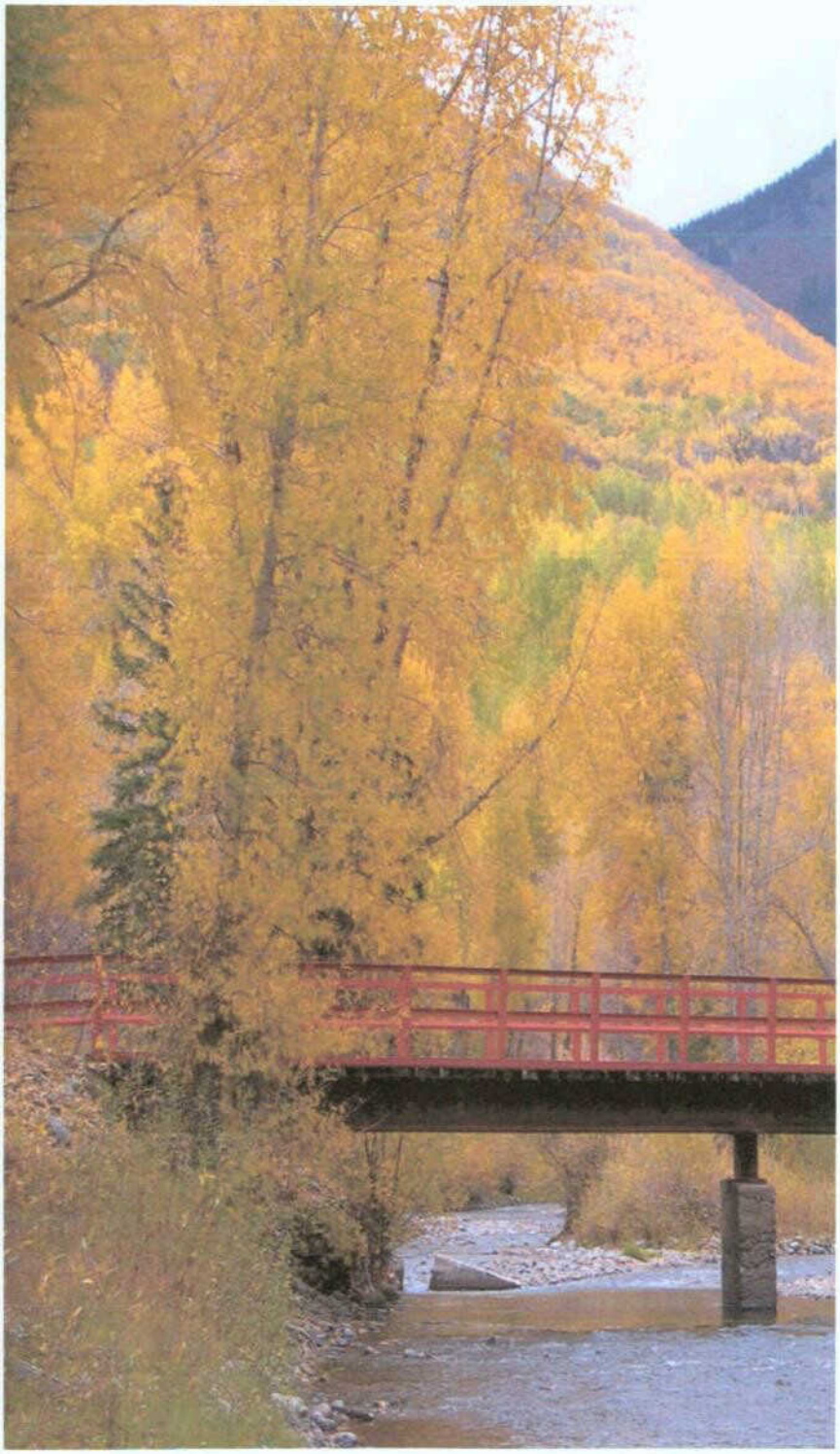
FLOODPLAIN INFORMATION REPORT:

CRYSTAL RIVER

TOWN OF MARBLE & VICINITY

GUNNISON COUNTY, COLORADO



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TECHNICAL APPENDIX

August 2004

FLOODPLAIN INFORMATION REPORT:
CRYSTAL RIVER
TOWN OF MARBLE & VICINTIY
GUNNISON COUNTY, COLORADO

TECHNICAL APPENDIX

APPENDIX A: **Background Information**

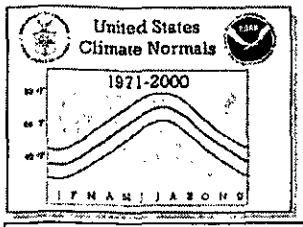
APPENDIX B: **Hydrologic Data**

APPENDIX C: **Hydraulic Data (HEC-RAS)**

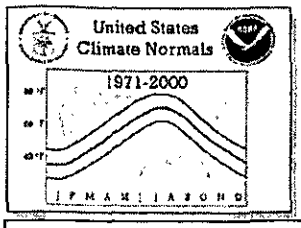
APPENDIX D: **Bridge Documentation**

TECHNICAL APPENDIX

APPENDIX A: Background Information



No.	Station Name	Element	TEMPERATURE NORMALS (Degrees Fahrenheit) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
002	AKRON 4 E	MAX	38.2	43.9	51.7	60.4	70.0	81.8	88.7	86.8	78.1	65.6	49.2	40.4	62.9
		MEAN	25.1	30.5	37.8	46.0	55.9	66.4	72.7	70.9	61.9	49.6	35.5	27.1	48.3
		MIN	11.9	17.1	23.8	31.6	41.7	51.0	56.7	55.0	45.7	33.5	21.7	13.7	33.6
003	AKRON 1 N	MAX	38.3	43.8	51.7	60.2	69.9	81.8	88.0	86.5	77.3	64.9	48.8	40.1	62.6
		MEAN	27.1	32.2	39.0	47.1	57.0	67.8	73.7	72.3	63.1	51.0	36.7	28.7	49.6
		MIN	15.8	20.6	26.2	34.0	44.1	53.7	59.3	58.0	48.9	37.0	24.6	17.3	36.6
004	ALAMOSA BERGMAN FIELD	MAX	33.1	40.2	49.6	58.7	68.3	78.4	81.7	78.9	72.5	61.7	45.7	34.8	58.6
		MEAN	14.7	22.5	32.7	40.8	50.4	59.4	64.1	62.1	54.5	42.8	28.4	17.1	40.8
		MIN	-3.7	4.7	15.8	22.8	32.4	40.4	46.4	45.2	36.5	23.9	11.1	-0.7	22.9
005	ALTENBERN	MAX	35.8	42.8	52.9	62.0	71.7	83.3	88.8	85.9	77.4	65.0	48.4	37.5	62.6
		MEAN	23.3	30.0	38.7	45.8	54.5	63.2	69.3	67.4	59.3	48.3	34.8	24.9	46.6
		MIN	10.7	17.2	24.4	29.5	37.2	43.1	49.8	48.8	41.1	31.5	21.1	12.2	30.6
007	ANTERO RESERVOIR	MAX	32.3	35.6	41.5	48.0	58.8	70.0	75.4	73.1	66.6	55.9	41.0	32.6	52.6
		MEAN	14.6	17.4	26.3	33.2	43.3	52.3	57.8	56.1	48.8	37.6	24.4	15.0	35.6
		MIN	-3.1	-0.8	11.0	18.4	27.8	34.5	40.1	39.1	31.0	19.3	7.7	-2.7	18.5
008	ASPEN 1 SW	MAX	34.0	38.9	44.6	51.0	61.3	72.1	77.3	75.4	68.5	57.7	42.5	34.8	54.8
		MEAN	20.7	25.1	31.7	37.9	47.4	56.4	61.7	60.5	53.6	43.4	29.8	21.7	40.8
		MIN	7.4	11.2	18.8	24.8	33.5	40.6	46.2	45.6	38.6	29.1	17.0	8.6	26.8
009	BAILEY	MAX	37.8	41.3	46.3	52.5	61.8	73.1	77.7	75.6	68.9	58.8	45.0	37.9	56.4
		MEAN	22.7	25.8	31.6	37.6	46.3	55.4	60.5	58.9	51.5	41.4	30.2	23.3	40.4
		MIN	7.6	10.3	16.9	22.7	30.8	37.6	43.3	42.2	34.1	24.0	15.3	8.6	24.5
010	BERTHOUD PASS	MAX	21.8	25.2	31.0	36.9	45.7	55.4	61.4	60.3	53.1	42.4	29.7	23.4	40.5
		MEAN	12.1	14.4	19.3	25.6	34.6	44.2	50.2	49.6	42.4	31.8	19.6	13.3	29.8
		MIN	2.4	3.6	7.6	14.2	23.5	33.0	38.9	38.8	31.6	21.1	9.5	3.2	19.0
011	BLANCA	MAX	34.2	40.2	48.5	57.0	66.5	77.2	81.1	78.8	72.3	61.6	46.3	35.8	58.3
		MEAN	17.9	24.7	33.8	41.5	50.6	60.0	64.7	62.6	55.0	43.9	30.1	19.6	42.0
		MIN	1.5	9.2	19.0	25.9	34.7	42.8	48.2	46.4	37.7	26.2	13.9	3.4	25.7
012	BLUE MESA LAKE	MAX	27.4	31.9	42.7	54.9	65.5	76.9	82.4	80.6	72.8	61.1	43.8	30.0	55.8
		MEAN	13.6	17.7	29.6	40.1	49.2	58.8	64.8	63.6	55.8	44.8	30.8	17.4	40.5
		MIN	-0.3	3.5	16.5	25.2	32.9	40.6	47.2	46.6	38.7	28.4	17.7	4.8	25.2
014	BONNY DAM 2 NE	MAX	40.0	46.1	54.1	63.6	72.6	83.7	89.2	86.9	77.9	66.2	50.3	41.7	64.4
		MEAN	26.9	32.3	39.4	48.3	58.1	68.6	74.2	72.2	62.9	50.7	37.1	29.0	50.0
		MIN	13.7	18.5	24.6	33.0	43.6	53.5	59.2	57.5	47.9	35.1	23.9	16.2	35.6
015	BOULDER	MAX	45.7	49.1	55.8	62.7	71.7	82.2	87.2	85.0	77.4	66.7	52.6	46.1	65.2
		MEAN	32.5	35.8	41.8	48.3	56.9	66.4	71.6	70.0	62.1	51.9	39.7	33.4	50.9
		MIN	19.2	22.5	27.7	33.9	42.0	50.5	55.9	55.0	46.8	37.1	26.8	20.6	36.5
018	BRIGGSDALE	MAX	40.8	46.6	54.4	63.2	72.5	83.1	89.2	86.9	78.3	66.4	50.0	41.6	64.4
		MEAN	25.8	31.3	38.9	47.3	57.1	67.0	72.9	70.9	61.7	49.8	35.1	26.7	48.7
		MIN	10.7	16.0	23.4	31.3	41.7	50.8	56.5	54.8	45.1	33.1	20.2	11.7	32.9
019	BRIGHTON 3 SE	MAX	41.4	46.8	54.3	62.0	71.6	82.6	87.9	85.9	77.5	66.6	50.1	42.6	64.1
		MEAN	26.8	31.8	39.2	47.3	57.0	66.9	72.1	70.3	61.2	50.0	35.5	28.1	48.9
		MIN	12.2	16.8	24.1	32.5	42.3	51.2	56.3	54.6	44.9	33.3	20.9	13.5	33.6
020	BROWNS PARK REFUGE	MAX	37.3	43.2	51.5	59.8	70.6	82.3	88.8	87.2	77.8	66.0	48.2	38.7	62.6
		MEAN	21.6	27.4	36.3	43.5	53.2	62.0	67.9	66.1	57.0	46.2	32.3	23.2	44.7
		MIN	5.9	11.5	21.1	27.2	35.7	41.6	46.9	44.9	36.1	26.4	16.4	7.7	26.8
021	BUCKHORN MTN 1 E	MAX	38.9	41.5	46.5	52.7	61.6	72.5	79.6	78.5	69.9	59.1	46.3	40.6	57.3
		MEAN	28.0	29.9	35.3	40.8	49.9	59.8	66.7	66.1	57.3	46.9	35.2	29.7	45.5
		MIN	17.1	18.3	24.0	28.8	38.2	47.0	53.8	53.6	44.7	34.6	24.0	18.8	33.6
022	BUENA VISTA 2 S	MAX	39.2	42.6	47.9	54.7	64.8	76.1	80.8	78.3	71.4	61.1	47.0	39.6	58.6
		MEAN	24.7	28.1	34.2	40.3	49.5	59.1	64.0	62.1	54.6	44.2	32.4	24.9	43.2
		MIN	10.1	13.6	20.4	25.8	34.2	42.0	47.2	45.8	37.7	27.2	17.8	10.1	27.7
023	BURLINGTON 4 S	MAX	39.9	45.3	52.8	61.9	71.2	82.9	88.5	86.0	77.8	66.1	49.7	41.4	63.6
		MEAN	27.4	32.1	38.6	47.7	57.6	68.9	74.0	72.1	63.4	51.3	36.9	29.0	49.9
		MIN	14.8	18.8	24.4	33.4	44.0	54.8	59.5	58.2	49.0	36.4	24.1	16.6	36.2
024	BYERS 5 ENE	MAX	40.2	45.3	53.1	61.4	70.9	82.9	89.0	86.9	78.1	66.7	50.2	41.7	63.9
		MEAN	26.1	31.0	38.4	46.6	56.4	67.3	73.1	71.5	62.1	50.4	35.8	27.9	48.9
		MIN	12.0	16.6	23.6	31.8	41.8	51.6	57.2	56.0	46.0	34.1	21.3	14.0	33.8
025	CABIN CREEK	MAX	30.2	32.4	36.6	42.5	52.1	63.4	68.3	66.5	60.0	50.0	37.1	31.9	47.6
		MEAN	18.5	20.4	24.6	31.0	40.6	50.3	55.1	53.6	46.9	37.7	25.4	20.5	35.4
		MIN	6.8	8.4	12.5	19.5	29.0	37.2	41.8	40.6	33.8	25.4	13.7	9.0	23.1
026	CAMPO 7 S	MAX	47.6	53.0	60.2	68.3	77.2	87.8	92.3	89.7	82.2	71.6	57.0	48.5	69.6
		MEAN	31.9	36.6	43.6	52.1	61.8	71.8	76.6	74.5	66.2	54.6	41.2	33.1	53.7
		MIN	16.2	20.2	26.9	35.9	46.3	55.8	60.9	59.3	50.2	37.6	25.3	17.7	37.7
027	CANON CITY	MAX	48.5	52.4	57.8	64.6	73.4	84.3	89.6	87.1	79.1	68.7	55.6	49.0	67.5
		MEAN	34.1	37.7	42.7	49.7	58.8	68.7	74.3	72.6	63.8	53.4	41.7	35.1	52.7
		MIN	19.7	22.9	27.6	34.7	44.2	53.1	59.0	58.0	48.4	38.1	27.7	21.1	37.9
028	CASTLE ROCK	MAX	43.9	46.6	51.9	58.3	67.4	78.2	84.0	81.9	74.4	65.0	51.2	45.0	62.3
		MEAN	28.8	32.0	37.7	44.3	53.5	62.9	68.6	66.7	58.7	48.4	36.2	29.9	47.3
		MIN	13.6	17.4	23.4	30.2	39.5	47.6	53.1	51.4	43.0	31.8	21.2	14.8	32.3



COLORADO

PRECIPITATION NORMALS (Total in Inches)

No.	Station Name	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
001	AGUILAR 1 SE	.37	.54	1.61	1.96	2.91	1.66	2.82	3.04	1.53	1.08	.95	.71	19.18
002	AKRON 4 E	.36	.37	1.06	1.42	3.00	2.28	2.95	2.26	.98	.85	.70	.36	16.59
003	AKRON 1 N	.33	.36	1.04	1.58	3.15	2.32	2.93	2.00	.92	.90	.69	.40	16.62
004	ALAMOSA BERGMAN FIELD	.25	.21	.46	.54	.70	.59	.94	1.19	.89	.67	.48	.33	7.25
005	ALTENBERN	1.13	1.29	1.65	1.51	1.81	.97	1.35	1.36	1.64	1.82	1.41	1.06	17.00
006	AMES	1.68	1.79	2.43	1.87	1.99	1.37	2.71	3.24	2.74	2.29	1.87	1.59	25.57
007	ANTERO RESERVOIR	.21	.25	.52	.73	1.02	1.18	1.89	1.97	.93	.64	.37	.26	9.97
008	ASPEN 1 SW	1.72	2.05	2.74	2.56	2.10	1.26	1.76	1.37	1.65	2.06	2.24	1.75	23.26
009	BAILEY	.40	.54	1.28	1.92	2.10	1.76	2.55	2.68	1.25	1.15	.89	.58	17.10
010	BERTHOUD PASS	3.09	2.60	3.65	4.49	3.99	2.11	2.25	2.75	2.24	2.30	3.37	2.68	35.52
011	BLANCA	.32	.31	.58	.64	1.00	.73	1.44	1.50	1.01	.79	.58	.33	9.23
012	BLUE MESA LAKE	.91	.67	.53	.51	.55	.59	1.16	1.31	.83	.77	.64	.79	9.26
013	BONHAM RESERVOIR	3.23	3.27	4.26	3.19	2.69	1.31	2.26	2.37	2.23	2.66	3.39	3.03	33.89
014	BONNY DAM 2 NE	.46	.45	1.22	1.83	3.48	2.70	2.81	2.17	1.39	1.00	.75	.36	18.62
015	BOULDER	.70	.75	1.78	2.88	3.05	1.99	1.88	1.63	1.79	1.28	1.42	.78	19.93
016	BRANDON	.19	.21	.65	1.13	2.37	2.14	2.43	2.06	.83	.89	.48	.19	13.57
017	BRECKENRIDGE	1.43	1.41	1.81	1.90	1.87	1.40	2.29	2.18	1.55	1.20	1.38	1.31	19.73
018	BRIGGSDALE	.30	.19	.78	1.28	1.94	2.07	2.51	1.81	1.28	.66	.45	.26	13.53
019	BRIGHTON 3 SE	.45	.38	1.19	1.74	2.44	1.68	1.63	1.50	1.08	.85	.88	.52	14.34
020	BROWNS PARK REFUGE	.39	.45	.74	.81	1.16	.69	.68	.66	1.00	1.16	.56	.37	8.67
021	BUCKHORN MTN 1 E	.87	.57	2.05	2.86	3.37	2.50	2.48	2.08	2.03	1.07	1.18	.56	21.62
022	BUENA VISTA 2 S	.28	.40	.69	.94	1.09	.86	1.45	1.67	.94	.82	.53	.36	10.03
023	BURLINGTON 4 S	.33	.42	1.05	1.35	2.88	2.50	2.77	2.28	1.04	.94	.58	.34	16.48
024	BYERS 5 ENE	.43	.35	1.04	1.57	2.76	1.86	2.33	1.81	1.13	.82	.81	.43	15.34
025	CABIN CREEK	.68	.84	1.62	2.49	2.09	1.78	2.53	2.74	1.59	1.19	1.10	.78	19.43
026	CAMPO 7 S	.31	.34	.99	1.51	2.59	2.49	2.91	2.53	1.47	1.19	.54	.34	17.21
027	CANON CITY	.46	.38	1.06	1.47	1.64	1.24	1.78	2.05	1.21	.72	.80	.49	13.30
028	CASTLE ROCK	.55	.53	1.50	1.87	2.42	1.92	2.37	2.16	1.24	1.09	.98	.71	17.34
029	CEDAREDGE	1.19	.88	1.34	.97	1.22	.59	.91	1.19	1.10	1.65	1.24	.97	13.25
030	CENTER 4 SSW	.16	.17	.37	.39	.62	.67	1.11	1.30	.91	.57	.46	.25	6.98
031	CHEESMAN	.42	.56	1.41	1.78	2.04	1.92	2.57	2.75	1.20	1.08	.86	.66	17.25
032	CHERRY CREEK DAM	.49	.47	1.50	2.08	2.85	2.00	2.46	2.05	1.44	1.03	1.18	.65	18.20
033	CHEYENNE WELLS	.25	.34	.86	1.29	2.80	2.41	2.63	2.45	1.31	.81	.60	.25	16.00
034	CIMARRON	.92	.75	1.02	1.12	1.20	.84	1.28	1.36	1.41	1.38	1.12	.76	13.16
035	CLIMAX	2.04	1.75	2.35	2.38	2.10	1.13	2.24	2.09	1.49	1.42	1.96	1.84	22.79
036	COCHETOPA CREEK	.74	.67	.82	.91	1.01	.71	1.52	1.81	1.14	.82	.73	.79	11.67
037	COLLBRAN	.87	.89	1.54	1.52	1.56	.76	1.09	1.18	1.16	1.59	1.22	.96	14.34
038	COLORADO NATL MONUMENT	.71	.67	1.14	.93	1.21	.68	.86	1.02	.93	1.29	.95	.78	11.17
039	COLORADO SPRINGS MNPL A	.28	.35	1.06	1.62	2.39	2.34	2.85	3.48	1.23	.86	.52	.42	17.40
040	CORTEZ	1.01	.95	1.37	.90	1.01	.43	1.23	1.37	1.31	1.55	1.18	.90	13.21
041	CRAIG 4 SW	1.05	1.12	1.39	1.63	1.52	1.11	1.34	1.15	1.39	1.82	1.38	.97	15.87
042	CREEDE	.46	.60	.65	.76	.85	.79	1.48	2.40	1.52	1.37	.99	.58	12.45
043	CRESTED BUTTE	2.58	2.44	2.36	1.82	1.63	1.17	1.90	2.00	1.97	1.76	2.09	2.15	23.87
044	CRESTONE 1 SE	.64	.37	.93	1.00	1.09	.86	2.44	2.03	1.25	1.03	.75	.53	12.92
045	DEL NORTE 2 E	.31	.34	.83	.71	.89	.77	1.59	1.94	1.13	.83	.65	.47	10.46
046	DELTA	.37	.39	.66	.53	.69	.40	.72	.79	.90	1.07	.67	.42	7.61
047	DENVER INTL AP (DNR)	.51	.49	1.28	1.93	2.32	1.56	2.16	1.82	1.14	.99	.98	.63	15.81
048	DENVER STAPELTON	.51	.49	1.28	1.93	2.32	1.56	2.16	1.82	1.14	.99	.98	.63	15.81
049	DILLON 1 E	.86	.95	1.13	1.22	1.45	1.21	1.75	1.66	1.32	.78	.87	.83	14.03
050	DINOSAUR NATL MONUMNT	.72	.62	1.01	1.21	1.41	.85	1.00	.85	1.21	1.48	.80	.57	11.73
051	DOLORES	1.71	1.63	2.16	1.46	1.40	.66	1.43	1.77	1.64	2.12	2.03	1.36	19.37
052	DURANGO	1.65	1.44	1.71	1.30	1.17	.61	1.64	2.58	1.94	2.10	1.82	1.37	19.33
053	EADS	.30	.34	.97	1.31	2.47	2.07	2.80	2.24	1.06	.89	.64	.34	15.43
054	EAGLE AP	.75	.61	.80	.79	.92	.84	1.44	.93	1.08	1.09	.67	.80	10.72
055	EASTONVILLE 2 NNW	.45	.45	1.40	2.19	2.91	2.16	3.01	3.35	1.34	1.05	.91	.54	19.76
056	ESTES PARK	.32	.47	.90	1.42	2.11	1.43	2.16	1.98	1.23	.93	.63	.37	13.95
057	EVERGREEN	.54	.68	1.69	2.53	2.60	2.05	2.29	2.38	1.45	1.26	1.05	.78	19.30
058	FLAGLER 1 S	.35	.36	.98	1.48	2.79	2.65	2.72	2.31	1.11	.79	.67	.35	16.56
059	FLEMING	.34	.37	1.02	1.54	3.08	2.70	2.83	1.94	1.33	.74	.58	.34	16.81
060	FLORISSANT FOSSIL BED	.29	.30	.81	1.06	1.61	1.41	2.73	3.02	1.47	.84	.61	.27	14.42
061	FORT CARSON	.28	.19	.79	1.18	2.19	1.74	2.89	3.13	.97	.69	.39	.31	14.75
062	FORT COLLINS	.42	.38	1.42	2.09	2.60	1.99	1.87	1.40	1.38	.98	.82	.49	15.84
063	FORT LEWIS	1.65	1.40	1.78	1.05	1.23	.62	2.14	2.45	1.90	1.98	1.71	1.23	19.14
064	FORT MORGAN	.21	.18	.74	1.33	2.41	1.98	1.93	1.58	1.21	.81	.49	.26	13.13
065	FOUNTAIN	.31	.31	.82	1.51	2.26	2.19	3.23	3.54	1.20	.79	.51	.38	17.05
066	FOWLER 1 SE	.20	.19	.71	1.13	1.78	1.35	1.77	1.99	.77	.64	.48	.28	11.29
067	FRASER	1.66	1.56	1.58	1.99	1.94	1.16	1.49	1.43	1.15	.96	1.51	1.70	18.13
068	FRUITA 1 W	.65	.57	.96	.77	1.04	.51	.77	.73	.78	1.01	.74	.65	9.18
069	GATEWAY 1 SE	.78	.63	1.17	1.08	1.13	.53	1.07	1.26	1.05	1.23	1.03	.64	11.60

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Walking Tour

SELF GUIDED WALKING TOUR OF MARBLE, COLORADO

This is an update and revision of the tour guide prepared by Duncan McCollum for the Marble Historical Society. It begins at the museum at 412 West Main, and proceeds east to West 1st St, then south to State St, then west to West 2nd St, then south to Park St, then west to West 3rd St, and finally south to the mill site. The route requires about 1 hour to complete. You may obtain a copy of this guide at the museum (hours are generally 2-4 PM on Saturday and Sunday), or you may print this page using your browser.

WELCOME TO MARBLE! Have you ever seen the Lincoln Memorial in Washington DC, or the Denver Post Office, or the Tomb of the Unknown Soldier, and wondered where the beautiful white stone came from? You are standing in the town which produced that stone, as well as marble for the New York City Municipal Building, the Montana State Capital, and hundreds of other buildings.

This tour guide will take you on a short tour of Marble Colorado. As you follow the route you will see some of the buildings which were a part of this once thriving quarry town. For each numbered point of interest on the map there is a brief description in this guide. While you walk the tour please stay on the roadsides, as all of the buildings are located on private property. For their safety, children should be accompanied by an adult. You are welcome to wander through and picnic at the Mill Site, which is a town park.

WARNING! All of the marble that you see is privately owned, and is valuable (about $1/lb, and a cubic foot of marble weighs 170 lbs). Do not attempt to steal the marble!

THE PURE WHITE STONE. Marble was a unique type of boom town. Instead of gold or silver mining, its economy was based on an entire mountainside of the finest marble found anywhere in the world.

The marble deposits were discovered in 1873 by a geological survey expedition when the Crystal River Valley was still part of the Ute Indian Reservation. Soon after, the Utes were removed farther west, and prospectors and settlers entered the area, founding Marble in 1881. Eighteen years later the Town was officially incorporated and began its forty year cycle of boom and bust. The peak period in Marble's history was the five years preceding the United States' entry into World War I in 1917, when the town supported a population of 1400.

The marble quarries are located four miles south of the town in rugged terrain. Quarried blocks of stone were transported down in a variety of ways. The earliest method was to haul them behind teams of horses. The horses were soon replaced by a huge steam tractor and four wagons. Finally, an electric railroad, called a tram or trolley, was constructed which ran directly into the finishing mill located along the Crystal River. Today specially equipped large trucks bring the stone down the mountain.

At the finishing mill in Marble dozens (or hundreds) of skilled stoneworkers cut and carved the stone, readying it for uses as varied as tombstones and courthouses.

1) MARBLE HIGH SCHOOL. The Marble High School was built in 1910 when Marble had 200 school age children. About three-fourths of these children regularly attended school. In later years, as the town's population dwindled, all twelve grades met in this building. In the 1940's the school was closed. In 1996, after extensive renovation, it was reopened as the Marble Charter School. The building also houses the museum of the Marble Historical Society.

Originally the winters in Marble were much more severe than they are now, and the school year was April thru October, thus bypassing the winter months. The school was built without indoor plumbing, and some of the students were charged with bringing water from the river each morning. The outhouse in the back of the school is original.

2) TOWN HALL. Across the street from the High School is one of Marble's former private homes. Most of the original homes in Marble have been lost due to fire, mud slides, and removal of buildings (generally to Grand Junction, where they remain to this day). The building stands on the site of the old Marble Grade School. This house was originally located at West 2nd and Park Streets where it was used as a schoolhouse during the 1940's. It was moved to its present location after the Marble Grade School building was demolished in 1942. Today it houses the Marble Town Offices.

3) CONCRETE VAULT. Approximately 200 yards east of the High School on the right hand side of the road stands a concrete vault. Next to it is the foundation of the offices of the Colorado Yule Marble Company to which the vault was attached. The office building was occupied only until 1908 when the company moved its offices to the newly completed finishing mill. This vault was used to protect valuable papers from theft or fire, and is all that remains of the original office building.

4) THE OLD PERRY HOUSE. One block east on Main Street is the former residence of William D. Perry, one of the founders of Marble. Perry and William Woods founded the town in 1881. The house, as well as most others in town, was furnished with 'outside plumbing'. To this day there is no sewer system in Marble.

5) MARBLE CITY STATE BANK. At the end of the same block is the building which housed the Marble City State Bank from 1912 to 1917. These years were Marble's greatest boom period and the only time the town had a bank (though it had up to 3 newspapers). Inside the building is concrete vault complete with door and lock. The construction is unusual: the walls are solid wood, to deter thieves.

6) HOUSE. One block north of the bank building is one of the few houses in Marble still in its original condition and location. It was one of the large private residences in the town.

7) RESTORED HOUSE. Across the street is another private home. It was swept off its foundation by the 1941 flash flood of Carbonate Creek which damaged much of the center of the town. You may notice that all of Marble is on mudflow, and mudflows occur nearly every year, sometimes blocking traffic for hours. The 1941 mudflow was particularly large. In 1975 this house was returned to its rebuilt foundation and restored by the great-grandson of Horace Williams, the original owner. The building was moved over 30 feet by the mudflow.

8) FLOOD DAMAGED HOUSE. Two blocks south, on West 1st St is the remains of house which as damaged during flash floods in 1941 and 1945. The house is now buried in 3 to 4 feet of once swiftly flowing mud and stone. Both of these floods occurred after Marble had virtually ceased to exist as a functioning town (at one point the population was reputedly one) and neither caused any serious personal injuries. Little remains of the many other buildings damaged by these two very destructive floods.

9) JAIL. A small building a foul balls distance from third base at the baseball field is an old two cell jail. The cells are still there.

10) HOUSE. West on State Street are three original buildings. The first is a private residence which has been maintained since the early days of Marble.

11) SMALL HOUSE. Next door is a little house which started as a tent on a board floor that reportedly rented for $40 per month. Later, board walls and finally a wood roof were added. From about 1905 to 1915 Marble grew rapidly and experienced a housing shortage so that many residents lived in tent houses.

12) ST. PAUL'S EPISCOPAL CHURCH. This church was moved to Marble from Aspen in 1908. The steeple was added two years later. Inside is an operating pump organ which has been used during services since the church was moved to Marble. There is a separate page which gives much more detail about the church.

13) COLUMBUS CATHOLIC CHURCH FOUNDATION. One block south of the church, on Park Street, is a marble foundation constructed in 1912 for the Columbus Catholic Church. The stone building never progressed beyond the point seen here.

The marble for its construction had been donated by the Colorado Yule Marble Company until the company president, Colonel Channing F. Meek, was killed by a runaway train on the electric tram. After his death in 1912 donations of marble ceased, and the building was never completed.

14) FINISHING MILL SITE. Beginning at the south end of West 3rd St (basically where the bridge crosses the Crystal River), and running west for 1500 feet is the site of what was formerly the world's largest marble finishing mill. It was here that marble from the quarries was brought to be cut, carved, and polished before shipment to building sites around the country. Today there are few remnants of the vast building, but because of its unique nature the site has been entered on the National Register of Historic Sites. Because it is a federally protected area it must be stressed that nothing in the Mill Site be disturbed, including the scraps of marble scattered about. It is also a town park that you are welcome to explore.

In the finishing mill site are two rows of marble pillars. Each of these rows supported one end of an overhead crane. These cranes unloaded rough marble blocks from the electric trolley and moved them into the mill for processing. They had capacities of 15 and 25 tons. Also note the two high standing marble walls. They were firewalls, built between major shops in the mill and intended to help slow the spread of a blaze should a fire start.

In 1942 the mill was disassembled and marble production ceased because of increasing costs and a dwindling market.

Near the mill site (immediately east, across the street) is a sixty foot diameter, marble lined hole. This was the railroad turntable where locomotives were turned around by hand for the trip out of Marble.

The bridge across the Crystal River near the turntable was built in 1976, financed in part with federal grant money as a Bicentennial Project. A few yards downstream are some of the pilings from the original bridge over which the trolley carried marble to the finishing mill.

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About the Crystal Valley

The Crystal Valley (or the Upper Crystal Valley, for some folks) extends from the intersection of Route 133 and Country Road 3 (where the main road turns off to Marble) up to Scholfield Park, a total distance of about 15 miles. About half of that (say, 8 miles) is either paved or at least maintained. The other half is four wheel drive only. The valley includes two ghost towns: Marble and Crystal. Crystal is about 6 miles east of Marble, and is inhabited only in the summer. Marble is inhabited the year around, although the year around population is probably less than one hundred, and the main road through town is unpaved. There are no stree lights, stop lights, or any other trappings of civilization.

The valley is traversed by the Crystal River, which has its origin above Scholfield Park. The river is very scenic, and lives up to its name: the water is so pure that native fish populations have a hard time surviving due to the lack of nutrients. Fishing ranges from mediocre to excellent - you have to know where to go, and we ain't telling here.

The forests consist of both Aspen groves, and evergreens. Legend has it that the Ut Indians, upon being driven out of the valley by the early prospectors and settlers, s fire to the valley. For good measure they also put a curse on it. At any rate, if the legend be true, the fire gave the Aspen groves a chance to get started - Aspens are just big weeds, and will repopulate a burn first. The evergreens take longer. At any rate, for whatever reason, there is a large population of Aspen. Many years the bes fall colors in all of Colorado are in the Crystal Valley, causing a huge influx of tourists during the end of September, and the beginning of October. The combination of evergreens and Aspens is mind boggling. As an aside (whatever were we talking about anyway?), it is said that Aspen groves are the largest and oldest living organisms - the contention being that a grove is a single plant, and some groves are tens of thousands of years old. Go figure.

We should also mention, while talking about plants in the valley, that you can find morel mushrooms. But ya gotta know where, and we ain't telling here.

Wildlife includes deer, elk, cougar, bear, raccoon, fox, marmot, chipmunk, squirrel, rabbit, skunk, grouse, mice, big horn sheep, mountain goats, eagles, and tourists. A are harmless, except the mice (hantavirus) and the tourists.

Insects include ticks and glow worms. Honest to God. Residents devise ingenious methods of killing ticks (pulling off all the legs, and letting it lose to starve is a favorite). The little blood suckers don't get any more mercy than lawyers. Incidentally, to the best of our knowledge there are no lawyers in the valley, which

is why they are not listed under wildlife, above. The glow worms may be found in July on south facing slopes. They are about 3/8's of an inch long, and emit a greenish glow continuously from one end. Which end I haven't the faintest. Of course there are all the other usual suspects, but nothing to write home about. In particular, the mosquitoes are not bad, but they are there.

Mines. Lots of mines. Two old prospectors still come into the valley every year, an work a claim on the top of Treasure Mountain. There's a jeep track up the mountai and they will meet you if you try to cross their claim. With rifles. Anyway, there ar mines or exploratory shafts everywhere. Most have been sealed, but it is still possible to come across a few dozen mines in an afternoon of exploring. Try Sheep Mountain, which is riddled with shafts.

But it was marble that could be converted to gold. One of the worlds largest concentrations of marble is in the mountains immediately south of the town of Marble. Originally, the marble formed a cap about 8 miles in diameter, and several hundred feet thick. Over time erosion caused it to be exposed in places. In the very early 1900's, a couple of quarries (actually, they are mines, since the marble is extracted from within the mountain) began operation. A finishing mill was established in Marble (aptly named, don't you think?), and the rest, as they say, wa history. The Yule Marble Quarry produced some of the finest marble in the world (still does), and the finishing mill was the worlds largest. Marble from Marble was used in hundreds of buildings, including the Lincoln Memorial and the Tomb of th Unknown Soldier. Declining use as a building material, and World War II finally did in the quarry, and the town of Marble. By 1945 the population of Marble was down to one hearty or crazy soul. The quarry was reopened in 1990, and continues operation today, though the finishing of the stone is done elsewhere.

The population of the Crystal Valley is probably about 300 hearty souls, all of them rugged self sufficient individualists. You have to be self sufficient to survive in the valley - we roar with laughter when visitors ask 'don't you have trouble getting tradesmen?'. Since almost anything can happen at any time, ya gotta be prepared, and able to cope.

There are no bars, and only one church. The church was built in Aspen, and brought over on the back of a railcar. It is a classically white little church which inspires lots of people to get married. The pastor is Linda Arocha, who is a real hoc - you have to go at least once. It is a rare combination of magic and religion.

There is also a school - the Marble Charter School. Housed in the renovated old High School building of Marble, the school is parent run and enrolls students from kindergarten thru 8th grade. It is one of those rare little gems that are almost impossible to find anymore. As a charter school (one of the first in Colorado) MCS part of the public school system, but is quite independent of the rules and restrictions of the typical and traditional public school. With two truly gifted

teachers and about 20 students, the school is a dream come true.

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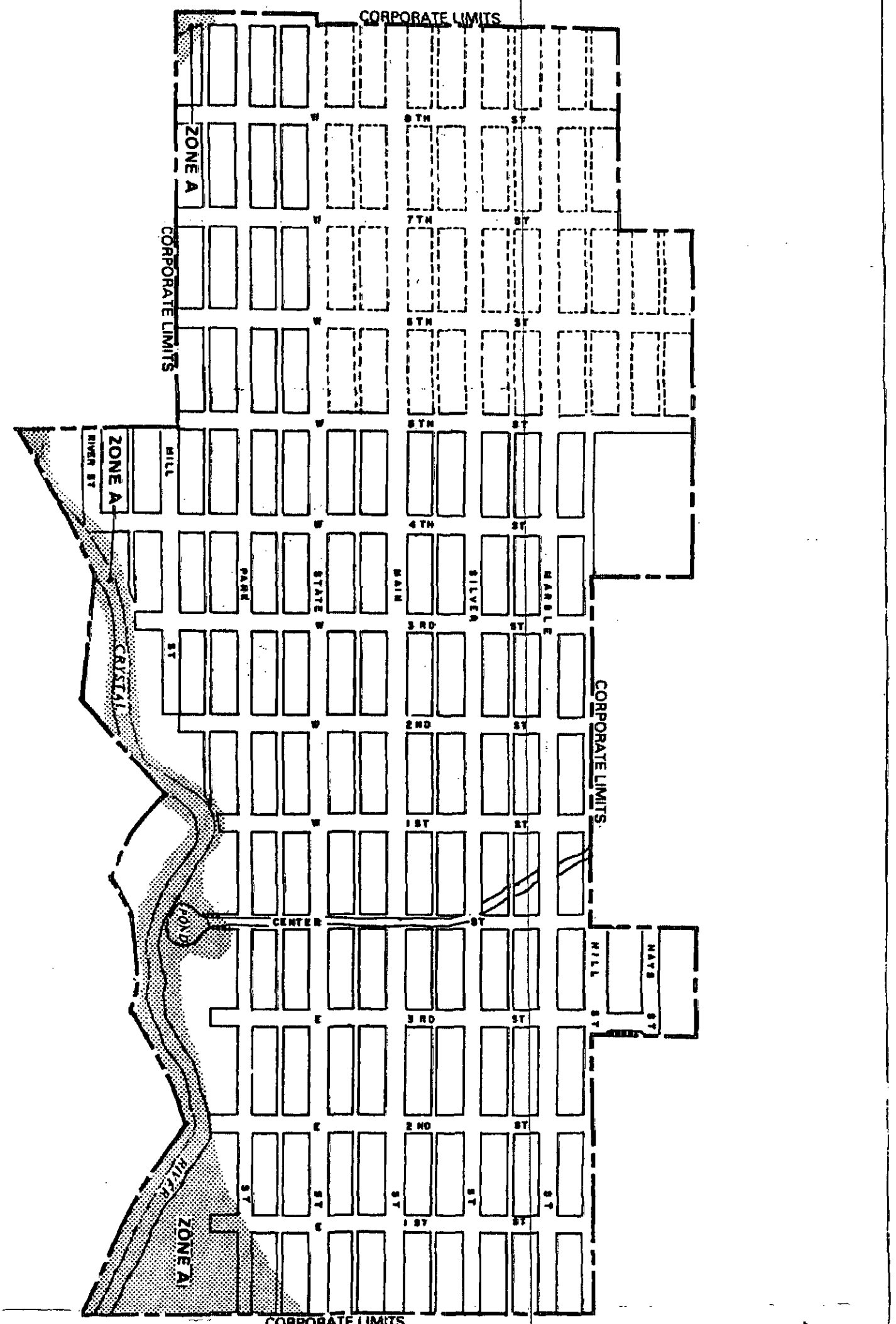

01	DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Federal Insurance Administration **TOWN OF MARBLE, CO** (GUNNISON CO.)	APPROXIMATE SCALE 400 0 400 800 1200 FEET	EFFECTIVE DATE 6/17/77
		FLOOD HAZARD BOUNDARY MAP	

TECHNICAL APPENDIX

APPENDIX B: Hydrologic Data

03-023-CRY-415
'Hydrology'

1.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for each flooding source studied in detail affecting the geographic area of the Town of Marble, Colorado.

Discharges along the Crystal River were calculated using the PEAKFQ computer program (Reference 1) which uses a log-Pearson Type III frequency analysis. The analysis is based on USGS gage information, totaling over 45 years of record, along the Crystal River, just downstream of the Town of Marble. Peak discharges from the USGS gaging stations were adjusted along the study reach based on the guidelines provided in the Manual for Estimating Characteristics of Natural-Flow Streams in Colorado, Technical Manual No. 1 (Reference 2).

Peak discharge-drainage area relationships for the streams studied by detailed methods are shown in Table 1.

Table 1. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharge (cfs) 10-Year	50-Year	100-Year	500-Year
Crystal River					
Confluence with Rapid Creek	93.05	1994	2445	2625	3028
Confluence with Milton Creek	83.65	1833	2248	2413	2783
Town of Marble	73.59	1657	2031	2181	2515
Upstream Limit of Study	53.32	1284	1575	1691	1950

9.0 BIBLIOGRAPHY AND REFERENCES

1. U.S. Geological Survey, Computer Program PEAKFQ Version 4.0, Annual Flood Frequency Analysis Using Bulletin 17B Guidelines, December 2000.

2. Colorado Water Conservation Board, Colorado Department of Natural Resources, Manual for Estimating Flood Characteristics of Natural-Flow Streams in Colorado, Technical Manual No. 1, 1976

Preliminary Hydrology Section, sent to Tom Bowing CWCB on 10/8/03. -DJS Discussed w/ Tom on 10/9/03. Tom said he felt comfortable w/ Hydrology based on assumptions. CDJS also said he was comfortable. Any other adjustments would not yeild signficantly different results. This analysis incorporates major storms that occured outside of the Placita Gage years of record.

1

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
Following Bulletin 17-B Guidelines
Program peakfq
(Version 4.0, December, 2000)

--- PROCESSING DATE/TIME ---

2003 OCT 7 10:29:09

--- PROCESSING OPTIONS ---

Plot option	= Graphics & Printer
Basin char output	= None
Print option	= Yes
Debug print	= No
Input peaks listing	= Long
Input peaks format	= WATSTORE peak file

1

U. S. GEOLOGICAL SURVEY
ANNUAL PEAK FLOW FREQUENCY ANALYSIS
Following Bulletin 17-B Guidelines
Program peakfq
(Version 4.0, December, 2000)

Station - 09081550 CRYSTAL RIVER AT PLACITA, CO.
2003 OCT 7 10:29:09

I N P U T D A T A S U M M A R Y

Number of peaks in record	=	45
Peaks not used in analysis	=	0
Systematic peaks in analysis	=	45
Historic peaks in analysis	=	0
Years of historic record	=	0
Generalized skew	=	-0.300
Standard error of generalized skew	=	0.550
Skew option	=	WEIGHTED
Gage base discharge	=	0.0
User supplied high outlier threshold	=	--
User supplied low outlier criterion	=	--
Plotting position parameter	=	0.00

********* NOTICE -- Preliminary machine computations. *********
********* User responsible for assessment and interpretation. *********

WCF134I-NO SYSTEMATIC PEAKS WERE BELOW GAGE BASE. 0.0
WCF195I-NO LOW OUTLIERS WERE DETECTED BELOW CRITERION. 743.7
WCF163I-NO HIGH OUTLIERS OR HISTORIC PEAKS EXCEEDED HHBASE. 3317.8

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Station - 09081550 CRYSTAL RIVER AT PLACITA, CO.
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ANNUAL FREQUENCY CURVE PARAMETERS -- LOG-PEARSON TYPE III

	FLOOD BASE		LOGARITHMIC		
	DISCHARGE	EXCEEDANCE PROBABILITY	MEAN	STANDARD DEVIATION	SKEW
SYSTEMATIC RECORD	0.0	1.0000	3.1961	0.1191	0.022
BULL.17B ESTIMATE	0.0	1.0000	3.1961	0.1191	-0.067

ANNUAL FREQUENCY CURVE -- DISCHARGES AT SELECTED EXCEEDANCE PROBABILITIES

ANNUAL EXCEEDANCE PROBABILITY	BULL.17B ESTIMATE	SYSTEMATIC RECORD	'EXPECTED PROBABILITY' ESTIMATE	95-PCT CONFIDENCE LIMITS FOR BULL. 17B ESTIMATES LOWER	UPPER
0.9950	762.0	779.6	730.1	642.5	863.2
0.9900	819.0	833.8	792.1	700.1	919.3
0.9500	995.4	1002.0	980.1	881.5	1092.0
0.9000	1103.0	1106.0	1093.0	993.5	1198.0
0.8000	1248.0	1247.0	1242.0	1144.0	1342.0
0.5000	1576.0	1569.0	1576.0	1472.0	1687.0
0.2000	1980.0	1978.0	1989.0	1841.0	2161.0
0.1000	2228.0	2234.0	2248.0	2052.0	2472.0
0.0400	2523.0	2544.0	2564.0	2295.0	2857.0
0.0200	2732.0	2768.0	2794.0	2463.0	3138.0
0.0100	2933.0	2986.0	3022.0	2622.0	3414.0
0.0050	3129.0	3202.0	3250.0	2774.0	3687.0
0.0020	3383.0	3484.0	3555.0	2969.0	4046.0
0.6667	1399.4	(1.50-year flood)			
0.4292	1654.5	(2.33-year flood)			

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Station - 09081550 CRYSTAL RIVER AT PLACITA, CO.
2003 OCT 7 10:29:09

I N P U T D A T A L I S T I N G

WATER YEAR	DISCHARGE	CODES	WATER YEAR	DISCHARGE	CODES
1956	1687.0		1979	1849.0	
1957	2797.0		1980	2038.0	
1958	2031.0		1981	1364.0	
1959	1476.0		1982	1483.0	
1960	1430.0		1983	2938.0	
1961	1500.0		1984	2165.0	
1962	1680.0		1985	2249.0	
1963	1260.0		1986	2038.0	
1964	1490.0		1987	1174.0	
1965	1710.0		1989	949.0	
1966	940.0		1990	1195.0	
1967	1670.0		1991	1596.0	
1968	1880.0		1992	998.0	
1969	1460.0		1993	2151.0	
1970	1690.0		1994	1350.0	
1971	1940.0		1995	2411.0	
1972	1630.0		1996	1244.0	
1973	1930.0		1997	1722.0	
1974	1300.0		1998	1343.0	
1975	1820.0		1999	1230.0	
1976	1540.0		2000	1413.0	
1977	929.0		2001	1005.0	
1978	1638.0				

Explanation of peak discharge qualification codes

PEAKFQ CODE	WATSTORE CODE	DEFINITION
D	3	Dam failure, non-recurrent flow anomaly
G	8	Discharge greater than stated value
X	3+8	Both of the above
L	4	Discharge less than stated value
K	6 OR C	Known effect of regulation or urbanization
H	7	Historic peak

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Station - 09081550 CRYSTAL RIVER AT PLACITA, CO.
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EMPIRICAL FREQUENCY CURVES -- WEIBULL PLOTTING POSITIONS

WATER YEAR	RANKED DISCHARGE	SYSTEMATIC RECORD	BULL.17B ESTIMATE
1983	2938.0	0.0217	0.0217
1957	2797.0	0.0435	0.0435
1995	2411.0	0.0652	0.0652
1985	2249.0	0.0870	0.0870
1984	2165.0	0.1087	0.1087
1993	2151.0	0.1304	0.1304
1980	2038.0	0.1522	0.1522
1986	2038.0	0.1739	0.1739
1958	2031.0	0.1957	0.1957
1971	1940.0	0.2174	0.2174
1973	1930.0	0.2391	0.2391
1968	1880.0	0.2609	0.2609
1979	1849.0	0.2826	0.2826
1975	1820.0	0.3043	0.3043
1997	1722.0	0.3261	0.3261
1965	1710.0	0.3478	0.3478
1970	1690.0	0.3696	0.3696
1956	1687.0	0.3913	0.3913
1962	1680.0	0.4130	0.4130
1967	1670.0	0.4348	0.4348
1978	1638.0	0.4565	0.4565
1972	1630.0	0.4783	0.4783
1991	1596.0	0.5000	0.5000
1976	1540.0	0.5217	0.5217
1961	1500.0	0.5435	0.5435
1964	1490.0	0.5652	0.5652
1982	1483.0	0.5870	0.5870
1959	1476.0	0.6087	0.6087
1969	1460.0	0.6304	0.6304
1960	1430.0	0.6522	0.6522
2000	1413.0	0.6739	0.6739
1981	1364.0	0.6957	0.6957
1994	1350.0	0.7174	0.7174
1998	1343.0	0.7391	0.7391
1974	1300.0	0.7609	0.7609
1963	1260.0	0.7826	0.7826
1996	1244.0	0.8043	0.8043
1999	1230.0	0.8261	0.8261
1990	1195.0	0.8478	0.8478
1987	1174.0	0.8696	0.8696
2001	1005.0	0.8913	0.8913
1992	998.0	0.9130	0.9130
1989	949.0	0.9348	0.9348
1966	940.0	0.9565	0.9565
1977	929.0	0.9783	0.9783

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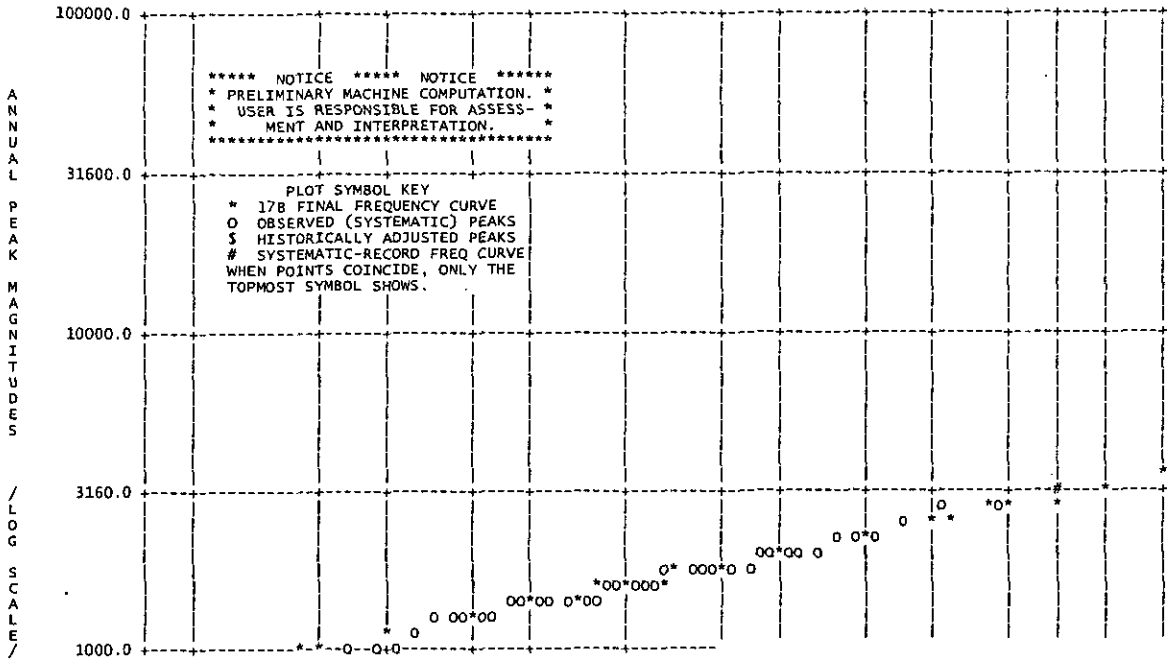
PLACITAF.OUT
(Version 4.0, December, 2000)

2003 OCT 7 10:29:09

Station - 09081550 CRYSTAL RIVER AT PLACITA, CO.



Year	Peak flow Avalanche Gage	Peak flow Placita Gage	Avalanche Gage Adjusted* to Placita drainage area	% difference
1961	2270	1500	1596	6
1962	2620	1680	1842	10
1963	1410	1260	991	-21
1964	2240	1490	1574	6
1965	2780	1710	1954	14
1966	1250	940	879	-7
1967	2580	1670	1813	9
1968	2690	1880	1891	1
1969	1930	1460	1357	-7
1970	1980	1690	1392	-18
1971	2140	1940	1504	-22
1972	2080	1630	1462	-10
1973	2980	1930	2095	9
1975	2580	1820	1813	0
1976	1910	1540	1343	-13
1977	1730	929	1216	31
			avg. =	-0.88 over 16 years
			avg. =	11.50% each year

Drainage Area Avalanche Gage = 167 square miles
Drainage Area Placita Gage = 107 square miles
*Adjustment based on TM-1, CWCB : Qt(u) = (Au/Ag)^.79*Qt(g)

The results indicate that over the 16-year period of record, the Avalanche Creek Gage adjusted to the Placita Gage exceeded the Placita Gage discharge 9 times and was lower than the Placita Gage discharge 7 times, averaging a percent diference each year of 11.5 % However, comparing the entire 16-year period, the average peak discharge varied less than 1% from the determined gage records at Placita. Therefore it was determined that the comparison was reasonable and the Placita Gage records could be extended using the Avalanche Creek gage records adjusted to the Placita Gage.

Year	Peak flow Avalanche Gage	Peak flow Placita Gage	Avalanche Gage Adjusted* to Placita drainage area	Peak flow Placita Gage Fabricated
1956	2400		1687	1687
1957	3980		2797	2797
1958	2890		2031	2031
1959	2100		1476	1476
1960	1760	1430	1237	1430
1961	2270	1500	1596	1500
1962	2620	1680	1842	1680
1963	1410	1260	991	1260
1964	2240	1490	1574	1490
1965	2780	1710	1954	1710
1966	1250	940	879	940
1967	2580	1670	1813	1670
1968	2690	1880	1891	1880
1969	1930	1460	1357	1460
1970	1980	1690	1392	1690
1971	2140	1940	1504	1940
1972	2080	1630	1462	1630
1973	2980	1930	2095	1930
1974	1850		1300	1300
1975	2580	1820	1813	1820
1976	1910	1540	1343	1540
1977	1730	929	1216	929
1978	2330		1638	1638
1979	2630		1849	1849
1980	2900		2038	2038
1981	1940		1364	1364
1982	2110		1483	1483
1983	4180		2938	2938
1984	3080		2165	2165
1985	3200		2249	2249
1986	2900		2038	2038
1987	1670		1174	1174
1988	.--	.--	.--	.--
1989	1350		949	949
1990	1700		1195	1195
1991	2270		1596	1596
1992	1420		998	998
1993	3060		2151	2151
1994	1920		1350	1350
1995	3430		2411	2411
1996	1770		1244	1244
1997	2450		1722	1722
1998	1910		1343	1343
1999	1750		1230	1230
2000	2010		1413	1413
2001	1430		1005	1005

Summary of Discharges

Location	DA	(DA/DAG)	(DA/DAG)^0.79	Q10	Q50	Q100	Q500
Upstream Limit of Study	53.32	0.50	0.58	1284	1575	1691	1950
Town of Marble	73.59	0.69	0.74	1657	2031	2181	2515
Confluence with Milton Creek	83.65	0.78	0.82	1833	2248	2413	2783
Confluence with Rapid Creek	93.05	0.87	0.89	1994	2445	2625	3028

@ Placita Gage	Q500=	3383
	Q100=	2933
	Q50=	2732
	Q10=	2228

COLORADO WATER CONSERVATION BOARD
COLORADO DEPARTMENT OF NATURAL RESOURCES

TECHNICAL MANUAL NO. 1

MANUAL FOR ESTIMATING FLOOD CHARACTERISTICS OF NATURAL FLOW STREAMS IN COLORADO

Prepared in cooperation with the
U.S. GEOLOGICAL SURVEY

Colorado Water Conservation Board
1845 Sherman Street
Denver, Colorado 80203

FLOOD INFORMATION NEAR GAGED SITES ON THE SAME STREAM

Peak discharges at sites near gaging stations on the same stream can be computed by the following equation:

$$Q_{T(U)} = \left(\frac{A_U}{A_G}\right)^X Q_{T(G)}$$

where

$Q_{T(U)}$ = peak discharge at ungaged site for recurrence interval T,

$Q_{T(G)}$ = weighted average discharge at gaged site for recurrence interval T,

A_U = drainage area at ungaged site,

A_G = drainage area at gaged site, and

X = exponent for each flood region as follows:

Flood Region	Exponent, X
Plains	0.48
Mountains	.79
Northern Plateau	.50
Southern Plateau	.71

The above procedure is applicable for ungaged sites where the drainage area ratio lies between 0.5 and 2.0.

SITES NEAR GAGED SITES ON THE SAME STREAM

Peak discharge information for study sites near gaged sites on the same stream can be computed using the method described on page 4. The first step is to determine the drainage area ratio of ungaged site to gaged site. If that ratio lies between 0.5 and 2.0, the equation given on page 4 should be used to compute the required peak discharges. If the drainage area ratio lies outside the range, the method for "Ungaged Sites" should be used.

Flood depth information for study sites near gaged sites on the same stream should be computed from the flood depth regression equations for the region in which the study site lies. The method is illustrated in Example 2.

Example 2.--*Flood Frequency near a Gaged Site*

Determine the Q_{10}-, Q_{50}-, Q_{100}-, and Q_{500}-year recurrence-interval floods for Cherry Creek at State Route 83, 4.5 mi south of Franktown, Colo. (lat 39°19'41", long 104°44'02", NW¼ sec. 25, T. 8 S., R. 66 W.).

Map coverage: Russellville Gulch quadrangle, scale = 1:24,000
Denver quadrangle, scale = 1:250,000.

From table 5, note that station 06712000 Cherry Creek near Franktown, Colo. (A_{Gage}=169 mi^2), is located downstream.

Determine the contributing drainage area at the site (A_U=132 mi^2).

Check that A_U is either more than half A_G or less than twice A_G:

$$A_U \div A_G = 132 \text{ mi}^2 \div 169 \text{ mi}^2 = 0.78.$$

This meets the drainage-area requirement, and the following relation is used:

$$Q_{T(U)} = (A_U \div A_G)^X Q_{T(G)}$$

where X=0.48 for the Plains Region, and $Q_{T(G)}$ is the weighted discharge from table 5.

Obtain the weighted discharges at the gage:

Q_{10} = 5,070 ft^3/s

Q_{50} =13,100 ft^3/s

Q_{100}=18,400 ft^3/s

Q_{500}=36,000 ft^3/s

Compute discharges at ungaged site:

Q_{10} =(132÷169)$^{0.48}$(5,070 ft^3/s)=0.89(5,070)= 4,510 ft^3/s

Q_{50} =(132÷169)$^{0.48}$(13,100 ft^3/s)=0.89(13,100)=11,700 ft^3/s

Q_{100}=(132÷169)$^{0.48}$(18,400 ft^3/s)=0.89(18,400)=16,400 ft^3/s

Q_{500}=(132÷169)$^{0.48}$(36,000 ft^3/s)=0.89(36,000)=32,000 ft^3/s

Table 8.--*Selected basin and climatic parameters and flood characteristics for gaging stations in the Southern Plateau Region*--Continued

Station number	Station name	Period of record, in years	Drainage area, in square miles	Gage datum, in feet above mean sea level	Basin slope, in feet per mile	Streambed slope, in feet per mile	Mean annual precipitation, in inches	10-Year flood discharge, in cubic ft per second	50-Year flood discharge, in cubic ft per second	100-Year flood discharge, in cubic ft per second	500-Year flood discharge, in cubic ft per second	100-Year flood depth, in feet
RIO GRANDE RIVER BASIN - CONTINUED												
08284000	RITO DE TIERRA AMARILLA AT TIERRA AMARILLA, N. MEX. LAT 36 41 55 LONG 106 33 25	12	49.7	7520	138	77	21	733 833	1130 1260	1320 1470	1810 2000	-
08284500	WILLOW CREEK NEAR PARK VIEW, N. MEX. LAT 36 40 05 LONG 106 42 15	*33	193	6945	48	38	18	2460 2470	4070 3990	4900 4770	7260 6930	-
COLORADO RIVER BASIN												
09059500	PINEY RIVER NEAR STATE BRIDGE, COLO. LAT 38 46 00 LONG 106 35 00	29	86.2	7272	210	87	28	944 1060	1130 1380	1190 1510	1300 1810	4.4
09067500	EAGLE RIVER AT EAGLE, COLO. LAT 39 39 24 LONG 106 49 29	14	628	6560	-	36	29	6630 6260	7940 8210	8420 9070	9450 11200	6.2
09068000	BRUSH CREEK NEAR EAGLE, COLO. LAT 39 33 26 LONG 106 45 45	22	69.7	7450	350	101	28	551 757	842 1140	984 1330	1370 1830	3.7
09070000	EAGLE RIVER BELOW GYPSUM, COLO. LAT 39 38 58 LONG 106 57 11	*24	944	6275	64	24	27	5930 6440	7360 8570	7880 9490	8960 11700	7.6
09081550	CRYSTAL RIVER AT PLACITA, COLO. LAT 39 08 34 LONG 107 15 26	*13	107	7372	-	63	34	1900 1790	2060 2230	2120 2430	2230 2930	4.7
09081600	CRYSTAL RIVER ABOVE AVALANCHE CREEK NEAR REDSTONE, COLO. LAT 39 13 56 LONG 107 13 36	18	167	6905	140	59	33	3170 2840	3780 3630	4000 3960	4470 4750	5.3
09082500	CRYSTAL RIVER NEAR REDSTONE, COLO. LAT 39 17 55 LONG 107 12 49	29	229	6484	-	70	34	3880 3610	4540 4450	4770 4800	5220 5570	6.6
09083000	THOMPSON CREEK NEAR CARBONDALE, COLO. LAT 39 19 50 LONG 107 13 26	14	75.7	6450	220	132	34	823 1020	1170 1480	1310 1690	1640 2210	3.3
09085000	ROARING FORK RIVER AT GLENWOOD SPRINGS, COLO. LAT 39 32 37 LONG 107 19 44	*59	1451	5721	-	26	28	13900 13400	17400 17100	18700 18600	21500 22000	8.4
09096500	PLATEAU CREEK NEAR COLLBRAN, COLO. LAT 39 15 02 LONG 107 50 24	*35	80.4	7130	170	176	30	1820 1710	2440 2340	2740 2650	3540 3450	5.9
09097500	BUZZARD CREEK NEAR COLLBRAN, COLO. LAT 39 16 20 LONG 107 51 00	52	143	6955	-	46	28	1140 1280	1670 1890	1890 2150	2390 2770	7.2

TECHNICAL APPENDIX

APPENDIX C: Hydraulic Data (HEC-RAS)

HEC-RAS Version 3.1.1 May 2003
U.S. Army Corp of Engineers
Hydrologic Engineering Center
609 Second Street, Suite D
Davis, California 95616-4687
(916) 756-1104

```
X    X  XXXXXX    XXXX       XXXX      XX      XXXX
X    X  X        X    X      X   X    X  X     X
X    X  X        X           X   X   X    X    X
XXXXXXX  XXXX    X       XXX  XXXX    XXXXXX    XXXX
X    X  X        X           X  X     X    X        X
X    X  X        X    X      X   X    X    X        X
X    X  XXXXXX    XXXX       X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Crystal River Flood Study
Project File : CrystalRiver.prj
Run Date and Time: 5/3/2004 11:51:54 AM

Project in English units

Project Description:
Crystal River Flood Study
Prepared by: ICON Engineering, Inc. May 2004
(03-023-CRY-415)
Prepared for: Colorado Water Conservation Board
Study
Location: From approximately 3 miles downstream of the Town of Marble,
CO
(Prospect Ranch) to approximately 1 mile upstream of the Town
of Marble
(Snowshoe Ranch)

PLAN DATA

Plan Title: Crystal River Flood Study
Plan File : p:\P\03023cry\Hydraulics\CrystalRiver.p04

Geometry Title: Crystal River Flood Study
Geometry File : p:\P\03023cry\Hydraulics\CrystalRiver.g04

Flow Title : Crystal River Flood Study
Flow File : p:\P\03023cry\Hydraulics\CrystalRiver.f02

Plan Summary Information:
Number of: Cross Sections = 53 Mulitple Openings = 0
Culverts = 0 Inline Structures = 0
Bridges = 4 Lateral Structures = 0

Computational Information
Water surface calculation tolerance = 0.01
Critical depth calculaton tolerance = 0.01
Maximum number of interations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options
Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

Encroachment Data
Equal Conveyance = True
Left Offset = 0
Right Offset = 0

River = Crystal Reach = Marble

RS	Profile	Method	Value1	Value2
23576	Floodway	1	211.48	310
23230	Floodway	1	676.46	728.44
23204	Floodway	1	700.15	754.87
22724	Floodway	1	481	800
21874	Floodway	1	550	735
21304	Floodway	1	475	650
20771	Floodway	1	569.53	660.48
19905	Floodway	1	280.63	369.18
19361	Floodway	1	357	460
18783	Floodway	1	115	210
14921	Floodway	1	260	346.96
14378	Floodway	1	135.94	180
12820	Floodway	1	284.18	330.48
12347	Floodway	1	565.78	648.12
11815	Floodway	1	624.09	734.4
11147	Floodway	1	822.42	1009.38
10584	Floodway	1	1058	1139
10063	Floodway	1	675	820
9536	Floodway	1	530	670
9086	Floodway	1	638.81	729.71
8612	Floodway	1	625	735
8077	Floodway	1	471.25	536.63
8048	Floodway	1	462.73	711.12
7560	Floodway	1	775.5	830.52
7123	Floodway	1	828.7	891.99
6674	Floodway	1	410	490.99
6179	Floodway	1	567.14	635
5216	Floodway	1	51.93	108.63
2242	Floodway	1	410.63	456.53
1750	Floodway	1	375.56	425.1
1241	Floodway	1	640	720.1
746	Floodway	1	375	430.01
329	Floodway	1	190	245.29
0	Floodway	1	46.77	84.38

FLOW DATA

Flow Title: Crystal River Flood Study
Flow File : p:\P\03023cry\Hydraulics\CrystalRiver.f02

Flow Data (cfs)

River	Reach	RS	100-year	Floodway	10-year	50-year	500-year
Crystal	Marble	24407	1691	1691	1284	1575	1950
Crystal	Marble	19361	2181	2181	1657	2031	2515
Crystal	Marble	8077	2413	2413	1833	2248	2783
Crystal	Marble	746	2625	2625	1994	2445	3028

Boundary Conditions

River	Reach	Profile	Upstream	Downstream
Crystal	Marble	100-year		Normal S = 0.013
Crystal	Marble	Floodway		Normal S = 0.013
Crystal	Marble	10-year		Normal S = 0.013
Crystal	Marble	50-year		Normal S = 0.013
Crystal	Marble	500-year		Normal S = 0.013

GEOMETRY DATA

Geometry Title: Crystal River Flood Study
Geometry File : p:\P\03023cry\Hydraulics\CrystalRiver.g04

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 24407

INPUT
Description:
Station Elevation Data num= 36

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7966	2.6	7965.01	8.34	7962.45	10.66	7961.58	18.61	7958.47
18.73	7958.43	18.94	7958.35	29.97	7954.11	31.68	7953.47	45.99	7953.44
51.06	7953.44	57.24	7954.89	60.43	7955.58	60.68	7955.64	64.51	7956.47
68.24	7956.92	70.85	7957.24	75.17	7957.81	81.26	7958.63	83.23	7958.9
89.98	7959.71	91.3	7959.87	91.68	7959.92	92.05	7959.96	99.85	7960.99
100.95	7962.04	102.1	7963.14	107.42	7968.22	112.52	7973.08	115.49	7975.92
122.93	7983.05	123.55	7983.58	125.67	7985.67	131.61	7992.22	132.37	7992.84
132.72	7993.27								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	31.68	.035	51.06	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
31.68	51.06	773.34	831.57	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7960.52	Element			
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7958.71	Reach Len. (ft)	773.34	831.57	855.60
Crit W.S. (ft)	7958.71	Flow Area (sq ft)	35.87	101.82	69.86
E.G. Slope (ft/ft)	0.009191	Area (sq ft)	35.87	101.82	69.86
Q Total (cfs)	1691.00	Flow (cfs)	154.81	1252.49	283.70
Top Width (ft)	63.80	Top Width (ft)	13.67	19.38	30.75
Vel Total (ft/s)	8.15	Avg. Vel. (ft/s)	4.32	12.30	4.06
Max Chl Dpth (ft)	5.27	Hydr. Depth (ft)	2.62	5.25	2.27
Conv. Total (cfs)	17638.5	Conv. (cfs)	1614.8	13064.5	2959.2
Length Wtd. (ft)	833.07	Wetted Per. (ft)	14.64	19.38	31.23
Min Ch El (ft)	7953.44	Shear (lb/sq ft)	1.41	3.01	1.28
Alpha	1.76	Stream Power (lb/ft s)	6.07	37.08	5.21
Frctn Loss (ft)	7.43	Cum Volume (acre-ft)	105.07	102.62	185.73
C & E Loss (ft)	0.29	Cum SA (acres)	49.85	26.60	67.93

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7960.52	Element			
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7958.71	Reach Len. (ft)	773.34	831.57	855.60
Crit W.S. (ft)	7958.71	Flow Area (sq ft)	35.87	101.82	69.86
E.G. Slope (ft/ft)	0.009191	Area (sq ft)	35.87	101.82	69.86
Q Total (cfs)	1691.00	Flow (cfs)	154.81	1252.49	283.70
Top Width (ft)	63.80	Top Width (ft)	13.67	19.38	30.75
Vel Total (ft/s)	8.15	Avg. Vel. (ft/s)	4.32	12.30	4.06
Max Chl Dpth (ft)	5.27	Hydr. Depth (ft)	2.62	5.25	2.27
Conv. Total (cfs)	17638.5	Conv. (cfs)	1614.8	13064.5	2959.2
Length Wtd. (ft)	835.90	Wetted Per. (ft)	14.64	19.38	31.23
Min Ch El (ft)	7953.44	Shear (lb/sq ft)	1.41	3.01	1.28
Alpha	1.76	Stream Power (lb/ft s)	6.07	37.08	5.21
Frctn Loss (ft)	8.47	Cum Volume (acre-ft)	30.77	112.79	25.39
C & E Loss (ft)	0.23	Cum SA (acres)	12.33	26.60	9.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7959.57	Element			
Vel Head (ft)	1.64	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7957.93	Reach Len. (ft)	773.34	831.57	855.60
Crit W.S. (ft)	7957.93	Flow Area (sq ft)	26.09	86.85	48.32
E.G. Slope (ft/ft)	0.009886	Area (sq ft)	26.09	86.85	48.32
Q Total (cfs)	1284.00	Flow (cfs)	105.04	996.54	182.42
Top Width (ft)	56.05	Top Width (ft)	11.65	19.38	25.02
Vel Total (ft/s)	7.96	Avg. Vel. (ft/s)	4.03	11.47	3.78
Max Chl Dpth (ft)	4.49	Hydr. Depth (ft)	2.24	4.48	1.93
Conv. Total (cfs)	12913.8	Conv. (cfs)	1056.5	10022.7	1834.6
Length Wtd. (ft)	833.02	Wetted Per. (ft)	12.48	19.38	25.45
Min Ch El (ft)	7953.44	Shear (lb/sq ft)	1.29	2.77	1.17
Alpha	1.66	Stream Power (lb/ft s)	5.20	31.74	4.42
Frctn Loss (ft)	11.06	Cum Volume (acre-ft)	81.45	86.84	155.22
C & E Loss (ft)	0.09	Cum SA (acres)	43.93	26.60	60.57

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7960.26	Element			
Vel Head (ft)	1.77	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7958.50	Reach Len. (ft)	773.34	831.57	855.60
Crit W.S. (ft)	7958.50	Flow Area (sq ft)	33.05	97.74	63.55
E.G. Slope (ft/ft)	0.009375	Area (sq ft)	33.05	97.74	63.55
Q Total (cfs)	1575.00	Flow (cfs)	140.11	1181.63	253.26
Top Width (ft)	61.71	Top Width (ft)	13.13	19.38	29.20
Vel Total (ft/s)	8.10	Avg. Vel. (ft/s)	4.24	12.09	3.99
Max Chl Dpth (ft)	5.05	Hydr. Depth (ft)	2.52	5.04	2.18
Conv. Total (cfs)	16266.8	Conv. (cfs)	1447.1	12204.0	2615.7
Length Wtd. (ft)	833.51	Wetted Per. (ft)	14.06	19.38	29.66
Min Ch El (ft)	7953.44	Shear (lb/sq ft)	1.38	2.95	1.25
Alpha	1.73	Stream Power (lb/ft s)	5.83	35.68	5.00
Frctn Loss (ft)	8.09	Cum Volume (acre-ft)	98.03	98.41	177.12
C & E Loss (ft)	0.25	Cum SA (acres)	48.55	26.60	66.15

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7961.05	Element			
Vel Head (ft)	1.94	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7959.10	Reach Len. (ft)	773.34	831.57	855.60
Crit W.S. (ft)	7959.10	Flow Area (sq ft)	41.53	109.55	82.73
E.G. Slope (ft/ft)	0.009135	Area (sq ft)	41.53	109.55	82.73
Q Total (cfs)	1950.00	Flow (cfs)	187.74	1410.62	351.64
Top Width (ft)	67.94	Top Width (ft)	14.69	19.38	33.87
Vel Total (ft/s)	8.34	Avg. Vel. (ft/s)	4.52	12.88	4.25
Max Chl Dpth (ft)	5.66	Hydr. Depth (ft)	2.83	5.65	2.44
Conv. Total (cfs)	20402.8	Conv. (cfs)	1964.3	14759.2	3679.2
Length Wtd. (ft)	832.89	Wetted Per. (ft)	15.73	19.38	34.38
Min Ch El (ft)	7953.44	Shear (lb/sq ft)	1.51	3.22	1.37
Alpha	1.80	Stream Power (lb/ft s)	6.80	41.51	5.83
Frctn Loss (ft)	7.61	Cum Volume (acre-ft)	120.31	111.15	204.42
C & E Loss (ft)	0.31	Cum SA (acres)	53.47	26.60	72.34

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 23576

INPUT
Description:
Station Elevation Data num= 64

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7970.49	2.04	7969.54	3.66	7968.86	13.71	7964.12	14.37	7963.83
15.44	7963.35	25.07	7959.07	31.02	7956.52	35.78	7954.43	43.48	7950.92
45.9	7949.88	46.49	7949.58	49.27	7949.56	57.18	7949.48	65.65	7949.46
67.89	7949.45	71.52	7949.45	78.59	7949.36	82.96	7949.4	89.3	7949.42
96.8	7949.58	98.45	7949.65	103.88	7949.69	106.47	7949.68	109.77	7948.91
114.74	7947.71	115.78	7947.37	118.61	7947.98	122.57	7949.14	125.02	7949.82
140.16	7949.23	142.19	7949.07	150.84	7948.22	153.74	7947.9	154.86	7947.77
158.49	7947.73	185.63	7947.31	198.22	7947.09	200.14	7946.65	207.04	7945.09
209.69	7944.68	211.48	7944.39	211.9	7944.33	237.65	7944.53	240.31	7944.54
241.84	7944.83	250.36	7946.41	251.33	7946.61	254.05	7947.13	260.18	7947.25
267.8	7947.32	271.26	7947.39	278.21	7947.92	279.17	7947.58	284.09	7945.54
284.39	7945.42	312.75	7945.38	313.69	7945.6	323.88	7947.88	326.29	7948.4
328.14	7949.87	335.48	7955.21	340.02	7959.11	345.1	7963.7		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	211.48	.035	237.65	.05	312.75	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
211.48 237.65 321.73 345.98 365.58 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	125.02	7949.82	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7948.93	Element			
Vel Head (ft)	0.83	Wt. n-Val.	0.060	0.035	0.051
W.S. Elev (ft)	7948.09	Reach Len. (ft)	321.73	345.98	365.58
Crit W.S. (ft)	7948.09	Flow Area (sq ft)	61.10	95.91	159.34
E.G. Slope (ft/ft)	0.008648	Area (sq ft)	61.19	95.91	159.34
Q Total (cfs)	1691.00	Flow (cfs)	142.75	900.00	648.25
Top Width (ft)	178.73	Top Width (ft)	65.34	26.17	87.22
Vel Total (ft/s)	5.35	Avg. Vel. (ft/s)	2.34	9.38	4.07
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)	1.03	3.66	1.83
Conv. Total (cfs)	18183.9	Conv. (cfs)	1535.0	9678.0	6970.8
Length Wtd. (ft)	348.36	Wetted Per. (ft)	59.80	26.18	88.27
Min Ch El (ft)	7944.33	Shear (lb/sq ft)	0.55	1.98	0.97
Alpha	1.88	Stream Power (lb/ft s)	1.29	18.56	3.96
Frctn Loss (ft)	1.33	Cum Volume (acre-ft)	104.19	100.74	183.47
C & E Loss (ft)	0.05	Cum SA (acres)	49.14	26.16	66.77

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7949.28	Element			
Vel Head (ft)	1.06	Wt. n-Val.		0.035	0.050
W.S. Elev (ft)	7948.22	Reach Len. (ft)	321.73	345.98	365.58
Crit W.S. (ft)	7948.22	Flow Area (sq ft)		99.21	144.65
E.G. Slope (ft/ft)	0.011236	Area (sq ft)		99.21	144.65
Q Total (cfs)	1691.00	Flow (cfs)		990.86	700.14

Top Width (ft)	98.52	Top Width (ft)		26.17	72.35
Vel Total (ft/s)	6.93	Avg. Vel. (ft/s)		9.99	4.84
Max Chl Dpth (ft)	3.89	Hydr. Depth (ft)		3.79	2.00
Conv. Total (cfs)	15953.2	Conv. (cfs)		9347.9	6605.3
Length Wtd. (ft)	349.67	Wetted Per. (ft)		30.00	75.94
Min Ch El (ft)	7944.33	Shear (lb/sq ft)		2.32	1.34
Alpha	1.42	Stream Power (lb/ft s)		23.16	6.47
Frctn Loss (ft)	1.37	Cum Volume (acre-ft)	30.45	110.87	23.28
C & E Loss (ft)	0.12	Cum SA (acres)	12.20	26.16	8.55

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7948.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.33	Wt. n-Val.	0.060	0.035	0.050
W.S. Elev (ft)	7947.09	Reach Len. (ft)	321.73	345.98	365.58
Crit W.S. (ft)	7947.09	Flow Area (sq ft)	19.19	69.51	81.66
E.G. Slope (ft/ft)	0.018770	Area (sq ft)	19.19	69.51	81.66
Q Total (cfs)	1284.00	Flow (cfs)	82.25	775.34	426.40
Top Width (ft)	95.54	Top Width (ft)	13.24	26.17	56.13
Vel Total (ft/s)	7.54	Avg. Vel. (ft/s)	4.29	11.15	5.22
Max Chl Dpth (ft)	2.75	Hydr. Depth (ft)	1.45	2.66	1.45
Conv. Total (cfs)	9372.0	Conv. (cfs)	600.4	5659.3	3112.4
Length Wtd. (ft)	348.15	Wetted Per. (ft)	13.52	26.18	56.89
Min Ch El (ft)	7944.33	Shear (lb/sq ft)	1.66	3.11	1.68
Alpha	1.50	Stream Power (lb/ft s)	7.13	34.71	8.78
Frctn Loss (ft)	1.45	Cum Volume (acre-ft)	81.05	85.35	153.94
C & E Loss (ft)	0.25	Cum SA (acres)	43.71	26.16	59.78

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7948.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.92	Wt. n-Val.	0.060	0.035	0.051
W.S. Elev (ft)	7947.87	Reach Len. (ft)	321.73	345.98	365.58
Crit W.S. (ft)	7947.87	Flow Area (sq ft)	47.99	90.05	139.93
E.G. Slope (ft/ft)	0.010051	Area (sq ft)	48.97	90.05	139.93
Q Total (cfs)	1575.00	Flow (cfs)	105.30	873.39	596.31
Top Width (ft)	173.05	Top Width (ft)	61.50	26.17	85.38
Vel Total (ft/s)	5.67	Avg. Vel. (ft/s)	2.19	9.70	4.26
Max Chl Dpth (ft)	3.54	Hydr. Depth (ft)	0.83	3.44	1.64
Conv. Total (cfs)	15710.2	Conv. (cfs)	1050.4	8711.9	5948.0
Length Wtd. (ft)	348.54	Wetted Per. (ft)	57.77	26.18	86.40
Min Ch El (ft)	7944.33	Shear (lb/sq ft)	0.52	2.16	1.02
Alpha	1.85	Stream Power (lb/ft s)	1.14	20.94	4.33
Frctn Loss (ft)	1.36	Cum Volume (acre-ft)	97.30	96.62	175.12
C & E Loss (ft)	0.09	Cum SA (acres)	47.89	26.16	65.02

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7949.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.060	0.035	0.051
W.S. Elev (ft)	7948.26	Reach Len. (ft)	321.73	345.98	365.58
Crit W.S. (ft)	7948.26	Flow Area (sq ft)	71.19	100.29	174.01
E.G. Slope (ft/ft)	0.009132	Area (sq ft)	74.36	100.29	174.01
Q Total (cfs)	1950.00	Flow (cfs)	186.01	996.33	767.66
Top Width (ft)	182.34	Top Width (ft)	68.17	26.17	88.00
Vel Total (ft/s)	5.64	Avg. Vel. (ft/s)	2.61	9.93	4.41
Max Chl Dpth (ft)	3.93	Hydr. Depth (ft)	1.17	3.83	1.98
Conv. Total (cfs)	20406.1	Conv. (cfs)	1946.5	10426.3	8033.3
Length Wtd. (ft)	348.28	Wetted Per. (ft)	61.37	26.18	89.07
Min Ch El (ft)	7944.33	Shear (lb/sq ft)	0.66	2.18	1.11
Alpha	1.84	Stream Power (lb/ft s)	1.73	21.70	4.91
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	119.29	109.15	201.90
C & E Loss (ft)	0.04	Cum SA (acres)	52.74	26.16	71.15

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 23230

INPUT
Description:
Station Elevation Data num= 155

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7968.74	4.74	7968.51	7.34	7968.33	14.97	7967.78	20.23	7967.31
21.75	7967.17	34.67	7966.31	35.92	7966.22	46.28	7965.53	48.44	7965.38
63.6	7964.37	64.46	7964.31	75.01	7963.6	76.76	7963.47	89.57	7962.45
91.9	7962.27	107.89	7961.01	117.4	7960.31	123.24	7959.85	131.14	7959.27

139.53	7958.6	147.25	7958.03	148.41	7957.93	156.92	7957.16	164.14	7956.54		
172.61	7955.77	180.96	7955.03	184.79	7954.68	187.57	7954.44	193.67	7954		
209.58	7952.82	211.53	7952.68	213.77	7952.51	215.75	7952.37	221.77	7951.93		
224.95	7951.71	226.63	7951.58	234.37	7951.15	235.71	7951.08	248.25	7950.39		
251.61	7950.19	256.98	7949.9	259.63	7949.85	297.48	7949.4	306.96	7949.38		
310.32	7949.38	314.43	7949.37	318.81	7949.35	328.41	7949.33	341.75	7949.2		
353.58	7949.11	362.37	7949.2	365.11	7949.22	368.96	7949.18	371.46	7949.17		
372.14	7949.08	373.75	7948.75	378.37	7947.76	379.03	7947.58	380.18	7947.37		
390.86	7947.37	393.2	7947.56	398.85	7948.12	406.45	7949	412.19	7949.46		
412.43	7949.55	414.96	7949.54	433.6	7949.2	446.23	7949.16	449.1	7949.12		
461.67	7949.11	466.45	7948.82	474.56	7948.29	482.25	7948.59	484.02	7948.64		
494.65	7948.96	502.27	7949.03	513.12	7949.25	516.15	7949.32	536.9	7949.5		
543.24	7949.46	560.96	7949.25	567.81	7949.29	578.71	7949.49	579.81	7949.44		
580.99	7949.52	592.25	7949.94	595.88	7949.9	599.09	7950.03	609.5	7950.68		
610.23	7950.78	610.37	7950.84	612.07	7950.89	621.07	7950.96	631.67	7951.12		
639.02	7951.33	643.71	7951.45	645.73	7951.41	650.7	7951.3	654.1	7951.09		
657.84	7950.93	664.55	7949.42	664.82	7949.34	666.66	7949.22	669.28	7948.14		
674.64	7944.88	687	7938	705	7937.25	723	7938	728.01	7943.62		
733.02	7946.54	736.35	7948.78	737.57	7949	742.51	7950.69	744.62	7951.33		
745.21	7951.49	746.02	7951.6	746.31	7951.66	746.8	7951.75	749.11	7952.24		
756.7	7953.56	763.33	7953.35	764.69	7953.19	767.85	7953.25	771.36	7953.33		
775.44	7953.45	776.04	7953.18	776.43	7953.1	779.37	7953.08	784.73	7953.75		
786.47	7953.91	796.48	7955.34	806.49	7955.85	816.5	7956.55	826.51	7956.48		
828.56	7956.46	836.51	7956.47	842.95	7956.6	845.8	7956.64	847.2	7957		
850.74	7957.78	856.2	7958.83	856.53	7958.89	859.88	7959.74	866.54	7961.49		
872.89	7963.29	874.35	7963.65	875.47	7964.02	880.24	7964.02	886.12	7963.97		
896.57	7963.9	901.64	7963.85	906.57	7963.88	912.08	7963.85	913.09	7963.85		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	687	.035	723	.06

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
687	723	24.46	25.9	26.29	.3	.5

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	676	7947.37	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7944.78	Element			
Vel Head (ft)	0.68	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7944.10	Reach Len. (ft)	4.70	4.70	4.70
Crit W.S. (ft)	7941.65	Flow Area (sq ft)	33.40	233.03	16.67
E.G. Slope (ft/ft)	0.002137	Area (sq ft)	33.40	233.03	16.67
Q Total (cfs)	1691.00	Flow (cfs)	73.49	1587.56	29.95
Top Width (ft)	52.79	Top Width (ft)	10.96	36.00	5.83
Vel Total (ft/s)	5.87	Avg. Vel. (ft/s)	2.20	6.81	1.80
Max Chl Dpth (ft)	6.85	Hydr. Depth (ft)	3.05	6.47	2.86
Conv. Total (cfs)	36580.7	Conv. (cfs)	1589.8	34342.9	647.9
Length Wtd. (ft)	4.70	Wetted Per. (ft)	12.54	36.03	8.48
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.36	0.86	0.26
Alpha	1.23	Stream Power (lb/ft s)	0.78	5.88	0.47
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	103.83	99.43	182.74
C & E Loss (ft)	0.02	Cum SA (acres)	48.86	25.91	66.38

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7944.89	Element			
Vel Head (ft)	0.65	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7944.24	Reach Len. (ft)	4.70	4.70	4.70
Crit W.S. (ft)	7941.65	Flow Area (sq ft)	34.82	238.03	17.38
E.G. Slope (ft/ft)	0.001981	Area (sq ft)	34.82	238.03	17.38
Q Total (cfs)	1691.00	Flow (cfs)	76.26	1583.62	31.12
Top Width (ft)	51.98	Top Width (ft)	10.54	36.00	5.44
Vel Total (ft/s)	5.83	Avg. Vel. (ft/s)	2.19	6.65	1.79
Max Chl Dpth (ft)	6.99	Hydr. Depth (ft)	3.30	6.61	3.19
Conv. Total (cfs)	37990.3	Conv. (cfs)	1713.2	35577.9	699.2
Length Wtd. (ft)	4.70	Wetted Per. (ft)	12.43	36.03	8.39
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.35	0.82	0.26
Alpha	1.23	Stream Power (lb/ft s)	0.76	5.44	0.46
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	30.32	109.53	22.60
C & E Loss (ft)	0.02	Cum SA (acres)	12.17	25.91	8.22

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7943.95	Element			
Vel Head (ft)	0.49	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7943.45	Reach Len. (ft)	4.70	4.70	4.70
Crit W.S. (ft)	7940.98	Flow Area (sq ft)	26.69	209.74	13.24
E.G. Slope (ft/ft)	0.001774	Area (sq ft)	26.69	209.74	13.24
Q Total (cfs)	1284.00	Flow (cfs)	49.66	1223.79	20.55
Top Width (ft)	50.65	Top Width (ft)	9.79	36.00	4.86
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)	1.86	5.79	1.55
Max Chl Dpth (ft)	6.20	Hydr. Depth (ft)	2.73	5.83	2.73
Conv. Total (cfs)	30481.6	Conv. (cfs)	1178.9	28814.9	487.8
Length Wtd. (ft)	4.70	Wetted Per. (ft)	11.21	36.03	7.30
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.26	0.64	0.20
Alpha	1.20	Stream Power (lb/ft s)	0.49	3.73	0.31
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	80.88	84.24	153.54
C & E Loss (ft)	0.02	Cum SA (acres)	43.63	25.91	59.52

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7944.53	Element			
Vel Head (ft)	0.63	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7943.90	Reach Len. (ft)	4.70	4.70	4.70
Crit W.S. (ft)	7941.46	Flow Area (sq ft)	31.28	225.93	15.55
E.G. Slope (ft/ft)	0.002064	Area (sq ft)	31.28	225.93	15.55
Q Total (cfs)	1575.00	Flow (cfs)	66.16	1481.78	27.06
Top Width (ft)	52.09	Top Width (ft)	10.60	36.00	5.49
Vel Total (ft/s)	5.77	Avg. Vel. (ft/s)	2.12	6.56	1.74
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)	2.95	6.28	2.83
Conv. Total (cfs)	34668.4	Conv. (cfs)	1456.4	32616.4	595.7
Length Wtd. (ft)	4.70	Wetted Per. (ft)	12.13	36.03	8.09
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.33	0.81	0.25
Alpha	1.22	Stream Power (lb/ft s)	0.70	5.30	0.43
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	97.00	95.36	174.46
C & E Loss (ft)	0.02	Cum SA (acres)	47.62	25.91	64.64

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7945.30	Element			
Vel Head (ft)	0.79	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7944.52	Reach Len. (ft)	4.70	4.70	4.70
Crit W.S. (ft)	7942.05	Flow Area (sq ft)	37.98	248.03	19.25
E.G. Slope (ft/ft)	0.002280	Area (sq ft)	38.12	248.03	19.25
Q Total (cfs)	1950.00	Flow (cfs)	93.78	1819.28	36.94
Top Width (ft)	54.25	Top Width (ft)	11.70	36.00	6.54
Vel Total (ft/s)	6.39	Avg. Vel. (ft/s)	2.47	7.33	1.92
Max Chl Dpth (ft)	7.26	Hydr. Depth (ft)	3.45	6.89	2.94
Conv. Total (cfs)	40842.2	Conv. (cfs)	1964.2	38104.3	773.8
Length Wtd. (ft)	4.70	Wetted Per. (ft)	12.59	36.03	9.31
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.43	0.98	0.29
Alpha	1.24	Stream Power (lb/ft s)	1.06	7.19	0.56

Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	118.87	107.77	201.09
C & E Loss (ft)	0.03	Cum SA (acres)	52.44	25.91	70.75

BRIDGE

RIVER: Crystal
REACH: Marble RS: 23225

INPUT
Description: BRIDGE NO. 4 - SNOWSHOE RANCH
Distance from Upstream XS = 4.7
Deck/Roadway Width = 14.25
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
650	7951		676	7951		676	7951	7948.25
744	7951	7948.25	744	7951		800	7951	

Upstream Bridge Cross Section Data
Station Elevation Data num= 155

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7968.74	4.74	7968.51	7.34	7968.33	14.97	7967.78	20.23	7967.31
21.75	7967.17	34.67	7966.31	35.92	7966.22	46.28	7965.53	48.44	7965.38
63.6	7964.37	64.46	7964.31	75.01	7963.6	76.76	7963.47	89.57	7962.45
91.9	7962.27	107.89	7961.01	117.4	7960.31	123.24	7959.85	131.14	7959.27
139.53	7958.6	147.25	7958.03	148.41	7957.93	156.92	7957.16	164.14	7956.54
172.61	7955.77	180.96	7955.03	184.79	7954.68	187.57	7954.44	193.67	7954
209.58	7952.82	211.53	7952.68	213.77	7952.51	215.75	7952.37	221.77	7951.93
224.95	7951.71	226.63	7951.58	234.37	7951.15	235.71	7951.08	248.25	7950.39
251.61	7950.19	256.98	7949.9	259.63	7949.85	297.48	7949.4	306.96	7949.38
310.32	7949.38	314.43	7949.37	318.81	7949.35	328.41	7949.33	341.75	7949.2
353.58	7949.11	362.37	7949.2	365.11	7949.22	368.96	7949.18	371.46	7949.17
372.14	7949.08	373.75	7948.75	378.37	7947.76	379.03	7947.58	380.18	7947.37
390.86	7947.37	393.2	7947.56	398.85	7948.12	406.45	7949	412.19	7949.46
412.43	7949.55	414.96	7949.54	433.6	7949.2	446.23	7949.16	449.1	7949.12
461.67	7949.11	466.45	7948.82	474.56	7948.29	482.25	7948.59	484.02	7948.64
494.65	7948.96	502.27	7949.03	513.12	7949.25	516.15	7949.32	536.9	7949.5
543.24	7949.46	560.96	7949.25	567.81	7949.29	578.71	7949.49	579.81	7949.44
580.99	7949.52	592.25	7949.94	595.89	7949.9	599.09	7950.03	609.5	7950.68
610.23	7950.78	610.37	7950.84	612.07	7950.89	621.07	7950.96	631.67	7951.12
639.02	7951.33	643.71	7951.45	645.73	7951.41	650.7	7951.3	654.1	7951.09
657.84	7950.93	664.55	7949.42	664.82	7949.34	666.66	7949.22	669.28	7948.14
674.64	7944.88	687	7938	705	7937.25	723	7938	728.01	7943.62
733.02	7946.54	736.35	7948.78	737.57	7949	742.51	7950.69	744.62	7951.33
745.21	7951.49	746.02	7951.6	746.31	7951.66	746.8	7951.75	749.11	7952.24
756.7	7953.56	763.33	7953.35	764.69	7953.19	767.85	7953.25	771.36	7953.33
775.44	7953.45	776.04	7953.18	776.42	7953.1	779.37	7953.08	784.73	7953.75
786.47	7953.91	796.48	7955.34	806.49	7955.85	816.5	7956.55	826.51	7956.48
828.56	7956.46	836.51	7956.47	842.95	7956.6	845.8	7956.64	847.2	7957
850.74	7957.78	856.2	7958.83	856.53	7958.89	859.88	7959.74	866.54	7961.49
872.89	7963.29	874.35	7963.65	875.47	7964.02	880.24	7964.02	886.12	7963.97
896.57	7963.9	901.64	7963.85	906.57	7963.88	912.08	7963.85	913.09	7963.85

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	687	.035	723	.06

Bank Sta: Left Right Coeff Contr. Expan.
687 723 .3 .5
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	676	7947.37	T

Downstream Deck/Roadway Coordinates
num= 6

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
680	7951		694	7951		694	7951	7948.25
762	7951	7948.25	762	7951		800	7951	

Downstream Bridge Cross Section Data
Station Elevation Data num= 182

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7967.08	.48	7966.93	7.71	7966.36	8.43	7966.24	10.2	7966.16
20.04	7964.89	28.37	7964.04	32.02	7963.63	36.94	7963.14	43.77	7962.18
45.33	7962.07	46.54	7961.99	55.97	7961.35	58.72	7961.17	67.95	7960.75
74.23	7960.58	79.93	7960.39	82.87	7960.19	91.91	7959.69	101.04	7959.01
103.88	7958.81	117.72	7957.92	119.21	7957.85	127.84	7957.42	131.31	7957.17
137.38	7956.82	139.06	7956.72	146.44	7956.25	153.77	7955.76	155.55	7955.7
163.77	7955.53	173.72	7955.01	174.97	7954.95	175.75	7954.9	181.84	7954.57
186.64	7954.19	192.76	7953.94	197.06	7953.93	199.8	7953.79	211.18	7953.29
217.35	7952.98	220.46	7952.8	226.2	7952.53	233.6	7951.56	236.32	7951.14
238.75	7950.95	247	7950.33	258.31	7950.03	266.35	7949.73	269.07	7949.62
273.21	7949.49	288.9	7949.18	293.91	7949.07	295.64	7948.67	298.14	7948.42
301.35	7947.72	303.52	7947.59	306.87	7947.18	312.98	7947.13	316.87	7946.81
322.86	7946.95	327.45	7947	331.69	7947.07	334.15	7947	339.22	7946.87
346.33	7946.62	348.99	7946.66	354.61	7946.83	362.95	7947.13	367.36	7947.27
372.05	7947.45	376.39	7947.72	380.86	7948.02	381.7	7948.08	386.17	7948.38
387.41	7948.47	393.24	7948.88	395.6	7948.5	399.32	7948.35	400.8	7947.9
407.32	7947.08	408.24	7946.98	410.4	7946.81	413.39	7946.54	420.49	7945.95
450.19	7945.95	455.85	7946.25	458.47	7946.52	463.93	7946.95	472.56	7948.27
476.23	7948.04	479.78	7947.8	482.63	7947.62	484.67	7947.53	487.86	7947.37
491.06	7947.28	499.31	7946.91	505.41	7946.72	513.45	7946.5	515.99	7946.63
524.31	7947.02	528.66	7947.25	531.21	7947.42	535.58	7947.72	537.24	7947.81
542.76	7948.1	544.94	7948.27	551.63	7948.6	554.85	7948.66	560.83	7948.71
565.59	7948.86	570.89	7948.99	588.08	7949.36	589.74	7949.41	596.88	7949.55
606.7	7949.84	608.06	7949.89	617.9	7950.17	619.36	7950.24	623.98	7950.44
628.47	7950.3	632.11	7950.2	640.19	7950.29	647.38	7950.32	651.54	7950.29
659.68	7950.56	662.89	7950.65	672.28	7951.13	675.95	7951.31	683.95	7951.72
685.78	7950.71	696.54	7945.57	697.43	7945.06	701.51	7943.16	706	7938
727	7937.25	749	7938	755.27	7944.19	755.8	7944.36	758.33	7945.54
764.06	7948.51	767.16	7949.71	769.7	7949.97	771.88	7950.11	775.3	7950.72
777.36	7951.15	780.29	7951.68	785.87	7951.67	791.32	7951.6	794.65	7951.76
800.05	7951.95	805.3	7952.07	809.87	7952.19	815.31	7952.25	817.48	7952.37
821.96	7952.89	825.31	7953.07	829.49	7953.2	835.31	7953.56	839.31	7953.46
845.31	7953.46	849.12	7953.52	855.31	7953.75	858.94	7953.85	868.75	7954.14
875.32	7954.11	888.38	7954.19	895.32	7954.31	898.19	7954.34	905.32	7954.4
912.16	7954.44	914.07	7954.78	916.95	7955.54	922.93	7957.18	925.53	7957.88
935.33	7960.4	942	7961.75	944.11	7962.2	946.58	7962.69	947.48	7962.93
948.06	7963.11	954.17	7963.17						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	706	.035	749	.06

Bank Sta: Left Right Coeff Contr. Expan.
706 749 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	694	7945.95	T
762	954.17	7951	T

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7947.37
Energy head used in spillway design =

Spillway height used in design =
Weir crest shape = Broad Crested

Number of Piers = 1

Pier Data
Pier Station Upstream= 702 Downstream= 720

Upstream num= 2			
Width	Elev	Width	Elev
2	0	2	7948.5

Downstream num= 2			
Width	Elev	Width	Elev
2	0	2	7948.5

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	7944.78	E.G. Elev (ft)	7944.74	7944.61
W.S. US. (ft)	7944.10	W.S. Elev (ft)	7943.99	7944.04
Q Total (cfs)	1691.00	Crit W.S. (ft)	7941.85	7941.39
Q Bridge (cfs)	1691.00	Max Chl Dpth (ft)	6.74	6.78
Q Weir (cfs)		Vel Total (ft/s)	6.41	5.69
Weir Sta Lft (ft)		Flow Area (sq ft)	263.98	297.32
Weir Sta Rgt (ft)		Froude # Chl	0.51	0.43
Weir Submerg		Specif Force (cu ft)	1142.71	1226.09
Weir Max Depth (ft)		Hydr Depth (ft)	5.24	5.56
Min El Weir Flow (ft)	7947.38	W.P. Total (ft)	67.81	71.60
Min El Prs (ft)	7948.25	Conv. Total (cfs)	27343.6	33318.1
Delta EG (ft)	0.21	Top Width (ft)	50.39	53.48
Delta WS (ft)	0.06	Frctn Loss (ft)	0.04	0.01
BR Open Area (sq ft)	495.15	C & E Loss (ft)	0.09	0.02
BR Open Vel (ft/s)	6.41	Shear Total (lb/sq ft)	0.93	0.67
Coef of Q		Power Total (lb/ft s)	5.95	3.80
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #Floodway

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	7944.89	E.G. Elev (ft)	7944.86	7944.73
W.S. US. (ft)	7944.24	W.S. Elev (ft)	7944.15	7944.19
Q Total (cfs)	1691.00	Crit W.S. (ft)	7941.85	7941.39
Q Bridge (cfs)	1691.00	Max Chl Dpth (ft)	6.90	6.94
Q Weir (cfs)		Vel Total (ft/s)	6.23	5.54
Weir Sta Lft (ft)		Flow Area (sq ft)	271.34	305.47
Weir Sta Rgt (ft)		Froude # Chl	0.48	0.41
Weir Submerg		Specif Force (cu ft)	1173.88	1264.18
Weir Max Depth (ft)		Hydr Depth (ft)	5.51	5.79
Min El Weir Flow (ft)	7951.01	W.P. Total (ft)	66.85	71.00
Min El Prs (ft)	7948.25	Conv. Total (cfs)	28575.7	34668.4
Delta EG (ft)	0.19	Top Width (ft)	49.26	52.72
Delta WS (ft)	0.04	Frctn Loss (ft)	0.04	0.01
BR Open Area (sq ft)	484.17	C & E Loss (ft)	0.08	0.02
BR Open Vel (ft/s)	6.23	Shear Total (lb/sq ft)	0.89	0.64
Coef of Q		Power Total (lb/ft s)	5.53	3.54
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #10-year

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	7943.95	E.G. Elev (ft)	7943.92	7943.81
W.S. US. (ft)	7943.45	W.S. Elev (ft)	7943.37	7943.40
Q Total (cfs)	1284.00	Crit W.S. (ft)	7941.15	7940.76
Q Bridge (cfs)	1284.00	Max Chl Dpth (ft)	6.12	6.15
Q Weir (cfs)		Vel Total (ft/s)	5.50	4.86
Weir Sta Lft (ft)		Flow Area (sq ft)	233.42	264.06
Weir Sta Rgt (ft)		Froude # Chl	0.45	0.38
Weir Submerg		Specif Force (cu ft)	861.89	936.45
Weir Max Depth (ft)		Hydr Depth (ft)	4.82	5.13
Min El Weir Flow (ft)	7947.38	W.P. Total (ft)	64.24	67.92
Min El Prs (ft)	7948.25	Conv. Total (cfs)	23226.3	28302.7
Delta EG (ft)	0.16	Top Width (ft)	48.43	51.48
Delta WS (ft)	0.05	Frctn Loss (ft)	0.04	0.01
BR Open Area (sq ft)	495.15	C & E Loss (ft)	0.07	0.02
BR Open Vel (ft/s)	5.50	Shear Total (lb/sq ft)	0.69	0.50
Coef of Q		Power Total (lb/ft s)	3.81	2.43
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #50-year

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	7944.53	E.G. Elev (ft)	7944.50	7944.37
W.S. US. (ft)	7943.90	W.S. Elev (ft)	7943.80	7943.84
Q Total (cfs)	1575.00	Crit W.S. (ft)	7941.66	7941.21
Q Bridge (cfs)	1575.00	Max Chl Dpth (ft)	6.54	6.59
Q Weir (cfs)		Vel Total (ft/s)	6.19	5.49
Weir Sta Lft (ft)		Flow Area (sq ft)	254.42	286.96
Weir Sta Rgt (ft)		Froude # Chl	0.49	0.42
Weir Submerg		Specif Force (cu ft)	1056.60	1136.78
Weir Max Depth (ft)		Hydr Depth (ft)	5.12	5.43
Min El Weir Flow (ft)	7947.38	W.P. Total (ft)	66.66	70.47
Min El Prs (ft)	7948.25	Conv. Total (cfs)	26048.7	31744.2
Delta EG (ft)	0.20	Top Width (ft)	49.72	52.86
Delta WS (ft)	0.06	Frctn Loss (ft)	0.04	0.01
BR Open Area (sq ft)	495.15	C & E Loss (ft)	0.09	0.02
BR Open Vel (ft/s)	6.19	Shear Total (lb/sq ft)	0.87	0.63
Coef of Q		Power Total (lb/ft s)	5.39	3.43
Br Sel Method	Energy only			

BRIDGE OUTPUT Profile #500-year

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	7945.30	E.G. Elev (ft)	7945.26	7945.11
W.S. US. (ft)	7944.52	W.S. Elev (ft)	7944.39	7944.45
Q Total (cfs)	1950.00	Crit W.S. (ft)	7942.26	7941.75
Q Bridge (cfs)	1950.00	Max Chl Dpth (ft)	7.14	7.19
Q Weir (cfs)		Vel Total (ft/s)	6.85	6.10
Weir Sta Lft (ft)		Flow Area (sq ft)	284.57	319.59
Weir Sta Rgt (ft)		Froude # Chl	0.53	0.45
Weir Submerg		Specif Force (cu ft)	1338.58	1429.14
Weir Max Depth (ft)		Hydr Depth (ft)	5.54	5.79
Min El Weir Flow (ft)	7947.38	W.P. Total (ft)	69.71	74.37
Min El Prs (ft)	7948.25	Conv. Total (cfs)	30213.7	36702.5
Delta EG (ft)	0.23	Top Width (ft)	51.33	55.23
Delta WS (ft)	0.06			

BR Open Area (sq ft)	495.15	Frctn Loss (ft)		0.05	0.02
BR Open Vel (ft/s)	6.85	C & E Loss (ft)		0.10	0.02
Coef of Q		Shear Total (lb/sq ft)		1.06	0.76
Br Sel Method	Energy only	Power Total (lb/ft s)		7.27	4.62

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 23204

INPUT
Description:
Station Elevation Data num= 182

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7967.08	.48	7966.93	7.71	7966.36	8.43	7966.24	10.2	7966.16
20.04	7964.89	28.37	7964.04	32.02	7963.63	36.94	7963.14	43.77	7962.18
45.33	7962.07	46.54	7961.99	55.97	7961.35	58.72	7961.17	67.95	7960.75
74.23	7960.58	79.93	7960.39	82.87	7960.19	91.91	7959.69	101.04	7959.01
103.88	7958.81	117.72	7957.92	119.21	7957.85	127.84	7957.42	131.31	7957.17
137.38	7956.82	139.06	7956.72	146.44	7956.25	153.77	7955.76	155.55	7955.7
163.77	7955.53	173.72	7955.01	174.97	7954.95	175.75	7954.9	181.84	7954.57
186.64	7954.19	192.76	7953.94	197.06	7953.93	199.8	7953.79	211.18	7953.29
217.35	7952.98	220.46	7952.8	226.2	7952.53	233.6	7951.56	236.32	7951.14
238.75	7950.95	247	7950.33	258.31	7950.03	266.35	7949.73	269.07	7949.62
273.21	7949.49	288.9	7949.18	293.91	7949.07	295.64	7948.67	298.14	7948.42
301.35	7947.72	303.52	7947.59	306.87	7947.18	312.98	7947.13	316.87	7946.81
322.86	7946.95	327.45	7947	331.69	7947.07	334.15	7947	339.22	7946.87
346.33	7946.62	348.99	7946.66	354.61	7946.83	362.95	7947.13	367.36	7947.27
372.05	7947.45	376.39	7947.72	380.86	7948.02	381.7	7948.08	386.17	7948.38
387.41	7948.47	393.24	7948.88	395.6	7948.5	399.32	7948.15	400.8	7947.9
407.32	7947.08	408.24	7946.98	410.4	7946.81	413.39	7946.54	420.49	7945.95
450.19	7945.95	455.85	7946.25	458.47	7946.52	463.93	7946.95	472.56	7948.27
476.23	7948.04	479.78	7947.8	482.63	7947.62	484.67	7947.53	487.86	7947.37
491.06	7947.28	499.31	7946.91	505.41	7946.72	513.45	7946.5	515.99	7946.63
524.31	7947.02	528.66	7947.25	531.21	7947.42	535.58	7947.72	537.24	7947.81
542.76	7948.1	544.94	7948.27	551.63	7948.6	554.85	7948.66	560.83	7948.71
565.59	7948.86	570.89	7948.99	588.08	7949.36	589.74	7949.41	596.88	7949.55
606.7	7949.84	608.06	7949.89	617.9	7950.17	619.36	7950.24	623.98	7950.44
628.47	7950.3	632.11	7950.2	640.19	7950.29	647.38	7950.32	651.54	7950.29
659.68	7950.56	662.89	7950.65	672.28	7951.13	675.95	7951.31	683.95	7951.72
685.78	7950.71	696.54	7945.57	697.43	7945.06	701.51	7943.16	706	7938
727	7937.25	749	7938	755.27	7944.19	755.8	7944.36	758.33	7945.54
764.06	7948.51	767.16	7949.71	769.7	7949.97	771.88	7950.11	775.3	7950.72
777.36	7951.15	780.29	7951.68	785.87	7951.67	791.32	7951.6	794.65	7951.76
800.05	7951.95	805.3	7952.07	809.87	7952.19	815.31	7952.25	817.48	7952.37
821.96	7952.89	825.31	7953.07	829.49	7953.2	835.31	7953.56	839.31	7953.46
845.31	7953.46	849.12	7953.52	855.31	7953.75	858.94	7953.85	868.75	7954.14
875.32	7954.11	888.38	7954.19	895.32	7954.31	898.19	7954.34	905.32	7954.4
912.16	7954.44	914.07	7954.78	916.95	7955.54	922.93	7957.18	925.53	7957.88
935.33	7960.4	942	7961.75	944.11	7962.2	946.58	7962.69	947.48	7962.93
948.06	7963.11	954.17	7963.17						

Manning's n values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	706	.035	749	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
706	749	467.46	479.73	474.53	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	694	7945.95	T
762	954.17	7951	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7944.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7944.04	Reach Len. (ft)	467.46	479.73	474.53
Crit W.S. (ft)		Flow Area (sq ft)	16.37	275.87	18.48
E.G. Slope (ft/ft)	0.001637	Area (sq ft)	16.37	275.87	18.48
Q Total (cfs)	1691.00	Flow (cfs)	24.58	1635.58	30.84
Top Width (ft)	55.50	Top Width (ft)	6.38	43.00	6.12
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)	1.50	5.93	1.67
Max Chl Dpth (ft)	6.79	Hydr. Depth (ft)	2.57	6.42	3.02
Conv. Total (cfs)	41790.6	Conv. (cfs)	607.4	40421.0	762.2
Length Wtd. (ft)	478.85	Wetted Per. (ft)	8.93	43.03	8.60
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.19	0.66	0.22
Alpha	1.15	Stream Power (lb/ft s)	0.28	3.89	0.37
Frctn Loss (ft)	1.52	Cum Volume (acre-ft)	103.82	99.28	182.73
C & E Loss (ft)	0.19	Cum SA (acres)	48.86	25.89	66.38

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7944.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.50	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7944.20	Reach Len. (ft)	467.46	479.73	474.53
Crit W.S. (ft)		Flow Area (sq ft)	17.21	282.52	19.36
E.G. Slope (ft/ft)	0.001508	Area (sq ft)	17.21	282.52	19.36
Q Total (cfs)	1691.00	Flow (cfs)	25.99	1633.15	31.85
Top Width (ft)	54.72	Top Width (ft)	5.85	43.00	5.87
Vel Total (ft/s)	5.30	Avg. Vel. (ft/s)	1.51	5.78	1.65
Max Chl Dpth (ft)	6.95	Hydr. Depth (ft)	2.94	6.57	3.30
Conv. Total (cfs)	43549.1	Conv. (cfs)	669.4	42059.4	820.3
Length Wtd. (ft)	478.92	Wetted Per. (ft)	8.74	43.03	8.65
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.19	0.62	0.21
Alpha	1.15	Stream Power (lb/ft s)	0.28	3.57	0.35
Frctn Loss (ft)	1.47	Cum Volume (acre-ft)	30.31	109.38	22.59
C & E Loss (ft)	0.23	Cum SA (acres)	12.16	25.89	8.22

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7943.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7943.40	Reach Len. (ft)	467.46	479.73	474.53
Crit W.S. (ft)		Flow Area (sq ft)	12.74	248.51	14.79
E.G. Slope (ft/ft)	0.001347	Area (sq ft)	12.74	248.51	14.79
Q Total (cfs)	1284.00	Flow (cfs)	16.62	1246.59	20.79
Top Width (ft)	53.49	Top Width (ft)	5.01	43.00	5.47
Vel Total (ft/s)	4.65	Avg. Vel. (ft/s)	1.30	5.02	1.41
Max Chl Dpth (ft)	6.15	Hydr. Depth (ft)	2.54	5.78	2.70
Conv. Total (cfs)	34982.6	Conv. (cfs)	452.7	33963.4	566.5

Length Wtd. (ft)	479.14	Wetted Per. (ft)	7.42	43.03	7.69
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.14	0.49	0.16
Alpha	1.13	Stream Power (lb/ft s)	0.19	2.44	0.23
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	80.87	84.11	153.53
C & E Loss (ft)	0.18	Cum SA (acres)	43.62	25.89	59.52

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7944.34	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7943.85	Reach Len. (ft)	467.46	479.73	474.53
Crit W.S. (ft)		Flow Area (sq ft)	15.16	267.47	17.30
E.G. Slope (ft/ft)	0.001578	Area (sq ft)	15.16	267.47	17.30
Q Total (cfs)	1575.00	Flow (cfs)	22.01	1525.25	27.74
Top Width (ft)	54.88	Top Width (ft)	5.96	43.00	5.92
Vel Total (ft/s)	5.25	Avg. Vel. (ft/s)	1.45	5.70	1.60
Max Chl Dpth (ft)	6.60	Hydr. Depth (ft)	2.54	6.22	2.92
Conv. Total (cfs)	39643.2	Conv. (cfs)	554.0	38390.9	698.3
Length Wtd. (ft)	478.90	Wetted Per. (ft)	8.46	43.03	8.32
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.18	0.61	0.20
Alpha	1.14	Stream Power (lb/ft s)	0.26	3.49	0.33
Frctn Loss (ft)	1.46	Cum Volume (acre-ft)	96.99	95.22	174.46
C & E Loss (ft)	0.17	Cum SA (acres)	47.61	25.89	64.64

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7945.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7944.45	Reach Len. (ft)	467.46	479.73	474.53
Crit W.S. (ft)		Flow Area (sq ft)	19.18	293.61	21.16
E.G. Slope (ft/ft)	0.001761	Area (sq ft)	19.18	293.61	21.16
Q Total (cfs)	1950.00	Flow (cfs)	30.98	1881.75	37.27
Top Width (ft)	57.27	Top Width (ft)	7.27	43.00	7.00
Vel Total (ft/s)	5.84	Avg. Vel. (ft/s)	1.61	6.41	1.76
Max Chl Dpth (ft)	7.20	Hydr. Depth (ft)	2.64	6.83	3.02
Conv. Total (cfs)	46472.4	Conv. (cfs)	738.4	44845.8	888.3
Length Wtd. (ft)	478.76	Wetted Per. (ft)	9.90	43.03	9.59
Min Ch El (ft)	7937.25	Shear (lb/sq ft)	0.21	0.75	0.24
Alpha	1.17	Stream Power (lb/ft s)	0.34	4.81	0.43
Frctn Loss (ft)	1.65	Cum Volume (acre-ft)	118.85	107.61	201.08
C & E Loss (ft)	0.21	Cum SA (acres)	52.44	25.89	70.75

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 22724

INPUT
Description:
Station Elevation Data num= 261

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7990.68	12.11	7992.24	13.09	7992.37	14.22	7992.51	26.16	7989.98
27.82	7989.48	38.83	7986.54	43.53	7984.9	51.8	7982.07	59.24	7979.59
64.49	7977.77	65.06	7977.57	70.5	7975.76	90.66	7969.27	90.88	7969.2
103.67	7964.97	106.37	7964.1	116.63	7960.85	120.5	7959.63	120.9	7959.5
123.45	7956.83	129.08	7950.55	132.84	7945.69	137.79	7945.19	142.56	7945.08
147.67	7945.14	153.5	7945.33	155.53	7945.4	161.47	7945.35	168.39	7945.27
176.29	7945.3	181.45	7945.29	184.48	7945.27	194.43	7945.25	199.14	7945.23
204.36	7945.22	207.39	7945.22	216.34	7945.2	218.61	7945.21	222.5	7945.22
232.05	7945.27	240.25	7945.35	246.14	7945.38	259.25	7945.41	261.19	7945.38
263.47	7945.37	272.22	7945.22	277.05	7945.17	285.19	7945.02	294.89	7945.23
298.16	7945.26	310.6	7945.46	326.31	7945.45	337.05	7945.65	339.47	7945.68
342.02	7945.76	350.02	7945.87	357.73	7945.94	362.99	7945.97	373.44	7946.01
375.95	7946.03	387.83	7945.56	389.02	7945.51	401.89	7945.83	409.19	7945.95
413.48	7946.16	414.85	7946.35	420.57	7946.88	429.7	7947.19	432.38	7947.29
435.44	7947.38	441.38	7947.58	450.99	7947.46	466.89	7947.15	473.17	7947.01
479.65	7946.91	483.49	7946.9	491.54	7946.86	500.5	7946.84	506.52	7946.87
513.84	7946.87	518.05	7946.94	523.38	7946.94	524.19	7946.99	528.56	7947.37
531.14	7947.2	533.2	7947.07	537	7946.81	544.25	7946	545.44	7945.93
553.74	7944.95	554.56	7944.59	556.7	7943.72	560.42	7942.18	564.84	7941.33
567.94	7940.53	569.51	7940.72	574.02	7941.38	583.89	7942.46	592.17	7942.42
595.62	7942.42	607.57	7942.4	611.92	7942.35	620.24	7942.21	628.21	7942
632.9	7941.98	649.26	7941.88	658.23	7941.89	660.81	7941.85	670.9	7941.71
677.1	7941.49	683.57	7941.15	693.4	7940.96	696.23	7940.92	706.11	7940.8
708.9	7940.76	721.56	7940.83	725.09	7940.96	734.22	7940.95	744.91	7940.46
747.36	7939.97	751.36	7939	754.45	7938.23	754.77	7938.13	798.32	7938.13
798.66	7938.22	805.2	7940.02	807.47	7940.68	810.22	7941.46	818.55	7943.85
821.72	7943.78	823.77	7943.74	835.55	7943.75	838.6	7943.76	841.14	7943.4
848.21	7941.86	856.36	7940.36	860.88	7940.25	872.65	7941	878.62	7941.34
881.87	7940.73	887.71	7940.35	892.73	7939.92	899.12	7939.96	901.22	7939.96
906.96	7939.98	911.69	7940.14	914.71	7940.17	918.55	7940.33	922.98	7940.58
930.22	7940.95	932.8	7941.01	934.7	7941.08	938.95	7941.23	944.96	7940.94
954.86	7940.94	957.44	7941.11	963.01	7941.01	966.22	7940.94	969.04	7940.91
974.02	7940.76	981.06	7940.69	988.56	7940.52	993.01	7940.45	996.07	7940.38
1003.97	7940.25	1011.62	7940.22	1016.01	7940.27	1018.13	7940.3	1022.23	7940.35
1024.26	7940.37	1026.95	7940.39	1035.09	7940.17	1039.17	7940.03	1040.21	7939.97
1050.74	7939.94	1053.79	7939.91	1061.92	7939.86	1068.79	7939.74	1073.07	7939.71
1076.28	7939.63	1079.3	7939.58	1084.26	7939.35	1085.48	7939.3	1090.69	7938.92
1096.35	7938.98	1101.55	7938.96	1107.39	7939.14	1110.49	7939.07	1112.54	7938.98
1116.35	7938.83	1120.78	7938.74	1132.23	7938.34	1136.75	7938.06	1145.87	7938.33
1151.14	7938.34	1156.35	7938.45	1161.14	7938.45	1166.35	7938.57	1171.14	7938.52
1176.35	7938.73	1186.35	7938.62	1196.35	7938.64	1201.14	7938.66	1206.35	7938.66
1211.14	7938.72	1216.35	7938.75	1221.14	7938.82	1226.35	7938.88	1241.14	7938.77
1246.35	7938.75	1266.35	7938.6	1271.14	7938.63	1276.35	7938.59	1286.35	7938.67
1296.35	7938.44	1306.35	7938.18	1311.14	7938.22	1316.35	7938.17	1326.35	7938.25
1331.14	7938.13	1341.14	7937.9	1346.35	7937.77	1356.35	7937.79	1361.14	7937.81
1371.14	7937.77	1376.35	7937.81	1386.35	7937.77	1401.14	7937.59	1406.35	7937.61
1411.14	7937.37	1416.35	7937.28	1426.35	7936.77	1434.44	7936.33	1436.66	7936.32
2539.83	7936.32	2540.15	7936.39	2546.35	7937.74	2552.08	7939.42	2553.56	7939.87
2568.96	7939.92	2574.4	7939.92	2581.14	7941.8	2586.35	7943.31	2589.95	7944.27
2590.23	7944.33	2596.35	7945.53	2601.14	7946.55	2606.35	7947.61	2621.14	7951.22
2626.35	7952.47	2631.14	7953.39	2636.35	7954.69	2636.63	7954.81	2639.06	7955.62
2642.08	7956.31	2646.35	7957.46	2661.14	7961.96	2666.35	7963.27	2676.35	7966.7
2676.64	7966.83								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	754.77	.035	798.32	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
754.77	798.32	894.82	849.72 700.27	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	583.89	7942.6	T
818.55	2676.64	7943.85	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7942.86	Element			
Vel Head (ft)	1.15	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7941.71	Reach Len. (ft)	894.82	849.72	700.27
Crit W.S. (ft)	7941.71	Flow Area (sq ft)	78.10	155.85	23.08
E.G. Slope (ft/ft)	0.008683	Area (sq ft)	86.05	155.85	7569.52
Q Total (cfs)	1691.00	Flow (cfs)	171.50	1442.45	77.05
Top Width (ft)	1886.08	Top Width (ft)	97.98	43.55	1744.55
Vel Total (ft/s)	6.58	Avg. Vel. (ft/s)	2.20	9.26	3.34
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)	0.93	3.58	1.81
Conv. Total (cfs)	18147.5	Conv. (cfs)	1840.5	15480.1	826.9
Length Wtd. (ft)	849.75	Wetted Per. (ft)	84.13	43.55	13.26
Min Ch El (ft)	7938.13	Shear (lb/sq ft)	0.50	1.94	0.94
Alpha	1.71	Stream Power (lb/ft s)	1.10	17.95	3.15
Frctn Loss (ft)	4.81	Cum Volume (acre-ft)	103.27	96.91	141.39
C & E Loss (ft)	0.26	Cum SA (acres)	48.30	25.42	56.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7942.99	Element			
Vel Head (ft)	1.28	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7941.71	Reach Len. (ft)	894.82	849.72	700.27
Crit W.S. (ft)	7941.71	Flow Area (sq ft)	77.77	155.68	5.62
E.G. Slope (ft/ft)	0.009407	Area (sq ft)	85.67	155.68	5.62
Q Total (cfs)	1691.00	Flow (cfs)	177.42	1498.69	14.89
Top Width (ft)	143.04	Top Width (ft)	97.81	43.55	1.68
Vel Total (ft/s)	7.07	Avg. Vel. (ft/s)	2.28	9.63	2.65
Max Chl Dpth (ft)	3.57	Hydr. Depth (ft)	0.93	3.57	3.35
Conv. Total (cfs)	17434.7	Conv. (cfs)	1829.3	15451.9	153.5
Length Wtd. (ft)	851.19	Wetted Per. (ft)	84.02	43.55	4.86
Min Ch El (ft)	7938.13	Shear (lb/sq ft)	0.54	2.10	0.68
Alpha	1.65	Stream Power (lb/ft s)	1.24	20.21	1.80
Frctn Loss (ft)	3.24	Cum Volume (acre-ft)	29.76	106.97	22.46
C & E Loss (ft)	0.32	Cum SA (acres)	11.60	25.42	8.18

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7942.28	Element			
Vel Head (ft)	0.99	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7941.29	Reach Len. (ft)	894.82	849.72	700.27
Crit W.S. (ft)	7941.29	Flow Area (sq ft)	45.41	137.69	18.06
E.G. Slope (ft/ft)	0.008413	Area (sq ft)	48.70	137.69	6843.17
Q Total (cfs)	1284.00	Flow (cfs)	74.37	1154.98	54.65
Top Width (ft)	1864.09	Top Width (ft)	82.32	43.55	1738.22
Vel Total (ft/s)	6.38	Avg. Vel. (ft/s)	1.64	8.39	3.03
Max Chl Dpth (ft)	4.97	Hydr. Depth (ft)	0.61	3.16	1.60
Conv. Total (cfs)	13998.8	Conv. (cfs)	810.8	12592.1	595.8
Length Wtd. (ft)	848.66	Wetted Per. (ft)	74.19	43.55	11.74
Min Ch El (ft)	7938.13	Shear (lb/sq ft)	0.32	1.66	0.81
Alpha	1.57	Stream Power (lb/ft s)	0.53	13.93	2.44
Frctn Loss (ft)	5.07	Cum Volume (acre-ft)	80.54	81.98	116.18
C & E Loss (ft)	0.22	Cum SA (acres)	43.16	25.42	50.02

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7942.70	Element			
Vel Head (ft)	1.06	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7941.64	Reach Len. (ft)	894.82	849.72	700.27
Crit W.S. (ft)	7941.64	Flow Area (sq ft)	72.27	152.79	22.19
E.G. Slope (ft/ft)	0.008189	Area (sq ft)	79.26	152.79	7446.89
Q Total (cfs)	1575.00	Flow (cfs)	148.72	1355.28	71.00
Top Width (ft)	1882.20	Top Width (ft)	94.99	43.55	1743.67
Vel Total (ft/s)	6.37	Avg. Vel. (ft/s)	2.06	8.87	3.20
Max Chl Dpth (ft)	5.32	Hydr. Depth (ft)	0.88	3.51	1.77
Conv. Total (cfs)	17404.5	Conv. (cfs)	1643.4	14976.5	784.6
Length Wtd. (ft)	849.57	Wetted Per. (ft)	82.15	43.55	13.00
Min Ch El (ft)	7938.13	Shear (lb/sq ft)	0.45	1.79	0.87
Alpha	1.69	Stream Power (lb/ft s)	0.93	15.91	2.79
Frctn Loss (ft)	4.53	Cum Volume (acre-ft)	96.49	92.91	133.80
C & E Loss (ft)	0.24	Cum SA (acres)	47.07	25.42	55.11

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for

additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7943.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.32	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7941.88	Reach Len. (ft)	894.82	849.72	700.27
Crit W.S. (ft)	7941.86	Flow Area (sq ft)	93.89	163.48	25.37
E.G. Slope (ft/ft)	0.009519	Area (sq ft)	104.54	163.48	7875.52
Q Total (cfs)	1950.00	Flow (cfs)	222.82	1635.62	91.56
Top Width (ft)	1907.11	Top Width (ft)	116.85	43.55	1746.71
Vel Total (ft/s)	6.90	Avg. Vel. (ft/s)	2.37	10.00	3.61
Max Chl Dpth (ft)	5.56	Hydr. Depth (ft)	0.94	3.75	1.90
Conv. Total (cfs)	19986.7	Conv. (cfs)	2283.8	16764.4	938.5
Length Wtd. (ft)	849.80	Wetted Per. (ft)	100.49	43.55	13.89
Min Ch El (ft)	7938.13	Shear (lb/sq ft)	0.56	2.23	1.09
Alpha	1.79	Stream Power (lb/ft s)	1.32	22.32	3.92
Frctn Loss (ft)	6.50	Cum Volume (acre-ft)	118.19	105.09	158.07
C & E Loss (ft)	0.27	Cum SA (acres)	51.77	25.42	61.19

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 21874

INPUT
Description:
Station Elevation Data num= 161

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7970.81	.99	7970.38	2.32	7969.79	6.03	7968.12	12.5	7965.22
13.27	7964.88	19.2	7962.23	21.19	7961.39	22.68	7960.75	32.86	7956.43
51.73	7948.3	53.22	7947.67	53.71	7947.21	53.83	7947.13	62.51	7941.77
63.4	7941.2	67.21	7938.66	72.04	7938.65	76.88	7937.93	83.76	7936.48
84.99	7936.14	87.34	7935.7	89.56	7935.81	102.02	7936.23	104.12	7936.33
113.04	7936.62	124.47	7936.63	127.16	7936.62	134.65	7936.5	155.01	7936.52
175.37	7936.15	177.45	7936.16	195.73	7936.16	205.91	7936.23	215.16	7936.19
226.27	7936.25	236.45	7935.96	241.16	7935.79	245.35	7935.65	248.5	7935.64
256.81	7935.32	258.14	7935.26	260.92	7935.18	267.12	7934.86	271.11	7934.69
326.74	7934.69	327.82	7934.86	333.24	7935.78	336.13	7935.78	338.24	7935.73
340.87	7935.7	348.42	7935.76	356.21	7935.65	358.66	7935.63	362.47	7935.73
369.11	7935.84	378.52	7936.08	386.55	7936.06	389.99	7936.04	394.57	7936.07
400.44	7936.02	402.6	7936.03	409.8	7936.08	418.66	7936.17	421.32	7936.17
431.77	7936.29	434.71	7936.33	442.21	7936.38	458.79	7936.68	463.1	7936.75
466.82	7936.73	473.54	7936.54	476.83	7936.44	479.54	7936.37	481.79	7935.9
483.17	7935.59	485.13	7935.21	487.64	7934.69	496.69	7934.69	503.47	7935.47
504.87	7935.56	507.37	7935.8	507.98	7935.86	514.65	7935.98	524.38	7935.64
526.45	7935.58	527.4	7935.46	534.73	7934.86	536.43	7934.68	544.29	7935.13
546.64	7935.26	548.56	7935.11	557.8	7934.29	575.87	7934.15	602.66	7934
655	7934	728.69	7934	733.2	7935.79	734.25	7936.1	735.45	7936.39
737.84	7936.16	740.64	7936.02	746.26	7936.03	752.46	7935.85	757.05	7935.65
764.25	7935.64	771.16	7936.25	775.22	7936.25	778.66	7936.23	786.57	7936.17
790.18	7936.31	792.23	7936.38	799.76	7936.66	809.16	7936.98	811.41	7937.16
817.57	7936.9	821.74	7937.06	824.04	7937.13	831.91	7937.14	842.4	7937.28
847.26	7937.3	851.66	7937.34	853	7942.49	951	7939.44	1052	7938.3
1155	7938.43	1185	7941.4	1257	7938.24	1362	7938.13	1466	7937.96
1568	7938.25	1621.3	7939.9	1623.9	7937.55	1647.7	7937.58	1650.5	7940.01
1668	7939.49	1770	7939.5	1874	7939.29	1975	7939.21	2083.52	7939.24
2086.38	7939.28	2106.16	7939.45	2116.6	7939.18	2118.6	7939.25	2121.39	7939.33
2128.01	7939.53	2129.66	7939.72	2132.18	7939.76	2134.05	7939.86	2140.94	7940.3
2160.4	7939.89	2164.05	7941.98	2174.05	7947.69	2177.37	7949.69	2183.46	7953.23
2184.54	7954.12	2185.3	7954.74	2188.8	7957.51	2194.05	7961.86	2200.6	7965.88
2204.32	7968.26								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	87.34	.05	557.8	.035	728.69	.05	1257	0

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
557.8	728.69	552.36	570.84	551.05	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	463.1	7937	T
735	2204.32	7941.72	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7936.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7936.12	Reach Len. (ft)	552.36	570.84	551.05
Crit W.S. (ft)		Flow Area (sq ft)	69.17	356.57	5.72
E.G. Slope (ft/ft)	0.003984	Area (sq ft)	201.13	356.57	13.94
Q Total (cfs)	1691.00	Flow (cfs)	120.39	1560.27	10.34
Top Width (ft)	481.53	Top Width (ft)	273.90	170.89	36.74
Vel Total (ft/s)	3.92	Avg. Vel. (ft/s)	1.74	4.38	1.81
Max Chl Dpth (ft)	2.12	Hydr. Depth (ft)	0.90	2.09	1.01
Conv. Total (cfs)	26790.2	Conv. (cfs)	1907.3	24719.0	163.9
Length Wtd. (ft)	563.24	Wetted Per. (ft)	77.39	170.89	6.04
Min Ch El (ft)	7934.00	Shear (lb/sq ft)	0.22	0.52	0.24
Alpha	1.17	Stream Power (lb/ft s)	0.39	2.27	0.43
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)	100.32	91.91	80.44
C & E Loss (ft)	0.03	Cum SA (acres)	44.48	23.32	42.53

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7936.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7936.67	Reach Len. (ft)	552.36	570.84	551.05
Crit W.S. (ft)		Flow Area (sq ft)	15.84	449.78	9.11
E.G. Slope (ft/ft)	0.002046	Area (sq ft)	15.84	449.78	9.11
Q Total (cfs)	1691.00	Flow (cfs)	29.92	1646.64	14.45
Top Width (ft)	185.00	Top Width (ft)	7.80	170.89	6.31
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)	1.89	3.66	1.59
Max Chl Dpth (ft)	2.67	Hydr. Depth (ft)	2.03	2.63	1.44
Conv. Total (cfs)	37381.7	Conv. (cfs)	661.3	36401.0	319.4
Length Wtd. (ft)	564.92	Wetted Per. (ft)	9.52	170.89	7.10
Min Ch El (ft)	7934.00	Shear (lb/sq ft)	0.21	0.34	0.16
Alpha	1.04	Stream Power (lb/ft s)	0.40	1.23	0.26
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	28.72	101.06	22.34
C & E Loss (ft)	0.01	Cum SA (acres)	10.52	23.32	8.11

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7936.01	Element			
Vel Head (ft)	0.25	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7935.77	Reach Len. (ft)	552.36	570.84	552.05
Crit W.S. (ft)		Flow Area (sq ft)	43.71	295.58	3.92
E.G. Slope (ft/ft)	0.004466	Area (sq ft)	122.23	295.58	5.02
Q Total (cfs)	1284.00	Flow (cfs)	68.86	1208.32	6.83
Top Width (ft)	368.85	Top Width (ft)	182.27	170.89	15.69
Vel Total (ft/s)	3.74	Avg. Vel. (ft/s)	1.58	4.09	1.74
Max Chl Dpth (ft)	1.76	Hydr. Depth (ft)	0.71	1.73	0.88
Conv. Total (cfs)	19214.1	Conv. (cfs)	1030.4	18081.5	102.1
Length Wtd. (ft)	563.59	Wetted Per. (ft)	61.87	170.89	4.78
Min Ch El (ft)	7934.00	Shear (lb/sq ft)	0.20	0.48	0.23
Alpha	1.13	Stream Power (lb/ft s)	0.31	1.97	0.40
Frctn Loss (ft)	1.66	Cum Volume (acre-ft)	78.79	77.76	61.13
C & E Loss (ft)	0.03	Cum SA (acres)	40.44	23.32	35.92

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7936.33	Element			
Vel Head (ft)	0.25	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7936.08	Reach Len. (ft)	552.36	570.84	551.05
Crit W.S. (ft)		Flow Area (sq ft)	65.64	348.73	5.46
E.G. Slope (ft/ft)	0.003748	Area (sq ft)	188.75	348.73	12.29
Q Total (cfs)	1575.00	Flow (cfs)	107.21	1458.30	9.48
Top Width (ft)	469.83	Top Width (ft)	263.81	170.89	35.13
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	1.63	4.18	1.74
Max Chl Dpth (ft)	2.08	Hydr. Depth (ft)	0.85	2.04	1.00
Conv. Total (cfs)	25725.5	Conv. (cfs)	1751.2	23819.4	154.9
Length Wtd. (ft)	563.45	Wetted Per. (ft)	77.16	170.89	5.86
Min Ch El (ft)	7934.00	Shear (lb/sq ft)	0.20	0.48	0.22
Alpha	1.16	Stream Power (lb/ft s)	0.33	2.00	0.38
Frctn Loss (ft)	1.93	Cum Volume (acre-ft)	93.73	88.02	73.84
C & E Loss (ft)	0.02	Cum SA (acres)	43.39	23.32	40.81

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7936.44	Element			
Vel Head (ft)	0.41	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7936.03	Reach Len. (ft)	552.36	570.84	551.05
Crit W.S. (ft)		Flow Area (sq ft)	61.85	340.30	5.20
E.G. Slope (ft/ft)	0.006282	Area (sq ft)	176.63	340.30	10.60
Q Total (cfs)	1950.00	Flow (cfs)	125.98	1812.49	11.53
Top Width (ft)	433.67	Top Width (ft)	231.44	170.89	31.34
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	2.04	5.33	2.22
Max Chl Dpth (ft)	2.03	Hydr. Depth (ft)	0.81	1.99	0.98
Conv. Total (cfs)	24602.7	Conv. (cfs)	1589.5	22867.8	145.4
Length Wtd. (ft)	562.70	Wetted Per. (ft)	76.92	170.89	5.69
Min Ch El (ft)	7934.00	Shear (lb/sq ft)	0.32	0.78	0.36
Alpha	1.16	Stream Power (lb/ft s)	0.64	4.16	0.80
Frctn Loss (ft)	1.85	Cum Volume (acre-ft)	125.30	100.18	94.68
C & E Loss (ft)	0.09	Cum SA (acres)	48.20	23.32	46.90

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 21304

INPUT

Description:

Station Elevation Data num= 180

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	8015.76	1.09	8014.18	5.12	8009.26	8.97	8004.58	14.39	7998.12
19.69	7991.7	28.44	7981.48	29.86	7979.83	30.41	7979.19	32.27	7977.02
39.86	7968.15	40.29	7967.65	41.96	7965.99	49.94	7958.11	51.84	7956.22
53.06	7955.02	56.21	7951.9	60.8	7947.39	62.56	7945.78	66.78	7941.93
73.25	7935.89	74.62	7934.66	78.44	7934.65	81.5	7934.65	84	7933.87
91.73	7931.93	94.72	7931.21	99.46	7930.37	105.44	7930.22	111.75	7930.23
114.94	7930.24	123.3	7930.25	130.34	7930.39	132.8	7930.43	136.54	7930.54
393.93	7930.54	395.25	7931.12	399.12	7932.81	400.19	7933.27	405.58	7933.06
408.82	7932.92	416.3	7932.93	426.69	7933.15	432.92	7933.23	437.74	7933.28
439.75	7933.36	449.23	7933.5	452.24	7933.57	456.92	7931.52	459.3	7930.5
459.98	7930.65	465.06	7931.16	473.73	7932.11	477.36	7931.93	481.42	7931.66
488.41	7930.78	497.24	7931.04	499.74	7931.45	501.54	7931.88	503.51	7932.36
505.56	7932.89	506.01	7932.95	508.82	7933.15	524.26	7933.5	526.29	7933.54
528.27	7933.64	532.56	7933.78	534.21	7933.89	537.01	7934.03	541.79	7934.12
544.93	7934.3	548.6	7934.15	555.58	7932.97	557.6	7932.6	561.94	7932.55
566.37	7932.62	570.93	7932.58	575.97	7932.94	577.09	7933.03	578.95	7933.27
579.98	7933.43	584.38	7933.41	587.2	7933.39	589.84	7933.77	594.77	7933.52
597.83	7932.75	599.04	7932.36	609.24	7932.72	617.02	7932.74	618.06	7932.39
619.96	7931.73	623.67	7930.48	624.63	7930.15	645.27	7930.38	647.42	7932.31
649.82	7934.16	652.12	7934.15	656.3	7934.16	664.03	7934.16	667.11	7934.18
671.76	7934.16	679.5	7934.05	687.23	7933.92	695	7933.92	702.7	7933.87
716.44	7933.9	758.14	7933.89	766.56	7933.43	778.14	7932.98	789.28	7932.41
792.8	7932.08	798.68	7931.85	799	7931.8	819.23	7931.8	823.14	7931.88
826.7	7931.8	1298.14	7931.8	1306.56	7931.81	1412.09	7931.81	1424.53	7933.49
1426.56	7933.79	1428.14	7934.02	1436.56	7935.15	1437.32	7935.27	1439.23	7935.54
1448.03	7933.97	1449.08	7933.79	1556.56	7934.47	1558.6	7934.31	1566.37	7933.79
1574.58	7934.63	1576.56	7934.85	1616.56	7935.39	1636.56	7936.16	1656.56	7936.7
1666.56	7936.83	1676.56	7937	1698.14	7937.83	1718.14	7938.47	1728.76	7938.9
1730.92	7938.97	1736.63	7938.89	1744.84	7939.04	1748.14	7939.03	1756.56	7939.18
1776.56	7939.32	1779.91	7940.09	1782	7940.8	1784.8	7940.54	1786.77	7940.35
1795.09	7939.58	1796.56	7939.45	1798.14	7939.36	1836.56	7939.62	1846.56	7939.71
1876.56	7939.92	1886.56	7940.21	1888.14	7940.27	1896.56	7940.54	1906.56	7940.81
1916.56	7941.05	1932.88	7940.91	1935.65	7941.23	1938.39	7941.56	1946.62	7942.54
1947.44	7942.63	1958.94	7942.9	1963.44	7942.96	1964.32	7943.55	1965.56	7945.08
1968.14	7946.18	1976.56	7951.83	1976.86	7952.06	1979.73	7953.99	1985.24	7956.21
1986.56	7956.7	1988.14	7957.3	1996.56	7960.69	1998.14	7961.37	2005.4	7964.67

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	99.46	.05	624.63	.035	645.27	.05	1412.09	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
624.63 645.27 522.08 532.15 493.21 .1 .3
Ineffective Flow num= 4
Sta L Sta R Elev Permanent
0 425 7933.57 T
425 544.93 7934.3 F
664.03 900 7934.18 F
900 2005.4 8000 T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7934.46	Element			
Vel Head (ft)	0.18	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7934.28	Reach Len. (ft)	522.08	532.15	493.21
Crit W.S. (ft)	7934.19	Flow Area (sq ft)	350.76	82.79	348.32
E.G. Slope (ft/ft)	0.002926	Area (sq ft)	1501.73	82.79	1659.75
Q Total (cfs)	1691.00	Flow (cfs)	523.77	479.95	687.28
Top Width (ft)	1437.89	Top Width (ft)	540.93	20.64	876.32
Vel Total (ft/s)	2.16	Avg. Vel. (ft/s)	1.49	5.80	1.97
Max Chl Dpth (ft)	4.13	Hydr. Depth (ft)	0.83	4.01	1.37
Conv. Total (cfs)	31259.5	Conv. (cfs)	9682.3	8872.3	12704.9
Length Wtd. (ft)	511.98	Wetted Per. (ft)	423.27	20.64	256.16
Min Ch El (ft)	7930.15	Shear (lb/sq ft)	0.15	0.73	0.25
Alpha	2.53	Stream Power (lb/ft s)	0.23	4.25	0.49
Frctn Loss (ft)	1.41	Cum Volume (acre-ft)	89.52	89.03	69.85
C & E Loss (ft)	0.00	Cum SA (acres)	39.31	22.07	36.75

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7935.54	Element			
Vel Head (ft)	0.32	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7935.23	Reach Len. (ft)	522.08	532.15	493.21
Crit W.S. (ft)	7934.41	Flow Area (sq ft)	366.58	102.43	13.32
E.G. Slope (ft/ft)	0.002678	Area (sq ft)	366.58	102.43	13.32
Q Total (cfs)	1691.00	Flow (cfs)	1005.34	654.69	30.97
Top Width (ft)	175.00	Top Width (ft)	149.63	20.64	4.73
Vel Total (ft/s)	3.51	Avg. Vel. (ft/s)	2.74	6.39	2.32
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)	2.45	4.96	2.82
Conv. Total (cfs)	32677.5	Conv. (cfs)	19427.6	12651.5	598.4
Length Wtd. (ft)	519.30	Wetted Per. (ft)	153.93	20.64	7.17
Min Ch El (ft)	7930.15	Shear (lb/sq ft)	0.40	0.83	0.31
Alpha	1.66	Stream Power (lb/ft s)	1.09	5.30	0.72
Frctn Loss (ft)	1.44	Cum Volume (acre-ft)	26.29	97.44	22.20
C & E Loss (ft)	0.01	Cum SA (acres)	9.52	22.07	8.04

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7934.32	Element			
Vel Head (ft)	0.13	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7934.19	Reach Len. (ft)	522.08	532.15	493.21
Crit W.S. (ft)	7934.19	Flow Area (sq ft)	314.03	80.98	326.05
E.G. Slope (ft/ft)	0.002079	Area (sq ft)	1454.63	80.98	1583.91
Q Total (cfs)	1284.00	Flow (cfs)	375.24	389.92	518.85
Top Width (ft)	1416.83	Top Width (ft)	536.98	20.64	859.21
Vel Total (ft/s)	1.78	Avg. Vel. (ft/s)	1.19	4.81	1.59
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)	0.75	3.92	1.28
Conv. Total (cfs)	28163.4	Conv. (cfs)	8230.5	8552.5	11380.4
Length Wtd. (ft)	512.24	Wetted Per. (ft)	420.83	20.64	256.16
Min Ch El (ft)	7930.15	Shear (lb/sq ft)	0.10	0.51	0.17
Alpha	2.67	Stream Power (lb/ft s)	0.12	2.45	0.26
Frctn Loss (ft)	1.12	Cum Volume (acre-ft)	68.79	75.29	51.08
C & E Loss (ft)	0.00	Cum SA (acres)	35.88	22.07	30.39

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7934.39	Element			
Vel Head (ft)	0.20	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7934.19	Reach Len. (ft)	522.08	532.15	493.21
Crit W.S. (ft)	7934.19	Flow Area (sq ft)	314.03	80.98	326.05
E.G. Slope (ft/ft)	0.003127	Area (sq ft)	1454.63	80.98	1583.91
Q Total (cfs)	1575.00	Flow (cfs)	460.28	478.28	636.44
Top Width (ft)	1416.83	Top Width (ft)	536.98	20.64	859.21
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	1.47	5.91	1.95
Max Chl Dpth (ft)	4.04	Hydr. Depth (ft)	0.75	3.92	1.28
Conv. Total (cfs)	28163.4	Conv. (cfs)	8230.5	8552.5	11380.4
Length Wtd. (ft)	512.11	Wetted Per. (ft)	420.83	20.64	256.16
Min Ch El (ft)	7930.15	Shear (lb/sq ft)	0.15	0.77	0.25
Alpha	2.67	Stream Power (lb/ft s)	0.21	4.52	0.49
Frctn Loss (ft)	1.44	Cum Volume (acre-ft)	83.31	85.20	63.75
C & E Loss (ft)	0.00	Cum SA (acres)	38.31	22.07	35.15

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7934.50	Element			
Vel Head (ft)	0.11	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7934.39	Reach Len. (ft)	522.08	532.15	493.21
Crit W.S. (ft)	7934.19	Flow Area (sq ft)	611.39	85.08	376.67
E.G. Slope (ft/ft)	0.002020	Area (sq ft)	1562.07	85.08	1758.52
Q Total (cfs)	1950.00	Flow (cfs)	882.07	417.37	650.56
Top Width (ft)	1460.88	Top Width (ft)	542.29	20.64	897.95
Vel Total (ft/s)	1.82	Avg. Vel. (ft/s)	1.44	4.91	1.73
Max Chl Dpth (ft)	4.24	Hydr. Depth (ft)	1.13	4.12	1.48
Conv. Total (cfs)	43388.2	Conv. (cfs)	19626.4	9286.5	14475.2
Length Wtd. (ft)	512.69	Wetted Per. (ft)	545.21	20.64	256.16
Min Ch El (ft)	7930.15	Shear (lb/sq ft)	0.14	0.52	0.19

Alpha	2.15	Stream Power (lb/ft s)	0.20	2.55	0.32
Frctn Loss (ft)	1.12	Cum Volume (acre-ft)	104.28	97.39	83.49
C & E Loss (ft)	0.01	Cum SA (acres)	43.29	22.07	41.02

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 20771

INPUT
Description:
Station Elevation Data num= 332

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7966.81	2.24	7966.53	6.87	7965.86	8.55	7965.35	14.3	7963.78
18.27	7962.94	21.49	7962.3	26.14	7961.65	28.68	7961.35	30.43	7960.95
42.59	7958.19	43.05	7958.1	43.73	7957.88	50.24	7955.52	54.74	7953.9
57.43	7952.92	64.62	7950.91	66.9	7950.28	71.81	7948.75	78.91	7946.38
79.2	7946.3	88.78	7943.69	89.87	7943.4	96.5	7939.81	100.56	7937.55
103.36	7935.8	104.06	7935.39	107.35	7933.44	115.92	7933.33	123.59	7933.29
127.59	7931.65	130.56	7930.39	136.54	7928.2	166.81	7928.2	170.96	7928.54
176.3	7929	182.96	7929.51	184.65	7929.67	329.11	7929.67	332.56	7930.06
334.25	7930.22	342.75	7931.06	344.95	7931.27	358.63	7931.33	373.7	7931.28
377.93	7931.31	380.89	7931.32	382.94	7931.33	402.46	7931.32	407.25	7931.31
409.65	7931.31	413.11	7931.39	416.83	7931.44	419.41	7931.48	424.02	7931.49
430.69	7931.64	445.59	7931.73	459.96	7931.67	465.87	7931.76	480.19	7932.23
483.46	7932.4	488.71	7932.66	497.69	7932.52	499.85	7932.48	502.37	7931.75
504.73	7931.19	509.49	7930.11	516.32	7930.18	518.64	7930.22	528.1	7930.36
530.08	7930.48	532.63	7931.06	534.44	7931.55	538.25	7931.47	540.97	7931.42
546.22	7931.49	560.59	7931.58	565.28	7931.59	567.78	7931.59	571.41	7931.57
576.64	7931.4	578.15	7931.25	588.57	7929	589	7928.9	590.45	7928.65
605.82	7928.71	611.92	7928.72	613.29	7928.99	616.71	7930.43	621.72	7930.43
624.6	7930.42	629.09	7930.38	631.12	7930.35	634.62	7930.32	641.78	7928.99
642.42	7928.87	643.68	7928.64	655.31	7928.68	665.91	7928.67	666.99	7929.18
669.31	7930.27	671.22	7931.16	673.92	7930.89	676.59	7930.65	680.72	7930.26
684.09	7930.25	686.59	7930.33	693.8	7930.5	696.59	7930.63	704.27	7930.83
706.23	7931.58	707.15	7931.94	713.27	7934.52	714.07	7934.33	715.66	7933.87
720.07	7933	722.12	7932.6	723.79	7932.05	725.33	7931.64	726.42	7931.17
732.87	7931.23	743.8	7931.66	746.59	7931.71	749.21	7931.75	754.34	7931.46
756.59	7931.3	761.42	7930.83	762.3	7930.77	766.63	7931.25	773.03	7932.81
774.19	7933.03	776.59	7933.66	781.35	7935.12	783.69	7935.57	784.36	7935.44
786.59	7934.95	793.8	7933.78	796.59	7933.31	797.05	7933.23	798.68	7933.07
806.74	7933.08	807.45	7932.99	823.15	7931.01	815.86	7931.4	816.59	7931.52
823.99	7932.59	824.67	7932.68	833.8	7932.75	836.59	7932.78	843.8	7933.03
846.59	7933.1	853.8	7933.15	856.59	7933.22	859.39	7933.28	885.2	7933.67
893.8	7933.7	896.59	7933.7	903.8	7933.75	913.8	7933.75	916.59	7933.77
923.8	7933.81	926.59	7933.83	933.8	7933.98	936.59	7934.03	943.8	7934.17
946.59	7934.23	956.59	7934.56	963.8	7934.7	966.59	7934.79	973.8	7934.94
976.59	7934.99	983.8	7935.04	986.59	7935.09	993.8	7935.29	1006.59	7935.62
1020.44	7935.92	1026.72	7936.09	1030.05	7936.31	1032.87	7936.93	1033.82	7937.15
1036.6	7937.6	1039.96	7938.22	1041.48	7938.12	1043.72	7938.11	1048.44	7938
1049.22	7938.06	1055.25	7937.88	1055.74	7938.02	1056.44	7938.17	1057.29	7938.36
1059.41	7938.78	1063.82	7939.66	1069.61	7939.9	1070.93	7939.96	1071.34	7939.84
1076.59	7938.23	1079.03	7937.49	1078.64	7937.3	1086.59	7937.5	1093.8	7937.67
1096.59	7937.74	1103.8	7937.83	1106.59	7937.9	1108.13	7937.95	1111.52	7937.9
1118.64	7938.19	1130.7	7938.44	1136.59	7938.58	1143.8	7938.9	1146.59	7938.95
1153.8	7939.38	1166.59	7939.88	1170.2	7939.98	1173.8	7940.07	1186.59	7940.75
1193.4	7940.88	1196.59	7940.9	1209.39	7941.07	1216.59	7941.29	1223.8	7941.48
1226.59	7941.59	1233.8	7942.11	1236.59	7942.18	1240.47	7942.64	1246.45	7942.85
1252.42	7942.96	1263.8	7942.8	1266.59	7942.77	1273.8	7943.05	1283.8	7943.12
1286.59	7943.13	1296.59	7943.53	1303.8	7943.67	1306.59	7943.78	1313.8	7943.92
1323.8	7944.06	1326.59	7944.09	1346.59	7944.23	1353.8	7944.37	1366.86	7945.08
1368.85	7944.87	1375.69	7944.31	1383.8	7944.35	1386.59	7944.4	1391.47	7944.68
1392.57	7944.74	1403.43	7944.71	1404.45	7944.78	1416.59	7945.64	1420.85	7945.91
1426.59	7946.07	1436.59	7946.54	1443.8	7946.68	1456.59	7947.27	1463.8	7947.46
1466.59	7947.59	1473.8	7947.82	1486.59	7947.91	1503.8	7948.14	1506.59	7948.17
1513.8	7948.27	1516.59	7948.29	1523.8	7948.33	1526.59	7948.35	1533.8	7948.69
1536.59	7948.81	1543.8	7948.96	1546.59	7949.08	1553.8	7949.46	1563.8	7949.6
1566.59	7949.63	1576.59	7950.23	1583.8	7950.46	1586.59	7950.63	1593.8	7950.92
1596.59	7950.95	1603.8	7951.05	1606.59	7951.08	1646.59	7951.08	1653.8	7950.99
1656.59	7950.95	1663.8	7950.95	1666.59	7950.92	1673.8	7950.55	1676.59	7950.5
1681.68	7950.42	1692.79	7950.14	1701.05	7950.03	1705.18	7950.65	1706.59	7950.81
1712.29	7951.75	1716.59	7951.8	1726.59	7951.95	1733.8	7952.31	1736.59	7952.38
1743.8	7952.6	1746.59	7952.67	1753.8	7953.04	1756.59	7953.29	1763.72	7953.76
1764.63	7953.92	1766.59	7954.47	1773.8	7956.39	1776.59	7956.98	1778.77	7957.45
1781.94	7958.12	1783.78	7958.01	1786.59	7957.83	1793.8	7957.68	1796.59	7957.59
1798.8	7957.56	1803.83	7957.66	1806.59	7957.87	1816.59	7957.94	1823.8	7957.79
1826.59	7957.81	1833.8	7957.62	1846.59	7957.2	1863.8	7957.65	1866.59	7957.73
1873.8	7957.95	1876.59	7958.06	1878.86	7958.12	1882.39	7958.17	1883.7	7958.34
1886.59	7958.72	1893.8	7959.74	1896.59	7960.22	1903.8	7961.55	1906.59	7962.1
1913.8	7964	1919.77	7966.61						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	115.92	.05	590.45	.035	611.92	.05	714.07	.06

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

590.45	611.92	739.92	866.01	800.58	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	485.01	7935.76	F
714.2	1919.77	7934.67	F

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7933.05	Element	Left OB	Channel	Right OB	
Vel Head (ft)	0.22	Wt. n-Val.	0.050	0.035	0.050	
W.S. Elev (ft)	7932.82	Reach Len. (ft)	739.92	866.01	800.58	
Crit W.S. (ft)	7931.82	Flow Area (sq ft)	172.85	88.73	277.55	
E.G. Slope (ft/ft)	0.002589	Area (sq ft)	1082.59	88.73	362.90	
Q Total (cfs)	1691.00	Flow (cfs)	361.76	493.62	835.62	
Top Width (ft)	666.53	Top Width (ft)	465.72	21.47	179.34	
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)	2.09	5.56	3.01	
Max Chl Dpth (ft)	4.62	Hydr. Depth (ft)	1.64	4.13	2.85	
Conv. Total (cfs)	33234.2	Conv. (cfs)	7109.8	9701.5	16423.0	
Length Wtd. (ft)	827.08	Wetted Per. (ft)	106.16	21.47	98.79	
Min Ch El (ft)	7928.65	Shear (lb/sq ft)	0.26	0.67	0.45	
Alpha	1.47	Stream Power (lb/ft s)	0.55	3.72	1.37	
Frctn Loss (ft)	1.58	Cum Volume (acre-ft)	74.03	87.98	58.40	
C & E Loss (ft)	0.01	Cum SA (acres)	33.28	21.81	30.77	

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7934.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.050	0.035	0.050

W.S. Elev (ft)	7933.68	Reach Len. (ft)	739.92	866.01	800.58
Crit W.S. (ft)	7932.10	Flow Area (sq ft)	65.26	107.21	201.49
E.G. Slope (ft/ft)	0.002873	Area (sq ft)	65.26	107.21	201.49
Q Total (cfs)	1691.00	Flow (cfs)	206.51	712.78	771.72
Top Width (ft)	90.95	Top Width (ft)	20.92	21.47	48.56
Vel Total (ft/s)	4.52	Avg. Vel. (ft/s)	3.16	6.65	3.83
Max Chl Dpth (ft)	5.04	Hydr. Depth (ft)	3.12	4.99	4.15
Conv. Total (cfs)	31548.6	Conv. (cfs)	3852.7	13298.1	14397.8
Length Wtd. (ft)	843.38	Wetted Per. (ft)	23.31	21.47	54.04
Min Ch El (ft)	7928.65	Shear (lb/sq ft)	0.50	0.90	0.67
Alpha	1.30	Stream Power (lb/ft s)	1.59	5.95	2.56
Frctn Loss (ft)	1.56	Cum Volume (acre-ft)	23.70	96.16	20.98
C & E Loss (ft)	0.06	Cum SA (acres)	8.50	21.81	7.74

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7932.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7932.46	Reach Len. (ft)	739.92	866.01	800.58
Crit W.S. (ft)	7931.39	Flow Area (sq ft)	135.77	80.83	241.88
E.G. Slope (ft/ft)	0.002312	Area (sq ft)	913.03	80.83	301.69
Q Total (cfs)	1284.00	Flow (cfs)	252.89	399.25	631.86
Top Width (ft)	630.44	Top Width (ft)	449.45	21.47	159.52
Vel Total (ft/s)	2.80	Avg. Vel. (ft/s)	1.86	4.94	2.61
Max Chl Dpth (ft)	4.25	Hydr. Depth (ft)	1.50	3.76	2.51
Conv. Total (cfs)	26706.5	Conv. (cfs)	5260.0	8304.3	13142.3
Length Wtd. (ft)	835.32	Wetted Per. (ft)	91.22	21.47	97.84
Min Ch El (ft)	7928.65	Shear (lb/sq ft)	0.21	0.54	0.36
Alpha	1.48	Stream Power (lb/ft s)	0.40	2.68	0.93
Frctn Loss (ft)	2.34	Cum Volume (acre-ft)	54.60	74.30	40.41
C & E Loss (ft)	0.01	Cum SA (acres)	29.97	21.81	24.62

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7932.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.21	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7932.73	Reach Len. (ft)	739.92	866.01	800.58
Crit W.S. (ft)	7931.75	Flow Area (sq ft)	162.87	86.70	268.34
E.G. Slope (ft/ft)	0.002528	Area (sq ft)	1038.48	86.70	346.20
Q Total (cfs)	1575.00	Flow (cfs)	323.74	469.33	781.93
Top Width (ft)	658.01	Top Width (ft)	465.49	21.47	171.05
Vel Total (ft/s)	3.04	Avg. Vel. (ft/s)	1.99	5.41	2.91
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)	1.54	4.04	2.76
Conv. Total (cfs)	31322.6	Conv. (cfs)	6438.4	9333.7	15550.5
Length Wtd. (ft)	830.53	Wetted Per. (ft)	106.16	21.47	98.54
Min Ch El (ft)	7928.65	Shear (lb/sq ft)	0.24	0.64	0.43
Alpha	1.49	Stream Power (lb/ft s)	0.48	3.45	1.25
Frctn Loss (ft)	1.83	Cum Volume (acre-ft)	68.37	84.18	52.82
C & E Loss (ft)	0.00	Cum SA (acres)	32.30	21.81	29.32

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7933.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7933.14	Reach Len. (ft)	739.92	866.01	800.58
Crit W.S. (ft)	7931.98	Flow Area (sq ft)	206.22	95.53	308.46
E.G. Slope (ft/ft)	0.002378	Area (sq ft)	1230.06	95.53	422.59
Q Total (cfs)	1950.00	Flow (cfs)	465.26	534.98	949.76
Top Width (ft)	695.55	Top Width (ft)	466.49	21.47	207.59
Vel Total (ft/s)	3.20	Avg. Vel. (ft/s)	2.26	5.60	3.08
Max Chl Dpth (ft)	4.94	Hydr. Depth (ft)	1.96	4.45	3.15
Conv. Total (cfs)	39988.2	Conv. (cfs)	9541.1	10970.7	19476.5
Length Wtd. (ft)	820.68	Wetted Per. (ft)	106.16	21.47	99.60
Min Ch El (ft)	7928.65	Shear (lb/sq ft)	0.29	0.66	0.46
Alpha	1.41	Stream Power (lb/ft s)	0.65	3.70	1.42
Frctn Loss (ft)	1.14	Cum Volume (acre-ft)	87.55	96.29	71.14
C & E Loss (ft)	0.03	Cum SA (acres)	37.24	21.81	34.76

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 19905

INPUT
Description:
Station Elevation Data num= 188

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7962.75	3.66	7961.82	4.62	7961.51	6.79	7960.87	13.62	7958.27
14.62	7957.91	23.66	7954.48	24.62	7954.16	32.35	7952.68	33.64	7952.15
34.63	7951.69	35.35	7951.45	42.58	7948.51	53.66	7947.69	54.63	7947.62
55.61	7947.57	64.58	7947.17	67.04	7947.08	70.48	7946.3	74.63	7945.33
83.66	7943.6	84.63	7943.41	87.09	7943.3	95.04	7942.69	97.47	7942.51
104.62	7937.41	104.95	7937.17	109.56	7933.88	113.8	7933.66	114.62	7933.61
124.62	7933.1	133.66	7932.74	134.62	7932.69	139.6	7932.5	141.03	7932.42
144.49	7931.53	151.9	7929.6	154.07	7929.48	163.66	7928.93	173.66	7928.89
184.62	7928.89	193.66	7929.13	203.66	7929.36	213.66	7929.51	220.54	7929.58
222.9	7929.59	225.01	7929.61	238.05	7929.62	253.2	7929.49	257.84	7929.46
260.78	7929.45	267.38	7929.6	268.99	7929.67	273.96	7930.1	278.61	7927.08
280.63	7925.95	292.53	7926.09	310.6	7926.27	313.13	7926.46	316.59	7926.65
321.38	7926.93	323.51	7927.05	328.96	7927.22	334.46	7927.54	336.53	7927.61
341.2	7927.59	344.37	7927.67	350.82	7927.56	355	7927.37	359.3	7927.56
365.8	7927.51	369.18	7927.46	378.23	7929.81	379.52	7930.18	380.51	7930.48
388.28	7930.56	390.41	7930.55	397.13	7930.44	400.12	7930.5	404.71	7930.62
406.86	7930.67	410.71	7930.72	414.02	7930.88	420.71	7930.97	424.02	7931.15
430.71	7931.49	434.02	7931.58	440.71	7931.93	444.02	7932.17	460.71	7932.94
464.02	7933.18	470.71	7933.54	480.71	7934.06	484.02	7934.17	500.71	7935.27
504.02	7935.36	520.71	7935.91	524.02	7936.06	540.71	7936.28	544.02	7936.44

554.02	7936.63	560.71	7936.77	564.02	7936.85	590.71	7937.56	594.02	7937.64		
600.71	7937.82	604.02	7937.84	620.71	7938.28	624.02	7938.31	630.71	7938.39		
634.02	7938.44	640.71	7938.52	644.02	7938.63	650.71	7938.99	660.71	7939.51		
670.71	7939.84	674.02	7940	680.71	7940.22	684.02	7940.26	700.71	7940.7		
704.02	7940.77	720.71	7940.88	724.02	7941.01	740.71	7941.35	744.02	7941.52		
750.71	7942.01	754.02	7942.24	760.71	7942.73	764.02	7942.85	770.71	7942.99		
780.71	7943.18	784.02	7943.34	790.71	7943.6	794.02	7943.74	800.71	7944		
804.02	7944.2	810.71	7944.59	814.02	7944.68	820.71	7945.07	824.02	7945.29		
840.71	7945.73	850.71	7945.86	854.02	7945.91	864.02	7946.04	880.71	7946.15		
884.02	7946.28	900.71	7946.83	910.71	7947.23	914.02	7947.29	920.71	7947.55		
924.02	7947.73	940.71	7948.39	944.02	7948.42	954.02	7948.61	960.71	7948.75		
964.02	7948.83	972.38	7949.1	977.61	7949.51	980.71	7949.78	984.02	7949.94		
990.71	7950.19	994.02	7950.42	1000.71	7950.62	1004.02	7950.71	1010.71	7951.11		
1014.02	7951.23	1020.71	7951.62	1030.71	7951.89	1034.02	7952	1040.71	7952.17		
1044.02	7952.31	1054.02	7952.83	1060.71	7953.19	1064.02	7953.27	1070.71	7953.45		
1074.02	7953.67	1084.02	7953.94	1090.71	7954.46	1094.02	7954.73	1100.71	7955.25		
1104.02	7955.32	1110.71	7955.45	1114.02	7955.6	1120.71	7955.73	1124.02	7955.86		
1140.71	7956.42	1144.02	7956.52	1145.91	7956.65						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	139.6	.05	280.63	.035	310.6	.05	369.18	.06

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

280.63	369.18	533.84	544.56	485.44	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	273.96	7930.1	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7931.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.18	Wt. n-Val.	0.050	0.042	0.060
W.S. Elev (ft)	7931.28	Reach Len. (ft)	533.84	544.56	485.44
Crit W.S. (ft)		Flow Area (sq ft)	169.80	387.70	53.39
E.G. Slope (ft/ft)	0.001472	Area (sq ft)	262.51	387.70	53.39
Q Total (cfs)	1691.00	Flow (cfs)	223.77	1419.10	48.12
Top Width (ft)	281.10	Top Width (ft)	135.18	88.55	57.37
Vel Total (ft/s)	2.77	Avg. Vel. (ft/s)	1.32	3.66	0.90
Max Chl Dpth (ft)	5.33	Hydr. Depth (ft)	1.26	4.38	0.93
Conv. Total (cfs)	44077.8	Conv. (cfs)	5832.9	36990.5	1254.4
Length Wtd. (ft)	531.63	Wetted Per. (ft)	136.63	88.60	57.79
Min Ch El (ft)	7925.95	Shear (lb/sq ft)	0.11	0.40	0.08
Alpha	1.50	Stream Power (lb/ft s)	0.15	1.47	0.08
Frctn Loss (ft)	0.15	Cum Volume (acre-ft)	62.61	83.25	54.58
C & E Loss (ft)	0.05	Cum SA (acres)	28.18	20.72	28.60

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7932.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.		0.043	
W.S. Elev (ft)	7932.27	Reach Len. (ft)	533.84	544.56	485.44
Crit W.S. (ft)		Flow Area (sq ft)		475.60	
E.G. Slope (ft/ft)	0.001292	Area (sq ft)		475.60	
Q Total (cfs)	1691.00	Flow (cfs)		1691.00	
Top Width (ft)	88.55	Top Width (ft)		88.55	
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)		3.56	
Max Chl Dpth (ft)	6.32	Hydr. Depth (ft)		5.37	
Conv. Total (cfs)	47044.7	Conv. (cfs)		47044.7	
Length Wtd. (ft)	535.00	Wetted Per. (ft)		99.73	
Min Ch El (ft)	7925.95	Shear (lb/sq ft)		0.38	
Alpha	1.00	Stream Power (lb/ft s)		1.37	
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	23.15	90.37	19.13
C & E Loss (ft)	0.01	Cum SA (acres)	8.32	20.72	7.30

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7930.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.050	0.041	0.060
W.S. Elev (ft)	7929.96	Reach Len. (ft)	533.84	544.56	485.44
Crit W.S. (ft)		Flow Area (sq ft)	13.34	270.83	12.02
E.G. Slope (ft/ft)	0.003475	Area (sq ft)	87.58	270.83	12.02
Q Total (cfs)	1284.00	Flow (cfs)	34.00	1230.02	19.99
Top Width (ft)	226.38	Top Width (ft)	128.26	88.55	9.57
Vel Total (ft/s)	4.34	Avg. Vel. (ft/s)	2.55	4.54	1.66
Max Chl Dpth (ft)	4.01	Hydr. Depth (ft)	2.07	3.06	1.26
Conv. Total (cfs)	21780.5	Conv. (cfs)	576.7	20864.7	339.0
Length Wtd. (ft)	533.14	Wetted Per. (ft)	7.60	88.60	9.89
Min Ch El (ft)	7925.95	Shear (lb/sq ft)	0.38	0.66	0.26
Alpha	1.06	Stream Power (lb/ft s)	0.97	3.01	0.44
Frctn Loss (ft)	0.27	Cum Volume (acre-ft)	46.10	70.80	37.53
C & E Loss (ft)	0.08	Cum SA (acres)	25.06	20.72	23.07

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7931.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.050	0.042	0.060
W.S. Elev (ft)	7930.90	Reach Len. (ft)	533.84	544.56	485.44
Crit W.S. (ft)		Flow Area (sq ft)	118.57	353.72	32.94
E.G. Slope (ft/ft)	0.001936	Area (sq ft)	210.91	353.72	32.94
Q Total (cfs)	1575.00	Flow (cfs)	142.11	1404.31	28.58
Top Width (ft)	268.21	Top Width (ft)	133.70	88.55	45.96
Vel Total (ft/s)	3.12	Avg. Vel. (ft/s)	1.20	3.97	0.87
Max Chl Dpth (ft)	4.94	Hydr. Depth (ft)	0.89	3.99	0.72
Conv. Total (cfs)	35796.8	Conv. (cfs)	3230.0	31917.4	649.5
Length Wtd. (ft)	532.28	Wetted Per. (ft)	135.11	88.60	46.37
Min Ch El (ft)	7925.95	Shear (lb/sq ft)	0.11	0.48	0.09
Alpha	1.46	Stream Power (lb/ft s)	0.13	1.92	0.07
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	57.76	79.80	49.33
C & E Loss (ft)	0.06	Cum SA (acres)	27.21	20.72	27.33

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7932.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.050	0.042	0.060
W.S. Elev (ft)	7932.07	Reach Len. (ft)	533.84	544.56	485.44
Crit W.S. (ft)		Flow Area (sq ft)	277.15	457.40	105.35
E.G. Slope (ft/ft)	0.000910	Area (sq ft)	370.10	457.40	105.35
Q Total (cfs)	1950.00	Flow (cfs)	392.21	1458.03	99.76
Top Width (ft)	300.18	Top Width (ft)	138.22	88.55	73.40
Vel Total (ft/s)	2.32	Avg. Vel. (ft/s)	1.42	3.19	0.95
Max Chl Dpth (ft)	6.12	Hydr. Depth (ft)	2.01	5.17	1.44
Conv. Total (cfs)	64631.5	Conv. (cfs)	12999.6	48325.4	3306.5
Length Wtd. (ft)	530.32	Wetted Per. (ft)	139.78	88.60	73.84
Min Ch El (ft)	7925.95	Shear (lb/sq ft)	0.11	0.29	0.08

Alpha	1.49	Stream Power (lb/ft s)	0.16	0.94	0.08
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	73.96	90.79	66.29
C & E Loss (ft)	0.03	Cum SA (acres)	32.11	20.72	32.18

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 19361

INPUT
Description:
Station Elevation Data num= 201

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7965.19	6.12	7960.84	6.9	7960.38	7.09	7960.17	7.18	7960.17
8.22	7960.15	17.42	7959.92	20.38	7959.88	21.01	7959.86	21.64	7959.53
27.42	7956.29	34.19	7952.89	37.32	7951.36	38.12	7950.97	38.2	7950.97
44.19	7951.12	47.42	7951.18	51.2	7951.29	54.08	7951.38	55.86	7950.35
57.42	7949.4	60.52	7947.58	67.43	7943.57	70.52	7941.75	77.43	7937.72
80.52	7935.89	87.43	7933.83	91.21	7929.6	97.35	7925.99	97.65	7925.99
104.09	7926.08	107.43	7926.1	127.43	7926.1	140.52	7926.53	147.43	7926.62
167.43	7926.75	180.52	7926.75	197.43	7926.71	227.43	7926.71	230.52	7926.62
240.52	7926.36	247.43	7926.31	260.52	7926.31	267.43	7926.27	280.52	7926.1
286	7925.99	287.69	7925.95	289.27	7925.95	291.74	7925.89	299.57	7925.77
303.75	7925.77	310.29	7925.85	311.88	7925.91	313.4	7926	323.31	7928.21
328.32	7929.29	335.18	7929.23	339.95	7929.23	347.06	7929.02	347.19	7929.02
347.4	7929.01	356.88	7928.92	357.52	7928.92	363.22	7925.76	365.16	7924.69
406.27	7924.3	407.12	7924.29	407.32	7924.31	420.78	7926.14	421.54	7926.24
422.34	7926.52	423.83	7926.96	428.8	7928.42	429.8	7928.4	440.15	7928.29
441.3	7928.28	442.04	7928.28	446.61	7928.44	448.61	7928.48	451.49	7926.98
452.65	7926.38	453.09	7926.36	458.7	7926.28	460.49	7926.26	461.85	7926.24
465.78	7926.11	470.26	7926.02	477.25	7925.94	477.66	7925.94	484.74	7925.83
489.53	7925.9	491.98	7925.93	495.8	7925.97	499.22	7926.02	501.4	7926.04
506.46	7926.21	513.27	7926.37	513.88	7926.39	517.64	7926.5	521.85	7927.48
525.15	7928.15	527.06	7928.57	529.99	7929.26	532.45	7929.69	536.83	7929.76
537.43	7929.77	543.34	7929.76	547.08	7929.71	554.64	7929.91	557.08	7929.95
564.64	7930.15	567.08	7930.24	574.64	7930.34	577.08	7930.44	587.08	7930.57
594.64	7930.77	597.08	7930.84	604.64	7931.04	607.08	7931.1	614.64	7931.3
617.08	7931.36	624.64	7931.56	627.08	7931.64	647.08	7932.56	654.64	7932.66
657.08	7932.7	664.64	7932.79	667.08	7932.79	674.64	7932.9	677.08	7933.01
687.08	7933.14	694.64	7933.44	697.08	7933.52	704.64	7933.83	707.08	7933.92
714.64	7934.12	717.08	7934.18	724.64	7934.38	727.08	7934.41	734.64	7934.61
737.08	7934.67	744.64	7934.87	747.08	7934.89	764.64	7935.12	784.64	7935.52
787.08	7935.56	794.64	7935.96	797.08	7936.06	807.08	7936.59	814.64	7936.79
817.08	7936.98	824.64	7937.18	827.08	7937.25	834.64	7937.84	837.08	7938.04
844.64	7938.63	847.08	7938.68	864.64	7939.84	867.08	7939.92	884.64	7940.15
887.08	7940.28	907.08	7941.2	914.64	7941.6	917.08	7941.75	924.64	7942.15
927.08	7942.27	934.64	7942.67	937.08	7942.83	947.08	7943.36	964.64	7944.17
967.08	7944.27	974.64	7944.72	977.08	7944.85	984.64	7945.29	987.08	7945.44
994.64	7945.64	997.08	7945.69	1004.64	7945.89	1007.08	7945.95	1014.64	7946.5
1017.08	7946.63	1027.08	7947.36	1034.64	7947.85	1037.08	7948.16	1047.08	7948.82
1054.64	7949.22	1057.08	7949.22	1064.64	7949.62	1067.08	7949.74	1074.64	7949.84
1077.08	7949.88	1084.64	7949.98	1104.64	7950.9	1107.08	7951.08	1124.64	7952.01
1147.08	7953.04	1154.64	7953.44	1157.08	7953.56	1174.64	7954.49	1177.08	7954.6
1179.3	7954.72								

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	97.35	.05	365.16	.035	406.27	.05	517.64	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
365.16 406.27 461.26 577.52 747.59 .1 .3
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	328.32	7929.29	F
446.61	1179.3	7928.44	F

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7931.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.050	0.035	0.051
W.S. Elev (ft)	7931.24	Reach Len. (ft)	461.26	577.52	747.59
Crit W.S. (ft)	7928.40	Flow Area (sq ft)	1222.97	277.28	645.33
E.G. Slope (ft/ft)	0.000136	Area (sq ft)	1222.97	277.28	645.33
Q Total (cfs)	2181.00	Flow (cfs)	1138.41	490.61	551.99
Top Width (ft)	523.94	Top Width (ft)	276.73	41.11	206.10
Vel Total (ft/s)	1.02	Avg. Vel. (ft/s)	0.93	1.77	0.86
Max Chl Dpth (ft)	6.95	Hydr. Depth (ft)	4.42	6.74	3.13
Conv. Total (cfs)	186813.2	Conv. (cfs)	97509.9	42022.7	47280.5
Length Wtd. (ft)	547.95	Wetted Per. (ft)	279.64	41.11	207.44
Min Ch El (ft)	7924.30	Shear (lb/sq ft)	0.04	0.06	0.03
Alpha	1.30	Stream Power (lb/ft s)	0.03	0.10	0.02
Frctn Loss (ft)	0.09	Cum Volume (acre-ft)	53.51	79.09	50.68
C & E Loss (ft)	0.00	Cum SA (acres)	25.65	19.91	27.13

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7931.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.31	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7931.51	Reach Len. (ft)	461.26	577.52	747.59
Crit W.S. (ft)	7928.40	Flow Area (sq ft)	37.33	288.50	243.68
E.G. Slope (ft/ft)	0.001101	Area (sq ft)	37.33	288.50	243.68
Q Total (cfs)	2181.00	Flow (cfs)	79.14	1489.78	612.08
Top Width (ft)	103.00	Top Width (ft)	8.16	41.11	53.73
Vel Total (ft/s)	3.83	Avg. Vel. (ft/s)	2.12	5.16	2.51
Max Chl Dpth (ft)	7.22	Hydr. Depth (ft)	4.57	7.02	4.54
Conv. Total (cfs)	65725.2	Conv. (cfs)	2384.8	44895.1	18445.3
Length Wtd. (ft)	576.90	Wetted Per. (ft)	11.85	41.11	59.95
Min Ch El (ft)	7924.30	Shear (lb/sq ft)	0.22	0.48	0.28
Alpha	1.37	Stream Power (lb/ft s)	0.46	2.49	0.70
Frctn Loss (ft)	0.47	Cum Volume (acre-ft)	22.92	85.59	17.77
C & E Loss (ft)	0.03	Cum SA (acres)	8.27	19.91	7.00

Warning: The cross section had to be extended vertically during the critical depth calculations.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7929.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7929.88	Reach Len. (ft)	461.26	577.52	747.59
Crit W.S. (ft)	7927.80	Flow Area (sq ft)	848.89	221.48	404.19
E.G. Slope (ft/ft)	0.000236	Area (sq ft)	848.89	221.48	404.19
Q Total (cfs)	1657.00	Flow (cfs)	819.63	444.16	393.21
Top Width (ft)	462.86	Top Width (ft)	274.43	41.11	147.32
Vel Total (ft/s)	1.12	Avg. Vel. (ft/s)	0.97	2.01	0.97
Max Chl Dpth (ft)	5.59	Hydr. Depth (ft)	3.09	5.39	2.74
Conv. Total (cfs)	107799.6	Conv. (cfs)	53323.1	28895.7	25580.8
Length Wtd. (ft)	544.75	Wetted Per. (ft)	276.97	41.11	148.65

Min Ch El (ft)	7924.30	Shear (lb/sq ft)	0.05	0.08	0.04
Alpha	1.40	Stream Power (lb/ft s)	0.04	0.16	0.04
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	40.36	67.73	35.21
C & E Loss (ft)	0.00	Cum SA (acres)	22.59	19.91	22.19

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7930.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.050	0.035	0.051
W.S. Elev (ft)	7930.86	Reach Len. (ft)	461.26	577.52	747.59
Crit W.S. (ft)	7928.26	Flow Area (sq ft)	1117.29	261.56	569.34
E.G. Slope (ft/ft)	0.000156	Area (sq ft)	1117.29	261.56	569.34
Q Total (cfs)	2031.00	Flow (cfs)	1050.15	476.72	504.13
Top Width (ft)	508.67	Top Width (ft)	276.08	41.11	191.47
Vel Total (ft/s)	1.04	Avg. Vel. (ft/s)	0.94	1.82	0.89
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)	4.05	6.36	2.97
Conv. Total (cfs)	162441.1	Conv. (cfs)	83992.0	38128.2	40320.8
Length Wtd. (ft)	546.97	Wetted Per. (ft)	278.88	41.11	192.82
Min Ch El (ft)	7924.30	Shear (lb/sq ft)	0.04	0.06	0.03
Alpha	1.32	Stream Power (lb/ft s)	0.04	0.11	0.03
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	49.62	75.95	45.98
C & E Loss (ft)	0.00	Cum SA (acres)	24.70	19.91	26.00

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7932.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.050	0.035	0.051
W.S. Elev (ft)	7932.03	Reach Len. (ft)	461.26	577.52	747.59
Crit W.S. (ft)	7928.40	Flow Area (sq ft)	1441.58	309.68	818.15
E.G. Slope (ft/ft)	0.000108	Area (sq ft)	1441.58	309.68	818.15
Q Total (cfs)	2515.00	Flow (cfs)	1327.05	524.22	663.74
Top Width (ft)	548.42	Top Width (ft)	278.07	41.11	229.24
Vel Total (ft/s)	0.98	Avg. Vel. (ft/s)	0.92	1.69	0.81
Max Chl Dpth (ft)	7.74	Hydr. Depth (ft)	5.18	7.53	3.57
Conv. Total (cfs)	242379.6	Conv. (cfs)	127892.1	50520.9	63966.6
Length Wtd. (ft)	550.05	Wetted Per. (ft)	281.19	41.11	230.60
Min Ch El (ft)	7924.30	Shear (lb/sq ft)	0.03	0.05	0.02
Alpha	1.27	Stream Power (lb/ft s)	0.03	0.09	0.02
Frctn Loss (ft)	0.08	Cum Volume (acre-ft)	62.85	86.00	61.14
C & E Loss (ft)	0.00	Cum SA (acres)	29.56	19.91	30.50

Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 18783

INPUT
Description:
Station Elevation Data num= 158

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7957.48	5.96	7951.66	6.21	7951.41	12.94	7944.83	27.94	7944.72
31.99	7941.75	36.4	7938.85	40.75	7935.78	46.55	7931.34	49.41	7930.02
56.7	7927.03	58.5	7926.53	58.63	7926.47	59.16	7926.32	65.33	7924.67
66.73	7924.3	66.85	7924.27	67.26	7924.15	72.27	7922.75	74.49	7922.83
82.61	7922.9	85.88	7922.92	88.6	7922.96	89.1	7922.98	91.18	7923.1
97.29	7923.39	100.9	7923.58	107.13	7923.88	107.67	7923.91	110.69	7924.04
116.15	7924.29	116.77	7924.32	118.24	7924.33	119.18	7924.33	124.6	7924.35
127.41	7924.37	127.91	7924.37	131.81	7924.42	139.9	7924.51	147.77	7924.56
152.72	7924.5	154.46	7924.46	159.66	7924.28	163.86	7923.64	165.74	7923.37
170.61	7922.63	200.88	7922.63	202.79	7924.06	207.4	7927.47	208.2	7928.06
212.14	7927.44	216.86	7926.64	223.06	7925.65	224.05	7925.45	228.04	7926.23
229.5	7926.49	233.14	7927.19	233.28	7927.13	239.5	7927.08	242.52	7927.03
243.56	7927.05	254.97	7927.55	255.26	7927.56	259.07	7927.44	264.73	7927.17
265.83	7927.12	265.93	7927.11	266.43	7927.74	273.44	7932.91	276.1	7933.36
278.76	7933.71	292.73	7933.81	294.08	7934.1	295.13	7934.12	297.53	7934.17
308.59	7934.56	308.66	7934.56	309.26	7934.63	316.35	7934.56	317.93	7934.62
330.43	7934.58	333.44	7934.6	335.26	7934.23	339.98	7933.32	340.41	7933.26
340.93	7933.25	348.32	7932.98	352	7932.92	353.52	7933.17	356.7	7933.87
360.11	7934.48	363.55	7934.3	365.26	7934.17	372.36	7933.9	375.26	7933.69
395.26	7933.95	402.35	7934	405.26	7934.01	415.26	7934.08	431.68	7934.76
432.37	7934.79	432.58	7934.82	437.4	7935.54	442.02	7936.21	445.26	7936.23
452.34	7936.26	455.26	7936.28	462.33	7936.66	465.26	7936.81	472.33	7937.46
475.26	7937.61	482.32	7937.89	485.26	7938.08	492.32	7938.76	495.26	7938.96
497.63	7939.24	498.55	7939.33	501.93	7940.07	509.14	7941.67	511.66	7942.12
511.81	7942.14	535.26	7942.35	542.3	7942.53	555.26	7942.62	562.3	7943.04
565.26	7943.21	572.29	7943.58	575.26	7943.76	582.29	7944.22	585.26	7944.48
592.28	7945.08	595.26	7945.33	602.28	7945.84	605.26	7946.04	612.28	7946.5
615.26	7946.7	622.27	7947.21	625.26	7947.42	635.26	7948.15	642.27	7948.84
645.26	7949.06	652.26	7949.56	655.26	7949.78	662.26	7950.24	672.25	7950.71
675.26	7950.86	682.23	7951.64	683.25	7951.75	683.36	7951.78	683.97	7952
686.71	7952.74	689.59	7953.63	693.31	7953.44	695.26	7953.35	697.35	7953.01
698.29	7952.86	702.28	7953.09	708.77	7953.39				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	72.27	.05	170.61	.035	200.89	.05	266.43	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
170.61	200.89	216.69	205.74	150.3	.1	.3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
272	708.77	7935.88	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7931.17	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7931.12	Reach Len. (ft)	216.69	205.74	150.30
Crit W.S. (ft)		Flow Area (sq ft)	832.54	257.04	290.96
E.G. Slope (ft/ft)	0.000198	Area (sq ft)	832.54	257.04	290.96
Q Total (cfs)	2181.00	Flow (cfs)	1231.91	639.23	309.86
Top Width (ft)	223.98	Top Width (ft)	123.58	30.28	70.12
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	1.48	2.49	1.06
Max Chl Dpth (ft)	8.49	Hydr. Depth (ft)	6.74	8.49	4.15
Conv. Total (cfs)	154936.2	Conv. (cfs)	87513.7	45410.6	22011.9
Length Wtd. (ft)	203.79	Wetted Per. (ft)	125.16	30.28	73.75
Min Ch El (ft)	7922.63	Shear (lb/sq ft)	0.08	0.11	0.05
Alpha	1.29	Stream Power (lb/ft s)	0.12	0.26	0.05
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	42.62	75.55	42.65
C & E Loss (ft)	0.17	Cum SA (acres)	23.53	19.43	24.76

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7931.32	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7931.11	Reach Len. (ft)	216.69	205.74	150.30
Crit W.S. (ft)		Flow Area (sq ft)	382.38	256.91	47.85
E.G. Slope (ft/ft)	0.000635	Area (sq ft)	382.38	256.91	47.85
Q Total (cfs)	2181.00	Flow (cfs)	956.99	1143.68	80.33
Top Width (ft)	95.00	Top Width (ft)	55.61	30.28	9.11
Vel Total (ft/s)	3.17	Avg. Vel. (ft/s)	2.50	4.45	1.68
Max Chl Dpth (ft)	8.48	Hydr. Depth (ft)	6.88	8.48	5.25
Conv. Total (cfs)	86523.2	Conv. (cfs)	37965.1	45371.5	3186.7
Length Wtd. (ft)	206.01	Wetted Per. (ft)	62.62	30.28	14.27
Min Ch El (ft)	7922.63	Shear (lb/sq ft)	0.24	0.34	0.13
Alpha	1.31	Stream Power (lb/ft s)	0.61	1.50	0.22
Frctn Loss (ft)	0.28	Cum Volume (acre-ft)	20.70	81.98	15.27
C & E Loss (ft)	0.15	Cum SA (acres)	7.93	19.43	6.46

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7929.78	Element			
Vel Head (ft)	0.05	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7929.73	Reach Len. (ft)	216.69	205.74	150.30
Crit W.S. (ft)		Flow Area (sq ft)	662.68	214.90	194.69
E.G. Slope (ft/ft)	0.000244	Area (sq ft)	662.68	214.90	194.69
Q Total (cfs)	1657.00	Flow (cfs)	951.43	526.60	178.97
Top Width (ft)	219.00	Top Width (ft)	120.49	30.28	68.23
Vel Total (ft/s)	1.55	Avg. Vel. (ft/s)	1.44	2.45	0.92
Max Chl Dpth (ft)	7.10	Hydr. Depth (ft)	5.50	7.10	2.85
Conv. Total (cfs)	106022.2	Conv. (cfs)	60876.7	33694.4	11451.1
Length Wtd. (ft)	205.02	Wetted Per. (ft)	121.76	30.28	71.40
Min Ch El (ft)	7922.63	Shear (lb/sq ft)	0.08	0.11	0.04
Alpha	1.33	Stream Power (lb/ft s)	0.12	0.27	0.04
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	32.36	64.83	30.07
C & E Loss (ft)	0.14	Cum SA (acres)	20.50	19.43	20.34

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7930.78	Element			
Vel Head (ft)	0.05	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7930.73	Reach Len. (ft)	216.69	205.74	150.30
Crit W.S. (ft)		Flow Area (sq ft)	784.49	245.23	263.70
E.G. Slope (ft/ft)	0.000209	Area (sq ft)	784.49	245.23	263.70
Q Total (cfs)	2031.00	Flow (cfs)	1152.07	607.40	271.53
Top Width (ft)	222.61	Top Width (ft)	122.74	30.28	69.59
Vel Total (ft/s)	1.57	Avg. Vel. (ft/s)	1.47	2.48	1.03
Max Chl Dpth (ft)	8.10	Hydr. Depth (ft)	6.39	8.10	3.79
Conv. Total (cfs)	140389.5	Conv. (cfs)	79634.6	41985.8	18769.2
Length Wtd. (ft)	204.10	Wetted Per. (ft)	124.22	30.28	73.09
Min Ch El (ft)	7922.63	Shear (lb/sq ft)	0.08	0.11	0.05
Alpha	1.30	Stream Power (lb/ft s)	0.12	0.26	0.05
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	39.55	72.60	38.83
C & E Loss (ft)	0.16	Cum SA (acres)	22.59	19.43	23.76

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7931.97	Element			
Vel Head (ft)	0.05	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7931.92	Reach Len. (ft)	216.69	205.74	150.30
Crit W.S. (ft)		Flow Area (sq ft)	931.75	281.21	347.37
E.G. Slope (ft/ft)	0.000181	Area (sq ft)	931.75	281.21	347.37
Q Total (cfs)	2515.00	Flow (cfs)	1409.91	710.41	394.68
Top Width (ft)	226.30	Top Width (ft)	124.81	30.28	71.20
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)	1.51	2.53	1.14
Max Chl Dpth (ft)	9.29	Hydr. Depth (ft)	7.47	9.29	4.88
Conv. Total (cfs)	186742.8	Conv. (cfs)	104688.1	52749.4	29305.3
Length Wtd. (ft)	203.17	Wetted Per. (ft)	126.63	30.28	74.98
Min Ch El (ft)	7922.63	Shear (lb/sq ft)	0.08	0.11	0.05
Alpha	1.27	Stream Power (lb/ft s)	0.13	0.27	0.06
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	50.29	82.08	51.14
C & E Loss (ft)	0.18	Cum SA (acres)	27.42	19.43	27.92

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 18578

INPUT
Description:
Station Elevation Data num= 119

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7980.61	6.36	7972.61	7.67	7970.89	7.83	7970.71	14.73	7963.34
15.59	7961.98	16.03	7961.39	18.2	7957.89	20.54	7954.78	23.65	7950.58
25.75	7947.87	26.34	7947.01	27.57	7945.19	28.1	7944.77	36.17	7938.35
42.58	7938.22	57.97	7937.87	61.69	7937.81	83.13	7937.4	89.83	7936.21
95.11	7935.77	100.25	7935.4	107.51	7934.48	114.8	7934.37	121.07	7934
121.88	7934.1	125.5	7933.83	130.32	7933.81	132.7	7932.8	153.7	7922.8
163.8	7919.92	175.8	7922.8	193	7932.8	195.67	7934.27	197.92	7935.42
198.77	7935.71	200.38	7935.92	206.68	7934.75	207.92	7934.55	208.13	7934.49
210.38	7933.91	213.2	7933.81	218.87	7933.73	226.3	7933.51	235.65	7933.18
246.08	7933.02	249.24	7933.04	256.96	7932.85	259.01	7932.84	267.1	7932.81
277.92	7932.81	285.67	7932.94	287.92	7932.97	289.85	7933.03	297.49	7933.23
299.75	7933.34	304.96	7933.46	308.76	7933.75	309.35	7933.81	316.72	7934.53
318.96	7934.64	324.38	7934.83	324.58	7934.77	326.7	7934.12	327.92	7933.75
330.14	7933.64	332.98	7933.37	337.92	7933.33	347.11	7934.69	347.6	7934.75
349.74	7934.8	357.92	7934.89	365.67	7934.96	367.92	7935	375.67	7935.17
377.92	7935.21	387.92	7936.01	395.67	7936.57	397.92	7936.75	405.67	7937.31
417.92	7938.35	425.67	7938.61	427.92	7938.68	435.67	7939.25	437.92	7939.32
445.67	7939.99	447.92	7940.13	455.67	7940.65	457.92	7940.79	465.67	7941.35
475.67	7942.15	477.92	7942.32	485.67	7942.88	487.92	7943.05	495.67	7943.46
497.92	7943.62	505.67	7944.23	507.92	7944.41	515.67	7945.02	517.92	7945.2
525.67	7945.66	527.92	7945.79	535.67	7946.36	537.92	7946.49	547.92	7947.29
555.67	7948.26	557.92	7948.44	565.67	7949.04	567.92	7949.22	575.67	7949.73

577.92 7949.91 585.67 7950.47 587.92 7950.63 595.67 7951.3 597.92 7951.46
605.67 7952.18 607.92 7952.41 610.16 7952.61 614.16 7952.88

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	153.7	.035	175.8	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
153.7 175.8 34.24 35.06 34.99 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	132.1	7936.2	T
187.4	614.16	7935.88	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7930.89	Element			
Vel Head (ft)	1.70	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7929.19	Reach Len. (ft)	5.25	5.25	5.25
Crit W.S. (ft)	7927.89	Flow Area (sq ft)	42.89	173.07	35.13
E.G. Slope (ft/ft)	0.004585	Area (sq ft)	42.89	173.07	35.13
Q Total (cfs)	2181.00	Flow (cfs)	145.77	1919.25	115.98
Top Width (ft)	46.51	Top Width (ft)	13.42	22.10	10.99
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)	3.40	11.09	3.30
Max Chl Dpth (ft)	9.27	Hydr. Depth (ft)	3.20	7.83	3.20
Conv. Total (cfs)	32208.2	Conv. (cfs)	2152.6	28342.8	1712.8
Length Wtd. (ft)	5.25	Wetted Per. (ft)	14.87	22.84	12.72
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	0.83	2.17	0.79
Alpha	1.45	Stream Power (lb/ft s)	2.81	24.05	2.61
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	40.45	74.53	42.09
C & E Loss (ft)	0.28	Cum SA (acres)	23.19	19.31	24.62

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7930.89	Element			
Vel Head (ft)	1.70	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7929.19	Reach Len. (ft)	5.25	5.25	5.25
Crit W.S. (ft)	7927.89	Flow Area (sq ft)	42.89	173.07	35.13
E.G. Slope (ft/ft)	0.004585	Area (sq ft)	42.89	173.07	35.13
Q Total (cfs)	2181.00	Flow (cfs)	145.77	1919.25	115.98
Top Width (ft)	46.51	Top Width (ft)	13.42	22.10	10.99
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)	3.40	11.09	3.30
Max Chl Dpth (ft)	9.27	Hydr. Depth (ft)	3.20	7.83	3.20
Conv. Total (cfs)	32208.2	Conv. (cfs)	2152.6	28342.8	1712.8
Length Wtd. (ft)	5.25	Wetted Per. (ft)	14.87	22.84	12.72
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	0.83	2.17	0.79
Alpha	1.45	Stream Power (lb/ft s)	2.81	24.05	2.61
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	19.64	80.96	15.13
C & E Loss (ft)	0.28	Cum SA (acres)	7.76	19.31	6.42

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7929.50	Element			
Vel Head (ft)	1.47	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7928.03	Reach Len. (ft)	5.25	5.25	5.25
Crit W.S. (ft)	7926.87	Flow Area (sq ft)	28.76	147.49	23.56
E.G. Slope (ft/ft)	0.004774	Area (sq ft)	28.76	147.49	23.56
Q Total (cfs)	1657.00	Flow (cfs)	87.31	1500.21	69.47
Top Width (ft)	42.09	Top Width (ft)	10.99	22.10	9.00
Vel Total (ft/s)	8.29	Avg. Vel. (ft/s)	3.04	10.17	2.95
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)	2.62	6.67	2.62
Conv. Total (cfs)	23981.1	Conv. (cfs)	1263.6	21712.0	1005.5
Length Wtd. (ft)	5.25	Wetted Per. (ft)	12.17	22.84	10.41
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	0.70	1.92	0.67
Alpha	1.37	Stream Power (lb/ft s)	2.14	19.57	1.99
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	30.64	63.98	29.69
C & E Loss (ft)	0.25	Cum SA (acres)	20.17	19.31	20.21

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7930.50	Element			
Vel Head (ft)	1.65	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7928.85	Reach Len. (ft)	5.25	5.25	5.25
Crit W.S. (ft)	7927.61	Flow Area (sq ft)	38.42	165.50	31.47
E.G. Slope (ft/ft)	0.004693	Area (sq ft)	38.42	165.50	31.47
Q Total (cfs)	2031.00	Flow (cfs)	127.34	1802.34	101.32
Top Width (ft)	45.21	Top Width (ft)	12.70	22.10	10.40
Vel Total (ft/s)	8.63	Avg. Vel. (ft/s)	3.31	10.89	3.22
Max Chl Dpth (ft)	8.93	Hydr. Depth (ft)	3.02	7.49	3.02
Conv. Total (cfs)	29646.0	Conv. (cfs)	1858.7	26308.3	1479.0
Length Wtd. (ft)	5.25	Wetted Per. (ft)	14.07	22.84	12.03
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	0.80	2.12	0.77
Alpha	1.43	Stream Power (lb/ft s)	2.65	23.12	2.47
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	37.51	71.63	38.32
C & E Loss (ft)	0.26	Cum SA (acres)	22.25	19.31	23.62

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7931.69	Element			
Vel Head (ft)	1.82	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7929.87	Reach Len. (ft)	5.25	5.25	5.25
Crit W.S. (ft)	7928.49	Flow Area (sq ft)	52.53	188.13	42.93
E.G. Slope (ft/ft)	0.004450	Area (sq ft)	52.53	188.13	43.02
Q Total (cfs)	2515.00	Flow (cfs)	188.15	2172.87	153.98
Top Width (ft)	49.12	Top Width (ft)	14.85	22.10	12.17
Vel Total (ft/s)	8.87	Avg. Vel. (ft/s)	3.58	11.55	3.59
Max Chl Dpth (ft)	9.95	Hydr. Depth (ft)	3.54	8.51	3.70
Conv. Total (cfs)	37701.5	Conv. (cfs)	2820.5	32572.7	2308.3
Length Wtd. (ft)	5.25	Wetted Per. (ft)	16.45	22.84	13.42
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	0.89	2.29	0.89
Alpha	1.49	Stream Power (lb/ft s)	3.18	26.43	3.19
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	47.84	80.97	50.47
C & E Loss (ft)	0.30	Cum SA (acres)	27.08	19.31	27.77

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE

RIVER: Crystal
REACH: Marble RS: 18573

INPUT
Description: BRIDGE NO. 3 - TOWN OF MARBLE
Distance from Upstream XS = 5.25
Deck/Roadway Width = 25
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
36.2	7938.2		109	7936.2		132.1	7937.14	
132.1	7939.14	7933.14	187.4	7938.7	7932.7	187.4	7936.7	
211	7936.52		241	7936.26		270	7935.9	
304	7935.88		326	7936.24		358	7937.03	
387	7938.29		413	7939.82		438	7941.63	
474	7944.11		505	7946.57		532	7948.72	
559	7951.02		600	7951.02				

Upstream Bridge Cross Section Data
Station Elevation Data num= 119

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7980.61	6.36	7972.61	7.67	7970.89	7.83	7970.71	14.73	7963.34
15.59	7961.98	16.03	7961.39	18.2	7957.89	20.54	7954.78	23.65	7950.58
25.75	7947.87	26.34	7947.01	27.57	7945.19	28.1	7944.77	36.17	7938.35
42.58	7938.22	57.97	7937.87	61.69	7937.81	83.13	7937.4	89.83	7936.21
95.11	7935.77	100.25	7935.4	107.51	7934.48	114.8	7934.37	121.07	7934
121.88	7934.1	125.5	7933.83	130.32	7933.81	132.7	7932.8	153.7	7922.8
163.8	7919.92	175.8	7922.8	193	7932.8	195.67	7934.27	197.92	7935.42
198.77	7935.71	200.38	7935.92	206.68	7934.75	207.92	7934.55	208.13	7934.49
210.38	7933.91	213.2	7933.81	218.82	7933.73	226.3	7933.51	235.65	7933.18
246.08	7933.02	249.24	7933.04	256.96	7932.85	259.01	7932.84	267.1	7932.81
277.92	7932.81	285.67	7932.94	287.92	7932.97	289.85	7933.03	297.49	7933.23
299.75	7933.34	304.96	7933.46	308.76	7933.75	309.35	7933.81	316.72	7934.53
318.96	7934.64	324.38	7934.83	324.58	7934.77	326.7	7934.12	327.92	7933.75
330.14	7933.64	332.98	7933.37	337.92	7933.33	347.11	7934.69	347.6	7934.75
349.74	7934.8	357.92	7934.89	365.67	7934.96	367.92	7935	375.67	7935.17
377.92	7935.21	387.92	7936.01	395.67	7936.57	397.92	7936.75	405.67	7937.31
417.92	7938.35	425.67	7938.61	427.92	7938.68	435.67	7939.25	437.92	7939.32
445.67	7939.99	447.92	7940.13	455.67	7940.65	457.92	7940.79	465.67	7941.35
475.67	7942.15	477.92	7942.32	485.67	7942.88	487.92	7943.05	495.67	7943.46
497.92	7943.62	505.67	7944.23	507.92	7944.41	515.67	7945.02	517.92	7945.2
525.67	7945.66	527.92	7945.79	535.67	7946.36	537.92	7946.49	547.92	7947.29
555.67	7948.26	557.92	7948.44	565.67	7949.04	567.92	7949.22	575.67	7949.73
577.92	7949.91	585.67	7950.47	587.92	7950.63	595.67	7951.3	597.92	7951.46
605.67	7952.18	607.92	7952.41	610.16	7952.61	614.16	7952.88		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	153.7	.035	175.8	.06

Bank Sta: Left Right Coeff Contr. Expan.
153.7 175.8 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	132.1	7936.2	T
187.4	614.16	7935.88	T

Downstream Deck/Roadway Coordinates
num= 19

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
35	7936.8		58	7937.14		58	7939.14	7933.14
113.3	7938.7	7932.7	113.3	7936.7		137.8	7936.52	
168	7936.26		193	7935.9		236	7935.88	
266	7936.24		299	7937.03		326	7938.29	
355	7939.82		381	7941.63		413	7944.11	
441	7946.57		468	7948.72		497	7951.02	
510	7951.02							

Downstream Bridge Cross Section Data
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7958.47	2.97	7956.9	3.11	7956.83	4.28	7955.96	8.19	7953.11
14.86	7948.23	15.37	7947.87	16.14	7947.35	23.43	7942.93	25.52	7941.54
27.51	7940.31	31.83	7937.87	35.08	7936.75	38.8	7935.46	39.22	7935.29
45.52	7935.38	47.83	7935.38	53.32	7934.88	55.4	7934.8	78.2	7920.8
89.4	7919.92	101.2	7920.8	113.3	7928.8	123.73	7932.69	125.34	7932.29
128.34	7932.37	133.71	7933.01	135.05	7933.18	136.57	7933.43	147.68	7934.46
151.95	7934.76	153.68	7935	170.63	7934.92	204.23	7934.22	210.38	7934.38
215.79	7934.19	219.04	7934.22	225.62	7934.24	233.06	7934.4	236.94	7934.42
240.38	7934.48	257.64	7934.99	261.67	7935.03	289.72	7935.72	300.37	7936.13
310.95	7936.58	314.19	7936.7	320.03	7936.85	327.65	7937.27	338.53	7937.54
344.58	7937.89	392.14	7941.29	394.8	7941.47	398.9	7941.8	406.45	7942.38
418.86	7943.38	425.8	7943.92	440.25	7945.08	445.34	7945.48	448.21	7945.69
448.85	7945.74	454.21	7946.13	458.14	7946.47	463.4	7946.85	466.91	7947.16
472.32	7947.55	476.7	7947.93	482.72	7948.37	505.74	7950.36	510.04	7950.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	78.2	.035	101.2	.06

Bank Sta: Left Right Coeff Contr. Expan.
78.2 101.2 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	58	7936.8	T
113.3	510.04	7935.88	T

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7935.88
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7930.89	Element	7930.57	7929.52
W.S. US. (ft)	7929.19	E.G. Elev (ft)	7927.93	7927.80
Q Total (cfs)	2181.00	W.S. Elev (ft)	7927.93	7926.58
Q Bridge (cfs)	2181.00	Crit W.S. (ft)	8.01	7.88
Q Weir (cfs)		Max Chl Dpth (ft)		

Weir Sta Lft (ft)		Vel Total (ft/s)	11.17	8.79
Weir Sta Rgt (ft)		Flow Area (sq ft)	195.29	248.19
Weir Submerg		Froude # Chl	0.94	0.72
Weir Max Depth (ft)		Specif Force (cu ft)	1433.75	1508.87
Min El Weir Flow (ft)	7935.89	Hydr Depth (ft)	4.69	5.52
Min El Prs (ft)	7933.14	W.P. Total (ft)	44.96	49.15
Delta EG (ft)	1.68	Conv. Total (cfs)	23276.6	31573.7
Delta WS (ft)	2.62	Top Width (ft)	41.68	45.00
BR Open Area (sq ft)	441.29	Frctn Loss (ft)	0.16	0.03
BR Open Vel (ft/s)	11.17	C & E Loss (ft)	0.47	0.28
Coef of Q		Shear Total (lb/sq ft)	2.38	1.50
Br Sel Method	Energy only	Power Total (lb/ft s)	26.59	13.22

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #Floodway

E.G. US. (ft)	7930.89	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	7929.19	E.G. Elev (ft)	7930.57	7929.52
Q Total (cfs)	2181.00	W.S. Elev (ft)	7927.93	7927.80
Q Bridge (cfs)	2181.00	Crit W.S. (ft)	7927.93	7926.58
Q Weir (cfs)		Max Chl Dpth (ft)	8.01	7.88
Weir Sta Lft (ft)		Vel Total (ft/s)	11.17	8.79
Weir Sta Rgt (ft)		Flow Area (sq ft)	195.29	248.19
Weir Submerg		Froude # Chl	0.94	0.72
Weir Max Depth (ft)		Specif Force (cu ft)	1433.75	1508.87
Min El Weir Flow (ft)	7935.89	Hydr Depth (ft)	4.69	5.52
Min El Prs (ft)	7933.14	W.P. Total (ft)	44.96	49.15
Delta EG (ft)	1.68	Conv. Total (cfs)	23276.6	31573.7
Delta WS (ft)	2.62	Top Width (ft)	41.68	45.00
BR Open Area (sq ft)	441.29	Frctn Loss (ft)	0.16	0.03
BR Open Vel (ft/s)	11.17	C & E Loss (ft)	0.47	0.28
Coef of Q		Shear Total (lb/sq ft)	2.38	1.50
Br Sel Method	Energy only	Power Total (lb/ft s)	26.59	13.22

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #10-year

E.G. US. (ft)	7929.50	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	7928.03	E.G. Elev (ft)	7929.21	7928.14
Q Total (cfs)	1657.00	W.S. Elev (ft)	7926.90	7926.68
Q Bridge (cfs)	1657.00	Crit W.S. (ft)	7926.90	7925.61
Q Weir (cfs)		Max Chl Dpth (ft)	6.98	6.75
Weir Sta Lft (ft)		Vel Total (ft/s)	10.73	8.31
Weir Sta Rgt (ft)		Flow Area (sq ft)	154.36	199.45
Weir Submerg		Froude # Chl	0.94	0.72
Weir Max Depth (ft)		Specif Force (cu ft)	1006.70	1053.34
Min El Weir Flow (ft)	7935.89	Hydr Depth (ft)	4.09	4.81
Min El Prs (ft)	7933.14	W.P. Total (ft)	40.52	44.95
Delta EG (ft)	1.63	Conv. Total (cfs)	17075.7	23484.3
Delta WS (ft)	2.46	Top Width (ft)	37.74	41.45
BR Open Area (sq ft)	441.29	Frctn Loss (ft)	0.17	0.03
BR Open Vel (ft/s)	10.73	C & E Loss (ft)	0.42	0.25
Coef of Q		Shear Total (lb/sq ft)	2.24	1.38
Br Sel Method	Energy only	Power Total (lb/ft s)	24.04	11.46

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #50-year

E.G. US. (ft)	7930.50	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	7928.85	E.G. Elev (ft)	7930.20	7929.15
Q Total (cfs)	2031.00	W.S. Elev (ft)	7927.67	7927.52
Q Bridge (cfs)	2031.00	Crit W.S. (ft)	7927.67	7926.33
Q Weir (cfs)		Max Chl Dpth (ft)	7.75	7.60
Weir Sta Lft (ft)		Vel Total (ft/s)	11.00	8.62
Weir Sta Rgt (ft)		Flow Area (sq ft)	184.65	235.50
Weir Submerg		Froude # Chl	0.93	0.72
Weir Max Depth (ft)		Specif Force (cu ft)	1308.83	1377.77
Min El Weir Flow (ft)	7935.89	Hydr Depth (ft)	4.54	5.34
Min El Prs (ft)	7933.14	W.P. Total (ft)	43.85	48.09
Delta EG (ft)	1.66	Conv. Total (cfs)	21632.9	29422.5
Delta WS (ft)	2.54	Top Width (ft)	40.69	44.10
BR Open Area (sq ft)	441.29	Frctn Loss (ft)	0.16	0.03
BR Open Vel (ft/s)	11.00	C & E Loss (ft)	0.45	0.27
Coef of Q		Shear Total (lb/sq ft)	2.32	1.46
Br Sel Method	Energy only	Power Total (lb/ft s)	25.49	12.56

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #500-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7931.69	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	7929.87	E.G. Elev (ft)	7931.36	7930.33
Q Total (cfs)	2515.00	W.S. Elev (ft)	7928.54	7928.50
Q Bridge (cfs)	2515.00	Crit W.S. (ft)	7928.54	7927.18
Q Weir (cfs)		Max Chl Dpth (ft)	8.62	8.58
Weir Sta Lft (ft)		Vel Total (ft/s)	11.35	8.97
Weir Sta Rgt (ft)		Flow Area (sq ft)	221.62	280.25
Weir Submerg		Froude # Chl	0.93	0.72
Weir Max Depth (ft)		Specif Force (cu ft)	1722.48	1823.59
Min El Weir Flow (ft)	7935.89	Hydr Depth (ft)	5.03	5.94
Min El Prs (ft)	7933.14	W.P. Total (ft)	47.62	51.74
Delta EG (ft)	1.69	Conv. Total (cfs)	27429.1	37143.0
Delta WS (ft)	2.75	Top Width (ft)	44.03	47.18
BR Open Area (sq ft)	441.29	Frctn Loss (ft)	0.15	0.03
BR Open Vel (ft/s)	11.35	C & E Loss (ft)	0.49	0.31
Coef of Q		Shear Total (lb/sq ft)	2.44	1.35
Br Sel Method	Energy only	Power Total (lb/ft s)	27.72	13.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 18542

INPUT
Description:
Station Elevation Data num= 70

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7958.47	2.97	7956.9	3.11	7956.83	4.28	7955.96	8.19	7953.11
14.86	7948.23	15.37	7947.87	16.14	7947.35	23.43	7942.93	25.52	7941.54
27.51	7940.31	31.83	7937.87	35.08	7936.75	38.8	7935.46	39.22	7935.29
45.52	7935.38	47.83	7935.38	53.32	7934.88	55.4	7934.8	78.2	7920.8
89.4	7919.92	101.2	7920.8	113.3	7928.8	123.73	7932.69	125.34	7932.29
128.34	7932.37	133.71	7933.01	135.05	7933.18	136.57	7933.43	147.68	7934.46
151.95	7934.76	153.68	7935	170.63	7934.92	204.23	7934.22	210.38	7934.38
215.79	7934.19	219.04	7934.22	225.62	7934.24	233.06	7934.4	236.94	7934.42
240.38	7934.48	257.64	7934.99	261.67	7935.03	289.72	7935.72	300.37	7936.13
310.95	7936.58	314.19	7936.7	320.03	7936.85	327.65	7937.27	338.53	7937.54
344.58	7937.89	392.14	7941.29	394.8	7941.47	398.9	7941.8	406.45	7942.38
418.86	7943.38	425.8	7943.92	440.25	7945.08	445.34	7945.48	448.21	7945.69
448.85	7945.74	454.21	7946.13	458.14	7946.47	463.4	7946.85	466.91	7947.16
472.32	7947.55	476.7	7947.93	482.72	7948.37	505.74	7950.36	510.04	7950.79

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	78.2	.035	101.2	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
78.2 101.2 466.19 475.1 491.64 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	58	7936.8	T
113.3	510.04	7935.88	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7929.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.64	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7926.57	Reach Len. (ft)	466.19	475.10	491.64
Crit W.S. (ft)	7926.57	Flow Area (sq ft)	27.11	142.82	25.17
E.G. Slope (ft/ft)	0.009161	Area (sq ft)	27.11	142.82	25.17
Q Total (cfs)	2181.00	Flow (cfs)	117.03	1956.81	107.16
Top Width (ft)	41.12	Top Width (ft)	9.40	23.00	8.73
Vel Total (ft/s)	11.18	Avg. Vel. (ft/s)	4.32	13.70	4.26
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)	2.88	6.21	2.88
Conv. Total (cfs)	22786.3	Conv. (cfs)	1222.7	20444.1	1119.5
Length Wtd. (ft)	476.16	Wetted Per. (ft)	11.03	23.07	10.46
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	1.41	3.54	1.38
Alpha	1.36	Stream Power (lb/ft s)	6.07	48.52	5.86
Frctn Loss (ft)	4.53	Cum Volume (acre-ft)	40.42	74.40	42.06
C & E Loss (ft)	0.43	Cum SA (acres)	23.18	19.29	24.61

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7929.21	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.64	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7926.57	Reach Len. (ft)	466.19	475.10	491.64
Crit W.S. (ft)	7926.57	Flow Area (sq ft)	27.11	142.82	25.17
E.G. Slope (ft/ft)	0.009161	Area (sq ft)	27.11	142.82	25.17
Q Total (cfs)	2181.00	Flow (cfs)	117.03	1956.81	107.16
Top Width (ft)	41.12	Top Width (ft)	9.40	23.00	8.73
Vel Total (ft/s)	11.18	Avg. Vel. (ft/s)	4.32	13.70	4.26
Max Chl Dpth (ft)	6.65	Hydr. Depth (ft)	2.88	6.21	2.88
Conv. Total (cfs)	22786.3	Conv. (cfs)	1222.7	20444.1	1119.5
Length Wtd. (ft)	476.16	Wetted Per. (ft)	11.03	23.07	10.46
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	1.41	3.54	1.38
Alpha	1.36	Stream Power (lb/ft s)	6.07	48.52	5.86
Frctn Loss (ft)	4.53	Cum Volume (acre-ft)	19.61	80.84	15.10
C & E Loss (ft)	0.43	Cum SA (acres)	7.75	19.29	6.41

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7927.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.29	Wt. n-Val.	0.060	0.035	0.060

W.S. Elev (ft)	7925.58	Reach Len. (ft)	466.19	475.10	491.64
Crit W.S. (ft)	7925.58	Flow Area (sq ft)	18.57	119.96	17.25
E.G. Slope (ft/ft)	0.009842	Area (sq ft)	18.57	119.96	17.25
Q Total (cfs)	1657.00	Flow (cfs)	73.28	1516.63	67.09
Top Width (ft)	38.00	Top Width (ft)	7.78	23.00	7.22
Vel Total (ft/s)	10.64	Avg. Vel. (ft/s)	3.95	12.64	3.89
Max Chl Dpth (ft)	5.66	Hydr. Depth (ft)	2.39	5.22	2.39
Conv. Total (cfs)	16702.8	Conv. (cfs)	738.6	15287.9	676.3
Length Wtd. (ft)	476.07	Wetted Per. (ft)	9.13	23.07	8.66
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	1.25	3.20	1.22
Alpha	1.30	Stream Power (lb/ft s)	4.93	40.40	4.76
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	30.62	63.87	29.68
C & E Loss (ft)	0.34	Cum SA (acres)	20.17	19.29	20.20

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7928.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.54	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7926.30	Reach Len. (ft)	466.19	475.10	491.64
Crit W.S. (ft)	7926.30	Flow Area (sq ft)	24.67	136.71	22.91
E.G. Slope (ft/ft)	0.009289	Area (sq ft)	24.67	136.71	22.91
Q Total (cfs)	2031.00	Flow (cfs)	103.93	1831.92	95.15
Top Width (ft)	40.29	Top Width (ft)	8.96	23.00	8.32
Vel Total (ft/s)	11.02	Avg. Vel. (ft/s)	4.21	13.40	4.15
Max Chl Dpth (ft)	6.38	Hydr. Depth (ft)	2.75	5.94	2.75
Conv. Total (cfs)	21073.0	Conv. (cfs)	1078.3	19007.4	987.3
Length Wtd. (ft)	476.14	Wetted Per. (ft)	10.52	23.07	9.98
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	1.36	3.44	1.33
Alpha	1.35	Stream Power (lb/ft s)	5.73	46.05	5.53
Frctn Loss (ft)	4.71	Cum Volume (acre-ft)	37.48	71.50	38.30
C & E Loss (ft)	0.38	Cum SA (acres)	22.25	19.29	23.62

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7930.00	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.87	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7927.13	Reach Len. (ft)	466.19	475.10	491.64
Crit W.S. (ft)	7927.13	Flow Area (sq ft)	32.59	155.62	30.27
E.G. Slope (ft/ft)	0.008951	Area (sq ft)	32.59	155.62	30.27
Q Total (cfs)	2515.00	Flow (cfs)	147.89	2231.71	135.40
Top Width (ft)	42.87	Top Width (ft)	10.30	23.00	9.57
Vel Total (ft/s)	11.51	Avg. Vel. (ft/s)	4.54	14.34	4.47
Max Chl Dpth (ft)	7.21	Hydr. Depth (ft)	3.16	6.77	3.16
Conv. Total (cfs)	26583.3	Conv. (cfs)	1563.1	23588.9	1431.2
Length Wtd. (ft)	476.17	Wetted Per. (ft)	12.09	23.07	11.47
Min Ch El (ft)	7919.92	Shear (lb/sq ft)	1.51	3.77	1.47
Alpha	1.39	Stream Power (lb/ft s)	6.84	54.06	6.60
Frctn Loss (ft)	4.36	Cum Volume (acre-ft)	47.81	80.83	50.44
C & E Loss (ft)	0.50	Cum SA (acres)	27.07	19.29	27.77

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 18067

INPUT
Description:
Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7950.32	8.87	7946.63	9.85	7946.25	10.26	7946.05	22.08	7940.71
24.5	7939.41	29.89	7936.64	44.98	7935.37	46.55	7935.17	50.28	7934.64
71.02	7931.59	79.71	7930.41	95.48	7928.81	96.22	7928.72	97.07	7928.63
106.51	7927.39	107.29	7927.31	108.41	7926.96	112.45	7925.66	115.87	7924.58
117.56	7924.18	119.95	7923.85	131.79	7923.11	133.11	7922.94	144.41	7921.31
149.15	7920.92	168.88	7919.57	174.52	7919.31	181.11	7918.99	183.88	7918.91
191.02	7918.79	192.47	7918.73	194.53	7918.01	201.24	7915.65	204.44	7914.6
205.71	7914.25	236.3	7914.25	239.25	7914.74	242.28	7915.26	246.55	7915.97
249.43	7916.62	252.84	7918.36	254.51	7919.25	266.74	7925.8	270.68	7927.97
278.98	7932.52	282.92	7934.83	284.5	7935.76	287.02	7935.68	291.21	7935.54
298.76	7935.27	303.44	7935.09	305.41	7935.01	315.68	7934.55	322.77	7934.33
338.02	7934.16	339.75	7934.11	351.74	7934.23	359.12	7934.19	360.55	7934.49
369.29	7936.38	370.58	7936.59	378.71	7938.87	379.57	7939.08	382.91	7940.29
385.65	7941.42	387.68	7941.43	389.75	7941.4	398.54	7941.33	408.54	7941.22
428.54	7941.22	438.54	7941.15	448.54	7941.03	479.75	7941.03	488.54	7941.09
499.75	7941.09	508.54	7941.07	521.39	7940.88	521.47	7940.94	524.19	7944.24
527.79	7945.25	530.68	7945.94	531.43	7946.34	534.1	7946.47	537.76	7946.56
540.16	7946.59	546.31	7947.74	549.89	7948.09	561.52	7948.78		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	192.47	.05	205.71	.035	236.3	.05	249.43	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
205.71	236.3	658.53	592.77	538.05	.1	.3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7920.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7918.91	Reach Len. (ft)	658.53	592.77	538.05
Crit W.S. (ft)	7918.91	Flow Area (sq ft)	33.52	142.54	51.59
E.G. Slope (ft/ft)	0.009905	Area (sq ft)	33.52	142.54	51.59
Q Total (cfs)	2181.00	Flow (cfs)	172.22	1680.21	328.57
Top Width (ft)	69.96	Top Width (ft)	21.80	30.59	17.57
Vel Total (ft/s)	9.58	Avg. Vel. (ft/s)	5.14	11.79	6.37

Max Chl Dpth (ft)	4.66	Hydr. Depth (ft)	1.54	4.66	2.94
Conv. Total (cfs)	21914.1	Conv. (cfs)	1730.4	16882.3	3301.4
Length Wtd. (ft)	590.11	Wetted Per. (ft)	22.54	30.59	18.34
Min Ch El (ft)	7914.25	Shear (lb/sq ft)	0.92	2.88	1.74
Alpha	1.26	Stream Power (lb/ft s)	4.72	33.97	11.08
Frctn Loss (ft)	5.76	Cum Volume (acre-ft)	40.09	72.85	41.63
C & E Loss (ft)	0.05	Cum SA (acres)	23.02	19.00	24.46

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7920.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7918.91	Reach Len. (ft)	658.53	592.77	538.05
Crit W.S. (ft)	7918.91	Flow Area (sq ft)	33.52	142.54	51.59
E.G. Slope (ft/ft)	0.009905	Area (sq ft)	33.52	142.54	51.59
Q Total (cfs)	2181.00	Flow (cfs)	172.22	1680.21	328.57
Top Width (ft)	69.96	Top Width (ft)	21.80	30.59	17.57
Vel Total (ft/s)	9.58	Avg. Vel. (ft/s)	5.14	11.79	6.37
Max Chl Dpth (ft)	4.66	Hydr. Depth (ft)	1.54	4.66	2.94
Conv. Total (cfs)	21914.1	Conv. (cfs)	1730.4	16882.3	3301.4
Length Wtd. (ft)	590.11	Wetted Per. (ft)	22.54	30.59	18.34
Min Ch El (ft)	7914.25	Shear (lb/sq ft)	0.92	2.88	1.74
Alpha	1.26	Stream Power (lb/ft s)	4.72	33.97	11.08
Frctn Loss (ft)	5.76	Cum Volume (acre-ft)	19.29	79.28	14.67
C & E Loss (ft)	0.05	Cum SA (acres)	7.59	19.00	6.27

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7919.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.61	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7918.14	Reach Len. (ft)	658.53	592.77	538.05
Crit W.S. (ft)	7918.14	Flow Area (sq ft)	23.19	119.01	38.64
E.G. Slope (ft/ft)	0.011127	Area (sq ft)	23.19	119.01	38.64
Q Total (cfs)	1657.00	Flow (cfs)	111.57	1318.42	227.00
Top Width (ft)	58.25	Top Width (ft)	11.55	30.59	16.11
Vel Total (ft/s)	9.16	Avg. Vel. (ft/s)	4.81	11.08	5.88
Max Chl Dpth (ft)	3.89	Hydr. Depth (ft)	2.01	3.89	2.40
Conv. Total (cfs)	15708.7	Conv. (cfs)	1057.7	12498.9	2152.0
Length Wtd. (ft)	590.04	Wetted Per. (ft)	12.19	30.59	16.69
Min Ch El (ft)	7914.25	Shear (lb/sq ft)	1.32	2.70	1.61
Alpha	1.24	Stream Power (lb/ft s)	6.36	29.94	9.45
Frctn Loss (ft)	5.89	Cum Volume (acre-ft)	30.40	62.57	29.36
C & E Loss (ft)	0.10	Cum SA (acres)	20.06	19.00	20.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7920.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7918.66	Reach Len. (ft)	658.53	592.77	538.05
Crit W.S. (ft)	7918.66	Flow Area (sq ft)	29.56	134.88	47.25
E.G. Slope (ft/ft)	0.010563	Area (sq ft)	29.56	134.88	47.25
Q Total (cfs)	2031.00	Flow (cfs)	150.32	1582.45	298.23
Top Width (ft)	60.73	Top Width (ft)	13.04	30.59	17.10
Vel Total (ft/s)	9.59	Avg. Vel. (ft/s)	5.08	11.73	6.31
Max Chl Dpth (ft)	4.41	Hydr. Depth (ft)	2.27	4.41	2.76
Conv. Total (cfs)	19761.4	Conv. (cfs)	1462.6	15397.0	2901.8
Length Wtd. (ft)	590.04	Wetted Per. (ft)	13.77	30.59	17.81
Min Ch El (ft)	7914.25	Shear (lb/sq ft)	1.42	2.91	1.75
Alpha	1.25	Stream Power (lb/ft s)	7.20	34.11	11.04
Frctn Loss (ft)	5.87	Cum Volume (acre-ft)	37.19	70.02	37.90
C & E Loss (ft)	0.08	Cum SA (acres)	22.13	19.00	23.47

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7921.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.	0.050	0.035	0.051
W.S. Elev (ft)	7919.35	Reach Len. (ft)	658.53	592.77	538.05
Crit W.S. (ft)	7919.35	Flow Area (sq ft)	45.42	155.86	59.42
E.G. Slope (ft/ft)	0.009361	Area (sq ft)	45.42	155.86	59.42
Q Total (cfs)	2515.00	Flow (cfs)	227.06	1895.69	392.25
Top Width (ft)	80.93	Top Width (ft)	31.95	30.59	18.39
Vel Total (ft/s)	9.65	Avg. Vel. (ft/s)	5.00	12.16	6.60
Max Chl Dpth (ft)	5.10	Hydr. Depth (ft)	1.42	5.10	3.23
Conv. Total (cfs)	25994.5	Conv. (cfs)	2346.9	19593.4	4054.2
Length Wtd. (ft)	590.38	Wetted Per. (ft)	32.71	30.59	19.27
Min Ch El (ft)	7914.25	Shear (lb/sq ft)	0.81	2.98	1.80
Alpha	1.30	Stream Power (lb/ft s)	4.06	36.22	11.90
Frctn Loss (ft)	5.73	Cum Volume (acre-ft)	47.39	79.14	49.93
C & E Loss (ft)	0.00	Cum SA (acres)	26.84	19.00	27.61

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 17475

INPUT
Description:
Station Elevation Data num= 83

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7942.33	6.23	7940.88	10.71	7939.38	13.82	7938.56	20.93	7936.19
21.41	7936.05	21.62	7935.98	29	7934.19	32.54	7932.98	36.6	7931.87
43.46	7929.73	44.84	7929.34	49.83	7927.92	51.93	7927.35	54.37	7926.05
59.37	7923.1	65.29	7919.02	66.97	7917.74	70.8	7916.01	74.56	7914.46
76.2	7913.62	87.99	7908.41	126.36	7908.17	130.65	7908.15	131.71	7908.21
139.84	7909.29	141.65	7910.77	145.62	7914.19	152.62	7920.24	155.64	7922.86
156.14	7923.29	160.66	7923.12	163.53	7923.06	164.82	7923.19	168.16	7923.7
170.56	7924	173.26	7924.41	174.45	7924.49	178.01	7924.93	181.28	7923.43
183.88	7922.61	185.4	7923.04	190.52	7924.26	193.85	7925.03	196.06	7925.58
198.37	7925.69	203.56	7925.92	207.2	7926.04	211.23	7926.26	218.11	7926.84
219.35	7927.01	224.5	7927.75	225.86	7928.18	229.03	7929.09	233.34	7930.57
237.94	7932.05	238.56	7932.25	249.19	7932.16	256.78	7932.28	261.78	7932.37
264.37	7932.39	272.14	7932.41	273.81	7932.36	282.14	7932.36	283.81	7932.29
292.14	7931.9	302.14	7931.55	303.81	7931.6	312.14	7931.88	313.81	7931.93
322.14	7932.21	323.81	7932.28	332.14	7932.76	342.14	7933.11	345.06	7933.14
345.24	7933.24	352.14	7938.52	355.92	7941.27	360.92	7941.48	362.14	7941.54
420.86	7941.62	427.69	7941.64	435.61	7940.77				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	87.99	.035	131.71	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
87.99 131.71 515.18 591.49 626.76 .1 .3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7914.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7912.42	Reach Len. (ft)	515.18	591.49	626.76
Crit W.S. (ft)	7912.20	Flow Area (sq ft)	18.17	181.11	35.71
E.G. Slope (ft/ft)	0.009623	Area (sq ft)	18.17	181.11	35.71
Q Total (cfs)	2181.00	Flow (cfs)	66.09	1945.33	169.59
Top Width (ft)	64.64	Top Width (ft)	9.07	43.72	11.85
Vel Total (ft/s)	9.28	Avg. Vel. (ft/s)	3.64	10.74	4.75
Max Chl Dpth (ft)	4.27	Hydr. Depth (ft)	2.00	4.14	3.01
Conv. Total (cfs)	22233.4	Conv. (cfs)	673.7	19830.9	1728.8
Length Wtd. (ft)	589.20	Wetted Per. (ft)	9.91	43.72	13.06
Min Ch El (ft)	7908.15	Shear (lb/sq ft)	1.10	2.49	1.64
Alpha	1.22	Stream Power (lb/ft s)	4.00	26.73	7.80
Frctn Loss (ft)	5.95	Cum Volume (acre-ft)	39.70	70.65	41.09
C & E Loss (ft)	0.01	Cum SA (acres)	22.78	18.49	24.28

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7914.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7912.42	Reach Len. (ft)	515.18	591.49	626.76
Crit W.S. (ft)	7912.20	Flow Area (sq ft)	18.17	181.11	35.71
E.G. Slope (ft/ft)	0.009623	Area (sq ft)	18.17	181.11	35.71
Q Total (cfs)	2181.00	Flow (cfs)	66.09	1945.33	169.59
Top Width (ft)	64.64	Top Width (ft)	9.07	43.72	11.85
Vel Total (ft/s)	9.28	Avg. Vel. (ft/s)	3.64	10.74	4.75
Max Chl Dpth (ft)	4.27	Hydr. Depth (ft)	2.00	4.14	3.01
Conv. Total (cfs)	22233.4	Conv. (cfs)	673.7	19830.9	1728.8
Length Wtd. (ft)	589.20	Wetted Per. (ft)	9.91	43.72	13.06
Min Ch El (ft)	7908.15	Shear (lb/sq ft)	1.10	2.49	1.64
Alpha	1.22	Stream Power (lb/ft s)	4.00	26.73	7.80
Frctn Loss (ft)	5.95	Cum Volume (acre-ft)	18.90	77.08	14.13
C & E Loss (ft)	0.01	Cum SA (acres)	7.35	18.49	6.08

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7913.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.28	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7911.87	Reach Len. (ft)	515.18	591.49	626.76
Crit W.S. (ft)	7911.57	Flow Area (sq ft)	13.57	157.35	29.44
E.G. Slope (ft/ft)	0.009013	Area (sq ft)	13.57	157.35	29.44
Q Total (cfs)	1657.00	Flow (cfs)	43.36	1489.33	124.31
Top Width (ft)	62.78	Top Width (ft)	7.84	43.72	11.22
Vel Total (ft/s)	8.27	Avg. Vel. (ft/s)	3.19	9.47	4.22
Max Chl Dpth (ft)	3.72	Hydr. Depth (ft)	1.73	3.60	2.62
Conv. Total (cfs)	17451.4	Conv. (cfs)	456.7	15687.3	1309.4
Length Wtd. (ft)	589.50	Wetted Per. (ft)	8.57	43.72	12.23
Min Ch El (ft)	7908.15	Shear (lb/sq ft)	0.89	2.03	1.35
Alpha	1.20	Stream Power (lb/ft s)	2.85	19.17	5.72
Frctn Loss (ft)	5.86	Cum Volume (acre-ft)	30.12	60.69	28.94
C & E Loss (ft)	0.01	Cum SA (acres)	19.92	18.49	19.90

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7913.80	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.52	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7912.28	Reach Len. (ft)	515.18	591.49	626.76
Crit W.S. (ft)	7912.02	Flow Area (sq ft)	16.94	175.11	34.09
E.G. Slope (ft/ft)	0.009371	Area (sq ft)	16.94	175.11	34.09
Q Total (cfs)	2031.00	Flow (cfs)	59.43	1814.95	156.62
Top Width (ft)	64.17	Top Width (ft)	8.76	43.72	11.69
Vel Total (ft/s)	8.98	Avg. Vel. (ft/s)	3.51	10.36	4.59
Max Chl Dpth (ft)	4.13	Hydr. Depth (ft)	1.93	4.01	2.92
Conv. Total (cfs)	20980.1	Conv. (cfs)	613.9	18748.3	1617.9
Length Wtd. (ft)	589.29	Wetted Per. (ft)	9.57	43.72	12.85
Min Ch El (ft)	7908.15	Shear (lb/sq ft)	1.04	2.34	1.55
Alpha	1.21	Stream Power (lb/ft s)	3.63	24.29	7.13
Frctn Loss (ft)	5.93	Cum Volume (acre-ft)	36.84	67.91	37.40
C & E Loss (ft)	0.00	Cum SA (acres)	21.96	18.49	23.30

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7914.58	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7912.72	Reach Len. (ft)	515.18	591.49	626.76
Crit W.S. (ft)	7912.57	Flow Area (sq ft)	20.97	194.13	39.29

E.G. Slope (ft/ft)	0.010071	Area (sq ft)	20.97	194.13	39.29
Q Total (cfs)	2515.00	Flow (cfs)	81.85	2234.29	198.85
Top Width (ft)	65.66	Top Width (ft)	9.74	43.72	12.20
Vel Total (ft/s)	9.89	Avg. Vel. (ft/s)	3.90	11.51	5.06
Max Chl Dpth (ft)	4.56	Hydr. Depth (ft)	2.15	4.44	3.22
Conv. Total (cfs)	25061.1	Conv. (cfs)	815.6	22263.9	1981.5
Length Wtd. (ft)	588.91	Wetted Per. (ft)	10.65	43.72	13.52
Min Ch El (ft)	7908.15	Shear (lb/sq ft)	1.24	2.79	1.83
Alpha	1.23	Stream Power (lb/ft s)	4.83	32.13	9.25
Frctn Loss (ft)	5.98	Cum Volume (acre-ft)	46.89	76.75	49.32
C & E Loss (ft)	0.05	Cum SA (acres)	26.53	18.49	27.42

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 16883

INPUT
Description:
Station Elevation Data num= 78

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7932.77	.35	7932.58	2	7931.77	3.47	7930.98	13.89	7925.51
18.89	7923.21	27.02	7919.39	34.32	7916.05	40.16	7913.36	54.42	7906.71
54.82	7906.52	57.94	7906	66.42	7904.57	79.56	7902.58	80.23	7902.49
80.88	7902.41	96.6	7902.43	120.65	7902.6	121.86	7902.83	126.87	7903.65
132.09	7904.62	138.12	7905.45	138.98	7905.63	142.7	7907.34	145.23	7908.44
157.72	7914.22	158.27	7914.47	163.01	7916.67	163.65	7916.97	171.38	7918.29
173.14	7918.46	184.63	7918.98	188.57	7919.12	197.76	7919.42	203.99	7919.39
210.9	7919.6	214.33	7919.71	221.81	7919.71	242.06	7920.25	252.18	7920.45
257.1	7920.54	261.6	7920.64	270.33	7921.12	279.07	7921.62	282.56	7921.76
296.55	7922.62	302.81	7923.09	305.29	7923.17	312.93	7923.4	320.91	7924.11
322.77	7924.29	331.5	7924.55	340.24	7925.06	343.31	7925.12	353.43	7925.66
357.72	7925.91	363.56	7926.22	366.46	7926.44	373.69	7927.01	375.2	7927.1
383.81	7927.8	384.72	7927.86	392.67	7928.37	393.94	7928.46	401.41	7928.94
404.06	7929.12	410.15	7929.44	414.19	7929.55	424.31	7930.05	434.44	7930.42
436.37	7930.48	444.56	7931.52	445.1	7931.6	448.53	7932.01	453.84	7932.67
454.69	7932.77	455.75	7932.89	455.99	7932.92				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	80.88	.035	120.65	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
80.88	120.65	535.61	475.86 425.77	.1	.3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7908.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.59	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7906.50	Reach Len. (ft)	535.61	475.86	425.77
Crit W.S. (ft)	7906.50	Flow Area (sq ft)	54.74	159.91	43.71
E.G. Slope (ft/ft)	0.010621	Area (sq ft)	54.74	159.91	43.71
Q Total (cfs)	2181.00	Flow (cfs)	228.02	1769.15	183.83
Top Width (ft)	85.92	Top Width (ft)	25.93	39.77	20.22
Vel Total (ft/s)	8.44	Avg. Vel. (ft/s)	4.17	11.06	4.21
Max Chl Dpth (ft)	4.09	Hydr. Depth (ft)	2.11	4.02	2.16
Conv. Total (cfs)	21163.3	Conv. (cfs)	2212.6	17166.9	1783.8
Length Wtd. (ft)	476.20	Wetted Per. (ft)	26.25	39.77	20.66
Min Ch El (ft)	7902.41	Shear (lb/sq ft)	1.38	2.67	1.40
Alpha	1.44	Stream Power (lb/ft s)	5.76	29.49	5.90
Frctn Loss (ft)	5.14	Cum Volume (acre-ft)	39.27	68.33	40.52
C & E Loss (ft)	0.03	Cum SA (acres)	22.58	17.93	24.05

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7908.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.59	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7906.50	Reach Len. (ft)	535.61	475.86	425.77
Crit W.S. (ft)	7906.50	Flow Area (sq ft)	54.74	159.91	43.71
E.G. Slope (ft/ft)	0.010621	Area (sq ft)	54.74	159.91	43.71
Q Total (cfs)	2181.00	Flow (cfs)	228.02	1769.15	183.83
Top Width (ft)	85.92	Top Width (ft)	25.93	39.77	20.22
Vel Total (ft/s)	8.44	Avg. Vel. (ft/s)	4.17	11.06	4.21
Max Chl Dpth (ft)	4.09	Hydr. Depth (ft)	2.11	4.02	2.16
Conv. Total (cfs)	21163.3	Conv. (cfs)	2212.6	17166.9	1783.8
Length Wtd. (ft)	476.20	Wetted Per. (ft)	26.25	39.77	20.66
Min Ch El (ft)	7902.41	Shear (lb/sq ft)	1.38	2.67	1.40
Alpha	1.44	Stream Power (lb/ft s)	5.76	29.49	5.90
Frctn Loss (ft)	5.14	Cum Volume (acre-ft)	18.47	74.76	13.56
C & E Loss (ft)	0.03	Cum SA (acres)	7.15	17.93	5.85

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7907.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.37	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7905.91	Reach Len. (ft)	535.61	475.86	425.77
Crit W.S. (ft)	7905.91	Flow Area (sq ft)	40.52	136.51	32.19
E.G. Slope (ft/ft)	0.011015	Area (sq ft)	40.52	136.51	32.19
Q Total (cfs)	1657.00	Flow (cfs)	155.07	1384.08	117.85
Top Width (ft)	81.12	Top Width (ft)	22.41	39.77	18.94
Vel Total (ft/s)	7.92	Avg. Vel. (ft/s)	3.83	10.14	3.66
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	1.81	3.43	1.70
Conv. Total (cfs)	15788.4	Conv. (cfs)	1477.6	13187.9	1122.9
Length Wtd. (ft)	476.27	Wetted Per. (ft)	22.68	39.77	19.25
Min Ch El (ft)	7902.41	Shear (lb/sq ft)	1.23	2.36	1.15
Alpha	1.41	Stream Power (lb/ft s)	4.70	23.93	4.21
Frctn Loss (ft)	5.40	Cum Volume (acre-ft)	29.80	58.69	28.50
C & E Loss (ft)	0.03	Cum SA (acres)	19.74	17.93	19.68

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7907.87	Element			
Vel Head (ft)	1.54	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7906.33	Reach Len. (ft)	535.61	475.86	425.77
Crit W.S. (ft)	7906.33	Flow Area (sq ft)	50.37	153.08	40.27
E.G. Slope (ft/ft)	0.010829	Area (sq ft)	50.37	153.08	40.27
Q Total (cfs)	2031.00	Flow (cfs)	205.95	1660.96	164.09
Top Width (ft)	84.52	Top Width (ft)	24.90	39.77	19.85
Vel Total (ft/s)	8.33	Avg. Vel. (ft/s)	4.09	10.85	4.08
Max Chl Dpth (ft)	3.92	Hydr. Depth (ft)	2.02	3.85	2.03
Conv. Total (cfs)	19517.3	Conv. (cfs)	1979.1	15961.4	1576.8
Length Wtd. (ft)	476.21	Wetted Per. (ft)	25.21	39.77	20.25
Min Ch El (ft)	7902.41	Shear (lb/sq ft)	1.35	2.60	1.34
Alpha	1.43	Stream Power (lb/ft s)	5.52	28.23	5.48
Frctn Loss (ft)	5.23	Cum Volume (acre-ft)	36.44	65.68	36.87
C & E Loss (ft)	0.03	Cum SA (acres)	21.76	17.93	23.07

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7908.55	Element			
Vel Head (ft)	1.70	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7906.86	Reach Len. (ft)	535.61	475.86	425.77
Crit W.S. (ft)	7906.86	Flow Area (sq ft)	64.17	174.13	51.08
E.G. Slope (ft/ft)	0.010240	Area (sq ft)	64.17	174.13	51.08
Q Total (cfs)	2515.00	Flow (cfs)	285.20	2002.04	227.76
Top Width (ft)	87.54	Top Width (ft)	26.77	39.77	21.00
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)	4.44	11.50	4.46
Max Chl Dpth (ft)	4.45	Hydr. Depth (ft)	2.40	4.38	2.43
Conv. Total (cfs)	24854.0	Conv. (cfs)	2818.4	19784.8	2250.8
Length Wtd. (ft)	476.29	Wetted Per. (ft)	27.17	39.77	21.52
Min Ch El (ft)	7902.41	Shear (lb/sq ft)	1.51	2.80	1.52
Alpha	1.45	Stream Power (lb/ft s)	6.71	32.18	6.77
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	46.38	74.25	48.67
C & E Loss (ft)	0.04	Cum SA (acres)	26.31	17.93	27.18

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 16407

INPUT
Description:
Station Elevation Data num= 52

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7983.88	1.17	7982.34	2.11	7979.86	2.73	7978.2	4.86	7964.85
7.16	7956.01	10.12	7944.01	13.09	7932.71	13.63	7932.13	18.93	7925.25
21.92	7921.59	24.76	7918.02	32.87	7907.57	34.19	7905.86	35.9	7904.62
38.57	7902.66	45.49	7898.31	48.16	7896.69	89.91	7896.69	91.52	7897.08
93.8	7897.64	99.73	7899.9	105.95	7903.42	107.61	7904.67	113.87	7909.41
120.45	7914.63	121.43	7915.42	127.67	7920.77	134.9	7921.15	142.16	7921.43
161.14	7922.58	162.42	7922.64	163.68	7922.79	167.79	7922.89	171.69	7923.07
172.88	7923.12	179.69	7923.74	183.34	7924.06	187.7	7924.45	193.8	7924.79
195.71	7924.96	201.94	7925.58	203.71	7925.75	211.72	7926.47	214.71	7926.78
219.73	7927.59	235.63	7930.43	236.09	7930.51	243.75	7931.67	246.09	7931.99
250.37	7932.82	250.76	7932.88						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	48.16	.035	89.91	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
48.16	89.91	493.09	498.06 503.19	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7902.77	Element			
Vel Head (ft)	1.92	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7900.86	Reach Len. (ft)	493.09	498.06	503.19
Crit W.S. (ft)	7900.86	Flow Area (sq ft)	14.14	174.05	27.57
E.G. Slope (ft/ft)	0.010967	Area (sq ft)	14.14	174.05	27.57
Q Total (cfs)	2181.00	Flow (cfs)	53.98	2004.51	122.52
Top Width (ft)	59.99	Top Width (ft)	6.72	41.75	11.51
Vel Total (ft/s)	10.11	Avg. Vel. (ft/s)	3.82	11.52	4.44
Max Chl Dpth (ft)	4.17	Hydr. Depth (ft)	2.10	4.17	2.39
Conv. Total (cfs)	20826.2	Conv. (cfs)	515.4	19140.8	1169.9
Length Wtd. (ft)	498.43	Wetted Per. (ft)	7.91	41.75	12.30
Min Ch El (ft)	7896.69	Shear (lb/sq ft)	1.22	2.85	1.54
Alpha	1.21	Stream Power (lb/ft s)	4.67	32.87	6.82
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	38.85	66.51	40.17
C & E Loss (ft)	0.02	Cum SA (acres)	22.37	17.48	23.90

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7902.77	Element			
Vel Head (ft)	1.92	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7900.86	Reach Len. (ft)	493.09	498.06	503.19
Crit W.S. (ft)	7900.86	Flow Area (sq ft)	14.14	174.05	27.57
E.G. Slope (ft/ft)	0.010967	Area (sq ft)	14.14	174.05	27.57
Q Total (cfs)	2181.00	Flow (cfs)	53.98	2004.51	122.52
Top Width (ft)	59.99	Top Width (ft)	6.72	41.75	11.51
Vel Total (ft/s)	10.11	Avg. Vel. (ft/s)	3.82	11.52	4.44
Max Chl Dpth (ft)	4.17	Hydr. Depth (ft)	2.10	4.17	2.39
Conv. Total (cfs)	20826.2	Conv. (cfs)	515.4	19140.8	1169.9
Length Wtd. (ft)	498.43	Wetted Per. (ft)	7.91	41.75	12.30
Min Ch El (ft)	7896.69	Shear (lb/sq ft)	1.22	2.85	1.54
Alpha	1.21	Stream Power (lb/ft s)	4.67	32.87	6.82
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	18.04	72.94	13.21
C & E Loss (ft)	0.02	Cum SA (acres)	6.95	17.48	5.70

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical

depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7901.81	Element			
Vel Head (ft)	1.63	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7900.19	Reach Len. (ft)	493.09	498.06	503.19
Crit W.S. (ft)	7900.19	Flow Area (sq ft)	9.97	145.94	20.22
E.G. Slope (ft/ft)	0.011654	Area (sq ft)	9.97	145.94	20.22
Q Total (cfs)	1657.00	Flow (cfs)	34.92	1540.61	81.48
Top Width (ft)	57.73	Top Width (ft)	5.65	41.75	10.32
Vel Total (ft/s)	9.41	Avg. Vel. (ft/s)	3.50	10.56	4.03
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	1.76	3.50	1.96
Conv. Total (cfs)	15349.2	Conv. (cfs)	323.4	14271.0	754.7
Length Wtd. (ft)	498.37	Wetted Per. (ft)	6.65	41.75	10.93
Min Ch El (ft)	7896.69	Shear (lb/sq ft)	1.09	2.54	1.35
Alpha	1.18	Stream Power (lb/ft s)	3.82	26.85	5.42
Frctn Loss (ft)	5.14	Cum Volume (acre-ft)	29.49	57.15	28.24
C & E Loss (ft)	0.02	Cum SA (acres)	19.57	17.48	19.54

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7902.51	Element			
Vel Head (ft)	1.84	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7900.67	Reach Len. (ft)	493.09	498.06	503.19
Crit W.S. (ft)	7900.67	Flow Area (sq ft)	12.90	166.23	25.45
E.G. Slope (ft/ft)	0.011156	Area (sq ft)	12.90	166.23	25.45
Q Total (cfs)	2031.00	Flow (cfs)	48.20	1872.42	110.38
Top Width (ft)	59.36	Top Width (ft)	6.43	41.75	11.18
Vel Total (ft/s)	9.93	Avg. Vel. (ft/s)	3.74	11.26	4.34
Max Chl Dpth (ft)	3.98	Hydr. Depth (ft)	2.01	3.98	2.28
Conv. Total (cfs)	19229.0	Conv. (cfs)	456.3	17727.7	1045.0
Length Wtd. (ft)	498.41	Wetted Per. (ft)	7.56	41.75	11.92
Min Ch El (ft)	7896.69	Shear (lb/sq ft)	1.19	2.77	1.49
Alpha	1.20	Stream Power (lb/ft s)	4.44	31.24	6.45
Frctn Loss (ft)	5.04	Cum Volume (acre-ft)	36.05	63.94	36.54
C & E Loss (ft)	0.02	Cum SA (acres)	21.57	17.48	22.92

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7903.34	Element			
Vel Head (ft)	2.09	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7901.25	Reach Len. (ft)	493.09	498.06	503.19
Crit W.S. (ft)	7901.25	Flow Area (sq ft)	16.90	190.44	32.23
E.G. Slope (ft/ft)	0.010670	Area (sq ft)	16.90	190.44	32.23
Q Total (cfs)	2515.00	Flow (cfs)	67.55	2297.13	150.31
Top Width (ft)	61.31	Top Width (ft)	7.35	41.75	12.21
Vel Total (ft/s)	10.50	Avg. Vel. (ft/s)	4.00	12.06	4.66
Max Chl Dpth (ft)	4.56	Hydr. Depth (ft)	2.30	4.56	2.64
Conv. Total (cfs)	24347.4	Conv. (cfs)	654.0	22238.2	1455.2
Length Wtd. (ft)	498.45	Wetted Per. (ft)	8.65	41.75	13.09
Min Ch El (ft)	7896.69	Shear (lb/sq ft)	1.30	3.04	1.64
Alpha	1.22	Stream Power (lb/ft s)	5.20	36.65	7.65
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	45.89	72.26	48.26
C & E Loss (ft)	0.02	Cum SA (acres)	26.10	17.48	27.02

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 15909

INPUT
Description:
Station Elevation Data num= 51

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7936.08	9.31	7926.67	11.31	7924.91	14.43	7922.25	19.15	7918.17
19.6	7917.8	21.48	7916.72	32.94	7910.22	33.07	7910.15	37.56	7907.76
40.97	7905.49	44.96	7902.95	47.5	7901.47	51.45	7899.37	54.73	7897.61
56.84	7896.4	61.97	7893.36	68.73	7889.79	69.4	7889.41	72.57	7887.69
73.32	7887.28	95.76	7887.24	99.3	7888.85	100.64	7889.61	106.97	7889.89
116.03	7890.23	117.68	7891.04	120.25	7892.13	126.28	7894.99	128.15	7895.1
140.03	7895.76	141.58	7895.83	143.98	7895.98	149.44	7896.23	151.92	7896.45
161.05	7896.81	162.49	7896.98	163.8	7897.18	170.53	7899.61	175.69	7901.43
177.76	7902.73	181	7905.05	192.24	7913.84	199.46	7918.82	206.71	7923.37
211.34	7925.83	213.38	7927.14	213.81	7927.35	218.24	7927.14	223.22	7926.92
226.59	7926.76								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	73.32	.035	95.76	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
73.32	95.76	479.98	486.68	492.59	.1 .3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7895.10	Element			
Vel Head (ft)	2.10	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7893.00	Reach Len. (ft)	479.98	486.68	492.59
Crit W.S. (ft)	7893.00	Flow Area (sq ft)	30.32	128.90	78.25
E.G. Slope (ft/ft)	0.009127	Area (sq ft)	30.32	128.90	78.25
Q Total (cfs)	2181.00	Flow (cfs)	132.26	1676.97	371.77
Top Width (ft)	59.45	Top Width (ft)	10.68	22.44	26.33
Vel Total (ft/s)	9.18	Avg. Vel. (ft/s)	4.36	13.01	4.75
Max Chl Dpth (ft)	5.76	Hydr. Depth (ft)	2.84	5.74	2.97
Conv. Total (cfs)	22828.9	Conv. (cfs)	1384.4	17553.2	3891.4
Length Wtd. (ft)	487.15	Wetted Per. (ft)	12.12	22.44	27.50
Min Ch El (ft)	7887.24	Shear (lb/sq ft)	1.43	3.27	1.62
Alpha	1.60	Stream Power (lb/ft s)	6.22	42.58	7.70
Frctn Loss (ft)	4.87	Cum Volume (acre-ft)	38.60	64.77	39.56

C & E Loss (ft)	0.05	Cum SA (acres)	22.28	17.12	23.68

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7895.10	Element			
Vel Head (ft)	2.10	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7893.00	Reach Len. (ft)	479.98	486.68	492.59
Crit W.S. (ft)	7893.00	Flow Area (sq ft)	30.32	128.90	78.25
E.G. Slope (ft/ft)	0.009127	Area (sq ft)	30.32	128.90	78.25
Q Total (cfs)	2181.00	Flow (cfs)	132.26	1676.97	371.77
Top Width (ft)	59.45	Top Width (ft)	10.68	22.44	26.33
Vel Total (ft/s)	9.18	Avg. Vel. (ft/s)	4.36	13.01	4.75
Max Chl Dpth (ft)	5.76	Hydr. Depth (ft)	2.84	5.74	2.97
Conv. Total (cfs)	22828.9	Conv. (cfs)	1384.4	17553.2	3891.4
Length Wtd. (ft)	487.15	Wetted Per. (ft)	12.12	22.44	27.50
Min Ch El (ft)	7887.24	Shear (lb/sq ft)	1.43	3.27	1.62
Alpha	1.60	Stream Power (lb/ft s)	6.22	42.58	7.70
Frctn Loss (ft)	4.87	Cum Volume (acre-ft)	17.79	71.21	12.60
C & E Loss (ft)	0.05	Cum SA (acres)	6.85	17.12	5.48

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7894.04	Element			
Vel Head (ft)	1.80	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7892.24	Reach Len. (ft)	479.98	486.68	492.59
Crit W.S. (ft)	7892.24	Flow Area (sq ft)	22.71	111.75	58.73
E.G. Slope (ft/ft)	0.009175	Area (sq ft)	22.71	111.75	58.73
Q Total (cfs)	1657.00	Flow (cfs)	90.25	1325.14	241.62
Top Width (ft)	56.39	Top Width (ft)	9.23	22.44	24.72
Vel Total (ft/s)	8.58	Avg. Vel. (ft/s)	3.97	11.86	4.11
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)	2.46	4.98	2.38
Conv. Total (cfs)	17299.0	Conv. (cfs)	942.2	13834.4	2522.5
Length Wtd. (ft)	487.11	Wetted Per. (ft)	10.48	22.44	25.72
Min Ch El (ft)	7887.24	Shear (lb/sq ft)	1.24	2.85	1.31
Alpha	1.57	Stream Power (lb/ft s)	4.93	33.82	5.38
Frctn Loss (ft)	4.99	Cum Volume (acre-ft)	29.31	55.68	27.78
C & E Loss (ft)	0.04	Cum SA (acres)	19.48	17.12	19.34

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7894.81	Element			
Vel Head (ft)	2.03	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7892.79	Reach Len. (ft)	479.98	486.68	492.59
Crit W.S. (ft)	7892.79	Flow Area (sq ft)	28.02	123.97	72.52
E.G. Slope (ft/ft)	0.009208	Area (sq ft)	28.02	123.97	72.52
Q Total (cfs)	2031.00	Flow (cfs)	119.59	1578.34	333.07
Top Width (ft)	58.57	Top Width (ft)	10.26	22.44	25.87
Vel Total (ft/s)	9.05	Avg. Vel. (ft/s)	4.27	12.73	4.59
Max Chl Dpth (ft)	5.54	Hydr. Depth (ft)	2.73	5.52	2.80
Conv. Total (cfs)	21165.8	Conv. (cfs)	1246.3	16448.5	3471.0
Length Wtd. (ft)	487.14	Wetted Per. (ft)	11.64	22.44	26.99
Min Ch El (ft)	7887.24	Shear (lb/sq ft)	1.38	3.18	1.54
Alpha	1.59	Stream Power (lb/ft s)	5.90	40.43	7.09
Frctn Loss (ft)	4.90	Cum Volume (acre-ft)	35.82	62.28	35.98
C & E Loss (ft)	0.06	Cum SA (acres)	21.48	17.12	22.70

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7895.72	Element			
Vel Head (ft)	2.27	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7893.45	Reach Len. (ft)	479.98	486.68	492.59
Crit W.S. (ft)	7893.45	Flow Area (sq ft)	35.26	138.89	90.18
E.G. Slope (ft/ft)	0.009090	Area (sq ft)	35.26	138.89	90.18
Q Total (cfs)	2515.00	Flow (cfs)	161.49	1895.05	458.46
Top Width (ft)	61.21	Top Width (ft)	11.50	22.44	27.27
Vel Total (ft/s)	9.51	Avg. Vel. (ft/s)	4.58	13.64	5.08
Max Chl Dpth (ft)	6.21	Hydr. Depth (ft)	3.07	6.19	3.31
Conv. Total (cfs)	26379.0	Conv. (cfs)	1693.8	19876.6	4808.6
Length Wtd. (ft)	487.16	Wetted Per. (ft)	13.05	22.44	28.54
Min Ch El (ft)	7887.24	Shear (lb/sq ft)	1.53	3.51	1.79
Alpha	1.62	Stream Power (lb/ft s)	7.02	47.92	9.12
Frctn Loss (ft)	4.84	Cum Volume (acre-ft)	45.59	70.38	47.56
C & E Loss (ft)	0.05	Cum SA (acres)	25.99	17.12	26.79

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 15423

INPUT
Description:
Station Elevation Data num= 62

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev

0	7916.59	4.93	7914.78	8.8	7913.32	13.01	7911.74	19.21	7909.49
21.1	7908.78	27.68	7906.48	29.18	7905.94	29.61	7905.77	37.26	7902.87
40.01	7901.89	45.35	7899.89	50.42	7898.15	60.82	7894.32	61.52	7894.07
63.95	7893.17	69.6	7891.05	71.22	7890.48	77.69	7888.1	81.63	7886.67
89.68	7883.71	91.83	7883.34	100.21	7882.21	101.94	7882.03	112.84	7881.18
114.85	7881	118.98	7881.08	119.71	7880.91	123.24	7880.01	126.19	7879.31
133.64	7877.45	134.41	7877.27	139.92	7875.85	168.26	7875.81	174.13	7876.53
175.26	7876.68	182.15	7877.52	183.18	7877.73	185.44	7879.2	185.66	7879.31
190.87	7882.46	196.06	7884.62	198.95	7886.22	206.47	7890.28	207.51	7890.94
214.67	7894.58	216.51	7894.72	217.77	7894.82	224.77	7897.86	227.27	7899.17
231.29	7901.29	237.68	7904.01	242.46	7904.58	246.46	7905.05	247.49	7905.89
248.08	7906.4	249.7	7907.7	257.87	7914.24	260.14	7915.94	261.44	7915.78
266.25	7914.91	266.87	7914.8						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	139.92	.035	168.26	.06

Bank Sta: Left	Right	Lengths: Left	Channel	Right	Coeff Contr.	Expan.
139.92	168.26	520.6	502.01	487	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7882.42	Element			
Vel Head (ft)	1.92	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7880.50	Reach Len. (ft)	520.60	502.01	487.00
Crit W.S. (ft)	7880.50	Flow Area (sq ft)	42.89	132.37	62.27
E.G. Slope (ft/ft)	0.011020	Area (sq ft)	42.89	132.37	62.27
Q Total (cfs)	2181.00	Flow (cfs)	190.66	1648.47	341.87
Top Width (ft)	66.32	Top Width (ft)	18.61	28.34	19.37
Vel Total (ft/s)	9.18	Avg. Vel. (ft/s)	4.45	12.45	5.49
Max Chl Dpth (ft)	4.69	Hydr. Depth (ft)	2.31	4.67	3.21
Conv. Total (cfs)	20776.3	Conv. (cfs)	1816.3	15703.4	3256.6
Length Wtd. (ft)	506.33	Wetted Per. (ft)	19.18	28.34	20.29
Min Ch El (ft)	7875.81	Shear (lb/sq ft)	1.54	3.21	2.11
Alpha	1.47	Stream Power (lb/ft s)	6.84	40.02	11.59
Frctn Loss (ft)	6.79	Cum Volume (acre-ft)	38.19	63.32	38.76
C & E Loss (ft)	0.22	Cum SA (acres)	22.11	16.83	23.42

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7882.42	Element			
Vel Head (ft)	1.92	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7880.50	Reach Len. (ft)	520.60	502.01	487.00
Crit W.S. (ft)	7880.50	Flow Area (sq ft)	42.89	132.37	62.27
E.G. Slope (ft/ft)	0.011020	Area (sq ft)	42.89	132.37	62.27
Q Total (cfs)	2181.00	Flow (cfs)	190.66	1648.47	341.87
Top Width (ft)	66.32	Top Width (ft)	18.61	28.34	19.37
Vel Total (ft/s)	9.18	Avg. Vel. (ft/s)	4.45	12.45	5.49
Max Chl Dpth (ft)	4.69	Hydr. Depth (ft)	2.31	4.67	3.21
Conv. Total (cfs)	20776.3	Conv. (cfs)	1816.3	15703.4	3256.6
Length Wtd. (ft)	507.90	Wetted Per. (ft)	19.18	28.34	20.29
Min Ch El (ft)	7875.81	Shear (lb/sq ft)	1.54	3.21	2.11
Alpha	1.47	Stream Power (lb/ft s)	6.84	40.02	11.59
Frctn Loss (ft)	7.20	Cum Volume (acre-ft)	17.39	69.75	11.80
C & E Loss (ft)	0.17	Cum SA (acres)	6.69	16.83	5.22

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7881.45	Element			
Vel Head (ft)	1.65	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7879.80	Reach Len. (ft)	520.60	502.01	487.00
Crit W.S. (ft)	7879.80	Flow Area (sq ft)	30.80	112.49	49.08
E.G. Slope (ft/ft)	0.011527	Area (sq ft)	30.80	112.49	49.08
Q Total (cfs)	1657.00	Flow (cfs)	125.30	1285.40	246.30
Top Width (ft)	62.34	Top Width (ft)	15.79	28.34	18.21
Vel Total (ft/s)	8.61	Avg. Vel. (ft/s)	4.07	11.43	5.02
Max Chl Dpth (ft)	3.99	Hydr. Depth (ft)	1.95	3.97	2.70
Conv. Total (cfs)	15433.2	Conv. (cfs)	1167.1	11972.1	2294.0
Length Wtd. (ft)	506.21	Wetted Per. (ft)	16.28	28.34	18.93
Min Ch El (ft)	7875.81	Shear (lb/sq ft)	1.36	2.86	1.87
Alpha	1.43	Stream Power (lb/ft s)	5.54	32.64	9.36
Frctn Loss (ft)	6.94	Cum Volume (acre-ft)	29.01	54.42	27.17
C & E Loss (ft)	0.20	Cum SA (acres)	19.34	16.83	19.10

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7882.16	Element			
Vel Head (ft)	1.83	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7880.32	Reach Len. (ft)	520.60	502.01	487.00
Crit W.S. (ft)	7880.32	Flow Area (sq ft)	39.60	127.27	58.81
E.G. Slope (ft/ft)	0.011036	Area (sq ft)	39.60	127.27	58.81
Q Total (cfs)	2031.00	Flow (cfs)	171.42	1544.98	314.60
Top Width (ft)	65.31	Top Width (ft)	17.90	28.34	19.07
Vel Total (ft/s)	9.00	Avg. Vel. (ft/s)	4.33	12.14	5.35
Max Chl Dpth (ft)	4.51	Hydr. Depth (ft)	2.21	4.49	3.08
Conv. Total (cfs)	19333.4	Conv. (cfs)	1631.7	14706.9	2994.8
Length Wtd. (ft)	506.30	Wetted Per. (ft)	18.45	28.34	19.94
Min Ch El (ft)	7875.81	Shear (lb/sq ft)	1.48	3.09	2.03
Alpha	1.46	Stream Power (lb/ft s)	6.40	37.56	10.87
Frctn Loss (ft)	6.78	Cum Volume (acre-ft)	35.45	60.88	35.24
C & E Loss (ft)	0.21	Cum SA (acres)	21.32	16.83	22.45

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7882.99	Element			
Vel Head (ft)	2.09	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7880.89	Reach Len. (ft)	520.60	502.01	487.00
Crit W.S. (ft)	7880.89	Flow Area (sq ft)	50.49	143.50	70.00
E.G. Slope (ft/ft)	0.010901	Area (sq ft)	50.49	143.50	70.00
Q Total (cfs)	2515.00	Flow (cfs)	236.08	1875.65	403.27
Top Width (ft)	68.50	Top Width (ft)	20.14	28.34	20.02
Vel Total (ft/s)	9.53	Avg. Vel. (ft/s)	4.68	13.07	5.76
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)	2.51	5.06	3.50
Conv. Total (cfs)	24087.7	Conv. (cfs)	2261.1	17964.2	3862.4
Length Wtd. (ft)	506.40	Wetted Per. (ft)	20.77	28.34	21.05
Min Ch El (ft)	7875.81	Shear (lb/sq ft)	1.65	3.45	2.26
Alpha	1.49	Stream Power (lb/ft s)	7.74	45.04	13.04
Frctn Loss (ft)	6.64	Cum Volume (acre-ft)	45.12	68.80	46.65
C & E Loss (ft)	0.25	Cum SA (acres)	25.82	16.83	26.52

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 14921

INPUT
Description:
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7910.52	2.49	7908.55	6.08	7905.79	12.85	7900.37	14.4	7899.14
20.8	7894.01	21.57	7893.81	23.21	7893.37	30.54	7891.39	43.93	7887.8
46.85	7887.01	54.29	7885.02	55.01	7884.83	57.67	7884.11	63.16	7882.64
64.64	7882.24	75	7879.46	79.47	7878.27	95.72	7873.91	96.01	7873.85
103.94	7872.27	106.08	7871.77	121.56	7869.88	126.44	7869.22	136.56	7868.8
144.71	7868.66	147.51	7868.6	157.87	7868.42	161.02	7868.35	168.23	7868.3
172.68	7868.21	177.33	7868.1	185.49	7868.04	199.31	7866.97	209.67	7866.55
218.11	7866.29	223.25	7866.25	225.87	7866.26	232.24	7866.11	242.7	7865.93
245.35	7865.7	249.4	7864.98	256.65	7863.59	260.43	7862.89	287.96	7862.81
307.91	7862.82	310.24	7863	311.44	7863.09	316.28	7863.27	323.62	7862.88
325.25	7862.78	326.49	7862.6	329.54	7862.3	344.21	7861.98	344.88	7862.06
346.96	7862.28	349.73	7862.61	353.64	7863.06	358.3	7863.53	360.15	7863.73
363.03	7864.76	373.85	7870	374.93	7870.38	375.84	7870.89	382.03	7874.77
388.89	7881.02	389.41	7881.41	396.23	7885.69	401.95	7890.88	403.32	7891.84
404.97	7892.84	410.42	7895.47	415	7897.28	417.52	7898.55	420.52	7900.09
426.32	7902.87	427.19	7903.36	430.05	7902.69	433.75	7900.92	435.98	7900.58

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	245.35	.05	329.54	.035	346.96	.05	360.15	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
329.54	346.96	552.68	542.09	587.67	.1 .3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7866.56	Element			
Vel Head (ft)	1.17	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7865.39	Reach Len. (ft)	552.68	542.09	587.67
Crit W.S. (ft)	7865.39	Flow Area (sq ft)	190.73	56.65	34.89
E.G. Slope (ft/ft)	0.016687	Area (sq ft)	190.73	56.65	34.89
Q Total (cfs)	2181.00	Flow (cfs)	1277.73	681.33	221.94
Top Width (ft)	117.24	Top Width (ft)	82.45	17.42	17.37
Vel Total (ft/s)	7.73	Avg. Vel. (ft/s)	6.70	12.03	6.36
Max Chl Dpth (ft)	3.41	Hydr. Depth (ft)	2.31	3.25	2.01
Conv. Total (cfs)	16883.9	Conv. (cfs)	9891.4	5274.4	1718.1
Length Wtd. (ft)	554.68	Wetted Per. (ft)	82.74	17.44	17.78
Min Ch El (ft)	7861.98	Shear (lb/sq ft)	2.40	3.38	2.04
Alpha	1.27	Stream Power (lb/ft s)	16.09	40.70	13.01
Frctn Loss (ft)	6.53	Cum Volume (acre-ft)	36.80	62.23	38.22
C & E Loss (ft)	0.10	Cum SA (acres)	21.51	16.57	23.21

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7866.94	Element			
Vel Head (ft)	1.35	Wt. n-Val.	0.050	0.035	
W.S. Elev (ft)	7865.59	Reach Len. (ft)	552.68	542.09	587.67
Crit W.S. (ft)	7865.59	Flow Area (sq ft)	189.02	60.12	
E.G. Slope (ft/ft)	0.018922	Area (sq ft)	189.02	60.12	
Q Total (cfs)	2181.00	Flow (cfs)	1467.51	713.49	
Top Width (ft)	86.96	Top Width (ft)	69.54	17.42	
Vel Total (ft/s)	8.75	Avg. Vel. (ft/s)	7.76	11.87	
Max Chl Dpth (ft)	3.61	Hydr. Depth (ft)	2.72	3.45	
Conv. Total (cfs)	15855.1	Conv. (cfs)	10668.3	5186.8	
Length Wtd. (ft)	548.65	Wetted Per. (ft)	72.22	20.75	
Min Ch El (ft)	7861.98	Shear (lb/sq ft)	3.09	3.42	
Alpha	1.13	Stream Power (lb/ft s)	24.00	40.62	
Frctn Loss (ft)	8.59	Cum Volume (acre-ft)	16.00	68.64	11.46
C & E Loss (ft)	0.08	Cum SA (acres)	6.16	16.57	5.11

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7865.98	Element			
Vel Head (ft)	0.99	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7864.99	Reach Len. (ft)	552.68	542.09	587.67
Crit W.S. (ft)	7864.99	Flow Area (sq ft)	158.32	49.70	28.13
E.G. Slope (ft/ft)	0.016567	Area (sq ft)	158.32	49.70	28.13
Q Total (cfs)	1657.00	Flow (cfs)	950.99	545.99	160.02
Top Width (ft)	114.18	Top Width (ft)	80.21	17.42	16.55
Vel Total (ft/s)	7.02	Avg. Vel. (ft/s)	6.01	10.98	5.69
Max Chl Dpth (ft)	3.01	Hydr. Depth (ft)	1.97	2.85	1.70
Conv. Total (cfs)	12873.6	Conv. (cfs)	7388.4	4241.9	1243.2
Length Wtd. (ft)	550.62	Wetted Per. (ft)	80.46	17.44	16.86
Min Ch El (ft)	7861.98	Shear (lb/sq ft)	2.04	2.95	1.73
Alpha	1.29	Stream Power (lb/ft s)	12.22	32.38	9.82
Frctn Loss (ft)	7.56	Cum Volume (acre-ft)	27.88	53.49	26.74
C & E Loss (ft)	0.02	Cum SA (acres)	18.77	16.57	18.90

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7866.40	Element			
Vel Head (ft)	1.12	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7865.29	Reach Len. (ft)	552.68	542.09	587.67
Crit W.S. (ft)	7865.29	Flow Area (sq ft)	182.02	54.80	33.06
E.G. Slope (ft/ft)	0.016583	Area (sq ft)	182.02	54.80	33.06
Q Total (cfs)	2031.00	Flow (cfs)	1184.15	642.74	204.12
Top Width (ft)	116.43	Top Width (ft)	81.85	17.42	17.15
Vel Total (ft/s)	7.53	Avg. Vel. (ft/s)	6.51	11.73	6.17
Max Chl Dpth (ft)	3.30	Hydr. Depth (ft)	2.22	3.15	1.93
Conv. Total (cfs)	15771.5	Conv. (cfs)	9195.4	4991.1	1585.0
Length Wtd. (ft)	554.35	Wetted Per. (ft)	82.13	17.44	17.53
Min Ch El (ft)	7861.98	Shear (lb/sq ft)	2.29	3.25	1.95
Alpha	1.27	Stream Power (lb/ft s)	14.93	38.16	12.05
Frctn Loss (ft)	6.49	Cum Volume (acre-ft)	34.12	59.83	34.72
C & E Loss (ft)	0.09	Cum SA (acres)	20.73	16.57	22.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7866.91	Element			
Vel Head (ft)	1.25	Wt. n-Val.	0.050	0.035	0.051
W.S. Elev (ft)	7865.66	Reach Len. (ft)	552.68	542.09	587.67
Crit W.S. (ft)	7865.66	Flow Area (sq ft)	212.99	61.31	39.61
E.G. Slope (ft/ft)	0.016071	Area (sq ft)	212.99	61.31	39.61
Q Total (cfs)	2515.00	Flow (cfs)	1488.99	762.85	263.16
Top Width (ft)	119.30	Top Width (ft)	83.95	17.42	17.93
Vel Total (ft/s)	8.01	Avg. Vel. (ft/s)	6.99	12.44	6.64
Max Chl Dpth (ft)	3.68	Hydr. Depth (ft)	2.54	3.52	2.21
Conv. Total (cfs)	19838.7	Conv. (cfs)	11745.4	6017.5	2075.8
Length Wtd. (ft)	555.31	Wetted Per. (ft)	84.26	17.44	18.39
Min Ch El (ft)	7861.98	Shear (lb/sq ft)	2.54	3.53	2.16
Alpha	1.25	Stream Power (lb/ft s)	17.73	43.89	14.36
Frctn Loss (ft)	6.55	Cum Volume (acre-ft)	43.54	67.62	46.04
C & E Loss (ft)	0.10	Cum SA (acres)	25.20	16.57	26.31

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 14378

INPUT
Description:
Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7902.98	.28	7902.87	3.14	7901.6	6.65	7900.24	9.11	7899.3
17.65	7896.05	18.7	7895.56	18.87	7895.5	19.07	7895.43	29.73	7890.6
35.05	7888.51	36.19	7888.02	39.72	7887	44.13	7885.75	47.12	7885.02
51.33	7883.6	57.55	7881.74	58.93	7881.35	61.74	7880.61	71.27	7875.23
72.94	7874.14	75.39	7872.5	80.14	7869.33	83.35	7866	93.23	7855.72
94.54	7854.44	95.42	7853.81	97.15	7852.9	104.32	7849.11	110.5	7848.98
117.37	7850.87	117.73	7850.97	118.43	7850.92	120.77	7850.73	125.87	7850.68
129.69	7850.41	130.19	7850.26	132.33	7849.92	135.94	7848.9	165.06	7849
168.87	7849	172.58	7849.6	180.36	7850.87	181.05	7850.98	185.63	7851.85
188.24	7852.35	191.33	7852.32	198.92	7852.21	201.6	7852.19	207.23	7851.92
222.15	7852.01	240.48	7851.55	242.7	7851.5	247.55	7851.48	248.88	7851.21
252.98	7850.4	257.52	7849.46	262.42	7848.96	265.83	7849.05	273	7850.37
273.53	7850.48	274.51	7850.69	284.51	7852.56	286.81	7852.98	289.01	7852.92
294.08	7852.83	304.35	7852.58	306.98	7852.57	314.63	7852.66	324.9	7852.81
331.5	7851.96	333.06	7851.81	335.18	7852.18	340.23	7852.98	345.45	7853.66
346.48	7853.86	346.96	7853.94	349.24	7853.93	365.17	7853.84	373.48	7853.93
376.28	7853.93	381.79	7853.9	386.55	7853.9	390.11	7853.85	396.83	7853.92
400.86	7853.92	405.99	7855.48	407.1	7855.81	415.05	7859.45	417.37	7860.77
423.36	7865.65	427.65	7868.99	430.78	7871.54	433.53	7873.73	439.98	7873.67
448.2	7873.71	456.61	7874.3	458.47	7874.44	464.92	7875.08	468.75	7875.54
473.22	7876.14	475.36	7876.42	476.41	7876.26	478.14	7875.98	482.77	7875.21
488.32	7875.38	489.86	7875.44	492.23	7875.62	498.17	7876.04	499.57	7876.13
506.48	7876.6	509.85	7876.84	515.77	7877.77	519.92	7878.26	521.26	7878.48
530.4	7882.94	531.18	7883.38	531.39	7883.5	535.78	7881.59	539.04	7879.87
546.86	7880.21	547.78	7880.33	570.08	7880.07	571.46	7880.5	578	7881.92

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	104.32	.05	135.94	.035	168.87	.05	286.81	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
135.94 168.87 535.21 599.19 522.7 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
188.24	578	7852.35	F

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7853.47	Element			
Vel Head (ft)	0.85	Wt. n-Val.	0.051	0.035	0.050

W.S. Elev (ft)	7852.62	Reach Len. (ft)	535.21	599.19	522.70
Crit W.S. (ft)	7852.62	Flow Area (sq ft)	94.03	120.62	169.19
E.G. Slope (ft/ft)	0.008738	Area (sq ft)	94.03	120.62	169.19
Q Total (cfs)	2181.00	Flow (cfs)	465.17	1137.46	578.37
Top Width (ft)	207.06	Top Width (ft)	38.26	32.93	135.87
Vel Total (ft/s)	5.68	Avg. Vel. (ft/s)	4.95	9.43	3.42
Max Chl Dpth (ft)	3.72	Hydr. Depth (ft)	2.46	3.66	1.25
Conv. Total (cfs)	23331.7	Conv. (cfs)	4976.3	12168.2	6187.2
Length Wtd. (ft)	575.59	Wetted Per. (ft)	39.61	32.93	136.86
Min Ch El (ft)	7848.90	Shear (lb/sq ft)	1.30	2.00	0.67
Alpha	1.69	Stream Power (lb/ft s)	6.41	18.84	2.31
Frctn Loss (ft)	5.35	Cum Volume (acre-ft)	34.99	61.12	36.84
C & E Loss (ft)	0.10	Cum SA (acres)	20.75	16.26	22.18

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7855.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.17	Wt. n-Val.		0.035	0.050
W.S. Elev (ft)	7853.60	Reach Len. (ft)	535.21	599.19	522.70
Crit W.S. (ft)	7853.60	Flow Area (sq ft)		152.83	41.10
E.G. Slope (ft/ft)	0.013158	Area (sq ft)		152.83	41.10
Q Total (cfs)	2181.00	Flow (cfs)		1894.58	286.42
Top Width (ft)	44.06	Top Width (ft)		32.93	11.13
Vel Total (ft/s)	11.25	Avg. Vel. (ft/s)		12.40	6.97
Max Chl Dpth (ft)	4.70	Hydr. Depth (ft)		4.64	3.69
Conv. Total (cfs)	19013.7	Conv. (cfs)		16516.7	2497.0
Length Wtd. (ft)	587.53	Wetted Per. (ft)		37.63	14.06
Min Ch El (ft)	7848.90	Shear (lb/sq ft)		3.34	2.40
Alpha	1.11	Stream Power (lb/ft s)		41.36	16.73
Frctn Loss (ft)	6.67	Cum Volume (acre-ft)	14.80	67.31	11.18
C & E Loss (ft)	0.09	Cum SA (acres)	5.72	16.26	5.04

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7853.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.18	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7852.26	Reach Len. (ft)	535.21	599.19	522.70
Crit W.S. (ft)	7852.26	Flow Area (sq ft)	80.24	108.64	31.87
E.G. Slope (ft/ft)	0.011559	Area (sq ft)	80.24	108.64	124.26
Q Total (cfs)	1657.00	Flow (cfs)	415.10	1098.94	142.97
Top Width (ft)	182.89	Top Width (ft)	37.57	32.93	112.39
Vel Total (ft/s)	7.51	Avg. Vel. (ft/s)	5.17	10.12	4.49
Max Chl Dpth (ft)	3.35	Hydr. Depth (ft)	2.14	3.30	1.69
Conv. Total (cfs)	15412.4	Conv. (cfs)	3861.0	10221.6	1329.8
Length Wtd. (ft)	582.10	Wetted Per. (ft)	38.83	32.93	19.15
Min Ch El (ft)	7848.90	Shear (lb/sq ft)	1.49	2.38	1.20
Alpha	1.35	Stream Power (lb/ft s)	7.71	24.08	5.39
Frctn Loss (ft)	6.52	Cum Volume (acre-ft)	26.37	52.50	25.71
C & E Loss (ft)	0.05	Cum SA (acres)	18.02	16.26	18.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7853.35	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.83	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7852.52	Reach Len. (ft)	535.21	599.19	522.70
Crit W.S. (ft)	7852.52	Flow Area (sq ft)	90.27	117.37	156.46
E.G. Slope (ft/ft)	0.008695	Area (sq ft)	90.27	117.37	156.46
Q Total (cfs)	2031.00	Flow (cfs)	434.71	1084.16	512.12
Top Width (ft)	196.60	Top Width (ft)	38.07	32.93	125.60
Vel Total (ft/s)	5.58	Avg. Vel. (ft/s)	4.82	9.24	3.27
Max Chl Dpth (ft)	3.62	Hydr. Depth (ft)	2.37	3.56	1.25
Conv. Total (cfs)	21781.4	Conv. (cfs)	4662.1	11627.1	5492.2
Length Wtd. (ft)	576.31	Wetted Per. (ft)	39.40	32.93	126.56
Min Ch El (ft)	7848.90	Shear (lb/sq ft)	1.24	1.93	0.67
Alpha	1.71	Stream Power (lb/ft s)	5.99	17.87	2.20
Frctn Loss (ft)	5.42	Cum Volume (acre-ft)	32.40	58.76	33.44
C & E Loss (ft)	0.10	Cum SA (acres)	19.97	16.26	21.28

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7853.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.91	Wt. n-Val.	0.051	0.035	0.050
W.S. Elev (ft)	7852.81	Reach Len. (ft)	535.21	599.19	522.70
Crit W.S. (ft)	7852.81	Flow Area (sq ft)	101.26	126.81	197.13
E.G. Slope (ft/ft)	0.009034	Area (sq ft)	101.26	126.81	197.13
Q Total (cfs)	2515.00	Flow (cfs)	532.19	1257.19	725.62
Top Width (ft)	232.37	Top Width (ft)	38.61	32.93	160.82
Vel Total (ft/s)	5.91	Avg. Vel. (ft/s)	5.26	9.91	3.68
Max Chl Dpth (ft)	3.91	Hydr. Depth (ft)	2.62	3.85	1.23
Conv. Total (cfs)	26460.0	Conv. (cfs)	5599.1	13226.8	7634.2
Length Wtd. (ft)	574.48	Wetted Per. (ft)	40.01	32.93	161.85
Min Ch El (ft)	7848.90	Shear (lb/sq ft)	1.43	2.17	0.69
Alpha	1.68	Stream Power (lb/ft s)	7.50	21.53	2.53

Frctn Loss (ft)	5.68	Cum Volume (acre-ft)	41.55	66.45	44.44
C & E Loss (ft)	0.13	Cum SA (acres)	24.42	16.26	25.10

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 13779

INPUT
Description:
Station Elevation Data num= 164

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7872.16	1.22	7871.76	8.96	7868.7	11.76	7866.82	16.53	7863.65
21.56	7861.06	28.96	7857.51	31.73	7856.61	38.97	7854.18	48.97	7850.93
52.07	7850	58.97	7848.33	62.24	7847.35	68.97	7844.93	72.69	7843.36
73.46	7843.13	78.97	7843.1	82.58	7843.11	88.97	7843.08	98.97	7842.81
102.92	7842.71	113.09	7842.68	118.98	7842.71	138.98	7842.71	143.6	7842.7
153.77	7842.7	158.98	7842.54	163.94	7842.47	168.98	7842.38	171.71	7842.22
175.96	7840.45	178.99	7838.98	186.23	7836.05	188.64	7834.89	220.09	7834.89
221.61	7835.21	228.99	7836.68	235.12	7838.34	238.99	7839.22	240.36	7839.61
242	7840.01	247.27	7839.93	255.46	7839.88	259	7839.91	265.63	7839.9
269	7840.01	276.84	7839.93	277.36	7840.06	285.6	7843.07	287.91	7843.21
292.49	7843.28	296.78	7843.41	299	7843.51	306.31	7843.62	309	7843.29
326.65	7843.42	329.01	7843.56	346.99	7843.56	349.01	7843.55	369.01	7843.68
387.67	7843.91	428.34	7844.65	446.95	7845.1	449.23	7845.15	460.22	7845.25
463.33	7845.27	470.11	7845.33	478.42	7845.54	482.22	7845.66	485.96	7845.79
493.21	7846.03	500.26	7846.15	502.59	7846.17	509.15	7846.2	516.72	7846.21
524.32	7847.25	525.67	7847.43	531.07	7847.49	537.19	7847.43	538.78	7847.5
542.26	7847.58	546.33	7847.71	548.19	7847.78	553.87	7847.96	559.19	7848.25
561.42	7848.42	566.3	7848.67	568.97	7848.84	570.18	7848.9	577.07	7849.38
582.71	7849.57	585.33	7849.94	590.4	7850.71	592.17	7851.02	594.43	7851.33
596.98	7851.72	603.17	7851.78	606.69	7851.79	621.87	7851.88	624.83	7851.91
630.24	7852.12	632.42	7852.13	636.26	7852.13	638.45	7852.12	643.52	7852.17
648.45	7852.24	651.22	7852.2	661.25	7852.38	663.24	7852.68	668.39	7853.73
674.97	7854.42	677.43	7854.9	677.85	7855	681.11	7855.02	684.41	7855.53
686.54	7855.89	689.86	7856.13	691.14	7856.27	694.11	7856.81	695.87	7857.46
700.94	7858.15	702.13	7858.31	704.79	7858.73	710.59	7859.44	711.9	7859.62
713.13	7859.86	714.1	7860.19	722.07	7862.52	724.65	7863.45	728	7863.87
729.37	7864.03	753.28	7863.61	754.14	7863.44	769.03	7860.65	771.65	7860.18
778.08	7860.08	780.24	7860.1	782.74	7860.24	787.79	7860.7	790.1	7860.87
795.33	7861.36	801.09	7861.88	802.88	7862.08	806.78	7862.43	810.42	7862.79
812.09	7862.96	817.97	7863.85	823.09	7864.26	825.73	7864.79	830.83	7865.23
834.11	7865.53	840.43	7865.55	845.08	7865.84	848.15	7866.17	854.88	7866.97
855.46	7867.03	855.92	7867.1	858.48	7867.42	867.03	7868.46	868.16	7868.53
869.38	7868.28	874.06	7867.85	877.96	7869.14	879.38	7869.55		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	175.96	.05	188.64	.035	220.09	.05	276.84	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
188.64	220.09	465.25	464.83	465.06	.1	.3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7841.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7839.64	Reach Len. (ft)	465.25	464.83	465.06
Crit W.S. (ft)	7839.64	Flow Area (sq ft)	25.84	149.26	50.86
E.G. Slope (ft/ft)	0.009909	Area (sq ft)	25.84	149.26	50.86
Q Total (cfs)	2181.00	Flow (cfs)	127.57	1781.48	271.94
Top Width (ft)	62.83	Top Width (ft)	11.00	31.45	20.38
Vel Total (ft/s)	9.65	Avg. Vel. (ft/s)	4.94	11.94	5.35
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)	2.35	4.75	2.50
Conv. Total (cfs)	21910.4	Conv. (cfs)	1281.6	17896.8	2732.0
Length Wtd. (ft)	464.93	Wetted Per. (ft)	11.99	31.45	20.93
Min Ch El (ft)	7834.89	Shear (lb/sq ft)	1.33	2.94	1.50
Alpha	1.30	Stream Power (lb/ft s)	6.58	35.04	8.04
Frctn Loss (ft)	5.19	Cum Volume (acre-ft)	34.26	58.27	35.52
C & E Loss (ft)	0.03	Cum SA (acres)	20.44	15.81	21.24

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7841.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.88	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7839.64	Reach Len. (ft)	465.25	464.83	465.06
Crit W.S. (ft)	7839.64	Flow Area (sq ft)	25.84	149.26	50.86
E.G. Slope (ft/ft)	0.009909	Area (sq ft)	25.84	149.26	50.86
Q Total (cfs)	2181.00	Flow (cfs)	127.57	1781.48	271.94
Top Width (ft)	62.83	Top Width (ft)	11.00	31.45	20.38
Vel Total (ft/s)	9.65	Avg. Vel. (ft/s)	4.94	11.94	5.35
Max Chl Dpth (ft)	4.75	Hydr. Depth (ft)	2.35	4.75	2.50
Conv. Total (cfs)	21910.4	Conv. (cfs)	1281.6	17896.8	2732.0
Length Wtd. (ft)	464.93	Wetted Per. (ft)	11.99	31.45	20.93
Min Ch El (ft)	7834.89	Shear (lb/sq ft)	1.33	2.94	1.50
Alpha	1.30	Stream Power (lb/ft s)	6.58	35.04	8.04
Frctn Loss (ft)	5.19	Cum Volume (acre-ft)	14.64	65.23	10.63
C & E Loss (ft)	0.03	Cum SA (acres)	5.65	15.81	4.85

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7840.55	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.67	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7838.88	Reach Len. (ft)	465.25	464.83	465.06
Crit W.S. (ft)	7838.88	Flow Area (sq ft)	18.06	125.31	36.43
E.G. Slope (ft/ft)	0.010863	Area (sq ft)	18.06	125.31	36.43
Q Total (cfs)	1657.00	Flow (cfs)	81.87	1393.55	181.59
Top Width (ft)	58.22	Top Width (ft)	9.39	31.45	17.38

				CrystalRiver.rep	
Vel Total (ft/s)	9.22	Avg. Vel. (ft/s)	4.53	11.12	4.98
Max Chl Dpth (ft)	3.98	Hydr. Depth (ft)	1.92	3.98	2.10
Conv. Total (cfs)	15898.2	Conv. (cfs)	785.5	13370.5	1742.2
Length Wtd. (ft)	464.92	Wetted Per. (ft)	10.20	31.45	17.84
Min Ch El (ft)	7834.89	Shear (lb/sq ft)	1.20	2.70	1.38
Alpha	1.27	Stream Power (lb/ft s)	5.44	30.05	6.90
Frctn Loss (ft)	5.27	Cum Volume (acre-ft)	25.76	50.90	24.75
C & E Loss (ft)	0.07	Cum SA (acres)	17.73	15.81	17.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7841.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.84	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7839.42	Reach Len. (ft)	465.25	464.83	465.06
Crit W.S. (ft)	7839.42	Flow Area (sq ft)	23.52	142.48	46.55
E.G. Slope (ft/ft)	0.010203	Area (sq ft)	23.52	142.48	46.55
Q Total (cfs)	2031.00	Flow (cfs)	113.77	1672.86	244.37
Top Width (ft)	61.61	Top Width (ft)	10.56	31.45	19.60
Vel Total (ft/s)	9.56	Avg. Vel. (ft/s)	4.84	11.74	5.25
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)	2.23	4.53	2.37
Conv. Total (cfs)	20106.6	Conv. (cfs)	1126.3	16561.1	2419.2
Length Wtd. (ft)	464.92	Wetted Per. (ft)	11.49	31.45	20.13
Min Ch El (ft)	7834.89	Shear (lb/sq ft)	1.30	2.89	1.47
Alpha	1.29	Stream Power (lb/ft s)	6.31	33.88	7.73
Frctn Loss (ft)	5.27	Cum Volume (acre-ft)	31.70	56.97	32.23
C & E Loss (ft)	0.04	Cum SA (acres)	19.67	15.81	20.41

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7842.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.20	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7839.89	Reach Len. (ft)	465.25	464.83	465.06
Crit W.S. (ft)	7839.89	Flow Area (sq ft)	28.71	157.27	56.20
E.G. Slope (ft/ft)	0.010870	Area (sq ft)	28.71	157.27	56.20
Q Total (cfs)	2515.00	Flow (cfs)	154.26	2035.59	325.15
Top Width (ft)	67.40	Top Width (ft)	11.53	31.45	24.43
Vel Total (ft/s)	10.39	Avg. Vel. (ft/s)	5.37	12.94	5.79
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)	2.49	5.00	2.30
Conv. Total (cfs)	24122.1	Conv. (cfs)	1479.6	19524.0	3118.6
Length Wtd. (ft)	464.93	Wetted Per. (ft)	12.57	31.45	25.01
Min Ch El (ft)	7834.89	Shear (lb/sq ft)	1.55	3.39	1.52
Alpha	1.31	Stream Power (lb/ft s)	8.33	43.92	8.82
Frctn Loss (ft)	5.38	Cum Volume (acre-ft)	40.75	64.50	42.92
C & E Loss (ft)	0.08	Cum SA (acres)	24.11	15.81	23.99

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 13314

INPUT
Description:
Station Elevation Data num= 92

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7853.18	17	7848.99	17.16	7848.94	37	7843.34	37.21	7843.27
49.22	7838.74	50.69	7838.63	57	7838.2	67	7837.68	77	7837.18
97	7836.93	117	7835.79	127	7835.71	137	7835.41	139.34	7835.24
146.85	7832.06	147	7831.99	147.12	7831.94	153.45	7829.3	156.93	7829.1
167	7828.77	177	7828.67	183.81	7827.81	209.18	7827.75	216.79	7830.2
217	7830.27	217.55	7830.46	222.01	7831.96	226.42	7832.3	227	7832.35
237.01	7832.94	238.2	7833.02	246.34	7834.62	246.72	7834.71	257	7834.1
266.7	7833.9	277	7833.75	297	7833.62	317	7832.99	357	7832.23
377	7831.97	397	7831.59	417	7831.84	437	7831.97	457	7832.35
477	7832.48	497	7832.73	517	7833.36	537.16	7833.36	557	7833.49
577	7834	597.16	7834.01	617	7834.26	627	7834.19	637	7834.14
657	7834.64	677	7835.4	697	7835.65	717	7835.53	747	7835.54
757	7835.3	760.95	7835.29	763.6	7835.82	764.66	7836.04	766.85	7836.11
777	7836.39	787	7836.54	797	7836.67	817	7837.05	837	7837.31
857.16	7837.31	877	7837.94	887.44	7838.17	891.47	7838.23	896.4	7840.6
897	7840.88	897.16	7840.96	907	7845.27	907.14	7845.36	914.18	7849.74
916.92	7850.16	920.83	7850.71	941.39	7850.46	943.62	7850.31	947	7849.62
947.96	7849.44	948.49	7849.77	955.48	7856.42	956.96	7858.07	957	7858.12
957.25	7858.38	964.42	7865.49						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	183.81	.035	209.18	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
183.81 209.18 514.62 494.08 474.87 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
246.72	964.42	7834.71	F

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7833.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7832.13	Reach Len. (ft)	514.62	494.08	474.87
Crit W.S. (ft)	7832.13	Flow Area (sq ft)	112.56	110.36	29.67
E.G. Slope (ft/ft)	0.012664	Area (sq ft)	112.56	110.36	51.11
Q Total (cfs)	2181.00	Flow (cfs)	649.75	1404.96	126.29
Top Width (ft)	158.23	Top Width (ft)	37.12	25.37	95.73
Vel Total (ft/s)	8.63	Avg. Vel. (ft/s)	5.77	12.73	4.26
Max Chl Dpth (ft)	4.38	Hydr. Depth (ft)	3.03	4.35	1.97
Conv. Total (cfs)	19380.4	Conv. (cfs)	5773.7	12484.5	1122.2
Length Wtd. (ft)	495.86	Wetted Per. (ft)	37.76	25.37	15.71
Min Ch El (ft)	7827.75	Shear (lb/sq ft)	2.36	3.44	1.49
Alpha	1.55	Stream Power (lb/ft s)	13.61	43.78	6.35
Frctn Loss (ft)	5.92	Cum Volume (acre-ft)	33.52	57.88	34.98

C & E Loss (ft)	0.06	Cum SA (acres)	20.19	15.51	20.62

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7833.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.79	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7832.13	Reach Len. (ft)	514.62	494.08	474.87
Crit W.S. (ft)	7832.13	Flow Area (sq ft)	112.56	110.36	29.67
E.G. Slope (ft/ft)	0.012664	Area (sq ft)	112.56	110.36	51.11
Q Total (cfs)	2181.00	Flow (cfs)	649.75	1404.96	126.29
Top Width (ft)	158.23	Top Width (ft)	37.12	25.37	95.73
Vel Total (ft/s)	8.63	Avg. Vel. (ft/s)	5.77	12.73	4.26
Max Chl Dpth (ft)	4.38	Hydr. Depth (ft)	3.03	4.35	1.97
Conv. Total (cfs)	19380.4	Conv. (cfs)	5773.7	12484.5	1122.2
Length Wtd. (ft)	496.58	Wetted Per. (ft)	37.76	25.37	15.71
Min Ch El (ft)	7827.75	Shear (lb/sq ft)	2.36	3.44	1.49
Alpha	1.55	Stream Power (lb/ft s)	13.61	43.78	6.35
Frctn Loss (ft)	6.53	Cum Volume (acre-ft)	13.91	63.85	10.08
C & E Loss (ft)	0.02	Cum SA (acres)	5.39	15.51	4.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7833.03	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.43	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7831.60	Reach Len. (ft)	514.62	494.08	474.87
Crit W.S. (ft)	7831.60	Flow Area (sq ft)	93.20	96.90	22.87
E.G. Slope (ft/ft)	0.011845	Area (sq ft)	93.20	96.90	22.88
Q Total (cfs)	1657.00	Flow (cfs)	470.13	1094.04	92.83
Top Width (ft)	74.30	Top Width (ft)	35.87	25.37	13.05
Vel Total (ft/s)	7.78	Avg. Vel. (ft/s)	5.04	11.29	4.06
Max Chl Dpth (ft)	3.85	Hydr. Depth (ft)	2.60	3.82	1.94
Conv. Total (cfs)	15225.2	Conv. (cfs)	4319.8	10052.5	853.0
Length Wtd. (ft)	495.89	Wetted Per. (ft)	36.40	25.37	12.37
Min Ch El (ft)	7827.75	Shear (lb/sq ft)	1.89	2.82	1.37
Alpha	1.52	Stream Power (lb/ft s)	9.55	31.89	5.55
Frctn Loss (ft)	5.78	Cum Volume (acre-ft)	25.17	49.71	24.43
C & E Loss (ft)	0.03	Cum SA (acres)	17.49	15.51	17.09

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7833.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.71	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7831.96	Reach Len. (ft)	514.62	494.08	474.87
Crit W.S. (ft)	7831.96	Flow Area (sq ft)	106.19	105.98	27.27
E.G. Slope (ft/ft)	0.012689	Area (sq ft)	106.19	105.98	36.74
Q Total (cfs)	2031.00	Flow (cfs)	594.76	1314.67	121.58
Top Width (ft)	132.31	Top Width (ft)	36.73	25.37	70.21
Vel Total (ft/s)	8.48	Avg. Vel. (ft/s)	5.60	12.40	4.46
Max Chl Dpth (ft)	4.21	Hydr. Depth (ft)	2.89	4.18	2.13
Conv. Total (cfs)	18030.1	Conv. (cfs)	5279.9	11670.9	1079.3
Length Wtd. (ft)	495.88	Wetted Per. (ft)	37.33	25.37	13.50
Min Ch El (ft)	7827.75	Shear (lb/sq ft)	2.25	3.31	1.60
Alpha	1.53	Stream Power (lb/ft s)	12.62	41.05	7.14
Frctn Loss (ft)	6.26	Cum Volume (acre-ft)	31.01	55.64	31.78
C & E Loss (ft)	0.03	Cum SA (acres)	19.41	15.51	19.93

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7834.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.94	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7832.52	Reach Len. (ft)	514.62	494.08	474.87
Crit W.S. (ft)	7832.52	Flow Area (sq ft)	127.16	120.22	36.53
E.G. Slope (ft/ft)	0.012334	Area (sq ft)	127.16	120.22	99.51
Q Total (cfs)	2515.00	Flow (cfs)	772.29	1599.06	143.65
Top Width (ft)	222.36	Top Width (ft)	38.04	25.37	158.95
Vel Total (ft/s)	8.86	Avg. Vel. (ft/s)	6.07	13.30	3.93
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)	3.34	4.74	1.77
Conv. Total (cfs)	22646.0	Conv. (cfs)	6954.0	14398.6	1293.5
Length Wtd. (ft)	495.31	Wetted Per. (ft)	38.76	25.37	21.37
Min Ch El (ft)	7827.75	Shear (lb/sq ft)	2.53	3.65	1.32
Alpha	1.59	Stream Power (lb/ft s)	15.34	48.53	5.18
Frctn Loss (ft)	5.33	Cum Volume (acre-ft)	39.92	63.02	42.09
C & E Loss (ft)	0.16	Cum SA (acres)	23.85	15.51	23.01

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.

This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 12820

INPUT
Description:
Station Elevation Data num= 184

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7852.37	3.62	7850.66	8.43	7848.34	13.61	7846.53	23.61	7841.71
28.43	7840	33.61	7838.3	43.61	7834.77	48.43	7833.56	53.61	7831.62
63.61	7829.11	68.66	7828.37	73.62	7827.73	74.36	7827.62	79.31	7827.11
83.61	7826.36	98.43	7826.18	103.61	7826.04	108.43	7826.08	123.61	7826.17
128.43	7826.28	133.61	7826.31	138.43	7826.42	143.61	7826.56	148.43	7826.67
153.61	7826.77	158.43	7826.88	163.61	7826.98	168.43	7827.05	173.61	7827.31
178.43	7827.39	183.61	7827.59	193.99	7827.75	197.84	7827.82	199.46	7827.67
204.17	7827.16	205.05	7827.06	211.37	7826.45	216.1	7825.88	218.89	7825.53
224.79	7824.81	226.4	7824.73	233.91	7824.88	241.43	7825.09	248.24	7824.64
249.27	7824.57	256.45	7824.81	263.97	7824.19	271.38	7823.74	274.17	7823.59
276.81	7822.63	282.44	7820.57	284.18	7820.14	300.33	7820.14	330.48	7820.27
332.72	7820.54	337.72	7821.09	339.29	7821.27	342.77	7821.66	344.71	7821.56
348.78	7822.2	360.03	7823.95	360.91	7824.08	365.1	7823.45	365.6	7823.37
368.27	7823.01	370.89	7823.07	378.85	7823.09	379.73	7823.01	382.93	7822.64
389.25	7821.95	391.18	7821.73	392.14	7821.85	393	7821.95	395.72	7822.24
402.87	7823.3	404.06	7823.37	406.72	7824.17	412.35	7824.37	414.83	7824.5
421.88	7825.42	426.07	7825.9	429.15	7826.14	430.17	7826.29	437.01	7825.96
444.28	7825.55	451.79	7825.3	459.24	7825.38	480.51	7824.96	485.24	7824.86
490.51	7824.8	495.24	7824.73	505.24	7824.61	510.51	7824.5	515.24	7824.44
520.51	7824.44	530.51	7824.31	535.24	7824.31	540.51	7824.35	550.51	7824.35
555.24	7824.38	560.51	7824.38	570.51	7824.44	575.24	7824.44	580.51	7824.58
590.51	7824.58	595.24	7824.64	600.51	7824.67	610.51	7824.8	615.24	7824.99
620.51	7825.43	630.51	7825.81	635.24	7825.94	640.51	7825.94	650.51	7826.19
665.24	7826.38	690.51	7826.38	705.24	7826.29	715.24	7826.29	720.51	7826.22
730.51	7826.22	745.24	7826.31	750.51	7826.31	755.24	7826.37	760.51	7826.34
770.51	7826.47	785.24	7826.47	790.51	7826.37	795.24	7826.37	800.51	7826.44
810.51	7826.44	815.24	7826.31	825.24	7826.06	830.51	7826.06	835.24	7826.02
840.51	7825.89	850.51	7825.83	855.24	7825.55	860.51	7825.38	870.51	7824.8
885.24	7824.71	890.51	7824.67	895.24	7824.67	900.51	7824.64	910.51	7824.64
915.24	7824.7	920.51	7824.84	930.51	7824.96	935.24	7825.09	940.51	7825.16
950.51	7825.41	955.24	7825.44	960.51	7825.44	985.24	7825.6	990.51	7825.7
1005.24	7825.61	1015.24	7825.42	1020.51	7825.38	1030.51	7825.19	1035.24	7825.17
1040.51	7824.94	1041.13	7824.87	1044.3	7824.67	1049.08	7827	1050.51	7827.7
1055.24	7830.01	1060.51	7832.55	1065.24	7834.46	1070.51	7836.56	1073.67	7837.86
1080.51	7838.19	1083.82	7838.66	1090.45	7838.57	1110.2	7838.2	1112.29	7837.71
1115.24	7837.03	1119.84	7835.91	1126.6	7840.06	1135.24	7845.52	1140.51	7848.8
1149.91	7854.68	1152.43	7856.29	1154.41	7856.64	1157.69	7856.93		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	284.18	.035	330.48	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
284.18 330.48 450.77 472.93 503.15 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
360.91	1157.69	7824.08	F

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7825.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.60	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7823.91	Reach Len. (ft)	450.77	472.93	503.15
Crit W.S. (ft)	7823.91	Flow Area (sq ft)	22.20	172.50	58.19
E.G. Slope (ft/ft)	0.011270	Area (sq ft)	22.20	172.50	106.32
Q Total (cfs)	2181.00	Flow (cfs)	72.10	1868.52	240.38
Top Width (ft)	134.94	Top Width (ft)	15.57	46.30	73.08
Vel Total (ft/s)	8.62	Avg. Vel. (ft/s)	3.25	10.83	4.13
Max Chl Dpth (ft)	3.77	Hydr. Depth (ft)	1.43	3.73	1.99
Conv. Total (cfs)	20544.4	Conv. (cfs)	679.2	17600.9	2264.3
Length Wtd. (ft)	471.21	Wetted Per. (ft)	16.16	46.30	29.54
Min Ch El (ft)	7820.14	Shear (lb/sq ft)	0.97	2.62	1.39
Alpha	1.38	Stream Power (lb/ft s)	3.14	28.39	5.72
Frctn Loss (ft)	5.58	Cum Volume (acre-ft)	32.72	56.28	34.12
C & E Loss (ft)	0.28	Cum SA (acres)	19.87	15.10	19.70

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7826.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.03	Wt. n-Val.		0.035	
W.S. Elev (ft)	7824.30	Reach Len. (ft)	450.77	472.93	503.15
Crit W.S. (ft)	7824.30	Flow Area (sq ft)		190.68	
E.G. Slope (ft/ft)	0.013663	Area (sq ft)		190.68	
Q Total (cfs)	2181.00	Flow (cfs)		2181.00	
Top Width (ft)	46.30	Top Width (ft)		46.30	
Vel Total (ft/s)	11.44	Avg. Vel. (ft/s)		11.44	
Max Chl Dpth (ft)	4.16	Hydr. Depth (ft)		4.12	
Conv. Total (cfs)	18658.7	Conv. (cfs)		18658.7	
Length Wtd. (ft)	472.93	Wetted Per. (ft)		54.49	
Min Ch El (ft)	7820.14	Shear (lb/sq ft)		2.98	
Alpha	1.00	Stream Power (lb/ft s)		34.14	
Frctn Loss (ft)	6.45	Cum Volume (acre-ft)	13.24	62.14	9.80
C & E Loss (ft)	0.20	Cum SA (acres)	5.17	15.10	3.71

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7824.68	Element			
Vel Head (ft)	1.33	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7823.35	Reach Len. (ft)	450.77	472.93	503.15
Crit W.S. (ft)	7823.35	Flow Area (sq ft)	15.81	146.82	42.94
E.G. Slope (ft/ft)	0.011462	Area (sq ft)	15.81	146.82	68.31
Q Total (cfs)	1657.00	Flow (cfs)	57.26	1440.42	159.32
Top Width (ft)	119.43	Top Width (ft)	9.36	46.30	63.77
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)	3.62	9.81	3.71
Max Chl Dpth (ft)	3.21	Hydr. Depth (ft)	1.69	3.17	1.67
Conv. Total (cfs)	15477.0	Conv. (cfs)	534.8	13454.1	1488.1
Length Wtd. (ft)	471.13	Wetted Per. (ft)	9.90	46.30	25.93
Min Ch El (ft)	7820.14	Shear (lb/sq ft)	1.14	2.27	1.18
Alpha	1.32	Stream Power (lb/ft s)	4.14	22.26	4.40
Frctn Loss (ft)	5.36	Cum Volume (acre-ft)	24.52	48.33	23.94
C & E Loss (ft)	0.23	Cum SA (acres)	17.23	15.10	16.67

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7825.27	Element			
Vel Head (ft)	1.62	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7823.65	Reach Len. (ft)	450.77	472.93	503.15
Crit W.S. (ft)	7823.65	Flow Area (sq ft)	18.74	160.57	50.85
E.G. Slope (ft/ft)	0.012545	Area (sq ft)	18.74	160.57	88.03
Q Total (cfs)	2031.00	Flow (cfs)	71.07	1749.28	210.65
Top Width (ft)	126.28	Top Width (ft)	11.13	46.30	68.85
Vel Total (ft/s)	8.82	Avg. Vel. (ft/s)	3.79	10.89	4.14
Max Chl Dpth (ft)	3.51	Hydr. Depth (ft)	1.68	3.47	1.84
Conv. Total (cfs)	18133.5	Conv. (cfs)	634.5	15618.2	1880.7
Length Wtd. (ft)	471.12	Wetted Per. (ft)	11.72	46.30	27.87
Min Ch El (ft)	7820.14	Shear (lb/sq ft)	1.25	2.72	1.43
Alpha	1.34	Stream Power (lb/ft s)	4.75	29.59	5.92
Frctn Loss (ft)	5.86	Cum Volume (acre-ft)	30.27	54.13	31.10
C & E Loss (ft)	0.29	Cum SA (acres)	19.13	15.10	19.18

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7825.65	Element			
Vel Head (ft)	1.40	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7824.25	Reach Len. (ft)	450.77	472.93	503.15
Crit W.S. (ft)	7824.25	Flow Area (sq ft)	28.46	188.31	132.12
E.G. Slope (ft/ft)	0.009485	Area (sq ft)	28.46	188.31	132.12
Q Total (cfs)	2515.00	Flow (cfs)	82.67	1983.85	448.48
Top Width (ft)	145.71	Top Width (ft)	20.93	46.30	78.48
Vel Total (ft/s)	7.21	Avg. Vel. (ft/s)	2.90	10.54	3.39
Max Chl Dpth (ft)	4.11	Hydr. Depth (ft)	1.36	4.07	1.68
Conv. Total (cfs)	25823.1	Conv. (cfs)	848.8	20369.4	4604.9
Length Wtd. (ft)	472.09	Wetted Per. (ft)	21.54	46.30	79.14
Min Ch El (ft)	7820.14	Shear (lb/sq ft)	0.78	2.43	0.99
Alpha	1.73	Stream Power (lb/ft s)	2.27	25.37	3.36
Frctn Loss (ft)	4.78	Cum Volume (acre-ft)	39.00	61.27	40.83
C & E Loss (ft)	0.23	Cum SA (acres)	23.50	15.10	21.72

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 12347

INPUT
Description:
Station Elevation Data num= 198

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7834.32	9.67	7831.45	11.38	7830.94	19.67	7828.48	21.38	7827.95
29.67	7826.49	31.38	7825.97	40.21	7825	42.23	7824.77	43.62	7824.62
48.78	7824.05	52.21	7823.71	55.37	7823.47	61.38	7823.07	71.03	7822.39
121.38	7822.42	149.67	7822.51	159.67	7822.51	189.67	7822.23	199.67	7822.35
202.86	7822.47	204.96	7822.57	209.48	7821.66	211.38	7821.21	219.67	7821.06
231.38	7821.13	239.67	7820.97	241.38	7820.9	249.67	7820.59	251.38	7820.52
269.67	7820.17	279.67	7820.09	289.67	7819.92	299.67	7819.7	301.38	7819.65
309.67	7819.43	311.38	7819.38	319.67	7819.17	321.38	7819.04	329.67	7818.4
331.38	7818.27	339.67	7817.79	351.38	7817.18	359.67	7816.44	371.38	7815.42
372.1	7815.36	376.3	7814.99	381.38	7814.95	389.67	7814.96	399.67	7814.83
411.38	7814.76	421.38	7814.82	429.67	7814.77	439.67	7814.17	441.38	7814.04
447.69	7813.57	451.38	7814.02	453.31	7814.27	461.07	7815.26	464.79	7815.74
468.07	7815.73	471.38	7815.75	479.67	7815.62	481.38	7815.52	489.67	7815.15
497.21	7815.02	510.18	7814.83	512.23	7814.81	519.41	7814.02	525	7813.81
528.11	7813.96	530.44	7813.97	532.92	7813.93	536.56	7813.88	539.17	7813.88
547.35	7813.85	548.47	7814.08	552.62	7814.92	555.6	7815.51	557.24	7815.05
559.07	7814.52	561.52	7813.85	562.73	7813.51	565.78	7812.6	572.78	7812.84
581.82	7813.06	585.48	7813.32	592.37	7813.47	607.25	7814.01	611.56	7813.92
643.89	7813.9	648.12	7813.88	650.38	7814.42	654.38	7815.17	657.43	7815.2
660.72	7815.03	673.57	7814.52	682.56	7815.47	685.78	7815.79	690.46	7817.47
694.13	7818.82	695.89	7819.47	697.02	7819.88	698.84	7819.23	704.29	7817.02
712.44	7817.16	716.64	7817.25	720.29	7817.27	726.86	7817.29	728.92	7817.27
737.01	7817.31	740.63	7817.38	746.19	7817.47	754.82	7817.54	757.32	7817.57
763.45	7817.56	767.47	7817.68	777.63	7817.71	780.71	7817.73	787.78	7818.01
797.93	7818.1	815.24	7818.37	818.24	7818.41	823.88	7818.5	828.4	7818.53
832.51	7818.57	855.83	7818.75	884.3	7818.65	889.32	7818.64	892.94	7818.62
899.48	7818.6	901.57	7818.56	909.63	7818.38	913.43	7818.36	940.09	7818.36
944.73	7818.33	950.25	7818.34	953.36	7818.34	1028.62	7818.49	1031.05	7818.5

```
1041.64 7818.44 1051.79 7818.58 1056.95 7818.59 1061.94 7818.67 1065.58 7818.68
1082.25 7818.98 1086.22 7819.06 1100.11 7819.25 1102.56 7819.28 1108.74 7819.29
1112.72 7819.29 1117.38  7819.3 1122.87 7819.35 1126.01 7819.29 1133.02 7819.17
1143.18 7819.17 1151.91 7819.17 1157.82 7818.96 1164.54 7818.69 1168.59 7818.07
1173.29 7817.01 1173.87 7816.87 1183.79 7817.03 1186.43 7817.04  1203.7 7817.21
1212.69 7816.84 1214.26    7817 1223.69 7817.99 1225.04 7818.15  1230.3 7818.22
1238.23 7818.35 1244.72 7818.27 1249.21 7818.06 1253.14  7817.6 1255.05 7817.18
1258.48 7816.88 1263.04 7816.41 1265.03 7816.35 1267.63 7816.26 1275.51 7815.96
1277.48 7815.87 1290.02 7823.05 1295.49 7825.96 1298.66 7827.26 1305.65 7829.15
1306.96 7829.48 1310.38 7830.33 1333.54 7830.68 1335.59 7830.45 1336.11  7830.4
1341.54 7829.99 1342.42 7829.92 1346.26 7827.54 1351.29 7823.16 1355.22 7820.88
1364.38  7820.8 1366.57 7820.79 1369.37 7820.76

Manning's n Values          num=      5
     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val     Sta   n Val
       0     .06   376.3     .05  565.78    .035  648.12     .05  685.78     .06

Bank Sta: Left   Right     Lengths: Left Channel   Right     Coeff Contr.   Expan.
        565.78  648.12              523.49  532.79  600.34             .1      .3
Ineffective Flow     num=      2
   Sta L    Sta R    Elev  Permanent
       0   555.6 7815.51        F
  657.43 2369.37  7815.2        F
```

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7816.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7815.73	Reach Len. (ft)	523.49	532.79	600.34
Crit W.S. (ft)	7815.73	Flow Area (sq ft)	203.78	175.71	30.34
E.G. Slope (ft/ft)	0.012455	Area (sq ft)	203.78	175.71	30.34
Q Total (cfs)	2181.00	Flow (cfs)	713.66	1379.65	87.69
Top Width (ft)	311.38	Top Width (ft)	191.95	82.34	37.09
Vel Total (ft/s)	5.32	Avg. Vel. (ft/s)	3.50	7.85	2.89
Max Chl Dpth (ft)	3.13	Hydr. Depth (ft)	1.06	2.13	0.82
Conv. Total (cfs)	19542.4	Conv. (cfs)	6394.6	12362.1	785.8
Length Wtd. (ft)	540.46	Wetted Per. (ft)	192.81	82.37	37.30
Min Ch El (ft)	7812.60	Shear (lb/sq ft)	0.82	1.66	0.63
Alpha	1.53	Stream Power (lb/ft s)	2.88	13.02	1.83
Frctn Loss (ft)	5.44	Cum Volume (acre-ft)	31.55	54.39	33.33
C & E Loss (ft)	0.00	Cum SA (acres)	18.80	14.40	19.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7817.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.37	Wt. n-Val.		0.035	
W.S. Elev (ft)	7816.42	Reach Len. (ft)	523.49	532.79	600.34
Crit W.S. (ft)	7816.42	Flow Area (sq ft)		232.00	
E.G. Slope (ft/ft)	0.013611	Area (sq ft)		232.00	
Q Total (cfs)	2181.00	Flow (cfs)		2181.00	
Top Width (ft)	82.34	Top Width (ft)		82.34	
Vel Total (ft/s)	9.40	Avg. Vel. (ft/s)		9.40	
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)		2.82	
Conv. Total (cfs)	18694.6	Conv. (cfs)		18694.6	
Length Wtd. (ft)	530.94	Wetted Per. (ft)		88.72	
Min Ch El (ft)	7812.60	Shear (lb/sq ft)		2.22	
Alpha	1.00	Stream Power (lb/ft s)		20.89	
Frctn Loss (ft)	5.70	Cum Volume (acre-ft)	13.24	59.85	9.80
C & E Loss (ft)	0.05	Cum SA (acres)	5.17	14.40	3.71

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7816.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.55	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7815.52	Reach Len. (ft)	523.49	532.79	600.34
Crit W.S. (ft)	7815.52	Flow Area (sq ft)	164.74	158.10	22.64
E.G. Slope (ft/ft)	0.011294	Area (sq ft)	164.74	158.10	22.64
Q Total (cfs)	1657.00	Flow (cfs)	501.91	1101.75	53.34
Top Width (ft)	294.51	Top Width (ft)	177.23	82.34	34.94
Vel Total (ft/s)	4.80	Avg. Vel. (ft/s)	3.05	6.97	2.36
Max Chl Dpth (ft)	2.92	Hydr. Depth (ft)	0.93	1.92	0.65
Conv. Total (cfs)	15591.7	Conv. (cfs)	4722.7	10367.0	501.9
Length Wtd. (ft)	540.94	Wetted Per. (ft)	178.06	82.37	35.14
Min Ch El (ft)	7812.60	Shear (lb/sq ft)	0.65	1.35	0.45
Alpha	1.53	Stream Power (lb/ft s)	1.99	9.43	1.07
Frctn Loss (ft)	4.83	Cum Volume (acre-ft)	23.59	46.67	23.41
C & E Loss (ft)	0.00	Cum SA (acres)	16.26	14.40	16.10

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7816.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.64	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7815.67	Reach Len. (ft)	523.49	532.79	600.34
Crit W.S. (ft)	7815.67	Flow Area (sq ft)	191.32	170.24	27.90
E.G. Slope (ft/ft)	0.012319	Area (sq ft)	191.32	170.24	27.90
Q Total (cfs)	2031.00	Flow (cfs)	652.57	1301.67	76.76
Top Width (ft)	303.54	Top Width (ft)	184.78	82.34	36.42
Vel Total (ft/s)	5.21	Avg. Vel. (ft/s)	3.41	7.65	2.75
Max Chl Dpth (ft)	3.07	Hydr. Depth (ft)	1.04	2.07	0.77
Conv. Total (cfs)	18298.7	Conv. (cfs)	5879.5	11727.6	691.6
Length Wtd. (ft)	540.58	Wetted Per. (ft)	185.62	82.37	36.63
Min Ch El (ft)	7812.60	Shear (lb/sq ft)	0.79	1.59	0.59
Alpha	1.53	Stream Power (lb/ft s)	2.70	12.15	1.61
Frctn Loss (ft)	5.33	Cum Volume (acre-ft)	29.18	52.34	30.43
C & E Loss (ft)	0.00	Cum SA (acres)	18.12	14.40	18.57

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7816.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7815.95	Reach Len. (ft)	523.49	532.79	600.34
Crit W.S. (ft)	7815.95	Flow Area (sq ft)	246.83	193.52	38.58
E.G. Slope (ft/ft)	0.010826	Area (sq ft)	246.83	193.52	38.58
Q Total (cfs)	2515.00	Flow (cfs)	883.98	1510.78	120.25
Top Width (ft)	322.81	Top Width (ft)	200.48	82.34	39.99
Vel Total (ft/s)	5.25	Avg. Vel. (ft/s)	3.58	7.81	3.12
Max Chl Dpth (ft)	3.35	Hydr. Depth (ft)	1.23	2.35	0.96
Conv. Total (cfs)	24172.1	Conv. (cfs)	8496.0	14520.3	1155.7
Length Wtd. (ft)	540.29	Wetted Per. (ft)	201.34	82.37	40.25
Min Ch El (ft)	7812.60	Shear (lb/sq ft)	0.83	1.59	0.65
Alpha	1.51	Stream Power (lb/ft s)	2.97	12.40	2.02
Frctn Loss (ft)	5.29	Cum Volume (acre-ft)	37.58	59.20	39.84
C & E Loss (ft)	0.01	Cum SA (acres)	22.35	14.40	21.04

Warning: The energy equation could not be balanced within the specified number of iterations. The
program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical
depth, the calculated water surface came back below critical depth. This indicates that there is
not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 11815

INPUT
Description:
Station Elevation Data num= 259

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7828.83	6.52	7827.84	10.46	7827.73	14.75	7827.51	20.46	7827.28
30.46	7826.51	34.75	7826.17	40.46	7825.73	44.75	7825.39	53.67	7824.7
54.41	7824.64	57.51	7824.69	60.46	7824.56	100.46	7819.64	104.75	7819.04
110.46	7818.37	117.27	7817.52	120.15	7817.06	263.34	7814.7	265.45	7814.5
270.46	7813.88	274.75	7813.59	280.46	7812.98	284.75	7812.99	290.46	7813.02
294.75	7813.03	300.46	7813.03	314.75	7813.29	320.46	7813.29	324.75	7813.15
330.46	7813.11	334.75	7812.98	340.46	7812.79	360.46	7812.79	364.75	7812.77
374.75	7812.7	380.46	7812.63	384.75	7812.63	390.46	7812.59	400.46	7812.59
414.75	7812.5	420.46	7812.5	424.75	7812.47	430.46	7812.47	434.75	7812.44
440.46	7812.41	480.46	7812.41	484.75	7812.29	490.46	7812.08	494.75	7811.88
500.46	7811.52	503.11	7810.93	505.1	7810.48	507.52	7810.18	510.46	7809.77
514.75	7809.16	520.46	7808.41	525.28	7807.74	527.26	7807.46	530.46	7807.5
534.75	7807.58	540.52	7807.66	545.49	7807.76	550.71	7807.57	551.66	7807.5
553.98	7807.37	559.69	7807.02	561.41	7806.96	567.71	7806.59	571.86	7806.38
579.88	7806.22	585.32	7804.75	588.5	7803.8	605.19	7803.8	605.35	7803.86
607.45	7804.62	608.82	7805.1	613.89	7806.91	614.99	7807.28	622.9	7807.69
624.09	7807.75	631.9	7807.92	634.53	7807.94	639.92	7807.96	644.98	7807.99
647.95	7807.96	655.42	7807.84	660.53	7807.82	662.3	7807.57	665.74	7807.06
668.21	7806.68	670.47	7807.03	676.29	7807.85	682.8	7807.83	686.76	7807.83
692.39	7807.91	696.09	7807.97	699.73	7808.07	703.25	7808.13	704.01	7807.94
707.65	7806.98	712.48	7805.78	715.74	7804.94	732.31	7805.03	735.65	7805.5
738.99	7805.85	744.05	7806.41	745.12	7806.52	746.82	7806.58	749.43	7806.66
752.25	7806.76	759.88	7807.13	763.77	7807.02	769.95	7806.68	773.94	7806.14
774.82	7806.38	780.77	7808.01	789.47	7810.44	791.96	7811.03	797.72	7810.58
801.66	7810.22	804.78	7810.03	810.4	7809.7	812.61	7809.77	819.59	7810.33
822.55	7810.49	824.47	7810.59	830.8	7810.49	833	7810.45	848.54	7810.39
851.89	7810.36	864.34	7810.13	874.78	7809.94	877.51	7809.96	881.15	7809.97
884.92	7809.92	890.5	7809.93	894.94	7809.93	899.86	7809.89	904.97	7809.77
913.2	7809.69	914.73	7809.93	918.68	7810.67	919.14	7810.75	922.67	7811.59
924.94	7811.43	931.9	7810.95	935.05	7810.78	943.52	7810.15	944.11	7810.08
955.1	7810.09	965.12	7809.94	968.53	7809.93	974.71	7809.94	984.06	7809.88
995.2	7809.89	1005.22	7809.77	1012.13	7809.78	1015.25	7809.74	1021.48	7809.63
1025.28	7809.62	1031.72	7809.94	1035.34	7810.08	1038.78	7810.36	1049.35	7811.09
1052.22	7811.1	1055.35	7811.12	1058.91	7811.05	1065.38	7810.94	1068.26	7810.99
1075.4	7810.84	1077.62	7810.94	1085.43	7811.31	1095.46	7811.75	1105.48	7811.79
1115.52	7811.66	1123.79	7810.39	1124.9	7810.19	1133.75	7810.05	1143.11	7810.01
1145.58	7810.05	1152.46	7810.06	1155.61	7810.06	1165.63	7810.08	1171.17	7810.08
1180.53	7810.1	1185.69	7810.1	1195.71	7810.12	1205.74	7810	1208.6	7809.97
1215.76	7809.94	1217.95	7809.92	1225.79	7809.77	1235.81	7809.66	1245.84	7809.61
1264.73	7809.4	1277.75	7809.33	1285.54	7809.32	1287.29	7809.44	1288.88	7810.12
1295.97	7812.86	1302.15	7815.26	1305.99	7816.53	1313.42	7819.47	1315.53	7820.2
1330.36	7819.91	1338.64	7819.69	1341.55	7818.97	1346.1	7817.77	1347.44	7817.47
1348.63	7817.21	1354.78	7817.33	1358.29	7817.27	1366.15	7817.73	1367.64	7817.82
1376.17	7818.37	1386.2	7819.35	1390.77	7819.81	1392.49	7820.05	1400.49	7820.94
1402.69	7821.29	1409.03	7822.29	1414.71	7822.75	1418.52	7823.25	1423.45	7823.91
1426.73	7824.23	1430.66	7824.64	1436.55	7825.2	1437.87	7825.33	1438.75	7825.39
1445.08	7825.68	1450.77	7826.02	1454.58	7826.22	1459.5	7826.45	1462.78	7826.65
1466.72	7826.62	1472.62	7827.21	1473.91	7827.3	1481.14	7827.7	1486.82	7827.98
1490.65	7828.18	1495.56	7828.58	1498.84	7828.83	1506.97	7829.72	1511.08	7829.93
1513.96	7828.68	1522.35	7828.59	1530.16	7828.54	1531.88	7828.69	1534.89	7829.06
1538.83	7829.49	1544.74	7830.2	1546.04	7830.35	1546.91	7830.46	1553.25	7831.22
1558.92	7832.3	1567.67	7833.55	1582.96	7837.09	1593.47	7838.86		

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	525.28	.05	715.74	.035	732.31	.05	789.47	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
715.74	732.31	655.25	667.3	694.85 .1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	644.98	7807.99	T
791.96	1593.47	7811.03	F

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7809.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.67	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7809.17	Reach Len. (ft)	655.25	667.30	694.85
Crit W.S. (ft)	7809.17	Flow Area (sq ft)	264.70	69.35	128.23
E.G. Slope (ft/ft)	0.008292	Area (sq ft)	435.55	69.35	128.23
Q Total (cfs)	2181.00	Flow (cfs)	860.69	696.22	624.08
Top Width (ft)	270.24	Top Width (ft)	201.06	16.57	52.61
Vel Total (ft/s)	4.72	Avg. Vel. (ft/s)	3.25	10.04	4.87
Max Chl Dpth (ft)	5.37	Hydr. Depth (ft)	1.32	4.19	2.44
Conv. Total (cfs)	23950.9	Conv. (cfs)	9451.8	7645.7	6853.5
Length Wtd. (ft)	668.88	Wetted Per. (ft)	202.74	16.57	53.17
Min Ch El (ft)	7804.94	Shear (lb/sq ft)	0.68	2.17	1.25
Alpha	1.94	Stream Power (lb/ft s)	2.20	21.75	6.08
Frctn Loss (ft)	5.05	Cum Volume (acre-ft)	27.71	52.89	32.24
C & E Loss (ft)	0.05	Cum SA (acres)	16.44	13.80	18.45

Warning: The energy equation could not be balanced within the specified number of iterations. The

program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7811.32	Element			
Vel Head (ft)	1.20	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7810.12	Reach Len. (ft)	655.25	667.30	694.85
Crit W.S. (ft)	7810.12	Flow Area (sq ft)	228.62	85.14	10.34
E.G. Slope (ft/ft)	0.008687	Area (sq ft)	230.29	85.14	10.34
Q Total (cfs)	2181.00	Flow (cfs)	1140.41	1003.14	37.46
Top Width (ft)	110.31	Top Width (ft)	91.65	16.57	2.09
Vel Total (ft/s)	6.73	Avg. Vel. (ft/s)	4.99	11.78	3.62
Max Chl Dpth (ft)	5.18	Hydr. Depth (ft)	2.49	5.14	4.95
Conv. Total (cfs)	23400.4	Conv. (cfs)	12235.6	10762.9	401.9
Length Wtd. (ft)	664.39	Wetted Per. (ft)	94.60	16.57	6.91
Min Ch El (ft)	7804.94	Shear (lb/sq ft)	1.31	2.79	0.81
Alpha	1.70	Stream Power (lb/ft s)	6.54	32.83	2.94
Frctn Loss (ft)	3.65	Cum Volume (acre-ft)	11.86	57.91	9.73
C & E Loss (ft)	0.26	Cum SA (acres)	4.62	13.80	3.69

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7809.50	Element			
Vel Head (ft)	0.57	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7808.93	Reach Len. (ft)	655.25	667.30	694.85
Crit W.S. (ft)	7808.93	Flow Area (sq ft)	215.65	65.28	115.44
E.G. Slope (ft/ft)	0.007229	Area (sq ft)	386.50	65.28	115.44
Q Total (cfs)	1657.00	Flow (cfs)	574.38	587.85	494.77
Top Width (ft)	267.50	Top Width (ft)	199.20	16.57	51.74
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	2.66	9.00	4.29
Max Chl Dpth (ft)	5.13	Hydr. Depth (ft)	1.08	3.94	2.23
Conv. Total (cfs)	19488.9	Conv. (cfs)	6755.6	6914.0	5819.3
Length Wtd. (ft)	669.33	Wetted Per. (ft)	200.86	16.57	52.26
Min Ch El (ft)	7804.94	Shear (lb/sq ft)	0.48	1.78	1.00
Alpha	2.10	Stream Power (lb/ft s)	1.29	16.01	4.27
Frctn Loss (ft)	4.67	Cum Volume (acre-ft)	20.28	45.31	22.46
C & E Loss (ft)	0.05	Cum SA (acres)	14.00	13.80	15.51

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7809.75	Element			
Vel Head (ft)	0.65	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7809.10	Reach Len. (ft)	655.25	667.30	694.85
Crit W.S. (ft)	7809.10	Flow Area (sq ft)	250.29	68.16	124.47
E.G. Slope (ft/ft)	0.008079	Area (sq ft)	421.14	68.16	124.47
Q Total (cfs)	2031.00	Flow (cfs)	775.18	667.70	588.12
Top Width (ft)	269.44	Top Width (ft)	200.52	16.57	52.36
Vel Total (ft/s)	4.59	Avg. Vel. (ft/s)	3.10	9.80	4.73
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)	1.25	4.11	2.38
Conv. Total (cfs)	22595.6	Conv. (cfs)	8624.1	7428.4	6543.1
Length Wtd. (ft)	669.00	Wetted Per. (ft)	202.19	16.57	52.90
Min Ch El (ft)	7804.94	Shear (lb/sq ft)	0.62	2.07	1.19
Alpha	1.98	Stream Power (lb/ft s)	1.93	20.32	5.61
Frctn Loss (ft)	4.88	Cum Volume (acre-ft)	25.50	50.88	29.38
C & E Loss (ft)	0.06	Cum SA (acres)	15.80	13.80	17.96

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7810.04	Element			
Vel Head (ft)	0.73	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7809.31	Reach Len. (ft)	655.25	667.30	694.85
Crit W.S. (ft)	7809.31	Flow Area (sq ft)	292.26	71.61	135.46
E.G. Slope (ft/ft)	0.008911	Area (sq ft)	463.11	71.61	135.46
Q Total (cfs)	2515.00	Flow (cfs)	1049.13	761.48	704.39
Top Width (ft)	271.69	Top Width (ft)	202.02	16.57	53.10
Vel Total (ft/s)	5.04	Avg. Vel. (ft/s)	3.59	10.63	5.20
Max Chl Dpth (ft)	5.51	Hydr. Depth (ft)	1.45	4.32	2.55
Conv. Total (cfs)	26641.8	Conv. (cfs)	11113.6	8066.5	7461.7
Length Wtd. (ft)	668.66	Wetted Per. (ft)	203.71	16.57	53.68
Min Ch El (ft)	7804.94	Shear (lb/sq ft)	0.80	2.40	1.40
Alpha	1.86	Stream Power (lb/ft s)	2.87	25.57	7.30
Frctn Loss (ft)	5.06	Cum Volume (acre-ft)	33.31	57.57	38.64
C & E Loss (ft)	0.06	Cum SA (acres)	19.93	13.80	20.39

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 11147

INPUT
Description:
Station Elevation Data num= 234

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7826.66	2.28	7826.33	4.9	7825.97	6.73	7825.73	11.8	7824.98
16.96	7824.23	68.12	7816.72	70.68	7816.34	78.35	7815.22	79.09	7815.11
95.92	7812.64	98.81	7812.21	119.27	7809.21	121.15	7808.93	129.5	7807.71
131.24	7807.77	139.74	7807.53	146.38	7807.57	149.97	7807.56	160.2	7807.62
163.21	7807.63	170.43	7807.67	177.12	7807.57	180.66	7807.51	188.44	7807.18
190.89	7807.07	196.85	7807	201.12	7806.78	205.27	7806.55	221.59	7806.26
224.41	7806.15	230.5	7805.9	238.91	7805.66	247.32	7805.37	252.28	7805.39
255.73	7805.3	262.51	7805.11	289.38	7805.22	303.44	7805.49	306.2	7805.53
318.98	7805.6	344.36	7805.56	348.26	7805.56	373.49	7805.52	381.91	7805.47
390.32	7805.47	395.52	7805.43	398.73	7805.4	405.75	7805.35	413.56	7805.34
423.96	7805.29	426.21	7805.29	432.37	7805.22	436.45	7805.26	446.68	7805.19
449.2	7805.18	456.91	7805.12	466.02	7805.09	477.37	7805.08	482.84	7804.91
487.6	7804.94	491.25	7804.97	508.07	7804.7	516.49	7804.73	524.9	7804.74
533.31	7804.77	538.76	7804.78	541.72	7804.79	548.99	7804.59	558.55	7804.56
566.96	7804.39	569.45	7804.4	575.37	7804.4	579.68	7804.41	589.92	7804.42
592.19	7804.4	609.02	7804.2	630.84	7804.13	650	7804.18	659.48	7804.26
671.77	7804.09	676.31	7804.11	692.23	7804.07	697.29	7804.09	712.69	7804.22
733.16	7804.28	735.19	7804.29	746.82	7804.18	751.75	7803.91	753.62	7803.79
757.02	7803.62	764.37	7804.24	769.25	7804.32	774.08	7804.38	777.24	7804.36
791.87	7804.22	794.07	7804.19	802.48	7804.29	804.78	7804.34	809.28	7804.41
810.68	7803.69	815.01	7801.63	816.32	7801.36	822.42	7798.13	860.45	7798.34
863.06	7798.36	866.16	7798.57	869.77	7798.77	876.39	7799.25	882.82	7799.7
885.85	7799.9	895.01	7799.5	903.42	7799.45	907.09	7799.41	917.32	7799.38
918.61	7799.3	925.44	7798.52	926.83	7798.43	928.91	7798.51	937.06	7798.87
945.47	7799.19	948.01	7799.21	951.46	7799.4	953.74	7799.35	958.25	7799.2
962.3	7799.14	968.48	7799.01	970.71	7799.04	978.71	7798.83	980.86	7798.77
983.96	7798.73	1009.38	7798.6	1010.01	7799.02	1016.05	7802.96	1017.19	7803.7
1018.23	7803.42	1027.76	7800.9	1029.67	7800.66	1030.19	7800.61	1039.17	7799.51
1040.01	7799.4	1044.23	7799.28	1050.33	7799.17	1054.82	7799.1	1060.56	7798.8
1063.23	7798.74	1070.79	7798.77	1075.6	7798.78	1080.06	7798.8	1120.18	7798.53
1141.01	7798.52	1155.73	7798.48	1159.64	7799.11	1161.02	7799.34	1161.67	7799.44
1169.98	7800.68	1180.53	7800.59	1220.76	7801.35	1261	7801.09	1281.02	7801.22
1291.17	7801.22	1301.02	7801.19	1303.72	7801.17	1310.82	7799.41	1311.02	7799.36
1311.29	7799.29	1314.78	7798.4	1324.31	7798.4	1330.95	7799.19	1332.17	7799.54
1339.99	7801.52	1349.01	7801.27	1351.02	7801.22	1361.02	7800.95	1381.02	7801.6
1401.02	7801.59	1411.02	7801.66	1431.02	7801.76	1442.05	7801.76	1461.02	7802
1471.02	7802.09	1477.87	7802.66	1479.96	7802.7	1481.25	7802.8	1489.56	7804.3
1494.89	7805.32	1495.15	7805.37	1500.91	7807.28	1502.41	7807.71	1511.02	7809.7
1512.47	7810	1513.09	7810.07	1519.05	7811.19	1544.55	7811.1	1550.8	7810.05
1558.55	7808.63	1558.95	7808.55	1561.12	7808.81	1569.35	7809.81	1571.02	7810.05
1572.82	7810.35	1581.02	7811.59	1582.88	7811.86	1591.02	7813.12	1595.27	7814.22
1601.12	7815.51	1602.1	7815.73	1606.83	7815.52	1611.02	7815.4	1613.05	7815.35
1621.02	7815.01	1623.11	7815	1631.02	7815	1633.17	7814.97	1641.02	7814.97
1651.02	7815.42	1653.29	7815.69	1661.02	7816.04	1663.35	7816.38	1671.02	7817.67
1673.4	7817.96	1681.02	7819.24	1683.46	7819.31	1686.18	7819.45	1688.78	7819.81
1690.59	7820	1701.51	7821.1	1702.75	7821.23	1707.54	7821.71	1709.09	7821.84
1711.02	7822.04	1718.8	7822.68	1724.44	7823.1	1724.87	7823.14		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	822.42	.035	1009.38	.05	1381.02	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
822.42 1009.38 397.52 563.66 336.93 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	809.28	7804.41	F
1017.19	1724.87	7803.7	F

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7801.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.060	0.035	0.050
W.S. Elev (ft)	7800.92	Reach Len. (ft)	397.52	563.66	336.93
Crit W.S. (ft)	7800.49	Flow Area (sq ft)	7.34	380.32	4.09
E.G. Slope (ft/ft)	0.006910	Area (sq ft)	7.34	380.32	348.34
Q Total (cfs)	2181.00	Flow (cfs)	17.37	2153.76	9.87
Top Width (ft)	398.84	Top Width (ft)	5.27	186.96	206.62
Vel Total (ft/s)	5.57	Avg. Vel. (ft/s)	2.37	5.66	2.41
Max Chl Dpth (ft)	2.79	Hydr. Depth (ft)	1.39	2.03	1.16
Conv. Total (cfs)	26236.6	Conv. (cfs)	208.9	25908.9	118.8
Length Wtd. (ft)	515.30	Wetted Per. (ft)	5.96	187.10	4.23
Min Ch El (ft)	7798.13	Shear (lb/sq ft)	0.53	0.88	0.42
Alpha	1.02	Stream Power (lb/ft s)	1.26	4.97	1.01
Frctn Loss (ft)	3.57	Cum Volume (acre-ft)	24.38	49.44	28.44
C & E Loss (ft)	0.04	Cum SA (acres)	14.89	12.24	16.38

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7801.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.		0.035	
W.S. Elev (ft)	7801.37	Reach Len. (ft)	397.52	563.66	336.93
Crit W.S. (ft)	7800.52	Flow Area (sq ft)		464.67	
E.G. Slope (ft/ft)	0.003791	Area (sq ft)		464.67	
Q Total (cfs)	2181.00	Flow (cfs)		2181.00	
Top Width (ft)	186.96	Top Width (ft)		186.96	
Vel Total (ft/s)	4.69	Avg. Vel. (ft/s)		4.69	
Max Chl Dpth (ft)	3.24	Hydr. Depth (ft)		2.49	
Conv. Total (cfs)	35423.6	Conv. (cfs)		35423.6	
Length Wtd. (ft)	524.71	Wetted Per. (ft)		193.11	
Min Ch El (ft)	7798.13	Shear (lb/sq ft)		0.57	
Alpha	1.00	Stream Power (lb/ft s)		2.67	
Frctn Loss (ft)	3.03	Cum Volume (acre-ft)	10.12	53.70	9.65
C & E Loss (ft)	0.12	Cum SA (acres)	3.93	12.24	3.68

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7801.01	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.39	Wt. n-Val.	0.060	0.035	0.050
W.S. Elev (ft)	7800.62	Reach Len. (ft)	397.52	563.66	336.93
Crit W.S. (ft)	7800.23	Flow Area (sq ft)	5.87	325.09	3.11

E.G. Slope (ft/ft)	0.006739	Area (sq ft)	5.87	325.09	290.56
Q Total (cfs)	1657.00	Flow (cfs)	12.72	1637.51	6.77
Top Width (ft)	370.36	Top Width (ft)	4.71	186.96	178.69
Vel Total (ft/s)	4.96	Avg. Vel. (ft/s)	2.17	5.04	2.18
Max Chl Dpth (ft)	2.49	Hydr. Depth (ft)	1.25	1.74	1.01
Conv. Total (cfs)	20184.2	Conv. (cfs)	155.0	19946.7	82.5
Length Wtd. (ft)	520.32	Wetted Per. (ft)	5.33	187.10	3.69
Min Ch El (ft)	7798.13	Shear (lb/sq ft)	0.46	0.73	0.35
Alpha	1.02	Stream Power (lb/ft s)	1.00	3.68	0.77
Frctn Loss (ft)	3.67	Cum Volume (acre-ft)	17.33	42.32	19.22
C & E Loss (ft)	0.05	Cum SA (acres)	12.46	12.24	13.67

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7801.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.45	Wt. n-Val.	0.060	0.035	0.050
W.S. Elev (ft)	7800.86	Reach Len. (ft)	397.52	563.66	336.93
Crit W.S. (ft)	7800.42	Flow Area (sq ft)	7.03	369.18	3.88
E.G. Slope (ft/ft)	0.006619	Area (sq ft)	7.03	369.18	336.15
Q Total (cfs)	2031.00	Flow (cfs)	16.04	2005.94	9.01
Top Width (ft)	394.61	Top Width (ft)	5.15	186.96	202.50
Vel Total (ft/s)	5.34	Avg. Vel. (ft/s)	2.28	5.43	2.32
Max Chl Dpth (ft)	2.73	Hydr. Depth (ft)	1.36	1.97	1.13
Conv. Total (cfs)	24964.7	Conv. (cfs)	197.2	24656.7	110.8
Length Wtd. (ft)	516.81	Wetted Per. (ft)	5.83	187.10	4.12
Min Ch El (ft)	7798.13	Shear (lb/sq ft)	0.50	0.82	0.39
Alpha	1.02	Stream Power (lb/ft s)	1.14	4.43	0.90
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	22.28	47.53	25.71
C & E Loss (ft)	0.04	Cum SA (acres)	14.26	12.24	15.92

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7801.67	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.53	Wt. n-Val.	0.060	0.035	0.050
W.S. Elev (ft)	7801.14	Reach Len. (ft)	397.52	563.66	336.93
Crit W.S. (ft)	7800.66	Flow Area (sq ft)	8.55	421.58	4.91
E.G. Slope (ft/ft)	0.006511	Area (sq ft)	8.55	421.58	397.12
Q Total (cfs)	2515.00	Flow (cfs)	20.65	2482.12	12.23
Top Width (ft)	441.70	Top Width (ft)	5.68	186.96	249.06
Vel Total (ft/s)	5.78	Avg. Vel. (ft/s)	2.42	5.89	2.49
Max Chl Dpth (ft)	3.01	Hydr. Depth (ft)	1.50	2.25	1.27
Conv. Total (cfs)	31188.8	Conv. (cfs)	256.0	30761.4	151.5
Length Wtd. (ft)	513.54	Wetted Per. (ft)	6.43	187.10	4.63
Min Ch El (ft)	7798.13	Shear (lb/sq ft)	0.54	0.92	0.43
Alpha	1.03	Stream Power (lb/ft s)	1.31	5.39	1.07
Frctn Loss (ft)	3.53	Cum Volume (acre-ft)	29.76	53.80	34.40
C & E Loss (ft)	0.04	Cum SA (acres)	18.37	12.24	17.98

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 10584

INPUT
Description:
Station Elevation Data num= 298

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7836.57	3.31	7835.67	4.05	7835.47	6.81	7834.91	12.21	7833.77
13.66	7833.55	20.38	7832.71	28.54	7831.35	36.7	7829.95	44.73	7828.62
45.36	7828.55	53.02	7827.68	55.08	7827.45	61.19	7826.76	65.44	7826.29
69.35	7825.85	75.79	7825.09	77.51	7824.89	93.84	7822.86	96.5	7822.5
102	7821.81	106.85	7821.08	110.16	7820.65	117.21	7819.77	118.32	7819.63
122.47	7819.29	127.56	7818.86	137.92	7818.01	142.81	7817.72	148.27	7817.23
150.97	7817.12	158.63	7816.34	161.02	7816.21	167.3	7815.98	168.98	7815.82
175.46	7815.51	179.33	7815.2	189.69	7814.62	191.78	7814.55	199.58	7814.3
208.11	7814.01	210.4	7813.94	216.27	7813.49	229.88	7811.61	231.23	7811.43
238.42	7811.5	241.46	7811.54	248.92	7811.65	251.82	7811.57	257.08	7811.06
262.17	7810.82	265.24	7810.55	272.52	7809.93	273.4	7809.88	276.68	7809.67
281.57	7809.38	289.73	7808.94	293.23	7808.76	303.59	7808.4	306.05	7808.24
313.94	7808.04	315.24	7807.96	322.38	7807.46	324.3	7807.33	329.19	7806.91
333.59	7806.58	338.67	7809.08	342.04	7810.89	344.83	7812.4	345.35	7812.11
353.79	7807.35	355.33	7806.51	355.76	7806.25	356.93	7805.42	359.21	7805.34
365.71	7805.13	371.35	7804.98	376.07	7804.98	379.51	7805	392.35	7804.68
396.78	7804.63	404	7804.68	407.13	7804.73	417.48	7804.82	428.49	7804.98
436.65	7804.91	444.81	7804.76	448.55	7804.68	452.97	7804.73	458.9	7804.55
461.14	7804.54	469.26	7804.31	477.46	7804.17	479.61	7804.12	485.62	7804.16
489.97	7804.09	493.79	7804.1	500.32	7804.1	508.01	7804.31	510.11	7804.36
520.9	7804.58	522.25	7804.77	531.38	7806.66	534.6	7807.31	541.74	7808.63
543.19	7808.96	545.95	7809.4	549.5	7809.98	550.68	7810.17	552.11	7809.78
558.89	7808.37	562.45	7807.4	567.25	7806.37	572.8	7805.21	576.14	7804.58
582.96	7803.64	585.12	7803.61	589.31	7803.56	593.51	7803.45	599.89	7803.36
603.86	7803.41	632.54	7803.04	634.93	7802.98	640.71	7802.88	645.28	7802.81
655.64	7802.44	665.19	7802.24	673.35	7802.04	686.7	7801.6	700.78	7801.22
728.12	7800.66	738.47	7800.52	746.81	7800.33	748.82	7800.29	754.98	7800.15
759.18	7800	769.53	7799.61	771.3	7799.53	784.68	7799.38	787.55	7798.89
790.24	7798.26	795.83	7797.19	800.13	7796.44	801.03	7796.26	809.97	7797.76
810.95	7797.92	812.9	7798.29	815.29	7798.72	820.05	7798.78	828.44	7798.93
831.66	7798.96	836.6	7798.94	842.01	7798.93	844.76	7798.97	852.37	7798.91
869.26	7798.91	873.06	7798.95	877.47	7798.96	883.39	7799.08	885.69	7799.1
893.71	7799.15	904.04	7799.05	910.32	7799.13	914.36	7799.07	918.53	7799.12
924.69	7799.18	926.75	7799.16	934.73	7799.29	943.17	7799.59	945.34	7799.7
953.3	7800.09	956.04	7799.83	962.1	7799.27	965.99	7798.92	967.81	7798.76
974.85	7798.29	976.02	7798.21	980.18	7797.75	982.52	7796.76	983.89	7796.13
987.05	7794.7	987.76	7794.36	997.57	7794.5	1001.07	7794.6	1002.06	7794.78
1007.3	7795.46	1009.45	7795.75	1011.26	7795.98	1017.06	7795.49	1017.62	7795.44
1025.29	7795.28	1027.95	7795.25	1033.5	7795.1	1038.28	7795.03	1041.72	7795.22
1048.6	7795.57	1050.8	7795.67	1055.08	7795.76	1058.14	7795.84	1060.19	7795.82
1069.07	7795.5	1071.68	7794.95	1077.41	7793.85	1079.58	7793.83	1082.78	7793.76
1089.91	7793.73	1095.2	7793.66	1100.14	7793.58	1101.74	7793.49	1108.86	7792.09
1128.66	7792.09	1131.18	7793.34	1133.67	7794.58	1139.26	7797.77	1140.8	7797.35
1141.54	7797.15	1148.47	7796.42	1151.86	7795.36	1152.81	7795.24	1157.8	7794.88
1168.6	7795.85	1170.23	7795.97	1172.51	7796.16	1181.32	7797	1182.84	7797.2
1189.81	7797.92	1191.35	7797.99	1197.75	7798.27	1203.49	7798.44	1205.96	7798.49
1213.82	7798.58	1222.38	7798.76	1230.6	7798.82	1234.47	7798.84	1238.81	7798.84
1244.65	7798.89	1254.79	7798.82	1257.54	7798.81	1264.79	7798.76	1267.54	7798.54
1274.79	7797.87	1275.66	7797.82	1282.34	7798.57	1284.79	7798.88	1286.34	7799.03
1288.29	7799.23	1293.16	7799.03	1294.79	7798.97	1296.5	7798.9	1298.22	7798.81

1303.13	7797.5	1304.19	7797.24	1305.65	7796.87	1306.58	7796.64	1314.79	7795.79
1317.54	7795.5	1324.79	7794.75	1330.87	7794.1	1548.13	7794.1	1549.53	7794.3
1554.79	7795.02	1557.54	7795.42	1564.79	7796.46	1567.54	7796.92	1574.79	7798.37
1582.56	7799.99	1583.97	7800.34	1591.26	7801.52	1594.79	7802.08	1597.54	7802.45
1604.79	7803.58	1612.7	7804.48	1613.88	7804.61	1623.02	7806.31	1624.79	7806.58
1627.66	7807.05	1631.39	7807.54	1636.13	7807.73	1654.91	7808.29	1661.28	7806.54
1662.54	7806.2	1664.74	7806.83	1673.15	7810.27	1675.05	7811.02	1675.58	7811.26
1681.32	7812.8	1684.79	7813.46	1687.54	7814.21	1694.79	7816.06	1697.54	7816.75
1704.79	7818.6	1714.79	7820.82	1717.54	7821.27	1724.79	7822.88	1734.79	7824.92
1737.54	7825.63	1741.28	7827.02	1747.41	7828.96				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	784.68	.05	1108.86	.035	1128.66	.05	1574.79	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
1108.86	1128.66	503.03	520.29	498.09 .1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	953.3	7800.09	F
1139.26	1747.41	7797.77	F

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7797.81	Element			
Vel Head (ft)	0.86	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7796.95	Reach Len. (ft)	503.03	520.29	498.09
Crit W.S. (ft)	7796.84	Flow Area (sq ft)	270.76	96.26	23.05
E.G. Slope (ft/ft)	0.006947	Area (sq ft)	273.48	96.26	749.84
Q Total (cfs)	2181.00	Flow (cfs)	1106.23	977.56	97.21
Top Width (ft)	463.48	Top Width (ft)	134.75	19.80	308.93
Vel Total (ft/s)	5.59	Avg. Vel. (ft/s)	4.09	10.15	4.22
Max Chl Dpth (ft)	4.86	Hydr. Depth (ft)	2.14	4.86	2.52
Conv. Total (cfs)	26167.9	Conv. (cfs)	13272.7	11728.9	1166.3
Length Wtd. (ft)	510.55	Wetted Per. (ft)	127.81	19.80	10.38
Min Ch El (ft)	7792.09	Shear (lb/sq ft)	0.92	2.11	0.96
Alpha	1.77	Stream Power (lb/ft s)	3.75	21.41	4.06
Frctn Loss (ft)	4.18	Cum Volume (acre-ft)	23.10	46.36	24.19
C & E Loss (ft)	0.03	Cum SA (acres)	14.25	10.90	14.39

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7798.56	Element			
Vel Head (ft)	1.52	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7797.04	Reach Len. (ft)	503.03	520.29	498.09
Crit W.S. (ft)	7797.04	Flow Area (sq ft)	146.25	98.09	23.91
E.G. Slope (ft/ft)	0.009877	Area (sq ft)	146.25	98.09	23.91
Q Total (cfs)	2181.00	Flow (cfs)	856.51	1202.79	121.70
Top Width (ft)	79.99	Top Width (ft)	50.86	19.80	9.33
Vel Total (ft/s)	8.13	Avg. Vel. (ft/s)	5.86	12.26	5.09
Max Chl Dpth (ft)	4.95	Hydr. Depth (ft)	2.88	4.95	2.56
Conv. Total (cfs)	21944.9	Conv. (cfs)	8618.1	12102.3	1224.6
Length Wtd. (ft)	510.96	Wetted Per. (ft)	52.38	19.80	10.57
Min Ch El (ft)	7792.09	Shear (lb/sq ft)	1.72	3.05	1.40
Alpha	1.48	Stream Power (lb/ft s)	10.08	37.46	7.10
Frctn Loss (ft)	3.60	Cum Volume (acre-ft)	9.46	50.06	9.56
C & E Loss (ft)	0.23	Cum SA (acres)	3.70	10.90	3.64

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7797.30	Element			
Vel Head (ft)	0.85	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7796.45	Reach Len. (ft)	503.03	520.29	498.09
Crit W.S. (ft)	7796.45	Flow Area (sq ft)	207.83	86.39	18.70
E.G. Slope (ft/ft)	0.007393	Area (sq ft)	208.04	86.39	599.86
Q Total (cfs)	1657.00	Flow (cfs)	739.14	842.12	75.74
Top Width (ft)	439.68	Top Width (ft)	127.80	19.80	292.08
Vel Total (ft/s)	5.30	Avg. Vel. (ft/s)	3.56	9.75	4.05
Max Chl Dpth (ft)	4.36	Hydr. Depth (ft)	1.65	4.36	2.26
Conv. Total (cfs)	19270.7	Conv. (cfs)	8596.1	9793.7	880.9
Length Wtd. (ft)		Wetted Per. (ft)	126.58	19.80	9.37
Min Ch El (ft)	7792.09	Shear (lb/sq ft)	0.76	2.01	0.92
Alpha	1.95	Stream Power (lb/ft s)	2.70	19.63	3.73
Frctn Loss (ft)		Cum Volume (acre-ft)	16.35	39.65	15.78
C & E Loss (ft)		Cum SA (acres)	11.86	10.90	11.85

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7797.67	Element			
Vel Head (ft)	0.89	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7796.78	Reach Len. (ft)	503.03	520.29	498.09
Crit W.S. (ft)	7796.72	Flow Area (sq ft)	249.19	92.89	21.52
E.G. Slope (ft/ft)	0.007345	Area (sq ft)	250.72	92.89	697.65
Q Total (cfs)	2031.00	Flow (cfs)	992.74	947.14	91.12
Top Width (ft)	455.71	Top Width (ft)	132.36	19.80	303.55
Vel Total (ft/s)	5.59	Avg. Vel. (ft/s)	3.98	10.20	4.23
Max Chl Dpth (ft)	4.69	Hydr. Depth (ft)	1.97	4.69	2.43
Conv. Total (cfs)	23698.9	Conv. (cfs)	11583.9	11051.8	1063.3
Length Wtd. (ft)	510.78	Wetted Per. (ft)	127.37	19.80	10.04
Min Ch El (ft)	7792.09	Shear (lb/sq ft)	0.90	2.15	0.98
Alpha	1.83	Stream Power (lb/ft s)	3.57	21.93	4.16
Frctn Loss (ft)	4.22	Cum Volume (acre-ft)	21.10	44.54	21.71
C & E Loss (ft)	0.02	Cum SA (acres)	13.63	10.90	13.97

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7798.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7797.17	Reach Len. (ft)	503.03	520.29	498.09
Crit W.S. (ft)	7797.04	Flow Area (sq ft)	298.74	100.62	25.12
E.G. Slope (ft/ft)	0.007255	Area (sq ft)	303.49	100.62	818.57
Q Total (cfs)	2515.00	Flow (cfs)	1327.98	1075.60	111.43
Top Width (ft)	472.70	Top Width (ft)	137.85	19.80	315.06
Vel Total (ft/s)	5.92	Avg. Vel. (ft/s)	4.45	10.69	4.44
Max Chl Dpth (ft)	5.08	Hydr. Depth (ft)	2.35	5.08	2.63
Conv. Total (cfs)	29526.3	Conv. (cfs)	15590.6	12627.6	1308.2
Length Wtd. (ft)	510.11	Wetted Per. (ft)	128.37	19.80	10.82
Min Ch El (ft)	7792.09	Shear (lb/sq ft)	1.05	2.30	1.05
Alpha	1.71	Stream Power (lb/ft s)	4.69	24.61	4.66
Frctn Loss (ft)	4.13	Cum Volume (acre-ft)	28.34	50.42	29.69
C & E Loss (ft)	0.03	Cum SA (acres)	17.72	10.90	15.80

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 10063

INPUT
Description:
Station Elevation Data num= 277

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7824.46	2.97	7823.4	5.65	7822.3	9.66	7820.98	11.51	7820.31
16.2	7820.28	18.76	7820.1	34.55	7818.94	37.3	7818.75	42.45	7818.13
47.85	7817.49	50.35	7817.19	57.77	7816.06	58.24	7815.99	66.14	7814.79
68.95	7814.35	74.03	7813.64	79.5	7812.79	81.93	7812.5	89.14	7811.57
89.82	7811.48	97.72	7810.5	100.6	7810.13	105.61	7809.63	111.15	7809.11
120.52	7808.19	121.7	7808.07	132.25	7807.22	137.19	7806.64	142.8	7806.26
151.9	7806.03	160.88	7805.75	163.9	7805.66	176.67	7804.16	183.27	7803.44
184.57	7803.3	192.46	7802.35	195.55	7801.97	200.36	7801.53	206.1	7800.78
208.25	7800.46	214.65	7799.72	216.15	7799.56	216.65	7799.5	217.5	7799.4
222.51	7798.83	225.75	7797.91	231.59	7796.2	231.79	7796.14	232.06	7796.06
243.34	7796.06	248.3	7795.98	255.63	7795.97	258.85	7795.98	263.52	7795.78
269.4	7795.88	271.42	7795.83	277.41	7795.77	287.21	7795.62	290.5	7795.6
295.1	7795.55	301.05	7795.41	309.11	7795.09	310.41	7795.02	311.54	7794.66
315.74	7793.53	318.18	7792.86	319.24	7792.58	320.14	7792.35	320.81	7792.17
325.05	7791.98	331.29	7791.69	342.48	7791.31	344.89	7791.22	350.24	7791.11
353.76	7792.06	357.1	7793.07	361.54	7794.4	362.74	7794.79	364.99	7794.83
371.54	7794.92	374.06	7794.98	381.95	7795.06	387.67	7795.18	396	7795.17
402.91	7795.02	413.53	7794.67	417.11	7794.67	421.43	7794.64	427.66	7794.45
434.29	7794.37	437.22	7794.35	445.12	7794.23	448.76	7794.19	453.01	7793.95
459.31	7793.96	460.91	7793.9	465.67	7793.7	469.86	7793.5	476.7	7793.16
480.41	7793.22	490.96	7793.72	492.49	7793.79	497.04	7793.75	500.38	7793.71
508.28	7793.76	512.06	7793.79	516.17	7793.93	528.42	7793.93	531.97	7793.94
533.16	7793.84	539.86	7793.72	543.71	7793.69	547.76	7793.63	554.26	7793.87
559.8	7793.86	563.55	7793.8	564.81	7793.85	575.36	7794.15	579.34	7794.23
585.91	7794.44	591.18	7794.48	603.02	7794.26	607.01	7794.41	610.92	7794.18
617.56	7794.17	618.81	7794.11	622.55	7793.94	626.71	7793.69	634.61	7793.43
638.66	7793.38	642.5	7793.32	649.21	7793.23	653.93	7793.21	658.29	7793.13
666.19	7793.04	670.31	7792.98	674.08	7792.71	680.86	7792.36	681.83	7792.3
687.96	7791.9	688.3	7791.84	691.41	7791.22	692.4	7791.01	696.7	7790.22
698.9	7790.5	701.96	7790.98	708.17	7792.12	710.08	7792.4	712.8	7791.22
719.29	7788.2	719.49	7788.11	744.6	7788.18	747.55	7788.51	754.71	7789.36
759.22	7789.85	760.86	7789.91	765.26	7789.98	767.93	7789.96	769.89	7789.78
775.33	7789.23	775.64	7789.29	779.44	7790.06	780.88	7790.32	784.87	7791.1
786.27	7791.3	790.41	7790.94	797.19	7790.33	798.67	7790.2	804.28	7789.67
807.25	7790.59	807.46	7790.66	808.3	7790.92	816.2	7793.31	818.01	7793.89
820.98	7794.87	821.42	7795.04	824.4	7795.1	828.56	7795.12	831.99	7794.88
839.11	7794.47	840.39	7794.38	846.01	7793.9	848.87	7793.11	853.05	7791.85
855.85	7791.14	856.71	7791.27	867.6	7793.01	869.39	7793.3	870.26	7793.38
879.36	7794.15	881.31	7794.3	891.86	7794.5	895.15	7794.58	902.41	7794.7
922.58	7794.71	942.7	7794.58	947.87	7794.34	952.75	7793.93	958.06	7792.95
962.81	7793.66	970.4	7795.37	972.87	7796.26	973.71	7796.46	982.2	7797.65
983.37	7797.81	990.84	7798.86	992.88	7798.92	1003.12	7799.31	1010.45	7799.47
1012.47	7799.54	1015.15	7799.58	1018.66	7799.67	1023.38	7799.68	1028.41	7799.68
1030.77	7799.76	1045.04	7799.93	1048.92	7799.75	1052.37	7799.77	1073.58	7799.81
1075.4	7799.93	1093.56	7800.02	1103.61	7799.96	1113.67	7800.06	1116.84	7800.19
1123.73	7800.37	1133.78	7800.85	1150.64	7801.69	1153.9	7801.86	1155.11	7801.93
1157.25	7802.05	1173.61	7801.82	1179.54	7801.75	1180.14	7801.65	1183.17	7801.19
1183.61	7801.13	1184.02	7801.07	1189.23	7803.59	1194.13	7806.03	1195.39	7806.69
1203.24	7810.6	1203.56	7810.66	1204.19	7810.75	1206.96	7811.23	1214.24	7812.37
1218.22	7813.24	1224.3	7814.77	1227.78	7815.99	1234.36	7815.91	1238.53	7816.04
1241	7816.22	1242.75	7816.61	1244.41	7816.97	1248.51	7817.82	1253.83	7819.18
1254.64	7819.29	1262.86	7820.46	1264.53	7820.72	1265.42	7820.88	1267.2	7821.44
1274.59	7823.03	1277.51	7823.6	1281.49	7823.59	1285.16	7823.64	1292.56	7823.78
1294.7	7823.75	1297.07	7823.76	1304.76	7823.86	1309.7	7823.95	1313.3	7824.15
1314.6	7824.29	1320.83	7825.1	1325.25	7825.3	1327.39	7825.74	1333.01	7826.28
1334.93	7826.46	1335.19	7826.49						

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	232.06	.05	719.29	.035	744.6	.05	962.81	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
719.29 744.6 453.78 527.62 576.04 .1 .3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	387.51	7795.2	F
828.56	1335.19	7795.12	F

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7793.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.20	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7792.40	Reach Len. (ft)	453.78	527.62	576.04
Crit W.S. (ft)	7792.40	Flow Area (sq ft)	47.81	107.61	160.58
E.G. Slope (ft/ft)	0.009808	Area (sq ft)	75.18	107.61	168.60
Q Total (cfs)	2181.00	Flow (cfs)	167.27	1186.91	826.82
Top Width (ft)	280.46	Top Width (ft)	74.04	25.31	81.11
Vel Total (ft/s)	6.90	Avg. Vel. (ft/s)	3.50	11.03	5.15
Max Chl Dpth (ft)	4.29	Hydr. Depth (ft)	1.22	4.25	2.34
Conv. Total (cfs)	22022.6	Conv. (cfs)	1689.0	11984.8	8348.8
Length Wtd. (ft)		Wetted Per. (ft)	40.39	25.33	69.39
Min Ch El (ft)	7788.11	Shear (lb/sq ft)	0.72	2.60	1.42
Alpha	1.62	Stream Power (lb/ft s)	2.54	28.69	7.30
Frctn Loss (ft)		Cum Volume (acre-ft)	21.08	45.14	18.94
C & E Loss (ft)		Cum SA (acres)	13.04	10.63	12.16

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7793.73	Element			
Vel Head (ft)	0.74	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7793.00	Reach Len. (ft)	453.78	527.62	576.04
Crit W.S. (ft)	7792.40	Flow Area (sq ft)	73.75	122.83	202.40
E.G. Slope (ft/ft)	0.005290	Area (sq ft)	73.75	122.83	202.40
Q Total (cfs)	2181.00	Flow (cfs)	218.69	1086.61	875.71
Top Width (ft)	140.17	Top Width (ft)	44.29	25.31	70.57
Vel Total (ft/s)	5.47	Avg. Vel. (ft/s)	2.97	8.85	4.33
Max Chl Dpth (ft)	4.89	Hydr. Depth (ft)	1.67	4.85	2.87
Conv. Total (cfs)	29986.3	Conv. (cfs)	3006.7	14939.6	12040.0
Length Wtd. (ft)	538.84	Wetted Per. (ft)	45.90	25.33	71.47
Min Ch El (ft)	7788.11	Shear (lb/sq ft)	0.53	1.60	0.94
Alpha	1.59	Stream Power (lb/ft s)	1.57	14.17	4.05
Frctn Loss (ft)	2.62	Cum Volume (acre-ft)	8.19	48.74	8.26
C & E Loss (ft)	0.00	Cum SA (acres)	3.15	10.63	3.18

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7793.00	Element			
Vel Head (ft)	0.91	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7792.09	Reach Len. (ft)	453.78	527.62	576.04
Crit W.S. (ft)	7791.96	Flow Area (sq ft)	37.08	99.90	139.84
E.G. Slope (ft/ft)	0.007970	Area (sq ft)	54.20	99.90	144.48
Q Total (cfs)	1657.00	Flow (cfs)	113.78	945.26	597.96
Top Width (ft)	165.33	Top Width (ft)	62.83	25.31	77.19
Vel Total (ft/s)	5.99	Avg. Vel. (ft/s)	3.07	9.46	4.28
Max Chl Dpth (ft)	3.98	Hydr. Depth (ft)	1.18	3.95	2.07
Conv. Total (cfs)	18560.1	Conv. (cfs)	1274.4	10587.9	6697.8
Length Wtd. (ft)	544.17	Wetted Per. (ft)	32.68	25.33	68.34
Min Ch El (ft)	7788.11	Shear (lb/sq ft)	0.56	1.96	1.02
Alpha	1.63	Stream Power (lb/ft s)	1.73	18.57	4.35
Frctn Loss (ft)	3.01	Cum Volume (acre-ft)	14.84	38.54	11.52
C & E Loss (ft)	0.15	Cum SA (acres)	10.76	10.63	9.74

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7793.43	Element			
Vel Head (ft)	1.12	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7792.31	Reach Len. (ft)	453.78	527.62	576.04
Crit W.S. (ft)	7792.31	Flow Area (sq ft)	44.50	105.40	154.60
E.G. Slope (ft/ft)	0.009357	Area (sq ft)	68.84	105.40	161.56
Q Total (cfs)	2031.00	Flow (cfs)	150.90	1119.83	760.27
Top Width (ft)	176.38	Top Width (ft)	71.09	25.31	79.98
Vel Total (ft/s)	6.67	Avg. Vel. (ft/s)	3.39	10.62	4.92
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)	1.21	4.16	2.26
Conv. Total (cfs)	20996.8	Conv. (cfs)	1560.0	11577.0	7859.7
Length Wtd. (ft)		Wetted Per. (ft)	38.03	25.33	69.09
Min Ch El (ft)	7788.11	Shear (lb/sq ft)	0.68	2.43	1.31
Alpha	1.62	Stream Power (lb/ft s)	2.32	25.82	6.43
Frctn Loss (ft)		Cum Volume (acre-ft)	19.26	43.36	16.80
C & E Loss (ft)		Cum SA (acres)	12.45	10.63	11.77

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7793.95	Element			
Vel Head (ft)	1.20	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7792.75	Reach Len. (ft)	453.78	527.62	576.04
Crit W.S. (ft)	7792.75	Flow Area (sq ft)	62.84	116.55	185.00
E.G. Slope (ft/ft)	0.009074	Area (sq ft)	102.98	116.55	198.04
Q Total (cfs)	2515.00	Flow (cfs)	215.74	1303.98	995.29
Top Width (ft)	194.18	Top Width (ft)	83.21	25.31	85.66
Vel Total (ft/s)	6.90	Avg. Vel. (ft/s)	3.43	11.19	5.38
Max Chl Dpth (ft)	4.64	Hydr. Depth (ft)	1.37	4.60	2.65
Conv. Total (cfs)	26401.6	Conv. (cfs)	2264.7	13688.7	10448.2
Length Wtd. (ft)	527.18	Wetted Per. (ft)	47.05	25.33	70.61
Min Ch El (ft)	7788.11	Shear (lb/sq ft)	0.76	2.61	1.48
Alpha	1.62	Stream Power (lb/ft s)	2.60	29.16	7.99
Frctn Loss (ft)	2.14	Cum Volume (acre-ft)	25.99	49.12	23.88
C & E Loss (ft)	0.30	Cum SA (acres)	16.44	10.63	13.51

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 9536

INPUT
Description:
Station Elevation Data num= 223

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7820.69	6.17	7819.61	8.13	7819.53	16.24	7818.45	18.49	7818.1
47.43	7816.35	56.49	7815.29	62.4	7814.5	66.55	7814.66	71.44	7814.94
76.62	7814.89	82.02	7815.43	83.04	7815.24	86.68	7812.65	89.53	7812.04
96.74	7807.9	106.81	7805.36	107.47	7804.95	112.79	7802.58	116.51	7802.29
126.93	7801.43	134.75	7800.46	147.06	7799.36	152.84	7798.78	167.19	7797.01
170.93	7796.58	187.31	7795.37	190.8	7794.9	195.49	7794.16	197.31	7793.97
199.85	7793.66	203.32	7793.19	209.05	7793.25	212.57	7793.49	216.35	7793.85
216.64	7793.79	217.5	7793.64	225.2	7792.31	227.57	7791.96	234.24	7791.54
237.63	7791.35	243.28	7790.99	247.69	7790.77	252.41	7790.62	256.4	7790.45
262.19	7790.44	270.19	7789.58	277.51	7789.18	278.05	7789.13	287.33	7788.32
288.51	7788.22	296.47	7787.2	297.93	7786.98	300.64	7787	304.59	7788.62
307.97	7789.08	312.96	7788.95	321.23	7788.92	327.43	7788.54	331.56	7786.96
331.69	7786.9	334.87	7786.9	338.59	7787.87	339.8	7787.96	345.6	7788.82
348.18	7789.58	348.45	7789.65	358.39	7789.82	360.86	7789.92	388.19	7789.77
397.33	7789.57	401.26	7789.47	403.98	7789.37	405.47	7788.81	409.06	7787.44
415.51	7785.76	432.16	7785.8	435.18	7786.65	438.89	7787.58	448.06	7789.92
448.86	7790.12	452.42	7790.08	459.02	7789.93	460.35	7789.88	469.08	7789.65
478.44	7788.76	479.15	7788.68	482.56	7788.36	482.89	7788.3	489.44	7786.17
490.59	7785.8	502.13	7785.76	505.06	7786.91	509.34	7788.47	511.85	7789.21
512.74	7789.54	519.4	7789.45	523.66	7789.41	529.46	7789.38	531.76	7789.38
540.43	7789.42	546.39	7789.36	551.67	7789.25	557.24	7789.25	566.06	7789.2
566.5	7788.94	570.6	7785.61	607.78	7785.68	608.6	7785.76	612.11	7786.07
619.11	7786.67	626.55	7787.13	629.28	7787.31	631.13	7787.48	634.02	7787.81
638.92	7788.36	641.71	7788.68	645.74	7788.55	652.83	7788.25	668.84	7788.24
674.6	7788.29	679.81	7788.36	684.62	7788.39	689.23	7788.59	694.65	7788.78
697.45	7788.87	699.04	7788.46	704.9	7786.84	706.21	7786.52	709.39	7786.92
714.69	7787.54	716.02	7787.69	719.08	7788.12	724.71	7788.25	734.73	7788.26
744.75	7788.29	764.79	7788.29	773.78	7787.93	775.64	7787.88	779.16	7787.16
783.41	7786.3	784.94	7785.92	785.66	7786.09	789.92	7787.56	790.9	7787.96
792.18	7788.47	796.58	7790.24	798.29	7790.35	804.33	7790.77	811.68	7790.89
814.89	7790.87	821.1	7790.96	824.91	7790.93	830.52	7790.93	834.93	7790.96
839.93	7790.97	844.95	7790.97	849.35	7790.98	858.77	7790.98	864.99	7791.03
868.19	7791.03	875.01	7791.09	877.61	7791.09	905.07	7791.15	915.09	7791.04
924.71	7791.1	943.54	7791.35	952.96	7791.17	955.17	7791.11	962.38	7790.97
965.19	7790.9	971.8	7790.86	975.22	7790.83	981.22	7790.76	985.24	7790.73
990.64	7790.59	1005.28	7790.32	1009.48	7790.21	1015.3	7790.07	1018.9	7790
1025.32	7789.83	1028.31	7789.78	1035.34	7789.64	1037.73	7789.61	1045.36	7789.47
1055.38	7789.65	1075.28	7790.05	1084.83	7790.26	1086.44	7790.31	1096.45	7790.7
1102.9	7792.24	1105.48	7792.92	1113.09	7794.91	1115.5	7795.55	1119.34	7796.54
1120.77	7796.93	1121.57	7797.17	1143.21	7797.45	1154.67	7796.77	1157.75	7796.66
1166.23	7796.12	1174.34	7796.24	1177.38	7796.29	1178.33	7796.41	1194.04	7798.63
1213.08	7800.98	1218.71	7801.58	1223.51	7802.17	1231.42	7803.02	1245.81	7804.94
1254.38	7806.19	1264.14	7807.56	1278.24	7808.81	1283.82	7809.49	1300.11	7811.31
1301.73	7811.95	1304.9	7812.67	1305.89	7812.95	1310.89	7815.98	1315.91	7819.13
1320.31	7820.75	1323.03	7822.56	1325.68	7824.69				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	262.19	.05	570.6	.035	607.78	.05	1096.45	.06

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

570.6	607.78	442.6	450.16	233.01	.1	.3

Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
0	512.74	7790.12	F
699.11	900	7788.84	T
943.54	1200	7791.35	F

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7790.34	Element			
Vel Head (ft)	0.37	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7789.96	Reach Len. (ft)	442.60	450.16	233.01
Crit W.S. (ft)	7788.65	Flow Area (sq ft)	43.60	160.48	388.18
E.G. Slope (ft/ft)	0.003343	Area (sq ft)	421.48	160.48	401.20
Q Total (cfs)	2181.00	Flow (cfs)	61.15	1044.40	1075.45
Top Width (ft)	570.35	Top Width (ft)	294.54	37.18	238.63
Vel Total (ft/s)	3.68	Avg. Vel. (ft/s)	1.40	6.51	2.77
Max Chl Dpth (ft)	4.35	Hydr. Depth (ft)	0.75	4.32	2.06
Conv. Total (cfs)	37719.2	Conv. (cfs)	1057.6	18062.3	18599.3
Length Wtd. (ft)	394.35	Wetted Per. (ft)	59.12	37.18	189.62
Min Ch El (ft)	7785.61	Shear (lb/sq ft)	0.15	0.90	0.43
Alpha	1.78	Stream Power (lb/ft s)	0.22	5.86	1.18
Frctn Loss (ft)	2.02	Cum Volume (acre-ft)	18.50	43.52	15.17
C & E Loss (ft)	0.04	Cum SA (acres)	11.12	10.25	10.04

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7791.11	Element			
Vel Head (ft)	0.72	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7790.39	Reach Len. (ft)	442.60	450.16	233.01
Crit W.S. (ft)	7789.84	Flow Area (sq ft)	51.90	176.30	170.17
E.G. Slope (ft/ft)	0.004494	Area (sq ft)	51.90	176.30	170.17
Q Total (cfs)	2181.00	Flow (cfs)	117.45	1416.23	647.32
Top Width (ft)	140.00	Top Width (ft)	40.60	37.18	62.22
Vel Total (ft/s)	5.47	Avg. Vel. (ft/s)	2.26	8.03	3.80
Max Chl Dpth (ft)	4.78	Hydr. Depth (ft)	1.28	4.74	2.73
Conv. Total (cfs)	32532.3	Conv. (cfs)	1752.0	21124.8	9655.5
Length Wtd. (ft)	417.73	Wetted Per. (ft)	42.86	37.18	64.50
Min Ch El (ft)	7785.61	Shear (lb/sq ft)	0.34	1.33	0.74
Alpha	1.55	Stream Power (lb/ft s)	0.77	10.69	2.82
Frctn Loss (ft)	1.97	Cum Volume (acre-ft)	7.53	46.92	5.80
C & E Loss (ft)	0.01	Cum SA (acres)	2.71	10.25	2.31

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7789.84	Element			
Vel Head (ft)	0.42	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7789.43	Reach Len. (ft)	442.60	450.16	233.01
Crit W.S. (ft)	7788.65	Flow Area (sq ft)	13.15	140.61	287.96
E.G. Slope (ft/ft)	0.004057	Area (sq ft)	289.36	140.61	287.96
Q Total (cfs)	1657.00	Flow (cfs)	10.22	922.94	723.84
Top Width (ft)	432.02	Top Width (ft)	208.06	37.18	186.78
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	0.78	6.56	2.51
Max Chl Dpth (ft)	3.82	Hydr. Depth (ft)	0.27	3.78	1.54
Conv. Total (cfs)	26013.9	Conv. (cfs)	160.4	14489.6	11363.9
Length Wtd. (ft)	400.47	Wetted Per. (ft)	49.96	37.18	188.19
Min Ch El (ft)	7785.61	Shear (lb/sq ft)	0.07	0.96	0.39
Alpha	1.90	Stream Power (lb/ft s)	0.05	6.29	0.97
Frctn Loss (ft)	1.96	Cum Volume (acre-ft)	13.05	37.08	8.66
C & E Loss (ft)	0.01	Cum SA (acres)	9.35	10.25	7.99

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7790.20	Element			
Vel Head (ft)	0.38	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7789.81	Reach Len. (ft)	442.60	450.16	233.01
Crit W.S. (ft)	7788.65	Flow Area (sq ft)	35.04	154.98	360.38
E.G. Slope (ft/ft)	0.003520	Area (sq ft)	379.61	154.98	366.88
Q Total (cfs)	2031.00	Flow (cfs)	43.59	1011.12	976.30
Top Width (ft)	527.24	Top Width (ft)	265.11	37.18	224.95
Vel Total (ft/s)	3.69	Avg. Vel. (ft/s)	1.24	6.52	2.71
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)	0.61	4.17	1.92
Conv. Total (cfs)	34232.4	Conv. (cfs)	734.7	17042.3	16455.4
Length Wtd. (ft)	395.76	Wetted Per. (ft)	59.12	37.18	189.22
Min Ch El (ft)	7785.61	Shear (lb/sq ft)	0.13	0.92	0.42
Alpha	1.82	Stream Power (lb/ft s)	0.16	5.98	1.13
Frctn Loss (ft)	2.01	Cum Volume (acre-ft)	16.92	41.78	13.30
C & E Loss (ft)	0.03	Cum SA (acres)	10.70	10.25	9.76

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7790.37	Element			
Vel Head (ft)	0.21	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7790.15	Reach Len. (ft)	442.60	450.16	233.01
Crit W.S. (ft)	7790.13	Flow Area (sq ft)	478.68	167.56	328.94
E.G. Slope (ft/ft)	0.002296	Area (sq ft)	478.68	167.56	448.38
Q Total (cfs)	2515.00	Flow (cfs)	909.88	930.06	675.06
Top Width (ft)	599.52	Top Width (ft)	305.73	37.18	256.61
Vel Total (ft/s)	2.58	Avg. Vel. (ft/s)	1.90	5.55	2.05
Max Chl Dpth (ft)	4.54	Hydr. Depth (ft)	1.57	4.51	1.74
Conv. Total (cfs)	52486.7	Conv. (cfs)	18988.8	19409.9	14088.1
Length Wtd. (ft)	417.35	Wetted Per. (ft)	310.39	37.18	190.13
Min Ch El (ft)	7785.61	Shear (lb/sq ft)	0.22	0.65	0.25
Alpha	2.08	Stream Power (lb/ft s)	0.42	3.59	0.51
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	22.96	47.40	19.61
C & E Loss (ft)	0.08	Cum SA (acres)	14.41	10.25	11.25

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 9086

INPUT
Description:
Station Elevation Data num= 235

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7822.49	8.56	7821.51	11.14	7821.19	17.59	7820.4	21.2	7819.94
35.65	7818.46	41.33	7817.87	61.47	7815.15	62.74	7815.02	80.8	7813.29
81.6	7813.21	89.83	7812.42	91.66	7812.25	98.86	7811.56	101.73	7811.16
107.88	7810.54	111.79	7810.1	121.86	7809.07	125.94	7808.5	131.93	7807.96
134.97	7807.55	141.99	7806.59	152.06	7805.43	153.03	7805.32	161.52	7804.34
162.06	7804.27	171.09	7803.4	172.19	7803.3	182.25	7802.35	189.15	7801.27
192.32	7800.88	199.58	7799.54	200.66	7799.31	207.54	7799.62	210.16	7799.72
214.72	7799.77	223.51	7799.83	227.92	7799.33	232.76	7798.62	241.39	7797.88
242.65	7797.81	249.21	7797.5	252.35	7797.36	262.78	7796.84	270.41	7796.17
272.85	7795.9	277.94	7795.04	278.9	7794.89	280.2	7793.65	283.48	7790.65
283.88	7790.83	287.29	7790.35	293.34	7789.99	293.72	7789.77	295.93	7788.5
301.99	7787.25	304.85	7787	308.04	7786.7	312.91	7786.91	315.56	7786.96
323.17	7787.2	333.62	7787.21	342.64	7787.29	351.67	7787.64	360.7	7787.56
363.44	7787.57	365.82	7787.7	370.41	7787.55	373.5	7787.44	378.25	7787.12
381.51	7786.93	385.66	7786.6	411.7	7786.6	413.23	7787.14	418.88	7789.15
421.18	7790.07	423.56	7789.42	423.83	7789.33	424.48	7789.17	432.59	7786.94
441.97	7786.54	451	7786.32	454.03	7786.25	460.02	7786.1	464.09	7786.12
468.62	7786.32	472.13	7786.35	473.36	7786.62	474.16	7786.78	480.46	7788.19
483.25	7788.5	487.8	7788.44	494.29	7788.22	496.13	7788.33	497.19	7788.4
504.38	7787.51	504.36	7787.34	506.72	7786.98	508.23	7787.15	514.27	7787.84
517.61	7788.23	524.49	7787.83	526.31	7787.74	534.34	7787.25	544.62	7787.82
549.35	7788.18	551.98	7788.34	552.9	7788.27	554.68	7788.15	559.35	7787.92
566	7787.71	569.31	7786.15	573.74	7783.72	574.33	7783.82	574.82	7783.91
577.4	7784.37	580.23	7784.89	583.84	7785.43	585.05	7785.6	588.91	7786.24
589.25	7786.3	598.9	7786.43	606.47	7786.7	611.67	7787	616	7787.08
620.71	7786.98	628.56	7787.03	630.74	7787.09	633.2	7786.35	637.15	7785.15
638.81	7784.75	680.92	7784.8	681.71	7784.91	688.29	7785.05	690.47	7785.38
696.4	7785.19	700.47	7785.4	706.11	7785.44	712.47	7785.17	714.22	7785.04
720.66	7784.96	724.47	7783.62	729.71	7783.62	736.38	7787.28	739.47	7787.29
744.63	7787.34	752.14	7787.43	760.71	7787.63	763.05	7787.69	770.17	7787.77
776.79	7787.83	780.71	7787.9	788.4	7787.97	794.29	7788.13	798.49	7788.19
808.57	7788.46	818.65	7788.54	821.1	7788.55	828.73	7788.55	838.81	7788.81
847.91	7788.99	856.85	7789.13	858.97	7789.16	865.79	7789.21	869.06	7789.25
874.73	7789.3	879.14	7789.33	883.66	7789.4	889.22	7789.44	892.6	7789.47
899.3	7789.52	901.54	7789.53	909.38	7789.59	937.29	7789.63	939.63	7789.55
949.71	7789.52	959.79	7789.1	964.1	7788.93	969.87	7788.69	973.04	7788.62
979.95	7788.62	990.04	7788.42	1010.2	7788.42	1017.73	7788.38	1030.36	7788.38
1040.44	7788.24	1044.54	7788.23	1050.53	7788.15	1053.11	7788.12	1054.64	7788.41
1060.61	7790.22	1062.42	7790.71	1070.69	7793.36	1074	7794.45	1075.45	7794.95
1096.92	7795.23	1099.89	7794.08	1100.93	7793.66	1110.33	7790.18	1110.93	7789.95
1124.98	7790.14	1131.18	7790.16	1141.26	7789.94	1151.34	7789.92	1160.73	7789.56
1172.31	7789.52	1174.74	7789.5	1177.59	7789.46	1178.47	7789.58	1181.59	7789.98
1187.54	7790.71	1191.67	7791.15	1196.48	7792.76	1201.75	7795.08	1206.6	7797.56
1206.88	7797.71	1211.83	7797.7	1221.91	7797.54	1224.71	7797.47	1231.82	7800.55
1231.99	7800.63	1232.3	7800.76	1237.75	7803.12	1237.9	7803.19	1242.08	7803.42
1249.72	7803.75	1251.33	7804.49	1252.16	7804.86	1259.04	7808.47	1262.24	7810.01
1267.98	7812.99	1272.32	7815.91	1276.92	7819.75	1282.4	7824.4	1289.14	7828.62

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	301.99	.05	638.81	.035	729.71	.05	1075.45	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
638.81 729.71 246.51 473.8 527.55 .1 .3
Ineffective Flow num= 3

Sta L	Sta R	Elev	Permanent
287	421.18	7790.07	T

421.18	551.98 7788.34		T
1096	1220 7795.23		T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7788.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.79	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7787.47	Reach Len. (ft)	246.51	473.80	527.55
Crit W.S. (ft)		Flow Area (sq ft)	92.98	241.19	15.95
E.G. Slope (ft/ft)	0.008856	Area (sq ft)	187.03	241.19	15.95
Q Total (cfs)	2181.00	Flow (cfs)	303.35	1844.74	32.91
Top Width (ft)	337.21	Top Width (ft)	222.06	90.90	24.25
Vel Total (ft/s)	6.23	Avg. Vel. (ft/s)	3.26	7.65	2.06
Max Chl Dpth (ft)	3.85	Hydr. Depth (ft)	1.29	2.65	0.66
Conv. Total (cfs)	23176.3	Conv. (cfs)	3223.6	19603.1	349.7
Length Wtd. (ft)	434.87	Wetted Per. (ft)	73.79	91.05	25.17
Min Ch El (ft)	7783.62	Shear (lb/sq ft)	0.70	1.46	0.35
Alpha	1.31	Stream Power (lb/ft s)	2.27	11.20	0.72
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	15.41	41.44	14.06
C & E Loss (ft)	0.14	Cum SA (acres)	8.50	9.59	9.34

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7789.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.		0.035	
W.S. Elev (ft)	7788.44	Reach Len. (ft)	246.51	473.80	527.55
Crit W.S. (ft)		Flow Area (sq ft)		329.20	
E.G. Slope (ft/ft)	0.004944	Area (sq ft)		329.20	
Q Total (cfs)	2181.00	Flow (cfs)		2181.00	
Top Width (ft)	90.90	Top Width (ft)		90.90	
Vel Total (ft/s)	6.63	Avg. Vel. (ft/s)		6.63	
Max Chl Dpth (ft)	4.82	Hydr. Depth (ft)		3.62	
Conv. Total (cfs)	31019.2	Conv. (cfs)		31019.2	
Length Wtd. (ft)	460.90	Wetted Per. (ft)		99.56	
Min Ch El (ft)	7783.62	Shear (lb/sq ft)		1.02	
Alpha	1.00	Stream Power (lb/ft s)		6.76	
Frctn Loss (ft)	2.23	Cum Volume (acre-ft)	7.27	44.31	5.34
C & E Loss (ft)	0.02	Cum SA (acres)	2.50	9.59	2.14

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7787.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.51	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7787.36	Reach Len. (ft)	246.51	473.80	527.55
Crit W.S. (ft)		Flow Area (sq ft)	84.63	230.67	13.54
E.G. Slope (ft/ft)	0.006050	Area (sq ft)	162.10	230.67	13.54
Q Total (cfs)	1657.00	Flow (cfs)	214.85	1415.53	26.62
Top Width (ft)	316.43	Top Width (ft)	209.19	90.90	16.34
Vel Total (ft/s)	5.04	Avg. Vel. (ft/s)	2.54	6.14	1.97
Max Chl Dpth (ft)	3.74	Hydr. Depth (ft)	1.17	2.54	0.83
Conv. Total (cfs)	21303.5	Conv. (cfs)	2762.3	18198.9	342.2
Length Wtd. (ft)	446.75	Wetted Per. (ft)	73.52	91.05	17.26
Min Ch El (ft)	7783.62	Shear (lb/sq ft)	0.43	0.96	0.30
Alpha	1.30	Stream Power (lb/ft s)	1.10	5.87	0.58
Frctn Loss (ft)	2.21	Cum Volume (acre-ft)	10.75	35.17	7.86
C & E Loss (ft)	0.01	Cum SA (acres)	7.23	9.59	7.45

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7788.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7787.45	Reach Len. (ft)	246.51	473.80	527.55
Crit W.S. (ft)		Flow Area (sq ft)	91.07	238.79	15.32
E.G. Slope (ft/ft)	0.007982	Area (sq ft)	181.22	238.79	15.32
Q Total (cfs)	2031.00	Flow (cfs)	278.39	1722.47	30.14
Top Width (ft)	332.90	Top Width (ft)	218.88	90.90	23.12
Vel Total (ft/s)	5.88	Avg. Vel. (ft/s)	3.06	7.21	1.97
Max Chl Dpth (ft)	3.83	Hydr. Depth (ft)	1.26	2.63	0.66
Conv. Total (cfs)	22732.8	Conv. (cfs)	3116.0	19279.5	337.4
Length Wtd. (ft)	437.76	Wetted Per. (ft)	73.73	91.05	24.04
Min Ch El (ft)	7783.62	Shear (lb/sq ft)	0.62	1.31	0.32
Alpha	1.31	Stream Power (lb/ft s)	1.88	9.43	0.62
Frctn Loss (ft)	1.91	Cum Volume (acre-ft)	14.07	39.74	12.28
C & E Loss (ft)	0.11	Cum SA (acres)	8.24	9.59	9.09

Warning: Divided flow computed for this cross-section.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7788.52	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.97	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7787.56	Reach Len. (ft)	246.51	473.80	527.55
Crit W.S. (ft)	7787.53	Flow Area (sq ft)	99.24	249.04	18.21
E.G. Slope (ft/ft)	0.010399	Area (sq ft)	206.68	249.04	18.21
Q Total (cfs)	2515.00	Flow (cfs)	365.74	2108.70	40.56
Top Width (ft)	351.44	Top Width (ft)	232.58	90.90	27.96
Vel Total (ft/s)	6.86	Avg. Vel. (ft/s)	3.69	8.47	2.23
Max Chl Dpth (ft)	3.94	Hydr. Depth (ft)	1.37	2.74	0.65
Conv. Total (cfs)	24663.2	Conv. (cfs)	3586.6	20678.8	397.8
Length Wtd. (ft)	429.33	Wetted Per. (ft)	73.99	91.05	28.88
Min Ch El (ft)	7783.62	Shear (lb/sq ft)	0.87	1.78	0.41
Alpha	1.32	Stream Power (lb/ft s)	3.21	15.03	0.91
Frctn Loss (ft)	1.52	Cum Volume (acre-ft)	19.48	45.25	18.36
C & E Loss (ft)	0.21	Cum SA (acres)	11.68	9.59	10.49

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal

REACH: Marble RS: 8612

INPUT
Description:
Station Elevation Data num= 140

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7822.72	18.98	7820.13	28.98	7819.08	38.98	7817.65	48.98	7816.54
58.98	7815.3	68.98	7814.7	78.98	7813.98	88.98	7813.84	98.98	7813.32
119.13	7812.38	128.98	7811.72	139.1	7809.89	140.96	7809.54	148.21	7808.54
149.13	7808.41	158.98	7806.95	168.98	7805.23	179.04	7804.21	188.87	7803.18
189.51	7803.08	190.03	7802.99	190.53	7802.93	199.13	7802.35	208.98	7801.79
218.98	7801.37	228.98	7800.99	238.98	7800.82	248.98	7800.08	255.24	7799.75
268.76	7799.82	277.51	7799.84	286.46	7799.92	289	7798.41	289.34	7798.25
293.97	7795.98	298.85	7796.06	308.98	7795.79	338.98	7794.82	349.13	7794.81
358.98	7794.42	378.98	7793.77	388.98	7793.31	398.98	7792.92	408.98	7792.34
418.98	7791.88	428.98	7791.3	438.98	7790.52	458.98	7789.85	468.98	7789.21
478.98	7788.69	488.98	7787.69	497.2	7788.38	499.12	7788	508.95	7786.11
509.46	7786.01	512.21	7785.42	518.43	7785.48	528.98	7785.17	538.98	7784.95
548.98	7784.7	553.61	7784.63	567.34	7782.88	578.98	7783.88	579.66	7783.95
583.01	7784.28	588.4	7784.19	599.13	7784.19	608.98	7784.44	631.07	7784.58
638.57	7784.61	644.08	7784.6	654.2	7784.46	657.09	7784.44	663.65	7784.42
668.63	7784.37	669.91	7784.02	671.78	7783.2	676.22	7781.3	730.23	7782.01
743.55	7783.42	745.06	7783.56	747.85	7783.53	766.39	7783.4	767.63	7783.52
774.19	7784.22	776.59	7784.39	777.87	7784.53	780.61	7784.81	784.14	7784.93
787.2	7785.04	794.88	7785.29	800.22	7785.44	812.43	7785.19	814.28	7785.13
823.04	7785.02	833.04	7785.08	843.04	7784.98	854.28	7784.98	863.04	7784.86
873.04	7784.6	883.04	7784.57	903.04	7784.44	913.04	7784.24	923.04	7784.16
924.28	7784.05	925.72	7783.9	936.79	7782.6	942.3	7784.17	945.53	7785.01
946.24	7785.22	953.04	7785.23	963.04	7785.13	973.04	7785.19	1034.28	7785.19
1043.04	7785.02	1074.28	7785.02	1083.04	7784.79	1093.04	7784.72	1103.04	7784.48
1110.58	7784.56	1113.24	7784.6	1123.04	7788.31	1124.52	7788.85	1128.19	7790.15
1130.14	7790.83	1151.94	7790.79	1153.04	7790.44	1154.66	7789.77	1159.83	7787.51
1162.43	7789.06	1163.04	7789.48	1164.28	7790.32	1173.04	7795.71	1174.28	7796.45
1183.04	7802.35	1184.28	7803.36	1193.04	7810.56	1194.28	7811.57	1202.79	7818.52

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	508.95	.05	676.22	.035	730.23	.05	1113.24	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
676.22	730.23	602.05 535.11	226.7	.1	.3

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	638.57	7784.61	F
800.22	1202.79	7786.9	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7786.33	Element			
Vel Head (ft)	0.31	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7786.02	Reach Len. (ft)	602.05	535.11	226.70
Crit W.S. (ft)	7785.16	Flow Area (sq ft)	269.29	235.92	146.71
E.G. Slope (ft/ft)	0.002363	Area (sq ft)	269.29	235.92	522.27
Q Total (cfs)	21B1.00	Flow (cfs)	533.46	1300.95	346.58
Top Width (ft)	607.61	Top Width (ft)	166.83	54.01	386.77
Vel Total (ft/s)	3.35	Avg. Vel. (ft/s)	1.98	5.51	2.36
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)	1.61	4.37	2.10
Conv. Total (cfs)	44867.9	Conv. (cfs)	10974.5	26763.4	7130.0
Length Wtd. (ft)	516.32	Wetted Per. (ft)	167.69	54.01	70.15
Min Ch El (ft)	7781.30	Shear (lb/sq ft)	0.24	0.64	0.31
Alpha	1.79	Stream Power (lb/ft s)	0.47	3.55	0.73
Frctn Loss (ft)	1.40	Cum Volume (acre-ft)	14.11	38.85	10.80
C & E Loss (ft)	0.07	Cum SA (acres)	7.40	8.81	6.85

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7786.88	Element			
Vel Head (ft)	0.83	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7786.04	Reach Len. (ft)	602.05	535.11	226.70
Crit W.S. (ft)	7785.42	Flow Area (sq ft)	90.19	236.95	18.03
E.G. Slope (ft/ft)	0.004746	Area (sq ft)	90.19	236.95	18.03
Q Total (cfs)	2181.00	Flow (cfs)	262.09	1857.12	61.79
Top Width (ft)	110.00	Top Width (ft)	51.22	54.01	4.77
Vel Total (ft/s)	6.32	Avg. Vel. (ft/s)	2.91	7.84	3.43
Max Chl Dpth (ft)	4.74	Hydr. Depth (ft)	1.76	4.39	3.78
Conv. Total (cfs)	31659.6	Conv. (cfs)	3804.5	26958.1	897.0
Length Wtd. (ft)	531.48	Wetted Per. (ft)	53.33	54.01	8.32
Min Ch El (ft)	7781.30	Shear (lb/sq ft)	0.50	1.30	0.64
Alpha	1.34	Stream Power (lb/ft s)	1.46	10.19	2.20
Frctn Loss (ft)	1.99	Cum Volume (acre-ft)	7.01	41.23	5.24
C & E Loss (ft)	0.01	Cum SA (acres)	2.36	8.81	2.11

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7785.65	Element			
Vel Head (ft)	0.47	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7785.18	Reach Len. (ft)	602.05	535.11	226.70
Crit W.S. (ft)	7784.80	Flow Area (sq ft)	133.35	190.38	88.87
E.G. Slope (ft/ft)	0.004128	Area (sq ft)	133.35	190.38	200.97
Q Total (cfs)	1657.00	Flow (cfs)	237.16	1202.77	217.07
Top Width (ft)	489.43	Top Width (ft)	147.57	54.01	287.85
Vel Total (ft/s)	4.02	Avg. Vel. (ft/s)	1.78	6.32	2.44
Max Chl Dpth (ft)	3.88	Hydr. Depth (ft)	0.90	3.52	1.45
Conv. Total (cfs)	25788.6	Conv. (cfs)	3691.0	18719.2	3378.4
Length Wtd. (ft)	518.17	Wetted Per. (ft)	148.37	54.01	61.42
Min Ch El (ft)	7781.30	Shear (lb/sq ft)	0.23	0.91	0.37
Alpha	1.87	Stream Power (lb/ft s)	0.41	5.74	0.91
Frctn Loss (ft)	1.88	Cum Volume (acre-ft)	9.92	32.88	6.56
C & E Loss (ft)	0.03	Cum SA (acres)	6.22	8.81	5.61

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7786.14	Element			
Vel Head (ft)	0.35	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7785.79	Reach Len. (ft)	602.05	535.11	226.70
Crit W.S. (ft)	7785.05	Flow Area (sq ft)	230.48	223.32	130.37
E.G. Slope (ft/ft)	0.002742	Area (sq ft)	230.48	223.32	432.07
Q Total (cfs)	2031.00	Flow (cfs)	445.38	1278.93	306.69
Top Width (ft)	605.90	Top Width (ft)	165.73	54.01	386.15
Vel Total (ft/s)	3.48	Avg. Vel. (ft/s)	1.93	5.73	2.35
Max Chl Dpth (ft)	4.49	Hydr. Depth (ft)	1.39	4.13	1.86
Conv. Total (cfs)	38784.4	Conv. (cfs)	8505.1	24422.8	5856.5
Length Wtd. (ft)	516.97	Wetted Per. (ft)	166.57	54.01	70.15

Min Ch El (ft)	7781.30	Shear (lb/sq ft)	0.24	0.71	0.32
Alpha	1.85	Stream Power (lb/ft s)	0.46	4.05	0.75
Frctn Loss (ft)	1.52	Cum Volume (acre-ft)	12.91	37.23	9.57
C & E Loss (ft)	0.06	Cum SA (acres)	7.16	8.81	6.61

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7786.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.25	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7786.54	Reach Len. (ft)	602.05	535.11	226.70
Crit W.S. (ft)	7785.37	Flow Area (sq ft)	355.50	263.62	182.59
E.G. Slope (ft/ft)	0.001767	Area (sq ft)	355.50	263.62	720.92
Q Total (cfs)	2515.00	Flow (cfs)	730.04	1353.42	431.55
Top Width (ft)	611.62	Top Width (ft)	169.48	54.01	388.12
Vel Total (ft/s)	3.14	Avg. Vel. (ft/s)	2.05	5.13	2.36
Max Chl Dpth (ft)	5.24	Hydr. Depth (ft)	2.10	4.88	2.61
Conv. Total (cfs)	59837.9	Conv. (cfs)	17369.3	32201.1	10267.5
Length Wtd. (ft)	515.37	Wetted Per. (ft)	170.40	54.01	70.15
Min Ch El (ft)	7781.30	Shear (lb/sq ft)	0.23	0.54	0.29
Alpha	1.66	Stream Power (lb/ft s)	0.47	2.76	0.68
Frctn Loss (ft)	1.19	Cum Volume (acre-ft)	17.89	42.46	13.88
C & E Loss (ft)	0.08	Cum SA (acres)	10.54	8.81	7.97

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 8077

INPUT
Description:
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7808.75	9.66	7808.04	10.66	7807.96	32.8	7806.24	33.55	7806.19
41.18	7805.59	43.66	7805.4	54.52	7804.81	56.44	7804.69	60.99	7804.46
64.07	7804.21	65.37	7804.07	71.7	7803.51	76.23	7803.28	79.33	7803.04
86.65	7802.74	94.59	7802.12	97.95	7802.09	102.22	7802.21	108.81	7802.12
111.22	7802.01	112.65	7801.95	113.83	7801.74	119.66	7800.68	125.73	7799.62
130.02	7798.85	131.87	7798.37	136.74	7798.09	140.37	7797.83	148	7797.33
152.24	7797.16	155.63	7797.09	163.1	7797	170.89	7796.94	173.95	7796.82
184.81	7796.52	189.31	7796.33	193.78	7796.13	195.67	7796.05	201.41	7795.72
214.98	7795.17	216.67	7795.07	224.3	7794.59	228.25	7794.37	231.93	7794.15
239.1	7793.7	240.64	7793.62	247.19	7793.25	249.96	7793.1	254.82	7792.75
260.82	7792.46	262.45	7792.36	266.31	7792.1	271.68	7791.63	277.71	7791.12
282.54	7790.54	285.34	7790.32	291.97	7789.81	292.97	7789.73	293.39	7789.67
294.03	7789.57	303.11	7788.25	309.15	7787.33	316.48	7787.08	332.24	7786.8
338.27	7787.08	343.3	7787.03	346.38	7786.99	358.54	7786.94	361.64	7786.95
368.97	7786.89	380.26	7786.69	384.53	7786.86	391.12	7786.98	400.39	7787.35
404.35	7787.27	406.71	7787.15	412.91	7787.37	417.91	7787.58	420.54	7787.55
422.69	7787.68	428.78	7787.93	432.83	7788.11	438.24	7788.34	441.71	7788.46
444.91	7788.55	451.17	7788.78	456.45	7788.48	458.84	7788.37	462.4	7788.28
463.37	7788.08	465.1	7786.8	482.1	7778.8	507.1	7776.35	526.8	7778.8
542.2	7786.8	549.27	7788.31	553.09	7788.14	561.08	7787.73	562.46	7787.61
564.22	7787.52	573.01	7787.27	582.03	7787.13	595.97	7787.02	603.33	7786.89
608.29	7787.24	613.43	7786.94	616.13	7787.25	617.7	7787.31	623.18	7787.51
626.59	7787.49	634.75	7787.83	636.8	7787.84	639.29	7787.92	642.43	7787.94
645.86	7787.98	657.8	7787.84	659.96	7787.79	667.01	7787.7	671.79	7787.63
674.81	7787.62	689.78	7787.69	696.95	7787.67	709.89	7787.76	714.32	7787.75
720.11	7787.8	724.41	7787.79	727.31	7787.79	730.17	7787.52	739.87	7787.5
743.78	7787.54	748.14	7787.83	763.71	7787.95	771.18	7787.98	778.58	7787.97
800.71	7788.13	808.1	7788.17	814.95	7788.15	826.68	7788.21	829.01	7788.25
842.55	7788.31	849.67	7788.42	877.94	7788.76	881.65	7788.88	900.02	7789.1
904.23	7789.21	930.34	7789.43	933.22	7789.54	955.38	7791.97	959.61	7795.54
964.28	7799.52	969.7	7804.2	979.79	7810.68	982.09	7812.39	989.88	7817.29
991.8	7818.64	994.21	7820.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	482.1	.035	526.8	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
482.1	526.8	23.98	28.33	40.69	.3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	467.4	7786.8	T
535.4	994.21	7787.75	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7784.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7783.90	Reach Len. (ft)	7.00	7.00	7.00
Crit W.S. (ft)	7782.05	Flow Area (sq ft)	27.68	282.92	24.69
E.G. Slope (ft/ft)	0.003110	Area (sq ft)	27.68	282.92	25.08
Q Total (cfs)	2413.00	Flow (cfs)	66.80	2282.61	63.59
Top Width (ft)	65.37	Top Width (ft)	10.85	44.70	9.83
Vel Total (ft/s)	7.20	Avg. Vel. (ft/s)	2.41	8.07	2.58
Max Chl Dpth (ft)	7.55	Hydr. Depth (ft)	2.55	6.33	2.87
Conv. Total (cfs)	43271.8	Conv. (cfs)	1197.8	40933.6	1140.4
Length Wtd. (ft)	7.00	Wetted Per. (ft)	11.99	44.97	9.69
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.45	1.22	0.49
Alpha	1.20	Stream Power (lb/ft s)	1.08	9.85	1.27
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	12.06	35.66	9.37
C & E Loss (ft)	0.00	Cum SA (acres)	6.17	8.20	5.82

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7784.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7783.91	Reach Len. (ft)	7.00	7.00	7.00
Crit W.S. (ft)	7782.06	Flow Area (sq ft)	27.78	283.31	24.76
E.G. Slope (ft/ft)	0.003094	Area (sq ft)	27.78	283.31	25.16
Q Total (cfs)	2413.00	Flow (cfs)	66.97	2282.27	63.76
Top Width (ft)	65.38	Top Width (ft)	10.85	44.70	9.83
Vel Total (ft/s)	7.18	Avg. Vel. (ft/s)	2.41	8.06	2.57
Max Chl Dpth (ft)	7.56	Hydr. Depth (ft)	2.56	6.34	2.88
Conv. Total (cfs)	43378.5	Conv. (cfs)	1204.0	41028.3	1146.2
Length Wtd. (ft)	7.00	Wetted Per. (ft)	12.00	44.97	9.69
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.45	1.22	0.49
Alpha	1.20	Stream Power (lb/ft s)	1.08	9.80	1.27
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	6.20	38.04	5.12
C & E Loss (ft)	0.01	Cum SA (acres)	1.93	8.20	2.07

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7783.73	Element			
Vel Head (ft)	0.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7782.92	Reach Len. (ft)	7.00	7.00	7.00
Crit W.S. (ft)	7781.30	Flow Area (sq ft)	18.01	238.77	16.31
E.G. Slope (ft/ft)	0.003255	Area (sq ft)	18.01	238.77	16.31
Q Total (cfs)	1833.00	Flow (cfs)	38.51	1760.05	34.44
Top Width (ft)	61.37	Top Width (ft)	8.75	44.70	7.92
Vel Total (ft/s)	6.71	Avg. Vel. (ft/s)	2.14	7.37	2.11
Max Chl Dpth (ft)	6.57	Hydr. Depth (ft)	2.06	5.34	2.06
Conv. Total (cfs)	32129.1	Conv. (cfs)	675.0	30850.4	603.6
Length Wtd. (ft)	7.00	Wetted Per. (ft)	9.67	44.97	8.93
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.38	1.08	0.37
Alpha	1.16	Stream Power (lb/ft s)	0.81	7.95	0.78
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	8.87	30.24	5.99
C & E Loss (ft)	0.00	Cum SA (acres)	5.14	8.20	4.84

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7784.56	Element			
Vel Head (ft)	0.92	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7783.64	Reach Len. (ft)	7.00	7.00	7.00
Crit W.S. (ft)	7781.84	Flow Area (sq ft)	24.86	270.98	22.39
E.G. Slope (ft/ft)	0.003142	Area (sq ft)	24.86	270.98	22.52
Q Total (cfs)	2248.00	Flow (cfs)	58.18	2135.50	54.32
Top Width (ft)	64.29	Top Width (ft)	10.28	44.70	9.31
Vel Total (ft/s)	7.06	Avg. Vel. (ft/s)	2.34	7.88	2.43
Max Chl Dpth (ft)	7.29	Hydr. Depth (ft)	2.42	6.06	2.60
Conv. Total (cfs)	40102.3	Conv. (cfs)	1037.9	38095.3	969.1
Length Wtd. (ft)	7.00	Wetted Per. (ft)	11.36	44.97	9.69
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.43	1.18	0.45
Alpha	1.19	Stream Power (lb/ft s)	1.00	9.32	1.10
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	11.14	34.19	8.39
C & E Loss (ft)	0.00	Cum SA (acres)	5.94	8.20	5.59

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7785.52	Element			
Vel Head (ft)	1.05	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7784.46	Reach Len. (ft)	7.00	7.00	7.00
Crit W.S. (ft)	7782.47	Flow Area (sq ft)	34.06	307.83	29.48
E.G. Slope (ft/ft)	0.003070	Area (sq ft)	34.06	307.83	30.85
Q Total (cfs)	2783.00	Flow (cfs)	87.49	2610.59	84.92
Top Width (ft)	67.63	Top Width (ft)	12.03	44.70	10.90
Vel Total (ft/s)	7.49	Avg. Vel. (ft/s)	2.57	8.48	2.88
Max Chl Dpth (ft)	8.11	Hydr. Depth (ft)	2.83	6.89	3.43
Conv. Total (cfs)	50224.8	Conv. (cfs)	1579.0	47113.3	1532.6
Length Wtd. (ft)	7.00	Wetted Per. (ft)	13.30	44.97	9.69
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.49	1.31	0.58
Alpha	1.21	Stream Power (lb/ft s)	1.26	11.13	1.68
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	15.20	38.95	11.93
C & E Loss (ft)	0.00	Cum SA (acres)	9.29	8.20	6.93

BRIDGE

RIVER: Crystal
REACH: Marble RS: 8070

INPUT
Description: BRIDGE NO. 2 - ISLAND LAKE
Distance from Upstream XS = 7
Deck/Roadway Width = 14.8
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 20

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
400	7786.78		427.9	7787.78		453	7789.26	
467.4	7789.26		467.4	7793.85	7787.35	535.4	7793.85	7787.35
535.4	7789.55		560	7788.5		585	7787.75	
624	7787.77		664	7788.11		688	7788.18	
713	7788.32		738	7788.38		763	7788.39	
789	7788.23		819	7788.43		844	7788.22	
874	7788.36		899	7789				

Upstream Bridge Cross Section Data
Station Elevation Data num= 157

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7808.75	9.66	7808.04	10.66	7807.96	32.8	7806.24	33.55	7806.19
41.18	7805.59	43.66	7805.4	54.52	7804.81	56.44	7804.69	60.99	7804.46
64.07	7804.21	65.37	7804.07	71.7	7803.51	76.23	7803.28	79.33	7803.04
86.65	7802.74	94.59	7802.12	97.95	7802.09	102.22	7802.21	108.81	7802.12
111.22	7802.01	112.65	7801.95	113.83	7801.74	119.66	7800.68	125.73	7799.62
130.02	7798.85	131.87	7798.37	136.74	7798.09	140.37	7797.83	148	7797.33
152.24	7797.16	155.63	7797.09	163.1	7797	170.89	7796.94	173.95	7796.82
184.81	7796.52	189.31	7796.33	193.78	7796.13	195.67	7796.05	201.41	7795.72
214.98	7795.17	216.67	7795.07	224.3	7794.59	228.25	7794.37	231.93	7794.15
239.1	7793.7	240.64	7793.62	247.19	7793.25	249.96	7793.1	254.82	7792.75
260.82	7792.46	262.45	7792.36	266.31	7792.1	271.68	7791.83	277.71	7791.42
282.54	7790.54	285.34	7790.32	291.97	7789.81	292.97	7789.73	293.39	7789.67
294.03	7789.57	303.11	7788.25	309.15	7787.33	316.48	7787.08	332.24	7786.8
338.27	7787.08	343.3	7787.03	346.38	7786.99	358.54	7786.94	361.64	7786.95
368.97	7786.89	380.26	7786.69	384.53	7786.86	391.12	7786.98	400.39	7787.35
404.35	7787.27	406.71	7787.15	412.91	7787.37	417.91	7787.58	420.54	7787.55
422.69	7787.68	428.78	7787.93	432.83	7788.11	438.24	7788.34	441.71	7788.46
444.91	7788.55	451.17	7788.78	456.45	7788.48	458.84	7788.37	462.4	7788.28
463.37	7788.08	465.1	7786.8	482.1	7778.8	507.1	7776.35	526.8	7778.8
542.2	7786.8	549.27	7788.31	553.09	7788.14	561.08	7787.73	562.46	7787.61
564.22	7787.52	573.01	7787.27	582.03	7787.13	595.97	7787.02	603.33	7786.89
608.29	7787.24	613.43	7786.94	616.13	7787.25	617.7	7787.31	623.18	7787.51
626.59	7787.49	634.75	7787.83	636.8	7787.84	639.29	7787.92	642.43	7787.94
645.86	7787.98	657.8	7787.84	659.96	7787.79	667.01	7787.7	671.79	7787.63
674.81	7787.62	689.78	7787.69	696.95	7787.67	709.89	7787.76	714.32	7787.75
720.11	7787.8	724.41	7787.79	727.31	7787.79	730.17	7787.52	739.87	7787.5
743.78	7787.54	748.14	7787.83	763.71	7787.95	771.18	7787.98	778.58	7787.97
800.71	7788.13	808.1	7788.17	814.95	7788.15	826.68	7788.21	829.01	7788.25
842.55	7788.31	849.67	7788.42	877.94	7788.76	881.65	7788.88	900.02	7789.1
904.23	7789.21	930.34	7789.43	933.22	7789.54	955.38	7791.97	959.61	7795.54
964.28	7799.52	969.7	7804.2	979.79	7810.68	982.09	7812.39	989.88	7817.29
991.8	7818.64	994.21	7820.24						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	482.1	.035	526.8	.06

Bank Sta: Left 482.1 Right 526.8 Coeff Contr. .3 Expan. .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	467.4	7786.8	T
535.4	994.21	7787.75	T

Downstream Deck/Roadway Coordinates
num= 21

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
380	7786.3		391	7786.78		421.2	7787.78	
446.6	7789.26		460	7789.26		460	7793.85	7787.35

528	7793.85	7787.35	528	7789.55		545.7	7788.5		
556.6	7787.75		564.4	7787.77		575.8	7788.11		
600	7788.18		629	7788.32		652	7788.38		
675	7788.39		701	7788.23		730	7788.43		
759	7788.22		790	7788.22		819	7789		

Downstream Bridge Cross Section Data
Station Elevation Data num= 166

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7802.68	2.86	7802.43	5.81	7802.14	11.32	7801.61	13.58	7801.52
20.96	7801.17	27.39	7800.67	28.83	7800.56	29.49	7800.5	35.54	7800.04
39.71	7799.78	51.47	7799.42	59.02	7799.22	66.76	7799	73.29	7798.57
74.86	7798.46	81.67	7798.08	84.45	7797.97	88.24	7797.76	94.52	7797.35
104.31	7796.38	106.43	7796.35	109.92	7796.04	114.97	7795.65	118.96	7795.31
125.68	7794.75	127.15	7794.64	129.74	7794.42	131.2	7794.31	139.74	7794.24
141	7794.06	145.81	7793.99	149.74	7793.91	161.01	7793.53	164.24	7793.43
168.15	7793.3	172.12	7793.13	172.94	7793.07	183.19	7792.29	186.06	7792.06
189.43	7791.89	194.88	7791.57	196.01	7791.5	197.98	7791.39	202.12	7791.15
204.47	7791.23	211.61	7791.77	216.19	7791.87	220.1	7791.93	226.04	7791.77
232.54	7791.58	234.82	7791.53	238.05	7791.43	241.23	7791.18	242.39	7791.13
243.77	7791	249.33	7790.23	260.32	7789.56	262.81	7789.4	268.28	7788.97
270.36	7788.81	271.31	7788.73	277.91	7788.29	282.3	7787.93	285.46	7787.7
289.2	7787.39	291.26	7787.3	332.16	7787.07	346.31	7786.79	349.91	7786.05
353.68	7786.42	356.05	7786.25	356.99	7786.62	361.79	7786.79	364.23	7786.73
368.61	7786.7	372.06	7786.61	376.86	7786.46	390.1	7786.36	394.97	7786.17
398.63	7786.14	404.39	7786.17	410.63	7786.8	416.82	7786.64	419.61	7786.56
425.09	7786.67	427.55	7786.73	435.76	7787	445.53	7787.23	448.96	7786.79
456.34	7786.55	457.6	7786.72	458	7784.8	469.2	7778.8	481.4	7776.35
510.3	7778.8	517.1	7780.8	528.7	7786.8	530.12	7788.23	532.21	7788.7
535.55	7788.24	537.02	7788.12	545.38	7787.48	550.94	7786.25	554.29	7785.46
561.76	7783.9	564.64	7783.18	571.59	7781.23	573.49	7780.65	585.33	7780.54
594.45	7780.48	606.03	7780.52	610.8	7780.39	616.38	7780.45	620.08	7780.44
623.18	7780.39	626.86	7780.27	630.98	7781.22	634.92	7782.21	636.2	7782.53
644.11	7782.49	646.35	7782.49	654.04	7782.48	658.5	7782.44	660.79	7782.33
666.58	7782.22	676.18	7781.93	678.47	7781.83	706.46	7782.16	708.87	7782.22
717.04	7782.38	719.86	7782.42	725.22	7782.52	730.21	7782.49	733.39	7782.53
745.34	7782.55	749.73	7782.59	757.91	7782.44	761.25	7782.48	763.99	7782.7
769.67	7782.88	772.78	7782.92	775.49	7783.06	779.31	7783	782.24	7783.34
784.22	7783.64	790.6	7784.59	792.3	7784.82	798.77	7785.81	807.31	7787.04
811.42	7787.78	819	7789	826.09	7788.98	831.53	7789.15	833.35	7789.21
836.15	7789.21	858.32	7789.38	875.08	7791.75	880.5	7795.85	885.43	7799.63
895.78	7807.42	896.85	7808.22	905.02	7814.17	906.13	7814.97	913.19	7819.5
914.21	7820.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	469.2	.035	510.3	.06

Bank Sta: Left Right Coeff Contr. Expan.
469.2 510.3 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	460	7786.05	T
528	914.21	7787.75	T

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7786.69
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7784.87	Element	7784.84	7784.67
W.S. US. (ft)	7783.90	E.G. Elev (ft)	7783.87	7783.32
Q Total (cfs)	2413.00	W.S. Elev (ft)	7782.07	7782.31
Q Bridge (cfs)	2413.00	Crit W.S. (ft)	7.52	6.97
Q Weir (cfs)		Max Chl Dpth (ft)	7.24	8.45
Weir Sta Lft (ft)		Vel Total (ft/s)	333.07	285.52
Weir Sta Rgt (ft)		Flow Area (sq ft)	0.58	0.70
Weir Submerg		Froude # Chl	1570.37	1455.22
Weir Max Depth (ft)		Specif Force (cu ft)	5.20	4.66
Min El Weir Flow (ft)	7786.81	Hydr Depth (ft)	66.57	63.61
Min El Prs (ft)	7787.35	W.P. Total (ft)	42854.3	34099.8
Delta EG (ft)	0.47	Conv. Total (cfs)	64.07	61.22
Delta WS (ft)	1.64	Top Width (ft)	0.06	0.05
BR Open Area (sq ft)	549.76	Frctn Loss (ft)	0.11	0.23
BR Open Vel (ft/s)	8.45	C & E Loss (ft)	0.99	1.40
Coef of Q		Shear Total (lb/sq ft)	7.17	11.86
Br Sel Method	Energy only	Power Total (lb/ft s)		

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #Floodway

			Inside BR US	Inside BR DS
E.G. US. (ft)	7784.87	Element	7784.84	7784.69
W.S. US. (ft)	7783.91	E.G. Elev (ft)	7783.86	7783.37
Q Total (cfs)	2413.00	W.S. Elev (ft)	7782.07	7782.34
Q Bridge (cfs)	2413.00	Crit W.S. (ft)	7.51	7.02
Q Weir (cfs)		Max Chl Dpth (ft)	7.46	8.41
Weir Sta Lft (ft)		Vel Total (ft/s)	323.65	287.06
Weir Sta Rgt (ft)		Flow Area (sq ft)	0.56	0.69
Weir Submerg		Froude # Chl	1563.41	1459.84
Weir Max Depth (ft)		Specif Force (cu ft)	5.58	4.84
Min El Weir Flow (ft)	7787.76	Hydr Depth (ft)	59.82	61.46
Min El Prs (ft)	7787.35	W.P. Total (ft)	42622.4	34622.0
Delta EG (ft)	0.23	Conv. Total (cfs)	57.97	59.33
Delta WS (ft)	0.66	Top Width (ft)	0.06	0.03
BR Open Area (sq ft)	526.07	Frctn Loss (ft)	0.10	0.02
BR Open Vel (ft/s)	8.41	C & E Loss (ft)	1.08	1.42
Coef of Q		Shear Total (lb/sq ft)	8.07	11.91
Br Sel Method	Energy only	Power Total (lb/ft s)		

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the

downstream energy. This is not physically possible, the momentum answer has been disregarded.

BRIDGE OUTPUT Profile #10-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7783.73	Element		
W.S. US. (ft)	7782.92	E.G. Elev (ft)	7783.71	7783.54
Q Total (cfs)	1833.00	W.S. Elev (ft)	7782.88	7782.37
Q Bridge (cfs)	1833.00	Crit W.S. (ft)	7781.34	7781.56
Q Weir (cfs)		Max Chl Dpth (ft)	6.53	6.02
Weir Sta Lft (ft)		Vel Total (ft/s)	6.77	8.01
Weir Sta Rgt (ft)		Flow Area (sq ft)	270.87	228.90
Weir Submerg		Froude # Chl	0.57	0.71
Weir Max Depth (ft)		Specif Force (cu ft)	1096.98	1010.48
Min El Weir Flow (ft)	7786.81	Hydr Depth (ft)	4.42	3.97
Min El Prs (ft)	7787.35	W.P. Total (ft)	63.41	59.52
Delta EG (ft)	0.40	Conv. Total (cfs)	31752.3	24819.0
Delta WS (ft)	1.30	Top Width (ft)	61.23	57.60
BR Open Area (sq ft)	549.76	Frctn Loss (ft)	0.06	0.05
BR Open Vel (ft/s)	8.01	C & E Loss (ft)	0.10	0.16
Coef of Q		Shear Total (lb/sq ft)	0.89	1.31
Br Sel Method	Energy only	Power Total (lb/ft s)	6.01	10.49

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #50-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7784.56	Element		
W.S. US. (ft)	7783.64	E.G. Elev (ft)	7784.54	7784.37
Q Total (cfs)	2248.00	W.S. Elev (ft)	7783.60	7783.07
Q Bridge (cfs)	2248.00	Crit W.S. (ft)	7781.88	7782.10
Q Weir (cfs)		Max Chl Dpth (ft)	7.25	6.72
Weir Sta Lft (ft)		Vel Total (ft/s)	7.11	8.32
Weir Sta Rgt (ft)		Flow Area (sq ft)	316.00	270.22
Weir Submerg		Froude # Chl	0.59	0.70
Weir Max Depth (ft)		Specif Force (cu ft)	1432.34	1325.84
Min El Weir Flow (ft)	7786.81	Hydr Depth (ft)	4.98	4.48
Min El Prs (ft)	7787.35	W.P. Total (ft)	65.94	62.53
Delta EG (ft)	0.46	Conv. Total (cfs)	39693.1	31517.6
Delta WS (ft)	1.56	Top Width (ft)	63.51	60.27
BR Open Area (sq ft)	549.76	Frctn Loss (ft)	0.06	0.05
BR Open Vel (ft/s)	8.32	C & E Loss (ft)	0.11	0.22
Coef of Q		Shear Total (lb/sq ft)	0.96	1.37
Br Sel Method	Energy only	Power Total (lb/ft s)	6.83	11.42

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #500-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7785.52	Element		
W.S. US. (ft)	7784.46	E.G. Elev (ft)	7785.49	7785.32
Q Total (cfs)	2783.00	W.S. Elev (ft)	7784.43	7783.84
Q Bridge (cfs)	2783.00	Crit W.S. (ft)	7782.50	7782.74
Q Weir (cfs)		Max Chl Dpth (ft)	8.08	7.49
Weir Sta Lft (ft)		Vel Total (ft/s)	7.54	8.76
Weir Sta Rgt (ft)		Flow Area (sq ft)	369.13	317.86
Weir Submerg		Froude # Chl	0.57	0.71
Weir Max Depth (ft)		Specif Force (cu ft)	1886.59	1751.70
Min El Weir Flow (ft)	7786.81	Hydr Depth (ft)	5.66	5.05
Min El Prs (ft)	7787.35	W.P. Total (ft)	67.88	65.60
Delta EG (ft)	0.49	Conv. Total (cfs)	49785.0	39734.8
Delta WS (ft)	1.74	Top Width (ft)	65.26	62.99
BR Open Area (sq ft)	549.76	Frctn Loss (ft)	0.06	0.04
BR Open Vel (ft/s)	8.76	C & E Loss (ft)	0.12	0.25
Coef of Q		Shear Total (lb/sq ft)	1.06	1.48
Br Sel Method	Energy only	Power Total (lb/ft s)	8.00	12.99

Warning: For the final momentum answer at the bridge, the upstream energy was computed lower than the downstream energy. This is not physically possible, the momentum answer has been disregarded.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 8048

INPUT
Description:
Station Elevation Data num= 166

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7802.68	2.86	7802.43	5.81	7802.14	11.32	7801.61	13.58	7801.52
20.96	7801.17	27.39	7800.67	28.83	7800.56	29.49	7800.5	35.54	7800.04
39.71	7799.78	51.47	7799.42	59.02	7799.22	66.76	7799	73.29	7798.57
74.86	7798.46	81.67	7798.08	84.45	7797.97	88.24	7797.76	94.52	7797.35
104.31	7796.38	106.43	7796.35	109.92	7796.04	114.97	7795.65	118.96	7795.31
125.68	7794.75	127.15	7794.64	129.74	7794.42	131.2	7794.31	139.74	7794.24
141	7794.06	145.81	7793.99	149.74	7793.91	161.01	7793.53	164.24	7793.43
168.15	7793.3	172.12	7793.13	172.94	7793.07	183.19	7792.29	186.06	7792.06
188.43	7791.89	194.86	7791.57	196.03	7791.5	197.98	7791.39	202.11	7791.15
204.47	7791.23	211.61	7791.77	216.19	7791.87	220.1	7791.93	226.04	7791.77
232.54	7791.58	234.82	7791.53	238.05	7791.43	241.23	7791.18	242.38	7791.13
243.77	7791	249.33	7790.23	260.32	7789.56	262.81	7789.4	268.28	7788.97
270.36	7788.81	271.31	7788.73	277.91	7788.29	282.3	7787.93	285.46	7787.7
289.2	7787.39	291.26	7787.3	332.16	7787.07	346.31	7786.79	349.91	7786.05
353.68	7786.42	356.05	7786.25	356.99	7786.62	361.79	7786.79	364.23	7786.73
368.61	7786.7	372.06	7786.61	376.86	7786.46	390.1	7786.36	394.97	7786.17
398.63	7786.14	404.39	7786.17	410.63	7786.8	416.82	7786.64	419.61	7786.56
425.09	7786.67	427.55	7786.73	435.76	7787	445.53	7787.23	448.96	7786.79
456.34	7786.55	457.6	7786.72	458	7784.8	469.2	7778.8	481.4	7776.35
510.3	7778.8	517.1	7780.8	528.7	7786.8	530.12	7788.23	532.21	7788.7
535.55	7788.24	537.02	7788.12	545.38	7787.48	550.94	7786.25	554.29	7785.46
561.76	7783.9	564.64	7783.18	571.59	7781.23	573.49	7780.65	585.33	7780.54
594.45	7780.48	606.03	7780.52	610.8	7780.39	616.38	7780.45	620.08	7780.44
623.18	7780.39	626.86	7780.27	630.98	7781.22	634.92	7782.21	636.2	7782.53
644.11	7782.49	646.35	7782.49	654.04	7782.48	658.5	7782.44	660.79	7782.33
666.58	7782.22	676.18	7781.93	678.47	7781.83	706.46	7782.16	708.87	7782.22
717.04	7782.38	719.86	7782.42	725.22	7782.52	730.21	7782.49	733.39	7782.53
745.34	7782.55	749.73	7782.59	757.91	7782.44	761.25	7782.48	763.99	7782.7
769.67	7782.88	772.78	7782.92	775.49	7783.06	779.31	7783	782.24	7783.34
784.22	7783.64	790.6	7784.59	792.3	7784.82	798.77	7785.81	807.31	7787.04
811.42	7787.78	819	7789	826.09	7788.98	831.53	7789.15	833.35	7789.21
836.15	7789.21	858.32	7789.38	875.08	7791.75	880.5	7795.85	885.43	7799.63
895.78	7807.42	896.85	7808.22	905.02	7814.17	906.13	7814.97	913.19	7819.5
914.21	7820.1								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	469.2	.035	510.3	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
469.2	510.3	453.73	488.71	373.76 .3	.5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	460	7786.05	T
528	914.21	7787.75	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7784.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.13	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7782.26	Reach Len. (ft)	453.73	488.71	373.76
Crit W.S. (ft)	7782.26	Flow Area (sq ft)	11.20	192.73	18.83
E.G. Slope (ft/ft)	0.010227	Area (sq ft)	11.20	192.73	136.87
Q Total (cfs)	2413.00	Flow (cfs)	37.20	2305.18	70.62
Top Width (ft)	171.28	Top Width (ft)	6.47	41.10	123.72
Vel Total (ft/s)	10.83	Avg. Vel. (ft/s)	3.32	11.96	3.75
Max Chl Dpth (ft)	5.91	Hydr. Depth (ft)	1.73	4.69	1.96
Conv. Total (cfs)	23860.8	Conv. (cfs)	367.8	22794.6	698.4
Length Wtd. (ft)	477.52	Wetted Per. (ft)	7.34	41.45	10.28
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.97	2.97	1.17
Alpha	1.17	Stream Power (lb/ft s)	3.24	35.51	4.39
Frctn Loss (ft)	2.84	Cum Volume (acre-ft)	12.05	35.50	9.35
C & E Loss (ft)	0.73	Cum SA (acres)	6.16	8.17	5.80

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7784.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.39	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7783.25	Reach Len. (ft)	453.73	488.71	373.76
Crit W.S. (ft)		Flow Area (sq ft)	17.57	233.18	29.25
E.G. Slope (ft/ft)	0.005246	Area (sq ft)	17.57	233.18	284.44
Q Total (cfs)	2413.00	Flow (cfs)	51.87	2268.26	92.87
Top Width (ft)	205.86	Top Width (ft)	6.47	41.10	158.29
Vel Total (ft/s)	8.62	Avg. Vel. (ft/s)	2.95	9.73	3.18
Max Chl Dpth (ft)	6.90	Hydr. Depth (ft)	2.72	5.67	2.54
Conv. Total (cfs)	33314.0	Conv. (cfs)	716.1	31315.7	1282.2
Length Wtd. (ft)	480.16	Wetted Per. (ft)	8.32	41.45	12.42
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.69	1.84	0.77
Alpha	1.21	Stream Power (lb/ft s)	2.04	17.92	2.45
Frctn Loss (ft)	2.88	Cum Volume (acre-ft)	6.19	37.87	5.09
C & E Loss (ft)	0.06	Cum SA (acres)	1.93	8.17	2.05

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7783.33	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.71	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7781.61	Reach Len. (ft)	453.73	488.71	373.76
Crit W.S. (ft)	7781.51	Flow Area (sq ft)	7.38	165.94	12.96
E.G. Slope (ft/ft)	0.009938	Area (sq ft)	7.38	165.94	78.28
Q Total (cfs)	1833.00	Flow (cfs)	21.03	1770.71	41.26
Top Width (ft)	117.03	Top Width (ft)	5.25	41.10	70.68
Vel Total (ft/s)	9.84	Avg. Vel. (ft/s)	2.85	10.67	3.18
Max Chl Dpth (ft)	5.26	Hydr. Depth (ft)	1.41	4.04	1.55
Conv. Total (cfs)	18387.0	Conv. (cfs)	211.0	17762.1	413.9
Length Wtd. (ft)	478.74	Wetted Per. (ft)	5.96	41.45	8.86
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.77	2.48	0.91
Alpha	1.14	Stream Power (lb/ft s)	2.19	26.51	2.89
Frctn Loss (ft)	2.96	Cum Volume (acre-ft)	8.86	30.10	5.98
C & E Loss (ft)	0.55	Cum SA (acres)	5.13	8.17	4.83

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7784.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.03	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7782.07	Reach Len. (ft)	453.73	488.71	373.76
Crit W.S. (ft)	7782.07	Flow Area (sq ft)	10.00	184.84	17.02
E.G. Slope (ft/ft)	0.010269	Area (sq ft)	10.00	184.84	115.06
Q Total (cfs)	2248.00	Flow (cfs)	32.02	2154.52	61.46
Top Width (ft)	149.78	Top Width (ft)	6.11	41.10	102.57
Vel Total (ft/s)	10.61	Avg. Vel. (ft/s)	3.20	11.66	3.61
Max Chl Dpth (ft)	5.72	Hydr. Depth (ft)	1.64	4.50	1.84
Conv. Total (cfs)	22183.7	Conv. (cfs)	316.0	21261.3	606.5
Length Wtd. (ft)	477.85	Wetted Per. (ft)	6.93	41.45	9.86
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	0.92	2.86	1.11
Alpha	1.16	Stream Power (lb/ft s)	2.96	33.33	4.00
Frctn Loss (ft)	2.90	Cum Volume (acre-ft)	11.13	34.04	8.37
C & E Loss (ft)	0.68	Cum SA (acres)	5.93	8.17	5.57

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

					CrystalRiver,rep	
E.G. Elev (ft)	7785.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.30	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7782.72	Reach Len. (ft)	453.73	488.71	373.76
Crit W.S. (ft)	7782.72	Flow Area (sq ft)	14.34	211.45	23.42
E.G. Slope (ft/ft)	0.009837	Area (sq ft)	14.34	211.45	213.56
Q Total (cfs)	2783.00	Flow (cfs)	50.72	2638.60	93.69
Top Width (ft)	257.26	Top Width (ft)	7.32	41.10	208.84
Vel Total (ft/s)	11.17	Avg. Vel. (ft/s)	3.54	12.48	4.00
Max Chl Dpth (ft)	6.37	Hydr. Depth (ft)	1.96	5.14	2.23
Conv. Total (cfs)	28059.8	Conv. (cfs)	511.4	26603.8	944.6
Length Wtd. (ft)	476.80	Wetted Per. (ft)	8.30	41.45	11.27
Min Ch El (ft)	7776.35	Shear (lb/sq ft)	1.06	3.13	1.28
Alpha	1.19	Stream Power (lb/ft s)	3.75	39.10	5.11
Frctn Loss (ft)	2.63	Cum Volume (acre-ft)	15.18	38.77	11.89
C & E Loss (ft)	0.81	Cum SA (acres)	9.28	8.17	6.91

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 7560

INPUT
Description:
Station Elevation Data num= 155

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7806.67	1.74	7806.5	2.41	7806.44	9.82	7805.59	14.05	7805.07
20.21	7804.03	21.28	7803.86	23.95	7803.74	25.34	7803.68	32.04	7803.52
36.62	7803.4	39.45	7803.37	47.89	7803.42	57.84	7803.54	62.2	7803.24
66.4	7803.31	69.08	7803.22	70.49	7803.11	76.49	7802.47	81.78	7802.01
83.9	7801.83	87.95	7801.58	91.31	7801.36	93.07	7801.26	98.72	7800.8
104.36	7800.29	106.13	7800.1	109.5	7799.83	113.53	7799.58	115.64	7799.47
120.94	7799.34	126.93	7799.16	128.5	7799.11	131.05	7798.98	135.76	7798.75
138.22	7798.64	148.07	7797.89	149.8	7797.79	157.98	7798.08	160.8	7798.07
165.39	7797.92	172.09	7798.42	174.16	7798.43	180.21	7798.24	183.38	7798.48
187.62	7798.38	194.67	7797.98	207.8	7797.27	216.63	7797.61	224.66	7796.92
228.53	7796.53	232.07	7796.2	238.82	7795.23	239.48	7795.14	239.82	7795.09
246.88	7794.07	251.11	7793.47	262.05	7792.4	274.48	7792.25	276.79	7792.23
284.46	7791.21	288.33	7793.62	290.54	7793.31	296.26	7792.29	301.07	7791.26
302.17	7791.11	307.55	7790.96	314.06	7790.64	318.84	7790.77	322.25	7790.59
326.5	7790.28	328.87	7790.05	330.53	7789.98	336.73	7790.27	341.42	7790.6
343.19	7790.72	346.58	7790.85	350.6	7791.05	352.71	7791.01	358.14	7790.93
362.06	7790.86	362.68	7790.72	363.99	7790.34	372.83	7790.19	375.28	7790.14
386.57	7789.93	387.64	7789.86	389.69	7789.58	395.05	7788.97	397.86	7788.55
399.74	7788.26	404.81	7787.82	409.53	7786.92	411.24	7786.56	417.28	7785.67
420.44	7785.17	424.68	7784.49	431.73	7782.69	432.13	7782.58	435.44	7781.86
437.06	7781.46	438.71	7781.06	441.64	7780.46	442.78	7780.1	679.37	7780.11
681.09	7780.29	686.8	7782.24	687.95	7782.65	691.3	7782.4	698.79	7782
702.65	7781.8	703.84	7781.73	706.67	7781.59	713.94	7778.48	714.38	7779.35
722.65	7776.99	725.32	7777.04	735.84	7776.47	736.52	7776.41	743.02	7775.91
746	7776.2	747.81	7776.37	751.52	7777.01	753.82	7777.29	757.4	7777.4
763.37	7777.25	770.15	7777	771.1	7776.9	776.33	7776.28	777.64	7776.1
780.29	7775.75	781.67	7775.62	791.47	7774.61	792.94	7774.48	821.74	7774.49
822.14	7774.73	826.83	7777.56	837.3	7784.33	838.86	7785.3	839.37	7785.48
843.07	7786.45	853.94	7786.11	864.6	7785.81	869.43	7785.32	870.32	7785.72
872.11	7787.05	881.08	7795.11	883.27	7797.03	884	7797.77	885.4	7799.27
891.41	7805.78	894.56	7808.8	898.6	7812.34	901.52	7814.29	918.73	7824.06

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	442.78	.05	792.94	.035	821.74	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
792.94 821.74 426.58 436.49 444.55 .1 .3
Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	687.95	7782.65	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7780.62	Element			
Vel Head (ft)	0.67	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7779.95	Reach Len. (ft)	426.58	436.49	444.55
Crit W.S. (ft)		Flow Area (sq ft)	261.62	157.27	24.36
E.G. Slope (ft/ft)	0.003884	Area (sq ft)	261.62	157.27	24.36
Q Total (cfs)	2413.00	Flow (cfs)	1056.11	1290.31	66.58
Top Width (ft)	118.18	Top Width (ft)	80.61	28.80	8.78
Vel Total (ft/s)	5.44	Avg. Vel. (ft/s)	4.04	8.20	2.73
Max Chl Dpth (ft)	5.47	Hydr. Depth (ft)	3.25	5.46	2.77
Conv. Total (cfs)	38719.3	Conv. (cfs)	16946.4	20704.5	1068.4
Length Wtd. (ft)	434.31	Wetted Per. (ft)	81.30	28.80	10.34
Min Ch El (ft)	7774.48	Shear (lb/sq ft)	0.78	1.32	0.57
Alpha	1.46	Stream Power (lb/ft s)	3.15	10.86	1.56
Frctn Loss (ft)	2.49	Cum Volume (acre-ft)	10.63	33.53	8.66
C & E Loss (ft)	0.07	Cum SA (acres)	5.71	7.78	5.24

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7781.70	Element			
Vel Head (ft)	1.59	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7780.11	Reach Len. (ft)	426.58	436.49	444.55
Crit W.S. (ft)		Flow Area (sq ft)	82.59	161.98	25.80
E.G. Slope (ft/ft)	0.006936	Area (sq ft)	82.59	161.98	25.80
Q Total (cfs)	2413.00	Flow (cfs)	504.89	1811.24	96.87
Top Width (ft)	55.02	Top Width (ft)	17.44	28.80	8.78
Vel Total (ft/s)	8.92	Avg. Vel. (ft/s)	6.11	11.18	3.75
Max Chl Dpth (ft)	5.63	Hydr. Depth (ft)	4.74	5.62	2.94
Conv. Total (cfs)	28974.2	Conv. (cfs)	6062.5	21748.5	1163.1
Length Wtd. (ft)	435.62	Wetted Per. (ft)	21.28	28.80	10.50
Min Ch El (ft)	7774.48	Shear (lb/sq ft)	1.68	2.44	1.06
Alpha	1.28	Stream Power (lb/ft s)	10.28	27.23	3.99
Frctn Loss (ft)	3.02	Cum Volume (acre-ft)	5.66	35.65	3.76
C & E Loss (ft)	0.12	Cum SA (acres)	1.80	7.78	1.34

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7779.82	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7779.20	Reach Len. (ft)	426.58	436.49	444.55
Crit W.S. (ft)		Flow Area (sq ft)	202.51	135.81	18.25
E.G. Slope (ft/ft)	0.004211	Area (sq ft)	202.51	135.81	18.25
Q Total (cfs)	1833.00	Flow (cfs)	733.81	1052.09	47.10
Top Width (ft)	114.46	Top Width (ft)	78.04	28.80	7.63
Vel Total (ft/s)	5.14	Avg. Vel. (ft/s)	3.62	7.75	2.58
Max Chl Dpth (ft)	4.72	Hydr. Depth (ft)	2.60	4.72	2.39
Conv. Total (cfs)	28247.9	Conv. (cfs)	11308.6	16213.5	725.9
Length Wtd. (ft)	434.49	Wetted Per. (ft)	78.63	28.80	8.97
Min Ch El (ft)	7774.48	Shear (lb/sq ft)	0.68	1.24	0.54
Alpha	1.51	Stream Power (lb/ft s)	2.45	9.60	1.38
Frctn Loss (ft)	2.50	Cum Volume (acre-ft)	7.77	28.41	5.56
C & E Loss (ft)	0.04	Cum SA (acres)	4.70	7.78	4.49

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7780.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.66	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7779.73	Reach Len. (ft)	426.58	436.49	444.55
Crit W.S. (ft)		Flow Area (sq ft)	244.03	150.95	22.47
E.G. Slope (ft/ft)	0.004013	Area (sq ft)	244.03	150.95	22.47
Q Total (cfs)	2248.00	Flow (cfs)	962.19	1225.05	60.76
Top Width (ft)	117.09	Top Width (ft)	79.85	28.80	8.44
Vel Total (ft/s)	5.38	Avg. Vel. (ft/s)	3.94	8.12	2.70
Max Chl Dpth (ft)	5.25	Hydr. Depth (ft)	3.06	5.24	2.66
Conv. Total (cfs)	35485.4	Conv. (cfs)	15188.5	19337.8	959.1
Length Wtd. (ft)	434.36	Wetted Per. (ft)	80.51	28.80	9.93
Min Ch El (ft)	7774.48	Shear (lb/sq ft)	0.76	1.31	0.57
Alpha	1.47	Stream Power (lb/ft s)	2.99	10.66	1.53
Frctn Loss (ft)	2.47	Cum Volume (acre-ft)	9.81	32.15	7.78
C & E Loss (ft)	0.06	Cum SA (acres)	5.49	7.78	5.10

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7781.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.68	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7780.46	Reach Len. (ft)	426.58	436.49	444.55
Crit W.S. (ft)		Flow Area (sq ft)	303.72	172.15	29.10
E.G. Slope (ft/ft)	0.003531	Area (sq ft)	388.99	172.15	29.10
Q Total (cfs)	2783.00	Flow (cfs)	1272.09	1430.39	80.52
Top Width (ft)	360.73	Top Width (ft)	322.35	28.80	9.58
Vel Total (ft/s)	5.51	Avg. Vel. (ft/s)	4.19	8.31	2.77
Max Chl Dpth (ft)	5.98	Hydr. Depth (ft)	3.69	5.98	3.04
Conv. Total (cfs)	46833.1	Conv. (cfs)	21407.1	24071.0	1355.1
Length Wtd. (ft)	434.25	Wetted Per. (ft)	83.15	28.80	11.29
Min Ch El (ft)	7774.48	Shear (lb/sq ft)	0.83	1.32	0.57
Alpha	1.44	Stream Power (lb/ft s)	3.37	10.95	1.57
Frctn Loss (ft)	2.50	Cum Volume (acre-ft)	13.08	36.62	10.85
C & E Loss (ft)	0.11	Cum SA (acres)	7.56	7.78	5.97

Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 7123

INPUT
Description:
Station Elevation Data num= 144

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7806.7	3.68	7806.4	3.95	7806.45	5.27	7806.7	12.04	7805.35
13.82	7804.98	16.29	7804.44	20.35	7803.59	21.93	7803.48	24.11	7803.3
28.64	7803.11	34.4	7802.88	36.93	7802.77	40.39	7802.77	45.22	7802.62
48.02	7802.49	53.51	7802.32	84.44	7801.72	96.11	7801.37	103.25	7801.09
106.4	7800.92	111.54	7800.69	116.68	7800.44	119.57	7800.24	127.16	7799.65
127.68	7799.59	130.4	7799.23	134.47	7798.71	137.25	7798.34	138.83	7798.08
146.92	7796.74	150.57	7796.71	157.37	7796.67	159.83	7796.66	163.33	7796.58
168.11	7796.52	169.57	7796.4	179.81	7795.34	185.78	7794.89	192.27	7794.44
193.81	7794.3	198.75	7794	202.06	7793.84	209.18	7793.52	218.36	7793.44
227.6	7793.3	229.82	7793.31	234.13	7793.2	240.29	7793.15	245.02	7793.2
249.57	7793.31	260.32	7792.83	270.97	7792.06	277.34	7791.75	281.25	7791.55
285.63	7791.34	291.54	7790.87	293.92	7790.72	301.82	7790.48	303.8	7790.37
310.5	7789.96	318.79	7789.79	322.4	7789.62	332.68	7789.12	335.37	7789.06
342.97	7788.88	346.52	7788.79	351.95	7788.75	360.24	7788.56	363.54	7788.66
368.53	7788.58	371.82	7788.51	376.82	7788.54	384.11	7788.39	389.25	7788.41
393.4	7788.45	401.69	7788.28	404.68	7788.21	409.98	7788.2	414.97	7788.08
431.97	7787.42	434.85	7787.28	443.14	7786.89	445.82	7786.81	474.69	7785.52
476.3	7785.45	484.59	7785.08	486.97	7784.97	497.25	7784.52	517.41	7784.26
534.33	7783.86	538.4	7783.77	542.61	7783.69	548.68	7783.59	550.9	7783.55
558.97	7783.47	567.48	7783.23	575.77	7783.12	579.54	7783.08	584.06	7782.99
589.83	7782.74	592.35	7782.64	600.11	7782.31	602.86	7782.27	620.08	7782.07
624.43	7781.99	626.53	7780.85	627.7	7780.1	768.93	7780.1	772.64	7781.12
774.79	7781.7	776.61	7781.55	784.64	7780.86	785.3	7780.8	786.59	7780.52
795.54	7778.36	799.6	7777.52	805.83	7776.79	811.61	7776.7	816.15	7776.38
819.32	7775.55	824.47	7773.99	828.7	7773.03	867.3	7772.97	891.99	7772.98
898.04	7775.75	898.4	7775.92	900.83	7777.06	901.92	7777.57	908.48	7780.65
909.98	7780.81	914.52	7781.35	936.14	7781.56	941.66	7780.55	949.83	7787.05
957.11	7792.27	960.11	7794.52	970.58	7802.46	971.11	7802.85	971.2	7802.94
971.35	7803	980.68	7807.73	982.3	7808.5	986.25	7810.48		

Manning's n Values num= 4

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	626.53	.05	828.7	.035	891.99	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
828.7 891.99 478.48 448.85 416.42 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
0	775	7781.7	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7778.06	Element			
Vel Head (ft)	1.39	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7776.67	Reach Len. (ft)	478.48	448.85	416.42
Crit W.S. (ft)	7776.38	Flow Area (sq ft)	25.93	232.67	14.82
E.G. Slope (ft/ft)	0.009267	Area (sq ft)	25.93	232.67	14.82
Q Total (cfs)	2413.00	Flow (cfs)	98.01	2265.03	49.96
Top Width (ft)	87.90	Top Width (ft)	16.61	63.29	8.00
Vel Total (ft/s)	8.83	Avg. Vel. (ft/s)	3.78	9.74	3.37
Max Chl Dpth (ft)	3.70	Hydr. Depth (ft)	1.56	3.68	1.85
Conv. Total (cfs)	25065.7	Conv. (cfs)	1018.1	23528.7	519.0
Length Wtd. (ft)	454.45	Wetted Per. (ft)	17.07	63.29	8.81
Min Ch El (ft)	7772.97	Shear (lb/sq ft)	0.88	2.13	0.97
Alpha	1.15	Stream Power (lb/ft s)	3.32	20.71	3.28
Frctn Loss (ft)	1.38	Cum Volume (acre-ft)	9.22	31.58	8.46
C & E Loss (ft)	0.21	Cum SA (acres)	5.23	7.32	5.15

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7778.55	Element			
Vel Head (ft)	1.17	Wt. n-Val.		0.035	
W.S. Elev (ft)	7777.38	Reach Len. (ft)	478.48	448.85	416.42
Crit W.S. (ft)		Flow Area (sq ft)		277.79	
E.G. Slope (ft/ft)	0.006923	Area (sq ft)		277.79	
Q Total (cfs)	2413.00	Flow (cfs)		2413.00	
Top Width (ft)	63.29	Top Width (ft)		63.29	
Vel Total (ft/s)	8.69	Avg. Vel. (ft/s)		8.69	
Max Chl Dpth (ft)	4.41	Hydr. Depth (ft)		4.39	
Conv. Total (cfs)	29000.2	Conv. (cfs)		29000.2	
Length Wtd. (ft)	454.51	Wetted Per. (ft)		72.04	
Min Ch El (ft)	7772.97	Shear (lb/sq ft)		1.67	
Alpha	1.00	Stream Power (lb/ft s)		14.48	
Frctn Loss (ft)	2.92	Cum Volume (acre-ft)	5.26	33.45	3.62
C & E Loss (ft)	0.07	Cum SA (acres)	1.72	7.32	1.29

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7777.27	Element			
Vel Head (ft)	1.06	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7776.21	Reach Len. (ft)	478.48	448.85	416.42
Crit W.S. (ft)		Flow Area (sq ft)	19.68	203.84	11.39
E.G. Slope (ft/ft)	0.008369	Area (sq ft)	19.68	203.84	11.39
Q Total (cfs)	1833.00	Flow (cfs)	73.08	1726.51	33.41
Top Width (ft)	82.23	Top Width (ft)	11.90	63.29	7.03
Vel Total (ft/s)	7.80	Avg. Vel. (ft/s)	3.71	8.47	2.93
Max Chl Dpth (ft)	3.24	Hydr. Depth (ft)	1.65	3.22	1.62
Conv. Total (cfs)	20036.8	Conv. (cfs)	798.9	18872.7	365.2
Length Wtd. (ft)	454.21	Wetted Per. (ft)	12.33	63.29	7.74
Min Ch El (ft)	7772.97	Shear (lb/sq ft)	0.83	1.68	0.77
Alpha	1.12	Stream Power (lb/ft s)	3.10	14.25	2.26
Frctn Loss (ft)	3.07	Cum Volume (acre-ft)	6.68	26.71	5.41
C & E Loss (ft)	0.13	Cum SA (acres)	4.26	7.32	4.41

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7777.85	Element			
Vel Head (ft)	1.27	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7776.58	Reach Len. (ft)	478.48	448.85	416.42
Crit W.S. (ft)		Flow Area (sq ft)	24.57	227.29	14.15
E.G. Slope (ft/ft)	0.008705	Area (sq ft)	24.57	227.29	14.15
Q Total (cfs)	2248.00	Flow (cfs)	91.18	2111.32	45.51
Top Width (ft)	86.52	Top Width (ft)	15.41	63.29	7.82
Vel Total (ft/s)	8.45	Avg. Vel. (ft/s)	3.71	9.29	3.22
Max Chl Dpth (ft)	3.61	Hydr. Depth (ft)	1.59	3.59	1.81
Conv. Total (cfs)	24094.4	Conv. (cfs)	977.2	22629.4	487.8
Length Wtd. (ft)	454.39	Wetted Per. (ft)	15.86	63.29	8.61
Min Ch El (ft)	7772.97	Shear (lb/sq ft)	0.84	1.95	0.89
Alpha	1.15	Stream Power (lb/ft s)	3.12	18.13	2.87
Frctn Loss (ft)	3.29	Cum Volume (acre-ft)	8.49	30.26	7.59
C & E Loss (ft)	0.17	Cum SA (acres)	5.02	7.32	5.01

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7778.54	Element			
Vel Head (ft)	1.73	Wt. n-Val.	0.050	0.035	0.060
W.S. Elev (ft)	7776.81	Reach Len. (ft)	478.48	448.85	416.42
Crit W.S. (ft)	7776.57	Flow Area (sq ft)	28.66	241.51	15.96
E.G. Slope (ft/ft)	0.010960	Area (sq ft)	28.66	241.51	15.96
Q Total (cfs)	2783.00	Flow (cfs)	101.87	2621.15	59.98
Top Width (ft)	94.60	Top Width (ft)	23.01	63.29	8.30
Vel Total (ft/s)	9.73	Avg. Vel. (ft/s)	3.55	10.85	3.76
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	1.25	3.82	1.92
Conv. Total (cfs)	26583.1	Conv. (cfs)	973.1	25037.1	573.0
Length Wtd. (ft)	454.47	Wetted Per. (ft)	23.47	63.29	9.14
Min Ch El (ft)	7772.97	Shear (lb/sq ft)	0.84	2.61	1.19
Alpha	1.18	Stream Power (lb/ft s)	2.97	28.34	4.49
Frctn Loss (ft)	3.56	Cum Volume (acre-ft)	11.03	34.54	10.62
C & E Loss (ft)	0.32	Cum SA (acres)	5.87	7.32	5.88

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 6674

INPUT
Description:
Station Elevation Data num= 158

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7822.78	1.75	7822.46	11.48	7820.42	18.12	7818.94	18.67	7818.77
19.48	7818.51	25.87	7816.52	33.06	7814.85	37.22	7813.9	42.33	7811.88
47.45	7809.54	54.44	7806.82	54.65	7806.73	54.95	7806.6	64.21	7802.49

66.22	7801.59	69.36	7800.68	72.69	7799.65	76.24	7798.2	78.66	7796.73
83.43	7794.38	90.43	7790.52	90.63	7790.43	90.77	7790.33	90.99	7790.18
100	7783.68	103.96	7780.91	104.74	7780.8	108.16	7780.3	112.22	7779.77
114.98	7779.49	119.41	7778.95	125.9	7778.14	126.61	7778.06	127.09	7778
133.8	7777.22	139.2	7776.69	143.36	7776.27	148.47	7775.69	150.19	7775.5
158.07	7774.05	158.78	7773.9	159.1	7773.83	162.25	7773.68	163.41	7773.6
169.78	7773.46	179.11	7773.39	184.17	7773.51	187.63	7773.58	191.37	7773.69
196.84	7773.84	199.74	7773.91	211.85	7774.13	214.58	7774.13	220.15	7773.92
223.95	7773.77	227.35	7773.65	234.54	7773.56	248.17	7773.42	256.13	7773.44
260.28	7773.47	263.33	7773.38	267.79	7773.28	270.52	7773.21	277.72	7773
284.49	7772.86	296.6	7773.12	299.3	7773.17	303.26	7773.05	306.5	7772.94
308.71	7772.87	313.7	7772.84	320.82	7772.87	335.28	7772.87	338.73	7772.78
342.48	7772.72	345.03	7772.7	350.93	7772.63	355.76	7772.61	356.77	7772.06
357.51	7771.65	361.58	7769.47	367.11	7769.79	371.06	7770.05	375.73	7771.12
377.06	7771.38	381.41	7772.24	382.56	7772.49	391.26	7772.62	393.59	7772.62
399.94	7772.58	406.4	7772.45	407.06	7772.4	414.17	7771.8	419.21	7771.65
421.29	7771.58	423.88	7771.51	428.4	7771.37	432.02	7771.27	439.88	7771.12
442.63	7771.06	444.83	7770.82	449.74	7770.3	455.88	7769.68	457.11	7769.54
459.19	7769.39	490.99	7769.39	493.64	7770.41	496.07	7771.33	497.37	7771.83
500.25	7773.02	504.15	7773.13	513.77	7773.6	519.88	7773.6	521.69	7773.54
528	7773.36	534.5	7773.35	542.23	7773.17	547.31	7773.06	549.34	7772.98
551.88	7772.96	556.46	7772.89	560.12	7772.9	563.57	7772.94	566.88	7772.96
577.79	7773.06	580.79	7773.17	586.3	7773.39	588.69	7773.48	593.9	7773.71
599.59	7773.92	605.91	7773.88	609.1	7773.85	621.39	7773.85	623.91	7773.92
631.32	7776.91	632.5	7777.37	635.03	7778.45	639.17	7778.53	644.56	7778.49
656.83	7778.6	660.65	7778.65	662.26	7778.54	664.99	7778.38	666.04	7778.32
668.83	7778.15	671.16	7780.03	675.9	7783.81	677.52	7785.11	681.27	7788.02
685.12	7790.93	686.8	7792.31	697.7	7799.6	700.33	7801.35	706.39	7805.4
707.93	7806.24	708.6	7806.68	710.39	7807.2				

Manning's n Values num= 5

Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val	Sta	n Val
0	.06	159.1	.05	459.19	.035	490.99	.05	599.59	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
459.19	490.99	465.72	494.99 561.78	.1	.3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7774.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7773.79	Reach Len. (ft)	465.72	494.99	561.78
Crit W.S. (ft)		Flow Area (sq ft)	351.40	139.79	76.70
E.G. Slope (ft/ft)	0.006097	Area (sq ft)	351.40	139.79	76.70
Q Total (cfs)	2413.00	Flow (cfs)	1025.75	1243.54	143.71
Top Width (ft)	407.28	Top Width (ft)	270.51	31.80	104.97
Vel Total (ft/s)	4.25	Avg. Vel. (ft/s)	2.92	8.90	1.87
Max Chl Dpth (ft)	4.40	Hydr. Depth (ft)	1.30	4.40	0.73
Conv. Total (cfs)	30904.0	Conv. (cfs)	13137.1	15926.4	1840.5
Length Wtd. (ft)	499.88	Wetted Per. (ft)	271.73	31.80	105.70
Min Ch El (ft)	7769.39	Shear (lb/sq ft)	0.49	1.67	0.28
Alpha	2.47	Stream Power (lb/ft s)	1.44	14.88	0.52
Frctn Loss (ft)	2.36	Cum Volume (acre-ft)	7.15	29.66	8.02
C & E Loss (ft)	0.01	Cum SA (acres)	3.66	6.83	4.61

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7775.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.050	0.035	
W.S. Elev (ft)	7774.64	Reach Len. (ft)	465.72	494.99	561.78
Crit W.S. (ft)		Flow Area (sq ft)	176.85	166.78	
E.G. Slope (ft/ft)	0.005972	Area (sq ft)	176.85	166.78	
Q Total (cfs)	2413.00	Flow (cfs)	921.10	1491.91	
Top Width (ft)	80.99	Top Width (ft)	49.19	31.80	
Vel Total (ft/s)	7.02	Avg. Vel. (ft/s)	5.21	8.95	
Max Chl Dpth (ft)	5.24	Hydr. Depth (ft)	3.60	5.24	
Conv. Total (cfs)	31224.6	Conv. (cfs)	11919.1	19305.5	
Length Wtd. (ft)	495.87	Wetted Per. (ft)	51.78	37.04	
Min Ch El (ft)	7769.39	Shear (lb/sq ft)	1.27	1.68	
Alpha	1.21	Stream Power (lb/ft s)	6.63	15.02	
Frctn Loss (ft)	2.82	Cum Volume (acre-ft)	4.29	31.16	3.62
C & E Loss (ft)	0.01	Cum SA (acres)	1.45	6.83	1.29

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7774.07	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.62	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7773.45	Reach Len. (ft)	465.72	494.99	561.78
Crit W.S. (ft)		Flow Area (sq ft)	265.78	128.97	43.95
E.G. Slope (ft/ft)	0.005585	Area (sq ft)	265.78	128.97	43.95
Q Total (cfs)	1833.00	Flow (cfs)	713.34	1040.68	78.98
Top Width (ft)	333.37	Top Width (ft)	219.16	31.80	82.41
Vel Total (ft/s)	4.18	Avg. Vel. (ft/s)	2.68	8.07	1.80
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)	1.21	4.06	0.53
Conv. Total (cfs)	24526.6	Conv. (cfs)	9544.9	13924.9	1056.8
Length Wtd. (ft)	496.44	Wetted Per. (ft)	220.37	31.80	83.12
Min Ch El (ft)	7769.39	Shear (lb/sq ft)	0.42	1.41	0.18
Alpha	2.29	Stream Power (lb/ft s)	1.13	11.41	0.33
Frctn Loss (ft)	2.56	Cum Volume (acre-ft)	5.11	24.99	5.15
C & E Loss (ft)	0.01	Cum SA (acres)	2.99	6.83	3.99

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7774.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7773.70	Reach Len. (ft)	465.72	494.99	561.78
Crit W.S. (ft)		Flow Area (sq ft)	327.44	136.94	67.38
E.G. Slope (ft/ft)	0.006109	Area (sq ft)	327.44	136.94	67.38
Q Total (cfs)	2248.00	Flow (cfs)	927.65	1202.67	117.68
Top Width (ft)	397.24	Top Width (ft)	262.84	31.80	102.60
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)	2.83	8.78	1.75
Max Chl Dpth (ft)	4.31	Hydr. Depth (ft)	1.25	4.31	0.66
Conv. Total (cfs)	28762.1	Conv. (cfs)	11868.9	15387.6	1505.7
Length Wtd. (ft)	498.94	Wetted Per. (ft)	264.07	31.80	103.32
Min Ch El (ft)	7769.39	Shear (lb/sq ft)	0.47	1.64	0.25
Alpha	2.50	Stream Power (lb/ft s)	1.34	14.42	0.43
Frctn Loss (ft)	2.46	Cum Volume (acre-ft)	6.56	28.38	7.20
C & E Loss (ft)	0.00	Cum SA (acres)	3.49	6.83	4.49

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7774.66	Element			
Vel Head (ft)	0.67	Wt. n-Val.	0.050	0.035	0.050
W.S. Elev (ft)	7773.99	Reach Len. (ft)	465.72	494.99	561.78
Crit W.S. (ft)		Flow Area (sq ft)	409.07	146.38	101.97
E.G. Slope (ft/ft)	0.005879	Area (sq ft)	409.07	146.38	101.97
Q Total (cfs)	2783.00	Flow (cfs)	1252.13	1318.51	212.36
Top Width (ft)	451.86	Top Width (ft)	286.96	31.80	133.10
Vel Total (ft/s)	4.23	Avg. Vel. (ft/s)	3.06	9.01	2.08
Max Chl Dpth (ft)	4.60	Hydr. Depth (ft)	1.43	4.60	0.77
Conv. Total (cfs)	36295.8	Conv. (cfs)	16330.2	17196.0	2769.6
Length Wtd. (ft)	501.69	Wetted Per. (ft)	288.21	31.80	133.84
Min Ch El (ft)	7769.39	Shear (lb/sq ft)	0.52	1.69	0.28
Alpha	2.40	Stream Power (lb/ft s)	1.59	15.22	0.58
Frctn Loss (ft)	2.15	Cum Volume (acre-ft)	8.63	32.55	10.06
C & E Loss (ft)	0.02	Cum SA (acres)	4.17	6.83	5.20

Warning: Divided flow computed for this cross-section.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 6179

INPUT
Description:
Station Elevation Data num= 173

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7798.79	6.17	7798.49	8.94	7798.42	14.5	7798.25	18.71	7798.11
28.78	7797.8	31.26	7797.72	35.92	7797.52	42.07	7797.32	50.19	7797.12
56.34	7796.91	58.64	7796.85	68.88	7796.55	71.61	7796.49	75.21	7796.37
78.75	7796.3	81.42	7796.24	91.78	7796.19	93.97	7796.15	106.51	7795.74
108.35	7795.67	114.44	7795.48	119.05	7795.35	121.58	7795.27	131.59	7794.88
141.49	7794.9	156.67	7795	169.22	7795.15	171.55	7795.15	174.62	7795.21
181.76	7795.33	185.82	7795.05	191.19	7794.73	192.96	7794.61	200.1	7794.63
206.84	7794.52	214.38	7794.53	219.38	7794.51	222.13	7794.51	224.33	7794.52
228.65	7794.53	231.93	7794.51	240.9	7794.49	242.93	7794.48	257.01	7794.47
269.55	7794.78	274.04	7794.9	278.62	7794.97	300.04	7795.33	307.18	7795.46
315.5	7795.04	318.67	7794.82	324.57	7794.45	326.37	7794.32	332.26	7794.2
340.31	7794.1	350.01	7794.28	356.88	7794.34	364.28	7794.66	373.45	7795.08
378.56	7795.36	382.43	7795.56	385.7	7795.67	390.02	7796.05	392.84	7796.23
394.97	7796.37	399.98	7796.53	406.59	7797.11	407.51	7797.17	414.25	7797.23
420.05	7797.44	423.16	7797.52	428.45	7797.69	432.77	7797.86	435.44	7798.01
439.23	7797.96	449.74	7797.98	452.17	7798.02	455.92	7797.76	457.13	7797.68
469.35	7796.81	470.45	7796.74	475.5	7796.38	478.47	7796.21	480.06	7795.97
482.76	7795.73	485.64	7795.2	489.43	7794.43	492.78	7793.86	495.3	7793.01
499.91	7791.62	506	7789.4	507.84	7788.77	514.19	7786.34	520.39	7783.91
520.92	7783.68	521.53	7783.44	522.44	7783.25	527.02	7782.08	531.89	7780.86
532.16	7780.78	532.61	7780.66	539.14	7778.37	549.88	7773.37	555.71	7770.94
558.01	7769.99	564.16	7767.55	565.92	7766.81	567.14	7766.33	605.3	7766.33
608.18	7766.38	614.77	7766.59	620.3	7767.57	621.36	7767.73	630.22	7768.75
636.18	7769.24	636.99	7769.3	652.99	7769.81	660.9	7769.89	663.53	7769.94
695.15	7770.33	700.44	7770.53	716.23	7770.59	724.16	7770.46	726.77	7770.46
731.58	7770.4	737.03	7770.41	738.76	7770.48	741.75	7770.51	747.75	7769.64
756.31	7768.76	759.4	7768.45	766.5	7769.23	769.85	7769.69	778.12	7770.48
786.87	7770.76	790.01	7770.92	795.32	7771.16	800.55	7771.52	803.23	7771.69
811.09	7772.08	821.24	7772.5	827.63	7772.64	834.43	7772.69	842.71	7772.91
852.2	7773.2	853.5	7773.3	858.78	7773.52	863.79	7773.93	866.48	7774.24
874.33	7775.17	879.97	7775.8	881.32	7776.28	884.87	7777.5	890.2	7779.66
895.41	7781.94	896.72	7782.46	898.14	7783.12	920.6	7783.01	921.75	7782.92
923.72	7782.74	925.64	7782.56	926.64	7783.09	937.29	7787.97	937.57	7788.1
937.86	7788.27	945.55	7792.82	948.11	7794.37	953.07	7797.3	955.23	7798.54
958.65	7799.95	964.64	7802.04	965.8	7802.46				

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	567.14	.035	608.18	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
567.14 608.18 451.46 459.57 419.3 .1 .3

Ineffective Flow num= 1

Sta L	Sta R	Elev	Permanent
716.23	965.8	7770.59	F

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7772.10	Element			
Vel Head (ft)	0.65	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7771.45	Reach Len. (ft)	451.46	459.57	419.30
Crit W.S. (ft)	7771.02	Flow Area (sq ft)	32.54	210.08	323.80
E.G. Slope (ft/ft)	0.003771	Area (sq ft)	32.54	210.08	323.80
Q Total (cfs)	2413.00	Flow (cfs)	88.28	1626.63	698.09
Top Width (ft)	245.06	Top Width (ft)	12.66	41.04	191.36
Vel Total (ft/s)	4.26	Avg. Vel. (ft/s)	2.71	7.74	2.16
Max Chl Dpth (ft)	5.12	Hydr. Depth (ft)	2.57	5.12	1.69
Conv. Total (cfs)	39296.5	Conv. (cfs)	1437.7	26490.3	11368.6
Length Wtd. (ft)	451.75	Wetted Per. (ft)	13.65	41.04	191.82
Min Ch El (ft)	7766.33	Shear (lb/sq ft)	0.56	1.20	0.40
Alpha	2.32	Stream Power (lb/ft s)	1.52	9.33	0.86
Frctn Loss (ft)	2.65	Cum Volume (acre-ft)	5.09	27.67	5.44
C & E Loss (ft)	0.14	Cum SA (acres)	2.14	6.41	2.70

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7772.73	Element			
Vel Head (ft)	1.03	Wt. n-Val.		0.035	0.060
W.S. Elev (ft)	7771.70	Reach Len. (ft)	451.46	459.57	419.30
Crit W.S. (ft)	7770.60	Flow Area (sq ft)		220.26	107.99
E.G. Slope (ft/ft)	0.005427	Area (sq ft)		220.26	107.99
Q Total (cfs)	2413.00	Flow (cfs)		1945.54	467.46
Top Width (ft)	67.86	Top Width (ft)		41.04	26.82
Vel Total (ft/s)	7.35	Avg. Vel. (ft/s)		8.83	4.33
Max Chl Dpth (ft)	5.37	Hydr. Depth (ft)		5.37	4.03
Conv. Total (cfs)	32753.8	Conv. (cfs)		26408.5	6345.3
Length Wtd. (ft)	453.82	Wetted Per. (ft)		46.41	29.55
Min Ch El (ft)	7766.33	Shear (lb/sq ft)		1.61	1.24
Alpha	1.23	Stream Power (lb/ft s)		14.20	5.36
Frctn Loss (ft)	3.32	Cum Volume (acre-ft)	3.34	28.96	2.93
C & E Loss (ft)	0.11	Cum SA (acres)	1.18	6.41	1.12

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section.
This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7771.50	Element			
Vel Head (ft)	0.76	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7770.73	Reach Len. (ft)	451.46	459.57	419.30
Crit W.S. (ft)	7769.81	Flow Area (sq ft)	24.08	180.66	191.01
E.G. Slope (ft/ft)	0.004779	Area (sq ft)	24.08	180.66	191.01
Q Total (cfs)	1833.00	Flow (cfs)	66.40	1424.23	342.38
Top Width (ft)	229.85	Top Width (ft)	10.93	41.04	177.88
Vel Total (ft/s)	4.63	Avg. Vel. (ft/s)	2.76	7.88	1.79
Max Chl Dpth (ft)	4.40	Hydr. Depth (ft)	2.20	4.40	1.07
Conv. Total (cfs)	26514.0	Conv. (cfs)	960.4	20601.1	4952.4
Length Wtd. (ft)	454.02	Wetted Per. (ft)	11.79	41.04	178.32
Min Ch El (ft)	7766.33	Shear (lb/sq ft)	0.61	1.31	0.32
Alpha	2.29	Stream Power (lb/ft s)	1.68	10.35	0.57
Frctn Loss (ft)	3.14	Cum Volume (acre-ft)	3.56	23.23	3.63
C & E Loss (ft)	0.10	Cum SA (acres)	1.76	6.41	2.31

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Note: Multiple critical depths were found at this location. The critical depth with the lowest, valid, water surface was used.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7771.93	Element			
Vel Head (ft)	0.69	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7771.25	Reach Len. (ft)	451.46	459.57	419.30
Crit W.S. (ft)	7770.89	Flow Area (sq ft)	30.00	201.68	284.95
E.G. Slope (ft/ft)	0.004050	Area (sq ft)	30.00	201.68	284.95
Q Total (cfs)	2248.00	Flow (cfs)	82.05	1575.09	590.85
Top Width (ft)	241.59	Top Width (ft)	12.16	41.04	188.39
Vel Total (ft/s)	4.35	Avg. Vel. (ft/s)	2.74	7.81	2.07
Max Chl Dpth (ft)	4.92	Hydr. Depth (ft)	2.47	4.91	1.51
Conv. Total (cfs)	35322.6	Conv. (cfs)	1289.3	24749.3	9284.0
Length Wtd. (ft)	452.33	Wetted Per. (ft)	13.12	41.04	188.84
Min Ch El (ft)	7766.33	Shear (lb/sq ft)	0.58	1.24	0.38
Alpha	2.33	Stream Power (lb/ft s)	1.58	9.70	0.79
Frctn Loss (ft)	2.78	Cum Volume (acre-ft)	4.65	26.46	4.93
C & E Loss (ft)	0.13	Cum SA (acres)	2.02	6.41	2.61

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7772.49	Element			
Vel Head (ft)	0.60	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7771.90	Reach Len. (ft)	451.46	459.57	419.30
Crit W.S. (ft)	7771.26	Flow Area (sq ft)	38.40	228.31	410.44
E.G. Slope (ft/ft)	0.003271	Area (sq ft)	38.40	228.31	410.44
Q Total (cfs)	2783.00	Flow (cfs)	102.65	1740.47	939.88
Top Width (ft)	253.94	Top Width (ft)	13.72	41.04	199.18
Vel Total (ft/s)	4.11	Avg. Vel. (ft/s)	2.67	7.62	2.29
Max Chl Dpth (ft)	5.56	Hydr. Depth (ft)	2.80	5.56	2.06
Conv. Total (cfs)	48661.4	Conv. (cfs)	1794.8	30432.5	16434.1
Length Wtd. (ft)	450.67	Wetted Per. (ft)	14.81	41.04	199.65
Min Ch El (ft)	7766.33	Shear (lb/sq ft)	0.53	1.14	0.42
Alpha	2.27	Stream Power (lb/ft s)	1.42	8.66	0.96
Frctn Loss (ft)	2.40	Cum Volume (acre-ft)	6.24	30.42	6.75
C & E Loss (ft)	0.17	Cum SA (acres)	2.56	6.41	3.06

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 5720

INPUT
Description:
Station Elevation Data num= 125

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7798.8	5.46	7798.6	12.28	7798.28	19.62	7798	26.14	7797.71
33.79	7797.45	39.5	7797.15	42.43	7797.03	47.96	7796.85	52.86	7796.6
55.04	7796.53	57.5	7796.46	69.21	7796.19	76.29	7795.9	79.59	7795.76
87.66	7795.55	90.46	7795.56	92.95	7795.52	102.73	7795.47	106.31	7795.46
117.81	7795.17	119.67	7795.1	125.88	7794.84	132.89	7794.67	146.4	7794.55
154.22	7794.59	159.76	7794.64	168.39	7794.77	178.11	7795.07	186.49	7795.19
189.64	7795.25	193.19	7795.33	199.85	7795.46	203.81	7795.53	208.27	7795.62
210.89	7795.71	213.21	7795.72	223.34	7795.87	226.57	7795.93	238.42	7796.21
246.31	7796.21	253.3	7796.24	260.48	7796.21	266.66	7796.23	274.64	7795.99
280.03	7795.81	281.73	7795.76	293.39	7795.26	298.72	7794.96	302.98	7794.75
310.06	7794.36	313.8	7794.16	317.15	7794	324.23	7793.59	328.88	7793.5
331.32	7793.4	333.48	7793.32	338.4	7793.13	346.84	7793.05	359.03	7792.74
373.56	7792.32	389.18	7792.24	400.29	7792.04	409.24	7791.66	413.65	7791.55
419.33	7791.42	423.41	7791.23	427.01	7791.1	437.57	7790.56	440.38	7790.44
444.66	7790.27	453.74	7789.87	458.83	7789.56	465.91	7789.25	467.1	7789.19
472.99	7788.83	479.64	7788.54	480.46	7788.48	493.14	7787.09	493.88	7786.92
494.72	7786.56	506.56	7781.13	507.35	7780.83	508.47	7781.35	509.79	7780.68
515.5	7777.34	520.55	7775.04	522.58	7773.97	524.87	7772.77	529.66	7769.97
533.92	7768.03	536.75	7766.5	539.94	7765.09	544.62	7763.29	546.5	7762.47
546.64	7762.41	582.03	7762.42	586.09	7763.48	587.37	7763.6	593.42	7765.53
600.25	7769.03	600.5	7769.22	600.73	7769.39	607.59	7774.5	614.09	7777.53
614.67	7777.86	615.33	7778.13	627.45	7783.98	628.84	7784.76	630.4	7785.4
635.92	7788.35	640.82	7789.52	650.09	7792.56	654.18	7794.16	657.17	7795.41
657.67	7795.65	661.16	7797.19	671.47	7797.12	682.97	7796.97	684.16	7796.74
687.16	7796.17	690.16	7795.93	692.29	7796.32	692.97	7796.39	695.85	7796.92

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.05	546.64	.035	582.03	.06

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
546.64	582.03	523.22	503.52	481.6	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7769.31	Element			
Vel Head (ft)	2.09	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7767.22	Reach Len. (ft)	523.22	503.52	481.60
Crit W.S. (ft)	7767.22	Flow Area (sq ft)	28.00	169.93	40.85

E.G. Slope (ft/ft)	0.010395	Area (sq ft)	28.00	169.93	40.85
Q Total (cfs)	2413.00	Flow (cfs)	122.91	2093.55	196.53
Top Width (ft)	61.29	Top Width (ft)	11.22	35.39	14.68
Vel Total (ft/s)	10.11	Avg. Vel. (ft/s)	4.39	12.32	4.81
Max Chl Dpth (ft)	4.81	Hydr. Depth (ft)	2.50	4.80	2.78
Conv. Total (cfs)	23667.3	Conv. (cfs)	1205.6	20534.1	1927.7
Length Wtd. (ft)	503.25	Wetted Per. (ft)	12.21	35.39	15.53
Min Ch El (ft)	7762.41	Shear (lb/sq ft)	1.49	3.12	1.71
Alpha	1.32	Stream Power (lb/ft s)	6.53	38.39	8.21
Frctn Loss (ft)	5.47	Cum Volume (acre-ft)	4.78	25.67	3.68
C & E Loss (ft)	0.10	Cum SA (acres)	2.02	6.01	1.71

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7769.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.09	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7767.22	Reach Len. (ft)	523.22	503.52	481.60
Crit W.S. (ft)	7767.22	Flow Area (sq ft)	28.00	169.93	40.85
E.G. Slope (ft/ft)	0.010395	Area (sq ft)	28.00	169.93	40.85
Q Total (cfs)	2413.00	Flow (cfs)	122.91	2093.55	196.53
Top Width (ft)	61.29	Top Width (ft)	11.22	35.39	14.68
Vel Total (ft/s)	10.11	Avg. Vel. (ft/s)	4.39	12.32	4.81
Max Chl Dpth (ft)	4.81	Hydr. Depth (ft)	2.50	4.80	2.78
Conv. Total (cfs)	23667.3	Conv. (cfs)	1205.6	20534.1	1927.7
Length Wtd. (ft)	503.13	Wetted Per. (ft)	12.21	35.39	15.53
Min Ch El (ft)	7762.41	Shear (lb/sq ft)	1.49	3.12	1.71
Alpha	1.32	Stream Power (lb/ft s)	6.53	38.39	8.21
Frctn Loss (ft)	5.86	Cum Volume (acre-ft)	3.20	26.90	2.21
C & E Loss (ft)	0.06	Cum SA (acres)	1.13	6.01	0.92

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7768.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.78	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7766.47	Reach Len. (ft)	523.22	503.52	481.60
Crit W.S. (ft)	7766.47	Flow Area (sq ft)	20.17	143.63	30.48
E.G. Slope (ft/ft)	0.010903	Area (sq ft)	20.17	143.63	30.48
Q Total (cfs)	1833.00	Flow (cfs)	79.92	1620.08	133.01
Top Width (ft)	58.45	Top Width (ft)	9.83	35.39	13.23
Vel Total (ft/s)	9.43	Avg. Vel. (ft/s)	3.96	11.28	4.36
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)	2.05	4.06	2.30
Conv. Total (cfs)	17554.7	Conv. (cfs)	765.4	15515.6	1273.8
Length Wtd. (ft)	503.28	Wetted Per. (ft)	10.64	35.39	13.90
Min Ch El (ft)	7762.41	Shear (lb/sq ft)	1.29	2.76	1.49
Alpha	1.29	Stream Power (lb/ft s)	5.11	31.16	6.51
Frctn Loss (ft)	5.79	Cum Volume (acre-ft)	3.34	21.52	2.57
C & E Loss (ft)	0.09	Cum SA (acres)	1.65	6.01	1.39

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7769.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.00	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7767.02	Reach Len. (ft)	523.22	503.52	481.60
Crit W.S. (ft)	7767.02	Flow Area (sq ft)	25.84	163.02	38.02
E.G. Slope (ft/ft)	0.010458	Area (sq ft)	25.84	163.02	38.02
Q Total (cfs)	2248.00	Flow (cfs)	110.37	1959.45	178.18
Top Width (ft)	60.55	Top Width (ft)	10.85	35.39	14.30
Vel Total (ft/s)	9.91	Avg. Vel. (ft/s)	4.27	12.02	4.69
Max Chl Dpth (ft)	4.61	Hydr. Depth (ft)	2.38	4.61	2.66
Conv. Total (cfs)	21982.6	Conv. (cfs)	1079.2	19161.0	1742.4
Length Wtd. (ft)	503.26	Wetted Per. (ft)	11.80	35.39	15.10
Min Ch El (ft)	7762.41	Shear (lb/sq ft)	1.43	3.01	1.64
Alpha	1.31	Stream Power (lb/ft s)	6.11	36.15	7.70
Frctn Loss (ft)	5.52	Cum Volume (acre-ft)	4.36	24.53	3.37
C & E Loss (ft)	0.09	Cum SA (acres)	1.90	6.01	1.63

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7769.92	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.27	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7767.65	Reach Len. (ft)	523.22	503.52	481.60
Crit W.S. (ft)	7767.65	Flow Area (sq ft)	33.05	185.31	47.41
E.G. Slope (ft/ft)	0.010157	Area (sq ft)	33.05	185.31	47.41
Q Total (cfs)	2783.00	Flow (cfs)	152.65	2390.99	239.36
Top Width (ft)	62.94	Top Width (ft)	12.02	35.39	15.53
Vel Total (ft/s)	10.47	Avg. Vel. (ft/s)	4.62	12.90	5.05
Max Chl Dpth (ft)	5.24	Hydr. Depth (ft)	2.75	5.24	3.05
Conv. Total (cfs)	27613.5	Conv. (cfs)	1514.6	23723.9	2375.0
Length Wtd. (ft)	503.24	Wetted Per. (ft)	11.13	35.39	16.48
Min Ch El (ft)	7762.41	Shear (lb/sq ft)	1.60	3.32	1.82
Alpha	1.34	Stream Power (lb/ft s)	7.37	42.84	9.21
Frctn Loss (ft)	5.33	Cum Volume (acre-ft)	5.87	28.24	4.55
C & E Loss (ft)	0.10	Cum SA (acres)	2.43	6.01	2.03

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 5216

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7796.34	1.86	7795.33	3.33	7794.12	10.66	7787.22	11.83	7786.14
12.06	7785.93	20.33	7778.29	22.26	7776.11	28.83	7771.35	32.45	7769.04
34.22	7767.76	36.47	7766.12	40.57	7763.11	42.65	7761.57	46.64	7759.46
49.94	7758.04	51.93	7757.52	63.04	7757.44	75.19	7757.48	80.79	7757.51
83.44	7757.55	88.34	7757.51	93.64	7757.6	96.85	7757.66	108.63	7757.84
113.71	7760.4	113.86	7760.48	114.03	7760.54	122.35	7764.6	124.23	7765.38
134.42	7769.12	140.19	7771.26	141.99	7772.02	144.62	7772.29	147.86	7772.48
154.82	7773.05	164.09	7773.13	173.36	7773.27	175.21	7773.37	181.86	7773.88
185.41	7774.04	188.43	7774.29	191.84	7774.51	193.59	7774.92	195.6	7775.37
198.87	7776.14	205.8	7777.85	207.37	7778.34	215.23	7781.27	215.87	7781.51
216	7781.56	224.37	7784.68	226.19	7785.35	232.87	7787.65	236.39	7788.83
246.59	7792.33	256.78	7794.84	258.38	7795.23	266.38	7797.82	266.88	7797.98
275.38	7800.33	277.18	7800.9	277.81	7801.11	281.87	7802.11	287.38	7801.91
295.71	7801.64	299.1	7801.94	302.83	7802.48	303.73	7802.64	327.92	7802.52
329.26	7802.27	333.47	7801.41	333.99	7801.3	338.36	7802.63	338.99	7802.82

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	51.93	.035	108.63	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
51.93	108.63	476.7	487.87 499.41	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7763.04	Element			
Vel Head (ft)	1.76	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7761.28	Reach Len. (ft)	476.70	487.87	499.41
Crit W.S. (ft)	7761.28	Flow Area (sq ft)	18.45	211.20	11.79
E.G. Slope (ft/ft)	0.011359	Area (sq ft)	18.45	211.20	11.79
Q Total (cfs)	2413.00	Flow (cfs)	75.56	2296.18	41.26
Top Width (ft)	72.35	Top Width (ft)	8.73	56.70	6.92
Vel Total (ft/s)	9.99	Avg. Vel. (ft/s)	4.10	10.87	3.50
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	2.11	3.72	1.70
Conv. Total (cfs)	22641.1	Conv. (cfs)	709.0	21544.9	387.2
Length Wtd. (ft)	487.74	Wetted Per. (ft)	9.54	56.70	7.73
Min Ch El (ft)	7757.44	Shear (lb/sq ft)	1.37	2.64	1.08
Alpha	1.13	Stream Power (lb/ft s)	5.61	28.71	3.79
Frctn Loss (ft)	5.53	Cum Volume (acre-ft)	4.50	23.47	3.39
C & E Loss (ft)	0.00	Cum SA (acres)	1.90	5.48	1.59

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7763.30	Element			
Vel Head (ft)	1.89	Wt. n-Val.		0.035	
W.S. Elev (ft)	7761.42	Reach Len. (ft)	476.70	487.87	499.41
Crit W.S. (ft)	7761.42	Flow Area (sq ft)		218.92	
E.G. Slope (ft/ft)	0.013125	Area (sq ft)		218.92	
Q Total (cfs)	2413.00	Flow (cfs)		2413.00	
Top Width (ft)	56.70	Top Width (ft)		56.70	
Vel Total (ft/s)	11.02	Avg. Vel. (ft/s)		11.02	
Max Chl Dpth (ft)	3.98	Hydr. Depth (ft)		3.86	
Conv. Total (cfs)	21062.0	Conv. (cfs)		21062.0	
Length Wtd. (ft)	487.82	Wetted Per. (ft)		64.18	
Min Ch El (ft)	7757.44	Shear (lb/sq ft)		2.80	
Alpha	1.00	Stream Power (lb/ft s)		30.81	
Frctn Loss (ft)	5.94	Cum Volume (acre-ft)	3.03	24.65	1.98
C & E Loss (ft)	0.02	Cum SA (acres)	1.06	5.48	0.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7762.15	Element			
Vel Head (ft)	1.49	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7760.66	Reach Len. (ft)	476.70	487.87	499.41
Crit W.S. (ft)	7760.66	Flow Area (sq ft)	13.42	176.18	7.91
E.G. Slope (ft/ft)	0.012172	Area (sq ft)	13.42	176.18	7.91
Q Total (cfs)	1833.00	Flow (cfs)	50.80	1757.08	25.11
Top Width (ft)	69.92	Top Width (ft)	7.56	56.70	5.65
Vel Total (ft/s)	9.28	Avg. Vel. (ft/s)	3.79	9.97	3.17
Max Chl Dpth (ft)	3.22	Hydr. Depth (ft)	1.77	3.11	1.40
Conv. Total (cfs)	16614.1	Conv. (cfs)	460.5	15926.0	227.6
Length Wtd. (ft)	487.75	Wetted Per. (ft)	8.22	56.70	6.32
Min Ch El (ft)	7757.44	Shear (lb/sq ft)	1.24	2.36	0.95
Alpha	1.11	Stream Power (lb/ft s)	4.70	23.55	3.02
Frctn Loss (ft)	5.94	Cum Volume (acre-ft)	3.13	19.67	2.35
C & E Loss (ft)	0.00	Cum SA (acres)	1.55	5.48	1.28

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7762.80	Element			
Vel Head (ft)	1.68	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7761.11	Reach Len. (ft)	476.70	487.87	499.41
Crit W.S. (ft)	7761.11	Flow Area (sq ft)	17.02	201.73	10.67
E.G. Slope (ft/ft)	0.011532	Area (sq ft)	17.02	201.73	10.67
Q Total (cfs)	2248.00	Flow (cfs)	68.26	2143.37	36.38

Top Width (ft)	71.69	Top Width (ft)	8.42	56.70	6.57
Vel Total (ft/s)	9.80	Avg. Vel. (ft/s)	4.01	10.62	3.41
Max Chl Dpth (ft)	3.67	Hydr. Depth (ft)	2.02	3.56	1.62
Conv. Total (cfs)	20933.6	Conv. (cfs)	635.6	19959.3	338.7
Length Wtd. (ft)	487.74	Wetted Per. (ft)	9.19	56.70	7.35
Min Ch El (ft)	7757.44	Shear (lb/sq ft)	1.33	2.56	1.05
Alpha	1.13	Stream Power (lb/ft s)	5.35	27.21	3.56
Frctn Loss (ft)	5.65	Cum Volume (acre-ft)	4.10	22.43	3.11
C & E Loss (ft)	0.01	Cum SA (acres)	1.79	5.48	1.52

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7763.56	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.92	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7761.64	Reach Len. (ft)	476.70	487.87	499.41
Crit W.S. (ft)	7761.64	Flow Area (sq ft)	21.68	231.41	14.39
E.G. Slope (ft/ft)	0.011048	Area (sq ft)	21.68	231.41	14.39
Q Total (cfs)	2783.00	Flow (cfs)	92.84	2637.13	53.04
Top Width (ft)	73.72	Top Width (ft)	9.37	56.70	7.65
Vel Total (ft/s)	10.40	Avg. Vel. (ft/s)	4.28	11.40	3.69
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)	2.31	4.08	1.88
Conv. Total (cfs)	26477.4	Conv. (cfs)	883.3	25089.5	504.6
Length Wtd. (ft)	487.74	Wetted Per. (ft)	10.28	56.70	8.54
Min Ch El (ft)	7757.44	Shear (lb/sq ft)	1.46	2.81	1.16
Alpha	1.14	Stream Power (lb/ft s)	6.23	32.08	4.28
Frctn Loss (ft)	5.39	Cum Volume (acre-ft)	5.54	25.83	4.21
C & E Loss (ft)	0.01	Cum SA (acres)	2.30	5.48	1.90

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 4728

INPUT
Description:
Station Elevation Data num= 57

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7796.19	3.43	7794.23	6.51	7792.86	8.29	7791.29	9.36	7789.77
15.36	7786.45	17.4	7785.37	24.1	7781.81	28.29	7779.73	30.92	7778.72
31.39	7778.48	38.56	7777.88	39.32	7777.82	48.72	7777.1	50.07	7777
52	7775.58	59.43	7770.07	60.97	7768.92	62.32	7767.9	63.14	7767.27
64.99	7766.31	77.36	7759.85	82.75	7757.06	84.97	7755.82	90.11	7753.19
92.58	7751.88	93.64	7751.34	94.24	7751.04	100.29	7747.6	104.02	7747.48
109.2	7747.43	141.81	7747.43	145.27	7747.55	148.1	7747.67	156.61	7747.98
157.73	7748.04	159.97	7749.84	165.82	7755.54	168.66	7757.28	169.88	7758.03
176.27	7761.94	180.77	7765.37	183.87	7768.15	191.06	7773.88	191.66	7774.38
199.09	7780.73	202.56	7783.29	204.77	7784.75	205.08	7784.97	208.09	7785.42
212.41	7786.29	229.21	7786.51	235.07	7786.57	235.88	7786.41	237.51	7786.08
242.7	7785.06	243.76	7785.72						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	100.29	.035	157.73	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
100.29	157.73	520.88 486.71	449.95	.1	.3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7753.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7751.27	Reach Len. (ft)	520.88	486.71	449.95
Crit W.S. (ft)	7751.27	Flow Area (sq ft)	11.87	215.47	6.28
E.G. Slope (ft/ft)	0.011336	Area (sq ft)	11.87	215.47	6.28
Q Total (cfs)	2413.00	Flow (cfs)	42.58	2350.96	19.47
Top Width (ft)	67.67	Top Width (ft)	6.52	57.44	3.71
Vel Total (ft/s)	10.33	Avg. Vel. (ft/s)	3.59	10.91	3.10
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	1.82	3.75	1.69
Conv. Total (cfs)	22663.3	Conv. (cfs)	399.9	22080.6	182.8
Length Wtd. (ft)	485.10	Wetted Per. (ft)	7.48	57.45	4.93
Min Ch El (ft)	7747.43	Shear (lb/sq ft)	1.12	2.65	0.90
Alpha	1.09	Stream Power (lb/ft s)	4.03	28.96	2.80
Frctn Loss (ft)	5.48	Cum Volume (acre-ft)	4.34	21.08	3.29
C & E Loss (ft)	0.00	Cum SA (acres)	1.82	4.84	1.53

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7753.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7751.27	Reach Len. (ft)	520.88	486.71	449.95
Crit W.S. (ft)	7751.27	Flow Area (sq ft)	11.87	215.47	6.28
E.G. Slope (ft/ft)	0.011336	Area (sq ft)	11.87	215.47	6.28
Q Total (cfs)	2413.00	Flow (cfs)	42.58	2350.96	19.47
Top Width (ft)	67.67	Top Width (ft)	6.52	57.44	3.71
Vel Total (ft/s)	10.33	Avg. Vel. (ft/s)	3.59	10.91	3.10
Max Chl Dpth (ft)	3.84	Hydr. Depth (ft)	1.82	3.75	1.69
Conv. Total (cfs)	22663.3	Conv. (cfs)	399.9	22080.6	182.8
Length Wtd. (ft)	485.10	Wetted Per. (ft)	7.48	57.45	4.93
Min Ch El (ft)	7747.43	Shear (lb/sq ft)	1.12	2.65	0.90
Alpha	1.09	Stream Power (lb/ft s)	4.03	28.96	2.80
Frctn Loss (ft)	5.48	Cum Volume (acre-ft)	2.96	22.22	1.95
C & E Loss (ft)	0.00	Cum SA (acres)	1.02	4.84	0.82

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7752.17	Element			
Vel Head (ft)	1.52	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7750.65	Reach Len. (ft)	520.88	486.71	449.95
Crit W.S. (ft)	7750.65	Flow Area (sq ft)	8.15	179.37	4.15
E.G. Slope (ft/ft)	0.012171	Area (sq ft)	8.15	179.37	4.15
Q Total (cfs)	1833.00	Flow (cfs)	26.84	1794.59	11.57
Top Width (ft)	65.86	Top Width (ft)	5.35	57.44	3.07
Vel Total (ft/s)	9.56	Avg. Vel. (ft/s)	3.29	10.00	2.79
Max Chl Dpth (ft)	3.21	Hydr. Depth (ft)	1.52	3.12	1.35
Conv. Total (cfs)	16614.7	Conv. (cfs)	243.3	16266.5	104.9
Length Wtd. (ft)	485.23	Wetted Per. (ft)	6.16	57.45	4.03
Min Ch El (ft)	7747.43	Shear (lb/sq ft)	1.01	2.37	0.78
Alpha	1.07	Stream Power (lb/ft s)	3.31	23.73	2.18
Frctn Loss (ft)	5.82	Cum Volume (acre-ft)	3.02	17.68	2.28
C & E Loss (ft)	0.00	Cum SA (acres)	1.48	4.84	1.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7752.83	Element			
Vel Head (ft)	1.74	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7751.09	Reach Len. (ft)	520.88	486.71	449.95
Crit W.S. (ft)	7751.09	Flow Area (sq ft)	10.72	205.06	5.62
E.G. Slope (ft/ft)	0.011636	Area (sq ft)	10.72	205.06	5.62
Q Total (cfs)	2248.00	Flow (cfs)	37.79	2193.20	17.01
Top Width (ft)	67.12	Top Width (ft)	6.15	57.44	3.52
Vel Total (ft/s)	10.15	Avg. Vel. (ft/s)	3.52	10.70	3.03
Max Chl Dpth (ft)	3.66	Hydr. Depth (ft)	1.74	3.57	1.60
Conv. Total (cfs)	20840.2	Conv. (cfs)	350.3	20332.1	157.7
Length Wtd. (ft)	485.14	Wetted Per. (ft)	7.08	57.45	4.67
Min Ch El (ft)	7747.43	Shear (lb/sq ft)	1.10	2.59	0.88
Alpha	1.09	Stream Power (lb/ft s)	3.88	27.73	2.65
Frctn Loss (ft)	5.57	Cum Volume (acre-ft)	3.95	20.15	3.01
C & E Loss (ft)	0.00	Cum SA (acres)	1.71	4.84	1.46

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7753.62	Element			
Vel Head (ft)	1.99	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7751.63	Reach Len. (ft)	520.88	486.71	449.95
Crit W.S. (ft)	7751.63	Flow Area (sq ft)	14.33	236.05	7.68
E.G. Slope (ft/ft)	0.011064	Area (sq ft)	14.33	236.05	7.68
Q Total (cfs)	2783.00	Flow (cfs)	53.85	2704.00	25.15
Top Width (ft)	68.74	Top Width (ft)	7.22	57.44	4.08
Vel Total (ft/s)	10.78	Avg. Vel. (ft/s)	3.76	11.46	3.28
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)	1.98	4.11	1.88
Conv. Total (cfs)	26458.6	Conv. (cfs)	512.0	25707.5	239.1
Length Wtd. (ft)	485.03	Wetted Per. (ft)	8.27	57.45	5.44
Min Ch El (ft)	7747.43	Shear (lb/sq ft)	1.20	2.84	0.97
Alpha	1.10	Stream Power (lb/ft s)	4.50	32.51	3.19
Frctn Loss (ft)	5.30	Cum Volume (acre-ft)	5.34	23.21	4.08
C & E Loss (ft)	0.01	Cum SA (acres)	2.21	4.84	1.83

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 4242

INPUT
Description:
Station Elevation Data num= 79

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7792.29	.54	7792.02	2.68	7791.06	3.04	7790.69	12.3	7781.67
14.54	7779.39	16.47	7777.73	26.52	7768.22	32.86	7763.3	36.56	7759.76
42.03	7754.81	46.61	7750.8	51.19	7746.86	56.66	7742.86	60.24	7741.26
63.21	7739.78	90.09	7740.09	105.18	7740.14	106.37	7740.24	115.33	7740.91
116.93	7741.04	137.03	7745.15	142.81	7749.6	147.07	7752.85	155.15	7759.07
156.15	7759.13	157.12	7759.2	160	7759.38	165.38	7760.1	167.17	7760.42
172.22	7760.98	173.1	7761.13	176.35	7761.64	177.21	7761.86	179.46	7761.93
187.26	7761.99	196.17	7762.18	199.66	7762.27	204.85	7762.37	208.09	7762.67
209.05	7762.77	216.42	7763.49	218.89	7763.77	219.99	7763.92	221.54	7764.17
227.84	7765.17	233.43	7765.08	250.36	7764.96	253.57	7764.27	257	7763.56
262.33	7765.34	263.75	7765.83	265.53	7766.46	266.48	7766.77	267.71	7766.86
279.49	7767.48	285.67	7767.78	294.64	7768.02	302.21	7768.09	307.56	7768.29
314.79	7768.52	317.36	7768.59	324.93	7768.77	329.45	7769.13	339.38	7769.95
340.08	7770.01	347.66	7770.93	351.34	7771.37	353.43	7771.38	355.19	7771.52
355.75	7771.68	362.29	7775.15	362.81	7775.44	363.98	7776.13	370.38	7779.34
373.23	7780.74	377.96	7782.54	380.5	7783.52	383.26	7785.29		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	63.21	.035	105.18	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
63.21	105.18	424.52	451.73	493.59	.1 .3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7745.96	Element			
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7744.15	Reach Len. (ft)	424.52	451.73	493.59
Crit W.S. (ft)	7744.15	Flow Area (sq ft)	19.37	174.00	65.35
E.G. Slope (ft/ft)	0.011263	Area (sq ft)	19.37	174.00	65.35
Q Total (cfs)	2413.00	Flow (cfs)	82.30	2023.23	307.47
Top Width (ft)	77.22	Top Width (ft)	8.31	41.97	26.94
Vel Total (ft/s)	9.33	Avg. Vel. (ft/s)	4.25	11.63	4.70
Max Chl Dpth (ft)	4.37	Hydr. Depth (ft)	2.33	4.15	2.43
Conv. Total (cfs)	22737.0	Conv. (cfs)	775.5	19064.3	2897.2
Length Wtd. (ft)	454.01	Wetted Per. (ft)	9.42	41.97	27.29

Min Ch El (ft)	7739.78	Shear (lb/sq ft)	1.45	2.92	1.68
Alpha	1.34	Stream Power (lb/ft s)	6.14	33.89	7.92
Frctn Loss (ft)	4.94	Cum Volume (acre-ft)	4.15	18.90	2.92
C & E Loss (ft)	0.03	Cum SA (acres)	1.73	4.28	1.37

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7745.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7744.15	Reach Len. (ft)	424.52	451.73	493.59
Crit W.S. (ft)	7744.15	Flow Area (sq ft)	19.37	174.00	65.35
E.G. Slope (ft/ft)	0.011263	Area (sq ft)	19.37	174.00	65.35
Q Total (cfs)	2413.00	Flow (cfs)	82.30	2023.23	307.47
Top Width (ft)	77.22	Top Width (ft)	8.31	41.97	26.94
Vel Total (ft/s)	9.33	Avg. Vel. (ft/s)	4.25	11.63	4.70
Max Chl Dpth (ft)	4.37	Hydr. Depth (ft)	2.33	4.15	2.43
Conv. Total (cfs)	22737.0	Conv. (cfs)	775.5	19064.3	2897.2
Length Wtd. (ft)	454.01	Wetted Per. (ft)	9.42	41.97	27.29
Min Ch El (ft)	7739.78	Shear (lb/sq ft)	1.45	2.92	1.68
Alpha	1.34	Stream Power (lb/ft s)	6.14	33.89	7.92
Frctn Loss (ft)	4.94	Cum Volume (acre-ft)	2.78	20.05	1.58
C & E Loss (ft)	0.03	Cum SA (acres)	0.93	4.28	0.66

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning. During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7745.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.54	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7743.50	Reach Len. (ft)	424.52	451.73	493.59
Crit W.S. (ft)	7743.50	Flow Area (sq ft)	14.31	147.01	49.04
E.G. Slope (ft/ft)	0.011827	Area (sq ft)	14.31	147.01	49.04
Q Total (cfs)	1833.00	Flow (cfs)	55.26	1565.51	212.23
Top Width (ft)	73.19	Top Width (ft)	7.43	41.97	23.79
Vel Total (ft/s)	8.71	Avg. Vel. (ft/s)	3.86	10.65	4.33
Max Chl Dpth (ft)	3.72	Hydr. Depth (ft)	1.93	3.50	2.06
Conv. Total (cfs)	16855.0	Conv. (cfs)	508.1	14395.3	1951.5
Length Wtd. (ft)	453.80	Wetted Per. (ft)	8.33	41.97	24.08
Min Ch El (ft)	7739.78	Shear (lb/sq ft)	1.27	2.59	1.50
Alpha	1.31	Stream Power (lb/ft s)	4.90	27.54	6.51
Frctn Loss (ft)	5.22	Cum Volume (acre-ft)	2.88	15.86	2.01
C & E Loss (ft)	0.02	Cum SA (acres)	1.40	4.28	1.10

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7745.71	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.73	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7743.98	Reach Len. (ft)	424.52	451.73	493.59
Crit W.S. (ft)	7743.98	Flow Area (sq ft)	17.99	166.93	60.88
E.G. Slope (ft/ft)	0.011330	Area (sq ft)	17.99	166.93	60.88
Q Total (cfs)	2248.00	Flow (cfs)	74.49	1893.68	279.83
Top Width (ft)	76.16	Top Width (ft)	8.08	41.97	26.11
Vel Total (ft/s)	9.15	Avg. Vel. (ft/s)	4.14	11.34	4.60
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)	2.23	3.98	2.33
Conv. Total (cfs)	21119.5	Conv. (cfs)	699.8	17790.8	2628.9
Length Wtd. (ft)	453.95	Wetted Per. (ft)	9.13	41.97	26.45
Min Ch El (ft)	7739.78	Shear (lb/sq ft)	1.39	2.81	1.63
Alpha	1.33	Stream Power (lb/ft s)	5.77	31.91	7.48
Frctn Loss (ft)	5.00	Cum Volume (acre-ft)	3.78	18.07	2.67
C & E Loss (ft)	0.03	Cum SA (acres)	1.62	4.28	1.31

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7746.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.95	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7744.55	Reach Len. (ft)	424.52	451.73	493.59
Crit W.S. (ft)	7744.55	Flow Area (sq ft)	22.80	190.79	76.52
E.G. Slope (ft/ft)	0.010789	Area (sq ft)	22.80	190.79	76.52
Q Total (cfs)	2783.00	Flow (cfs)	100.94	2308.66	373.40
Top Width (ft)	79.72	Top Width (ft)	8.85	41.97	28.89
Vel Total (ft/s)	9.59	Avg. Vel. (ft/s)	4.43	12.10	4.88
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)	2.57	4.55	2.65
Conv. Total (cfs)	26793.3	Conv. (cfs)	971.8	22226.6	3594.9
Length Wtd. (ft)	454.12	Wetted Per. (ft)	10.10	41.97	29.28
Min Ch El (ft)	7739.78	Shear (lb/sq ft)	1.52	3.06	1.76
Alpha	1.36	Stream Power (lb/ft s)	6.73	37.05	8.59
Frctn Loss (ft)	4.76	Cum Volume (acre-ft)	5.12	20.82	3.65
C & E Loss (ft)	0.03	Cum SA (acres)	2.11	4.28	1.66

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 3790

INPUT

Description:

Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7800.91	.38	7800.82	.69	7800.56	7.56	7795.13	12.88	7790.94
14.75	7789.47	17.43	7787.35	25.07	7781.34	34.91	7773.96	36.29	7772.86
37.26	7772.15	43.48	7767.37	49.45	7762.77	50.66	7761.62	52.39	7761.04
61.65	7755.6	65.02	7752.38	69.87	7750.76	72.21	7750	75.35	7749.17
81.49	7747.67	83.57	7747.19	85.78	7747.12	95.37	7746.58	96.81	7746.46
103.09	7742.78	105.87	7741.19	112.3	7737.44	116.14	7735.15	126.42	7730.89
127.95	7730.26	130.46	7729.22	171.34	7729.21	177.19	7732.44	177.8	7732.77
178.78	7733.36	187.08	7738.39	188.08	7739.1	190.05	7740.33	196.34	7744.23
198.35	7744.32	200.22	7744.42	205.15	7744.66	220.61	7744.82	226.5	7744.89
227.6	7744.6	229.67	7744.03	231.2	7743.6	233.79	7745.57	239.46	7749.87
245.25	7755.51	249.74	7759.87	253.56	7763.6	260.01	7770.41	261.87	7771.88
269.73	7778.07	270.18	7778.43	270.29	7778.5	276.82	7782.9		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	130.46	.035	171.34	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
130.46	171.34	543.23	532.25	520.56	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7735.85	Element			
Vel Head (ft)	2.08	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7733.77	Reach Len. (ft)	543.23	532.25	520.56
Crit W.S. (ft)	7733.77	Flow Area (sq ft)	25.05	186.37	18.80
E.G. Slope (ft/ft)	0.010529	Area (sq ft)	25.05	186.37	18.80
Q Total (cfs)	2413.00	Flow (cfs)	104.56	2232.16	76.28
Top Width (ft)	60.00	Top Width (ft)	11.00	40.88	8.12
Vel Total (ft/s)	10.48	Avg. Vel. (ft/s)	4.17	11.98	4.06
Max Chl Dpth (ft)	4.56	Hydr. Depth (ft)	2.28	4.56	2.31
Conv. Total (cfs)	23515.9	Conv. (cfs)	1019.0	21753.5	743.4
Length Wtd. (ft)	532.45	Wetted Per. (ft)	11.90	40.88	9.32
Min Ch El (ft)	7729.21	Shear (lb/sq ft)	1.38	3.00	1.33
Alpha	1.22	Stream Power (lb/ft s)	5.77	35.89	5.38
Frctn Loss (ft)	5.59	Cum Volume (acre-ft)	3.93	17.03	2.44
C & E Loss (ft)	0.02	Cum SA (acres)	1.63	3.85	1.17

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7735.85	Element			
Vel Head (ft)	2.08	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7733.77	Reach Len. (ft)	543.23	532.25	520.56
Crit W.S. (ft)	7733.77	Flow Area (sq ft)	25.05	186.37	18.80
E.G. Slope (ft/ft)	0.010529	Area (sq ft)	25.05	186.37	18.80
Q Total (cfs)	2413.00	Flow (cfs)	104.56	2232.16	76.28
Top Width (ft)	60.00	Top Width (ft)	11.00	40.88	8.12
Vel Total (ft/s)	10.48	Avg. Vel. (ft/s)	4.17	11.98	4.06
Max Chl Dpth (ft)	4.56	Hydr. Depth (ft)	2.28	4.56	2.31
Conv. Total (cfs)	23515.9	Conv. (cfs)	1019.0	21753.5	743.4
Length Wtd. (ft)	532.45	Wetted Per. (ft)	11.90	40.88	9.32
Min Ch El (ft)	7729.21	Shear (lb/sq ft)	1.38	3.00	1.33
Alpha	1.22	Stream Power (lb/ft s)	5.77	35.89	5.38
Frctn Loss (ft)	5.59	Cum Volume (acre-ft)	2.56	18.18	1.10
C & E Loss (ft)	0.02	Cum SA (acres)	0.84	3.85	0.46

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7734.81	Element			
Vel Head (ft)	1.77	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7733.04	Reach Len. (ft)	543.23	532.25	520.56
Crit W.S. (ft)	7733.04	Flow Area (sq ft)	17.61	156.26	13.27
E.G. Slope (ft/ft)	0.011200	Area (sq ft)	17.61	156.26	13.27
Q Total (cfs)	1833.00	Flow (cfs)	67.39	1716.46	49.15
Top Width (ft)	57.01	Top Width (ft)	9.22	40.88	6.90
Vel Total (ft/s)	9.79	Avg. Vel. (ft/s)	3.83	10.98	3.70
Max Chl Dpth (ft)	3.83	Hydr. Depth (ft)	1.91	3.82	1.92
Conv. Total (cfs)	17320.0	Conv. (cfs)	636.7	16218.8	464.4
Length Wtd. (ft)	532.42	Wetted Per. (ft)	9.98	40.88	7.89
Min Ch El (ft)	7729.21	Shear (lb/sq ft)	1.43	2.67	1.18
Alpha	1.19	Stream Power (lb/ft s)	4.72	29.36	4.35
Frctn Loss (ft)	5.96	Cum Volume (acre-ft)	2.73	14.29	1.66
C & E Loss (ft)	0.01	Cum SA (acres)	1.32	3.85	0.92

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7735.57	Element			
Vel Head (ft)	2.00	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7733.57	Reach Len. (ft)	543.23	532.25	520.56
Crit W.S. (ft)	7733.57	Flow Area (sq ft)	22.89	178.12	17.20
E.G. Slope (ft/ft)	0.010697	Area (sq ft)	22.89	178.12	17.20
Q Total (cfs)	2248.00	Flow (cfs)	93.40	2086.42	68.18
Top Width (ft)	59.18	Top Width (ft)	10.51	40.88	7.79
Vel Total (ft/s)	10.30	Avg. Vel. (ft/s)	4.08	11.71	3.96
Max Chl Dpth (ft)	4.36	Hydr. Depth (ft)	2.18	4.36	2.21
Conv. Total (cfs)	21735.7	Conv. (cfs)	903.1	20173.4	659.2
Length Wtd. (ft)	532.45	Wetted Per. (ft)	11.38	40.88	8.93
Min Ch El (ft)	7729.21	Shear (lb/sq ft)	1.34	2.91	1.29
Alpha	1.21	Stream Power (lb/ft s)	5.48	34.08	5.10
Frctn Loss (ft)	5.68	Cum Volume (acre-ft)	3.58	16.28	2.23
C & E Loss (ft)	0.02	Cum SA (acres)	1.53	3.85	1.11

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is

not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7736.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.26	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7734.21	Reach Len. (ft)	543.23	532.25	520.56
Crit W.S. (ft)	7734.21	Flow Area (sq ft)	30.10	204.27	22.52
E.G. Slope (ft/ft)	0.010170	Area (sq ft)	30.10	204.27	22.52
Q Total (cfs)	2783.00	Flow (cfs)	131.27	2556.17	95.57
Top Width (ft)	61.78	Top Width (ft)	12.06	40.88	8.85
Vel Total (ft/s)	10.83	Avg. Vel. (ft/s)	4.36	12.51	4.24
Max Chl Dpth (ft)	5.00	Hydr. Depth (ft)	2.50	5.00	2.55
Conv. Total (cfs)	27596.4	Conv. (cfs)	1301.6	25347.1	947.7
Length Wtd. (ft)	532.48	Wetted Per. (ft)	13.05	40.88	10.16
Min Ch El (ft)	7729.21	Shear (lb/sq ft)	1.46	3.17	1.41
Alpha	1.24	Stream Power (lb/ft s)	6.39	39.70	5.97
Frctn Loss (ft)	5.35	Cum Volume (acre-ft)	4.86	18.78	3.09
C & E Loss (ft)	0.03	Cum SA (acres)	2.01	3.85	1.45

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 3258

INPUT
Description:
Station Elevation Data num= 75

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7784.67	.13	7784.6	.3	7784.48	7.26	7779.17	12.56	7775.4
14.4	7774.12	16.82	7772.39	21.54	7769.06	25.12	7766.5	28.67	7764.03
33.35	7760.69	35.81	7758.96	37.67	7757.62	42.95	7753.94	49.88	7749.02
50.08	7748.88	50.23	7748.77	52.05	7747.25	61.21	7739.66	61.49	7739.3
63.46	7738.91	66.41	7738.58	71.49	7738.17	75.35	7737.96	78.63	7737.83
82.94	7737.85	85.76	7737.85	87.91	7737.87	92.9	7737.9	99.47	7737.73
104.59	7737.46	105.81	7737.4	113.03	7735.6	114.66	7735.14	117.58	7734.4
119.75	7734.25	122.08	7734.07	124.65	7733.84	126.83	7732.83	132.53	7730.09
135.72	7728.74	138.15	7727.78	142.86	7726.17	149.06	7724.63	149.99	7724.35
150.71	7724.14	160.45	7721.33	182.4	7721.26	201.63	7721.25	203.57	7722.37
212.11	7727.14	213.5	7727.89	215.05	7728.78	220.6	7731.71	226.83	7731.77
242.86	7731.88	246.1	7731.03	246.92	7730.8	249.66	7731.92	249.91	7732.07
251.18	7732.92	257.04	7736.68	263.74	7740.77	264.18	7741.05	264.76	7741.42
271.32	7745.33	276.3	7749.07	278.45	7750.5	281.29	7752.37	285.59	7754.94
288.86	7757.39	297.82	7764.02	299.86	7765.35	300.43	7765.72	305.31	7769.71

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	160.45	.035	201.63	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
160.45 201.63 509.64 502.17 496.15 .1 .3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7727.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.01	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7725.78	Reach Len. (ft)	509.64	502.17	496.15
Crit W.S. (ft)	7725.78	Flow Area (sq ft)	34.61	185.44	18.10
E.G. Slope (ft/ft)	0.010482	Area (sq ft)	34.61	185.44	18.10
Q Total (cfs)	2413.00	Flow (cfs)	143.09	2197.98	71.92
Top Width (ft)	65.24	Top Width (ft)	16.02	41.18	8.04
Vel Total (ft/s)	10.13	Avg. Vel. (ft/s)	4.13	11.85	3.97
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)	2.16	4.50	2.25
Conv. Total (cfs)	23568.2	Conv. (cfs)	1397.6	21468.1	702.5
Length Wtd. (ft)	502.39	Wetted Per. (ft)	16.63	41.18	9.23
Min Ch El (ft)	7721.25	Shear (lb/sq ft)	1.36	2.95	1.28
Alpha	1.26	Stream Power (lb/ft s)	5.63	34.93	5.10
Frctn Loss (ft)	5.17	Cum Volume (acre-ft)	3.56	14.76	2.22
C & E Loss (ft)	0.04	Cum SA (acres)	1.47	3.35	1.07

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7727.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.01	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7725.78	Reach Len. (ft)	509.64	502.17	496.15
Crit W.S. (ft)	7725.78	Flow Area (sq ft)	34.61	185.44	18.10
E.G. Slope (ft/ft)	0.010482	Area (sq ft)	34.61	185.44	18.10
Q Total (cfs)	2413.00	Flow (cfs)	143.09	2197.98	71.92
Top Width (ft)	65.24	Top Width (ft)	16.02	41.18	8.04
Vel Total (ft/s)	10.13	Avg. Vel. (ft/s)	4.13	11.85	3.97
Max Chl Dpth (ft)	4.53	Hydr. Depth (ft)	2.16	4.50	2.25
Conv. Total (cfs)	23568.2	Conv. (cfs)	1397.6	21468.1	702.5
Length Wtd. (ft)	502.39	Wetted Per. (ft)	16.63	41.18	9.23
Min Ch El (ft)	7721.25	Shear (lb/sq ft)	1.36	2.95	1.28
Alpha	1.26	Stream Power (lb/ft s)	5.63	34.93	5.10
Frctn Loss (ft)	5.17	Cum Volume (acre-ft)	2.19	15.91	0.88
C & E Loss (ft)	0.04	Cum SA (acres)	0.67	3.35	0.36

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7726.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.72	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7725.05	Reach Len. (ft)	509.64	502.17	496.15
Crit W.S. (ft)	7725.05	Flow Area (sq ft)	24.04	155.52	12.73
E.G. Slope (ft/ft)	0.011200	Area (sq ft)	24.04	155.52	12.73
Q Total (cfs)	1833.00	Flow (cfs)	92.04	1694.46	46.50
Top Width (ft)	61.02	Top Width (ft)	13.09	41.18	6.74
Vel Total (ft/s)	9.53	Avg. Vel. (ft/s)	3.83	10.90	3.65
Max Chl Dpth (ft)	3.80	Hydr. Depth (ft)	1.84	3.78	1.89
Conv. Total (cfs)	17320.6	Conv. (cfs)	869.8	16011.4	439.4
Length Wtd. (ft)	502.34	Wetted Per. (ft)	13.61	41.18	7.74

Min Ch El (ft)	7721.25	Shear (lb/sq ft)	1.23	2.64	1.15
Alpha	1.22	Stream Power (lb/ft s)	4.73	28.77	4.20
Frctn Loss (ft)	5.60	Cum Volume (acre-ft)	2.47	12.38	1.50
C & E Loss (ft)	0.02	Cum SA (acres)	1.18	3.35	0.84

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7727.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.93	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7725.58	Reach Len. (ft)	509.64	502.17	496.15
Crit W.S. (ft)	7725.58	Flow Area (sq ft)	31.52	177.27	16.55
E.G. Slope (ft/ft)	0.010657	Area (sq ft)	31.52	177.27	16.55
Q Total (cfs)	2248.00	Flow (cfs)	127.66	2056.02	64.31
Top Width (ft)	64.09	Top Width (ft)	15.22	41.18	7.69
Vel Total (ft/s)	9.98	Avg. Vel. (ft/s)	4.05	11.60	3.89
Max Chl Dpth (ft)	4.33	Hydr. Depth (ft)	2.07	4.30	2.15
Conv. Total (cfs)	21775.8	Conv. (cfs)	1236.6	19916.2	623.0
Length Wtd. (ft)	502.37	Wetted Per. (ft)	15.80	41.18	8.82
Min Ch El (ft)	7721.25	Shear (lb/sq ft)	1.33	2.86	1.25
Alpha	1.25	Stream Power (lb/ft s)	5.37	33.22	4.85
Frctn Loss (ft)	5.26	Cum Volume (acre-ft)	3.24	14.11	2.02
C & E Loss (ft)	0.04	Cum SA (acres)	1.37	3.35	1.02

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7728.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.15	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7726.23	Reach Len. (ft)	509.64	502.17	496.15
Crit W.S. (ft)	7726.23	Flow Area (sq ft)	42.27	204.06	21.92
E.G. Slope (ft/ft)	0.009945	Area (sq ft)	42.27	204.06	21.92
Q Total (cfs)	2783.00	Flow (cfs)	181.48	2511.09	90.43
Top Width (ft)	67.80	Top Width (ft)	17.77	41.18	8.85
Vel Total (ft/s)	10.37	Avg. Vel. (ft/s)	4.29	12.31	4.12
Max Chl Dpth (ft)	4.98	Hydr. Depth (ft)	2.38	4.96	2.48
Conv. Total (cfs)	27906.3	Conv. (cfs)	1819.8	25179.7	906.8
Length Wtd. (ft)	502.41	Wetted Per. (ft)	18.44	41.18	10.16
Min Ch El (ft)	7721.25	Shear (lb/sq ft)	1.42	3.08	1.34
Alpha	1.29	Stream Power (lb/ft s)	6.11	37.86	5.53
Frctn Loss (ft)	4.98	Cum Volume (acre-ft)	4.41	16.28	2.82
C & E Loss (ft)	0.04	Cum SA (acres)	1.83	3.35	1.34

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 2755

INPUT
Description:
Station Elevation Data num= 99

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7770.76	4.16	7770.42	10.38	7769.95	20.38	7769.34	24.19	7768.97
30.38	7768.59	34.2	7768.19	40.38	7767.56	44.22	7767.24	50.38	7766.6
54.24	7766.37	70.38	7765.15	90.38	7763.5	100.38	7762.4	104.32	7762.1
110.38	7761.44	120.38	7760.61	124.35	7760.2	130.38	7759.71	140.38	7758.81
144.38	7758.32	150.38	7757.78	154.4	7757.54	160.38	7757.17	164.41	7756.64
170.38	7756.27	180.38	7754.89	184.44	7754.42	190.38	7753.61	194.46	7753.12
210.38	7751.58	214.49	7751.41	220.38	7750.92	227.49	7750.83	228.1	7750.78
231.22	7750.2	236.75	7749.5	240.38	7748.95	244.54	7748.43	247.84	7747.95
251.55	7747.6	252.66	7747.52	257.2	7747.02	258.63	7746.4	266.21	7741.84
266.73	7741.55	267.23	7741.31	278.48	7734.35	279.29	7733.86	282.68	7733.13
284.76	7732.75	294.59	7729.72	295.04	7729.62	295.51	7729.27	302.11	7725.4
308.27	7721.49	309.93	7720.43	313.56	7718.2	320.6	7716.58	321.95	7716.3
323.34	7715.93	326.07	7715.16	330.95	7713.89	371.31	7713.89	372.69	7714.27
376.67	7715.5	379.94	7716.58	383.44	7717.75	389.14	7719.44	390.76	7719.95
398.09	7720.02	401.16	7720.2	404.03	7720.21	408.24	7720.38	417.29	7720.86
418.17	7720.91	418.76	7721.19	422.56	7722.74	427.4	7724.78	429.46	7725.75
431.39	7726.5	434	7727.33	437.92	7728.78	440.98	7728.72	460.02	7728.54
465.46	7727.1	471.35	7731.27	472.44	7732.04	478.99	7736.58	486.01	7741.78
486.12	7741.86	499.8	7751.47	500.22	7751.76	500.67	7752.06	507.29	7756.56
513.48	7761.6	514.37	7762.33	515.32	7763.1	520.74	7767.11		

Manning's n values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	330.95	.035	371.31	.06

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
330.95	371.31	491.45	513.58	537.34	.1	.3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7720.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.87	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7718.39	Reach Len. (ft)	491.45	513.58	537.34
Crit W.S. (ft)	7718.39	Flow Area (sq ft)	39.47	181.56	32.54
E.G. Slope (ft/ft)	0.010117	Area (sq ft)	39.47	181.56	32.54
Q Total (cfs)	2413.00	Flow (cfs)	164.22	2112.80	135.97
Top Width (ft)	72.34	Top Width (ft)	17.70	40.36	14.28
Vel Total (ft/s)	9.52	Avg. Vel. (ft/s)	4.16	11.64	4.18
Max Chl Dpth (ft)	4.50	Hydr. Depth (ft)	2.23	4.50	2.28
Conv. Total (cfs)	23989.9	Conv. (cfs)	1632.7	21005.4	1351.8
Length Wtd. (ft)	513.01	Wetted Per. (ft)	18.28	40.36	14.98
Min Ch El (ft)	7713.89	Shear (lb/sq ft)	1.36	2.84	1.37
Alpha	1.33	Stream Power (lb/ft s)	5.67	33.06	5.73
Frctn Loss (ft)	5.35	Cum Volume (acre-ft)	3.13	12.64	1.93
C & E Loss (ft)	0.02	Cum SA (acres)	1.27	2.88	0.95

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7720.26	Element			
Vel Head (ft)	1.87	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7718.39	Reach Len. (ft)	491.45	513.58	537.34
Crit W.S. (ft)	7718.39	Flow Area (sq ft)	39.47	181.56	32.54
E.G. Slope (ft/ft)	0.010117	Area (sq ft)	39.47	181.56	32.54
Q Total (cfs)	2413.00	Flow (cfs)	164.22	2112.80	135.97
Top Width (ft)	72.34	Top Width (ft)	17.70	40.36	14.28
Vel Total (ft/s)	9.52	Avg. Vel. (ft/s)	4.16	11.64	4.18
Max Chl Dpth (ft)	4.50	Hydr. Depth (ft)	2.23	4.50	2.28
Conv. Total (cfs)	23989.9	Conv. (cfs)	1632.7	21005.4	1351.8
Length Wtd. (ft)	513.50	Wetted Per. (ft)	18.28	40.36	14.98
Min Ch El (ft)	7713.89	Shear (lb/sq ft)	1.36	2.84	1.37
Alpha	1.33	Stream Power (lb/ft s)	5.67	33.06	5.73
Frctn Loss (ft)	5.46	Cum Volume (acre-ft)	1.76	13.79	0.59
C & E Loss (ft)	0.01	Cum SA (acres)	0.47	2.88	0.24

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7719.30	Element			
Vel Head (ft)	1.65	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7717.65	Reach Len. (ft)	491.45	513.58	537.34
Crit W.S. (ft)	7717.65	Flow Area (sq ft)	27.20	151.63	22.87
E.G. Slope (ft/ft)	0.011110	Area (sq ft)	27.20	151.63	22.87
Q Total (cfs)	1833.00	Flow (cfs)	103.53	1639.70	89.77
Top Width (ft)	67.17	Top Width (ft)	14.99	40.36	11.82
Vel Total (ft/s)	9.09	Avg. Vel. (ft/s)	3.81	10.81	3.92
Max Chl Dpth (ft)	3.76	Hydr. Depth (ft)	1.82	3.76	1.93
Conv. Total (cfs)	17390.5	Conv. (cfs)	982.3	15556.6	851.7
Length Wtd. (ft)	513.11	Wetted Per. (ft)	15.45	40.36	12.41
Min Ch El (ft)	7713.89	Shear (lb/sq ft)	1.22	2.61	1.28
Alpha	1.29	Stream Power (lb/ft s)	4.65	28.18	5.02
Frctn Loss (ft)	5.77	Cum Volume (acre-ft)	2.17	10.61	1.30
C & E Loss (ft)	0.03	Cum SA (acres)	1.02	2.88	0.73

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7720.00	Element			
Vel Head (ft)	1.81	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7718.20	Reach Len. (ft)	491.45	513.58	537.34
Crit W.S. (ft)	7718.20	Flow Area (sq ft)	36.10	173.82	29.86
E.G. Slope (ft/ft)	0.010283	Area (sq ft)	36.10	173.82	29.86
Q Total (cfs)	2248.00	Flow (cfs)	144.69	1980.80	122.51
Top Width (ft)	71.37	Top Width (ft)	17.38	40.36	13.64
Vel Total (ft/s)	9.38	Avg. Vel. (ft/s)	4.01	11.40	4.10
Max Chl Dpth (ft)	4.31	Hydr. Depth (ft)	2.08	4.31	2.19
Conv. Total (cfs)	22168.3	Conv. (cfs)	1426.9	19533.3	1208.1
Length Wtd. (ft)	513.05	Wetted Per. (ft)	17.90	40.36	14.30
Min Ch El (ft)	7713.89	Shear (lb/sq ft)	1.29	2.76	1.34
Alpha	1.32	Stream Power (lb/ft s)	5.19	31.51	5.50
Frctn Loss (ft)	5.45	Cum Volume (acre-ft)	2.84	12.08	1.76
C & E Loss (ft)	0.01	Cum SA (acres)	1.18	2.88	0.90

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7720.82	Element			
Vel Head (ft)	2.03	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7718.79	Reach Len. (ft)	491.45	513.58	537.34
Crit W.S. (ft)	7718.79	Flow Area (sq ft)	46.70	197.76	38.55
E.G. Slope (ft/ft)	0.009870	Area (sq ft)	46.70	197.76	38.55
Q Total (cfs)	2783.00	Flow (cfs)	208.93	2406.35	167.72
Top Width (ft)	74.35	Top Width (ft)	18.35	40.36	15.64
Vel Total (ft/s)	9.83	Avg. Vel. (ft/s)	4.47	12.17	4.35
Max Chl Dpth (ft)	4.90	Hydr. Depth (ft)	2.54	4.90	2.46
Conv. Total (cfs)	28012.1	Conv. (cfs)	2103.0	24220.9	1688.2
Length Wtd. (ft)	512.95	Wetted Per. (ft)	19.05	40.36	16.39
Min Ch El (ft)	7713.89	Shear (lb/sq ft)	1.51	3.02	1.45
Alpha	1.35	Stream Power (lb/ft s)	6.76	36.74	6.31
Frctn Loss (ft)	5.44	Cum Volume (acre-ft)	3.89	13.97	2.48
C & E Loss (ft)	0.01	Cum SA (acres)	1.62	2.88	1.20

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 2242

INPUT
Description:
Station Elevation Data num= 112

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7750.73	3.14	7750.29	8.57	7749.55	18.27	7748.35	18.74	7748.28
38.75	7745.66	47.39	7744.41	48.75	7744.21	57.09	7743.29	58.76	7743.05
88.77	7740.11	95.91	7739.32	98.78	7739.04	108.78	7737.86	115.32	7737
118.79	7736.59	128.79	7735	134.73	7734.18	138.8	7733.53	148.8	7732.01
154.15	7731.15	158.8	7730.44	159.71	7730.2	162.85	7729.48	166.55	7729.2

173.56	7728.71	178.81	7728.31	188.82	7727.42	192.97	7726.9	198.82	7726.38
202.67	7726.1	208.83	7725.73	212.38	7725.51	218.83	7725.12	238.84	7724.19
241.49	7723.98	248.85	7723.18	251.2	7722.89	258.85	7722.05	259.35	7721.97
266.75	7719.92	268.86	7719.34	270.7	7718.81	273.23	7718.01	277.03	7717.65
278.86	7717.49	280.31	7717.39	288.87	7716.94	298.87	7716.62	318.88	7716.08
338.55	7715.67	343.58	7715.54	348.3	7714.72	348.89	7714.61	358.96	7712.68
359.23	7712.62	363.17	7712.45	368.9	7712.18	377.37	7711.89	378.91	7711.84
380.69	7711.91	387.68	7712.15	388.4	7712.01	388.91	7711.9	396.78	7710.36
398.92	7709.95	406.48	7708.37	408.92	7707.9	410.63	7707.55	456.53	7707.65
457.45	7708.06	458.95	7708.81	464.71	7711.51	468.95	7713.48	475.33	7716.49
478.96	7716.46	484.12	7716.47	488.96	7716.56	493.83	7716.57	500.44	7716.82
501.4	7716.9	502.31	7716.98	510.01	7717.96	511.08	7718.15	515.1	7718.96
516.15	7719.17	522.62	7721.02	529.38	7723.15	529.69	7723.28	529.99	7723.46
536.76	7726.88	543.83	7731.17	546.12	7732.72	547.66	7732.83	550.91	7733.12
552.38	7733.32	555.81	7733.7	572.84	7733.61	576.47	7733.58	577.03	7733.46
582.65	7732.23	583.66	7732	586.05	7733.42	587.24	7734.12	593.34	7737.47
599.18	7742.4	600.42	7743.32	601.7	7744.37	603.04	7745.41	609.21	7750.22
616.17	7751.85	619.84	7752.66						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	410.63	.035	456.53	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
410.63	456.53	531.4	491.58	360.02	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7713.57	Element			
Vel Head (ft)	1.82	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7711.75	Reach Len. (ft)	531.40	491.58	360.02
Crit W.S. (ft)	7711.75	Flow Area (sq ft)	43.61	190.45	17.77
E.G. Slope (ft/ft)	0.010745	Area (sq ft)	43.61	190.45	17.77
Q Total (cfs)	2413.00	Flow (cfs)	180.16	2164.14	68.70
Top Width (ft)	75.54	Top Width (ft)	20.95	45.90	8.69
Vel Total (ft/s)	9.58	Avg. Vel. (ft/s)	4.13	11.36	3.87
Max Chl Dpth (ft)	4.20	Hydr. Depth (ft)	2.08	4.15	2.04
Conv. Total (cfs)	23278.1	Conv. (cfs)	1738.0	20877.3	662.7
Length Wtd. (ft)	487.39	Wetted Per. (ft)	21.37	45.90	9.61
Min Ch El (ft)	7707.55	Shear (lb/sq ft)	1.37	2.78	1.24
Alpha	1.28	Stream Power (lb/ft s)	5.66	31.63	4.79
Frctn Loss (ft)	5.24	Cum Volume (acre-ft)	2.66	10.45	1.62
C & E Loss (ft)	0.05	Cum SA (acres)	1.05	2.37	0.80

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7714.25	Element			
Vel Head (ft)	1.93	Wt. n-Val.		0.035	
W.S. Elev (ft)	7712.32	Reach Len. (ft)	531.40	491.58	360.02
Crit W.S. (ft)	7712.02	Flow Area (sq ft)		216.49	
E.G. Slope (ft/ft)	0.011180	Area (sq ft)		216.49	
Q Total (cfs)	2413.00	Flow (cfs)		2413.00	
Top Width (ft)	45.90	Top Width (ft)		45.90	
Vel Total (ft/s)	11.15	Avg. Vel. (ft/s)		11.15	
Max Chl Dpth (ft)	4.77	Hydr. Depth (ft)		4.72	
Conv. Total (cfs)	22820.9	Conv. (cfs)		22820.9	
Length Wtd. (ft)	491.58	Wetted Per. (ft)		55.33	
Min Ch El (ft)	7707.55	Shear (lb/sq ft)		2.73	
Alpha	1.00	Stream Power (lb/ft s)		30.44	
Frctn Loss (ft)	6.03	Cum Volume (acre-ft)	1.53	11.44	0.39
C & E Loss (ft)	0.02	Cum SA (acres)	0.37	2.37	0.15

warning: The cross section had to be extended vertically during the critical depth calculations.
warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7712.65	Element			
Vel Head (ft)	1.56	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7711.09	Reach Len. (ft)	531.40	491.58	360.02
Crit W.S. (ft)	7711.09	Flow Area (sq ft)	30.97	160.35	12.53
E.G. Slope (ft/ft)	0.011367	Area (sq ft)	30.97	160.35	12.53
Q Total (cfs)	1833.00	Flow (cfs)	117.65	1670.98	44.37
Top Width (ft)	70.79	Top Width (ft)	17.60	45.90	7.29
Vel Total (ft/s)	8.99	Avg. Vel. (ft/s)	3.80	10.42	3.54
Max Chl Dpth (ft)	3.54	Hydr. Depth (ft)	1.76	3.49	1.72
Conv. Total (cfs)	17192.8	Conv. (cfs)	1103.5	15673.1	416.2
Length Wtd. (ft)	487.84	Wetted Per. (ft)	17.95	45.90	8.06
Min Ch El (ft)	7707.55	Shear (lb/sq ft)	1.22	2.48	1.10
Alpha	1.24	Stream Power (lb/ft s)	4.65	25.83	3.90
Frctn Loss (ft)	5.37	Cum Volume (acre-ft)	1.84	8.77	1.08
C & E Loss (ft)	0.06	Cum SA (acres)	0.83	2.37	0.62

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7713.32	Element			
Vel Head (ft)	1.76	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7711.56	Reach Len. (ft)	531.40	491.58	360.02
Crit W.S. (ft)	7711.56	Flow Area (sq ft)	39.75	181.77	16.16
E.G. Slope (ft/ft)	0.010996	Area (sq ft)	39.75	181.77	16.16
Q Total (cfs)	2248.00	Flow (cfs)	161.11	2025.62	61.27
Top Width (ft)	74.17	Top Width (ft)	19.98	45.90	8.29
Vel Total (ft/s)	9.46	Avg. Vel. (ft/s)	4.05	11.14	3.79
Max Chl Dpth (ft)	4.01	Hydr. Depth (ft)	1.99	3.96	1.95
Conv. Total (cfs)	21437.5	Conv. (cfs)	1536.4	19316.8	584.3
Length Wtd. (ft)	487.59	Wetted Per. (ft)	20.38	45.90	9.16
Min Ch El (ft)	7707.55	Shear (lb/sq ft)	1.34	2.72	1.21
Alpha	1.27	Stream Power (lb/ft s)	5.43	30.30	4.59
Frctn Loss (ft)	5.29	Cum Volume (acre-ft)	2.42	9.99	1.48
C & E Loss (ft)	0.06	Cum SA (acres)	0.97	2.37	0.77

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7714.12	Element			
Vel Head (ft)	2.10	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7712.02	Reach Len. (ft)	531.40	491.58	360.02
Crit W.S. (ft)	7712.02	Flow Area (sq ft)	50.35	202.82	20.19
E.G. Slope (ft/ft)	0.011429	Area (sq ft)	50.35	202.82	20.19
Q Total (cfs)	2783.00	Flow (cfs)	220.30	2478.73	83.98
Top Width (ft)	87.68	Top Width (ft)	32.51	45.90	9.27
Vel Total (ft/s)	10.18	Avg. Vel. (ft/s)	4.38	12.22	4.16
Max Chl Dpth (ft)	4.47	Hydr. Depth (ft)	1.55	4.42	2.18
Conv. Total (cfs)	26032.5	Conv. (cfs)	2060.7	23186.2	785.5
Length Wtd. (ft)	487.05	Wetted Per. (ft)	32.96	45.90	10.25
Min Ch El (ft)	7707.55	Shear (lb/sq ft)	1.09	3.15	1.41
Alpha	1.30	Stream Power (lb/ft s)	4.77	38.53	5.84
Frctn Loss (ft)	4.81	Cum Volume (acre-ft)	3.34	11.60	2.11
C & E Loss (ft)	0.15	Cum SA (acres)	1.33	2.37	1.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: Divided flow computed for this cross-section.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 1750

INPUT
Description:
Station Elevation Data num= 114

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7732.78	.83	7732.68	9.11	7732.15	10.28	7732.02	19.13	7731.02
29.15	7730.26	49.18	7729.21	57.5	7728.69	59.2	7728.6	66.94	7727.96
76.38	7727.25	79.24	7727.03	85.83	7726.54	89.26	7726.28	95.27	7725.78
99.28	7725.48	104.72	7724.96	129.33	7722.97	133.05	7722.79	139.35	7722.27
142.49	7722.09	149.37	7721.65	153.93	7721.51	159.39	7721.04	169.4	7720.46
179.42	7719.83	180.27	7719.71	208.6	7715.58	209.48	7715.46	218.04	7714.01
219.5	7713.7	224.27	7712.78	224.85	7712.67	229.52	7712.33	246.37	7711.28
249.55	7711.12	255.82	7710.73	259.57	7710.59	293.59	7708.68	309.66	7708.06
312.48	7707.96	320.71	7707.64	328.8	7707.44	348.18	7706.22	351.62	7706.02
355.92	7705.73	357.46	7705.67	358.94	7705.58	360.5	7705.31	364.63	7704.51
370.38	7703.12	371.79	7702.81	372.81	7702.58	373.16	7702.5	375.56	7701.94
389	7701.91	425.1	7701.88	428.3	7702.37	429.12	7702.5	434.37	7703.3
442.8	7705	443.76	7705.06	446.68	7705.27	450.61	7705.53	457.78	7706.04
470.61	7706.13	471.15	7706.18	473.23	7706.44	490.37	7708.62	494.44	7709.13
507.52	7708.98	524.66	7709.41	529.43	7709.54	532.86	7709.54	541.8	7709.56
545.17	7709.56	557.49	7709.58	606.73	7709.98	610.37	7709.96	622.58	7709.93
627.51	7709.91	629.75	7709.91	643.67	7709.89	653.98	7709.82	658.41	7709.88
661.8	7709.98	665.58	7710.08	668.29	7710.16	672.74	7710.28	678.94	7710.36
680.6	7710.42	687.07	7710.74	692.92	7711.09	696.55	7711.28	697.84	7711.34
698.27	7711.55	700.04	7712.42	705.23	7714.95	708.57	7716.45	713.23	7718.78
715.74	7720.02	717.54	7720.93	722.9	7723.42	729.85	7726.93	730.43	7727.22
731.32	7727.62	735.32	7727.63	750.37	7727.69	753.92	7727.74	755.12	7727.58
756.32	7727.46	759.38	7727.17	764.61	7730.97	767.34	7732.94		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	375.56	.035	425.1	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
375.56	425.1	438.96 509.76	641.67	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7707.48	Element			
Vel Head (ft)	1.66	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7705.82	Reach Len. (ft)	438.96	509.76	641.67
Crit W.S. (ft)	7705.82	Flow Area (sq ft)	33.37	193.96	48.87
E.G. Slope (ft/ft)	0.010772	Area (sq ft)	33.37	193.96	48.87
Q Total (cfs)	2413.00	Flow (cfs)	115.52	2123.05	174.43
Top Width (ft)	100.06	Top Width (ft)	20.95	49.54	29.56
Vel Total (ft/s)	8.74	Avg. Vel. (ft/s)	3.46	10.95	3.57
Max Chl Dpth (ft)	3.94	Hydr. Depth (ft)	1.59	3.92	1.65
Conv. Total (cfs)	23248.9	Conv. (cfs)	1113.0	20455.3	1680.6
Length Wtd. (ft)	513.09	Wetted Per. (ft)	21.36	49.54	29.87
Min Ch El (ft)	7701.88	Shear (lb/sq ft)	1.05	2.63	1.10
Alpha	1.40	Stream Power (lb/ft s)	3.64	28.82	3.93
Frctn Loss (ft)	5.08	Cum Volume (acre-ft)	2.19	8.28	1.35
C & E Loss (ft)	0.08	Cum SA (acres)	0.79	1.84	0.65

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7708.19	Element			
Vel Head (ft)	2.09	Wt. n-Val.		0.035	
W.S. Elev (ft)	7706.11	Reach Len. (ft)	438.96	509.76	641.67
Crit W.S. (ft)	7706.11	Flow Area (sq ft)		208.18	
E.G. Slope (ft/ft)	0.013541	Area (sq ft)		208.18	
Q Total (cfs)	2413.00	Flow (cfs)		2413.00	
Top Width (ft)	49.54	Top Width (ft)		49.54	
Vel Total (ft/s)	11.59	Avg. Vel. (ft/s)		11.59	
Max Chl Dpth (ft)	4.23	Hydr. Depth (ft)		4.20	
Conv. Total (cfs)	20736.0	Conv. (cfs)		20736.0	
Length Wtd. (ft)	510.07	Wetted Per. (ft)		57.93	
Min Ch El (ft)	7701.88	Shear (lb/sq ft)		3.04	
Alpha	1.00	Stream Power (lb/ft s)		35.21	
Frctn Loss (ft)	4.51	Cum Volume (acre-ft)	1.53	9.05	0.39
C & E Loss (ft)	0.30	Cum SA (acres)	0.37	1.84	0.15

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than

0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7706.61	Element			
Vel Head (ft)	1.35	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7705.25	Reach Len. (ft)	438.96	509.76	641.67
Crit W.S. (ft)	7705.11	Flow Area (sq ft)	23.77	166.00	34.47
E.G. Slope (ft/ft)	0.010677	Area (sq ft)	23.77	166.00	34.47
Q Total (cfs)	1833.00	Flow (cfs)	82.17	1630.56	120.27
Top Width (ft)	85.67	Top Width (ft)	14.77	49.54	21.36
Vel Total (ft/s)	8.17	Avg. Vel. (ft/s)	3.46	9.82	3.49
Max Chl Dpth (ft)	3.37	Hydr. Depth (ft)	1.61	3.35	1.61
Conv. Total (cfs)	17739.6	Conv. (cfs)	795.3	15780.4	1164.0
Length Wtd. (ft)	512.72	Wetted Per. (ft)	15.14	49.54	21.64
Min Ch El (ft)	7701.88	Shear (lb/sq ft)	1.05	2.23	1.06
Alpha	1.30	Stream Power (lb/ft s)	3.62	21.94	3.70
Frctn Loss (ft)	5.10	Cum Volume (acre-ft)	1.50	6.93	0.89
C & E Loss (ft)	0.06	Cum SA (acres)	0.64	1.84	0.50

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7707.24	Element			
Vel Head (ft)	1.57	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7705.67	Reach Len. (ft)	438.96	509.76	641.67
Crit W.S. (ft)	7705.55	Flow Area (sq ft)	30.38	186.41	44.53
E.G. Slope (ft/ft)	0.010724	Area (sq ft)	30.38	186.41	44.53
Q Total (cfs)	2248.00	Flow (cfs)	108.67	1982.69	156.64
Top Width (ft)	95.00	Top Width (ft)	18.04	49.54	27.42
Vel Total (ft/s)	8.60	Avg. Vel. (ft/s)	3.58	10.64	3.52
Max Chl Dpth (ft)	3.79	Hydr. Depth (ft)	1.68	3.76	1.62
Conv. Total (cfs)	21708.0	Conv. (cfs)	1049.3	19146.0	1512.6
Length Wtd. (ft)	512.89	Wetted Per. (ft)	18.44	49.54	27.72
Min Ch El (ft)	7701.88	Shear (lb/sq ft)	1.10	2.52	1.08
Alpha	1.37	Stream Power (lb/ft s)	3.95	26.79	3.78
Frctn Loss (ft)	5.15	Cum Volume (acre-ft)	1.99	7.91	1.23
C & E Loss (ft)	0.07	Cum SA (acres)	0.74	1.84	0.62

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7708.00	Element			
Vel Head (ft)	1.58	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7706.42	Reach Len. (ft)	438.96	509.76	641.67
Crit W.S. (ft)	7706.42	Flow Area (sq ft)	48.78	223.69	72.79
E.G. Slope (ft/ft)	0.008635	Area (sq ft)	48.78	223.69	72.79
Q Total (cfs)	2783.00	Flow (cfs)	152.00	2410.79	220.21
Top Width (ft)	128.03	Top Width (ft)	30.53	49.54	47.96
Vel Total (ft/s)	8.06	Avg. Vel. (ft/s)	3.12	10.78	3.03
Max Chl Dpth (ft)	4.54	Hydr. Depth (ft)	1.60	4.52	1.52
Conv. Total (cfs)	29948.9	Conv. (cfs)	1635.7	25943.3	2369.8
Length Wtd. (ft)	513.35	Wetted Per. (ft)	30.95	49.54	48.29
Min Ch El (ft)	7701.88	Shear (lb/sq ft)	0.85	2.43	0.81
Alpha	1.57	Stream Power (lb/ft s)	2.65	26.23	2.46
Frctn Loss (ft)	4.44	Cum Volume (acre-ft)	2.74	9.20	1.73
C & E Loss (ft)	0.03	Cum SA (acres)	0.94	1.84	0.81

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 1241

INPUT
Description:
Station Elevation Data num= 90

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7734.75	8.62	7734.1	40.31	7730.85	48.98	7730.18	64.3	7729.15
65.74	7729.06	68.67	7728.78	78.66	7727.86	86.13	7727.29	88.67	7727.03
90.95	7726.97	101.69	7726.71	106.43	7726.39	109.7	7726.16	118.69	7725.51
124.76	7724.95	128.7	7724.54	144.08	7723.59	148.71	7723.31	153.74	7722.87
158.72	7722.56	163.39	7722.14	168.72	7721.69	173.05	7721.17	178.73	7720.51
182.71	7720.04	188.74	7719.52	192.37	7719.2	198.74	7718.65	207.03	7718.36
208.75	7717.78	218.76	7716.69	221.34	7716.4	228.76	7715.58	231	7715.36
238.77	7714.49	247.01	7713.68	248.13	7713.56	249.31	7713.5	257.62	7711.74
259.97	7711.13	268.79	7708.94	269.52	7708.75	270.51	7708.5	276.57	7708.51
278.79	7708.52	288.8	7708.45	292.9	7708.38	298.6	7708.27	317.92	7707.16
318.82	7707.11	327.57	7706.6	328.83	7706.53	346.89	7705.74	348.84	7705.66
358.85	7705.22	366.2	7705.02	368.85	7704.91	375.86	7704.67	404.84	7704.2
408.88	7704.13	433.81	7703.82	438.9	7703.75	443.47	7703.7	448.91	7703.63
453.12	7703.59	458.91	7703.5	462.78	7703.43	482.1	7703.12	488.93	7703
491.75	7702.97	508.95	7702.74	511.07	7702.72	528.96	7702.51	568.98	7701.69
607.65	7701.46	617.3	7701.44	626.96	7701.45	629.02	7701.44	635.58	7701.45
637.7	7701.12	647.44	7697.23	695.42	7697.18	713.4	7697.24	723.54	7702.72
729.09	7705.75	759.11	7721.88	762.17	7723.53	769.11	7727.03	772.37	7728.55

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	647.44	.035	713.4	.06

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

Left	Right	Left	Channel	Right	Coeff Contr.	Expan.
647.44	713.4	543.61	494.97	446.6	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7702.25	Element			
Vel Head (ft)	1.39	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7700.86	Reach Len. (ft)	543.61	494.97	446.60
Crit W.S. (ft)	7700.60	Flow Area (sq ft)	16.49	240.91	12.11
E.G. Slope (ft/ft)	0.009137	Area (sq ft)	16.49	240.91	12.11
Q Total (cfs)	2413.00	Flow (cfs)	55.26	2318.64	39.10
Top Width (ft)	81.74	Top Width (ft)	9.09	65.96	6.70
Vel Total (ft/s)	8.95	Avg. Vel. (ft/s)	3.35	9.62	3.23
Max Chl Dpth (ft)	3.68	Hydr. Depth (ft)	1.81	3.65	1.81

Conv. Total (cfs)	25244.3	Conv. (cfs)	578.1	24257.2	409.0
Length Wtd. (ft)	499.54	Wetted Per. (ft)	9.78	65.96	7.61
Min Ch El (ft)	7697.18	Shear (lb/sq ft)	0.96	2.08	0.91
Alpha	1.12	Stream Power (lb/ft s)	3.22	20.05	2.93
Frctn Loss (ft)	3.23	Cum Volume (acre-ft)	1.94	5.74	0.90
C & E Loss (ft)	0.04	Cum SA (acres)	0.64	1.16	0.38

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7702.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.09	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7701.29	Reach Len. (ft)	543.61	494.97	446.60
Crit W.S. (ft)		Flow Area (sq ft)	19.18	269.61	15.03
E.G. Slope (ft/ft)	0.006216	Area (sq ft)	19.18	269.61	15.03
Q Total (cfs)	2413.00	Flow (cfs)	61.55	2306.95	44.50
Top Width (ft)	80.10	Top Width (ft)	7.44	65.96	6.70
Vel Total (ft/s)	7.94	Avg. Vel. (ft/s)	3.21	8.56	2.96
Max Chl Dpth (ft)	4.11	Hydr. Depth (ft)	2.58	4.09	2.24
Conv. Total (cfs)	30606.7	Conv. (cfs)	780.7	29261.6	564.4
Length Wtd. (ft)	502.25	Wetted Per. (ft)	9.10	65.96	8.05
Min Ch El (ft)	7697.18	Shear (lb/sq ft)	0.82	1.59	0.72
Alpha	1.12	Stream Power (lb/ft s)	2.62	13.57	2.15
Frctn Loss (ft)	3.22	Cum Volume (acre-ft)	1.44	6.25	0.28
C & E Loss (ft)	0.03	Cum SA (acres)	0.34	1.16	0.10

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7701.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.14	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7700.30	Reach Len. (ft)	543.61	494.97	446.60
Crit W.S. (ft)	7700.04	Flow Area (sq ft)	11.78	203.91	8.65
E.G. Slope (ft/ft)	0.009306	Area (sq ft)	11.78	203.91	8.65
Q Total (cfs)	1833.00	Flow (cfs)	35.64	1772.18	25.18
Top Width (ft)	79.30	Top Width (ft)	7.68	65.96	5.66
Vel Total (ft/s)	8.17	Avg. Vel. (ft/s)	3.02	8.69	2.91
Max Chl Dpth (ft)	3.12	Hydr. Depth (ft)	1.53	3.09	1.53
Conv. Total (cfs)	19001.2	Conv. (cfs)	369.4	18370.8	261.0
Length Wtd. (ft)	499.17	Wetted Per. (ft)	8.27	65.96	6.43
Min Ch El (ft)	7697.18	Shear (lb/sq ft)	0.83	1.80	0.78
Alpha	1.10	Stream Power (lb/ft s)	2.50	15.61	2.27
Frctn Loss (ft)	3.72	Cum Volume (acre-ft)	1.32	4.77	0.57
C & E Loss (ft)	0.01	Cum SA (acres)	0.52	1.16	0.30

Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7702.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7700.68	Reach Len. (ft)	543.61	494.97	446.60
Crit W.S. (ft)	7700.45	Flow Area (sq ft)	14.90	229.13	10.95
E.G. Slope (ft/ft)	0.009410	Area (sq ft)	14.90	229.13	10.95
Q Total (cfs)	2248.00	Flow (cfs)	49.02	2164.32	34.66
Top Width (ft)	80.96	Top Width (ft)	8.64	65.96	6.37
Vel Total (ft/s)	8.82	Avg. Vel. (ft/s)	3.29	9.45	3.17
Max Chl Dpth (ft)	3.50	Hydr. Depth (ft)	1.73	3.47	1.72
Conv. Total (cfs)	23174.1	Conv. (cfs)	505.3	22311.5	357.3
Length Wtd. (ft)	499.49	Wetted Per. (ft)	9.30	65.96	7.24
Min Ch El (ft)	7697.18	Shear (lb/sq ft)	0.94	2.04	0.89
Alpha	1.11	Stream Power (lb/ft s)	3.10	19.28	2.81
Frctn Loss (ft)	3.36	Cum Volume (acre-ft)	1.76	5.48	0.82
C & E Loss (ft)	0.03	Cum SA (acres)	0.60	1.16	0.37

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7702.74	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.50	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7701.24	Reach Len. (ft)	543.61	494.97	446.60
Crit W.S. (ft)	7700.93	Flow Area (sq ft)	20.19	266.26	14.82
E.G. Slope (ft/ft)	0.008646	Area (sq ft)	20.19	266.26	14.82
Q Total (cfs)	2783.00	Flow (cfs)	68.52	2664.71	49.78
Top Width (ft)	83.90	Top Width (ft)	10.53	65.96	7.41
Vel Total (ft/s)	9.24	Avg. Vel. (ft/s)	3.39	10.01	3.36
Max Chl Dpth (ft)	4.06	Hydr. Depth (ft)	1.92	4.04	2.00
Conv. Total (cfs)	29930.5	Conv. (cfs)	736.9	28658.2	535.3
Length Wtd. (ft)	499.75	Wetted Per. (ft)	11.29	65.96	8.42
Min Ch El (ft)	7697.18	Shear (lb/sq ft)	0.97	2.18	0.95
Alpha	1.13	Stream Power (lb/ft s)	3.28	21.81	3.19
Frctn Loss (ft)	2.91	Cum Volume (acre-ft)	2.39	6.33	1.09
C & E Loss (ft)	0.08	Cum SA (acres)	0.74	1.16	0.41

Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 746

INPUT
Description:
Station Elevation Data num= 113

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7722.72	.7	7722.62	6.1	7721.71	17.25	7721.25	24.81	7720.74
28.01	7720.49	32.34	7721.34	35.41	7722.03	45.17	7721.44	48.83	7720.97
51.16	7720.47	55.73	7718.97	55.98	7718.9	72.93	7718.9	79.83	7719.86
82.64	7720.28	86.47	7720.08	90.51	7719.92	93.73	7719.76	100.08	7719.59
101.45	7719.31	102.65	7719.02	105.01	7718.27	109.6	7716.61	113.36	7715.33
117.18	7713.73	121.49	7712.23	125.18	7710.87	133.14	7709.97	138.34	7710.31
140.67	7710.47	145.73	7710.65	148.71	7710.72	151.64	7710.7	155.07	7710.58
165.66	7710.17	174.28	7709.65	177	7709.48	179.67	7709.25	188.55	7708.34
191.14	7707.94	193.68	7707.67	202.83	7707.15	205.13	7707.03	207.69	7706.84
217.1	7706.26	224.52	7705.73	226.89	7705.58	229.16	7705.58	231.38	7705.54
233.57	7705.44	235.72	7705.36	240.52	7705.2	245.65	7704.91	249.73	7704.65
254.78	7704.37	259.93	7704	261.85	7703.85	263.74	7703.71	268.93	7703.38
274.21	7703.1	276	7702.99	277.76	7702.89	283.07	7702.55	288.48	7702.26
291.77	7702.06	297.21	7701.72	302.76	7701.42	305.78	7701.24	311.35	7700.88

317.03	7700.58	319.79	7700.44	325.5	7700.11	331.31	7699.8	332.57	7699.73		
333.81	7699.67	339.64	7699.35	345.58	7698.92	346.71	7698.84	347.82	7698.72		
353.78	7698.11	359.86	7697.51	361.31	7697.38	363.78	7697.15	374.13	7695.04		
375	7694.86	375.84	7694.71	382.07	7693.52	388.41	7692.9	389.14	7692.81		
389.86	7692.73	396.21	7691.91	402.68	7691.33	403.66	7691.24	405.71	7691.21		
409.05	7691.21	430.01	7691.17	431.89	7691.47	438.64	7695.86	445.51	7700.46		
445.71	7700.6	445.91	7700.73	452.78	7705.15	459.78	7708.54	459.92	7708.61		
466.92	7711.58	473.93	7714.64	474.06	7714.7	481.07	7717.65	487.95	7720.67		
488.14	7720.75	488.34	7720.84	493.5	7722.63						

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	402.68	.035	430.01	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
402.68	430.01	205.5	193.3	.1	.3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7698.98	Element			
Vel Head (ft)	1.25	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7697.73	Reach Len. (ft)	205.50	199.00	193.30
Crit W.S. (ft)		Flow Area (sq ft)	155.64	178.40	42.06
E.G. Slope (ft/ft)	0.004915	Area (sq ft)	155.64	178.40	42.06
Q Total (cfs)	2625.00	Flow (cfs)	613.34	1854.43	157.23
Top Width (ft)	83.76	Top Width (ft)	45.01	27.33	11.42
Vel Total (ft/s)	6.98	Avg. Vel. (ft/s)	3.94	10.39	3.74
Max Chl Dpth (ft)	6.56	Hydr. Depth (ft)	3.46	6.53	3.68
Conv. Total (cfs)	37442.6	Conv. (cfs)	8748.6	26451.3	2242.7
Length Wtd. (ft)	199.66	Wetted Per. (ft)	45.51	27.33	13.31
Min Ch El (ft)	7691.17	Shear (lb/sq ft)	1.05	2.00	0.97
Alpha	1.66	Stream Power (lb/ft s)	4.13	20.82	3.62
Frctn Loss (ft)	1.05	Cum Volume (acre-ft)	0.86	3.36	0.62
C & E Loss (ft)	0.07	Cum SA (acres)	0.31	0.63	0.29

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7699.14	Element			
Vel Head (ft)	1.36	Wt. n-Val.	0.060	0.035	
W.S. Elev (ft)	7697.78	Reach Len. (ft)	205.50	199.00	193.30
Crit W.S. (ft)		Flow Area (sq ft)	136.11	179.94	
E.G. Slope (ft/ft)	0.006608	Area (sq ft)	136.11	179.94	
Q Total (cfs)	2625.00	Flow (cfs)	737.17	1887.83	
Top Width (ft)	55.01	Top Width (ft)	27.68	27.33	
Vel Total (ft/s)	8.31	Avg. Vel. (ft/s)	5.42	10.49	
Max Chl Dpth (ft)	6.61	Hydr. Depth (ft)	4.92	6.58	
Conv. Total (cfs)	32291.5	Conv. (cfs)	9068.3	23223.2	
Length Wtd. (ft)	199.98	Wetted Per. (ft)	30.85	33.95	
Min Ch El (ft)	7691.17	Shear (lb/sq ft)	1.82	2.19	
Alpha	1.27	Stream Power (lb/ft s)	9.86	22.94	
Frctn Loss (ft)	1.22	Cum Volume (acre-ft)	0.47	3.70	0.20
C & E Loss (ft)	0.06	Cum SA (acres)	0.12	0.63	0.07

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7697.71	Element			
Vel Head (ft)	1.23	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7696.47	Reach Len. (ft)	205.50	199.00	193.30
Crit W.S. (ft)		Flow Area (sq ft)	106.26	144.17	28.93
E.G. Slope (ft/ft)	0.006201	Area (sq ft)	106.26	144.17	28.93
Q Total (cfs)	1994.00	Flow (cfs)	426.46	1460.44	107.10
Top Width (ft)	72.46	Top Width (ft)	35.58	27.33	9.55
Vel Total (ft/s)	7.14	Avg. Vel. (ft/s)	4.01	10.13	3.70
Max Chl Dpth (ft)	5.30	Hydr. Depth (ft)	2.99	5.28	3.03
Conv. Total (cfs)	25321.7	Conv. (cfs)	5415.6	18546.1	1360.1
Length Wtd. (ft)	199.59	Wetted Per. (ft)	35.99	27.33	11.06
Min Ch El (ft)	7691.17	Shear (lb/sq ft)	1.14	2.04	1.01
Alpha	1.56	Stream Power (lb/ft s)	4.59	20.68	3.75
Frctn Loss (ft)	1.22	Cum Volume (acre-ft)	0.59	2.79	0.38
C & E Loss (ft)	0.04	Cum SA (acres)	0.25	0.63	0.22

Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7698.63	Element			
Vel Head (ft)	1.74	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7697.39	Reach Len. (ft)	205.50	199.00	193.30
Crit W.S. (ft)		Flow Area (sq ft)	140.93	169.11	38.26
E.G. Slope (ft/ft)	0.005170	Area (sq ft)	140.93	169.11	38.26
Q Total (cfs)	2445.00	Flow (cfs)	563.13	1739.74	142.13
Top Width (ft)	79.68	Top Width (ft)	41.44	27.33	10.91
Vel Total (ft/s)	7.02	Avg. Vel. (ft/s)	4.00	10.29	3.71
Max Chl Dpth (ft)	6.22	Hydr. Depth (ft)	3.40	6.19	3.51
Conv. Total (cfs)	34004.9	Conv. (cfs)	7832.0	24196.2	1976.7
Length Wtd. (ft)	199.65	Wetted Per. (ft)	41.93	27.33	12.70
Min Ch El (ft)	7691.17	Shear (lb/sq ft)	1.08	2.00	0.97
Alpha	1.62	Stream Power (lb/ft s)	4.33	20.54	3.61
Frctn Loss (ft)	1.07	Cum Volume (acre-ft)	0.79	3.22	0.56
C & E Loss (ft)	0.06	Cum SA (acres)	0.29	0.63	0.28

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7699.76	Element			
Vel Head (ft)	1.25	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7698.51	Reach Len. (ft)	205.50	199.00	193.30
Crit W.S. (ft)		Flow Area (sq ft)	193.92	199.78	51.44
E.G. Slope (ft/ft)	0.004290	Area (sq ft)	193.92	199.78	51.44
Q Total (cfs)	3028.00	Flow (cfs)	743.73	2092.07	192.20
Top Width (ft)	92.71	Top Width (ft)	52.79	27.33	12.59
Vel Total (ft/s)	6.80	Avg. Vel. (ft/s)	3.84	10.47	3.74
Max Chl Dpth (ft)	7.34	Hydr. Depth (ft)	3.67	7.31	4.09
Conv. Total (cfs)	46232.7	Conv. (cfs)	11355.6	31942.5	2934.6
Length Wtd. (ft)	199.70	Wetted Per. (ft)	53.33	27.33	14.72
Min Ch El (ft)	7691.17	Shear (lb/sq ft)	0.97	1.96	0.94
Alpha	1.73	Stream Power (lb/ft s)	3.73	20.50	3.50
Frctn Loss (ft)	0.93	Cum Volume (acre-ft)	1.05	3.68	0.75
C & E Loss (ft)	0.08	Cum SA (acres)	0.34	0.63	0.30

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 547

INPUT
Description:
Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7726.76	.61	7726.7	6.68	7726.13	11.09	7725.7	12.77	7725.52
18.51	7724.87	19.84	7724.71	25.56	7723.95	28.59	7723.46	33.53	7722.67
34.23	7722.45	34.85	7722.3	35.99	7722.09	39.43	7721.28	47.13	7719.5
53.89	7718.21	55.12	7717.99	57.08	7717.67	62.37	7716.83	75.9	7715.17
77.5	7714.97	84.14	7714.08	89.3	7713.47	94.73	7712.85	98.65	7712.41
101.1	7712.13	105.9	7711.62	112.91	7710.9	120.41	7710.23	124.71	7709.87
127.86	7709.59	132.38	7709.21	135.15	7709	136.51	7708.9	142.17	7708.31
148.32	7707.75	149.48	7707.61	151.2	7707.46	156.68	7706.94	160.12	7706.72
162.36	7706.55	164.37	7706.44	170.03	7706.09	171.92	7705.97	188.85	7705.01
195.53	7704.67	201.39	7704.33	207.36	7704.06	214.72	7703.54	219.13	7703.27
222.48	7703.04	226.5	7703.16	230.94	7703.22	239.43	7703.47	242.62	7703.46
247.55	7703.68	255.18	7704.49	258.65	7704.83	264.06	7705.31	265.78	7705.48
273.8	7705.88	278.31	7705.93	283.63	7705.91	285.81	7705.91	287.29	7705.81
294.64	7704.77	301.5	7704.14	301.84	7704.09	308.93	7703.13	312.31	7702.31
317.06	7701.59	320.63	7701.13	325.15	7701.88	329.9	7701.65	334	7696.8
346.6	7690.8	361.7	7686.83	377.3	7690.8	378.33	7691.89	381.05	7694.45
384.47	7697.06	385.67	7697.92	390.08	7700.51	393.16	7701.94	395.96	7703.56
396.19	7703.7	399.95	7705.63	401.98	7706.85	405.92	7708.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	346.6	.035	377.3	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
346.6 377.3 41.79 41.82 42.71 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	317.8	7706.31	T
396.8	405.92	7709.63	T

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7697.86	Element			
Vel Head (ft)	1.96	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7695.90	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	7694.93	Flow Area (sq ft)	27.30	217.46	13.49
E.G. Slope (ft/ft)	0.005628	Area (sq ft)	27.30	217.46	13.49
Q Total (cfs)	2625.00	Flow (cfs)	88.40	2499.95	36.65
Top Width (ft)	47.05	Top Width (ft)	10.71	30.70	5.65
Vel Total (ft/s)	10.16	Avg. Vel. (ft/s)	3.24	11.50	2.72
Max Chl Dpth (ft)	9.07	Hydr. Depth (ft)	2.55	7.08	2.39
Conv. Total (cfs)	34992.0	Conv. (cfs)	1178.4	33325.0	488.5
Length Wtd. (ft)	5.00	Wetted Per. (ft)	11.86	31.71	7.62
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	0.81	2.41	0.62
Alpha	1.22	Stream Power (lb/ft s)	2.62	27.70	1.69
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.43	2.45	0.49
C & E Loss (ft)	0.03	Cum SA (acres)	0.17	0.50	0.25

CROSS SECTION OUTPUT Profile #Floodway

			Left OB	Channel	Right OB
E.G. Elev (ft)	7697.86	Element			
Vel Head (ft)	1.96	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7695.90	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	7694.93	Flow Area (sq ft)	27.30	217.46	13.49
E.G. Slope (ft/ft)	0.005628	Area (sq ft)	27.30	217.46	13.49
Q Total (cfs)	2625.00	Flow (cfs)	88.40	2499.95	36.65
Top Width (ft)	47.05	Top Width (ft)	10.71	30.70	5.65
Vel Total (ft/s)	10.16	Avg. Vel. (ft/s)	3.24	11.50	2.72
Max Chl Dpth (ft)	9.07	Hydr. Depth (ft)	2.55	7.08	2.39
Conv. Total (cfs)	34992.0	Conv. (cfs)	1178.4	33325.0	488.5
Length Wtd. (ft)	5.00	Wetted Per. (ft)	11.86	31.71	7.62
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	0.81	2.41	0.62
Alpha	1.22	Stream Power (lb/ft s)	2.62	27.70	1.69
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.08	2.79	0.17
C & E Loss (ft)	0.03	Cum SA (acres)	0.03	0.50	0.05

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7696.44	Element			
Vel Head (ft)	1.68	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7694.77	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	7693.91	Flow Area (sq ft)	16.53	182.76	7.94
E.G. Slope (ft/ft)	0.005978	Area (sq ft)	16.53	182.76	7.94
Q Total (cfs)	1994.00	Flow (cfs)	46.70	1928.48	18.83
Top Width (ft)	43.20	Top Width (ft)	8.33	30.70	4.17
Vel Total (ft/s)	9.62	Avg. Vel. (ft/s)	2.82	10.55	2.37
Max Chl Dpth (ft)	7.94	Hydr. Depth (ft)	1.98	5.95	1.91
Conv. Total (cfs)	25789.6	Conv. (cfs)	604.0	24942.1	243.5
Length Wtd. (ft)	5.00	Wetted Per. (ft)	9.23	31.71	5.76
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	0.67	2.15	0.51
Alpha	1.17	Stream Power (lb/ft s)	1.89	22.70	1.22
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.30	2.04	0.29
C & E Loss (ft)	0.06	Cum SA (acres)	0.15	0.50	0.19

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7697.49	Element			
Vel Head (ft)	1.85	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7695.64	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	7694.64	Flow Area (sq ft)	24.56	209.41	12.05
E.G. Slope (ft/ft)	0.005577	Area (sq ft)	24.56	209.41	12.05
Q Total (cfs)	2445.00	Flow (cfs)	76.45	2337.11	31.44
Top Width (ft)	46.16	Top Width (ft)	10.16	30.70	5.30
Vel Total (ft/s)	9.94	Avg. Vel. (ft/s)	3.11	11.16	2.61
Max Chl Dpth (ft)	8.81	Hydr. Depth (ft)	2.42	6.82	2.27
Conv. Total (cfs)	32739.2	Conv. (cfs)	1023.7	31294.5	421.0
Length Wtd. (ft)	5.00	Wetted Per. (ft)	11.25	31.71	7.19
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	0.76	2.30	0.58
Alpha	1.21	Stream Power (lb/ft s)	2.37	25.66	1.52
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.40	2.35	0.45
C & E Loss (ft)	0.05	Cum SA (acres)	0.17	0.50	0.24

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7698.75	Element			
Vel Head (ft)	2.02	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7696.72	Reach Len. (ft)	5.00	5.00	5.00
Crit W.S. (ft)	7695.52	Flow Area (sq ft)	36.85	242.80	18.59
E.G. Slope (ft/ft)	0.005064	Area (sq ft)	36.85	242.80	18.59

Q Total (cfs)	3028.00	Flow (cfs)	125.11	2848.67	53.22
Top Width (ft)	49.87	Top Width (ft)	12.44	30.70	6.73
Vel Total (ft/s)	10.15	Avg. Vel. (ft/s)	3.40	11.74	2.86
Max Chl Dpth (ft)	9.89	Hydr. Depth (ft)	2.96	7.91	2.76
Conv. Total (cfs)	42549.3	Conv. (cfs)	1758.1	40043.5	747.8
Length Wtd. (ft)	5.00	Wetted Per. (ft)	13.78	31.71	8.98
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	0.85	2.42	0.65
Alpha	1.26	Stream Power (lb/ft s)	2.87	28.41	1.87
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	0.51	2.67	0.59
C & E Loss (ft)	0.02	Cum SA (acres)	0.19	0.50	0.26

BRIDGE

RIVER: Crystal
REACH: Marble RS: 542

INPUT
Description: BRIDGE NO. 1 - PROSPECT RANCH
Distance from Upstream XS = 5
Deck/Roadway Width = 32
Weir Coefficient = 2.6
Upstream Deck/Roadway Coordinates
num= 18

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	7726.59		27	7723.53		52	7720.4	
76.7	7717.27		104	7714.14		132.9	7711.69	
161.5	7709.9		189.9	7708.33		216.7	7707.33	
246.1	7706.5		272.1	7706.31		297.1	7706.46	
306.8	7706.46		306.8	7707.86		317.8	7707.86	7704.46
396.8	7711.03	7707.63	405.9	7711.03		405.9	7709.63	

Upstream Bridge Cross Section Data
Station Elevation Data num= 89

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7726.76	.61	7726.7	6.68	7726.13	11.09	7725.7	12.77	7725.52
18.51	7724.87	19.84	7724.71	25.56	7723.95	28.59	7723.46	33.53	7722.67
34.23	7722.45	34.85	7722.3	35.99	7722.09	39.43	7721.28	47.13	7719.5
53.89	7718.21	55.12	7717.99	57.08	7717.67	62.37	7716.83	75.9	7715.17
77.5	7714.97	84.14	7714.08	89.3	7713.47	94.73	7712.85	98.65	7712.41
101.1	7712.13	105.9	7711.62	112.91	7710.9	120.41	7710.23	124.71	7709.87
127.86	7709.59	132.38	7709.21	135.15	7709	136.51	7708.9	142.17	7708.31
148.32	7707.75	149.48	7707.61	151.2	7707.46	156.68	7706.94	160.12	7706.72
162.36	7706.55	164.37	7706.44	170.03	7706.09	171.92	7705.97	188.85	7705.01
195.53	7704.67	201.39	7704.33	207.36	7704.06	214.72	7703.54	219.13	7703.27
222.48	7703.04	226.5	7703.16	230.94	7703.22	239.43	7703.47	242.62	7703.46
247.55	7703.68	255.18	7704.49	258.65	7704.83	264.06	7705.31	265.78	7705.48
273.8	7705.88	278.31	7705.93	283.63	7705.91	285.81	7705.91	287.29	7705.81
294.64	7704.77	301.5	7704.14	301.84	7704.09	308.93	7703.13	312.31	7702.31
317.06	7701.59	320.63	7701.13	325.15	7701.88	329.9	7701.65	334	7696.8
346.6	7690.8	361.7	7686.83	377.3	7690.8	378.33	7691.89	381.05	7694.45
384.47	7697.06	385.67	7697.92	390.08	7700.51	393.16	7701.94	395.96	7703.56
396.19	7703.7	399.95	7705.63	401.98	7706.85	405.92	7708.98		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	346.6	.035	377.3	.06

Bank Sta: Left Right Coeff Contr. Expan.
346.6 377.3 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	317.8	7706.31	T
396.8	405.92	7709.63	T

Downstream Deck/Roadway Coordinates
num= 18

Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord	Sta	Hi Cord	Lo Cord
0	7726.59		38.6	7723.53		63.6	7720.4	
84	7717.27		112.5	7714.14		140.5	7711.69	
166.8	7709.9		193.5	7708.33		221.9	7707.35	
250.5	7706.5		277.1	7706.31		305.9	7706.46	
313.6	7706.46		313.6	7707.86		322.3	7707.86	7704.46
401.3	7711.03	7707.63	401.3	7709.63		402.27	7709.63	

Downstream Bridge Cross Section Data
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7728.29	6.35	7728.29	12.49	7727.21	16.98	7726.85	21.06	7726.16
22.46	7726.03	25.85	7725.65	28.05	7725.5	33.19	7724.82	35.74	7724.56
44.23	7723.62	46.26	7723.39	51.16	7722.69	52.63	7722.49	53.04	7722.43
53.4	7722.38	56.65	7721.91	58.44	7721.38	65.92	7719.75	69.2	7719
76.18	7717.49	83.92	7715.62	85.74	7715.56	87.6	7715.43	88.5	7715.37
94.96	7714.99	98.57	7714.66	101.05	7714.36	107.21	7715.01	107.68	7715.06
112.49	7715.31	115.02	7715.39	115.87	7715.19	117.88	7715.23	119.72	7714.68
122.08	7713.89	123.96	7713.36	124.86	7713.05	126.06	7712.62	129.52	7712.38
130.86	7712.27	142.26	7711.03	143.66	7710.9	145.6	7710.76	150.8	7710.34
165.3	7709.42	172.55	7708.98	177.72	7708.7	187.05	7708.33	189.54	7708.24
193.36	7708.09	208.81	7707.51	213.18	7707.32	223.31	7706.94	225	7706.87
245.06	7706.3	248.64	7706.19	252.25	7706.09	259.56	7705.98	29..09	7705.87
295.66	7705.75	298.31	7705.52	304.37	7704.9	307.39	7704.52	310.45	7704.2
314.42	7703.76	317.57	7703.44	319.55	7703.09	330.75	7701.06	331.48	7700.93
332.19	7700.8	347.7	7688.8	361.3	7686.83	375.6	7688.8	377.52	7695.44
385.46	7705.72	389.45	7708.01	390.47	7708.48	398.08	7708.17	402.27	7708.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	347.7	.035	375.6	.06

Bank Sta: Left Right Coeff Contr. Expan.
347.7 375.6 .3 .5
Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	322.3	7706.31	T
387.85	402.27	7709.63	T

Upstream Embankment side slope = 0 horiz. to 1.0 vertical
Downstream Embankment side slope = 0 horiz. to 1.0 vertical
Maximum allowable submergence for weir flow = .95
Elevation at which weir flow begins = 7706.31
Energy head used in spillway design =
Spillway height used in design =
Weir crest shape = Broad Crested

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
Energy
Selected Low Flow Methods = Highest Energy Answer

High Flow Method
Energy Only

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

BRIDGE OUTPUT Profile #100-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7697.86	Element		
W.S. US. (ft)	7695.90	E.G. Elev (ft)	7697.81	7697.61
Q Total (cfs)	2625.00	W.S. Elev (ft)	7695.76	7695.62
Q Bridge (cfs)	2625.00	Crit W.S. (ft)	7694.96	7694.29
Q Weir (cfs)		Max Chl Dpth (ft)	8.93	8.79
Weir Sta Lft (ft)		Vel Total (ft/s)	10.43	10.32
Weir Sta Rgt (ft)		Flow Area (sq ft)	251.68	254.48
Weir Submerg		Froude # Chl	0.79	0.73
Weir Max Depth (ft)		Specif Force (cu ft)	1749.12	1849.71
Min El Weir Flow (ft)	7706.32	Hydr Depth (ft)	5.40	6.56
Min El Prs (ft)	7707.63	W.P. Total (ft)	50.63	46.46
Delta EG (ft)	0.60	Conv. Total (cfs)	33779.1	37725.6
Delta WS (ft)	1.67	Top Width (ft)	46.58	38.77
BR Open Area (sq ft)	777.62	Frctn Loss (ft)	0.17	0.03
BR Open Vel (ft/s)	10.43	C & E Loss (ft)	0.03	0.31
Coef of Q		Shear Total (lb/sq ft)	1.87	1.66
Br Sel Method	Energy only	Power Total (lb/ft s)	19.55	17.08

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #Floodway

			Inside BR US	Inside BR DS
E.G. US. (ft)	7697.86	Element		
W.S. US. (ft)	7695.90	E.G. Elev (ft)	7697.81	7697.61
Q Total (cfs)	2625.00	W.S. Elev (ft)	7695.76	7695.62
Q Bridge (cfs)	2625.00	Crit W.S. (ft)	7694.96	7694.29
Q Weir (cfs)		Max Chl Dpth (ft)	8.93	8.79
Weir Sta Lft (ft)		Vel Total (ft/s)	10.43	10.32
Weir Sta Rgt (ft)		Flow Area (sq ft)	251.68	254.48
Weir Submerg		Froude # Chl	0.79	0.73
Weir Max Depth (ft)		Specif Force (cu ft)	1749.12	1849.71
Min El Weir Flow (ft)	7706.32	Hydr Depth (ft)	5.40	6.56
Min El Prs (ft)	7707.63	W.P. Total (ft)	50.63	46.46
Delta EG (ft)	0.60	Conv. Total (cfs)	33779.1	37725.6
Delta WS (ft)	1.67	Top Width (ft)	46.58	38.77
BR Open Area (sq ft)	777.62	Frctn Loss (ft)	0.17	0.03
BR Open Vel (ft/s)	10.43	C & E Loss (ft)	0.03	0.31
Coef of Q		Shear Total (lb/sq ft)	1.87	1.66
Br Sel Method	Energy only	Power Total (lb/ft s)	19.55	17.08

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #10-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7696.44	Element		
W.S. US. (ft)	7694.77	E.G. Elev (ft)	7696.34	7696.04
Q Total (cfs)	1994.00	W.S. Elev (ft)	7694.45	7694.37
Q Bridge (cfs)	1994.00	Crit W.S. (ft)	7693.93	7693.23
Q Weir (cfs)		Max Chl Dpth (ft)	7.62	7.54
Weir Sta Lft (ft)		Vel Total (ft/s)	10.29	9.62
Weir Sta Rgt (ft)		Flow Area (sq ft)	193.74	207.36
Weir Submerg		Froude # Chl	0.83	0.73
Weir Max Depth (ft)		Specif Force (cu ft)	1210.79	1285.96
Min El Weir Flow (ft)	7706.32	Hydr Depth (ft)	4.60	5.65
Min El Prs (ft)	7707.63	W.P. Total (ft)	45.44	43.07
Delta EG (ft)	0.70	Conv. Total (cfs)	23450.8	27937.6
Delta WS (ft)	1.57	Top Width (ft)	42.12	36.71
BR Open Area (sq ft)	777.62	Frctn Loss (ft)	0.19	0.03
BR Open Vel (ft/s)	10.29	C & E Loss (ft)	0.11	0.26
Coef of Q		Shear Total (lb/sq ft)	1.92	1.53
Br Sel Method	Energy only	Power Total (lb/ft s)	19.81	14.72

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #50-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7697.49	Element		
W.S. US. (ft)	7695.64	E.G. Elev (ft)	7697.40	7697.17
Q Total (cfs)	2445.00	W.S. Elev (ft)	7695.38	7695.25
Q Bridge (cfs)	2445.00	Crit W.S. (ft)	7694.67	7693.99
Q Weir (cfs)		Max Chl Dpth (ft)	8.55	8.42
Weir Sta Lft (ft)		Vel Total (ft/s)	10.44	10.17
Weir Sta Rgt (ft)		Flow Area (sq ft)	234.10	240.40
Weir Submerg		Froude # Chl	0.80	0.73
Weir Max Depth (ft)		Specif Force (cu ft)	1588.07	1681.08
Min El Weir Flow (ft)	7706.32	Hydr Depth (ft)	5.17	6.31
Min El Prs (ft)	7707.63	W.P. Total (ft)	49.11	45.44
Delta EG (ft)	0.65	Conv. Total (cfs)	30569.9	34721.5
Delta WS (ft)	1.67	Top Width (ft)	45.27	38.10
BR Open Area (sq ft)	777.62	Frctn Loss (ft)	0.18	0.03
BR Open Vel (ft/s)	10.44	C & E Loss (ft)	0.06	0.29
Coef of Q		Shear Total (lb/sq ft)	1.90	1.64
Br Sel Method	Energy only	Power Total (lb/ft s)	19.88	16.66

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

BRIDGE OUTPUT Profile #500-year

			Inside BR US	Inside BR DS
E.G. US. (ft)	7698.75	Element		
W.S. US. (ft)	7696.72	E.G. Elev (ft)	7698.71	7698.53
Q Total (cfs)	3028.00	W.S. Elev (ft)	7696.63	7696.36
Q Bridge (cfs)	3028.00	Crit W.S. (ft)	7695.55	7694.91
Q Weir (cfs)		Max Chl Dpth (ft)	9.80	9.53
Weir Sta Lft (ft)		Vel Total (ft/s)	10.31	10.66
Weir Sta Rgt (ft)		Flow Area (sq ft)	293.79	283.98
Weir Submerg		Froude # Chl	0.75	0.73
Weir Max Depth (ft)		Specif Force (cu ft)	2133.05	2235.41
Min El Weir Flow (ft)	7706.32	Hydr Depth (ft)	5.93	7.04
Min El Prs (ft)	7707.63	W.P. Total (ft)	54.12	48.62
Delta EG (ft)	0.59	Conv. Total (cfs)	41696.6	44180.2
Delta WS (ft)	1.87	Top Width (ft)	49.56	40.31
BR Open Area (sq ft)	777.62	Frctn Loss (ft)	0.16	0.03
BR Open Vel (ft/s)	10.66	C & E Loss (ft)	0.03	0.34
Coef of Q		Shear Total (lb/sq ft)	1.79	1.71
Br Sel Method	Energy only	Power Total (lb/ft s)	18.42	18.26

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 505

INPUT
Description:
Station Elevation Data num= 80

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7728.29	6.35	7728.29	12.49	7727.21	16.98	7726.85	21.06	7726.16
22.46	7726.03	25.85	7725.65	28.05	7725.5	33.19	7724.82	35.74	7724.56
44.23	7723.62	46.26	7723.39	51.16	7722.69	52.63	7722.49	53.04	7722.43
53.4	7722.38	56.65	7721.91	58.44	7721.38	65.92	7719.75	69.2	7719
76.18	7717.49	83.92	7715.62	85.74	7715.56	87.6	7715.43	88.5	7715.37
94.96	7714.99	98.57	7714.66	101.05	7714.36	107.21	7715.01	107.68	7715.06
112.49	7715.31	115.02	7715.39	115.87	7715.19	117.88	7715.23	119.72	7714.68
122.08	7713.89	123.96	7713.36	124.86	7713.05	126.06	7712.62	129.52	7712.38
130.86	7712.27	142.26	7711.03	143.66	7710.9	145.6	7710.76	150.8	7710.34
165.3	7709.42	172.55	7708.98	177.72	7708.7	187.05	7708.33	189.54	7708.24
193.36	7708.09	208.81	7707.51	213.18	7707.32	223.31	7706.94	225	7706.87
245.06	7706.3	248.64	7706.19	252.25	7706.09	259.56	7705.98	293.09	7705.87
295.66	7705.75	298.31	7705.52	304.37	7704.9	307.39	7704.52	310.45	7704.2
314.42	7703.76	317.57	7703.44	319.55	7703.09	330.75	7701.06	331.48	7700.93
332.19	7700.8	347.7	7688.8	361.3	7686.83	375.6	7688.8	377.52	7695.44
385.46	7705.72	389.45	7708.01	390.47	7708.48	398.08	7708.17	402.27	7708.05

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	347.7	.035	375.6	.06

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
347.7 375.6 174.79 175.37 182.11 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
0	322.3	7706.31	T
387.85	402.27	7709.63	T

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7697.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.03	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7694.23	Reach Len. (ft)	174.79	175.37	182.11
Crit W.S. (ft)	7694.23	Flow Area (sq ft)	19.05	178.95	4.26
E.G. Slope (ft/ft)	0.009503	Area (sq ft)	19.05	178.95	4.26
Q Total (cfs)	2625.00	Flow (cfs)	76.54	2539.94	8.52
Top Width (ft)	36.49	Top Width (ft)	7.02	27.90	1.57
Vel Total (ft/s)	12.98	Avg. Vel. (ft/s)	4.02	14.19	2.00
Max Chl Dpth (ft)	7.40	Hydr. Depth (ft)	2.71	6.41	2.71
Conv. Total (cfs)	26927.7	Conv. (cfs)	785.1	26055.2	87.4
Length Wtd. (ft)	175.46	Wetted Per. (ft)	8.87	28.18	5.65
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	1.27	3.77	0.45
Alpha	1.16	Stream Power (lb/ft s)	5.12	53.48	0.89
Frctn Loss (ft)	1.77	Cum Volume (acre-ft)	0.41	2.25	0.49
C & E Loss (ft)	0.53	Cum SA (acres)	0.17	0.47	0.25

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7697.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.03	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7694.23	Reach Len. (ft)	174.79	175.37	182.11
Crit W.S. (ft)	7694.23	Flow Area (sq ft)	19.05	178.95	4.26
E.G. Slope (ft/ft)	0.009503	Area (sq ft)	19.05	178.95	4.26
Q Total (cfs)	2625.00	Flow (cfs)	76.54	2539.94	8.52
Top Width (ft)	36.49	Top Width (ft)	7.02	27.90	1.57
Vel Total (ft/s)	12.98	Avg. Vel. (ft/s)	4.02	14.19	2.00
Max Chl Dpth (ft)	7.40	Hydr. Depth (ft)	2.71	6.41	2.71
Conv. Total (cfs)	26927.7	Conv. (cfs)	785.1	26055.2	87.4
Length Wtd. (ft)	175.50	Wetted Per. (ft)	8.87	28.18	5.65
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	1.27	3.77	0.45
Alpha	1.16	Stream Power (lb/ft s)	5.12	53.48	0.89
Frctn Loss (ft)	1.32	Cum Volume (acre-ft)	0.06	2.58	0.17
C & E Loss (ft)	0.75	Cum SA (acres)	0.02	0.47	0.05

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7695.54	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.54	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7693.20	Reach Len. (ft)	174.79	175.37	182.11
Crit W.S. (ft)	7693.18	Flow Area (sq ft)	12.51	150.25	2.80
E.G. Slope (ft/ft)	0.009972	Area (sq ft)	12.51	150.25	2.80
Q Total (cfs)	1994.00	Flow (cfs)	44.77	1944.24	4.99
Top Width (ft)	34.86	Top Width (ft)	5.69	27.90	1.27
Vel Total (ft/s)	12.04	Avg. Vel. (ft/s)	3.58	12.94	1.78
Max Chl Dpth (ft)	6.37	Hydr. Depth (ft)	2.20	5.39	2.20
Conv. Total (cfs)	19967.5	Conv. (cfs)	448.4	19469.2	49.9
Length Wtd. (ft)	175.45	Wetted Per. (ft)	7.19	28.18	4.58
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	1.08	3.32	0.38
Alpha	1.13	Stream Power (lb/ft s)	3.88	42.96	0.68
Frctn Loss (ft)	1.87	Cum Volume (acre-ft)	0.28	1.87	0.29
C & E Loss (ft)	0.43	Cum SA (acres)	0.14	0.47	0.19

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7696.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.86	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7693.96	Reach Len. (ft)	174.79	175.37	182.11
Crit W.S. (ft)	7693.96	Flow Area (sq ft)	17.22	171.51	3.85
E.G. Slope (ft/ft)	0.009536	Area (sq ft)	17.22	171.51	3.85
Q Total (cfs)	2445.00	Flow (cfs)	67.04	2370.50	7.47
Top Width (ft)	36.07	Top Width (ft)	6.67	27.90	1.49
Vel Total (ft/s)	12.70	Avg. Vel. (ft/s)	3.89	13.82	1.94
Max Chl Dpth (ft)	7.13	Hydr. Depth (ft)	2.58	6.15	2.58

Conv. Total (cfs)	25038.2	Conv. (cfs)	686.5	24275.3	76.4
Length Wtd. (ft)	175.46	Wetted Per. (ft)	8.44	28.18	5.37
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	1.22	3.62	0.43
Alpha	1.25	Stream Power (lb/ft s)	4.73	50.08	0.83
Frctn Loss (ft)	1.79	Cum Volume (acre-ft)	0.38	2.16	0.44
C & E Loss (ft)	0.49	Cum SA (acres)	0.16	0.47	0.24

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7698.16	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.31	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7694.85	Reach Len. (ft)	174.79	175.37	182.11
Crit W.S. (ft)	7694.85	Flow Area (sq ft)	23.69	196.40	5.30
E.G. Slope (ft/ft)	0.009186	Area (sq ft)	23.69	196.40	5.30
Q Total (cfs)	3028.00	Flow (cfs)	100.64	2916.15	11.21
Top Width (ft)	37.48	Top Width (ft)	7.83	27.90	1.75
Vel Total (ft/s)	13.43	Avg. Vel. (ft/s)	4.25	14.85	2.11
Max Chl Dpth (ft)	8.02	Hydr. Depth (ft)	3.03	7.04	3.03
Conv. Total (cfs)	31593.1	Conv. (cfs)	1050.1	30426.1	116.9
Length Wtd. (ft)	175.47	Wetted Per. (ft)	9.89	28.18	6.30
Min Ch El (ft)	7686.83	Shear (lb/sq ft)	1.37	4.00	0.48
Alpha	1.18	Stream Power (lb/ft s)	5.83	59.35	1.02
Frctn Loss (ft)	1.71	Cum Volume (acre-ft)	0.48	2.44	0.58
C & E Loss (ft)	0.58	Cum SA (acres)	0.18	0.47	0.26

Warning: The energy equation could not be balanced within the specified number of iterations. The program used critical depth for the water surface and continued on with the calculations.
Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 329

INPUT
Description:
Station Elevation Data num= 60

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7727.18	2.47	7726.36	5.68	7726.05	15.28	7721.78	19.96	7719.59
23.51	7717.92	31.81	7714.03	34.23	7712.89	36.07	7712.02	41.37	7709.42
48.35	7705.88	48.58	7705.76	48.68	7705.7	53.2	7702.79	61.18	7702.47
64.88	7702.33	69.92	7701.97	73.74	7701.79	77.05	7701.59	81.42	7701.44
84.19	7701.13	86.3	7700.91	91.33	7700.37	97.95	7699.79	98.85	7699.71
111.41	7698.77	112.74	7698.65	114.49	7698.54	123.97	7697.83	127.01	7697.55
131.02	7697.31	134.15	7697.07	136.52	7696.9	141.28	7696.45	147.56	7696.07
155.56	7695.51	161.64	7695.17	167.63	7694.78	171.43	7693.64	174.19	7692.79
176.97	7691.94	184.11	7689.89	186.75	7688.14	187.56	7688.9	190.57	7688.04
217.29	7688.15	238.79	7688.75	241.2	7689.65	246.76	7693.47	248.34	7694.52
249.53	7695.38	255.47	7699.78	262.09	7704.52	262.61	7705.01	263.3	7705.62
269.75	7711.44	274.65	7714.79	276.89	7716.28	280.66	7718.8	283.3	7720.59

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	190.57	.035	237.29	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
190.57	237.29	339.44	329.39	317.3	.1 .3

CROSS SECTION OUTPUT Profile #100-year

E.G. Elev (ft)	7694.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.98	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7692.46	Reach Len. (ft)	339.44	329.39	317.30
Crit W.S. (ft)	7692.46	Flow Area (sq ft)	34.01	203.82	19.60
E.G. Slope (ft/ft)	0.010760	Area (sq ft)	34.01	203.82	19.60
Q Total (cfs)	2625.00	Flow (cfs)	144.90	2396.42	83.68
Top Width (ft)	70.01	Top Width (ft)	15.29	46.72	8.00
Vel Total (ft/s)	10.20	Avg. Vel. (ft/s)	4.26	11.76	4.27
Max Chl Dpth (ft)	4.42	Hydr. Depth (ft)	2.22	4.36	2.45
Conv. Total (cfs)	25306.4	Conv. (cfs)	1396.9	23102.7	806.7
Length Wtd. (ft)	329.05	Wetted Per. (ft)	15.92	46.72	9.15
Min Ch El (ft)	7688.04	Shear (lb/sq ft)	1.44	2.93	1.44
Alpha	1.23	Stream Power (lb/ft s)	6.11	34.45	6.15
Frctn Loss (ft)	3.10	Cum Volume (acre-ft)	0.30	1.48	0.44
C & E Loss (ft)	0.11	Cum SA (acres)	0.12	0.32	0.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7694.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.53	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7693.43	Reach Len. (ft)	339.44	329.39	317.30
Crit W.S. (ft)		Flow Area (sq ft)	3.02	249.06	27.34
E.G. Slope (ft/ft)	0.006093	Area (sq ft)	3.02	249.06	27.34
Q Total (cfs)	2625.00	Flow (cfs)	3.78	2518.65	102.57
Top Width (ft)	55.29	Top Width (ft)	0.57	46.72	8.00
Vel Total (ft/s)	9.39	Avg. Vel. (ft/s)	1.25	10.11	3.75
Max Chl Dpth (ft)	5.39	Hydr. Depth (ft)	5.30	5.33	3.42
Conv. Total (cfs)	33628.9	Conv. (cfs)	48.4	32266.4	1314.1
Length Wtd. (ft)	329.16	Wetted Per. (ft)	5.82	46.72	10.12
Min Ch El (ft)	7688.04	Shear (lb/sq ft)	0.20	2.03	1.03
Alpha	1.12	Stream Power (lb/ft s)	0.25	20.51	3.86
Frctn Loss (ft)	2.83	Cum Volume (acre-ft)	0.01	1.72	0.10
C & E Loss (ft)	0.10	Cum SA (acres)	0.00	0.32	0.03

Warning: The velocity head has changed by more than 0.5 ft (0.15 m). This may indicate the need for additional cross sections.
Warning: The conveyance ratio (upstream conveyance divided by downstream conveyance) is less than 0.7 or greater than 1.4. This may indicate the need for additional cross sections.
Warning: The energy loss was greater than 1.0 ft (0.3 m), between the current and previous cross section.

This may indicate the need for additional cross sections.

CROSS SECTION OUTPUT Profile #10-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7693.44	Element			
Vel Head (ft)	1.69	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7691.75	Reach Len. (ft)	339.44	329.39	317.30
Crit W.S. (ft)	7691.75	Flow Area (sq ft)	24.05	170.92	14.33
E.G. Slope (ft/ft)	0.011452	Area (sq ft)	24.05	170.92	14.33
Q Total (cfs)	1994.00	Flow (cfs)	93.81	1843.72	56.47
Top Width (ft)	66.64	Top Width (ft)	12.95	46.72	6.97
Vel Total (ft/s)	9.53	Avg. Vel. (ft/s)	3.90	10.79	3.94
Max Chl Dpth (ft)	3.71	Hydr. Depth (ft)	1.86	3.66	2.06
Conv. Total (cfs)	18633.2	Conv. (cfs)	876.7	17228.9	527.7
Length Wtd. (ft)	329.09	Wetted Per. (ft)	13.47	46.72	7.90
Min Ch El (ft)	7688.04	Shear (lb/sq ft)	1.28	2.62	1.30
Alpha	1.20	Stream Power (lb/ft s)	4.98	28.21	5.11
Frctn Loss (ft)	3.50	Cum Volume (acre-ft)	0.21	1.23	0.25
C & E Loss (ft)	0.04	Cum SA (acres)	0.10	0.32	0.17

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #50-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7694.17	Element			
Vel Head (ft)	1.90	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7692.27	Reach Len. (ft)	339.44	329.39	317.30
Crit W.S. (ft)	7692.27	Flow Area (sq ft)	31.17	194.99	18.11
E.G. Slope (ft/ft)	0.010893	Area (sq ft)	31.17	194.99	18.11
Q Total (cfs)	2445.00	Flow (cfs)	129.66	2239.65	75.69
Top Width (ft)	69.12	Top Width (ft)	14.67	46.72	7.72
Vel Total (ft/s)	10.01	Avg. Vel. (ft/s)	4.16	11.49	4.18
Max Chl Dpth (ft)	4.23	Hydr. Depth (ft)	2.12	4.17	2.35
Conv. Total (cfs)	23426.6	Conv. (cfs)	1242.4	21459.1	725.2
Length Wtd. (ft)	329.09	Wetted Per. (ft)	15.27	46.72	8.81
Min Ch El (ft)	7688.04	Shear (lb/sq ft)	1.39	2.84	1.40
Alpha	1.22	Stream Power (lb/ft s)	5.77	32.60	5.84
Frctn Loss (ft)	3.11	Cum Volume (acre-ft)	0.28	1.42	0.40
C & E Loss (ft)	0.10	Cum SA (acres)	0.12	0.32	0.22

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION OUTPUT Profile #500-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7695.03	Element			
Vel Head (ft)	2.16	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7692.87	Reach Len. (ft)	339.44	329.39	317.30
Crit W.S. (ft)	7692.87	Flow Area (sq ft)	40.65	223.25	23.05
E.G. Slope (ft/ft)	0.010415	Area (sq ft)	40.65	223.25	23.05
Q Total (cfs)	3028.00	Flow (cfs)	181.32	2744.21	102.48
Top Width (ft)	71.97	Top Width (ft)	16.65	46.72	8.60
Vel Total (ft/s)	10.55	Avg. Vel. (ft/s)	4.46	12.29	4.45
Max Chl Dpth (ft)	4.83	Hydr. Depth (ft)	2.44	4.78	2.68
Conv. Total (cfs)	29670.9	Conv. (cfs)	1776.7	26890.0	1004.2
Length Wtd. (ft)	328.96	Wetted Per. (ft)	17.34	46.72	9.88
Min Ch El (ft)	7688.04	Shear (lb/sq ft)	1.52	3.11	1.52
Alpha	1.25	Stream Power (lb/ft s)	6.80	38.19	6.74
Frctn Loss (ft)	3.06	Cum Volume (acre-ft)	0.35	1.60	0.52
C & E Loss (ft)	0.12	Cum SA (acres)	0.13	0.32	0.23

Warning: The energy equation could not be balanced within the specified number of iterations. The program selected the water surface that had the least amount of error between computed and assumed values.
Warning: The energy loss was greater than 1.0 ft (0.3 m). between the current and previous cross section. This may indicate the need for additional cross sections.
Warning: During the standard step iterations, when the assumed water surface was set equal to critical depth, the calculated water surface came back below critical depth. This indicates that there is not a valid subcritical answer. The program defaulted to critical depth.

CROSS SECTION

RIVER: Crystal
REACH: Marble RS: 0

INPUT
Description:
Station Elevation Data num= 59

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
0	7712.55	4.94	7708.58	9.04	7705.25	12.13	7703.15	14.27	7701
19.31	7696.55	26.44	7691.28	76.59	7691.18	33.69	7687.73	38.6	7686.25
40.87	7685.75	45.3	7684.41	46.77	7683.99	84.38	7684.08	88.03	7685
91.17	7685.52	96.8	7685.47	99.46	7685.91	104.48	7688.42	109.77	7687.94
111.61	7687.58	112.73	7687.65	119.92	7687.6	123.78	7687.8	127.11	7688.1
131.91	7688.15	135.96	7688.43	136.5	7688.5	141.54	7689.93	141.81	7689.2
148.16	7691.72	149.46	7692.03	155.85	7693	160.28	7692.98	163.04	7693.16
167.01	7694.19	170.22	7694.91	172.45	7695.46	177.41	7696.45	184.57	7696.68
188.24	7697.17	196.78	7699.14	198.97	7699.49	202.12	7700.36	206.15	7701.38
208.95	7702.4	213.34	7703.91	219.67	7705.73	220.53	7706.01	221.12	7706.19
227.71	7708.46	233.29	7710.06	234.9	7710.75	237.23	7711.64	242.09	7714.04
245.45	7715.33	254.78	7719.51	256.46	7720.34	256.62	7720.42		

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
0	.06	46.77	.035	84.38	.06

Bank Sta: Left	Right	Lengths: Left Channel	Right	Coeff Contr.	Expan.
46.77	84.38	12.12	1.44	11.96	.1 .3

CROSS SECTION OUTPUT Profile #100-year

			Left OB	Channel	Right OB
E.G. Elev (ft)	7690.62	Element			
Vel Head (ft)	1.63	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7689.00	Reach Len. (ft)			
Crit W.S. (ft)	7689.00	Flow Area (sq ft)	42.74	186.67	100.07
E.G. Slope (ft/ft)	0.008333	Area (sq ft)	42.74	186.67	100.07
Q Total (cfs)	2625.00	Flow (cfs)	182.13	2105.00	337.87
Top Width (ft)	107.18	Top Width (ft)	15.69	37.61	53.88
Vel Total (ft/s)	7.97	Avg. Vel. (ft/s)	4.26	11.28	3.38
Max Chl Dpth (ft)	5.01	Hydr. Depth (ft)	2.72	4.96	1.86
Conv. Total (cfs)	28756.5	Conv. (cfs)	1995.2	23060.0	3701.3
Length Wtd. (ft)		Wetted Per. (ft)	16.51	37.61	54.82

Min Ch El (ft)	7683.99	Shear (lb/sq ft)	1.35	2.58	0.95
Alpha	1.65	Stream Power (lb/ft s)	5.74	29.12	3.21
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.

CROSS SECTION OUTPUT Profile #Floodway

E.G. Elev (ft)	7692.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.51	Wt. n-Val.		0.035	
W.S. Elev (ft)	7689.53	Reach Len. (ft)			
Crit W.S. (ft)	7689.39	Flow Area (sq ft)		206.62	
E.G. Slope (ft/ft)	0.013002	Area (sq ft)		206.62	
Q Total (cfs)	2625.00	Flow (cfs)		2625.00	
Top Width (ft)	37.61	Top Width (ft)		37.61	
Vel Total (ft/s)	12.70	Avg. Vel. (ft/s)		12.70	
Max Chl Dpth (ft)	5.54	Hydr. Depth (ft)		5.49	
Conv. Total (cfs)	23021.1	Conv. (cfs)		23021.1	
Length Wtd. (ft)		Wetted Per. (ft)		48.60	
Min Ch El (ft)	7683.99	Shear (lb/sq ft)		3.45	
Alpha	1.00	Stream Power (lb/ft s)		43.84	
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: The cross section had to be extended vertically during the critical depth calculations.
Warning: The parabolic search method failed to converge on critical depth. The program will try the cross section slice/secant method to find critical depth.

CROSS SECTION OUTPUT Profile #10-year

E.G. Elev (ft)	7689.66	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.55	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7688.11	Reach Len. (ft)			
Crit W.S. (ft)	7688.11	Flow Area (sq ft)	29.65	153.38	55.07
E.G. Slope (ft/ft)	0.009930	Area (sq ft)	29.65	153.38	55.07
Q Total (cfs)	1994.00	Flow (cfs)	117.98	1656.30	219.72
Top Width (ft)	91.49	Top Width (ft)	13.87	37.61	40.01
Vel Total (ft/s)	8.37	Avg. Vel. (ft/s)	3.98	10.80	3.99
Max Chl Dpth (ft)	4.12	Hydr. Depth (ft)	2.14	4.08	1.38
Conv. Total (cfs)	20010.1	Conv. (cfs)	1183.9	16621.3	2205.0
Length Wtd. (ft)		Wetted Per. (ft)	14.49	37.61	40.78
Min Ch El (ft)	7683.99	Shear (lb/sq ft)	1.27	2.53	0.84
Alpha	1.42	Stream Power (lb/ft s)	5.05	27.30	3.34
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Warning: Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.

CROSS SECTION OUTPUT Profile #50-year

E.G. Elev (ft)	7690.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.56	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7688.84	Reach Len. (ft)			
Crit W.S. (ft)	7688.84	Flow Area (sq ft)	40.21	180.56	91.35
E.G. Slope (ft/ft)	0.008293	Area (sq ft)	40.21	180.56	91.35
Q Total (cfs)	2445.00	Flow (cfs)	166.68	1986.62	291.70
Top Width (ft)	106.27	Top Width (ft)	15.36	37.61	53.30
Vel Total (ft/s)	7.83	Avg. Vel. (ft/s)	4.14	11.00	3.19
Max Chl Dpth (ft)	4.85	Hydr. Depth (ft)	2.62	4.80	1.71
Conv. Total (cfs)	26848.1	Conv. (cfs)	1830.3	21814.7	3203.2
Length Wtd. (ft)		Wetted Per. (ft)	16.14	37.61	54.23
Min Ch El (ft)	7683.99	Shear (lb/sq ft)	1.29	2.49	0.87
Alpha	1.64	Stream Power (lb/ft s)	5.35	27.35	2.79
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.

CROSS SECTION OUTPUT Profile #500-year

E.G. Elev (ft)	7691.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.75	Wt. n-Val.	0.060	0.035	0.060
W.S. Elev (ft)	7689.35	Reach Len. (ft)			
Crit W.S. (ft)	7689.35	Flow Area (sq ft)	48.36	199.86	119.21
E.G. Slope (ft/ft)	0.008373	Area (sq ft)	48.36	199.86	119.21
Q Total (cfs)	3028.00	Flow (cfs)	217.39	2364.35	446.26
Top Width (ft)	109.56	Top Width (ft)	16.41	37.61	55.54
Vel Total (ft/s)	8.24	Avg. Vel. (ft/s)	4.49	11.83	3.74
Max Chl Dpth (ft)	5.36	Hydr. Depth (ft)	2.95	5.31	2.15
Conv. Total (cfs)	33090.6	Conv. (cfs)	2375.6	25838.1	4876.8
Length Wtd. (ft)		Wetted Per. (ft)	17.31	37.61	56.67
Min Ch El (ft)	7683.99	Shear (lb/sq ft)	1.46	2.78	1.10
Alpha	1.60	Stream Power (lb/ft s)	6.56	32.86	4.12
Frctn Loss (ft)		Cum Volume (acre-ft)			
C & E Loss (ft)		Cum SA (acres)			

Warning: Divided flow computed for this cross-section.
Warning: Slope too steep for slope area to converge during supercritical flow calculations (normal depth is below critical depth). Water surface set to critical depth.

SUMMARY OF MANNING'S N VALUES

River:Crystal

Reach	River Sta.	n1	n2	n3	n4	n5
Marble	24407	.06	.035	.06		
Marble	23576	.06	.035	.05	.06	
Marble	23230	.06	.035	.06		
Marble	23225	Bridge				
Marble	23204	.06	.035	.06		
Marble	22724	.06	.035	.06		
Marble	21874	.06	.05	.035	.05	0
Marble	21304	.06	.05	.035	.05	.06
Marble	20771	.06	.05	.035	.05	.06
Marble	19905	.06	.05	.035	.05	.06
Marble	19361	.06	.05	.035	.05	.06
Marble	18783	.06	.05	.035	.05	.06
Marble	18578	.06	.035	.06		
Marble	18573	Bridge				
Marble	18542	.06	.035	.06		
Marble	18067	.06	.05	.035	.05	.06
Marble	17475	.06	.035	.06		
Marble	16883	.06	.035	.06		
Marble	16407	.06	.035	.06		
Marble	15909	.06	.035	.06		
Marble	15423	.06	.035	.06		

Marble	14921		.06	.05	.035	.05	.06
Marble	14378		.06	.05	.035	.05	.06
Marble	13779		.06	.05	.035	.05	.06
Marble	13314		.06	.035	.06		
Marble	12820		.06	.035	.06		
Marble	12347		.06	.05	.035	.05	.06
Marble	11815		.06	.05	.035	.05	.06
Marble	11147		.06	.035	.05	.06	
Marble	10584		.06	.05	.035	.05	.06
Marble	10063		.06	.05	.035	.05	.06
Marble	9536		.06	.05	.035	.05	.06
Marble	9086		.06	.05	.035	.05	.06
Marble	8612		.06	.05	.035	.05	.06
Marble	8077		.06	.035	.06		
Marble	8070	Bridge					
Marble	8048		.06	.035	.06		
Marble	7560		.06	.05	.035	.06	
Marble	7123		.06	.05	.035	.06	
Marble	6674		.06	.05	.035	.05	.06
Marble	6179		.06	.035	.06		
Marble	5720		.06	.035	.06		
Marble	5216		.06	.035	.06		
Marble	4728		.06	.035	.06		
Marble	4242		.06	.035	.06		
Marble	3790		.06	.035	.06		
Marble	3258		.06	.035	.06		
Marble	2755		.06	.035	.06		
Marble	2242		.06	.035	.06		
Marble	1750		.06	.035	.06		
Marble	1241		.06	.035	.06		
Marble	746		.06	.035	.06		
Marble	547		.06	.035	.06		
Marble	542	Bridge					
Marble	505		.06	.035	.06		
Marble	329		.06	.035	.06		
Marble	0		.06	.035	.06		

SUMMARY OF REACH LENGTHS

River: Crystal

Reach	River Sta.		Left	Channel	Right
Marble	24407		773.34	831.57	855.6
Marble	23576		321.73	345.98	365.58
Marble	23230		24.46	25.9	26.29
Marble	23225	Bridge			
Marble	23204		467.46	479.73	474.53
Marble	22724		894.82	849.72	700.27
Marble	21874		552.36	570.84	551.05
Marble	21304		522.08	532.15	493.21
Marble	20771		739.92	866.01	800.58
Marble	19905		533.84	544.56	485.44
Marble	19361		461.26	577.52	747.59
Marble	18783		216.69	205.74	150.3
Marble	18578		34.24	35.06	34.99
Marble	18573	Bridge			
Marble	18542		466.19	475.1	491.64
Marble	18067		658.53	592.77	538.05
Marble	17475		515.18	591.49	626.76
Marble	16883		535.61	475.86	425.77
Marble	16467		493.09	498.06	503.19
Marble	15909		479.98	486.68	492.59
Marble	15423		520.6	502.01	487
Marble	14921		552.68	542.09	587.67
Marble	14378		535.21	599.19	522.7
Marble	13779		465.25	464.83	465.06
Marble	13314		514.62	494.08	474.87
Marble	12820		450.77	472.93	503.15
Marble	12347		523.49	532.79	600.34
Marble	11815		655.25	667.3	694.85
Marble	11147		397.52	563.66	336.93
Marble	10584		503.03	520.29	498.09
Marble	10063		453.78	527.62	576.04
Marble	9536		442.6	450.16	233.01
Marble	9086		246.51	473.8	527.55
Marble	8612		602.05	535.11	226.7
Marble	8077		23.98	28.33	40.69
Marble	8070	Bridge			
Marble	8048		453.73	488.71	373.76
Marble	7560		426.58	436.49	444.55
Marble	7123		478.48	448.85	416.42
Marble	6674		465.72	494.99	561.78
Marble	6179		451.46	459.57	419.3
Marble	5720		523.22	503.52	481.6
Marble	5216		476.7	487.87	499.41
Marble	4728		520.88	456.71	448.95
Marble	4242		424.52	451.73	493.59
Marble	3790		543.23	532.25	520.56
Marble	3258		509.64	502.17	496.15
Marble	2755		491.45	513.58	537.34
Marble	2242		531.4	491.58	360.02
Marble	1750		438.96	509.76	641.67
Marble	1241		543.61	494.97	446.6
Marble	746		205.5	199	193.3
Marble	547		41.79	41.82	42.71
Marble	542	Bridge			
Marble	505		174.79	175.37	182.11
Marble	329		330.44	329.39	317.3
Marble	0		12.12	1.44	11.96

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Crystal

Reach	River Sta.		Contr.	Expan.
Marble	24407		.1	.3
Marble	23576		.1	.3
Marble	23230		.3	.5
Marble	23225	Bridge		
Marble	23204		.3	.5
Marble	22724		.1	.3
Marble	21874		.1	.3
Marble	21304		.1	.3
Marble	20771		.1	.3
Marble	19905		.1	.3
Marble	19361		.1	.3
Marble	18783		.1	.3
Marble	18578		.3	.5
Marble	18573	Bridge		
Marble	18542		.3	.5
Marble	18067		.1	.3

Marble	17475	.1	.3
Marble	16883	.1	.3
Marble	16407	.1	.3
Marble	15909	.1	.3
Marble	15423	.1	.3
Marble	14921	.1	.3
Marble	14378	.1	.3
Marble	13779	.1	.3
Marble	13314	.1	.3
Marble	12820	.1	.3
Marble	12347	.1	.3
Marble	11815	.1	.3
Marble	11147	.1	.3
Marble	10584	.1	.3
Marble	10063	.1	.3
Marble	9536	.1	.3
Marble	9086	.1	.3
Marble	8612	.1	.3
Marble	8077	.3	.5
Marble	8070	Bridge	
Marble	8048	.3	.5
Marble	7560	.1	.3
Marble	7123	.1	.3
Marble	6674	.1	.3
Marble	6179	.1	.3
Marble	5720	.1	.3
Marble	5216	.1	.3
Marble	4728	.1	.3
Marble	4242	.1	.3
Marble	3790	.1	.3
Marble	3258	.1	.3
Marble	2755	.1	.3
Marble	2242	.1	.3
Marble	1750	.1	.3
Marble	1241	.1	.3
Marble	746	.1	.3
Marble	547	.3	.5
Marble	542	Bridge	
Marble	505	.3	.5
Marble	329	.1	.3
Marble	0	.1	.3

Profile Output Table - Standard Table 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Marble	0	100-year	2625.00	7683.99	7689.00	7689.00	7690.62	0.008333	11.28	329.48	107.18	0.89
Marble	0	Floodway	2625.00	7683.99	7689.53	7689.39	7692.04	0.013002	12.70	206.62	37.61	0.96
Marble	0	10-year	1994.00	7683.99	7688.11	7688.11	7689.66	0.009930	10.80	238.10	91.49	0.94
Marble	0	50-year	2445.00	7683.99	7688.84	7688.84	7690.40	0.008293	11.00	312.12	106.27	0.88
Marble	0	500-year	3028.00	7683.99	7689.35	7689.35	7691.10	0.008373	11.83	367.43	109.56	0.90
Marble	329	100-year	2625.00	7688.04	7692.46	7692.46	7694.44	0.010760	11.76	257.42	70.01	0.99
Marble	329	Floodway	2625.00	7688.04	7693.43		7694.96	0.006093	10.11	279.42	55.29	0.77
Marble	329	10-year	1994.00	7688.04	7691.75	7691.75	7693.44	0.011452	10.79	209.30	66.64	0.99
Marble	329	50-year	2445.00	7688.04	7692.27	7692.27	7694.17	0.010893	11.49	244.28	69.12	0.99
Marble	329	500-year	3028.00	7688.04	7692.87	7692.87	7695.03	0.010415	12.29	286.96	71.97	0.99
Marble	505	100-year	2625.00	7686.83	7694.23	7694.23	7697.26	0.009503	14.19	202.26	36.49	0.99
Marble	505	Floodway	2625.00	7686.83	7694.23	7694.23	7697.26	0.009503	14.19	202.26	36.49	0.99
Marble	505	10-year	1994.00	7686.83	7693.20	7693.18	7695.74	0.009972	12.94	165.56	34.86	0.98
Marble	505	50-year	2445.00	7686.83	7693.96	7693.96	7696.85	0.009536	13.82	192.59	36.07	0.98
Marble	505	500-year	3028.00	7686.83	7694.85	7694.85	7698.16	0.009186	14.85	225.39	37.48	0.99
Marble	542			Bridge								
Marble	547	100-year	2625.00	7686.83	7695.90	7694.93	7697.86	0.005628	11.50	258.24	47.05	0.76
Marble	547	Floodway	2625.00	7686.83	7695.90	7694.93	7697.86	0.005628	11.50	258.24	47.05	0.76
Marble	547	10-year	1994.00	7686.83	7694.77	7693.91	7696.44	0.005978	10.55	207.23	43.20	0.76
Marble	547	50-year	2445.00	7686.83	7695.64	7694.64	7697.49	0.005577	11.16	246.02	46.16	0.75
Marble	547	500-year	3028.00	7686.83	7696.72	7695.52	7698.75	0.005064	11.74	298.23	49.87	0.74
Marble	746	100-year	2625.00	7691.17	7697.73		7698.98	0.004915	10.39	376.10	83.76	0.72
Marble	746	Floodway	2625.00	7691.17	7697.78		7699.14	0.006608	10.49	316.05	55.01	0.72
Marble	746	10-year	1994.00	7691.17	7696.47		7697.71	0.006201	10.13	279.36	72.46	0.78
Marble	746	50-year	2445.00	7691.17	7697.39		7698.63	0.005170	10.29	348.31	79.68	0.73
Marble	746	500-year	3028.00	7691.17	7698.51		7699.76	0.004290	10.47	445.14	92.71	0.68
Marble	1241	100-year	2413.00	7697.18	7700.86	7700.60	7702.25	0.009137	9.62	269.51	81.74	0.89
Marble	1241	Floodway	2413.00	7697.18	7701.29		7702.39	0.006216	8.56	303.82	80.10	0.75
Marble	1241	10-year	1833.00	7697.18	7700.30	7700.04	7701.44	0.009306	8.69	224.34	79.30	0.87
Marble	1241	50-year	2248.00	7697.18	7700.68	7700.45	7702.02	0.009410	9.45	254.98	80.96	0.89
Marble	1241	500-year	2783.00	7697.18	7701.24	7700.93	7702.74	0.008646	10.01	301.28	83.90	0.88
Marble	1750	100-year	2413.00	7701.88	7705.82	7705.82	7707.48	0.010772	10.95	276.21	100.06	0.97
Marble	1750	Floodway	2413.00	7701.88	7706.11	7706.11	7708.19	0.013541	11.59	208.18	49.54	1.00
Marble	1750	10-year	1833.00	7701.88	7705.25	7705.11	7706.61	0.010677	9.82	224.23	85.67	0.95
Marble	1750	50-year	2248.00	7701.88	7705.67	7705.55	7707.24	0.010724	10.64	261.32	95.00	0.97
Marble	1750	500-year	2783.00	7701.88	7706.42	7706.42	7708.00	0.008635	10.78	345.25	128.03	0.89
Marble	2242	100-year	2413.00	7707.55	7711.75	7711.75	7713.57	0.010745	11.36	251.83	75.34	0.98
Marble	2242	Floodway	2413.00	7707.55	7712.32	7712.02	7714.25	0.011180	11.15	216.49	45.90	0.90
Marble	2242	10-year	1833.00	7707.55	7711.09	7711.09	7712.65	0.011367	10.42	203.85	70.79	0.98
Marble	2242	50-year	2248.00	7707.55	7711.56	7711.56	7713.32	0.010996	11.14	237.68	74.17	0.99
Marble	2242	500-year	2783.00	7707.55	7712.02	7712.02	7714.12	0.011429	12.22	273.35	87.68	1.02
Marble	2755	100-year	2413.00	7713.89	7718.39	7718.39	7720.26	0.010117	11.64	253.57	72.34	0.97
Marble	2755	Floodway	2413.00	7713.89	7718.39	7718.39	7720.26	0.010117	11.64	253.57	72.34	0.97
Marble	2755	10-year	1833.00	7713.89	7717.65	7717.65	7719.30	0.011110	10.81	201.70	67.17	0.98
Marble	2755	50-year	2248.00	7713.89	7718.20	7718.20	7720.00	0.010283	11.40	236.78	71.37	0.97
Marble	2755	500-year	2783.00	7713.89	7718.79	7718.79	7720.82	0.009870	12.17	283.01	74.35	0.97
Marble	3258	100-year	2413.00	7721.25	7725.78	7725.78	7727.79	0.010482	11.85	238.15	65.24	0.98
Marble	3258	Floodway	2413.00	7721.25	7725.78	7725.78	7727.79	0.010482	11.85	238.15	65.24	0.98
Marble	3258	10-year	1833.00	7721.25	7725.05	7725.05	7726.77	0.011200	10.90	192.29	61.02	0.99
Marble	3258	50-year	2248.00	7721.25	7725.58	7725.58	7727.51	0.010657	11.60	225.34	64.09	0.99
Marble	3258	500-year	2783.00	7721.25	7726.23	7726.23	7728.38	0.009945	12.31	268.25	67.80	0.97
Marble	3790	100-year	2413.00	7729.21	7733.77	7733.77	7735.85	0.010529	11.98	230.22	60.00	0.99
Marble	3790	Floodway	2413.00	7729.21	7733.77	7733.77	7735.85	0.010529	11.98	230.22	60.00	0.99
Marble	3790	10-year	1833.00	7729.21	7733.04	7733.04	7734.81	0.011200	10.98	187.14	57.01	0.99
Marble	3790	50-year	2248.00	7729.21	7733.57	7733.57	7735.57	0.010697	11.71	218.20	59.18	0.99
Marble	3790	500-year	2783.00	7729.21	7734.21	7734.21	7736.47	0.010170	12.51	256.89	61.78	0.99
Marble	4242	100-year	2413.00	7739.78	7744.15	7744.15	7745.96	0.011263	11.63	258.72	77.22	1.01
Marble	4242	Floodway	2413.00	7739.78	7744.15	7744.15	7745.96	0.011263	11.63	258.72	77.22	1.01
Marble	4242	10-year	1833.00	7739.78	7743.50	7743.50	7745.05	0.011827	10.65	210.36	73.19	1.00
Marble	4242	50-year	2248.00	7739.78	7743.98	7743.98	7745.71	0.011330	11.34	245.80	76.16	1.00
Marble	4242	500-year	2783.00	7739.78	7744.55	7744.55	7746.49	0.010789	12.10	290.10	79.72	1.00
Marble	4728	100-year	2413.00	7747.43	7751.27	7751.27	7753.08	0.011336	10.91	233.61	67.67	0.99
Marble	4728	Floodway	2413.00	7747.43	7751.27	7751.27	7753.08	0.011336	10.91	233.61	67.67	0.99
Marble	4728	10-year	1833.00	7747.43	7750.65	7750.65	7752.17	0.012171	10.00	191.67	65.86	1.00
Marble	4728	50-year	2248.00	7747.43	7751.09	7751.09	7752.83	0.011636	10.70	221.41	67.12	1.00
Marble	4728	500-year	2783.00	7747.43	7751.63	7751.63	7753.62	0.011064	11.46	258.06	68.74	1.00
Marble	5216	100-year	2413.00	7757.44	7761.28	7761.28	7763.04	0.011359	10.87	241.44	72.35	0.99

Marble	5216	Floodway	2413.00	7757.44	7761.42	7761.42	7763.30	0.013125	11.02	218.92	56.70	0.99
Marble	5216	10-year	1833.00	7757.44	7760.66	7760.66	7762.15	0.012172	9.97	197.51	69.92	1.00
Marble	5216	50-year	2248.00	7757.44	7761.11	7761.11	7762.80	0.011532	10.62	229.42	71.69	0.99
Marble	5216	500-year	2783.00	7757.44	7761.64	7761.64	7763.56	0.011048	11.40	267.48	73.72	0.99
Marble	5720	100-year	2413.00	7762.41	7767.22	7767.22	7769.31	0.010395	12.32	238.78	61.29	0.99
Marble	5720	Floodway	2413.00	7762.41	7767.22	7767.22	7769.31	0.010395	12.32	238.78	61.29	0.99
Marble	5720	10-year	1833.00	7762.41	7766.47	7766.47	7768.25	0.010903	11.28	194.29	58.45	0.99
Marble	5720	50-year	2248.00	7762.41	7767.02	7767.02	7769.02	0.010458	12.02	216.89	60.55	0.99
Marble	5720	500-year	2783.00	7762.41	7767.65	7767.65	7769.92	0.010157	12.90	265.78	62.94	0.99
Marble	6179	100-year	2413.00	7766.33	7771.45	7771.02	7772.10	0.003771	7.74	566.41	245.06	0.60
Marble	6179	Floodway	2413.00	7766.33	7771.70	7770.60	7772.73	0.005427	8.83	328.25	67.86	0.67
Marble	6179	10-year	1833.00	7766.33	7770.73	7769.81	7771.50	0.004779	7.88	395.76	229.85	0.66
Marble	6179	50-year	2248.00	7766.33	7771.25	7770.89	7771.93	0.004050	7.81	516.63	241.59	0.62
Marble	6179	500-year	2783.00	7766.33	7771.90	7771.26	7772.49	0.003271	7.62	677.15	253.94	0.57
Marble	6674	100-year	2413.00	7769.39	7773.79		7774.48	0.006097	8.90	567.89	407.28	0.75
Marble	6674	Floodway	2413.00	7769.39	7774.64		7775.56	0.005972	8.95	343.63	80.99	0.69
Marble	6674	10-year	1833.00	7769.39	7773.45		7774.07	0.005585	8.07	438.71	333.37	0.71
Marble	6674	50-year	2248.00	7769.39	7773.70		7774.39	0.006109	8.78	531.75	397.24	0.75
Marble	6674	500-year	2783.00	7769.39	7773.99		7774.66	0.005879	9.01	657.42	451.86	0.74
Marble	7123	100-year	2413.00	7772.97	7776.67	7776.38	7778.06	0.009267	9.74	273.41	87.90	0.89
Marble	7123	Floodway	2413.00	7772.97	7777.38		7778.55	0.006923	8.69	277.79	63.29	0.73
Marble	7123	10-year	1833.00	7772.97	7776.21		7777.27	0.008369	8.47	234.91	82.23	0.83
Marble	7123	50-year	2248.00	7772.97	7776.58		7777.85	0.008705	9.29	266.00	86.52	0.86
Marble	7123	500-year	2783.00	7772.97	7776.81	7776.57	7778.54	0.010960	10.85	286.12	94.60	0.98
Marble	7560	100-year	2413.00	7774.48	7779.95		7780.62	0.003884	8.20	443.25	118.18	0.62
Marble	7560	Floodway	2413.00	7774.48	7780.11		7781.70	0.006936	11.18	270.37	55.02	0.83
Marble	7560	10-year	1833.00	7774.48	7779.20		7779.82	0.004211	7.75	356.57	114.46	0.63
Marble	7560	50-year	2248.00	7774.48	7779.73		7780.39	0.004013	8.12	417.46	117.09	0.62
Marble	7560	500-year	2783.00	7774.48	7780.46		7781.14	0.003531	8.31	504.97	360.73	0.60
Marble	8048	100-year	2413.00	7776.35	7782.26	7782.26	7784.40	0.010227	11.96	222.76	171.28	0.97
Marble	8048	Floodway	2413.00	7776.35	7783.25		7784.64	0.005246	9.73	280.00	205.86	0.72
Marble	8048	10-year	1833.00	7776.35	7781.61	7781.51	7783.33	0.009938	10.67	186.28	117.03	0.94
Marble	8048	50-year	2248.00	7776.35	7782.07	7782.07	7784.10	0.010269	11.66	211.85	149.78	0.97
Marble	8048	500-year	2783.00	7776.35	7782.72	7782.72	7785.02	0.009837	12.48	249.21	257.26	0.97
Marble	8070		Bridge									
Marble	8077	100-year	2413.00	7776.35	7783.90	7782.05	7784.87	0.003110	8.07	335.29	65.37	0.57
Marble	8077	Floodway	2413.00	7776.35	7783.91	7782.06	7784.87	0.003094	8.06	335.86	65.38	0.56
Marble	8077	10-year	1833.00	7776.35	7782.92	7781.30	7783.73	0.003255	7.37	273.09	61.37	0.56
Marble	8077	50-year	2248.00	7776.35	7783.64	7781.84	7784.56	0.003142	7.88	318.24	64.29	0.56
Marble	8077	500-year	2783.00	7776.35	7784.46	7782.47	7785.52	0.003070	8.48	371.36	67.63	0.57
Marble	8612	100-year	2181.00	7781.30	7786.02	7785.16	7786.33	0.002363	5.51	651.92	607.61	0.46
Marble	8612	Floodway	2181.00	7781.30	7786.04	7785.42	7786.88	0.004746	7.84	345.17	110.00	0.66
Marble	8612	10-year	1657.00	7781.30	7785.18	7784.80	7785.65	0.004128	6.32	412.60	489.43	0.59
Marble	8612	50-year	2031.00	7781.30	7785.79	7785.05	7786.14	0.002742	5.73	584.17	605.90	0.50
Marble	8612	500-year	2515.00	7781.30	7786.54	7785.37	7786.79	0.001767	5.13	801.71	611.62	0.41
Marble	9086	100-year	2181.00	7783.62	7787.47		7788.27	0.008856	7.65	350.12	337.21	0.83
Marble	9086	Floodway	2181.00	7783.62	7788.44		7789.12	0.004944	6.63	329.20	90.90	0.61
Marble	9086	10-year	1657.00	7783.62	7787.36		7787.87	0.006050	6.14	328.83	316.43	0.68
Marble	9086	50-year	2031.00	7783.62	7787.45		7788.15	0.007982	7.21	345.19	332.90	0.78
Marble	9086	500-year	2515.00	7783.62	7787.56	7787.53	7788.52	0.010399	8.47	366.49	351.44	0.90
Marble	9536	100 year	2181.00	7785.61	7789.96	7788.65	7790.34	0.003343	6.51	592.26	570.35	0.55
Marble	9536	Floodway	2181.00	7785.61	7790.39	7789.84	7791.11	0.004494	8.03	398.36	140.00	0.65
Marble	9536	10-year	1657.00	7785.61	7789.43	7788.65	7789.84	0.004057	6.56	441.71	432.02	0.59
Marble	9536	50-year	2031.00	7785.61	7789.81	7788.65	7790.20	0.003520	6.52	550.40	527.24	0.56
Marble	9536	500-year	2515.00	7785.61	7790.15	7790.13	7790.37	0.002296	5.55	975.18	599.57	0.46
Marble	10063	100-year	2181.00	7788.11	7792.40	7792.40	7793.60	0.009808	11.03	316.01	180.46	0.94
Marble	10063	Floodway	2181.00	7788.11	7793.00	7792.40	7793.73	0.005290	8.85	398.98	140.17	0.71
Marble	10063	10-year	1657.00	7788.11	7792.09	7791.96	7793.00	0.007970	9.46	276.82	165.33	0.84
Marble	10063	50-year	2031.00	7788.11	7792.31	7792.31	7793.43	0.009357	10.62	304.50	176.38	0.92
Marble	10063	500-year	2515.00	7788.11	7792.75	7792.75	7793.95	0.009074	11.19	364.38	194.18	0.92
Marble	10584	100-year	2181.00	7792.09	7796.95	7796.84	7797.81	0.006947	10.15	390.08	463.48	0.81
Marble	10584	Floodway	2181.00	7792.09	7797.04	7797.04	7798.56	0.009877	12.26	268.25	79.99	0.97
Marble	10584	10-year	1657.00	7792.09	7796.45	7796.45	7797.30	0.007393	9.75	312.93	439.68	0.82
Marble	10584	50-year	2031.00	7792.09	7796.78	7796.72	7797.67	0.007345	10.20	363.59	455.71	0.83
Marble	10584	500-year	2515.00	7792.09	7797.17	7797.04	7798.11	0.007255	10.69	424.48	472.70	0.84
Marble	11147	100-year	2181.00	7798.13	7800.92	7800.49	7801.41	0.006910	5.66	391.75	398.84	0.70
Marble	11147	Floodway	2181.00	7798.13	7801.37	7800.52	7801.71	0.003791	4.69	464.67	186.96	0.52
Marble	11147	10-year	1657.00	7798.13	7800.62	7800.23	7801.01	0.006739	5.04	334.06	370.36	0.67
Marble	11147	50-year	2031.00	7798.13	7800.86	7800.42	7801.31	0.006619	5.43	380.09	394.61	0.68
Marble	11147	500-year	2515.00	7798.13	7801.14	7800.66	7801.67	0.006511	5.89	435.03	441.70	0.69
Marble	11815	100-year	2181.00	7804.94	7809.17	7809.17	7809.84	0.008292	10.04	462.25	270.24	0.86
Marble	11815	Floodway	2181.00	7804.94	7810.12	7810.12	7811.32	0.008687	11.78	324.10	110.31	0.92
Marble	11815	10-year	1657.00	7804.94	7808.93	7808.93	7809.50	0.007229	9.00	396.38	267.50	0.80
Marble	11815	50-year	2031.00	7804.94	7809.10	7809.10	7809.75	0.008079	9.80	442.91	269.41	0.85
Marble	11815	500-year	2515.00	7804.94	7809.31	7809.31	7810.04	0.008911	10.63	499.33	271.69	0.90
Marble	12347	100-year	2181.00	7812.60	7815.73	7815.73	7816.41	0.017455	7.65	409.82	311.38	0.95
Marble	12347	Floodway	2181.00	7812.60	7816.42	7816.42	7817.79	0.013611	9.40	232.00	82.84	0.99
Marble	12347	10-year	1657.00	7812.60	7815.52	7815.52	7816.07	0.011294	6.97	345.48	264.51	0.89
Marble	12347	50-year	2031.00	7812.60	7815.67	7815.67	7816.31	0.012319	7.65	389.46	303.54	0.94
Marble	12347	500-year	2515.00	7812.60	7815.95	7815.95	7816.60	0.010826	7.81	478.94	322.81	0.90
Marble	12820	100-year	2181.00	7820.14	7823.91	7823.91	7825.50	0.011270	10.83	252.89	134.94	0.99
Marble	12820	Floodway	2181.00	7820.14	7824.30	7824.30	7826.33	0.013663	11.44	190.68	46.30	0.99
Marble	12820	10-year	1657.00	7820.14	7823.35	7823.35	7824.68	0.011462	9.81	205.57	119.43	0.97
Marble	12820	50-year	2031.00	7820.14	7823.65	7823.65	7825.27	0.012545	10.59	230.16	126.28	1.03
Marble	12820	500-year	2515.00	7820.14	7824.25	7824.25	7825.65	0.009485	10.54	348.89	145.71	0.92
Marble	13314	100-year	2181.00	7827.75	7832.13	7832.13	7833.92	0.012664	12.73	252.58	158.23	1.08
Marble	13314	Floodway	2181.00	7827.75	7832.13	7832.13	7833.92	0.012664	12.73	252.58	158.23	1.08
Marble	13314	10-year	1657.00	7827.75	7831.60	7831.60	7833.03	0.011845	11.29	212.97	74.30	1.02
Marble	13314	50-year	2031.00	7827.75	7831.96	7831.96	7833.67	0.012689	12.40	239.44	132.31	1.07
Marble	13314	500-year	2515.00	7827.75	7832.52	7832.52	7834.46	0.012334	13.30	283.91	222.36	1.08
Marble	13779	100-year	2181.00	7834.89	7839.64	7839.64	7841.52	0.009909	11.94	225.97	62.83	0.97
Marble	13779	Floodway	2181.00	7834.89	7839.64	7839.64	7841.52	0.009909	11.94	225.97	62.83	0.97
Marble	13779	10-year	1657.00	7834.89	7838.88	7838.88	7840.55	0.010863	11.12	179.80	58.22	0.98
Marble	13779	50-year	2031.00	7834.89	7839.42	7839.42	7841.26	0.010203	11.74	212.54	61.61	0.97
Marble	13779	500-year	2515.00	7834.89	7839.89	7839.89	7842.09	0.010870	12.94	242.17	67.40	1.02
Marble	14378	100-year	2181.00	7848.90	7852.62	7852.62	7853.47	0.008738	9.43	383.84	207.06	0.87
Marble	14378	Floodway	2181.00	7848.90	7853.60	7853.60	7855.77	0.013158	12.40	193.93	44.06	1.01
Marble	14378	10-year	1657.00	7848.90	7852.26	7852.26	7853.44	0.011559	10.12	220.75	182.89	0.98
Marble	14378	50-year	2031.00	7848.90	7852.52	7852.52	7853.35	0.008695	9.24	364.10	196.60	0.86
Marble	14378	500-year	2515.00	7848.90	7852.81	7852.81	7853.72	0.009034	9.91	425.19	232.37	0.89
Marble	14921	100-year	2181.00	7861.98	7865.39	7865.39	7866.56	0.016687	12.03	282.26	117.24	1.18
Marble	14921	Floodway	2181.00	7861.98	7865.59	7865.59	7866.94	0.018922	11.87	249.14	86.96	1.13
Marble	14921	10-year	1657.00	7861.98	7864.99	7864.99	7865.98	0.016567	10.98	236.16	114.18	1.15
Marble	14921	50-year	2031.00	7861.98	7865.29	7865.29	7866.40	0.016583	11.73	269.88	116.43	1.17
Marble	14921	500-year	2515.00	7861.98	7865.66	7865.66	7866.91	0.016071	12.44	313.91	119.30	1.17
Marble	15423	100-year	2181.00	7875.81	7880.50	7880.50	7882.42	0.011020	12.45	237.53	66.32	1.02
Marble	15423	Floodway	2181.00	7875.81	7880.50	7880.50	7882.42	0.011020	12.45	237.53	66.32	1.02

Marble	15423	10-year	1657.00	7875.81	7879.80	7879.80	7881.45	0.011527	11.43	192.38	62.34	1.01
Marble	15423	50-year	2031.00	7875.81	7880.32	7880.32	7882.16	0.011036	12.14	225.67	65.31	1.01
Marble	15423	500-year	2515.00	7875.81	7880.89	7880.89	7882.99	0.010901	13.07	263.99	68.50	1.02
Marble	15909	100-year	2181.00	7887.24	7893.00	7893.00	7895.10	0.009127	13.01	237.48	59.45	0.96
Marble	15909	Floodway	2181.00	7887.24	7893.00	7893.00	7895.10	0.009127	13.01	237.48	59.45	0.96
Marble	15909	10-year	1657.00	7887.24	7892.24	7892.24	7894.04	0.009175	11.86	193.19	56.39	0.94
Marble	15909	50-year	2031.00	7887.24	7892.79	7892.79	7894.81	0.009208	12.73	224.51	58.57	0.95
Marble	15909	500-year	2515.00	7887.24	7893.45	7893.45	7895.72	0.009090	13.64	264.32	61.21	0.97
Marble	16407	100-year	2181.00	7896.69	7900.86	7900.86	7902.77	0.010967	11.52	215.76	59.99	0.99
Marble	16407	Floodway	2181.00	7896.69	7900.86	7900.86	7902.77	0.010967	11.52	215.76	59.99	0.99
Marble	16407	10-year	1657.00	7896.69	7900.19	7900.19	7901.81	0.011654	10.56	176.13	57.73	1.00
Marble	16407	50-year	2031.00	7896.69	7900.67	7900.67	7902.51	0.011156	11.26	204.57	59.36	0.99
Marble	16407	500-year	2515.00	7896.69	7901.25	7901.25	7903.34	0.010670	12.06	239.57	61.31	1.00
Marble	16883	100-year	2181.00	7902.41	7906.50	7906.50	7908.09	0.010621	11.06	258.36	85.92	0.97
Marble	16883	Floodway	2181.00	7902.41	7906.50	7906.50	7908.09	0.010621	11.06	258.36	85.92	0.97
Marble	16883	10-year	1657.00	7902.41	7905.91	7905.91	7907.28	0.011015	10.14	209.22	81.12	0.96
Marble	16883	50-year	2031.00	7902.41	7906.33	7906.33	7907.87	0.010829	10.85	243.72	84.52	0.97
Marble	16883	500-year	2515.00	7902.41	7906.86	7906.86	7908.55	0.010240	11.50	289.38	87.54	0.97
Marble	17475	100-year	2181.00	7908.15	7912.42	7912.20	7914.05	0.009623	10.74	234.98	64.64	0.93
Marble	17475	Floodway	2181.00	7908.15	7912.42	7912.20	7914.05	0.009623	10.74	234.98	64.64	0.93
Marble	17475	10-year	1657.00	7908.15	7911.87	7911.57	7913.15	0.009013	9.47	200.36	62.78	0.88
Marble	17475	50-year	2031.00	7908.15	7912.28	7912.02	7913.80	0.009371	10.36	226.14	64.17	0.91
Marble	17475	500-year	2515.00	7908.15	7912.72	7912.57	7914.58	0.010071	11.51	254.38	65.66	0.96
Marble	18067	100-year	2181.00	7914.25	7918.91	7918.91	7920.70	0.009905	11.79	227.65	69.96	0.96
Marble	18067	Floodway	2181.00	7914.25	7918.91	7918.91	7920.70	0.009905	11.79	227.65	69.96	0.96
Marble	18067	10-year	1657.00	7914.25	7918.14	7918.14	7919.75	0.011127	11.08	180.84	58.25	0.99
Marble	18067	50-year	2031.00	7914.25	7918.66	7918.66	7920.45	0.010563	11.73	211.69	60.73	0.98
Marble	18067	500-year	2515.00	7914.25	7919.35	7919.35	7921.22	0.009361	12.16	260.70	80.93	0.95
Marble	18542	100-year	2181.00	7919.92	7926.57	7926.57	7929.21	0.009161	13.70	195.10	41.12	0.97
Marble	18542	Floodway	2181.00	7919.92	7926.57	7926.57	7929.21	0.009161	13.70	195.10	41.12	0.97
Marble	18542	10-year	1657.00	7919.92	7925.58	7925.58	7927.87	0.009842	12.64	155.79	38.00	0.98
Marble	18542	50-year	2031.00	7919.92	7926.30	7926.30	7928.85	0.009289	13.40	184.28	40.29	0.97
Marble	18542	500-year	2515.00	7919.92	7927.13	7927.13	7930.00	0.008851	14.34	218.47	42.87	0.97
Marble	18573		Bridge									
Marble	18578	100-year	2181.00	7919.92	7929.19	7927.89	7930.89	0.004585	11.09	251.08	46.51	0.70
Marble	18578	Floodway	2181.00	7919.92	7929.19	7927.89	7930.89	0.004585	11.09	251.08	46.51	0.70
Marble	18578	10-year	1657.00	7919.92	7928.03	7926.87	7929.50	0.004774	10.17	199.81	42.09	0.69
Marble	18578	50-year	2031.00	7919.92	7928.85	7927.61	7930.50	0.004693	10.89	235.39	45.21	0.70
Marble	18578	500-year	2515.00	7919.92	7929.87	7928.49	7931.69	0.004450	11.55	283.58	49.12	0.70
Marble	18783	100-year	2181.00	7922.63	7931.12		7931.17	0.000198	2.49	1380.54	223.98	0.15
Marble	18783	Floodway	2181.00	7922.63	7931.11		7931.32	0.000635	4.45	687.14	95.00	0.27
Marble	18783	10-year	1657.00	7922.63	7929.73		7929.78	0.000244	2.45	1072.27	219.00	0.16
Marble	18783	50-year	2031.00	7922.63	7930.73		7930.78	0.000209	2.48	1293.42	222.61	0.15
Marble	18783	500-year	2515.00	7922.63	7931.92		7931.97	0.000181	2.53	1560.33	226.30	0.15
Marble	19361	100-year	2181.00	7924.30	7931.24	7928.40	7931.26	0.000136	1.77	2145.58	523.94	0.12
Marble	19361	Floodway	2181.00	7924.30	7931.51	7928.40	7931.83	0.001101	5.16	569.52	103.00	0.34
Marble	19361	10-year	1657.00	7924.30	7929.88	7927.80	7929.91	0.000236	2.01	1474.56	462.86	0.15
Marble	19361	50-year	2031.00	7924.30	7930.86	7928.26	7930.88	0.000156	1.82	1948.19	508.67	0.13
Marble	19361	500-year	2515.00	7924.30	7932.03	7928.40	7932.05	0.000108	1.69	2569.41	548.42	0.11
Marble	19905	100-year	1691.00	7925.95	7931.28		7931.46	0.001472	3.66	610.89	281.10	0.31
Marble	19905	Floodway	1691.00	7925.95	7932.27		7932.47	0.001292	3.56	475.60	88.55	0.27
Marble	19905	10-year	1284.00	7925.95	7929.96		7930.27	0.003475	4.54	296.19	226.38	0.46
Marble	19905	50-year	1575.00	7925.95	7930.90		7931.12	0.001936	3.97	505.23	268.21	0.35
Marble	19905	500-year	1950.00	7925.95	7932.07		7932.19	0.000910	3.19	839.90	300.18	0.25
Marble	20771	100-year	1691.00	7928.65	7932.82	7931.82	7933.05	0.002589	5.56	549.13	666.53	0.48
Marble	20771	Floodway	1691.00	7928.65	7933.68	7932.10	7934.10	0.002873	6.65	373.96	90.95	0.52
Marble	20771	10-year	1284.00	7928.65	7932.46	7931.39	7932.64	0.002312	4.94	458.48	630.44	0.45
Marble	20771	50-year	1575.00	7928.65	7932.73	7931.75	7932.94	0.002528	5.41	517.90	658.01	0.47
Marble	20771	500-year	1950.00	7928.65	7933.14	7931.98	7933.36	0.002378	5.60	610.20	695.55	0.47
Marble	21304	100-year	1691.00	7930.15	7934.28	7934.19	7934.46	0.002926	5.80	781.86	1437.89	0.51
Marble	21304	Floodway	1691.00	7930.15	7935.23	7934.41	7935.54	0.002678	6.39	482.33	175.00	0.51
Marble	21304	10-year	1284.00	7930.15	7934.19	7934.19	7934.32	0.002079	4.81	721.07	1416.83	0.43
Marble	21304	50-year	1575.00	7930.15	7934.39	7934.19	7934.39	0.003127	5.91	721.07	1416.83	0.53
Marble	21304	500-year	1950.00	7930.15	7934.39	7934.19	7934.50	0.002020	4.91	1073.15	1460.88	0.43
Marble	21874	100-year	1691.00	7934.00	7936.12		7936.40	0.003984	4.38	431.46	481.53	0.53
Marble	21874	Floodway	1691.00	7934.00	7936.67		7936.87	0.002046	3.66	474.73	185.00	0.40
Marble	21874	10-year	1284.00	7934.00	7935.77		7936.01	0.004466	4.09	343.21	368.85	0.55
Marble	21874	50-year	1575.00	7934.00	7936.08		7936.33	0.003748	4.18	419.83	469.83	0.52
Marble	21874	500-year	1950.00	7934.00	7936.03		7936.44	0.006282	5.33	407.35	433.67	0.67
Marble	22724	100-year	1691.00	7938.13	7941.71	7941.71	7942.86	0.008683	9.26	257.02	1886.08	0.86
Marble	22724	Floodway	1691.00	7938.13	7941.71	7941.71	7942.99	0.009407	9.63	239.07	143.04	0.90
Marble	22724	10-year	1284.00	7938.13	7941.29	7941.29	7942.28	0.008413	8.39	201.16	1864.09	0.83
Marble	22724	50-year	1575.00	7938.13	7941.64	7941.64	7942.70	0.008189	8.87	247.25	1882.20	0.83
Marble	22724	500-year	1950.00	7938.13	7941.88	7941.86	7943.21	0.009519	10.00	282.74	1907.11	0.91
Marble	23204	100-year	1691.00	7937.25	7944.04		7944.37	0.001637	5.93	310.72	55.50	0.41
Marble	23204	Floodway	1691.00	7937.25	7944.70		7944.76	0.001508	5.78	319.98	54.52	0.40
Marble	23204	10-year	1284.00	7937.25	7943.40		7943.79	0.001847	5.02	276.05	53.49	0.37
Marble	23204	50-year	1575.00	7937.25	7943.85		7944.34	0.001578	5.70	299.94	53.88	0.40
Marble	23204	500-year	1950.00	7937.25	7944.45		7945.07	0.001761	6.41	333.95	57.27	0.43
Marble	23225		Bridge									
Marble	23230	100-year	1691.00	7937.25	7944.10	7941.65	7944.78	0.002137	6.81	263.11	52.79	0.47
Marble	23230	Floodway	1691.00	7937.25	7944.24	7941.65	7944.89	0.001981	6.65	290.22	51.98	0.46
Marble	23230	10-year	1284.00	7937.25	7943.45	7940.98	7943.95	0.001774	5.79	249.68	50.65	0.42
Marble	23230	50-year	1575.00	7937.25	7943.90	7941.46	7944.53	0.002064	6.56	272.76	52.09	0.46
Marble	23230	500-year	1950.00	7937.25	7944.52	7942.05	7945.30	0.002280	7.33	305.26	54.25	0.49
Marble	23576	100-year	1691.00	7944.33	7948.09	7948.09	7948.93	0.008648	9.38	316.35	178.73	0.86
Marble	23576	Floodway	1691.00	7944.33	7948.22	7948.22	7949.28	0.011236	9.99	243.85	98.52	0.90
Marble	23576	10-year	1284.00	7944.33	7947.09	7947.09	7948.41	0.018770	11.15	170.36	95.54	1.21
Marble	23576	50-year	1575.00	7944.33	7947.87	7947.87	7948.79	0.010051	9.70	277.96	173.05	0.92
Marble	23576	500-year	1950.00	7944.33	7948.26	7948.26	7949.17	0.009132	9.93	345.50	182.34	0.89
Marble	24407	100-year	1691.00	7953.44	7958.71	7958.71	7960.52	0.009191	12.30	207.55	63.80	0.95
Marble	24407	Floodway	1691.00	7953.44	7958.71	7958.71	7960.52	0.009191	12.30	207.55	63.80	0.95
Marble	24407	10-year	1284.00	7953.44	7957.93	7957.93	7959.57	0.009886	11.47	161.26	56.05	0.96
Marble	24407	50-year	1575.00	7953.44	7958.50	7958.50	7960.26	0.009375	12.09	194.35	61.71	0.95
Marble	24407	500-year	1950.00	7953.44	7959.10	7959.10	7961.05	0.009135	12.88	233.81	67.94	0.95

Profile Output Table - Standard Table 2

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Vel Head (ft)	Frctn Loss (ft)	C & E Loss (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Top Width (ft)
Marble	0	100-year	7690.62	7689.00	1.63			182.13	2105.00	337.87	107.18
Marble	0	Floodway	7692.04	7689.53	2.51				2625.00		37.61
Marble	0	10-year	7689.66	7688.11	1.55			117.98	1656.30	219.72	91.49
Marble	0	50-year	7690.40	7688.84	1.56			166.68	1986.62	291.70	106.27
Marble	0	500-year	7691.10	7689.35	1.75			217.39	2364.35	446.26	109.56
Marble	329	100-year	7694.44	7692.46	1.98	3.10	0.11	144.90	2396.42	83.68	70.01

Marble	329	Floodway	7694.96	7693.43	1.53	2.83	0.10	3.78	2518.65	102.57	55.29
Marble	329	10-year	7693.44	7691.75	1.69	3.50	0.04	93.81	1843.72	56.47	66.64
Marble	329	50-year	7694.17	7692.27	1.90	3.11	0.10	129.66	2239.65	75.69	69.12
Marble	329	500-year	7695.03	7692.87	2.16	3.06	0.12	181.32	2744.21	102.48	71.97
Marble	505	100-year	7697.26	7694.23	3.03	1.77	0.53	76.54	2539.94	8.52	36.49
Marble	505	Floodway	7697.26	7694.23	3.03	1.32	0.75	76.54	2539.94	8.52	36.49
Marble	505	10-year	7695.74	7693.20	2.54	1.87	0.43	44.77	1944.24	4.99	34.86
Marble	505	50-year	7696.85	7693.96	2.88	1.79	0.49	67.04	2370.50	7.47	36.07
Marble	505	500-year	7698.16	7694.85	3.31	1.71	0.58	100.64	2916.15	11.21	37.48
Marble	542		Bridge								
Marble	547	100-year	7697.86	7695.90	1.96	0.03	0.03	88.40	2499.95	36.65	47.05
Marble	547	Floodway	7697.86	7695.90	1.96	0.03	0.03	88.40	2499.95	36.65	47.05
Marble	547	10-year	7696.44	7694.77	1.68	0.03	0.06	46.70	1928.48	18.83	43.20
Marble	547	50-year	7697.49	7695.64	1.85	0.03	0.05	76.45	2337.11	31.44	46.16
Marble	547	500-year	7698.75	7696.72	2.02	0.03	0.02	125.11	2849.67	53.22	49.87
Marble	746	100-year	7698.98	7697.73	1.25	1.05	0.07	633.34	1854.43	157.23	83.76
Marble	746	Floodway	7699.14	7697.78	1.36	1.22	0.06	737.17	1887.83		55.01
Marble	746	10-year	7697.71	7696.47	1.23	1.22	0.04	426.46	1460.44	107.10	72.46
Marble	746	50-year	7698.63	7697.39	1.24	1.07	0.06	563.13	1739.74	142.13	79.68
Marble	746	500-year	7699.76	7698.51	1.25	0.93	0.08	743.73	2092.07	192.20	92.71
Marble	1241	100-year	7702.25	7700.86	1.39	3.23	0.04	55.26	2318.64	39.10	81.74
Marble	1241	Floodway	7702.39	7701.29	1.09	3.22	0.03	61.55	2306.95	44.50	80.10
Marble	1241	10-year	7701.44	7700.30	1.14	3.72	0.01	35.64	1772.18	25.18	79.30
Marble	1241	50-year	7702.02	7700.68	1.34	3.36	0.03	49.02	2164.32	34.66	80.96
Marble	1241	500-year	7702.74	7701.24	1.50	2.91	0.08	68.52	2664.71	49.78	83.90
Marble	1750	100-year	7707.48	7705.82	1.66	5.08	0.08	115.52	2123.05	174.43	100.06
Marble	1750	Floodway	7708.19	7706.11	2.09	4.51	0.30		2413.00		49.54
Marble	1750	10-year	7706.61	7705.25	1.35	5.10	0.06	82.17	1630.56	120.27	85.67
Marble	1750	50-year	7707.24	7705.67	1.57	5.15	0.07	108.67	1982.69	156.64	95.00
Marble	1750	500-year	7708.00	7706.42	1.58	4.44	0.03	152.00	2410.79	220.21	128.03
Marble	2242	100-year	7713.57	7711.75	1.82	5.24	0.05	180.16	2164.14	68.70	75.54
Marble	2242	Floodway	7714.25	7712.32	1.93	6.03	0.02		2413.00		45.90
Marble	2242	10-year	7712.65	7711.09	1.56	5.37	0.06	117.65	1670.98	44.37	70.79
Marble	2242	50-year	7713.32	7711.56	1.76	5.29	0.06	161.11	2025.62	61.27	74.17
Marble	2242	500-year	7714.12	7712.02	2.10	4.81	0.15	220.30	2478.73	83.98	87.68
Marble	2755	100-year	7720.26	7718.39	1.87	5.35	0.02	164.22	2112.80	135.97	72.34
Marble	2755	Floodway	7720.26	7718.39	1.87	5.46	0.01	164.22	2112.80	135.97	72.34
Marble	2755	10-year	7719.30	7717.65	1.65	5.77	0.03	103.53	1639.70	89.77	67.17
Marble	2755	50-year	7720.00	7718.20	1.81	5.45	0.01	144.69	1980.80	122.51	71.37
Marble	2755	500-year	7720.82	7718.79	2.03	5.44	0.01	208.93	2406.35	167.72	74.35
Marble	3258	100-year	7727.79	7725.78	2.01	5.17	0.04	143.09	2197.98	71.92	65.24
Marble	3258	Floodway	7727.79	7725.78	2.01	5.17	0.04	143.09	2197.98	71.92	65.24
Marble	3258	10-year	7726.77	7725.05	1.72	5.60	0.02	92.04	1694.46	46.50	61.02
Marble	3258	50-year	7727.51	7725.58	1.93	5.26	0.04	127.66	2056.02	64.31	64.09
Marble	3258	500-year	7728.38	7726.23	2.15	4.98	0.04	181.48	2511.09	90.43	67.80
Marble	3790	100-year	7735.85	7733.77	2.08	5.59	0.02	104.56	2232.16	76.28	60.00
Marble	3790	Floodway	7735.85	7733.77	2.08	5.59	0.02	104.56	2232.16	76.28	60.00
Marble	3790	10-year	7734.81	7733.04	1.77	5.96	0.01	67.39	1716.46	49.15	57.01
Marble	3790	50-year	7735.57	7733.57	2.00	5.68	0.02	93.40	2086.42	68.18	59.18
Marble	3790	500-year	7736.47	7734.21	2.26	5.35	0.03	131.27	2556.17	95.57	61.78
Marble	4242	100-year	7745.96	7744.15	1.81	4.94	0.03	82.30	2023.23	307.47	77.22
Marble	4242	Floodway	7745.96	7744.15	1.81	4.94	0.03	82.30	2023.23	307.47	77.22
Marble	4242	10-year	7745.05	7743.50	1.54	5.22	0.02	55.26	1565.51	212.23	73.10
Marble	4242	50-year	7745.71	7743.98	1.73	5.00	0.03	74.49	1893.68	279.83	76.16
Marble	4242	500-year	7746.49	7744.55	1.95	4.76	0.03	100.94	2308.66	373.40	79.77
Marble	4728	100-year	7753.08	7751.27	1.81	5.48	0.00	42.58	2350.96	19.47	67.67
Marble	4728	Floodway	7753.08	7751.27	1.81	5.48	0.00	42.58	2350.96	19.47	67.67
Marble	4728	10-year	7752.17	7750.65	1.52	5.82	0.00	26.84	1764.59	11.57	65.86
Marble	4728	50-year	7752.83	7751.09	1.74	5.57	0.00	37.79	2193.20	17.01	67.12
Marble	4728	500-year	7753.62	7751.63	1.99	5.30	0.01	53.85	2704.00	25.15	68.74
Marble	5216	100-year	7763.04	7761.28	1.76	5.53	0.00	75.56	2296.18	41.26	72.35
Marble	5216	Floodway	7763.30	7761.42	1.89	5.94	0.02		2413.00		56.70
Marble	5216	10-year	7762.15	7760.66	1.49	5.94	0.00	50.80	1757.08	25.11	69.02
Marble	5216	50-year	7762.80	7761.11	1.68	5.65	0.01	68.26	2143.37	36.38	71.69
Marble	5216	500-year	7763.56	7761.64	1.92	5.39	0.01	92.84	2637.13	53.04	73.72
Marble	5720	100-year	7769.31	7767.22	2.09	5.47	0.10	122.91	2093.55	196.53	61.29
Marble	5720	Floodway	7769.31	7767.22	2.08	5.86	0.06	122.91	2093.55	196.53	61.29
Marble	5720	10-year	7768.25	7766.47	1.78	5.79	0.09	79.92	1620.08	133.01	58.45
Marble	5720	50-year	7769.02	7767.02	2.00	5.52	0.09	110.37	1959.45	178.18	60.55
Marble	5720	500-year	7769.92	7767.65	2.27	5.33	0.10	152.65	2390.99	239.26	62.94
Marble	6179	100-year	7772.10	7771.45	0.65	2.65	0.14	88.28	1626.63	698.09	246.06
Marble	6179	Floodway	7772.73	7771.70	1.03	3.37	0.11		1945.54	467.46	62.86
Marble	6179	10-year	7771.50	7770.73	0.76	3.14	0.10	66.40	1424.23	342.48	229.85
Marble	6179	50-year	7771.93	7771.25	0.69	2.78	0.13	82.05	1575.09	590.87	241.59
Marble	6179	500-year	7772.49	7771.90	0.60	2.40	0.17	102.65	1740.47	939.88	253.94
Marble	6674	100-year	7774.48	7773.79	0.69	2.36	0.01	1025.75	1243.54	141.71	407.28
Marble	6674	Floodway	7775.56	7774.64	0.93	2.82	0.01	921.10	1491.91		86.99
Marble	6674	10-year	7774.07	7773.45	0.62	2.56	0.01	713.34	1040.68	78.98	333.37
Marble	6674	50-year	7774.39	7773.70	0.69	2.46	0.00	927.65	1202.67	117.68	397.74
Marble	6674	500-year	7774.66	7773.99	0.67	2.15	0.02	1252.13	1318.51	212.36	451.86
Marble	7123	100-year	7778.06	7776.67	1.39	3.38	0.21	98.01	2269.03	49.96	87.90
Marble	7123	Floodway	7778.55	7777.38	1.17	2.92	0.07		2413.00		63.20
Marble	7123	10-year	7777.27	7776.21	1.06	3.07	0.13	73.08	1720.51	33.11	82.73
Marble	7123	50-year	7777.85	7776.58	1.27	3.29	0.17	91.18	2111.32	46.51	86.52
Marble	7123	500-year	7778.54	7776.81	1.73	3.56	0.32	101.87	2621.15	59.98	94.60
Marble	7560	100-year	7780.62	7779.95	0.67	2.49	0.07	1056.11	1290.31	66.58	118.18
Marble	7560	Floodway	7781.70	7780.11	1.59	3.02	0.12	504.89	1811.24	96.87	55.02
Marble	7560	10-year	7779.82	7779.20	0.62	2.50	0.04	733.81	1052.09	47.10	114.46
Marble	7560	50-year	7780.39	7779.73	0.66	2.47	0.06	962.19	1225.05	60.76	117.09
Marble	7560	500-year	7781.14	7780.46	0.68	2.50	0.11	1272.09	1430.39	80.52	360.73
Marble	8048	100-year	7784.40	7782.26	2.13	2.84	0.73	37.20	2305.18	70.62	171.28
Marble	8048	Floodway	7784.64	7783.25	1.39	2.88	0.06	51.87	2268.26	92.87	306.86
Marble	8048	10-year	7783.33	7781.61	1.71	2.96	0.55	21.03	1770.71	41.26	117.03
Marble	8048	50-year	7784.10	7782.07	2.03	2.90	0.68	32.02	2154.52	61.46	149.78
Marble	8048	500-year	7785.02	7782.72	2.30	2.63	0.81	50.72	2638.60	93.69	257.26
Marble	8070		Bridge								
Marble	8077	100-year	7784.87	7783.90	0.96	0.02	0.00	66.80	2282.61	63.59	65.37
Marble	8077	Floodway	7784.87	7783.91	0.96	0.02	0.01	66.97	2282.27	63.76	65.38
Marble	8077	10-year	7783.73	7782.92	0.81	0.02	0.00	38.51	1760.05	34.44	61.37
Marble	8077	50-year	7784.56	7783.64	0.92	0.02	0.00	58.18	2135.50	54.32	64.29
Marble	8077	500-year	7785.52	7784.46	1.05	0.02	0.00	87.49	2610.59	84.92	67.63
Marble	8612	100-year	7786.33	7786.02	0.31	1.40	0.07	533.46	1300.95	346.58	607.61
Marble	8612	Floodway	7786.88	7786.04	0.83	1.99	0.01	262.09	1857.12	61.79	110.00
Marble	8612	10-year	7785.65	7785.18	0.47	1.88	0.03	237.16	1202.77	217.07	489.43
Marble	8612	50-year	7786.14	7785.79	0.35	1.52	0.06	445.38	1278.93	306.69	605.90
Marble	8612	500-year	7786.79	7786.54	0.25	1.19	0.08	730.04	1353.42	431.55	611.62

Marble	9086	100-year	7788.27	7787.47	0.79	1.79	0.14	303.35	1844.74	32.91	337.21
Marble	9086	Floodway	7789.12	7788.44	0.68	2.23	0.02		2181.00		90.90
Marble	9086	10-year	7787.87	7787.36	0.51	2.21	0.01	214.85	1415.53	26.62	316.43
Marble	9086	50-year	7788.15	7787.45	0.71	1.91	0.11	278.39	1722.47	30.14	332.90
Marble	9086	500-year	7788.52	7787.56	0.97	1.52	0.21	365.74	2108.70	40.56	351.44
Marble	9536	100-year	7790.34	7789.96	0.37	2.02	0.04	61.15	1044.40	1075.45	570.35
Marble	9536	Floodway	7791.11	7790.39	0.72	1.97	0.01	117.45	1416.23	647.32	140.00
Marble	9536	10-year	7789.84	7789.43	0.42	1.96	0.01	10.22	922.94	723.84	432.02
Marble	9536	50-year	7790.20	7789.81	0.38	2.01	0.03	43.59	1011.12	976.30	527.24
Marble	9536	500-year	7790.37	7790.15	0.21	1.77	0.08	909.88	930.06	675.06	599.52
Marble	10063	100-year	7793.60	7792.40	1.20			167.27	1186.91	826.82	180.46
Marble	10063	Floodway	7793.73	7793.00	0.74	2.62	0.00	218.69	1086.61	875.71	140.17
Marble	10063	10-year	7793.00	7792.09	0.91	3.01	0.15	113.78	945.26	597.96	165.33
Marble	10063	50-year	7793.43	7792.31	1.12			150.90	1119.83	760.27	176.38
Marble	10063	500-year	7793.95	7792.75	1.20	2.14	0.30	215.74	1303.98	995.29	194.18
Marble	10584	100-year	7797.81	7796.95	0.86	4.18	0.03	1106.23	977.56	97.21	463.48
Marble	10584	Floodway	7798.56	7797.04	1.52	3.60	0.23	856.51	1202.79	121.70	79.99
Marble	10584	10-year	7797.30	7796.45	0.85			739.14	842.12	75.74	439.68
Marble	10584	50-year	7797.67	7796.78	0.89	4.22	0.02	992.74	947.14	91.12	455.71
Marble	10584	500-year	7798.11	7797.17	0.93	4.13	0.03	1327.98	1075.60	111.43	472.70
Marble	11147	100-year	7801.41	7800.92	0.49	3.57	0.04	17.37	2153.76	9.87	398.84
Marble	11147	Floodway	7801.71	7801.37	0.34	3.03	0.12		2181.00		186.96
Marble	11147	10-year	7801.01	7800.62	0.39	3.67	0.05	12.72	1637.51	6.77	370.36
Marble	11147	50-year	7801.31	7800.86	0.45	3.60	0.04	16.04	2005.94	9.01	394.61
Marble	11147	500-year	7801.67	7801.14	0.53	3.53	0.04	20.65	2482.12	12.23	441.70
Marble	11815	100-year	7809.84	7809.17	0.67	5.05	0.05	860.69	696.22	624.08	270.24
Marble	11815	Floodway	7811.32	7810.12	1.20	3.65	0.26	1140.41	1003.14	37.46	110.31
Marble	11815	10-year	7809.50	7808.93	0.57	4.67	0.05	574.38	587.85	494.77	267.50
Marble	11815	50-year	7809.75	7809.10	0.65	4.88	0.06	775.18	667.70	588.12	269.44
Marble	11815	500-year	7810.04	7809.31	0.73	5.06	0.06	1049.13	761.48	704.39	271.69
Marble	12347	100-year	7816.41	7815.73	0.67	5.44	0.00	713.66	1379.65	87.69	311.38
Marble	12347	Floodway	7817.79	7816.42	1.37	5.70	0.05		2181.00		82.34
Marble	12347	10-year	7816.07	7815.52	0.55	4.83	0.00	501.91	1101.75	53.34	294.51
Marble	12347	50-year	7816.31	7815.67	0.64	5.33	0.00	652.57	1301.67	76.76	303.54
Marble	12347	500-year	7816.60	7815.95	0.65	5.29	0.01	883.98	1510.78	120.25	322.81
Marble	12820	100-year	7825.50	7823.91	1.60	5.58	0.28	72.10	1868.52	240.38	134.94
Marble	12820	Floodway	7826.33	7824.30	2.03	6.45	0.20		2181.00		46.30
Marble	12820	10-year	7824.68	7823.35	1.33	5.36	0.23	57.26	1440.42	159.32	119.43
Marble	12820	50-year	7825.27	7823.65	1.62	5.86	0.29	71.07	1749.28	210.65	126.28
Marble	12820	500-year	7825.65	7824.25	1.40	4.78	0.23	82.67	1983.85	448.48	145.71
Marble	13314	100-year	7833.92	7832.13	1.79	5.92	0.06	649.75	1404.96	126.29	158.23
Marble	13314	Floodway	7833.92	7832.13	1.79	6.53	0.02	649.75	1404.96	126.29	158.23
Marble	13314	10-year	7833.03	7831.60	1.43	5.78	0.03	470.13	1094.04	92.83	74.30
Marble	13314	50-year	7833.67	7831.96	1.71	6.26	0.03	594.76	1314.67	121.58	132.31
Marble	13314	500-year	7834.46	7832.52	1.94	5.33	0.16	772.29	1599.06	143.65	222.36
Marble	13779	100-year	7841.52	7839.64	1.88	5.19	0.03	127.57	1781.48	271.94	62.83
Marble	13779	Floodway	7841.52	7839.64	1.88	5.19	0.03	127.57	1781.48	271.94	62.83
Marble	13779	10-year	7840.55	7838.88	1.67	5.27	0.07	81.87	1393.55	181.59	58.22
Marble	13779	50-year	7841.26	7839.42	1.84	5.27	0.04	113.77	1672.86	244.37	61.61
Marble	13779	500-year	7842.09	7839.89	2.20	5.38	0.08	154.26	2035.59	325.15	67.40
Marble	14378	100-year	7853.47	7852.62	0.85	5.35	0.10	465.17	1137.46	578.37	207.06
Marble	14378	Floodway	7855.77	7853.60	2.17	6.67	0.09		1894.58	286.42	44.06
Marble	14378	10-year	7853.44	7852.26	1.18	6.52	0.05	415.10	1098.94	140.97	182.89
Marble	14378	50-year	7853.35	7852.52	0.83	5.42	0.10	434.71	1084.16	512.12	196.60
Marble	14378	500-year	7853.72	7852.81	0.91	5.68	0.13	532.19	1257.19	725.62	232.37
Marble	14921	100 year	7866.56	7865.39	1.17	6.53	0.10	1277.73	681.33	221.94	117.24
Marble	14921	Floodway	7866.94	7865.59	1.35	8.59	0.08	1467.51	713.49		86.96
Marble	14921	10-year	7865.98	7864.99	0.99	7.56	0.02	950.99	545.99	160.02	114.18
Marble	14921	50-year	7866.40	7865.29	1.12	6.49	0.09	1184.15	642.74	204.12	116.43
Marble	14921	500-year	7866.91	7865.66	1.25	6.55	0.10	1488.99	762.85	263.16	119.30
Marble	15423	100-year	7882.42	7880.50	1.92	6.79	0.22	190.66	1648.47	341.87	66.32
Marble	15423	Floodway	7882.42	7880.50	1.92	7.20	0.17	190.66	1648.47	341.87	66.32
Marble	15423	10-year	7881.45	7879.80	1.65	6.94	0.20	125.30	1285.40	246.30	62.34
Marble	15423	50-year	7882.16	7880.32	1.83	6.78	0.21	171.42	1544.98	314.60	65.31
Marble	15423	500-year	7882.99	7880.89	2.09	6.64	0.25	236.08	1875.65	403.27	68.50
Marble	15909	100-year	7895.10	7893.00	2.10	4.87	0.05	132.26	1676.97	371.77	59.45
Marble	15909	Floodway	7895.10	7893.00	2.10	4.87	0.05	132.26	1676.97	371.77	59.45
Marble	15909	10-year	7894.04	7892.24	1.80	4.99	0.04	90.25	1327.14	241.62	56.39
Marble	15909	50-year	7894.81	7892.79	2.03	4.90	0.06	119.58	1578.34	333.07	58.57
Marble	15909	500-year	7895.72	7893.45	2.27	4.84	0.05	161.48	1895.05	458.46	61.21
Marble	16407	100-year	7902.77	7900.86	1.92	4.98	0.02	53.98	2004.51	122.52	59.99
Marble	16407	Floodway	7902.77	7900.86	1.92	4.98	0.02	53.98	2004.51	122.52	59.99
Marble	16407	10-year	7901.81	7900.19	1.63	5.14	0.02	34.90	1540.61	81.48	57.73
Marble	16407	50-year	7902.51	7900.67	1.84	5.04	0.02	48.20	1872.42	110.38	59.36
Marble	16407	500-year	7903.34	7901.25	2.09	4.90	0.02	67.55	2297.13	150.31	61.31
Marble	16883	100-year	7908.09	7906.50	1.59	5.14	0.03	228.02	1769.15	183.83	85.92
Marble	16883	Floodway	7908.09	7906.50	1.59	5.14	0.03	228.02	1769.15	183.83	85.92
Marble	16883	10-year	7906.28	7904.91	1.37	5.40	0.03	155.87	1384.08	117.85	82.12
Marble	16883	50-year	7907.87	7906.33	1.54	5.23	0.03	206.95	1660.96	164.09	84.52
Marble	16883	500-year	7908.55	7906.86	1.70	4.98	0.04	285.20	2002.04	227.76	87.54
Marble	17475	100-year	7914.05	7912.42	1.63	5.95	0.01	66.09	1945.33	169.59	64.64
Marble	17475	Floodway	7914.05	7912.42	1.63	5.95	0.01	66.09	1945.33	169.59	64.64
Marble	17475	10-year	7912.15	7911.87	1.28	5.86	0.01	43.36	1489.33	124.31	62.78
Marble	17475	50-year	7913.80	7912.28	1.52	5.93	0.00	59.43	1814.95	176.62	64.17
Marble	17475	500-year	7914.58	7913.72	1.87	5.98	0.05	81.85	2234.29	198.85	65.66
Marble	18067	100-year	7920.70	7918.91	1.79	5.76	0.05	172.22	1680.21	328.57	69.96
Marble	18067	Floodway	7920.70	7918.91	1.79	5.76	0.05	172.22	1680.21	328.57	69.96
Marble	18067	10-year	7919.75	7918.14	1.61	5.89	0.10	111.57	1318.42	227.00	58.25
Marble	18067	50-year	7920.45	7918.66	1.79	5.87	0.08	150.32	1582.45	298.23	60.73
Marble	18067	500-year	7921.22	7919.35	1.87	5.73	0.00	227.06	1895.69	392.25	80.93
Marble	18542	100-year	7929.21	7926.57	2.64	4.53	0.43	117.03	1956.81	107.16	41.12
Marble	18542	Floodway	7929.21	7926.57	2.64	4.53	0.43	117.03	1956.81	107.16	41.12
Marble	18542	10-year	7927.87	7925.58	2.29	4.98	0.34	73.28	1516.63	67.09	38.00
Marble	18542	50-year	7928.85	7926.30	2.54	4.71	0.38	103.93	1831.92	95.15	40.29
Marble	18542	500-year	7930.00	7927.13	2.87	4.36	0.50	147.89	2231.71	135.40	42.87
Marble	18573		Bridge								
Marble	18578	100-year	7930.89	7929.19	1.70	0.03	0.28	145.77	1919.25	115.98	46.51
Marble	18578	Floodway	7930.89	7929.19	1.70	0.03	0.28	145.77	1919.25	115.98	46.51
Marble	18578	10-year	7929.50	7928.03	1.47	0.03	0.25	87.31	1500.21	69.47	42.09
Marble	18578	50-year	7930.50	7928.85	1.65	0.03	0.26	127.34	1802.34	101.32	45.21
Marble	18578	500-year	7931.69	7929.87	1.82	0.03	0.30	188.15	2172.87	153.98	49.12
Marble	18783	100-year	7931.17	7931.12	0.05	0.11	0.17	1231.91	639.23	309.86	223.98
Marble	18783	Floodway	7931.32	7931.11	0.21	0.28	0.15	956.99	1143.68	80.33	95.00
Marble	18783	10-year	7929.78	7929.73	0.05	0.13	0.14	951.43	526.60	178.97	219.00
Marble	18783	50-year	7930.78	7930.73	0.05	0.12	0.16	1152.07	607.40	271.53	222.61
Marble	18783	500-year	7931.97	7931.92	0.05	0.10	0.18	1409.91	710.41	394.68	226.30
Marble	19361	100-year	7931.26	7931.24	0.02	0.09	0.00	1138.41	490.61	551.99	523.94

Marble	19361	Floodway	7931.83	7931.51	0.31	0.47	0.03	79.14	1489.78	612.08	103.00
Marble	19361	10-year	7929.91	7929.88	0.03	0.13	0.00	819.63	444.16	393.21	462.86
Marble	19361	50-year	7930.88	7930.86	0.02	0.10	0.00	1050.15	476.72	504.13	508.67
Marble	19361	500-year	7932.05	7932.03	0.02	0.08	0.00	1327.05	524.22	663.74	548.42
Marble	19905	100-year	7931.46	7931.28	0.18	0.15	0.05	223.77	1419.10	48.12	282.10
Marble	19905	Floodway	7932.47	7932.27	0.20	0.63	0.01		1691.00		88.35
Marble	19905	10-year	7930.27	7929.96	0.31	0.27	0.08	34.00	1230.02	19.99	226.38
Marble	19905	50-year	7931.12	7930.90	0.22	0.18	0.06	142.11	1404.31	28.58	268.21
Marble	19905	500-year	7932.19	7932.07	0.12	0.11	0.03	392.21	1458.03	99.76	300.18
Marble	20771	100-year	7933.05	7932.82	0.22	1.58	0.01	361.76	493.62	835.62	666.53
Marble	20771	Floodway	7934.10	7933.68	0.41	1.56	0.06	206.51	712.78	771.72	90.95
Marble	20771	10-year	7932.64	7932.46	0.18	2.34	0.01	252.89	399.25	631.86	630.44
Marble	20771	50-year	7932.94	7932.73	0.21	1.83	0.00	323.74	469.33	781.93	658.01
Marble	20771	500-year	7933.36	7933.14	0.22	1.14	0.03	465.26	534.98	949.76	695.55
Marble	21304	100-year	7934.46	7934.28	0.18	1.41	0.00	523.77	479.95	687.28	1437.89
Marble	21304	Floodway	7935.54	7935.23	0.32	1.44	0.01	1005.34	654.69	30.97	175.00
Marble	21304	10-year	7934.32	7934.19	0.13	1.12	0.00	375.24	389.92	518.85	1416.83
Marble	21304	50-year	7934.39	7934.19	0.20	1.44	0.00	460.28	478.28	636.44	1416.83
Marble	21304	500-year	7934.50	7934.39	0.11	1.12	0.01	882.07	417.37	650.56	1460.88
Marble	21874	100-year	7936.40	7936.12	0.28	1.91	0.03	120.39	1560.27	10.34	481.53
Marble	21874	Floodway	7936.87	7936.67	0.20	1.32	0.01	29.92	1646.64	14.45	185.00
Marble	21874	10-year	7936.01	7935.77	0.25	1.66	0.03	68.86	1208.32	6.83	368.85
Marble	21874	50-year	7936.33	7936.08	0.25	1.93	0.02	107.21	1458.30	9.48	469.83
Marble	21874	500-year	7936.44	7936.03	0.41	1.85	0.09	125.98	1812.49	11.53	433.67
Marble	22724	100-year	7942.86	7941.71	1.15	4.81	0.26	171.50	1442.45	77.05	1886.08
Marble	22724	Floodway	7942.99	7941.71	1.28	3.24	0.32	177.42	1498.69	14.89	143.04
Marble	22724	10-year	7942.28	7941.29	0.99	5.07	0.22	74.37	1154.98	54.65	1864.09
Marble	22724	50-year	7942.70	7941.64	1.06	4.53	0.24	148.72	1355.28	71.00	1882.20
Marble	22724	500-year	7943.21	7941.88	1.32	6.50	0.27	222.82	1635.62	91.56	1907.11
Marble	23204	100-year	7944.57	7944.04	0.53	1.52	0.19	24.58	1635.58	30.84	55.50
Marble	23204	Floodway	7944.70	7944.20	0.50	1.47	0.23	25.99	1633.15	31.85	54.72
Marble	23204	10-year	7943.79	7943.40	0.38	1.32	0.18	16.62	1246.59	20.79	53.49
Marble	23204	50-year	7944.34	7943.85	0.49	1.46	0.17	22.01	1525.25	27.74	54.88
Marble	23204	500-year	7945.07	7944.45	0.62	1.65	0.21	30.98	1881.75	37.27	57.27
Marble	23225		Bridge								
Marble	23230	100-year	7944.78	7944.10	0.68	0.01	0.02	73.49	1587.56	29.95	52.79
Marble	23230	Floodway	7944.89	7944.24	0.65	0.01	0.02	76.26	1583.67	31.12	51.98
Marble	23230	10-year	7943.95	7943.45	0.49	0.01	0.02	49.66	1213.79	20.55	50.65
Marble	23230	50-year	7944.53	7943.90	0.63	0.01	0.02	66.16	1481.78	27.06	52.09
Marble	23230	500-year	7945.30	7944.52	0.79	0.01	0.03	93.78	1819.28	36.94	54.25
Marble	23576	100-year	7948.93	7948.09	0.83	1.33	0.05	142.75	900.00	648.25	178.73
Marble	23576	Floodway	7949.28	7948.22	1.06	1.37	0.12		990.86	700.14	98.52
Marble	23576	10-year	7948.41	7947.09	1.33	1.45	0.25	82.25	775.34	426.40	95.54
Marble	23576	50-year	7948.79	7947.87	0.92	1.36	0.09	105.30	873.39	596.31	173.05
Marble	23576	500-year	7949.17	7948.26	0.91	1.41	0.04	186.01	996.33	767.66	182.34
Marble	24407	100-year	7960.52	7958.71	1.81	7.43	0.29	154.81	1252.49	283.70	63.80
Marble	24407	Floodway	7960.52	7958.71	1.81	8.47	0.23	154.81	1252.49	283.70	63.80
Marble	24407	10-year	7959.57	7957.93	1.64	11.06	0.09	105.04	996.54	182.42	56.05
Marble	24407	50-year	7960.26	7958.50	1.77	8.09	0.25	140.11	1181.63	253.26	61.71
Marble	24407	500-year	7961.05	7959.10	1.94	7.61	0.31	187.74	1410.62	351.64	67.94

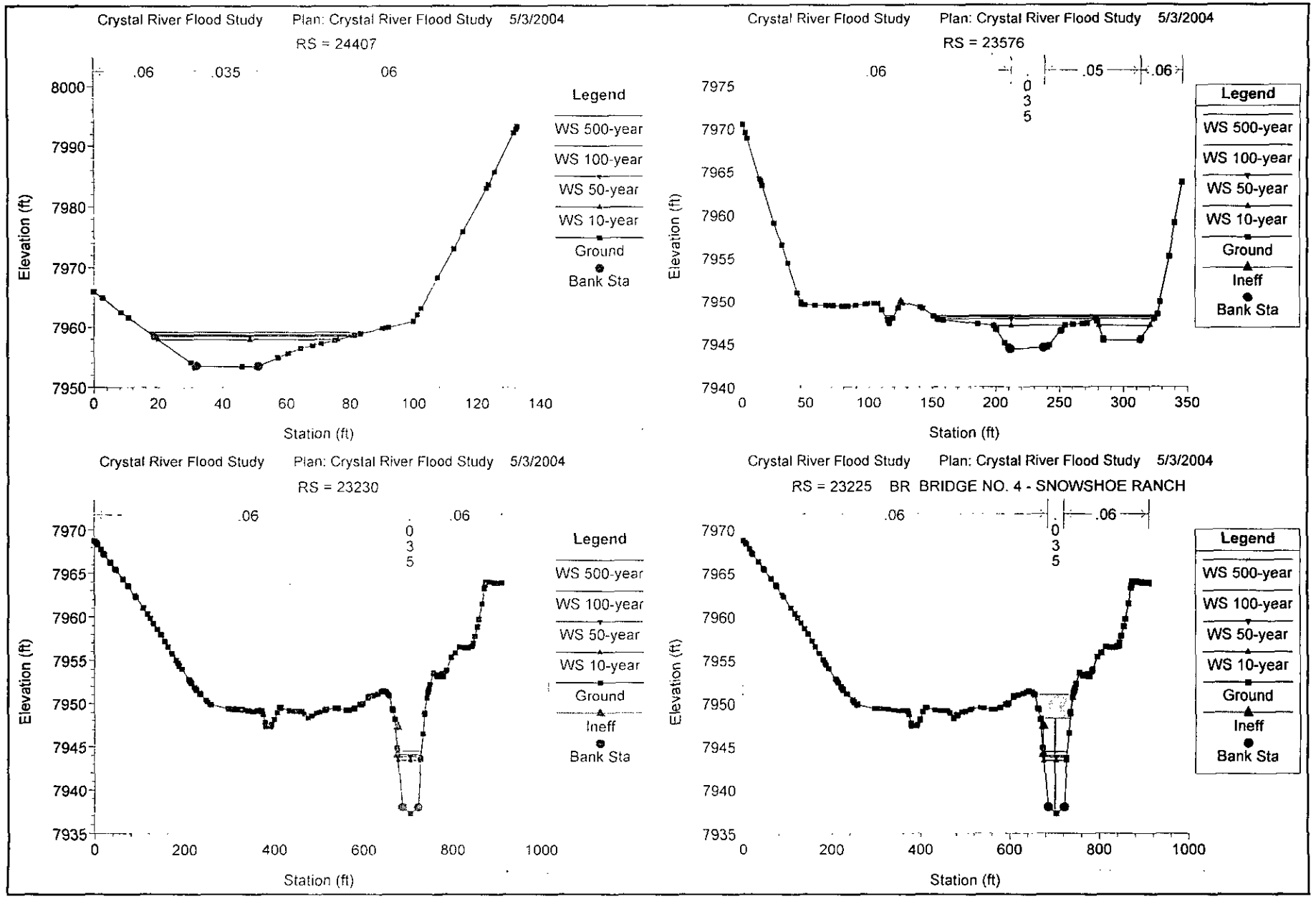
Profile Output Table - Encroachment 3

Reach	River Sta	Profile	Top Width Act (ft)	Area (sq ft)	Vel Total (ft/s)	W.S. Elev (ft)	Base WS (ft)	Prof Delta WS (ft)
Marble	0	100-year	107.18	329.48	7.97	7689.00	7689.00	
Marble	0	Floodway	37.61	206.62	12.70	7689.53	7689.00	0.53
Marble	0	10-year	91.49	238.10	8.37	7688.11	7689.00	-0.89
Marble	0	50-year	106.27	312.12	7.83	7688.84	7689.00	-0.16
Marble	0	500-year	109.56	367.43	8.24	7689.35	7689.00	0.35
Marble	329	100-year	70.01	257.42	10.20	7692.46	7692.46	
Marble	329	Floodway	55.29	279.42	9.39	7693.43	7692.46	0.97
Marble	329	10-year	66.64	209.30	9.53	7691.75	7692.46	-0.70
Marble	329	50-year	69.12	244.28	10.01	7692.27	7692.46	-0.19
Marble	329	500-year	71.97	286.96	10.55	7692.87	7692.46	0.42
Marble	505	100-year	36.49	202.26	12.98	7694.23	7694.23	
Marble	505	Floodway	36.49	202.26	12.98	7694.23	7694.23	0.00
Marble	505	10-year	34.86	165.56	12.04	7693.20	7694.23	-1.03
Marble	505	50-year	36.07	192.59	12.70	7693.96	7694.23	-0.27
Marble	505	500-year	37.48	225.39	13.43	7694.85	7694.23	0.63
Marble	542	BR D 100-year	38.77	254.48	10.32	7695.62	7695.62	
Marble	542	BR D Floodway	38.77	254.48	10.32	7695.62	7695.62	0.00
Marble	542	BR D 10-year	36.71	207.36	9.62	7694.37	7695.62	-1.25
Marble	542	BR D 50-year	38.10	240.40	10.17	7695.25	7695.62	-0.37
Marble	542	BR D 500-year	40.31	283.98	10.66	7696.36	7695.62	0.75
Marble	542	BR U 100-year	46.58	251.68	10.43	7695.76	7695.76	
Marble	542	BR U Floodway	46.58	251.68	10.43	7695.76	7695.76	0.00
Marble	542	BR U 10-year	42.12	193.74	10.29	7694.45	7695.76	-1.31
Marble	542	BR U 50-year	45.27	234.10	10.44	7695.38	7695.76	-0.38
Marble	542	BR U 500-year	49.56	293.79	10.31	7696.63	7695.76	0.88
Marble	547	100-year	47.05	258.24	10.16	7695.90	7695.90	
Marble	547	Floodway	47.05	258.24	10.16	7695.90	7695.90	0.00
Marble	547	10-year	43.20	207.23	9.62	7694.77	7695.90	-1.13
Marble	547	50-year	46.16	246.02	9.94	7695.64	7695.90	-0.26
Marble	547	500-year	49.87	298.23	10.15	7696.72	7695.90	0.83
Marble	746	100-year	83.76	376.10	6.98	7697.73	7697.73	
Marble	746	Floodway	55.01	316.05	8.31	7697.78	7697.73	0.06
Marble	746	10-year	72.46	279.36	7.14	7696.47	7697.73	-1.25
Marble	746	50-year	79.68	348.31	7.02	7697.39	7697.73	-0.34
Marble	746	500-year	92.71	445.14	6.80	7698.51	7697.73	0.78
Marble	1241	100-year	81.74	269.51	8.95	7700.86	7700.86	
Marble	1241	Floodway	80.10	303.82	7.94	7701.29	7700.86	0.44
Marble	1241	10-year	79.30	224.34	8.17	7700.30	7700.86	-0.56
Marble	1241	50-year	80.96	254.98	8.82	7700.68	7700.86	-0.18
Marble	1241	500-year	83.90	301.28	9.24	7701.24	7700.86	0.38
Marble	1750	100-year	100.06	276.21	8.74	7705.82	7705.82	
Marble	1750	Floodway	49.54	208.18	11.59	7706.11	7705.82	0.29
Marble	1750	10-year	85.67	224.23	8.17	7705.25	7705.82	-0.56
Marble	1750	50-year	95.00	261.32	8.60	7705.67	7705.82	-0.15
Marble	1750	500-year	128.03	345.25	8.06	7706.42	7705.82	0.60
Marble	2242	100-year	75.54	251.83	9.58	7711.75	7711.75	
Marble	2242	Floodway	45.90	216.49	11.15	7712.32	7711.75	0.57
Marble	2242	10-year	70.79	203.85	8.99	7711.09	7711.75	-0.66
Marble	2242	50-year	74.17	237.68	9.46	7711.56	7711.75	-0.19
Marble	2242	500-year	87.68	273.35	10.18	7712.02	7711.75	0.27
Marble	2755	100-year	72.34	253.57	9.52	7718.39	7718.39	
Marble	2755	Floodway	72.34	253.57	9.52	7718.39	7718.39	0.00

Marble	2755		10-year	67.17	201.70	9.09	7717.65	7718.39	-0.74
Marble	2755		50-year	71.37	239.78	9.38	7718.20	7718.39	-0.19
Marble	2755		500-year	74.35	283.01	9.83	7718.79	7718.39	0.40
Marble	3258		100-year	65.24	238.15	10.13	7725.78	7725.78	
Marble	3258		Floodway	65.24	238.15	10.13	7725.78	7725.78	0.00
Marble	3258		10-year	61.02	192.29	9.53	7725.05	7725.78	-0.73
Marble	3258		50-year	64.09	225.34	9.98	7725.58	7725.78	-0.20
Marble	3258		500-year	67.80	268.25	10.37	7726.23	7725.78	0.45
Marble	3790		100-year	60.00	230.22	10.48	7733.77	7733.77	
Marble	3790		Floodway	60.00	230.22	10.48	7733.77	7733.77	0.00
Marble	3790		10-year	57.01	187.14	9.79	7733.04	7733.77	-0.74
Marble	3790		50-year	59.18	218.20	10.30	7733.57	7733.77	-0.20
Marble	3790		500-year	61.78	256.89	10.83	7734.21	7733.77	0.44
Marble	4242		100-year	77.22	258.72	9.33	7744.15	7744.15	
Marble	4242		Floodway	77.22	258.72	9.33	7744.15	7744.15	0.00
Marble	4242		10-year	73.19	210.36	8.71	7743.50	7744.15	-0.64
Marble	4242		50-year	76.16	245.80	9.15	7743.98	7744.15	-0.17
Marble	4242		500-year	79.72	290.10	9.59	7744.55	7744.15	0.40
Marble	4728		100-year	67.67	233.61	10.33	7751.27	7751.27	
Marble	4728		Floodway	67.67	233.61	10.33	7751.27	7751.27	0.00
Marble	4728		10-year	65.86	191.67	9.56	7750.65	7751.27	-0.63
Marble	4728		50-year	67.12	221.41	10.15	7751.09	7751.27	-0.18
Marble	4728		500-year	68.74	258.06	10.78	7751.63	7751.27	0.36
Marble	5216		100-year	72.35	241.44	9.99	7761.28	7761.28	
Marble	5216		Floodway	56.70	218.92	11.02	7761.42	7761.28	0.14
Marble	5216		10-year	69.92	197.51	9.28	7760.66	7761.28	-0.62
Marble	5216		50-year	71.69	229.42	9.80	7761.11	7761.28	-0.17
Marble	5216		500-year	73.72	267.48	10.40	7761.64	7761.28	0.36
Marble	5720		100-year	61.29	238.78	10.11	7767.22	7767.22	
Marble	5720		Floodway	61.29	238.78	10.11	7767.22	7767.22	0.00
Marble	5720		10-year	58.45	194.29	9.43	7766.47	7767.22	-0.74
Marble	5720		50-year	60.55	226.89	9.91	7767.02	7767.22	-0.20
Marble	5720		500-year	62.94	265.78	10.47	7767.65	7767.22	0.43
Marble	6179		100-year	245.06	566.41	4.26	7771.45	7771.45	
Marble	6179		Floodway	67.86	328.25	7.35	7771.70	7771.45	0.25
Marble	6179		10-year	229.85	395.76	4.63	7770.73	7771.45	-0.72
Marble	6179		50-year	241.59	516.63	4.35	7771.25	7771.45	-0.20
Marble	6179		500-year	253.94	677.15	4.11	7771.90	7771.45	0.44
Marble	6674		100-year	407.28	567.89	4.25	7773.79	7773.79	
Marble	6674		Floodway	80.99	343.63	7.02	7774.64	7773.79	0.85
Marble	6674		10-year	333.37	438.71	4.18	7773.45	7773.79	-0.34
Marble	6674		50-year	397.24	531.75	4.23	7773.70	7773.79	-0.09
Marble	6674		500-year	451.86	657.42	4.23	7773.99	7773.79	0.21
Marble	7123		100-year	87.90	273.41	8.83	7776.67	7776.67	
Marble	7123		Floodway	63.29	277.79	8.69	7777.38	7776.67	0.71
Marble	7123		10-year	82.23	234.91	7.80	7776.21	7776.67	-0.46
Marble	7123		50-year	86.52	266.00	8.45	7776.58	7776.67	-0.08
Marble	7123		500-year	94.60	286.12	9.73	7776.81	7776.67	0.14
Marble	7560		100-year	118.18	443.25	5.44	7779.95	7779.95	
Marble	7560		Floodway	55.02	270.37	8.92	7780.11	7779.95	0.16
Marble	7560		10-year	114.46	356.57	5.14	7779.20	7779.95	-0.75
Marble	7560		50-year	117.09	417.46	5.38	7779.73	7779.95	-0.22
Marble	7560		500-year	120.76	590.23	5.51	7780.46	7779.95	0.52
Marble	8048		100-year	57.20	340.80	10.83	7782.26	7782.26	
Marble	8048		Floodway	59.10	535.19	8.62	7783.25	7782.26	0.98
Marble	8048		10-year	54.72	251.60	9.84	7781.61	7782.26	-0.65
Marble	8048		50-year	56.47	309.89	10.61	7782.07	7782.26	-0.19
Marble	8048		500-year	58.93	439.35	11.17	7782.72	7782.26	0.46
Marble	8070	BR D	100-year	61.22	285.52	8.45	7783.32	7783.32	
Marble	8070	BR D	Floodway	59.33	287.06	8.41	7783.37	7783.32	0.04
Marble	8070	BR D	10-year	57.60	228.90	8.01	7782.37	7783.32	-0.95
Marble	8070	BR D	50-year	60.27	270.22	8.32	7783.07	7783.32	-0.25
Marble	8070	BR D	500-year	62.99	317.86	8.76	7783.84	7783.32	0.52
Marble	8070	BR U	100-year	64.07	333.07	7.24	7783.87	7783.87	
Marble	8070	BR U	Floodway	57.97	323.65	7.46	7783.86	7783.87	-0.01
Marble	8070	BR U	10-year	61.23	270.87	6.77	7782.88	7783.87	-0.99
Marble	8070	BR U	50-year	63.51	316.00	7.11	7783.60	7783.87	-0.27
Marble	8070	BR U	500-year	65.26	368.13	7.54	7784.43	7783.87	0.56
Marble	8077		100-year	64.15	335.68	7.20	7783.90	7783.90	
Marble	8077		Floodway	64.15	336.26	7.18	7783.91	7783.90	0.01
Marble	8077		10-year	61.37	273.09	6.71	7782.92	7783.90	-0.99
Marble	8077		50-year	63.55	318.37	7.06	7783.64	7783.90	-0.27
Marble	8077		500-year	65.33	372.73	7.49	7784.46	7783.90	0.56
Marble	8612		100-year	290.82	1027.49	3.35	7786.02	7786.02	
Marble	8612		Floodway	110.00	345.17	6.32	7786.04	7786.02	0.02
Marble	8612		10-year	262.84	524.71	4.02	7785.18	7786.02	-0.84
Marble	8612		50-year	289.73	885.87	3.48	7785.79	7786.02	-0.23
Marble	8612		500-year	293.48	1340.03	3.14	7786.53	7786.02	0.51
Marble	9086		100-year	187.46	444.17	6.23	7787.47	7787.47	
Marble	9086		Floodway	90.96	329.20	6.63	7788.44	7787.47	0.97
Marble	9086		10-year	179.30	406.30	5.04	7787.36	7787.47	-0.12
Marble	9086		50-year	186.77	435.33	5.88	7787.45	7787.47	-0.02
Marble	9086		500-year	191.35	473.93	6.86	7787.86	7787.47	0.39
Marble	9536		100-year	483.15	983.17	3.68	7789.96	7789.96	
Marble	9536		Floodway	140.00	398.36	5.47	7790.39	7789.96	0.43
Marble	9536		10-year	272.66	717.93	3.75	7789.43	7789.96	-0.53
Marble	9536		50-year	282.78	901.48	3.69	7789.81	7789.96	-0.15
Marble	9536		500-year	531.49	1094.62	2.58	7790.15	7789.96	0.19
Marble	10063		100-year	133.01	351.40	6.90	7792.40	7792.40	
Marble	10063		Floodway	140.17	398.98	5.47	7793.00	7792.40	0.60
Marble	10063		10-year	124.39	298.59	5.99	7792.09	7792.40	-0.30
Marble	10063		50-year	130.40	335.81	6.67	7792.31	7792.40	-0.09
Marble	10063		500-year	140.83	417.57	6.90	7792.75	7792.40	0.35
Marble	10584		100-year	155.76	1119.59	5.59	7796.95	7796.95	
Marble	10584		Floodway	79.99	268.25	8.13	7797.04	7796.95	0.09
Marble	10584		10-year	153.77	894.29	5.30	7796.45	7796.95	-0.50
Marble	10584		50-year	155.06	1041.26	5.59	7796.78	7796.95	-0.17
Marble	10584		500-year	156.67	1222.69	5.92	7797.17	7796.95	0.22
Marble	11147		100-year	195.77	735.99	5.57	7800.92	7800.92	
Marble	11147		Floodway	186.96	464.67	4.69	7801.37	7800.92	0.45
Marble	11147		10-year	194.75	621.51	4.96	7800.62	7800.92	-0.30
Marble	11147		50-year	195.86	712.36	5.34	7800.86	7800.92	-0.06
Marble	11147		500-year	196.52	827.25	5.78	7801.14	7800.92	0.22
Marble	11815		100-year	270.24	633.13	4.72	7809.17	7809.17	
Marble	11815		Floodway	110.31	325.76	6.73	7810.12	7809.17	0.95
Marble	11815		10-year	267.50	567.23	4.18	7808.93	7809.17	-0.25
Marble	11815		50-year	269.44	613.77	4.59	7809.10	7809.17	-0.07
Marble	11815		500-year	271.69	670.18	5.04	7809.31	7809.17	0.14

Marble	12347		100-year	311.38	409.83	5.32	7815.73	7815.73	
Marble	12347		Floodway	82.34	232.00	9.40	7816.42	7815.73	0.68
Marble	12347		10-year	294.51	345.48	4.80	7815.52	7815.73	-0.21
Marble	12347		50-year	303.54	389.46	5.21	7815.67	7815.73	-0.07
Marble	12347		500-year	322.81	478.94	5.25	7815.95	7815.73	0.22
Marble	12820		100-year	91.15	301.02	8.62	7823.91	7823.91	
Marble	12820		Floodway	46.30	190.68	11.44	7824.30	7823.91	0.39
Marble	12820		10-year	81.37	230.94	8.06	7823.35	7823.91	-0.55
Marble	12820		50-year	85.06	267.33	8.82	7823.65	7823.91	-0.26
Marble	12820		500-year	145.71	348.89	7.21	7824.25	7823.91	0.34
Marble	13314		100-year	77.53	274.03	8.63	7832.13	7832.13	
Marble	13314		Floodway	77.53	274.03	8.63	7832.13	7832.13	0.00
Marble	13314		10-year	73.00	212.98	7.78	7831.60	7832.13	-0.53
Marble	13314		50-year	74.92	248.91	8.48	7831.96	7832.13	-0.17
Marble	13314		500-year	84.09	346.89	8.86	7832.52	7832.13	0.39
Marble	13779		100-year	62.83	225.97	9.65	7839.64	7839.64	
Marble	13779		Floodway	62.83	225.97	9.65	7839.64	7839.64	0.00
Marble	13779		10-year	58.22	179.80	9.22	7838.88	7839.64	-0.76
Marble	13779		50-year	61.61	212.54	9.56	7839.42	7839.64	-0.22
Marble	13779		500-year	67.40	242.17	10.39	7839.89	7839.64	0.25
Marble	14378		100-year	207.06	383.84	5.68	7852.62	7852.62	
Marble	14378		Floodway	44.06	193.93	11.25	7853.60	7852.62	0.98
Marble	14378		10-year	89.37	313.14	7.51	7852.26	7852.62	-0.36
Marble	14378		50-year	196.60	364.10	5.58	7852.52	7852.62	-0.10
Marble	14378		500-year	232.37	425.19	5.91	7852.81	7852.62	0.19
Marble	14921		100-year	117.24	282.26	7.73	7865.39	7865.39	
Marble	14921		Floodway	86.96	249.14	8.75	7865.59	7865.39	0.20
Marble	14921		10-year	114.18	236.16	7.02	7864.99	7865.39	-0.40
Marble	14921		50-year	116.43	269.88	7.53	7865.29	7865.39	-0.11
Marble	14921		500-year	119.30	313.91	8.01	7865.66	7865.39	0.27
Marble	15423		100-year	66.32	237.53	9.18	7880.50	7880.50	
Marble	15423		Floodway	66.32	237.53	9.18	7880.50	7880.50	0.00
Marble	15423		10-year	62.34	192.38	8.61	7879.80	7880.50	-0.70
Marble	15423		50-year	65.31	225.67	9.00	7880.32	7880.50	-0.18
Marble	15423		500-year	68.50	263.99	9.53	7880.89	7880.50	0.39
Marble	15909		100-year	59.45	237.48	9.18	7893.00	7893.00	
Marble	15909		Floodway	59.45	237.48	9.18	7893.00	7893.00	0.00
Marble	15909		10-year	56.39	193.19	8.58	7892.24	7893.00	-0.76
Marble	15909		50-year	58.57	224.51	9.05	7892.79	7893.00	-0.22
Marble	15909		500-year	61.21	264.32	9.51	7893.45	7893.00	0.44
Marble	16407		100-year	59.99	215.76	10.11	7900.86	7900.86	
Marble	16407		Floodway	59.99	215.76	10.11	7900.86	7900.86	0.00
Marble	16407		10-year	57.73	176.13	9.41	7900.19	7900.86	-0.67
Marble	16407		50-year	59.36	204.57	9.93	7900.67	7900.86	-0.19
Marble	16407		500-year	61.31	239.57	10.50	7901.25	7900.86	0.39
Marble	16883		100-year	85.92	258.36	8.44	7906.50	7906.50	
Marble	16883		Floodway	85.92	258.36	8.44	7906.50	7906.50	0.00
Marble	16883		10-year	81.12	209.22	7.92	7905.91	7906.50	-0.59
Marble	16883		50-year	84.52	243.72	8.33	7906.33	7906.50	-0.17
Marble	16883		500-year	87.54	289.38	8.69	7906.86	7906.50	0.36
Marble	17475		100-year	64.64	234.98	9.28	7912.42	7912.42	
Marble	17475		Floodway	64.64	234.98	9.28	7912.42	7912.42	0.00
Marble	17475		10-year	62.78	200.36	8.27	7911.87	7912.42	-0.54
Marble	17475		50-year	64.17	226.14	8.98	7912.28	7912.42	-0.14
Marble	17475		500-year	65.66	254.38	9.89	7912.72	7912.42	0.30
Marble	18067		100-year	69.96	227.65	9.58	7918.91	7918.91	
Marble	18067		Floodway	69.96	227.65	9.58	7918.91	7918.91	0.00
Marble	18067		10-year	58.25	180.84	9.16	7918.14	7918.91	-0.77
Marble	18067		50-year	60.73	211.69	9.59	7918.66	7918.91	-0.25
Marble	18067		500-year	80.93	260.70	9.65	7919.35	7918.91	0.44
Marble	18542		100-year	41.12	195.10	11.18	7926.57	7926.57	
Marble	18542		Floodway	41.12	195.10	11.18	7926.57	7926.57	0.00
Marble	18542		10-year	38.00	155.79	10.64	7925.58	7926.57	-0.99
Marble	18542		50-year	40.29	184.28	11.02	7926.30	7926.57	-0.27
Marble	18542		500-year	42.87	218.47	11.51	7927.13	7926.57	0.56
Marble	18573	BR D	100-year	45.00	248.19	8.79	7927.80	7927.80	
Marble	18573	BR D	Floodway	45.00	248.19	8.79	7927.80	7927.80	0.00
Marble	18573	BR D	10-year	41.45	199.45	8.31	7926.68	7927.80	-1.13
Marble	18573	BR D	50-year	44.10	235.50	8.82	7927.52	7927.80	-0.28
Marble	18573	BR D	500-year	47.18	280.25	8.97	7928.50	7927.80	0.70
Marble	18573	BR U	100-year	41.68	195.29	11.17	7927.93	7927.93	
Marble	18573	BR U	Floodway	41.68	195.29	11.17	7927.93	7927.93	0.00
Marble	18573	BR U	10-year	37.74	154.36	10.73	7926.90	7927.93	-1.03
Marble	18573	BR U	50-year	40.69	184.65	11.00	7927.67	7927.93	-0.26
Marble	18573	BR U	500-year	44.03	221.62	11.35	7928.54	7927.93	0.61
Marble	18578		100-year	46.51	251.08	8.69	7929.19	7929.19	
Marble	18578		Floodway	46.51	251.08	8.69	7929.19	7929.19	0.00
Marble	18578		10-year	42.09	199.81	8.29	7928.03	7929.19	-1.16
Marble	18578		50-year	45.21	238.38	8.63	7928.85	7929.19	-0.34
Marble	18578		500-year	48.55	283.66	8.87	7929.87	7929.19	0.68
Marble	18783		100-year	222.98	1380.64	1.55	7931.12	7931.12	
Marble	18783		Floodway	95.00	687.14	3.17	7931.31	7931.12	0.00
Marble	18783		10-year	219.00	1072.27	1.55	7929.73	7931.12	-1.39
Marble	18783		50-year	222.61	1293.42	1.57	7930.73	7931.12	-0.39
Marble	18783		500-year	226.20	1560.33	1.61	7931.92	7931.12	0.80
Marble	19361		100-year	523.94	2145.58	1.02	7931.24	7931.24	
Marble	19361		Floodway	103.00	569.52	3.83	7931.51	7931.24	0.27
Marble	19361		10-year	462.86	1474.56	1.12	7929.88	7931.24	-1.36
Marble	19361		50-year	508.67	1948.19	1.04	7930.86	7931.24	-0.38
Marble	19361		500-year	548.42	2569.41	0.98	7932.03	7931.24	0.79
Marble	19905		100-year	281.10	703.60	2.77	7931.28	7931.28	
Marble	19905		Floodway	88.55	475.60	3.56	7932.27	7931.28	0.99
Marble	19905		10-year	104.57	370.43	4.34	7929.96	7931.28	-1.32
Marble	19905		50-year	268.21	597.57	3.12	7930.90	7931.28	-0.38
Marble	19905		500-year	300.18	932.85	2.32	7932.07	7931.28	0.79
Marble	20771		100-year	224.23	1534.21	3.14	7932.82	7932.82	
Marble	20771		Floodway	90.95	373.96	4.52	7933.68	7932.82	0.86
Marble	20771		10-year	208.43	1295.55	2.80	7931.46	7932.82	-0.37
Marble	20771		50-year	224.01	1471.38	3.04	7932.73	7932.82	-0.09
Marble	20771		500-year	224.98	1748.18	3.20	7933.14	7932.82	0.32
Marble	21304		100-year	696.79	3244.27	2.16	7934.28	7934.28	
Marble	21304		Floodway	175.00	482.33	3.51	7935.23	7934.28	0.95
Marble	21304		10-year	694.37	3119.52	1.78	7934.19	7934.28	-0.09
Marble	21304		50-year	694.37	3119.52	2.18	7934.19	7934.28	-0.09
Marble	21304		500-year	817.66	3405.68	1.82	7934.39	7934.28	0.11
Marble	21874		100-year	253.61	571.65	3.92	7936.12	7936.12	
Marble	21874		Floodway	185.00	474.73	3.56	7936.67	7936.12	0.55

Marble	21874		10-year	236.93	422.83	3.74	7935.77	7936.12	-0.36
Marble	21874		50-year	253.22	549.77	3.75	7936.08	7936.12	-0.05
Marble	21874		500-year	252.82	527.54	4.79	7936.03	7936.12	-0.10
Marble	22724		100-year	140.14	7811.42	6.58	7941.71	7941.71	
Marble	22724		Floodway	128.95	246.97	7.07	7941.71	7941.71	0.00
Marble	22724		10-year	128.75	7029.16	6.38	7941.29	7941.71	-0.42
Marble	22724		50-year	137.92	7678.94	6.37	7941.64	7941.71	-0.07
Marble	22724		500-year	157.11	8143.54	6.90	7941.88	7941.71	0.18
Marble	23204		100-year	55.50	310.72	5.44	7944.04	7944.04	
Marble	23204		Floodway	54.72	319.09	5.30	7944.20	7944.04	0.15
Marble	23204		10-year	53.49	276.05	4.65	7943.40	7944.04	-0.64
Marble	23204		50-year	54.88	299.94	5.25	7943.85	7944.04	-0.20
Marble	23204		500-year	57.27	333.95	5.84	7944.45	7944.04	0.41
Marble	23225	BR D	100-year	53.48	297.32	5.69	7944.04	7944.04	
Marble	23225	BR D	Floodway	52.72	305.47	5.54	7944.19	7944.04	0.16
Marble	23225	BR D	10-year	51.48	264.06	4.86	7943.40	7944.04	-0.63
Marble	23225	BR D	50-year	52.86	286.96	5.49	7943.84	7944.04	-0.19
Marble	23225	BR D	500-year	55.23	319.59	6.10	7944.45	7944.04	0.41
Marble	23225	BR U	100-year	50.39	263.98	6.41	7943.99	7943.99	
Marble	23225	BR U	Floodway	49.26	271.34	6.23	7944.15	7943.99	0.16
Marble	23225	BR U	10-year	48.43	233.42	5.50	7943.37	7943.99	-0.62
Marble	23225	BR U	50-year	49.72	254.42	6.19	7943.80	7943.99	-0.19
Marble	23225	BR U	500-year	51.33	284.57	6.85	7944.39	7943.99	0.40
Marble	23230		100-year	52.79	283.11	5.97	7944.10	7944.10	
Marble	23230		Floodway	51.98	290.22	5.83	7944.24	7944.10	0.14
Marble	23230		10-year	50.65	249.68	5.14	7943.45	7944.10	-0.65
Marble	23230		50-year	52.09	272.76	5.77	7943.90	7944.10	-0.20
Marble	23230		500-year	53.54	305.40	6.39	7944.52	7944.10	0.42
Marble	23576		100-year	172.89	318.44	5.35	7948.09	7948.09	
Marble	23576		Floodway	98.52	243.85	6.93	7948.22	7948.09	0.13
Marble	23576		10-year	95.54	170.36	7.54	7947.09	7948.09	-1.01
Marble	23576		50-year	169.03	278.94	5.67	7947.87	7948.09	-0.22
Marble	23576		500-year	175.22	348.67	5.64	7948.26	7948.09	0.17
Marble	24407		100-year	63.80	207.55	8.15	7958.71	7958.71	
Marble	24407		Floodway	63.80	207.55	8.15	7958.71	7958.71	0.00
Marble	24407		10-year	56.05	161.26	7.96	7957.93	7958.71	-0.77
Marble	24407		50-year	61.71	194.35	8.10	7958.50	7958.71	-0.21
Marble	24407		500-year	67.94	233.81	8.34	7959.10	7958.71	0.40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WS 10-year
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Station (ft)
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Bank Sta
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Station (ft)
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WS 50-year
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Ground
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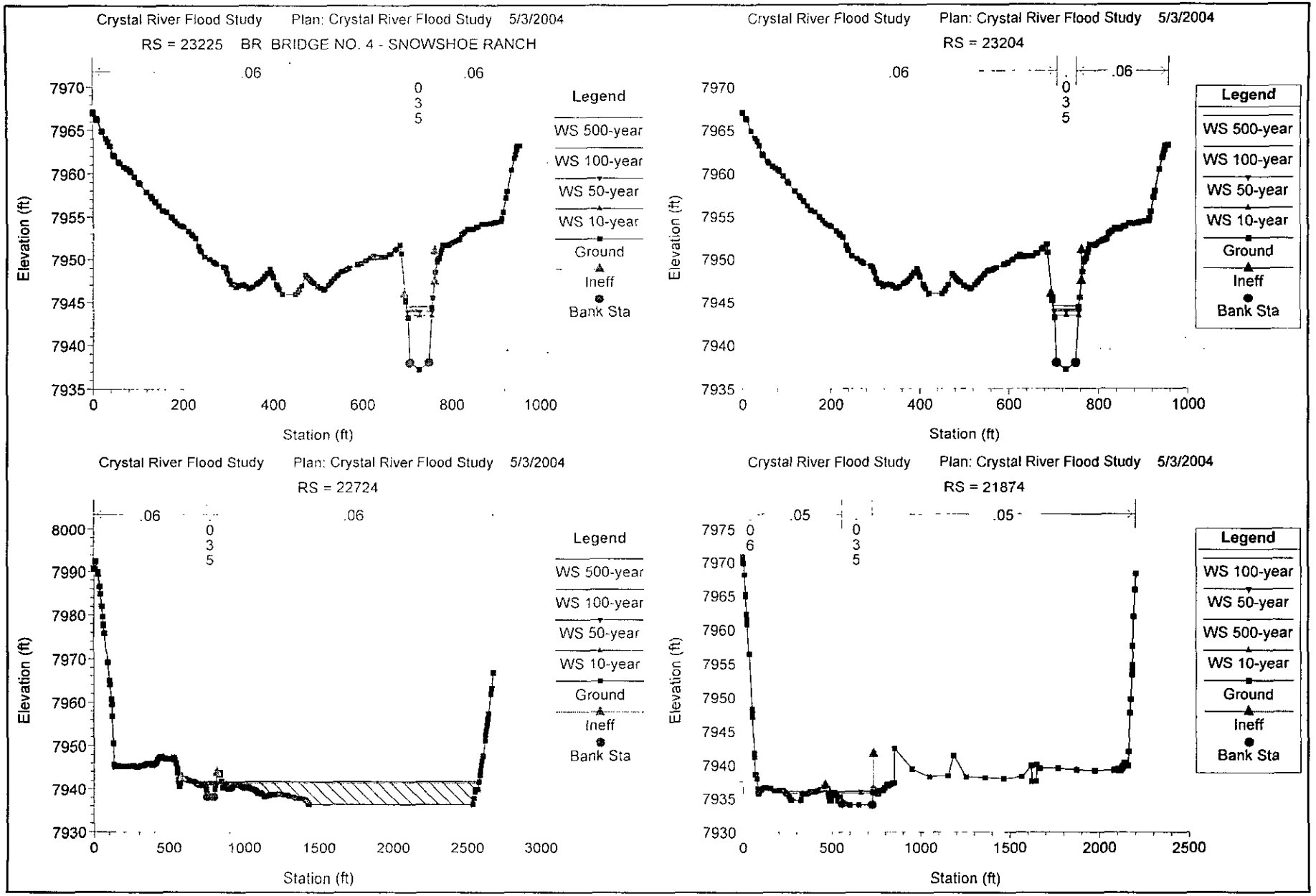
Bank Sta
Elevation (ft)
Station (ft)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WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
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Station (ft)
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Station (ft)
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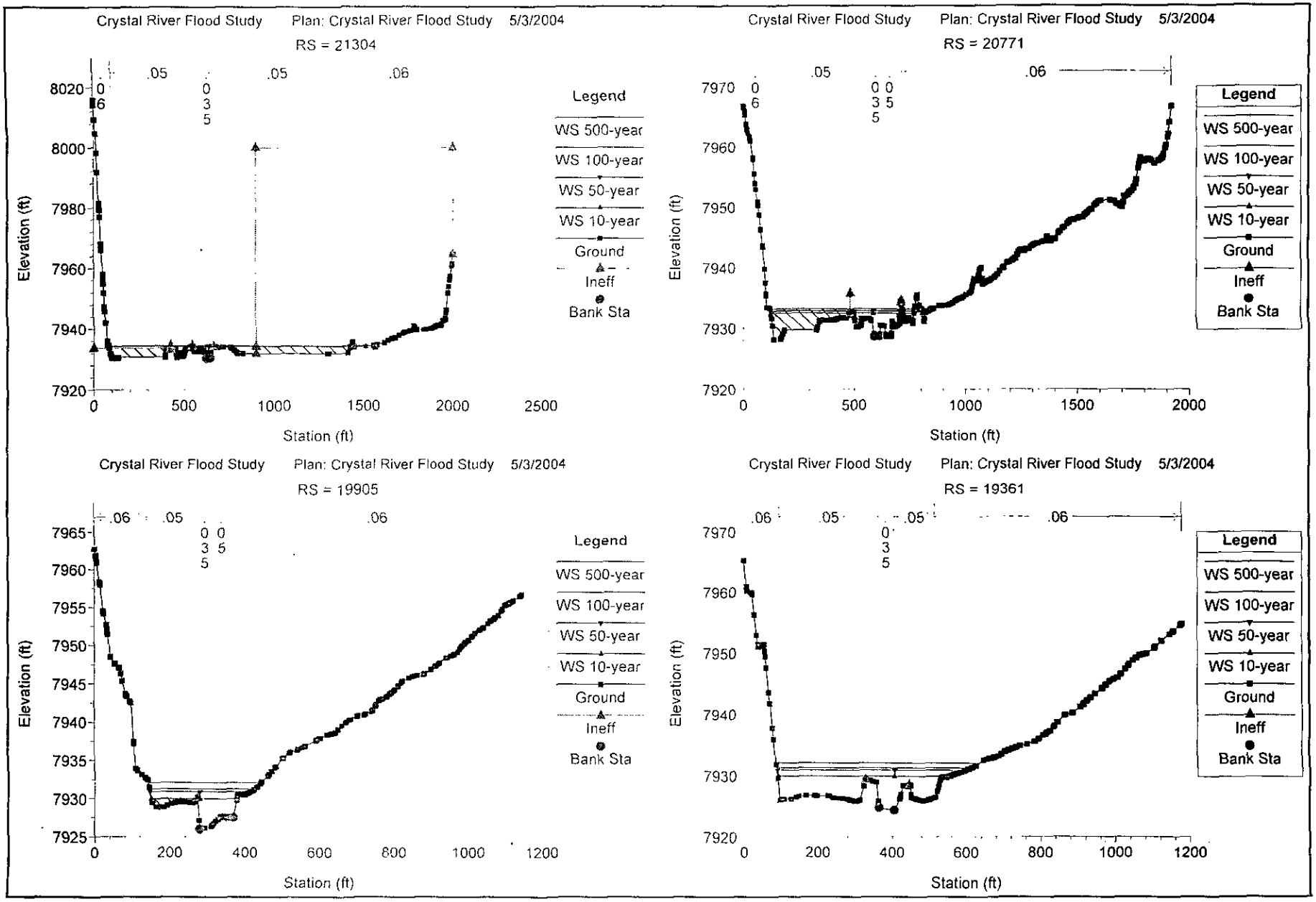
Station (ft)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WS 10-year
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Station (ft)
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Ineff
Bank Sta
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WS 100-year
WS 50-year
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Ground
Ineff
Bank Sta
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Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
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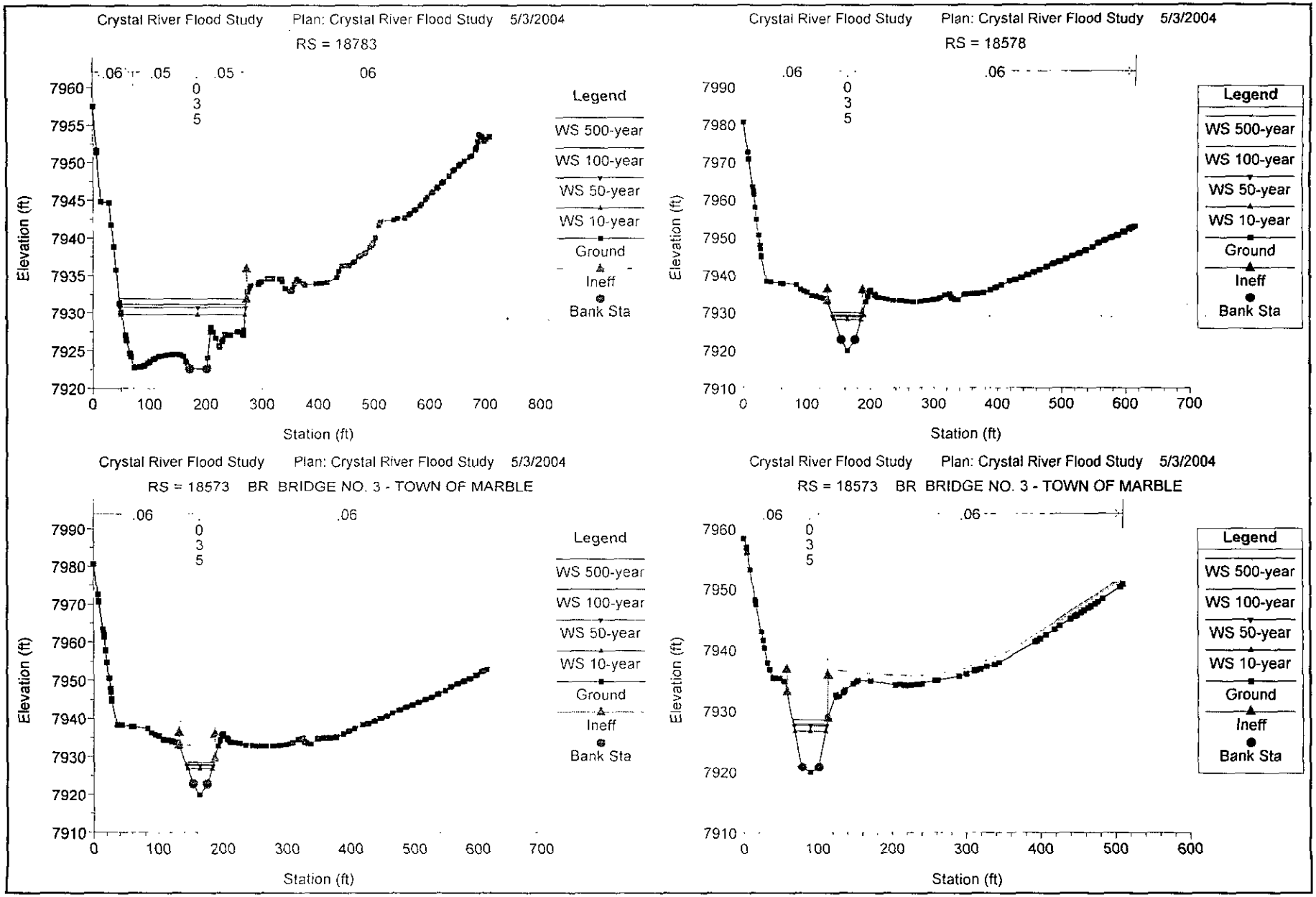
Station (ft)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WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
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Station (ft)
Legend
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WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
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Elevation (ft)
Station (ft)
Legend
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WS 100-year
WS 50-year
WS 10-year
Ground
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Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 18573 BR BRIDGE NO. 3 - TOWN OF MARBLE
.06 .06
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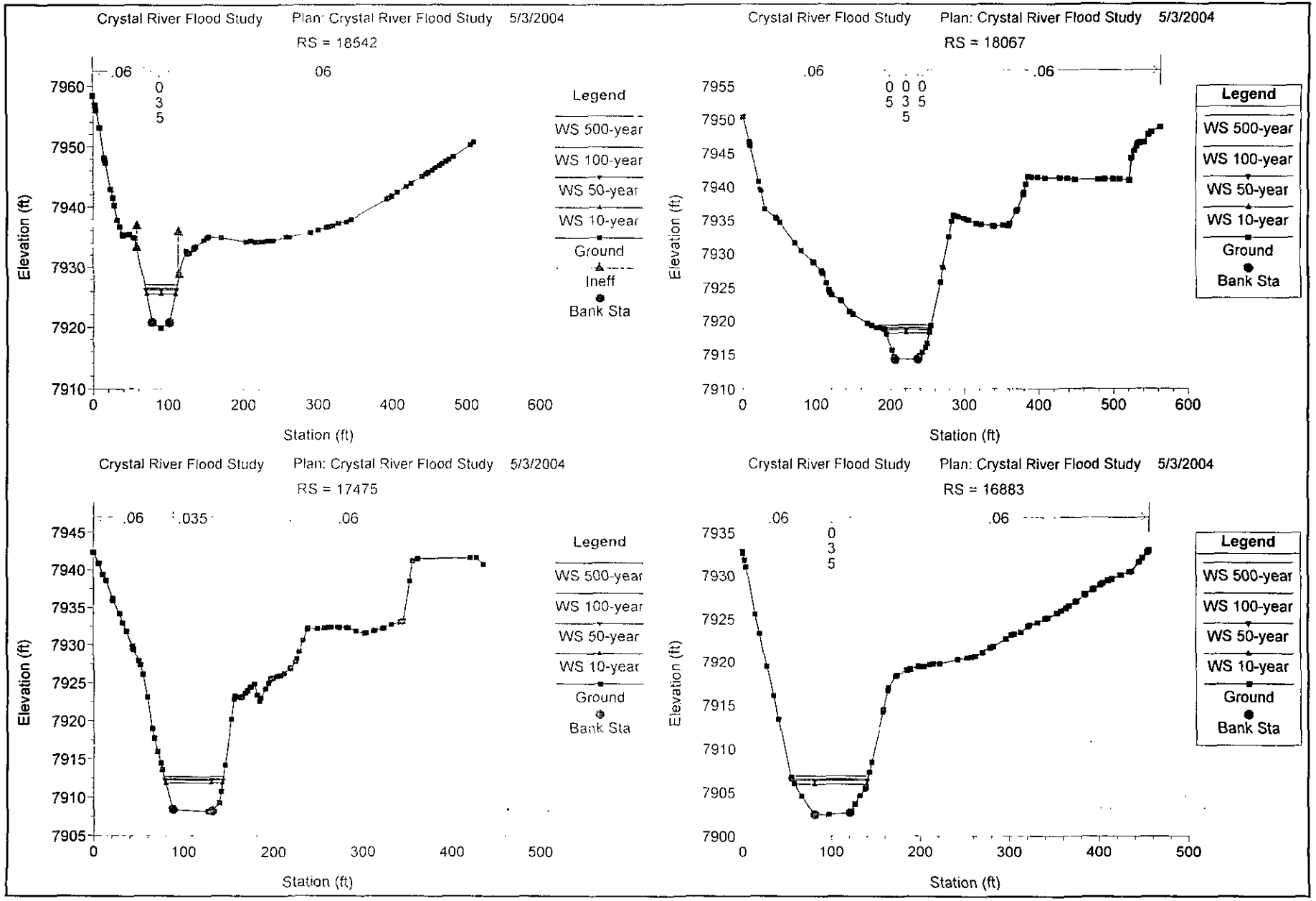
Elevation (ft)
Station (ft)
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta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Elevation (ft)
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Legend
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WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
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Elevation (ft)
Station (ft)
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WS 50-year
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Ground
Bank Sta
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WS 10-year
Ground
Bank Sta
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Plan: Crystal River Flood Study 5/3/2004
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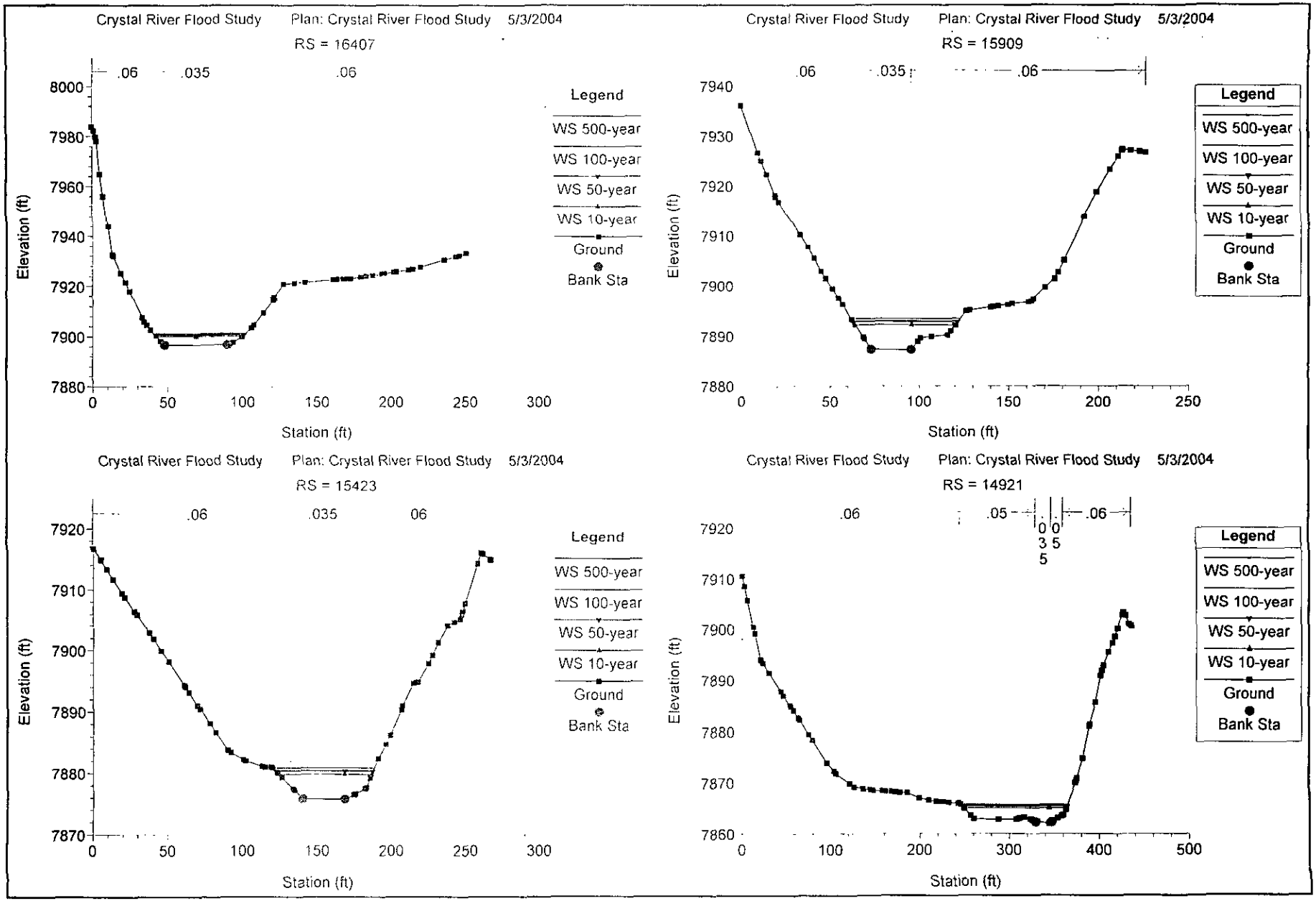
WS 10-year
Ground
Bank Sta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WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
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Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study
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Legend
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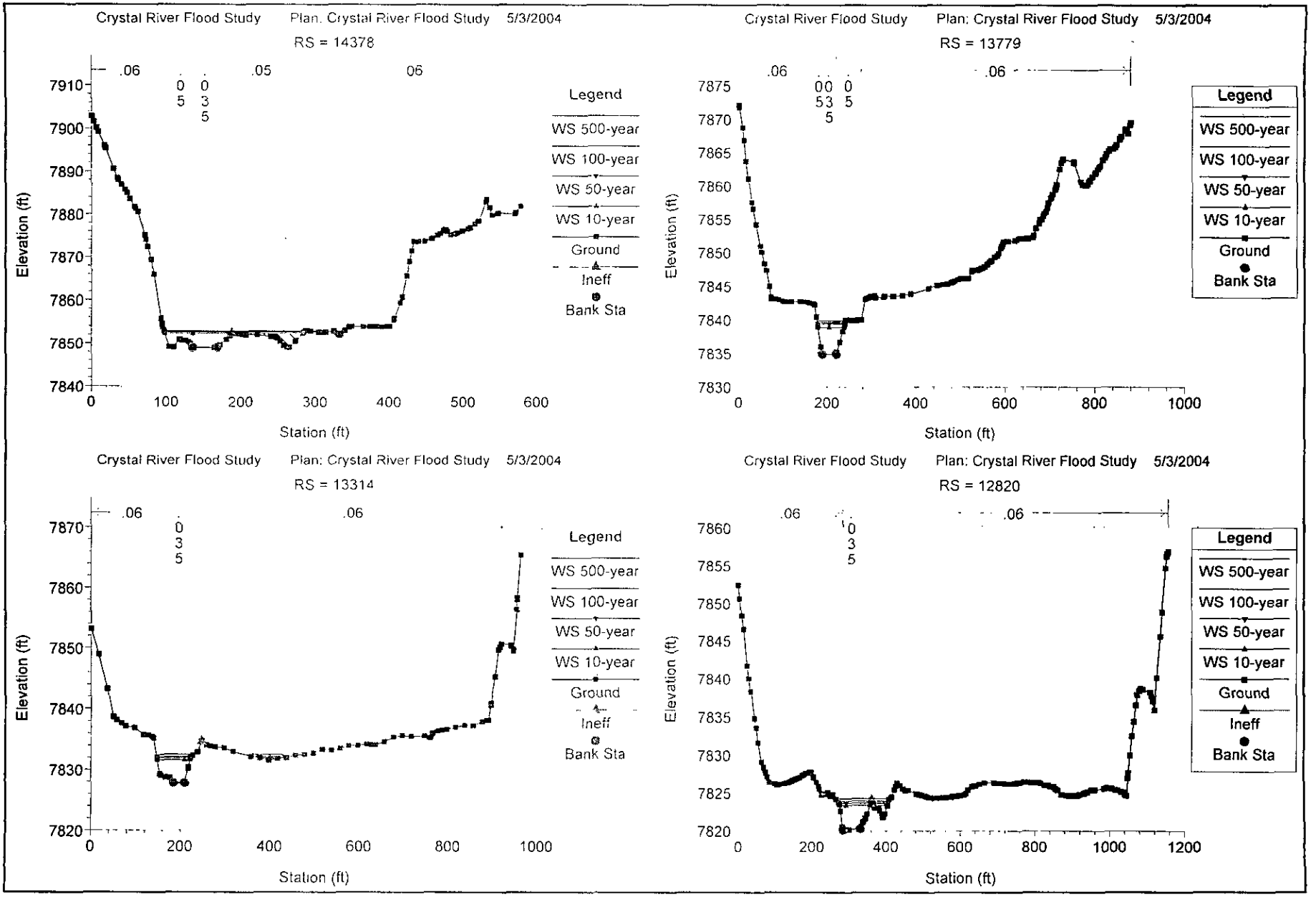
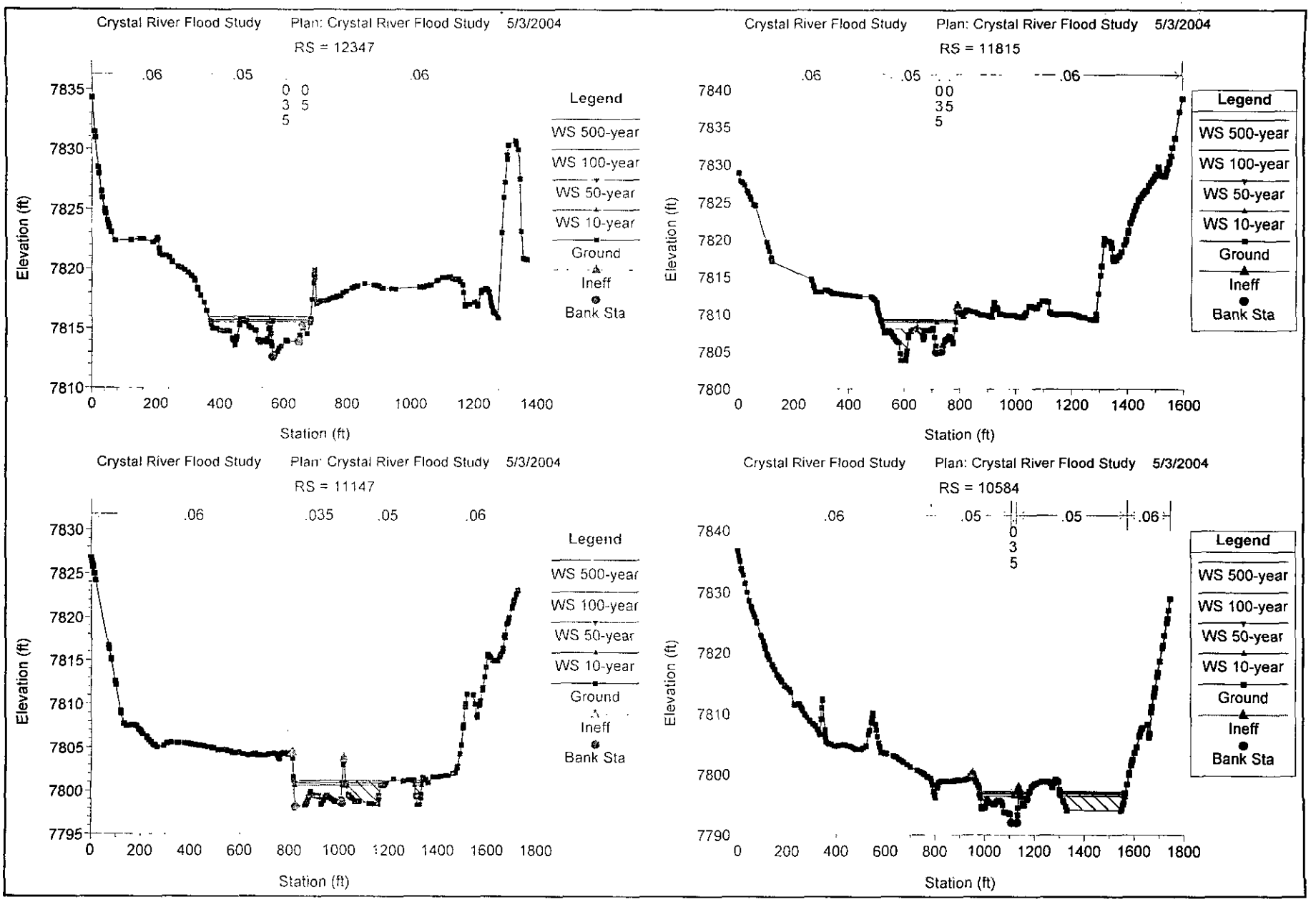
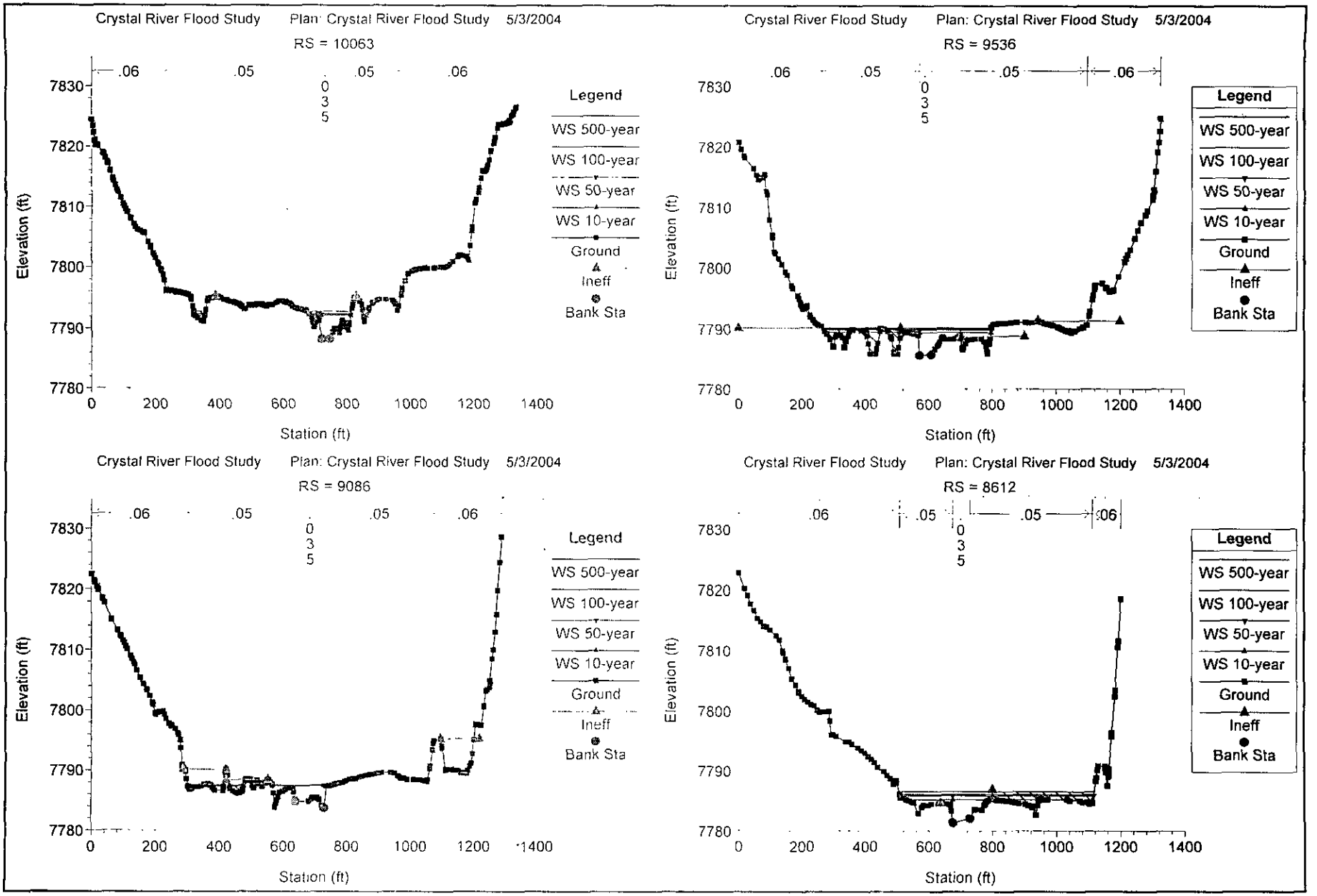
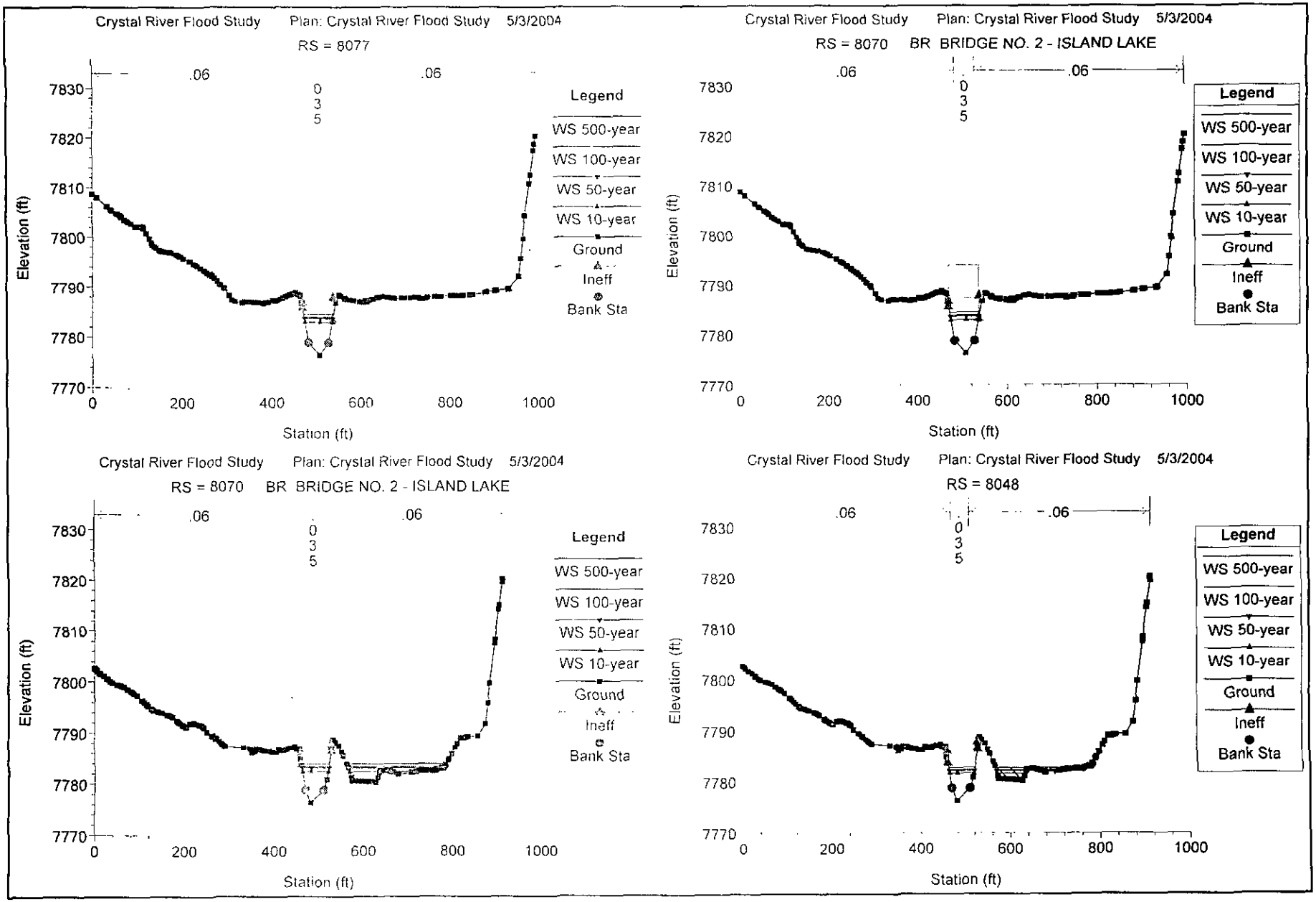
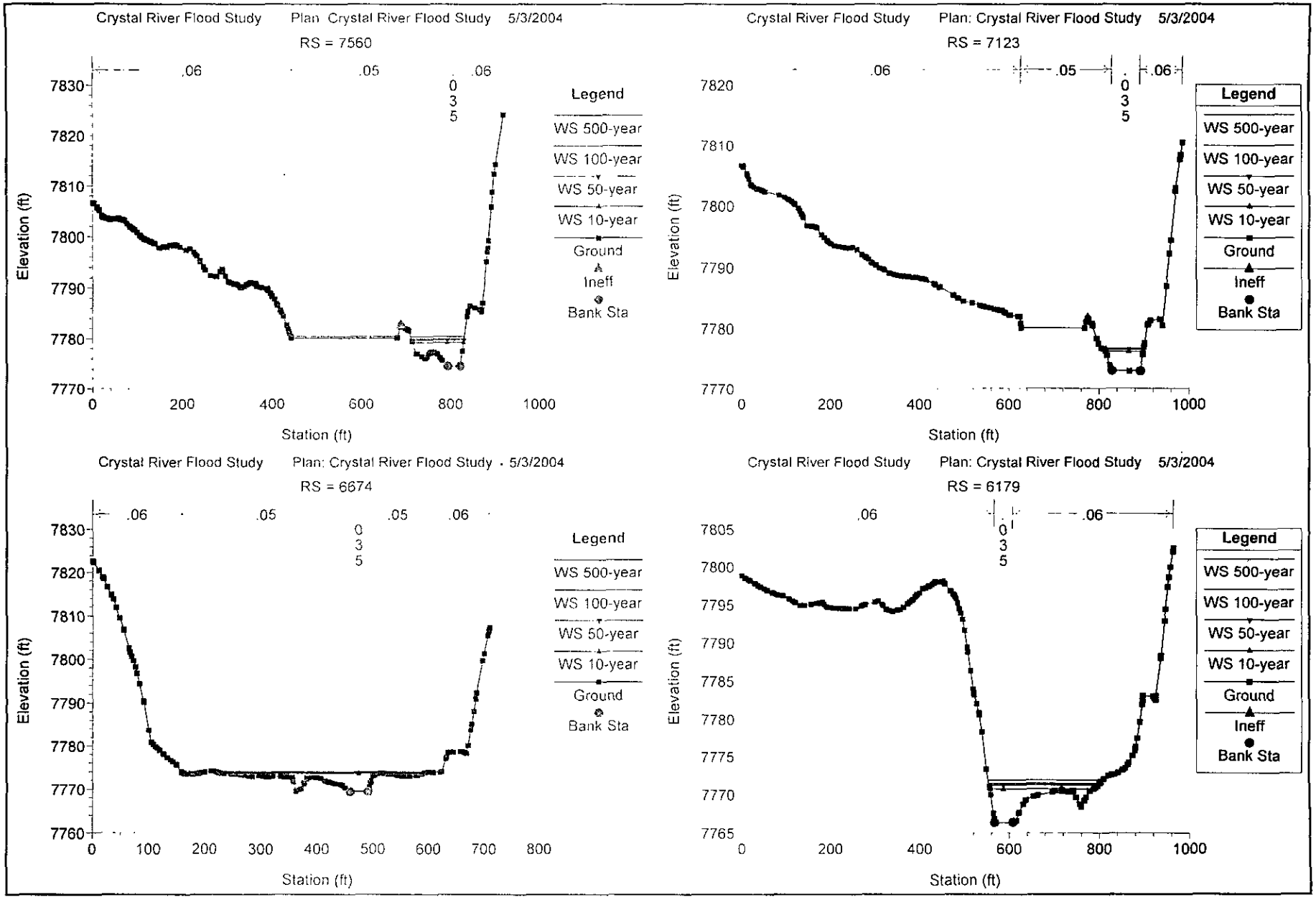
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 14921
.06
.05
.06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)

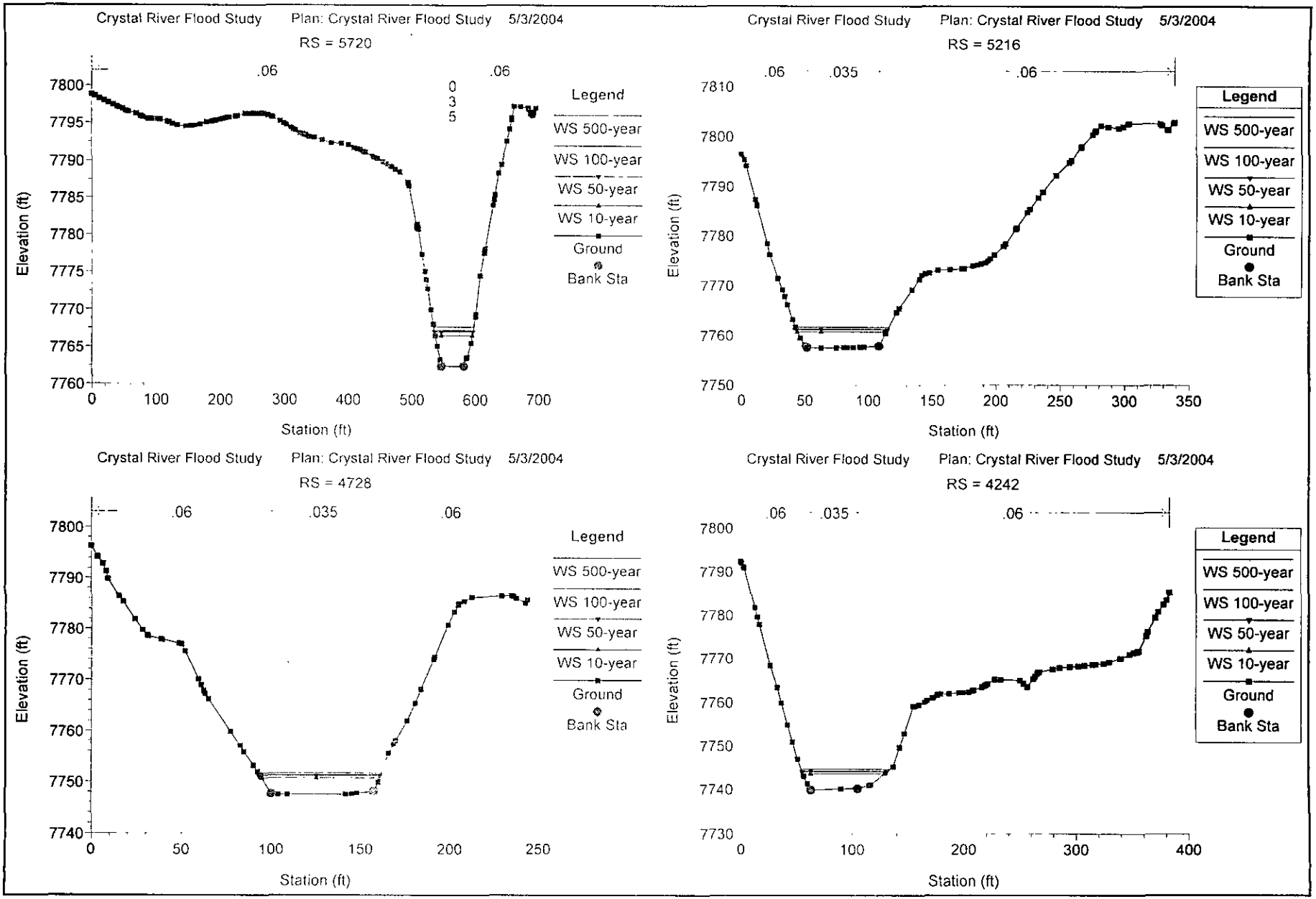

Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 14378
.06 .05 06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 13779
.06 .06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 13314
.06 .06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 12820
.06 .06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)

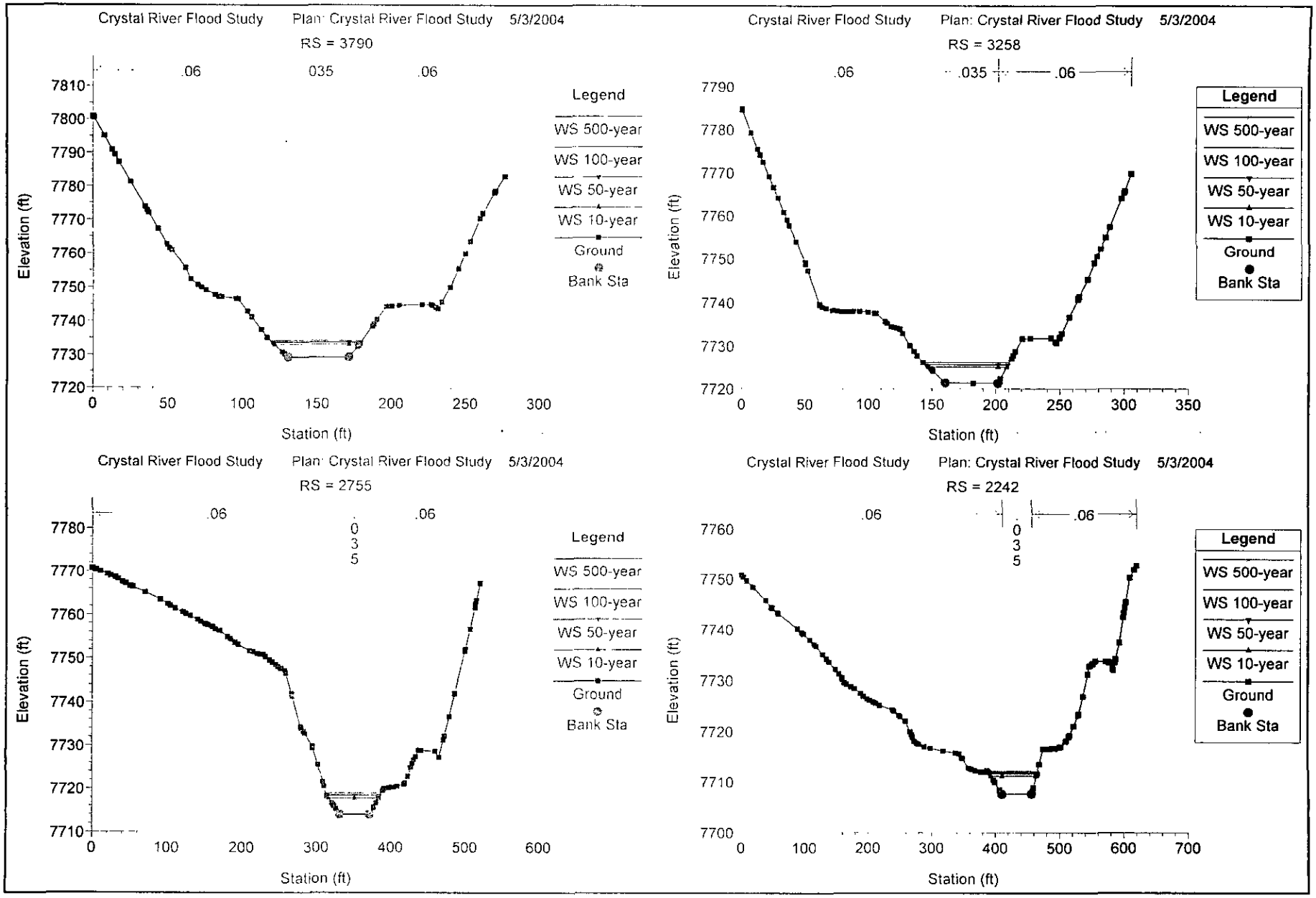

Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 12347
.06
.05
.06
0 0
3 5
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7835
7830
7825
7820
7815
7810
0
200
400
600
800
1000
1200
1400
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 11815
.06
.05
.06
0 0
3 5
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7840
7835
7830
7825
7820
7815
7810
7805
7800
0
200
400
600
800
1000
1200
1400
1600
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 11147
.06
.035
.05
.06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7825
7820
7815
7810
7805
7800
7795
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 10584
.06
.05
.05
.06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7840
7830
7820
7810
7800
7790
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

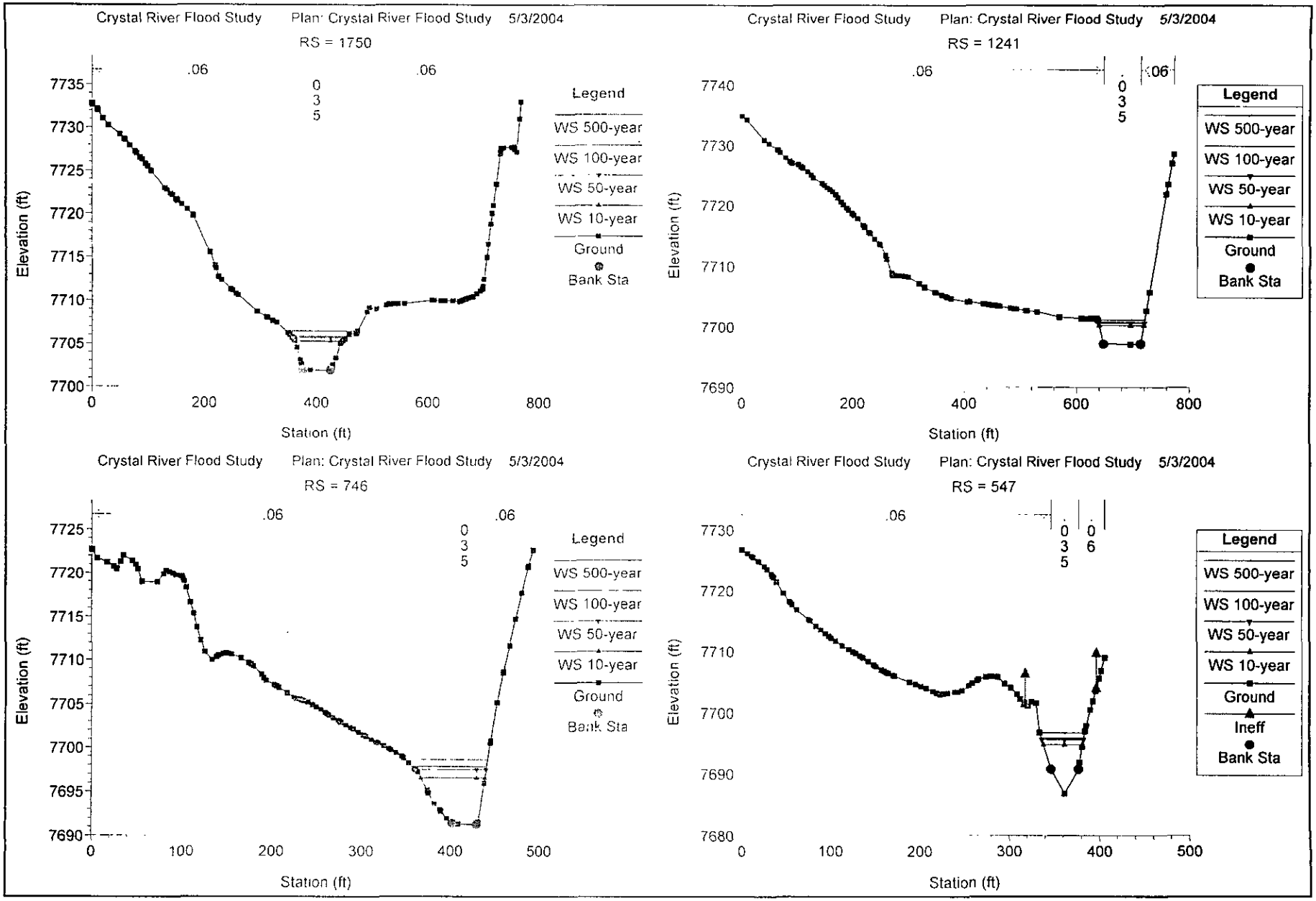

Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 10063
.06 .05 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
0 200 400 600 800 1000 1200 1400
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 9536
.06 .05 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
0 200 400 600 800 1000 1200 1400
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 9086
.06 .05 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
0 200 400 600 800 1000 1200 1400
Station (ft)
Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 8612
.06 .05 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
0 200 400 600 800 1000 1200 1400
Station (ft)

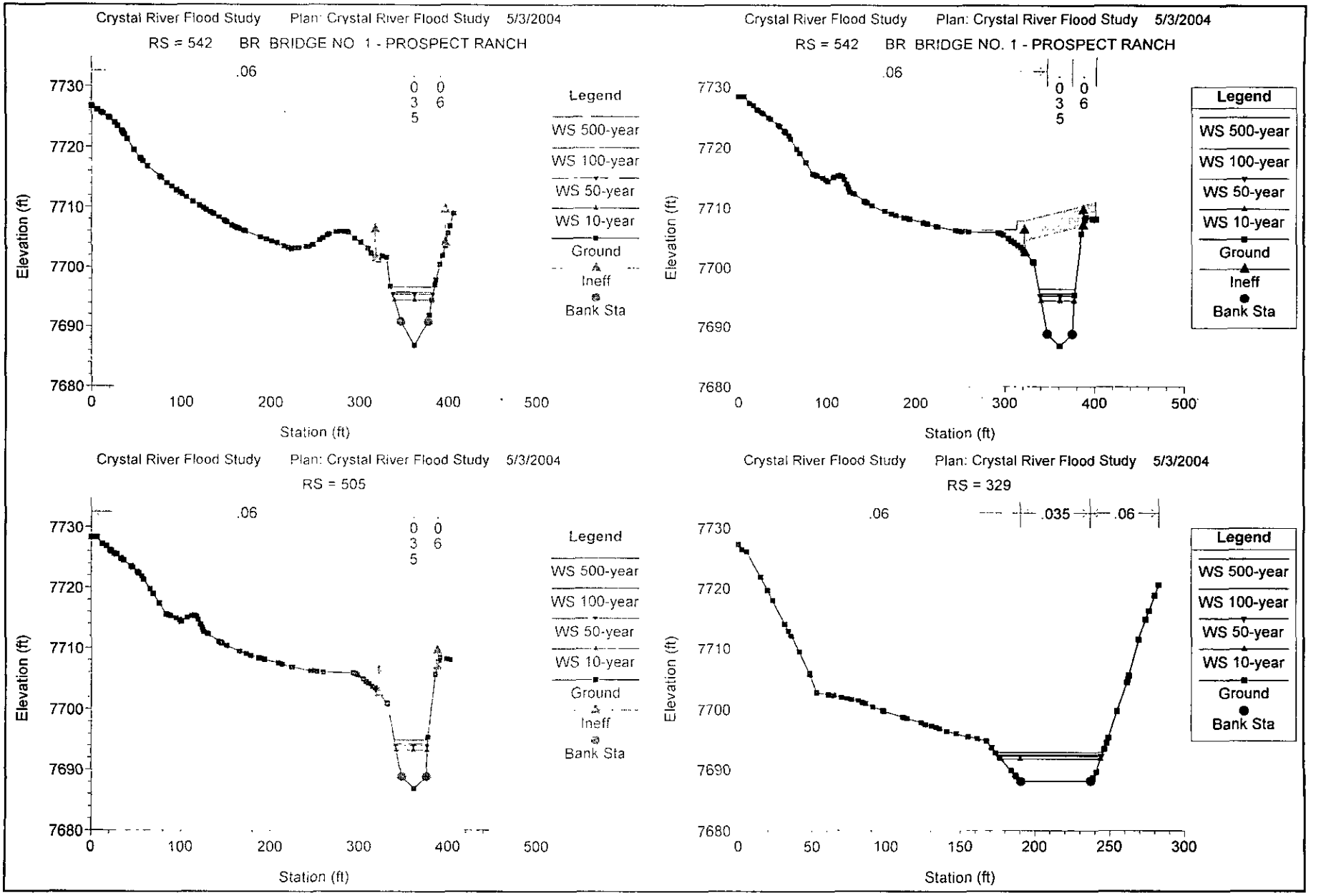

Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 8077
.06
.06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
7770
0
200
400
600
800
1000
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 8070 BR BRIDGE NO. 2 - ISLAND LAKE
.06
.06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
7770
0
200
400
600
800
1000
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 8070 BR BRIDGE NO. 2 - ISLAND LAKE
.06
.06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
7770
0
200
400
600
800
1000
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 8048
.06
.06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
7770
0
200
400
600
800
1000
Station (ft)

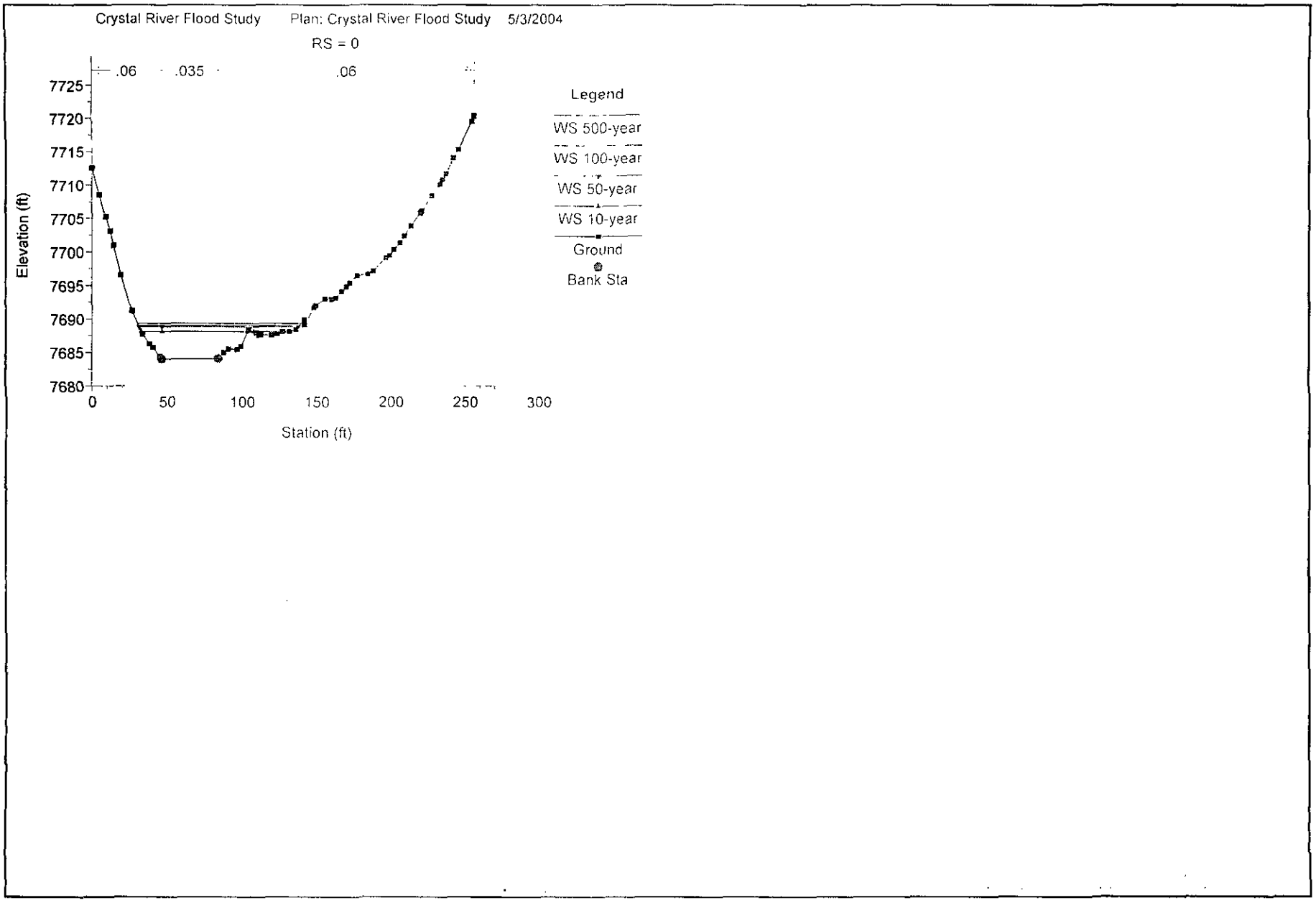

Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 7560
.06 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
7770
0 200 400 600 800 1000
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 7123
.06 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7820
7810
7800
7790
7780
7770
0 200 400 600 800 1000
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 6674
.06 .05 .05 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
7830
7820
7810
7800
7790
7780
7770
7760
0 100 200 300 400 500 600 700 800
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 6179
.06 .06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
7805
7800
7795
7790
7785
7780
7775
7770
7765
0 200 400 600 800 1000
Station (ft)


Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 5720
.06
.06
0
3
5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 5216
.06
.035
.06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 4728
.06
.035
.06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 4242
.06
.035
.06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)


Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 3790
.06 .035 .06
Elevation (ft)
Station (ft)
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 3258
.06 .035 .06
Elevation (ft)
Station (ft)
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 2755
.06 .035 .06
Elevation (ft)
Station (ft)
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 2242
.06 .035 .06
Elevation (ft)
Station (ft)
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta

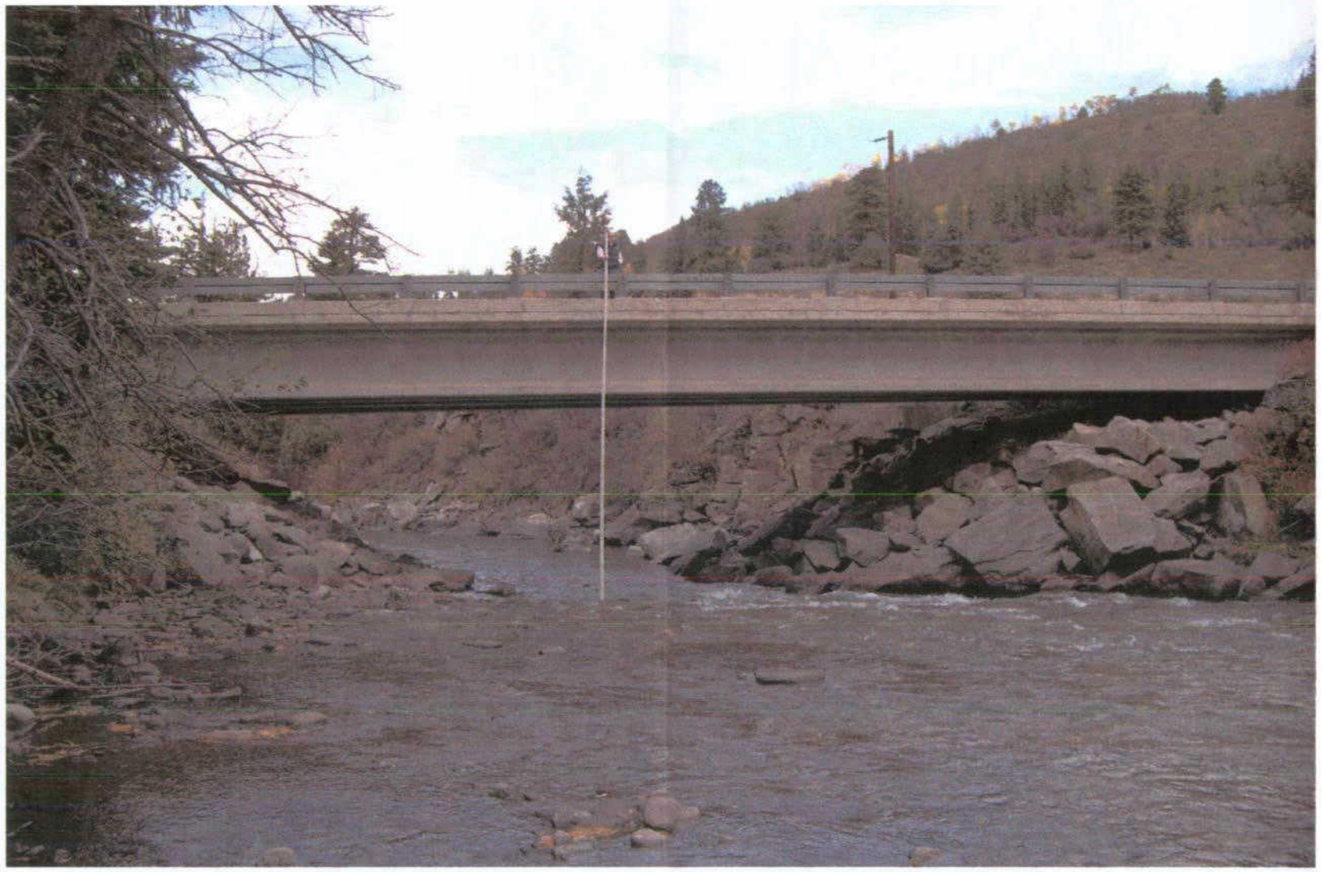

Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 1750
.06 .06
0 3 5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 1241
.06 .06
0 3 5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 746
.06 .06
0 3 5
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta
Elevation (ft)
Station (ft)
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 547
.06
0 3 5
0 6
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)


Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 542 BR BRIDGE NO 1 - PROSPECT RANCH
.06
.035
.06
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
7730
7720
7710
7700
7690
7680
0
100
200
300
400
500
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 542 BR BRIDGE NO. 1 - PROSPECT RANCH
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 505
Crystal River Flood Study Plan: Crystal River Flood Study 5/3/2004
RS = 329
50
150
250
300


Crystal River Flood Study
Plan: Crystal River Flood Study 5/3/2004
RS = 0
.06
.035
.06
Elevation (ft)
7725
7720
7715
7710
7705
7700
7695
7690
7685
7680
0
50
100
150
200
250
300
Station (ft)
Legend
WS 500-year
WS 100-year
WS 50-year
WS 10-year
Ground
Bank Sta

TECHNICAL APPENDIX

APPENDIX D: Bridge Documentation



Prospect Ranch Bridge (County Road 3): Upstream Looking Downstream

ICON ENGINEERING, INC. 8100 S. Akron Street, Ste 300, Englewood, CO 80112 Phone 303-221-0802 Fax 303-221-1019

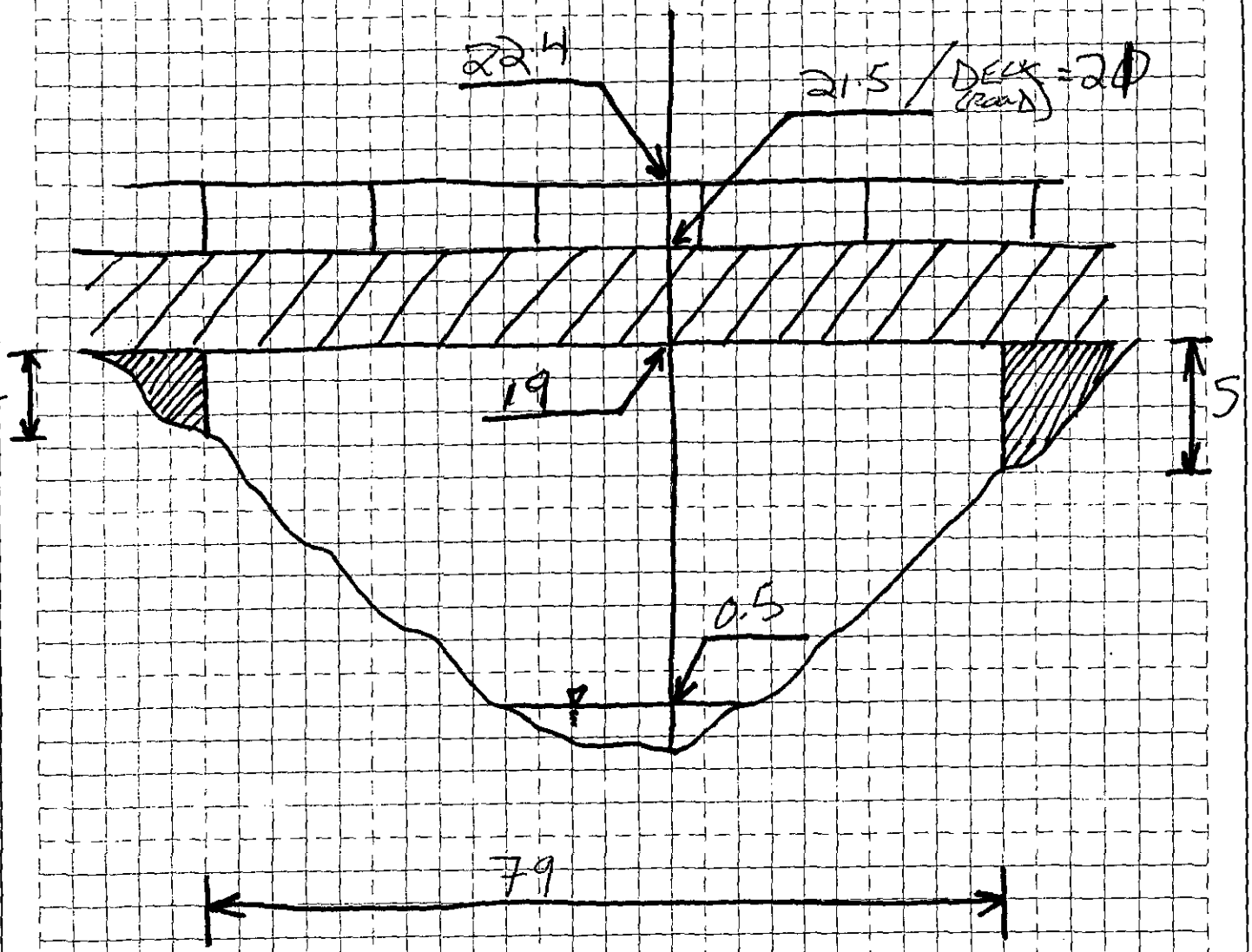
BY: _____ DATE _____ SUBJECT CRYSTAL RIVER SHEET ___ OF ___

CHK'D. BY: _____ DATE _____ JOB NO _____

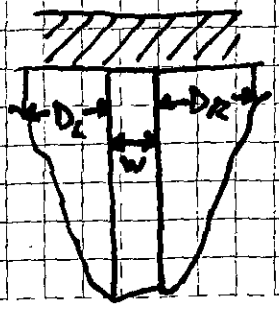
FE. BY: _____ DATE _____ 03-023-CRY-415 FILE NO. _____

BRIDGE No. 1-PROSPECT RANCH

DESCRIPTION: CONCRETE, ASPHALT DECK, GUARD RAIL



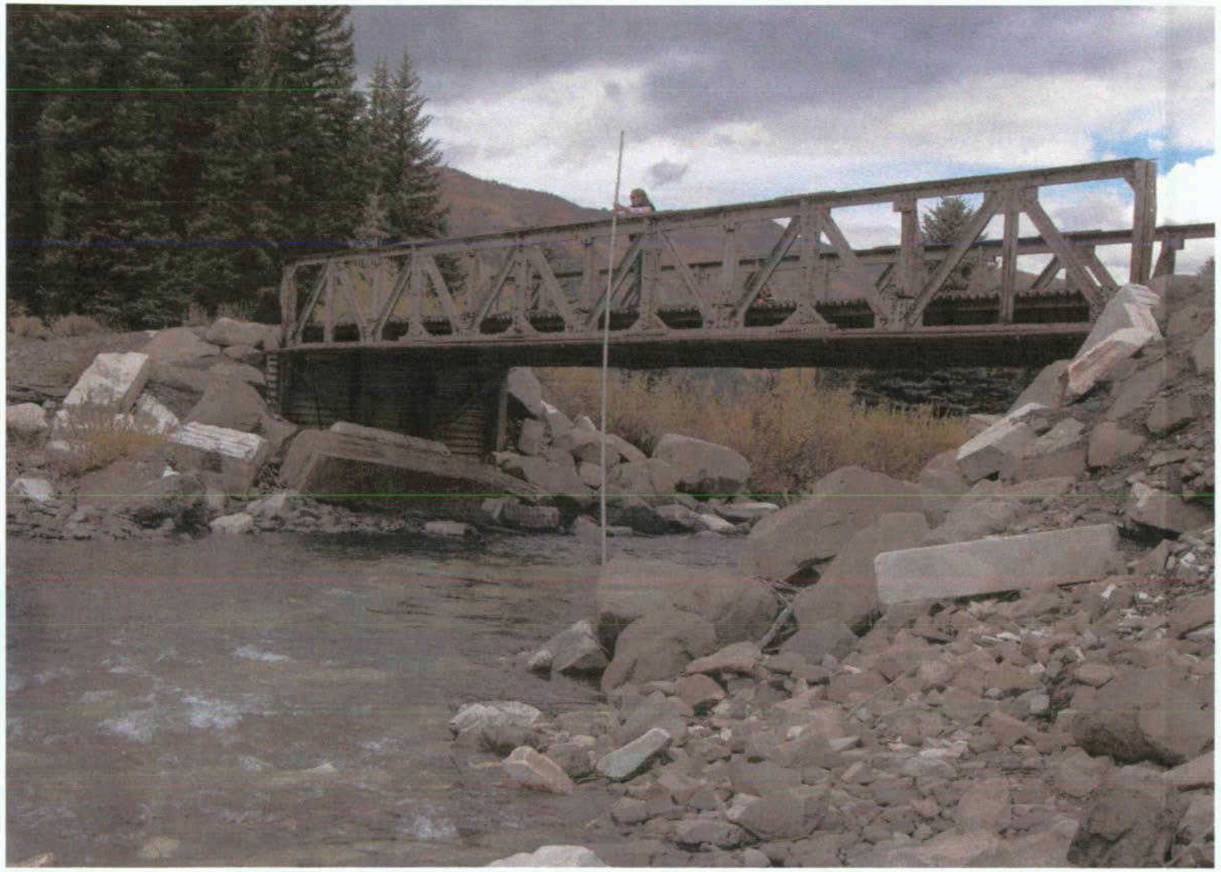
PIER

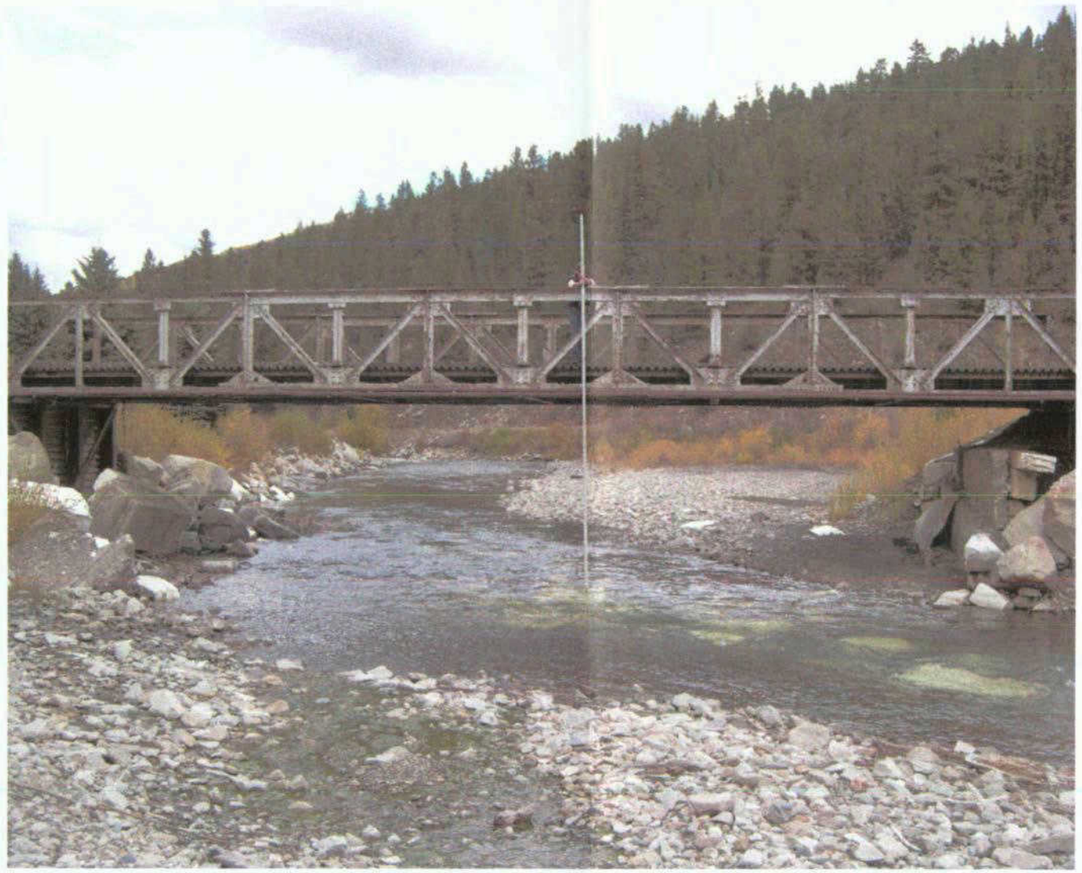


WIDTH = NONE
D_L =
D_R =

DECK @ 20'

→ MARK FOR BOSS √





Island Lake Bridge (Meadow Lane): Upstream Looking Downstream

ICON ENGINEERING, INC. 8100 S. Akron Street, Ste 300, Englewood, CO 80112 Phone 303-221-0802 Fax 303-221-4019

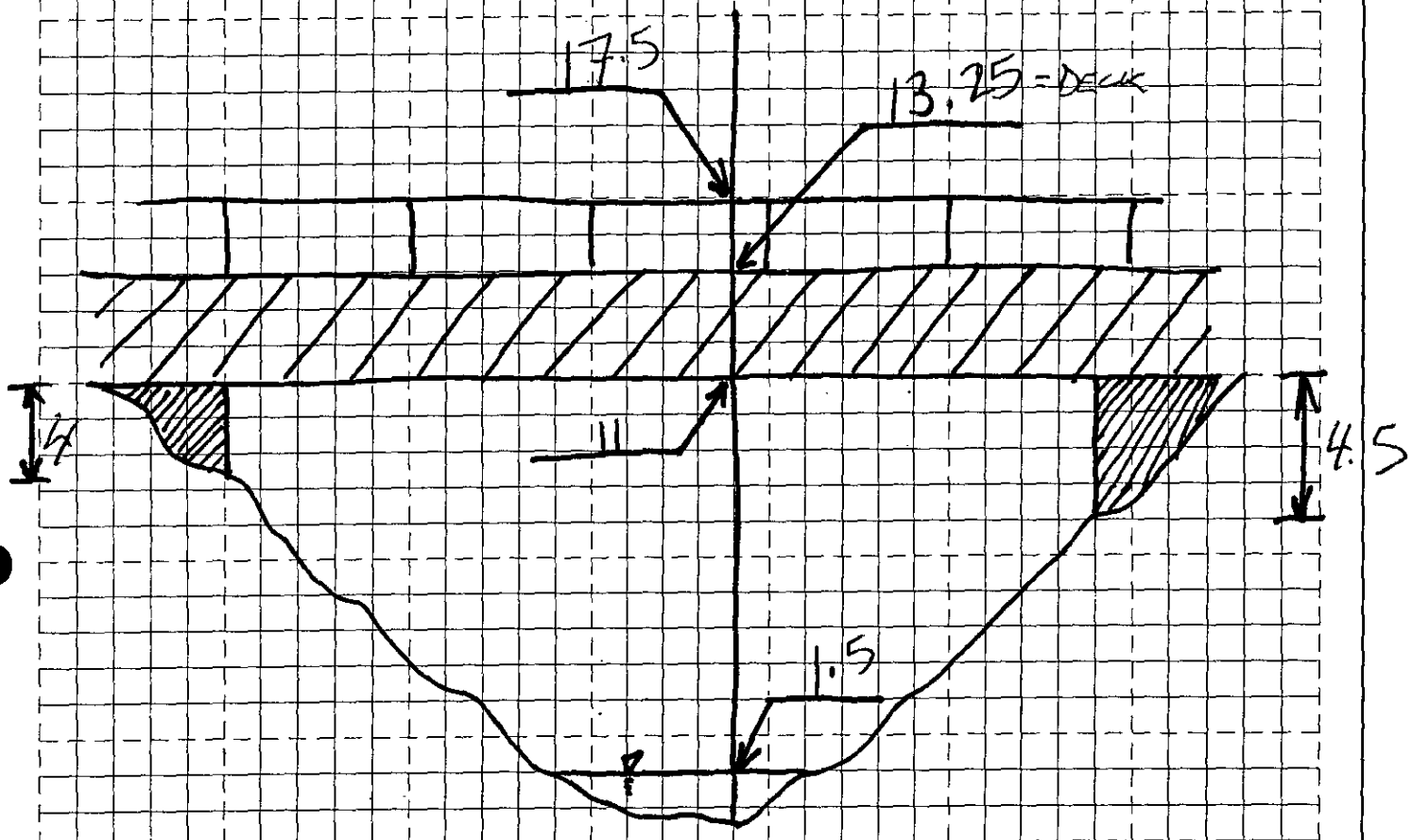
BY _____ DATE _____ SUBJECT CRYSTAL RIVER SHEET ___ OF ___

CHKD. BY _____ DATE _____ 03-023-CRY-415 JOB NO. _____

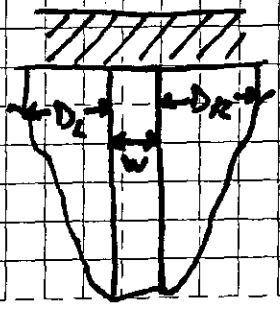
REV. BY _____ DATE _____ FILE NO. _____

T BRIDGE No. 2 - ISLAND LAKE

DESCRIPTION: STEEL GIRDER, DIRT DECK



PIER



WIDTH = NONE
D_L =
D_R =

→ MARK FOR TSOB ✓

Town of Marble Bridge (Highway 30): (Upstream Looking Downstream)

ICON ENGINEERING, INC. 8100 S Akron Street, Ste 300, Englewood, CO 80112 Phone 303-221-0802 Fax 303-221-9019

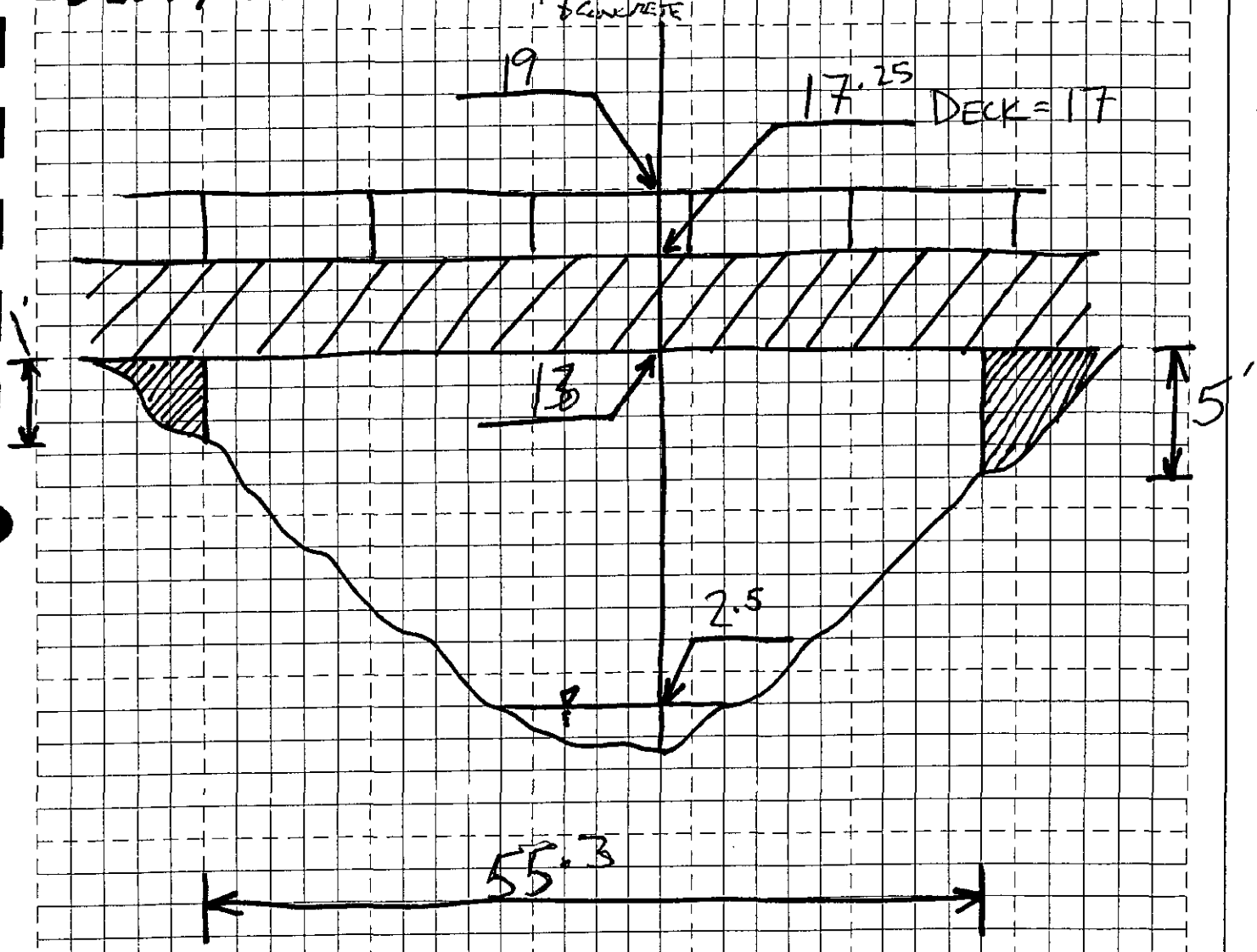
BY _____ DATE _____ SUBJECT CRYSTAL RIVER SHEET ___ OF ___

CHKD. BY _____ DATE _____ JOB NO. _____

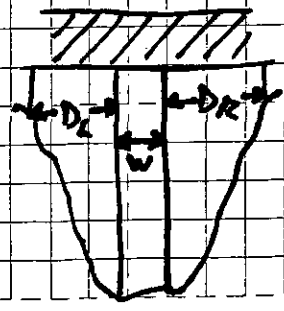
REV. BY _____ DATE _____ 03-023-CRY-415 FILE NO. _____

BRIDGE No. 5-MARCY LE

DESCRIPTION: CONCRETE, DIRT DECK, RAIL GUARDS & CONCRETE

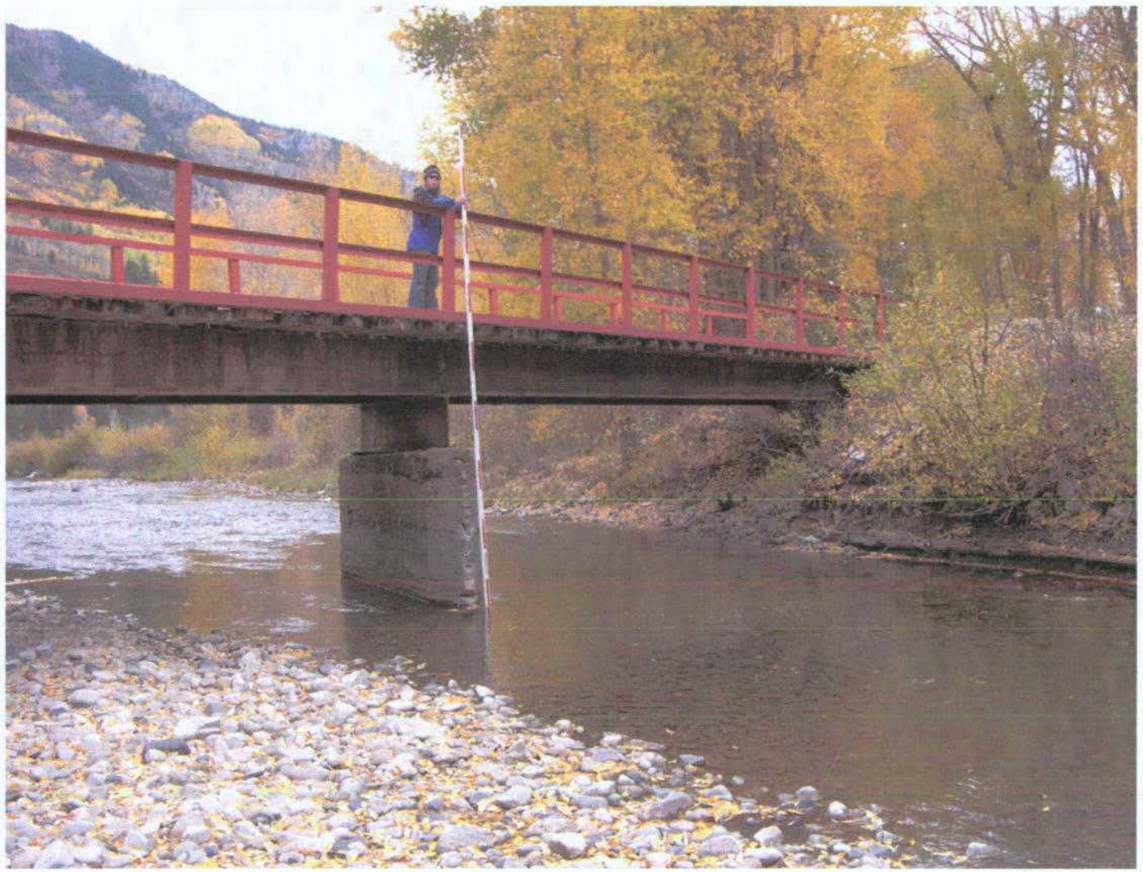


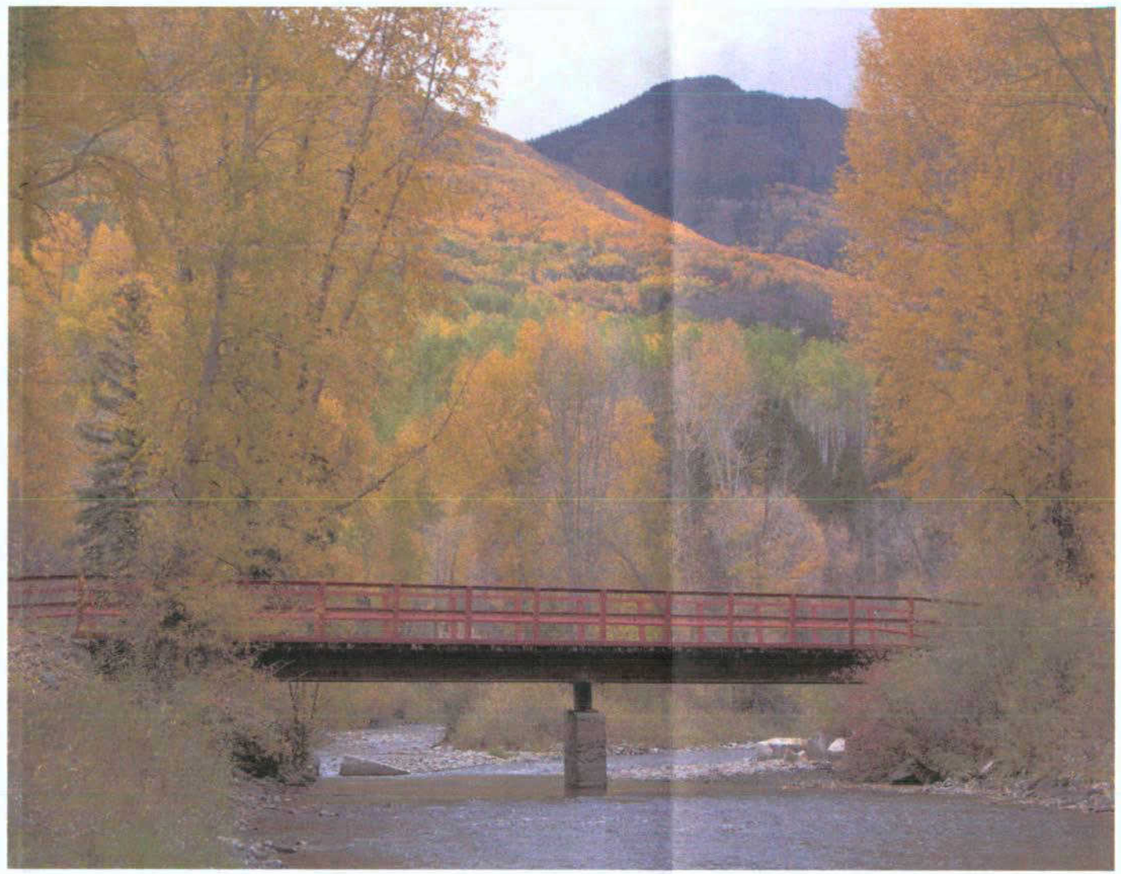
PIER



WIDTH = N/A
D_L = N/A
D_R = N/A

→ MARK FOR BOB ✓





Snowshoe Ranch Bridge:

(Upstream Looking Downstream)

(Downstream Looking Upstream)

6100 S. Fiddler Street, Ste 300, Englewood, CO 80112 Phone 303-221-0802 Fax 303-221-4019

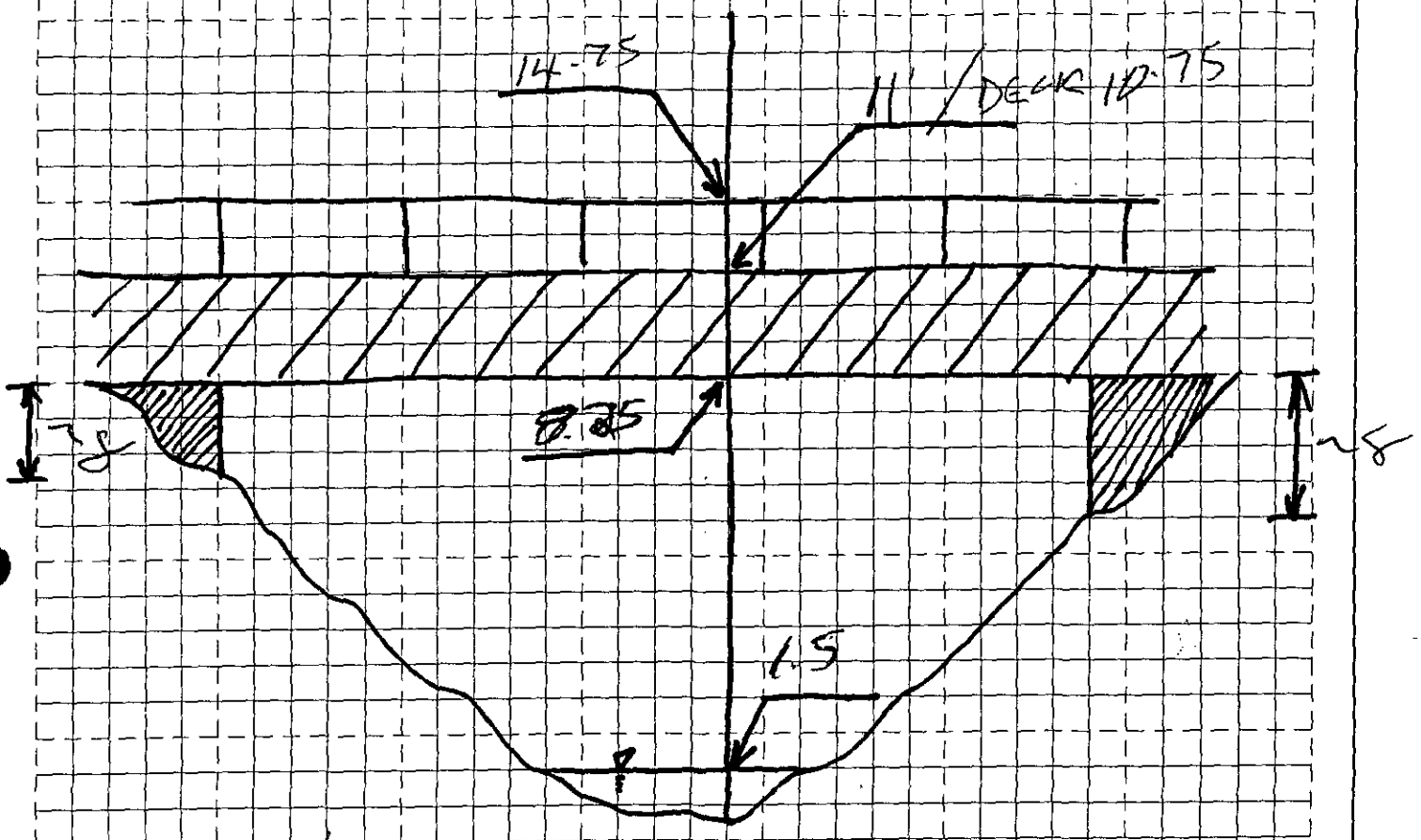
BY _____ DATE _____ SUBJECT CRYSTAL RIVER SHEET ___ OF ___

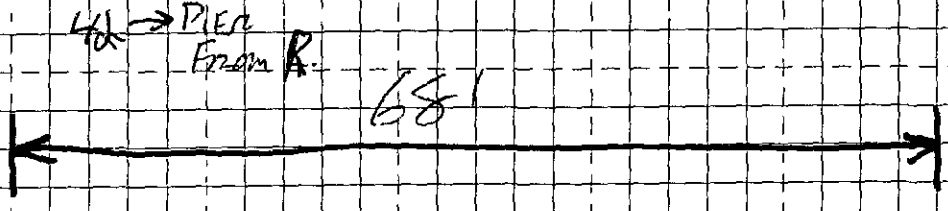
CHKD. BY _____ DATE _____ 03-023-CRY-415 JOB NO. _____

REV. BY _____ DATE _____ FILE NO. _____

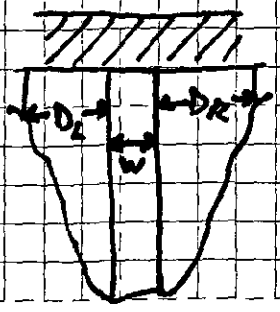
BRIDGE No. 4 - SNOWSHOE RANCH

DESCRIPTION: WOOD DECK, METAL GIRDER





PIER



WIDTH = ~2'
D_L = ~~42'~~
D_R = 42'

→ MARK FOR ISOTS NO