96	602.63	126.18
75	52.22	161.92	560.24	125.66
76	38.04	88.86	386.19	81.84
77	30.80	73.51	490.40	70.45
64-77	23.19	113.70	1624.30	148.40

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
ASCALMORE CREEK				
64	32.02	48.83	118.50	19.80
65	32.28	46.59	321.48	40.48
66	32.60	44.35	187.96	24.73
67	31.92	41.11	72.98	10.73
68	21.23	62.30	380.18	65.19
69	28.29	44.69	126.28	20.75
70	29.21	63.62	458.13	69.14
71	23.06	51.54	444.48	65.55
72	15.03	29.88	80.75	15.37
73	2.22	56.03	503.02	85.03
74	8.02	34.61	302.14	53.29
75	19.23	59.99	315.37	40.69
76	27.48	39.82	112.50	16.89
77	17.99	38.93	211.69	25.92
64-77	2.22	47.31	503.02	46.52
WHALEY				
64	408.08	2863.48	6575.48	1533.74
65	295.96	1869.94	5257.02	1640.76
66	382.71	1358.74	5740.15	1045.04
67	433.76	1129.70	3640.50	593.43
68	997.24	3418.17	7830.65	1539.66
69	526.82	2506.38	4756.22	1180.03
70	1240.73	2771.94	6252.29	973.97
71	392.47	2372.56	4933.76	1167.93
72	606.83	1888.98	5160.62	888.49
73	2486.38	6361.97	19427.96	4163.05
74	1252.91	5189.30	14674.51	3040.08
75	1222.79	4297.05	8976.92	2075.27
76	761.55	2401.28	5246.39	1265.71
77	517.57	1846.15	6133.42	1114.62
64-77	295.96	2876.83	19427.96	2316.36
CANE CREEK				
64	15.10	49.60	324.39	67.57
65	14.36	34.92	326.41	55.75
66	14.89	31.40	520.61	70.05
67	15.73	26.03	84.38	15.33
68	13.54	41.11	254.72	49.30
69	14.47	28.42	124.56	20.81
70	15.73	47.02	331.37	61.24
71	12.48	36.13	214.67	37.65
72	9.98	28.08	180.40	29.34
73	9.13	47.98	445.28	69.90
74	7.43	35.56	193.15	40.44
75	16.74	51.90	179.56	40.28
76	12.19	28.48	123.78	26.23
77	9.87	23.56	157.18	22.58
64-77	7.43	36.44	520.61	47.57

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
GRENADA				
64	87.76	2066.14	7533.90	1392.30
65	54.60	1002.44	4447.26	1094.88
66	88.42	804.73	7720.48	1162.37
67	100.76	588.12	3993.09	583.94
68	152.14	2270.73	8929.36	1600.22
69	138.97	1612.52	4839.63	1057.08
70	306.25	2259.42	7525.95	1263.11
71	83.95	1625.07	4139.88	1077.68
72	84.96	1126.71	4439.87	919.02
73	391.59	4290.21	12813.53	2152.29
74	250.64	4054.58	9869.23	2512.28
75	88.51	2804.83	5418.63	1293.81
76	153.82	1542.17	4528.97	1154.18
77	75.98	871.69	2649.87	629.81
64-77	54.60	1922.81	12813.53	1755.30
BUTUPAN BOGUE				
64	.01	216.18	3428.59	623.16
65	.01	122.08	2649.34	446.56
66	.01	111.80	4970.10	688.80
67	.01	82.76	1866.76	282.93
68	.01	260.37	5307.17	844.04
69	.01	151.32	2947.05	558.97
70	.01	314.10	4523.10	942.54
71	.01	104.23	1675.56	290.92
72	.01	153.38	2873.80	472.20
73	.01	777.33	8183.94	1274.36
74	.01	612.94	3110.83	868.14
75	.01	220.69	1710.72	389.45
76	.01	63.00	567.37	148.27
77	.01	77.59	1502.54	252.14
64-77	.01	233.41	8183.94	678.89
GRENDA DAM				
64	54.43	2183.96	3790.00	1062.75
65	5.00	1130.98	3117.14	989.49
66	5.00	874.21	2855.71	756.30
67	106.71	654.67	1640.00	486.56
68	5.00	2259.92	4474.29	1250.16
69	237.86	1792.88	3315.71	1079.71
70	248.86	2121.54	3488.57	1008.09
71	5.00	1791.48	3482.86	1171.81
72	5.00	1154.31	3635.71	995.69
73	94.14	3124.37	4688.57	1372.30
74	169.86	3188.61	5685.71	1767.48
75	5.00	2686.35	4670.00	1384.78
76	216.71	1878.79	3937.14	981.79
77	5.00	1064.73	2655.94	810.06
64-77	5.00	1850.49	5685.71	1356.04

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
NPS-2				
64	-2123.10	774.68	2460.20	821.33
65	-3284.20	199.72	1183.46	972.17
66	-2417.69	1051.42	3488.31	780.82
67	66.55	1270.62	2102.35	481.04
68	-1477.59	1163.01	2195.06	768.93
69	-408.53	978.83	2111.40	625.62
70	-3110.42	679.28	1999.04	873.58
71	-1454.19	-44.59	731.58	452.24
72	-2504.82	-211.49	580.00	579.03
73	-9049.12	-1175.05	2629.45	2804.11
74	-2978.72	552.56	2495.82	1195.44
75	-1597.27	401.66	1856.70	707.18
76	-408.58	603.30	2703.25	566.99
77	-3933.02	-291.86	1317.27	1013.16
64-77	-9049.12	425.15	3488.31	1240.84
NPS-3				
64	-2519.87	544.17	4544.70	1047.93
65	-743.32	677.04	3966.65	896.41
66	-4313.21	380.27	3934.20	906.61
67	-766.68	393.21	2233.39	381.98
68	-3726.07	915.78	4489.66	1264.60
69	-1788.25	732.08	3700.24	991.64
70	-4066.04	255.17	4412.76	1335.03
71	-1675.74	547.07	3304.42	693.63
72	-2249.20	616.69	2846.29	687.71
73	-2680.80	1818.05	15953.43	3526.40
74	-3556.83	953.59	8798.90	2461.42
75	-657.31	1218.41	6557.46	1585.58
76	-431.09	701.94	2577.58	499.07
77	-14.99	838.46	4303.96	831.98
64-77	-4313.21	756.57	15953.43	1503.72
NPS-4				
64	-1122.84	-334.01	1862.45	584.28
65	-872.99	-250.63	1439.14	445.17
66	-750.85	-181.27	2699.81	467.22
67	-570.36	-149.31	1014.04	288.66
68	-1023.83	-249.56	2882.90	661.45
69	-938.09	-331.68	1600.87	513.85
70	-866.58	-176.21	2456.99	680.81
71	-833.58	-270.64	910.18	390.86
72	-811.48	-180.97	1561.07	422.13
73	-333.93	388.51	4445.59	717.01
74	-789.65	253.02	1689.83	549.35
75	-815.46	-102.21	929.28	407.00
76	-975.63	-399.62	308.20	377.93
77	-804.52	-270.63	816.19	361.04
64-77	-1122.84	-161.09	4445.59	545.27

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
SWANLAKE				
64	1751.57	7984.67	18600.00	3610.37
65	774.14	6840.29	17042.86	4671.29
66	987.14	4333.35	14800.00	2887.33
67	1251.43	5248.24	11471.43	2413.82
68	1148.43	8508.90	16942.86	3445.52
69	2450.00	8150.55	18300.00	3221.61
70	3455.71	8621.65	14471.43	2296.16
71	2068.57	6127.23	14471.43	2900.20
72	1478.57	4874.45	15385.71	3052.28
73	5814.29	13710.96	36428.57	6429.14
74	6854.29	12797.09	25671.43	4905.71
75	5847.14	10985.36	20042.86	4164.43
76	1348.57	5943.87	15500.00	2897.27
77	1122.86	4719.62	11463.96	2521.47
64-77	774.14	7774.73	36428.57	4656.92
NPS-5				
64	-2695.06	-922.63	1012.74	826.51
65	-1665.93	-279.55	1635.05	716.14
66	-1880.05	-172.68	2517.00	620.02
67	-2411.79	-548.95	489.79	543.85
68	-1397.58	294.81	3412.15	1038.53
69	-2472.70	222.44	1901.50	745.23
70	-1106.81	830.39	3455.57	1003.85
71	-421.01	973.81	1964.67	551.39
72	-690.80	707.31	3286.10	676.66
73	-14816.10	644.65	4733.75	3383.43
74	-5036.62	610.51	5164.42	2233.11
75	-1365.72	642.16	2928.71	1060.09
76	-709.57	517.67	3309.88	776.18
77	-615.63	850.47	5514.61	1140.64
64-77	-14816.10	312.17	5514.61	1430.97
LOCOPOLIS				
64	1964.00	6700.37	16698.17	3300.83
65	713.15	5991.02	18477.94	4446.92
66	914.00	3607.11	13176.53	2608.98
67	1207.16	4180.59	9061.26	1922.33
68	1137.40	7420.02	16067.41	3280.64
69	2222.11	7560.46	17489.90	3131.91
70	4091.55	8235.11	13244.75	2092.77
71	2042.10	5629.05	13080.69	2515.22
72	1445.53	4498.36	15641.80	2824.63
73	5585.78	13687.37	29802.49	6036.55
74	7474.87	12639.32	23752.34	4593.61
75	5804.07	11009.51	20544.46	4275.05
76	275.11	4760.73	14472.99	3357.68
77	108.55	3275.42	10473.91	2701.74
64-77	108.55	7085.32	29802.49	4735.85

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
NPS-6				
64	-287.14	1284.30	2706.65	535.20
65	-2020.80	849.27	2187.30	621.10
66	-80.16	726.24	1699.44	433.77
67	44.27	1067.65	2410.17	541.10
68	11.03	1088.88	2241.63	417.92
69	-145.77	590.09	2295.31	416.43
70	-779.63	386.54	1368.55	422.42
71	-222.58	498.18	1875.73	473.01
72	-256.09	376.09	2512.12	470.54
73	-2124.90	23.59	6626.08	1289.22
74	-985.87	157.77	1919.09	602.29
75	-1373.03	-24.15	1100.26	430.96
76	-2489.31	1183.14	2007.28	858.21
77	168.58	1444.20	2792.93	545.96
64-77	-2489.31	689.41	6626.08	767.48
LAMBERT				
64	708.57	2751.56	9590.00	2457.89
65	208.71	2480.74	10554.29	2750.98
66	241.71	1574.63	9334.29	1803.78
67	234.14	1813.62	6725.71	1449.65
68	310.86	3149.54	9822.86	2461.38
69	116.43	2944.59	10272.86	2491.09
70	143.00	2984.63	9842.86	2255.78
71	383.43	1956.62	8032.86	1597.96
72	552.86	2156.59	11285.71	2254.47
73	245.14	5131.68	14571.43	3754.97
74	517.14	4284.89	11971.43	3182.54
75	255.29	4196.51	11278.57	2762.11
76	179.14	1986.43	7194.29	1849.68
77	390.09	1663.70	5683.22	1379.26
64-77	116.43	2791.13	14571.43	2606.71
TILLATOBA CREEK				
64	.01	149.94	1908.52	352.23
65	.01	113.94	1438.80	285.63
66	.01	66.97	1535.55	239.66
67	.01	33.33	484.01	81.12
68	.01	238.54	1547.97	444.34
69	.01	177.62	1611.11	333.90
70	.01	205.71	1578.02	369.74
71	.01	219.60	1523.29	334.86
72	.01	121.57	1097.26	188.51
73	.01	461.67	2285.17	606.16
74	.01	411.86	2080.27	558.29
75	.01	436.07	1653.86	434.55
76	.01	177.09	894.92	293.04
77	.01	68.04	820.79	161.86
64-77	.01	205.85	2285.17	383.67

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
ENID DAM				
64	5.00	859.62	1670.00	503.46
65	5.00	608.57	1594.29	316.98
66	5.00	510.27	1977.14	516.17
67	74.71	564.01	1600.00	517.69
68	5.00	964.68	2521.43	657.83
69	5.00	1001.91	1445.71	413.23
70	5.00	1269.15	2550.00	689.78
71	5.00	788.70	3234.29	693.36
72	5.00	427.20	1600.00	356.74
73	5.00	1794.33	3925.71	924.86
74	5.00	1583.17	3232.86	926.84
75	1.20	1301.02	2271.43	666.22
76	5.00	674.19	1715.71	533.70
77	28.44	481.96	1611.98	338.57
64-77	1.20	916.34	3925.71	728.62
PETERS CREEK				
64	.01	67.81	863.09	159.29
65	.01	51.53	650.67	129.17
66	.01	30.29	694.42	108.38
67	.01	15.08	218.88	36.68
68	.01	107.88	700.04	200.94
69	.01	80.33	728.59	151.00
70	.01	93.03	713.63	167.20
71	.01	99.31	688.87	151.43
72	.01	54.98	496.22	85.25
73	.01	208.78	1033.42	274.12
74	.01	186.26	940.76	252.47
75	.01	197.20	747.92	196.52
76	.01	80.09	404.71	132.52
77	.01	30.77	371.19	73.19
64-77	.01	93.10	1033.42	173.51
BATESVILLE				
64	261.46	3189.94	6753.07	1352.19
65	128.22	3069.29	6888.79	1624.21
66	174.16	1720.78	4523.08	991.58
67	352.71	2092.22	4539.34	1228.28
68	255.73	2964.29	5771.33	1284.56
69	810.83	3348.54	6817.05	1089.81
70	407.92	3603.70	5879.77	1459.33
71	197.99	2187.73	4289.42	1180.31
72	96.67	1596.67	4571.34	1196.95
73	1073.35	5348.08	13815.14	2246.18
74	623.47	5428.61	7599.79	1355.15
75	408.82	4029.11	6621.21	1395.55
76	102.53	2202.94	5469.06	1066.51
77	52.50	1696.94	4595.02	1221.40
64-77	52.50	3034.20	13815.14	1816.10

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
SARDIS DAM				
64	15.00	2326.15	4250.00	1235.74
65	15.00	2279.25	4277.14	1229.03
66	15.00	1279.83	3741.43	827.39
67	65.14	1602.01	4234.29	1247.77
68	15.00	2190.62	4552.86	1266.51
69	15.00	2702.68	4221.43	1053.97
70	15.00	2830.76	4572.86	1457.86
71	15.00	1817.26	3977.14	1145.61
72	15.00	1227.58	3522.86	1050.81
73	301.57	4176.17	10997.14	1617.35
74	15.00	4272.99	5987.14	1499.72
75	15.00	3296.18	5328.57	1471.03
76	15.00	1993.66	4332.86	976.66
77	15.00	1490.80	4082.87	1117.84
64-77	15.00	2391.85	10997.14	1553.79
MC IVOR DRAINAGE				
64	.01	150.26	992.31	172.08
65	1.74	137.43	1062.52	194.52
66	.01	77.06	766.97	109.28
67	.01	86.50	368.73	73.62
68	.01	136.14	932.62	170.33
69	.01	112.42	856.98	138.48
70	.01	136.25	639.90	138.38
71	.01	66.45	411.65	79.90
72	.01	69.24	604.84	108.90
73	.01	205.43	1191.89	231.41
74	.01	201.29	1060.02	208.12
75	.01	133.15	727.49	150.13
76	.01	45.48	474.23	85.14
77	.01	48.66	303.51	87.26
64-77	.01	114.70	1191.89	154.41
NPS-7				
64	-3465.69	-318.50	4254.67	1288.65
65	-3523.83	-333.07	3207.52	1125.29
66	-2201.91	-295.84	3423.21	835.68
67	-1483.89	-337.66	1079.01	531.88
68	-2133.80	-4.90	3450.88	1395.74
69	-3362.34	7.48	3591.65	1078.67
70	-1647.15	78.89	3517.89	1104.84
71	-751.32	377.09	3395.86	841.13
72	-1600.94	141.35	2446.13	591.36
73	-5164.40	742.83	5094.33	1807.96
74	-1676.58	744.53	4637.54	1420.61
75	-3156.22	849.58	3686.95	1199.50
76	-1849.35	-360.01	1995.04	1204.36
77	-1787.96	-666.00	1829.79	830.31
64-77	-5164.40	44.70	5094.33	1218.84

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
NPS-8				
64	-1.29	713.53	4712.19	817.19
65	8.28	652.61	5045.56	923.72
66	-105.50	363.89	3642.11	520.60
67	-226.92	403.71	1750.99	359.80
68	-209.45	637.53	4428.71	817.02
69	-23.01	533.43	4069.50	657.97
70	-255.83	636.69	3038.68	669.05
71	-466.33	304.02	1954.79	394.60
72	-369.03	299.85	2872.21	541.33
73	-298.03	966.48	5659.90	1107.97
74	-79.83	954.32	5033.68	989.88
75	-672.84	599.78	3454.64	751.09
76	-449.75	163.80	2251.97	443.27
77	-640.59	157.48	1441.30	472.39
64-77	-672.84	527.65	5659.90	748.86
MARKS				
64	477.68	2667.16	9127.11	2371.67
65	248.59	2417.38	9862.84	2715.71
66	219.50	1336.59	8499.96	1675.44
67	276.12	1539.50	5906.66	1210.94
68	310.76	3016.09	8685.97	2314.53
69	359.30	3000.07	10162.69	2461.05
70	1204.03	3187.76	9225.87	1907.19
71	422.93	2083.74	8287.63	1689.35
72	422.87	2070.91	12477.68	2369.96
73	1206.61	6063.57	14854.86	3630.43
74	2076.59	5274.18	12168.63	2911.91
75	1198.02	4778.49	11357.24	2766.48
76	537.08	2422.21	8376.49	2085.84
77	586.53	1883.99	6423.61	1412.99
64-77	219.50	2981.55	14854.86	2692.68
NPS-9				
64	-487.16	84.40	755.61	303.56
65	-350.84	63.36	736.87	222.26
66	-121.46	238.04	1124.06	270.18
67	-327.16	274.12	934.71	349.06
68	-578.49	133.45	1477.78	373.45
69	-554.98	-55.48	548.24	247.66
70	-1076.33	-203.13	981.95	491.74
71	-985.96	-127.12	484.44	313.97
72	-1191.97	85.68	660.16	300.39
73	-2045.71	-931.89	121.36	482.81
74	-1790.85	-989.29	839.66	518.74
75	-1434.57	-581.97	2005.34	566.93
76	-1459.80	-435.78	60.22	355.84
77	-1067.04	-220.28	189.83	185.19
64-77	-2045.71	-190.42	2005.34	538.88

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
DARLING				
64	325.86	2054.99	8284.70	2243.08
65	184.59	1941.48	8908.21	2422.06
66	170.80	1045.11	8103.23	1458.48
67	192.07	1179.71	5356.21	1075.48
68	248.09	2364.46	7492.56	2074.99
69	154.82	2323.77	8978.98	2326.41
70	340.42	2368.21	8370.70	1784.47
71	223.64	1592.44	6984.52	1464.73
72	365.36	1717.96	13089.13	2356.12
73	436.49	4953.64	14686.54	3743.11
74	558.92	3958.19	11784.34	3085.61
75	429.37	3836.81	10975.99	2644.14
76	314.31	2068.54	7720.78	1900.68
77	333.53	1533.11	5730.79	1189.11
64-77	154.82	2352.74	14686.54	2474.42
NPS-10				
64	100.00	612.17	1365.49	285.59
65	63.78	475.90	1448.37	388.98
66	48.70	291.48	1897.05	313.84
67	15.98	359.79	1146.82	225.86
68	51.17	651.63	1396.27	326.02
69	-98.68	676.30	1223.07	286.34
70	40.86	819.55	1363.57	251.76
71	75.39	491.30	1510.64	340.55
72	-611.45	352.96	1362.15	319.12
73	-439.93	1109.93	2854.46	504.24
74	-1222.18	1315.99	2078.21	471.96
75	381.25	941.68	1956.17	309.93
76	-27.34	353.67	1148.37	263.46
77	22.21	350.88	1219.98	305.43
64-77	-1222.18	628.80	2854.46	451.94
SLEDGE				
64	653.25	2215.38	6336.15	1475.33
65	455.69	1976.56	6437.07	1744.52
66	434.01	1265.19	6468.56	1103.38
67	400.57	1429.91	4315.90	885.20
68	425.36	2100.84	5422.05	1416.18
69	262.78	2079.15	6438.60	1605.96
70	185.97	1977.05	5591.14	1140.44
71	288.65	1363.71	4434.20	1018.32
72	373.49	1475.24	9410.28	1612.51
73	100.11	3561.61	11091.25	2509.96
74	343.99	2911.04	8641.48	2059.58
75	351.82	2917.20	7961.15	1889.83
76	247.24	1636.65	5570.22	1405.47
77	401.66	1299.91	4267.79	925.19
64-77	100.11	2014.96	11091.25	1678.27

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
NPS-11				
64	-767.95	-160.39	2445.62	819.64
65	-1095.45	-35.08	3074.81	784.28
66	-563.46	-220.08	2097.57	492.52
67	-780.39	-250.20	1040.31	332.70
68	-483.33	263.62	2483.00	748.18
69	-310.82	244.63	3050.77	773.85
70	-611.15	391.16	2781.06	717.69
71	-231.05	228.73	2662.55	511.24
72	-228.12	242.71	3678.85	786.61
73	-524.29	1392.03	9275.45	1765.52
74	62.53	1047.15	4004.99	1098.78
75	-369.28	919.60	3014.84	813.07
76	-259.73	431.89	2563.24	562.87
77	-319.81	233.19	1463.00	351.96
64-77	-1095.45	337.78	9275.45	945.19
CRENSHAW				
64	604.80	2493.82	7383.97	1724.16
65	382.49	2183.59	7386.43	2089.11
66	336.35	1352.10	6609.01	1241.54
67	330.09	1682.32	4803.66	1097.07
68	357.76	2302.29	5716.41	1503.85
69	87.00	2248.53	7607.48	1770.67
70	102.73	2069.24	5038.74	1184.97
71	101.94	1310.59	4802.43	1088.60
72	319.78	1394.50	10216.68	1686.09
73	110.68	3347.76	13631.35	2845.82
74	41.75	2315.51	9321.82	2038.19
75	97.95	2840.92	7261.63	1796.63
76	16.69	1452.64	5222.68	1361.84
77	136.18	1108.23	4121.14	915.01
64-77	16.69	2007.29	13631.35	1770.95
NPS-12				
64	-1053.95	-278.45	78.46	321.07
65	-1034.90	-207.03	327.89	407.58
66	-757.11	-86.91	733.41	254.36
67	-712.74	-252.41	70.48	237.98
68	-817.66	-201.45	380.05	263.59
69	-1168.88	-169.38	590.36	278.43
70	-1100.89	-92.20	911.07	295.21
71	-862.79	53.12	1037.39	235.09
72	-806.40	80.74	1533.87	299.21
73	-7233.88	213.85	1999.44	1273.00
74	-680.34	595.53	2954.02	463.93
75	-659.78	76.29	937.04	328.75
76	-962.82	184.01	1264.87	282.17
77	-342.61	191.69	1358.32	218.61
64-77	-7233.88	7.67	2954.02	503.26

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
SARAH				
64	468.04	2028.05	6943.26	1450.25
65	322.53	1815.68	7100.84	1787.26
66	263.54	1122.20	5441.06	1064.51
67	296.08	1465.38	4129.26	986.52
68	302.69	2059.33	5043.01	1338.23
69	129.78	1971.24	6804.43	1518.13
70	163.58	1986.02	4422.09	1052.68
71	84.86	1163.92	4543.41	1020.93
72	181.70	1271.38	8405.78	1457.73
73	77.42	3207.02	13949.71	2644.60
74	98.19	2307.93	7589.69	1604.85
75	202.79	3163.73	7297.90	1830.87
76	97.49	1680.32	5556.23	1554.08
77	188.26	1245.87	4011.20	967.90
64-77	77.42	1892.00	13949.71	1630.57
NPS-13				
64	136.76	465.77	2798.56	403.83
65	50.55	367.91	1496.96	345.36
66	-79.97	229.90	1167.95	196.61
67	15.09	216.95	674.40	119.24
68	-95.09	242.96	762.17	199.34
69	-42.78	277.29	1368.54	285.55
70	-1216.69	83.22	718.10	278.58
71	13.21	146.68	499.82	96.10
72	-154.05	123.12	1810.90	273.83
73	-900.91	140.74	1809.66	515.61
74	-508.14	7.58	1732.13	516.91
75	-694.85	-322.82	-2.28	161.58
76	-1493.01	-227.68	477.31	345.28
77	-822.02	-137.64	401.20	237.57
64-77	-1493.01	115.28	2798.56	375.15
STRAYHORN CREEK				
64	.27	90.93	1442.12	268.83
65	.27	107.13	2254.51	361.28
66	.27	142.40	2716.39	519.81
67	.27	26.27	447.78	78.27
68	.27	31.10	544.39	82.67
69	.27	35.04	523.48	111.76
70	.27	29.97	380.73	66.65
71	.27	11.19	162.79	28.81
72	.27	30.98	592.39	103.10
73	.27	68.43	1345.55	213.37
74	.27	51.50	620.76	114.83
75	.03	44.62	984.70	140.55
76	.03	20.20	374.11	66.73
77	.03	9.26	73.26	18.05
64-77	.03	49.93	2716.39	208.18

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
ARKABUTLA CREEK				
64	.59	201.22	3191.07	594.85
65	.59	237.05	4988.69	799.43
66	.59	315.09	6010.74	1150.23
67	.59	58.14	990.84	173.18
68	.59	68.81	1204.61	182.92
69	.59	77.53	1158.33	247.29
70	.59	66.31	842.48	147.48
71	.59	24.76	360.22	63.74
72	.59	68.55	1310.82	228.14
73	.59	151.41	2977.39	472.13
74	.59	113.97	1373.59	254.10
75	.06	98.72	2178.92	311.00
76	.06	44.70	827.82	147.65
77	.06	20.49	162.10	39.95
64-77	.06	110.48	6010.74	460.65
PRICHARD				
64	136.83	1724.91	5123.05	1443.88
65	151.84	1629.27	5407.92	1766.71
66	146.52	892.28	3937.59	940.99
67	146.52	1238.31	3589.74	958.86
68	176.23	1852.97	4689.67	1281.20
69	47.27	1924.83	5925.10	1566.28
70	71.59	1762.41	4092.04	982.41
71	53.58	1121.33	3841.29	979.22
72	176.73	1240.22	9892.21	1589.95
73	151.21	3452.03	13030.41	2627.59
74	101.14	2401.89	6959.00	1708.81
75	63.34	2609.44	6493.50	1842.85
76	24.10	1503.95	6475.33	1603.15
77	104.41	931.04	4126.01	909.37
64-77	24.10	1734.63	13030.41	1649.81
NPS-14				
64	-3924.02	10.99	363.88	793.09
65	-5550.28	-157.78	268.72	974.83
66	-7223.66	-227.57	427.84	1559.95
67	-899.11	142.66	507.18	186.93
68	-355.15	106.46	509.24	165.94
69	-1559.62	-66.15	301.24	312.23
70	-205.82	127.34	972.58	191.35
71	-217.03	6.64	538.96	146.87
72	-1530.20	-68.37	287.58	322.58
73	-2171.23	-464.84	711.53	561.02
74	-1405.53	-259.43	1901.38	534.73
75	-1484.94	410.95	1181.87	434.94
76	-4362.25	111.47	1325.80	894.74
77	-142.42	285.08	891.22	222.96
64-77	-7223.66	-3.04	1901.38	683.94

YEAR	MINIMUM	MEAN	MAXIMUM	STANDARD DEVIATION
LAKE CORMORANT BAYOU				
64	.01	219.89	1928.06	387.91
65	.01	164.98	1626.95	329.23
66	.01	80.68	1838.10	290.07
67	.01	94.46	1143.38	195.92
68	.01	204.25	1285.40	310.51
69	.01	182.00	2105.21	376.27
70	.01	185.71	969.79	250.20
71	.01	100.53	1098.93	189.25
72	.01	163.27	2203.76	448.46
73	.01	455.19	2626.49	604.55
74	.01	348.39	2674.14	519.78
75	.01	370.87	2770.39	488.88
76	.01	214.35	1780.38	419.73
77	.01	82.31	837.57	169.41
64-77	.01	204.78	2770.39	390.22
ARKABUTLA DAM				
64	40.43	1266.43	3972.86	982.73
65	105.29	1288.12	4001.43	1371.24
66	43.00	740.98	2844.29	749.52
67	113.14	1055.20	2977.14	819.72
68	139.00	1429.77	3398.57	982.81
69	5.00	1558.70	4797.14	1169.47
70	5.00	1376.20	2984.29	770.08
71	5.00	927.45	2524.29	745.66
72	198.14	931.49	5222.86	832.40
73	5.00	2492.44	7675.71	1614.71
74	5.00	1664.21	5030.00	1201.40
75	5.00	1828.03	4608.57	1285.93
76	5.00	1060.19	3972.86	1047.99
77	5.00	790.32	3011.34	709.28
64-77	5.00	1314.97	7675.71	1139.30
NPS-15				
64	-86.12	238.59	2157.13	438.79
65	-66.03	176.17	1820.26	373.02
66	-97.47	70.62	2056.49	331.22
67	-114.69	88.65	1279.22	229.17
68	-120.37	218.96	1438.12	354.40
69	-190.96	184.12	2355.34	432.79
70	-116.33	200.50	1085.01	286.45
71	-102.31	93.35	1229.50	224.05
72	-150.18	145.45	2465.59	517.50
73	-115.47	504.40	2938.54	680.39
74	-21.88	389.29	2991.86	581.89
75	-67.61	410.55	3099.54	550.50
76	-93.66	229.41	1991.92	475.43
77	-190.96	58.41	937.09	209.92
64-77	-190.96	214.89	3099.54	445.01

Appendix C

Spatial Design

This appendix contains the detailed spatial design of the Yazoo River Basin used in the known discharge sediment routing model in Phase II. These figures show the locations of all cross sections used in the model as well as locations of tributaries and important towns.

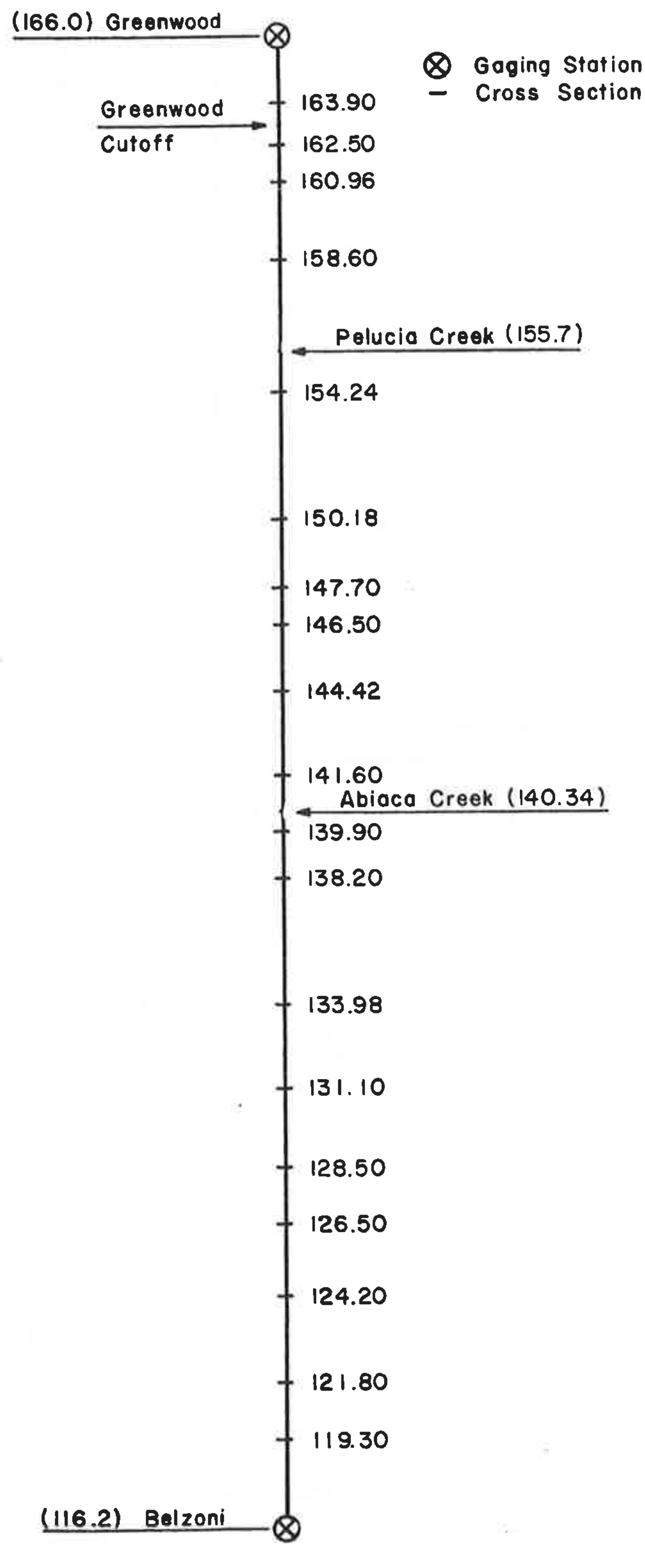


Figure C.1. Mainstem, Belzoni to Greenwood.

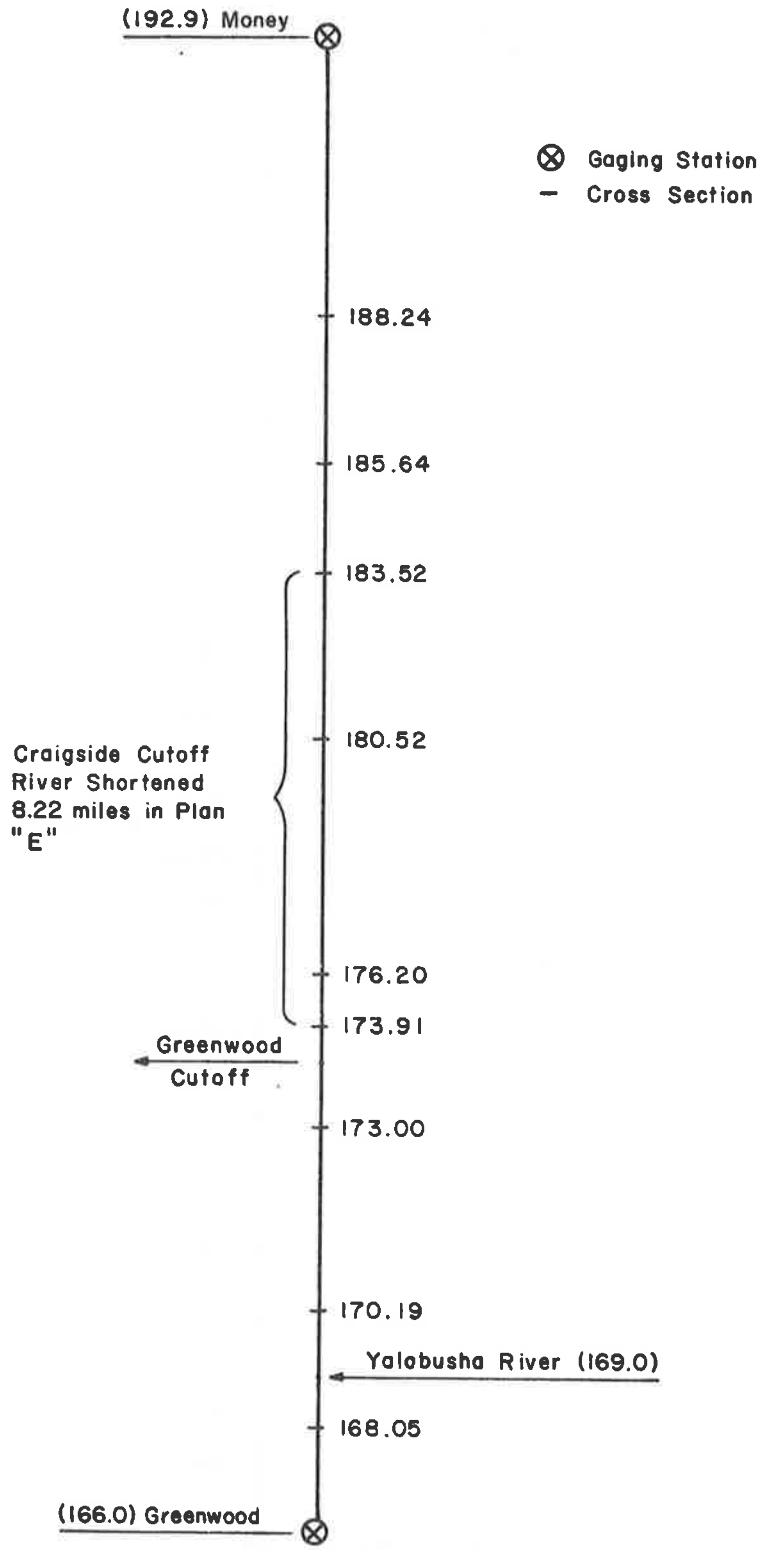


Figure C.2. Mainstem, Greenwood to Money.

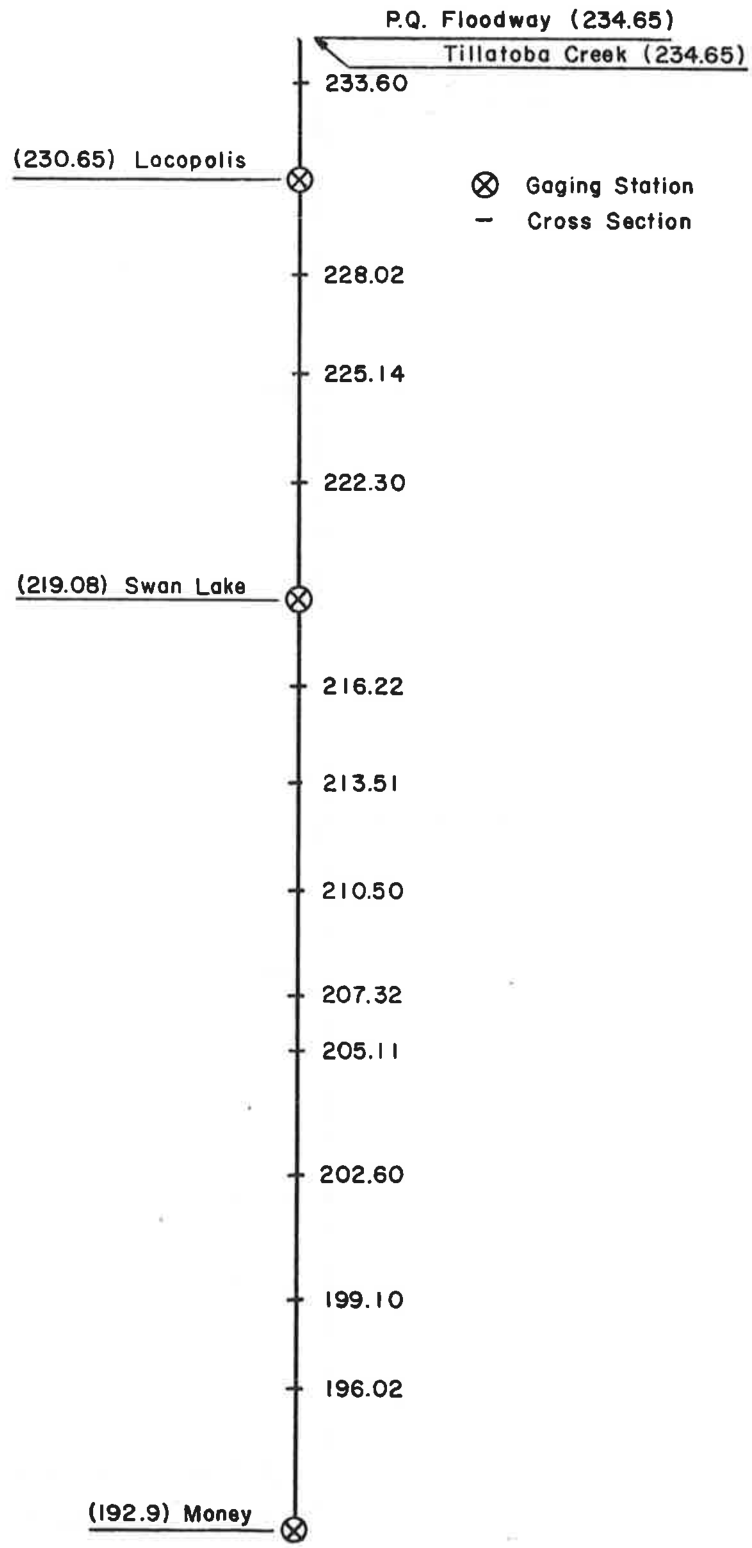


Figure C.3. Mainstem, Money to P-Q Floodway.

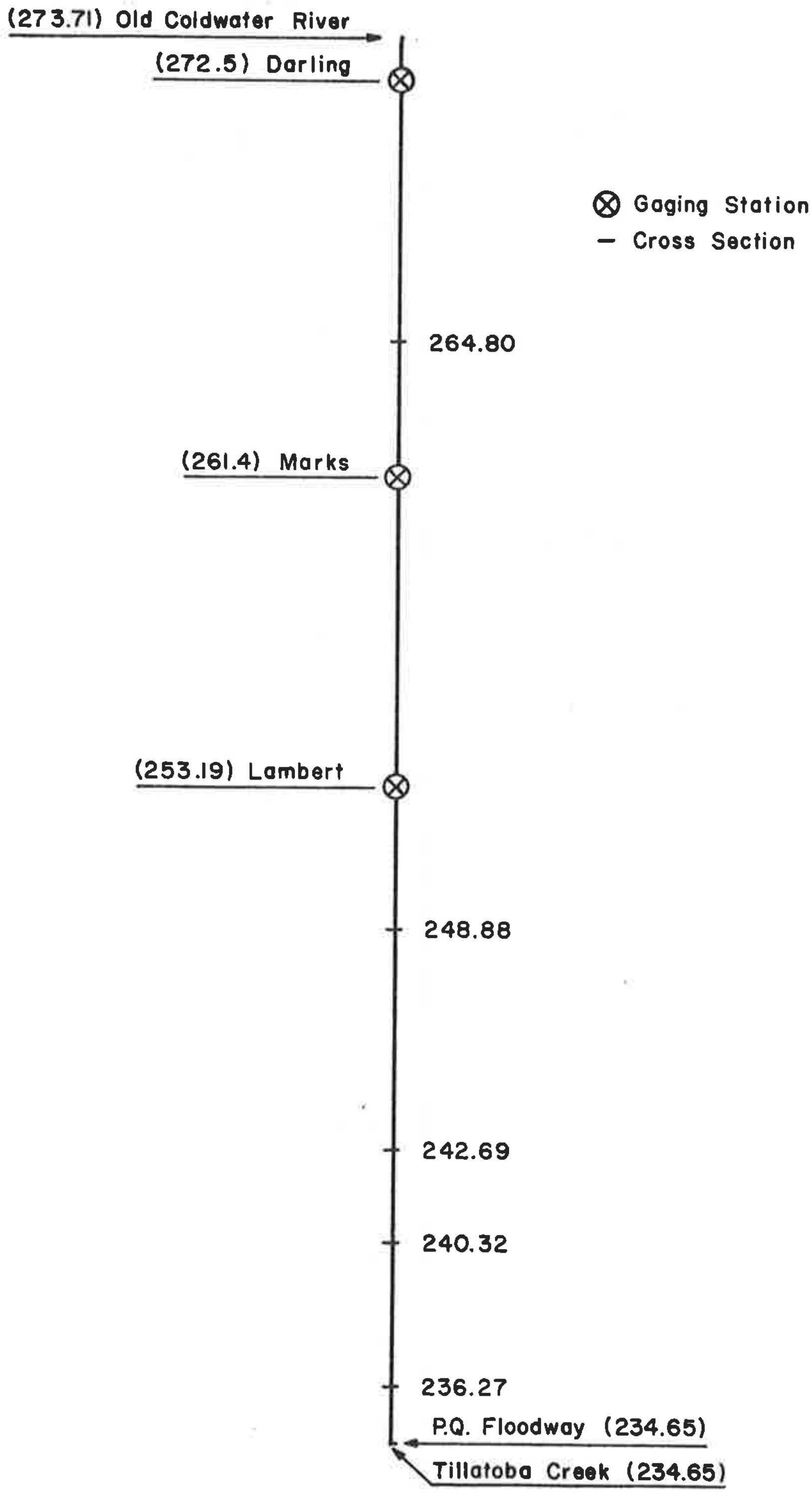


Figure C.4. Mainstem, P-Q Floodway to Old Coldwater River.

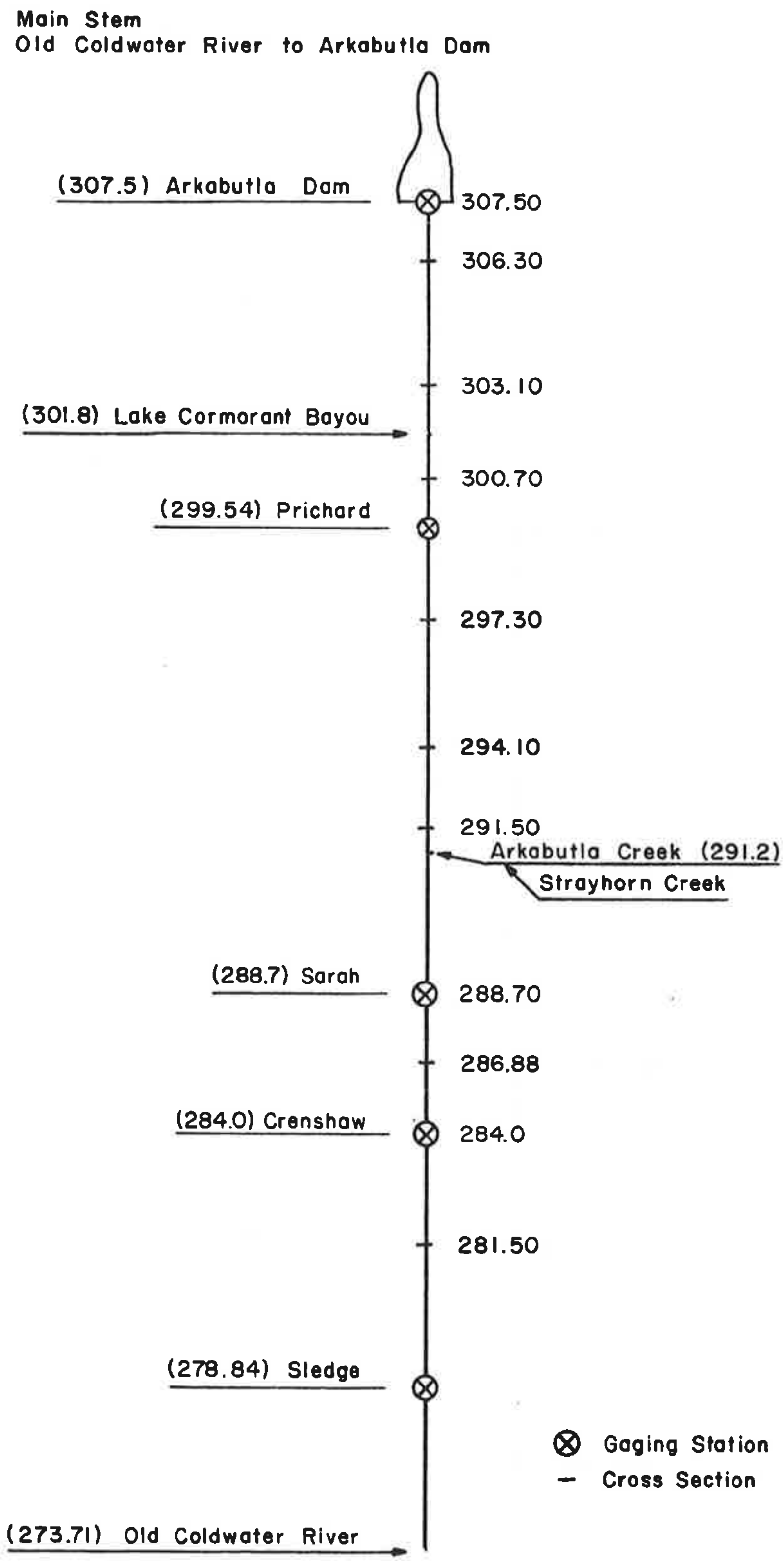


Figure C.5. Mainstem, Old Coldwater River to Arkabutla Dam.

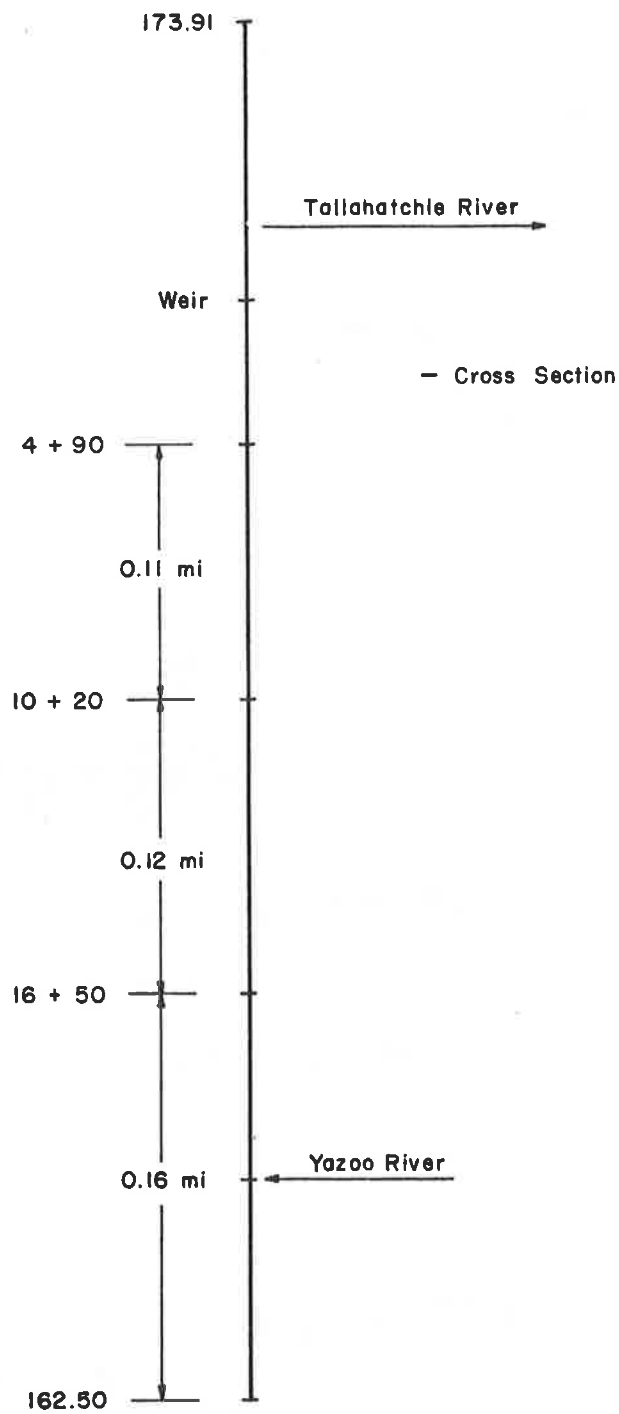


Figure C.6. Fort Pemberton (Greenwood) Cut-off.

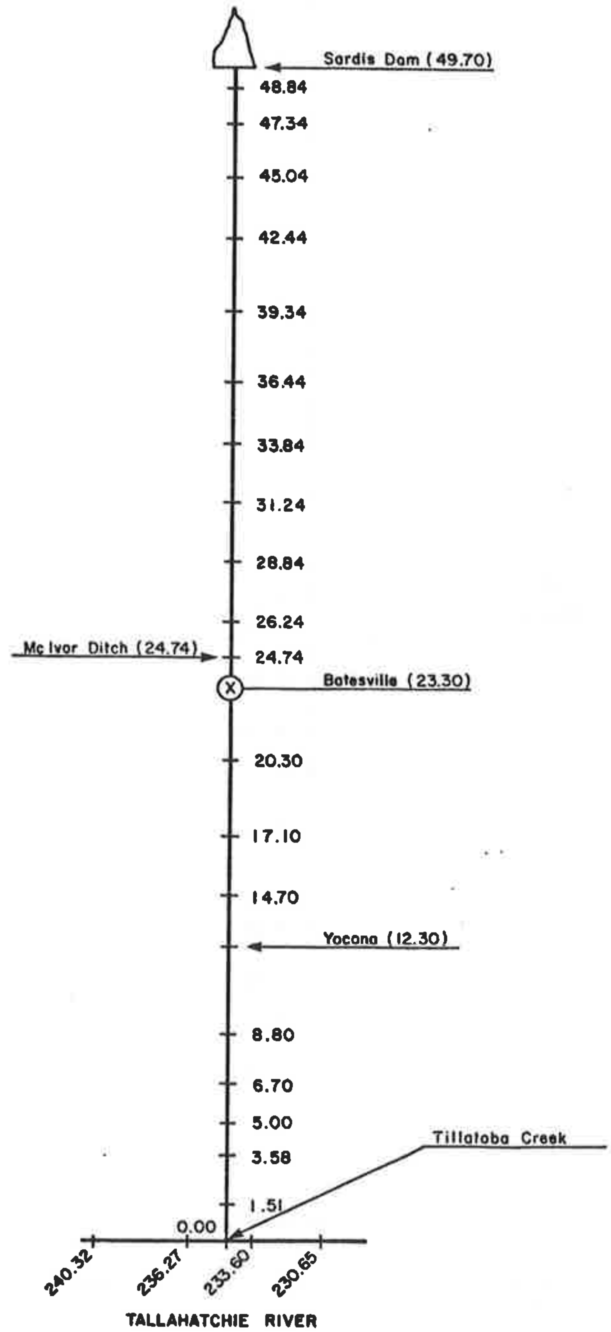


Figure C.7. P-Q Floodway and Little Tallahatchie River.

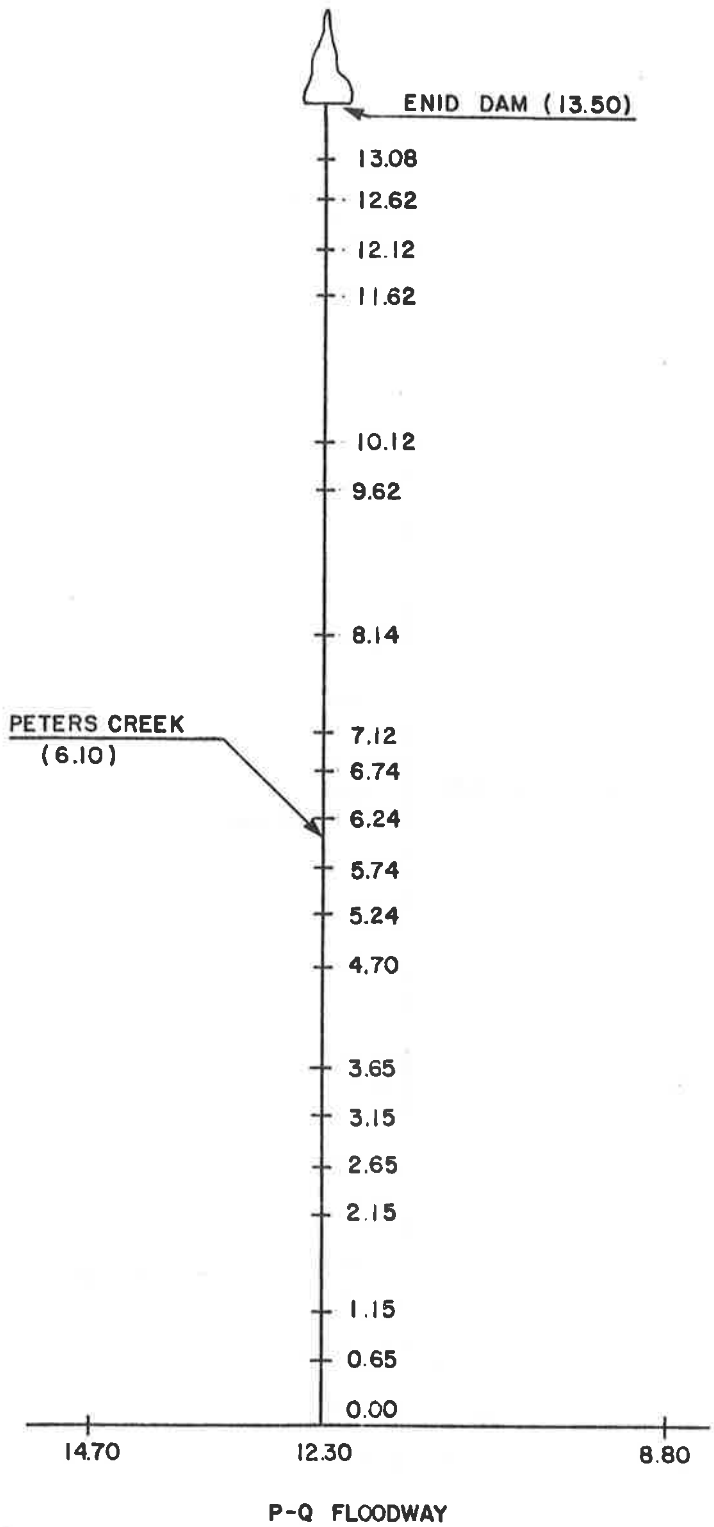


Figure C.8. Yocona River.

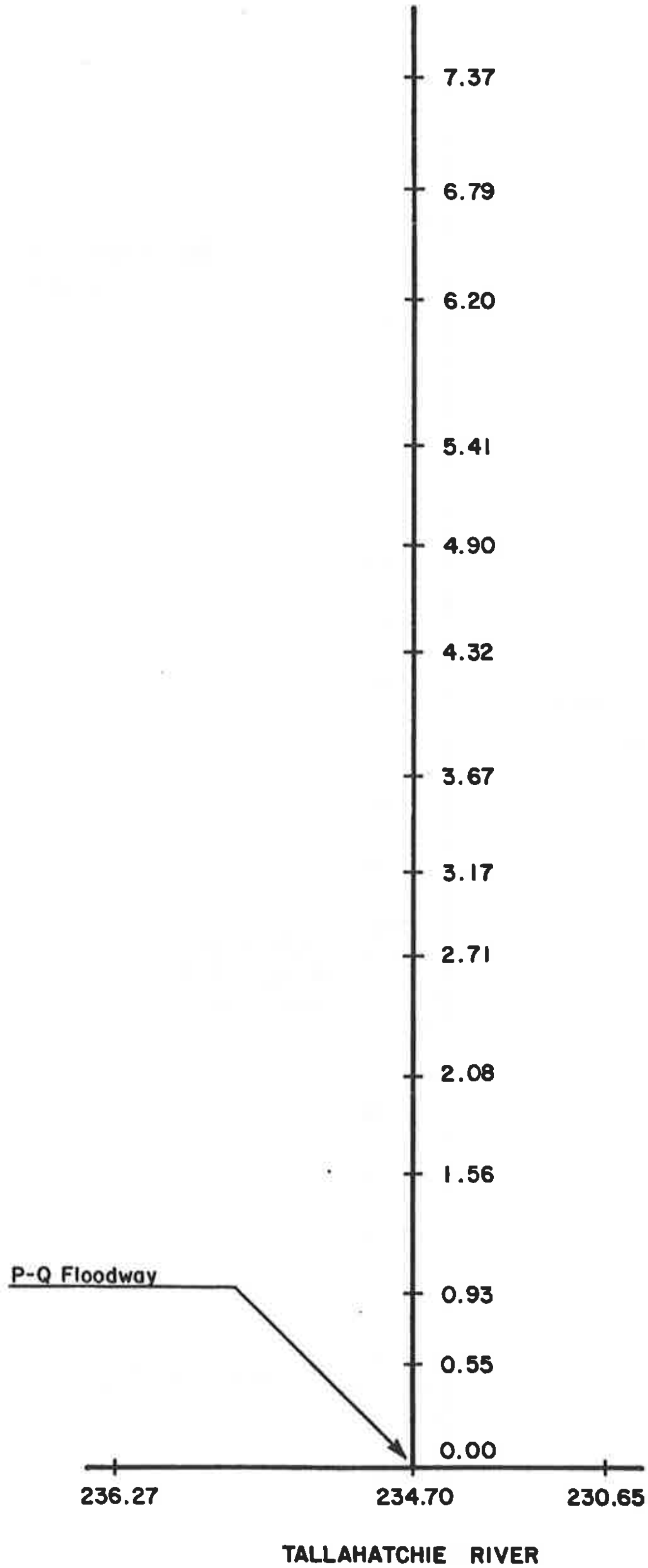


Figure C.9. Tillatoba Creek.

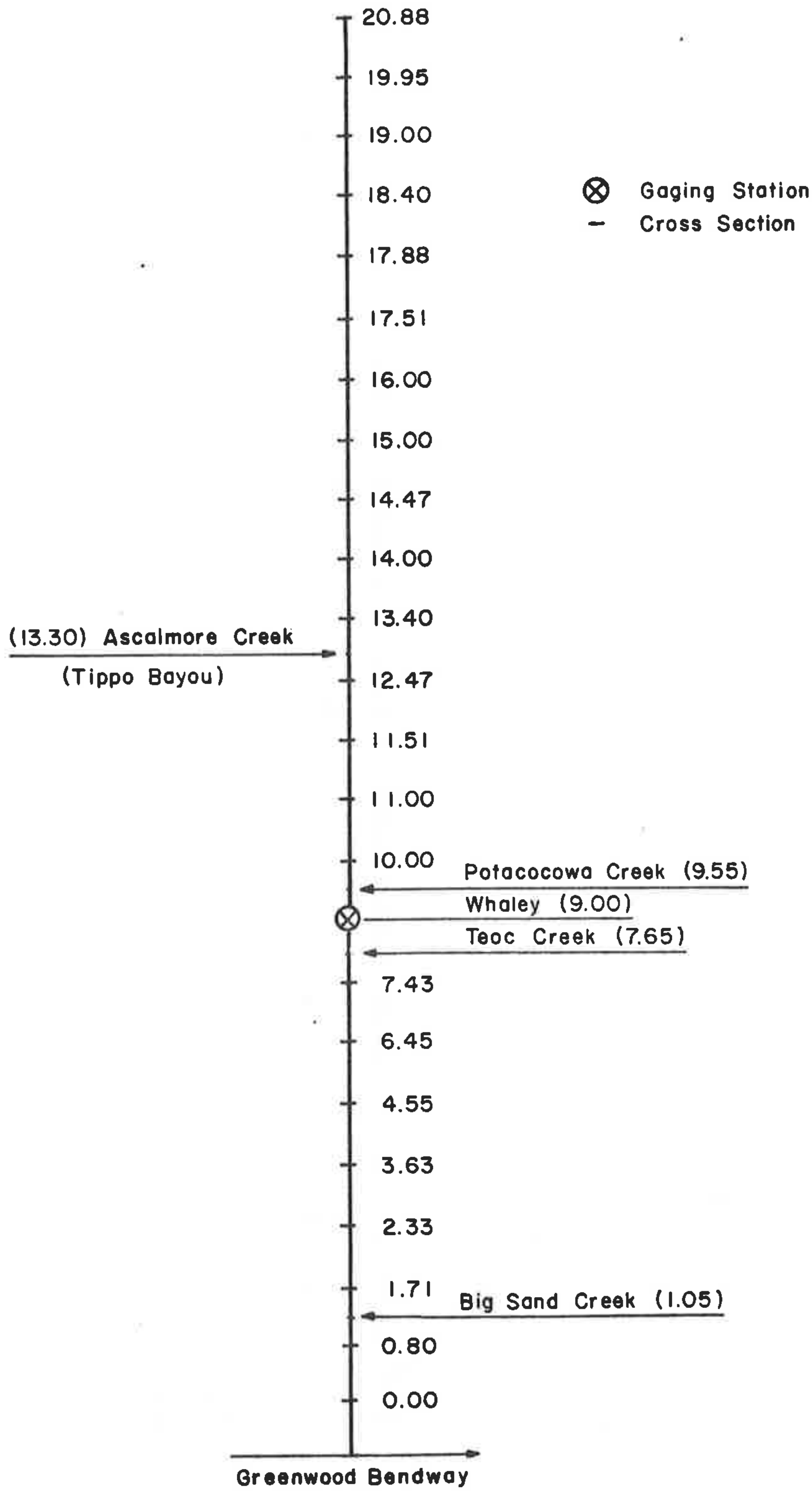


Figure C.10. Lower Yalobusha River.

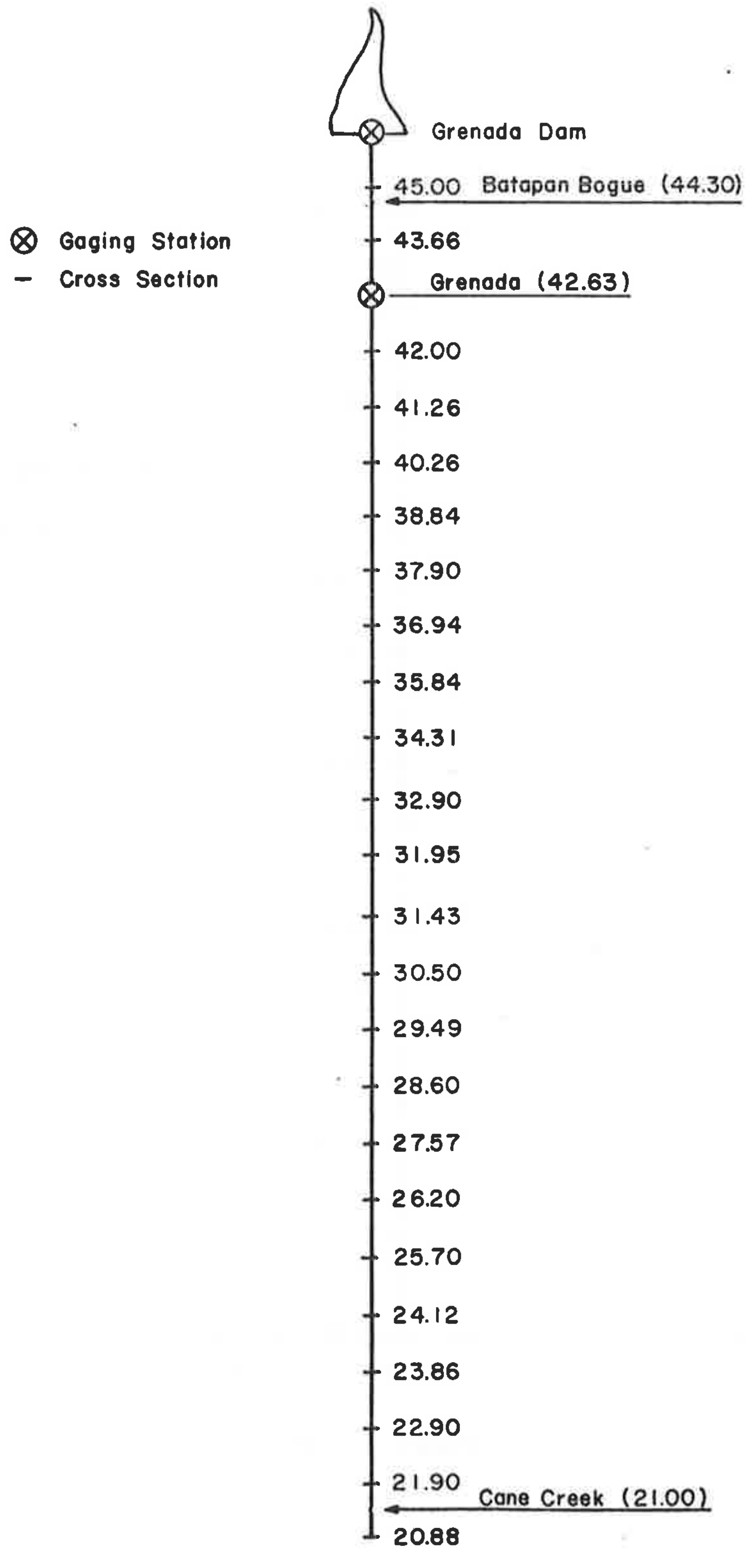


Figure C.11. Upper Yalobusha River.

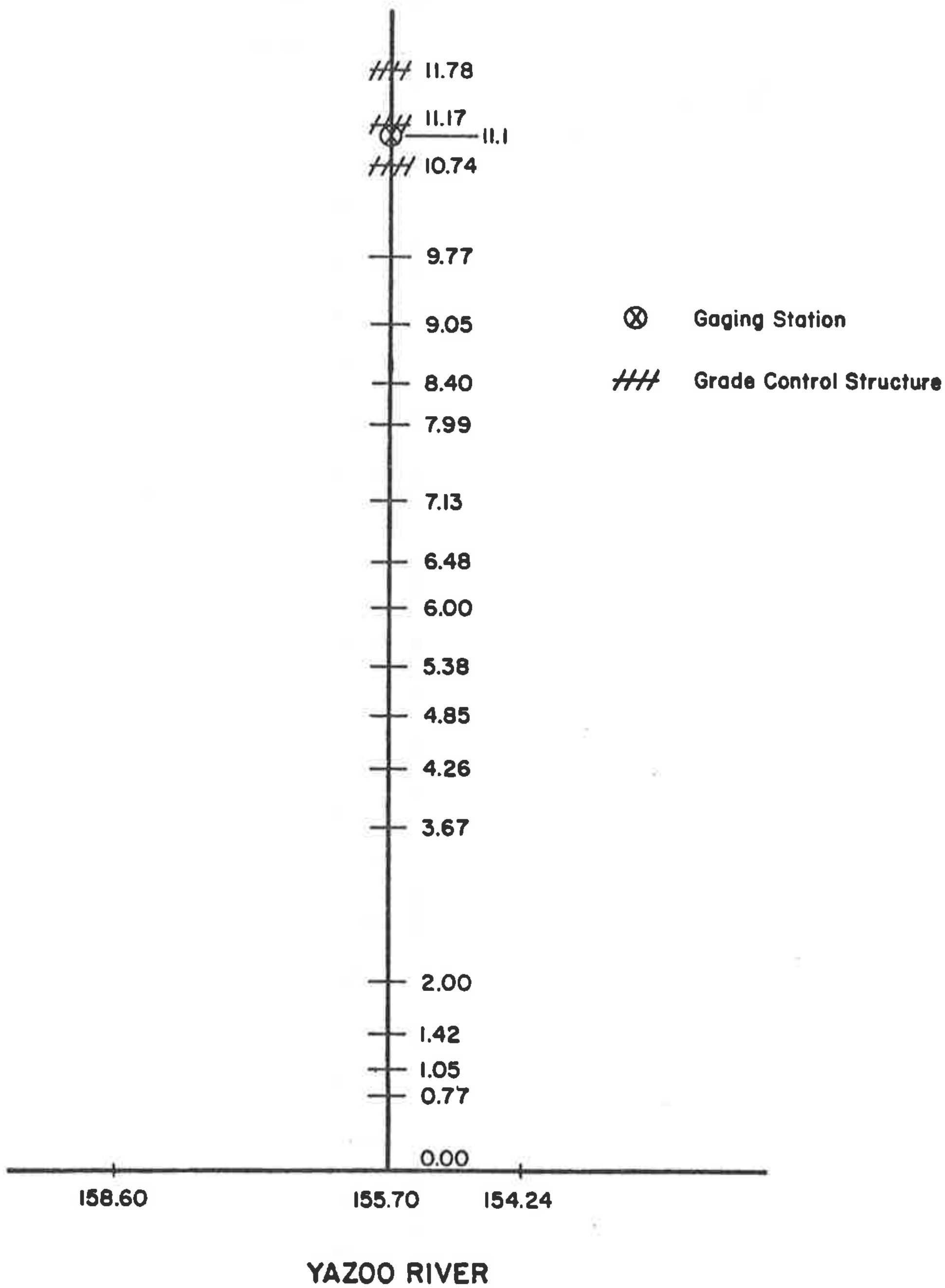


Figure C.12. Pelucia Creek, Existing Conditions.

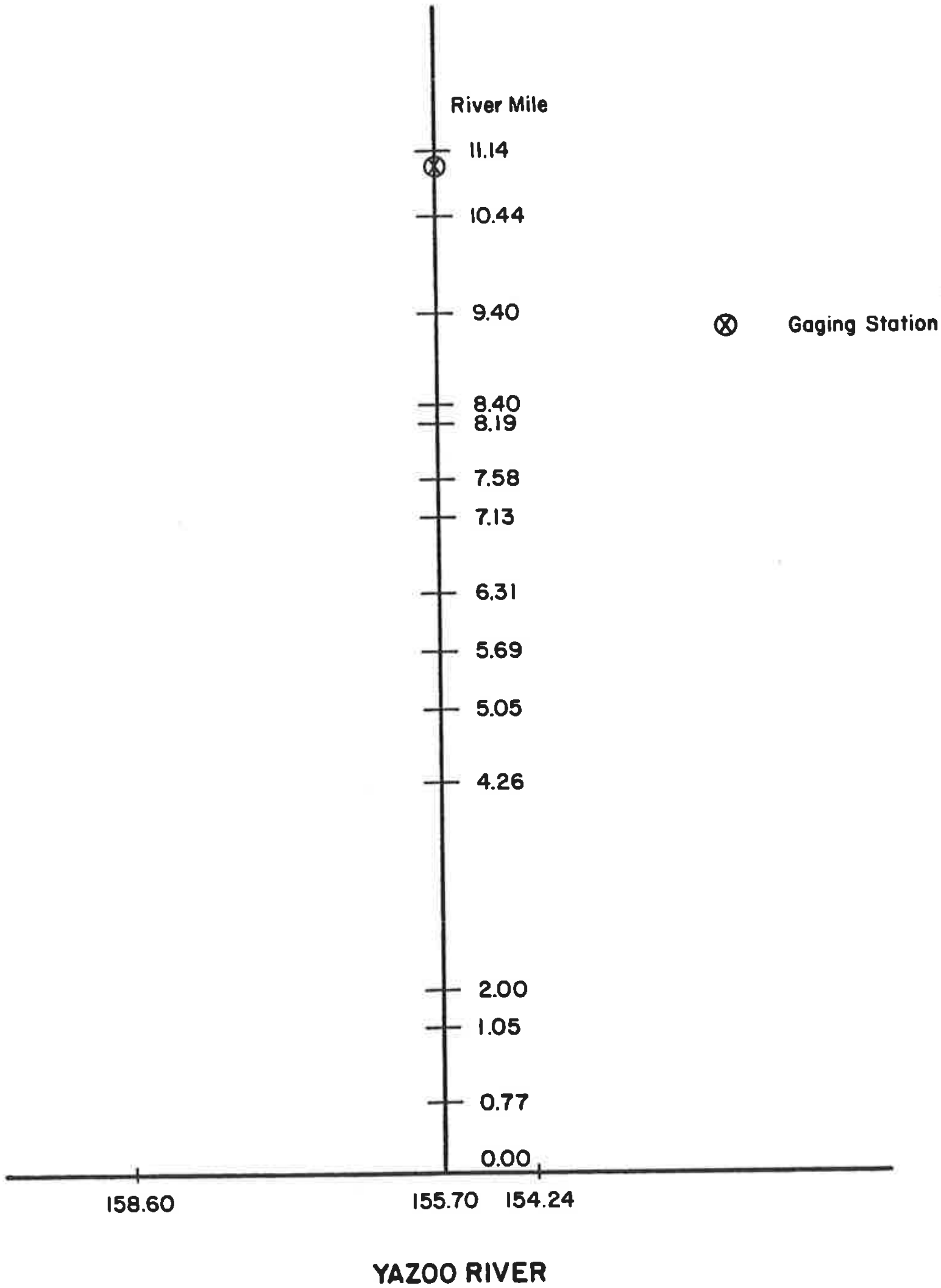


Figure C.13. Pelucia Creek, Borrow Excavation.

Appendix D

SEDIMENTATION STUDY OF THE YAZOO RIVER BASIN

Phase II

EVALUATION OF RIPARIAN GREENBELT

CONTRACT NO. DACW38-76-C-0193

Prepared for

U.S. Army Corps of Engineers
Vicksburg District
Vicksburg, Mississippi

Prepared by

Civil Engineering Department
Engineering Research Center
Colorado State University
Fort Collins, Colorado

D. B. Simons
R. M. Li

June 1980

D. EVALUATION OF RIPARIAN GREENBELT

To evaluate the effectiveness of the implementation of Greenbelt along the riparian zone, a special alternative study was conducted. In order to do so, the existing model was modified to account for effective velocity in the computer code. This effective velocity is determined by the effective depth. Effective depth is computed by weighting the flow conveyance.

Two computer runs similar to Run B of the "Greenwood Bendway Report" (Simons, Li and Brown, 1979) were made. Run B-1 simulated identical conditions as Run B that represent Plan E alternative, except effective velocity instead of average flow velocity was used to calculate sediment transport rate. Run B-1 represents the baseline condition for comparison. Run B-2 has identical initial cross-sectional and flow conditions as Run B-1, but the Manning roughness coefficients in the floodplain are assumed to be 0.2 instead of 0.15. The higher Manning's n represent the greenbelt or vegetation zone effect. Table D-1 summarizes the sediment deposition or erosion in the six river segments (reaches). River Segment No. 1 extends on the Yazoo from Belzoni to just below the Bendway. River Segment No. 2 is the Yazoo River in the Bendway and extends from the confluence with the Greenwood cutoff to the confluence of the Yalobusha River. River Segment No. 3 is the Tallhatchie River in the Bendway and extends from the confluence of the Yalobusha to the inlet of the cutoff. River Segment No. 4 extends on the Tallahatchie River from the inlet of the cutoff to Swan Lake. The Yalobusha River from its conflunce with the Yazoo to Whaley is River Segment No. 5 and the Ft. Pemberton cutoff (Greenwood cutoff) is River Segment No. 6.

Table D.1. Net Aggradation and Degradation for Run 2, Run B-1 and Run B-3

	River Segment*					
	1	2	3	4	5	6
Run B	19902	2949	2104	2387	1114	252
Run B-1	20117	1605	1933	2366	919	164
Run B-2	19617	2336	2126	3159	1258	226

*Volume in thousand cubic yards.

Table D.1 indicates that the implementation of greenbelt will induce more deposition in River Segments No. 2 to 6, but will reduce deposition in River Segment No. 1. This result is reasonable because River Segment No. 1 is the longest reach and the presence of vegetation on the bank tends to act like a dike that would confine the flow, in turn increasing the velocity in the main channel, which would increase the transporting capacity of the river. Hence, deposition in Reach No. 1 is reduced.

Plottings of the channel aggradation and degradation with time for each river segment for Run B-1 and B-2 are shown in Figures D-1 and D-2, respectively. Bed profile changes and maximum water stages experienced during the 50 years for these two runs are shown in Figures D-3 and D-4, respectively.

Final bed profile and maximum water surface elevations for Runs B, B-1, and B-2 are similar in the shape and the maximum difference of final bed elevation and maximum water surface elevation at each individual cross section between these two alternative runs did not exceed 4 percent.

Stage-discharge relationships at Greenwood for Runs B-1 and B-2 are shown in Figures D.5 and D.6. These stage-discharge curves are similar and average magnitude of the differences is about 1 percent. For a given discharge, stages for the greenbelt condition (Run B-2) are slightly higher than those for Run B-1.

The final bed profile and maximum water surface elevations for Run B, B-1 and B-2 are similar in the shape and the maximum difference of final bed elevation and maximum water surface elevation at each individual cross section between these two alternative runs did not exceed 4 percent.

The stage-discharge relationships at Greenwood for Run B-1 and Run B-2 are shown in Figures 5 and 6. These stage-discharge curves are similar, and the average magnitude of the differences is about 1%. For a given discharge, the stages for the greenbelt condition (Run B-2) are slightly higher than those for Run B-1.

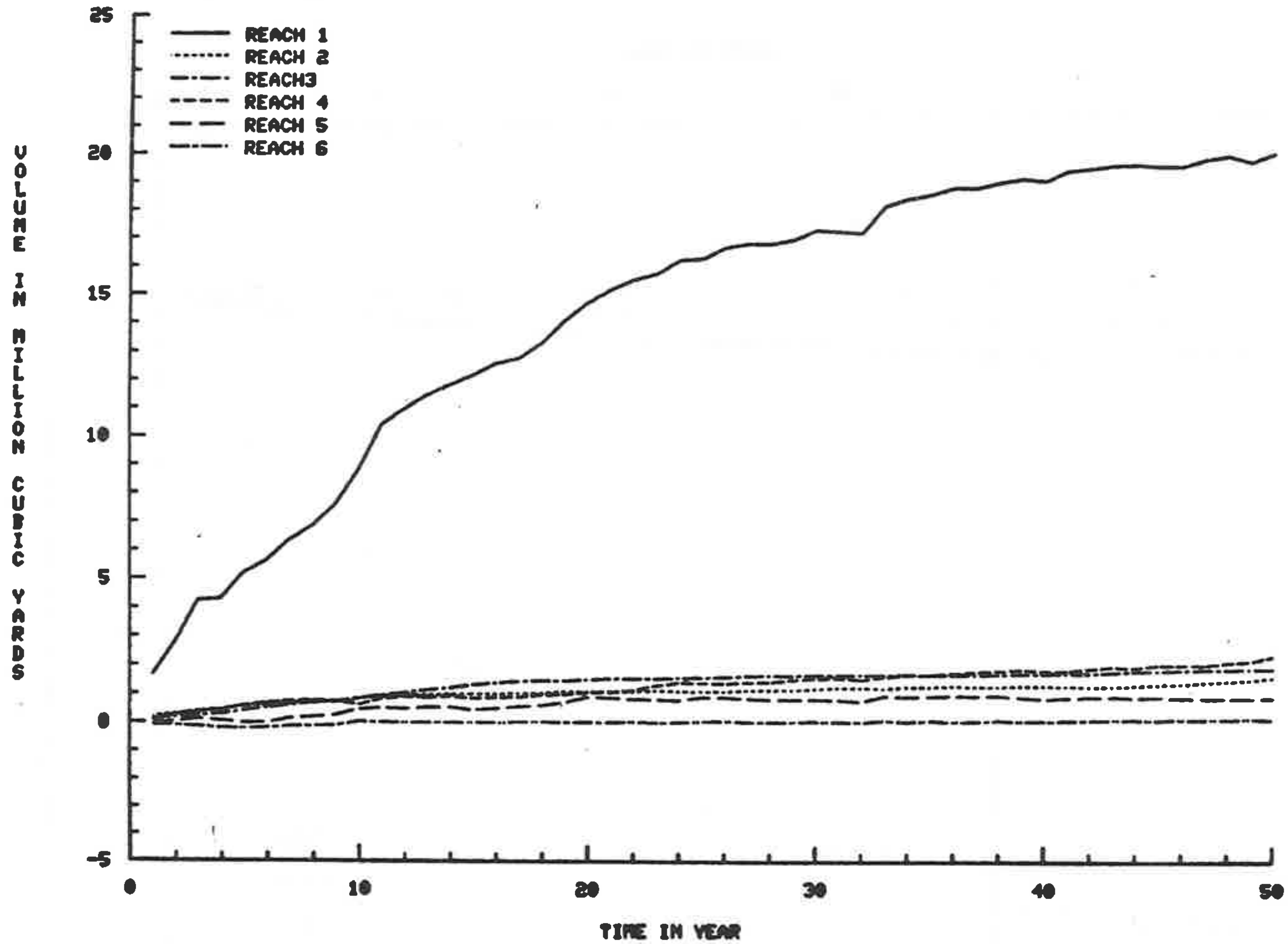


Figure D.1. Aggradation and degradation in each run for Run B-1.

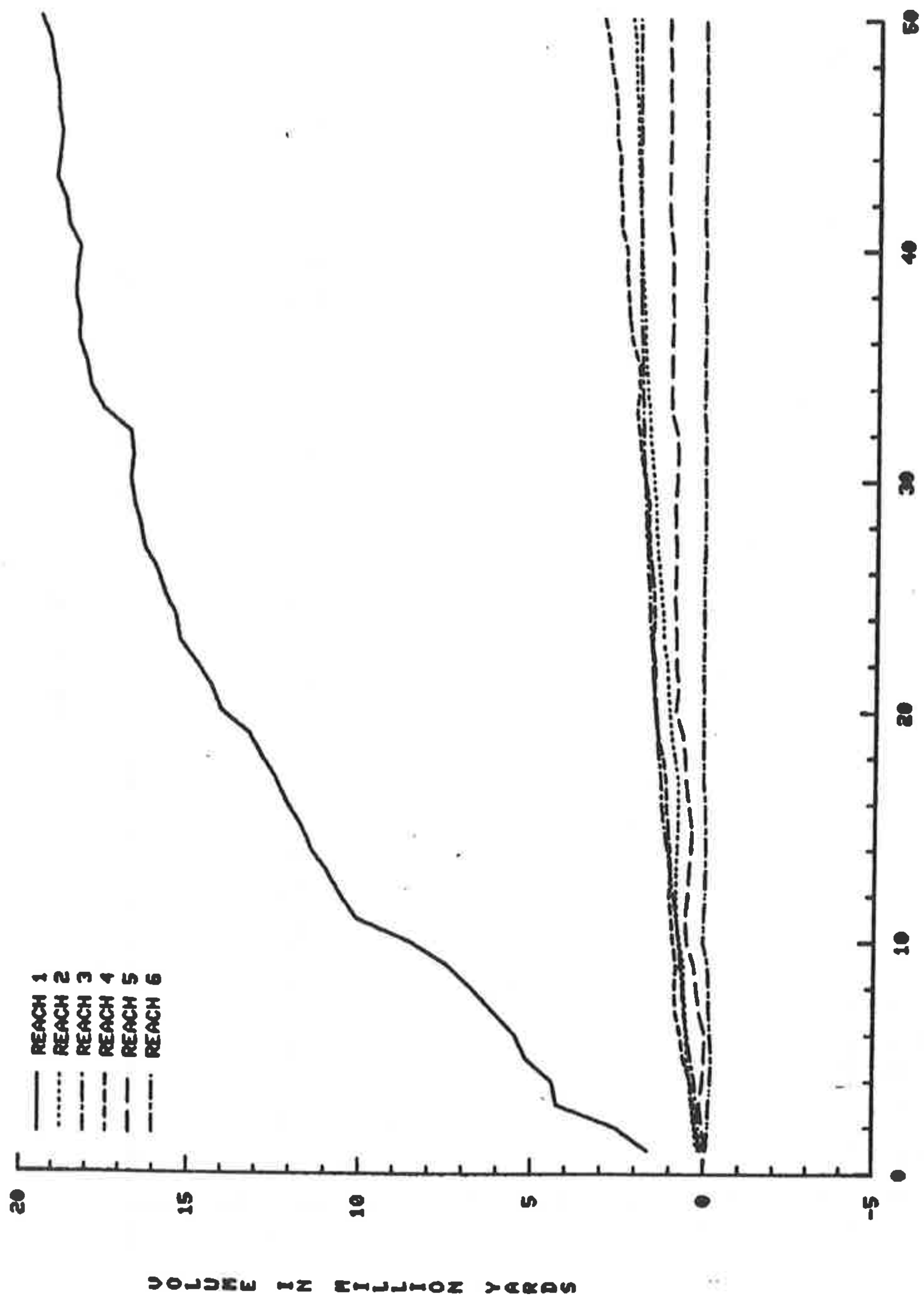


Figure D.2. Aggradation and degradation in each reach for Run B-2.

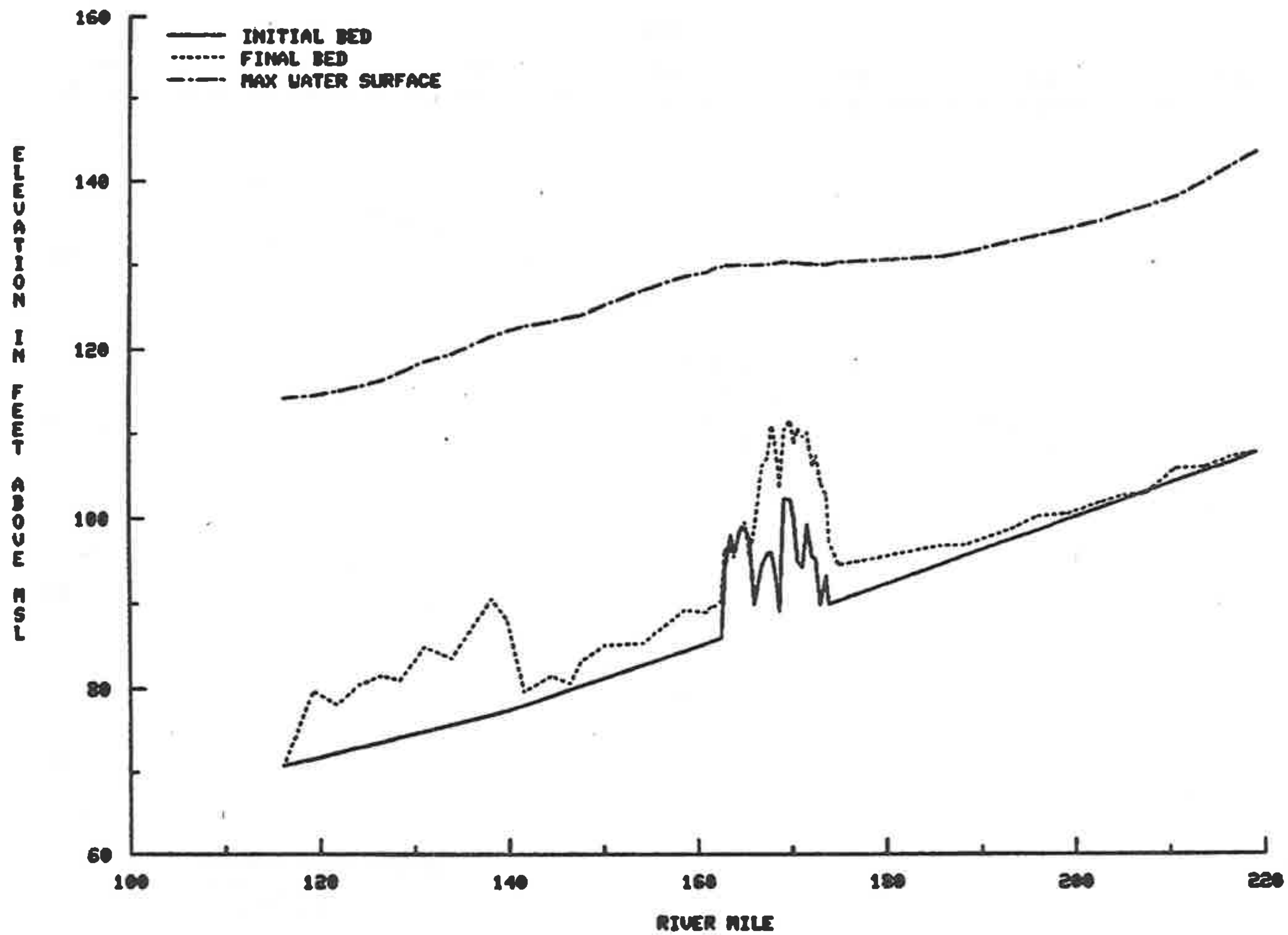


Figure D.3. Initial and final bed profiles and maximum water surfaces for Run B-1.

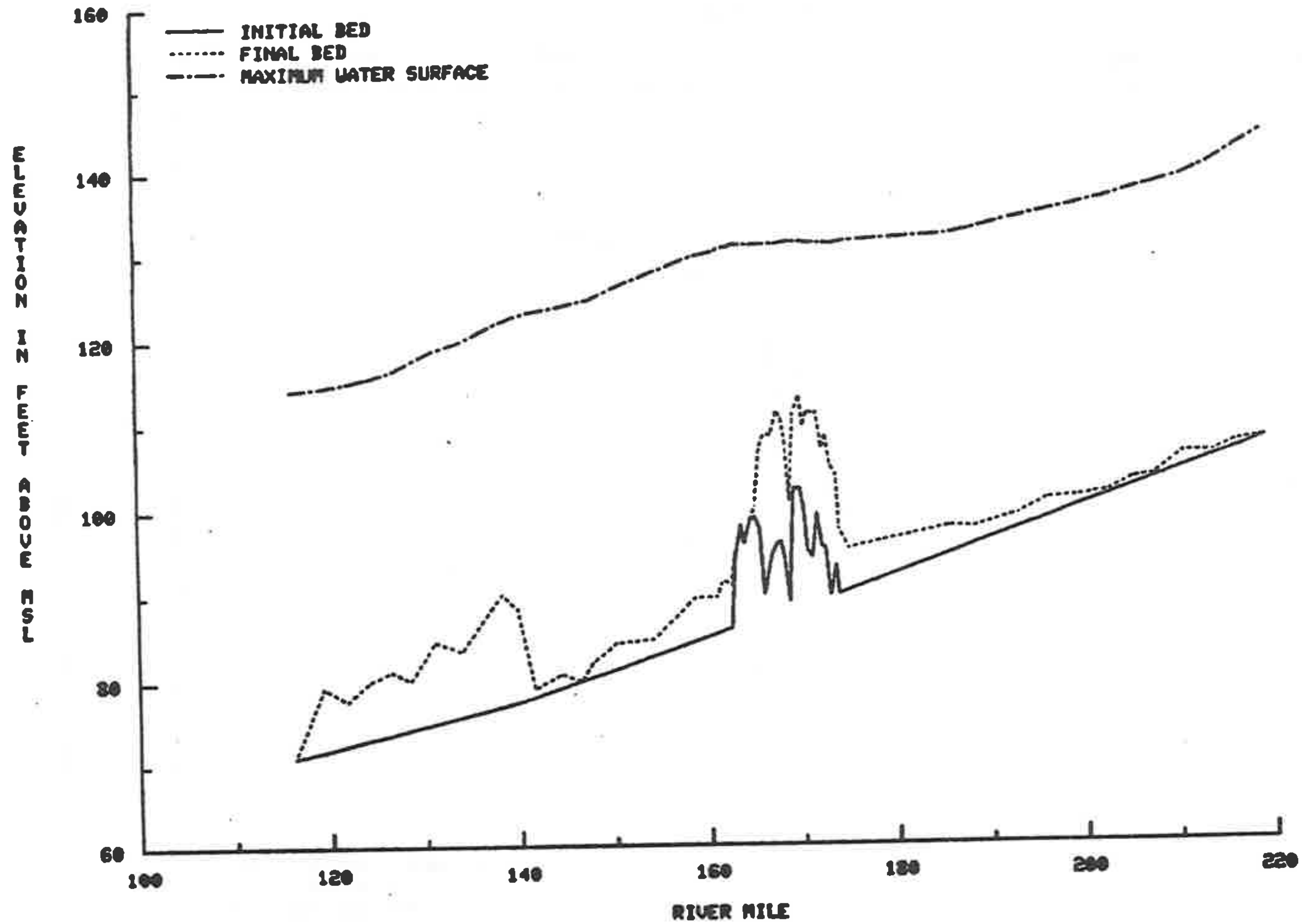


Figure D.4. Initial and final bed elevation and maximum water surface for Run B-2.

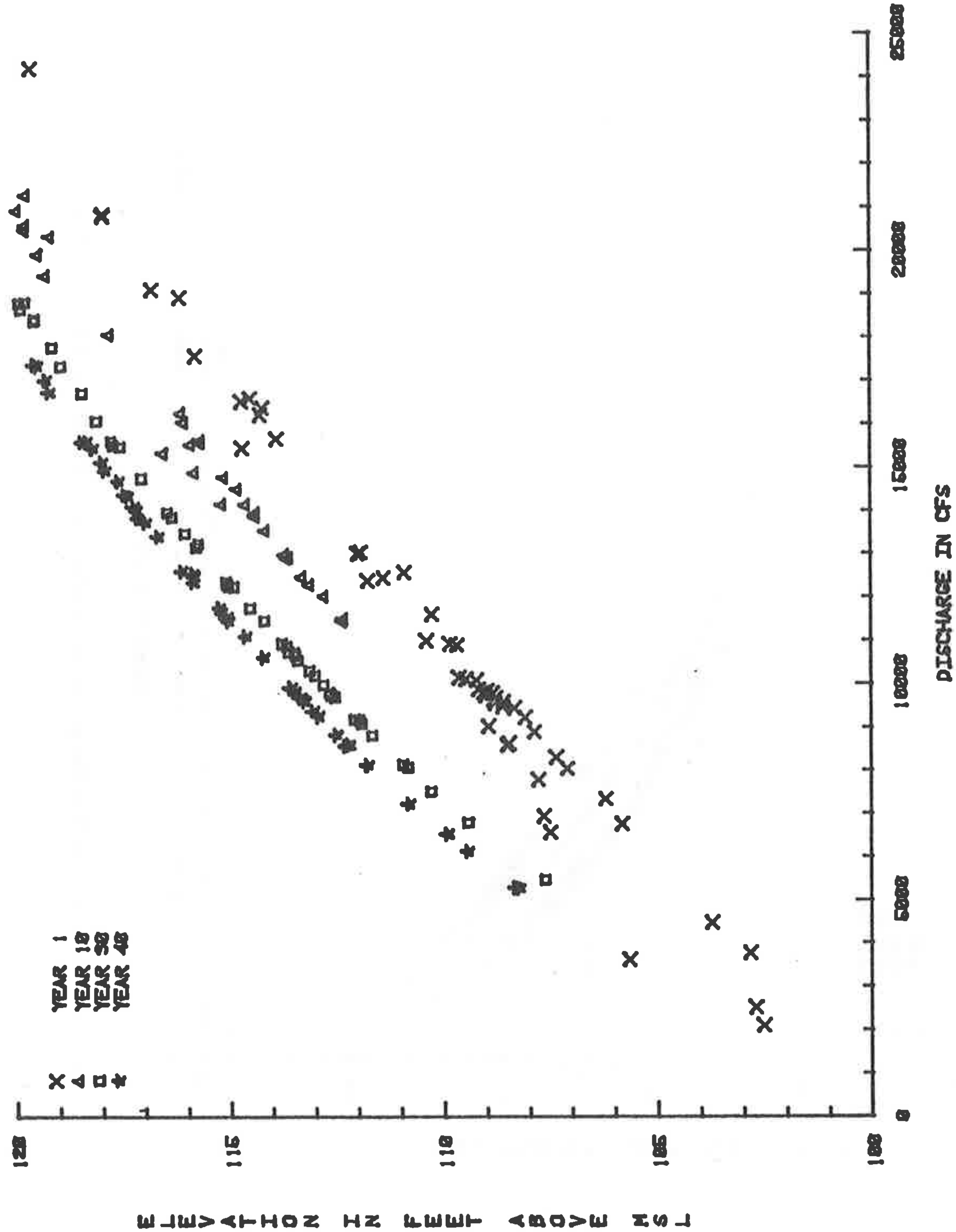


Figure D.5. Stage-discharge relationship at Greenwood for Run B-1.

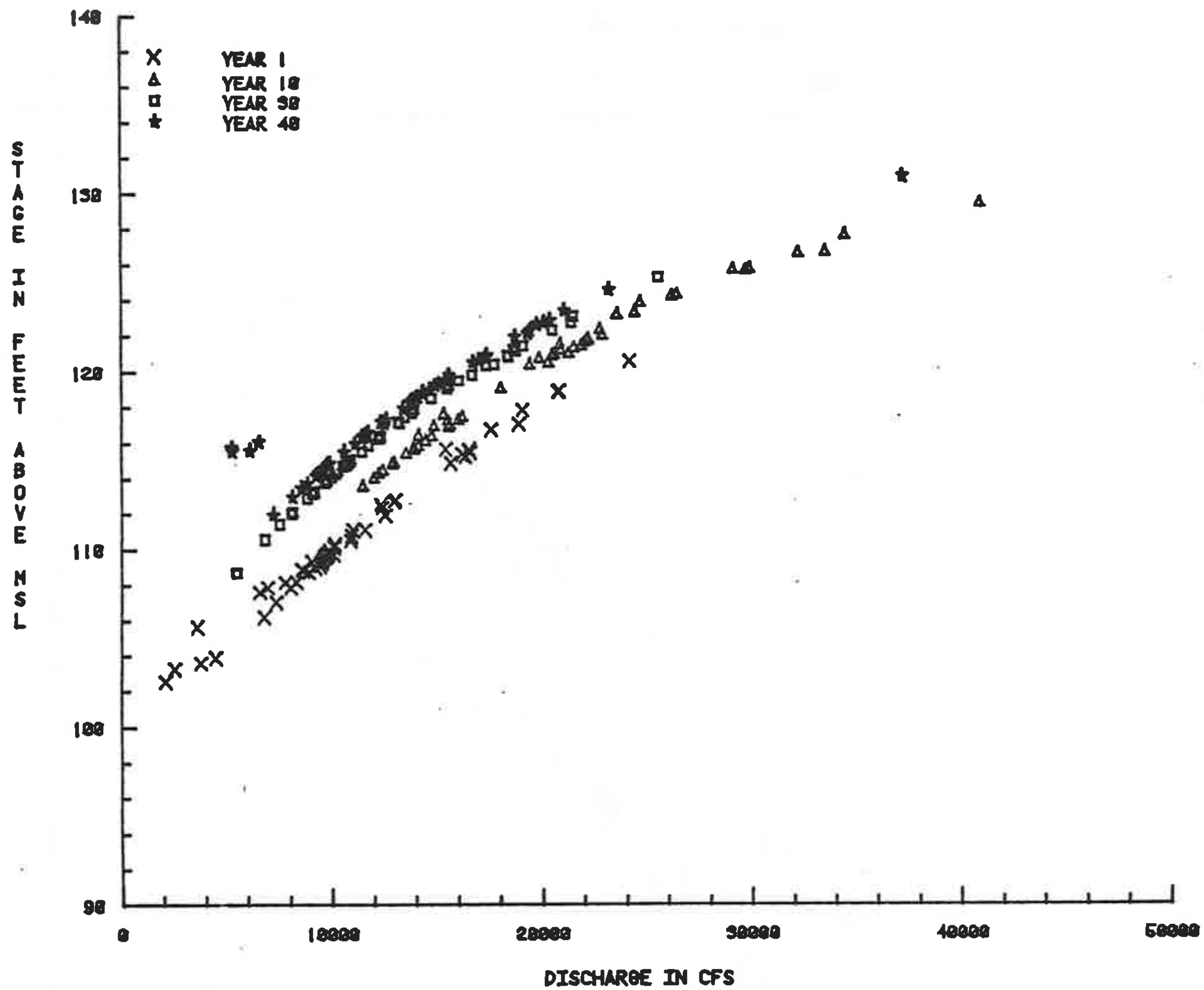


Figure D.6. Stage-discharge relationship at Greenwood for Run B-2.

Appendix E

SEDIMENTATION STUDY OF THE YAZOO BASIN

Phase II

CONTRACT NO. DACW38-76-C-0193

ANALYSIS OF TWO NAVIGATION PLANS

Prepared for

U.S. Army Corps of Engineers
Vicksburg District
Vicksburg, Mississippi

Prepared by

Civil Engineering Department
Engineering Research Center
Colorado State University
Fort Collins, Colorado

D. B. Simons
R. M. Li
L. Y. Li

October 1980

E.I INTRODUCTION

The objective of this report is to evaluate the effect of the proposed lock and dam on the sedimentation in the main channel and tributaries. The following alternatives are proposed and analyzed.

1. A one-lock plan with the lock located at the mouth of the Yazoo River. This lock and dam will have a minimum pool elevation of 70 ft NGVD.

2. A two-lock plan with a lock and dam at the mouth of the Yazoo River and the other lock located at mile 77.3, the minimum pool elevation being 70 or 90 ft NGVD, respectively.

The system is modeled using the base conditions as defined in Run 4 of the Phase I study. In the Phase I study, the reach from the mouth of Big Sunflower to Vicksburg was not modeled. The main stem of the lower basin is extended to Vicksburg in this study. Since the downstream stage controlled by the lock and dam can significantly affect only the downstream reaches, the part of the basin upstream of Swan Lake is not considered in this study as in the Greenwood Bendway Study. The Greenwood cutoff is regulated at 15,000 cfs as in Run 7 of the Greenwood Bendway Study.

E.II SPATIAL DESIGN

The system can be represented by the schematic diagram shown in Figure E.1. Reach 1 is from Vicksburg to the mouth of Big Sunflower. The tributaries in this reach, Deer Creek, Steele Bayou, and Little Sunflower are not considered in the design. Reach 2 is from the mouth of Big Sunflower to Belzoni. Short Creek, Piney Creek, Techeva Creek, Black Creek, Fannegusha Creek, Tchula Lake, and Lower Auxiliary Canal are included as point source tributaries. Reach 3 is from Belzoni to the downstream divide of the Greenwood Bendway. Pelucia Creek and Abiaca Creek are the point source tributaries in this reach. Reach 4 is Yazoo River in the Bendway and extends from the confluence with the Ft. Pemberton cutoff to Yalobusha River. Reach 5 is Tallahatchie River from Yalobusha River to the inlet of the Ft. Pemberton cutoff. This reach may have reverse flow depending on the flow levels in the Yalobusha River and Tallahatchie River upstream of the cutoff. Reach 9 is defined for this reach for reverse flow conditions. Reach 6 extends on the Tallahatchie River from the inlet of the Ft. Pemberton cutoff to Swan Lake. Reach 7 is Yalobusha River from its confluence with the Yazoo River to Waley. The Greenwood cutoff (Ft. Pemberton cutoff) is Reach 8. Ascalmore, Potococowa, Teoc, and Big Sand are the four tributaries of the Yalobusha River reach. The cross sections in Reaches 3, 4, 5 (or 9), 6, 7, and 8 are obtained from the Greenwood Bendway Study. Cross sections in Reach 2 are taken from Run 11 in the Yazoo Phase I Study. Cross sections in Reach 1 use the data compiled for the report entitled "Little Sunflower Structure Lawsuit, Yazoo River Basin" submitted to the Corps of Engineers, Vicksburg District in June 1980 by D. B. Simons, R. M. Li, and L. Y. Li.

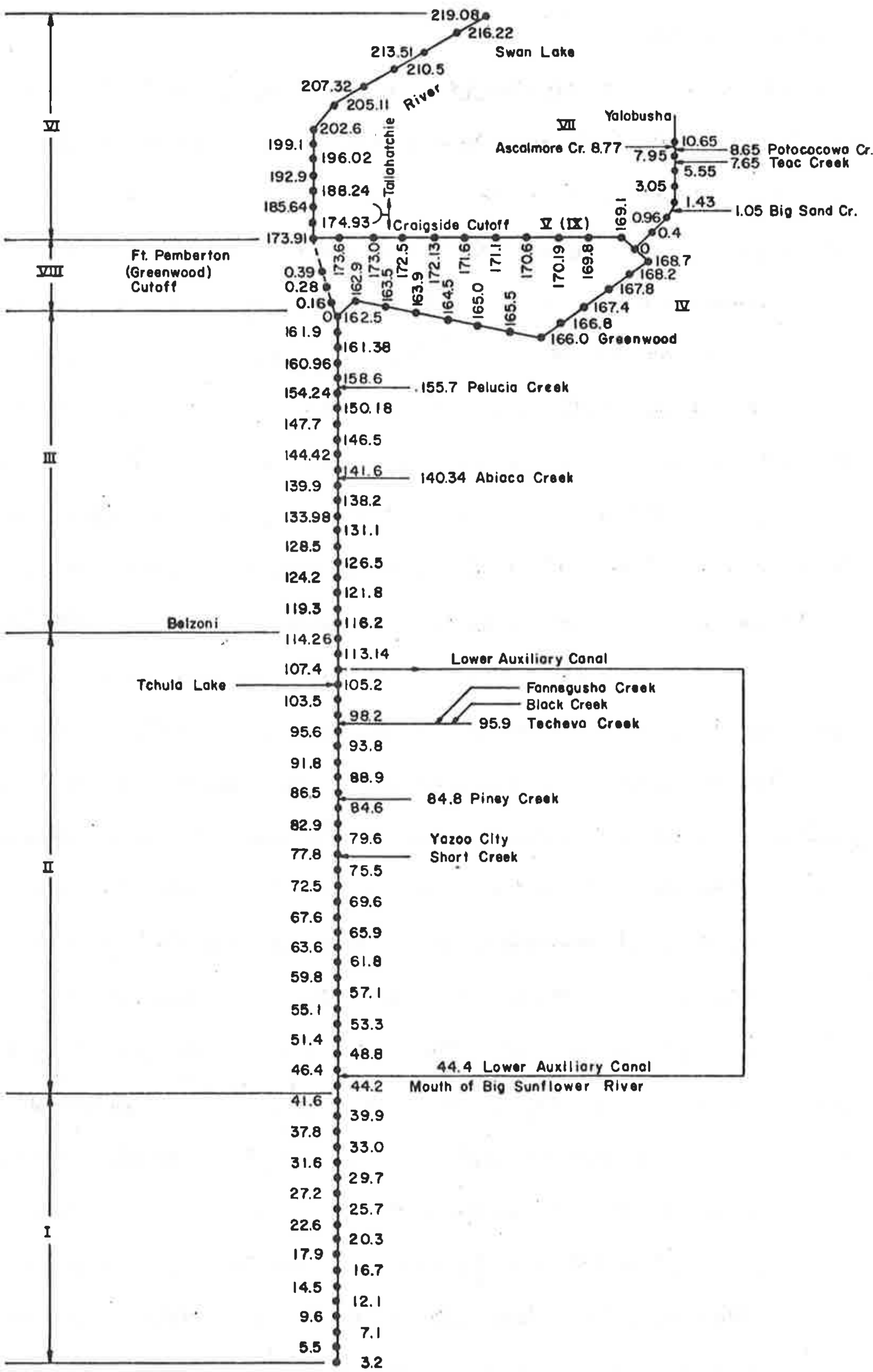


Figure E.1. Schematic Diagram.

E.III TEMPORAL DESIGN

Discharges for all the discharge points are computed using the discharge data base. It should be noted that the discharge data base utilized for the Yazoo Basin study does not include information from Vicksburg to the mouth of Big Sunflower. As stated previously, tributaries in this reach are not to be modeled. Therefore discharges throughout the reach are assumed the same as the mouth of Big Sunflower discharge.

In the backwater computation, the stage hydrograph is used as the downstream control. The stage hydrograph at Vicksburg is prepared using the following procedure. The 50-years of weekly data, including 11 years of measured data for period 1964-1974 inclusive and 39 years of generated data, are desired. Measured daily stage data are averaged for a 7-day period to obtain the weekly data. The 11-year historical record is extended to 50 years by correlating the Vicksburg stage to the stage at the mouth of Big Sunflower. Stage correlation between these two stations is:

$$S_V = 1.07716\ S_M - 15.0387 \qquad \text{(E.1)}$$

where S_V and S_M are respectively the Vicksburg stage and the mouth of Big Sunflower stage at mean sea level. This relation is obtained by the regression analysis of the historical stage data at these two stations. This relation is then used to convert the stage at the mouth of Big Sunflower to the Vicksburg stage for the 39 years of extended period. Stages at the mouth of Big Sunflower for the extended years are converted from the 39-year generated discharge to the following stage-discharge relationship:

$$S_M = \left(\frac{Q_M}{923.322}\right)^{\frac{1}{1.007}} + 55.0 \qquad (E.2)$$

where S_M and Q_M are the stage and discharge at the mouth of Big Sunflower.

E.IV RESULTS

Results of analysis show that downstream reaches (1, 2, and 3) are aggrading for the 50-year study period. Figures E.2, E.3, and E.4 show aggradation and degradation in the main stem reaches for as-is condition (no stage control), one-lock control, and two-lock control respectively. Tables E.1 and E.2 summarize total aggradation in the 50 years. The effects of stage control, in terms of recent change in the aggradation are also shown in this table. It can be seen from this table that only the reach close to the control will be significantly affected. Effects on the upstream reaches are only at noise levels. The 90-ft control in the two-lock plan is located in the middle of Reach 2, increased aggradation upstream of the control seems balanced by increased degradation downstream of the control. Therefore, compared to baseline conditions, there is no significant change in aggradation in Reach 2 due to the 90-ft control. More detailed analysis on the lock and dam effect follows.

Analysis of the stage hydrograph at Vicksburg shows that 62 percent of the time in the 50 years the downstream stage is below 70 feet. Figure E.5 shows the effect of the 70-ft control on the aggradation in Reach 1 (cross sections 1-19), Reach 2 (cross sections 19-49), and Reach 3 (cross sections 49-69). It is revealed on this figure that the more downstream, the more significant the effect is on aggradation induced by the 70-ft control. Results of sediment transport analysis show that for Reach 1 about 36 percent of the total aggradation is experienced when the downstream stage is below 70 feet, and this part of aggradation increases about 28 percent due to the lock and dam control. The effects on the aggradation in the upstream reaches are not significant for the

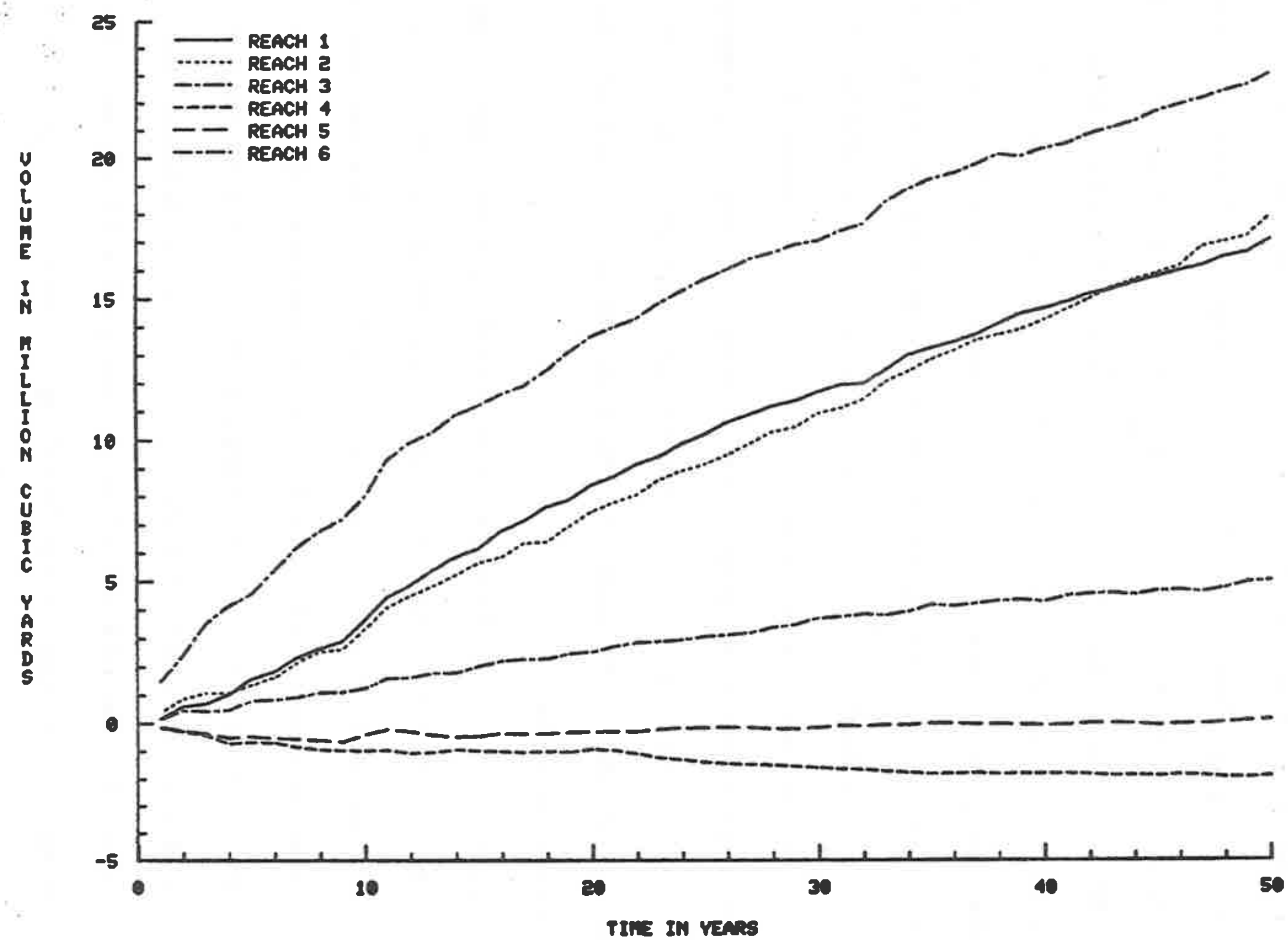


Figure E.2. Aggradation and degradation in each reach.

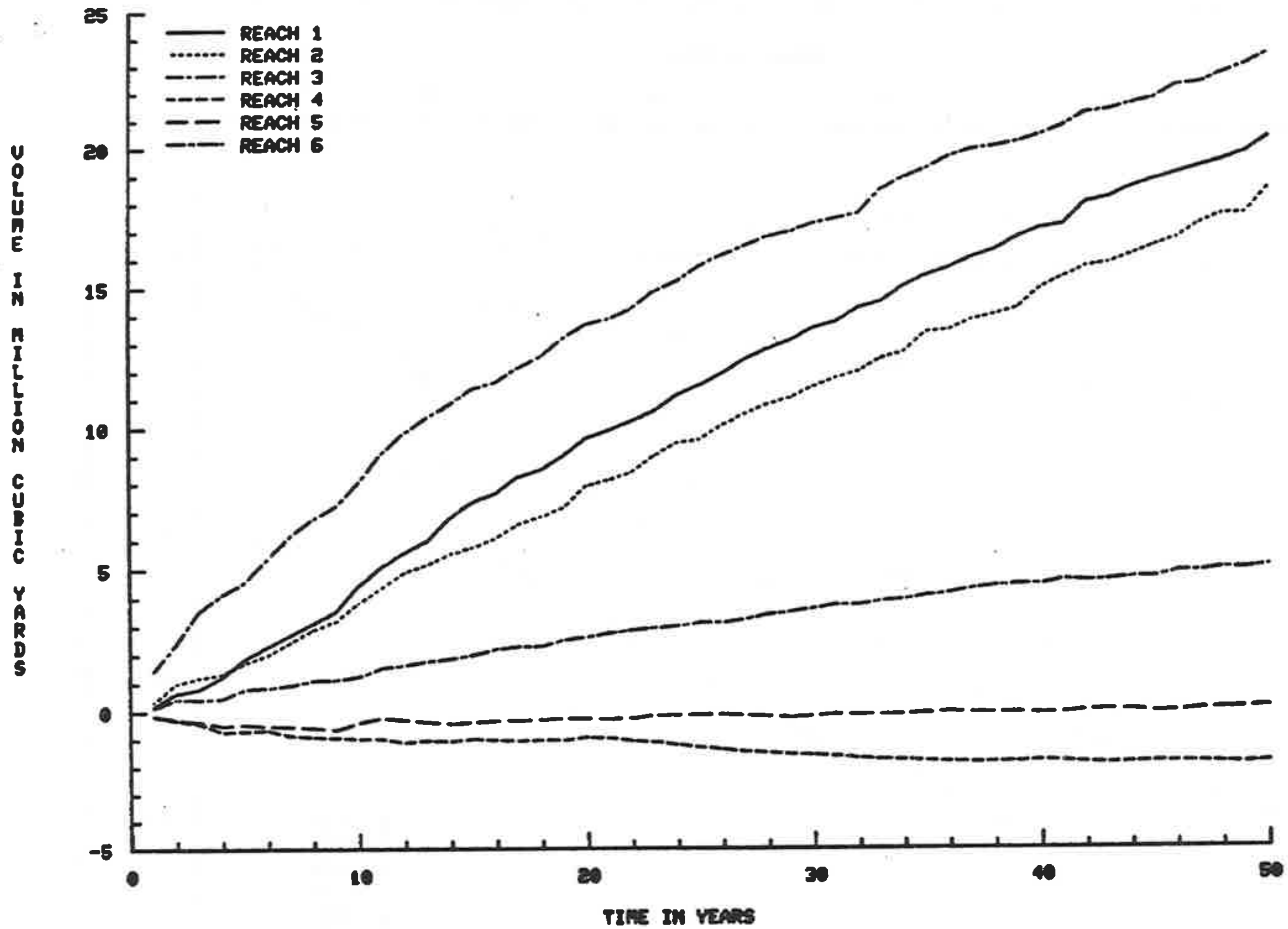


Figure E.3. Aggradation and degradation in each reach, one lock.

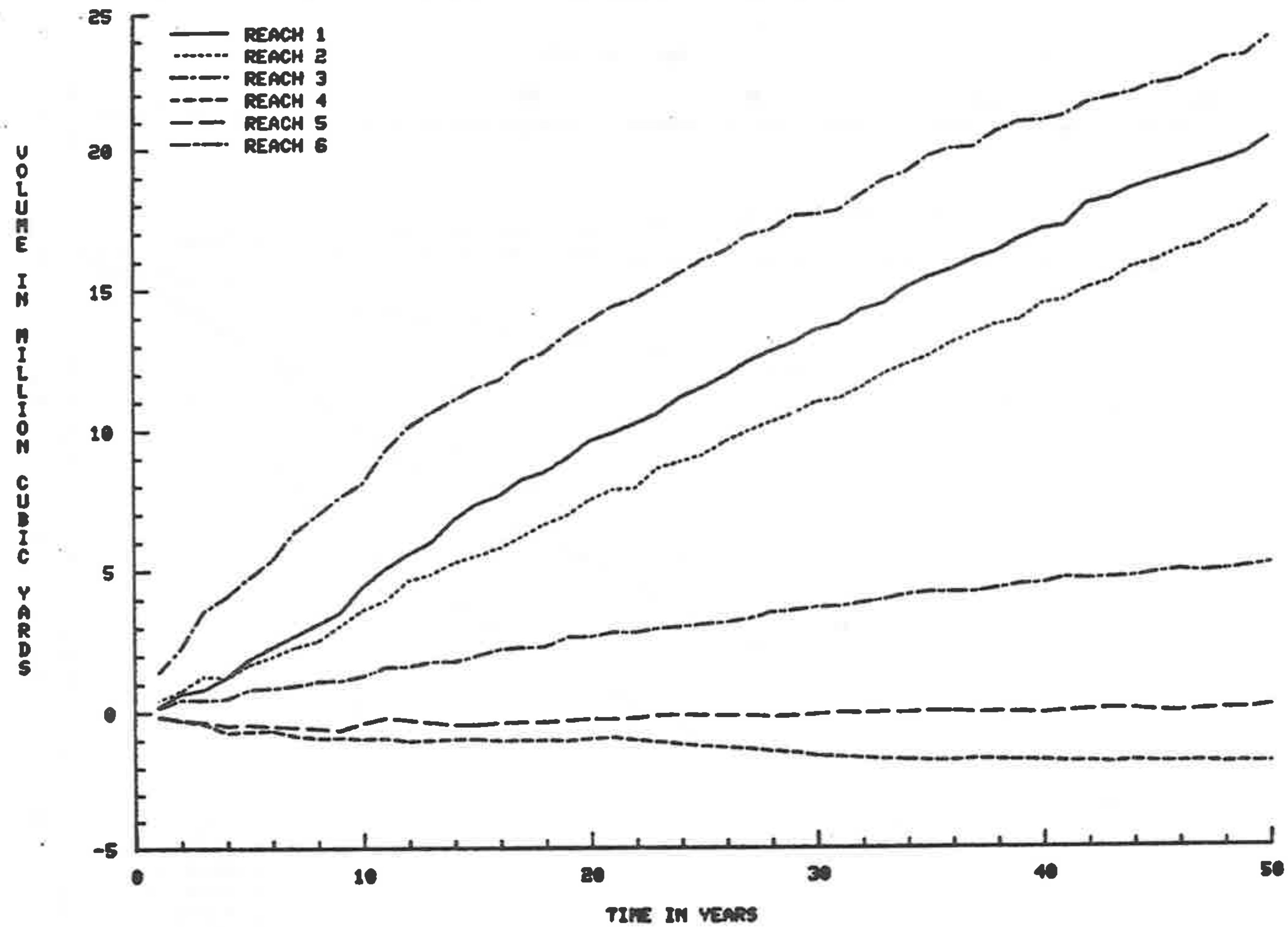


Figure E.4. Aggradation and degredation in each reach, two locks.

Table E.1. Net aggradation and degradation in 50 years.

	1	2	3	4	5	6	7	8
			(Sediment in cubic yards)					
Baseline condition	17,131	17,982	23,095	-1,894	137	5,069	3,722	706
One-lock control	20,332	18,529	23,390	-1,853	135	5,101	3,643	707
Two-lock control	20,332	17,927	24,034	-1,875	153	5,197	3,685	714
% change due to one-lock control	18.7	3.0	1.3	2.2	0	1.0	-2.1	0
% change due to two-lock control	18.7	-.3	4.1	1.0	11.0	2.5	-1	1.1

Table E.2. Aggradation and degradation in downstream reaches in 50 years for one-lock and two-lock control.

	Stations 1-19	Stations 19-34	Stations 34-49	Stations 49-69
One-lock control	20,332	2,029	16,500	23,390
Two-lock 70-ft and 90-ft control	20,332	787	17,141	24,034
% change due to 90-ft control	0	-61.0	+3.9	+2.8

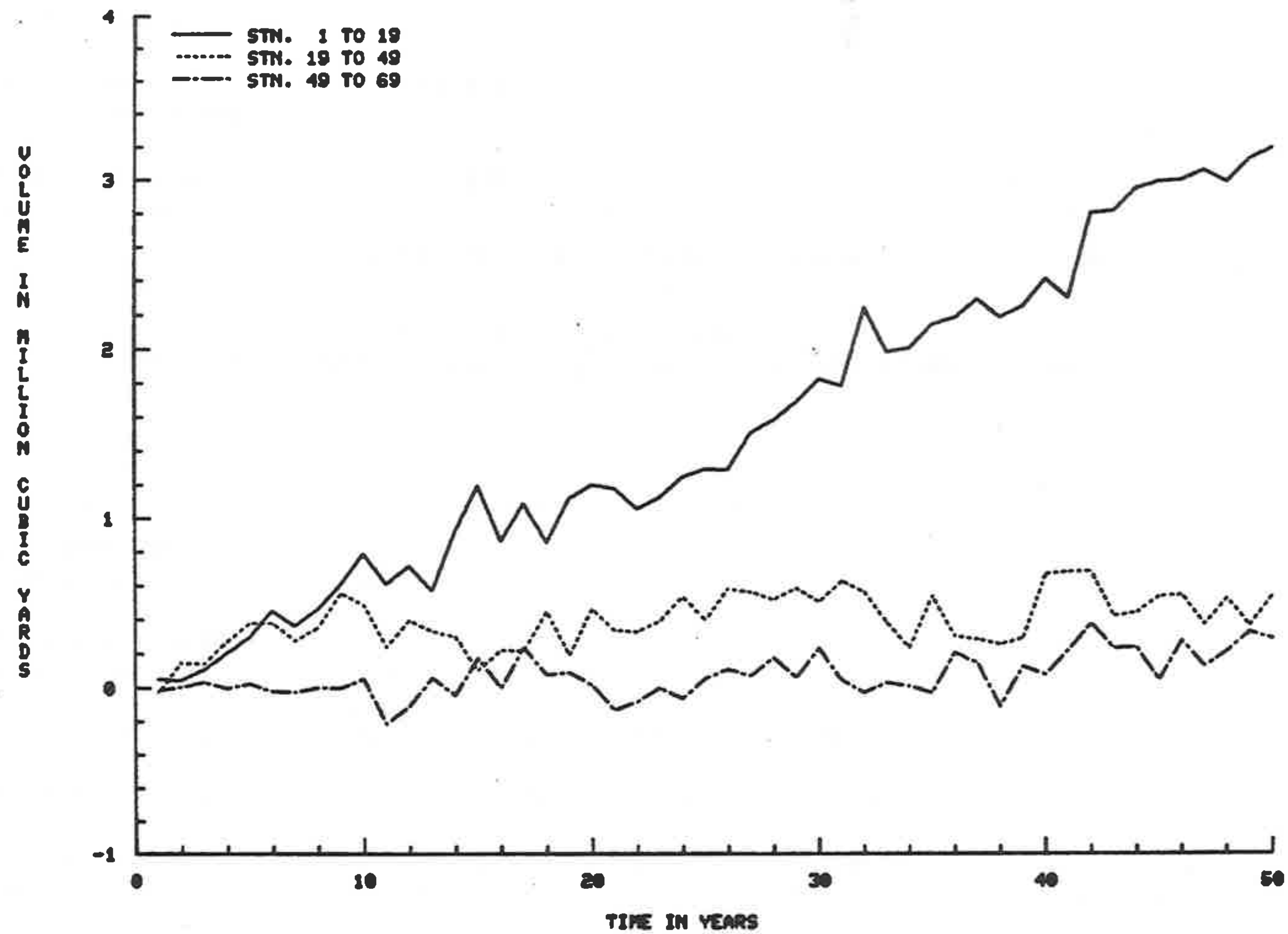


Figure E.5. Change of volume of 70-ft control WRT, as-is condition.

same period. This substantiates the conclusion that the 70-ft control does not have significant effect on Reach 2 and more upstream reaches.

The 90-ft control at Yazoo city (cross section No. 34 in Figure E.1) affects aggradation and degradation by depositing more sediment upstream of the control and scouring more sediment downstream of the control. This is shown in Figure E.6. According to stage analysis, 90-ft control at the Yazoo City lock and dam operates for about 56 percent of the time in the 50-year study period. Sediment deposited in this period is about 85 percent of total aggradation for Reach 2 upstream of the dam. This amount of sediment increases about 24 percent due to the sediment trapping by the lock and dam.

Effects of locks and dams on the sediment transport rate are through their effects on the backwater profile. Figures E.7 through E.9 show maximum and minimum water surface elevation for each cross section during the 50-year routing period for as-is condition, one-lock condition, and two-lock condition, respectively. Initial and final thalweg profiles are also shown on these figures. Minimum depth for each cross section in the mainstem is depicted on Figures E.10 to E.12 for as-is, one-lock, and two-lock conditions, respectively. There are 43 cross sections that have minimum thalweg depth less than 9 feet for as-is conditions. This number decreases to 38 with 70-ft control at Vicksburg and decreases further to 29 with 90-ft control at Yazoo City.

Stage-discharge relationships for year 1 at the mouth of Big Sunflower are compared for as-is and 70-ft control conditions in Figure E.13. Similar information for year 46 is included in Figure E.14.

Stage-discharge relations for year 1 and year 46 at Belzoni for as-is, one-lock, and two-lock conditions are compared and shown in

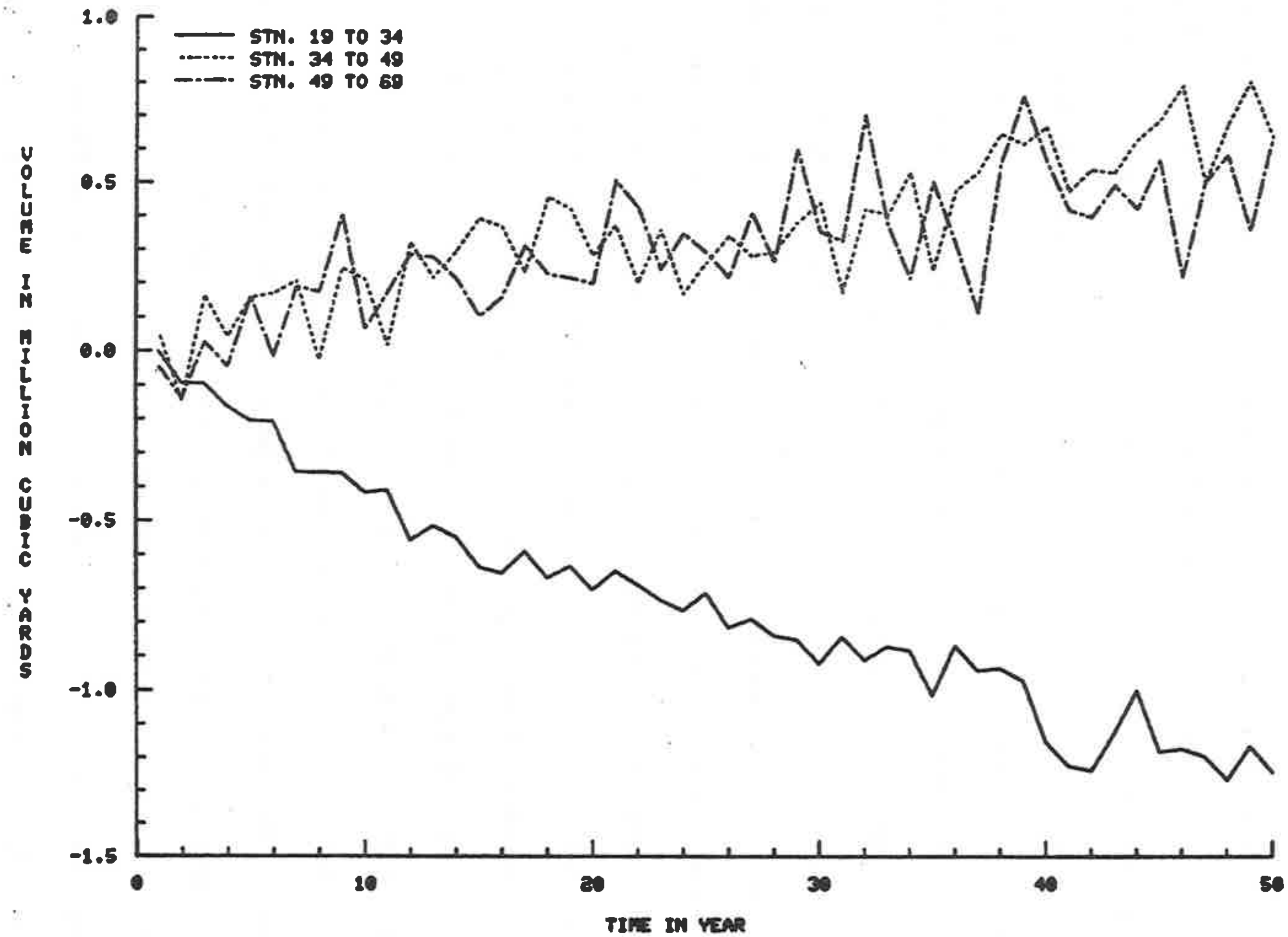


Figure E.6. Change of volume of 90-ft control WRT, 70-ft control.

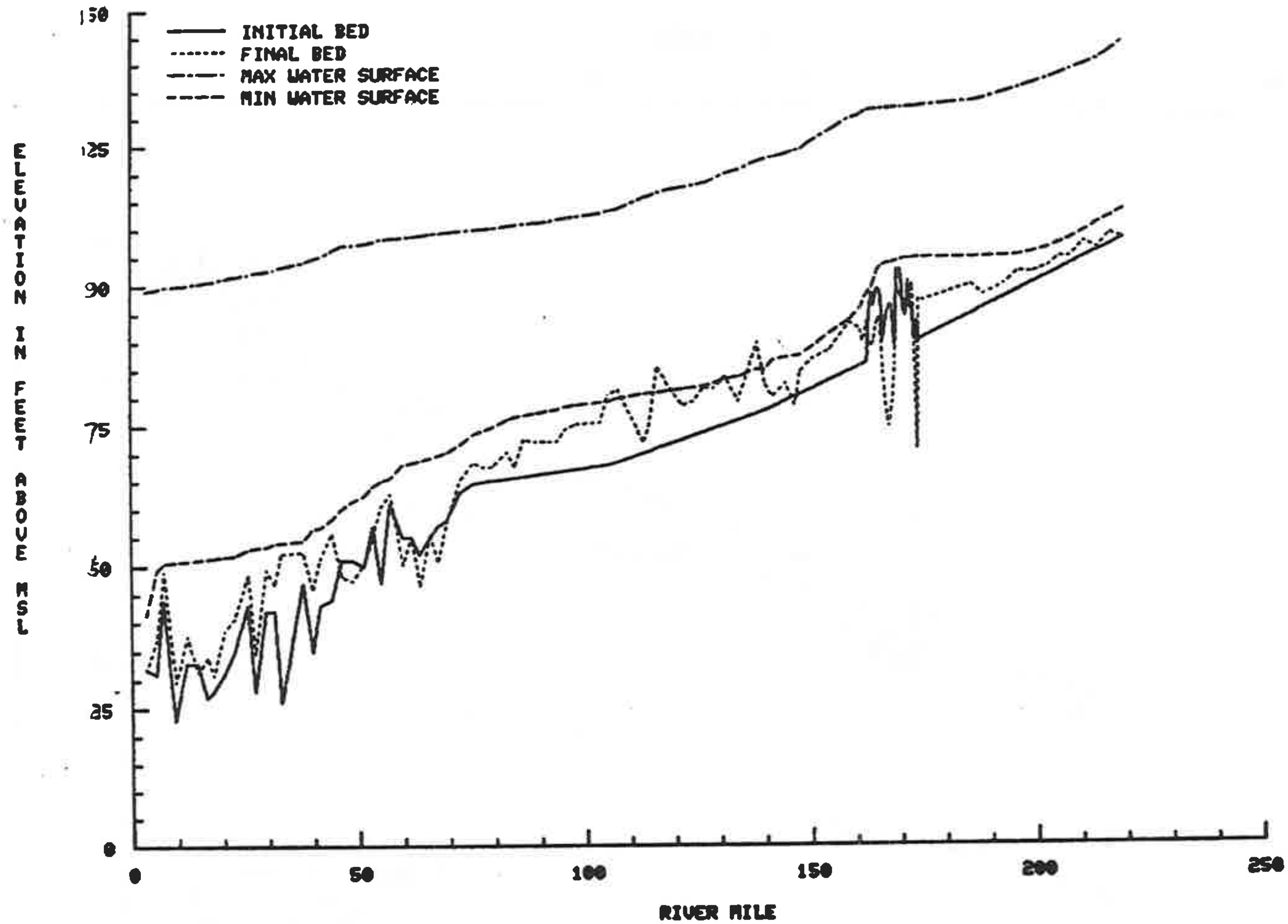


Figure E.7. Initial and final bed profiles and maximum and minimum water surfaces for as-is condition.

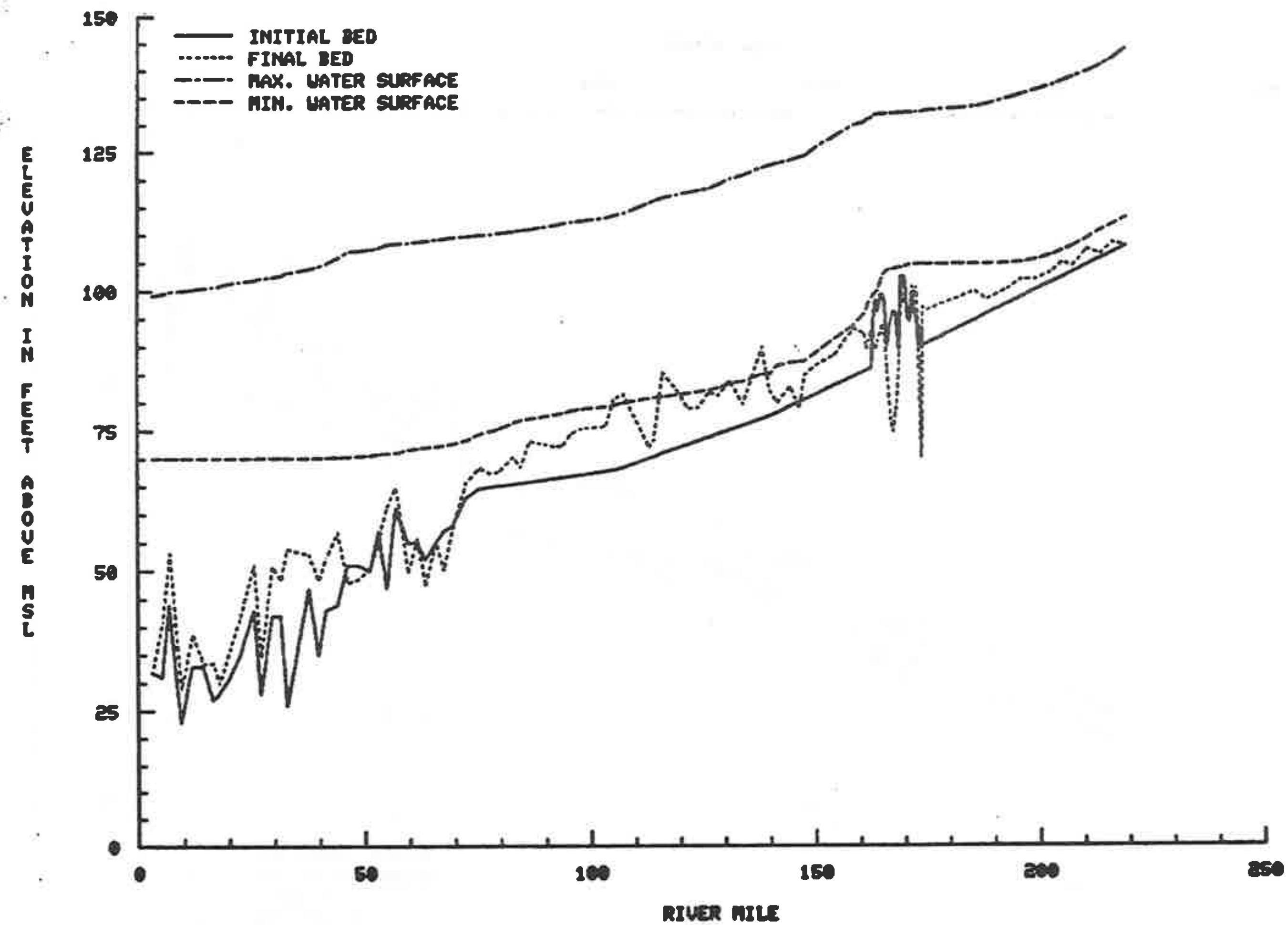


Figure E.8. Initial and final bed profiles and maximum and minimum water surfaces for one-lock condition.

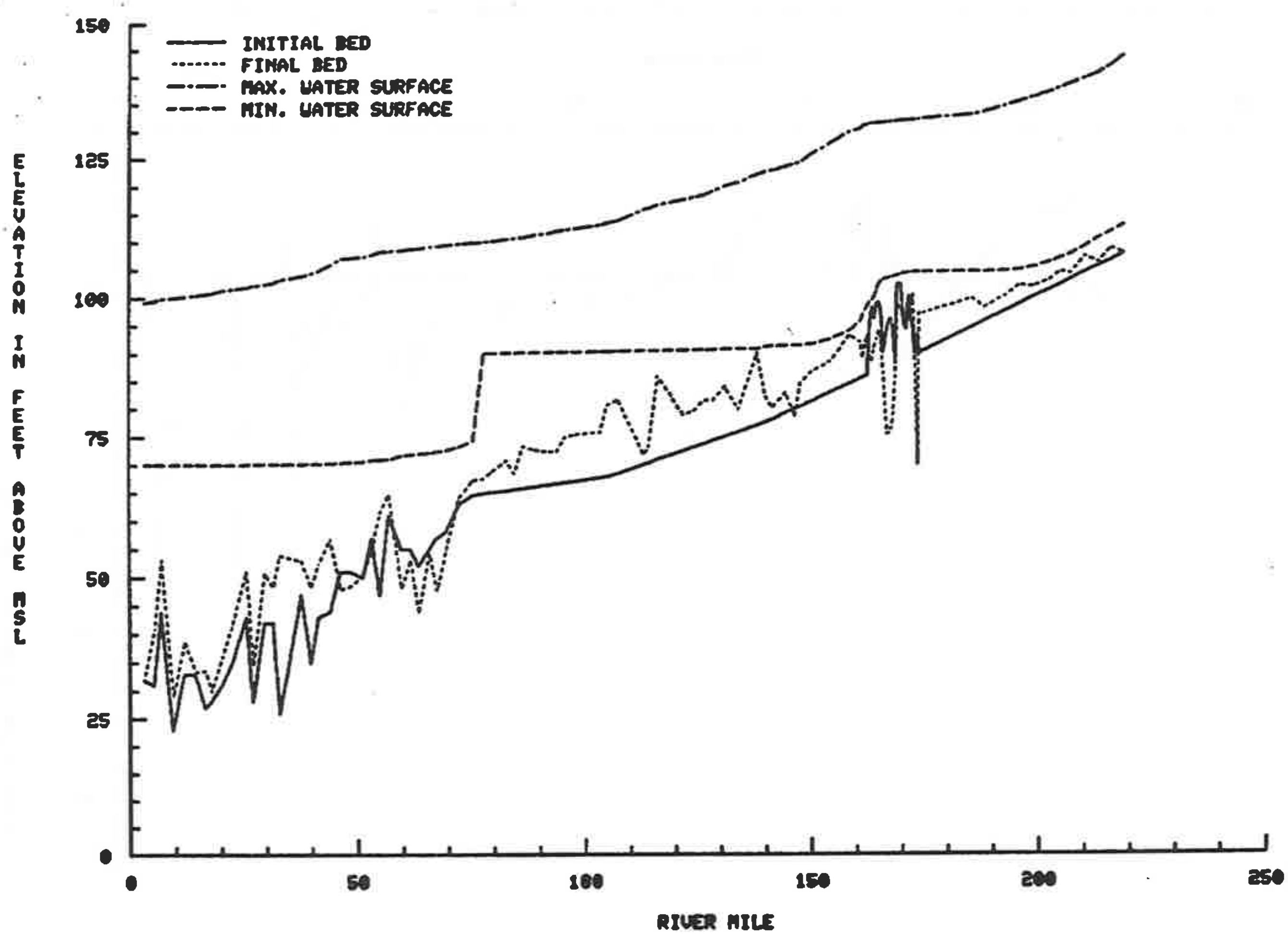


Figure E.9. Initial and final bed profiles and maximum and minimum water surfaces for two-lock condition.

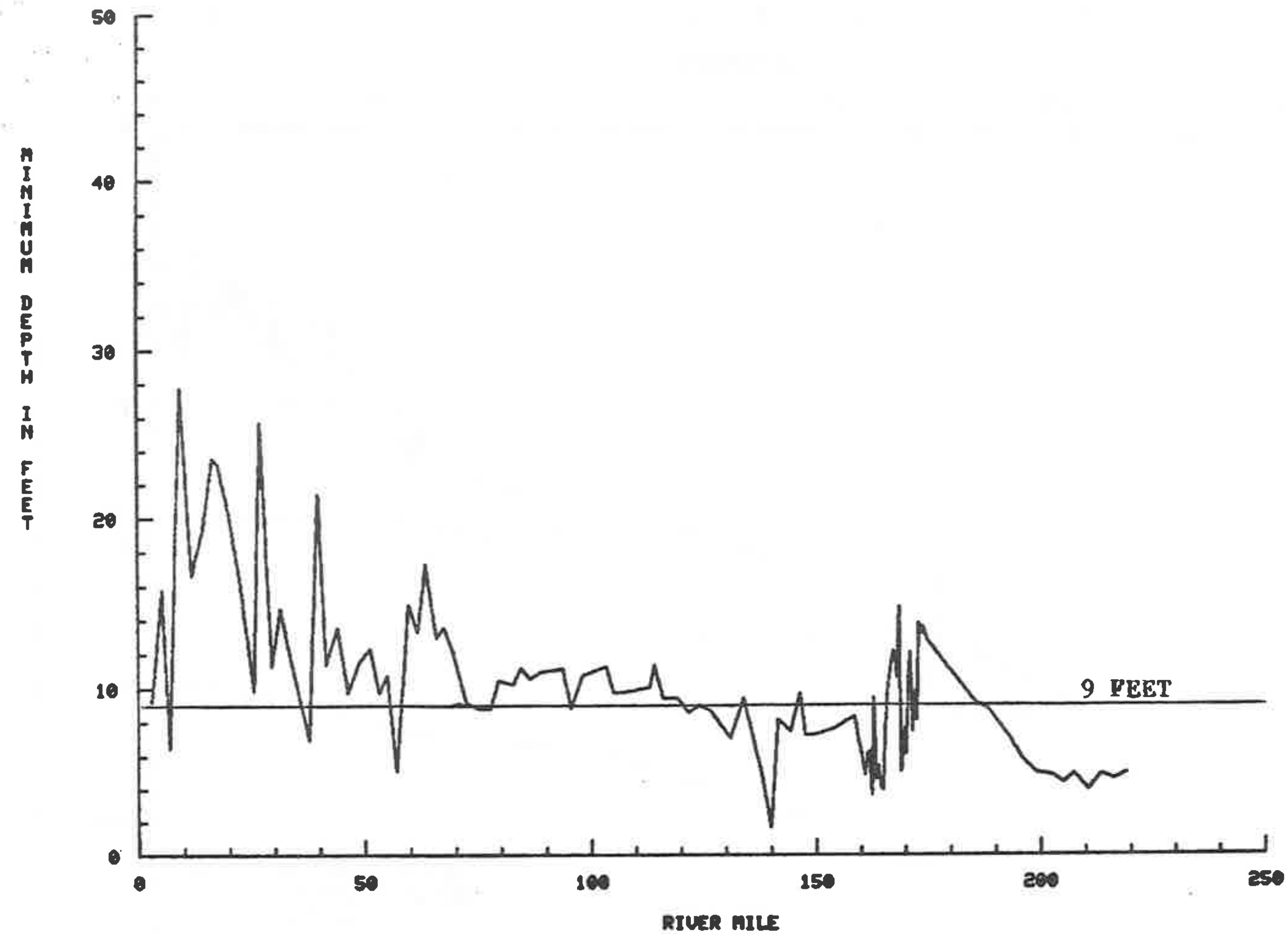


Figure E.10. Minimum depth along the main stem for as-is condition.

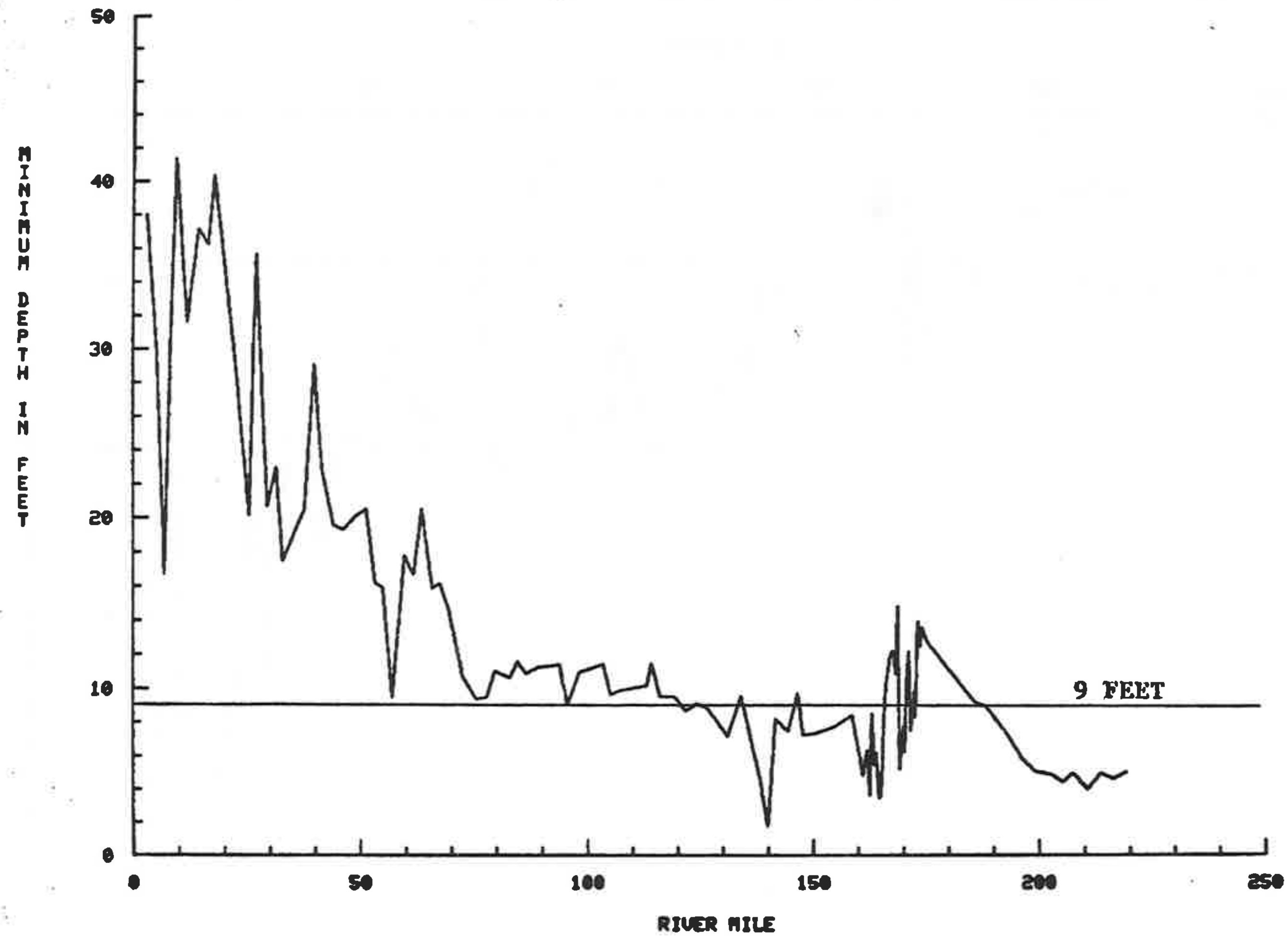


Figure E.11. Minimum depth along main stem for one-lock condition 70-ft stage controlled.

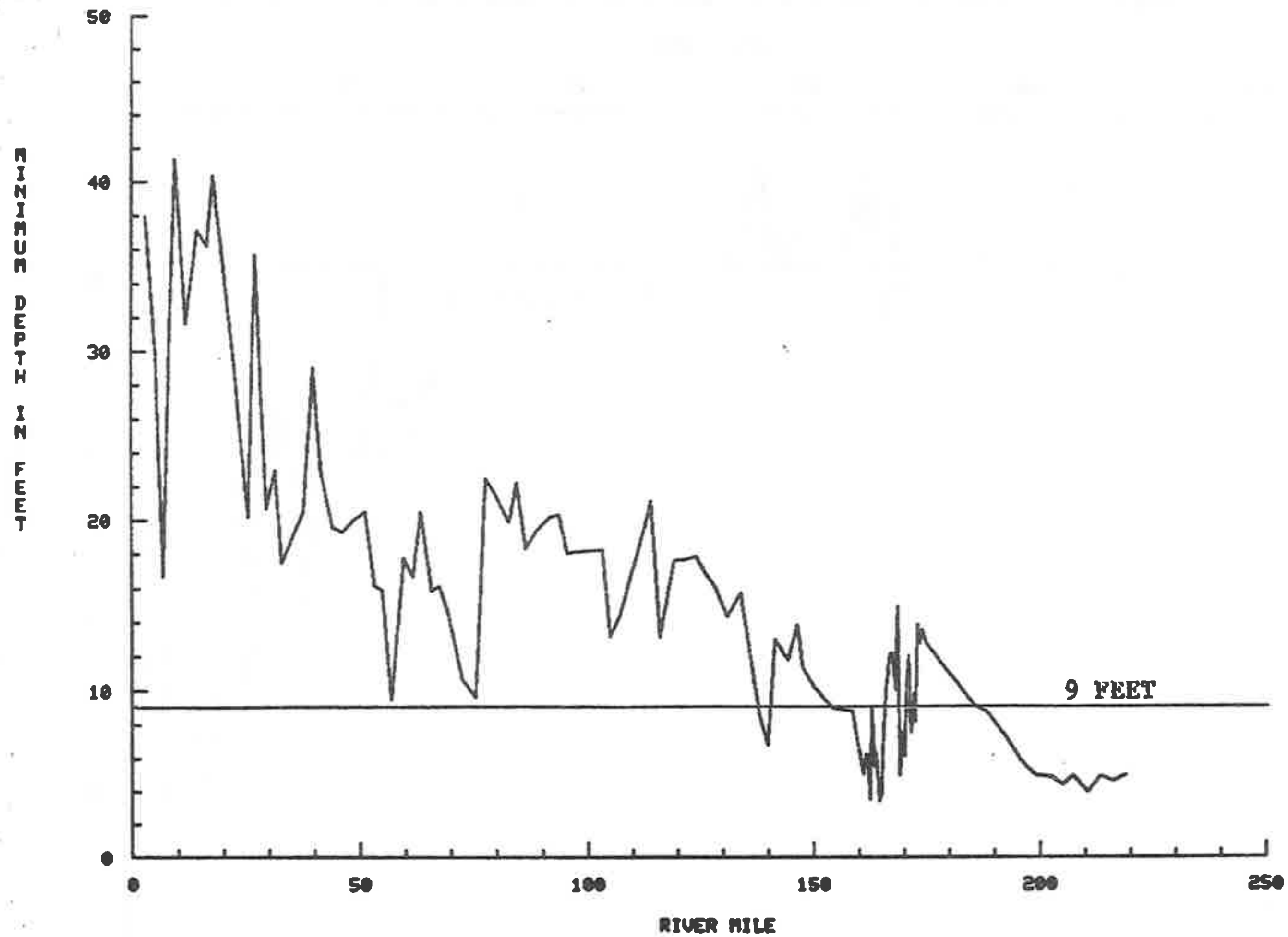


Figure E.12. Minimum depth along the main stem for two-lock condition 70-ft and 90-ft stage controlled.

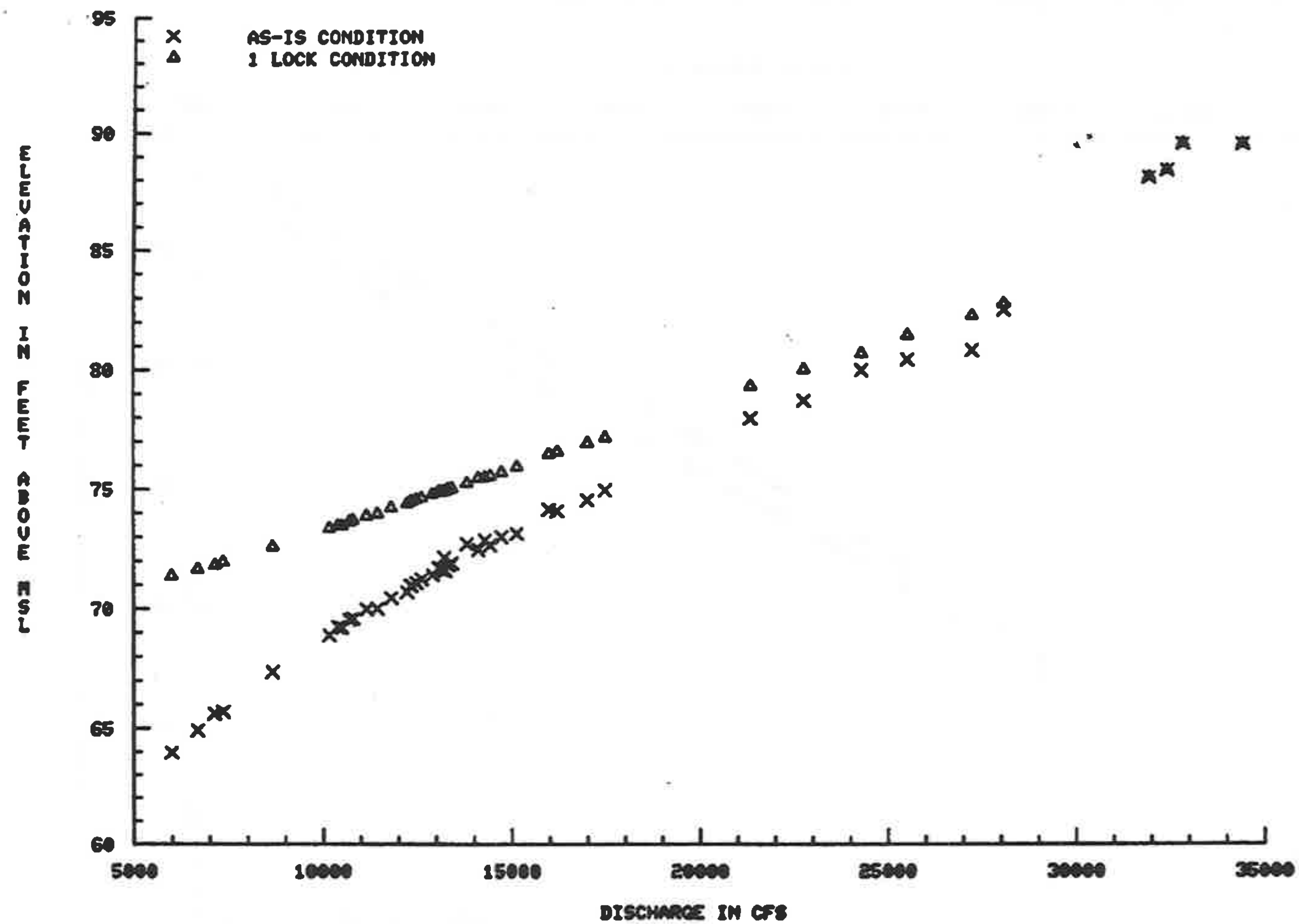


Figure E.13. Comparison of stage-discharge relationships at mouth of Big Sunflower, year 1.

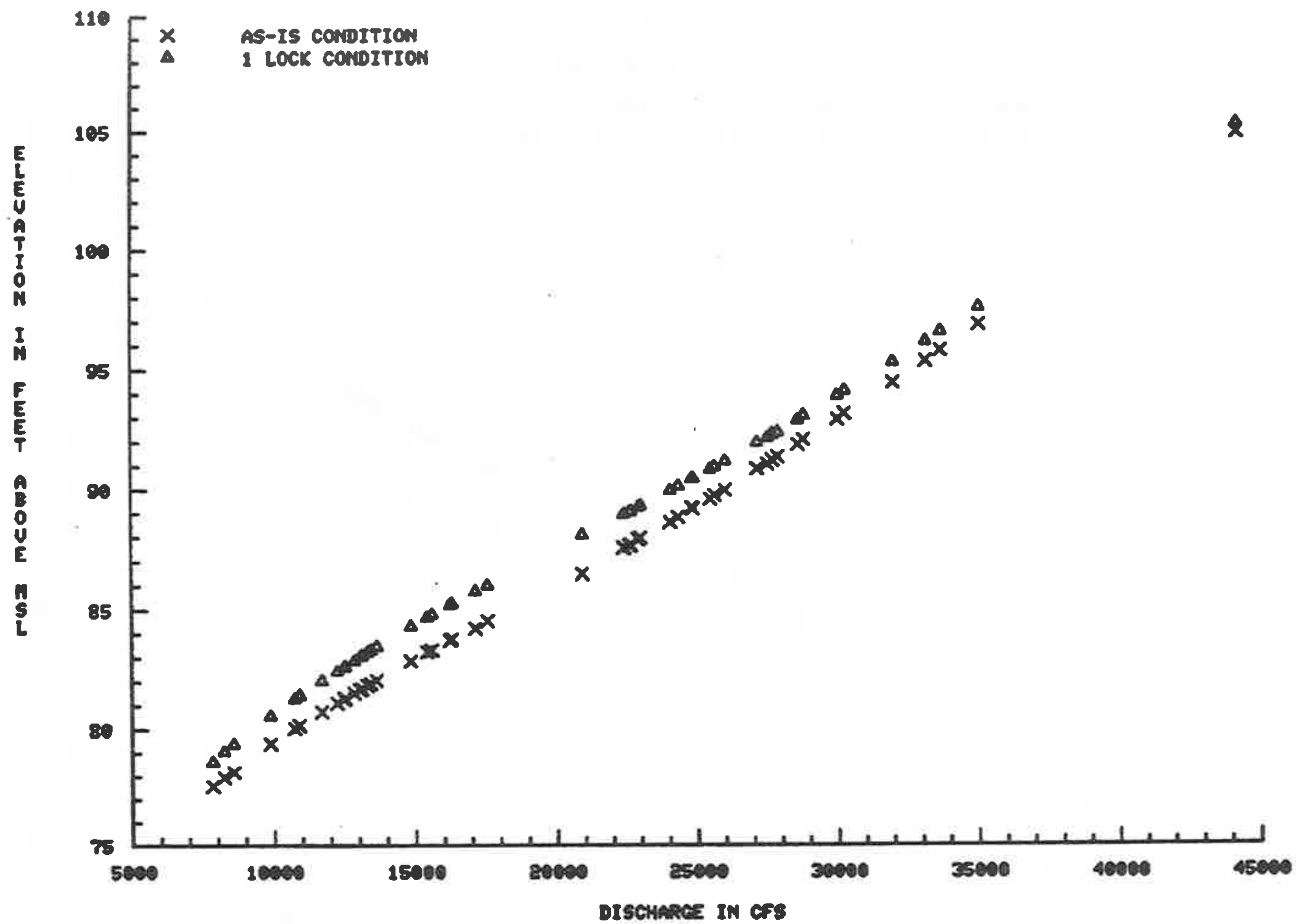


Figure E.14. Comparison of stage-discharge relationships at mouth of Big Sunflower, year 46.

Figures E.15 and E.16. Those at Greenwood are shown in Figures E.17 and E.18. It is noted from these plots that for a given discharge, stage increases due to stage control, and magnitude of the effect decreases with flow discharge and the distance from the control. Stage discharge relationships at Greenwood, Belzoni, and mouth of Big Sunflower for years 1, 10, 30, and 46 for as-is condition are depicted in Figures E.19, E.20 and E.21, respectively.

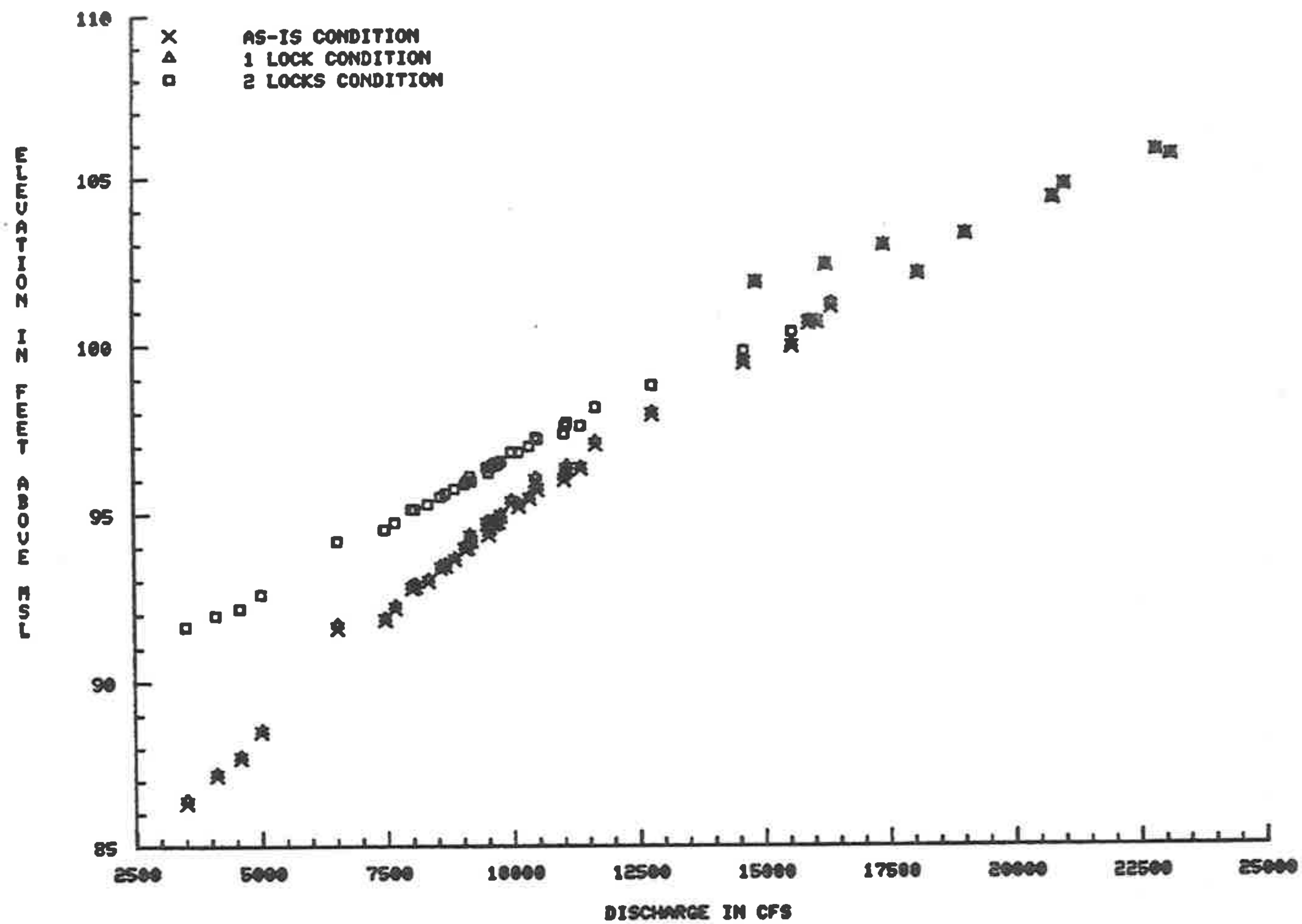


Figure E.15. Comparison of stage-discharge relationships at Belzoni, year 1.

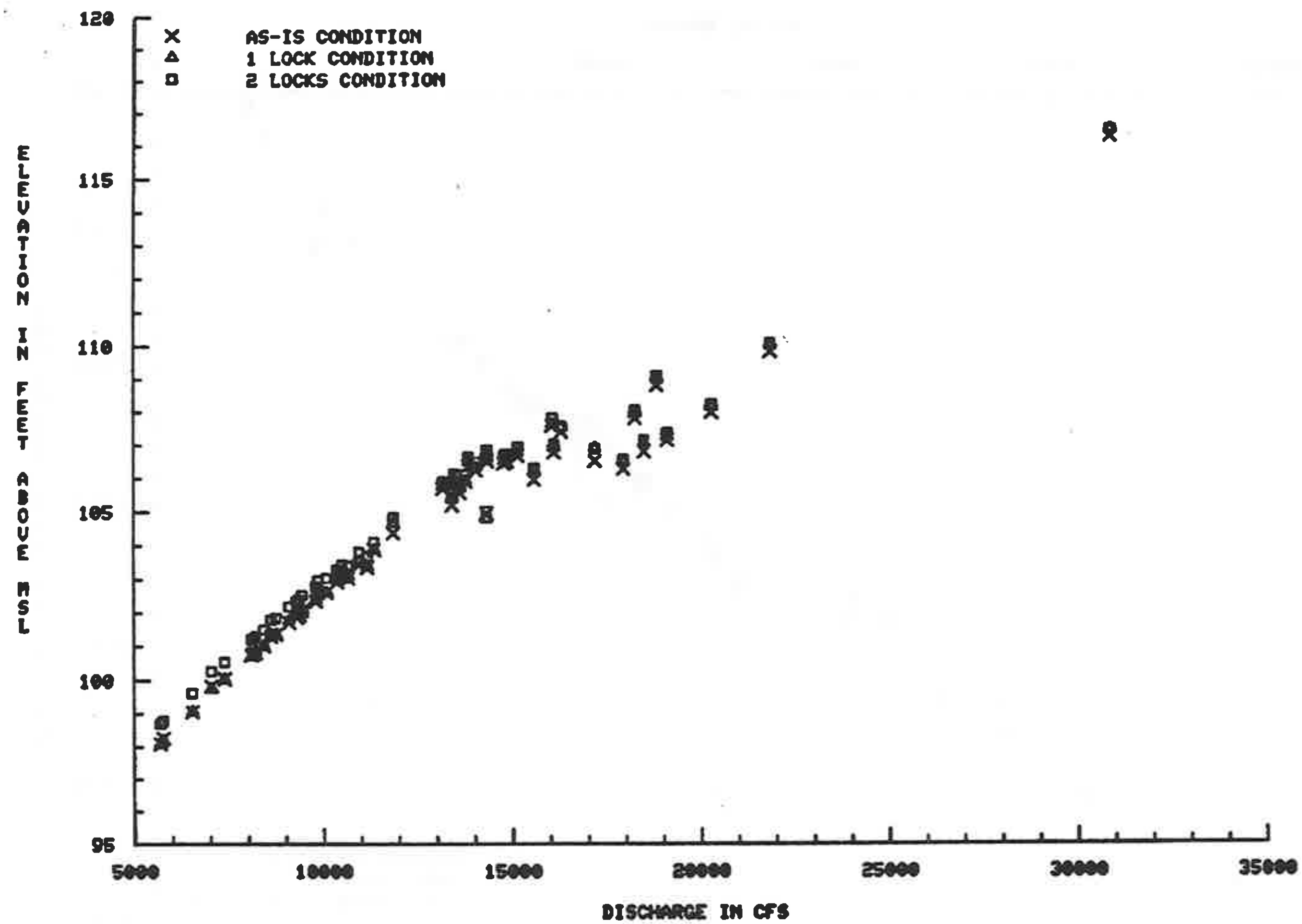


Figure E.16. Comparison of stage-discharge relationships at Belzoni, year 46.

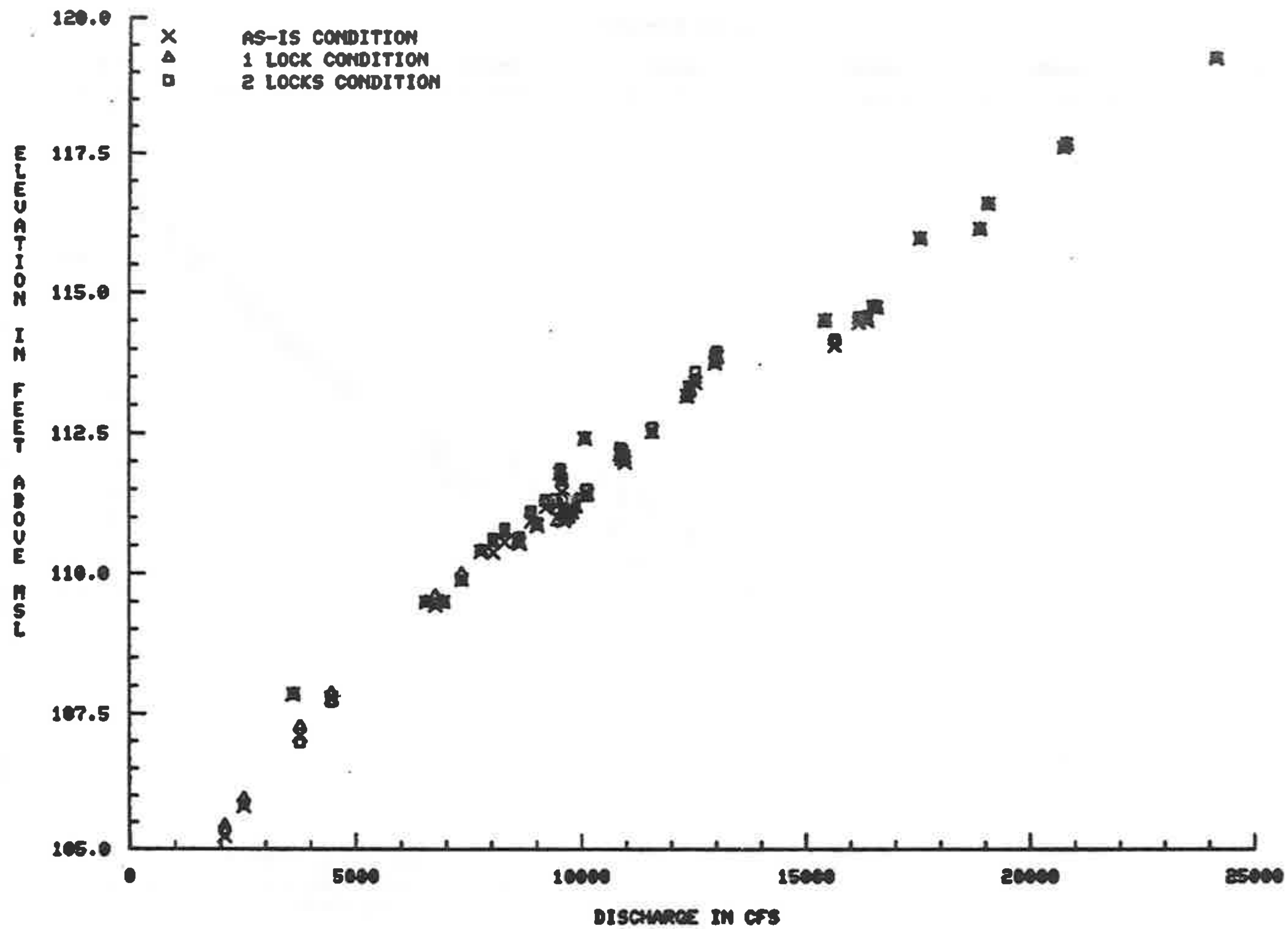


Figure E.17. Comparison of stage-discharge relationships at Greenwood, year 1.

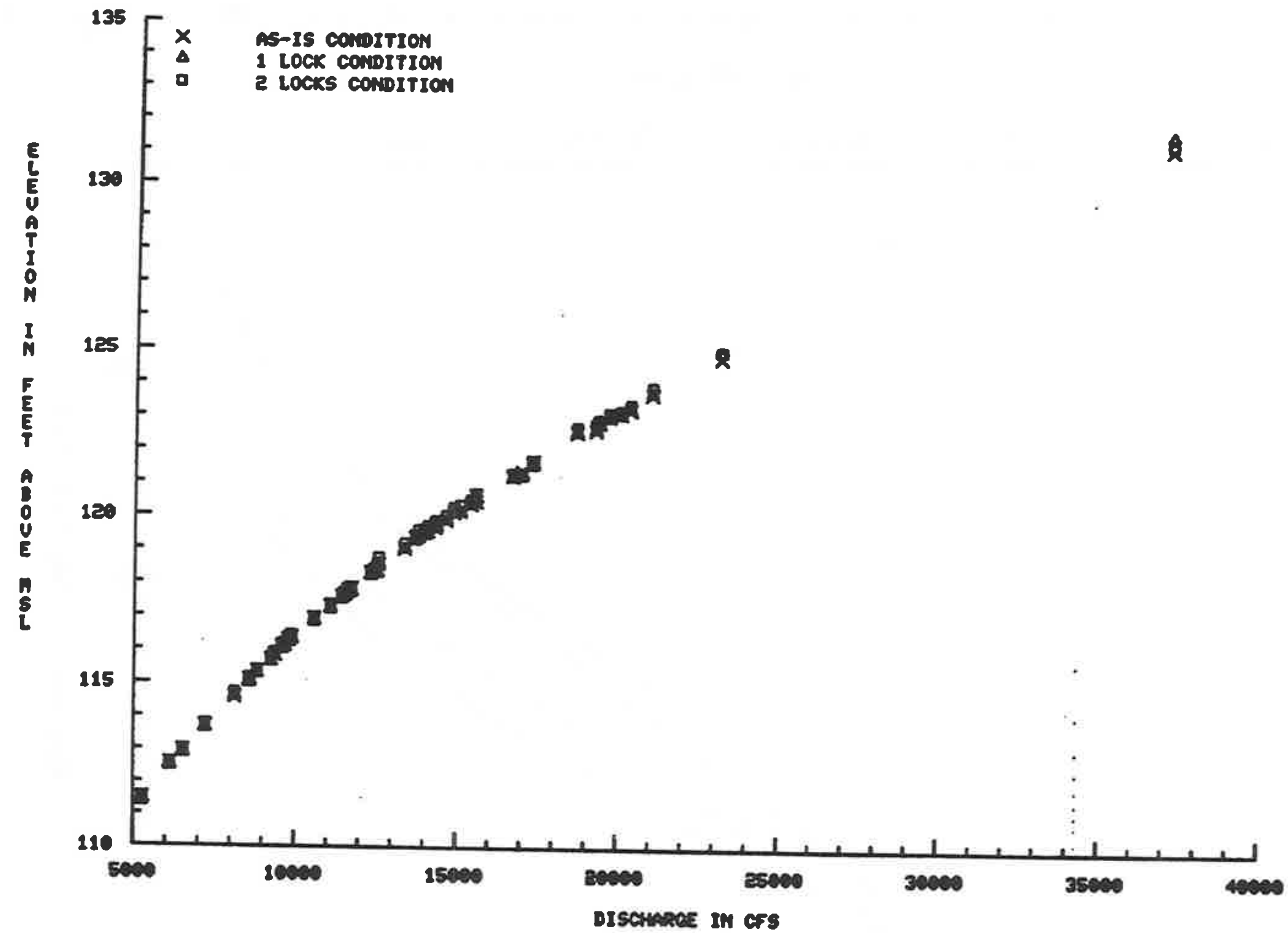


Figure E.18. Comparison of stage-discharge relationships at Greenwood, year 46.

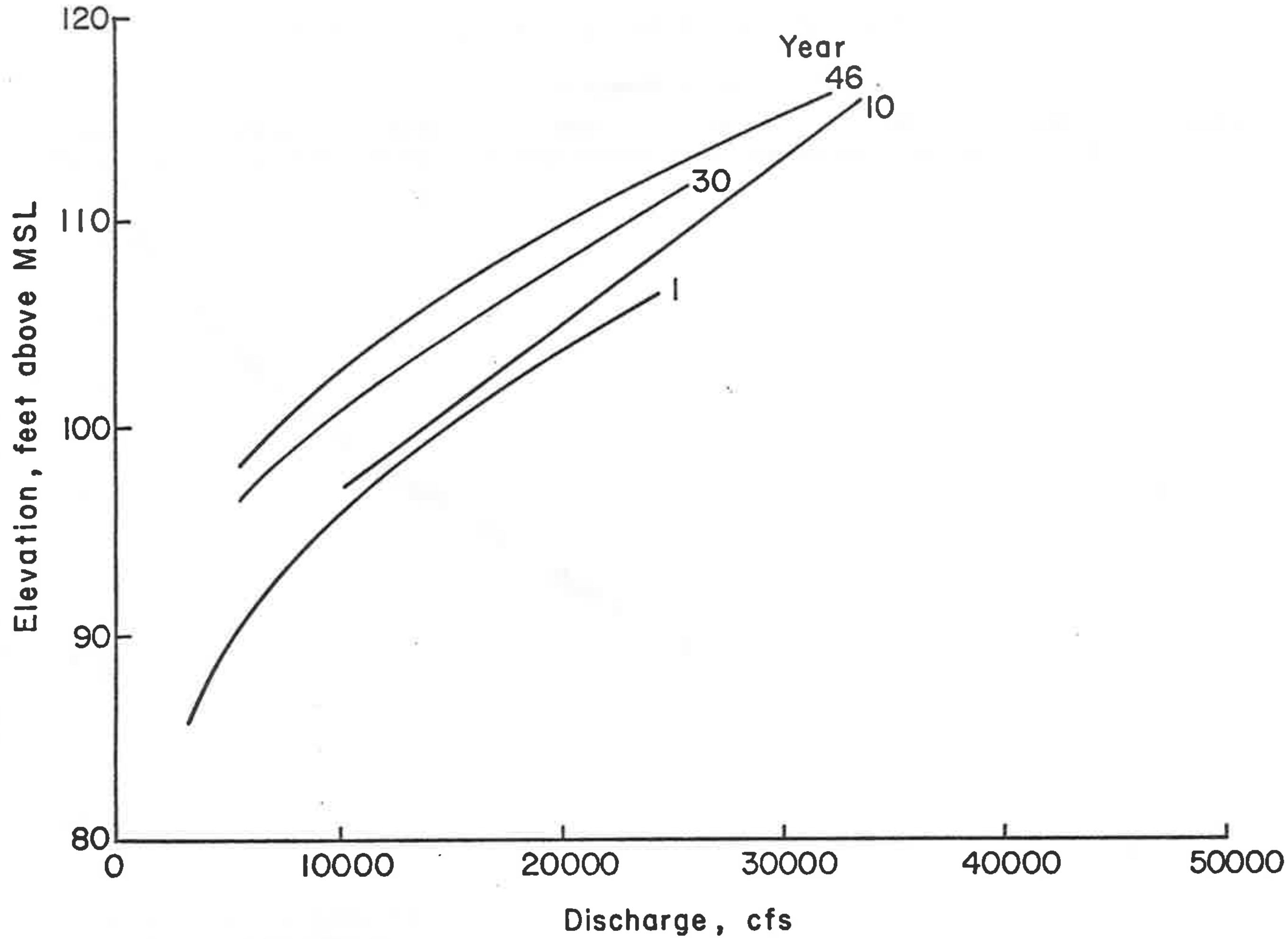


Figure E.19. Stage-discharge relationship at Greenwood, as-is condition, years 1, 10, 30 and 46.

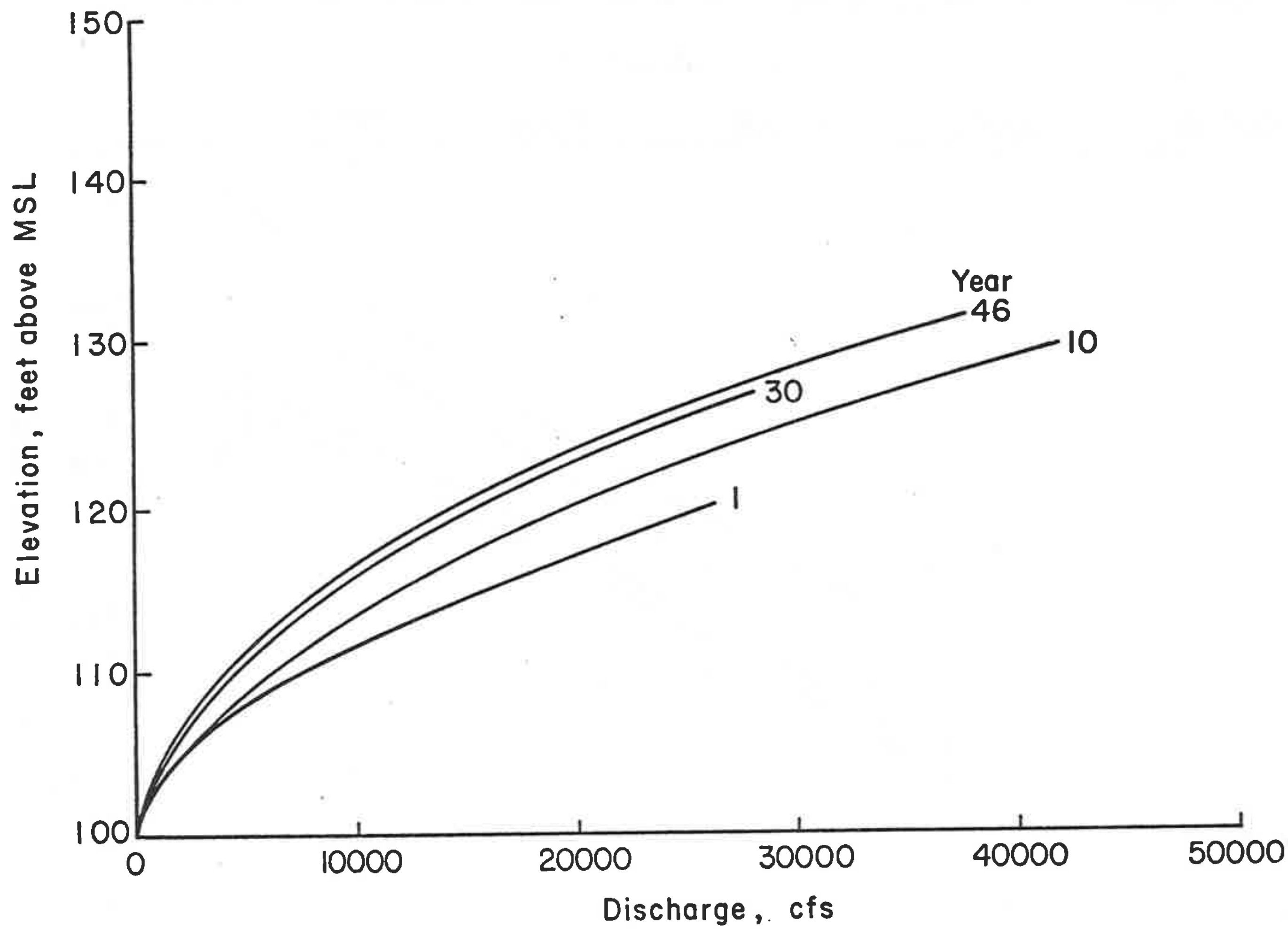


Figure E.20. Stage-discharge relationship at Belzoni, as-is condition, years 1, 10, 30 and 46.

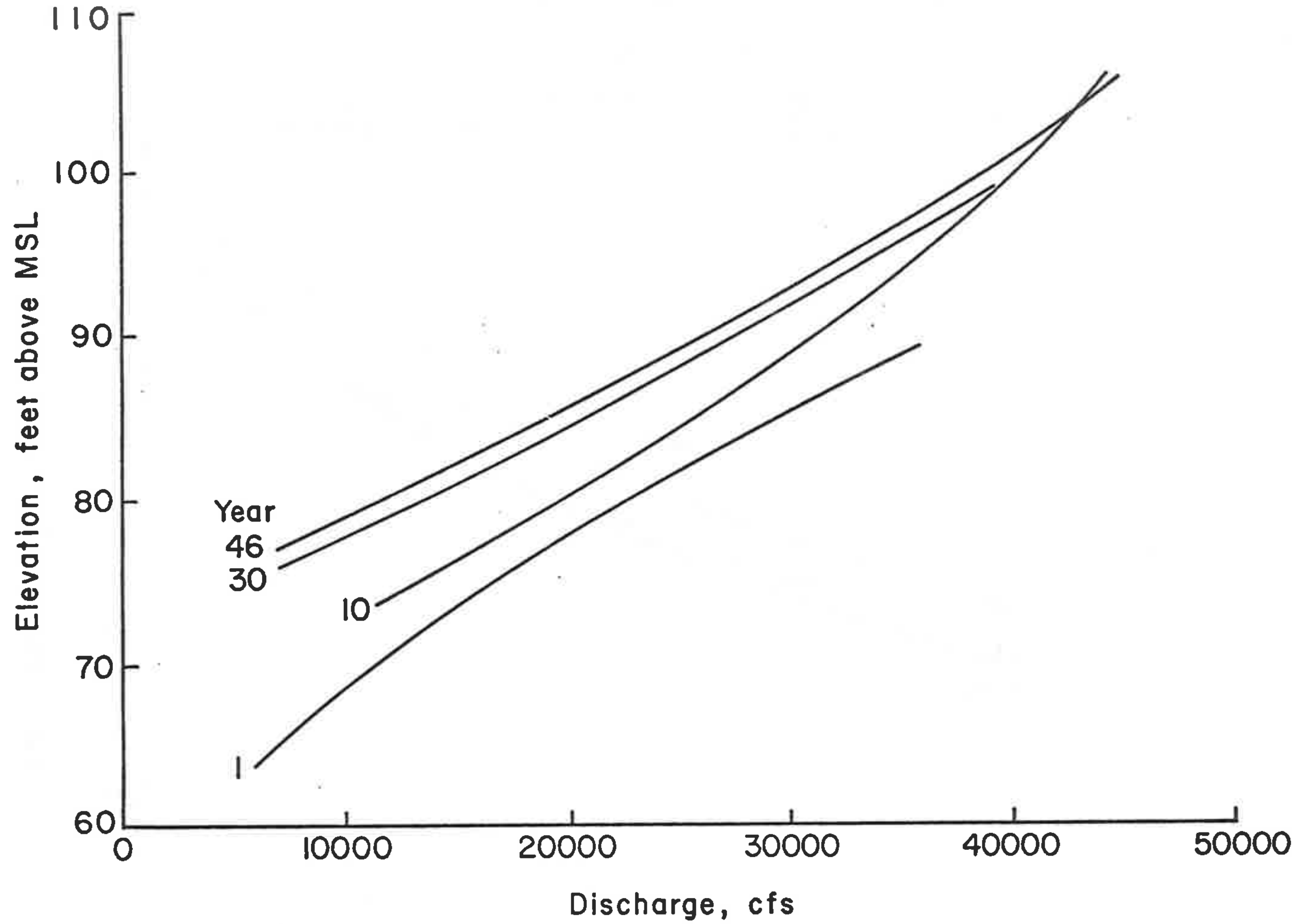


Figure E.21. Stage-discharge relationship at mouth of Big Sunflower, as-is condition, years 1, 10, 30 and 46.

Appendix F

SEDIMENTATION STUDY OF THE YAZOO RIVER BASIN

Phase II

SEDIMENTATION STUDY OF ABIACA AND PELUCIA CREEKS

CONTACT NO. DACW38-76-C-0193

Prepared for

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March 1982

F.I INTRODUCTION

In phase I of the Yazoo River Basin study, emphasis was on evaluation of the response of the main stem and major tributaries resulting from the various design alternatives. Most of the tributaries were treated as a single point source. The second phase of the analysis provides a detailed study of some important tributaries and watersheds and their effect on the main stem. This analysis is essential to provide sufficient information for detailed design and economic considerations. The purpose of this report is to present the results of two Yazoo tributary studies, Abiaca Creek and Pelucia Creek, and to update the progress in developing an accurate tributary model.

Abiaca and Pelucia Creeks are located approximately 140 and 156 miles upstream from the confluence of the Yazoo and Mississippi Rivers near the towns of Marksville and Rising Sun respectively (Figure F.1). The Abiaca Creek study reach covers the lower 5.3 miles of the stream and the Pelucia Creek study covers the lower 10.4 miles of that stream. Both reaches are significant sediment contributing tributaries not studied in detail in the Phase I analysis.

Refinement and expansion of the "known discharge, uncoupled sediment routing model" were made to enhance the program's applicability on the hill tributaries. These modifications were needed to correctly model steep slopes, high velocities, local channel expansions and contractions, and channel overflow onto the flood plain, all of which are characteristics of the hill tributaries.

Water and sediment simulation was made on each tributary, based on their "as is" condition, for a period of 50 years. Results are presented on the creek's bed elevation changes, channel cross section

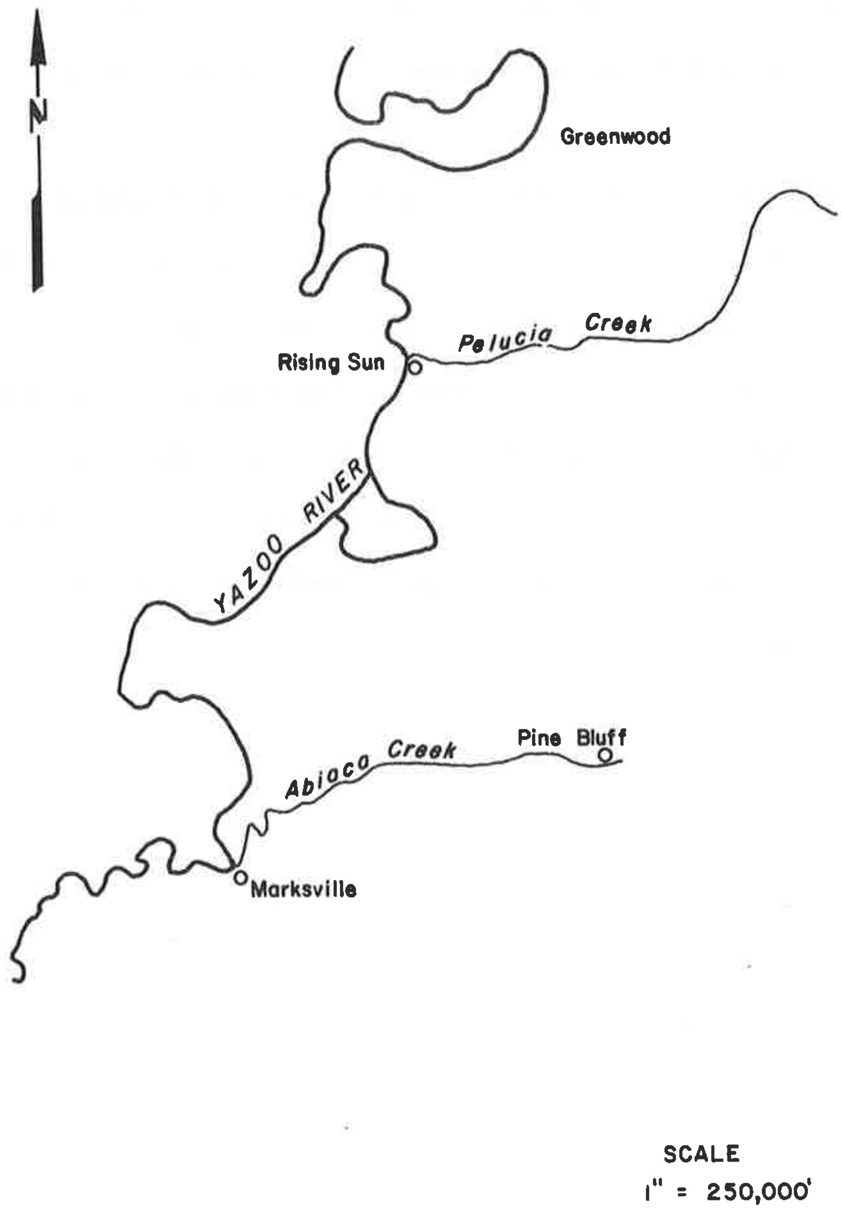

Figure 1. Vicinity Map

area changes, stage discharge relationships, and the total and average sediment yields.

This report documents the accomplishments that have been made for Abiaca and Pelucia Creeks.

1. Sediment and cross section data were collected.
2. Weekly discharge hydrographs and downstream stage hydrographs were established.
3. Sediment transport equations were derived based on field data.
4. Water and sediment routing model was modified for compatibility with the tributary condition.
5. Resistance to flow parameter (Manning's N) was calibrated.
6. Sediment routing was performed based on simulated stream flow.
7. Final results of aggradation/degradation, bed elevation and cross section area changes, sediment balance and annual sediment yield were analyzed.

F.II SYSTEM DESIGN

Both spatial and temporal design of the study tributaries is essential to represent the space-time structure for the simulated reach.

Spatial design outlines the river system, relates tributaries to the main stem, defines cross section spacing, and locates pertinent gaging stations.

Temporal design defines the discharge, time increment, and controlling water surface elevation for each time step of the simulation hydrograph.

F.2.1 Spatial Design

Spatial design of the tributary models was constructed to accurately represent the geometry of the streams while meeting the functional needs of the computer model.

Cross-sectional data for both tributaries were provided by the U.S. Army Corps of Engineers. For Pelucia Creek, two conditions were simulated. The first considered the existing condition, using 14 cross sections extending from the confluence with the Yazoo River upstream to river mile 10.4. These cross sections were surveyed in 1977. The second simulated the proposed borrow excavation within the channel. Seventeen cross sections extending from the confluence to river mile 10.7 were used. The channel for this condition has an 80 foot bottom width and 3H to 1V side slopes with levees as described in Supplement 13 to General Design Memorandum No. 41, Greenwood Protection Works. Schematic diagrams showing the location of the cross sections for each case are shown in Figures F.2 and F.3.

The Abiaca Creek model considered the 6.7 mile reach of the Old River between the Yazoo River and Matthews Brake, Matthews Brake, and the downstream six miles of Abiaca Creek. The Old River was represented by six trapezoidal cross sections as estimated by the U.S. Army Corps of Engineers. Conditions in Matthews Brake were simulated based upon the stage-volume curve provided by the Corps of Engineers and using the three 54" CMP culverts as the outlet conditions. Details of the modeling procedure are discussed in a later section. The lower six miles of Abiaca Creek were modeled using 11 cross sections which were surveyed in 1979. A schematic diagram showing the layout of the model and the cross section locations is presented in Figure F.4.

F.2.2 Temporal Design

Because of the flashy characteristics of the flows in the hill tributaries, it was recommended by the Corps of Engineers that average weekly flows not be used for the 50-year simulation hydrograph as was done in the Phase I study. In order to obtain a realistic daily flow hydrograph, measured 8:00 a.m. stages for Pelucia Creek at Valley Hill and Abiaca Creek at Pine Bluff for the 25-year period 1956 through 1980 were obtained from Corps of Engineers records. The Pelucia Creek stages were converted to 8:00 a.m. discharges using the stage-discharge relations in Table F.1. Average daily discharges were obtained as described in the Phase I Temporal Design.

For Abiaca Creek, analysis of the stages for the 25-year record indicated that the measured stages were increasing at the rate of approximately 0.25 feet per year during the 1956 to 1964 period. Since no evidence is available to indicate that the dicharges were increasing during that period, the measured stages were adjusted to eliminate the trend. The resulting stages were then converted to average daily discharges as discussed above.

Statistics for the resulting 25-year daily discharge record are shown in Table F.2. It should be noted that the flows for the new record are considerably lower than those used in the Phase I study. Conversations with the Corps of Engineers indicated that the low and medium discharges predicted by the Phase I stage-discharge relations were too large. New data were provided and a considerable amount of effort expended to generate a more realistic discharge record.

Because of the excessive length of the daily discharge hydrograph, it was determined that flows of less than 75 cfs could be neglected in the sediment routing without introducing appreciable error since the transport rates at those flows are insignificant. (Sediment transport for these flows was considered in the total sediment yield, however.) In addition, the routing time increment was allowed to vary up to seven days for flows between 75 and 300 cfs. All flows greater than 300 cfs were routed on a daily basis. This procedure produced a simulation hydrograph that was reasonable in length but preserved the extreme variability in the flows during storms. Figure F.5 contains discharge frequency curves for the two streams. The 25-year record resulting from this procedure was duplicated in order to obtain the desired 50-year simulation.

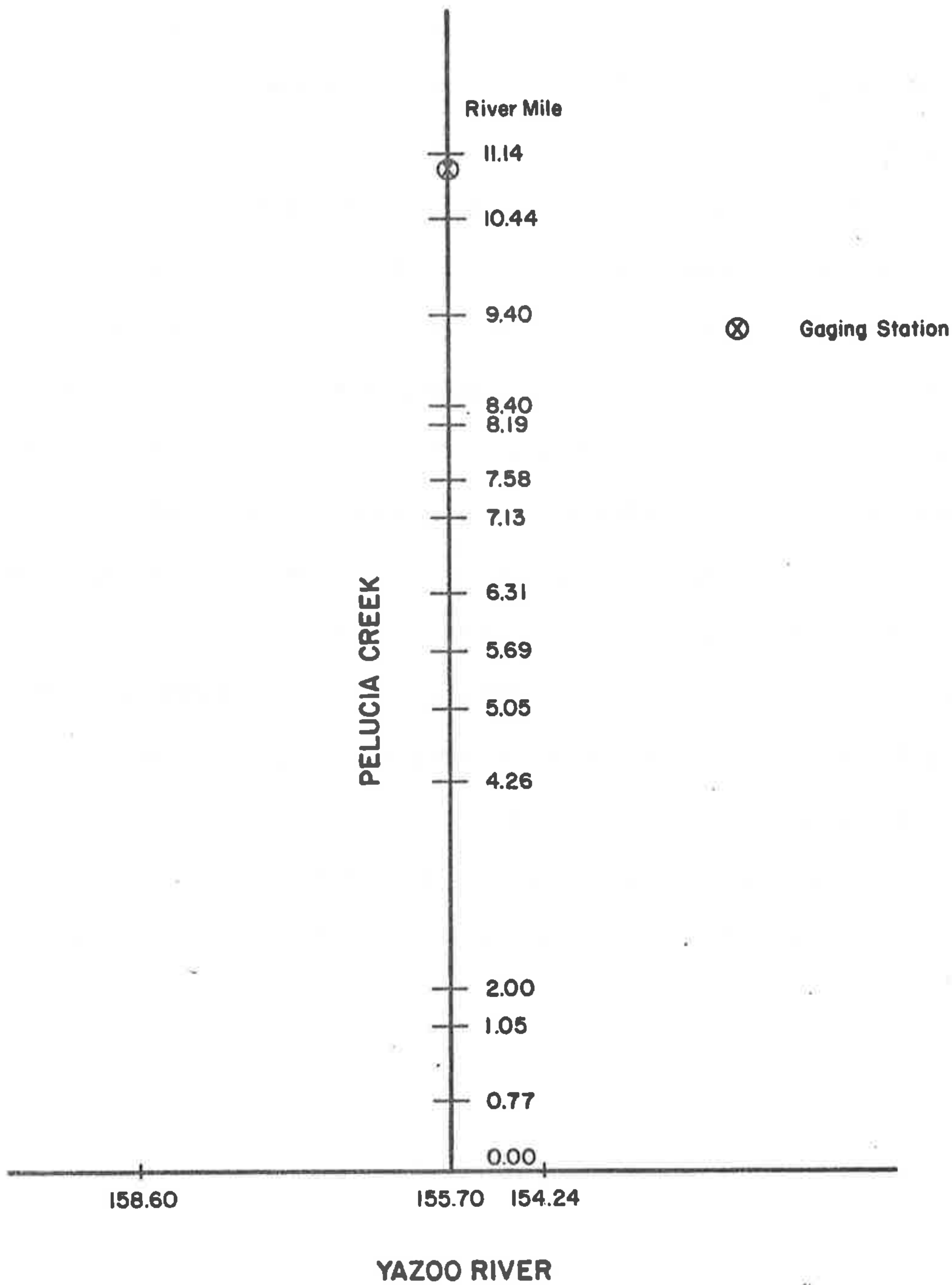

Figure F.2. Spatial design of Pelucia Creek Model, as-is condition.

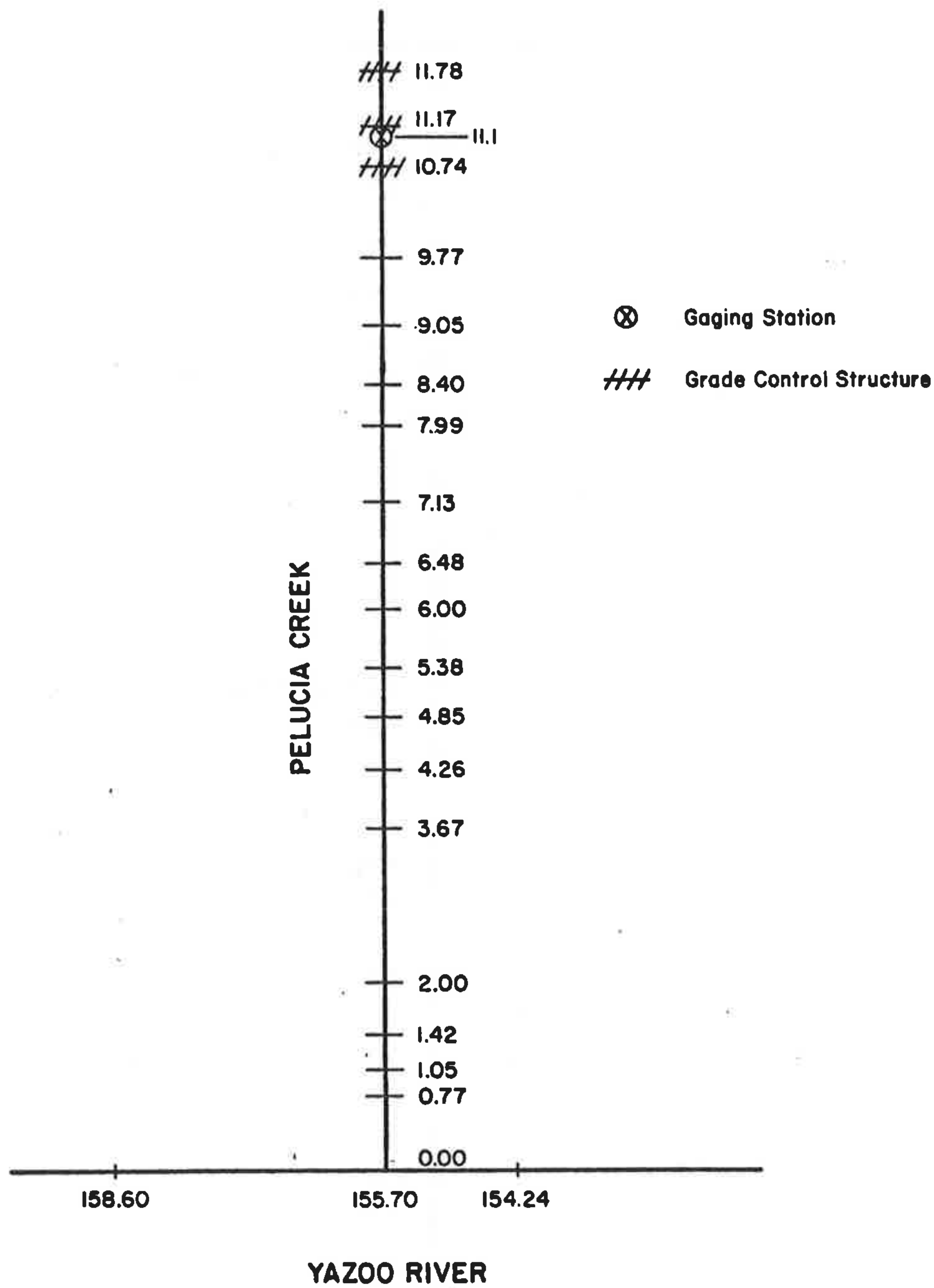

Figure F.3. Spatial design of Abiaca Creek model, proposed borrow excavation.

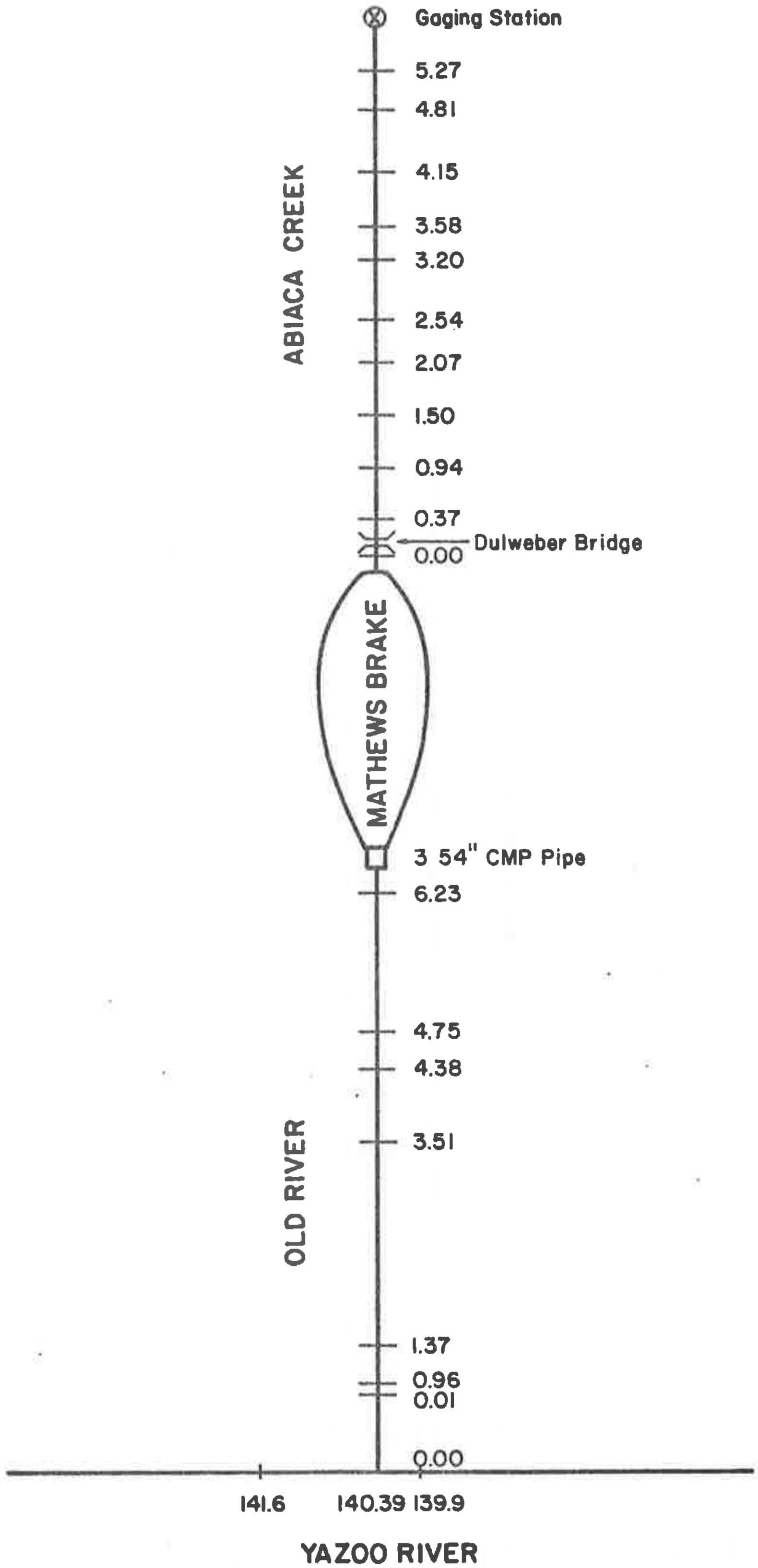

Figure F.4. Spatial design of Abiaca Creek model.

F.III CALIBRATION OF FLOW RESISTANCE

Manning's n values were calibrated for low, medium, and high flows by comparing computed stages to measured stages at the gaging stations. Calibration results show the two creeks have similar flow resistance characteristics; Manning's n values are about 0.03 in the main channel and 0.15 on the flood plain.

F.IV SEDIMENT ANALYSIS

In the sedimentation study of the Yazoo River basin, empirical relationships of the following form were used in the mathematical modeling:

$$Q_s = a\ V^b\ D_e^c\ W_e \qquad (F.1)$$

where Q_s is the bed material sediment transport in cfs and V, D_e, and W_e are the velocity, effective depth, and effective width, respectively. Tributaries to the main stem were treated as point sources with the Q_s versus Q relation of the general form

$$Q_s = a\ Q^b \qquad (F.2)$$

In the current study, more field survey data were collected for Pelucia and Abiaca Creeks to enable further analysis of these reaches. These data are compiled in the report "Yazoo River Basin Tributaries Data Collection," October, 1980 by Water and Environment Consultants. The data was collected during the spring and summer of 1979 and included stage-discharge, cross section, suspended sediment, and bed material size fraction data for seven cross sections for each of the two tributaries. These cross sections ranged from river mile 1.03 to 22.28 for Abiaca Creek and river mile 1.03 to 17.53 for Pelucia Creek. Data for cross sections less than river mile 10.94 for Abiaca Creek and less than river mile 11.72 for Pelucia Creek were used to generate the hydraulic flow parameters and subsequently to extend the sediment data to total bed material load by using the Improved Modified Einstein Procedure.

There were 12 data sets available for the regression analysis for Pelucia Creek and 9 for Abiaca Creek (Table F.3).

In developing the new relationship, regression analysis was used and simple correlation was assumed. Correlation of Q_s vs Q and Q_s vs $Q/D_e^{.94}/W_e$ was evaluated by using a power function.

Resulting sediment equations and their correlation coefficients (r) for both Pelucia Creek and Abiaca Creek are as follows

for Pelucia Creek $Q_s = 4.188 \times 10^{-5} \times Q^{1.47}$ $r = .97$ (F.3)

$Q_s = 2.626 \times 10^{-4} \times V^{2.24} D_e^{.94} W_e$ $r = .92$ (F.4)

and for Abiaca Creek $Q_s = 7.16 \times 10^{-5} \times Q^{1.37}$ $r = 0.94$ (F.5)

$Q_s = 5.85 \times 10^{-5} \times V^{3.04} D_e^{.94} W_e$ $r = 0.99$ (F.6)

These equations were used later in the mathematical model to generate sediment transport rates at various river cross sections.

For comparison, it is important to recall that the original point source power equations from the Phase I General Report for Pelucia and Abiaca Creeks were

$$Q_s = 7.5 \times 10^{-8} Q^{2.3} \quad (F.7)$$

$$Q_s = 7.5 \times 10^{-8} Q^{2.4} \quad (F.8)$$

The results of comparison indicate that the original point source power functions are adequate for preliminary assessment.

Table F.1. Stage-Discharge Relations

Pelucia Creek at Valley Hill

1956-1969

$Q = 47.863\ (S - 7.5)^{2.395}$	$S \leq 13.35'$
$Q = 2485.71\ (S - 12.023)$	$S > 13.35'$

1970-1974

$Q = 9.131\ (S - 7.5)^{3.155}$	$S \leq 13.00'$
$Q = 900.0\ (S - 10.78)$	$S > 13.00'$

1975-1980

$Q = 1743\ (S - 7.5)^{3.909}$	$S \leq 12.50'$
$Q = 761.0\ (S - 11.29)$	$S > 12.50'$

Abiaca Creek at Pine Bluff

1956-1960

$Q = 131.698\ (S - 4.73)^{1.636}$	$S < 6.63$
$Q = 863.87\ (S - 6.53)^{0.461}$	$6.63 < S \leq 8.33$
$Q = 2799.24\ (S - 7.97)^{0.391}$	$S > 8.33$

1961-1980

$Q = 2.718\ (S - 4.0)^{3.355}$	$S < 9.0$
$Q = 645.49\ (S - 7.93)^{0.697}$	$9.0 < S \leq 10.8$
$Q = 625.57\ (S - 8.649)$	$S > 10.8$

Table F.2. Flow Statistics (cfs).

	Mean	Min.	Max.	Std. Dev.
Pelucia Creek at Valley Hill	117.6	0.0	6993.8	317.5
Abiaca Creek at Pine Bluff	222.6	0.0	4498.0	390.2

Table F.3. Sediment Data Used for Regression Analysis

Q (cfs)	D (ft)	W (ft)	V (fps)	Q_s (cfs)
		Pelucia Creek		
56.7	1.28	18.82	2.21	.010
64.7	.91	40.06	1.61	.011
1510	3.64	74.85	5.13	4.248
1960	8.42	105.53	2.14	1.457
2220	11.85	113.74	1.58	2.062
2710	9.54	66.29	4.14	4.185
2690	9.05	65.51	4.41	3.856
2450	9.33	65.95	3.86	2.907
790	3.06	55.95	4.46	2.174
2040	4.18	61.26	7.64	4.120
4010	6.24	76.72	7.09	8.284
3710	5.82	71.58	7.7	6.944
		Abiaca Creek		
65	1.21	17.4	2.99	.021
1870	6.23	74.9	3.84	1.65
1980	5.19	72.32	5.10	2.65
4220	6.98	76.67	7.45	6.77
3482	6.67	75.78	6.54	4.23
1820	5.02	72.18	4.44	3.59
2020	5.04	72.35	4.89	2.54
3980	7.60	96.59	4.58	5.89
4910	7.53	95.88	5.75	8.61

Q = flow rate
D = channel depth
W = channel width
V = Average Velocity
Q_s = Sediment transport rate

Table F.4. Summary of Results for Pelucia Creek.

	Cumulative Aggradation/Degradation (10^3 yards^3)	Total Sediment Yield (10^3 yards^3)	Average Sediment Yield (10^3 yards^3/year)
As-Is Condition	-134.5	7,004	140
Proposed Borrow Excavation	+602.0	5,680	114

F.V PROGRAM MODIFICATION

F.5.1 General

The known discharge, uncoupled steady flow sediment routing model KUWASER was used in this study. It assumed that during any one time period water discharge is constant along the entire reach of the river. Water and sediment routing are uncoupled and the bed profile is assumed unchanged during the water routing. Sediment discharge is calculated after the water surface profile is determined, and is related to the flow and channel characteristics by a sediment transport function. The model has been applied successfully previously in the Yazoo River Basin Study. Simplicity of the known discharge, uncoupled model has resulted in tremendous savings in computer time and, with the accuracy it achieves, makes the model an excellent tool for evaluating long-term average effects of sediment movement.

In the current phase of the hill tributary study, program modifications were made to reflect special tributary characteristics which make the original model unable to function properly for all conditions. The following are the major problems encountered in the initial stage of the tributary study.

1. Overbank flow occurs frequently in the tributaries. This poses two potential problems to the model. First, as the flow depth exceeds the channel bank, the relative width of the channel becomes proportionally less than the width of the inundated floodplain. Average velocity calculated by the discharge and flow area are no longer representative of the true velocity within the main channel, thus causing an inaccurate sediment rate calculation. Second, hydraulic

properties, such as flow area, conveyance, velocity distribution factor, and effective depth and width, are all related to the thalweg depth by a simple power function. As the water stage rises above the bank full condition, the sudden change in width causes discontinuity of the power function.

2. In the original KUWASER Program, sediment balance based on the transporting capacity was assumed between channel cross sections for the simulation time increment. Sediment transport capacities for the cross sections were represented by an empirical relationship derived from the measured sediment data. This is generally true in the main stem where sediment continuity based on the transporting capacities can be attained between cross sections of small sediment transport rate deviation. However, in the tributary, sediment balance based on the transporting capacity might not exist due to limited sediment supply, large channel geometry changes, and aggradation and/or degradation.

3. In a tributary, variation of cross section geometry is greater than variation in the main stem and, generally, the tributary's bed slope is steeper. Large local flow area variation, plus steeper slope, cause the tributary flow regime to approach the critical flow condition. The analytical solution to the backwater curve in the model, calculated by using an iterative first-order Newton-Raphson approximation, becomes very sensitive as flow approaches the critical condition.

To remedy these difficulties, several modifications have been made.

F.5.2 Average Velocity

The average velocity, previously calculated using the discharge and combined area of the main channel and floodplain, is replaced by

$$V = \frac{Q}{D_e \cdot W_e} \tag{F.9}$$

where Q is the discharge and D_e and W_e are the effective depth and width respectively. Effective depth is a weighted depth based on conveyance, and the effective width is a result of equal section factors

$$D_e = \frac{\sum_{i=1}^{n} (d_i \cdot K_i)}{\sum K_i} \tag{F.10}$$

and

$$W_e = \frac{\sum_{i=1}^{n} (a_i \cdot r_i^{2/3})}{D_e^{5/3}} \tag{F.11}$$

where d_i, K_i, a_i, and r_i are the corresponding depth, conveyance, area, and hydraulic radius between individual cross section points. Velocity, so derived, will give more weight to the velocity in the main channel and will result in a more accurate value for the sediment transport rate calculation.

F.5.3 Sediment Transport Rate

A bed material transport rate which is out of balance between two sections considering the transporting capacities is resolved by the following scheme. First, potential sediment balance exists, assuming aggradation or degradation of a downstream channel section is calculated by the sediment continuity equation (time needed to reach such a condition must be calculated). Second, using proportions, time needed to reach sediment balance and the time increment of routing are used to

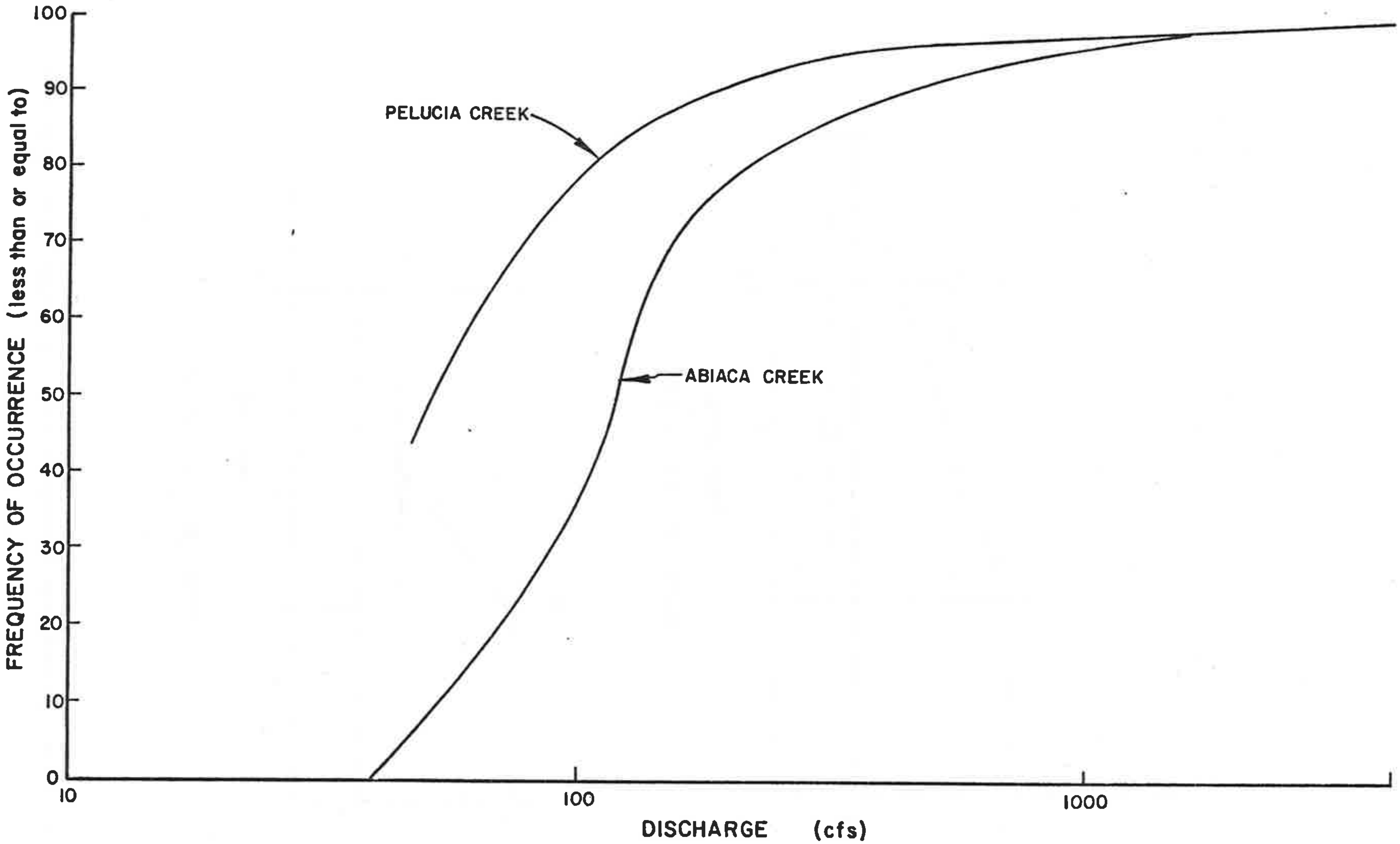

Figure F.5. Discharge-frequency curves for 25-year daily flow record (1956-1980), Abiaca and Pelucia Creeks.

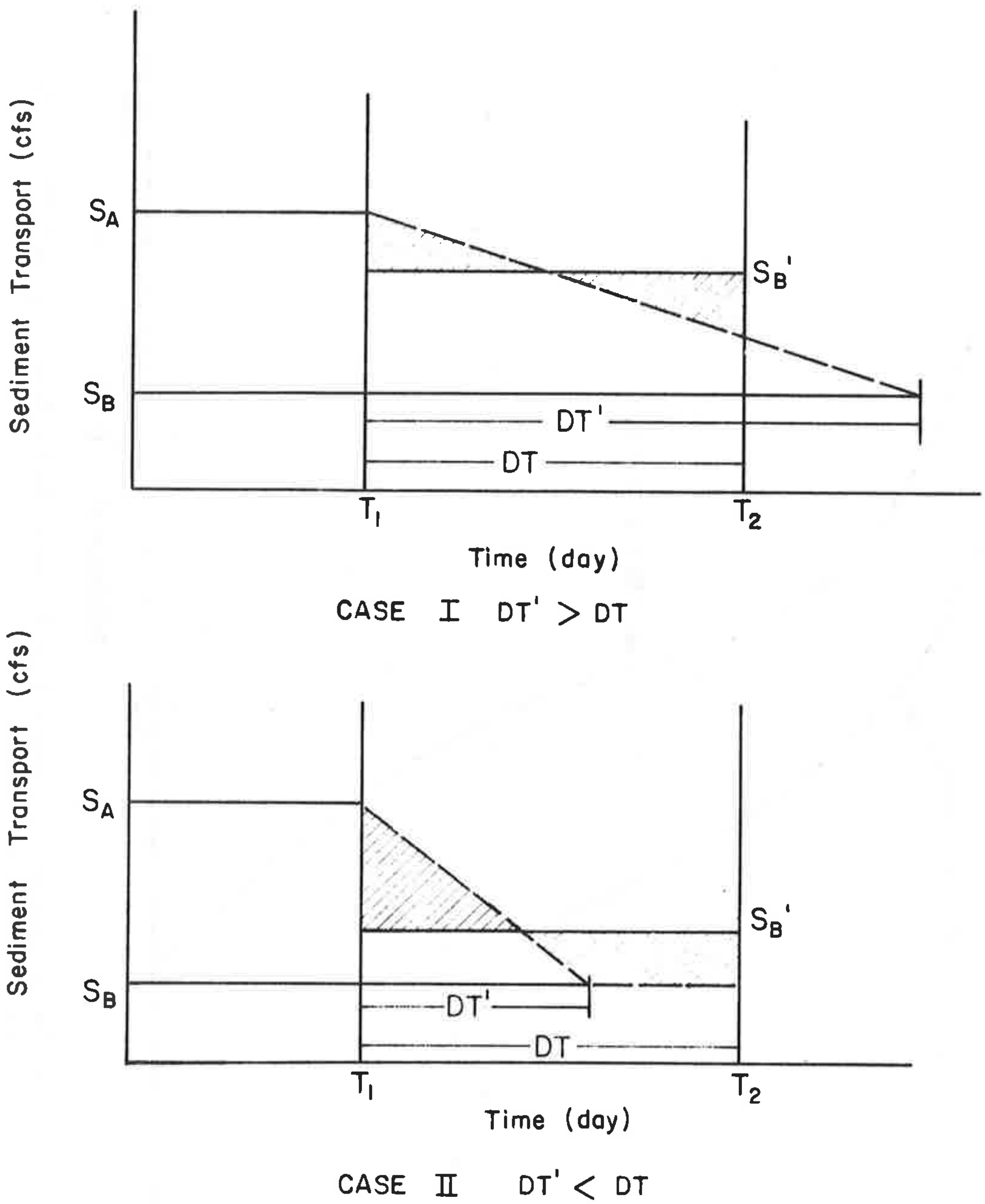

Figure F.6. Average sediment transport rate of a unit time increment.

establish the instantaneous downstream transport rate at the end of the routing period. Final average transport rate of the routing period is then estimated as an average of the initial upstream value at the start of the routing period and the instantaneous downstream value at the end of the routing period. Figure F.6 shows two cases of the average transport rate calculation. Case I assumes that the time required for sediment balance (DT') exceeds the routing time increment (DT). In Case II balance is assumed to be reached prior to the end of the routing time increment. S_A and S_B represent the bed material transport rates for upstream section A and downstream section B, and T_1 and T_2 are the start and end of the routing time increment. Final averaged outgoing bed material transport rate is represented by S_B'.

Ability of the model to calculate a new sediment transport rate for a non-balanced sediment condition considering the transport capacities only greatly improves the model's applicability to tributary sediment routing. Again, this modification considers the importance of limited sediment supply and sources.

F.5.4 <u>Other Modifications</u>

In the original KUWASER Program, energy slope was used to provide trial values for unknown water surface elevations. In the tributary program, normal depth and channel bed slope, in addition to energy slope, were used to provide an estimation for the first-order Newton-Raphson solution. This modification works well at locations where the water surface is controlled by backwater and where large grade breaks occur.

The method of "least squares through a fixed point" was used to improve the continuity of the thalweg depth power function. Consistency establish the instantaneous downstream transport rate at the end of the routing period. Final average transport rate of the routing period is then estimated as an average of the initial upstream value at the start of the routing period and the instantaneous downstream value at the end of the routing period. Figure F.6 shows two cases of the average transport rate calculation. Case I assumes that the time required for sediment balance (DT') exceeds the routing time increment (DT). In Case II balance is assumed to be reached prior to the end of the routing time increment. S_A and S_B represent the bed material transport rates for upstream section A and downstream section B, and T_1 and T_2 are the start and end of the routing time increment. Final averaged outgoing bed material transport rate is represented by S_B'.

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The method of "least squares through a fixed point" was used to improve the continuity of the thalweg depth power function. Consistency of the power function was thus achieved in the region of bank full elevations.

A correlation exists between spacing of points describing channel geometry and the weighting factors used in sediment distribution. Using this relationship improves the accuracy of calculated sediment distribution within the cross section.

The resulting model, after the above modification, is an effective tool in simulating water and sediment movement in the hill tributary. This model can also be used to evaluate the effect of channelization, downstream dredging, and the installation of sediment control structures.

F.VI ANALYSIS OF RESULTS

F.6.1 Pelucia Creek

As previously discussed, sediment routing was performed for Pelucia Creek considering the as-is condition and the effects of the proposed borrow excavation. The 50-year simulation was obtained by performing the routing using the discharge files discussed in Section 2.2.

F.6.1.1 As-Is Condition

The results of the simulation for the as-is condition indicate cumulative degradation of 134,500 cubic yards for the 50-year period. Figure F.7 shows the temporal distribution of the aggradation/ degradation. In general, significant degradation occurred during the first two years, followed by slight aggradation through approximately the seventeenth year. Considerable aggradation took place during the seventeenth year. This period corresponds to calender year 1973. The aggradation was caused by backwater from the high stages in the main stem during that year. The response of the channel to the second 25-year period was basically the same as the first.

Figure F.8 shows the average change in bed elevation with river mile at the end of the simulation period. From the figure, it can be seen that the degradation occurred upstream of river mile 3.0. Aggradation in the lower three miles of the reach was caused by the backwater from the main stem. The indication from this is that Pelucia Creek in its 1977 condition was generally degrading with the main stem water-surface elevation as the control.

The initial and final minimum bed elevations and maximum water-surface elevation that occurred during the period are shown in Figure F.9. It should be noted that the maximum water-surface elevation at each point did not necessarily occur during the same time period.

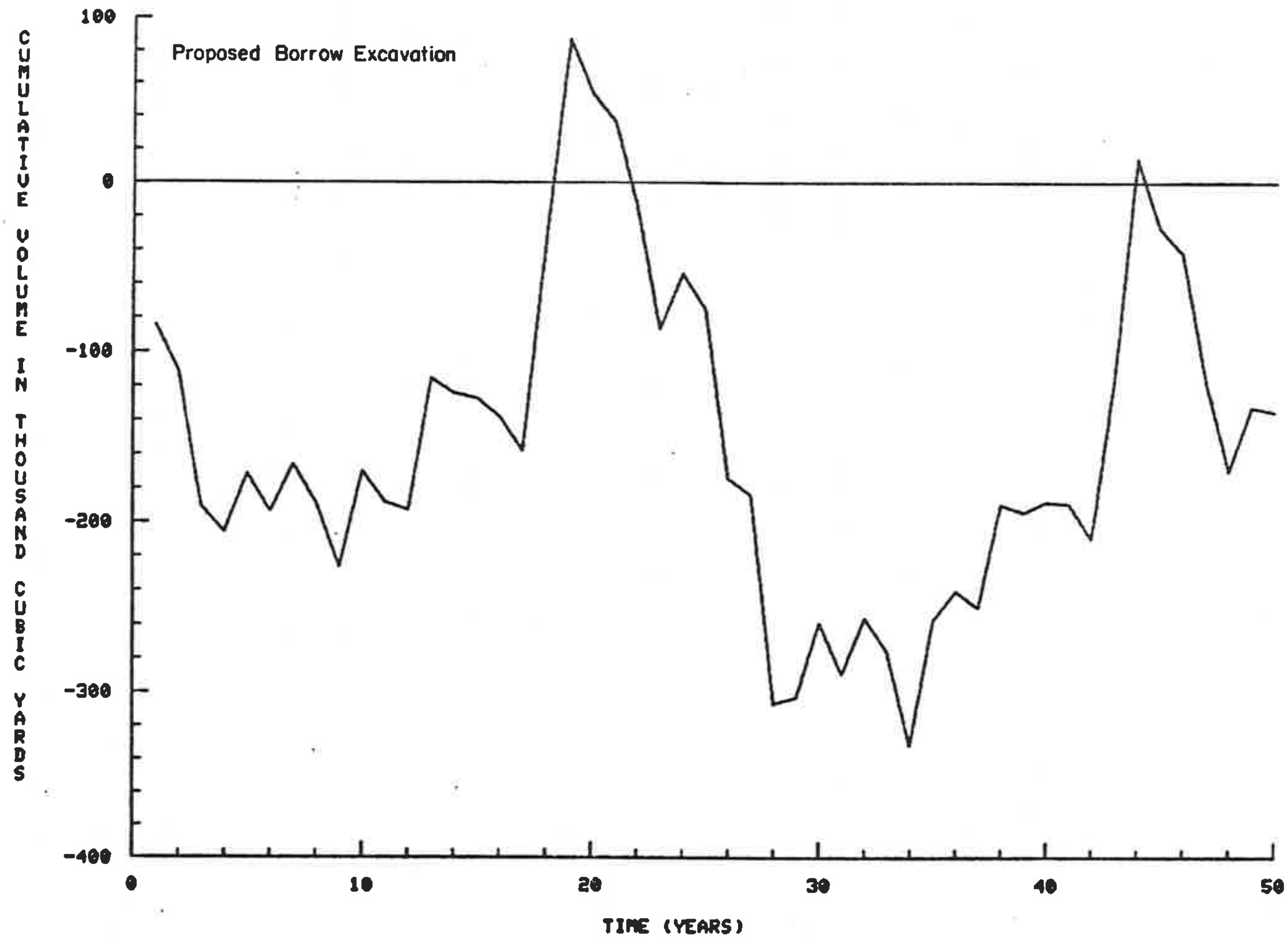

Figure F.7. Cumulative aggradation/degradation in Pelucia Creek, as-is condition.

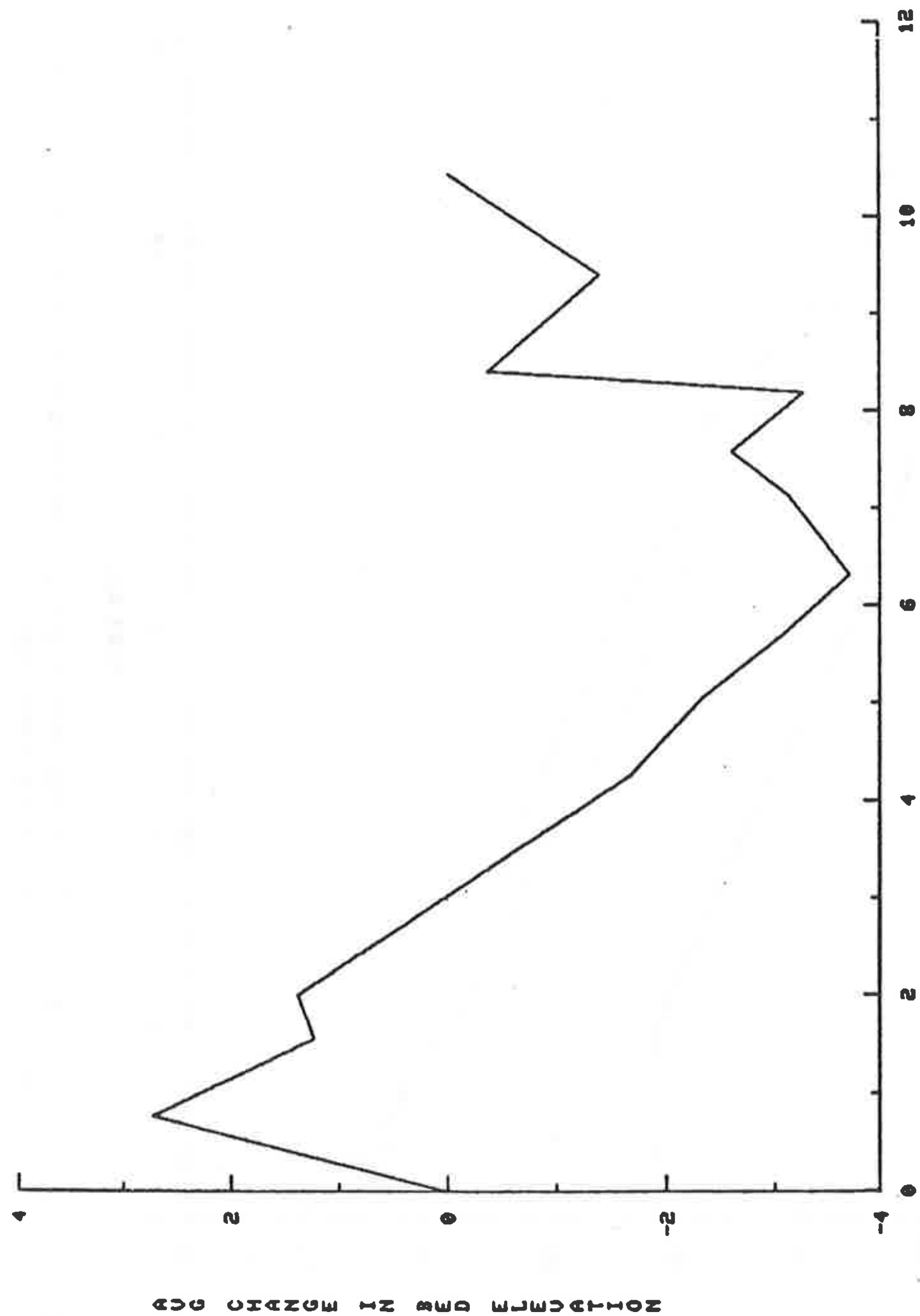

Figure F.8. Average change in bed elevation, as-is condition.

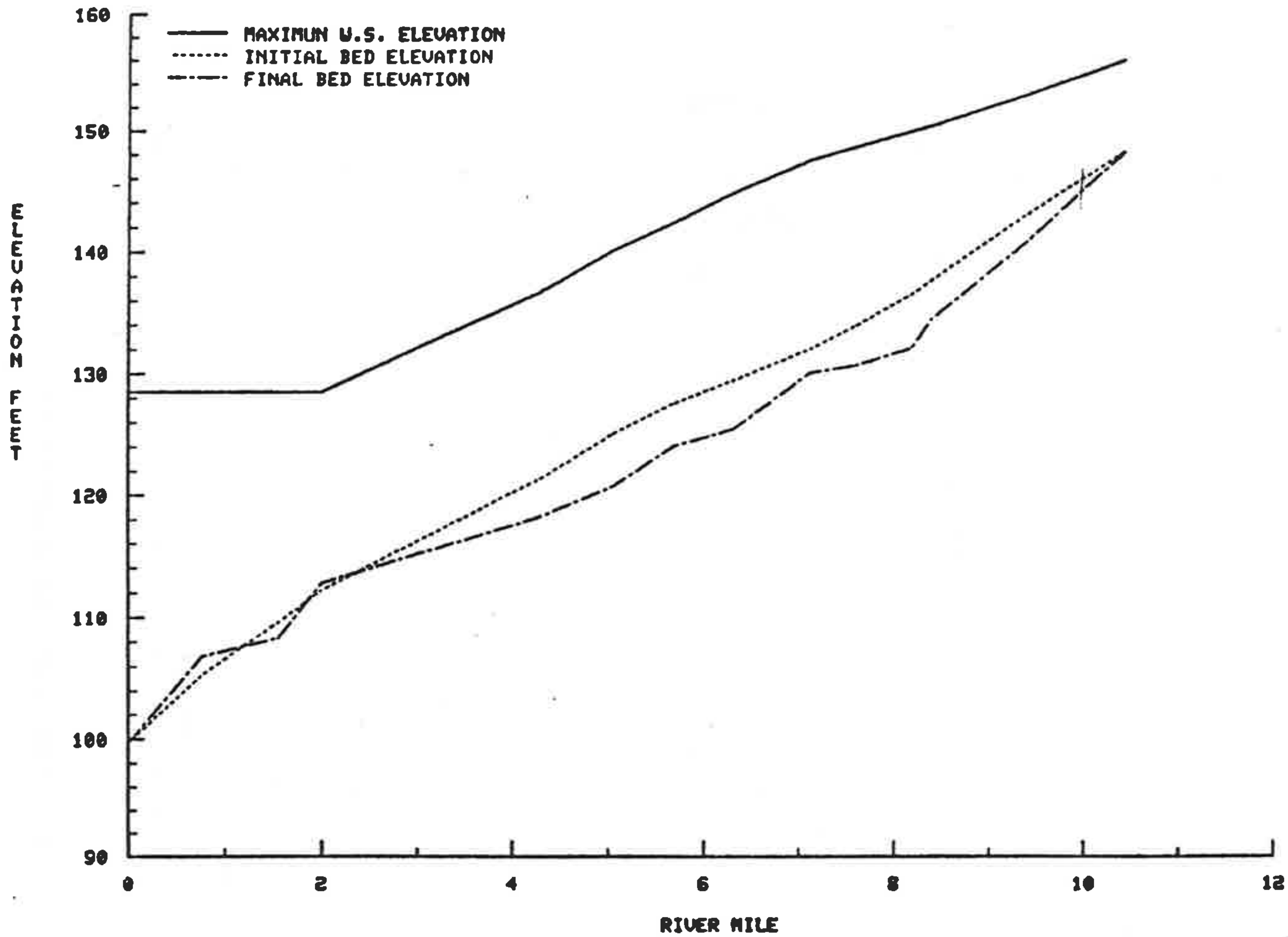

Figure F.9. Initial and final minimum bed elevation and maximum water surface elevation for Pelucia Creek, as-is condition.

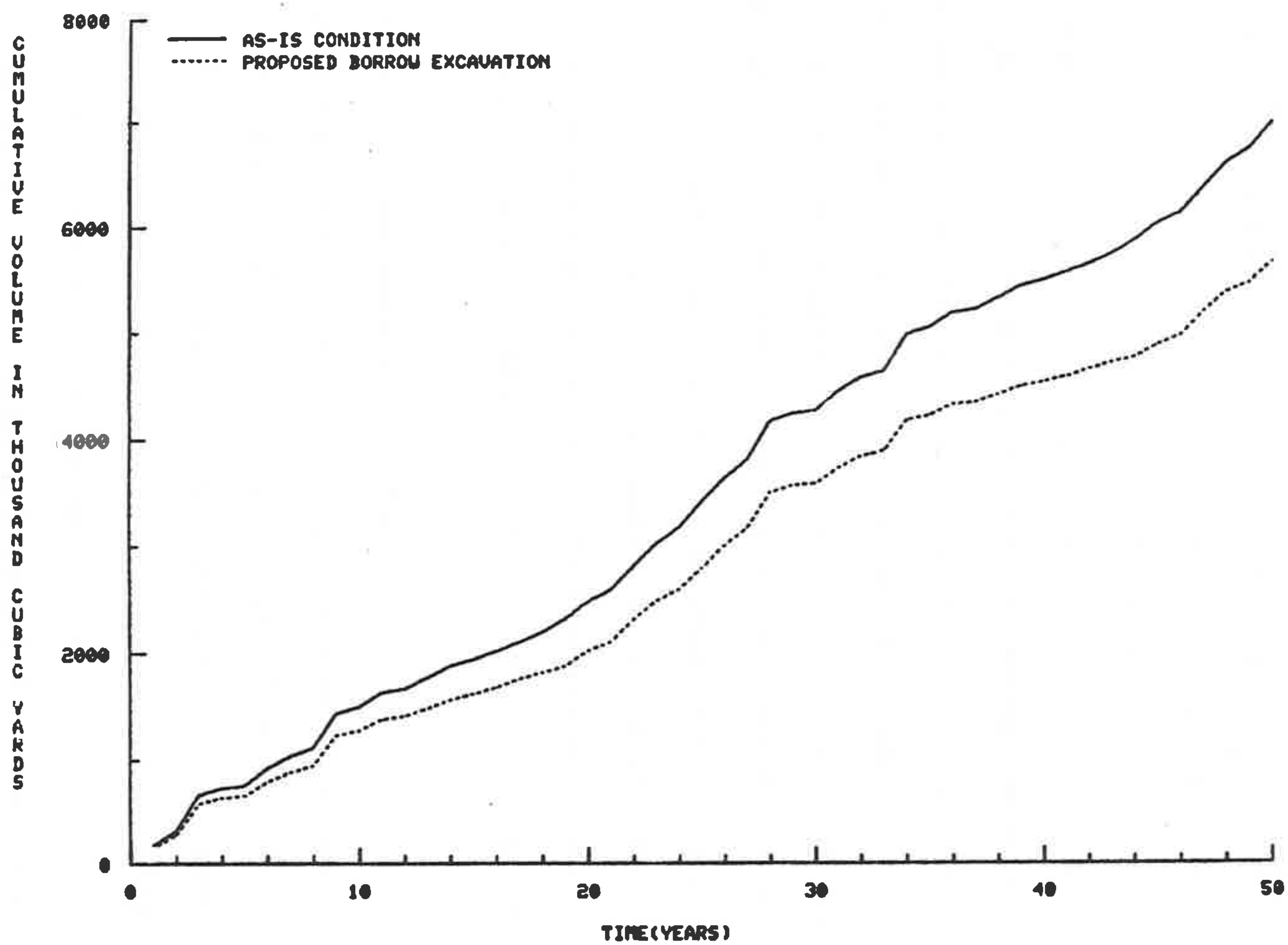

Figure F.10. Cumulative sediment yield for Pelucia Creek.

The total sediment yield from Pelucia Creek for the 50-year period was 7,004,000 cubic yards, or an average of approximately 140,000 cubic yards per year. Figure 10 shows the temporal distribution of the sediment yield.

Plots showing the initial and final cross section profiles at river miles 2.00, 5.69 and 9.40 are attached.

F.6.1.2 Proposed Borrow Excavation

The results of the simulation for the proposed borrow excavation indicated cumulative aggradation of 602,000 cubic yards for the 50-year period. The temporal distribution of the aggradation/degradation for this condition is shown in Figure F.11. The first 20 years were characterized by rapid aggradation in the channel at the rate of approximately 41,000 cubic yards per year. Throughout the remainder of the period, the channel appeared to be relatively stable.

The average change in bed elevation with river mile for this condition is shown in Figure F.12. Significant aggradation occurred in the lower eight miles of the reach with degradation upstream of that point.

Figure F.13 shows the initial and final minimum bed elevation for the proposed borrow excavation channel and the maximum water-surface elevation that occurred during the simulation. This figure clearly shows the tendency of the excavated channel to refill.

Total sediment yield from Pelucia Creek for this condition was 5,680,000 cubic yards, or an average of approximately 114,000 cubic yards per year. Figure F.8 shows the temporal distribution of this sediment yield.

Plots showing the initial and final cross section profiles at river miles 0.77, 2.00, 5.38 and 9.05 are presented at the end of the appendix.

F.6.1.3 Comparison and Discussion of Results

Table F.4 contains a summary of the results for each of the two cases. These results indicate that the proposed excavation will induce considerable aggradation. Figure F.14 is a copy of the profiles for Pelucia Creek extracted from the previously mentioned General Design Memorandum No. 1. The final simulation profile for the proposed borrow excavation and the maximum water-surface elevations for both conditions have been added for ease of comparison. As shown in the figure, the final thalweg profile is not significantly different from the original 1977 profile. It appears that the excavated channel will refill to the approximate existing grade.

Comparison of the maximum water-surface elevation profiles shows the effect of the expanded channel cross section. The flood stages were significantly reduced for the excavated channel.

Aggradation associated with the proposed borrow excavation is the result of reduced sediment transportation capacities within the expanded channel. Additionally, this resulted in a reduction of approximately 20 percent in the sediment yield to the main stem.

F.6.1.4 Effect of Lower Main Stem Stages

The effect of the lowering of the main stem stages associated with the recommended channelization alternative from the Phase I study (Plan E conditions) was analyzed. A stage-frequency curve for the Yazoo River at the mouth of Pelucia Creek was prepared and is presented in Figure F.15. These curves are based on the 50-year simulation performed in the Phase I study for each condition. The average stage for the existing condition was 110.6 feet MSL and 108.5 feet MSL for Plan E conditions, or a difference of approximately two feet. Based

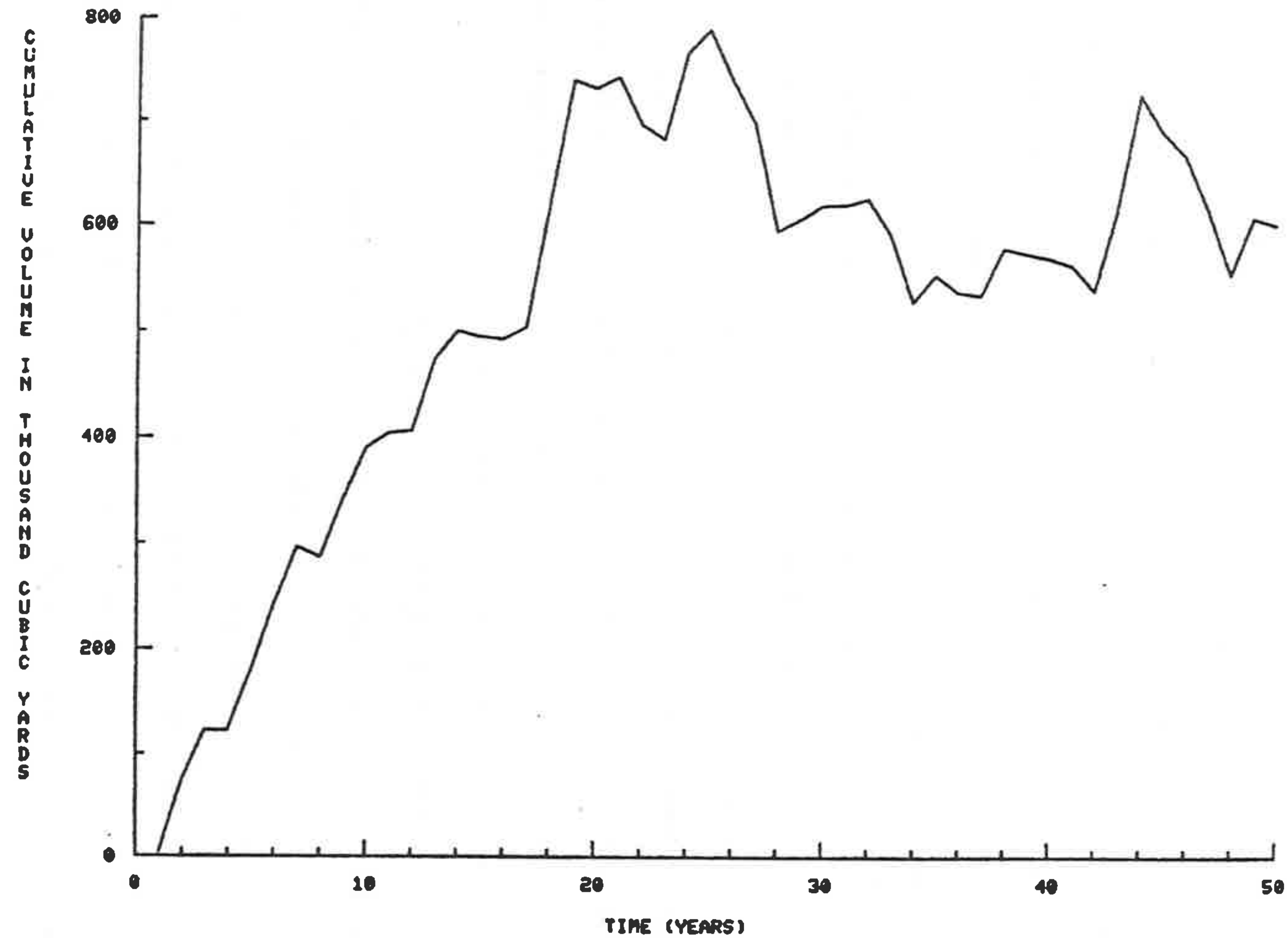

Figure F.11. Cumulative aggradation/degradation in Pelucia Creek, proposed borrow excavation.

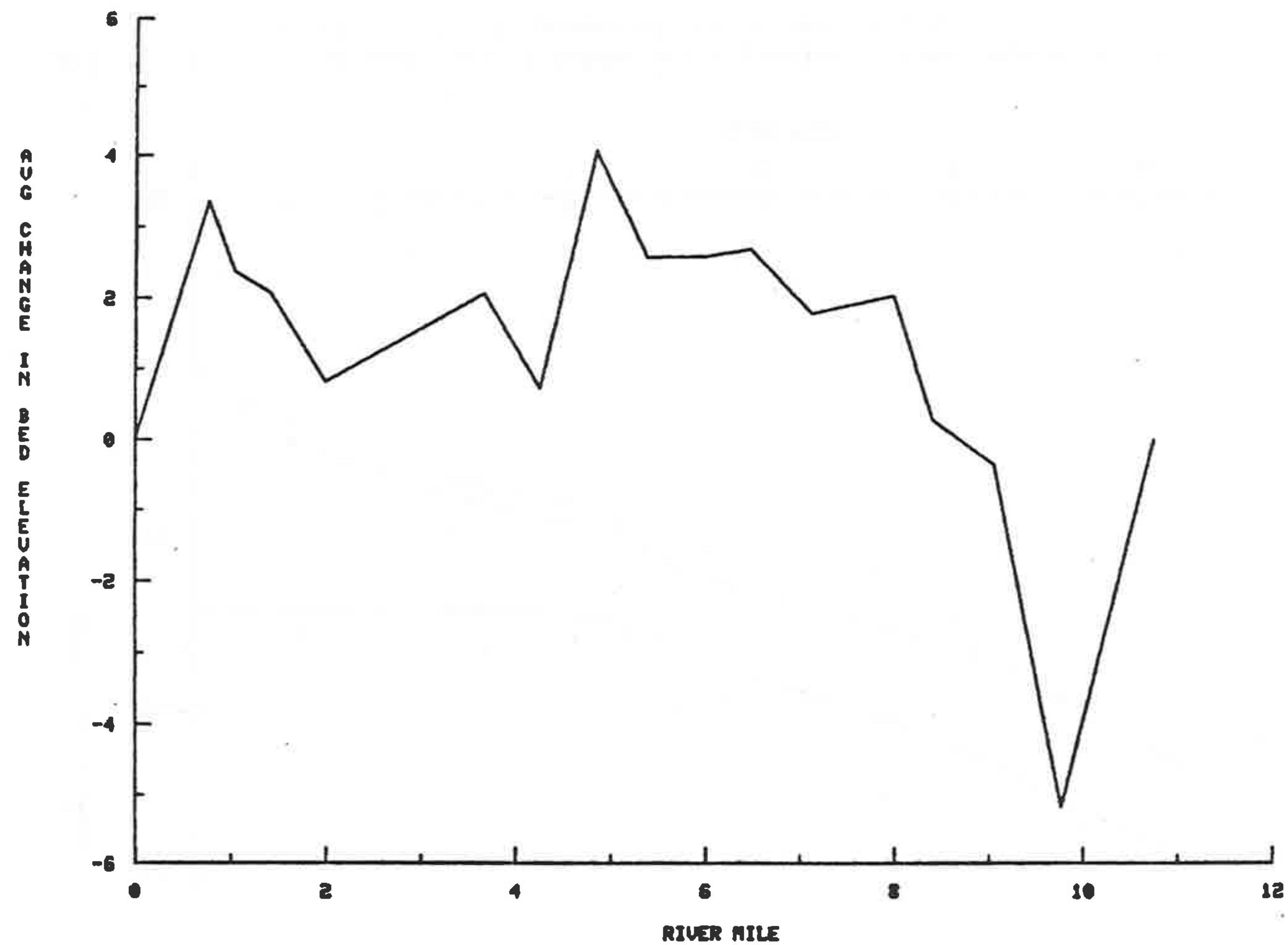

Figure F.12. Average change in bed elevation, proposed borrow excavation.

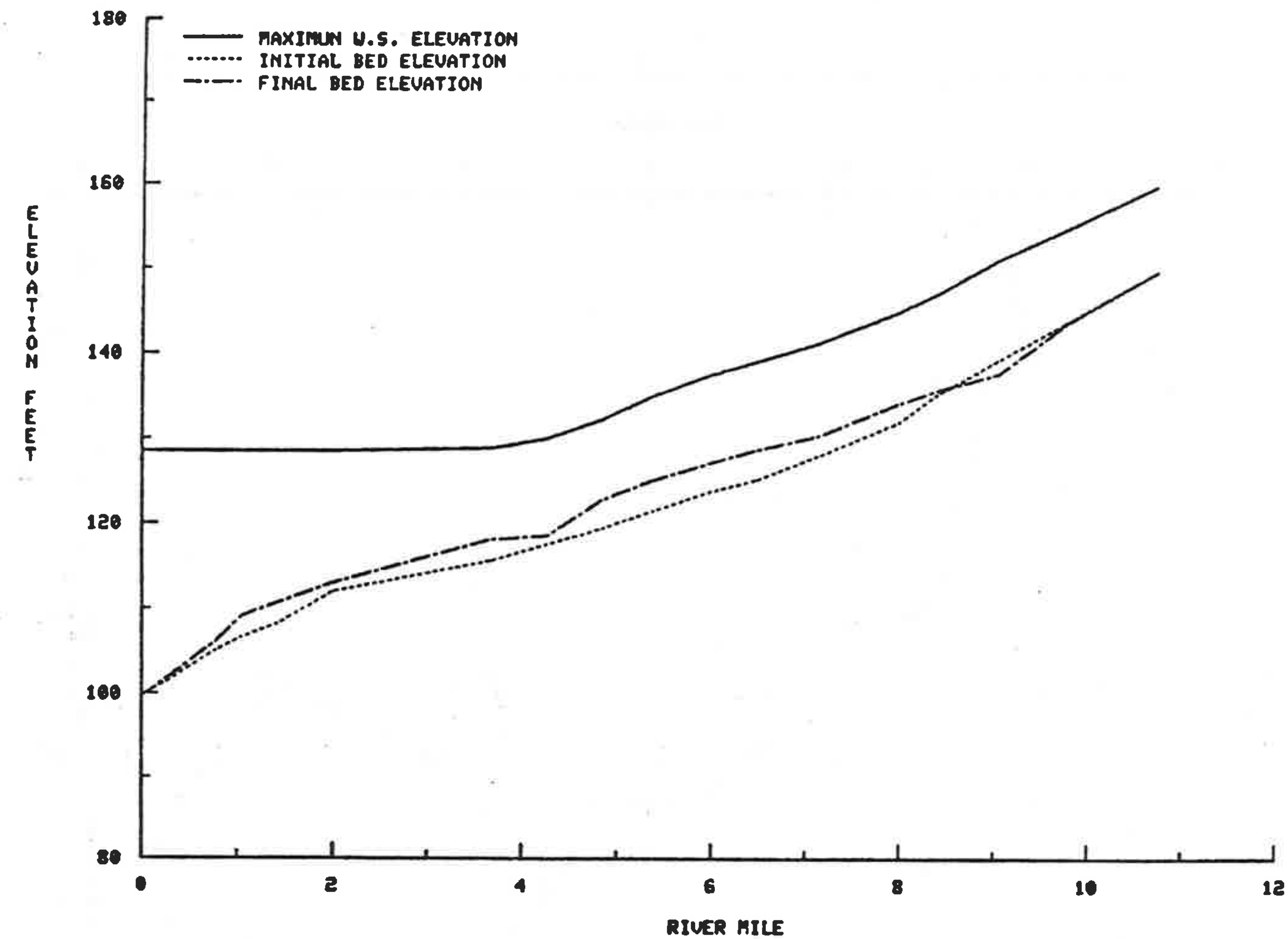

Figure F.13. Initial and final minimum bed elevation and maximum water surface elevation for Pelucia Creek, proposed borrow excavation.

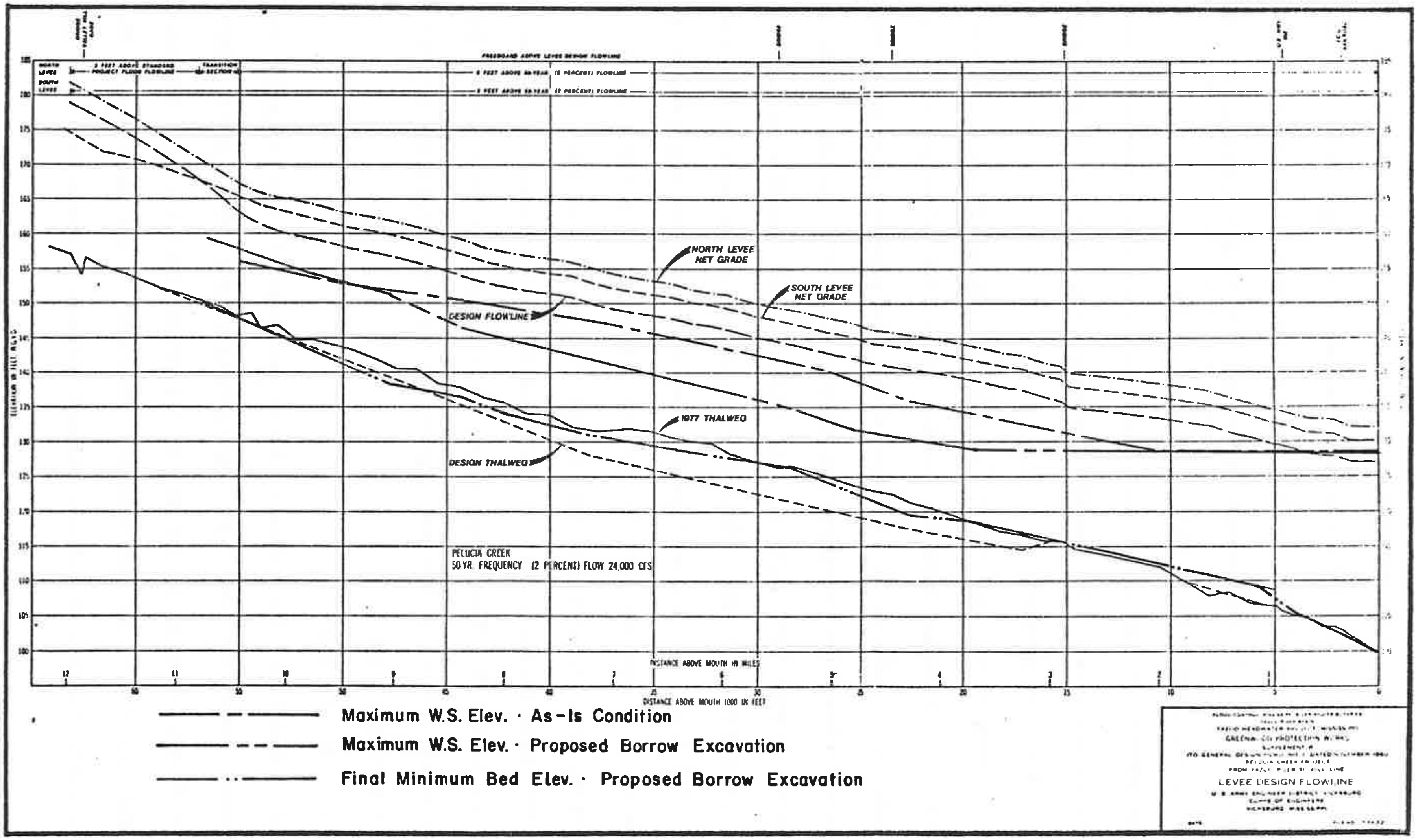

Figure F.14. Thalweg profiles, Pelucia Creek.

upon the tendency for degradation in Pelucia Creek for the as-is condition, this would effectively eliminate the aggradation in the downstream portions of the reach, lowering the base level by an amount corresponding to the difference in stages. A slight increase in the sediment yield from Pelucia Creek can be expected.

The effect of the lower main stem stages on the proposed channel for Pelucia Creek would be roughly the same as for the as-is condition.

F.6.1.5 Conclusions

This study shows that in its existing condition, Pelucia Creek has a tendency to degrade, with the amount controlled principally by the water-surface elevations in the main stem. The proposed borrow excavation will reduce the transporting capacity of the stream, inducing aggradation within the channel. The final thalweg profile at the end of the simulation for the excavated channel was approximately the same as the 1977 profile. Sediment yield from Pelucia Creek was reduced by approximately 20 percent for the proposed channel. The final grade of the stream, particularly in the downstream portion of the reach, is controlled significantly by the water-surface elevations in the main stem. Lowering of these elevations will lower the base level for Pelucia Creek, allowing further degradation and increasing the sediment yield to the main stem.

F.6.2 Abiaca Creek

The simulation for Abiaca Creek considered the aggradation/ degradation potential for the approximately six mile reach above Matthews Brake, as well as the sediment trapping potential for Matthews Brake and its effect on the sediment delivery to the main stem. The data available for the Old River channel between Matthews Brake and the

Yazoo River indicates that this channel is relatively stable, most likely due to cohesive bed and bank material and stabilization offered by the vegetation along the channel. For this reason, it is felt that the sediment entering the Old River from the Brake will simply pass through and thus will be the sediment yield from this system to the main stem.

F.6.2.1 Sediment Routing Results

The results of the 50-year simulation using the discharge files discussed in Section F.II for the six-mile reach of Abiaca Creek indicate total cumulative aggradation of 169,000 cubic yards. This aggradation occurred fairly continuously throughout the simulation period at the rate of approximately 3380 cubic yds per year. Figure F.16 shows the variation in aggradation/degradation with time.

A plot of the average change in bed elevation with river mile is presented in Figure F.17. From this figure it can be seen that the majority of the aggradation occurred in the middle of the reach. This is partially due to a general widening of the cross sections in this area.

The initial and final minimum bed elevation and maximum water-surface elevation that occurred during the simulation are plotted in Figure F.18. The changes in minimum bed elevation generally correspond to the aggradation pattern as discussed above.

Plots showing the initial and final cross section profiles at river miles 0.37, 2.54 and 4.81 are presented at the end of the appendix.

F.6.2.2 Sediment Yield and the Effect of Matthews Brake

Cumulative sediment yield from Abiaca Creek into Matthews Brake was 5,950,000 cubic yards, or an average of approximately 119,000 cubic yards per year. In order to evaluate the percentage of this material trapped in the Brake, a model was developed which performed level pool routing to determine the hydraulic conditions within the swamp. A turbulent settling length concept as described in Li and Shen (1975) was used to determine the percentage of material settling in the Brake. The stage volume relation from the Brake was continuously adjusted as deposition occurred.

Output from this model indicated that initially all but a percentage of the fine silt and clay sizes settled out. The material passing through was less than five percent of the inflow. As the Brake continued to fill, the average velocities increased so that by the end of the simulation, approximately 30 percent of the material was carried through. Figue F.19 shows the cumulative volume of sediment stored in the Brake with time. Total storage at the end of the period was approximately 2540 acre-feet. This corresponds to a rate of filling of about 50 acre-feet per year. According to data provided by the Corps of Engineers, the mean stage for March through July, 1980, was 114.7 feet MSL. Total volume of water within the brake at that stage is 5300 acre-feet. If this is assumed to represent the average condition, the model indicates that approximately 50 percent of the capacity of the Brake will be filled with sediment within the 50-year period. Depending upon the deposition patterns within the inundated area, the trapping efficiency will be approximately 70 percent at that point in time.

Figure F.20 shows the cumulative volume of sediment delivered to the Brake by Abiaca Creek and discharged to the Old River from the Brake with time. As previously discussed, it was assumed that the material discharged from the Brake would simply pass through the Old River and be delivered to the main stem. Under this assumption, the total sediment yield to the main stem was 1,170,000 cubic yards, or an average of 23,400 cubic yards per year. These results indicate that the average reduction in sediment yield to the main stem by diverting Abiaca Creek through Matthews Brake is approximately 80 percent.

F.6.2.3 Conclusions

The 50-year simulation for the six-mile reach of Abiaca Creek above Matthews Brake indicates that significant aggradation will occur within the channel. Diversion of the flow from Abiaca Creek through Matthews Brake will significantly reduce the sediment yield to the main stem. The rate of filling of Mathews Brake was such that approximately 50 percent of the volume will be lost in the 50-year period. The average reduction in sediment yield was estimated to be approximately 80 percent over the entire simulation period.

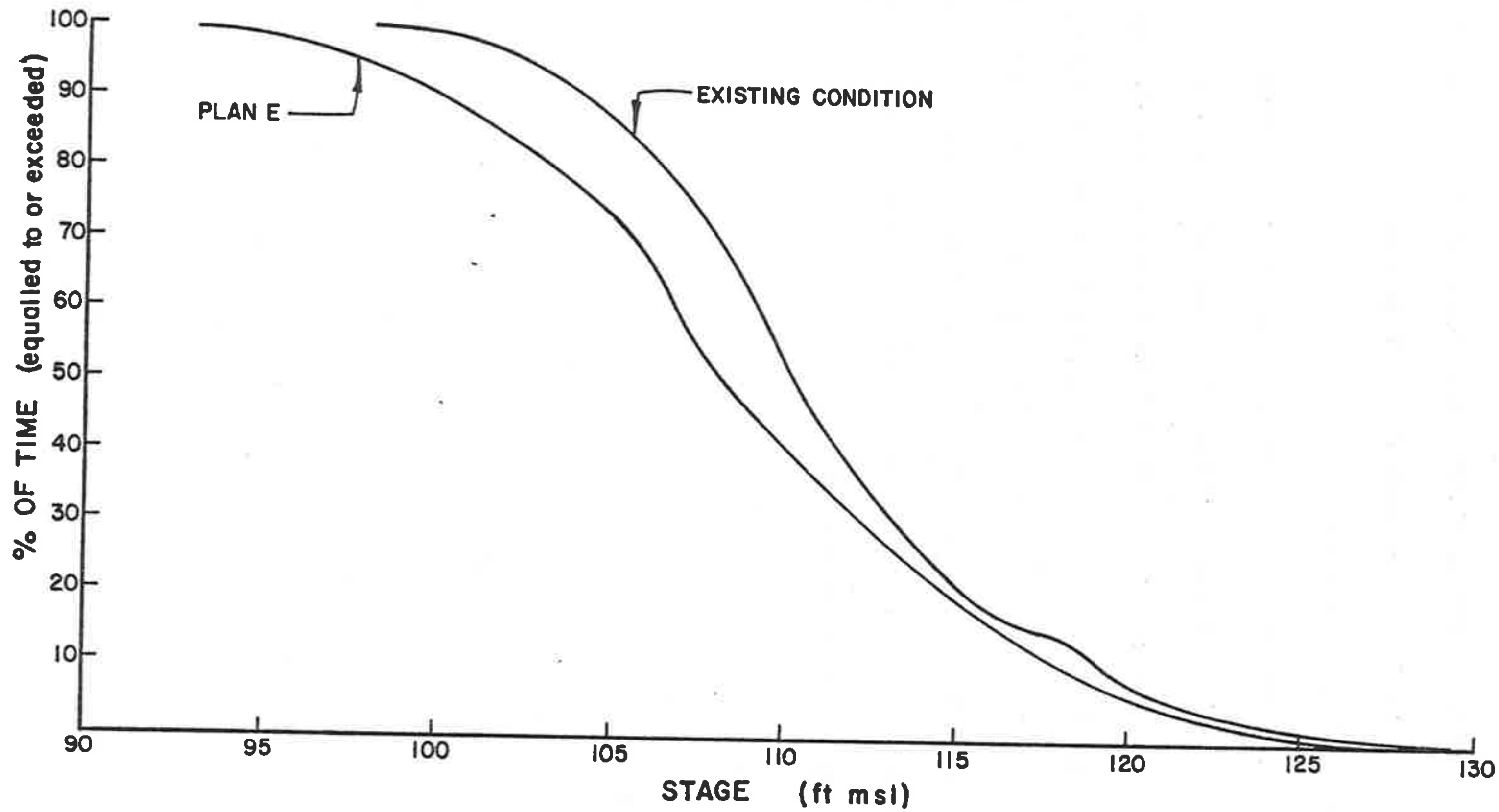

Figure F.15. Stage-frequency curve for Yazoo River at the mouth of Pelucia Creek.

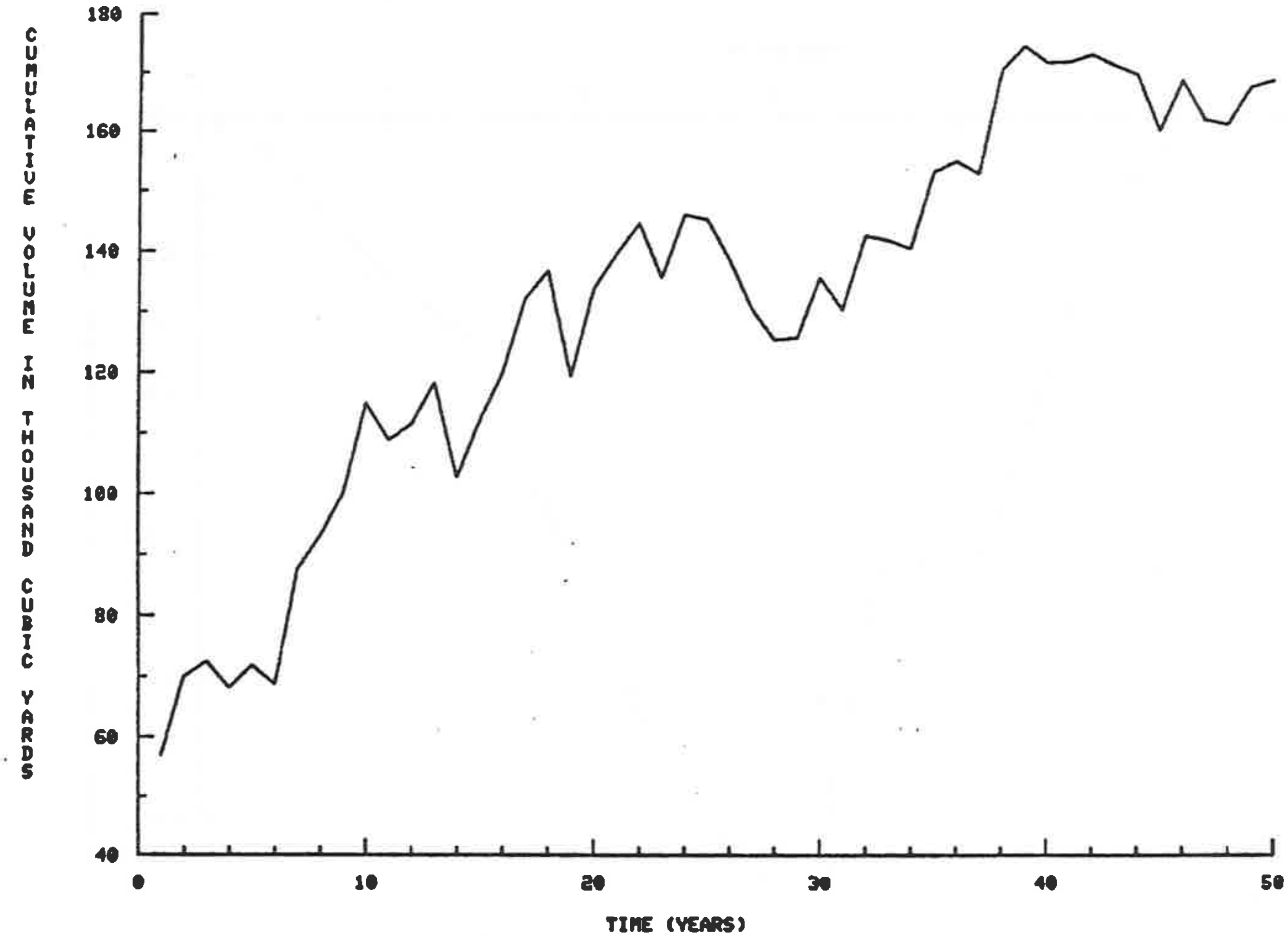

Figure F.16. Cumulative aggradation/degradation in Abiaca Creek.

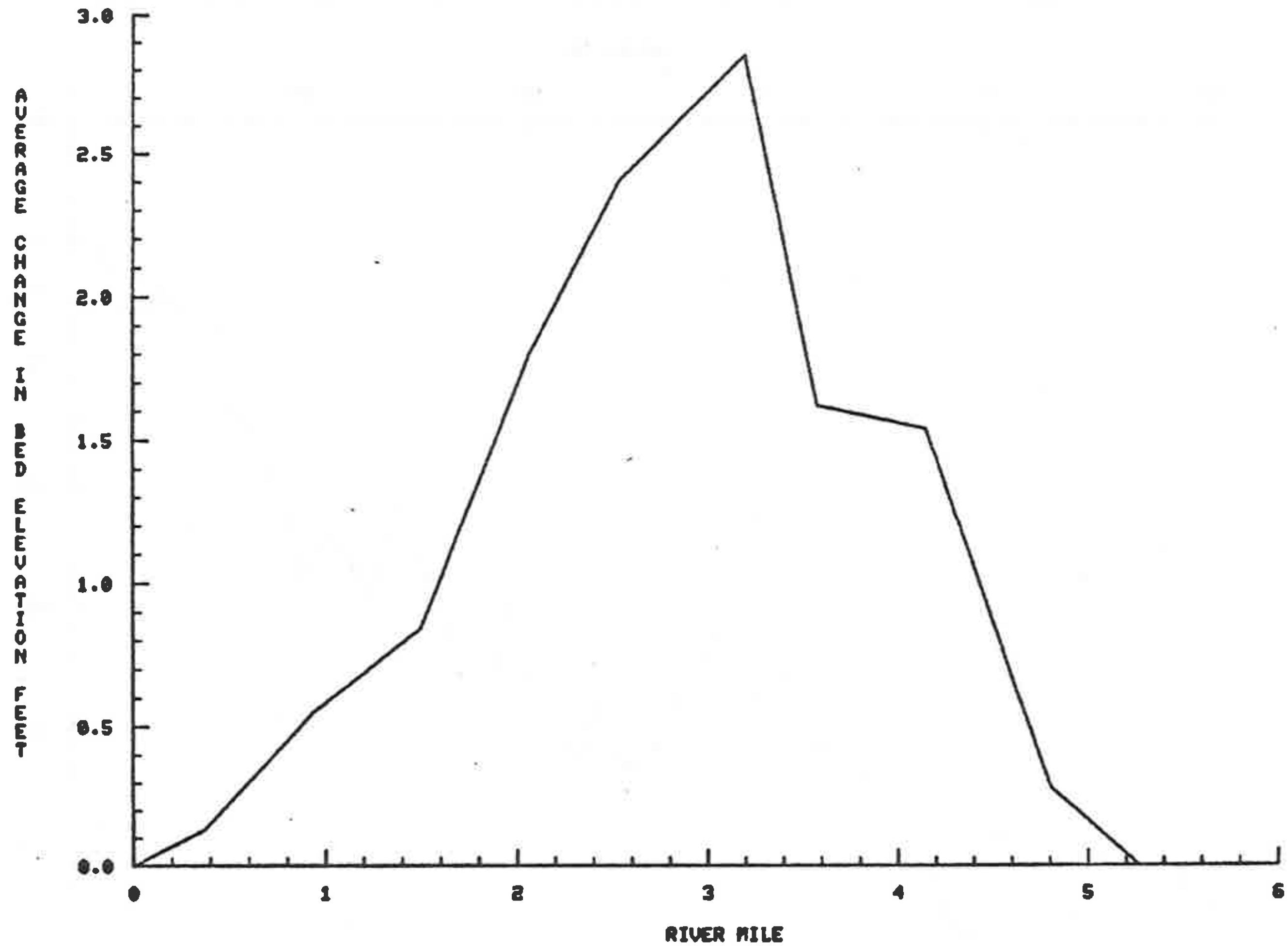

Figure F.17. Average change in bed elevation, Abiaca Creek.

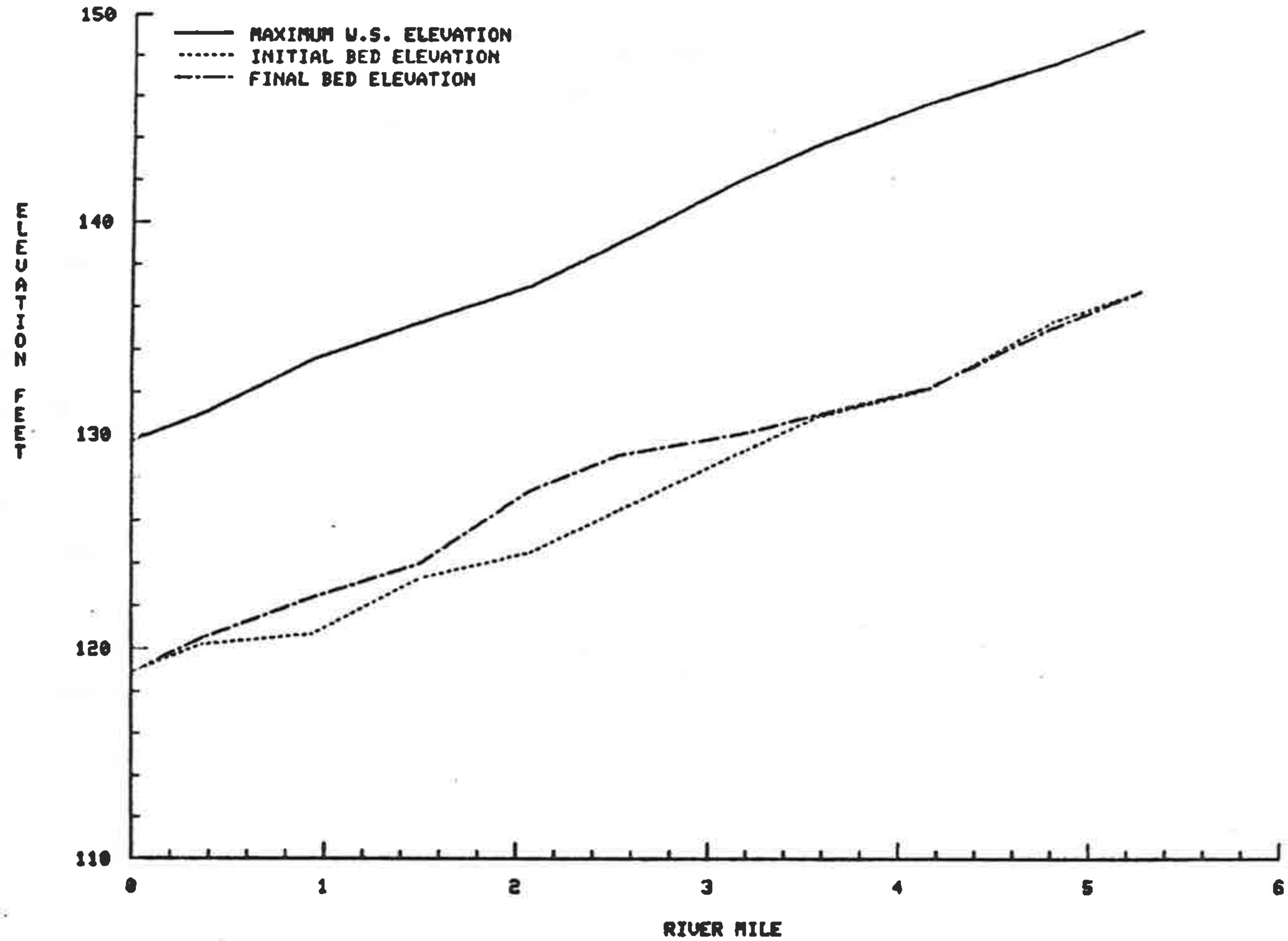

Figure F.18. Initial and final minimum bed elevation and maximum water surface elevation, Abiaca Creek.

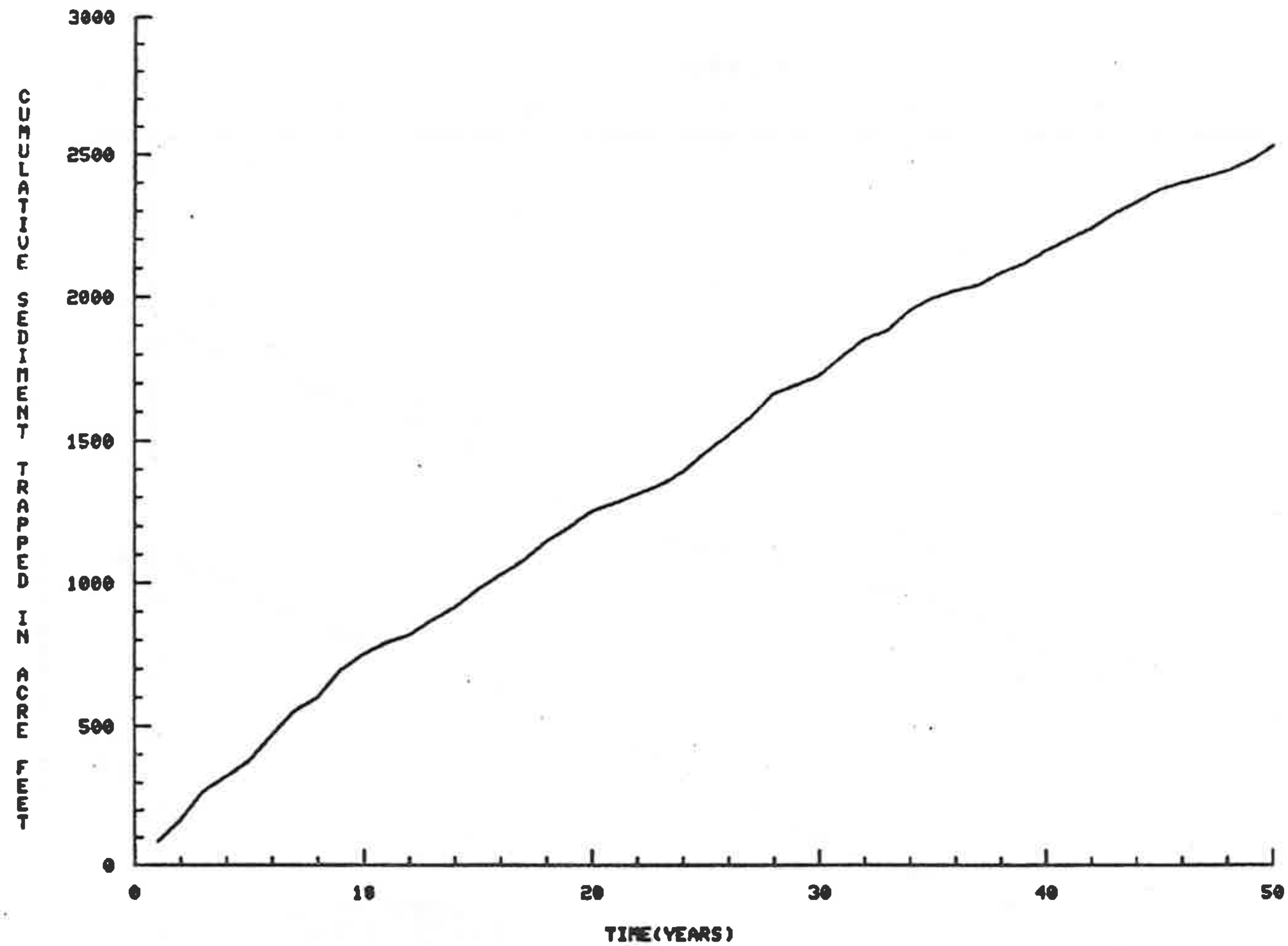

Figure F.19. Cumulative volume of sediment stored in Matthews Brake.

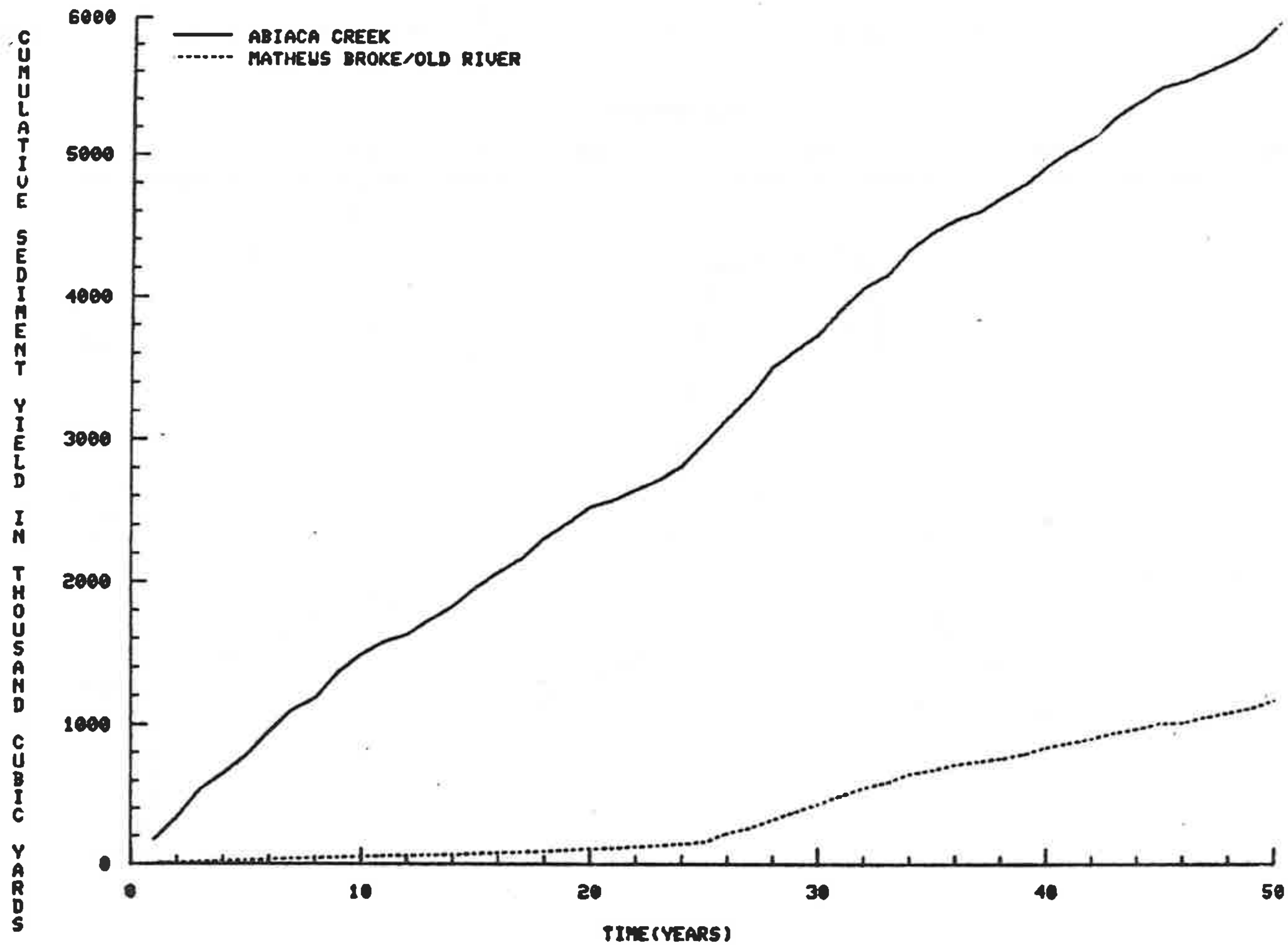

Figure F.20. Cumulative sediment yield from Abiaca Creek and Matthews Brake.

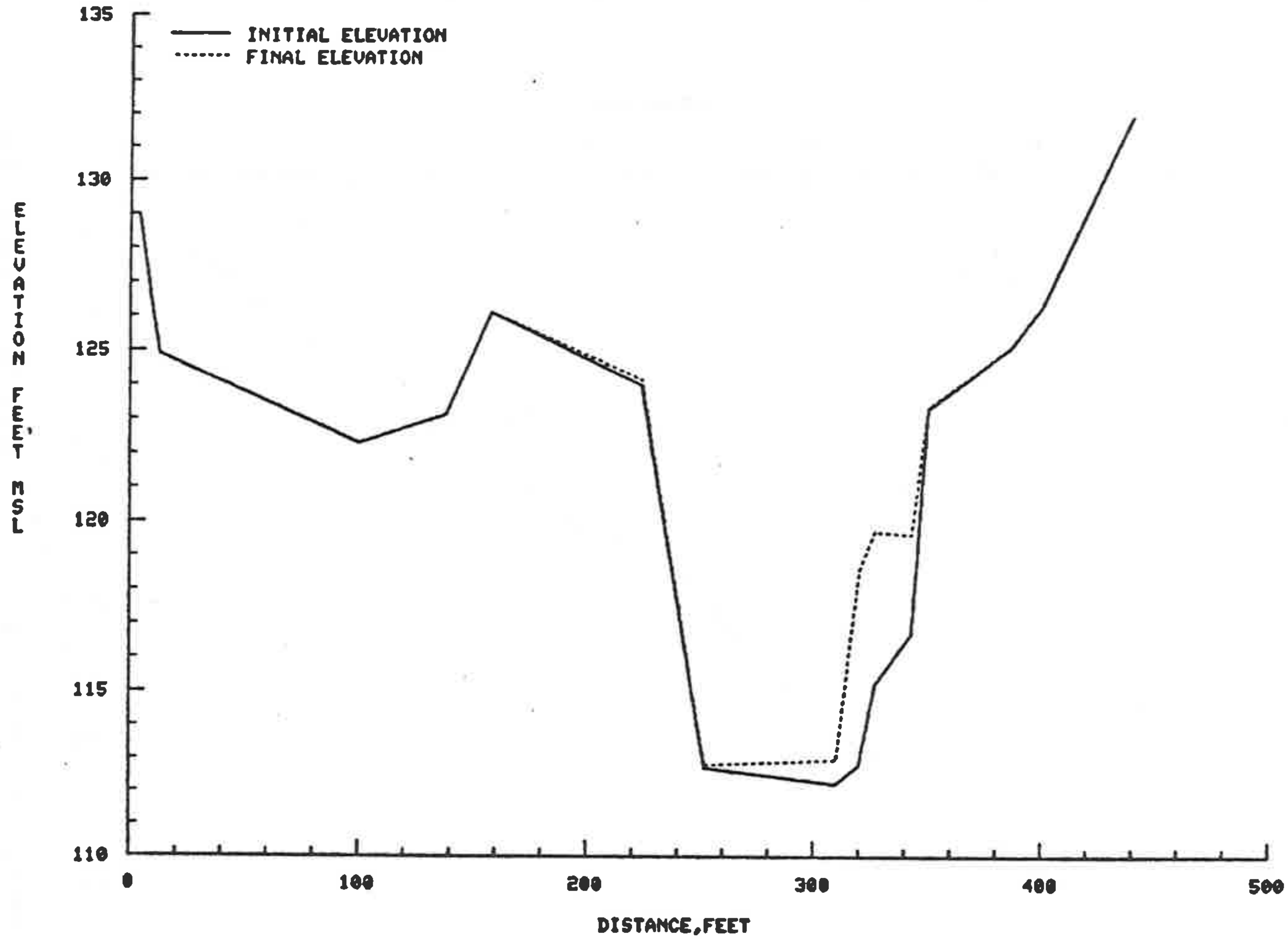

Figure F.21. Initial and final bed profile, river mile 2.00 for Pelucia Creek, as-is condition.

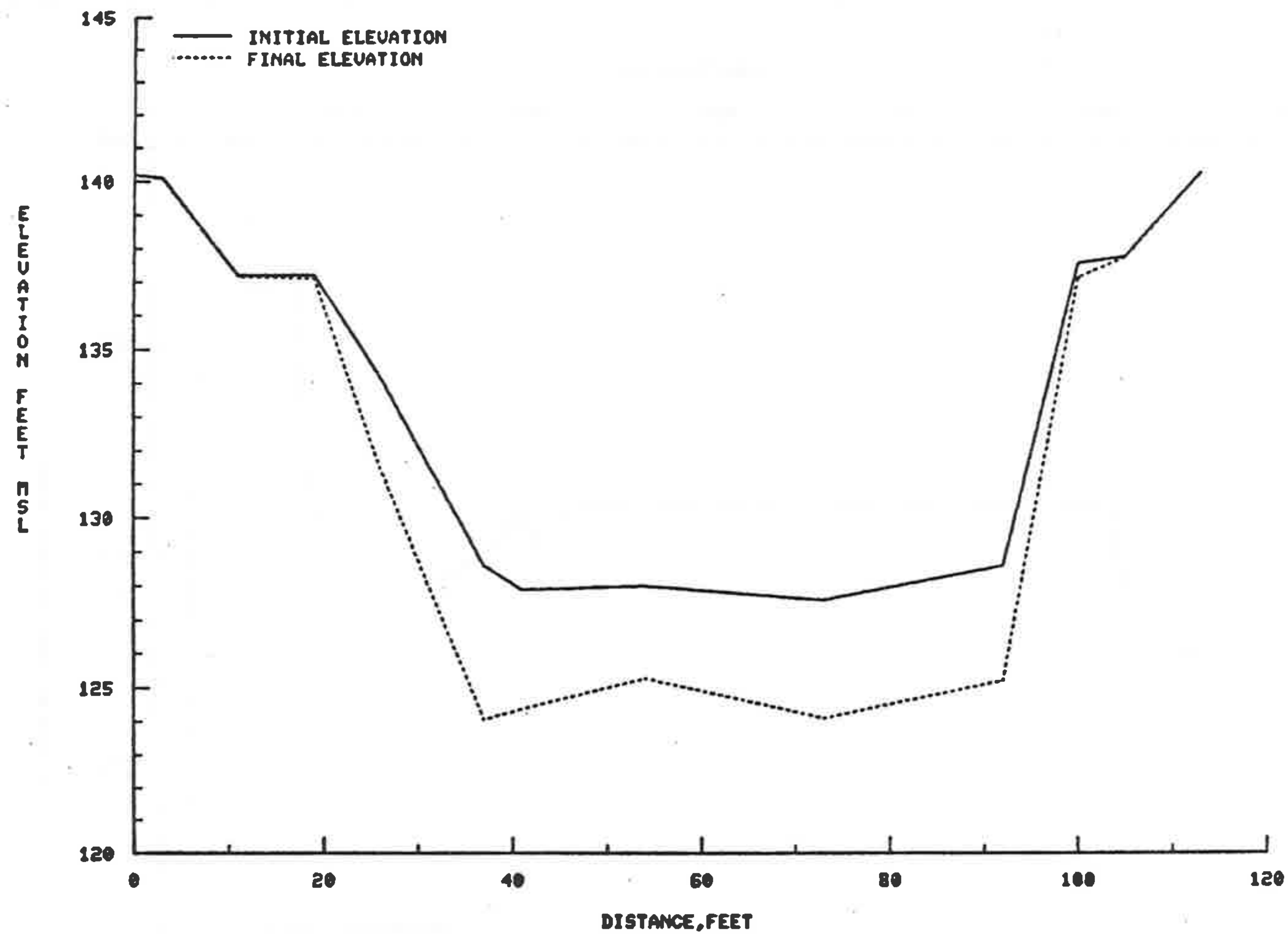

Figure F.22. Initial and final bed profile, river mile 5.69 for Pelucia Creek, as-is condition.

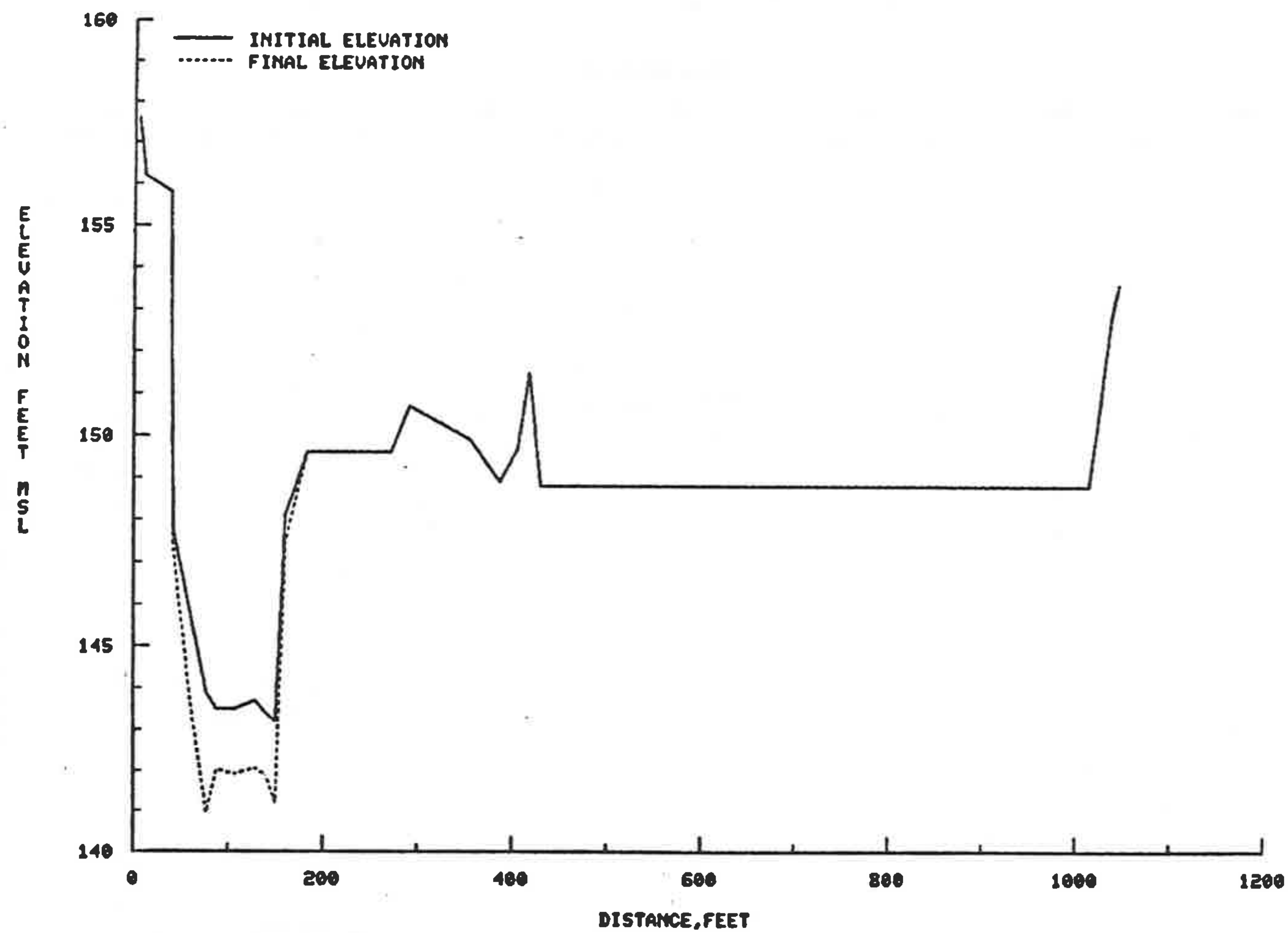

Figure F.23. Initial and final bed profile, river mile 9.40 for Pelucia Creek, as-is condition.

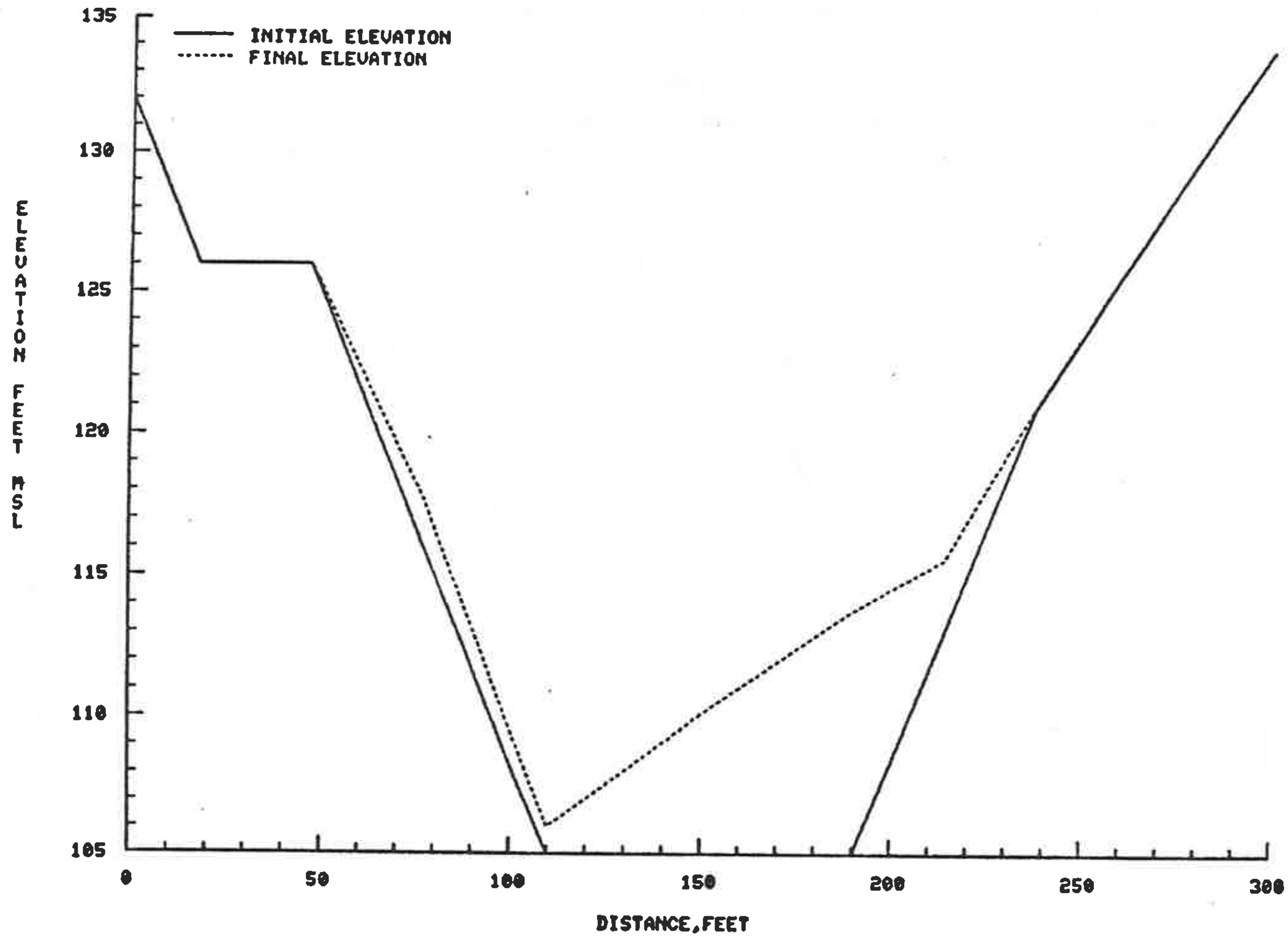

Figure F.24. Initial and final bed profile at river mile 0.77 for Pelucia Creek, proposed borrow excavation.

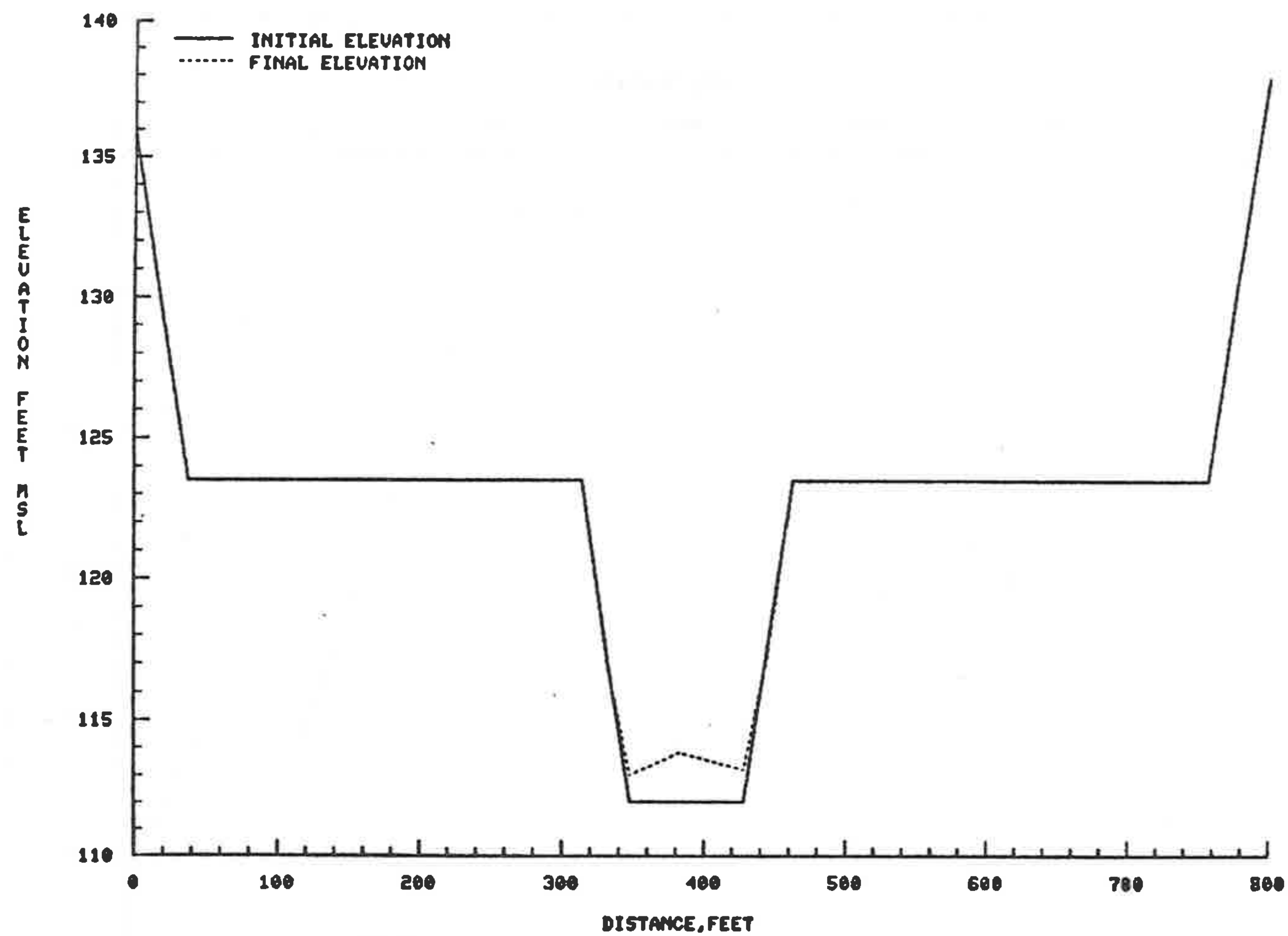

Figure F.25. Initial and final bed profile at river mile 2.00 for Pelucia Creek, proposed borrow excavation.

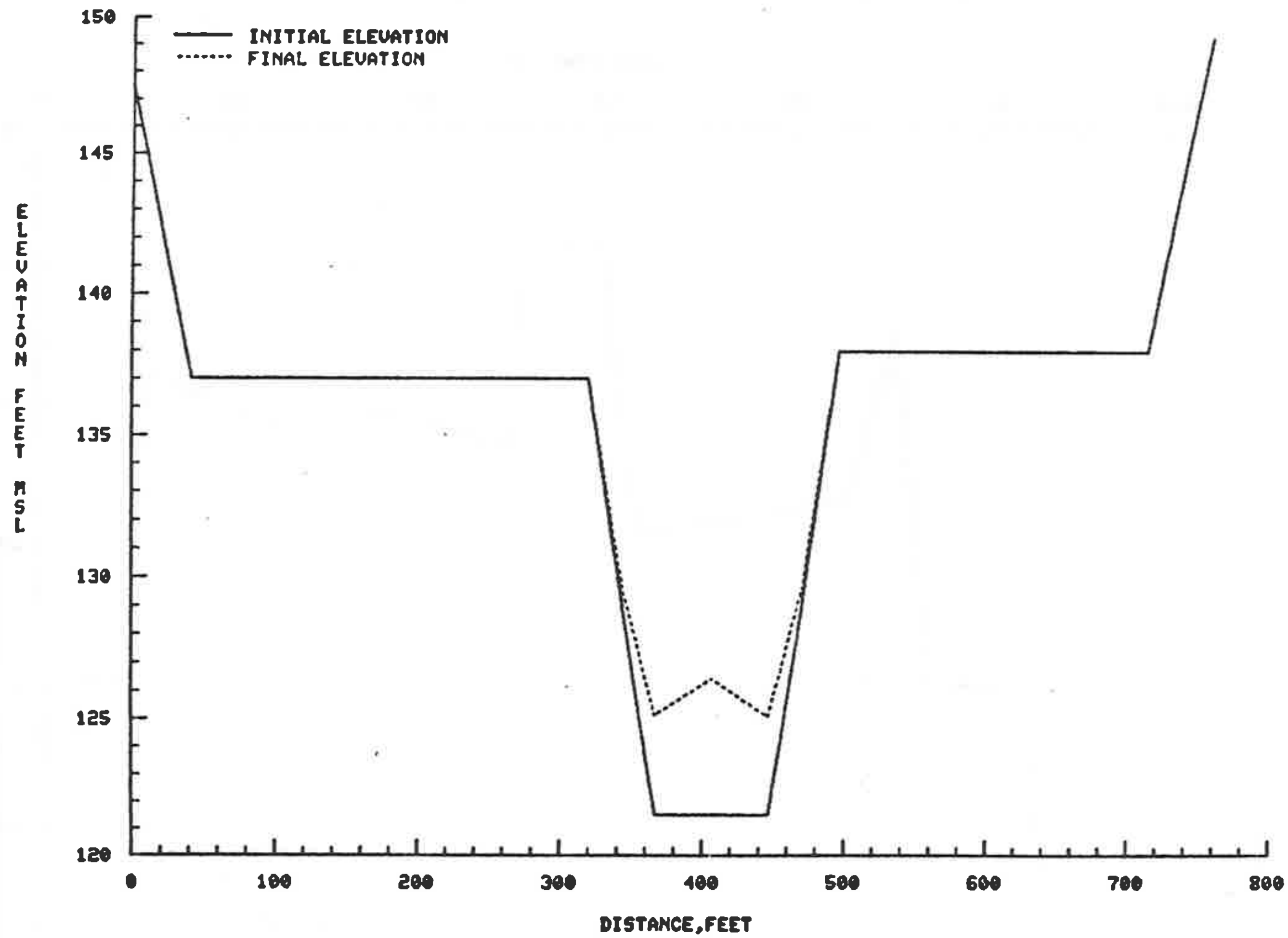

Figure F.26. Initial and final bed profile at river mile 5.38 for Pelucia Creek, proposed borrow excavation.

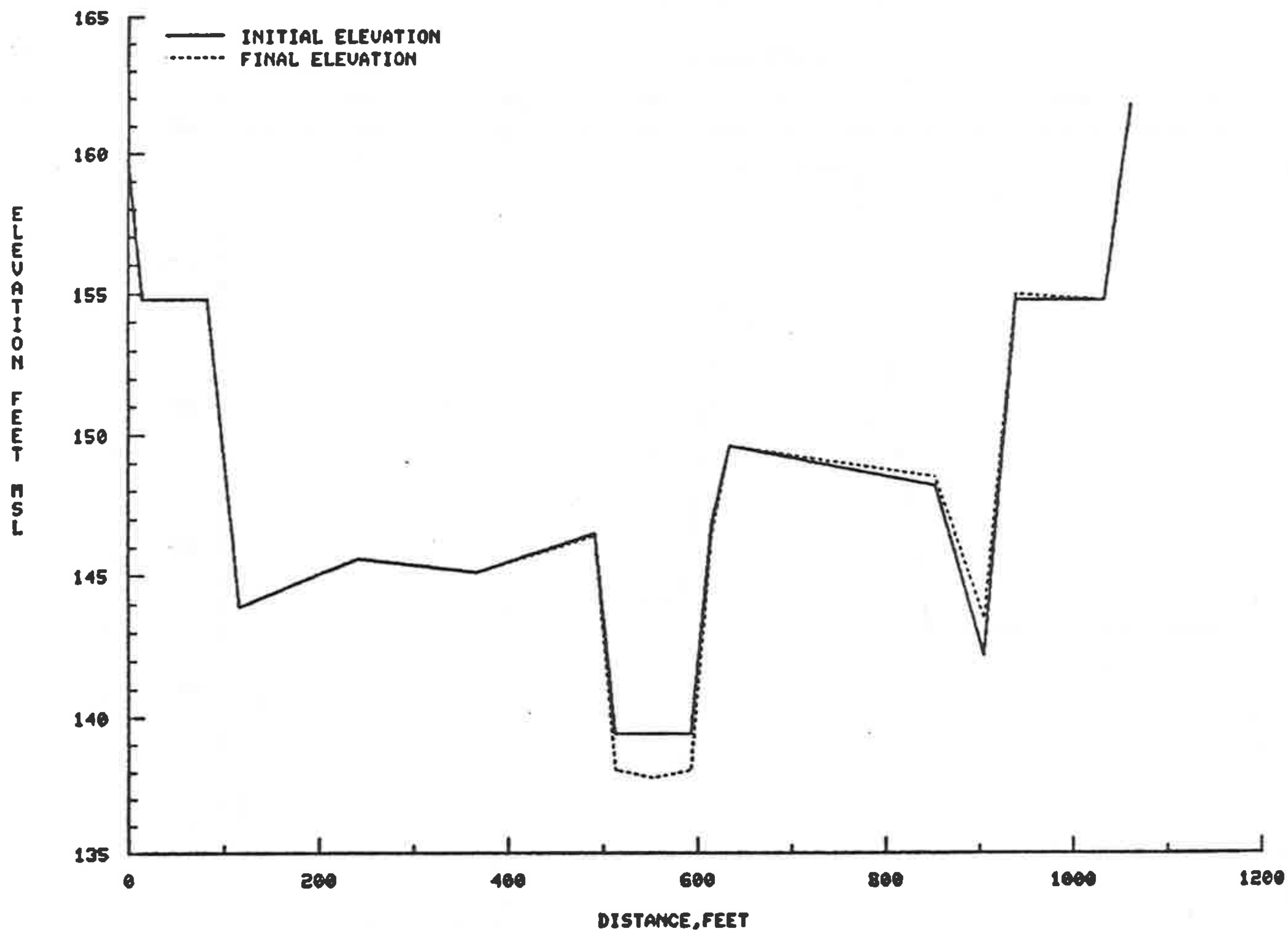

Figure F.27. Initial and final bed profile at river mile 9.05 for Pelucia Creek, proposed borrow excavation.

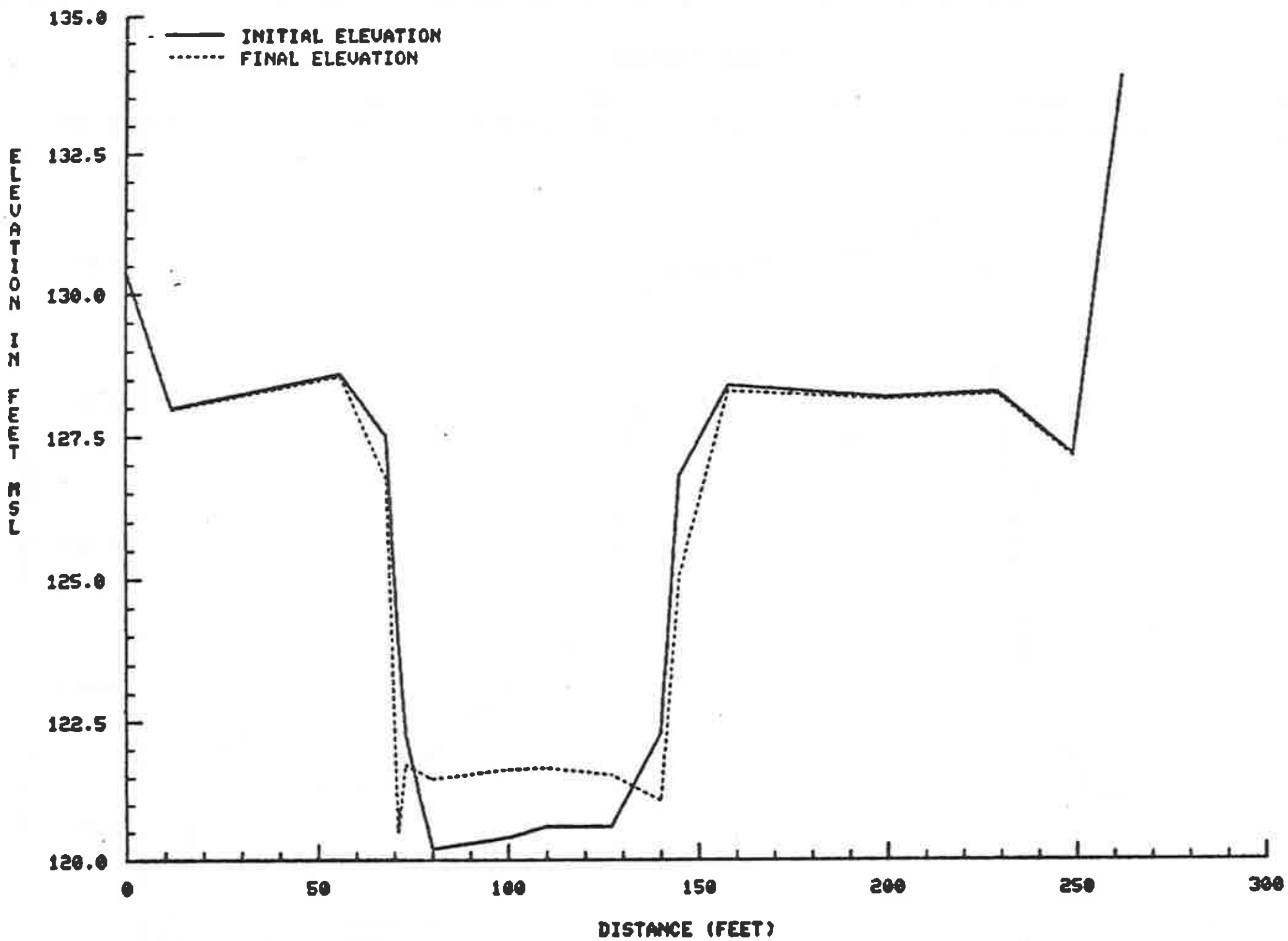

Figure F.28. Initial and final bed profile for river mile 0.37, Abiaca Creek.

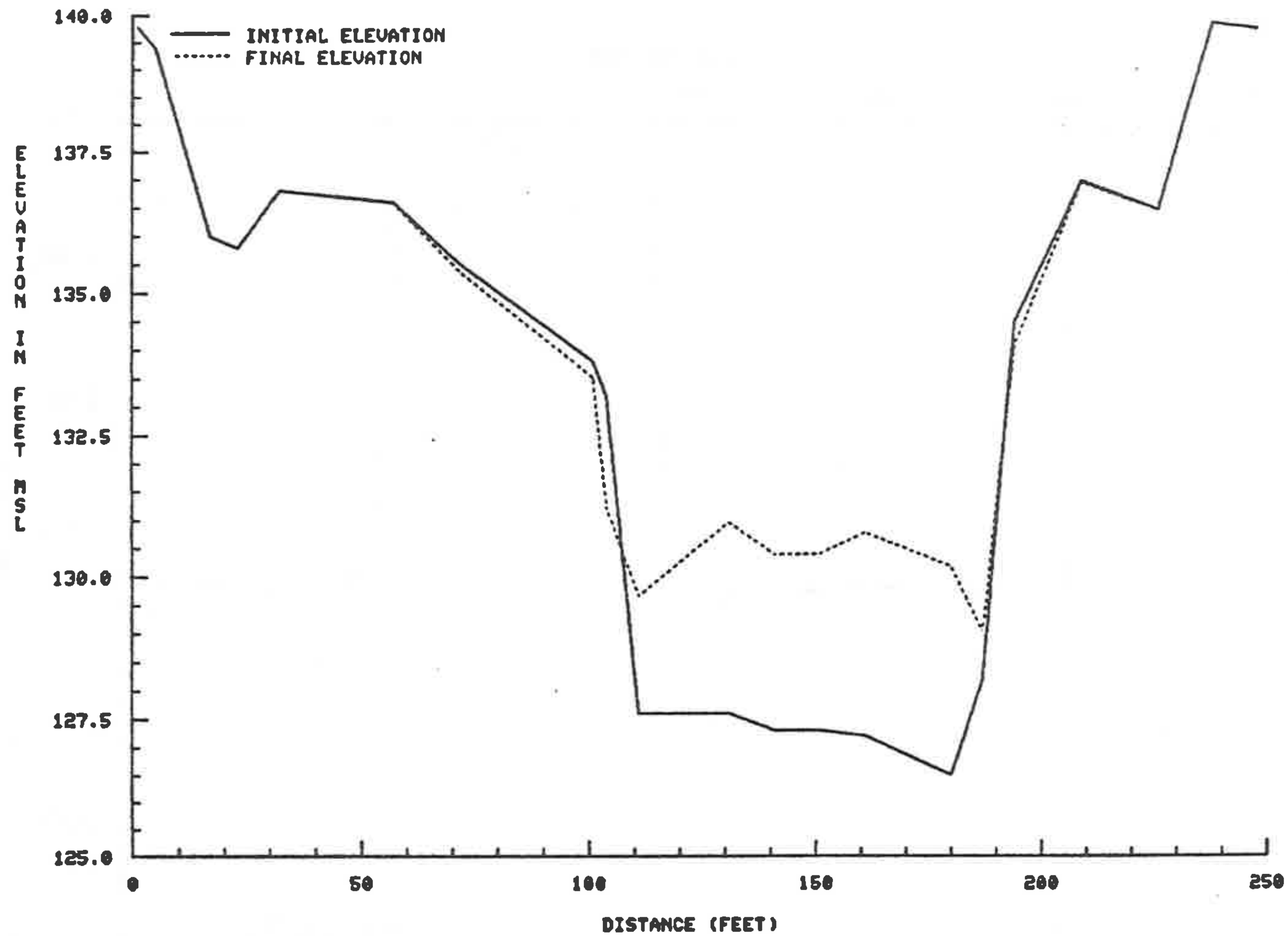

Figure F.29. Initial and final bed profile for river mile 2.54, Abiaca Creek.

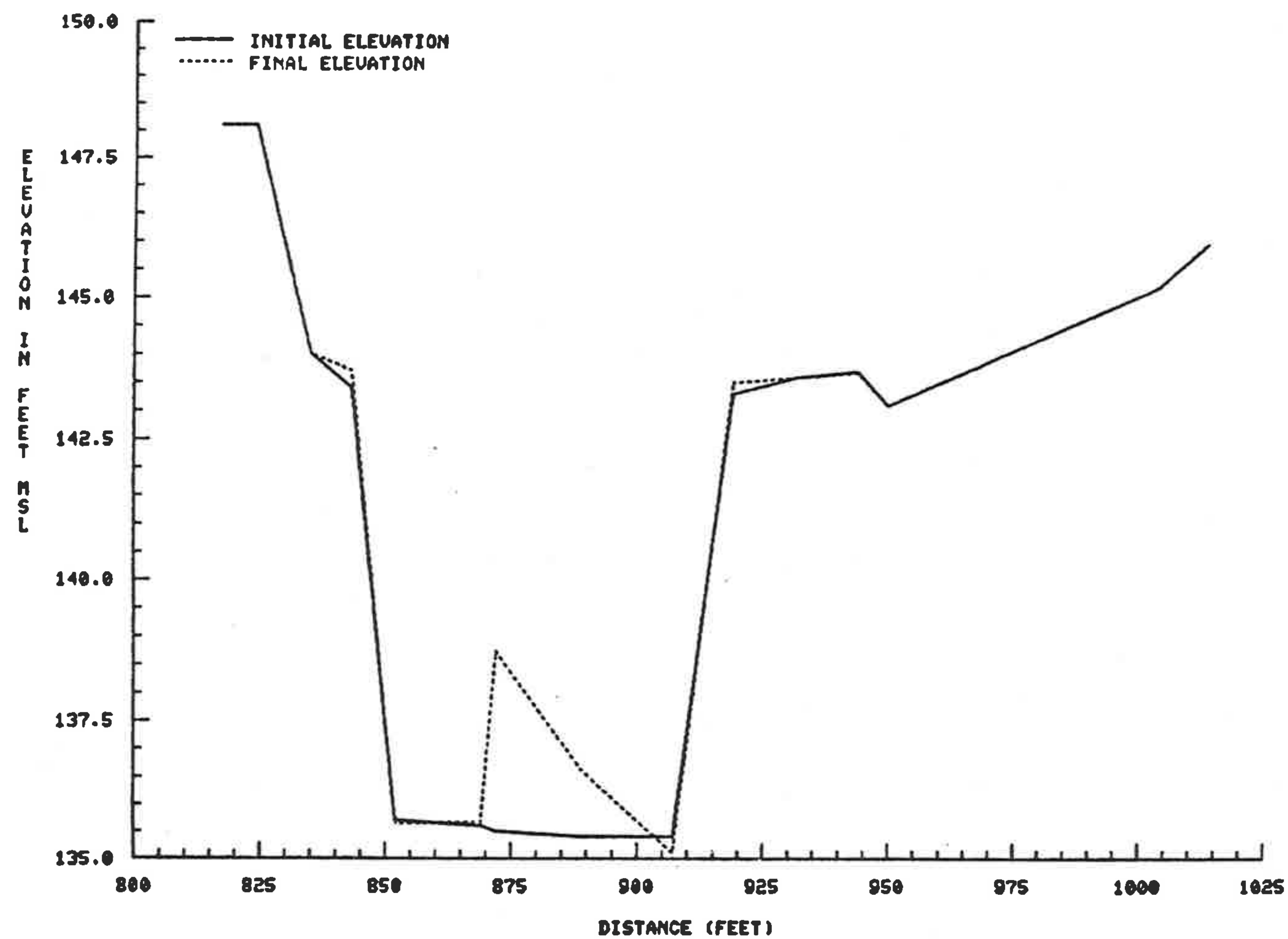

Figure F.30. Initial and final bed profile for river mile 4.81, Abiaca Creek.

Appendix G

SEDIMENTATION STUDY OF THE YAZOO RIVER BASIN

PHASE II

CONTRACT NO. DACW-38-76-C-0193

ANALYSIS OF CHANNEL MODIFICATION OF PANOLA-QUITMAN FLOODWAY AND YALOBUSHA RIVER

Prepared for

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Vicksburg, Mississippi

Prepared by

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September 1983

G.I. INTRODUCTION

This report presents a sedimentation analysis of two channel modifications in the Yazoo River Basin, Mississippi being evaluated by the U.S. Army Corps of Engineers, Vicksburg District. The analysis was carried out under Contract No. DACW38-76-C-0193, Modification 0002 and was authorized by the Corps by the letter of August 1, 1983.

The Corps is currently evaluating the effectiveness of two channel modifications in the Yazoo River Basin. The modifications are channel enlargements of the Panola-Quitman Floodway and the Yalobusha River. The Panola-Quitman Floodway is an artificial channel which diverts the Little Tallahatchie and Yocona Rivers. The P-Q confluences with the Tallahatchie River above Locopolis, Mississippi. The Yalobusha River confluences with the Tallahatchie at Greenwood, Mississippi to form the Yazoo River.

The purpose of this analysis is to determine the impact on the river system if these channel modifications are carried out. Of specific interest are the erosion and sedimentation and the maximum water surfaces in the mainstem and major tributaries. Because of the similarities between this analysis and the Phase II analysis presented in the main text, this report is kept to a minimum for clarity. The reader is referred to the main text for most details.

G.II ANALYSIS

6.2.1 Spatial Design

The spatial design used in the computer modeling of this analysis is similar to Run 6 of the Phase II Sedimentation Study of the Yazoo River Basin. The only differences are the channelization of the P-Q Floodway and the Yalobusha River along with the removal of any designed weirs in the channelized reaches. Table G.1 presents the specifications for the channelizations determined by the Corps of Engineers and used in this analysis. On the Yalobusha the design channel only slightly enlarges the current channel and its grade is generally equal to existing conditions. On the P-Q the design channel is quite large having almost twice the existing bottom width and having a grade five feet below existing grade at the mouth. The channelization required the elimination of several designed grade control structures on streams. Table G.2 lists the structures used in the Phase II runs and this analysis (Run 7). Of most interest is the removal of the structures at the mouths of the P-Q and Yalobusha. With these structures gone the tributaries will experience lower stages at low flow.

Table G.1. Channel Specifications

Stream	Reach		Bottom Width	Bottom Grade	
	From (mile)	To (mile)	(ft)	From (ft)	To (ft)
P-Q	0.00	12.74	175	126.3	145.2
Yalobusha	0.00	28.57	80	99.8	132.5

G.2.2 Temporal Design

The temporal design used here is the same used in the Phase II study. Section 4.3 presents the design. The Phase II design is based

Table G.2. Grade Control Structures*

Stream	Location	Run 5		Run 6		Channelized P-Q & Yalobusha	
		Elevation	Height	Elevation	Height	Elevation	Height
P-Q	0.00	135.0	4.1				
	1.00			140.0	9.0		
	8.00			145.0	8.0		
	14.00			147.0	0.0	147.0	0.0
Little Tallahatchie	19.0			155.0	1.0	155.0	1.0
	24.0			161.5	0.0	161.5	0.0
	29.0			169.0	3.0	169.0	3.0
	33.84	180.0	5.9				
	34.00			176.5	2.0	176.5	2.0
	39.00			184.0	15	184.0	1.5
	39.34	185.0	1.7				
Yocona	0.00	156.0	5.0	156.0	5.0	156.0	5.0
Tillitoba	0.00	135.0	6.6	135.0	6.6	135.0	6.6
Yalobusha	0.00	106.0	5.0	106.0	5.0		
	5.00			107.8	0.0		
	15.00			117.3	1.0		
	20.00			121.0	1.5		
	25.00			128.0	2.0		
	30.00			135.0	0.0	135.0	0.0
	34.31	138.0	2.1				
	35.00			142.0	1.0	142.0	1.0
	40.00			149.0	1.0	149.0	1.0
	40.26	150.0	1.4				
Pelucia	0.0	112.0	12.3	109.0	9.3	0.0	9.3

*Single structures listed here may be replaced by multiple structures, closely spaced with same total height.

entirely on historical records. As such, it assumes no changes in the stream discharge characteristics in the future. This may not be completely correct for this analysis since the channelizations will increase the reservoir emptying capacity of the streams. Thus, the actual discharges the P-Q and Yalobusha will experience may have higher peaks and longer periods of low flow. No attempt was made to account for these possible changes for two reasons. First it would be difficult to correct the temporal design accurately since the actual changes in the hydrographs are unknown, and second, it is felt that changes will not be of a magnitude large enough to effect the results of the study.

G.2.3 Results

A system run was performed using the known discharge model and the conditions described above. Table G.3 presents the volume of degradation and aggradation in each reach for the run and the six Phase II runs. (This run is noted as Run 7.) The table shows that the aggradation in the mainstem increased over Run 6. Figure G.1 to G.6 shows the initial bed, final bed, and maximum water surface for each stream. The total number mainstem aggradate (Reaches 1, 2 and 3) was increased 5.7 million cubic yards or 45 percent over Run 6 conditions.

Table G.3. Net Degradation and Aggradation for 50 Years Under Different Design Conditions in 10^6 cubic yards.

River Segment	Phase II Run Number 1	2	3	4	5	6	7
1	1.19	9.63	9.18	8.97	10.3	9.98	11.1
2	-1.32	-1.28	-1.37	-1.31	-2.00	-.407	.828
3	9.12	21.1	20.3	19.8	17.1	2.81	6.24
4	-2.22	1.56	1.73	1.08	-3.70	3.35	3.59
5	1.03	1.57	1.30	1.22	.773	.803	.641
6	.658	1.17	1.13	1.12	.470	-.087	-.008
7	.001	1.99	1.76	1.41	-.744	-1.49	1.70
8	-.682	.055	-.232	-.619	-1.24	-2.32	-.298
9	.038	.043	.044	.044	.038	.039	.037
10	.087	-.474	-.454	-.465	-.237	.061	.294
11	.361	1.67	1.71	1.8	1.95	1.92	2.63

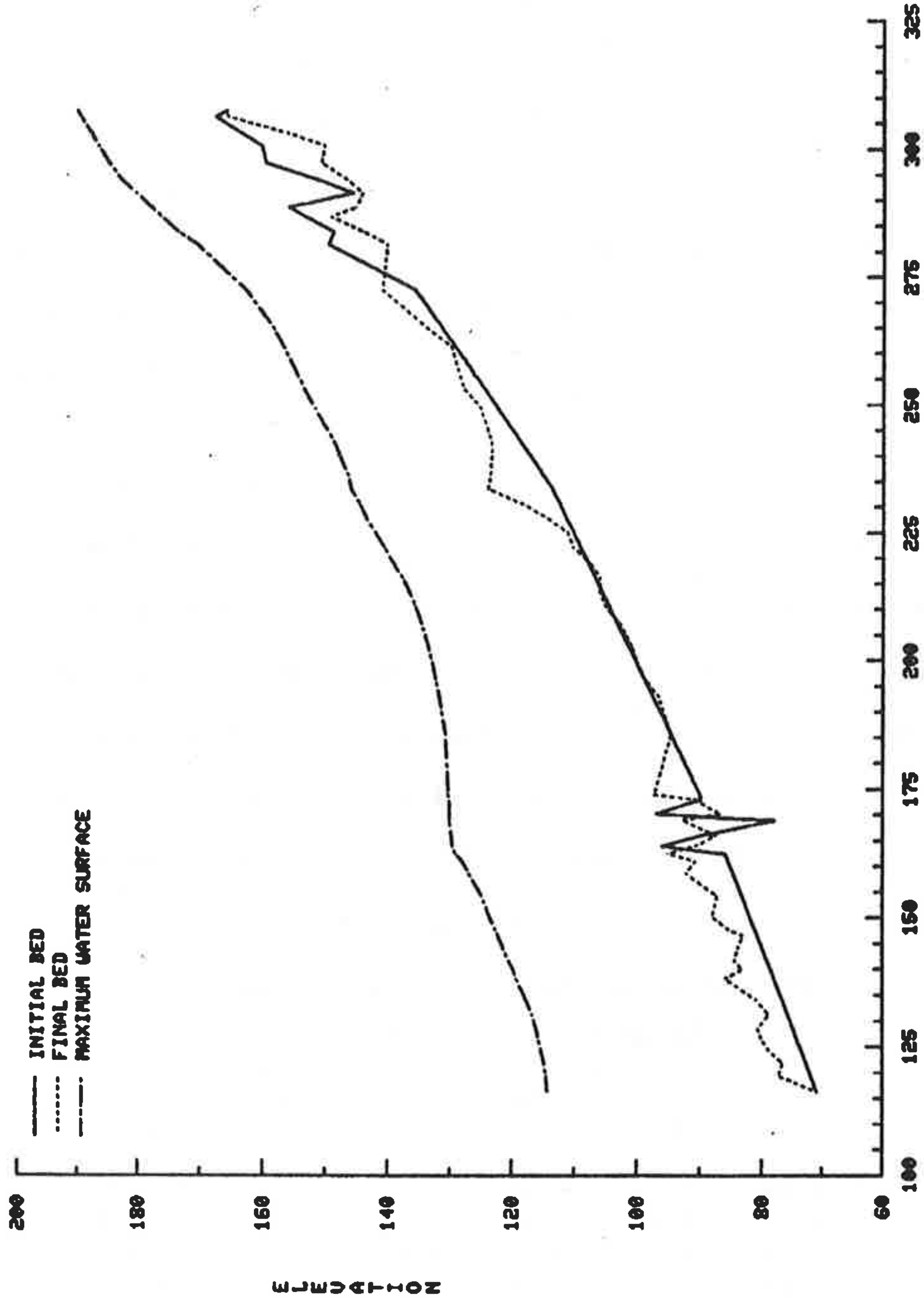

Figure G.1. Profiles on Mainstem

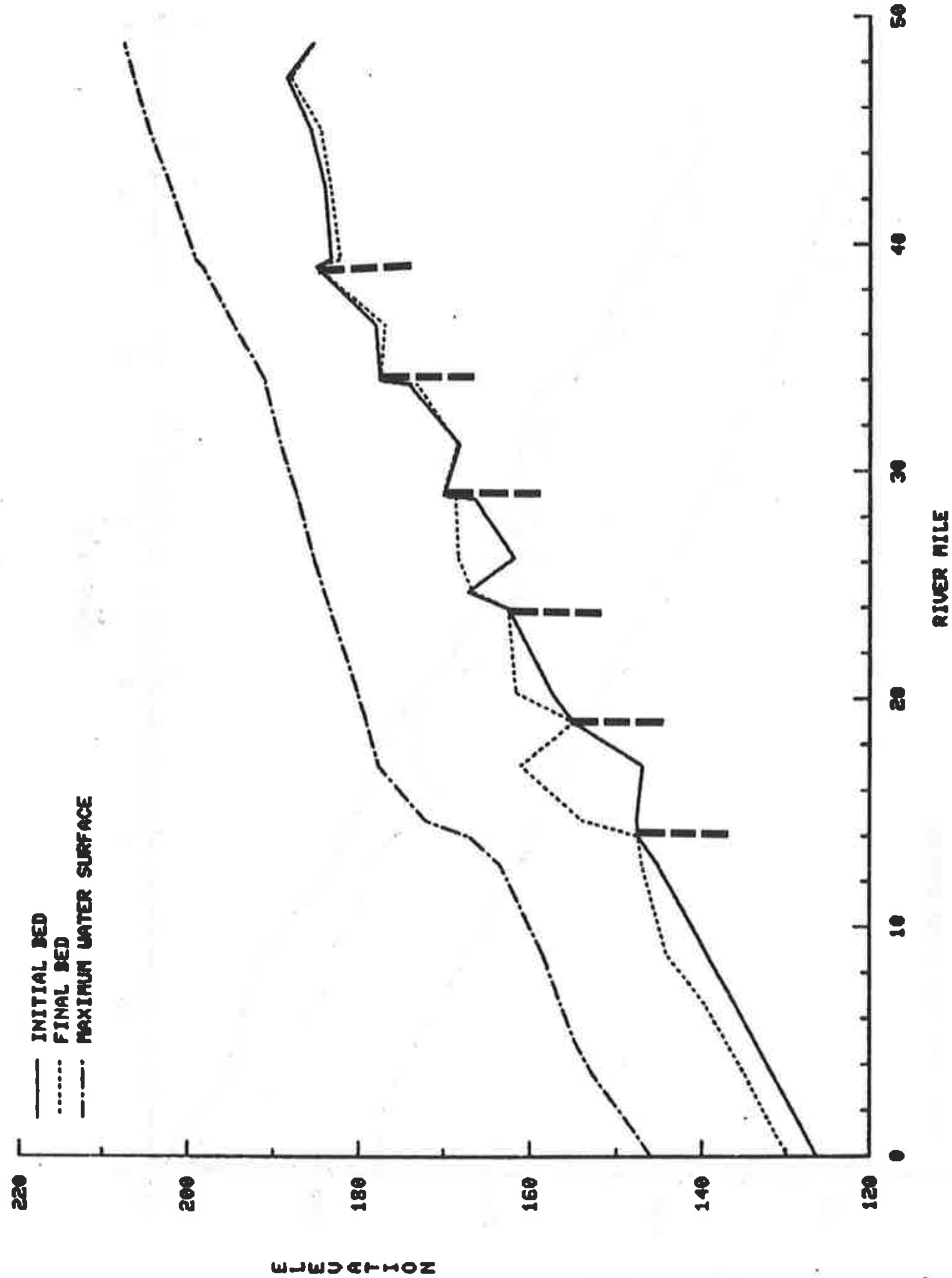

Figure G.2. Profiles on P-Q, Little Tallahatchie

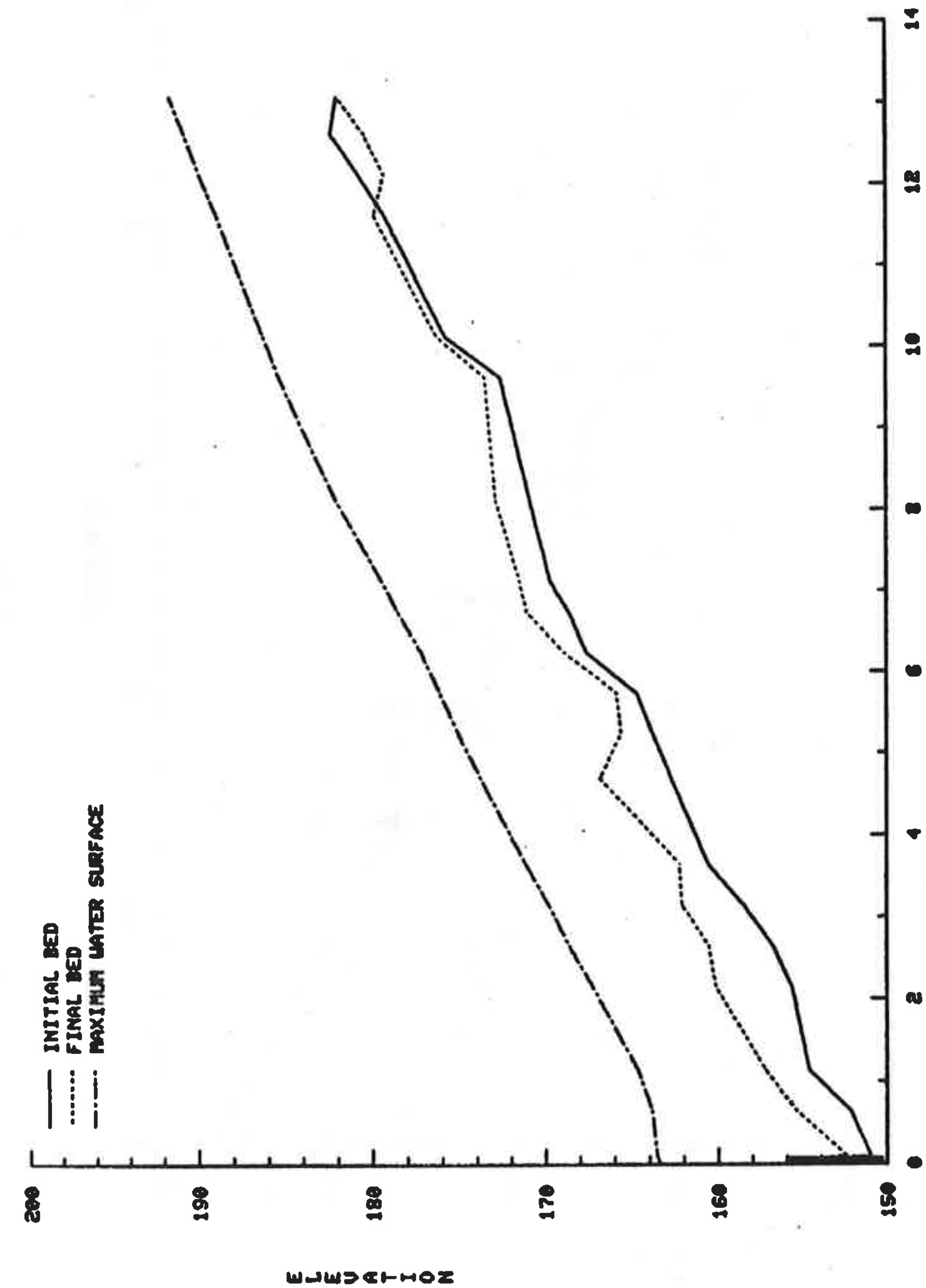

Figure G.3. Profiles on Yocona River

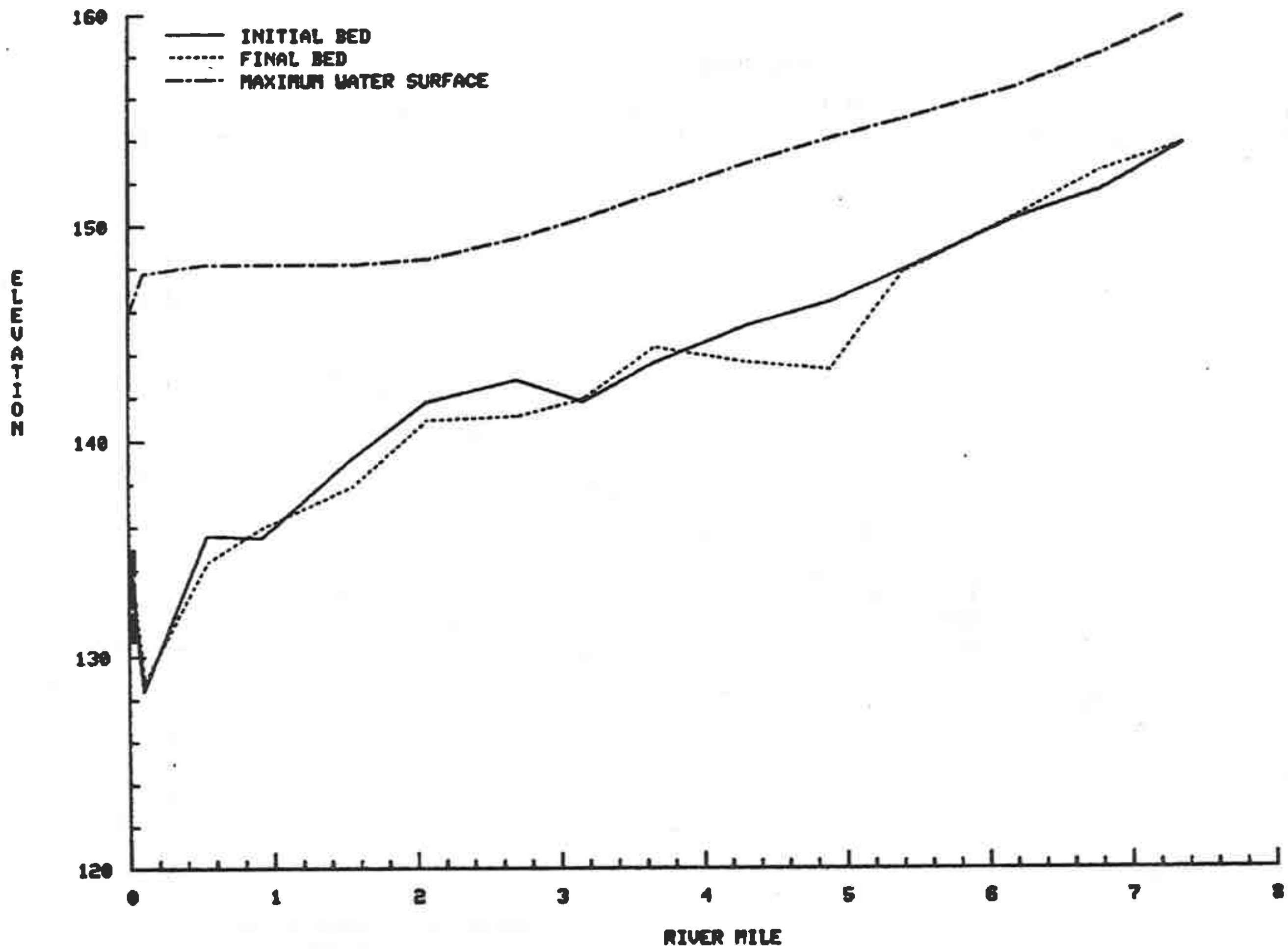

Figure G.4. Profiles on Tillitoba Creek

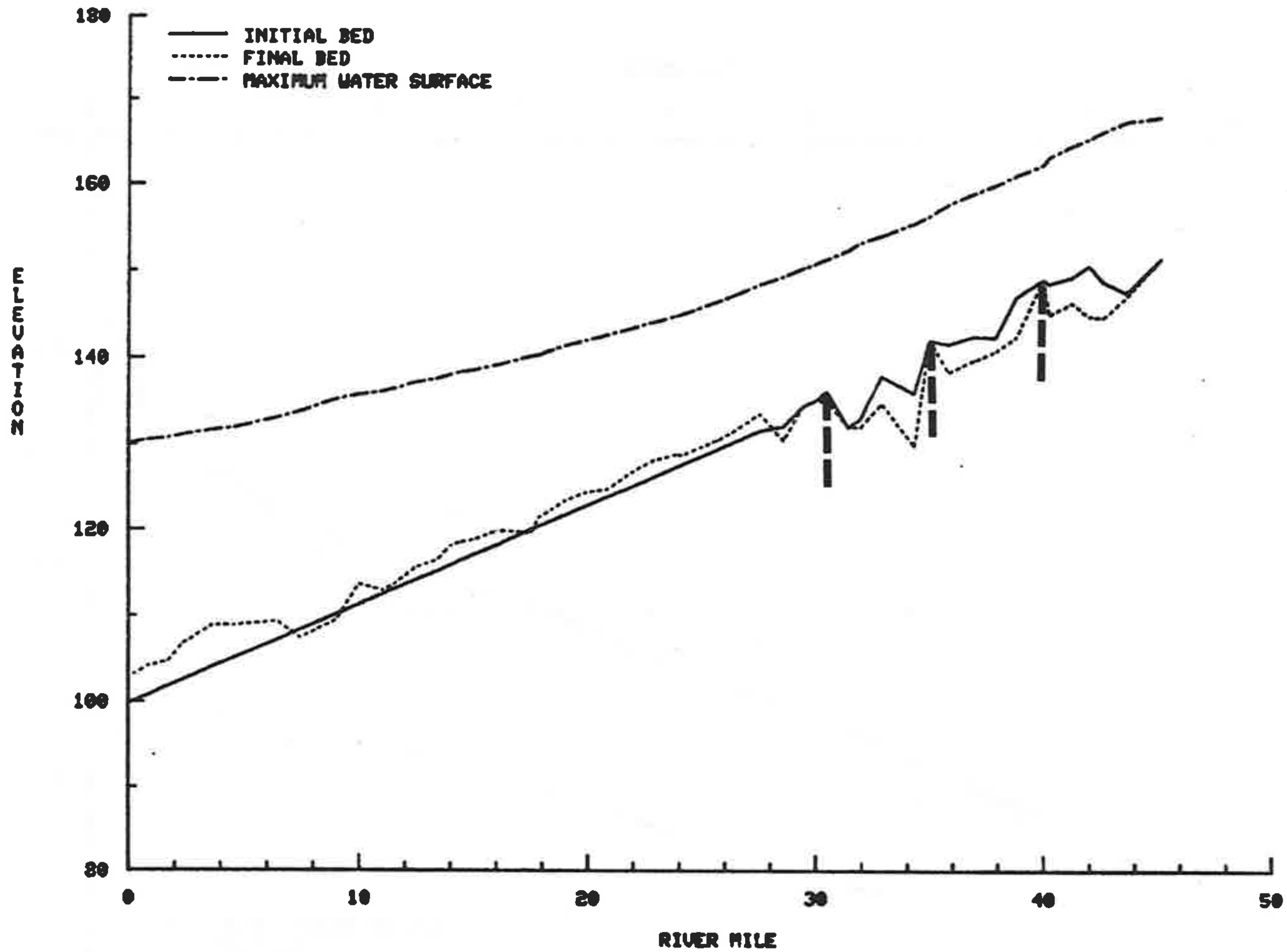

Figure G.5. Profiles on Yalobusha River

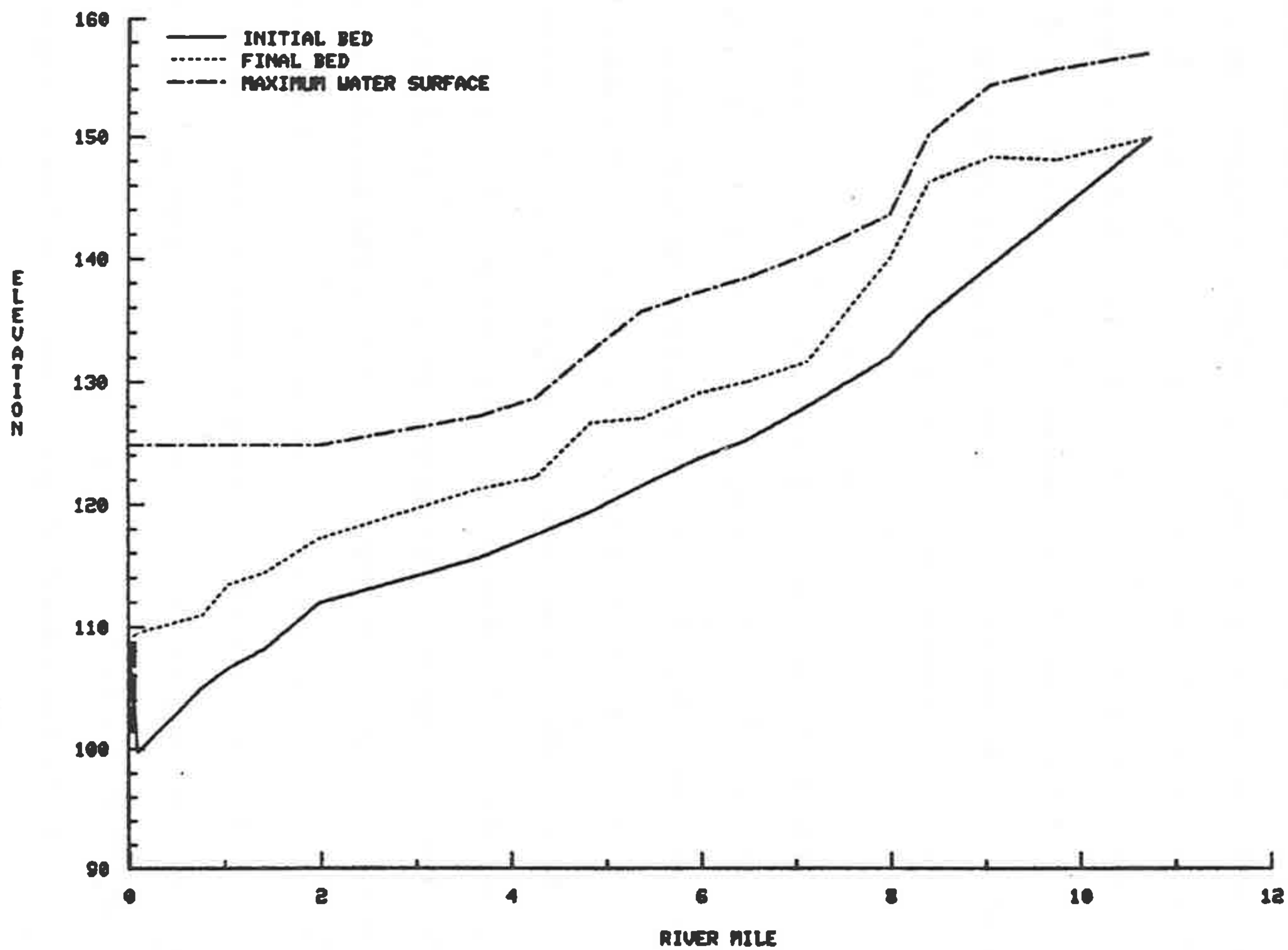

Figure G.6. Profiles on Pelucia Creek

The aggradation in the Tallahatchie River (Reach 3) increased over Run 6 (3.4 MCY) to 6.2 MCY due to the removal of the weir on the P-Q at RM 1.00. This was still much less than the 21 to 17 MCY aggradation in Runs 2 to 5. This reduction over Runs 2 to 5 is due to the enlargement of the P-Q and the resulting decrease in sediment transport into the Tallahatchie. Figure G.7 shows that stages on the mainstem were increased slightly over Run 6. The P-Q, Little Tallahatchie aggrade significantly, with the new channel aggrading 5 to 6 feet (Figure G.2). The aggradation on the Yocona (Reach 5) was reduced by 20 percent from Run 6 due to the stages reductions achieved by the enlarged channel on the P-Q.

Figure G.8 presents the stage-frequency plot for Runs 5, 6 and 7 at Batesville. As can be seen the average stage at Batesville was reduced by five to ten feet. This is a major reduction and will undoubtedly induce head cutting of the tributaries on the Little Tallahatchie. Since these tributaries are not modeled in this study, the results of the run do not reflect the probable increased sediment load from them. The probable result of the head cutting will be an increased aggradation on the P-Q Floodway and eventually an increase in the aggradation and flood stages on the Tallahatchie. It is impossible with the present data base to predict the actual response but based on experience in the basin the increased aggradation could easily total five million cubic yards over the 50 year period.

On the Yalobusha the removal of grade control and the enlargement of the channel resulted in increased transport into and aggradation in the bendway.

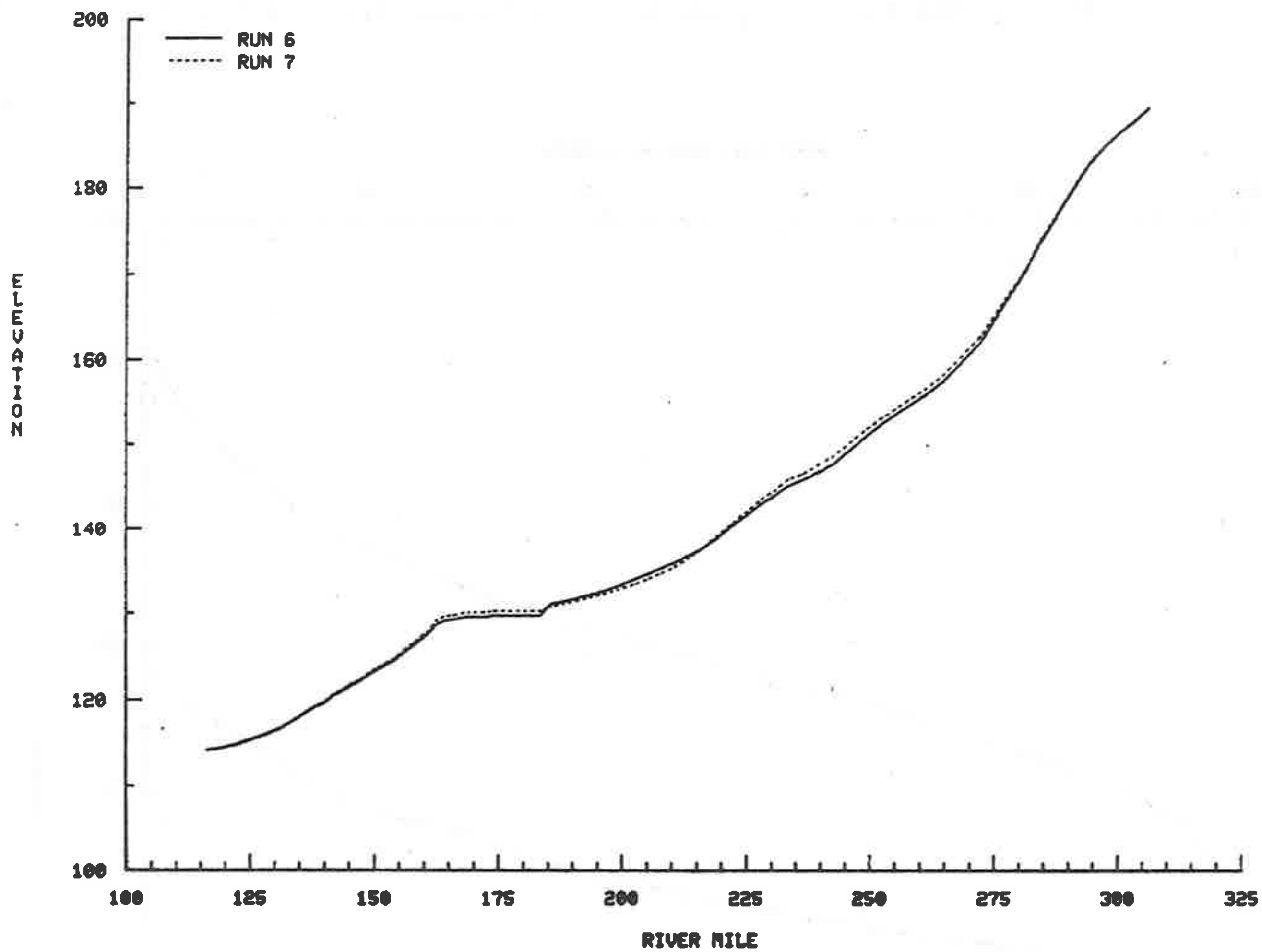

Figure G.7. Maximum Water Surface Profiles on the Mainstem for Runs 6 and 7

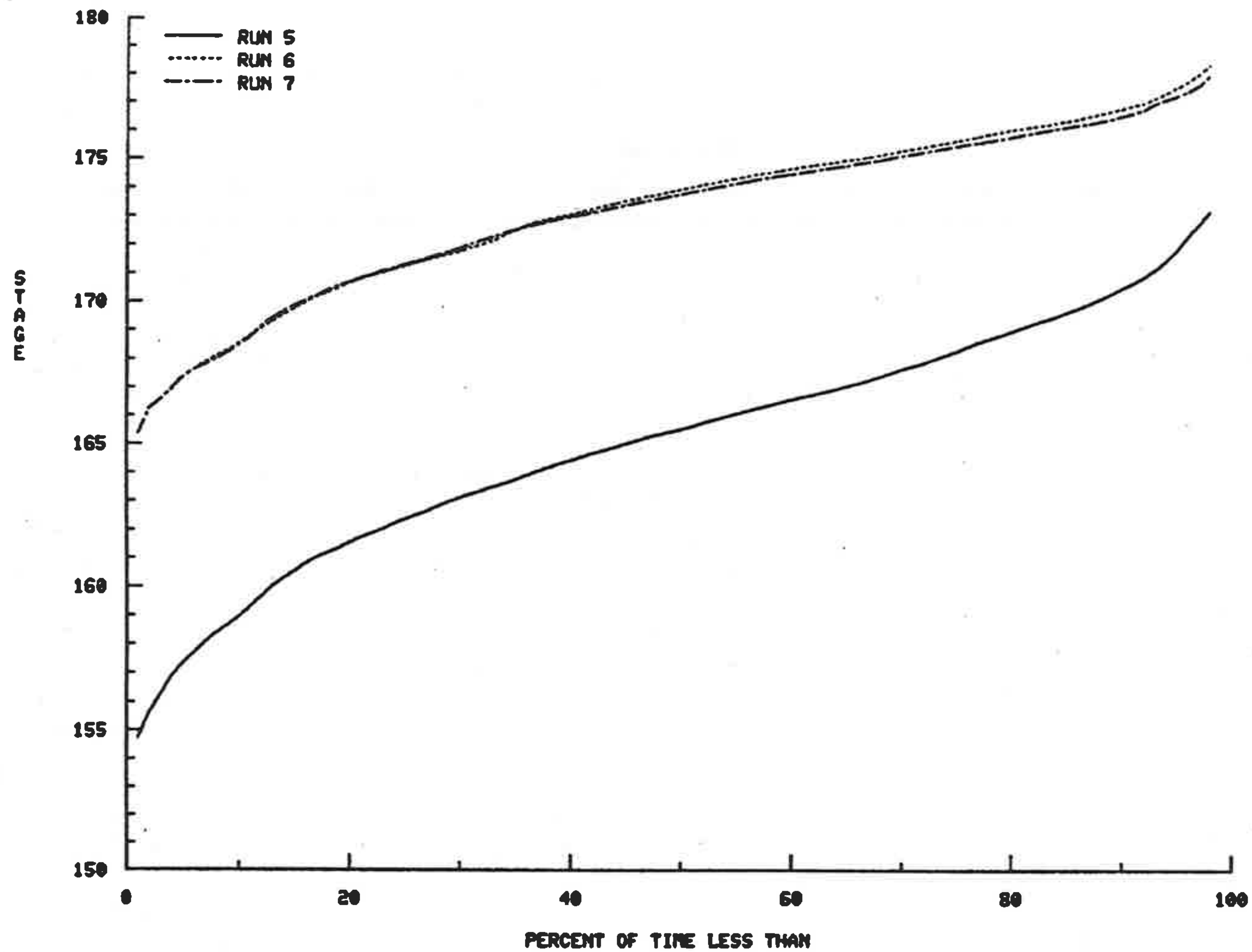

Figure G.8. Stage-Duration Plot at Batesville for Runs 5, 6 and 7

The enlarged channel in the lower Yalobusha (Reach 7) was oversized and aggraded. Figure G.9 shows the average stage at Whaley was reduced one to two feet. Again this stage reduction has the potential to rejuvenate the tributaries on the Yalobusha and increase the aggradation greatly over what is predicted here.

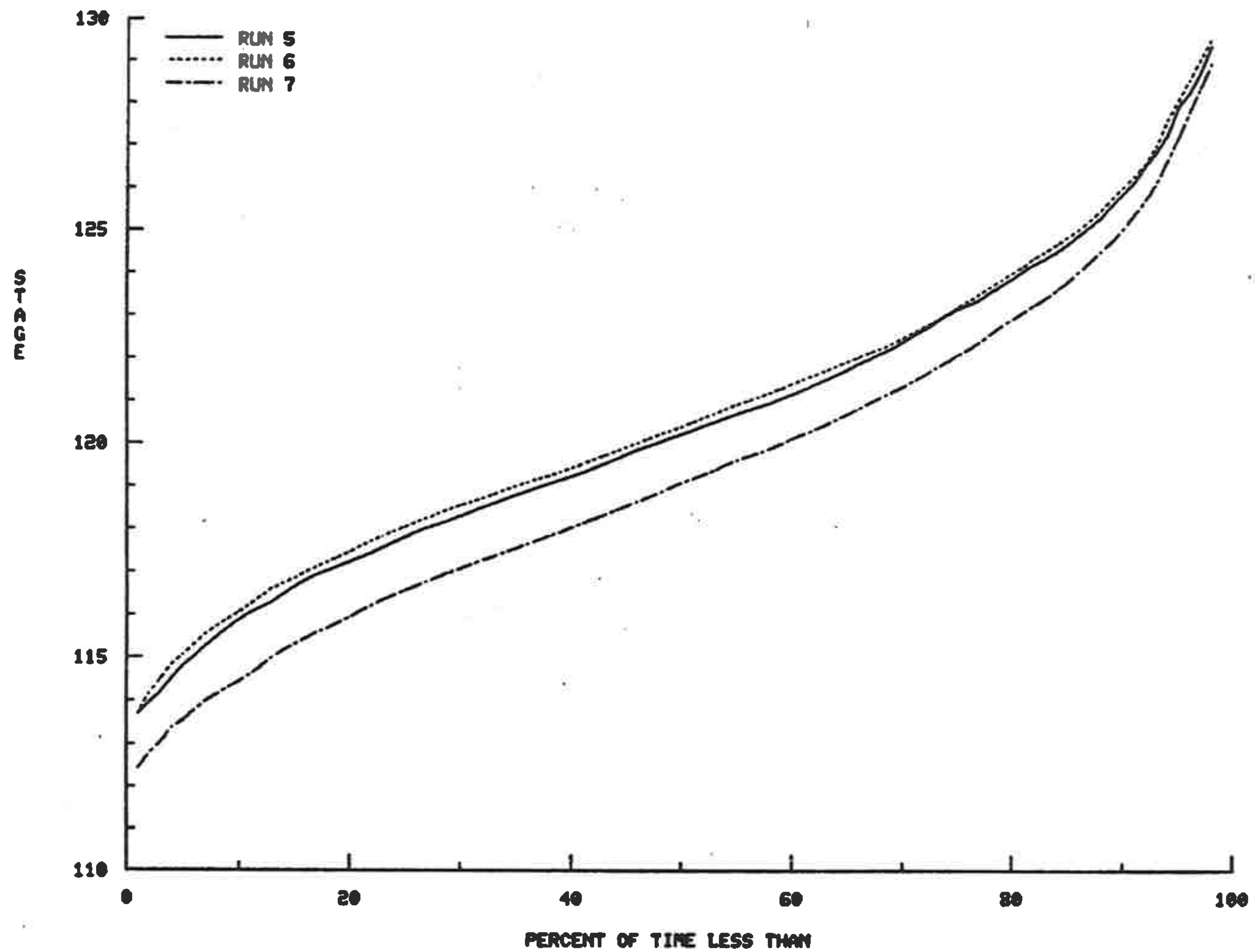

Figure G.9. Stage-Duration Plot at Whaley for Runs 5, 6 and 7