Middle Snoqualmie River
100-Year Flood Water-Surface
Elevations Transmitted From
J. Cotton R&M Consultants, Inc.
to
L. Gilbertson III

015398

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Susitna File # 4.2.2.1

LETTER OF TRANSMITTAL

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

ANCHORAGE OFFICE
☒ P. O. BOX 6087, ANCHORAGE, ALASKA 99502 TEL. (907) 561-1733

SALT LAKE OFFICE
☐ 5280 S. 320 W. SUITE E-160, MURRAY, UTAH 84107
TEL. (801) 263-3419

DATE: December 3, 1985

PROJECT NO.: 552403

RE: Middle Susitna River - 100-year Flood Water-Surface Elevations

TO
Harza-Ebasco Susitna Joint Venture
711 H Street
Anchorage, Alaska 99501

ATTENTION Dr. Larry Gilbertson

WE ARE S
☒ Attached
☐ Under se
the follc
☐ Shop dra
☐ Plans
☐ Specifica
☐ Change c
☐ Other

HARZA-EBASCO SUSITNA HYDROELECTRIC PROJECT DOCUMENT ROUTING

	LARSON		FAIRBANKS
	CASEY		BERGMANN
X	THRALL		GORDON
	CRADDOCK	X	GEMPERLINE
	VOLLAND	X	DURST
	PETTIGREW		
	LAMBERT		
	DYOK		
X	GILBERTSON		

COPIES	DATE	NO.	DESCRIPTION
1	2/18/83	11	J. Coffin memo to W. Dyok w/ W.S. Profile data for 100-year flood (with only pgs. 9-15 and 29 of memo attachments).

THESE ARE TRANSMITTED as checked below:

- ☐ For approval
- ☒ For your use
- ☒ As requested
- ☐ For review and comment
- ☐ FOR BIDS DUE _____ 19____
- ☐ Approved as submitted
- ☐ Approved as noted
- ☐ Returned for corrections
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REMARKS 1. These data were requested by Jim Durst.

2. These data supersede those sent to Jim last week. Those were from the 1/29/83 memo, which was a preliminary report. This 2/18/83 memo was the final report on the flood water-surface profiles. A quick inspection indicates that the computed WSE's did change at several of the cross-sections (from the preliminary to the final).

3. If you have any questions, please give me a call at 561-1733.

HARZA EBASCO
5 DEC 85 3:33

COPY TO J. Durst (H-E)
file

SIGNED: Jeffrey H. Coffin, P.E.
Senior Hydrologist

If enclosures are not as noted, kindly notify us at once.

002650

MEMORANDUM

R&M

TO	SUBJECT	
Wayne Dyok, Acres American	Water-Surface Profiles for Susitna River Floods	
FROM	**DATE**	**PROJECT NO.**
Jeff Coffin JHC	2/18/83	253315

Attached are information sheets pertaining to hydraulic analyses which you requested January 11, 1983. These are water-surface profiles and 100-year flood plain limits for various flows in the Watana and Gold Creek reaches of the Susitna River. Items attached consist of the following:

1. Summary HEC-2 printout tables (5 pages) for the Watana reach (from URX-101 at Deadman Creek to URX-121 at Devil Creek) for three flow levels:

   a. Q_{Watana} = 70,000 cfs (post-project 100-year flood),

   b. Q_{Watana} = 97,000 cfs (pre-project 100-year flood), and

   c. Q_{Watana} = 326,000 cfs (PMF).

   The PMF is in a separate table from the other two profiles since a separate input deck was required.

2. Enlarged U.S.G.S. quad sheets (2 sheets) at 1:24,000 scale of the Watana reach. The 100-year floodplain boundary is sketched on the maps in red pencil. The boundaries are quite uncertain in the reaches between widely-separated cross-sections (such as 115-116 and downstream of 119), but should be fairly well-defined otherwise. The steep canyon walls through most of the study reach make the floodplain quite insensitive to stage changes of up to several feet.

3. Thalweg profile of the Watana reach with the PMF water surface profile plotted (1 page). The 14 points identified with arrows are felt to be representative of the profile.

4. Summary HEC-2 printout tables (12 pages) for the Gold Creek reach (from LRX-68, just below Devil Canyon, to LRX-3 at the Chulitna River confluence) for three flow levels:

   a. $Q_{Gold\ Creek}$ = 90,000 cfs (post-project 100-year flood),

   b. $Q_{Gold\ Creek}$ = 118,000 cfs (pre-project 100-year flood), and

c. $Q_{\text{Devil Canyon}}$ = 353,000 cfs and $Q_{\text{Gold Creek}}$ = 394,000 cfs (PMF).

Again, two tables were necessary because of two separate input decks.

5. Copies of the marked-up aerial photos transmitted to you on 1/29/83 (8 sheets). These delineated the preliminary floodplain limits for the Gold Creek reach on 16 photos at a scale of approximately 1:21,000. The currently-attached photocopies identify (in red pencil) areas of changes to those original limits, of which six are noteworthy:

   a. An area excluded from the original floodplain near Gold Creek (LRX-44),

   b. an area added upstream of Sherman (LRX-37),

   c. an area added upstream of Curry (LRX-25), covering a portion of the RR tracks,

   d. a slight widening of the floodplain at Curry (LRX-24),

   e. a slight narrowing just downstream of Curry (LRX-23), and,

   f. a reduction in the area inundated on an island near Chase (LRX-10).

6. Thalweg profile of the Gold Creek reach with the PMF plotted (1 page). The 15 points identified with arrows are felt to be representative of the PMF profile and are the ones given to you over the phone.

All the cross-section locations are shown in the "Hydraulic and Ice Studies" report (March 1982). The 12 columns tabulated in the HEC-2 summary tables are as follows, identified by their printout headings:

- SECNO — Cross-section number (LRX or URX),
- Q — flow at cross-section (cfs),
- CWSEL — computed water-surface elevation (ft, msl),
- VCH — Average velocity in the "channel" portion of the cross-section (i.e. between the defined banks) (ft/sec),
- DEPTH — Maximum depth at the cross-section (ft),

- K*CHSL Thalweg slope between the current cross-section and next-downstream one (x 1000) (ft/ft),
- 10K*S Slope of the energy grade line at the current cross-section (x 10,000) (ft/ft),
- XLCH Length of the channel (thalweg) from the current cross-section to the next-downstream one (ft),
- AREA Total cross-sectional area of the flow (ft^2),
- TOPWID Cumulative surface width of wetted portion of the cross-section (ft),
- SSTA Starting survey station where the water surface intersects the ground on the left side (ft).
- ENDST Ending survey station where the water surface intersects the ground on the right side (ft). The difference between ENDST and SSTA gives the total distance from the left edge to the right edge of water.

GOLD CREEK REACH: 100-YR POST-PROJ. AND 100-YR PRE-PROJ. FLOWS (90,000 AND 118,000 CFS, RESPECTIVELY) [p. 1 of 7]

THIS RUN EXECUTED 83702/18. 17.32.06.

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 HEC2 RELEASE DATED NOV 76 UPDATED MARC 1982
 ERRCR CORR -  01,02,03,04,05
 MODIFICATION -  50,51,52,53,54,55
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

LCWER SUSITNA--100-YR

SUMMARY PRINTOUT

SECNO	Q	CWSEL	VCH	DEPTH	K*CHSL	10K*S	XLCH	AREA	TOPWID	SSTA	ENDST
3.000	92701.65	350.00	5.52	21.90	0.00	7.51	0.00	24009.80	4351.00	1766.00	6117.00
3.000	121538.35	352.00	5.48	23.90	0.00	5.74	0.00	34845.80	5819.00	1758.00	7577.00
4.000	92701.65	355.43	7.09	11.83	3.21	21.04	4830.00	13185.30	3042.75	3987.05	7029.80
4.000	121538.35	356.49	7.58	12.89	3.21	21.82	4830.00	16718.07	3655.67	3986.60	7642.27
4.100	92701.65	357.66	6.11	11.16	2.76	17.25	1050.00	16252.33	3922.04	2643.35	6565.40
4.100	121538.35	358.75	6.63	12.25	2.76	16.79	1050.00	20552.62	4043.62	2640.62	6684.24
4.200	92701.65	358.76	7.32	13.96	-2.43	19.70	700.00	13331.04	3200.63	2713.86	6523.12
4.200	121538.35	359.82	8.02	15.02	-2.43	20.73	700.00	16970.08	3587.02	2711.52	6531.53
4.300	92701.65	360.98	5.70	15.88	.24	11.82	1240.00	17968.87	4313.15	3370.05	7683.21
4.300	121538.35	362.15	6.20	17.05	.24	11.83	1240.00	23040.73	4348.15	3366.16	7714.32
4.400	92701.65	361.68	7.01	11.88	8.70	23.59	540.00	13240.68	2386.43	4007.43	6393.87
4.400	121538.35	362.79	7.69	12.99	8.70	23.44	540.00	16073.29	2690.96	4007.21	6698.17
5.000	92701.65	363.57	6.74	11.27	2.87	18.56	870.00	15199.16	3230.14	3646.08	6876.22
5.000	121538.35	364.73	7.36	12.43	2.87	18.70	870.00	19152.67	3581.31	3643.18	7224.49
6.000	92701.65	368.73	7.27	11.63	1.50	14.69	3190.00	12753.09	1585.60	6106.78	7692.38
6.000	121538.35	370.04	8.19	12.94	1.50	15.82	3190.00	14974.49	1911.65	5751.81	7694.92
7.000	92701.65	373.14	7.67	13.74	.79	16.09	2910.00	12218.77	1424.95	1007.73	2467.20
7.000	121538.35	374.66	8.55	15.26	.79	16.39	2910.00	14449.12	1466.62	1002.24	2468.86
8.000	92701.65	380.64	9.21	16.54	1.02	17.91	4590.00	10060.56	887.51	3107.86	3995.37
8.000	121538.35	382.44	10.42	18.34	1.02	19.36	4590.00	11668.18	898.96	3106.02	4004.98
9.000	92701.65	388.63	9.89	22.03	.51	15.63	4870.00	9371.11	691.15	1972.03	2663.18
9.000	121538.35	390.94	11.06	24.34	.51	16.36	4870.00	10989.13	711.18	1958.53	2669.71

SECNO	G	CWSEL	VCH	DEPTH	K*CHSL	10K*S	XLCH	AREA	TOPWID	SSTA	ENDST
9.100	92701.65	395.43	7.78	16.93	3.07	16.01	3870.00	13624.61	1925.94	4017.87	5943.81
9.100	121538.35	397.80	8.08	19.30	3.07	13.79	3870.00	18192.49	1931.80	4014.64	5946.44
10.000	92701.65	400.04	8.73	13.84	2.45	14.73	3140.00	10619.53	1141.83	1116.65	2971.95
10.000	121538.35	401.91	9.40	15.71	2.45	14.48	3140.00	12929.30	1332.48	1113.56	2974.00
10.100	92701.65	403.05	8.10	12.45	2.84	23.18	1550.00	11442.34	1202.48	3999.72	5202.20
10.100	121538.35	404.84	8.95	14.24	2.84	22.96	1550.00	13624.29	1229.71	3979.67	5209.38
10.200	92701.65	411.46	8.52	15.86	1.18	17.36	4250.00	10883.96	847.69	4011.78	4859.46
10.200	121538.35	413.44	9.67	17.84	1.18	18.55	4250.00	12573.53	852.88	4009.46	4862.34
10.300	92701.65	416.24	8.02	15.54	1.83	15.96	2790.00	11751.12	1477.35	1942.12	4558.97
10.300	121538.35	418.46	8.75	17.76	1.83	15.38	2790.00	15140.53	1572.80	1868.04	4972.45
11.000	92701.65	418.38	9.03	17.38	.22	18.36	1360.00	10260.90	764.79	2006.03	2770.82
11.000	121538.35	420.49	10.22	19.49	.22	19.50	1360.00	11887.88	769.66	2003.39	2773.25
12.000	92701.65	433.58	9.32	19.18	1.97	15.31	9120.00	10002.43	787.56	1062.22	1849.78
12.000	121538.35	436.25	10.32	21.85	1.47	15.44	9120.00	12948.39	1417.83	1058.08	2475.91
13.000	92701.65	450.14	6.78	23.64	1.18	15.59	10275.00	13699.94	1625.63	1046.14	2797.95
13.000	121538.35	452.70	6.72	26.20	1.18	14.62	10275.00	18132.83	1759.38	1041.53	2800.91
14.000	92701.65	454.37	5.72	17.17	3.79	12.92	2825.00	16594.80	1936.82	1000.75	2937.57
14.000	121538.35	456.58	6.10	19.38	3.79	12.02	2825.00	21823.35	2799.63	1000.00	3799.83
15.000	92701.65	460.86	7.41	14.76	1.79	14.22	4970.00	12530.27	1308.80	1048.48	2357.28
15.000	121538.35	462.82	8.08	16.72	1.79	14.53	4970.00	15105.36	1322.00	1045.35	2367.35
16.000	92701.65	464.43	6.43	14.73	1.33	10.77	2710.00	14672.74	2057.49	1040.51	3098.00
16.000	121538.35	466.44	6.60	16.74	1.33	10.07	2710.00	18813.78	2060.47	1037.53	3098.00
17.000	92701.65	466.56	8.75	13.16	2.03	18.31	1820.00	10696.25	1398.27	1044.23	3103.00
17.000	121538.35	468.31	9.53	14.91	2.03	17.46	1820.00	13569.95	1813.00	1041.37	3103.00
18.000	92701.65	469.22	11.27	16.32	-.29	18.59	1740.00	8242.19	623.63	1064.68	1688.31
18.000	121538.35	470.90	12.23	18.00	-.29	18.69	1740.00	13328.85	2039.78	1051.96	3091.74
18.100	92701.65	480.08	6.21	14.08	2.11	12.46	6200.00	15038.58	1947.73	4004.57	5952.31
18.100	121538.35	481.70	6.75	15.70	2.11	12.04	6200.00	18195.95	1965.68	4002.61	5968.28
18.200	92701.65	487.44	9.57	15.94	1.07	19.63	5140.00	9962.82	1218.41	3923.78	5460.78
18.200	121538.35	489.05	10.25	17.55	1.07	20.84	5140.00	12315.87	1551.66	3922.97	5474.64
18.300	92701.65	494.06	10.58	19.76	.69	14.50	4070.00	9375.18	954.75	4014.80	4969.55
18.300	121538.35	496.04	12.05	21.74	.69	16.01	4070.00	11451.53	1137.78	4012.25	5150.04
19.000	92701.65	497.92	10.56	16.22	2.80	14.75	2640.00	9335.72	1040.83	1474.62	2515.46
19.000	121538.35	500.27	11.63	18.57	2.80	14.68	2640.00	12130.99	1310.11	1470.02	2780.13

SECNO	Q	CWSEL	VCH	DEPTH	K*CHSL	10K*S	XLCH	AREA	TOPWID	SSTA	ENDST
19.100	92701.65	502.48	5.52	17.58	1.14	7.69	2810.00	18250.37	2388.64	3518.36	5907.01
19.100	121538.35	504.81	5.62	19.91	1.14	5.97	2810.00	23863.18	2408.21	3515.76	5923.97
20.000	92701.65	503.74	5.35	20.44	-1.27	13.40	1260.00	17331.74	2414.38	1312.10	3726.48
20.000	121538.35	505.82	5.44	22.52	-1.27	11.23	1260.00	22388.18	2435.24	1299.88	3735.12
20.100	92701.65	507.27	6.87	13.77	4.02	16.18	2540.00	13508.36	1768.66	4008.20	5785.78
20.100	121538.35	508.87	7.44	15.37	4.02	15.51	2540.00	16360.28	1785.46	4006.39	5791.84
20.200	92701.65	512.52	9.67	18.22	.22	15.04	3690.00	9874.79	1269.90	4015.30	5285.20
20.200	121538.35	514.13	11.08	19.83	.22	16.91	3690.00	12182.97	1471.82	4013.40	5485.22
21.000	92701.65	519.95	8.24	19.05	1.64	20.14	4030.00	11700.08	1332.42	1036.77	2369.19
21.000	121538.35	522.11	8.87	21.21	1.64	19.07	4030.00	14786.30	1523.65	1032.42	2556.06
22.000	92701.65	521.28	9.69	17.88	2.78	16.31	900.00	9571.71	1196.35	1120.04	2470.47
22.000	121538.35	523.45	9.81	20.05	2.78	15.78	900.00	12512.85	1531.52	1089.40	2620.92
23.000	92701.65	529.12	8.28	13.62	2.46	13.95	4920.00	11199.30	1406.45	1338.68	2745.12
23.000	121538.35	531.03	8.72	15.53	2.46	13.74	4920.00	14216.90	1578.02	1168.30	2746.32
24.000	90001.60	531.77	12.49	24.17	-3.66	17.10	2160.00	7224.43	510.03	1079.69	1589.72
24.000	117998.40	533.52	14.65	25.92	-3.66	20.35	2160.00	8173.89	568.87	1022.09	1590.96
24.100	90001.60	535.71	8.02	19.11	6.43	13.19	1400.00	11231.01	1208.40	4006.76	5215.16
24.100	117998.40	538.44	8.14	21.84	6.43	9.89	1400.00	14644.41	1324.08	3911.66	5235.74
24.500	90001.60	537.95	4.44	19.95	.64	3.47	2200.00	21497.38	2690.29	1493.98	4219.76
24.500	117998.40	540.42	4.64	22.42	.64	2.87	2200.00	28196.87	2759.95	1461.20	4232.05
25.000	90001.60	538.75	5.31	12.55	5.47	12.32	1500.00	17055.24	2640.49	1592.54	4233.03
25.000	117998.40	541.07	5.13	14.87	5.47	8.93	1500.00	23185.68	2652.15	1582.00	4234.15
25.100	90001.60	541.80	9.36	15.70	-.04	19.55	2290.00	10093.87	1978.02	2784.77	5450.95
25.100	117998.40	543.46	9.67	17.36	-.04	19.27	2290.00	13864.93	2561.85	2566.03	5458.85
26.000	90001.60	546.84	11.76	14.74	2.22	21.98	2700.00	7653.99	612.38	2508.07	3120.46
26.000	117998.40	548.37	12.15	16.27	2.22	20.18	2700.00	13868.85	2394.65	726.57	3121.21
27.000	90001.60	553.60	11.52	19.80	.44	13.31	3900.00	9826.30	1475.76	1476.22	2951.99
27.000	117998.40	554.97	13.39	21.17	.44	15.95	3900.00	12444.48	2526.24	449.24	2975.48
28.000	90001.60	563.03	6.79	15.03	2.44	14.48	5820.00	13444.93	1726.33	1003.69	2730.02
28.000	117998.40	565.05	7.15	17.05	2.44	12.39	5820.00	16936.67	1734.41	996.62	2731.03
28.100	90001.60	572.14	6.97	12.84	1.87	15.98	6030.00	13978.94	3216.53	2975.13	6472.24
28.100	117998.40	573.41	7.20	14.11	1.87	15.71	6030.00	18340.23	3534.88	2930.47	6478.28
29.000	90001.60	577.87	8.36	14.57	1.36	26.27	2940.00	10774.71	2163.85	980.63	4072.50
29.000	117998.40	579.48	7.65	16.18	1.36	28.92	2940.00	15427.43	3103.32	970.10	4073.42

SECNO	Q	CWSEL	VCH	DEPTH	K*CHSL	10K*S	XLCH	AREA	TOPWID	SSTA	ENDST
30.000	90001.60	591.84	5.19	13.44	2.06	13.21	7320.00	17338.91	3283.52	1172.87	4459.63
30.000	117998.40	593.25	5.38	14.85	2.06	12.41	7320.00	21959.75	3290.63	1169.80	4460.43
31.000	90001.60	601.78	8.96	14.98	1.37	22.26	6140.00	11494.16	2322.74	1128.49	3930.20
31.000	117998.40	602.98	9.35	16.18	1.37	24.28	6140.00	14639.21	2750.09	1124.42	3931.63
32.000	90001.60	612.97	8.38	11.02	2.84	19.53	5340.00	11147.28	1930.89	2810.10	4740.99
32.000	117998.40	614.39	9.13	12.44	2.84	18.97	5340.00	15760.85	4146.07	601.88	4747.95
33.000	90001.60	617.97	5.80	11.47	1.91	17.28	2380.00	15893.43	3446.97	845.19	4433.60
33.000	117998.40	619.35	5.87	12.85	1.91	16.16	2380.00	20820.37	3597.37	800.87	4443.27
34.000	90001.60	622.47	10.31	13.57	1.13	34.59	2130.00	8729.33	1124.92	1158.77	2507.07
34.000	117998.40	623.65	11.70	14.75	1.13	38.58	2130.00	10088.49	1203.84	1157.79	2508.91
35.000	90001.60	626.50	14.24	21.00	-1.88	20.84	1810.00	6339.39	476.25	1313.39	1823.45
35.000	117998.40	628.13	16.79	22.63	-1.88	25.39	1810.00	7233.06	642.73	1258.02	1900.75
36.000	90001.60	631.34	5.55	17.34	5.09	4.33	1670.00	16639.48	1598.73	1426.20	3024.93
36.000	117998.40	634.40	5.70	20.40	5.09	3.48	1670.00	21650.51	1679.75	1417.56	3097.30
37.000	90001.60	633.70	9.81	14.90	1.47	33.89	3270.00	9178.09	1277.95	1043.54	2321.49
37.000	117998.40	636.21	9.25	17.41	1.47	22.59	3270.00	15380.82	3661.99	1038.23	4700.22
38.000	90001.60	648.70	7.66	14.00	2.75	18.92	5790.00	11792.81	1725.45	1125.07	2850.52
38.000	117998.40	649.61	8.90	14.91	2.75	23.55	5790.00	13416.71	1909.99	1102.98	3012.97
39.000	90001.60	652.78	8.91	11.78	2.78	18.77	2270.00	10987.07	1732.93	1135.97	2922.71
39.000	117998.40	654.25	9.76	13.25	2.78	18.88	2270.00	13598.24	1793.88	1133.82	2927.69
40.000	90001.60	663.40	11.43	13.40	1.80	27.03	5010.00	9428.45	2272.30	1071.62	3426.27
40.000	117998.40	664.94	12.47	14.94	1.80	27.37	5010.00	13522.97	2730.02	1069.98	3800.00
41.000	90001.60	669.10	5.78	18.70	.17	12.46	2340.00	15076.56	1894.63	1147.61	3042.24
41.000	117998.40	670.79	6.27	20.39	.17	12.32	2340.00	19280.24	2607.64	1145.43	3753.07
42.000	90001.60	674.43	7.96	10.53	4.01	23.18	3370.00	12331.14	1782.61	1236.87	3019.48
42.000	117998.40	675.88	8.60	11.98	4.01	21.69	3370.00	14926.89	1786.77	1235.06	3021.84
43.000	90001.60	679.07	12.37	21.47	-3.32	35.07	1900.00	7279.04	798.36	2430.49	3228.85
43.000	117998.40	680.40	14.14	22.80	-3.32	40.97	1900.00	8348.93	801.69	2427.87	3229.56
43.500	90001.60	684.01	11.67	19.51	4.93	30.89	1400.00	7711.47	800.98	2629.49	3430.47
43.500	117998.40	686.12	7.73	21.62	4.93	10.50	1400.00	21262.20	2947.05	484.88	3431.93
44.000	90001.60	690.33	9.08	15.73	4.59	18.93	2200.00	10422.34	1356.65	1988.63	3439.72
44.000	117998.40	688.82	14.94	14.22	4.59	58.82	2200.00	7899.78	955.22	2335.06	3438.08
45.000	90001.60	692.38	15.40	18.88	-.75	36.47	1470.00	5933.91	522.94	1123.77	1680.41
45.000	117998.40	694.82	16.90	21.32	-.75	35.89	1470.00	7233.35	549.36	1100.28	1682.99

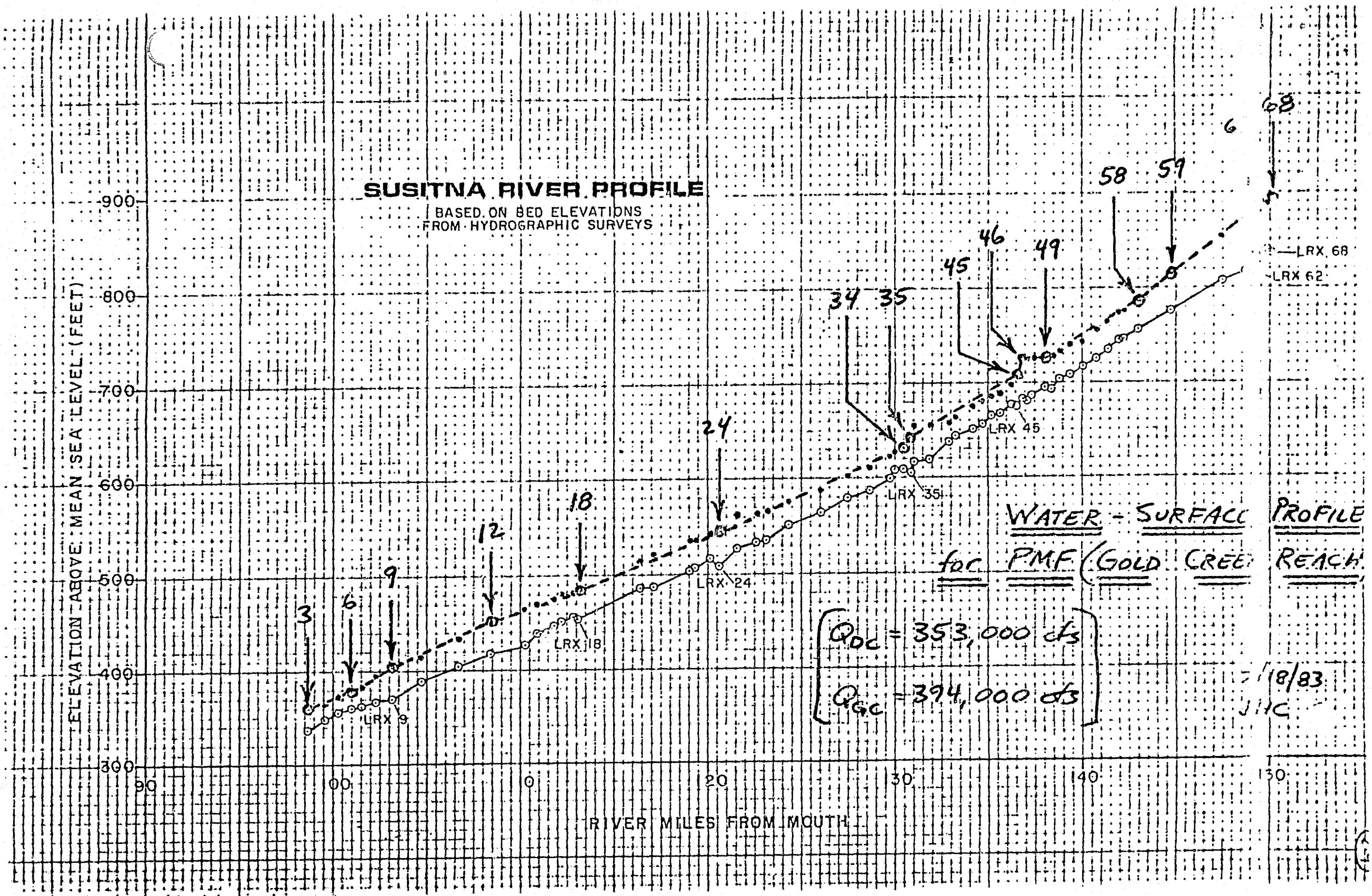
GOLD CREEK REACH 100-YR FLOWS (CONT.)

SECNO	Q	CWSEL	VCH	DEPTH	K*CHSL	10K*S	XLCH	AREA	TOPWID	SSTA	ENDST
46.000	90001.60	699.22	7.61	17.82	5.27	14.13	1500.00	11865.58	967.20	1107.38	2074.58
46.000	117998.40	702.20	7.67	20.80	5.27	11.06	1500.00	17796.69	1852.85	224.89	2077.74
47.000	90001.60	700.90	7.15	19.00	.49	16.34	1025.00	13555.41	2113.43	268.97	2546.44
47.000	117998.40	703.57	6.98	21.67	.49	12.70	1025.00	19727.54	2441.59	99.68	2548.72
48.000	90001.60	702.95	6.55	17.65	2.57	12.58	1325.00	15417.18	2018.22	445.06	2463.27
48.000	117998.40	705.15	6.93	19.85	2.57	11.11	1325.00	20367.50	2444.48	27.93	2472.41
49.000	90001.60	709.70	10.24	15.50	2.06	23.44	4325.00	8813.58	918.27	1198.87	2117.14
49.000	117998.40	711.30	11.53	17.10	2.06	24.30	4325.00	10281.76	927.33	1196.77	2124.10
50.000	90001.60	712.50	11.55	19.00	-.52	22.18	1350.00	8734.04	944.70	998.54	1943.24
50.000	117998.40	714.28	13.08	20.78	-.52	24.85	1350.00	10688.25	1412.56	997.74	2604.90
51.000	88478.50	717.89	9.95	15.99	3.93	23.23	2140.00	9084.32	835.08	1001.08	1836.16
51.000	116001.50	720.14	11.04	18.24	3.93	23.18	2140.00	11105.14	963.82	999.51	1963.33
52.000	88478.50	723.70	5.00	16.50	1.82	10.30	2910.00	17715.42	2182.84	1016.40	3199.24
52.000	116001.50	725.86	5.18	18.66	1.82	8.47	2910.00	22492.94	2242.90	1013.23	3256.13
53.000	88478.50	730.24	14.43	13.04	2.63	63.65	3800.00	6133.12	587.33	1883.08	2470.42
53.000	116001.50	731.13	17.41	13.93	2.63	83.97	3800.00	6663.31	595.92	1882.15	2478.07
54.000	88478.50	743.85	7.24	17.55	2.53	16.61	3590.00	12951.56	1648.18	489.69	2137.86
54.000	116001.50	746.42	7.53	20.12	2.53	14.19	3590.00	17843.85	2130.63	9.78	2140.42
55.000	88478.50	751.42	7.96	16.22	2.55	30.75	3490.00	11131.94	1298.89	996.29	2295.18
55.000	116001.50	753.17	8.67	17.97	2.55	30.53	3490.00	13406.83	1301.28	995.41	2296.69
56.000	88478.50	761.19	7.36	16.79	2.76	26.69	3335.00	13286.68	1799.82	497.65	2297.48
56.000	116001.50	762.88	7.87	18.48	2.76	26.04	3335.00	16320.69	1802.09	496.81	2298.90
57.000	88478.50	763.55	7.96	18.05	.95	18.28	1155.00	11121.22	1212.63	568.73	1781.36
57.000	116001.50	765.22	8.32	19.72	.95	18.03	1155.00	15834.49	1745.20	37.14	1782.34
58.000	88478.50	773.19	9.34	16.29	2.57	27.83	4435.00	9504.62	999.53	995.64	1995.17
58.000	116001.50	774.85	10.49	17.95	2.57	29.95	4435.00	11166.14	1001.46	994.67	1996.13
59.000	88478.50	796.59	11.83	20.79	2.18	27.43	8675.00	7717.17	641.02	1100.09	1741.11
59.000	116001.50	799.10	13.13	23.30	2.18	27.56	8675.00	9485.72	748.32	993.96	1742.27
60.000	88478.50	832.60	12.12	24.10	2.27	22.89	14430.00	7422.92	522.08	1014.21	1536.94
60.000	116001.50	835.51	13.53	27.01	2.27	23.34	14430.00	8980.57	541.61	998.89	1540.51
61.000	88478.50	846.81	13.65	27.31	1.78	24.47	6190.00	6510.28	319.24	992.85	1312.08
61.000	116001.50	850.08	15.46	30.58	1.78	25.87	6190.00	7560.43	324.64	990.43	1315.07
62.000	84774.58	849.90	12.44	27.60	2.50	21.26	1120.00	6829.05	337.91	992.03	1329.95
62.000	111145.42	853.53	13.83	31.23	2.50	21.48	1120.00	8059.69	341.53	990.23	1331.76

SECNO	Q	CWSEL	VCH	DEPTH	K*CHSL	10K*S	XLCH	AREA	TOPWID	SSTA	ENDST
63.000	84774.58	852.18	13.06	24.98	4.41	23.00	1110.00	6491.70	310.82	998.69	1309.51
63.000	111145.42	855.78	14.61	28.58	4.41	23.63	1110.00	7611.65	311.54	998.33	1309.87
64.000	84774.58	854.82	11.89	29.42	-1.73	18.39	1040.00	7134.56	332.07	998.59	1330.66
64.000	111145.42	858.61	13.25	33.21	-1.73	18.67	1040.00	8394.61	332.83	998.21	1331.04
65.000	84774.58	856.98	7.97	20.88	19.11	12.27	560.00	10650.62	689.70	998.58	1688.28
65.000	111145.42	861.18	8.22	25.08	19.11	9.56	560.00	13550.61	694.32	998.16	1692.49
66.000	84774.58	857.32	8.10	20.12	3.79	12.55	290.00	10469.46	669.29	998.59	1667.88
66.000	111145.42	861.43	8.41	24.23	3.79	9.99	290.00	13224.71	670.73	998.18	1668.91
67.000	84774.58	859.22	12.36	18.62	2.10	26.55	1620.00	6865.83	407.97	998.89	1406.86
67.000	111145.42	862.65	13.47	22.05	2.10	24.93	1620.00	8268.41	410.03	998.54	1408.58
68.000	84774.58	863.80	11.67	33.90	-5.35	17.68	2000.00	7278.49	352.47	998.95	1351.42
68.000	111145.42	867.06	13.21	37.16	-5.35	18.68	2000.00	8434.20	354.76	997.32	1352.07

SUMMARY OF ERRORS AND SPECIAL NOTES:

CAUTION SECNO= 31.000 PROFILE= 1 WSEL ASSUMED BASED ON MIN DIFF
CAUTION SECNO= 31.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL



PARED BY:

M CONSULTANTS, INC.

LONGITUDINAL RIVER PROFILE FROM DEVIL CANYON TO TALKEETNA

(from Hydraulic and Ice Studies, 3/82)

FIG. 4.3