2829

SUSITNA HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION
PROJECT No. 7114

HYDROLOGY FIELD DATA INDEX

PREPARED BY

R&M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

UNDER CONTRACT TO

HARZA-EBASCO
SUSITNA JOINT VENTURE

FINAL REPORT

JULY 1985
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Report by
R&M Consultants, Inc.

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Prepared for
Alaska Power Authority

Final Report
July 1985

NOTICE

ANY QUESTIONS OR COMMENTS CONCERNING
THIS REPORT SHOULD BE DIRECTED TO
THE ALASKA POWER AUTHORITY
SUSITNA PROJECT OFFICE

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

HYROLOGY FIELD DATA INDEX

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INTRODUCTION

The objective of the Field Data Index & Distribution System is to establish a formal system of conveying information concerning hydrologic and climatologic data availability to each member of the study team. The project data base consists of (a) Historical recorded data up to January 1, 1980; (b) Post 1980 data collected by government agencies and study team members.

Historical files have been researched and available data are documented in this report. Records which could be retrieved or copied exist in R&M Consultants files. Records which are unavailable at this time, are identified as to location of files, data type, and period of record.

Data stations are identified in this volume by a unique four digit index number which identifies type of data and station location. The first two digits of the index number correspond to the type of data collected. There are seventeen different types of water resource data indexed, so data stations series are numbered accordingly 0100 through 1700. The last two digits of the index number correspond to a unique location number. For data taken from river sampling, station numbers increase from up-stream to down stream locations. River miles are listed where applicable to help identify station locations. For data stations away from the river channel, the location number is unique for that location among each data series number.

Thus for the index number 0540, for example, the first two digits (05) identify the data as sediment discharge), while the latter two digits (40) identify the station as Susitna River at Gold Creek. Most of the data collection stations included in this index are shown on the Data Collection Stations map accompanying this volume. Most station index numbers are shown next to their associated station symbol on the map. In the cases where many index numbers are assignable to one location, index numbers are listed and cross referenced in the table of multiple record stations inset at the upper left portion of the map.

All new data collected by R&M Consultants or other organizations will be added to the index system. An update will be prepared and distributed to personnel listed in Appendix G each year. Anyone knowing of additional data that has been collected within or adjacent to the Susitna River Basin is asked to notify R&M Consultants, P.O. Box 6087, Anchorage, Alaska - 99503, (907) 561-1733.

Hard copy of the data will be stored in the R&M Consultants offices. The data will be made available to project team members and other concerned parties upon request.

WATER RESOURCES DATA COLLECTED IN THE SUSITNA RIVER BASIN

0100 STREAMFLOW CONTINUOUS GAGING

Mean daily discharge and/or annual maximum flood peak discharge data have been collected by the U.S. Geological Survey (USGS) & R&M Consultants (R&M) at several locations within the Susitna River Basin. The stations for which this information is available and the period of record at each location are listed below. Unless indicated by agency name in parentheses following the period of record, all data has been collected by the USGS. All data listed in this section are on file at R&M Consultants according to index number and name.

Seven additional continuous stream gages are included under Section 1700 Slough Observations. Therefore they have not been listed again in this section.

Index No.	Description
0110	Susitna River near Denali - USGS Station 15291000 (RM 290.7)
	Mean Daily Discharge Records: May 1957 - September 1966; July 1968 - Present
	Annual Instantaneous Peak Flow: 1957-1963, 1965, 1967, 1967 - Present
0115	Maclaren River near Paxson - USGS Station 15291200
	Mean Daily Discharge Records: June 1958 - Present
0120	Susitna River near Cantwell - USGS Station 15291500 (RM 223.0)
	Mean Daily Discharge Record: May 1961 - September 1972; May 1980 - Present
0122	Deadman Creek - R&M Consultants
	Mean Daily Discharge Record: June 14 - October 5, 1982 Single Winter Measurement: April 10, 1984
0130	Susitna River near Watana Damsite - R&M SG-1 (RM 182.1)
	Mean Daily Discharge Records: July 1980 - Present

Index No.	Description
0132	Portage Creek - ADF&G and R&M Consultants
	Mean Daily Discharge Records: August - October 1982, May - October 1983
0138	Indian River - ADF&G and R&M Consultants
	Mean Daily Discharge Records: August - October 1982, May - October 1983
0139	Gold Creek - ADF&G
	Mean Daily Discharge Records: May - October 1983
0140	Susitna River near Gold Creek - USGS Station 15292000 (RM 136.6)
	Mean Daily Discharge Record: August 1949 - Present
0145	Chulitna River near Talkeetna - USGS Station 15292400
	Mean Daily Discharge Record: February 1958 - September 1972 May 1980 - Present
	Annual Instantaneous Peak Flow: 1958-1977, 1980 - Present
0155	Talkeetna River near Talkeetna - USGS Station 15292700
	Mean Daily Discharge Record: June 1964 - Present
0160	Susitna River at Sunshine - USGS Station 15292780 (RM 83.8)
	Mean Daily Discharge Record: May 1981 - Present
	Miscellaneous Discharge Measurements: 1965, 1971, 1977
0161	Deshka River near Willow - USGS Station 15294100
	Mean Daily Discharge Record: October 1978 - Present
0162	Willow Creek near Willow - USGS Station 15294005
	Mean Daily Discharge Record: June 1978 - Present

Index No.	Description
0163	Deception Creek near Willow - USGS Station 15294010
	Mean Daily Discharge Record: May 1978 - Present
0165	Skwentna River near Skwentna - USGS Station 15294300
	Mean Daily Discharge Record: August 1959 - Present
0175	Yentna River near Susitna Station - USGS Station 15294345
	Mean Daily Discharge Record: October 1980 - Present
0190	Susitna River near Susitna Station - USGS Station 15294350 (RM 25.7)
	Mean Daily Discharge Record: October 1974 - Present

0200 STREAMFLOW PARTIAL RECORDS

All data collected relating to river stage or water discharge for the Susitna River Basin not previously listed under Section 0100: Streamflow Continuous Gaging are included below. This section includes all records from crest stage gages, staff gages or fragmentary data. Agencies collecting the data include: U.S. Geological Survey (USGS), R&M Consultants (R&M) and National Weather Service (NWS). The agency responsible for data collection at each site is indicated by the agency name in parentheses following the period of record.

It should be noted that National Weather Service stations collect river stage data which can be obtained from the NWS Alaska River Forecast Center on a daily basis.

Alaska Department of Fish and Game has additional data on stage and water discharge of selected tributaries and fresh-water sloughs in the Susitna River Basin for 1981. Appendix C includes location and period of record for the data available. Additional flow measurements, staff and crest gages, have been included under Section 1700 Aquatic Habitat Observations. Therefore they have not been listed again below.

All data given below are on file at R&M Consultants according to index number and location, unless marked by an asterisk (*) following the period of record.

Index No.	Description
0201	Raft Creek near Denali - USGS Station 15291000 Annual Maximum Discharge from Crest-Stage Gage: 1963-1977, 1979 - Present (USGS)
0203	Susitna River at Denali Highway (RM 290.7) Staff Gage: 1981 (R&M)
0205	Susitna River at Deadman Creek - R&M CSR-9 (RM 186.7) Crest-Stage Gage: 1980 - 1982 (R&M)
0210	Susitna River above Watana Damsite - R&M CSR-8 (RM 184.1) Crest-Stage Gage ($\frac{1}{4}$-mile upstream of damsite): 1980 - 1982 (R&M)

Index No.	Description
0211	Susitna River below Watana Damsite (RM 182.8) Staff Gage (1 mile downstream of damsite): 1981 - 1982 (R&M)
0212	Susitna River at Devil Creek (RM 161.5) Crest Stage Gage: 1981 - 1982 (R&M)
0215	Susitna River above Devil Canyon - R&M CSR-7 (RM 153.2) Crest-Stage Gage (1½ miles upstream of D.C. damsite): 1980 - 1982 (R&M)
0218	Susitna River below Devil Canyon (RM 150.7) Staff Gage (1 mile downstream of D.C. damsite): 1981 (R&M)
0220	Susitna River at Portage Creek - R&M CSR-6 (RM 148.8) Crest-Stage Gage: 1980 - 1982 (R&M)
0225	Susitna River at Sherman - R&M CSR-5 (RM 130.9) Crest-Stage Gage: 1980 - 1982 (R&M)
0230	Susitna River at Section 25 - R&M CSR-4 (RM 124.4) Crest-Stage Gage: 1980 - 1982 (R&M)
0235	Susitna River at Curry - R&M CSR-3 (RM 120.5) Crest-Stage Gage: 1980 - 1982 (R&M)
0236	Susitna River at Curry (RM 120.5) Partial Discharge Record: 1948 (1 date) (USGS) 1949 (1 date) (USGS)

Index No.	Description
0240	Susitna River near Chase - R&M CSR-2 (RM 107.6)
	Crest-Stage Gage: 1980 - 1982 (R&M)
0245	Susitna River above Susitna-Chulitna Confluence - R&M CSR-1 (RM 99.6)
	Crest-Stage Gage: 1980 - 1982 (R&M)
0246	Talkeetna River at Alaska Railroad Bridge
	Partial Discharge Record: 1949 (2 dates) (USGS)
0247	Talkeetna River at Alaska Railroad Bridge
	Partial Stage Record: 1976 - Present (NWS)
0250	Susitna River at Sunshine (RM 83.8)
	Partial Discharge Record: 1969-1971, 1976 - Oct. 1981 (NWS)
0251	Montana Creek near Montana - USGS Station 15292800
	Crest-Stage Gage: 1963-1972, 1978, 1981 (USGS)
0252	Montana Creek at Parks Highway
	Partial Stage Record: 1973 - Present (NWS)
0253	Goose Creek near Montana - USGS Station 15292900
	Crest-Stage Gage: 1963-1971 (USGS)
0254	Caswell Creek near Caswell - USGS Station 15293000
	Crest-Stage Gage: 1963 - Present (USGS)
	Miscellaneous Discharge Measurements: 1963 - 1976, 1979 - Present (USGS)

Index No.	Description
0255	Little Willow Creek near Kashwitna - USGS Station 15293700 Low-Flow Partial Record: 1978 (USGS)
0255.5	Peters Creek below Purches Creek near Willow Miscellaneous Discharge Measurements: 1979 - Present (USGS)
0255.6	Peters Creek, Tributary to Willow Creek (above confluence with Willow Creek) Miscellaneous Discharge Measurements: 1979 (USGS)
0255.8	Willow Creek above Deception Creek near Willow (2.2 miles downstream of continuous gage) Miscellaneous Discharge Measurements: 1979 (USGS)
0256	Willow Creek at Hatcher Pass Road near Willow - USGS Station 15294002 Low-Flow Partial Record: 1978 - 1979, 1981 - Present (USGS)
0256.5	Willow Creek at Alaska Railroad Bridge, 1 mile north of Willow Partial Discharge Record: 1948 (1 date) (USGS)
0257	Deception Creek above Tributary near Houston - USGS Station 15294007 Low-Flow Partial Record: 1978 - Present (USGS)
0257.5	Unnamed Deception Creek Tributary near Willow Miscellaneous Discharge Measurements: 1979 - Present (USGS)

Index No.	Description
0258	Deception Creek Tributary near Houston - USGS Station 15294008 Low-Flow Partial Record: 1978 - Present (USGS)
0259	Willow Creek at Parks Highway near Willow - USGS Station 15294012 Low-Flow Partial Record: 1978 - Present (USGS)
0260	Willow Creek at Parks Highway near Willow Partial Stage Record: 1973 - Present (NWS)
0265	Kroto Creek (head of Deshka River) near Peters Creek USGS Station 15294020 Low-Flow Partial Record: 1978 (USGS)
0270	Moose Creek near Talkeetna USGS Station 15294025 Low-Flow Partial Record: 1972-1975, 1978-1979 (USGS) Partial Discharge Record: 1980 (USGS) CrestStage Gage: 1972 Present (USGS)
0272	Peters Creek near Petersville USGS Station Low-Flow Partial Record: 1975-1976, 1977-1978 (USGS)
0274	Peters Creek above Martin Creek at Peters Creek USGS Station 15294310 Low-Flow Partial Record: 1975,1976, 1977,1978
0276	Martin Creek at Peters Creek USGS Station 15294312 LowFlow Partial Record: 1978 (USGS)

0300 WATER QUALITY

Water quality data have been collected by the U.S. Geological Survey (USGS) and R&M Consultants (R&M) at several sites within the Susitna River Basin. The locations for which this information is available and the period of record at each site are given below. Since the measurements are only taken periodically the number of measurements, timing and specific parameters measured vary from year to year at any given station. A list of water quality parameters that have been measured by the USGS in the basin is presented in Appendix B. Water quality parameters measured by R&M are included in Appendix F.

Unless indicated by the agency name in parentheses following the period of record, data have been collected by the USGS.

Data collected by the Alaska Department of Fish & Game are all included in Appendix C. Therefore, they have not been listed again in this section.

The data listed in this section are all on file at R&M Consultants according to index number and name, except where dates are marked by an asterisk (*). Most of the data are also available through the U.S. Geological Survey.

Index No.	Description
0310	Susitna River near Denali - USGS Station 15291000 (RM 290.7) Period of Record: 1957-1966, 1969, 1974 to 1982
0311	Raft Creek near Denali - USGS Station 15291100 Period of Record: 1972
0313	Clearwater Creek near Paxson - USGS Station 630230146530000 Period of Record: 1958*
0315	Maclaren River near Paxson - USGS Station 15291200 Period of Record: 1958-1961, 1967-1968, 1975

Index No.	Description
0318	Little Oshetna River near Eureka - USGS Station 621130147391500 Period of Record: 1953*
0320	Susitna River near Cantwell (Vee Canyon) - USGS Station 15291500 (RM 223.0) Period of Record: 1962-1972, 1980 to 1981 1980: June 19 (R&M) August 8 (R&M) September 5 (R&M) September 17 (R&M) October 17 (R&M) 1981: January 13 (R&M) May 20 (R&M) June 18 (R&M) June 30 (R&M) August 2 (R&M) August 3 (R&M) September 15 (R&M) October 7 (R&M) 1982: February 4 (R&M) October 1 1983: March 2 April 6 May 17
0330	Susitna River near Watana Damsite - R&M WQ-1 (RM 184.3) Continuous Water Quality Monitor Period of Record: October 1980 - December 1981 (Station destroyed December 1981) (Parameters monitored are listed in Appendix F.)
0335	Susitna River above Portage Creek near Gold Creek - USGS Station 624941149221500 Period of Record: 1977
0339	Gold Creek at Gold Creek - USGS Station 624606149412500 Period of Record: 1977*
0340	Susitna River at Gold Creek - USGS Station 15292000 (RM 136.6) Period of Record: 1949-1958, 1962, 1967-1968, 1975, 1977, 1980 to Present

Index No.	Description
	1980: May 2 August 8 (R&M) August 19 October 7 October 14 (R&M) 1981: January 14 (R&M) January 16 February 12 March 24 May 27 (R&M and USGS) June 30 (R&M) June 23 July 1 (R&M) July 21 August 2 (R&M) August 3 (R&M) August 27 October 8 (R&M) 1982: January 20 February 6 (R&M) March 3 March 30 May 27 June 10 (R&M) June 16 (R&M) June 23 (R&M) July 1 August 5 (R&M) August 10 (R&M) August 19 August 26 (R&M) September 4 (R&M) September 15 (R&M) September 16 October 17 (R&M) 1983: March 18 May 19 June 28 July 28 August 25 October 3 1984: May 31 June 27 July 25 August 23 September 28
0344	Ramsdyke Creek near Petersville - USGS Station 623742150462600 Period of Record: 1979
0344.5	Long Creek near Petersville USGS Station 623545150435600 Period of Record: 1979

Index No.	Description
0345	Chulitna River near Talkeetna - USGS Station 15292400
	Period of Record: 1958-1959, 1967-1972
0355	Talkeetna River near Talkeetna - USGS Station 15292700
	Period of Record: 1954, 1966-Present
	1982: March 3 April 9 June 1 July 2 August 20 September 17 October 14
	1983: March 18 May 13 June 23 July 29 October 4
	1984: March 7 May 31 July 26
0360	Susitna River at Sunshine - USGS Station 15292780 (RM 83.8)
	Period of Record: 1971, 1975, 1977, 1981 - Present
	1982: March 2 April 9 June 3 July 2 August 17 September 15 October 13
	1983: January 20 March 17 May 12 June 24 July 27 August 24 October 4

Index No.	Description
	1984: May 18 June 14 July 19 August 16 September 21
0361.1	Montana Creek near Montana - USGS Station 15292800 Period of Record: 1971-1972
0361.2	Sheep Creek at Highway near Willow - USGS Station 615945150024300 Period of Record: 1972
0361.3	Caswell Creek near Caswell - USGS Station 15293000 Period of Record: 1972
0361.4	Kashwitna River near Willow - USGS Station 615535150041500 Period of Record: 1972
0362	Willow Creek near Willow - USGS Station 15294005 Period of Record: 1979 - Present
0362.1	Willow Creek below Canyon near Willow - USGS Station 614607149552000 Period of Record: 1972
0362.2	Willow Creek at Parks Highway near Willow (USGS Station 15294012) Period of Record: 1972, 1979, 1980

Index No.	Description
0362.3	Willow Creek at Upper Bridge near Willow - USGS Station 614522149401700 Period of Record: 1972
0362.4	Willow Creek at Hatcher Pass Road near Willow - USGS Station 15294002 Period of Record: 1978-1979
0363	Deception Creek near Willow - USGS Station 15294010 Period of Record: 1978-Present
0363.1	Deception Creek at Mouth near Willow - USGS Station 614552150021000 Period of Record: 1972
0363.3	Deception Creek Tributary near Houston - USGS Station 15294008 Period of Record: 1978-1979, 1980
0363.4	Deception Creek above Tributary near Houston - USGS Station 15294007 Period of Record: 1978-1979, 1980, 1981
0363.5	Unnamed Tributary to Deception Creek near Willow - USGS Station 614446149551000 Period of Record: 1979-1980
0365	Skwentna River near Skwentna - USGS Station 15294300 Period of Record: 1959, 1961, 1967-1968, 1974-1975

Index No.	Description
0366	Yentna River near Skwentna - USGS Station 615815151070000 Period of Record: 1955*
0370	Yentna River near Susitna Station - USGS Station 15294345 Period of Record: 1981: May 20, June 11, July 13, July 14, August 11, September 16, October 6 1982: January 12, April 1, May 18, July 13, August 11, October 6 1984: February 23, April 5, May 14, June 12, July 17, August 14, September 19
0390	Susitna River at Susitna Station - USGS Station 15294350 (RM 25.7) Period of Record: 1955, 1970, 1975 - Present 1980: February 12, March 12, June 16, July 30, October 10

Index No.	Description	
	1981:	January 13
		April 9
		May 21
		June 12
		July 15
		August 12
		September 17
	1982:	January 12
		April 9
		May 19
		July 14
		August 12
		October 5
	1983:	April 5
		June 22
		June 27
		September 30
	1984:	April 6
		May 18
		July 18
		August 15
		September 20

0400 WATER TEMPERATURE

Water temperature data have been collected by the U.S. Geological Survey (USGS), R&M Consultants (R&M), and Alaska Department of Fish and Game (ADF&G) at many locations within the Susitna River Basin. The locations for which this information is available and the period of record at each site are given below. Continuous water temperature records are generally available for open-water months only, but the length of record will vary for each site from year to year. Descriptions of the data collected by ADF&G for 1981 have been included in Appendix C. Additional thermograph sites installed in 1982 and later for the slough observations can be found in Section 1700. Therefore, both sets of data have not been listed again in this section. It should also be noted that instantaneous temperature measurements have been taken and may be found in the water quality records published by the USGS.

Unless indicated by agency name in parentheses following the period of record, all data have been collected by the USGS.

The data listed in this section are on file at R&M Consultants according to index number and name, except the most recent data collected by the USGS and Talkeetna River data from 1954.

Index No.	Description
0410	Susitna River near Denali - USGS Station 15291000 (RM 290.7)
	Water Temperature Record: 1974 - 1982
	Temperature Cross Sections: 1980: May 22, June 24, July 22, August 26, October 1
	1981: May 19, June 24, July 21, August 25, September 29
	1982: March 30, May 25, June 30, July 27, August 26, September 27
	1983: April 6, June 8, July 20

Index No.	Description
	1984: February 25 July 19 August 22
0415	Maclaren River near Paxson - USGS Station 15291200
	Miscellaneous Water Temperatures: 1980
0420	Susitna River near Cantwell - USGS Station 15291500 (RM 223.0)
	Water Temperature Record: May 1980 - Present
	Temperature Cross Sections: 1982: June 30 July 27 August 26 October 1 1983: March 2 April 6 May 17 1984: June 14 August 26
0430	Susitna River near Watana Damsite (RM 183.8)
	Water Temperature Record: October 1980 - December 1981
	(Station destroyed December 1981)
0440	Susitna River at Gold Creek - USGS Station 15292000 (RM 136.6)
	Water Temperature Record: 1957, 1974 - Present
	Temperature Cross Sections: 1980: May 14 July 2 August 19 October 7 1981: May 27 June 23 July 21 August 27 September 28 1982: January 20 March 3 March 30 May 27 July 1 August 19 September 16

Index No.	Description
	1983: May 19 June 28 July 28 August 25 October 3 1984: May 31 June 27 July 25 September 28
	Miscellaneous Water Temperatures: 1980, 1981 and 1982 (R&M)
0443	Susitna River near Chase (RM 107.6)
	Daily water temperature, August and September 1977.
	Reported in "An Assessment Study of the Anadromous Fish Populations in the Upper Susitna Watershed" (Barrett, 1974)
0445	Chulitna River near Talkeetna - USGS Station 15292400
	Water Temperature Record: 1982 - Present
	Temperature Cross Sections:
	1980: June 3 July 17 September 1 October 22 1981: January 14 February 10 March 25 May 18 June 23 July 20 August 24 1982: April 8 June 3 June 4 June 9 June 16 June 22 June 29 July 27 July 13 July 20 1982: July 26 July 27 August 3 August 11 August 17 August 24 September 1 September 18 1984: May 17 May 31 June 8 July 18 July 25 August 9 August 21 September 17 September 27
	Miscellaneous Water Temperatures: 1980

Index No.	Description
0455	Talkeetna River near Talkeetna - USGS Station 15292700

Water Temperature Record: 1954

Temperature Cross Section:

1980:	April 1	1983:	March 18
	April 22		May 13
	May 23		June 23
	June 30		July 29
	July 10		August 3
	July 28		August 11
	July 29		September 1
	September 9		September 12
	October 15		September 27
			October 4
1981:	May 29		March 7
	June 24		May 31
	July 22		July 26
	August 23		
	September 28	1984:	March 18
	October 16		May 13
			May 23
1982:	January 21		May 26
	March 3		June 3
	April 9		June 9
	June 1		June 22
	July 2		June 23
	August 20		July 18
	September 17		July 29
	October 14		August 3
			August 11
			September 1
			September 12
			September 27

Index No.	Description

0460 Susitna River near Sunshine - USGS Station 15292780 (RM 83.8)

Water Temperature Record: 1981 - Present

Temperature Cross Section:

1981: October 19

1982: January 20
March 2
April 9
June 3
July 2
August 17
September 15
October 13

1983: January 20
March 17
May 12
June 24

1983: July 27
August 11
October 16

1984: May 21
June 14
July 19
August 16
September 28

0462 Willow Creek near Willow - USGS Station 15294005

Water Temperature Record: 1978 - Present

0463 Deception Creek near Willow - USGS Station 15294010

Water Temperature Record: 1978 - 1981

0465 Skwentna River near Skwentna - USGS Station 15294300

Miscellaneous Water Temperatures: 1967-68, 1974-75, 1980

0475 Yentna River near Susitna Station

Water Temperature Record: 1981 - Present

Index No.	Description

Temperature Cross Sections:

1981:	May 20	1983:	August 10
	June 11		August 26
	July 14		September 29
	August 11		
	September 16	1984:	February 23
1982:	January 12		April 5
	April 1		May 14
	May 18		June 12
	Juy 13		July 17
	August 11		August 14
	October 6		September 19
1983:	January 20		
	April 5		
	June 22		
	July 26		

0490 Susitna River at Susitna Station - USGS Station 15294350 (RM 25.7)

Water Temperature Record: 1975 - 1981;
May 10 to August 13, 1983

Temperature Cross Sections:

1980:	February 12	1982:	July 14
	March 12		August 12
	June 16		October 5
	July 30		
	October 10	1983:	April 5
1981:	January 13		June 22
	April 9		Jully 27
	May 21		September 30
	June 12	1984:	April 6
	July 15		June 13
	August 12		July 17
	September 17		August 15
1982:	January 12		September 20
	April 9		
	May 19		
	June 12		

0500 SEDIMENT DISCHARGE

Suspended sediment concentration (mg/l), suspended sediment discharge (tons/day) and suspended sediment particle size analysis data have been collected by the U.S. Geological Survey (USGS) and R&M Consultants (R&M) at several sites within the Susitna River Basin. The USGS and R&M Consultants cooperated in 1981 on measurements to determine bedload sediment transport rates as a function of stream discharge, and the size distributions of this sediment. Three measurements were made at each site (Talkeetna River, Chulitna River, and Susitna River at Gold Creek and Sunshine) in 1981. Additional data have been collected by the USGS since 1981 and are presented by Knott and Lipscomb (1983 and 1985).

The locations where sediment information has been collected are listed below. All of the data, except the most recent data collected by the USGS, are on file at R&M Consultants.

Unless indicated by agency name in parentheses following the period of record, all data have been collected by the USGS.

Additional bed load and bed material data at various sites between Devil Canyon and the Parks Highway can be found in the following publications:

1. Middle Susitna River Sedimentation Study
   Stream Channel Stability Analysis of Selected Sloughs,
   Side Channels and Main Channel Locations. Harza-Ebasco
   Susitna Joint Venture. March 1985.

2. River Morphology
   R&M Consultants, Inc.
   January 1982

3. Lower Susitna Aggradation Study: Field Data
   R&M Consultants, Inc.
   June 1985

Index No.	Description
0510	Susitna River near Denali - USGS Station 15291000 (RM 290.7)

Sediment Concentration and Sediment Discharge: 1958-Present

1980: May 22
June 24
July 22
August 26
October 1

1981: April 8
May 19

Index No.	Description
	June 24 July 21 August 25 1982: March 30 May 25 June 30 July 27 August 26 September 27 1983: April 6 June 8 July 20 August 24
	Particle Size Analysis: 1958-Present
0515	Maclaren River near Paxson - USGS Station 15291200
	Sediment Concentration and Sediment Discharge: 1958-1968, 1974-1975
	Particle Size Analysis: 1958-1967, 1974-1975
0520	Susitna River near Cantwell - USGS Station 15291500 (RM 223.0)
	Sediment Concentration and Sediment Discharge: 1962-1972 (USGS), 1980 Present (R&M)
	1980: September 5 (R&M) September 17 (R&M) October 18 (R&M) 1981: January 13 (R&M) May 20 (R&M) June 30 (R&M) August 2 (R&M) August 3 (R&M) September 15 (R&M) 1982: June 4 June 30 July 27 August 26 October 1 1983: March 2 April 6 May 17
	Particle Size Analysis: 1962-1972, 1980 Present
0525	Susitna River above Portage Creek near Gold Creek - USGS Station 624941149221500 (RM 148.9)

Index No.	Description
	Sediment Concentration and Sediment Discharge: 1977
	Particle Size Analysis: 1977
0530	Portage Creek near Gold Creek - USGS Station 625000149223500
	Sediment Concentration and Sediment Discharge: 1984
	1984: May 30 June 26 July 24 August 23
	Bedload Sediment Sampling:
	1984: May 30 June 26 July 24 September 27
0535	Indian Creek near Gold Creek - USGS Station 624718149393600
	Sediment Concentration and Sediment Discharge: 1984
	1984: May 30 June 27 July 25 August 23
	Bedload Sediment Sampling:
	1984: May 30 June 27 July 25
0540	Susitna River at Gold Creek - USGS Station 15292000 (RM 136.6)
	Sediment Concentration and Sediment Discharge: 1952-1957, 1962, 1967, 1974-Present
	1980: May 14 August 19 October 7 October 16 (R&M) 1981: January 14 (R&M) January 16

Index No.	Description
	February 12 March 24 May 27 (R&M & USGS) June 30 (R&M) June 23 July 21 July 1 (R&M) August 2 (R&M) August 3 (R&M) August 27 September 14 (R&M) 1982: January 20 March 3 March 30 June 10 (R&M) June 16 (R&M) July 1 August 19 September 16 1983: March 18 May 19 June 28 July 28 August 25 October 3
	Particle Size Analysis: 1953, 1955-1957, 1962, 1974 - Present Bedload Sediment Sampling: 1981: July 22 August 26 September 28
	After 1981, the main sediment and bedload sampling site was relocated to approximately four miles upstream from confluence at river mile 101.
	Susitna River near Talkeetna - USGS Station 15292100 (RM 101)
	Sediment Concentration and Sediment Discharge: 1984 1984: May 16 June 13 July 9 July 30 August 16 August 26 September 13 September 25

Index No.	Description

Bedload Sediment Sampling:

1982:	June 3	1983:	May 19
	June 8		May 25
	June 15		June 1
	June 22		June 8
	June 30		June 23
	July 8		July 7
	July 14		July 21
	July 21		August 2
	July 28		August 11
	August 4		August 31
	August 10		September 14
	August 18		October 6
	August 25		
	August 31		
	September 19		
1984:	May 17		
	June 13		
	July 9		
	July 30		
	August 16		
	August 26		
	September 13		
	September 25		

0545 Chulitna River near Talkeetna - USGS Station 15292400

Sediment Concentration and Sediment Discharge: 1967 - 1972, 1980 - Present

1980:	May 21	1982:	March 2
	June 3		April 8
	June 23		June 29
	July 17		
	September 1		
	September 30		
	October 22		
1981:	January 14		
	February 10		
	March 25		
	May 18		
	June 23		
	July 20		
	August 24		
	September 28		

Index No.	Description
	Particle Size Analysis: 1967-1972, 1980 - 1982 Bedload and Suspended Sediment Sampling: 1981: July 22 August 25 September 29 Bedload and suspended sediment sampling site relocated in 1982 at downstream location.
0546	Chulitna River below canyon near Talkeetna - USGS Station 15292410 Particle Size Analysis: 1982 - Present Bedload and Suspended Sediment Sampling: 1982: June 4, June 9, June 16, June 24, July 7, July 13, July 20, July 27, August 3, August 11, August 17, August 24, September 1, September 18 1983: May 19, May 25, May 31, June 2, June 9, June 22, July 6, July 20, August 2, August 9, August 31, September 13, October 5 1984: May 18, June 11, June 14, July 11, July 31, August 17, August 28, September 14, September 27
0547	Susitna River below Chulitna, Right Channel - USGS Station 15292439 (RM 97.5) Sediment Concentration and Sediment Discharge:

Index No.	Description
	1984: May 18 June 12 July 10 July 30 August 15 August 27 September 12 September 26 Bedload Sediment Sampling: 1984: May 18 June 12 July 10 July 30 August 15 August 27 September 12 September 26
0548	Susitna River below Chulitna, Left Channel - USGS Station 15292440 (RM 97.5) Sediment Concentration and Sediment Discharge: 1984: May 17 June 12 July 10 July 29 August 15 August 27 September 12 September 26 Bedload Sediment Sampling: 1984: May 17 June 12 July 10 July 29 August 15 August 27 September 12 September 26
0555	Talkeetna River near Talkeetna - USGS Station 15292700

Index No.	Description

Sediment Concentration and Sediment Discharge: 1966 - Present

1980:	January 17	1983:	March 18
	April 11		May 23
	May 15		May 26
	July 3		June 3
	August 20		June 9
	October 8		June 22
1981:	January 17		July 8
	February 11		July 18
	March 26		August 3
	May 29		August 11
	June 24		September 1
	July 22		September 12
	August 23		September 27
	September 28		October 4
1982:	June 9	1984:	May 15
	June 16		May 31
	June 23		June 13
	June 29		June 28
	July 2		July 26
	August 20		July 28
	September 17		August 16
	October 14		August 26
			September 26

Particle Size Analysis: 1966 - Present
Bedload Sediment Sampling:

1981:	July 21	1983:	May 23
	August 25		May 26
	September 29		June 3
1982:	June 2		June 9
	June 9		June 22
	June 16		July 8
	June 23		July 18
	June 29		August 3
	July 7		August 11
	July 13		September 1
	July 20		September 12
	July 28		September 27
	August 3		October 7
	August 10	1984:	May 18
	August 17		May 31
	August 24		June 13
	August 31		June 28
	September 20		July 26

Index No.	Description
	1984: July 28 August 16 August 24 August 26 September 26
0560	Susitna River at Sunshine - USGS Station 15292780 (RM 83.8)
	Sediment Concentration and Sediment Discharge: 1971, 1977, 1981 - Present
	1982: March 2 April 9 June 3 June 10 June 17 June 21 June 28 July 2 July 6 August 17 September 15 October 13
	1983: January 20 March 17 May 12 May 18 May 24 June 1 June 8 June 23 July 5 July 19 July 27 August 1 August 3 August 8 August 11 August 24 August 29 September 12 October 4
	1984: May 16 May 18 June 14 July 13 July 19 July 28 August 14 September 11 September 21 September 28
	Particle Size Analysis: 1971, 1977, 1981 - Present Bedload Sediment Sampling:
	1981: July 22 August 26 September 30
	1983: March 23 May 18 May 24

Index No.	Description
	1982: June 3, June 17, June 21, June 28, July 6, July 12, July 14, July 26, August 2, August 9, August 16, August 23, August 30, September 17 1983: June 1, June 8, June 23, July 5, July 19, August 1, August 3, August 8, August 9, August 29, September 12, October 4 1984: February 23, May 16, June 14, July 13, September 28, July 18, July 28, August 14, August 25, September 11, September 21, September 28
0561	Montana Creek near Montana - USGS Station 15292800 Sediment Concentration and Sediment Discharge: 1970-1971, 1973 Particle Size Analysis: 1970-1971, 1973
0563	Deception Creek near Willow - USGS Station 15294010 Sediment Concentration and Sediment Discharge: 1978-1981
0565	Skwentna River near Skwentna - USGS Station 15294300 Sediment Concentration and Sediment Discharge: 1967-1968, 1974-1975, 1980, 1981 1980: June 12, August 21 1981: July 13, September 11 Particle Size Analysis: 1967-1968, 1974-1975, 1980 Present

Index No.	Description

0575 Yentna River near Susitna Station - USGS Station 15294345

Sediment Concentration and Sediment

Discharge:

1981:	January 13		1983:	January 20
	April 9			June 22
	May 20			July 26
	June 11			August 10
	July 15			September 29
	August 11		1984:	May 14
	September 16			June 12
1982:	April 1			July 17
	May 18			August 15
	June 12			September 19
	July 13			
	April 1			
	May 1			
	August 11			
	October 6			

Particle Size Analysis: 1981 - Present

Bedload Sediment Sampling:

1984:	May 14
	June 12
	July 17
	August 15
	September 19

0590 Susitna River near Susitna Station - USGS Station 15294350 (RM 25.7)

Sediment Concentration and Sediment Discharge: 1975 - Present

1980:	February 12	1983:	April 5
	March 12		June 22
	June 16		July 29
	July 30		September 20
	October 10	1984:	May 18
1981:	January 13		July 18
	April 9		August 15
	May 21		September 20
	June 12		
	July 15		
	August 12		
	September 17		

Index No.	Description
	1982: April 9 May 19 June 10 June 12 July 14 August 12 October 5
	Particle Size Analysis: 1975 - Present
	Bedload Sediment Sampling:
	1984: May 17 June 13 July 18 August 15 September 20

0600 CLIMATE

Climatic data have been collected by the National Oceanic and Atmospheric Administration (NOAA), R&M Consultants (R&M), and others at a number of locations within and adjacent to the Susitna River Basin.

Climatic Data collected by NOAA appear for individual stations in one of two types of reports. The first, entitled "Local Climatological Data, Annual Summary with Comparative Data" is generally the most comprehensive and is published only for stations with over 30 years data. A list of the parameters included in this report is presented in Appendix D. The second, entitled "Annual Climatologic Summary" contains fewer parameters than the first, and a list of the parameters included in this report is presented in Appendix E. It should be noted that all of the parameters listed in the appendices for a particular report may not have actually been measured at any given station.

NOAA also publishes reports entitled "Local Climatological Data, Monthly Summaries". These reports are available for any station publishing an "Annual Summary with Comparative Data", and present most of the parameters contained in the annual summary on a daily basis, with selected parameters also presented on a 3-hour or hourly basis.

Data for stations not covered by the above reports can be obtained from NOAA reports entitled "Climatological Data" (CD's) which are published monthly and contain summary information on all climate stations in the State.

The miscellaneous wind data have been supplied by Mr. Jim Wise of the Arctic Environmental Information and Data Center, and are taken from the manuscript entitled "Wind Power Atlas". The data are listed by parameter collected. This information is footnoted in the table and listed at the end of the table.

Climate data measured at each R&M station include: air temperature, average wind speed, wind direction, peak wind gust, relative humidity, precipitation, and solar radiation. Longwave radiation is measured at Watana and Eklutna Lake. Snowfall amounts have been measured in a heated precipitation bucket, which was operated only at Watana through the spring of 1983. An accumulating precipitation gage was used during subsequent winters. A Wyoming wind shield was installed at Watana in hte fall of 1981 to reduce wind effect. Data are recorded at fifteen or thirty-minute intervals at all the stations. An evaporation pan was installed in spring of 1981 at Watana Camp and measurements are taken daily during May -September.

An attempt has been made at ordering climate stations from the upper to the lower Susitna River Basin, with R&M Stations in the upper Susitna River Basin listed first.

Climate data may be obtained through R&M Consultants.

Index Number	Station Name	Measured By	Report[1] Available	Period of Record
0610	Susitna Glacier	R&M	-	7/20/80 - Present
0618	Gracious House	NOAA	B	1959 - 1978
0620	Denali	R&M	-	7/18/80 - Present
0630	Tyone R.	R&M	-	8/27/80 - 5/13/82
0635	Vee Canyon	USBR	-	*
0640	Kosina Cr.	R&M	-	8/25/80 - Present
0650	Watana	R&M	-	4/8/80 - Present
0660	Devil Canyon	R&M	-	7/17/80 - Present
0665	Sherman	R&M	-	5/15/82 - Present
0670	McKinley Park	NOAA	B	1925 - Present
0671	Healy 1	NOAA	-	1922 - 1945
0671	Healy 2	NOAA	B	1972 - Present**
0672	Healy Power Plant I	NOAA	-	**
0673	Healy Power Plant II	NOAA	-	**
0674	Rapids	NOAA	-	**
0674.5	Trims Camp	NOAA	-	1957 - December 1979
0675	Big Delta	NOAA	A	1949 - Present**
0676	Paxson Lake	NOAA	-	1966 - 8/31/79
0676	Paxson	NOAA	A	1974 - Present

[1] NOAA Reports Available:
A Annual Summary with Comparative Data
B - Annual Climatologic Summary
* Miscellaneous Temperature Data (see p. 0600-4)
** Miscellaneous Wind Data also available (see pp. 0600-4 and 0600-5)

Index Number	Station Name	Measured By	Report[1] Available	Period of Record
0677	Gulkana	NOAA	A	1942 - Present**
0678	Summit	NOAA	A	1941 - 10/15/76**
0679	Chulitna R. Lodge	NOAA	B	1971 - Present
0680	Edgemire Lakes	NOAA	B	1971 - 2/28/81
0681	Chulitna Hwy. Camp	NOAA	B	1972 - July 1980
0682	Talkeetna	NOAA	A	1917 - Present**
0683	Willow Hwy. Camp	NOAA	B	1977 - Present
0684	Whites Crossing	NOAA	B	1971 - Present
0685	Puntilla	NOAA	B	1949 - Present
0686	Skwentna	NOAA	B	1949 - Present
0687	Palmer	NOAA	B	1950 - Present
0688	Matanuska Agricultural Exp. Station	NOAA	A	1923 - Present
0686.5	Eklutna Lake	R&M	-	6/2/82 - 12/84
0687	Anchorage	NOAA	A	1922 - Present

[1] NOAA Reports Available:
A Annual Summary with Comparative Data
B - Annual Climatologic Summary
** Miscellaneous Wind Data also available (see pp. 0600-4 and 0600-5)
* Miscellaneous Temperature data (see page 0600-5)

MISCELLANEOUS WIND DATA

Stations: Healy 2, Healy Power Plant I, Healy Power Plant II

Table containing wind speed, percent frequency and cumulative frequency at one meter per second increments. Table containing wind direction frequency in percent. Table containing wind speed and joint frequency.

Station: Rapids

Period summary by combined velocity groups (1 to 12 observations daily) covering 1935 - 1941.

Station: Big Delta

Period summary by combined velocity groups (1 to 3 observations daily) covering 1935 - 1941.

Station: Gulkana

Percentage frequency of occurrence, direction by speed groups - a summary of the data between January 1945 and November 1958.

Station: Summit

Period summary by combined velocity groups (16 observations daily) covering 1940 - 1941.

Station: Talkeetna

Period summary by combined velocity groups (16 observations daily) covering 1940 - 1941.

MISCELLANEOUS TEMPERATURE DATA

Station: Vee Canyon

Three-times daily observations made during March and April 1962 by US Bureau of Reclamation (USBR) drilling crews of temperatures and weather type. Reported in "Engineering Geology of Vee Canyon Damsite", USBR, November 1962.

Station: Chase ADF&G Fish Wheel Camp (RM 107.6)

Daily observations of air temperature and percent cloud cover. During August and September. Reported in "An Assessment Study of the Anodromous Fish Populations in the Upper Susitna Watershed. (Barrett, 1974).

MISCELLANEOUS PRECIPITATION DATA

Station: Curry at Elevation 500 feet
Daily precipitation August - October 1984

Station: Curry at Elevation 1750 feet
Cummulative station measured at two week intervals August - October 1984

Station: Sherman at Elevation 1900 feet
Precipitation data June - October 1984

Station: 4th of July Creek at Elevation 1600 feet
Cummulative station measured at two week intervals August - October 1984

Station: Gold Creek at Elevation 700 feet
Daily precipitation August - September 1984

Data from the above precipitation stations can be found in the following report.

R&M Consultants, Inc. 1984. Slough Water Balance Studies. December.

EVAPORATION DATA

Station Name	Reported by	Period of Record
Watana	R&M	5/7/81 - Present
Matanuska Agr. Exp. Sta.	NOAA	1934 - Present
McKinley Park	NOAA	1969 - Present
Palmer IAS	NOAA	1966 - Present
University Exp. Sta. (UAF)	NOAA	1940 - Present

Evaporation is read once a day and is recorded in conjunction with wind and maximum and minimum temperatures.

The evaporation data are on file at R&M or, with the exception of Watana, can be obtained directly from the National Weather Service.

0700 FREEZING RAIN AND ICING

Instrumentation for the measurement of freezing rain and in cloud icing (ice buildup on transmission lines) was installed by R&M Consultants in the Susitna River Basin in 1980. Both parameters were measured at each site until 1983. In addition, an electrically - operated ice detector and counter instrument was installed at the Watana site for a period of time. Data collected from these sites are on file at R&M Consultants according to index number and name.

Index No.	Description
0710	Denali (Susitna Lodge)
	In-cloud icing apparatus installed October 20, 1980
	Freezing rain apparatus installed November 12, 1980
	Both pieces of equipment removed September 2, 1983.
0730	Watana Camp
	In-cloud icing apparatus installed October 16, 1980
	Freezing rain apparatus installed November 12, 1980
	Ice detecter and counter apparatus installed December 5, 1980. Dismantled October 11, 1981.
	In-cloud icing and freezing rain equipment removed September 4, 1983.

0800 SNOW SURVEY

Snow depth and water equivalent data have been collected by the U.S. Soil Conservation Service (SCS), and R&M Consultants. The locations for which this information is available are listed below generally in order from the upstream end to the downstream end of the Susitna Basin.

The cross reference numbers for sites listed on the following pages correspond to map numbers as published in "Snow Surveys and Water Supply Outlook for Alaska" issued February through June by the Soil Conservation Service.

All of the data listed can be obtained from the agency responsible for the snow course or from R&M Consultants.

Index Number	Course Name	Measured By	Cross Reference Number	Years of Record Prior to 1980	Drainage Basin
0802	Cirque (*1983)	R&M	2C39	-	West Fork Gl.
0803	Ice Cave (*1983)	R&M	2C40	-	West Fork Gl.
0804	West Fork Gl.(A)	R&M	2C41	-	West Fork Gl.
0805	Crevasse (*1981)	R&M	-	-	Susitna Gl.
0806	Mt. Hayes (A)	R&M	2C42	-	Susitna Gl.
0807	Caribou	R&M	SC33	-	Susitna Gl.
0808	Malamute (*1983)	R&M	SC34	-	Susitna Gl.
0809	Mt. Deborah (*1981)	R&M	-	-	Susitna Gl.
0810	Aurora Peak (*1981)	R&M	-	-	Susitna Gl.
0811	East Fork @ 2850'	R&M	2C35	-	East Fork Gl.
0811.4	East Fork @ 3500' (*1982)	R&M	-	-	East Fork Gl.
0811.2	East Fork @ 5200' (*1983)	R&M	-	-	East Fork Gl.
0812	Pyramid	R&M	2C36	-	East Fork Gl.
0813	Jatu Pass (A)	R&M	2C37	-	East Fork Gl.
0814	Monahan Flats (A)(S)(P/*1984)	SCS	2C07	15	West Fork Gl.
0815	Denali (A)	R&M	2C44	-	Susitna River
0816	Butte Creek	R&M	2C32	-	Butte Creek
0817	Moose (*1981)	R&M	2C31	-	Butte Creek
0818	Red Fox (*1981)	R&M	-	-	Butte Creek
0819	Clearwater Lake (A) (*1982)	SCS	-	14	Maclaren River
0820	Tyone R. (A)	R&M	2C38	-	Tyone River
0821	Lake Louise (A)	SCS	2C06	15	Tyone River

(A) Indicates site with snow and/or aerial stadia marker.
(S) Indicates site with snow pillow, continuous snow fall data.
(P) Indicates site with precipitation gage.
* Indicates discontinued site. Year when discontinued noted.

Index Number	Course Name	Measured By	Cross Reference Number	Years of Record Prior to 1980	Drainage Basin
0822	Horsepasture Pass	SCS	2C15	12	Oshetna R.
0823	Kosina Cr. (A)	R&M	2C43	-	Kosina Cr.
0824	Square Lake (A)	SCS	2C13	15	Oshetna R.
0833	Fog Lakes (A)	SCS	2C14	10	Fog Cr.
0834	Watana Camp (A) (P)	R&M	2C45	-	Susitna River
0835	Devil Canyon (A)	R&M	2C16	-	Susitna River
0836	Devil Canyon (1980)	SCS	-	3	Susitna River
0837	Talkeetna R. (*1982)	SCS	-	2	Talkeetna R.
0838	Chunilna Creek	SCS	2C24	1	Talkeetna R.
0839	Talkeetna	SCS	2C12	13	Susitna River
0840	Middle Fork Iron Cr. (*1982)	SCS	-	1	Talkeetna R.
0841	Rainbow Lake (*1982)	SCS	-	2	Talkeetna R.
0842	Bald Mt. Lake (A)	SCS	2C03	15	Talkeetna R.
0843	Talkeetna R. Pass	SCS	2C22	1	Talkeetna R.
0844	Sheep River	SCS	2C19	1	Sheep River
0846	Upper Kashwitna R.	SCS	2C27	1	Kashwitna R.
0847	Kashwitna R. Cirque	SCS	2C20	1	Kashwitna R.
0848	Little Willow Cr.	SCS	2C21	1	Kashwitna R.
0849	Independence Mine	SCS	2B06	13	Little Susitna
0850	Deception Cr. (A)	SCS	2C17	1	Willow Creek
0851	Mt. Bullion (A) (*1981)	SCS	-	2	Willow Creek
0852	Capitol Site (A) (*1981)	SCS	-	2	Willow Creek
0853	Willow Airstrip	SCS	2C09	16	Willow Creek
0854	Jack River (*1982)	SCS	-	3	Tanana R.
0855	Tokositna Valley	SCS	2C30	-	Kahiltna R.
0856	Ramsdyke Cr. (A) (S)	SCS	2C29	-	Kahiltna R.
0857	Dutch Hills	SCS	2C28	-	Kahiltna R.
0858	Nugget Bench	SCS	2C10	12	Kahiltna R.

Index Number	Course Name	Measured By	Cross Reference Number	Years of Record Prior to 1980	Drainage Basin
0859	Chelatna Lake	SCS	2C04	16	Kahiltna R.
0860	Skwentna (A)	SCS	2C11	12	Yentna R.
0861	Alexander Lake (A)	SCS	2003	16	Yentna R.
0862	Haggard Cr. (A)	SCS	2003	14	Copper R.
0863	St. Anne Lake (A)	SCS	2004	15	Copper R.

(A) Indicates site with snow course and/or aerial stadia marker.
(S) Indicates site with snow pillow. Continuous snow fall data.
(P) Indicates site with precipitation gage.
* Indicates discontinued site. Year when discontinued noted.

0900 SNOW CREEP

Instrumentation for measuring the effect of snow creep forces on transmission line towers was installed by R&M Consultants during the winter of 1980-81. Two locations were chosen along the proposed transmission line route, a southfacing slope on Tsusena Butte above Watana Camp and a northfacing slope near Devil Canyon.

Some previous research on snow creep was done by the U.S. Army Corps of Engineers in 1974, reported in the following paper:

> Snow Creep Investigations in Southeast Alaska; Meyer, Robert. Alaska District, Army Corps of Engineers.

0920 NEAR WATANA

0940 NEAR DEVIL CANYON

Installed February 25, 1981

(Station destroyed December 1981)

1000 FREEZEUP RIVER ICE OBSERVATIONS

Field observations of the freezeup of the Susitna River were taken at regular intervals starting in October 1980. A specific reach of the river was studied on the listed dates. Observations were on the ground or aerial. All observations were thoroughly photo-documented. Condition and locations of the ice cover were noted and during the latter years of the program, much quantitative information was obtained on a continuous basis during the freezeup period. More information on the types of data collected are contained in the R&M Consultants Ice Studies Reports 1980-1984, 4 volumes.

Observers were all from R&M Consultants unless noted otherwise. All this information is on file and may be obtained from R&M Consultants.

Index Number	Date	Area of Ice Observations	Observers
1010	10/12/80	Lower Susitna	B. Drage, J. Coffin
1011	10/13/80	Oblique aerial photographs from Talkeetna to Devil Canyon	B. Drage, L. Grifiths
1012	10/16 - 10/17/80	Yentna River to Susitna Glacier	T. Lavender, (Acres) B. Drage
1013	10/31 - 11/1/80	Talkeetna to Vee Canyon	J. Coffin
1014	11/2 - 11/3/80	Talkeetna to Oshetna River	J. Coffin
1015	11/4/80	Oblique aerial photos with discontinuous coverage from Talkeetna to Devil Canyon	L. Griffiths, L. , Nicholson, H. Tomingas
1016	11/11/80	Parks Hwy. Bridge to Kosina Cr.	B. Drage, J. Coffin
1017	11/14/80	Vertical aerial photography from Alexander Creek to Devil Creek	J. Coffin, B. Butera
1018	11/19 - 11/20/80	Willow Creek to Watana	J. Coffin
1019	11/29/80	Cook Inlet to Kosina Cr.	B. Drage
1020	12/1 - 12/3/80	Talkeetna to Tyone River	J. Coffin
1021	12/2 - 12/3/80	Survey of ice cover formation Talkeetna to Devil Creek	B. Drage, L. Griffiths

Index Number	Date	Area of Ice Observations	Observers
1022	12/4 - 12/5/80	Talkeetna to Tyone River	J. Coffin
1023	12/5/80	Vertical aerial photography from Cook Inlet to Watana Creek	L. Griffiths, R. Mourtsen
1024	12/8/80	Survey of ice cover formation between Curry & Sherman	L. Griffiths, B. Butera
1025	12/12/80	Survey of ice cover formation near Gold Creek	L. Griffiths, B. Butera
1026	10/2/81	Talkeetna to Tyone	C. Schoch, L. Fotherby
1027	10/6/81	Cook Inlet to Watana	J. Coffin, B. Butera
1028	10/29/81	Cook Inlet to Curry	S. Bredthauer, L. Fotherby
1029	11/3/81	Talkeetna to Watana	J. Coffin, C. Schoch
1030	11/6/81	Cook Inlet to Watana	B. Butera, L. Fotherby
1031	11/18/81	Cook Inlet to Watana	C. Schoch, B. Butera
1032	12/2/81	Tsusena Creek to Tyone	C. Schoch, B. Butera
1033	12/14/81	Talkeetna to Watana	C. Schoch
1034	10/10/82	Talkeetna To Deadman Cr.	C. Schoch
1035	10/19/82	Talkeetna to Devil Canyon	C. Schoch
1036	10/21/82	Talkeetna to Devil Canyon	C. Schoch
1037	10/26/82	Susitna Mouth to Devil Canyon	C. Schoch
1038	10/29/82	Susitna Mouth to Devil Canyon	C. Schoch
1039	11/1/82	Talkeetna to Devil Canyon	C. Schoch
1040	11/2/82	Sunshine to Devil Canyon	C. Schoch
1041	11/9/82	Talkeetna to Devil Canyon	C. Schoch
1042	11/10/82	Talkeetna to Kosina Creek	J. Coffin

Index Number	Date	Area of Ice Observations	Observers
1043	11/17/82	Talkeetna to Devil Canyon	C. Schoch
1044	11/22/82	Talkeetna to Gold Creek	B. Butera, L. Fotherby
1045	12/10/82	Sherman to Watana	B. Jokela, L. Fotherby
1046	12/15/82	Talkeetna to Devil Canyon	C. Schoch
1047	12/30/82	Talkeetna to Devil Canyon	C. Schoch
1048	12/22/82	Talkeetna To Watana	B. Butera, L. Fotherby
1049	1/11/83	Talkeetna to Watana	S. Bredthauer, B. Butera
1050	1/20/83	Talkeetna to Watana	B. Jokela, C. Larson
1051	12/4/82	Talkeetna to Vee Canyon	T. Lavender (Acres), W. Dyock (Acres), C. Schoch
1052	10/5 - 10/8/83	Talkeetna to Denali	C. Schoch, S. Bredthauer
1053	10/17/83	Talkeetna to Jay Creek	C. Schoch
1054	10/21/83	Cook Inlet to Gold Creek	C. Schoch, Tom Stuart (H-E)
1055	10/25/83	Cook Inlet to Talkeetna	C. Schoch
1056	10/27/83	Gold Creek to Cook Inlet	C. Schoch
1057	11/1/83	Talkeetna to Alexander	C. Schoch
1058	11/16 - 11/17/83	Talkeetna to Denali	J. Coffin
1059	11/21/83	Montana Creek to Devil Canyon	J. Coffin
1060	11/1 - 12/1/83	Cook Inlet to Gold Creek	C. Schoch
1061	12/5/83	Chulitna Confluence	C. Schoch
1062	12/12/83	Chulitna Confluence	C. Schoch

Index Number	Date	Area of Ice Observations	Observers
1063	12/21/83	Talkeetna to Gold Creek	C. Schoch
1064	12/28/83	Talkeetna to Portage Creek	C. Schoch, S. Bredthauer
1065	1/5/84	Talkeetna to Gold Creek	C. Schoch, L. Story
1066	1/23 - 1/27/84	Cook Inlet to Gold Creek	C. Schoch, L. Story
1067	10/19/84	Denali to Cook Inlet	C. Schoch
1068	10/22/84	Cook Inlet to Gold Creek	C. Schoch
1069	10/23/84	Cook Inlet to Talkeetna	C. Schoch, S. Bredthauer
1070	10/26/84	Cook Inlet to Talkeetna	C. Schoch
1071	10/30/84	Talkeetna to Cook Inlet	C. Schoch
1072	11/03/84	Denali to Susitna Station	C. Schoch
1073	11/11/84	Talkeetna to Yentna River	C. Schoch
1074	11/14/84	Talkeetna to Delta Islands	C. Schoch, D. Calkins, H.T. Shen, W. Coleman, N. Paschke
1075	11/15/84	Talkeetna to Watana	
1076	11/19/84	Gold Creek to Delta Islands	C. Schoch
1077	11/21/84	Gold Creek to Sunshine	C. Schoch
1078	11/27/84	Denali to Talkeetna	C. Schoch
1079	12/06/84	Talkeetna to Gold Creek	C. Schoch
1080	12/11/84	Talkeetna to Sunshine	C. Schoch
1081	12/21/84	Talkeetna to Gold Creek	C. Schoch
1082	01/02/85	Talkeetna to Delta Islands	C. Schoch
1083	01/03/85	Talkeetna to Denali	C. Schoch
1084	01/22/85	Talkeetna to Gold Creek	C. Schoch

1100 WINTER RIVER ICE OBSERVATIONS

Field observations of ice cover conditions on the Susitna River were carried out by R&M personnel through the winter months during the period after freeze-up and prior to spring breakup. Photographs and other field observations document the extent of ice cover, stability, ice thickness, location of open water areas in the main channel and general characteristics of the channel. The results of this work have been used in hydraulic and ice studies for computer simulations of pre-project and predicted post-project conditions at low flow, and also in Environmental Studies to assess potential impacts of regulated flow. For detailed descriptions of each years ice program, consult the respective R&M Consultants Ice Study Report.

All of the information collected during winter field trips is on file at R&M Consultants.

Index Number	Date	Area of Ice Observations	Observers
1110	12/30/80	Talkeetna to Watana	J. Coffin
1111	1/6/81	Talkeetna to Watana	J. Coffin
1112	1/8/81	Watana to Tyone River	J. Coffin
1113	1/12 - 1/13/81	Talkeetna to Vee Canyon	J. Coffin, L. Griffiths
1114	2/27/81	Measurement of ice thickness and competence at all Crest-Stage Recorder locations except Section 25 and Susitna-Chulitna Confluence	J. Coffin R. Butera C. Schoch
1114.5	3/5/81	Talkeetna to Portage Creek	J. Coffin C. Schoch
1115	3/6/81	Sherman to Talkeetna	J. Coffin C. Schoch
1116	3/16/81	Talkeetna to Denali	C. Schoch

Index Number	Date	Area of Ice Observations	Observers
1117	3/24/81	Talkeetna to Watana Camp	J. Coffin
1118	3/31 - 4/2	Talkeetna to Denali	J. Coffin C. Schoch
1119	4/1/81	Measurement of ice thickness at Watana stream gage site	J. Coffin G. Claggett (SCS) C. Schoch
1120	4/13 - 4/14/81	Devil Canyon Survey of ice, water surface, water velocities, and bottom profile	J. Coffin R. Butera C. Schoch
1121	1/4 - 1/7/82	Talkeetna to Glaciers	S. Bredthauer J. Coffin
1122	2/3/82	Talkeetna to Glaciers	S. Bredthauer R. Butera
1123	3/10/82	Talkeetna to Watana Camp	R. Butera L. Fotherby
1124	2/3 - 2/5/83	Talkeetna to Denali	C. Schoch, B. Jokela
1125	2/14/83	near Alexander, tidal influence on river water salinity	C. Schoch, J. Martinisko
1126	3/2/83	Talkeetna to Denali	C. Schoch
1127	4/11 - 4/13/83	Talkeetna to Watana	C. Schoch, L. Fotherby
1128	2/22/84	Talkeetna to Watana	C. Schoch
1129	2/23/84	Watana to Kosina	C. Schoch
1130	4/10/84	Talkeetna to Watana	C. Schoch

1200 BREAKUP RIVER ICE OBSERVATIONS

Observations were made by R&M personnel during spring breakup on the Susitna River to assess the nature of ice cover breakup, position of ice jams in the channel, extent of flooding upstream of these ice jams, quantity and significance of ice floes and general decay of the ice cover. The information collected will be used for hydraulic and ice studies, as outlined in Subtask 3.06 of the Plan of Study. For detailed descriptions of each years ice study and the data collected refer to the respective R&M Consultants Ice Study Report.

All information collected during field trips is on file at R&M Consultants.

Index No.	Date(s)	Description	Observers
1201	4/13/81	Pre-breakup observations of ice cover condition between Talkeetna and Deadman Creek.	J. Coffin
1205	4/18 - 5/7/81	Summary of breakup observations and measurements by Leon Dick at Deshka - Susitna confluence.	Leon Dick
1210	4/23/81	Reconnaissance from the Deshka River (Kroto Creek) to Devil Creek and water level measurements at Chase crest gage and Gold Creek.	B. Drage L. Griffiths
1215	4/27/81	Aerial reconnaissance of the river from Anchorage to Vee Canyon.	J. Coffin T. Lavender (Acres)
1216	4/27/81	Vertical 35 mm aerial photography from Bell Island to Watana Creek	L. Griffiths R. Mourtsen
1217	4/29/81	Reconnaissance from Kosina Creek to Tsusena Creek and water level measurements taken at selected sites between Talkeetna and Watana Creek.	J. Coffin T. Lavender (Acres)
1219	4/30/81	Summary of trip from Talkeetna to Gold Creek with Glenn Valentine of the Alaska Railroad.	L. Griffiths
1220	4/30 - 5/1/81	Reconnaissance from Talkeetna and Denali.	C. Schoch R. Butera

Index No.	Date(s)	Description	Observers
1221	5/1/81	Reconnaissance Yentna-Susitna confluence to River mile 144 (downstream of Portage Creek) with survey of water levels at selected sites.	B. Drage L. Griffiths
1223	5/2/81	Reconnaissance from the Yentna River confluence to Devil Canyon with surveys of water levels at selected sites.	B. Drage L. Griffiths
1225	5/3/81	Reconnaissance from Yentna River confluence to Devil Canyon with survey of water levels in the vicinity of Gold Creek.	L. Griffiths
1227	5/4/81	Reconnaissance from Talkeetna to Devil Canyon with survey of water levels at selected sites.	L. Griffiths
1229	5/5/81	Reconnaissance from the Parks Highway Bridge to Devil Canyon with survey of water levels at selected sites.	L. Griffiths H. Tomingas
1231	5/6/81	Reconnaissance from the Parks Highway Bridge to above the Indian River with survey of water levels at selected sites.	H. Tomingas
1230	5/6/81	Vertical 35 mm aerial photography from Bell Island to Curry	L. Griffiths R. Mourtsen
1232	5/7/81	Reconnaissance from Talkeetna to Gold Creek with survey of water levels at selected sites.	H. Tomingas
1233	5/7/81	Reconnaissance from Watana to Denali, tracing leads and overflows.	C. Schoch
1235	5/8/81	Reconnaissance from the mouth of the Susitna River to the Tyone River confluence.	J. Coffin G. Krishnan (Acres)
1236	4/12/82	Talkeetna to Tyone River	L. Fotherby J.B. Jokela

Index No.	Date(s)	Description	Observers
1237	4/26/82	Talkeetna to Cook Inlet	L. Fotherby
1238	5/10/82 & 5/15/82	Talkeetna to Denali	R. Butera L. Fotherby
1239	5/27/82	Talkeetna to Watana	C. Schoch
1240	4/27 - 4/28/83	Talkeetna to Watana	C. Schoch
1241	4/30 - 5/10/83	Continuous on the ground and aerial documentation of breakup processes	C. Schoch
1242	5/3/83	Talkeetna to Montana Creek	J. Coffin
1243	4/10 - 5/10/83	Susitna Station - continuous breakup observations	Barb Hawley Butch Hawley
1244	4/10 - 5/10/83	Deshka River - continuous breakup observations	Leon Dick
1245	4/26/84	Gold Creek to Susitna Station	C. Schoch
1246	4/30/84	Talkeetna to Alexander	C. Schoch
1247	5/3/84	Gold Creek to Alexander	C. Schoch

1300 AERIAL PHOTOGRAPHY

This section includes a listing of vertical aerial photography, both low altitude and high altitude, that has been flown over part or all of the Susitna River Basin.

For each set of photographs, the table shows the date of photography, area of coverage, scale and location of the negatives. The approximate segment of river covered is also indicated, referenced to river miles in the Susitna River Mile Index (R&M, 1982). An agency list with addresses follows the table. More detailed information concerning precise area of coverage and availability of photographs can be obtained through these agencies.

1300 AERIAL PHOTOGRAPHY

Index No.	Date	Area	Scale	BW or Color	Contracting Agency	Loc. of Negs.	Approximate River Miles	Susitna Discharge* (cfs)
1310	1949-51	Susitna River Basin - Cook Inlet to Devil Canyon	1:40000	BW	USCE	EROS		
1311	1951-54	Denali Highway - West from Maclaren River	1:40000	BW	USCE	EROS		
1312	1951-54	Yentna River - Chelatna Lake	1:40000	BW	USCE	EROS		
1313	1951	Talkeetna	1:40000	BW	USCE	EROS		
1314	1961-62	Cook Inlet to Willow East of Susitna River	1:15840	BW	ADL	ADL		
1315	1961-62	Cook Inlet, Mt. Yenlo West of Susitna River	1:20000	BW	BLM	BLM		
1316	8/31/62	Delta Islands	1:20000	BW	BLM	BLM		
1316.1	8/31/62	Mouth to Alexander Slough head	1:20000	BW	BLM	BLM	1-20	
1316.2	9/4/62	Fog Lakes	1:14600	?	BLM	BLM		G.C. = 31,000
1316.3	9/4/62	Clarence Lake	1:16000	?	BLM	BLM		G.C. = 31,000
1316.4	9/4/62	Oshetna River Mouth	1:20000	BW	BLM	BLM	229-240	G.C. = 31,000
1317	1962	Talkeetna	1:20000	BW	ADL	ADL		
1318	1962-63	Susitna Valley	1:15840	BW	ADL	ADL		
1318.1	9/2/63	Gold Creek airstrip	1:3000	BW	BLM	BLM		
1318.5	8/26/64	Park Highway Bridge	1:10000	BW	BLM	BLM	83-85	
1320	1968	Upper Susitna Valley, Chulitna River	1:15840	BW	ADL	ADL		
1321	9/24/68	Curry Airstrip	1:3600	?	BLM	BLM		
1324	7/9/71	Talkeetna Village airstrip	1:3600	?	BLM	BLM		
1325	1972	Lake Louise Area	1:24000	C	SDP	ADL		
1330	7/1/74	Deadman Creek to Portage Creek	1:30000	BW	DOT	NPAS		G.C. = 17,100
1330.1	8/10/74	Talkeetna FAA airstrip	1:3600	?	BLM	BLM		
1330.2	8/10/74	Talkeetna Village airstrip	1:3600	?	BLM	BLM		
1330.3	8/10/74	Montana Creek Mouth	1:16800	C	BLM	BLM	75-78	
1330.4	8/10/74	Caswell Creek Mouth	1:16800	C	BLM	BLM	60-63	

1300 AERIAL PHOTOGRAPHY (Continued)

Index No.	Date	Area	Scale	BW or Color	Contracting Agency	Loc. of Negs.	Approximate River Miles	Susitna Discharge* (cfs)
1330.5	8/28/74	Alexander, Alexander Creek	1:4200	BW	BLM	BLM		
1330.8	9/27/74	Gold Creek to Watana Creek, then above Denali Highway	1:60000	C	USCE	NASA	135-200,290+	G.C. = 13,900
1330.9	9/27/74	Gold Creek to Watana Creek, then above Denali Highway	1:60000	C-IR	USCE	NASA	135-200,290+	G.C. = 13,900
1331	1974	Susitna River Basin	1:500000	BW	NASA	EROS		
1332	7/6/75	Cook Inlet to Talkeetna	1:63360	BW	CSSC	NPAS	1-98	G.C. = 26,500 S.S. = 130,000
1332.5	10/7/75	Includes Gold Creek (?)	1:60000	BW	USCE	?		G.C. = 8,500
1333	1976	Willow Basin	1:24000	BW&C	CSSC	ADL		
1333.3	5/25/76	Alexander, Alexander Creek	1:16800	BW	BLM	BLM		S.S. = 64,000
1333.4	5/25/76	Alexander, Alexander Creek	1:3000	BW	BLM	BLM		S.S. = 64,000
1333.5	6/15/76	Maclaren Glacier airstrip	1:3600	?	BLM	BLM		
1333.7	9/23/76	Talkeetna, Talkeetna River	1:4800	C	USCE	NPAS		
1333.8	9/23/76	Talkeetna, Talkeetna River	1:2400	BW	USCE	NPAS		
1334	1976-79	Susitna River Basin	1:500000 1:1000000	BW BW	NASA NASA	EROS EROS		
1334.5	6/19/77	Willow to Gold Creek	1:60000	C-IR	BLM	NASA	45-137	G.C. = 41,000 S.S. = 182,000
1335	7/28/77 7/29/77	Susitna River, Gold Creek to Glaciers	1:120000	C-IR	BLM	BLM	136-320?	G.C. = 19,700 G.C. = 19,900
1335.2	6/19/77	Willow to Gold Creek	1:60000	C-IR	BLM	NASA	45-137	G.C. = 41,000 S.S. = 182,000
1335.3	10/11/77	Deception & Willow Creeks	1:2400	BW	USCE	NPAS		
1335.4	10/11/77	Deception & Willow Creeks	1:18000	BW	USCE	NPAS		
1335.9	6/9/78	Devil Canyon Damsite	1:12000	BW	USCE	NPAS	145-160	G.C. = 19,500
1336	6/10/78	Watana Damsite area	1:18000	BW	USCE	NPAS	181-189	G.C. = 21,100
1336.1	6/10/78	Watana Damsite area	1:12000	BW	USCE	NPAS	181-189	G.C. = 21,100
1336.2	6/10/78	Watana Damsite area	1:24,000	BW	USCE	NPAS	181-189	G.C. = 21,000
1337	1978	Susitna River	1:72000	BW	USCE	NPAS		
1338	4/8/79 8/25/78	Susitna River Cook Inlet to Talkeetna	1:60000 1:120000	C-IR BW	BLM BLM	NASA NASA		S.S. = 6,500 S.S. = 79,600
1338.1	8/25/78	Devil Canyon Reservoir	1:120000	?	BLM	NASA		G.C. = 11,800

1300 AERIAL PHOTOGRAPHY (Continued)

Index No.	Date	Area	Scale	BW or Color	Contracting Agency	Loc. of Negs.	Approximate River Miles	Susitna Discharge* (cfs)
1338.2	8/25/78	Watana Dam Access, Deadman Creek	1:20000	C	BLM	BLM	181-183	G.C. = 11,800
1339	8/11/80	Upper Susitna River Basin	1:60000	C-IR	BLM	NASA	124-180	G.C. = 22,600
1339.1	8/1/80	Parks Hwy Bridge to Sherman	1:120000	BW	BLM	NASA	83-135	G.C. = 31,100
1339.2	8/1/80	Parks Hwy Bridge to Sherman	1:60000	C-IR	BLM	NASA	83-135	G.C. = 31,100
1340	7/19/80	Devil Canyon Reservoir	1:24000	C	R&M	NPAS	148-186	G.C. = 35,800
1341	7/19/80	Watana Reservoir	1:24000	C	R&M	NPAS	181-248	G.C. = 35,800
1342	7/19/80	Alternative Access Corridor - Susitna	1:24000	C	R&M	NPAS	131-187	G.C. = 35,800
1342.9	8/23/80	Alternative Access Corridor	1:24000	C	R&M	NPAS		
1343	8/24/80	Lower Susitna River	1:48000	BW	R&M	NPAS		G.C. = 18,000 S.S. =119,000
1343.1	9/4/80	Alternative Access Corridor	1:24000	C	R&M	NPAS	182-185	G.C. = 10,900
1344	11/14/80	Susitna River - Delta Islands to Watana Creek (35mm - river freeze-up)	1:60000	BW	R&M	R&M	45-162	G.C. = 3,100 S.S. = 14,000
1345	12/5/80	Susitna River - Cook Inlet to Watana Creek (35mm - river frozen)	1:24000	BW	R&M	R&M	1-194	Ice effects @ gages
1346	4/27/81	Susitna River - Bell Island to Watana Creek (35mm - river frozen)	1:24000	BW	R&M	R&M	15-194	Ice - covered
1346.5	1981	South Intertie - Willow to Healy and up Chulitna River, without photo panels (various flight lines on various dates: 4/30,5/12,5/13,5/29,5/30, 5/31).	1:12000	BW	COM	NPAS	50-138	
1347	5/6/81	Susitna River - Bell Island to Curry (35mm - river breakup)	1:24000	BW	R&M	R&M	15-120	G.C. = 10,000 S.S. = 70,000
1348	5/6/81	South Intertie - Pt. Mackenzie to Willow	1:30000	BW	R&M	NPAS		G.C. = 10,000 S.S. = 70,000
1349	5/12/81	North Intertie - Healy to Fairbanks	1:30000	BW	R&M	NPAS		N/A
1350	5/26/81	Alternative Access Corridors	1:24000	C	R&M	NPAS	131-143	G.C. = 13,800
1351	5/26/81	East-west intertie	1:24000	C	R&M	NPAS	135-153	G.C. = 13,800

1300 AERIAL PHOTOGRAPHY (Continued)

Index No.	Date	Area	Scale	BW or Color	Contracting Agency	Loc. of Negs.	Approximate River Miles	Susitna Discharge* (cfs)
1351.4	1981	South Intertie - Willow to Healy and up Chulitna River, with photo panels (various flight lines on various dates: 6/10,6/11, 6/13,6/16,6/17,7/2).	1:12000	BW	COM	NPAS	50-138	
1351.6	6/23/81	South Intertie - Point MacKenzie to Healy	1:30000	BW	COM	NPAS	50-138	G.C. = 17,500 S. = 51,400 S.S. = 117,000
1352	8/24/81	Susitna River - Cook Inlet to Devil Canyon (For Vegetation Studies)	1:36,000	C	R&M	TES		G.C. = 35,000 S. = 74,700 S.S. = 130,000
1352.5	10/2/81	Little Willow Creek to Talkeetna	1:12000	C	USCE	APT	52-102	S.S. = 32,000
1352.6	10/2/81	Susitna Station	1:4800	C	USCE	APT	25-27	S. = 18,500 S.S. = 32,000
1352.7	10/10/81	Alexander Creek Mouth	1:4800	C	USCE	APT	10	S.S. = 25,000
1353	10/19/81	Susitna River - Cook Inlet to Talkeetna, 5 miles up Chulitna, 5 miles up Upper Susitna (For Definition of Low Water Channel) (35mm - river freeze-up)	1:60,000	BW	R&M	R&M	1-105	G.C. = 6,810 S. = 15,000 S.S. = 30,700
1354	4/26/82	Susitna River - Talkeetna to Watana. Three sets of photos; morning, noon, evening. (For Shadow Study)	1:12000	BW	R&M	NPAS	97-187	Ice - covered
1355	5/31/82	Susitna River - selected locations between Kashwitna and Devil Canyon (for Slough Studies)	1:4800	BW	R&M	NPAS		G.C. = 21,000 S. = 41,700 S.S. = 110,000
1356	5/31/82	Alternate Access Corridors Band Between Sherman and Watana (Portage Access Route)	1:24,000	BW	R&M	NPAS	145-154	G.C. = 21,000 S. = 41,700 S.S. = 110,000
1357	6/1/82	Susitna River - Talkeetna to Devil Canyon (For Slough Studies)	1:12,000	BW	R&M	NPAS	98-153	G.C. = 23,000 S. = 49,000 S.S. = 120,000
1357.1	6/25/82	Parks Highway Bridge	1:12,000	BW	USCE	APT	83-84	S. = 66,700
1357.2	6/25/82	Delta Island (partial) and west of Susitna to above Chulitna confluence	1:12,000	C	USCE	APT	42-56	S. = 66,700 S.S. = 112,000

1300 AERIAL PHOTOGRAPHY (Continued)

Index No.	Date	Area	Scale	BW or Color	Contracting Agency	Loc. of Negs.	Approximate River Miles	Susitna Discharge* (cfs)
1357.3	7/19/82	Kroto Slough and Kroto Creek (Deshka River)	1:12,000	C	USCE	APT	35-41	S. = 61,500 S.S. = 107,000
1357.7	8/3/82	Cook Inlet to Talkeetna	1:120,000	BW	BLM	NASA	0-100	S. = 56,400 S.S. = 116,000
1357.8	8/3/82	Cook Inlet to Talkeetna	1:60,000	C-IR	BLM	NASA	0-100	S. = 56,400 S.S. = 116,000
1358	8/19/82	Assorted Sloughs	1:4800	BW	R&M	NAPAS		G.C. = 13,300 S. = 40,700 S.S. = 138,000
1358.1	8/22/82	Alternate Access Corridors	1:24000	BW	R&M	NPAS	144.5-146.5	G.C. = 12,200
1358.5	10/20/82	Assorted Sloughs	1:4800	BW	ADF&G	NPAS		G.C. = 6,800±
1359	11/17/82	Susitna River - Sunshine to Devil Canyon	1:12,000	BW	R&M	APT		Partially ice covered
1360	12/23/82	Susitna River - Sunshine to Devil Canyon	1:12,000	BW	R&M	APT		Partially ice covered G.C. = 2,900 S. = 5500
1361	3/2/83	Talkeetna to Devil Canyon (for winter ice conditions)	1:12000	BW	R&M	APT	98-153	Ice covered
1362	8/27/83	Cook Inlet to Talkeetna	1:24000	BW	R&M	APT	0-102	S. = 59,100 S.S. = 87,200
1363	9/6/83	Cook Inlet to Talkeetna	1:24000	BW	R&M	APT	0-102	S. = 36,600 S.S. = 66,200
1363.5	9/6/83	Talkeetna to Devil Canyon	1:12000	BW	R&M	APT	98-150+	G.C. = 16,000
1364	9/11/83	Talkeetna to Devil Canyon	1:12000	BW	R&M	APT	98-150+	G.C. = 12,200
1365	9/16/83	Cook Inlet to Talkeetna	1:24000	BW	R&M	APT	0-102	S. = 21,100 S.S. = 48,900
1366	10/8/83	Talkeetna to Devil Canyon	1:12000	BW	R&M	APT	98-150	G.C. = 7,560
1366.5	10/8/83	Chulitna River - lowest 20 miles	1:12000	BW	R&M	APT	C0-C20±	
1367	10/25/83	Cook Inlet to Talkeetna	1:24000	BW	R&M	APT	0-102	S. = 13,900 S.S. = 26,000

1300 AERIAL PHOTOGRAPHY (Continued)

Index No.	Date	Area	Scale	BW or Color	Contracting Agency	Loc. of Negs.	Approximate River Miles	Susitna Discharge* (cfs)
1368	8/27/84	Cook Inlet to Talkeetna	1:24000	BW	R&M	APT	0 - 101	G.C.= 28,000 S. = 75,200 S.S.= 142,000
1369	9/9/84	Talkeetna to Devil Canyon	1:12000	BW	R&M	NPAS	101 - 144	G.C.= 10,600
1370	10/4/84	Talkeetna To Devil Canyon	1:12000	BW	R&M	NPAS	101 - 144	G.C.= 7,400
1371	10/14/84	Talkeetna to Devil Canyon	1:12000	BW	R&M	NPAS	101 - 144	G.C.= 5,100
1372	11/4/84	Cook Inlet to Curry	1:24000	BW	R&M	APT	0 - 121	G.C.= 2,300

* From USGS streamflow records: G.C. = Gold Creek, S.S. = Susitna Station, and S. = Sunshine.

COMMENTS

(1) Preliminary values
(2) Approximate discharge
(3) Photography done by APT. Printing done and negatives held by NPAS

Parenthesis around "X's" indicate partial photographic coverage of the slough.

Contracting agency abbreviations:

ADF&G - Alaska Department of Fish & Game, Anchorage
BLM - Bureau of Land Management, Anchorage
CSSC - Capital Site Selection Committee, Anchorage
DOT - Alaska Department of Transportation, Anchorage
R&M - R&M Consultants, Inc., Anchorage
USCE - U.S. Corps of Engineers, Anchorage

Photographing agency abbreviations:

APT - Air Photo Tech, Inc., Anchorage
BLM - Bureau of Land Management, Anchorage
NASA - National Aero and Space Administration, Washington D.C.
NPAS - North Pacific Aerial Surveys, Inc., Anchorage
R&M - R&M Consultants, Inc., Anchorage

Scale - The number of inches on the ground represetend by 1 inch on the photo.

Mean Daily Discharge - Flow at the gaging station, obtained from USGS. For periods of no record at the Sunshine gage the flow is estimated by summing the flows in the three tributaries (Chulitna, Talkeetna, and Susitna River at Gold Creek) and adding 10%.

AERIAL PHOTOGRAPHY
AGENCY LIST

State of Alaska (ADL)
Division of Forest, Land and Water Management
3601 "C" Street
Anchorage, Alaska 99503

Air Photo Tech, Inc. (APT)
2013 Merrill Field Dr.
Anchorage, Alaska 99501

U.S. Department of Interior (BLM)
Bureau of Land Management
Federal Building
701 "C" Street
Anchorage, Alaska 99501

Gilbert-Commonwealth, Inc. (COM)
3601 "C" Street
Anchorage, Alaska 99503

Capital Site Selection Committee (CSSC)

State of Alaska (DOT&PF)
Highways
Planning & Research
P.O. Box 589
Douglas, Alaska 99824

North Pacific Aerial Surveys (NPAS)
4241 "B" Street
Anchorage, Alaska 99501

R&M Consultants, Inc. (R&M)
P.O. Box 6087
Anchorage, Alaska 99502

Soil Conservation Service (SCS)
U.S. Department of Agriculture
Federal Center Building
Hyatteville, Maryland

State of Alaska
Division of Parks (SDP)
619 Warehouse Drive
Anchorage, Alaska 99501

Terrestrial Environmental Specialists (TES)
2207 Spenard Rd.
Anchorage, Alaska 99503

U.S. Army Corps of Engineers (USCE)
Alaska District
P.O. Box 7002
Anchorage, Alaska 99510

U.S. Geological Survey (EROS and NASA)
EROS Data Center
Sioux Falls, SD 57198

1400 HYDROGRAPHIC SURVEYS

Data on river channel morphology and floodplain characteristics have been collected by R&M Consultants from parts of the Susitna River.

Precise location, date of cross-section survey, plot showing channel geometry, calculated hydraulic parameters and general descriptions of each cross-section site are available for the river reach between Talkeetna and Portage Creek. In addition, longitudinal streambed profiles of the main channel thalweg have been run from Talkeetna to Portage Creek. Miscellaneous cross-sections have also been surveyed near access points to the Lower Susitna River (i.e. below Talkeetna).

Channel cross-sections from fresh water sloughs adjacent to the Susitna River have been surveyed by Alaska Department of Fish and Game during 1976. This data has been included as part of Appendix C and therefore has not been listed again in this section.

All of the data in this section are on file at R&M according to index number and location.

Index No.	Dates	Location	Description
1409	1976	Susitna River	Cross-sections surveyed by ADF&G
1410	10/4 - 11/19/80	Talkeetna to Portage Creek	62 cross-sections defining river floodplain and channel geometry
1411	10/11/80	LRX - 18 at river mile 106 to Talkeetna	longitudinal profile of main channel thalweg
1412	10/26 - 10/27/80	Portage Creek to LRX - 18	longitudinal profile of main channel thalweg
1413	3/3 - 3/26/81	Devil Creek to Deadman Creek	23 cross sections defining river floodplain & channel geometry
1414	5/21/81	Portage Creek to Devil Canyon	6 cross sections defining river floodplain & channel geometry
1415	9/22 9/26/81	Access channels to Susitna River below Talkeetna	8 cross sections to assess the effects of controlled river discharge on navigation on the Susitna River

Index No.	Dates	Location	Description
1416	7/8 - 9/20/82	Tributary stability analyses	19 profiles and cross sections on selected Susitna tributaries to assess the potential of stream channel perching.
1417	7/8 - 9/20/82	Selected slough and side channels from Portage Cr. to Talkeetna	68 cross sections defining slough morphology and flow regimes.
1418	7/8 - 9/20/82	Main channel cross sections from the 3 rivers confluence area to Sherman	35 cross sections to assist in refining the HEC-2 model of the Susitna River. Cross sections include re-surveying LRX 1, 2 and 3, and adding 12 new sections below the Chulitna confluence.
1419	9/11 - 9/28/84	10 new cross section and 3 re-surveyed sections between the Chulitna confluence and the Yentna confluence	Re-surveyed LRX 1, 2, and 0.3. New sections at RM 40, 47.8, 59.7, 76.8, 84.6, 86.3, 87.8, 90.0, 91.7, and 95.8. Data was required for ice and aggradation modelling.
1420	6/26 - 6/29/85	5 new cross sections between Talkeetna and Parks Highway Bridge.	Now sectinos at RM 85.4, 85.8, 86.6, 89.1 and 92.3.

1500 GLACIAL OBSERVATIONS

Glacial studies were begun by R&M Consultants and the University of Alaska during 1981. The objective of this program is to identify any problems peculiar to the existence of glaciers in the Susitna Basin. This study assessed whether significant changes in water or sediment yield could occur or if potential lake dumps exist and is oriented toward a long-term glacial observation and study program.

Data were gathered on all major glaciers of the Upper Susitna Basin with the exception of the Eureka and Oshetna Glaciers. Study of the Eureka Glacier was limited to visual observations and aerial photography. The Oshetna Glacier was not considered a major contributor to the flow or sediment regime of the Susitna River and therefore was omitted from this study.

R&M conducted the control and velocity surveys on the West Fork Glacier, West Tributary of Susitna Glacier, Turkey Glacier and East Tributary of Susitna Glacier. The velocity surveys have been repeated monthly, May through September, during 1981 and 1982, to determine ice movement as an aid in mass balance and glacier dynamics analyses.

A thermocouple string was installed to a depth of 66 feet at an elevation of 7700 feet on the West Tributary of Susitna Glacier to determine the thermal regime of the ice.

Glacial studies were supported by historical data from climate stations and snow surveys in the Susitna Basin, as well as sediment discharge records for the Susitna and Maclaren Rivers.

The results of this data acquisition effort, as well as a thorough description of field procedures and analytical methods, are presented in reports by Dr. William Harrison of the Geophysical Institute (R&M and Harrison 1981, and 1982).

A mass balance survey was conducted by R&M and UAF in May 1983 on the following glaciers: West Fork, Susitna, Turkey, East Fork Susitna, East Fork and Maclaren. Velocity surveys were discontinued in 1983. UAF measured the snow stakes in September 1983 and obtained snow stratigraphy data.

R&M Consultants measured the remaining snow stakes in September 1984 and reset all the markers at the original locations. These markers consist of accumulation stakes at high elevations, ablation stakes at low elevations and velocity stakes near the equilibrium zone on all the previously named glaciers.

1600 GLACIAL LAKE OBSERVATIONS

To determine the effects of a large impoundment of glacial water, such as the Watana or Devil Canyon reservoir, upon a stream system, a glacial lake study was begun in the spring of 1982. On April 16 R&M Consultants, in conjunction with ADF&G, visited four glacial lakes in south-central Alaska; Kenai, Skilak, Tustumena and Eklutna. They measured temperature profiles and turbidity at each lake. It was then decided that a more intense study of one glacial lake would be a preferred approach. Eklutna Lake was chosen as an easily accessible glacial reservoir, and it is also comparable to the proposed Watana reservoir considering the following criteria:

1. Residence time of water in lake
2. Percent of drainage area covered by glaciers
3. Ratio of live storage to total storage

Continuous discharge and temperature data are being measured at the main inflow glacial streams by R&M Consultants during the open water season. Daily outflow temperatures and flow releases from the tailrace of the power plant are monitored by Alaska Power Administration personnel. Lake water quality profiles are being developed from sampling at fixed locations on a biweekly schedule during the summer, and at longer intervals during the winter. Profile data may include temperature, conductivity, turbidity and/or transmissivity. Water temperature was measured continuously at selected lake depths at one station from July, 1982 to November, 1984. Measurement of light penetration in the lake was also undertaken. Dates of the lake sampling trips are listed below.

A climate station was installed on the southern end of the reservoir in June 1982. Parameters recorded every 15 minutes include air temperature, wind speed and direction, peak wind gust, relative humidity, shortwave radiation and precipitation. Longwave radiation measurement was added in July 1982. In November 1983, recording interval was changed to 30 minutes and the station was removed in December 1984.

Data were collected concerning the sediment regime of the lake and the inflow streams, including sediment concentration and particle size distribution, sediment particle density distribution and mineralogy.

All the above-mentioned data can be found on file at R&M Consultants. Data collected after November 1982 were reported in "Glacial Lakes Physical Limnology Studies Eklutna Lake, Alaska" (R&M Consultants, 1985).

Lake sampling trips have been conducted on the following dates:

May 25, 1982
June 8, 1982
June 17 and 18, 1982
July 1 and 2, 1982
July 14 and 15, 1982
July 27-29, 1982

August 10-12, 1982
September 8-10, 1982
October 14-15, 1982
November 4, 1982
January 11 and 13, 1983
February 18, 1983
May 14, 1983
June 2, 1983
July 6, 1983
August 3, 1983
September 7, 1983
October 5, 1983
November 1, 1983
December 6, 1983
January 16, 1984
Feburary 16, 1984
March 23, 1984
April 20, 1984
May 17, 1984
June 6, 1984
June 21, 1984
July 5, 1984
July 19, 1984
August 3, 1984
August 16-20, 1984
September 3, 1984
September 17, 1984
October 1, 1984
October 15, 1984
October 29, 1984
November 12, 1984
November 26, 1984

1700 AQUATIC HABITAT OBSERVATIONS

The Alaska Department of Fish and Game (ADF&G) has studied the aquatic habitat of the Susitna River since 1974. Data collection during the period 1974-1981 is detailed in Appendix C of this report. In the spring of 1982, continuing into 1985, ADF&G intensified its study of selected areas.

Data collection sites are listed below according to type of site. The years of data collection at this site are noted in brackets [ ] following the site name. The agency responsible for each site is also noted, where this has been identified. It should be noted that this is not an exhaustive list of ADF&G study sites.

The results of the 1984 joint data collection effort by E. Woody Trihey (ETW&A) and ADF&G are presented in the 1985 draft report by EWT&A: Summary of Hydraulic Conditions and Habitat Forecasts at 1984 Middle River Study Sites.

River Mile	Site Description	Agency
CONTINUOUS STAGE RECORDERS		
148.8	Portage Creek [82,83], TRM 0.5	R&M + ADF&G
142.0	Slough 21 [82]	R&M
138.5	Indian River [82,83,84], TRM 1.0	R&M + ADF&G
138.0	Slough 16 [82]	R&M
136.7	Gold Creek [83], TRM 0.5	ADF&G
136.0	Slough 11 [82,83,84]	R&M
129.0	Slough 9 [82,83,84]	R&M
126.5	Slough 8 [83,84]	R&M

CONTINUOUS TEMPERATURE MONITORING STATIONS

River Mile	Site Description	Agency
235.2	Mainstem above Oshetna River Site #1 [83]	ADF&G
235.7	Mainstem above Oshetna River Site #2 [83]	ADF&G
233.4	Oshetna River TRM 0.1 [82,83]	ADF&G
231.3	Goose Creek TRM 0.1 [82,83]	ADF&G
206.8	Kosina Creek TRM 0.1 [82,83]	ADF&G
194.1	Watana Creek TRM 0.0 [82,83]	ADF&G
186.7	Deadman Creek TRM 0.0 [82,83]	ADF&G
181.6	Mainstem above Tsusena Creek [83]	ADF&G
181.3	Tsusena Creek TRM 0.0 [82,83]	ADF&G
150.1	Mainstem at Devil Canyon [82]	ADF&G
150.0	Mainstem at Devil Canyon [83]	ADF&G
148.8	Mainstem above Portage Creek [81]	ADF&G
148.8	Portage Creek Site #1 TRM 0.1 [6-8/82]	ADF&G
148.8	Portage Creek Site #2 TRM 0.5 [8-10/82,83]	ADF&G
142.3	LRX-57 Surface and Intragravel [83]	ADF&G
142.0	Upper Slough 21 Surface and Intragravel [82,83]	ADF&G
142.0	Slough 21 Middle [82]	ADF&G
141.8	Lower Slough 21 Surface and Intragravel (Previously Slough 21 Mouth RM 142.0)	
	Site #1 [2-5/82]	ADF&G
	Site #2 [9/82-83]	ADF&G
141.0	Side Channel 21 Surface and Intragravel [83]	ADF&G
140.1	LRX 53 [82]	ADF&G
140.0	Slough 19 [81]	ADF&G
140.0	Slough 19 Surface and Intragravel [82,83]	ADF&G
138.7	Mainstem above Indian River [81]	ADF&G
138.6	Indian River	
	Site #1 TRM 0.1 [81,6-8/82]	ADF&G
	Site #2 TRM 1.0 [8-10/82, 83]	ADF&G
138.0	Slough 16B Surface and Intragravel [82]	ADF&G
136.8	Mainstem above Gold Creek	
	Site #1 Surface [81]	ADF&G
	Site #2 Surface and Intragravel [82]	ADF&G
	Surface [83]	ADF&G
136.7	Gold Creek	
	Site #1 TRM 0.0 [81]	ADF&G
	Site #2 TRM 0.5 [83]	ADF&G
136.6	Mainstem at Gold Creek [83]	ADF&G
136.3	Upper Side Channel 11	
	Site #1 Surface and Intragravel [83]	ADF&G
	Site #2 Surface and Intragravel [83]	ADF&G
135.8	Mainstem below Gold Creek [83]	ADF&G
135.3	Slough 11 Site #1 Surface [2-4/82]	ADF&G
135.7	Slough 11 Site #2 Surface and Intragravel [8/82-83]	ADF&G
134.0	Slough 10 Northeast Surface and Intragravel [83]	ADF&G
134.0	Slough 10 Northwest Surface and Intragravel [83]	ADF&G

River Mile	Site Description	Agency
133.9	Side Channel 10 Surface and Intragravel [83]	ADF&G
131.1	Fourth of July Creek and Plume Intragravel [83]	ADF&G
	Creek Surface [installed 11/83]	ADF&G
131.1	Mainstem above Fourth of July Creek [81]	ADF&G
130.8	LRX 35 [82]	ADF&G
129.0	Slough 9B Surface and Intragravel [82]	ADF&G
128.3	Slough 9 Incubation Site [83]	ADF&G
128.8	Slough 9 Site #1 Surface and Intragravel [82] (Previously Slough 9 below trier B RM 129.0)	ADF&G
128.7	Slough 9 Site #2 Surface [82] (Previously RM 129.2)	ADF&G
128.6	Slough 9 Site #3 Surface and Intragravel [82,83]	ADF&G
126.6	Upper Slough 8A	
	Site #1 Surface and Intragravel [82]	ADF&G
	Site #2 Surface and Intragravel [83]	
126.1	LRX 29 Surface and Intragravel [82,83]	ADF&G
126.0	Slough 8A Northeast fort [82]	ADF&G
125.4	Lower Slough 8A Site #1 Surface and Intragravel [82-4/83]	ADF&G
125.6	Lower Slough 8A Sites #2 and #3 Surface and Intragravel [83]	ADF&G
120.7	Mainstem Curry Fishwheel [82,83]	ADF&G
113.0	LRX 18 [82]	ADF&G
103.2	Mainstem at LRX 9 Surface and Intragravel [83]	ADF&G
103.0	Mainstem at Talkeetna Fishwheel [81,82,83]	ADF&G
101.2	Whiskers Creek Slough [82]	ADF&G
98.6	Chulitna River	
	Site #1 TRM 0.5 [81]	ADF&G
	Site #2 TRM 0.6 [82,6/83]	ADF&G
	Site #3 TRM 2.0 [83]	ADF&G
	Site #4 TRM 3.0 [83]	ADF&G
97.2	Talkeetna River	
	Site #1 TRM 1.0 [81]	ADF&G
	Site #2 TRM 1.5 [82,83]	ADF&G
83.9	Mainstem at Parks Highway Bridge	
	Site #1 Eastshore [81]	ADF&G
	Site #2 Westshore [82,83]	ADF&G
	Site #3 Eastshore [82,83]	ADF&G
77.5	Mainstem above Montana Creek [81]	ADF&G
77.2	Montana Creek TRM 0.0 [81]	ADF&G
61.2	Mainstem above Kashwitna River [81]	ADF&G
50.5	Mainstem above Little Willow Creek [81]	ADF&G
50.5	Little Willow Creek TRM 1.0 [81]	ADF&G
41.1	Mainstem above Deshka River [83]	ADF&G
40.6	Deshka River TRM 1.2 [81]	ADF&G
32.3	Mainstem above Yentna River [81,82,83]	ADF&G

River Mile	Site Description	Agency
28.0	Yentna River Fishwheel	
	Site #1 TRM 2.0 [81]	ADF&G
	Site #2 TRM 4.0 [82,83]	ADF&G
25.8	Mainstem at Susitna Station [82,83]	ADF&G
18.2	Mainstem at Flathorn Station [83]	ADF&G
10.1	Mainstem above Alexander Creek [81]	ADF&G
10.1	Alexander Creek TRM 0.5 [81]	ADF&G
4.5	Estuary [83]	ADF&G

CROSS SECTIONS AND STAFF GAGES (SIDE CHANNELS, SLOUGHS, AND TRIBUTARIES)

River Mile	Site Description	Cross-Sections ADF&G	Cross-Sections R&M	Staff Gages ADF&G	Staff Gages R&M
148.8	Portage Creek TRM 0.2	83		81,82,83	
147.1	*Fat Canoe Island Side Channel	84(6)		84(6)	
144.3	Slough 22				
	Head	83	82	82,83	
	Discharge Site		82	82,83	82
	Site in backwater zone		82	82	
	Mouth	83	82	82,83	
142.0	Slough 21				
	NE Head	81,83		82,83	
	NW Head	81,83		82,83	
	Discharge Site	81,83		82,83	
	Mouth	81,83		82,83	
140.6	Side Channel 21				
	Upper A6 Head	83		83	82
	Lower A6 Head	83		83	82
	Upper Q Site	83		83	
	A5 Q Site			83	
	at LRX 55	83		83	
	Q Site	83		83	
	Mouth	83		83	82
	FHU Transects [8]	82			
140.1	Slough 20				
	Head		82	82,83	
	Tributary near head			82,83	
	Waterfall creek Q site			82,83	
	Q site		82	82,83	
	Mouth		8281	,82,83	
140.0	Slough 19				
	Q site	81,83	82	83	
	Backwater	81,83	82	82,83	
	Access	81,83	82	83	
139.4	*Upper Indian River			84	
139.0	*Middle Indian River			84	
138.7	*Lower Indian River			84	
138.6	Indian River Stage Recorder				
	TRM 1.0	83		81,83	82
138.0	Slough 16B				
	Head	81	82	82,83	
	Q site	81	82	82,83	
	Mouth	81	82	82,83	
137.4	*Above Gold Creek	84(3)		84(2)	

River Mile	Site Description	Cross-Sections ADF&G	Cross-Sections R&M	Staff Gages ADF&G	Staff Gages R&M
136.8	Gold Creek				
	Pressure Temp Station TRM 0.5	83		83	
	Q site TRM 0.4	83	82	83	82
136.2	Side Channel above Slough 11				
	Head	83		83	
	Q site	83		83	82
	Mouth	83		81,83	
	FHU Transect 2			83	
	FHU Transect 3			83	
136.0	*Doug's Delight (Slough 14)				
	Side Channel	84(6)		84(6)	
135.3	Slough 11				
	Head	83	82	82,83	
	Q site	83	82	82,83	
	Mouth	83	82	82,83	
134.6	Side Channel below Slough 11			83	82
133.8	Side Channel 10				
	Head	83		83	
	Q site (FHU Transect 4)	83		83	
	FHU Transect 3	83		83	
	FHU Transect 2	83		83	
	FHU Transect 1	83		83	
	Mouth	83		83	
133.8	Slough 10 mouth	83		81	
133.7	*Target			84	
132.1	*Side Channel 10A	84		83,84	
131.5	*4th of July Side Channel	84(7)		84	
131.1	*4th of July Q site	83,84	81,82,83,84		
129.8	*Side Channel above Slough 9	84(3)		84	
128.3	Slough 9				
	Head	83	82	83	
	Q site	83	82	83	82
	Mouth	83	82	83	
	FHU Transects (10)	82			
125.3	Slough 8A				
	NE Head	83		83	
	Below NE Head			83	
	NE Q site (FHU Transect 6)	82	82	83	82
	NW Head	81,82,83		83	
	NW Channel Q site	83		83	
	Below Beaver Dam East Chnl	83		83	
	Below Beaver Dam West Chnl	83		83	
	Backwater	83		81,83	
	Mouth	83		83	
	FHU Transects (11)	82		82	

* Data collection was a joint effort by EWT&A and ADF&G

Note: The number in parentheses beside the year indicates the number of locations collected at the site.

River Mile	Site Description	Cross-Sections ADF&G	Cross-Sections R&M	Staff Gages ADF&G	Staff Gages R&M
125.0	*Skull Creek Side Channel	84(2)		84(2)	
119.2	*Little Rock Side Channel	84(6)		84(6)	
119.1	*Upper Little Rock			84	
118.9	*Lower Little Rock			84	
114.4	Mainstem 2				
	NE Site	83		83	
	NE Q site	83		83	
	NW Head	83		83	
	NW Q Site	83		83	
	Backwater Head	83,84		83,84	
	Mid Backwater	83		83	
	Mouth	83		81,83	
114.0	*Lane Creek Side Channel	84(3)		84	
113.6	Slough 8 (Lane)				
	Head	83		82,83	
	Q site	83		82,83	
	Mouth	83		81,82,83	
113.6	Lane Creek				
	Q site (by bridge)	83		82,83	
	Below bridge	83		81,82,83	
112.3	*Slough 6A				
	Backwater	83		83	
	Mouth	83		82,83	
112.3	Side Channel 6A	84(9)		84(23)	
111.5	Gash Creek			82	
111.5	Gash Creek Side Channel			82	
107.6	Slough 5 mouth			83	
105.8	*Above Talkeetna Camp			84(2)	
102.0	*Whiskers Spawning Site	84(4)		84(3)	
101.2	Whiskers Creek Q site			82,83	
	Mouth			81	82
101.2	*Whiskers Slough				
	Head	83		82,83	
	Q site	83		82,83	
	Mouth	83		81,82,83	
101.2	*Whiskers West Side Channel	84(3)		84(3)	
101.2	Whiskers East Side Channel	84(9)		84(10)	
96.0	Cache Creek mouth TRM 0.0			81	
96.0	Cache Creek Slough Mouth			81	
91.6	Trapper Creek Side Channel	84		84	
88.4	Birch Slough				
	Head			82	
	Above Creek			82	
	Below Creek (Q site)			82,84	
	Mouth			82	

* Data collection was a joint effort by EWT&A and ADF&G

Note: The number in parentheses beside the year indicates the number of locations collected at the site.

River Mile	Site Description	Cross-Sections ADF&G	Cross-Sections R&M	Staff Gages ADF&G	Staff Gages R&M
88.4	Birch Creek mouth		81,82,83		
	Q site		82,83		
87.0	Sunrise Side Channel	84		84	
86.9	Sunset Side Channel	84		84	
86.3	Beaver Dam Slough	84		84	
85.7	Sunshine Slough				
	Head			82	
	Q site			82	
	Mouth			81,82	
85.7	Sunshine Creek			81,82	
84.5	Sucker Side Channel	84		84	
83.1	Rabideux Creek mouth			82	
83.1	Rabideux Creek Q Site			82	
83.1	Rabideux Slough (7 transects)	82		82	
79.8	Sauna Side Channel	84		84	
79.4	Whitefish Slough			82	
79.4	Whitefish Slough Tributary				
76.0	Montana Creek			81	
75.3	Circular Side Channel	84		84	
74.8	Goose 2 Side Channel	84		84	
74.4	Mainstem West Bank	84		84	
71.5	Goose Creek 2			81,82	
71.0	Goose Creek 1			81,82	
68.3	Chum Channel (8 transects)	82		82	
65.5	Sheep Creek Slough mouth			81,82	
63.2	Island Side Channel	84		84	
63.0	Caswell Creek mouth	84		81,84	
60.5	Kashwitna River			81	
59.5	Rustic Wilderness Side Channel	84		84	
50.5	Little Willow Creek mouth			81	
44.4	Last Chance Side Channel	84		84	
42.0	Bear Bait Side Channel	84		84	
40.6	Deshka River (3 sites)			81	
39.0	Rolly Creek mouth	84		84	
36.3	Mid Kroto Slough			81	
36.3	Kroto Slough Head	84		84	
36.2	Eagles Nest Side Channel	84		84	
35.2	Hooligan Side Channel	84		84	
31.0	Mainstem Slough			81	
30.1	Kroto Slough mouth			81	
23.8	Anderson Creek (4 sites)			81	
7.0	Fish Creek			81	

* Data collection was a joint effort by EWT&A and ADF&G

Note: The number in parentheses beside the year indicates the number of locations collected at the site.

River Mile	Site Description	Agency
FLOW MEASUREMENTS/RATING CURVE		
147.1	Fat Canoe Island Side Channel [84]	ADF&G/EWT&A
145.1	Slough 22 (near center) [82,83]	R&M
144.4	Mainstem II Sidechannel [83]	ADF&G
141.9	Slough 21 (near center) [82,83]	ADF&G
140.5	Slough 21 Sidechannel [83]	ADF&G
140.1	Slough 20 (near D/S end of slough, below Waterfall Cr. [82,83]	R&M
139.7	Slough 19 [83]	
138.0	Slough 16 (3/4 of way down the island) [82]	ADF&G
136.3	Sidechannel above Slough 11 [83]	ADF&G
136.0	Slough 11 (near D/S end, above backwater) [82,83]	R&M
136.0	Sidechannel at Slough 14 [84]	ADF&G/EWT&A
135.3	Sidechannel below Slough 11 [83]	R&M + ADF&G
133.7	Sidechannel at Slough 10 [83]	ADF&G
132.5	4th of July Side Channel [84]	ADF&G/EWT&A
132.1	Sidechannel 10A [84]	ADF&G/EWT&A
131.1	4th of July Creek [83]	ADF&G
129.0	Slough 9 [82,83] (a) N.E. Tributary, above backwater (b) N.E. Tributary, near R.R. tracks (c) LRX 31 in slough	R&M
126.5	Slough 8A (D/S end of upper slough) [82,83]	R&M
125.0	Skull Creek Side Channel [84]	ADF&G/EWT&A
119.2	Little Rock Side Channel [84]	ADF&G/EWT&A

River Mile	Site Description	Agency
113.6	Lane Creek [82,83] (a) Head of slough (b) Near R.R. crossing	R&M
113.7	Slough 8 [83]	ADF&G
112.3	Slough 6A [82,83]	ADF&G
112.3	Side Channel 6A [84]	ADF&G/EWT&A
101.4	Whiskers Creek (midpoint of slough) [82,83]	ADF&G
101.2	Whiskers West Side Channel [84]	ADF&G/EWT&A
101.2	Whiskers East Side Channel [84]	ADF&G/EWT&A
91.6	Trapper Creek Side Channel [84]	ADF&G
88.4	Birch Creek Slough [82,84] (a) In Birch Creek, above confluence with slough (b) In slough, above confluence with Birch Creek	ADF&G
87.0	Sunrise Side Channel [84]	ADF&G
86.9	Sunset Side Channel [84]	ADF&G
86.3	Beaver Dam Slough [84]	ADF&G
85.7	Sunshine Slough [82] (a) In Sunshine Creek, above confluence with slough (b) In slough, above confluence with creek	ADF&G
84.5	Sucker Side Channel [84]	ADF&G
83.1	Rabideux Creek (6 ADF&G located sites) [82]	R&M
79.8	Sauna Side Channel [84]	ADF&G
75.3	Circular Side Channel [84]	ADF&G
74.8	Goose 2 Side Channel [84]	ADF&G
74.4	Mainstem West Bank [84]	ADF&G
73.1	Goose Creek No. 2 [82] (a) In slough, above confluence with Goose Creek (b) In Goose Creek, above confluence with slough	ADF&G

River Mile	Site Description	Agency
63.2	Island Side Channel [84]	ADF&G
63.0	Caswell Creek Mouth [84]	ADF&G
59.5	Rustic Wilderness Side Channel [84]	ADF&G
44.4	Last Chance Side Channel [84]	ADF&G
42.0	Bear Bait Side Channel [84]	ADF&G
39.0	Rolly Creek Mouth [84]	ADF&G
36.3	Kroto Slough Head [84]	ADF&G
36.2	Eagles Nest Side Channel [84]	ADF&G
35.2	Hooligan Side Channel [84]	ADF&G
GROUNDWATER OBSERVATION WELLS		
129.0	Slough 9 (Several Locations) [82,83]	R&M
126.5	Slough 8 (Several Locations) [82]	R&M
NITROGEN SUPERSATURATION STATION		
150.2	Mouth of Devil Canyon [82]	ADF&G
STABILITY ANALYSIS OF CREEK		
148.8	Portage Creek [82]	R&M
144.9	Jack Long Creek [82]	R&M
138.5	Indian River [82]	R&M
136.6	Gold Creek [82]	R&M
131.0	Fourth of July Creek [82]	R&M
120.5	Curry Mainstem [82]	R&M
116.8	MacKenzie Creek [82]	R&M
113.6	Lane Creek [82]	R&M

MAINSTEM STAFF GAGES
Talkeetna to Devil Canyon Reach

River Mile	Site Description	Agency
148.9	LRX 62 [82,83]	ADF&G
148.7	LRX 61 [82,83]	ADF&G
147.1	Fat Canoe Island Side Channel [84]	ADF&G/EWT&A
144.7	Head of Slough 22 [82,83]	ADF&G
142.3	LRX 57 [82,83]	ADF&G
142.1	LRX 56 [82,83]	ADF&G
141.5	LRX 55 [83]	ADF&G
140.8	LRX 54 [82,83]	ADF&G
140.6	Mouth of Slough 21 Side Channel	ADF&G
140.1	LRX 53 [82,83]	ADF&G
139.8	Mouth of Slough 19 [83]	ADF&G
139.4	Upper Indian River [84]	ADF&G/EWT&A
139.0	Middle Indian River [84]	ADF&G/EWT&A
138.9	LRX 51 [82,83]	ADF&G
138.7	Lower Indian River [84]	ADF&G/EWT&A
138.5	LRX 50 [82,83]	ADF&G
138.3	LRX 49 [83]	ADF&G
138.2	Head of Slough 16B [82,83]	ADF&G
137.9	Mouth of Slough 16B [82,83]	ADF&G
136.7	At Gold Creek Bridge	USGS
135.3	At Side Channel above mouth of Slough 11 [82,83]	ADF&G
135.3	At Side Channel below mouth of Slough 11 [82,83]	ADF&G
134.3	LRX 40 [82,83]	ADF&G
133.8	At Side Channel mouth of Slough 10 [83]	ADF&G
133.7	Target [84]	ADF&G/EWT&A
131.8	LRX 37 [83]	ADF&G
131.1	Downstream of mouth 4th of July Creek [82,83]	ADF&G
130.9	LRX 35 [82,83]	ADF&G
130.6	LRX 34 [83]	ADF&G
129.7	LRX 32 [83]	ADF&G
128.7	LRX 31 [82,83]	ADF&G
126.1	LRX 29 [82,83]	ADF&G
125.3	NE Head of Slough 8A	ADF&G
125.3	NW Head of Slough 8A	ADF&G
125.3	At Side Channel at mouth of Slough 8A	ADF&G
124.4	LRX 28 [82,83]	ADF&G
120.7	LRX 24 [82,83]	ADF&G
120.6	Curry Station [82,83]	ADF&G
119.1	Upper Little Rock [84]	ADF&G/EWT&A
118.9	Lower Little Rock [84]	ADF&G/EWT&A
115.9	LRX 18C	ADF&G
115.5	Above NW Head Mainstem 2 [83]	ADF&G
114.4	At mouth of Mainstem 2 [83]	ADF&G
113.7	Mainstem upstream of Lane Creek [83]	ADF&G
113.4	Mainstem below Lane Creek [83]	ADF&G
113.0	LRX 18 [83]	ADF&G
112.4	LRX 16 [82]	ADF&G

River Mile	Site Description	Agency
111.0	Side Channel at Gash Creek [82]	ADF&G
108.4	LRX 12 [83]	ADF&G
106.7	LRX 11 [83]	ADF&G
106.4	LRX 10C [83]	ADF&G
105.9	LRX 10B [83]	ADF&G
105.8	Above Talkeetna Camp [84]	ADF&G/EWT&A
103.2	LRX 9 [82,83]	ADF&G
103.0	Talkeetna Station [82,83]	ADF&G
101.5	Mainstem, Head of Whiskers Slough	ADF&G
101.2	Mainstem, Mouth of Whiskers Slough	ADF&G
101.0	LRX 6 [82]	ADF&G

THALWEG SURVEY SITES

River Mile	Site Description	Agency
35.2	Hooligan Side Channel [84]	ADF&G
36.2	Eagle's Nest Side Channel [84]	ADF&G
36.3	Kroto Slough Head [84]	ADF&G
39.0	Rolly Creek Mouth [84]	ADF&G
42.0	Bear Bait Side Channel	ADF&G
44.4	Last Chance Side Channel [84]	ADF&G
59.5	Rustic Wilderness Side Channel [84]	ADF&G
63.0	Caswell Creek Mouth [84]	ADF&G
63.2	Island Side Channel [84]	ADF&G
74.4	Mainstem West Bank [84]	ADF&G
74.8	Goose 2 Side Channel [84]	ADF&G
75.3	Circular Side Channel [84]	ADF&G
79.8	Sauna Side Channel [84]	ADF&G
84.5	Sucker Side Channel [84]	ADF&G
86.3	Beaver Dam Slough [84]	ADF&G
86.9	Sunset Side Channel [84]	ADF&G
87.0	Sunrise Side Channel [84]	ADF&G
88.4	Birch Creek Slough [84]	ADF&G
91.6	Trapper Creek Side Channel [84]	ADF&G
101.2	Whiskers Creek Slough [83]	ADF&G
112.3	Slough 6A [83]	ADF&G
114.5	Maintem II [83]	ADF&G
125.3	Slough 8A [82]	ADF&G
128.3	Slough 9 [82]	ADF&G
133.2	Slough 9A [83]	ADF&G
133.8	Slough 10 Complex [83]	ADF&G
135.3	Slough 11 [82]	ADF&G
136.0	Upper Side CHannel 11 [83]	ADF&G
137.7	Slough 16 [83]	ADF&G
137.9	Slough 16B [83]	ADF&G
139.8	Slough 19 [83]	ADF&G
140.1	Slough 20 [83]	ADF&G
140.7	Slough 21 Lower [83]	ADF&G
140.7	Slough 21 Side Channel [83]	ADF&G
141.8	Slough 21 [82]	ADF&G
144.2	Slough 22 [83]	ADF&G

IFG-4 MODELING SITES *

River Mile	Site Description	Agency
141.8	Slough 21 [82,83]	ADF&G
140.7	Side Channel 21 [82,83]	ADF&G
136.0	Side Channel 11 [82,83]	ADF&G
133.8	Side Channel 10 [82,83]	ADF&G
128.3	Slough 9 [82,83]	ADF&G
125.3	Slough 8A [82,83]	ADF&G

TRIBUTARY MOUTH TRANSECT SITES *

River Mile	Site Description	Agency
113.6	Lane Creek [83]	ADF&G
131.1	Fourth of July Creek [83]	ADF&G

* Data includes cross-section and discharge measurements.

APPENDICES

APPENDIX A

GOVERNMENT AGENCIES THAT HAVE COLLECTED OR ANALYZED WATER RESOURCES DATA FOR THE SUSITNA RIVER BASIN

Alaska Department of Fish & Game
333 Raspberry Road
Anchorage, Alaska 99502
Attn: Sport Fish Division

Includes: Water Quality Data in Conjunction with Fisheries Studies

Alaska Department of Natural Resources
Division of Land and Water Management
Water Management Section
Pouch 7-005
Anchorage, Alaska 99510

Includes: Information on Navigation and Navigability

Alaska District, Corps of Engineers
Hydrology Section
Post Office Box 7002
Anchorage, Alaska 99510

Includes: Data Analysis

Arctic Environmental Information and Data Center
707 A Street
Anchorage, Alaska 99501

Includes: Data Analysis

National Climatic Center
National Oceanic & Atmospheric Administration
Asheville, North Carolina 28810

Includes: Climatic Data

Soil Conservation Service
2221 E. Northern Lights Blvd.
Room 129
Anchorage, Alaska 99501

Includes: Snow Surveys

U.S. Geological Survey
281 E Street
Anchorage, Alaska 99501
Water Resources Division

Includes: Water Discharge
Sediment
Water Quality
Water Temperature

APPENDIX B

WATER QUALITY PARAMETERS THAT HAVE BEEN SAMPLED BY THE USGS WITHIN THE SUSITNA RIVER BASIN

Site Parameters

Available for each sample

- Date
- Time
- Instantaneous Stream Flow (cfs)

Occasionally available for sample

- Sampling Depth (ft)
- Stream Width (ft)
- Percent of Total Depth
- Sample Location in Cross Section (ft from left bank)

Physical Parameters

- Color (Platinum - Cobalt Units)
- Hardness (mg/l as $CaCO_3$)
- Hardness, Noncarbonate (mg/l as $CaCO_3$)
- Methylene Blue Active Substance
- pH
- Solids, Dissolved (tons/day, tons/ac-ft)
- Solids, Dissolved Residue at 105°C (mg/l)
- Solids, Dissolved Residue at 180°C (mg/l)
- Solids, Suspended Residue at 180°C (mg/l)
- Specific Conductance (Micromhos/centimeter)
- Temperature, Instantaneous (°C)
- Turbidity (Jackson Turbidity Units)

Inorganic Parameters

- Alkalinity (mg/l as $CaCO_3$)
- Aluminum, Total Recoverable (ug/l as Al)
- Arsenic, Dissolved (ug/l as As)
- Arsenic, Total (ug/l as As)
- Arsenic, Total Suspended (ug/l as As)
- Barium, Dissolved (ug/l as Ba)
- Barium, Total Recoverable (ug/l as Ba)
- Beryllium, Dissolved (ug/l as Be)

Bicarbonate (mg/l as HCO_3)

Boron, Dissolved (ug/l as B)
Cadmium, Dissolved (ug/l as Cd)
Cadmium, Total Recoverable (ug/l as Cd)
Calcium, Dissolved (mg/l as Ca)
Carbon Dioxide, Dissolved (mg/l as CO_2)

Carbonate (mg/l as CO_3)

Chloride, Dissolved (mg/l as Cl)
Chromium, Dissolved (ug/l as Cr)
Chromium, Dissolved Hexavalent (ug/l as Cr)
Chromium, Suspended Recoverable (ug/l as Cr)
Chromium, Total Recoverable (ug/l as Cr)
Cobalt, Dissolved (ug/l as Co)
Copper, Dissolved (ug/l as Cu)
Copper, Total Recoverable (ug/l as Cu)
Cyanide, Total (mg/l as Cn)
Fluoride, Dissolved (mg/l as F)
Iron (ug/l as Fe)
Iron, Dissolved (ug/l as Fe)
Iron, Total Recoverable (ug/l as Fe)
Lead, Dissolved (ug/l as Pb)
Lead, Total Recoverable (ug/l as Pb)
Lithium, Dissolved (ug/l as Li)
Magnesium, Dissolved (mg/l as Mg)
Manganese (ug/l as Mn)
Manganese, Dissolved (ug/l as Mn)
Manganese, Total Recoverable (ug/l as Mn)
Mercury, Dissolved (ug/l as Hg)
Mercury, Total Recoverable (ug/l as Hg)
Molybdenum, Dissolved (ug/l as Mo)
Molybdenum, Total Recoverable (ug/l as Mo)
Nickel, Dissolved (ug/l as Ni)
Nickel, Total Recoverable (ug/l as Ni)
Nitrogen, Dissolved Ammonia (mg/l as N, mg/l as NH_4)

Nitrogen, Dissolved Nitrate (mg/l as N, mg/l as NO_3)

Nitrogen, Dissolved Nitrate + Nitrite (mg/l as N)
Nitrogen, Total (mg/l as NO_3)

Nitrogen, Total Ammonia (mg/l as N)
Nitrogen, Total Ammonia + Organic (mg/l as N)
Nitrogen, Total Nitrate (mg/l as N, mg/l as NO_3)

Nitrogen, Total Nitrate + Nitrite (mg/l as N)
Nitrogen, Total Nitrite (mg/l as N)
Nitrogen, Total Organic (mg/l as N)
Oxygen, Dissolved (mg/l, percent saturation)
Phosphate, Dissolved Ortho (mg/l as PO_4)

Phosphate, Total (mg/l as PO_4)

Phosphorus, Total (mg/l as P)
Phosphorus, Dissolved (mg/l as P)
Phosphorus, Dissolved Ortho (mg/l as P)
Potassium, Dissolved (mg/l as K)

Selenium, Dissolved (ug/l as Se)
Selenium, Total (ug/l as Se)
Silica, Dissolved (mg/l as SiO_2)
Silver, Dissolved (ug/l as Ag)
Silver, suspended recoverable (ug/l as Ag)
Silver, total recoverable (ug/l as Ag)
Sodium Adsorption Ratio
Sodium, Dissolved (mg/l as Na)
Sodium, Percent
Sodium + Potassium, Dissolved (mg/l as Na)
Strontium, Dissolved (ug/l as Sr)
Sulfate, Dissolved (mg/l as SO_4)
Uranium, Dissolved - Extraction (ug/l)
Uranium, Dissolved - Direct Flourometric (pci/l)
Zinc, Dissolved (ug/l as Zn)
Zinc, Total Recoverable (ug/l as Zn)

Organic Parameters

Aldrin, Total (ug/l)
Aldrin, Total in Bottom Material (ug/kg)
Biochemical Oxygen Demand, Five Day (mg/l)
Chlordane, Total (ug/l)
Chlordane, Total in Bottom Material (ug/kg)
2,4-D, Total (ug/l)
2,4-D, Total in Bottom Material (ug/kg)
DDD, Total (ug/l)
DDD, Total in Bottom Material (ug/kg)
DDE, Total (ug/l)
DDE, Total in Bottom Material (ug/kg)
DDT, Total (ug/l)
DDT, Total in Bottom Material (ug/kg)
Diazinon, Total (ug/l)
Dieldrin, Total (ug/l)
Dieldrin, Total in Bottom Material (ug/kg)
Endosulfan, Total (ug/l)
Endosulfan, Total in Bottom Material (ug/kg)
Endrin, Total (ug/l)
Endrin, Total in Bottom Material (ug/kg)
Ethion, Total (ug/l)
Ethion, Total in Bottom Material (ug/kg)
Heptachlor., Total (ug/l)
Heptachlor., Total in Bottom Material (ug/kg)
Heptachlor., Total Epoxide (ug/l)
Heptachlor., Total Epoxide in Bottom Material (ug/kg)
Lindane, Total (ug/l)
Lindane, Total in Bottom Material (ug/kg)
Malathion, Total (ug/l)
Malathion, Total in Bottom Material (ug/kg)

Mirex, Total (ug/l)
Napthalenes, Total Polychlor (ug/l)
Parathion, Total (ug/l)
Parathion, Total in Bottom Material (ug/kg)
Parathion, Total Methyl (ug/l)
Parathion, Total Methyl in Bottom Material (ug/kg)
PCB, Total (ug/l)
PCB, Total in Bottom Material (ug/kg)
PCN, Total in Bottom Material (ug/kg)
Perthane, Total (ug/l)
Phenols (ug/l)
Silvex, Total (ug/l)
Silvex, Total in Bottom Material (ug/kg)
2, 4, 5 - T, Total (ug/l)
2, 4, 5 - T, Total in Bottom Material (ug/kg)
Toxaphene, Total (ug/l)
Toxaphene, Total in Bottom Material (ug/kg)
Trithion, Total (ug/l)
Trithion, Total in Bottom Material (ug/kg)
Trithion, Total Methyl (ug/l)
Trithion, Total Methyl in Bottom Material (ug/kg)
Vanadium, Dissolved (ug/l as V)

Radioactive Parameters

Alpha, Dissolved Gross (pci/l as U-NAT, ug/l as U-NAT)
Alpha, Total Suspended Gross (pci/l as U-NAT, pci/g as U-NAT, ug/l as U-NAT)
Beta, Dissolved Gross (pci/l as Cs-137, pci/l as Sr/Yt - 90)
Beta, Total Suspended Gross (pci/l as Cs-137, pci/g as Sr/Yt - 90, pci/g as Cs-137)
Radium 226, Dissolved - Random Method (pci/l)

Coliform Bacteria

Coliform, Fecal - 0.45 UM-MF (Cols./100 ml.)
Coliform, Fecal - 0.7 UM-MF (Cols./100 ml.)
Coliform, Streptococci Fecal (Cols./100 ml.)
Coliform, Streptococci Fecal - KF Agar (Cols./100 ml.)
Coliform, Total - Delayed (Cols./100 ml.)
Coliform, Total - Immediate (Cols./100 ml.)

APPENDIX C

DATA COLLECTED BY ALASKA DEPARTMENT OF FISH AND GAME (ADF&G) IN THE SUSITNA RIVER BASIN FROM 1974 - 1978, and 1981

Streamflow, water quality and water temperature data have been collected by the Alaska Department of Fish and Game at a number of locations within the Susitna River Basin. Since the measurements have been taken periodically, the number of measurements, timing and specific parameters measured vary from year to year at any given station. Information available from the Alaska Department of Fish and Game has been included below. These reports are all on file at R&M Consultants.

Barrett, Bruce M. 1974. An assessment study of the anadromous fish populations in the Upper Susitna River watershed between Devil's Canyon and the Chulitna River. Cook Inlet Data Report No. 74-2. Alaska Department of Fish and Game. Division of Commerical Fisheries. 56 pp.

Figure 10: Profile of Susitna River water temperatures for September 4 - 11 at Gold Creek and Devil's Canyon Fishwheel Camp.

Figure 11: Profile of water and air temperatures recorded daily at east bank fishwheel.

Friese, Nancy V. 1975. Preauthorization assessment of anadromous fish populations of the Upper Susitna River watershed in the vicinity of the proposed Devil's Canyon Hydroelectric project. Cook Inlet Data Report No. 75-2. Alaska Department of Fish and Game - Division of Commerical Fisheries. 121 pp.

Table 10: Survey of winter conditions in Indian River, Lane Creek and Gold Creek.

Table 11: Analysis of Water Conditions in Indian River, at Chase Creek, 1974 - 1975.

Table 12: Analysis of Water Conditions at Gold Creek, 1974 - 1975.

Table 13: Analysis of water conditions at Parks Highway Bridge, 1974 - 1975.

Riis, James C. 1975. Pre-authorization assessment of the Susitna River Hydroelectric Projects: preliminary investigations of water quality and aquatic species composition. Alaska Department of Fish and Game. Division of Sport Fish. 61pp.

Figure 1: Daily water temperature in the Susitna River at Parks Highway Bridge, June 20 - September 23, 1975.

Figure 2: Maximum daily water temperatures of Birch Creek, April 11 - August 30, 1975.

Figure 3: Maximum daily water temperatures for Willow Creek, April 10 - September 23, 1975.

Table 9: Maximum and minimum daily water temperatures for the Susitna River at Parks Highway Bridge, June 20 - September 23, 1975.

Table 10: Maximum and Minimum daily water temperatures from Willow Creek, April 11 - August 30, 1975.

Table 12: Maximum, minimum and mean values of water quality data collected from the Susitna River and seven tributaries of the Susitna River.

Table 14: Water quality analysis on sample taken March 25, 1975 from the Susitna River at Sunshine.

Table 16: Water quality data collected from four tributaries of the Susitna River, August 1975.

Table 17: Water quality data collected from the Susitna River above Gold Creek, August 1975.

Table 18: Water quality data collected from the Susitna River above Portage Creek, August 1975.

Table 19: Water quality data collected from 15 sloughs between Talkeetna and Portage Creek, August 1975.

Table 20: Water quality data collected from Susitna River near Jay, Watana and Deadman Creeks.

Riis, James C., 1977. Pre-authorization assessment of the proposed Susitna River Hydroelectric Projects: preliminary investigations of water quality and aquatic species composition. Alaska Department of Fish and Game. Division of Sport Fish. 91 pp.

Appendix A

Table 1: Water quality data collected from the Susitna River at the Parks Highway Bridge between July 21 and October 1, 1976.

Table 2: Water quality data collected from the Susitna River at the Gold Creek Railroad Bridge between July 13 and October 1, 1976.

Table 3: Water quality data collected from the Susitna River upstream of Portage Creek between July 15 and October 29, 1976.

Table 4: Water quality data collected from sloughs 8 and 10, between June 25 and September 30, 1976.

Table 5: Water quality data collected from sloughs 11 and 13 between June 23 and September 30, 1976.

Table 6: Water quality data collected from Sloughs 14 & 15 between June 25 and September 30, 1976.

Table 7: Water quality data collected from Sloughs 16 & 17 between June 24 and September 29, 1976.

Table 8: Water quality data collected from Sloughs 18 & 19 between June 15 and September 29, 1976.

Table 9: Water quality data collected from slough 20 between June 24 - September 29, 1976.

Table 10: Water quality data collected from Willow Creek, Little Willow Creek, Kashwitna River and Caswell Creek between July 21 and October 12, 1976.

Table 11: Water quality data collected from Sheep Creek, Goose Creek and Montana Creek between July 21 and October 12, 1976.

Table 12: Water quality data collected from Slough 3c and Chase Creek between June 26 and October 1, 1976.

Table 13: Water quality data collected from Fourth of July Creek, Gold Creek, Indian River and Portage Creek between July 17 and September 28, 1976.

Table 14: Daily maximum and minimum water temperatures in the Susitna River at Parks Highway Bridge, June 26 - October 26, 1976.

Table 15: Daily maximum and minimum water temperatures in the Susitna River above Chase Creek, June 21 - September 29, 1976.

Table 16: Daily maximum and minimum water temperatures in the Susitan River between Devil's Canyon and Portage Creek, June 22 - October 30, 1976.

Table 17: Daily maximum and minimum water temperatures in Birch Creek, June 26 - December 2, 1976.

Table 19: Slough 8 cross sections and stage gage information.

Table 20: Slough 10 cross sections and stage gage information.

Table 21: Slough 11 cross sections and stage gage information.

Table 22: Slough 13 cross sections and stage gage information.

Table 23: Slough 14 cross sections and stage gage information.

Table 24: Slough 15 cross sections and stage gage information.

Table 25: Slough 16 cross sections and stage gage information.

Table 26: Slough 17 cross sections and stage gage information.

Table 27: Slough 18 cross sections and stage gage information.

Table 28: Slough 19 cross sections and stage gage information.

Table 29: Slough 20 cross sections and stage gage information.

Table 30: Slough 3C cross sections and stage gage information.

Table 31: Chase Creek cross sections and stage gage information.

Table 32: Tributary flow data, 1976.

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Table 8: Water quality data from selected tributaries to the Susitna River, 1977.

Table 10: Water flows of Montana, Rabideux and Willow Creeks from May through November, 1977.

Table 11: Daily maximum and minimum water temperatures from the Susitna River at the Parks Highway Bridge, June 27 - October 12, 1977.

Appendix II

Table 2: Water quality data from sloughs and clearwater tributaries of the Susitna River, June 14 - October 5, 1977.

Table 3: Daily maximum and minimum water temperatures in Rabideux Creek, May 25 - October 23, 1977.

Table 4: Daily maximum and minimum water temperatures in Montana Creek, May 25 - November 6, 1977.

Table 5: Water quality data from Rabideux Creek, May 25 - October 27, 1977.

Table 6: Water quality data from Montana Creek, June 7 - October 26, 1977.

WATER TEMPERATURE, WATER QUALITY AND STAGE DATA COLLECTED BY THE ALASKA DEPARTMENT OF FISH AND GAME DURING 1981

An extensive program of data collection was undertaken by the Alaska Department of Fish and Game (ADF&G) during 1981. The data collected are presented in: "Aquatic Habitat and Instream Flow Project," Susitna Hydro Subtask 7.10, Volumes 1 and 2, by the ADF&G, 1981, and analyzed and summarized in "Phase 1 Final Draft Report, Aquatic Studies Program", Susitna Hydro Subtask 7.10, ADF&G, 1982.

Physiochemical Data for Each General Habitat Evaluation Study Site

Dissolved oxygen, pH, water and air temperatures, turbidity and specific conductance were measured twice monthly at each general habitat evaluation study site, except in the impoundment reach, where these parameters were measured monthly. The data are presented for each site in a graphical format versus specific points in time and in tabular form. For locations, see the above referenced report.

Thermograph Data

Water temperature data were continually recorded at 29 sites in the study area using Ryan Model J-90 thermographs. The data were converted into daily means, calculated as the mean of 12, two hour point temperatures. The temperature data for each thermograph site are presented as a function of time.

Stage Data

Stage data were collected at three Adult Anadromous Fisheries fishwheel sites and each lower-river general habitat evaluation study site.

APPENDIX D

CLIMATOLOGICAL PARAMETERS WHICH APPEAR IN THE NOAA REPORTS ENTITLED "LOCAL CLIMATOLOGICAL DATA, ANNUAL SUMMARY WITH COMPARATIVE DATA"

1. Meteorological Data For The Current Year

Temperature (°F)

Average Daily Maximum, for each month.
Average Daily Maximum, for the year.
Average Daily Minimum, for each month.
Average Daily Minimum, for the year.
Average, for each month.
Average, for the year.
Highest, and Date of Occurrence, for each month.
Highest, and Date of Occurrence, for the year.
Lowest, and Date of Occurrence, for each month.
Lowest, and Date of Occurrence, for the year.

Degree Days (Base 65°F)

Number of Heating, for each month.
Number of Heating, for the year.
Number of Cooling, for each month.
Number of Cooling, for the year.

Precipitation (Inches)

Total Inches of Water Equivalent, for each month.

Total Inches of Water Equivalent, for the year.

Greatest Amount of Water Equivalent in 24 hours and the Date of Occurrence, for each month.

Greatest Amount of Water Equivalent in 24 hours and the Date of Occurrence, for the year.

Total Inches of Snow and/or Ice Pellets, for each month.

Total Inches of Snow and/or Ice Pellets, for the year.

Greatest Amount of Snow and/or Ice Pellets in 24 hours and the Date of Occurrence, for each month.

Greatest Amount of Snow and/or Ice Pellets in 24 hours and the Date of Occurrence, for the year.

Relative Humidity (Percent)

Average Relative Humidity at hour 0200, for each month.
Average Relative Humidity at hour 0200, for the year.
Average Relative Humidity at hour 0800, for each month.
Average Relative Humidity at hour 0800, for the year.
Average Relative Humidity at hour 1400, for each month.
Average Relative Humidity at hour 1400, for the year.
Average Relative Humidity at hour 2000, for each month.
Average Relative Humidity at hour 2000, for the year.

Wind

Resultant Direction, for each month.
Resultant Direction, for the year.
Resultant Speed (m.p.h.), for each month.
Resultant Speed (m.p.h.), for the year.
Average Speed (m.p.h.), for each month.
Average Speed (m.p.h.), for the year.
Speed of the Fastest Mile (m.p.h.), for each month.
Speed of the Fastest Mile, (m.p.h.) for the year.
Direction and Date of Occurrence of the Fastest Mile, for each month.
Direction and Date of Occurrence of the Fastest Mile, for the year.

Miscellaneous

Percent of Possible Sunshine, for each month.
Percent of Possible Sunshine, for the year.
Average Sky Cover, tenths, sunrise to sunset, for each month.
Average Sky Cover, tenths, sunrise to sunset, for the year.
Number of Clear Days, sunrise to sunset, for each month.
Number of Clear Days, sunrise to sunset, for the year.
Number of Partly Cloudy Days, sunrise to sunset, for each month.
Number of Partly Cloudy Days, sunrise to sunset, for the year.
Number of Cloudy Days, sunrise to sunset, for each month.
Number of Cloudy Days, sunrise to sunset, for the year.
Number of Days with 0.01 inch or more of Precipitation, for each month.
Number of Days with 0.01 inch or more of Precipitation, for the year.

Number of Days with 1.0 inch or more of Snow and/or Ice Pellets, for each month.

Number of Days with 1.0 inch or more of Snow and/or Ice Pellets, for the year.

Number of Days with Thunderstorms, for each month.

Number of Days with Thunderstorms, for each year.

Number of Days with Heavy Fog, visibility 1/4 mile or less for each month.

Number of Days with Heavy Fog, visibility 1/4 mile or less for the year.

Number of Days when the Maximum Temperature was 90°F and above, for each month.

Number of Days when the Maximum Temperature was 90°F and above, for the year.

Number of Days when the Maximum Temperature was 32°F and below, for the year.

Number of Days when the Maximum Temperature was 32°F and below, for the year.

Number of Days when the Minimum Temperature was 32°F and below, for each month.

Number of days when the Minimum Temperature was 32°F and Below, for the year.

Number of Days when the Minimum Temperature was 0°F and below, for each month.

Number of Days when the Minimum Temperature was 0°F and below, for the year.

Average Station Pressure (mb), for each month.

Average Station Pressure (mb), for the year.

2. Normals*, Means, and Extremes

Temperature (°F)

Normal Daily Maximum, for each month.

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* Normals are based on the previous 30 years of record.

Normal Daily Maximum, for a year.
Normal Daily Minimum, for each month.
Normal Daily Minimum, for a year.
Normal Monthly, for each month.
Normal Yearly.
Record High and Year of Occurrence, for each month.
Record High and Date of Occurrence.
Record Low and Year of Occurrence, for each month.
Record Low and Date of Occurrence.

Degree Days (Base 65°F)

Normal Number of Heating, for each month.
Normal Number of Heating, for a year.
Normal Number of Cooling, for each month.
Normal Number of Cooling, for a year.

Precipitation (Inches)

Normal Total Inches of Water Equivalent, for each month.

Normal Yearly Total Inches of Water Equivalent.

Maximum Monthly Total Inches of Water Equivalent and Year of Occurrence, for each month.

Maximum Monthly Total Inches of Water Equivalent and Date of occurrence.

Minimum Monthly Total Inches of Water Equivalent and Date of Occurrence, for each month.

Minimum Monthly Total Inches of Water Equivalent and Date of Occurrence.

Maximum Total Inches of Water Equivalent in 24 hours and Date of Occurrence, for each month.

Maximum Total Inches of Water Equivalent in 24 hours and Date of Occurrence.

Maximum Monthly Total Inches of Snow and/or Ice Pellets and Date of Occurrence, for each month.

Maximum Monthly Total Inches of Snow and/or Ice Pellets and Date of Occurrence.

Maximum Inches of Snow and/or Ice Pellets in 24 hours and Date of Occurrence, for each month.

Maximum Inches of Snow and/or Ice Pellets in 24 hours and Date of Occurrence.

Relative Humidity (Percent)

Normal Relative Humidity at hour 0200, for each month.
Normal Yearly Relative Humidity at hour 0200.
Normal Relative Humidity at hour 0800, for each month.
Normal Yearly Relative Humidity at hour 0800.
Normal Relative Humidity at hour 1400, for each month.
Normal Yearly Relative Humidity at hour 1400.
Normal Relative Humidity at hour 2000, for each month.
Normal Yearly Relative Humidity at hour 2000.

Wind

Mean Monthly Speed (m.p.h.), for each month.
Mean Yearly Speed (m.p.h.).
Prevailing Direction, for each month.
Yearly Prevailing Direction.

Maximum Speed, Direction, and Date of Occurrence of the Fastest Mile, for each month.

Maximum Speed, Direction, and Date of Occurrence of the Fastest Mile.

Miscellaneous

Mean Percent of Possible Sunshine, for each month.
Mean Yearly Percent of Possible Sunshine.
Mean Sky Cover, tenths, sunrise to sunset, for each month.
Mean Yearly Sky Cover, tenths, sunrise to sunset.
Mean Number of Clear Days, sunrise to sunset, for each month.
Mean Yearly Number of Clear Days, sunrise to sunset.

Mean Number of Partly Cloudy Days, sunrise to sunset, for each month.

Mean Yearly Number of Partly Cloudy Days, sunrise to sunset.
Mean Number of Cloudy Days, sunrise to sunset, for each month.
Mean Yearly Number of Cloudy Days, sunrise to sunset.

Mean Number of Days with 0.01 inch or more of Precipitation, for each month.

Mean Yearly Number of Days with 0.01 inch or more of Precipitation.

Mean Number of Days with 1.0 inch or more of Snow and/or Ice Pellets, for each month.

Mean Yearly Number of Days with 1.0 inch or more of Snow and/or Ice Pellets.

Mean Number of Days with Thunderstorms, for each month.
Mean Yearly Number of Days with Thunderstorms.

Mean Number of Days with Heavy Fog, visibility 1/4 mile or less, for each month.

Mean Yearly Number of Days with Heavy Fog, visibility 1/4 mile or less.

Mean Number of Days when the Maximum Daily Temperature is 90°F and above, for each month.

Mean Yearly Number of Days when the Maximum Daily Temperature is 90°F and above.

Mean Number of Days when the Maximum Daily Temperature is 32°F and below, for each month.

Mean Yearly Number of Days when the Maximum Daily Temperature is 32°F and below.

Mean Number of Days when the Minimum Daily Temperature is 32°F and below, for each month.

Mean Yearly Number of Days when the Minimum Daily Temperature is 32°F and below.

Mean Number of Days when the Minimum Daily Temperature is 0°F and below, for each month.

Mean Yearly Number of Days when the Minimum Daily Temperature is 0°F and below.

Average Station Pressure (mb), for each month.

Average Yearly Station Pressure (mb).

3. Average Temperature

Both the monthly and the annual average air temperatures are given for the period of record.

4. Precipitation

Both the monthly and the annual amounts of precipitation (in inches) are given for the period of record.

5. Heating Degree Days

Both the monthly and the annual number of heating degree days are given for the period of record.

6. Cooling Degree Days

Both the monthly and the annual number of cooling degree days are given for the period of record.

7. Snowfall

Both the monthly and the annual amounts of snowfall are given for the period of record.

APPENDIX E

CLIMATOLOGICAL PARAMETERS WHICH APPEAR IN THE NOAA REPORTS ENTITLED "ANNUAL CLIMATOLOGICAL SUMMARY"

Temperature (°F)

Mean Maximum Temperature, for each month.
Mean Maximum Temperature, for the year.
Mean Minimum Temperature for each month.
Mean Minimum Temperature for the year.
Mean Temperature for each month.
Mean Temperature for the year.
Total Degree Days, for each month.
Total Degree Days, for the year.
Highest Temperature and Date of Occurrence, for each month.
Highest Temperature and Date of Occurrence, for the year.
Lowest Temperature and Date of Occurrence, for each month.
Lowest Temperature and Date of Occurrence, for the year.

Number of Days when the Maximum Temperature was 90°F and above, for each month.

Number of Days when the Maximum Temperature was 90°F and above, for the year.

Number of Days when the Maximum Temperature was 32°F and below, for each month.

Number of Days when the Maximum Temperature was 32°F and below, for the year.

Number of Days when the Minimum Temperature was 32°F and below, for each month.

Number of Days when the Minimum Temperature was 32°F and below, for the year.

Number of Days when the Minimum Temperature was 0°F and below, for each month.

Number of Days when the Minimum Temperature was 0°F and below, for the year.

Precipitation (Inches)

Total Amount of Precipitation, for each month.
Total Amount of Precipitation, for the year.

Greatest Amount of Precipitation in 24 hours and Date of Occurrence, for each month.

Greatest Amount of Precipitation in 24 hours and Date of Occurrence, for the year.

Total Amount of Snow and/or Sleet, for each month.
Total Amount of Snow and/or Sleet, for the year.

Greatest Depth of Snow and/or Sleet and Date of Occurrence, for each month.

Greatest Depth of Snow and/or Sleet and Date of Occurrence, for the year.

Number of Days with 0.10 inch or more of Precipitation, for each month.
Number of Days with 0.10 inch or more of Precipitation, for the year.
Number of Days with 0.50 inch or more of Precipitation, for the year.
Number of Days with 0.50 inch or more of Precipitation, for each month.
Number of Days with 1.0 inch or more of Precipitation, for each month.
Number of Days with 1.0 inch or more of Precipitation, for the year.

APPENDIX F

CLIMATE AND WATER QUALITY PARAMETERS MEASURED BY R&M

Climate Parameters Measured

- Wind Direction
- Wind Speed
- Temperature
- Relative Humidity
- Solar Radiation
- Precipitation
- Peak Wind Gust
- Longwave Radiation (Watana and Eklutna Lake only)

Continuous WQ Parameters (Watana Site)

- Temperature
- pH
- Dissoloved Oxygen
- Oxidation - Reduction Potential
- Conductivity
- Temperature - Corrected Conductivity

Water Quality Parameters Measured (Vee Canyon, Gold Creek Sites)

Field:

- Dissolved Oxygen
- pH
- Conductivity
- Temperature
- Carbon Dioxide
- Alkalinity
- Settleable Solids

Laboratory:

- Turbidity
- Total Dissolved Solids
- Total Suspended Solids
- Total Phosphate
- Kjeldahl Nitrogen
- Total Nitrogen
- Nitrate Nitrogen
- Ammonia Nitrogen
- Chemical Oxygen Demand
- Hardness
- Chloride
- Color
- Sulfate
- ICAP Scan[1]
- Uranium
- Radioactivity, Gross Alpha
- Organic Chemicals
- Total Organic Carbon
- Total Inorganic Carbon

[1] ICAP Scan includes:

- Silver
- Aluminum
- Arsenic
- Gold
- Boron
- Barium
- Bismuth
- Calcium
- Cadmium
- Cobalt
- Chromium
- Copper
- Iron
- Mercury
- Potassium
- Magnesium
- Molybdenum
- Sodium
- Nickel
- Manganese
- Phosphorus
- Lead
- Platinum
- Antimony
- Selenium
- Tin
- Strontium
- Titanium
- Vanadium
- Tungsten
- Zinc
- Zirconium

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APPENDIX H

BIBLIOGRAPHY OF AVAILABLE DOCUMENTS RELATED TO THE HYDROLOGY AND CLIMATE OF THE SUSITNA RIVER BASIN

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