

2829

SUSITNA HYDROELECTRIC PROJECT

FEDERAL ENERGY REGULATORY COMMISSION
PROJECT No. 7114

LIBRARY
ALASKA DEPT. OF REVENUE & TAXES
333 Raspberry Rd.
Anchorage, Alaska 99518-1509



HYDROLOGY FIELD DATA INDEX

PREPARED BY

R&M

R & M CONSULTANTS, INC.
ENGINEERS GEOLOGISTS PLANNERS SURVEYORS

UNDER CONTRACT TO

HARZA-EBASCO
SUSITNA JOINT VENTURE

FINAL REPORT

JULY 1985

DOCUMENT No. 2829

Alaska Power Authority

TK
1425
.58
F472
no. 2829

SUSITNA HYDROELECTRIC PROJECT

HYDROLOGY FIELD DATA INDEX

Report by
R&M Consultants, Inc.

Under Contract to
Harza-Ebasco Susitna Joint Venture

Prepared for
Alaska Power Authority

Final Report
July 1985

ARLIS
Alaska Resources
Library & Information Services
Anchorage, Alaska

NOTICE

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

ARLIS
Alaska Resources
Library & Information Services
Anchorage, Alaska

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

HYROLOGY FIELD DATA INDEX

TABLE OF CONTENTS

PAGE

INTRODUCTION

1

WATER RESOURCES DATA COLLECTED IN THE SUSITNA
RIVER BASIN

0100	Streamflow Continuous Gaging	0100-1
0200	Streamflow Partial Records	0200-1
0300	Water Quality	0300-1
0400	Water Temperature	0400-1
0500	Sediment Discharge	0500-1
0600	Climate	0600-1
0700	Freezing Rain & Icing	0700-1
0800	Snow Survey	0800-1
0900	Snow Creep	0900-1
1000	Freeze-Up River Ice Observations	1000-1
1100	Winter River Ice Observations	1100-1
1200	Breakup River Ice Observations	1200-1
1300	Aerial Photography	1300-1
1400	Hydrographic Surveys	1400-1
1500	Glacial Observations	1500-1
1600	Glacial Lake Observations	1600-1
1700	Aquatic Habitat Observations	1700-1

3 3755 000 44113 9

APPENDICES

- A Government Agencies that have Collected or Analyzed Water Resources Data for the Susitna River Basin
- B Water Quality Parameters that have been Sampled by USGS within the Susitna River Basin
- C Data Collected by ADF&G in the Susitna River Basin from 1974 - 1977, and 1981
- 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
 - 2. Normals, Means & Extremes
 - 3. Average Temperature
 - 4. Precipitation
 - 5. Heating Degree Days
 - 6. Cooling Degree Days
 - 7. Snowfall
- E Climatological Parameters which Appear in the NOAA Report Entitled "Annual Climatological Summary"
- F Climate & Water Quality Parameters Measured by R&M
- G Distribution List for Field Data Index
- H Bibliography of Available Documents Related to the Susitna River Basin

PLATE 1: Data Collection Stations for the Susitna River Basin

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 upstream 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.

<u>Index No.</u>	<u>Description</u>
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.

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

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.

<u>Index No.</u>	<u>Description</u>
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) 1983: March 2 August 8 (R&M) April 6 September 5 (R&M) May 17 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
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	1983: March 18
August 8 (R&M)	May 19
August 19	June 28
October 7	July 28
October 14 (R&M)	August 25
1981: January 14 (R&M)	October 3
January 16	
February 12	1984: May 31
March 24	June 27
May 27 (R&M and USGS)	July 25
June 30 (R&M)	August 23
June 23	September 28
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)	

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.

<u>Index No.</u>	<u>Description</u>
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	1982:	July 26
	July 17		July 27
	September 1		August 3
	October 22		August 11
			August 17
1981:	January 14		August 24
	February 10		September 1
	March 25		September 18
	May 18		
	June 23	1984:	May 17
	July 20		May 31
	August 24		June 8
			July 18
1982:	April 8		July 25
	June 3		August 9
	June 4		August 21
	June 9		September 17
	June 16		September 27
	June 22		
	June 29		
	July 27		
	July 13		
	July 20		

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	<p>Susitna River near Sunshine - USGS Station 15292780 (RM 83.8)</p> <p>Water Temperature Record: 1981 - Present</p> <p>Temperature Cross Section:</p> <table> <tr> <td>1981: October 19</td><td>1983: July 27</td></tr> <tr> <td></td><td>August 11</td></tr> <tr> <td>1982: January 20</td><td>October 16</td></tr> <tr> <td>March 2</td><td></td></tr> <tr> <td>April 9</td><td>1984: May 21</td></tr> <tr> <td>June 3</td><td>June 14</td></tr> <tr> <td>July 2</td><td>July 19</td></tr> <tr> <td>August 17</td><td>August 16</td></tr> <tr> <td>September 15</td><td>September 28</td></tr> <tr> <td>October 13</td><td></td></tr> <tr> <td>1983: January 20</td><td></td></tr> <tr> <td>March 17</td><td></td></tr> <tr> <td>May 12</td><td></td></tr> <tr> <td>June 24</td><td></td></tr> </table>	1981: October 19	1983: July 27		August 11	1982: January 20	October 16	March 2		April 9	1984: May 21	June 3	June 14	July 2	July 19	August 17	August 16	September 15	September 28	October 13		1983: January 20		March 17		May 12		June 24	
1981: October 19	1983: July 27																												
	August 11																												
1982: January 20	October 16																												
March 2																													
April 9	1984: May 21																												
June 3	June 14																												
July 2	July 19																												
August 17	August 16																												
September 15	September 28																												
October 13																													
1983: January 20																													
March 17																													
May 12																													
June 24																													
0462	<p>Willow Creek near Willow - USGS Station 15294005</p> <p>Water Temperature Record: 1978 - Present</p>																												
0463	<p>Deception Creek near Willow - USGS Station 15294010</p> <p>Water Temperature Record: 1978 - 1981</p>																												
0465	<p>Skwentna River near Skwentna - USGS Station 15294300</p> <p>Miscellaneous Water Temperatures: 1967-68, 1974-75, 1980</p>																												
0475	<p>Yentna River near Susitna Station</p> <p>Water Temperature Record: 1981 - Present</p>																												

Index
No.

Description

Temperature Cross Sections:

1981:	May 20 June 11 July 14 August 11 September 16	1983:	August 10 August 26 September 29
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
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 March 12 June 16 July 30 October 10	1982:	July 14 August 12 October 5
1981:	January 13 April 9 May 21 June 12 July 15 August 12 September 17	1983:	April 5 June 22 July 27 September 30
1982:	January 12 April 9 May 19 June 12	1984:	April 6 June 13 July 17 August 15 September 20

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

<u>Index No.</u>	<u>Description</u>
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) 1983: March 2
September 17 (R&M) April 6
October 18 (R&M) May 17
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

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
	<p>Sediment Concentration and Sediment Discharge: 1977</p> <p>Particle Size Analysis: 1977</p>
0530	<p>Portage Creek near Gold Creek - USGS Station 625000149223500</p> <p>Sediment Concentration and Sediment Discharge: 1984</p> <p>1984: May 30 June 26 July 24 August 23</p> <p>Bedload Sediment Sampling:</p> <p>1984: May 30 June 26 July 24 September 27</p>
0535	<p>Indian Creek near Gold Creek - USGS Station 624718149393600</p> <p>Sediment Concentration and Sediment Discharge: 1984</p> <p>1984: May 30 June 27 July 25 August 23</p> <p>Bedload Sediment Sampling:</p> <p>1984: May 30 June 27 July 25</p>
0540	<p>Susitna River at Gold Creek - USGS Station 15292000 (RM 136.6)</p> <p>Sediment Concentration and Sediment Discharge: 1952-1957, 1962, 1967, 1974-Present</p> <p>1980: May 14 August 19 October 7 October 16 (R&M)</p> <p>1981: January 14 (R&M) January 16</p>

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	1983: May 19
June 9	May 25
June 16	May 31
June 24	June 2
July 7	June 9
July 13	June 22
July 20	July 6
July 27	July 20
August 3	August 2
August 11	August 9
August 17	August 31
August 24	September 13
September 1	October 5
September 18	
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

0560

Susitna River at Sunshine - USGS Station 15292780 (RM 83.8)

Sediment Concentration and Sediment
Discharge: 1971, 1977, 1981 - Present

1982:	March 2	1983:	January 20
	April 9		March 17
	June 3		May 12
	June 10		May 18
	June 17		May 24
	June 21		June 1
	June 28		June 8
	July 2		June 23
	July 6		July 5
	August 17		July 19
	September 15		July 27
	October 13		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	1983:	March 23
	August 26		May 18
	September 30		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
April 9
May 20
June 11
July 15
August 11
September 16
1982: April 1
May 18
June 12
July 13
April 1
May 1
August 11
October 6
1983: January 20
June 22
July 26
August 10
September 29
1984: May 14
June 12
July 17
August 15
September 19

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

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 the 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.

<u>Index Number</u>	<u>Station Name</u>	<u>Measured By</u>	<u>Report¹ Available</u>	<u>Period of Record</u>
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)

<u>Index Number</u>	<u>Station Name</u>	<u>Measured By</u>	<u>Report¹ Available</u>	<u>Period of Record</u>
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 Anadromous 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

<u>Station Name</u>	<u>Reported by</u>	<u>Period of Record</u>
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.

<u>Index No.</u>	<u>Description</u>
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 detector 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.

<u>Index Number</u>	<u>Course Name</u>	<u>Measured By</u>	<u>Cross Reference Number</u>	<u>Years of Record Prior to 1980</u>	<u>Drainage Basin</u>
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.

<u>Index Number</u>	<u>Course Name</u>	<u>Measured By</u>	<u>Cross Reference Number</u>	<u>Years of Record Prior to 1980</u>	<u>Drainage Basin</u>
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.

<u>Index Number</u>	<u>Course Name</u>	<u>Measured By</u>	<u>Cross Reference Number</u>	<u>Years of Record Prior to 1980</u>	<u>Drainage Basin</u>
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.

<u>Index Number</u>	<u>Date</u>	<u>Area of Ice Observations</u>	<u>Observers</u>
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. Griffiths
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

<u>Index Number</u>	<u>Date</u>	<u>Area of Ice Observations</u>	<u>Observers</u>
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.

<u>Index Number</u>	<u>Date</u>	<u>Area of Ice Observations</u>	<u>Observers</u>
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

<u>Index Number</u>	<u>Date</u>	<u>Area of Ice Observations</u>	<u>Observers</u>
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.

<u>Index No.</u>	<u>Date(s)</u>	<u>Description</u>	<u>Observers</u>
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

<u>Index No.</u>	<u>Date(s)</u>	<u>Description</u>	<u>Observers</u>
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 MacIaren 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	MacIaren 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)

<u>Index No.</u>	<u>Date</u>	<u>Area</u>	<u>BW Scale</u>	<u>or Color</u>	<u>Contracting Agency</u>	<u>Loc. of Negs.</u>	<u>Approximate River Miles</u>	<u>Susitna Discharge* (cfs)</u>
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 Aeronautics 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 represented 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
Hyattsville, 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.

<u>Index No.</u>	<u>Dates</u>	<u>Location</u>	<u>Description</u>
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 sections 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
February 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.

<u>River</u> <u>Mile</u>	<u>Site Description</u>	<u>Agency</u>
-----------------------------	-------------------------	---------------

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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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]	ADF&G
	(Previously Slough 9 below trier B RM 129.0)	
128.7	Slough 9 Site #2 Surface [82]	ADF&G
	(Previously RM 129.2)	
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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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		Staff Gages	
		ADF&G	R&M	ADF&G	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		82, 81	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		Staff Gages	
		ADF&G	R&M	ADF&G	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	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		Staff Gages	
		ADF&G	R&M	ADF&G	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		Staff Gages	
		ADF&G	R&M	ADF&G	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.

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
<u>FLOW MEASUREMENTS/RATING CURVE</u>		
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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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	Mainstem 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 *

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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 *

<u>River Mile</u>	<u>Site Description</u>	<u>Agency</u>
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

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

Includes: Climatic Data

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

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

Includes: Snow Surveys

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

Includes: Data Analysis

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

Includes: Water Discharge
Sediment
Water Quality
Water Temperature

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

Includes: Data Analysis

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 SiO₂)
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 SO₄)
Uranium, Dissolved - Extraction (ug/l)
Uranium, Dissolved - Direct Fluorimetric (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)
Naphthalenes, 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.

Riis, James C. and Friese, Nancy V., 1978. Fisheries and Habitat Investigations of the Susitna River - A preliminary study of potential impacts of the Devil's Canyon and Watana Hydroelectric Projects. Alaska Department of Fish and Game, Division of Sport & Commerical Fish. 116 pp.

- 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.

* 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
Dissolved 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

APPENDIX G

FIELD DATA INDEX
DISTRIBUTION LIST

AEIDC
707 "A" Street
Anchorage, Alaska 99501

Attention: Mr. Jim Wise
Dr. Bill Wilson

Alaska Cooperative Wildlife Research Unit
University of Alaska
Fairbanks, Alaska 99701

Attention: Dr. Phil Gipson

Alaska Department of Fish & Game
P.O. Box 47
Glenallen, Alaska 99588

Attention: Mr. Jack Witman

Alaska Department of Fish and Game
Susitna Hydro Aquatic Studies
620 East 10th, 3rd Floor, Michael Building
Anchorage, Alaska 99503

Attention: Mr. Richard Cannon

Alaska Department of Natural Resources
323 East 4th Avenue
Anchorage, Alaska 99501

Attention: Ms. Esther Wunnicke

Alaska Power Authority
334 West 5th Avenue
Anchorage, Alaska 99501

Attention: (2 copies) Dr. Richard Fleming
Mr. Eric Marchegiani

Milo Bell
P.O. Box 23
Mukilteo, Washington 98275

CIRI/Holmes & Narver
670 West Fireweed Lane
Anchorage, Alaska 99502

Attention: Mr. Karl Hansen

Department of Environmental Conservation
Pouch O
Juneau, Alaska 99811

Attention: Mr. Dave Sturdevant

Linda Dwight
P.O. Box 3613DT
Anchorage, Alaska 99510

Entrix, Inc.
4794 Business Park Blvd, Suite 06
Anchorage, Alaska 99503

Attention: Dr. Larry Moulton

E. W. Trihey & Associates
P.O. Box 111774
Anchorage, Alaska 99511

Attention: Mr. Woody Trihey

Federal Energy Regulatory Commission
DLP 4th Floor
825 N. Capitol Street
Washington, D.C. 20426

Attention: Mr. Mark Robinson

Geophysical Institute
University of Alaska
Fairbanks, Alaska 99701

Attention: Dr. Will Harrison

Harza Engineering Company
150 South Wacker Drive
Chicago, Illinois 60606

Attention: Dr. Bi-Hueh Wang
Mr. Wayne Coleman

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

Attention: Mr. William Larson
Dr. Larry Gilbertson
Dr. John Bizer
Mr. Wayne Dyok
Mr. Gene Gemperline

Institute of Water Resources
University of Alaska
Fairbanks, Alaska 99701

Attention: Dr. Tom Roberts

LGL Alaska, Inc.
505 West Northern Lights, Suite 201
Anchorage, Alaska 99503

Attention: Dr. Robin Sener

LGL Alaska, Inc.
P.O. Box 80607
Fairbanks, Alaska 99708

Attention: Mr. Dave Roseneau

Pillsbury, Madison, & Sutro
1050 17th Street NW, Suite 900
Washington, D.C. 20036

Attention: Ms. Jane Drennan

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

Attention: (2 copies) Mr. Stephen Bredthauer

Soil Conservation Service
2221 E. Northern Lights Blvd., Rm. 129
Anchorage, Alaska 99504

Attention: Mr. George Clagett

State Publications Distribution
and Data Access Center
Pouch G
Juneau, Alaska 99811

Attention: (20 copies) Distribution Manager

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

Attention: Mr. Vern Thompson

U.S. Fish and Wildlife Service
733 West 4th Avenue, Suite 101
Anchorage, Alaska 99501

Attention: Mr. Don Mackay

U.S. Fish and Wildlife Service
Western Alaska Ecological Service
605 W. 4th, #G-81
Anchorage, Alaska 99501

Attention: Ms. Ann Rappoport

U.S. Geological Survey/Water Resources
218 "E" Street
Anchorage, Alaska 99501

Attention: Mr. Phil Emery

U.S. Geological Survey/Water Resources Division
Subdistrict Office
1209 Orca Street
Anchorage, Alaska 99501

Attention: Mr. Larry Leveen

University of Alaska, Agricultural Experiment Station
P.O. Box AE
Palmer, Alaska 99645

Attention: Ms. Dot Helm

University of Alaska Museum
P.O. Box 80211
College, Alaska 99703

Attention: Dr. Brina Kessel

APPENDIX H

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

(This is an abbreviated listing of Susitna related reports. For the most current listing, contact the Harza-Ebasco Susitna Joint Venture Documents Control section)

- Alaska Department of Fish and Game. 1977. Corps of Engineers Susitna River Hydroelectric Project: Baseline inventory study (1 July 1976 - 30 September 1976). Prepared for U.S. Department of the Interior, Fish and Wildlife Service, Anchorage, Alaska. 91 pp.
- Alaska Department of Fish and Game. 1978. Preliminary environmental assessment of hydroelectric development on the Susitna River. Prepared for the U.S. Fish and Wildlife Service. Anchorage, Alaska. 207 pp.
- Alaska Department of Fish and Game. 1981. Susitna Hydro Aquatic Studies - Phase I Report (Vol. 1): Aquatic habitat and instream flow project. Prepared for Acres American, Inc. Buffalo, New York. 260 pp.
- Alaska Department of Fish and Game. 1981. Susitna Hydro Aquatic Studies - Phase I Report (Vol. 2 Pt. 1): Aquatic habitat and instream flow project. Prepared for Acres American, Inc. Buffalo, New York. 305 pp.
- Alaska Department of Fish and Game. 1981. Susitna Hydro Aquatic Studies - Phase I Report (Vol. 2 Pt. 2): Aquatic habitat and Instream Flow Project. Prepared for Acres American, Inc. Buffalo, New York. 541 pp.
- Alaska Department of Fish and Game. 1982. Susitna Hydro Aquatic Studies - Phase I Report: Aquatic Studies Program. Prepared for Acres American, Inc. Buffalo, New York. 137 pp.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Report: Summarization of Volumes 2, 3, 4; Parts I and II, and 5 - Su Hydro Basic Data Reports, 1982. Prepared for Alaska Power Authority, Anchorage, Alaska. 126 pp.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Data Report: Winter aquatic studies (October, 1982 - May, 1983), Anchorage, Alaska. 137 pp.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Report: Synopsis of the 1982 aquatic studies

and analysis of fish and habitat relationships. Anchorage, Alaska. 152 pp.

- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Report: Synopsis of the 1982 Aquatic Studies and Analysis of Fish and Habitat Relationships. Appendices A-K. Anchorage, Alaska. 357 pp.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Basic Data Report. Volume 4: Aquatic habitat and instream flow studies, 1982, Part I and II. 367 pp.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Basic Data Report. Volume 4: Aquatic habitat and instream flow studies, 1982, Appendix A-C. Anchorage, Alaska.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Basic Data Report. Volume 4: Aquatic habitat and instream flow studies, 1982, Appendices D-J. Anchorage, Alaska.
- Alaska Department of Fish and Game. 1983. Susitna Hydro Aquatic Studies - Phase II Basic Data Report. Volume 5: Upper Susitna River impoundment studies. 1982. Anchorage, Alaska. 150 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 2: Resident and juvenile anadromous fish investigations, May-October 1983. Dana C. Schmidt, Stephen S. Hale, Drew L. Crawford, Paul M. Suchanek (eds.), Prepared for: Alaska Power Authority, Anchorage, Alaska. 395 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983. Chapter 1: Stage and Discharge Investigations. Prepared for Alaska Power Authority, Anchorage, Alaska. 136 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983. Chapter 2: Channel geometry investigations of the Susitna River Basin. Prepared for Alaska Power Authority. 212 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983. Chapter 3: Continuous water temperature investigations. Prepared for Alaska Power Authority, Anchorage, Alaska. 145 pp.

- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983. Chapter 4: Water Quality Investigations (+ Appendix). Prepared for the Alaska Power Authority, Anchorage, Alaska. 30 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983. Chapter 5: Eulachon Spawning Habitat in the Lower Susitna River (+ Appendix). Prepared for Alaska Power Authority, Anchorage, Alaska. 32 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983 (Review Draft). Chapter 6: An evaluation of passage conditions for adult salmon in sloughs and side channels of the Middle Susitna River. Prepared for the Alaska Power Authority, Anchorage, Alaska. 178 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983 (Draft). Part II, Chapter 7: An evaluation of salmon spawning habitat in selected tributary mouth habitats of the Middle Susitna River. Prepared for Alaska Power Authority, Anchorage, Alaska. 178 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983 (Draft). Part II, Chapter 8: An evaluation of salmon spawning habitat in selected tributary mouth habitats of the Middle Susitna River. Prepared for Alaska Power Authority, Anchorage, Alaska. 70 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983 (Draft). Part II, Chapter 9: Habitat Suitability Criteria for Chinook, Coho, and Pink Salmon Spawning. Prepared for Alaska Power Authority, Anchorage, Alaska. 61 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 3: Aquatic Habitat and Instream Flow Investigations, May - October 1983 (Draft). Part II, Chapter 10: The Effectiveness of Infrared Thermal Imagery Techniques For Detecting Upwelling Groundwater. Prepared for Alaska Power Authority, Anchorage, Alaska. 61 pp.
- Alaska Department of Fish and Game. 1984. Susitna Hydro Aquatic Studies, Report No. 4: Access and Transmission Corridor Aquatic Investigations, July-October 1983. Prepared For Alaska Power Authority. Anchorage, Alaska.

- Alaska Department of Fish and Game. Sport Fish Division 1984. Annual Performance Report, Study G-II. Chinook Salmon Population and Angler Use Studies of Northern Cook Inlet Waters.
- Arctic Environmental Information and Data Center (AEIDC). 1982. Periodicity Chart for the Susitna River Salmon.
- Arctic Environmental Information and Data Center (AEIDC). 1983. Aquatic Concerns and Information Needs Relating to Potential Load Following Operations of the Susitna Project. Memo. September.
- Arctic Environmental Information and Data Center (AEIDC). 1983. Susitna Hydroelectric Project. Aquatic Impact of Project-Related Changes in Temperature, Turbidity, and Stream Discharge on Upper Susitna Salmon Resources. October.
- Arctic Environmental Information and Data Center (AEIDC). 1983. Effects of the Proposed SHP on Fishery Resources in the Susitna River Basin. Demonstration Impact Analysis. September.
- Arctic Environmental Information and Data Center (AEIDC). 1983. Streamflow and Temperature Modelling in the Susitna River Basin, Alaska. Final Report. June.
- Arctic Environmental Information and Data Center (AEIDC). 1984. Susitna Hydroelectric Project. Aquatic Impact: Effects of Project-Related Changes in Temperature, Turbidity, and Stream Discharge on Upper Susitna Salmon Resources During January through September. January.
- Arctic Environmental Information and Data Center (AEIDC). 1984. Examination of Discharge and Temperature Changes Due to the Proposed Susitna Hydroelectric Project. Final Report. February.
- ADNR. 1982. A Preliminary Analysis of Potential Navigation Problems Downstream of the Proposed Hydroelectric Dams on the Susitna River. March.
- Barrett, Bruce M. 1974. An Assessment Study of the Anadromous Fish Populations in the Upper Susitna River Watershed between Devil Canyon and the Chulitna River: Alaska Department of Fish and Game, Division of Commercial Fisheries, 56 pp.
- Bilello, Michael A. 1980. A Winter Environmental Data Survey of the Drainage Basin of the Upper Susitna River, Alaska: CRREL Special Report 80-19, 30 pp.
- Bishop, Dan. 1974. A Hydrologic Reconnaissance of the Susitna River below Devil's Canyon: for NOAA, U.S. Department of Commerce, 69 pp.

- Cole, Terrence. 1979. The History of the use of the Upper Susitna River: Indian River to the Head waters. July 1979.
- Dwight. 1982. Survey of Questions and Concerns Pertaining to Instream Flow Aspects of the Proposed Susitna Hydroelectric Project. May.
- E. Woody Trihey and Associates. 1984. Response of Aquatic Habitat Surface Areas to Mainstem Discharge in the Talkeetna to Devil Canyon Reach of the Susitna River, Alaska. June.
- E. Woody Trihey and Associates. 1985. Summary of Hydraulic Conditions and Habitat Forecasts at 1984 Middle River Study Sites. Draft Report. May, 1, 1985.
- Friese, Nancy V. 1975. Pre-Authorization Assessment of Anadromous Fish Populations of the Upper Susitna River Watershed in the Vicinity of the Proposed Devil Canyon Hydroelectric Project: Alaska Department of Fish and Game, Division of Commercial Fisheries, 121 pp.
- H. J. Kaiser and Company. 1974. Reassessment Report on the Upper Susitna River Hydroelectric Development for the State of Alaska.
- Harza-Ebasco. 1983. Susitna Hydroelectric Project. Lower Susitna River. Water Surface Profiles and Discharge Rating Curve. October.
- Harza-Ebasco. 1983. Susitna Hydroelectric Project. Task 42, Reservoir Operation Studies for Various Downstream Flow Requirements. October.
- Harza-Ebasco. 1983. Susitna Hydroelectric Project. Reservoir and River Sedimentation. Draft. December.
- Harza-Ebasco. 1984. Stream Flow Time Series, Susitna River at Watana and Devil Canyon. January.
- Harza-Ebasco. 1984. Probable Maximum Flood For Watana and Devil Canyon Sites. January.
- Harza-Ebasco. 1985. Draft Report on Analysis of Potential Aggradation and Degradation in the Susitna River Below Devil Canyon Dam.
- Harza-Ebasco. 1984. Susitna Hydroelectric Project Climatic Data Availability. January.
- Harza-Ebasco. 1984. Instream Ice Calibration of Computer Model. March.
- Harza-Ebasco. 1984. Eklutna Lake Temperature and Ice Study With Six Months Simulation for Watana Reservoir. March.

Harza-Ebasco. 1984. River Stage Fluctuations Resulting From Alternative Operations, Watana Development. March.

Imberger. 1981. A Dynamic Reservoir Simulation Model - DYRESM:5, in: Transport Models for Inland and Coastal Waters.

Knott, J.M. and S.W. Lipscomb. 1983. Sediment Discharge Data For Selected Sites in the Susitna River Basin, Alaska, 1981-82. Open-file report 83-870. U.S. Department of the Interior, Geological Survey, Anchorage, Alaska. 45 pp.

Krebs, P.V., Dean, K.G., & Lonn, W.S. 1978. Geomorphology & Vegetation of the Lower Susitna River Basin: for Soil Conservation Service, U.S. Department of Agriculture, 53 pp.

Peratrovich Nottingham & Drage, Inc. 1982. Susitna Reservoir Sedimentation and Water Clarity Study. November.

R&M Consultants, Inc. 1980. Field Data Index, July. Revised July 1981, February 1983, July 1982, and February 1983, April 1984, and April 1985.

R&M Consultants, Inc. 1981. Preliminary Channel Geometry, Velocity, and Water Level Data for the Susitna River at Devil Canyon. April.

R&M Consultants, Inc. 1981. Water Quality Annual Report 1980. April.

R&M Consultants, Inc. 1981. Regional Flood Peak and Volume Frequency Analysis. June.

R&M Consultants, Inc. 1981. Ice Observations 1980- 1981. August.

R&M Consultants, Inc. 1981. Flow Variability. September.

R&M Consultants, Inc., 1981. Hydrographic Surveys. October.

R&M Consultants, Inc. and W.D. Harrison, 1981. Glacier Studies. December.

R&M Consultants, Inc. 1981. Regional Flood Studies, December.

R&M Consultants, Inc. 1981. Susitna River Mile Index: Mouth to Susitna Glacier. December.

R&M Consultants, Inc. 1981. Water Quality Annual Report 1981. December.

R&M Consultants, Inc. 1982. Reservoir Evaporation. January.

R&M Consultants, Inc. 1982. Reservoir Sedimentation. January.

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

R&M Consultants, Inc. 1982. Field Data Collection and Processing Volumes 1-3. February.

R&M Consultants, Inc. 1982. Water Quality Interpretation 1981. February.

R&M Consultants, Inc. 1982. Hydraulic and Ice Studies. March.

R&M Consultants, Inc., 1982. Processed Climatic Data Volume 1 - Susitna Glacier Station. March.

R&M Consultants, Inc., 1982. Processed Climatic Data Volume 2 - Denali Station. March.

R&M Consultants, Inc., 1982. Processed Climatic Data Volume 3 - Tyone River Station. March.

R&M Consultants, Inc., 1982. Processed Climatic Data Volume 4 - Kosina Creek Station. March.

R&M Consultants, Inc., 1982. Processed Climatic Data Volume 5 - Watana Station. March.

R&M Consultants, Inc., 1982. Processed Climatic Data Volume 6 - Devil Canyon. March.

R&M Consultants, Inc., 1982. Ice Observations 1981-1982. December.

R&M Consultants, Inc., 1982. Field Data Collection and Processing Supplement 1, 1982 Data. December.

R&M Consultants, Inc., 1982 Slough Hydrology, Interim Report. December.

R&M Consultants, Inc., 1982. Hydrographic Surveys Report. December.

R&M Consultants, Inc., and W.D. Harrison, 1982. 1982 Susitna Basin Glacial Studies. December.

R&M Consultants, Inc., 1982. Water Quality Annual Report. December.

R&M Consultants, Inc. and L.A. Peterson and Associates, 1982. Water Quality Effects Resulting From Impoundment of the Susitna River. December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 1, Susitna Glacier Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 2, Denali Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 3, Tyone River Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 4, Kosina Creek Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 5, Watana Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 6, Devil Canyon Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 7, Sherman Station, December.

R&M Consultants, Inc. 1982. Processed Climatic Data, October 1981 - September 1982, Volume 8, Eklutna Lake Station, December.

R&M Consultants, Inc., 1983. Glacial Lake Studies Interim Report. January.

R&M Consultants, Inc., 1983. Tributary Stability Analysis. January.

R&M Consultants, Inc. 1983. Susitna River Ice Study, 1982-83. December.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 1, Susitna Glacier Station. June.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 2, Denali Station. June.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 3, Kosina Creek Station, June.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 4, Watana Station. June.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 5, Devil Canyon Station. June.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 6, Sherman Station. June.

R&M Consultants, Inc. 1984. Processed Climatic Data, October 1982 - September 1983, Volume 7, Eklutna Lake Station, June.

R&M Consultants, Inc. 1984 (Draft). 1983-1984 Susitna River Ice Study, June.

- R&M Consultants, Inc. 1984 (Draft). Suspended Sediment and Turbidity Settling Column Study. December.
- R&M Consultants, Inc. 1985 (Draft). 1984 Freezeup, Susitna River Ice Study, February.
- R&M Consultants, Inc. 1985. Lower Susitna River Aggradation Study: Field Data. June.
- R&M Consultants, Inc. 1985. Water Balance Studies of the Middle Susitna River Sloughs. April.
- R&M Consultants, Inc. 1985. Susitna Hydroelectric Project Effects on Navigation, April.
- R&M Consultants, Inc. 1985 (Draft). Glacial Lake Physical Limnology Studies: Eklutna Lake, Alaska. 2 Volumes. June.
- R&M Consultants, Inc. and E.W. Trihey and Associates. 1985. Assessment of Access by Spawning Salmon into Tributaries of the Lower Susitna River. June.
- Riis, James C. 1975. Pre-Authorization Assessment of the Susitna River Hydroelectric Projects: Preliminary Evaluation of Water Quality and Aquatic Species Compositions: Alaska Department of Fish & Game, Sport Fish Division, 61 pp.
- 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, Sport Fish Division, 91 pp.
- Riis, James C., and Friese, Nancy V. 1978. Fisheries and Habitat Investigations of the Susitna River - A Preliminary Study of Potential Impacts of the Devils Canyon & Watana Hydroelectric Projects, Alaska Department of Fish and Game, Sport Fish Division, 116 pp.
- Stuart. 1984. National and Predicted With Project Concentrations of Susitna River Suspended Sediment. Figure 3. January.
- Trihey, E. Woody. 1981. Fish Ecology: Survey of Questions and Concerns Pertaining to Instream Flow Aspects of the Proposed Susitna Hydroelectric Project. May.
- Trihey, E. Woody. 1982. Winter Temperature Study. Open file report. June.
- Trihey, E. Woody. 1982. Preliminary Assesement of Access by Spawning Salmon to Side Slough Habitat Above Talkeetna. November.

- Trihey, E. Woody. 1982. Habitat Characteristics of the Susitna River Above Talkeetna. November.
- Trihey, E. Woody. 1983. Preliminary Assessment of Access by Spawning Salmon Into Portage Creek and Indian River. March.
- U.S. Army Corps of Engineers (USCE). 1950-1951. Harbors and Rivers in Alaska Survey Report 1950/1951. Cook Inlet and Tributaries, Copper River and Gulf Coast, Yukon & Kuskokwim River Basin.
- USCE 1972. Flood Plain Information. Talkeetna River - Susitna River - Chulitna River. Prepared for the Matanuska Susitna Borough. June 1972.
- USCE. 1975. Southcentral Railbelt Area, Alaska. Upper Susitna Basin. Hydropower and Related Purposes. Interim Feasibility Report 1975.
- USCE. 1978. Southcentral Railbelt Area, Alaska. Upper Susitna Basin. Hydropower and Related Purposes. Supplemental Feasibility Report 1978.
- USCE. 1979. National Hydroelectric Power Resources Study. Preliminary Inventory of Hydropower Resources, Pacific Northwest, July 1979.
- USCE. 1980. Environmental Analysis of the Upper Susitna River Basin using Landsat Imagery: CRREL Report 80-4.
- USCE. 1980. Expanded Flood Plain Information Study for the Willow Creek Basin, Willow, Alaska.
- U.S. Department of Agriculture. 1980. Precipitation and Water Yield, Alaska Rivers Cooperative Study, Willow and Talkeetna Subbasins, May 1980.
- U.S. Department of Interior (USDI). 1952. Reconnaissance Report on the Potential Development of Water Resources in the Territory of Alaska: Bureau of Reclamation, January 1952.
- USDI. 1952. A Report on the Potential Development of Water Resources in the Susitna River Basin of Alaska: Bureau of Reclamation, August 1952.
- USDI. 1960. Devil's Canyon Project Alaska Feasibility Report: Bureau of Reclamation.
- USDI. 1974. Devil's Canyon Project - Alaska Status Report: Alaska Power Administration.
- USDI. 1979. Inventory - Type Calculations for Some Potential Hydroelectric Projects in Alaska: Alaska Power Administration.

- USFWS. 1983. Effects of Various Temperature Regimes on the Incubation of Susitna River Chum and Sockeye Salmon. Draft report. August.
- USFWS. 1983. Effects of Various Water Temperature Regimes on the Eggland Alevin Incubation of Susitna River Chum and Sockeye Salmon.
- U.S. Geological Survey (USGS) - Scully, D.R. 1977. Surface Water Records for Cook Inlet Basin, Alaska (through September 30, 1976).
- USGS. 1966-Present. Water Resources Data for Alaska, Water Year through Present.
- USGS - Lamke, R.D. 1979. Flood Characteristics of Alaskan Streams.
- USGS - Still, P.J. 1980. Index of Streamflow and Water Quality Records to September 30, 1978. Southcentral Alaska.
- USGS. 1980. Water Resources (Surface and Subsurface) of the Cook Inlet Basin, February 1980.

CANNOT
SCAN
LARGE
MAPS