Conditional Letter of Map Revision (CLOMR)
Technical Data Notebook
For

Bullard Wash; Maricopa County, Arizona
Sections 2.680 through Section 6.320
(approximately Lower Buckeye Road to Thomas Road)

Prepared for:

Pinnacle Engineering, Inc.
8712 E. Vista Bonita
Scottsdale, Arizona 85255

Prepared by:

JE FULLER
HYDROLOGY & GEOMORPHOLOGY, INC.

2881 N. Silver Spur Drive
Tucson, Arizona 85745

520-623-3112 (voice)
520-623-3130 (fax)

June 1999

Registered Professional Engineer (Civil)
CERTIFICATE NO.
22922
JOHN M.
WALLACE
Date signed 6/28/99
ARIZONA, U.S.A.

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SECTION 1: INTRODUCTION

The purpose of this study is to document the results of an evaluation of Bullard Wash in Maricopa County, Arizona between Sections 2.680 (just north of Lower Buckeye Road) and 6.320 (just south of Thomas Road) in support of a Conditional Letter of Map Revison (CLOMR). The basis for the CLOMR is two-fold:

- *Revised hydrology* based on changes in the upstream watershed
- *Proposed fill and channel construction* for a segment starting at Van Buren Road and extending upstream approximately 1200 feet.

This study was prepared by JE Fuller/Hydrology & Geomorphology, Inc. (JEF) under contract to Pinnacle Engineering, Inc. The project manager for JEF was John M. Wallace, P.E.. The project manager for Pinnacle Engineering was Wade Cooke. Pinnacle Engineering prepared the Bullard Wash Channel Improvement Plans under contract to Marwest Enterprises, L.L.C. Grading plans for Mountain View Estates subdivision were prepared by Hook Engineering under contract to Marwest Enterprises, L.L.C.. The project manager for Hook Engineering was Shane McClara, P.E..

This report was prepared using the format, forms and instructions outlined in References 1 and 2 by the Arizona Department of Water Resources (ADWR) and the Federal Emergency Management Agency (FEMA), respectively (see Appendix A: References).

The study reach for the CLOMR is located in Township 2 North, Range 1 West, Section 32 and Township 1 North, Range 1 West, Sections 5, 8, 17 and 20, Gila and Salt River Baseline and Meridian. The proposed fill and channel improvements are located entirely within Township 1 North, Range 1 West, Section 5. Figure 1.1 shows the study reach and improvement reach locations.

The methodology used for the hydrologic analysis for the CLOMR was the U.S. Army Corps of Engineers HEC-1 model. The model was developed utilizing existing modeling prepared by the Flood Control District of Maricopa County (FCDMC) and modified by JEF to reflect recent watershed modifications. The resulting HEC-1 model has been adopted by the FCDMC for use on future CLOMR submittals within the watershed (see correspondence in Appendices B and D of this report).

The methodology used for the hydraulic analysis for the CLOMR was the U.S. Army Corps of Engineers HEC-2 model. The analysis was performed by modifying the HEC-2 model used as the basis for the existing flood insurance study (FIS) to reflect the revised hydrology and the proposed fill and channelization improvements in Section 5 of T1N, R1W. The HEC-2 model revisions to reflect the proposed fill and channelization improvements were based on plans prepared by Pinnacle Engineering and Hook Engineering.

The results of the study provide a revised floodplain and floodway delineation for Bullard Wash for the study reach which reflects the revised hydrology and the proposed fill/channel improvements in Section 5 of T1N, R1W. In general the hydrologic revisions resulted in lower

SECTION 5: HYDRAULICS

5.1 Method Description

The hydraulic modeling for the proposed CLOMR was performed using the U.S. Army Corps of Engineers HEC-2 model which was used as the basis for the existing FIS. The model name of the existing FIS model is BULL_FIS.DAT. The model name of the revised HEC-2 model is BULL_CLM.DAT

The existing FIS HEC-2 model was revised to reflect the revised hydrology discussed in Section IV of this report. Also, the HEC-2 model was revised to reflect the proposed channel improvements planned as a part of the Mountain View Estates project located immediately upstream of Van Buren Street.

The revised HEC-2 model starts near the downstream end of the Bullard Wash area mapped in detail on the existing Flood Insurance Rate Map (FIRM) panel no. 04013C2070. A water surface elevation of 947.8 at HEC-2 section 2.680 was used to start the revised HEC-2 model based on the pending Maricopa County CLOMR for this location (FEMA Case No. 99-09-862R).

5.2 Work Study Maps

The results of the hydraulic modeling are documented on copies of the topographic maps used for the existing FIS, which were prepared by the WLB Group. The resulting maps are included in Appendix J of this report. These maps show the revised floodplain and floodway delineations resulting from the revised hydrology and proposed channel improvements planned as a part of the Mountain View Estates project. Appendix J also includes a large scale (1" =50') plan view plot of the Bullard Wash channel and Mountain View Estates subdivision grading adjacent to the channel. For comparison purposes, copies of the floodplain work maps from the existing FIS are also included in Appendix J.

5.3 Parameter Estimation

The reader is referred to the hydraulics submittals for the existing FIS (Reference 3) for a detailed discussion of the parameter estimation for the original HEC-2 model. No revision of the parameters for the model were included as a part of this CLOMR.

5.4 Cross-section Description

All cross-section locations are per the existing FIS (except as noted in Section 5.5 of this report). The reader is referred to the hydraulics submittals for the existing FIS (Reference 3) for a detailed discussion of the cross-section placement and orientation.

BULLARD WASH CLOMR
SUMMARY PRINTOUT

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
	2.680	3200.00	947.85	9661.88	9925.00	10050.00	10535.00	.00	743.52	2.65	945.20	68.25	6.93
	2.680	3200.00	948.67	9925.00	9925.00	10050.00	10124.00	.00	199.00	3.47	945.20	44.24	6.84
*	2.771	3200.00	950.45	9634.21	9985.00	10020.00	10649.53	2.60	1001.73	3.15	947.30	32.86	5.06
	2.771	3200.00	951.14	9917.92	9985.00	10020.00	10211.92	2.47	294.00	3.84	947.30	44.51	7.00
	2.883	3200.00	952.21	9629.03	9985.00	10015.00	10407.47	1.76	778.45	3.71	948.50	28.53	5.34
	2.883	3200.00	953.10	9853.00	9985.00	10015.00	10130.00	1.96	277.00	4.60	948.50	24.67	5.94
	2.977	3194.00	953.72	9683.29	9980.00	10050.00	10417.98	1.52	734.69	3.82	949.90	39.83	6.54
	2.977	3194.00	954.38	9875.00	9980.00	10050.00	10050.00	1.28	175.00	4.48	949.90	38.04	7.12
	3.070	3194.00	955.61	9531.52	9945.00	10025.00	10567.69	1.89	1036.17	3.31	952.30	28.10	4.58
	3.070	3194.00	956.40	9847.43	9945.00	10025.00	10134.02	2.03	286.58	4.10	952.30	35.56	6.27
	3.167	2742.00	956.85	9575.17	9970.00	10020.00	10569.96	1.24	994.79	2.95	953.90	20.27	4.11
	3.167	2742.00	957.87	9788.00	9970.00	10020.00	10130.00	1.46	342.00	3.97	953.90	17.78	4.83
*	3.291	2742.00	959.18	9989.12	9970.00	10020.00	10823.48	2.33	814.06	1.98	957.20	79.47	4.49
*	3.291	2742.00	960.06	9983.21	9970.00	10020.00	10287.35	2.19	300.12	2.86	957.20	91.81	5.66
*	3.376	2742.00	961.20	9773.44	9985.00	10015.00	10794.53	2.03	975.12	2.90	958.30	28.81	2.93
*	3.376	2742.00	962.24	9985.00	9985.00	10015.00	10291.17	2.18	306.17	3.94	958.30	27.85	4.10
	3.491	2742.00	962.61	9628.06	9980.00	10020.00	10599.32	1.40	971.26	3.11	959.50	18.99	3.36
	3.491	2742.00	963.62	9911.46	9980.00	10020.00	10234.03	1.37	322.57	4.12	959.50	19.01	4.43
*	3.602	2746.00	964.10	9742.08	9880.00	10100.00	10454.50	1.49	712.41	2.20	961.90	40.59	3.95
	3.602	2746.00	964.92	9880.00	9880.00	10100.00	10100.00	1.31	220.00	3.02	961.90	31.07	4.20
	3.702	2746.00	966.18	9297.68	9955.00	10055.00	10395.11	2.08	851.27	2.78	963.40	37.67	4.20
	3.702	2746.00	966.86	9600.00	9955.00	10055.00	10075.00	1.94	239.56	3.46	963.40	47.12	5.52

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	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
	3.841	2746.00	968.67	9229.64	9955.00	10070.00	10338.90	2.49	881.52	3.57	965.10	29.16	3.09
	3.841	2746.00	969.70	9588.66	9955.00	10070.00	10070.00	2.84	262.15	4.60	965.10	28.66	4.02
	3.978	2746.00	970.71	9279.87	9930.00	10095.00	10376.46	2.04	1096.59	3.81	966.90	27.95	3.56
	3.978	2746.00	971.60	9700.00	9930.00	10095.00	10095.00	1.90	395.00	4.70	966.90	24.66	4.06
	4.101	2746.00	972.63	9450.69	9960.00	10080.00	10450.14	1.92	999.46	3.93	968.70	30.33	3.57
	4.101	2746.00	973.48	9852.45	9960.00	10080.00	10091.34	1.87	238.89	4.78	968.70	35.66	4.77
	4.237	2746.00	974.47	9500.62	9935.00	10075.00	10323.19	1.84	822.57	3.17	971.30	22.35	3.49
	4.237	2746.00	975.50	9869.06	9935.00	10075.00	10075.00	2.02	205.94	4.20	971.30	22.27	4.22
	4.356	2746.00	975.86	9538.79	9950.00	10070.00	10345.86	1.40	807.07	3.26	972.60	21.66	3.47
	4.356	2746.00	976.90	9852.43	9950.00	10070.00	10070.00	1.41	217.57	4.30	972.60	21.57	4.18
	4.496	2746.00	977.52	9692.36	9975.00	10130.00	10385.67	1.66	693.31	3.12	974.40	23.85	3.61
	4.496	2746.00	978.53	9957.70	9975.00	10130.00	10131.67	1.63	173.97	4.13	974.40	23.92	4.43
*	4.625	2754.00	980.10	9810.00	9835.00	10095.00	10095.00	2.58	285.00	2.00	978.10	85.69	5.29
	4.625	2754.00	980.64	9835.00	9835.00	10095.00	10095.00	2.11	260.00	2.54	978.10	41.53	4.31
*	4.634	2754.00	980.53	9864.49	9862.00	10138.00	10135.51	.42	271.02	4.38	976.15	5.24	2.48
*	4.634	2754.00	980.92	9862.94	9862.00	10138.00	10137.06	.28	274.13	4.77	976.15	3.93	2.27
	4.670	2754.00	980.62	9872.13	9869.00	10131.00	10127.87	.09	255.74	4.22	976.40	6.70	2.73
	4.670	2754.00	980.99	9870.67	9869.00	10131.00	10129.33	.07	258.65	4.59	976.40	5.06	2.50

	4.752	2754.00	980.97	9871.03	9869.00	10131.00	10128.97	.35	257.94	3.49	977.48	11.84	3.23
	4.752	2754.00	981.25	9869.93	9869.00	10131.00	10130.07	.26	260.15	3.77	977.48	9.15	2.98
	4.820	2754.00	981.42	9871.69	9869.00	10131.00	10125.65	.45	253.96	3.33	978.09	14.01	3.42
	4.820	2754.00	981.60	9870.96	9869.00	10131.00	10126.23	.35	255.27	3.51	978.09	11.70	3.23
	4.840	2754.00	981.61	9837.82	9835.00	10165.00	10162.18	.19	324.37	3.30	978.31	8.65	2.69
	4.840	2754.00	981.76	9837.20	9835.00	10165.00	10162.80	.16	325.61	3.45	978.31	7.41	2.56
	4.855	2754.00	981.75	9690.88	9680.00	10175.00	10175.00	.14	484.12	3.18	978.57	6.96	2.14
	4.855	2754.00	981.88	9690.49	9680.00	10175.00	10175.00	.12	484.51	3.31	978.57	5.90	2.04
*	4.858	2754.00	981.53	9774.13	9705.00	10290.00	10280.63	-.22	506.49	1.53	980.00	189.23	5.24
*	4.858	2754.00	981.70	9850.00	9705.00	10290.00	10150.00	-.19	300.00	1.70	980.00	211.44	6.66
*	5.009	2754.00	985.15	9634.11	9935.00	10100.00	10371.11	3.62	737.00	3.25	981.90	17.18	2.96
*	5.009	2754.00	986.01	9875.00	9935.00	10100.00	10105.00	4.32	230.00	4.11	981.90	20.46	3.90
*	5.153	2754.00	987.06	9556.54	9945.00	10090.00	10287.07	1.91	730.52	2.76	984.30	42.16	4.06
	5.153	2754.00	988.03	9865.00	9945.00	10090.00	10090.00	2.01	225.00	3.73	984.30	38.04	4.85
*	5.282	2754.00	988.68	9324.37	9945.00	10055.00	10354.26	1.62	1029.88	3.18	985.50	13.61	2.75
*	5.282	2754.00	989.71	9758.05	9945.00	10055.00	10055.00	1.68	296.95	4.21	985.50	13.65	3.30

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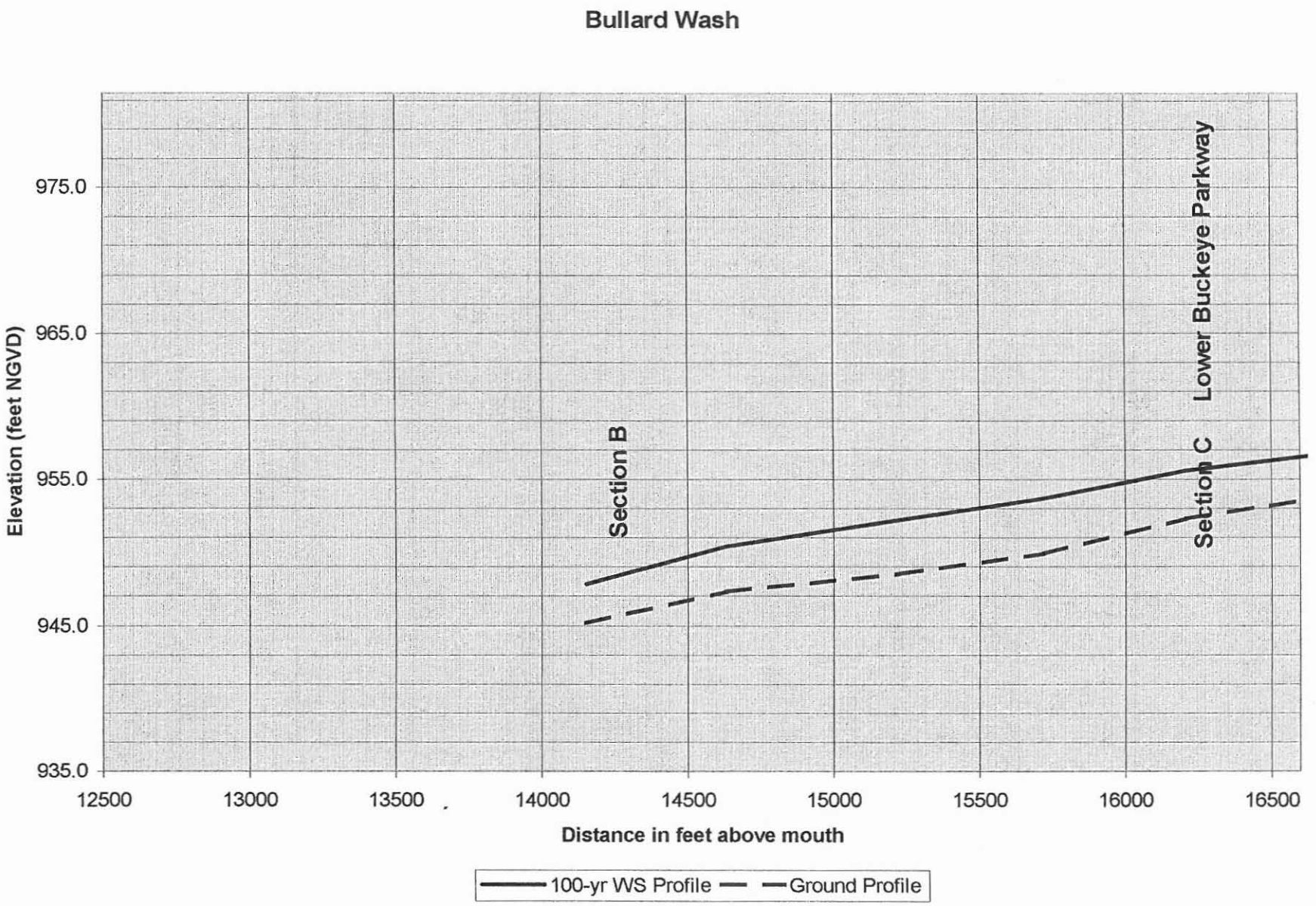
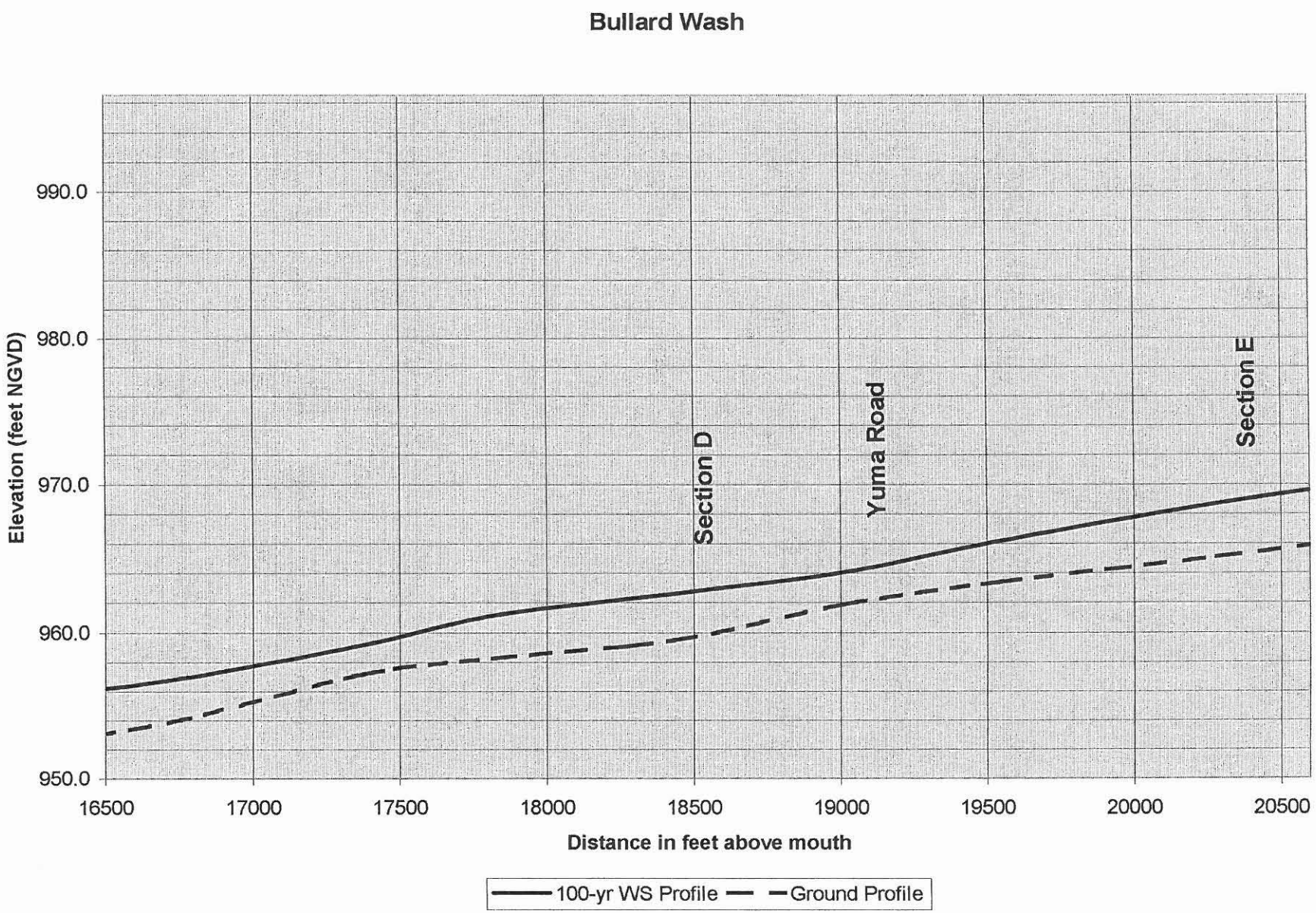
	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
*	5.430	2754.00	990.43	9913.91	9899.90	10100.10	10086.09	1.74	172.18	2.43	988.00	82.23	6.79
*	5.430	2754.00	991.12	9912.46	9899.90	10100.10	10087.54	1.41	175.08	3.12	988.00	35.48	5.24
*	5.460	3538.00	991.00	9912.71	9899.90	10100.10	10087.29	.57	174.57	3.00	988.00	66.93	7.01
	5.460	3538.00	992.00	9910.62	9899.90	10100.10	10089.38	.88	178.77	4.00	988.00	25.47	5.19
	5.563	3538.00	992.61	9351.43	9850.00	10100.00	10736.62	1.62	1385.19	4.11	988.50	5.08	2.02
*	5.563	3538.00	993.11	9850.00	9850.00	10100.00	10232.27	1.11	382.27	4.61	988.50	7.58	2.65
*	5.727	3400.00	993.54	9375.53	9935.00	10135.00	10467.83	.92	933.49	2.54	991.00	108.18	5.65
*	5.727	3400.00	994.30	9935.00	9935.00	10135.00	10135.00	1.19	200.00	3.30	991.00	81.47	5.92
*	5.840	3400.00	996.30	9353.26	9970.00	10170.00	10715.71	2.77	1293.70	2.90	993.40	21.83	3.01
*	5.840	3400.00	997.15	9953.67	9970.00	10170.00	10240.41	2.85	286.74	3.75	993.40	25.21	3.88
	5.960	3400.00	998.09	9735.32	9960.00	10150.00	10948.05	1.79	1212.73	2.19	995.90	39.62	3.21
	5.960	3400.00	999.10	9960.00	9960.00	10150.00	10274.07	1.95	314.07	3.20	995.90	39.84	4.24
	6.086	3400.00	1000.79	9475.24	9900.00	10100.00	10827.24	2.70	1352.00	2.49	998.30	40.60	3.39
	6.086	3400.00	1001.79	9900.00	9900.00	10100.00	10206.34	2.70	306.34	3.49	998.30	41.25	4.42
*	6.217	3400.00	1002.61	9445.54	9900.00	10100.00	10837.21	1.82	1391.67	2.51	1000.10	17.17	2.46
*	6.217	3400.00	1003.66	9850.00	9900.00	10100.00	10270.00	1.86	420.00	3.56	1000.10	15.88	3.01
	6.320	3400.00	1003.60	9582.91	9900.00	10100.00	10928.10	.99	1345.19	2.70	1000.90	19.52	2.67
	6.320	3400.00	1004.60	9900.00	9900.00	10100.00	10279.30	.94	379.30	3.70	1000.90	19.99	3.35

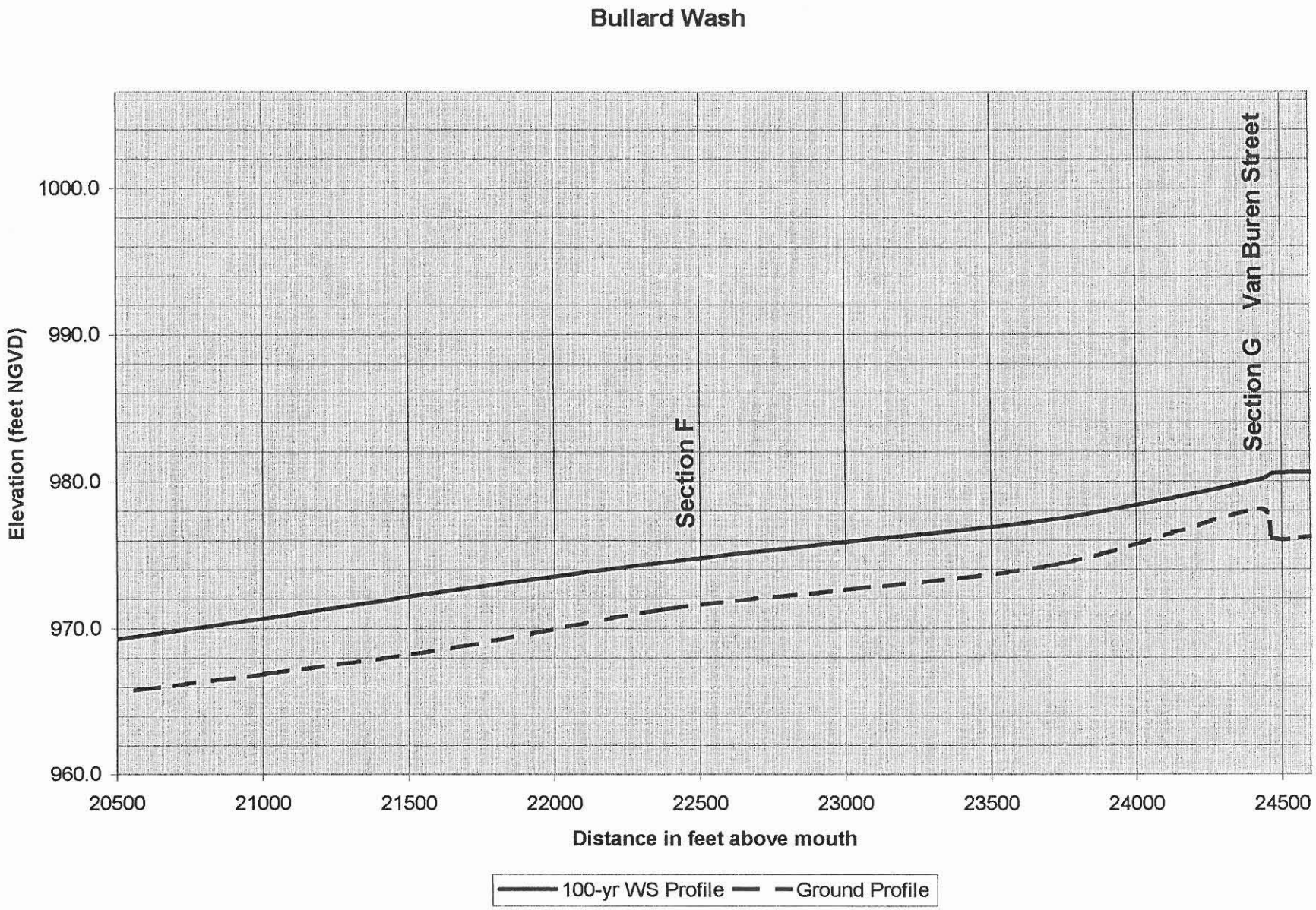
SECTION 7: DRAFT FIS REPORT DATA

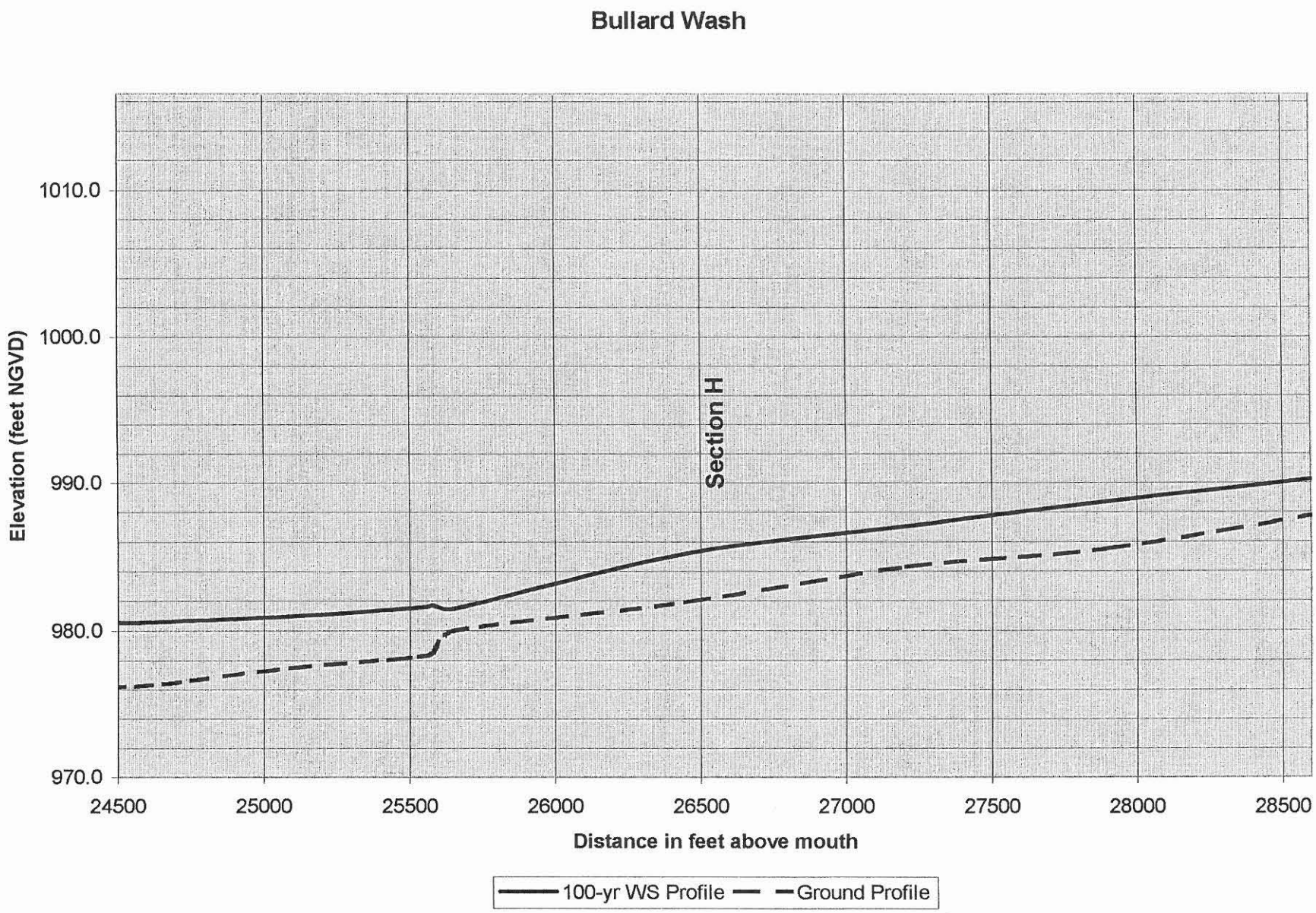
Draft floodway table data for the Bullard Wash CLOMR are shown below. Flood profiles are shown on the following pages.

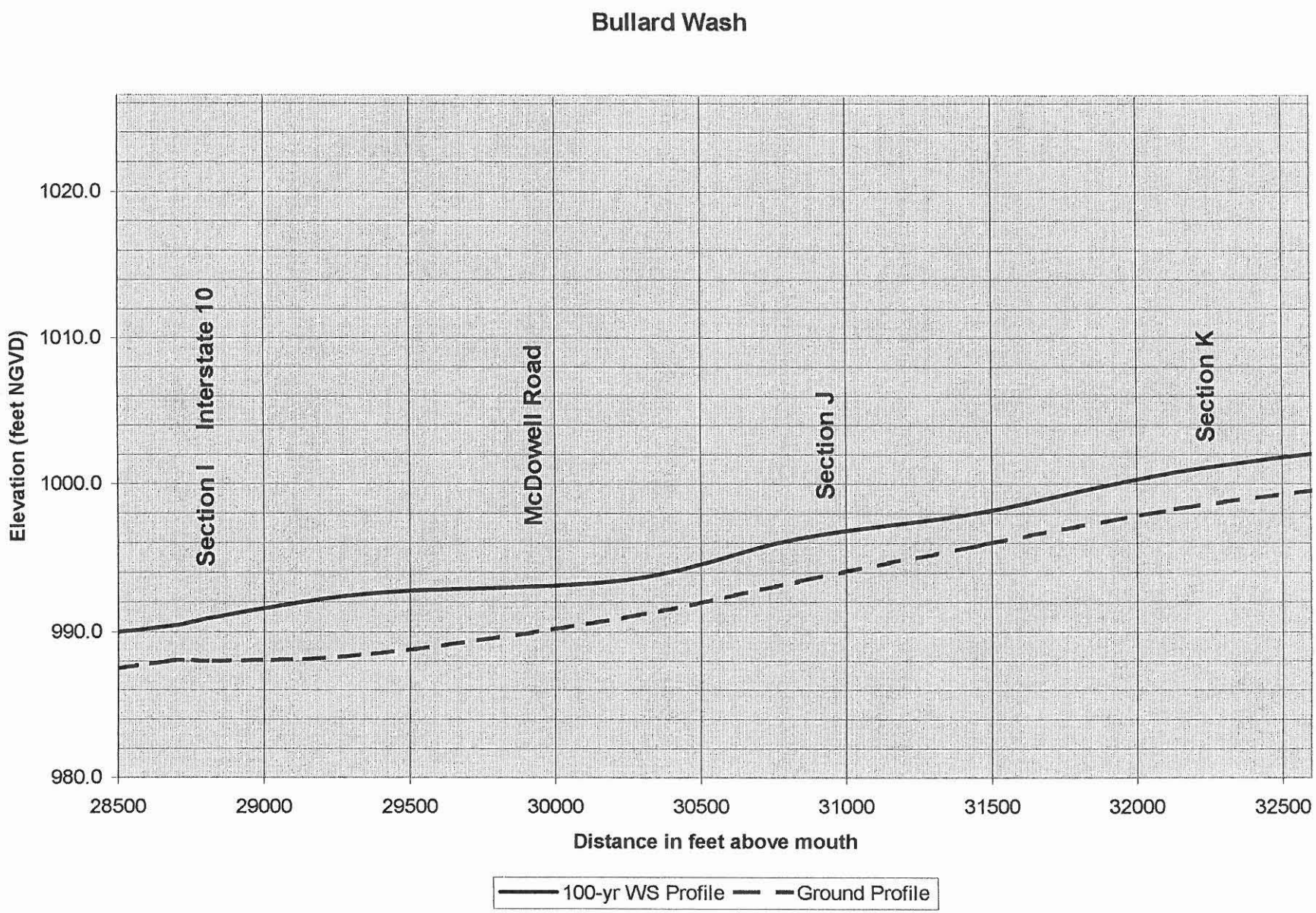
Flooding Source		Floodway			Base Flood Elevation Water Surface Elevation			
Cross Section	Distance (miles above mouth)	Width (feet)	Section Area (ft^2)	Mean Velocity (ft/s)	Regulatory	Without Floodway	With Floodway	Increase (ft)
B	2.680	199	596	5.4	947.8	947.8	948.6	0.8
	2.771	294	875	3.7	950.4	950.4	951.1	0.7
	2.883	277	956	3.3	952.2	952.2	953.1	0.9
	2.977	175	579	5.5	953.7	953.7	954.4	0.7
C	3.070	289	816	3.9	955.6	955.6	956.4	0.8
	3.167	342	991	2.8	956.8	956.8	957.8	1.0
	3.291	302	699	3.9	959.2	959.2	960.1	0.9
	3.376	307	1029	2.7	961.2	961.2	962.2	1.0
D	3.491	323	1090	2.5	962.6	962.6	963.6	1.0
	3.602	220	653	4.2	964.1	964.1	964.9	0.8
	3.702	475	675	4.1	966.2	966.2	966.9	0.7
E	3.841	481	856	3.2	968.7	968.7	969.7	1.0
	3.978	395	885	3.1	970.7	970.7	971.6	0.9
	4.101	239	739	3.7	972.6	972.6	973.5	0.9
F	4.237	206	755	3.6	974.5	974.5	975.5	1.0
	4.356	218	818	3.4	975.9	975.9	976.9	1.0
	4.496	174	656	4.2	977.5	977.5	978.5	1.0
G	4.625	260	639	4.3	980.1	980.1	980.6	0.5
	4.634	274	1216	2.3	980.5	980.5	980.9	0.4
	4.670	259	1101	2.5	980.6	980.6	981.0	0.4
	4.752	252	894	3.1	981.0	981.0	981.3	0.3
	4.820	258	862	3.2	981.4	981.4	981.6	0.2
	4.840	326	1081	2.5	981.6	981.6	981.8	0.2
	4.855	485	1358	2.0	981.7	981.7	981.8	0.1
	4.858	300	413	6.7	981.5	981.5	981.7	0.2
H	5.009	230	813	3.4	985.2	985.2	986.1	0.9
	5.153	225	673	4.1	987.1	987.1	988.1	1.0
	5.282	297	1140	2.4	988.7	988.7	989.7	1.0
I	5.430	175	526	5.2	990.4	990.4	991.1	0.7
	5.460	179	681	5.2	991.0	991.0	992.0	1.0
	5.563	382	1576	2.2	992.6	992.6	993.1	0.5
	5.727	200	574	5.9	993.5	993.5	994.3	0.8
J	5.840	287	994	3.4	996.3	996.3	997.1	0.8
	5.960	314	933	3.6	998.1	998.1	999.1	1.0
K	6.086	306	888	3.8	1000.8	1000.8	1001.8	1.0
	6.217	420	1412	2.4	1002.6	1002.6	1003.6	1.0
L	6.320	379	1240	2.7	1003.6	1003.6	1004.6	1.0

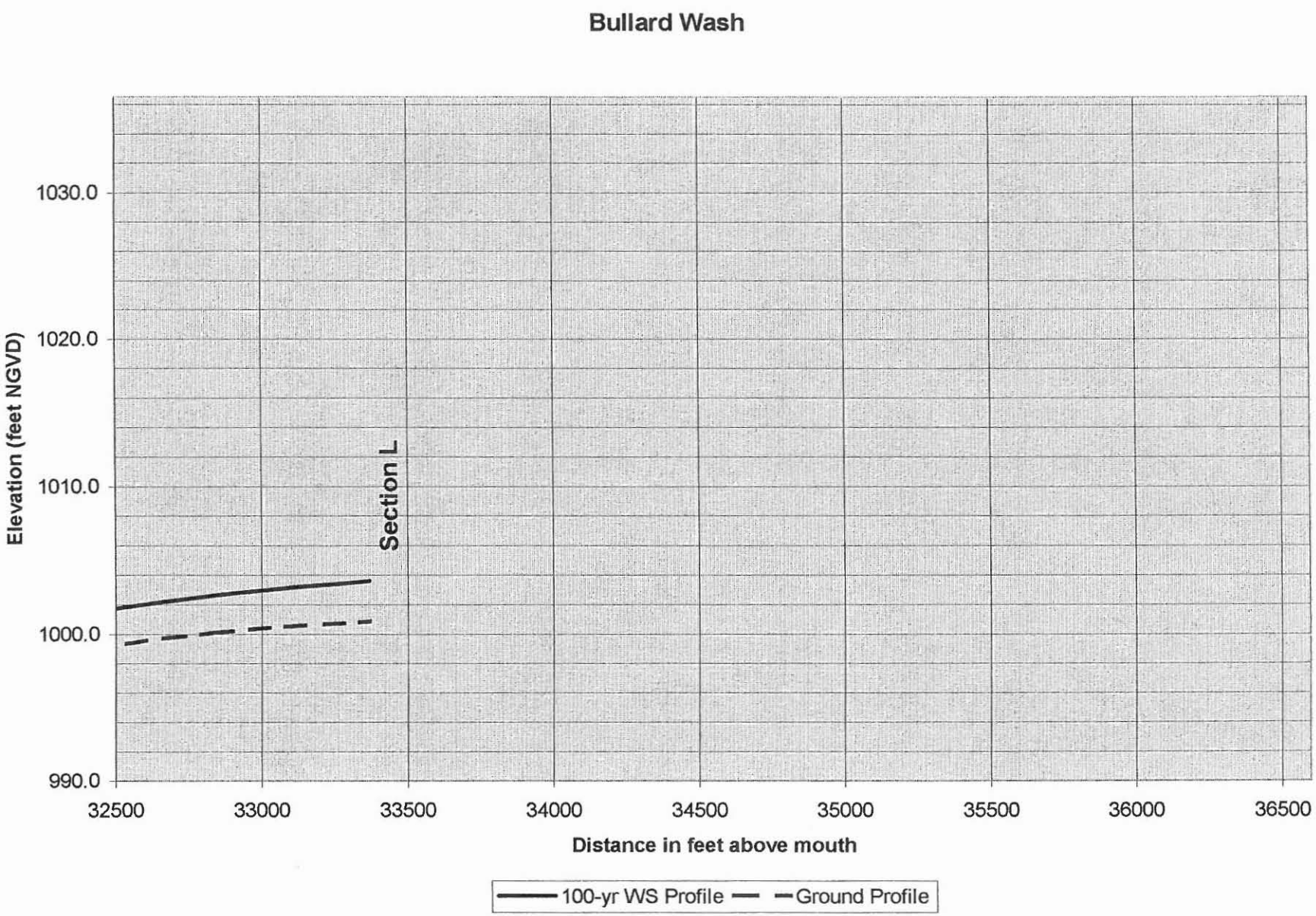

Bullard Wash
Elevation (feet NGVD)
975.0
965.0
955.0
945.0
935.0
12500
13000
13500
14000
14500
15000
15500
16000
16500
Distance in feet above mouth
Section B
Section C
Lower Buckeye Parkway
100-yr WS Profile
Ground Profile


Bullard Wash
Elevation (feet NGVD)
990.0
980.0
970.0
960.0
950.0
16500
17000
17500
18000
18500
19000
19500
20000
20500
Distance in feet above mouth
Section D
Yuma Road
Section E
100-yr WS Profile
Ground Profile


Bullard Wash
Elevation (feet NGVD)
1000.0
990.0
980.0
970.0
960.0
20500
21000
21500
22000
22500
23000
23500
24000
24500
Distance in feet above mouth
Section F
Section G
Van Buren Street
100-yr WS Profile
Ground Profile


Bullard Wash
Elevation (feet NGVD)
1010.0
1000.0
990.0
980.0
970.0
24500
25000
25500
26000
26500
27000
27500
28000
28500
Distance in feet above mouth
Section H
100-yr WS Profile
Ground Profile


Bullard Wash
Elevation (feet NGVD)
1020.0
1010.0
1000.0
990.0
980.0
28500
29000
29500
30000
30500
31000
31500
32000
32500
Distance in feet above mouth
Section I
Interstate 10
McDowell Road
Section J
Section K
100-yr WS Profile
Ground Profile


Bullard Wash
Elevation (feet NGVD)
1030.0
1020.0
1010.0
1000.0
990.0
Section L
32500
33000
33500
34000
34500
35000
35500
36000
36500
Distance in feet above mouth
100-yr WS Profile
Ground Profile

ATTACHMENT D: PRECIPITATION/RUNOFF MODEL

		FIS:		Revised:	
1.	Method or model used:	HEC-1		HEC-1	
	Version:	4.0		same	
	Date:	9/1990		same	
2.	Source of rainfall depth:	FCDMC		same	
3.	Source of rainfall distribution:	FCDMC		same	
4.	Rainfall duration:	24-hour		same	
5.	Areal adjustment to precipitation (%):	Varies		same	
6.	Maximum overland flow length	NA		same	
7.	Hydrograph development method:	Unit Hydrograph		same	
8.	Loss rate method:	Green-Ampt		same	
	Source of soils information:	FCMCD		same	
	Source of land use information:	FCMCD		same	
9.	Channel routing method:	Normal Depth		same	
10.	Reservoir routing:	☒ Yes	☐ No	☒ Yes	☐ No
11.	Baseflow considerations: **If Yes, explain below how baseflow was determined:**	☐ Yes	☒ No	☐ Yes	☒ No
12.	Snowmelt considerations:	☐ Yes	☒ No	☐ Yes	☒ No
13.	Model calibration: **If Yes, explain below how calibration was performed**	☐ Yes	☒ No	☐ Yes	☒ No
14.	Future land use condition: **If Yes, explain why below**	☐ Yes	☒ No	☐ Yes	☒ No

15. **Attach precipitation/runoff model, hydrologic model schematic, curve number calculations, time of concentration calculations, and supporting maps, delineating the watershed boundary and drainage area divides.**

Information and Maps provided? ☐ Yes ☒ No

NOTE: FEMA policy is to base flooding on existing conditions.

3. STARTING WATER-SURFACE ELEVATIONS

Explain how they were determined. Explanation Attached? ☒ Yes
☐ No

* SEE SECTION 5.1 OF THIS REPORT

NOTE: If the effective study is an approximate study, the slope/area method is recommended.
For detailed analysis studies, using a known water-surface elevation is recommended.

4. RESULTS (from the model used to revise the 100-year water surface elevations)

If the results indicate any of the following, attach an explanation - to this form, or to the hydraulic model printout- as to the reasonableness of the situation. SEE SECTION 5.7 OF THIS REPORT

☐ Supercritial depth ☒ Critical Depth ☐ Drawdowns ☐ Negative Floodway Surcharges

☐ Floodway Surcharges Greater Than Maximum Allowed by Community/State

☐ Water surface elevations higher than the end points of cross sections.

☐ Floodway discharge is different than the Natural 100-year (base) flood discharge.

☐ Project causes 100-year floodplain or floodway elevations to increase (state if increases are located off the requester's property)

Explanation attached with Form ☒ **Explanation provided on attached printout** ☐

If Hydraulic model used is HEC-2, has it been checked with FEMA'S CHECK-2 computer program ☐ **Yes** ☐ **No**
(see instructions for information on how to obtain CHECK-2)

5. REVISED FIRM/FBFM AND FLOOD PROFILES

1. **Profile Transition** NOTE: DOWNSTREAM END MATCHES MARICOPA COUNTY CLOMR, FEMA CASE #99-09-862R

a. 100-Year Water-Surface Elevations - indicate the difference in water surface elevations where the project 100-year elevations tie into the existing 100-year water surface elevations at each end of the project.

Downstream End 947.8 within 0 (feet) Upstream End 1003.6 within 0.4 (feet)
Cross-Section # 2.680 *Cross-Section #* 6.320

b. Floodway Elevations - indicate the difference in water surface elevations where the project floodway elevations tie into the existing floodway water surface elevations at each end of the project.

Downstream End 948.6 within 0 (feet) Upstream End 1004.6 within 0 (feet)
Cross-Section # 2.680 *Cross-Section #* 6.320

c. Floodway widths - indicate the difference in floodway widths where the project floodway widths tie into the existing floodway width at each end of the project.

Downstream End 199 within 0 (feet) Upstream End 379 within 84 (feet)
Cross-Section # 2.680 *Cross-Section #* 6.320

2. **Profile Checklist (check box if information has been provided on profile)**

The following information (unless in parentheses) must be included at the same scale as the existing profiles for this project:

☒ Stream Name ☒ Community Name ☒ Corporate Limits labeled ☒ Study limits labeled

☒ Confluences labeled ☒ Channel Stationing ☒ Streambed profiled ☒ Cross Sections labeled

☒ Horizontal/Vertical Scales indicated ☒ 100-year elevs profiled*

☒ Road Crossings ☒ Labeled ☒ Low Chord Elevations ☒ Top of Road Elevations

*All recurrence intervals in the effective study must also be profiled.

Floodway Data Table

Attach a Floodway Data Table for each cross section listed in the published Floodway Data table in the FIS report.

```
1*****************************************
 * HEC-2 WATER SURFACE PROFILES           *
 *                                        *
 * Version   4.6.2;  May 1991             *
 *                                        *
 * RUN DATE    25JUN99    TIME   09:57:29 *
 *****************************************
```

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

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

1

25JUN99 09:57:29 PAGE 1

THIS RUN EXECUTED 25JUN99 09:57:29

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

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

End WLB Comment Records

```
T1      BULLARD WASH CLOMR - PINNACLE ENGINEERING/MARWEST DEVELOPMENT
T2      FLOODPLAIN/FLOODWAY RUN  FILE: BULL_CLM.DAT
T3      BULLARD WASH CLOMR       - FROM LOWER BUCKEYE ROAD TO MCDOWELL RD

        Modeling performed by JE Fuller/ Hydrology & Geomorphology, Inc.
        John Wallace, P.E. 520-623-3112
        The following revisions were made to the orginal FIS HEC-2 by WLB
        Hydrology:
          HEC-1 was revised by Stanley Consultants & FCDMC to reflect
             construction of Dysart Drain.  New Q100 values were input
             based on revised HEC-1 model (see discussion in TDN report).
             Revised discharges are shown in WLB comment cards next to
             original values
        Hydraulics:
          Original WLB model shortened to include only detailed study reach
             from Section 2.680 to Section 6.320.  Downstream WSEL matches
             WSEL at Section 2.68 per pending Maricopa County Flood Control
             District CLOMR known as FEMA Case No. 99-09-862R.
          Section 4.625 (at Van Buren St.) modified to reflect encroachment
             associated with upstream channel improvements (see below)
          Sections 4.634, 4.670, 4.752 4.820 and 4.840 added to model to
             adequately define proposed Bullard Wash channel improvements
             at Mountain View Estates (upstream of Van Buren Street)
```

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0	2	0	0	0	0	0	0	947.85	0

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1	0	0	0	0	0	0	0	0	0

```
J3  VARIABLE CODES FOR SUMMARY PRINTOUT

     38        43        1        53        21        22        54        51        4        8
     42        5        26        0        110        0        200
1
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NC    .045      .07      .03       .1        .3
QT       3     3200     3200     3200
ET                        9.1                                                                  9925     10124

            ** BEGIN DETAILED FLOODPLAIN\FLOODWAY ANALYSIS.
               Q = Q AT CP335        (=4906 CFS). REVISED Q = 3191 CFS

               DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
               HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
               X1= 2.883

X1    2.680       17     9925    10050      735      725      760
GR      954     9265      952     9400      950     9505      948     9645    947.2     9735
GR      948     9790    949.9     9805    948.8     9900      948     9905    947.3     9925
GR      946     9940    945.2    10000    945.6    10050      946    10165      948    10565
GR      950    10935      952    11160

ET                        10.4
X1    2.771       16     9985    10020      480      480      480
GR      954     9440      952     9545      950     9660    948.1     9810      950     9880
GR    951.4     9890      950     9900    949.4     9985    947.4    10000    948.2    10020
GR    947.3    10075      948    10210      950    10505    950.9    10795      952    11105
GR    953.5    11255

ET                         9.1                                                          9853     10130
X1    2.883       15     9985    10015      580      580      590
GR      958     9190      956     9360      954     9535      952     9640      950     9840
GR    949.6     9920    950.2     9985    948.5    10000    950.1    10015    949.2    10035
GR      950    10165      952    10385      954    10600      956    11230    956.5    11270

QT       3      3194     3194     3194
ET                         9.1                                                          9875     10050

               Q = Q AT CP334        (= 4915 CFS). REVISED Q = 3194 CFS

X1    2.977       15     9980    10050      500      500      500
GR      960     9170      958     9345      956     9530      954     9660      952     9830
GR      951     9960    951.5     9980      950     9990    949.9    10000      950    10010
GR    952.1    10050      954    10480      956    10740      958    11200    958.5    11305

ET                        10.4
X1    3.070       13     9945    10025      485      495      490
GR    958.5     9510    953.8     9545    954.5     9600    954.5     9945      954     9960
GR    952.5     9975    954.2     9985    952.3    10000    953.2    10025    952.7    10060
GR      954    10290      956    10635      958    10875

QT       3      2742     2742     2742
ET                         9.1                                                          9788     10130
1
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               Q = Q AT 1I334        (= 4432 CFS). REVISED Q = 2742 CFS

X1    3.167       18     9970    10020      475      515      510
GR    960.7     9530      956     9585      955     9625    955.4     9730    954.9     9865
GR    955.8     9935    955.1     9970      954     9990    953.9    10000      954    10005
GR    954.9    10020    954.5    10080    955.1    10120    954.8    10220      956    10425
GR      958    10770      960    10990      962    11230
```

```
ET                          10.4

                 DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
                 HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
                 X1= 3.602

X1     3.291       23      9970     10020      660      650      655
GR       964     9530       962      9670    961.3     9690    961.8     9725     960.4     9770
GR     961.8     9785     960.1      9940    960.5     9970      960     9985       958     9995
GR     957.2    10000       958     10005      960    10015    960.1    10020       960    10025
GR       958    10040     957.2     10110    957.8    10360    957.6    10460       958    10700
GR       960    10910       962     10970      964    11600

ET                          10.4
X1     3.376       17      9985     10015      460      440      450
GR     967.9     9300       966      9370      964     9520      962     9630     960.5     9900
GR     961.9     9985       960      9995    958.3    10000      960    10005       961    10015
GR       960    10030     958.4     10055    958.6    10170    958.8    10365       960    10590
GR       962    10930       964     11490

ET                          10.4
X1     3.491       17      9980     10020      605      605      605
GR       968     9255       966      9435      964     9555      962     9660     960.5     9930
GR     961.9     9980       960      9995    959.5    10000      960    10005     961.9    10020
GR       960    10040     959.6     10130      960    10240      962    10540       964    10735
GR       966    11000       968     11780

QT         3      2746      2746      2746
NC       .07       .07       .04        .1       .3
ET                          10.4

                 CROSS-SECTION AT YUMA RD.

                 Q = Q AT CP316        (= 4438 CFS). REVISED Q = 2746 CFS

X1     3.602       13      9880     10100      590      590      590
GR       970     9225       968      9450      966     9600      964     9750       962     9880
GR     961.9    10000       962     10100    963.2    10330      964    10445       966    10625
GR       968    10770     968.9     10945      970    11005
1
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ET                          9.1                                                      9600    10075

                 DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
                 HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
                 X1= 4.101

X1     3.702       20      9955     10055      535      490      525
GR       972     8720       970      8925      968     9115      966     9315       964     9550
GR     963.5     9620       964      9665    970.5     9750    970.5     9900       970     9920
GR       968     9935       964      9945    963.5     9950    963.9     9955     963.4    10000
GR       964    10055       966     10370      968    10660      970    10980       972    11360

ET                          10.4
X1     3.841       23      9955     10070      735      735      735
GR       976     8355       974      8700      972     8995      970     9130       968     9280
GR       966     9550     965.5      9650      966     9685    970.5     9700     970.2     9900
GR       970     9915       968      9925      966     9930    965.1     9935       966     9940
GR     967.1     9955     966.3     10000    967.3    10070      968    10260       970    10495
GR       972    10710       974     11090      976    11350

ET                          9.1                                                      9700    10095
X1     3.978       23      9930     10095      725      725      725
GR       978     8360       976      8690      974     8990      972     9180       970     9335
GR     968.8     9570       970      9705    970.5     9740    970.5     9885       970     9900
GR       968     9910     966.9      9915      968     9920      969     9930       968     9990
GR     967.9    10000       968     10015    968.4    10095      970    10300       972    10515
GR       974    10655       976     10850      978    11110
```

```
ET                          10.4
X1    4.101        23       9960     10080       650       650       650
GR      980      8400        976      8715       974      8955       974      9255       972      9540
GR      971      9715      971.4      9780     970.2      9890     971.3      9920       970      9935
GR    968.7      9945        970      9950       971      9960       970      9985     969.8     10000
GR      970     10015      970.9     10080     970.7     10160       972     10400       974     10560
GR      976     10620        978     10915       980     11180

ET                          10.4
X1    4.237        19       9935     10075       715       715       715
GR      980      8695        978      9160     976.5      9270     977.4      9305       976      9390
GR      974      9535        972      9850     971.8      9870       972      9885     972.4      9910
GR    972.2      9920      972.6      9935       972      9940     971.3     10000       972     10075
GR      974     10290        976     10430       978     10600       980     10870

ET                          10.4
X1    4.356        16       9950     10070       630       630       630
GR    980.5      9300        980      9320       978      9430       976      9525       974      9725
GR    973.1      9895      973.5      9915     973.3      9935     973.5      9950     972.6     10000
GR    973.4     10070        974     10155       976     10360       978     10485       980     10615
GR      982     10870
1
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ET                          10.4
X1    4.496        14       9975     10130       740       740       740
GR      984      9180        982      9365       980      9540       978      9645       976      9845
GR    974.8      9945      975.2      9975     974.4     10000       975     10130       976     10275
GR      978     10420        980     10540       982     10620       984     10840

QT        3      2754       2754      2754
ET                          10.4

                CROSS-SECTION AT VAN BUREN ST.
                Q = Q AT CP298        (= 4446 CFS). REVISED Q = 2754 CFS
X1    4.625         4       9835     10095       680       680       680
GR    978.5      9810      978.3      9835     978.1     10000     978.2     10095

NC                          .035
ET                          10.4

                Begin Marwest Property Channelization and Fill

X1    4.634         4       9862     10138        50        50        50
GR   981.15      9862     976.15      9882    976.15     10118    981.15     10138

ET                          10.4
X1    4.670         4       9869     10131       185       185       185
GR    981.4      9869      976.4      9889     976.4     10111     981.4     10131

ET                          10.4
X1    4.752         4       9869     10131       438       438       438
GR   981.48      9869     977.48      9885    977.48     10115    981.48     10131

ET                          10.4
X1    4.820         4       9869     10131       357       357       357
GR   982.09      9869     978.09      9885    978.09     10115    983.09     10131

ET                          10.4
X1    4.840         4       9835     10165       103       103       103
GR   982.31      9835     978.31      9851    978.31     10149    982.31     10165

ET                          10.4
X1    4.855         5       9680     10175       126       126       126
GR   985.54      9680     978.57      9700    978.57      9850    978.76      9925    980.23     10175

NC                          0.04
ET                          9.1                                                          9850     10150
```

```
                End Marwest Property

X1    4.858       12      9705     10290        15        15        15
GR      988     9200       986      9420       984      9620       982      9705       980     10000
GR    980.3    10060       980     10090     980.5     10260       982     10290       984     10555
GR      986    10820       988     11220
1
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ET                          9.1                                                            9875     10105
X1    5.009       14      9935     10100       800       840       795
GR      990     9190       988      9410       986      9575       984      9715       982      9820
GR    981.9     9860       982      9900     983.7      9935       982     10000     982.5     10100
GR      984    10270       986     10445       988     10700       990     10880

ET                          9.1                                                            9865     10090
X1    5.153       12      9945     10090       775       730       765
GR      992     9110       990      9280       988      9480       986      9645     984.5      9800
GR    985.6     9945     984.3     10000     985.4     10090       986     10145       988     10410
GR      990    10480       992     10885

ET                         10.4
X1    5.282       13      9945     10055       690       665       680
GR      992     8865       990      9105       988      9440       986      9710     985.6      9850
GR      986     9915       987      9945       986      9960     985.5     10000       986     10055
GR      988    10230       990     10590       992     10870

NC     .07      .07      .035        .3        .5
ET                         10.4

                A 7-SPAN BRIDGE AT I-10

X1    5.430       11    9899.9   10100.1       680       820       780
X3       10                                                            996       996
GR     1000     9050       997     9899.9     994.2      9900     994.2      9906       988      9919
GR      988    10000       988     10081     994.2     10094     994.2     10100       997   10100.1
GR     1000    10450

QT        3     3538      3538      3538
SB     1.05      1.6       2.6         0       162         6      1203         2       988       988
ET                         10.4

                Q = Q AT CP287        (= 5319 CFS). REVISED Q = 3538 CFS

X1    5.460       11    9899.9   10100.1       160       160       160
X2        0        0         1       995       997
X3       10                                                            997       997
BT        4     9050      1000              9899.9       997              10100.1       997
BT    10450     1000
GR     1000     9050       997     9899.9     994.2      9900     994.2      9906       988      9919
GR      988    10000       988     10081     994.2     10094     994.2     10100       997   10100.1
GR     1000    10450

NC     .07      .07       .04        .3        .5
ET                         10.4
X1    5.563       13      9850     10100       540       535       540
GR      996     8140     994.2      8850       994      9085       992      9470       990      9790
GR    990.9     9815     989.5      9850     988.5     10000     988.9     10100       990     10370
GR      992    10655       994     10920       996     11105
1
   25JUN99      09:57:29                                                                          PAGE    7


QT        3     3400      3400      3400
NC     .07      .07      .045        .1        .3
ET                         10.4
```

CROSS-SECTION AT 280 FEET(ALONG FLOW PATH) NORTH OF MCDOWELL RD.

Q = Q AT CP286 (= 4662 CFS). REVISED Q = 3400 CFS

DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
X1= 5.960

```
X1    5.727      21     9935    10135      870      835      870
GR      999    8415      998     8710      996     9045      994     9250    992.4     9690
GR      994    9730    996.1     9780    993.5     9800    993.5     9830   1000.4     9870
GR     1000    9890      994     9900      992     9935      991    10000    991.8    10135
GR      992   10190      994    10550    994.6    10565      994    10600      996    10890
GR      998   11170

ET                      10.4
X1    5.840      22     9970    10170      590      580      595
GR   1001.6    8460     1000     8815      998     9090      996     9400    994.5     9760
GR      996    9805    998.1     9840    993.5     9865    993.5     9895    998.6     9920
GR      998    9925      996     9940      994     9970    993.4    10000    993.7    10170
GR      994   10300      996    10605    996.3    10620    995.8    10650      996    10675
GR      998   10945     1000    11190

ET                      10.4
X1    5.960      16     9960    10150      640      610      635
GR     1002    8825     1000     9240      998     9760      997     9910    997.3     9960
GR      996    9990    995.9    10000      996    10010    996.2    10150      996    10230
GR    996.2   10520    997.3    10680      997    10715      998    10935     1000    11210
GR     1002   11560

ET                      10.4
X1    6.086      12     9900    10100      655      685      665
GR     1004    8350     1002     9210     1000     9650    999.6     9810    999.2     9900
GR    998.3   10000    999.2    10100      999    10420    999.7    10495     1000    10720
GR     1002   10990     1004    11285

ET                       9.1                                                   9850    10270
X1    6.217      15     9900    10100      620      745      690
GR     1006    8300     1004     9175     1002     9565   1001.2     9630   1001.7     9665
GR   1000.6    9695   1000.3     9900   1000.1    10000   1000.3    10100   1000.7    10445
GR   1001.5   10535   1001.4    10600     1002    10730     1004    11080     1006    11110

ET                      10.4
X1    6.320      13     9900    10100      580      525      545
GR     1008    8860     1006     9230     1004     9555   1002.5     9660     1002     9670
GR   1001.3    9900   1000.9    10000   1001.4    10100     1002    10480   1003.1    10800
GR     1004   11030     1006    11060     1007    11220
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       ELMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

 *PROF 1
0

 CCHV=     .100 CEHV=     .300
 *SECNO 2.680

 3265 DIVIDED FLOW
```

** BEGIN DETAILED FLOODPLAIN\FLOODWAY ANALYSIS.
Q = Q AT CP335 (=4906 CFS). REVISED Q = 3191 CFS

DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT

X1= 2.883

2.680	2.65	947.85	.00	947.85	948.32	.47	.00	.00	947.30
3200.0	54.3	1908.7	1237.0	42.6	275.5	578.0	.0	.0	945.60
.00	1.28	6.93	2.14	.045	.030	.070	.000	945.20	9661.88
.006825	735.	760.	725.	0	0	0	.00	743.52	10535.00

*SECNO 2.771

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.44

2.771	3.15	950.45	.00	.00	950.56	.11	2.20	.04	949.40
3200.0	832.7	423.8	1943.5	378.5	83.7	986.0	12.9	9.6	948.20
.05	2.20	5.06	1.97	.045	.030	.070	.000	947.30	9634.21
.003286	480.	480.	480.	4	0	0	.00	1001.73	10649.53

*SECNO 2.883

2.883	3.71	952.21	.00	.00	952.34	.14	1.78	.01	950.20
3200.0	1557.8	462.0	1180.2	585.8	86.5	658.7	31.4	21.5	950.10
.11	2.66	5.34	1.79	.045	.030	.070	.000	948.50	9629.03
.002853	580.	590.	580.	3	0	0	.00	778.45	10407.47

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

*SECNO 2.977

Q = Q AT CP334 (= 4915 CFS). REVISED Q = 3194 CFS

2.977	3.82	953.72	.00	.00	954.08	.36	1.67	.07	951.50
3194.0	1456.2	1388.6	349.1	465.5	212.3	299.2	44.7	30.2	952.10
.15	3.13	6.54	1.17	.045	.030	.070	.000	949.90	9683.29
.003983	500.	500.	500.	1	0	0	.00	734.69	10417.98

*SECNO 3.070

3.070	3.31	955.61	.00	.00	955.73	.12	1.63	.02	954.50
3194.0	919.1	849.0	1425.9	475.4	185.3	836.4	58.6	40.1	953.20
.20	1.93	4.58	1.70	.045	.030	.070	.000	952.30	9531.52
.002810	485.	490.	495.	3	0	0	.00	1036.17	10567.69

*SECNO 3.167

Q = Q AT 1I334 (= 4432 CFS). REVISED Q = 2742 CFS

3.167	2.95	956.85	.00	.00	956.94	.09	1.20	.00	955.10
2742.0	1230.5	513.3	998.2	611.2	125.0	755.2	75.8	51.8	954.90
.26	2.01	4.11	1.32	.045	.030	.070	.000	953.90	9575.17
.002027	475.	510.	515.	2	0	0	.00	994.79	10569.96

*SECNO 3.291

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .51

DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
X1= 3.602

3.291	1.98	959.18	.00	.00	959.28	.10	2.34	.00	960.50
2742.0	.0	101.8	2640.2	.0	22.7	1085.0	95.2	65.3	960.10
.34	.00	4.49	2.43	.000	.030	.070	.000	957.20	9989.12
.007947	660.	655.	650.	3	0	0	.00	814.06	10823.48

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

*SECNO 3.376

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.66

3.376	2.90	961.20	.00	.00	961.26	.06	1.98	.00	961.90
2742.0	52.5	92.1	2597.4	59.5	31.4	1388.3	108.3	74.4	961.00
.40	.88	2.93	1.87	.045	.030	.070	.000	958.30	9773.44
.002881	460.	450.	440.	3	0	0	.00	975.12	10794.53

*SECNO 3.491

3.491	3.11	962.61	.00	.00	962.66	.05	1.40	.00	961.90
2742.0	781.0	263.4	1697.6	446.9	78.3	1095.4	129.8	87.9	961.90
.49	1.75	3.36	1.55	.045	.030	.070	.000	959.50	9628.06
.001899	605.	605.	605.	4	0	0	.00	971.26	10599.32

CCHV= .100 CEHV= .300
*SECNO 3.602

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .69

CROSS-SECTION AT YUMA RD.

Q = Q AT CP316 (= 4438 CFS). REVISED Q = 2746 CFS

3.602	2.20	964.10	.00	.00	964.28	.18	1.58	.04	962.00
2746.0	207.9	1872.9	665.2	144.1	474.2	404.9	147.7	99.3	962.00
.55	1.44	3.95	1.64	.070	.040	.070	.000	961.90	9742.08
.004059	590.	590.	590.	1	0	0	.00	712.41	10454.50

*SECNO 3.702

3265 DIVIDED FLOW

DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT

X1= 4.101

3.702	2.78	966.18	.00	.00	966.31	.13	2.03	.00	963.90
2746.0	1162.9	1046.9	536.1	617.1	249.6	371.7	161.2	108.5	964.00
.60	1.88	4.20	1.44	.070	.040	.070	.000	963.40	9297.68
.003767	535.	525.	490.	3	0	0	.00	851.27	10395.11

*SECNO 3.841

3265 DIVIDED FLOW

3.841	3.57	968.67	.00	.00	968.75	.08	2.43	.01	967.10
2746.0	1827.1	678.6	240.3	947.0	219.7	220.6	183.3	123.1	967.30
.70	1.93	3.09	1.09	.070	.040	.070	.000	965.10	9229.64
.002916	735.	735.	735.	3	0	0	.00	881.52	10338.90

*SECNO 3.978

3.978	3.81	970.71	.00	.00	970.83	.12	2.07	.01	969.00
2746.0	839.5	1433.3	473.3	630.3	402.6	337.0	206.2	139.6	968.40
.78	1.33	3.56	1.40	.070	.040	.070	.000	966.90	9279.87
.002795	725.	725.	725.	3	0	0	.00	1096.59	10376.46

*SECNO 4.101

4.101	3.93	972.63	.00	.00	972.72	.09	1.89	.00	971.00
2746.0	1074.1	986.5	685.4	675.2	276.5	468.3	227.1	155.2	970.90
.86	1.59	3.57	1.46	.070	.040	.070	.000	968.70	9450.69
.003033	650.	650.	650.	2	0	0	.00	999.46	10450.14

*SECNO 4.237

4.237	3.17	974.47	.00	.00	974.58	.11	1.85	.00	972.60
2746.0	962.7	1368.3	415.0	672.3	392.1	324.8	250.1	170.2	972.00
.94	1.43	3.49	1.28	.070	.040	.070	.000	971.30	9500.62
.002235	715.	715.	715.	2	0	0	.00	822.57	10323.19

*SECNO 4.356

4.356	3.26	975.86	.00	.00	975.96	.10	1.39	.00	973.50
2746.0	1092.4	1182.6	471.0	703.8	340.9	361.5	270.3	182.0	973.40
1.01	1.55	3.47	1.30	.070	.040	.070	.000	972.60	9538.79
.002166	630.	630.	630.	2	0	0	.00	807.07	10345.86

*SECNO 4.496

4.496	3.12	977.52	.00	.00	977.65	.13	1.68	.01	975.20
2746.0	611.2	1573.8	561.0	404.9	435.6	378.3	292.6	194.7	975.00
1.09	1.51	3.61	1.48	.070	.040	.070	.000	974.40	9692.36
.002385	740.	740.	740.	1	0	0	.00	693.31	10385.67

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

*SECNO 4.625
3280 CROSS SECTION 4.63 EXTENDED 1.90 FEET

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .53

CROSS-SECTION AT VAN BUREN ST.
Q = Q AT CP298 (= 4446 CFS). REVISED Q = 2754 CFS

4.625	2.00	980.10	.00	.00	980.52	.42	2.78	.09	978.30

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   2754.0     114.4    2639.6       .0      42.5     499.3       .0     306.4     202.3    978.20
     1.12      2.69      5.29      .00      .070      .040      .000      .000    978.10   9810.00
  .008569      680.      680.      680.         4         0         0       .00    285.00  10095.00

*SECNO 4.634

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  4.04

                Begin Marwest Property Channelization and Fill

     4.634      4.38    980.53       .00       .00    980.62       .10       .07       .03    981.15
   2754.0        .0    2754.0        .0        .0    1109.7        .0     307.3     202.7    981.15
     1.13       .00      2.48       .00      .000      .035      .000      .000    976.15   9864.49
  .000524       50.       50.       50.         2         0         0       .00    271.02  10135.51

*SECNO 4.670
     4.670      4.22    980.62       .00       .00    980.74       .12       .11       .01    981.40
   2754.0        .0    2754.0        .0        .0    1007.4        .0     311.8     203.8    981.40
     1.15       .00      2.73       .00      .000      .035      .000      .000    976.40   9872.13
  .000670      185.      185.      185.         2         0         0       .00    255.74  10127.87

*SECNO 4.752
     4.752      3.49    980.97       .00       .00    981.13       .16       .38       .01    981.48
   2754.0        .0    2754.0        .0        .0     852.0        .0     321.2     206.4    981.48
     1.19       .00      3.23       .00      .000      .035      .000      .000    977.48   9871.03
  .001184      438.      438.      438.         2         0         0       .00    257.94  10128.97

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

*SECNO 4.820
     4.820      3.33    981.42       .00       .00    981.60       .18       .46       .01    982.09
   2754.0        .0    2754.0        .0        .0     805.1        .0     328.0     208.5    983.09
     1.22       .00      3.42       .00      .000      .035      .000      .000    978.09   9871.69
  .001401      357.      357.      357.         2         0         0       .00    253.96  10125.65

*SECNO 4.840
     4.840      3.30    981.61       .00       .00    981.72       .11       .11       .01    982.31
   2754.0        .0    2754.0        .0        .0    1025.6        .0     330.1     209.1    982.31
     1.23       .00      2.69       .00      .000      .035      .000      .000    978.31   9837.82
  .000865      103.      103.      103.         2         0         0       .00    324.37  10162.18

*SECNO 4.855
3280 CROSS SECTION      4.86 EXTENDED      1.52 FEET

     4.855      3.18    981.75       .00       .00    981.82       .07       .10       .00    985.54
   2754.0        .0    2754.0        .0        .0    1285.8        .0     333.5     210.3    980.23
     1.24       .00      2.14       .00      .000      .035      .000      .000    978.57   9690.88
  .000696      126.      126.      126.         0         0         0       .00    484.12  10175.00

*SECNO 4.858

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .19

                End Marwest Property
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    4.858      1.53    981.53      .00      .00    981.96      .43      .03      .11    982.00
   2754.0        .0    2754.0       .0       .0     525.7       .0    333.8    210.5    982.00
     1.24       .00      5.24      .00     .000      .040     .000     .000   980.00   9774.13
  .018923       15.       15.      15.        3         0        0      .00   506.49  10280.63


*SECNO 5.009

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.32

    5.009      3.25    985.15      .00      .00    985.24      .08     3.25      .03    983.70
   2754.0     975.3    1304.9    473.8    610.2     440.4    382.4    351.9    222.0    982.50
     1.34      1.60      2.96     1.24     .070      .040     .070     .000   981.90   9634.11
  .001718      800.      795.     840.        6         0        0      .00   737.00  10371.11


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


*SECNO 5.153

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .64

    5.153      2.76    987.06      .00      .00    987.21      .15     1.96      .02    985.60
   2754.0    1270.2    1286.0    197.7    623.1     316.7    151.6    374.0    234.8    985.40
     1.42      2.04      4.06     1.30     .070      .040     .070     .000   984.30   9556.54
  .004216      775.      765.     730.        4         0        0      .00   730.52  10287.07


*SECNO 5.282

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.76

    5.282      3.18    988.68      .00      .00    988.74      .05     1.51      .01    987.00
   2754.0    1551.1     857.6    345.3   1154.5     312.2    338.7    396.7    248.5    986.00
     1.53      1.34      2.75     1.02     .070      .040     .070     .000   985.50   9324.37
  .001361      690.      680.     665.        2         0        0      .00  1029.88  10354.26


CCHV=     .300 CEHV=     .500
*SECNO 5.430

3301 HV CHANGED MORE THAN HVINS


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .41


3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       996.00 ELREA=       996.00


              A 7-SPAN BRIDGE AT I-10

    5.430      2.43    990.43      .00      .00    991.14      .72     2.08      .33    997.00
   2754.0        .0    2754.0       .0       .0     405.7       .0    415.3    258.7    997.00
     1.56       .00      6.79      .00     .000      .035     .000     .000   988.00   9913.91
  .008223      680.      780.     820.        2         0        0      .00   172.18  10086.09


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

SPECIAL BRIDGE

5227 DOWNSTREAM ELEV IS 990.10 , NOT 990.43 HYDRAULIC JUMP OCCURS DOWNSTREAM (IF LOW FLOW CONTROLS)

SB	XK	XKOR	COEQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	.00	162.00	6.00	1203.00	2.00	988.00	988.00

*SECNO 5.460

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.42

CLASS B LOW FLOW

3420 BRIDGE W.S.= 990.49 BRIDGE VELOCITY= 8.82 CALCULATED CHANNEL AREA= 401.

EGPRS	EGLWC	HB	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRLN
.00	991.76	.00	0.	3538.	1203.	1190.	995.00	997.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 997.00 ELREA= 997.00

Q = Q AT CP287 (= 5319 CFS). REVISED Q = 3538 CFS

5.460	3.00	991.00	.00	.00	991.76	.76	.62	.00	997.00
3538.0	.0	3538.0	.0	.0	504.6	.0	417.0	259.4	997.00
1.56	.00	7.01	.00	.000	.035	.000	.000	988.00	9912.71
.006693	160.	160.	160.	0	0	0	.00	174.57	10087.29

CCHV= .300 CEHV= .500
*SECNO 5.563

3301 HV CHANGED MORE THAN HVINS

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 3.63

5.563	4.11	992.61	.00	.00	992.65	.04	.67	.22	989.50
3538.0	464.8	1882.7	1190.6	692.3	934.0	1340.5	438.4	269.0	988.90
1.67	.67	2.02	.89	.070	.040	.070	.000	988.50	9351.43
.000508	540.	540.	535.	4	0	0	.00	1385.19	10736.62

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

CCHV= .100 CEHV= .300
*SECNO 5.727

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .21

CROSS-SECTION AT 280 FEET (ALONG FLOW PATH) NORTH OF MCDOWELL RD.

Q = Q AT CP286 (= 4662 CFS). REVISED Q = 3400 CFS

DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
X1= 5.960

5.727	2.54	993.54	.00	.00	993.90	.37	1.15	.10	992.00
3400.0	337.4	2386.3	676.3	218.3	422.2	304.8	476.9	291.8	991.80
1.72	1.55	5.65	2.22	.070	.045	.070	.000	991.00	9375.53
.010818	870.	870.	835.	3	0	0	.00	933.49	10467.83

*SECNO 5.840

3265 DIVIDED FLOW

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 2.23

5.840	2.90	996.30	.00	.00	996.39	.08	2.45	.03	994.00
3400.0	700.6	1644.5	1054.9	597.7	545.8	741.7	496.0	306.8	993.70
1.80	1.17	3.01	1.42	.070	.045	.070	.000	993.40	9353.26
.002183	590.	595.	580.	4	0	0	.00	1293.70	10715.71

*SECNO 5.960

5.960	2.19	998.09	.00	.00	998.18	.09	1.80	.00	997.30
3400.0	145.3	1175.1	2079.6	137.7	365.5	1117.9	521.0	324.7	996.20
1.87	1.06	3.21	1.86	.070	.045	.070	.000	995.90	9735.32
.003962	640.	635.	610.	4	0	0	.00	1212.73	10948.05

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

*SECNO 6.086

6.086	2.49	1000.79	.00	.00	1000.89	.10	2.71	.00	999.20
3400.0	477.0	1385.7	1537.3	354.0	408.9	905.6	546.5	344.5	999.20
1.95	1.35	3.39	1.70	.070	.045	.070	.000	998.30	9475.24
.004060	655.	665.	685.	4	0	0	.00	1352.00	10827.24

*SECNO 6.217

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.54

6.217	2.51	1002.61	.00	.00	1002.66	.05	1.77	.00	1000.30
3400.0	814.4	1187.6	1398.0	630.3	482.5	1092.0	577.7	366.5	1000.30
2.07	1.29	2.46	1.28	.070	.045	.070	.000	1000.10	9445.54
.001717	620.	690.	745.	3	0	0	.00	1391.67	10837.21

*SECNO 6.320

6.320	2.70	1003.60	.00	.00	1003.66	.06	1.00	.00	1001.30
3400.0	699.5	1322.5	1378.1	504.7	495.2	1091.0	604.5	383.6	1001.40
2.15	1.39	2.67	1.26	.070	.045	.070	.000	1000.90	9582.91
.001952	580.	545.	525.	3	0	0	.00	1345.19	10928.10

PLOTTED POINTS (BY PRIORITY) E-ENERGY,W-WATER SURFACE,I-INVERT,C-CRITICAL W.S.,L-LEFT BANK,R-RIGHT BANK,M-LOWER END STA

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ELEVATION  945.     955.     965.     975.     985.     995.     1005.    1015.    1025.    1035.
   SECNO   CUMDIS

    2.68      0.  I LE  M .        .        .        .        .        .        .        .        .
            100.  IR WE  M .        .        .        .        .        .        .        .        .
            200.  CI LE  M .        .        .        .        .        .        .        .        .
            300.  CIRLWE  M .       .        .        .        .        .        .        .        .
            400.  C IRLE  M .       .        .        .        .        .        .        .        .
    2.77    500.  C IRLE  M .       .        .        .        .        .        .        .        .
            600.  C IRL E  M.       .        .        .        .        .        .        .        .
            700.  C  IL E  M.       .        .        .        .        .        .        .        .
            800.  C  IRLE   M       .        .        .        .        .        .        .        .
            900.  C  IRLWE  M       .        .        .        .        .        .        .        .
           1000.  C  I L E  .M      .        .        .        .        .        .        .        .
    2.88   1100.  C  I L E  .M      .        .        .        .        .        .        .        .
           1200.  C   IL E  . M     .        .        .        .        .        .        .        .
           1300.  C   I L E . M     .        .        .        .        .        .        .        .
           1400.  C   I L E . M     .        .        .        .        .        .        .        .
           1500.  C   I L WE.  M    .        .        .        .        .        .        .        .
    2.98   1600.  C    ILR E.  M    .        .        .        .        .        .        .        .
           1700.  C    I L E.  M    .        .        .        .        .        .        .        .
           1800.  C     IRLWE  M    .        .        .        .        .        .        .        .
           1900.  C     I L E  M    .        .        .        .        .        .        .        .
           2000.  C      IRLE  M    .        .        .        .        .        .        .        .
    3.07   2100.  C      IRLWE M    .        .        .        .        .        .        .        .
           2200.  C      IRL.E M    .        .        .        .        .        .        .        .
           2300.  C       IRLE  M   .        .        .        .        .        .        .        .
           2400.  C       IRLE  M   .        .        .        .        .        .        .        .
           2500.  C       IRLE   M  .        .        .        .        .        .        .        .
    3.17   2600.  C        IL E   M .        .        .        .        .        .        .        .
           2700.  C        IRLE   M .        .        .        .        .        .        .        .
           2800.  C         IRE    M .       .        .        .        .        .        .        .
           2900.  C         I LE   M .       .        .        .        .        .        .        .
           3000.  C         .I E   M .       .        .        .        .        .        .        .
           3100.  C         .I WE  M .       .        .        .        .        .        .        .
           3200.  C         . I EL  M.       .        .        .        .        .        .        .
    3.29   3300.  C         . I EL  M.       .        .        .        .        .        .        .
           3400.  C         . I WEL M.       .        .        .        .        .        .        .
           3500.  C         . I  EL M.       .        .        .        .        .        .        .
           3600.  C         .  I EL M.       .        .        .        .        .        .        .
    3.38   3700.  C         .  I  EL M.      .        .        .        .        .        .        .
           3800.  C         .  I  EL M.      .        .        .        .        .        .        .
           3900.  C         .  I  WE  M      .        .        .        .        .        .        .
           4000.  C         .   I RE  .M     .        .        .        .        .        .        .
           4100.  C         .   I RE  .M     .        .        .        .        .        .        .
           4200.  C         .   I  E  . M    .        .        .        .        .        .        .
    3.49   4300.  C         .   I  E  .  M   .        .        .        .        .        .        .
           4400.  C         .    I LE .  M   .        .        .        .        .        .        .
           4500.  C         .    I LE .  M   .        .        .        .        .        .        .
           4600.  C         .     ILE .   M  .        .        .        .        .        .        .
           4700.  C         .     ILWE.   M  .        .        .        .        .        .        .
           4800.  C         .     IL E.   M  .        .        .        .        .        .        .
    3.60   4900.  C         .      I E.    M .        .        .        .        .        .        .
           5000.  C         .      I E.    M .        .        .        .        .        .        .
           5100.  C         .      IL E     M .       .        .        .        .        .        .
           5200.  C         .       I E     M .       .        .        .        .        .        .
           5300.  C         .       I WE    M .       .        .        .        .        .        .
    3.70   5400.  C         .       IL.E     M .      .        .        .        .        .        .
           5500.  C         .       IL.E     M .      .        .        .        .        .        .
           5600.  C         .        IL E     M.      .        .        .        .        .        .
           5700.  C         .        IL E     M.      .        .        .        .        .        .
           5800.  C         .        ILRE      M.     .        .        .        .        .        .
           5900.  C         .        I.L E      M     .        .        .        .        .        .
           6000.  C         .         IL E      M     .        .        .        .        .        .
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      6100. C        .       I LE     .M       .        .        .        .        .        .
3.84  6200. C        .       I DWE    .M       .        .        .        .        .        .
      6300. C        .       I L E    .M       .        .        .        .        .        .
      6400. C        .       I L E    .M       .        .        .        .        .        .
      6500. C        .       .I LE    . M      .        .        .        .        .        .
      6600. C        .       .I L E   . M      .        .        .        .        .        .
      6700. C        .       .I L E   . M      .        .        .        .        .        .
      6800. C        .       .I L E   . M      .        .        .        .        .        .
3.98  6900. C        .       . IRL E  . M      .        .        .        .        .        .
      7000. C        .       . I L E  . M      .        .        .        .        .        .
      7100. C        .       . I L E  . M      .        .        .        .        .        .
      7200. C        .       .  IRDWE . M      .        .        .        .        .        .
      7300. C        .       . I L E  . M      .        .        .        .        .        .
      7400. C        .       . I L E  . M      .        .        .        .        .        .
      7500. C        .       . I  LE  . M      .        .        .        .        .        .
4.10  7600. C        .       .  I DWE . M      .        .        .        .        .        .
      7700. C        .       .  I L E . M      .        .        .        .        .        .
      7800. C        .       .  I L E . M      .        .        .        .        .        .
      7900. C        .       .   IL E . M      .        .        .        .        .        .
      8000. C        .       .   IRDWE. M      .        .        .        .        .        .
      8100. C        .       .   IRL E. M      .        .        .        .        .        .
      8200. C        .       .    IL E. M      .        .        .        .        .        .
4.24  8300. C        .       .    IL E. M      .        .        .        .        .        .
      8400. C        .       .    IRDWE M      .        .        .        .        .        .
      8500. C        .       .     IL E M      .        .        .        .        .        .
      8600. C        .       .     IL E M      .        .        .        .        .        .
      8700. C        .       .     IL E M      .        .        .        .        .        .
      8800. C        .       .     IL E M      .        .        .        .        .        .
4.36  8900. C        .       .     IL .E M     .        .        .        .        .        .
      9000. C        .       .      IL.E  M    .        .        .        .        .        .
      9100. C        .       .      IL.E  M    .        .        .        .        .        .
      9200. C        .       .      IL.E   M   .        .        .        .        .        .
      9300. C        .       .      IL. E  M   .        .        .        .        .        .
      9400. C        .       .       I. E   M  .        .        .        .        .        .
      9500. C        .       .       IL E   M  .        .        .        .        .        .
4.50  9600. C        .       .       IL E    M.        .        .        .        .        .
      9700. C        .       .        I E   M  .        .        .        .        .        .
      9800. C        .       .        IL E  M  .        .        .        .        .        .
      9900. C        .       .        .I WE M  .        .        .        .        .        .
     10000. C        .       .        .IL EM   .        .        .        .        .        .
     10100. C        .       .        . I WE   .        .        .        .        .        .
     10200. C        .       .        . IDME   .        .        .        .        .        .
4.63 10300. C        .       .        .  I E   .        .        .        .        .        .
4.63 10400. C        .       .        .I  EL   .        .        .        .        .        .
     10500. C        .       .        .I  EL   .        .        .        .        .        .
4.67 10600. C        .       .        .I  WE   .        .        .        .        .        .
     10700. C        .       .        .I  WE   .        .        .        .        .        .
     10800. C        .       .        . I  E   .        .        .        .        .        .
     10900. C        .       .        . I  E   .        .        .        .        .        .
4.75 11000. C        .       .        . I  E   .        .        .        .        .        .
     11100. C        .       .        . I  ER  .        .        .        .        .        .
     11200. C        .       .        .  I EL  .        .        .        .        .        .
4.82 11300. C        .       .        .  I ELR .        .        .        .        .        .
     11400. C        .       .        .  I WE  .        .        .        .        .        .
4.84 11500. C        .       .        .  I WE  .        .        .        .        .        .
4.86 11600. C        .       .        .  I R E L        .        .        .        .        .
4.86 11700. C        .       .        .   DWE . M       .        .        .        .        .
     11800. C        .       .        .   I E . M       .        .        .        .        .
     11900. C        .       .        .   I WE . M      .        .        .        .        .
     12000. C        .       .        .    IL E . M     .        .        .        .        .
     12100. C        .       .        .    IRE . M      .        .        .        .        .
     12200. C        .       .        .    IRLE. M      .        .        .        .        .
     12300. C        .       .        .    IRLE. M      .        .        .        .        .
5.01 12400. C        .       .        .     I LE  M     .        .        .        .        .
     12500. C        .       .        .     IRLE  M     .        .        .        .        .
     12600. C        .       .        .     IRDWE M     .        .        .        .        .
     12700. C        .       .        .      IL.E  M    .        .        .        .        .
     12800. C        .       .        .      IL.E  M    .        .        .        .        .
     12900. C        .       .        .      IRLE  M    .        .        .        .        .
     13000. C        .       .        .       IDWE M    .        .        .        .        .
     13100. C        .       .        .       IL E  M   .        .        .        .        .
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 5.15 13200.  C        .         .         .        IL E   M .        .         .         .         .         .
      13300.  C        .         .         .        IRLE   M .        .         .         .         .         .
      13400.  C        .         .         .        IRLE   M .        .         .         .         .         .
      13500.  C        .         .         .         IL E  M .        .         .         .         .         .
      13600.  C        .         .         .         IL E  M .        .         .         .         .         .
      13700.  C        .         .         .         IL E  M .        .         .         .         .         .
 5.28 13800.  C        .         .         .         IRLWE M .        .         .         .         .         .
      13900.  C        .         .         .         .IRLE  M.        .         .         .         .         .
      14000.  C        .         .         .         .I E   M.        .         .         .         .         .
      14100.  C        .         .         .         .I ERL  M        .         .         .         .         .
      14200.  C        .         .         .         . I WERL .M      .         .         .         .         .
      14300.  C        .         .         .         . I E  L . M     .         .         .         .         .
      14400.  C        .         .         .         . I E  L. M      .         .         .         .         .
      14500.  C        .         .         .         . I WE  .L M     .         .         .         .         .
 5.43 14600.  C        .         .         .         . I WE  . L M    .         .         .         .         .
      14700.  C        .         .         .         . I E  . L M     .         .         .         .         .
 5.46 14800.  C        .         .         .         . I WE . L M     .         .         .         .         .
      14900.  C        .         .         .         . I WE L  M      .         .         .         .         .
      15000.  C        .         .         .         . I WE L. M      .         .         .         .         .
      15100.  C        .         .         .         . I  EL . M      .         .         .         .         .
      15200.  C        .         .         .         . I LE . M       .         .         .         .         .
 5.56 15300.  C        .         .         .         . IL  E .M       .         .         .         .         .
      15400.  C        .         .         .         .  IL  E .M      .         .         .         .         .
      15500.  C        .         .         .         .  IL  E .M      .         .         .         .         .
      15600.  C        .         .         .         .  IL  E .M      .         .         .         .         .
      15700.  C        .         .         .         .  IL  E . M     .         .         .         .         .
      15800.  C        .         .         .         .   IL E . M     .         .         .         .         .
      15900.  C        .         .         .         .   IL E . M     .         .         .         .         .
      16000.  C        .         .         .         .   IL E . M     .         .         .         .         .
      16100.  C        .         .         .         .    ILWE. M     .         .         .         .         .
 5.73 16200.  C        .         .         .         .    ILWE. M     .         .         .         .         .
      16300.  C        .         .         .         .    IL E. M     .         .         .         .         .
      16400.  C        .         .         .         .     I WE M     .         .         .         .         .
      16500.  C        .         .         .         .     IL E  M    .         .         .         .         .
      16600.  C        .         .         .         .     IL E  M    .         .         .         .         .
      16700.  C        .         .         .         .      I .E M    .         .         .         .         .
 5.84 16800.  C        .         .         .         .      IL.E  M   .         .         .         .         .
      16900.  C        .         .         .         .       I.E  M   .         .         .         .         .
      17000.  C        .         .         .         .       IL E M   .         .         .         .         .
      17100.  C        .         .         .         .       IL E  M  .         .         .         .         .
      17200.  C        .         .         .         .        ILE  M  .         .         .         .         .
      17300.  C        .         .         .         .        IL E M  .         .         .         .         .
 5.96 17400.  C        .         .         .         .        .ILE  M .         .         .         .         .
      17500.  C        .         .         .         .        .ILE  M .         .         .         .         .
      17600.  C        .         .         .         .        .IRLE M .         .         .         .         .
      17700.  C        .         .         .         .        . ILE  M.         .         .         .         .
      17800.  C        .         .         .         .        . IL E M.         .         .         .         .
      17900.  C        .         .         .         .        . ILE M.          .         .         .         .
      18000.  C        .         .         .         .        . ILE  M.         .         .         .         .
 6.09 18100.  C        .         .         .         .        . IL E M.         .         .         .         .
      18200.  C        .         .         .         .        . IL E M.         .         .         .         .
      18300.  C        .         .         .         .        .  I E M.         .         .         .         .
      18400.  C        .         .         .         .        .  I E  M         .         .         .         .
      18500.  C        .         .         .         .        .  IL E M         .         .         .         .
      18600.  C        .         .         .         .        .  IL E M         .         .         .         .
      18700.  C        .         .         .         .        .   I E .M        .         .         .         .
 6.22 18800.  C        .         .         .         .        .   I E .M        .         .         .         .
      18900.  C        .         .         .         .        .   I E .M        .         .         .         .
      19000.  C        .         .         .         .        .   IR E .M       .         .         .         .
      19100.  C        .         .         .         .        .   IL E .M       .         .         .         .
      19200.  C        .         .         .         .        .   IL E . M      .         .         .         .
 6.32 19300.  C        .         .         .         .        .    I E . M      .         .         .         .
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T1 WHITE TANKS / AGUA FRIA AREA DRAINAGE MASTER STUDY
T2 100 - YEAR STORM EVENT FLOODWAY RUN FILE: 10.H2I
T3 BULLARD WASH (WASH 10) - FROM BUCKEYE CANAL TO DYSART DRAIN.

J1 ICHECK INQ NINV IDIR STRT METRIC HVINS Q WSEL FQ

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       0        3        0        0        0        0        0        0   948.67        0

 J2  NPROF    IPLOT    PRFVS    XSECV    XSECH       FN   ALLDC      IBW    CHNIM   ITRACE

     14                -1

1
   25JUN99      09:57:29                                                                          PAGE   19

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

 *PROF 2
0

 CCHV=     .100 CEHV=     .300
 *SECNO 2.680

 3470 ENCROACHMENT STATIONS=     9925.0   10124.0  TYPE=      1  TARGET=      199.000

            **  BEGIN DETAILED FLOODPLAIN\FLOODWAY ANALYSIS.
                Q = Q AT CP335        (=4906 CFS). REVISED Q = 3191 CFS

                DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
                HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
                X1= 2.883

     2.680      3.47    948.67       .00    947.85    949.28       .61       .00       .00    947.30
    3200.0        .0    2584.6     615.4        .0     378.0     217.7        .0        .0    945.60
       .00       .00      6.84      2.83      .000      .030      .070      .000    945.20   9925.00
   .004424      735.      760.      725.         0         0         0       .00    199.00  10124.00

 *SECNO 2.771
  2800 NAT Q1=     558.20  WSELK=     950.45  ENC Q1=     558.20  WSEL=     951.45  RATIO=     .0000
  NAT Q1=    1248.  RATIOS LOB, CH, ROB=    .3234    .1060    .5706  WSEL=     951.45

 3470 ENCROACHMENT STATIONS=     9917.9   10211.9  TYPE=      4  TARGET=         .553
     2.771      3.84    951.14       .00    950.45    951.44       .30      2.13       .03    949.40
    3200.0     291.2     757.4    2151.4     101.5     108.3     665.6       8.1       2.7    948.20
       .03      2.87      7.00      3.23      .045      .030      .070      .000    947.30   9917.92
   .004451      480.      480.      480.         2         0         0       .00    294.00  10211.92

 *SECNO 2.883

 3470 ENCROACHMENT STATIONS=     9853.0   10130.0  TYPE=      1  TARGET=      277.000
     2.883      4.60    953.10       .00    952.21    953.34       .24      1.89       .01    950.20
    3200.0    1531.7     672.3     996.0     431.0     113.2     411.5      20.3       6.5    950.10
       .08      3.55      5.94      2.42      .045      .030      .070      .000    948.50   9853.00
   .002467      580.      590.      580.         3         0         0       .00    277.00  10130.00

 *SECNO 2.977
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK       EG        HV        HL     OLOSS   L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB       ACH      AROB       VOL       TWA   R-BANK ELEV
    TIME      VLOB      VCH       VROB       XNL      XNCH       XNR       WIN    EIMIN    SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL      IDC     ICONT     CORAR   TOPWID    ENDST

 3470 ENCROACHMENT STATIONS=     9875.0   10050.0  TYPE=      1  TARGET=      175.000
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                Q = Q AT CP334        (= 4915 CFS). REVISED Q = 3194 CFS

     2.977      4.48    954.38       .00    953.72    954.95       .57      1.51       .10    951.50
    3194.0    1358.5    1835.5        .0     321.6     257.8        .0      29.1       9.1 100000.00
       .10      4.22      7.12       .00      .045      .030      .000      .000    949.90   9875.00
   .003804      500.      500.      500.         2         0         0       .00    175.00  10050.00


*SECNO 3.070
 2800 NAT Q1=     602.57  WSELK=     955.61  ENC Q1=     602.57  WSEL=     956.61  RATIO=    .0000
 NAT Q1=    1359.  RATIOS LOB, CH, ROB=    .3598   .2144   .4258  WSEL=     956.61

3470 ENCROACHMENT STATIONS=     9847.4   10134.0  TYPE=      4  TARGET=        .557
     3.070      4.10    956.40       .00    955.61    956.77       .36      1.80       .02    954.50
    3194.0     553.6    1559.3    1081.1     185.5     248.6     379.3      37.0      11.7    953.20
       .13      2.98      6.27      2.85      .045      .030      .070      .000    952.30   9847.43
   .003556      485.      490.      495.         2         0         0       .00    286.58  10134.02


*SECNO 3.167

3470 ENCROACHMENT STATIONS=     9788.0   10130.0  TYPE=      1  TARGET=      342.000

                Q = Q AT 1I334        (= 4432 CFS). REVISED Q = 2742 CFS

     3.167      3.97    957.87       .00    956.85    958.04       .17      1.25       .02    955.10
    2742.0    1253.0     850.5     638.5     477.2     176.1     339.9      47.3      15.3    954.90
       .17      2.63      4.83      1.88      .045      .030      .070      .000    953.90   9788.00
   .001778      475.      510.      515.         2         0         0       .00    342.00  10130.00


*SECNO 3.291
 2800 NAT Q1=     307.58  WSELK=     959.18  ENC Q1=     307.58  WSEL=     960.18  RATIO=    .0000
 NAT Q1=     749.  RATIOS LOB, CH, ROB=    .0000   .0383   .9616  WSEL=     960.18

3265 DIVIDED FLOW


3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .44

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


3470 ENCROACHMENT STATIONS=     9970.0   10287.4  TYPE=      4  TARGET=        .589

                DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
                HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
                X1= 3.602

     3.291      2.86    960.06       .00    959.18    960.30       .25      2.24       .02    960.50
    2742.0        .0     259.8    2482.2        .0      45.9     657.6      60.0      20.1    960.10
       .22       .00      5.66      3.77      .000      .030      .070      .000    957.20   9983.21
   .009181      660.      655.      650.         3         0         0       .00    300.12  10287.35


*SECNO 3.376
 2800 NAT Q1=     510.87  WSELK=     961.20  ENC Q1=     510.87  WSEL=     962.20  RATIO=    .0000
 NAT Q1=    1113.  RATIOS LOB, CH, ROB=    .0993   .0417   .8590  WSEL=     962.20

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.82
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3470 ENCROACHMENT STATIONS=     9985.0   10291.2  TYPE=      4  TARGET=         .541
     3.376      3.94    962.24       .00    961.20    962.36       .12      2.04       .01    961.90
    2742.0        .0     250.3    2491.7        .0      61.1     964.6      68.8      23.2    961.00
       .27       .00      4.10      2.58      .000      .030      .070      .000    958.30   9985.00
   .002785      460.      450.      440.         1         0         0       .00    306.17  10291.17


*SECNO 3.491
 2800 NAT Q1=     629.20  WSELK=     962.61  ENC Q1=     629.20  WSEL=     963.61  RATIO=    .0000
 NAT Q1=    1335.  RATIOS LOB, CH, ROB=    .3463    .0899    .5638  WSEL=     963.61

3470 ENCROACHMENT STATIONS=     9911.5   10234.0  TYPE=      4  TARGET=         .529
     3.491      4.12    963.62       .00    962.61    963.74       .12      1.38       .00    961.90
    2742.0     468.0     525.2    1748.8     177.3     118.5     794.0      83.5      27.5    961.90
       .33      2.64      4.43      2.20      .045      .030      .070      .000    959.50   9911.46
   .001901      605.      605.      605.         2         0         0       .00    322.57  10234.03


CCHV=     .100 CEHV=     .300
*SECNO 3.602
 2800 NAT Q1=     431.01  WSELK=     964.10  ENC Q1=     553.02  WSEL=     965.10  RATIO=   -.2831
 NAT Q1=     935.  RATIOS LOB, CH, ROB=    .1085    .5915    .3000  WSEL=     965.10
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    SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
    Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
    TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       EIMIN     SSTA
    SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST


3470 ENCROACHMENT STATIONS=     9880.0   10100.0  TYPE=      4  TARGET=         .408

                CROSS-SECTION AT YUMA RD.

                Q = Q AT CP316        (= 4438 CFS). REVISED Q = 2746 CFS

     3.602      3.02    964.92       .00    964.10    965.20       .27      1.41       .04    962.00
    2746.0        .0    2746.0        .0        .0     653.2        .0      95.3      31.2    962.00
       .37       .00      4.20       .00      .000      .040      .000      .000    961.90   9880.00
   .003107      590.      590.      590.         2         0         0       .00    220.00  10100.00


*SECNO 3.702

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     9600.0   10075.0  TYPE=      1  TARGET=      475.000

                DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
                HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
                X1= 4.101

     3.702      3.46    966.86       .00    966.18    967.21       .35      1.99       .02    963.90
    2746.0     841.0    1756.4     148.6     300.8     318.3      55.9     103.3      34.0    964.00
       .40      2.80      5.52      2.66      .070      .040      .070      .000    963.40   9600.00
   .004712      535.      525.      490.         2         0         0       .00    239.56  10075.00


*SECNO 3.841
 2800 NAT Q1=     508.55  WSELK=     968.67  ENC Q1=     508.55  WSEL=     969.67  RATIO=    .0000
 NAT Q1=    1064.  RATIOS LOB, CH, ROB=    .6109    .2379    .1512  WSEL=     969.67

3265 DIVIDED FLOW


3470 ENCROACHMENT STATIONS=     9588.7   10070.0  TYPE=      4  TARGET=         .522
     3.841      4.60    969.70       .00    968.67    969.89       .18      2.66       .02    967.10
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   2746.0    1387.8    1358.2       .0     518.4     337.7       .0     116.2      38.2    967.30
      .46      2.68      4.02      .00      .070      .040      .000      .000    965.10   9588.66
  .002866      735.      735.     735.         3         0         0       .00    262.15  10070.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       EIMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 3.978

3470 ENCROACHMENT STATIONS=     9700.0   10095.0  TYPE=      1  TARGET=      395.000
    3.978      4.70    971.60       .00    970.71    971.82       .22      1.92       .01    969.00
   2746.0     510.1    2235.9        .0     334.8     550.1        .0     130.7      43.7 100000.00
      .52      1.52      4.06       .00      .070      .040      .000      .000    966.90   9700.00
  .002466      725.      725.      725.         3         0         0       .00    395.00  10095.00

*SECNO 4.101
 2800 NAT Q1=     498.63  WSELK=     972.63  ENC Q1=     498.63  WSEL=     973.63  RATIO=     .0000
 NAT Q1=    1107.  RATIOS LOB, CH, ROB=    .4193    .2951    .2857  WSEL=     973.63

3470 ENCROACHMENT STATIONS=     9852.5   10091.3  TYPE=      4  TARGET=        .549
    4.101      4.78    973.48       .00    972.63    973.75       .27      1.91       .02    971.00
   2746.0     880.6    1804.2      61.2     331.1     378.3      29.4     142.8      48.4    970.90
      .56      2.66      4.77      2.08      .070      .040      .070      .000    968.70   9852.45
  .003566      650.      650.      650.         2         0         0       .00    238.89  10091.34

*SECNO 4.237
 2800 NAT Q1=     580.84  WSELK=     974.47  ENC Q1=     580.84  WSEL=     975.47  RATIO=     .0000
 NAT Q1=    1148.  RATIOS LOB, CH, ROB=    .3917    .4179    .1903  WSEL=     975.47

3470 ENCROACHMENT STATIONS=     9869.1   10075.0  TYPE=      4  TARGET=        .494
    4.237      4.20    975.50       .00    974.47    975.74       .24      1.99       .00    972.60
   2746.0     482.6    2263.4        .0     218.7     536.2        .0     155.1      52.1    972.00
      .61      2.21      4.22       .00      .070      .040      .000      .000    971.30   9869.06
  .002227      715.      715.      715.         1         0         0       .00    205.94  10075.00

*SECNO 4.356
 2800 NAT Q1=     589.98  WSELK=     975.86  ENC Q1=     589.98  WSEL=     976.86  RATIO=     .0000
 NAT Q1=    1150.  RATIOS LOB, CH, ROB=    .4188    .3652    .2160  WSEL=     976.86

3470 ENCROACHMENT STATIONS=     9852.4   10070.0  TYPE=      4  TARGET=        .487
    4.356      4.30    976.90       .00    975.86    977.12       .22      1.38       .00    973.50
   2746.0     796.9    1949.1        .0     351.9     466.1        .0     166.4      55.1    973.40
      .66      2.26      4.18       .00      .070      .040      .000      .000    972.60   9852.43
  .002157      630.      630.      630.         3         0         0       .00    217.57  10070.00
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   SECNO     DEPTH     CWSEL     CRIWS     WSELK     EG        HV        HL        OLOSS     L-BANK ELEV
   Q         QLOB      QCH       QROB      ALOB      ACH       AROB      VOL       TWA       R-BANK ELEV
   TIME      VLOB      VCH       VROB      XNL       XNCH      XNR       WIN       EIMIN     SSTA
   SLOPE     XLOBL     XLCH      XLOBR     ITRIAL    IDC       ICONT     CORAR     TOPWID    ENDST

*SECNO 4.496
 2800 NAT Q1=     562.26  WSELK=     977.52  ENC Q1=     562.26  WSEL=     978.52  RATIO=     .0000
 NAT Q1=    1071.  RATIOS LOB, CH, ROB=    .2611    .4988    .2401  WSEL=     978.52
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3470 ENCROACHMENT STATIONS=     9957.7   10131.7  TYPE=      4  TARGET=        .475
     4.496      4.13    978.53       .00    977.52    978.82       .29      1.68       .02    975.20
    2746.0     124.3    2615.1       6.6      59.5     590.2       5.9     179.0      58.5    975.00
       .71      2.09      4.43      1.13      .070      .040      .070      .000    974.40   9957.70
   .002392      740.      740.      740.         2         0         0       .00    173.97  10131.67


*SECNO 4.625
 2800 NAT Q1=     297.51  WSELK=     980.10  ENC Q1=     572.14  WSEL=     981.10  RATIO=   -.9231
 NAT Q1=     598.  RATIOS LOB, CH, ROB=    .0435   .9565   .0000  WSEL=     981.10
3280 CROSS SECTION       4.63 EXTENDED       2.44 FEET


3470 ENCROACHMENT STATIONS=     9835.0   10095.0  TYPE=      4  TARGET=        .044

                CROSS-SECTION AT VAN BUREN ST.
                Q = Q AT CE298        (= 4446 CFS). REVISED Q = 2754 CFS
     4.625      2.54    980.64       .00    980.10    980.93       .29      2.10       .00    978.30
    2754.0        .0    2754.0        .0        .0     639.2        .0     189.1      61.8    978.20
       .75       .00      4.31       .00      .000      .040      .000      .000    978.10   9835.00
   .004153      680.      680.      680.         3         0         0       .00    260.00  10095.00


*SECNO 4.634
 2800 NAT Q1=    1202.65  WSELK=     980.53  ENC Q1=    1713.60  WSEL=     981.53  RATIO=   -.4249
 NAT Q1=    1714.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     981.53

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.25


3470 ENCROACHMENT STATIONS=     9862.0   10138.0  TYPE=      4  TARGET=        .000

                Begin Marwest Property Channelization and Fill

     4.634      4.77    980.92       .00    980.53    981.00       .08       .05       .02   1031.15
    2754.0        .0    2754.0        .0        .0    1215.5        .0     190.1      62.2    981.15
       .76       .00      2.27       .00      .000      .035      .000      .000    976.15   9862.94
   .000393       50.       50.       50.         2         0         0       .00    274.13  10137.06


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


*SECNO 4.670
 2800 NAT Q1=    1064.03  WSELK=     980.62  ENC Q1=    1534.30  WSEL=     981.62  RATIO=   -.4420
 NAT Q1=    1534.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     981.62

3470 ENCROACHMENT STATIONS=     9869.0   10131.0  TYPE=      4  TARGET=        .000
     4.670      4.59    980.99       .00    980.62    981.08       .10       .08       .01   1031.40
    2754.0        .0    2754.0        .0        .0    1101.1        .0     195.1      63.3    981.40
       .78       .00      2.50       .00      .000      .035      .000      .000    976.40   9870.67
   .000506      185.      185.      185.         0         0         0       .00    258.65  10129.33


*SECNO 4.752
 2800 NAT Q1=     800.51  WSELK=     980.97  ENC Q1=    1233.23  WSEL=     981.97  RATIO=   -.5405
 NAT Q1=    1233.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     981.97

3470 ENCROACHMENT STATIONS=     9869.0   10131.0  TYPE=      4  TARGET=        .000
     4.752      3.77    981.25       .00    980.97    981.39       .14       .29       .01   1031.48
    2754.0        .0    2754.0        .0        .0     923.6        .0     205.2      65.9    981.48
       .82       .00      2.98       .00      .000      .035      .000      .000    977.48   9869.93
   .000915      438.      438.      438.         2         0         0       .00    260.15  10130.07
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*SECNO 4.820
 2800 NAT Q1=     735.88  WSELK=     981.42  ENC Q1=    1149.12  WSEL=     982.42  RATIO=   -.5616
 NAT Q1=    1149.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     982.42

3470 ENCROACHMENT STATIONS=     9869.0   10131.0  TYPE=      4  TARGET=        .000
     4.820      3.51    981.60       .00    981.42    981.76       .16       .37       .01   1032.09
    2754.0        .0    2754.0        .0        .0     851.5        .0     212.5      68.0    983.09
       .85       .00      3.23       .00      .000      .035      .000      .000    978.09   9870.96
   .001170      357.      357.      357.         2         0         0       .00    255.27  10126.23


*SECNO 4.840
 2800 NAT Q1=     936.45  WSELK=     981.61  ENC Q1=    1467.96  WSEL=     982.61  RATIO=   -.5676
 NAT Q1=    1468.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     982.61

3470 ENCROACHMENT STATIONS=     9835.0   10165.0  TYPE=      4  TARGET=        .000
     4.840      3.45    981.76       .00    981.61    981.86       .10       .09       .01   1032.31
    2754.0        .0    2754.0        .0        .0    1076.1        .0     214.8      68.7    982.31
       .86       .00      2.56       .00      .000      .035      .000      .000    978.31   9837.20
   .000741      103.      103.      103.         2         0         0       .00    325.61  10162.80


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


*SECNO 4.855
 2800 NAT Q1=    1044.10  WSELK=     981.75  ENC Q1=    1770.71  WSEL=     982.75  RATIO=   -.6959
 NAT Q1=    1771.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     982.75
3280 CROSS SECTION      4.86 EXTENDED      1.65 FEET


3470 ENCROACHMENT STATIONS=     9680.0   10175.0  TYPE=      4  TARGET=        .000
     4.855      3.31    981.88       .00    981.75    981.95       .06       .08       .00   1035.54
    2754.0        .0    2754.0        .0        .0    1351.9        .0     218.3      69.9    980.23
       .88       .00      2.04       .00      .000      .035      .000      .000    978.57   9690.49
   .000590      126.      126.      126.         2         0         0       .00    484.51  10175.00


*SECNO 4.858

3301 HV CHANGED MORE THAN HVINS

3685 20 TRIALS ATTEMPTED WSEL,CWSEL
3693 PROBABLE MINIMUM SPECIFIC ENERGY
3720 CRITICAL DEPTH ASSUMED

3470 ENCROACHMENT STATIONS=     9850.0   10150.0  TYPE=      1  TARGET=      300.000

                End Marwest Property

     4.858      1.70    981.70    981.70    981.53    982.38       .69       .03       .19 100000.00
    2754.0        .0    2754.0        .0        .0     413.6        .0     218.6      70.0 100000.00
       .88       .00      6.66       .00      .000      .040      .000      .000    980.00   9850.00
   .021144       15.       15.       15.        20         8         0       .00    300.00  10150.00


*SECNO 5.009

3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  3.22


3470 ENCROACHMENT STATIONS=     9875.0   10105.0  TYPE=      1  TARGET=      230.000
     5.009      4.11    986.01       .00    985.15    986.22       .21      3.79       .05    983.70
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    2754.0     453.3    2273.5      27.2     212.3     583.2      17.5     229.8      74.8    982.50
       .94      2.14      3.90      1.56      .070      .040      .070      .000    981.90   9875.00
   .002046      800.      795.      840.         5         0         0       .00    230.00  10105.00


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   25JUN99      09:57:29                                                                                    PAGE   27

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


 *SECNO 5.153

 3470 ENCROACHMENT STATIONS=     9865.0   10090.0  TYPE=      1  TARGET=      225.000
     5.153      3.73    988.03       .00    987.06    988.34       .31      2.09       .03    985.60
    2754.0     545.0    2209.0        .0     218.4     455.1        .0     242.9      78.9 100000.00
       .99      2.50      4.85       .00      .070      .040      .000      .000    984.30   9865.00
   .003804      775.      765.      730.         5         0         0       .00    225.00  10090.00


 *SECNO 5.282
  2800 NAT Q1=     746.41  WSELK=     988.68  ENC Q1=     746.41  WSEL=     989.68  RATIO=    .0000
  NAT Q1=    1427.  RATIOS LOB, CH, ROB=    .5628   .2685   .1687  WSEL=     989.68

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.67


 3470 ENCROACHMENT STATIONS=     9758.0   10055.0  TYPE=      4  TARGET=         .477
     5.282      4.21    989.71       .00    988.68    989.82       .11      1.46       .02    987.00
    2754.0    1356.6    1397.4        .0     715.2     423.7        .0     257.2      83.0    986.00
      1.06      1.90      3.30       .00      .070      .040      .000      .000    985.50   9758.05
   .001365      690.      680.      665.         2         0         0       .00    296.95  10055.00


 CCHV=     .300 CEHV=     .500
 *SECNO 5.430
  2800 NAT Q1=     303.71  WSELK=     990.43  ENC Q1=     541.23  WSEL=     991.43  RATIO=   -.7821
  NAT Q1=     541.  RATIOS LOB, CH, ROB=    .0000  1.0000   .0000  WSEL=     991.43

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =   .62


 3470 ENCROACHMENT STATIONS=     9899.9   10100.1  TYPE=      4  TARGET=         .000

 3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA=       996.00 ELREA=       996.00


                A 7-SPAN BRIDGE AT I-10

     5.430      3.12    991.12       .00    990.43    991.55       .43      1.57       .16    997.00
    2754.0        .0    2754.0        .0        .0     525.9        .0     271.2      87.0    997.00
      1.10       .00      5.24       .00      .000      .035      .000      .000    988.00   9912.46
   .003548      680.      780.      820.         2         0         0       .00    175.08  10087.54


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   25JUN99      09:57:29                                                                                    PAGE   28

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


 SPECIAL BRIDGE
```

SB	XK	XKOR	CCFQ	RDLEN	BWC	BWP	BAREA	SS	ELCHU	ELCHD
	1.05	1.60	2.60	.00	162.00	6.00	1203.00	2.00	988.00	988.00

*SECNO 5.460

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.52

CLASS A LOW FLOW

3420 BRIDGE W.S.= 991.00 BRIDGE VELOCITY= 7.27 CALCULATED CHANNEL AREA= 486.

EGPRS	EGIWC	H3	QWEIR	QLOW	BAREA	TRAPEZOID AREA	ELLC	ELTRD	WEIRIN
.00	992.42	.06	0.	3538.	1203.	1190.	995.00	997.00	0.

3495 OVERBANK AREA ASSUMED NON-EFFECTIVE, ELLEA= 997.00 ELREA= 997.00

Q = Q AT CP287 (= 5319 CFS). REVISED Q = 3538 CFS

5.460	4.00	992.00	.00	991.00	992.42	.42	.87	.00	997.00
3538.0	.0	3538.0	.0	.0	681.3	.0	273.5	87.6	997.00
1.11	.00	5.19	.00	.000	.035	.000	.000	988.00	9910.62
.002547	160.	160.	160.	0	0	0	.00	178.77	10089.38

CCHV= .300 CEHV= .500
*SECNO 5.563
2800 NAT Q1= 1570.02 WSELK= 992.61 ENC Q1= 1570.02 WSEL= 993.61 RATIO= .0000
NAT Q1= 2666. RATIOS LOB, CH, ROB= .1788 .4650 .3562 WSEL= 993.61

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = 1.83

3470 ENCROACHMENT STATIONS= 9850.0 10232.3 TYPE= 4 TARGET= .411

5.563	4.61	993.11	.00	992.61	993.20	.09	.68	.10	989.50
3538.0	.0	2794.1	743.9	.0	1055.7	520.3	287.4	91.1	988.90
1.17	.00	2.65	1.43	.000	.040	.070	.000	988.50	9850.00
.000758	540.	540.	535.	2	0	0	.00	382.27	10232.27

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

CCHV= .100 CEHV= .300
*SECNO 5.727
2800 NAT Q1= 326.89 WSELK= 993.54 ENC Q1= 435.91 WSEL= 994.54 RATIO= -.3335
NAT Q1= 843. RATIOS LOB, CH, ROB= .2247 .5170 .2582 WSEL= 994.54

3302 WARNING: CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE, KRATIO = .29

3470 ENCROACHMENT STATIONS= 9935.0 10135.0 TYPE= 4 TARGET= .483

CROSS-SECTION AT 280 FEET (ALONG FLOW PATH) NORTH OF MCDOWELL RD.

Q = Q AT CP286 (= 4662 CFS). REVISED Q = 3400 CFS

DIVIDED FLOW OCCURS FOR THE NEXT TWO UPSTREAM CROSS-SECTIONS,
HOWEVER, THESE FLOWS ARE EFFECTIVE DUE TO UPSTREM INFLOW AT
X1= 5.960

```
     5.727      3.30    994.30       .00    993.54    994.85       .55      1.51       .14    992.00
    3400.0        .0    3400.0        .0        .0     573.9        .0     308.7      96.9    991.80
      1.21       .00      5.92       .00      .000      .045      .000      .000    991.00   9935.00
   .008147      870.      870.      835.         2         0         0       .00    200.00  10135.00


 *SECNO 5.840
  2800 NAT Q1=     727.72  WSELK=     996.30  ENC Q1=     727.72  WSEL=     997.30  RATIO=    .0000
  NAT Q1=    1529.  RATIOS LOB, CH, ROB=    .2733   .3875   .3392  WSEL=     997.30

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.80


 3470 ENCROACHMENT STATIONS=     9953.7   10240.4  TYPE=      4  TARGET=        .524
     5.840      3.75    997.15       .00    996.30    997.35       .20      2.47       .03    994.00
    3400.0      79.1    2770.7     550.2      42.5     714.8     236.9     319.4     100.2    993.70
      1.26      1.86      3.88      2.32      .070      .045      .070      .000    993.40   9953.67
   .002521      590.      595.      580.         3         0         0       .00    286.74  10240.41


 *SECNO 5.960
  2800 NAT Q1=     540.19  WSELK=     998.09  ENC Q1=     540.19  WSEL=     999.09  RATIO=    .0000
  NAT Q1=    1263.  RATIOS LOB, CH, ROB=    .0977   .2968   .6055  WSEL=     999.09

 3470 ENCROACHMENT STATIONS=     9960.0   10274.1  TYPE=      4  TARGET=        .572
1
   25JUN99       09:57:29                                                                          PAGE   30


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


     5.960      3.20    999.10       .00    998.09    999.33       .23      1.97       .01    997.30
    3400.0        .0    2361.2    1038.8        .0     556.7     376.1     333.2     104.5    996.20
      1.31       .00      4.24      2.76      .000      .045      .070      .000    995.90   9960.00
   .003984      640.      635.      610.         2         0         0       .00    314.07  10274.07


 *SECNO 6.086
  2800 NAT Q1=     533.63  WSELK=    1000.79  ENC Q1=     533.63  WSEL=    1001.79  RATIO=    .0000
  NAT Q1=    1294.  RATIOS LOB, CH, ROB=    .2002   .3264   .4734  WSEL=    1001.79

 3470 ENCROACHMENT STATIONS=     9900.0   10206.3  TYPE=      4  TARGET=        .587
     6.086      3.49   1001.79       .00   1000.79   1002.05       .26      2.72       .01    999.20
    3400.0        .0    2687.1     712.9        .0     608.6     279.2     347.3     109.3    999.20
      1.35       .00      4.42      2.55      .000      .045      .070      .000    998.30   9900.00
   .004125      655.      665.      685.         3         0         0       .00    306.34  10206.34


 *SECNO 6.217

 3302 WARNING:  CONVEYANCE CHANGE OUTSIDE OF ACCEPTABLE RANGE,  KRATIO =  1.61


 3470 ENCROACHMENT STATIONS=     9850.0   10270.0  TYPE=      1  TARGET=      420.000
     6.217      3.56   1003.66       .00   1002.61   1003.76       .11      1.70       .02   1000.30
    3400.0     299.9    2081.9    1018.3     166.1     691.8     554.2     365.9     115.2   1000.30
      1.43      1.81      3.01      1.84      .070      .045      .070      .000   1000.10   9850.00
   .001588      620.      690.      745.         3         0         0       .00    420.00  10270.00


 *SECNO 6.320
  2800 NAT Q1=     769.60  WSELK=    1003.60  ENC Q1=     769.60  WSEL=    1004.60  RATIO=    .0000
  NAT Q1=    1626.  RATIOS LOB, CH, ROB=    .2121   .3240   .4639  WSEL=    1004.60

 3470 ENCROACHMENT STATIONS=     9900.0   10279.3  TYPE=      4  TARGET=        .527
     6.320      3.70   1004.60       .00   1003.60   1004.73       .14       .96       .01   1001.30
```

3400.0	.0	2319.8	1080.2	.0	693.4	546.9	382.3	120.1	1001.40
1.48	.00	3.35	1.98	.000	.045	.070	.000	1000.90	9900.00
.001999	580.	545.	525.	2	0	0	.00	379.30	10279.30

THIS RUN EXECUTED 25JUN99 09:57:30

****
HEC-2 WATER SURFACE PROFILES

Version 4.6.2; May 1991
****

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

BULLARD WASH CLOMR

SUMMARY PRINTOUT

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
	2.680	3200.00	947.85	9661.88	9925.00	10050.00	10535.00	.00	743.52	2.65	945.20	68.25	6.93
	2.680	3200.00	948.67	9925.00	9925.00	10050.00	10124.00	.00	199.00	3.47	945.20	44.24	6.84
*	2.771	3200.00	950.45	9634.21	9985.00	10020.00	10649.53	2.60	1001.73	3.15	947.30	32.86	5.06
	2.771	3200.00	951.14	9917.92	9985.00	10020.00	10211.92	2.47	294.00	3.84	947.30	44.51	7.00
	2.883	3200.00	952.21	9629.03	9985.00	10015.00	10407.47	1.76	778.45	3.71	948.50	28.53	5.34
	2.883	3200.00	953.10	9853.00	9985.00	10015.00	10130.00	1.96	277.00	4.60	948.50	24.67	5.94
	2.977	3194.00	953.72	9683.29	9980.00	10050.00	10417.98	1.52	734.69	3.82	949.90	39.83	6.54
	2.977	3194.00	954.38	9875.00	9980.00	10050.00	10050.00	1.28	175.00	4.48	949.90	38.04	7.12
	3.070	3194.00	955.61	9531.52	9945.00	10025.00	10567.69	1.89	1036.17	3.31	952.30	28.10	4.58
	3.070	3194.00	956.40	9847.43	9945.00	10025.00	10134.02	2.03	286.58	4.10	952.30	35.56	6.27
	3.167	2742.00	956.85	9575.17	9970.00	10020.00	10569.96	1.24	994.79	2.95	953.90	20.27	4.11
	3.167	2742.00	957.87	9788.00	9970.00	10020.00	10130.00	1.46	342.00	3.97	953.90	17.78	4.83
*	3.291	2742.00	959.18	9989.12	9970.00	10020.00	10823.48	2.33	814.06	1.98	957.20	79.47	4.49
*	3.291	2742.00	960.06	9983.21	9970.00	10020.00	10287.35	2.19	300.12	2.86	957.20	91.81	5.66
*	3.376	2742.00	961.20	9773.44	9985.00	10015.00	10794.53	2.03	975.12	2.90	958.30	28.81	2.93
*	3.376	2742.00	962.24	9985.00	9985.00	10015.00	10291.17	2.18	306.17	3.94	958.30	27.85	4.10
	3.491	2742.00	962.61	9628.06	9980.00	10020.00	10599.32	1.40	971.26	3.11	959.50	18.99	3.36
	3.491	2742.00	963.62	9911.46	9980.00	10020.00	10234.03	1.37	322.57	4.12	959.50	19.01	4.43
*	3.602	2746.00	964.10	9742.08	9880.00	10100.00	10454.50	1.49	712.41	2.20	961.90	40.59	3.95
	3.602	2746.00	964.92	9880.00	9880.00	10100.00	10100.00	1.31	220.00	3.02	961.90	31.07	4.20
	3.702	2746.00	966.18	9297.68	9955.00	10055.00	10395.11	2.08	851.27	2.78	963.40	37.67	4.20
	3.702	2746.00	966.86	9600.00	9955.00	10055.00	10075.00	1.94	239.56	3.46	963.40	47.12	5.52

SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
3.841	2746.00	968.67	9229.64	9955.00	10070.00	10338.90	2.49	881.52	3.57	965.10	29.16	3.09
3.841	2746.00	969.70	9588.66	9955.00	10070.00	10070.00	2.84	262.15	4.60	965.10	28.66	4.02

	3.978	2746.00	970.71	9279.87	9930.00	10095.00	10376.46	2.04	1096.59	3.81	966.90	27.95	3.56
	3.978	2746.00	971.60	9700.00	9930.00	10095.00	10095.00	1.90	395.00	4.70	966.90	24.66	4.06
	4.101	2746.00	972.63	9450.69	9960.00	10080.00	10450.14	1.92	999.46	3.93	968.70	30.33	3.57
	4.101	2746.00	973.48	9852.45	9960.00	10080.00	10091.34	1.87	238.89	4.78	968.70	35.66	4.77
	4.237	2746.00	974.47	9500.62	9935.00	10075.00	10323.19	1.84	822.57	3.17	971.30	22.35	3.49
	4.237	2746.00	975.50	9869.06	9935.00	10075.00	10075.00	2.02	205.94	4.20	971.30	22.27	4.22
	4.356	2746.00	975.86	9538.79	9950.00	10070.00	10345.86	1.40	807.07	3.26	972.60	21.66	3.47
	4.356	2746.00	976.90	9852.43	9950.00	10070.00	10070.00	1.41	217.57	4.30	972.60	21.57	4.18
	4.496	2746.00	977.52	9692.36	9975.00	10130.00	10385.67	1.66	693.31	3.12	974.40	23.85	3.61
	4.496	2746.00	978.53	9957.70	9975.00	10130.00	10131.67	1.63	173.97	4.13	974.40	23.92	4.43
*	4.625	2754.00	980.10	9810.00	9835.00	10095.00	10095.00	2.58	285.00	2.00	978.10	85.69	5.29
	4.625	2754.00	980.64	9835.00	9835.00	10095.00	10095.00	2.11	260.00	2.54	978.10	41.53	4.31
*	4.634	2754.00	980.53	9864.49	9862.00	10138.00	10135.51	.42	271.02	4.38	976.15	5.24	2.48
*	4.634	2754.00	980.92	9862.94	9862.00	10138.00	10137.06	.28	274.13	4.77	976.15	3.93	2.27
	4.670	2754.00	980.62	9872.13	9869.00	10131.00	10127.87	.09	255.74	4.22	976.40	6.70	2.73
	4.670	2754.00	980.99	9870.67	9869.00	10131.00	10129.33	.07	258.65	4.59	976.40	5.06	2.50
	4.752	2754.00	980.97	9871.03	9869.00	10131.00	10128.97	.35	257.94	3.49	977.48	11.84	3.23
	4.752	2754.00	981.25	9869.93	9869.00	10131.00	10130.07	.26	260.15	3.77	977.48	9.15	2.98
	4.820	2754.00	981.42	9871.69	9869.00	10131.00	10125.65	.45	253.96	3.33	978.09	14.01	3.42
	4.820	2754.00	981.60	9870.96	9869.00	10131.00	10126.23	.35	255.27	3.51	978.09	11.70	3.23
	4.840	2754.00	981.61	9837.82	9835.00	10165.00	10162.18	.19	324.37	3.30	978.31	8.65	2.69
	4.840	2754.00	981.76	9837.20	9835.00	10165.00	10162.80	.16	325.61	3.45	978.31	7.41	2.56
	4.855	2754.00	981.75	9690.88	9680.00	10175.00	10175.00	.14	484.12	3.18	978.57	6.96	2.14
	4.855	2754.00	981.88	9690.49	9680.00	10175.00	10175.00	.12	484.51	3.31	978.57	5.90	2.04
*	4.858	2754.00	981.53	9774.13	9705.00	10290.00	10280.63	-.22	506.49	1.53	980.00	189.23	5.24
*	4.858	2754.00	981.70	9850.00	9705.00	10290.00	10150.00	-.19	300.00	1.70	980.00	211.44	6.66
*	5.009	2754.00	985.15	9634.11	9935.00	10100.00	10371.11	3.62	737.00	3.25	981.90	17.18	2.96
*	5.009	2754.00	986.01	9875.00	9935.00	10100.00	10105.00	4.32	230.00	4.11	981.90	20.46	3.90
*	5.153	2754.00	987.06	9556.54	9945.00	10090.00	10287.07	1.91	730.52	2.76	984.30	42.16	4.06
	5.153	2754.00	988.03	9865.00	9945.00	10090.00	10090.00	2.01	225.00	3.73	984.30	38.04	4.85
*	5.282	2754.00	988.68	9324.37	9945.00	10055.00	10354.26	1.62	1029.88	3.18	985.50	13.61	2.75
*	5.282	2754.00	989.71	9758.05	9945.00	10055.00	10055.00	1.68	296.95	4.21	985.50	13.65	3.30

	SECNO	Q	CWSEL	SSTA	STCHL	STCHR	ENDST	DIFWSX	TOPWID	DEPTH	ELMIN	10*KS	VCH
*	5.430	2754.00	990.43	9913.91	9899.90	10100.10	10086.09	1.74	172.18	2.43	988.00	82.23	6.79
*	5.430	2754.00	991.12	9912.46	9899.90	10100.10	10087.54	1.41	175.08	3.12	988.00	35.48	5.24
*	5.460	3538.00	991.00	9912.71	9899.90	10100.10	10087.29	.57	174.57	3.00	988.00	66.93	7.01
*	5.460	3538.00	992.00	9910.62	9899.90	10100.10	10089.38	.88	178.77	4.00	988.00	25.47	5.19
*	5.563	3538.00	992.61	9351.43	9850.00	10100.00	10736.62	1.62	1385.19	4.11	988.50	5.08	2.02
*	5.563	3538.00	993.11	9850.00	9850.00	10100.00	10232.27	1.11	382.27	4.61	988.50	7.58	2.65
*	5.727	3400.00	993.54	9375.53	9935.00	10135.00	10467.83	.92	933.49	2.54	991.00	108.18	5.65
*	5.727	3400.00	994.30	9935.00	9935.00	10135.00	10135.00	1.19	200.00	3.30	991.00	81.47	5.92
*	5.840	3400.00	996.30	9353.26	9970.00	10170.00	10715.71	2.77	1293.70	2.90	993.40	21.83	3.01
*	5.840	3400.00	997.15	9953.67	9970.00	10170.00	10240.41	2.85	286.74	3.75	993.40	25.21	3.88
	5.960	3400.00	998.09	9735.32	9960.00	10150.00	10948.05	1.79	1212.73	2.19	995.90	39.62	3.21
	5.960	3400.00	999.10	9960.00	9960.00	10150.00	10274.07	1.95	314.07	3.20	995.90	39.84	4.24

	6.086	3400.00	1000.79	9475.24	9900.00	10100.00	10827.24	2.70	1352.00	2.49	998.30	40.60	3.39
	6.086	3400.00	1001.79	9900.00	9900.00	10100.00	10206.34	2.70	306.34	3.49	998.30	41.25	4.42
*	6.217	3400.00	1002.61	9445.54	9900.00	10100.00	10837.21	1.82	1391.67	2.51	1000.10	17.17	2.46
*	6.217	3400.00	1003.66	9850.00	9900.00	10100.00	10270.00	1.86	420.00	3.56	1000.10	15.88	3.01
	6.320	3400.00	1003.60	9582.91	9900.00	10100.00	10928.10	.99	1345.19	2.70	1000.90	19.52	2.67
	6.320	3400.00	1004.60	9900.00	9900.00	10100.00	10279.30	.94	379.30	3.70	1000.90	19.99	3.35

BULLARD WASH CLOMR

SUMMARY PRINTOUT TABLE 110

	SECNO	OWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	2.680	947.85	.00	948.32	743.52	54.35	1908.66	1236.99	.00	.00	9925.00	10050.00	.00
	2.680	948.67	.82	949.28	199.00	.00	2584.59	615.41	199.00	9925.00	9925.00	10050.00	10124.00
*	2.771	950.45	.00	950.56	1001.73	832.69	423.83	1943.49	.00	.00	9985.00	10020.00	.00
	2.771	951.14	.69	951.44	294.00	291.18	757.38	2151.44	.55	9917.92	9985.00	10020.00	10211.92
	2.883	952.21	.00	952.34	778.45	1557.82	461.95	1180.23	.00	.00	9985.00	10015.00	.00
	2.883	953.10	.89	953.34	277.00	1531.72	672.28	996.00	277.00	9853.00	9985.00	10015.00	10130.00
	2.977	953.72	.00	954.08	734.69	1456.21	1388.64	349.15	.00	.00	9980.00	10050.00	.00
	2.977	954.38	.65	954.95	175.00	1358.52	1835.48	.00	175.00	9875.00	9980.00	10050.00	10050.00
	3.070	955.61	.00	955.73	1036.17	919.09	849.04	1425.87	.00	.00	9945.00	10025.00	.00
	3.070	956.40	.79	956.77	286.58	553.60	1559.34	1081.07	.56	9847.43	9945.00	10025.00	10134.02
	3.167	956.85	.00	956.94	994.79	1230.49	513.27	998.23	.00	.00	9970.00	10020.00	.00
	3.167	957.87	1.02	958.04	342.00	1253.00	850.53	638.47	342.00	9788.00	9970.00	10020.00	10130.00
*	3.291	959.18	.00	959.28	814.06	.00	101.80	2640.20	.00	.00	9970.00	10020.00	.00
*	3.291	960.06	.88	960.30	300.12	.00	259.84	2482.16	.59	9970.00	9970.00	10020.00	10287.36
*	3.376	961.20	.00	961.26	975.12	52.53	92.05	2597.42	.00	.00	9985.00	10015.00	.00
*	3.376	962.24	1.04	962.36	306.17	.00	250.26	2491.74	.54	9985.00	9985.00	10015.00	10291.17
	3.491	962.61	.00	962.66	971.26	781.00	263.42	1697.57	.00	.00	9980.00	10020.00	.00
	3.491	963.62	1.01	963.74	322.57	467.96	525.20	1748.83	.53	9911.46	9980.00	10020.00	10234.03
*	3.602	964.10	.00	964.28	712.41	207.89	1872.94	665.18	.00	.00	9880.00	10100.00	.00
	3.602	964.92	.82	965.20	220.00	.00	2746.00	.00	.41	9880.00	9880.00	10100.00	10100.00
	3.702	966.18	.00	966.31	851.27	1162.92	1046.95	536.13	.00	.00	9955.00	10055.00	.00
	3.702	966.86	.68	967.21	239.56	841.00	1756.43	148.58	475.00	9600.00	9955.00	10055.00	10075.00
	3.841	968.67	.00	968.75	881.52	1827.10	678.60	240.30	.00	.00	9955.00	10070.00	.00
	3.841	969.70	1.04	969.89	262.15	1387.78	1358.22	.00	.52	9588.66	9955.00	10070.00	10070.00
	3.978	970.71	.00	970.83	1096.59	839.46	1433.29	473.26	.00	.00	9930.00	10095.00	.00
	3.978	971.60	.89	971.82	395.00	510.07	2235.92	.00	395.00	9700.00	9930.00	10095.00	10095.00
	4.101	972.63	.00	972.72	999.46	1074.11	986.50	685.39	.00	.00	9960.00	10080.00	.00
	4.101	973.48	.85	973.75	238.89	880.65	1804.18	61.17	.55	9852.45	9960.00	10080.00	10091.34
	4.237	974.47	.00	974.58	822.57	962.69	1368.27	415.04	.00	.00	9935.00	10075.00	.00
	4.237	975.50	1.03	975.74	205.94	482.57	2263.43	.00	.49	9869.06	9935.00	10075.00	10075.00
	4.356	975.86	.00	975.96	807.07	1092.41	1182.58	471.01	.00	.00	9950.00	10070.00	.00
	4.356	976.90	1.04	977.12	217.57	796.94	1949.06	.00	.49	9852.43	9950.00	10070.00	10070.00

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	4.496	977.52	.00	977.65	693.31	611.18	1573.85	560.97	.00	.00	9975.00	10130.00	.00
	4.496	978.53	1.01	978.82	173.97	124.28	2615.07	6.65	.48	9957.70	9975.00	10130.00	10131.67
*	4.625	980.10	.00	980.52	285.00	114.35	2639.65	.00	.00	.00	9835.00	10095.00	.00
	4.625	980.64	.54	980.93	260.00	.00	2754.00	.00	.04	9835.00	9835.00	10095.00	10095.00
*	4.634	980.53	.00	980.62	271.02	.00	2754.00	.00	.00	.00	9862.00	10138.00	.00
*	4.634	980.92	.39	981.00	274.13	.00	2754.00	.00	.00	9862.00	9862.00	10138.00	10138.00
	4.670	980.62	.00	980.74	255.74	.00	2754.00	.00	.00	.00	9869.00	10131.00	.00
	4.670	980.99	.36	981.08	258.65	.00	2754.00	.00	.00	9869.00	9869.00	10131.00	10131.00
	4.752	980.97	.00	981.13	257.94	.00	2754.00	.00	.00	.00	9869.00	10131.00	.00
	4.752	981.25	.28	981.39	260.15	.00	2754.00	.00	.00	9869.00	9869.00	10131.00	10131.00
	4.820	981.42	.00	981.60	253.96	.00	2754.00	.00	.00	.00	9869.00	10131.00	.00
	4.820	981.60	.18	981.76	255.27	.00	2754.00	.00	.00	9869.00	9869.00	10131.00	10131.00
	4.840	981.61	.00	981.72	324.37	.00	2754.00	.00	.00	.00	9835.00	10165.00	.00
	4.840	981.76	.16	981.86	325.61	.00	2754.00	.00	.00	9835.00	9835.00	10165.00	10165.00
	4.855	981.75	.00	981.82	484.12	.00	2754.00	.00	.00	.00	9680.00	10175.00	.00
	4.855	981.88	.14	981.95	484.51	.00	2754.00	.00	.00	9680.00	9680.00	10175.00	10175.00
*	4.858	981.53	.00	981.96	506.49	.00	2754.00	.00	.00	.00	9705.00	10290.00	.00
*	4.858	981.70	.17	982.38	300.00	.00	2754.00	.00	300.00	9850.00	9705.00	10290.00	10150.00
*	5.009	985.15	.00	985.24	737.00	975.27	1304.93	473.80	.00	.00	9935.00	10100.00	.00
*	5.009	986.01	.86	986.22	230.00	453.30	2273.48	27.22	230.00	9875.00	9935.00	10100.00	10105.00
*	5.153	987.06	.00	987.21	730.52	1270.24	1286.03	197.73	.00	.00	9945.00	10090.00	.00
	5.153	988.03	.96	988.34	225.00	544.99	2209.01	.00	225.00	9865.00	9945.00	10090.00	10090.00
*	5.282	988.68	.00	988.74	1029.88	1551.11	857.60	345.29	.00	.00	9945.00	10055.00	.00
*	5.282	989.71	1.02	989.82	296.95	1356.56	1397.44	.00	.48	9758.05	9945.00	10055.00	10055.00
*	5.430	990.43	.00	991.14	172.18	.00	2754.00	.00	.00	.00	9899.90	10100.10	.00
*	5.430	991.12	.69	991.55	175.08	.00	2754.00	.00	.00	9899.90	9899.90	10100.10	10100.10
*	5.460	991.00	.00	991.76	174.57	.00	3538.00	.00	.00	.00	9899.90	10100.10	.00
*	5.460	992.00	1.00	992.42	178.77	.00	3538.00	.00	.00	.00	9899.90	10100.10	.00
*	5.563	992.61	.00	992.65	1385.19	464.76	1882.65	1190.59	.00	.00	9850.00	10100.00	.00
*	5.563	993.11	.49	993.20	382.27	.00	2794.05	743.95	.41	9850.00	9850.00	10100.00	10232.27
*	5.727	993.54	.00	993.90	933.49	337.36	2386.34	676.30	.00	.00	9935.00	10135.00	.00
*	5.727	994.30	.77	994.85	200.00	.00	3400.00	.00	.48	9935.00	9935.00	10135.00	10135.00
*	5.840	996.30	.00	996.39	1293.70	700.60	1644.53	1054.87	.00	.00	9970.00	10170.00	.00
*	5.840	997.15	.84	997.35	286.74	79.09	2770.68	550.23	.52	9953.67	9970.00	10170.00	10240.41

	SECNO	CWSEL	DIFKWS	EG	TOPWID	QLOB	QCH	QROB	PERENC	STENCL	STCHL	STCHR	STENCR
	5.960	998.09	.00	998.18	1212.73	145.33	1175.10	2079.57	.00	.00	9960.00	10150.00	.00
	5.960	999.10	1.00	999.33	314.07	.00	2361.20	1038.80	.57	9960.00	9960.00	10150.00	10274.08
	6.086	1000.79	.00	1000.89	1352.00	476.98	1385.72	1537.30	.00	.00	9900.00	10100.00	.00
	6.086	1001.79	1.00	1002.05	306.34	.00	2687.10	712.90	.59	9900.00	9900.00	10100.00	10206.34
*	6.217	1002.61	.00	1002.66	1391.67	814.38	1187.59	1398.03	.00	.00	9900.00	10100.00	.00
*	6.217	1003.66	1.05	1003.76	420.00	299.86	2081.89	1018.25	420.00	9850.00	9900.00	10100.00	10270.00
	6.320	1003.60	.00	1003.66	1345.19	699.47	1322.46	1378.07	.00	.00	9900.00	10100.00	.00

6.320	1004.60	.99	1004.73	379.30	.00	2319.76	1080.24	.53	9900.00	9900.00	10100.00	10279.30

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SUMMARY OF ERRORS AND SPECIAL NOTES

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WARNING SECNO=     2.771  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     3.291  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     3.291  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     3.376  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     3.376  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     3.602  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     4.625  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     4.634  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     4.634  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     4.858  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
CAUTION SECNO=     4.858  PROFILE=  2  CRITICAL DEPTH ASSUMED
CAUTION SECNO=     4.858  PROFILE=  2  PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO=     4.858  PROFILE=  2  20 TRIALS ATTEMPTED TO BALANCE WSEL

WARNING SECNO=     5.009  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.009  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     5.153  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     5.282  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.282  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     5.430  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.430  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

CAUTION SECNO=     5.460  PROFILE=  1  HYDRAULIC JUMP D.S.
WARNING SECNO=     5.460  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.460  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     5.563  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.563  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     5.727  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.727  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     5.840  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     5.840  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE

WARNING SECNO=     6.217  PROFILE=  1  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
WARNING SECNO=     6.217  PROFILE=  2  CONVEYANCE CHANGE OUTSIDE ACCEPTABLE RANGE
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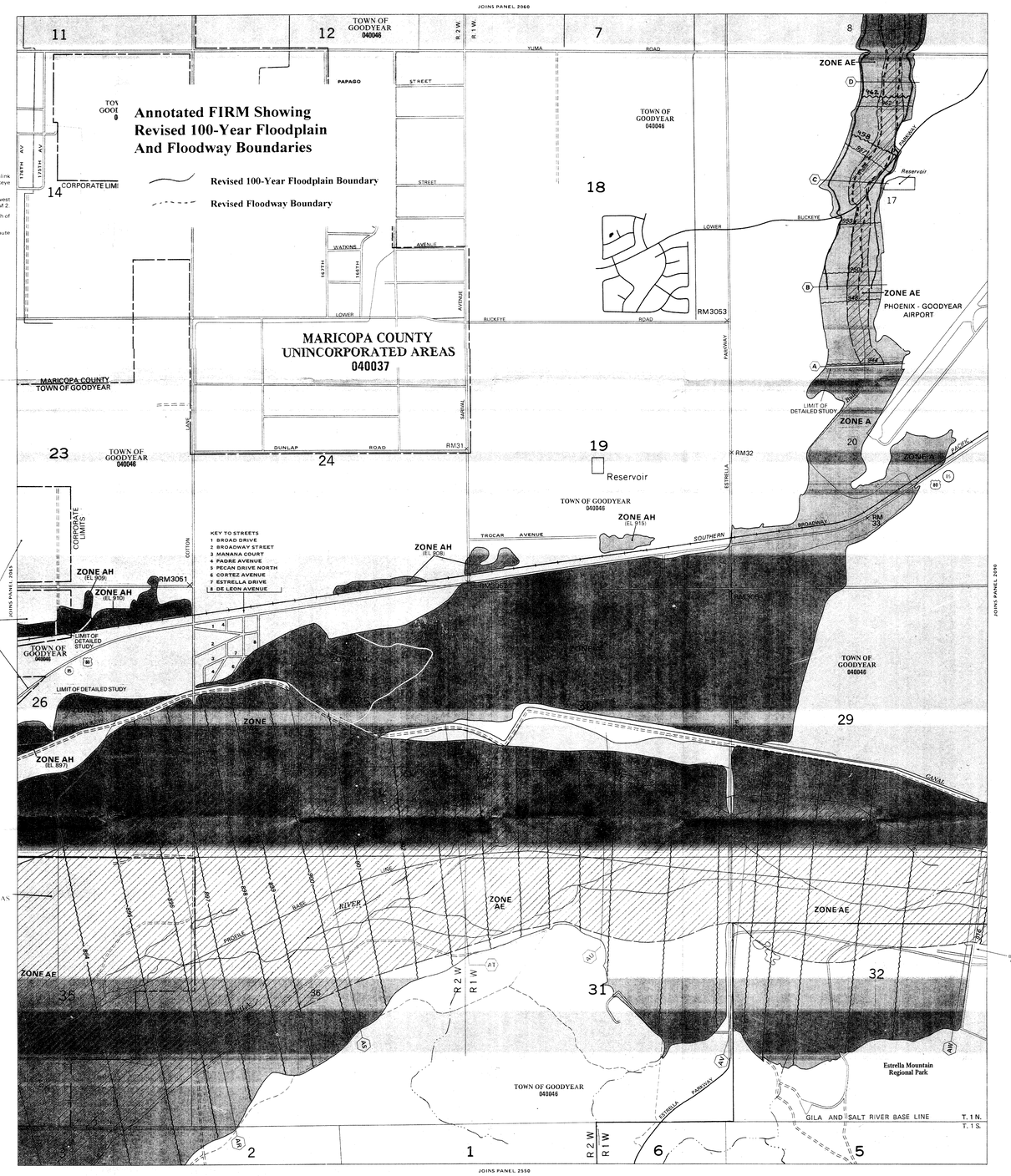
FLOODWAY DATA, BULLARD WASH CLOMR
PROFILE NO. 2

	——— FLOODWAY ———			WATER SURFACE ELEVATION		
STATION	WIDTH	SECTION AREA	MEAN VELOCITY	WITH FLOODWAY	WITHOUT FLOODWAY	DIFFERENCE

2.680	199.	596.	5.4	948.6	947.8	.8
2.771	294.	875.	3.7	951.1	950.4	.7
2.883	277.	956.	3.3	953.1	952.2	.9
2.977	175.	579.	5.5	954.4	953.7	.7
3.070	287.	813.	3.9	956.4	955.6	.8
3.167	342.	993.	2.8	957.8	956.8	1.0
3.291	304.	704.	3.9	960.1	959.2	.9
3.376	306.	1026.	2.7	962.2	961.2	1.0
3.491	323.	1090.	2.5	963.6	962.6	1.0
3.602	220.	653.	4.2	964.9	964.1	.8
3.702	475.	675.	4.1	966.9	966.2	.7
3.841	481.	856.	3.2	969.7	968.7	1.0
3.978	395.	885.	3.1	971.6	970.7	.9
4.101	239.	739.	3.7	973.5	972.6	.9
4.237	206.	755.	3.6	975.5	974.5	1.0
4.356	218.	818.	3.4	976.9	975.9	1.0
4.496	174.	656.	4.2	978.5	977.5	1.0
4.625	260.	639.	4.3	980.6	980.1	.5
4.634	274.	1216.	2.3	980.9	980.5	.4
4.670	259.	1101.	2.5	981.0	980.6	.4
4.752	260.	924.	3.0	981.3	981.0	.3
4.820	255.	852.	3.2	981.6	981.4	.2
4.840	326.	1076.	2.6	981.8	981.6	.2
4.855	485.	1352.	2.0	981.8	981.7	.1
4.858	300.	414.	6.7	981.7	981.5	.2
5.009	230.	813.	3.4	986.1	985.2	.9
5.153	225.	674.	4.1	988.1	987.1	1.0
5.282	297.	1139.	2.4	989.7	988.7	1.0
5.430	175.	526.	5.2	991.1	990.4	.7
5.460	179.	681.	5.2	992.0	991.0	1.0
5.563	382.	1576.	2.2	993.1	992.6	.5
5.727	200.	574.	5.9	994.3	993.5	.8
5.840	287.	994.	3.4	997.1	996.3	.8
5.960	314.	933.	3.6	999.1	998.1	1.0
6.086	306.	888.	3.8	1001.8	1000.8	1.0
6.217	420.	1412.	2.4	1003.6	1002.6	1.0
6.320	379.	1240.	2.7	1004.6	1003.6	1.0

ELEVETION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT.NGVD)	DESCRIPTION OF LOCATION
RM30	895.65	ANPP lead plub Number 862 at northwest corner of chainlink fence on east side of Cotton Lane, 1130 feet south of Buckeye Canal.
RM31	935.81	U.S. Geological Survey brass cap in concrete cylinder 42 feet west of Sarival Avenue, 0.5 mile north of Route 80. Marked GIN RM 2.
RM32	934.97	Rim of handhole at centerline of Reems Road, 1800 feet north of U.S. Route 80.
RM33	916.54	AHD brass cap in south headwall of box culvert under U.S. Route 80, 3000 feet west of Bullard Avenue.
RM 3051	912.90	One-inch open pipe in pothole, Cotton Lane and Broadway Road, southeast corner Section 23, Township 1 North, Range 1 West.
RM 3052	910.17	Chiseled "X" on concrete base power pole at northwest corner, intersection of Sarival Avenue and Broadway Road, near southeast corner Section 24, Township 1 North, Range 2 West.
RM 3053	952.11	Maricopa County Highway Department brass cap in handhole, Estrella Parkway and Lower Buckeye Road, southeast corner Section 18, Township 1 North, Range 1 West.
RM 3054	913.18	Brass cap in handhole, Estrella Parkway (Reems Road), and Broadway Road, southeast corner Section 19, Township 1 North, Range 1 West.



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** — No base flood elevations determined.
- **ZONE AE** — Base flood elevations determined.
- **ZONE AH** — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE A99** — To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- **ZONE V** — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** — Areas determined to be outside 500-year flood plain.
- **ZONE D** — Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

D — D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM7X — Elevation Reference Mark

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Areas of special flood hazard (100-year flood) include Zones A, A1-30, AE, AH, AO, A99, V, V1-30 AND VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Coastal base flood elevations apply only landward of the shoreline.

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of the map.

For community map revision history prior to countywide mapping, see Section 6.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
APRIL 15, 1988

EFFECTIVE DATE (S) OF REVISION (S) TO THIS PANEL:
SEPTEMBER 4, 1991

Map revised SEPTEMBER 30, 1995 to update corporate limits, to change base flood elevations, to add base flood elevations, to add special flood hazard areas, to change special flood hazard areas, to change zone designations, to add and update roads and road names, to reflect updated topographic information, to incorporate previously issued letters of map revision, and to incorporate previously issued letters of map amendment.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

MARICOPA COUNTY, ARIZONA AND INCORPORATED AREAS

PANEL 2070 OF 4350

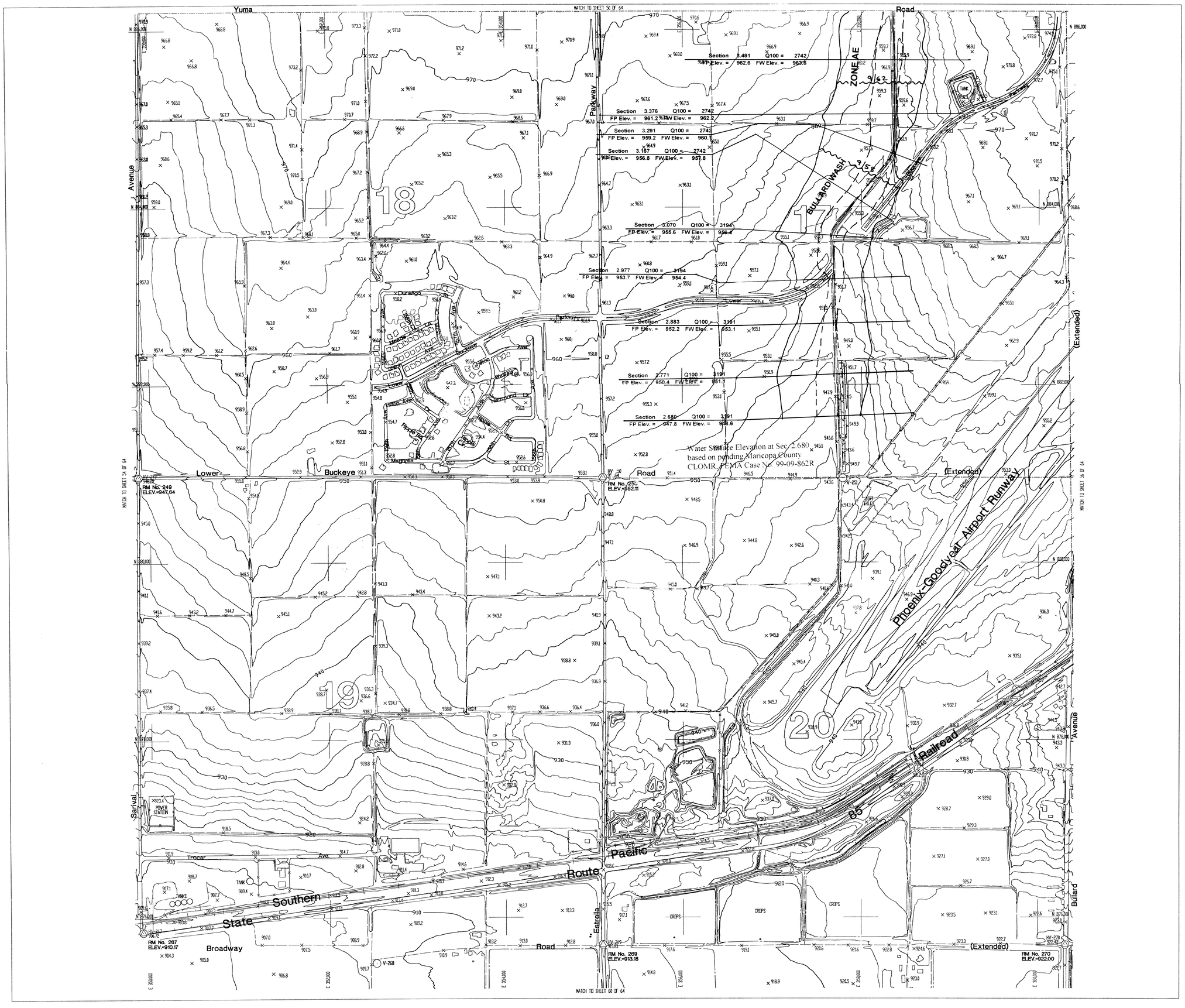
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GOODYEAR, TOWN OF	040046	2070	F
MARICOPA COUNTY, UNINCORPORATED AREAS	040037	2070	F

MAP NUMBER
04013C2070 F

MAP REVISED:
SEPTEMBER 30, 1995

Federal Emergency Management Agency



WHITE TANKS/AGUA FRIA

AREA DRAINAGE MASTER STUDY

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

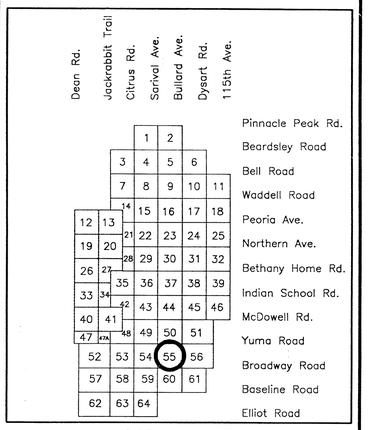
LEGEND

Section 2.883	- HEC-2 section number
Q100 = 3191	- 100-year discharge (cfs)
FP Elev. = 952.3	- 100-year floodplain elevation
FW Elev. = 953.3	- Floodway elevation
	- Floodplain boundary
	- Floodway boundary
	- Stream centerline (sta=10000)
ZONE AE	- Flood Insurance Rate Zone

CLOMR FLOODPLAIN MAP

REFERENCE MARKS (RM'S)

NO.	ELEVATION	DESCRIPTION
249	947.64	Maricopa County Highway Dept. Brass Cap in Hand Hole, Sarival Ave. and Lower Buckeye Rd.
250	952.11	Maricopa County Highway Dept. Brass Cap in Hand Hole, Estrella Pkwy. and Lower Buckeye Rd.
267	910.17	"X" Chiseled on Concrete Base Power Pole at Northeast Corner, Intersection of Sarival Ave. and Broadway Rd.
269	913.18	Brass Cap in Hand Hole, Estrella Pkwy. (Reems Rd.) and Broadway Rd.
270	922.00	Maricopa County Highway Dept. Brass Cap in Hand Hole, Bullard Ave. and Broadway Rd.



N

400 200 0 400 800 1200

CERTIFICATION

This is to certify that the horizontal and vertical control surveys on which this map was based were prepared under my supervision during the time from December, 1989 to April, 1990. The topography was developed from photogrammetric methods by Cooper Aerial Survey Co. and checked with field surveyed profiles conducted under my supervision. It was determined with the field surveys that over 90% of the contour lines and spot elevations were within one foot of the true elevation.

REGISTERED LAND SURVEYOR MARK T. GAVAN ARIZONA, U.S.A.

MARK T. GAVAN, R.L.S.

SHEET TITLE: **TOPOGRAPHIC MAP**

STUDY CONSULTANT: **The WLB Group** INC.

MAPPING COMPANY: Cooper Aerial of Phoenix, Inc.

SHEET 55 OF 64 | DATE FLOWN 12/22/89