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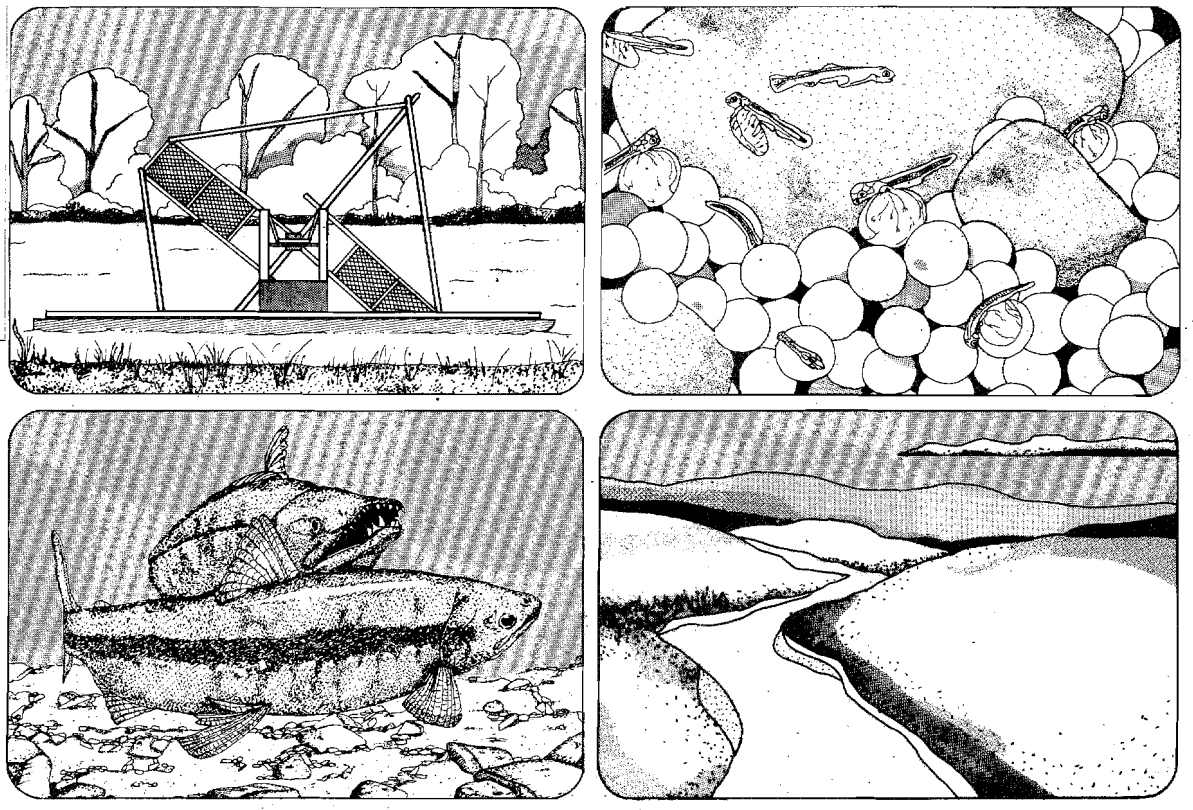

REPORT NO. 3

AQUATIC HABITAT AND INSTREAM FLOW INVESTIGATIONS (MAY-OCTOBER 1983)

Chapter 1: Stage and Discharge Investigations

ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES REPORT SERIES

ADFG 2/9.

ALASKA DEPARTMENT OF FISH AND GAME
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REPORT NO. 3

AQUATIC HABITAT AND INSTREAM FLOW INVESTIGATIONS (MAY-OCTOBER 1983)

Chapter 1: Stage and Discharge Investigations

Edited by:

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PREFACE

This report is one of a series of reports prepared for the Alaska Power Authority (APA) by the Alaska Department of Fish and Game (ADF&G) to provide information to be used in evaluating the feasibility of the proposed Susitna Hydroelectric Project. The ADF&G Susitna Hydro Aquatic Studies program was initiated in November 1980. The five year study program was divided into three study sections: Adult Anadromous Fish Studies (AA), Resident and Juvenile Anadromous Studies (RJ), and Aquatic Habitat and Instream Flow Studies (AH). Reports prepared by the ADF&G prior to 1983 on this subject are available from the APA.

The information in this report summarizes the findings of the 1983 open water field season investigations. Beginning with the 1983 reports, all reports were sequentially numbered as part of the Alaska Department of Fish and Game Susitna Hydro Aquatic Studies Report Series.

TITLES IN THE 1983 SERIES

Report Number	Title	Publication Date
1	Adult Anadromous Fish Investigations: May - October 1983	April 1984
2	Resident and Juvenile Anadromous Fish Investigations: May - October 1983	July 1984
3	Aquatic Habitat and Instream Flow Investigations: May - October 1983	1984
4	Access and Transmission Corridor Aquatic Investigations: May - October 1983	1984

This report, "Aquatic Habitat and Instream Flow Investigations" is divided into two parts. Part I, the "Hydrologic and Water Quality Investigations", is a compilation of the physical and chemical data collected by th ADF&G Su Hydro Aquatic Studies team during 1983. These data are arranged by individual variables and geographic location for ease of access to user agencies. The combined data set represents the available physical habitat of the study area within the Cook Inlet to Oshetna River reach of the Susitna River. Part II, the "Adult Anadromous Fish Habitat Investigations", describes the subset of available habitat compiled in Part 1 that is utilized by adult anadromous fish studied in the middle and lower Susitna River (Cook Inlet to Devil Canyon) study area. The studies primarily emphasize the utilization of side slough and side channel habitats of the middle reach of the Susitna River for spawning (Figures A). It represents the first stage of development for an instream flow relationships analysis report which will be prepared by E.W. Trihey and Associates.

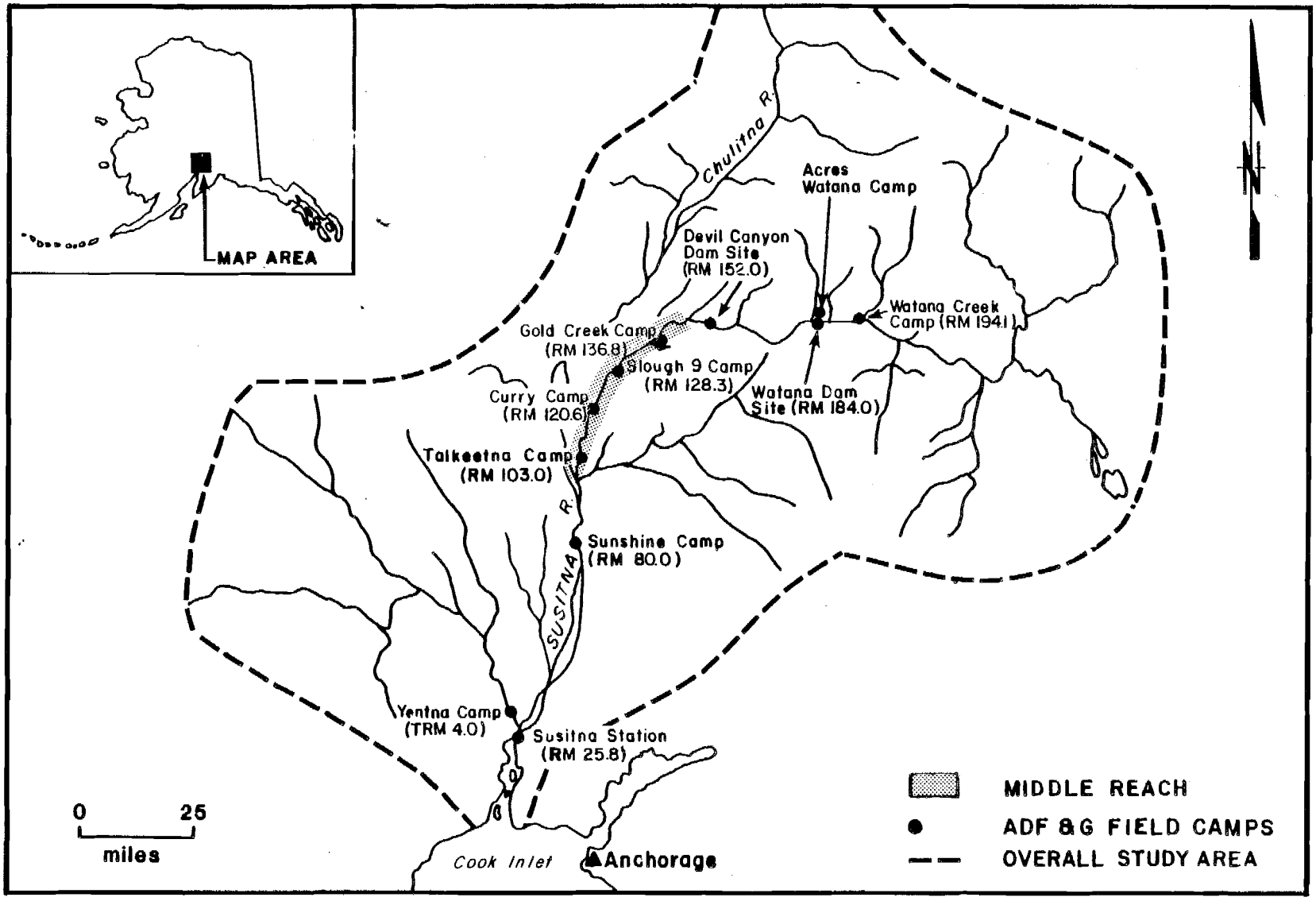

Figure A. Susitna River drainage basin.

CONTENTS OF REPORT NO. 3

Part One

Part Two

Questions concerning this and prior reports should be directed to:

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STAGE AND DISCHARGE INVESTIGATIONS

1984 Report No. 3, Chapter 1

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ABSTRACT

Baseline hydrological data have been collected within the Susitna River basin since 1981 in conjunction with the baseline fisheries studies being conducted by the Alaska Department of Fish and Game Susitna Hydroelectric Aquatic Studies Feasibility Team. The primary objective of the data collection program has been to collect baseline hydrological data (stage/water surface elevation, streamflow, and discharge) within the variety of fish habitats that are present in the Susitna River basin and to determine the influences of mainstem discharge conditions on the hydrological characteristics of these habitats. Although these investigations have been conducted throughout this large glacially-fed river system, effort has been concentrated in the reach of river extending from Talkeetna (RM 97) to Devil Canyon (RM 150) as impacts from the construction and operation of the proposed hydroelectric development are expected to be greatest in this river reach.

Six major fishery habitat types are located in the reach of river from Talkeetna to Devil Canyon; mainstem, side channel, side slough, upland slough, tributary mouth, and tributary. Sufficient data was collected to describe the relationship of mainstem discharge on the water surface elevation of the mainstem at 46 sites. Based on these data, this relationship is fairly well defined for the range of discharges from 5,000 to 30,000 cfs (as referenced to the USGS Gold Creek mainstem discharge gaging station). Mainstem discharge was also found to influence, to varying degrees, the hydraulic characteristics of side channels and side slough habitats by creating backwater areas and by overtopping the heads of these habitats. Prior to overtopping events, flow in these habitats was found to be generally clear and low, originating from groundwater upwelling and surface water runoff. Subsequent to overtopping, flow in these habitats was found to increase dramatically and become directly governed by mainstem discharge. The heads of upland slough habitats are never found to breach, with the only influence of mainstem discharge on these habitats being backwater effects. The streamflow regimes of the major clearwater tributaries in this reach were also evaluated to determine the relative contribution of the tributaries to the overall discharge of the Susitna River watershed.

Information from these studies will be used by other project biologists and engineers to evaluate the impact of hydroelectric development on the Susitna River.

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1.0 INTRODUCTION AND OBJECTIVES

1.1 Background

The Alaska Department of Fish and Game (ADF&G) Su Hydro Aquatic Feasibility Study Team has collected stage and discharge data throughout much of the Susitna River basin since 1981. The primary emphasis on the stage and discharge data collection program has been to define the relationship that mainstem discharge has on stage (water surface elevation) in the mainstem portion of the Susitna River and stage and streamflow within peripheral side channel, side slough, upland slough, and tributary habitats. Although measurements of stage and streamflow have been obtained in the lower river (Cook Inlet to Talkeetna reach), the emphasis of this data collection program has been largely oriented to the reach of the Susitna River from Talkeetna upstream to the Devil Canyon as project related impacts are expected to be most severe in this reach.

Results of these investigations (ADF&G 1982, 1983) have found that the range of mainstem discharges occurring at Gold Creek (USGS 15292000) during 1981 and 1982 were relatively higher for 1981 and similar for 1982 when compared to the historical 25 year mainstem discharge conditions (Figure 1-1) (USGS 1978). It was found that for the range of mainstem discharges from 8,000 to 30,000 cfs, the relationship between water surface elevation in the mainstem and mainstem discharge is relatively well defined at several mainstem locations between Talkeetna and Devil Canyon.

An understanding of the relationship between mainstem discharge and the hydraulic characteristics of side sloughs was obtained for the range of mainstem discharges from 8,000 to 30,000 cfs. Flows in side slough habitats during low to moderate mainstem discharges (when the head portions were not breached) was observed to consist primarily of ground water and surface water runoff. During these nonbreached conditions, side slough flow showed only an indirect relationship to mainstem discharge. With the occurrence of moderately high and high mainstem discharges, breaching (overtopping) of side slough habitats was observed to occur. With sufficient breaching by the mainstem, the flow conditions within these habitats was observed to become directly related to mainstem discharge. Generally, it was found that side sloughs in the Talkeetna to Devil Canyon reach breached in the range of mainstem discharges from 22,000 to 28,000 cfs. In addition, backwater areas were observed to occur to varying degrees at the mouths of many of the side slough habitats during moderate to high mainstem discharges. Results of stage and discharge investigations in side channel habitats show that hydraulic responses to mainstem discharges are very similar to those occurring in side slough habitats. Lower mainstem discharges initiate these responses in side channel habitats than are necessary for side slough habitats.

Investigations in upland slough habitats have shown that the hydraulic characteristics in these habitats are less directly related to mainstem discharges than side slough or side channel habitats. Upland slough habitats were found to join the mainstem river only at the mouth of the

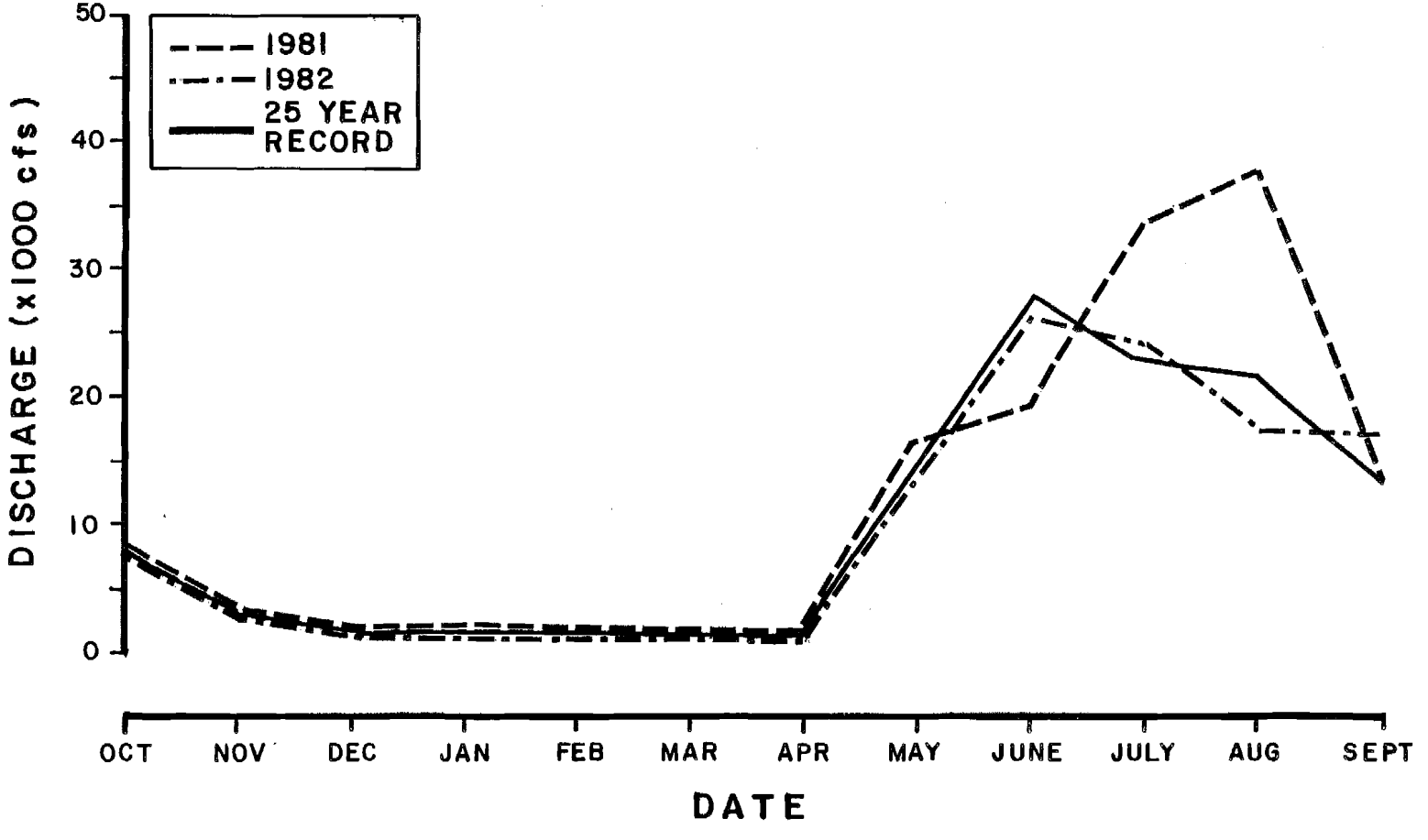

Figure 1-1. Comparison of the 25 year record for mean monthly mainstem discharge for Gold Creek (USGS 15292000) to the mean monthly mainstem discharge occurring at Gold Creek for years 1981 and 1982.

slough, with the head portions of these habitats isolated from the mainstem river. Upland sloughs are never breached by mainstem discharge. Extensive backwater areas were, however, observed to occur at the mouths of many of the upland slough habitats during moderate to high mainstem discharges.

Stage and discharge data were also obtained in seven tributaries in the Talkeetna to Devil Canyon reach. From these data, preliminary rating curves were developed for six of these tributaries (Whiskers Creek, Gash Creek, Lane Creek, Gold Creek, Waterfall Creek, Indian River, and Portage Creek).

1.2 Objectives

The FY84 open water field season (May-October, 1983) stage and discharge data collection program was specifically designed to expand the evaluation of the stage and discharge relationships occurring in mainstem and peripheral habitats in the Talkeetna to Devil Canyon reach of the Susitna River. Specific objectives for each habitat type are presented below.

1.2.1 Mainstem Habitats

The objectives of the 1983 open water season stage data collection program conducted in the mainstem Susitna River between Talkeetna and Devil Canyon were to:

1) Collect sufficient water surface elevation data at selected mainstem locations to define the relationship of mainstem water surface elevation to mainstem discharge for the full range of mainstem discharges occurring during the 1983 open water season. This information will be used by project engineers to further evaluate the predictive accuracy of various hydraulic simulation models;

2) Collect water surface elevation data at mainstem locations adjacent to the selected side channel, side and upland slough, and tributary mouth study locations to evaluate if and how mainstem discharge influences the hydrological characteristics of these peripheral habitats.

1.2.2 Side Channel, Side Slough, and Upland Slough Habitats

The objectives of the FY84 open water season stage and discharge data collection program conducted at side channel and slough (upland and side) habitats between Talkeetna and Devil Canyon were to:

1) Collect sufficient stage and streamflow measurements within selected side channel and slough (upland and side) habitats to develop stage/discharge rating curves covering the full range of mainstem discharges experienced during the 1983 open water field season;

2) Collect measurements of water surface elevations within selected side channel and slough (upland and side) habitats to further

evaluate if and how the water surface elevation in these peripheral habitats are influenced by mainstem discharge;

3) Collect measurements of stage and streamflow within selected side channel and slough (upland and side) habitats to support analysis of the effects of local (i.e., site) flow conditions on the availability and utilization of these habitats for fish passage, spawning and rearing (refer to Fish Habitat Study) and to determine if and how mainstem discharges influence these local flow conditions.

1.2.3 Tributary Habitats

The objectives of the 1983 stage/discharge monitoring program conducted at tributary habitats located between Talkeetna and Devil Canyon were to:

1) Collect sufficient stage and streamflow measurements within selected tributaries in the Talkeetna to Devil Canyon reach to develop stage/discharge rating curves covering the full range of conditions experienced during the 1983 open water field season;

2) Collect measurements of stage and streamflow within selected tributary and tributary mouth habitats to support analyses of fish habitats in these habitat zones.

2.0 METHODS

2.1 Site Selection

2.1.1 Mainstem Habitats

Locations at which stage monitoring stations were placed in the mainstem Susitna River between Talkeetna and Devil Canyon are presented in Table 1-1. Mainstem stage monitoring stations were chosen based on consultation with the project engineer and included selected R&M Consultants' lower river cross sections (LRX) and mainstem sites adjacent to peripheral habitats selected for study.

Stage monitoring stations were installed at several LRX sites appearing to be of uniform channel geometry and considered to represent the general morphological characteristics of the mainstem Susitna River in the Talkeetna to Devil Canyon reach. Mainstem stage monitoring stations were also installed adjacent to side channel, slough (upland and side), and tributary habitats to determine the effect of mainstem discharge on the stage and streamflow characteristics within these peripheral habitats. These mainstem staff gage sites were located near the head and mouth portion of the study site.

All stage data collected in the mainstem for the Talkeetna to Devil Canyon reach of the Susitna River (Figure 1-2) is referenced to mainstem discharge obtained at the U.S.G.S. Gold Creek gaging station (15292000). The Gold Creek discharge gaging station was selected as the index station because of its relative close proximity to stage monitoring stations in this reach and its extensive period of record.

2.1.2 Side Channel, Side Slough, and Upland Slough Habitats

Stage and streamflow were monitored at five side channel and 11 slough (9 side and 2 upland) study sites located between Talkeetna and Devil Canyon (Table 1-2, Figure 1-3). Sites were selected for study, based on consultations with the project engineers and biologists, to:

1) Provide baseline water surface elevation and discharge data to assist in determining the influence that mainstem discharge has on several key hydraulic characteristics of side channel and slough habitats (i.e., breaching, backwater and flow regime conditions); and,

2) Provide water surface elevation data to support evaluations of fish habitats by project biologists in side channel and slough habitats.

Stage was monitored within the mouth portion, free-flowing portion, and head portion of each study site. In addition, streamflow was monitored within the free-flowing portion of each study site. The stage data collected within the mouth portion of each study site was obtained to evaluate the presence and extent of backwater as a function of mainstem discharge. The stage and streamflow data measured within the free-flowing portion of each study site were obtained to formulate the site flow rating curve and evaluate the effect that mainstem discharge

Table 1-1. Locations of 1983 open water field season mainstem stage monitoring stations in the Talkeetna to Devil Canyon reach of the Susitna River.

Sampling Site	River Mile	Gage No.
Mainstem at Whiskers Slough Mouth	101.2	101.2M4
Mainstem at Whiskers Slough Head	101.5	101.5M6
Talkeetna Fishwheel Station	103.0	103.0F1
Right Bank at LRX 9	103.2	103.2M1
Left Bank at LRX 9	103.2	103.2M1
Right Bank at LRX 10B	105.9	105.9M1
Right Bank at LRX 10C	106.4	106.4M1
Right Bank at LRX 11	106.7	106.7M1
Left Bank at LRX 12	108.4	108.4M1
Mainstem at Slough 6A Mouth	112.3	112.3M1
Left Bank at LRX 16	112.4	112.4M2
Right Bank at LRX 18	113.0	113.0M1
Mainstem Below Lane Creek Mouth	113.4	113.4M6
Mainstem at Lane Creek Mouth	113.6	113.6M9
Mainstem Above Lane Creek Mouth	113.7	113.7M5
Mainstem Above Mainstem 2 Mouth	114.4	114.4M1
Mainstem Above Mainstem 2 NW Head	115.5	115.5M4
Mainstem Above Mainstem 2 NE Head	115.9	115.9M2
Curry Fishwheel Station	120.6	120.0F1
Right Bank at LRX 24	120.7	120.7M1
Right Bank at LRX 28	124.4	124.4M1
Side Channel at Slough 8A Mouth	125.3	125.3M4
Right Bank at LRX 29	126.1	125.3M3
Mainstem Above Slough 8A NE Head	127.1	125.3M6
Right Bank at LRX 31	128.7	128.7M1
Right Bank at LRX 32	129.7	129.7M1
Right Bank at LRX 33	130.1	130.1M1
Right Bank at LRX 34	130.5	130.5M1
Right Bank at LRX 35	130.8	130.9M1
Mainstem B/L Fourth of July Creek	131.1	131.1M3
Left Bank at LRX 37	131.8	131.8M1
Mainstem at Side Channel 10 Mouth	133.8	133.8M6
Left Bank at LRX 40	134.3	134.3M1
Side Channel B/L Slough 11 Mouth	135.3	135.3M4
Side Channel A/B Slough 11 Mouth	135.3	135.3M2
Mainstem at Slough 16B Mouth	138.0	138.0M2
Mainstem at Head of Slough 16B	138.3	138.0M4
Right Bank at LRX 49	138.3	138.3M1
Left Bank at LRX 50	138.5	138.5M1
Left Bank at LRX 51	138.9	138.9M1
Mainstem at Slough 19 Mouth	139.8	140.0M2
Right Bank at LRX 53	140.1	140.1M1
Mainstem at Side Channel 21 Mouth	140.6	140.6M1

Table 1-1 (Continued).

Sampling Site	River Mile	Gage No.
Right Bank at LRX 54	140.8	140.8M1
Right Bank at LRX 55	141.6	141.6M1
Right Bank at LRX 56	142.1	142.1M1
Right Bank at LRX 57	142.3	142.0M2
Mainstem at Slough 22 Head	144.7	144.3M1
Left Bank at LRX 61	148.7	148.7M1
Left Bank at LRX 62	148.9	148.9M1

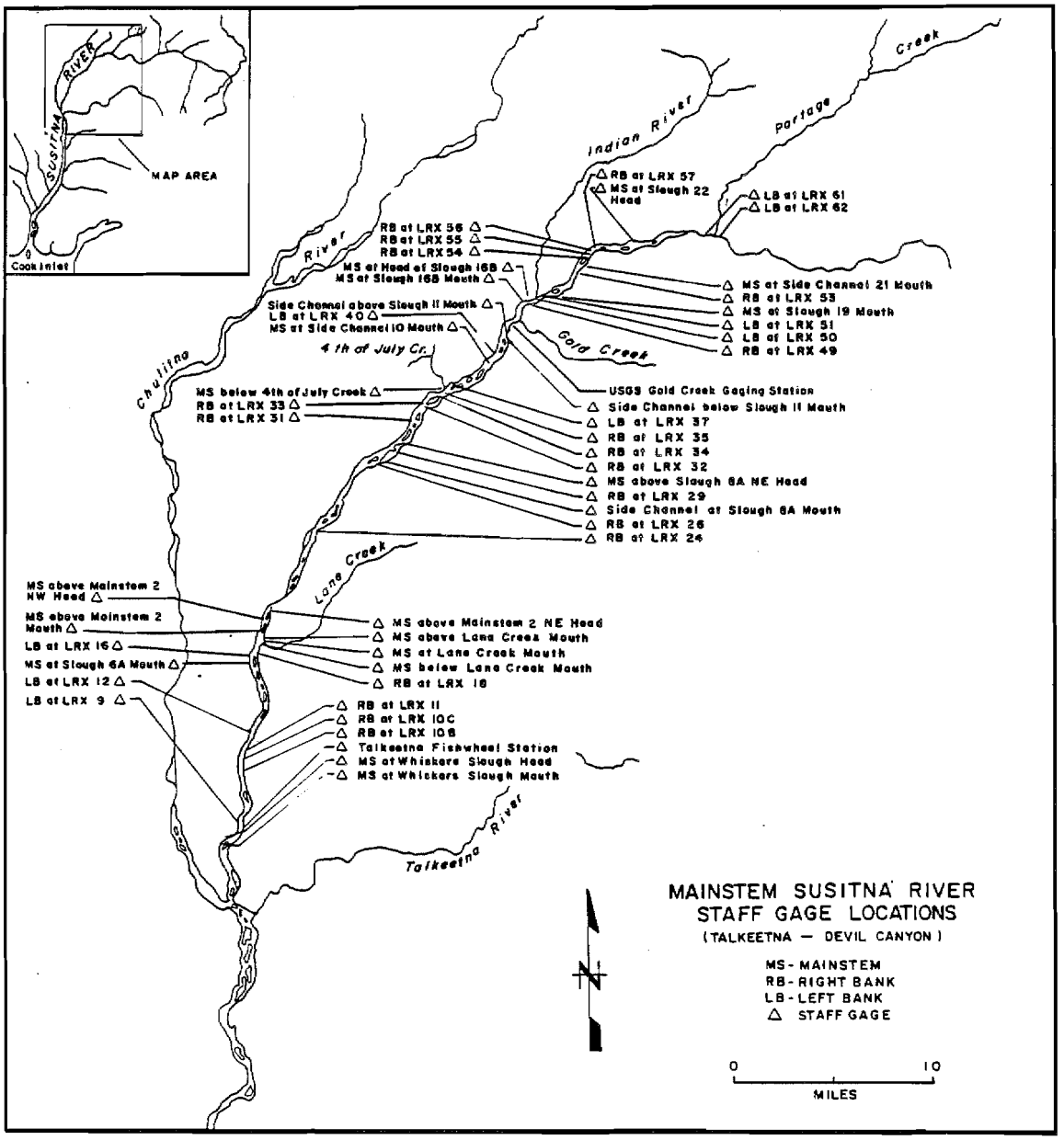

Figure 1-2. Mainstem staff gage locations in the Talkeetna to Devil Canyon reach of the Susitna River for the open water season of 1983.

Table 1-2. Side channel, side slough and upland slough sites in the Talkeetna to Devil Canyon reach selected for stage/discharge studies during the 1983 open water field season.

Site	River Mile[1/]	Habitat Type
Whiskers Slough	101.2	Side Slough
Slough 6A	112.3	Upland Slough
Slough 8	113.6	Side Slough
Mainstem 2	114.4	Side Channel
Slough 8A	125.3	Side Slough
Slough 9	128.3	Side Slough
Side Channel 10	133.8	Side Channel
Lower Side Channel 11	135.0	Side Channel
Slough 11	135.3	Side Slough
Upper Side Channel 11	136.2	Side Channel
Slough 16B	137.8	Side Slough
Slough 19	139.7	Upland Slough
Slough 20	140.1	Side Slough
Side Channel 21	140.6	Side Channel
Slough 21	141.8	Side Slough
Slough 22	144.2	Side Slough

1/ River mile is determined from the most downstream portion of the study site.

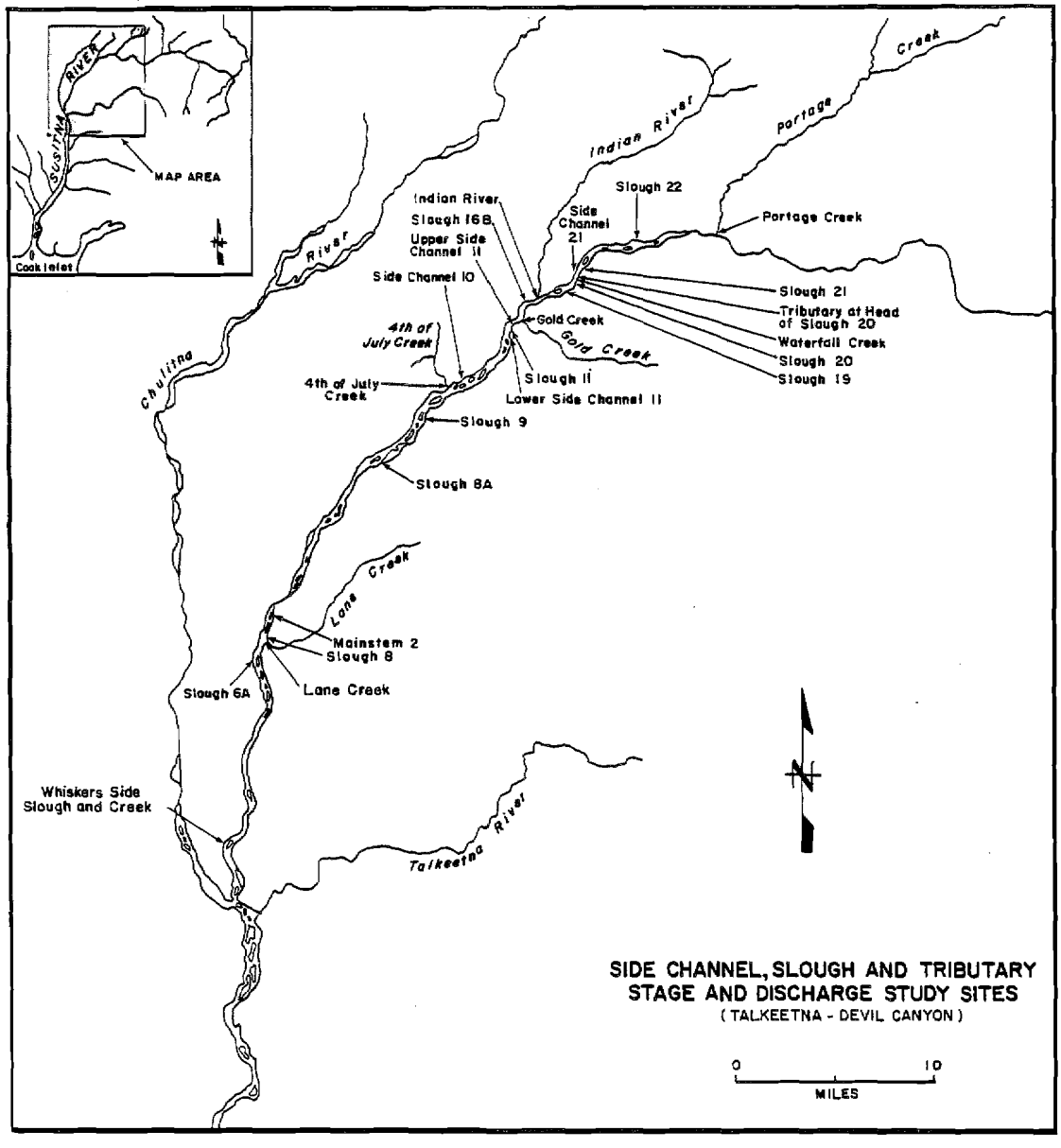

Figure 1-3. Side channel, slough and tributary sites selected for the stage/discharge studies for the 1983 open water field season.

has on the site stage and streamflow. The stage data collected at the head portion of each study site was obtained to aid in determining the mainstem discharge required to breach the head of the study site.

2.1.3 Tributary Habitats

Stage and streamflow were monitored at seven tributaries located between Talkeetna and Devil Canyon (Table 1-3, Figure 1-3). Streamflow stations were placed in areas optimal for the collection of discharge data. Study sites were selected based on consultation with the project engineer to provide baseline stage and discharge data to be used to develop rating curves and support evaluations of fish habitat by project biologists.

2.2 Field Data Collection

2.2.1 Stage

Measurements of stage were obtained utilizing either standard staff gages or continuous data recorders with associated pressure transducers (datapods).

Stage data obtained using standard Leopold and Stevens (0.00-3.33 ft.) staff gages were determined to the nearest one-hundredth of a foot. An assigned elevation, which is referenced to a temporary benchmark (TBM), was determined for each gage with the TBM's surveyed to a known elevation (project datum). This allowed all resultant stage readings to be converted to true water surface elevations. Staff gage installation and monitoring procedures can be found in the ADF&G Su-Hydro Aquatics Studies Procedures Manual Final Draft (ADF&G 1981a, 1983a, 1984). Measurements of stage were obtained from staff gage observations at least twice monthly during the open water field season at each stage monitoring station within each study area. In addition, selected staff gages located in the mainstem Susitna River were monitored more often to ensure that the full range of mainstem discharge conditions occurring during the 1983 open water season were evaluated.

The system used to continually monitor and record stage incorporated a pressure transducer and electronic interface unit (designed by Dryden and LaRue Consulting Engineers; Anchorage, Alaska) to record depth of water over the transducer probes in millivolts (mV). Every 0.5 mV represents 1.0 inch of water depth over the transducer probe. The transducer probes utilized have a range of 1 to 80 inches of water with an accuracy of 0.2 mV (i.e., 0.4 inches of water). The stream gage datapods are programmed to record average millivolt readings at 60 minute intervals on a UV-erasable, solid state Data Storage Module (DSM). Using a 60-minute recording interval, the DSM reaches capacity in 40 days and then must be exchanged for an erased (clean) DSM. Procedures involved in the installation and monitoring of the datapods can be found in the FY84 ADF&G Su-Hydro Aquatic Studies Procedures Manual, Final Draft (ADF&G 1984).

Table 1-3. Tributary study sites in the Talkeetna to Devil Canyon reach selected for stage/discharge studies during 1983 open water field season.

Site	River Mile	TRM
Whiskers Creek	101.4	0.4
Lane Creek	113.6	0.3
Fourth of July Creek	131.1	0.2
Gold Creek	136.7	0.2
Indian River	138.6	0.6
Waterfall Creek	140.3	0.1
Tributary at Head of Slough 20	140.6	0.1
Portage Creek	148.9	0.4

2.2.2 Discharge Procedures

Streamflow (discharge) measurements were obtained in the free-flowing portion of the study area utilizing standard U.S.G.S. techniques employing either Price AA or Pygmy flow meters. At the time of the streamflow measurement, a stage measurement was also obtained. Procedures utilized in obtaining discharge measurements are found in the FY84 ADF&G Su Hydro Aquatic Studies Procedures Manual, Final Draft (ADF&G 1984).

2.3 Analytical Approach

2.3.1 Mainstem Habitats

All stage data obtained from mainstem habitats were reduced to true water surface elevations (as referenced to project datum). These data, along with corresponding average daily discharges of the mainstem recorded at Gold Creek (USGS 15292000) were plotted as simple stage/discharge rating curves with water surface elevation presented on the y axis and mean daily mainstem discharge on the x axis. A least squares regression equation describing the relationship of stage to discharge was also derived for each plot.

2.3.2 Side Channel, Side Slough and Upland Slough Habitats

All stage data obtained at side channel and slough (side and upland) habitats were reduced to true water surface elevations (as referenced to project datum) and plotted against the mean daily mainstem discharge recorded at Gold Creek (USGS 15292000). In addition, stage data collected in conjunction with flow measurement at the stage/streamflow monitoring station located in the free-flowing portion of each study site were plotted as simple stage/streamflow rating curves. Measured streamflow was also plotted with corresponding mean daily mainstem discharge as measured at Gold Creek (15292000).

2.3.3 Tributary Habitats

All stage measurements obtained in tributaries were converted to true water surface elevations as referenced to project datum. Measurements of stage obtained from staff gage readings in conjunction with streamflow measurements in Whiskers, Lane, and Fourth of July Creeks and the unnamed tributary at the head of Slough 20 were plotted as simple stage/discharge rating curves. At those sites where stage was monitored with continuous data recorders (Portage and Gold Creeks, and Indian River) measurements of water depth were converted to mean daily streamflow. Measurements of water depth obtained in conjunction with streamflow measurements were plotted as simple rating curves. Based on these rating curves, streamflow was estimated from the continuous record of water depth for Portage Creek, Indian River, and Gold Creek.

3.0 RESULTS

3.1 Mainstem Habitats

Mean daily discharge of the Susitna River was continually monitored by the USGS at their Cantwell (15291500), Gold Creek (15292000), Sunshine (15292780), Susitna Station (15294350), and Yentna River (15294345) gaging stations during 1983. The USGS 1983 water year (October 1982 - September 1983) discharge data are tabulated in Appendix Tables 1-A-1 - 1-A-5 and plotted in Figure 1-4. Plots of the mean monthly discharges of the Susitna River at the USGS Gold Creek gaging station (USGS 15292000) for the 1981, 1982, and 1983 water years are presented with the Gold Creek (USGS 15292000) 25 year record of mean monthly discharge in Figure 1-5 (USGS 1981, 1982, 1983).

Stage was monitored at 46 stations in the mainstem Susitna River from Talkeetna to Devil Canyon during the 1983 open water field season (Figure 1-2). All stage measurements were converted to true water surface elevations as referenced to project datum. These 1983 water surface elevations and those obtained in 1982, along with corresponding mean daily discharge of the mainstem Susitna River as measured at the USGS Gold Creek gaging station (15292000), are presented in Appendix Table 1-A-6. These data were used to generate simple water surface elevation/discharge curves (Appendix Figures 1-A-1 - 1-A-23).

The water surface elevation data obtained in 1982 for LRX 53 were not included in these data sets. The 1983 stage data obtained from this stage monitoring station, when plotted with the 1982 data, was found to sufficiently differ in the observed water surface elevations. The 1983 and 1982 staff gage sites were determined not to be in the exact location for each years observations. The mainstem water surface elevations obtained for LRX 32 were actually observed approximately 100-200 feet upstream of LRX 32.

Although the water surface elevation (stage) in the mainstem Susitna River is directly related to mainstem discharge, the functional relationships determined for the mainstem rating curves (Appendix Figures 1-A-1 - 1-A-23) are also dependent upon site specific channel geometry. This resulted in as many as three separate stage/discharge relationships being determined for the data collected at each stage monitoring station with each separate relationship being restricted to a specific domain of mainstem discharge.

3.2 Side Channels

Measurements of stage and streamflow were obtained during the 1983 open water field season at selected sites within five side channels in the Talkeetna to Devil Canyon reach of the Susitna River (Table 1-2; Figure 1-3). The stage data obtained from the side channel stage monitoring stations were plotted against the mean daily mainstem discharge recorded at Gold Creek (USGS 15292000) in addition, stage data collected in conjunction with flow measurements at each stage/streamflow monitoring station were plotted as simple stage/streamflow rating curves. Measured streamflow was also plotted with corresponding mean daily mainstem discharge as measured at Gold Creek (15292000).

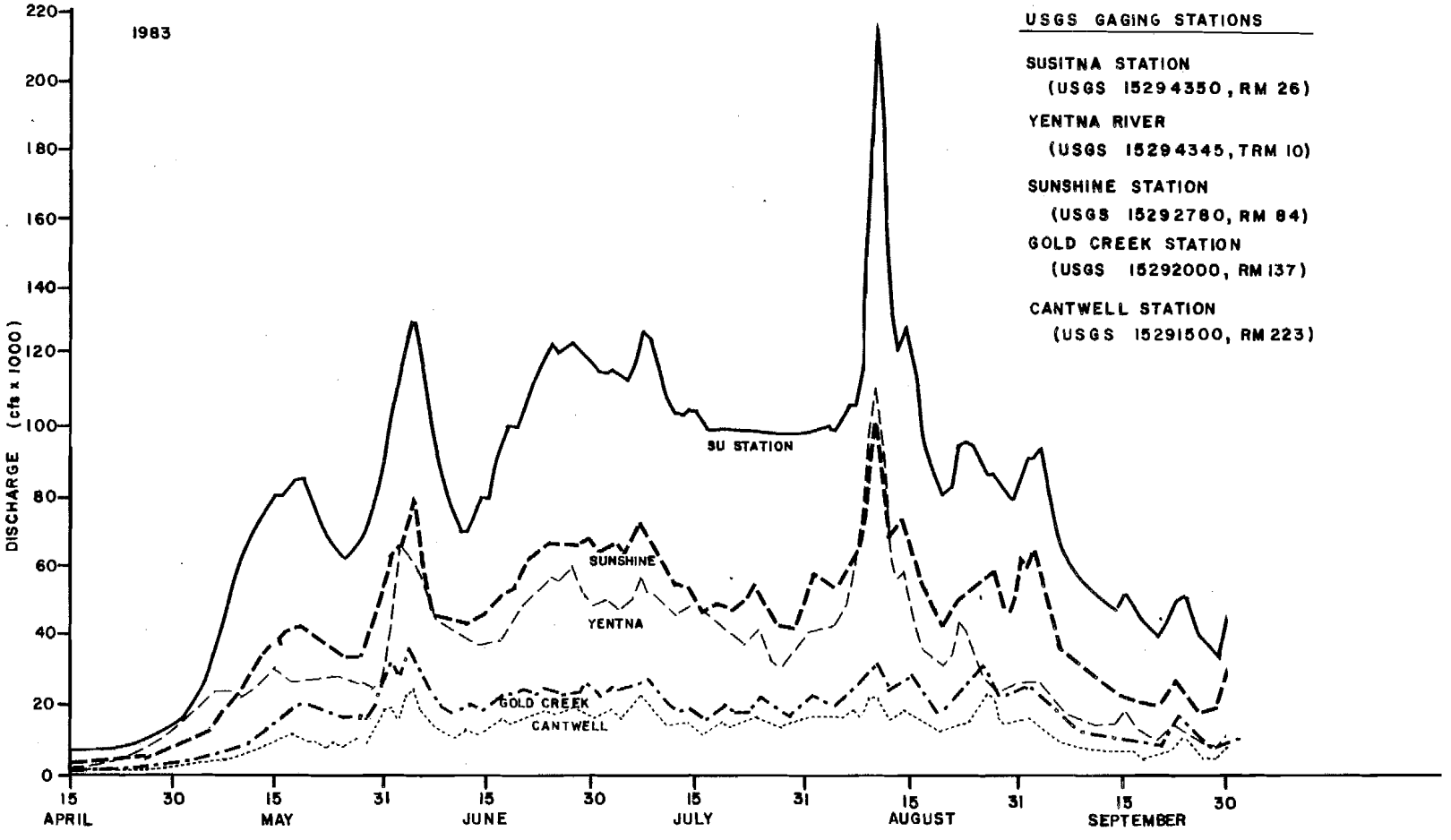

Figure 1-4. Comparison of the mean, daily Susitna River discharge for the USGS gaging stations located at Susitna Station, Sunshine Station, Gold Creek Station, Cantwell Station with the USGS gaging station on the Yentna River (near Susitna Station) for 1983.

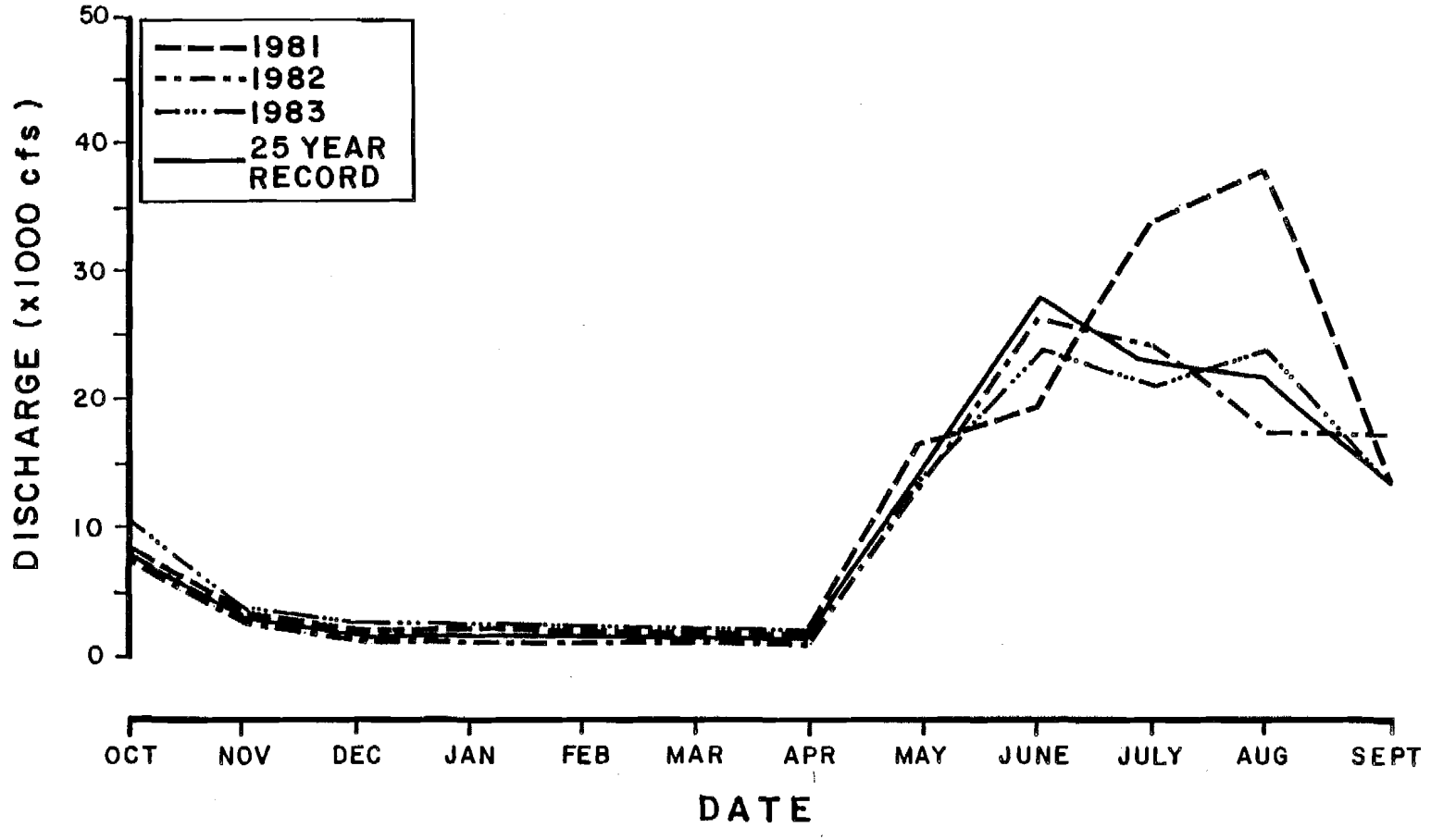

Figure 1-5. Comparison of the 25 year record for mean monthly mainstem discharge for Gold Creek (USGS 15292000) to the mean monthly mainstem discharge occurring at Gold Creek for years 1981, 1982, and 1983.

The plots of water surface elevation (stage) versus mainstem discharge (Appendix Figures 1-A-28 - 1-A-31; 1-A-37 - 1-A-41; 1-A-43 - 1-A-44; 1-A-50 - 1-A-52) show that up to six hydraulic conditions each described by their own stage/discharge relationship occur in side channel habitats. The first three of these hydraulic conditions occurs when the side channel flow is directly controlled by mainstem discharge. The first hydraulic condition, referred to as "Backwater", is restricted to stage monitoring stations located in the vicinity of the side channel mouth and reflects a backwater hydraulic condition created by mainstem discharge. The second hydraulic condition, referred to as "Controlled", is restricted to stage monitoring stations isolated from backwater effects which reflects the free flowing hydraulic condition when flow is controlled by mainstem discharge. The third hydraulic condition, referred to as "Breached", is limited to stage monitoring stations located at the head of the study site and refers to the period of breaching of the side channel head by mainstem discharge. The remaining three hydraulic conditions occur when the side channel flow is not controlled by the mainstem discharge. These three hydraulic conditions result from surface water runoff (tributary inflow) and groundwater. The first of the remaining three hydraulic conditions is referred to as "Not Breached", and represents the period when the head of the side channel is not breached and is dewatered. The second of the remaining hydraulic conditions is referred to as "Not Controlled", and represents the hydraulic condition in the free flowing portion of the side channel when the site is not directly influenced by mainstem discharge. The final hydraulic condition is referred to as "No Backwater", and is restricted to stage monitoring stations at the mouth of a side channel. This hydraulic condition reflects an absence of backwater effects created by mainstem discharge. Each of these hydraulic conditions is restricted to a specific range (domain) of mainstem discharge occurring at Gold Creek (USGS 15292000). The "Not Breached" hydraulic condition was plotted using the thalweg elevation obtained from a cross sectional profile at the head of the side channel versus a non-breaching mainstem discharge. On those plots derived from the stage monitoring stations at the heads of side channel habitats the lines depicting the "Breached" and "Not Breached" condition may not intersect. This results when the cross sectional profile used to determine the thalweg point was not obtained at the location of the side channel which is initially breached by mainstem discharge.

Results of the stage and discharge investigations for side channel habitats are addressed below by site.

3.2.1 Mainstem 2 Side Channel (RM 114.4)

3.2.1.1 Site Description

Mainstem 2 Side Channel (Figure 1-3) is located on the east bank of the Susitna River at river mile 114.4. It is approximately one mile in length and is separated from the mainstem by two relatively large vegetated islands. Approximately 0.3 miles upstream of the mouth, this side channel divides into two forks, referred to as the northeast (NE) and northwest (NW) channels. Prior to breaching, flow in the side channel is provided by local surface water runoff and groundwater inflow. Subsequent to breaching, the majority of the flow is provided

by turbid water from the mainstem. A substantial area of backwater exists at the mouth of this side channel during low and high mainstem flows.

During the 1983 open water field season, stage was monitored at seven sites within this side channel. Streamflow was monitored at two of these sites (Figure 1-6).

3.2.1.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-4. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-28 - 1-A-31. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.2.1.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained within the free-flowing portions of the NW and NE channels of the Mainstem 2 Side Channel study site (Appendix Table 1-A-8). From these measurements, simple stage/stream flow rating curves were developed for each channel (Figures 1-7 and 1-8). In addition, the streamflow data obtained in each channel were plotted against the corresponding mainstem discharge at Gold Creek (Figures 1-9 and 1-10). These curves represent the breached hydraulic condition of each channel.

3.2.1.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in the NW and NE channels become governed by the mainstem at discharges of 16,000 and 25,000 cfs at Gold Creek, respectively. These controlling breaching discharges compare to lowest observed breaching discharges for the NW and NE channels of 12,000 and 23,000 cfs at Gold Creek, respectively.

3.2.1.5 Backwater

A substantial area of backwater occurs at the mouth of this side channel during periods of low to high mainstem flow. Based on available stage and channel geometry data (see Chapter 2), the area of backwater extends to a point at least 2,000 feet upstream at mainstem discharges ranging from 16,000 to 31,700 cfs at Gold Creek. At a mainstem discharge of 7,000 cfs, however, this area of backwater became reduced in size extending approximately 800 feet into the side channel.

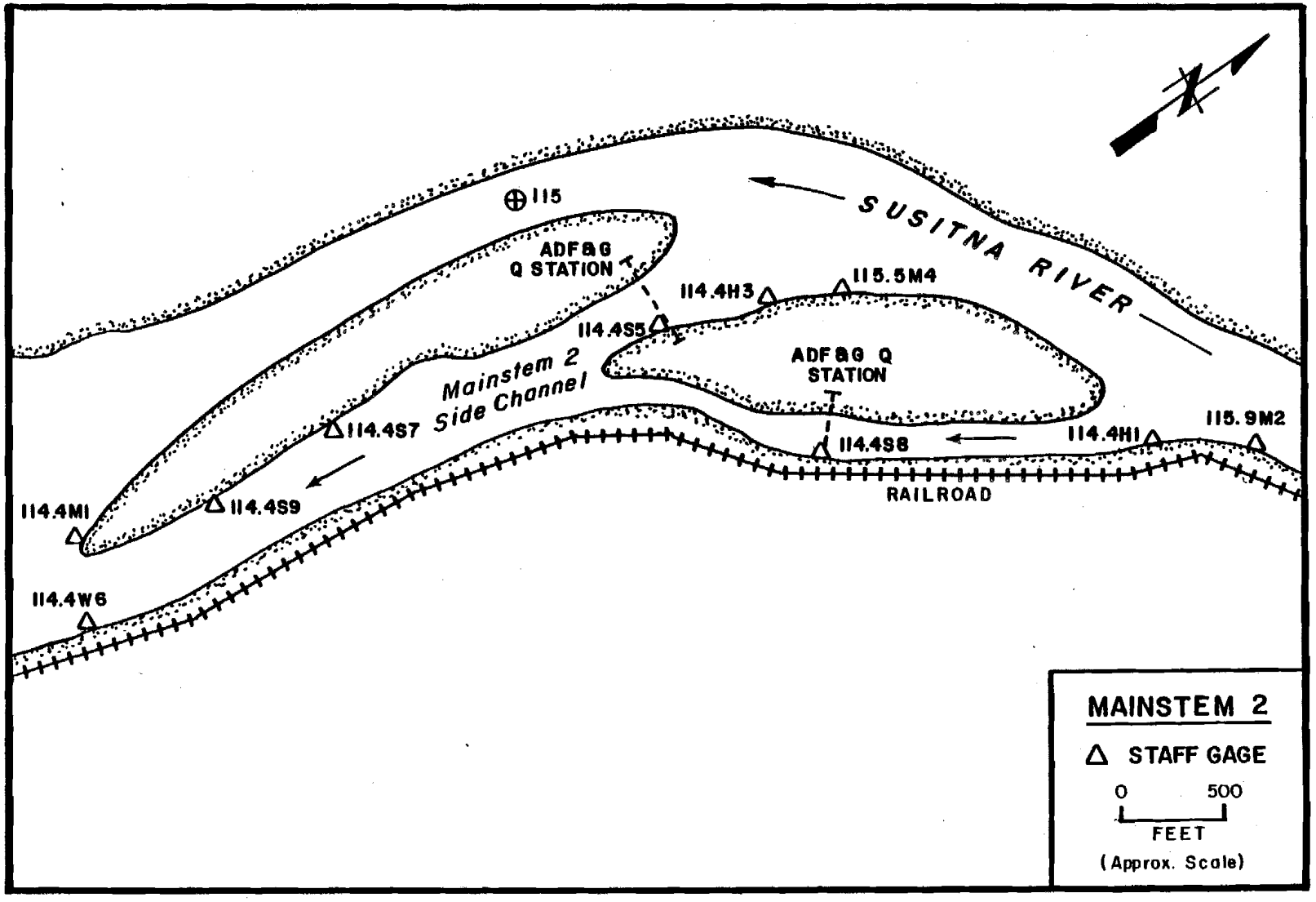

Figure 1-6. Site map of Mainstem 2 Side Channel which is located on the east bank of the Susitna River at river mile 114.4.

Table 1-4. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Mainstem 2 Side Channel at RM 114.4.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
114.4H1 (NE Head)	1.81	23,000 - 31,700
114.4S8 (NE Q-Site)	2.47	10,000 - 31,000
114.4H3 (NW Head)	2.66	13,600 - 31,700
114.4S5 (NW Q-Site)	3.13	10,000 - 27,400
114.4S7 (Upper Backwater)	2.93	16,000 - 31,700
114.4S9 (Lower Backwater)	2.38	18,600 - 31,700
114.4W6 (Mouth)	4.79	7,230 - 31,700

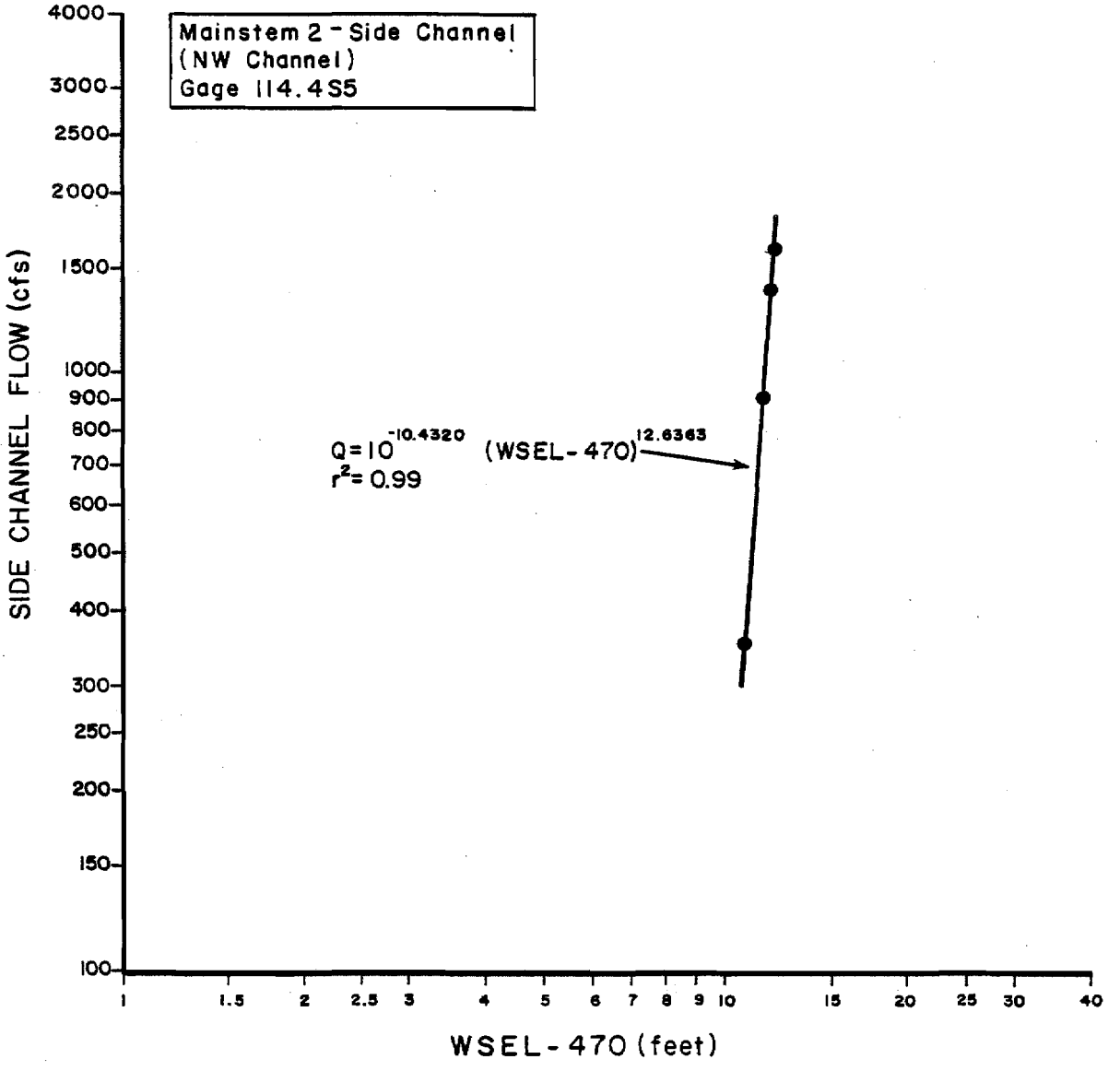

Figure 1-7. Stage versus flow rating curve for Mainstem 2 Side Channel (N.W. Channel), staff gage 114.4S5.

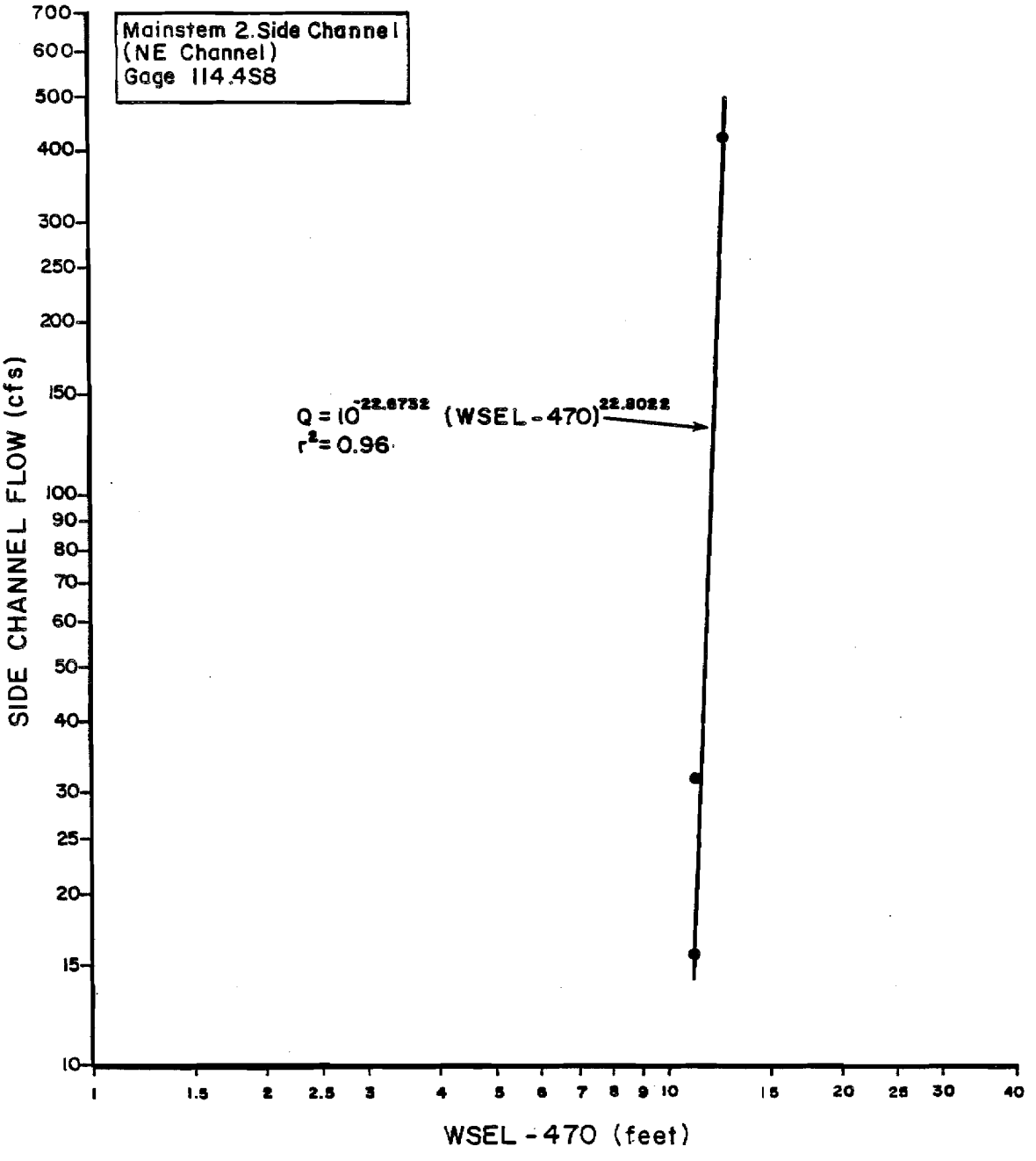

Figure 1-8. Stage versus flow rating curve for Mainstem 2 Side Channel (N.E. Channel), staff gage 114.4S8.

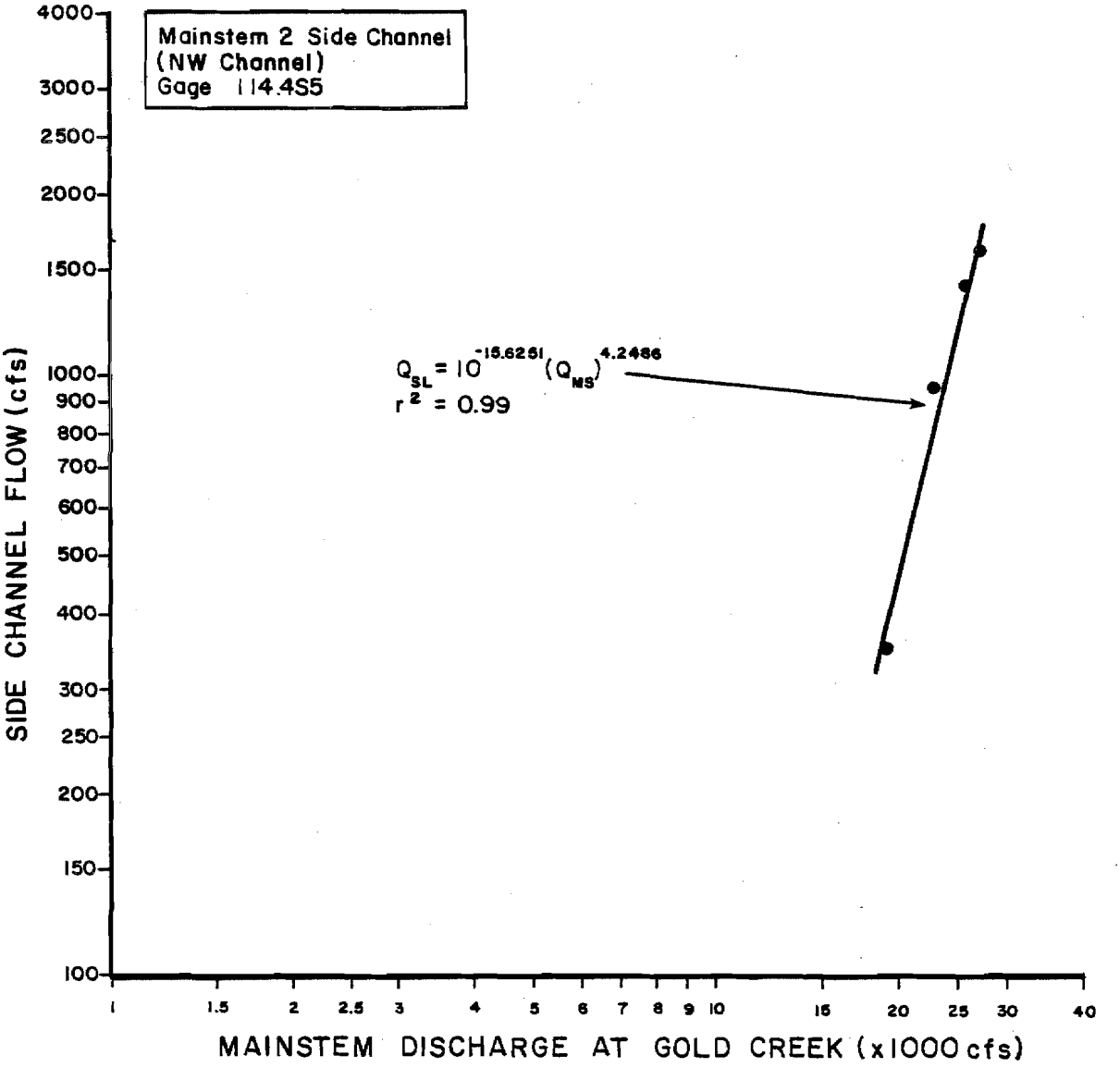

Figure 1-9. Side Channel flow versus mainstem discharge rating curve for Mainstem 2 (N.W. Channel), staff gage 114.4S5.

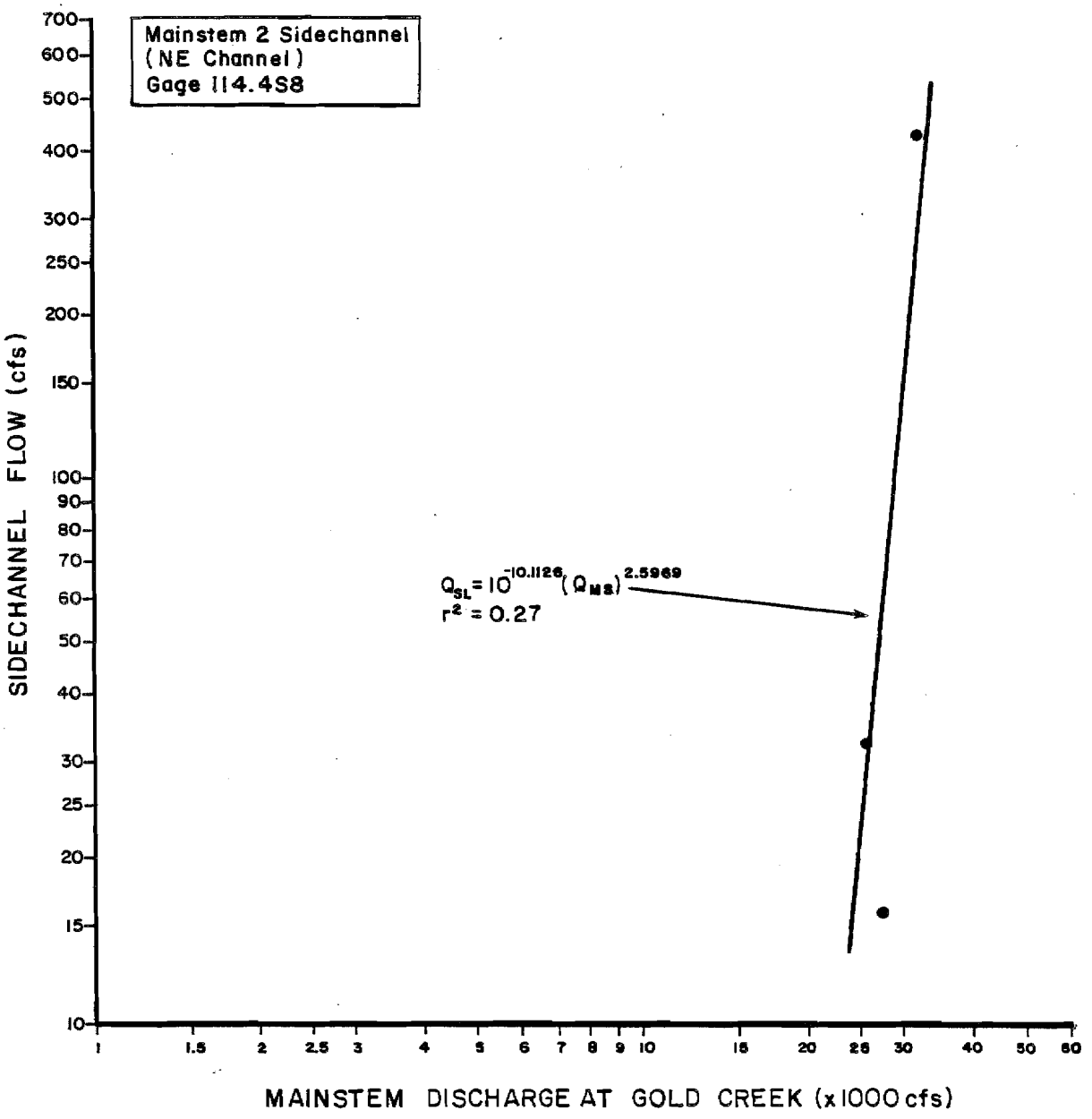

Figure 1-10. Side Channel flow versus mainstem discharge rating curve for Mainstem 2 (N.E. Channel), staff gage 114.4S8.

3.2.2 Side Channel 10 (RM 133.8)

3.2.2.1 Site Description

Side Channel 10 (Figure 1-3) is located on the west bank of the Susitna River at river mile 133.8. It is approximately 0.4 miles in length and is separated from the mainstem by a large gravel bar. At high mainstem discharges this gravel bar is breached at two locations. Prior to Side Channel 10 head breaching, groundwater seepage provides clearwater flow in this side channel. Subsequent to breaching, the majority of the flow in this side channel is provided by turbid water from the mainstem. A substantial area of backwater exists at the mouth of this side channel at moderate to high mainstem flows.

During the 1983 open water field season, stage was monitored at seven sites within this side channel. Streamflow was measured at three of these sites (Figure 1-11).

3.2.2.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-5. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring site are presented in Appendix Figures 1-A-37 - 1-A-39. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.2.2.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained within the free-flowing portion of the Side Channel 10 study site (Figure 1-11, Appendix Table 1-A-8). From the flow measurements obtained at staff gage site 133.8S3, a simple stage/streamflow rating curve was constructed (Figure 1-12). In addition, streamflow data obtained at this monitoring site were plotted against corresponding mainstem discharge at Gold Creek (Figure 1-13). The stage/streamflow relationship in this side channel changes during streamflows approaching 300 cfs due to the difference in channel geometry between the head portion and discharge station. Streamflow measurements at staff gage sites 133.8S2 and 133.8S1 (Figure 1-11) were obtained to determine the contribution of mainstem water breaching the gravel bar which separates Side Channel 10 from the Susitna River to that breaching the head of the side channel (Appendix Table 1-A-8).

3.2.2.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side channel become governed by the mainstem at a discharge of 19,000 cfs at Gold Creek. This controlling breaching discharge is the same as the lowest observed breaching discharge occur-

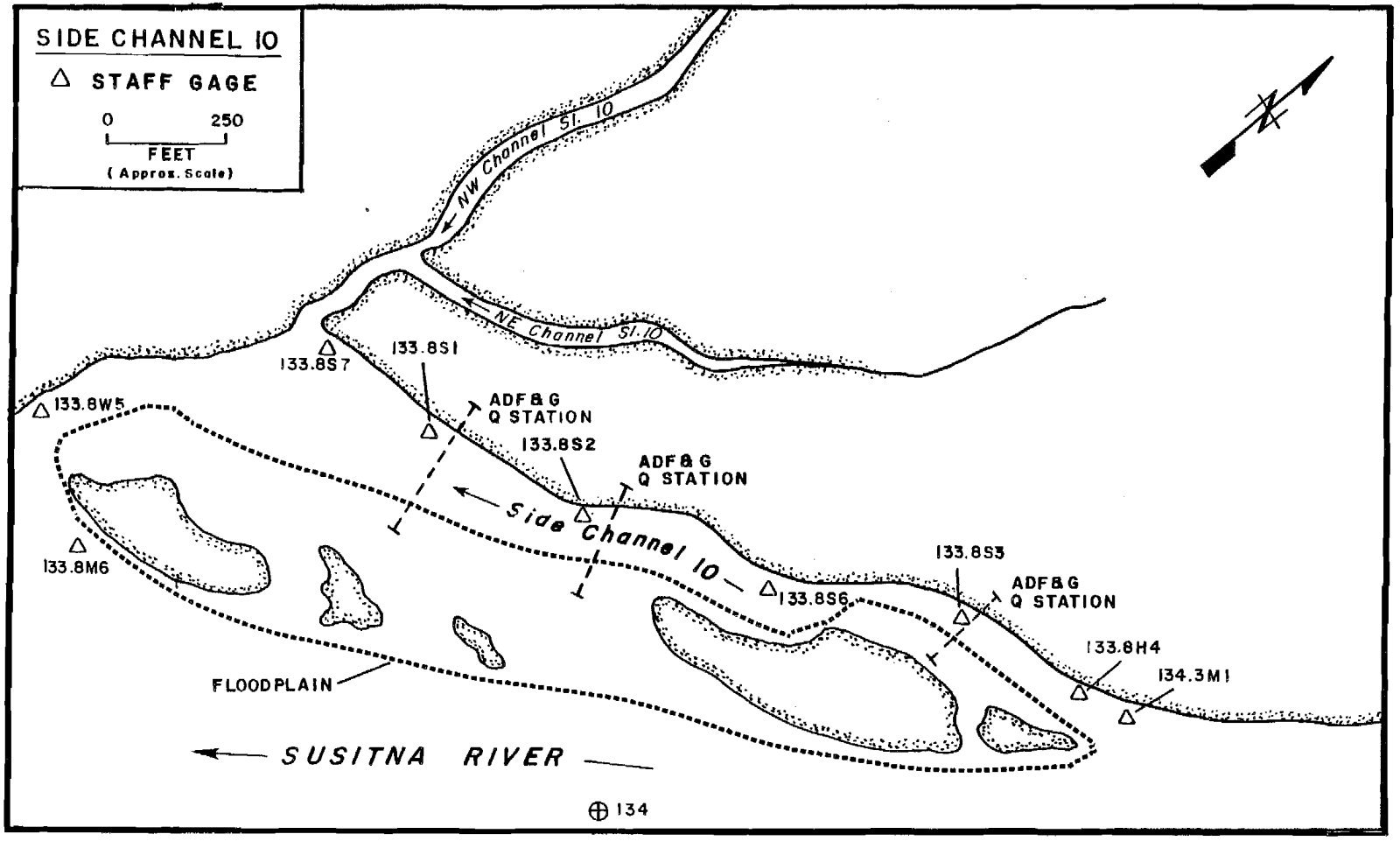

Figure 1-11. Site map of Side Channel 10, which is located on the west bank of the Susitna River at river mile 133.8.

Table 1-5. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Channel 10 at RM 133.8.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
133.8H4 (Head)	2.00	19,100 - 29,900
133.8S3 (Q-Site)	3.99	12,200 - 31,900
133.8S6	1.22	12,700 - 23,300
133.8S2	1.95	12,200 - 31,900
133.8S1	2.52	12,200 - 31,900
133.8S7	2.99	12,200 - 31,900
133.8W5 (Mouth)	3.50	12,200 - 31,900

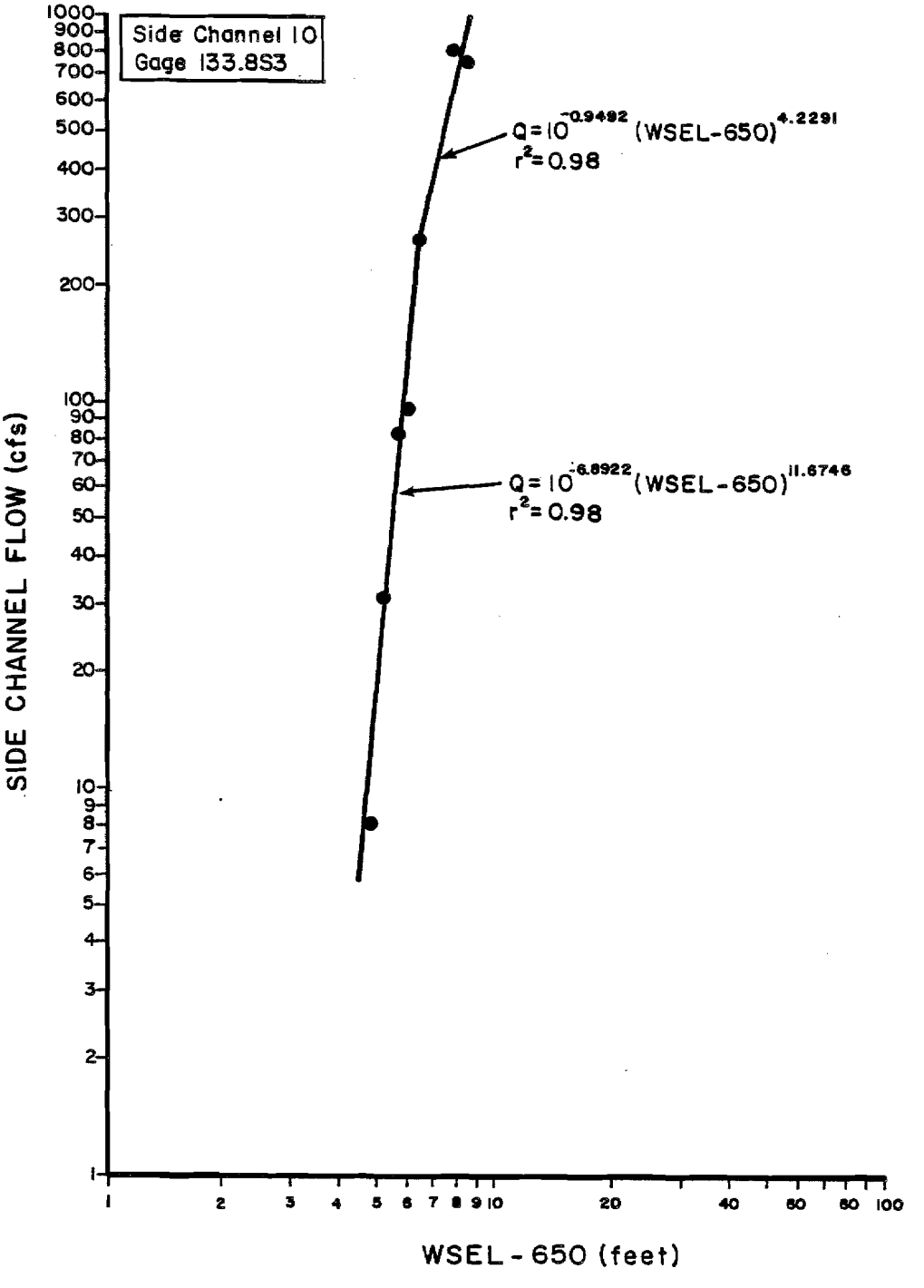

Figure 1-12. Stage versus flow rating curve for Side Channel 10, staff gage 133.8S3.

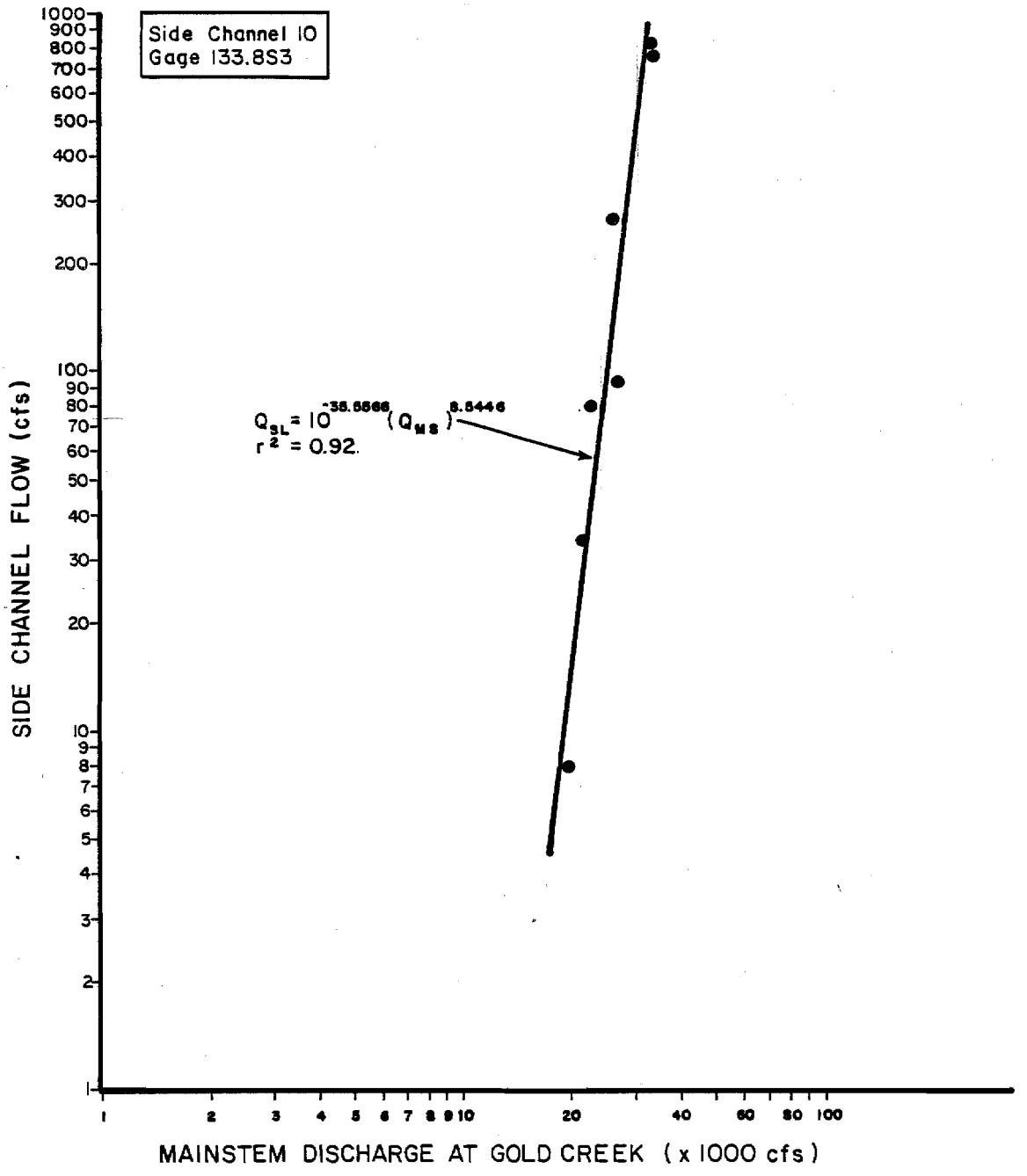

Figure 1-13. Side Channel flow versus mainstem discharge rating curve for Side Channel 10, staff gage 133.8S3.

ring at the head of Side Channel 10. The gravel island separating Side Channel 10 from the Susitna River is breached at two locations when mainstem discharge exceeds 30,000 cfs at Gold Creek.

3.2.2.5 Backwater

An area of backwater was observed to occur throughout the 1983 open water field season at the confluence of the side channel and the mainstem Susitna River. Based on stage and channel geometry data (see Chapter 2), the area of backwater extended to a point at least 900 ft upstream at mainstem discharges of 16,000 cfs at Gold Creek. From the comparison of water surface elevation to the Slough 10 complex thalweg profile (Chapter 2), a reduced area of backwater area occurred at mainstem discharges as low as 12,000 cfs.

3.2.3 Lower Side Channel 11 (RM 134.6)

3.2.3.1 Site Description

Lower Side Channel 11 (Figure 1-3) is located on the east bank of the Susitna River at river mile 134.6. It is approximately 0.7 miles in length and is separated from the mainstem by a well vegetated island. Just upstream of its confluence with Slough 11, the channel divides into two forks, a NE fork and NW fork. Prior to breaching, flow in this side channel is provided by the clear water flow from Side Slough 11. Subsequent to breaching, the majority of the flow is provided by turbid water from the mainstem. No backwater was observed at the mouth of this side channel.

During the 1983 open water field season, stage was monitored at four sites within this side channel. Streamflow was measured at one of these sites (Figure 1-14).

3.2.3.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-6. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-40 - 1-A-41. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.2.3.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained within the free-flowing portion of the Lower Side Channel 11 study site (Appendix Table 1-A-8). From these measurements, a simple stage/stream flow rating curve was constructed (Figure 1-15). In addition, the streamflow data obtained at this monitoring station were plotted against the correspond-

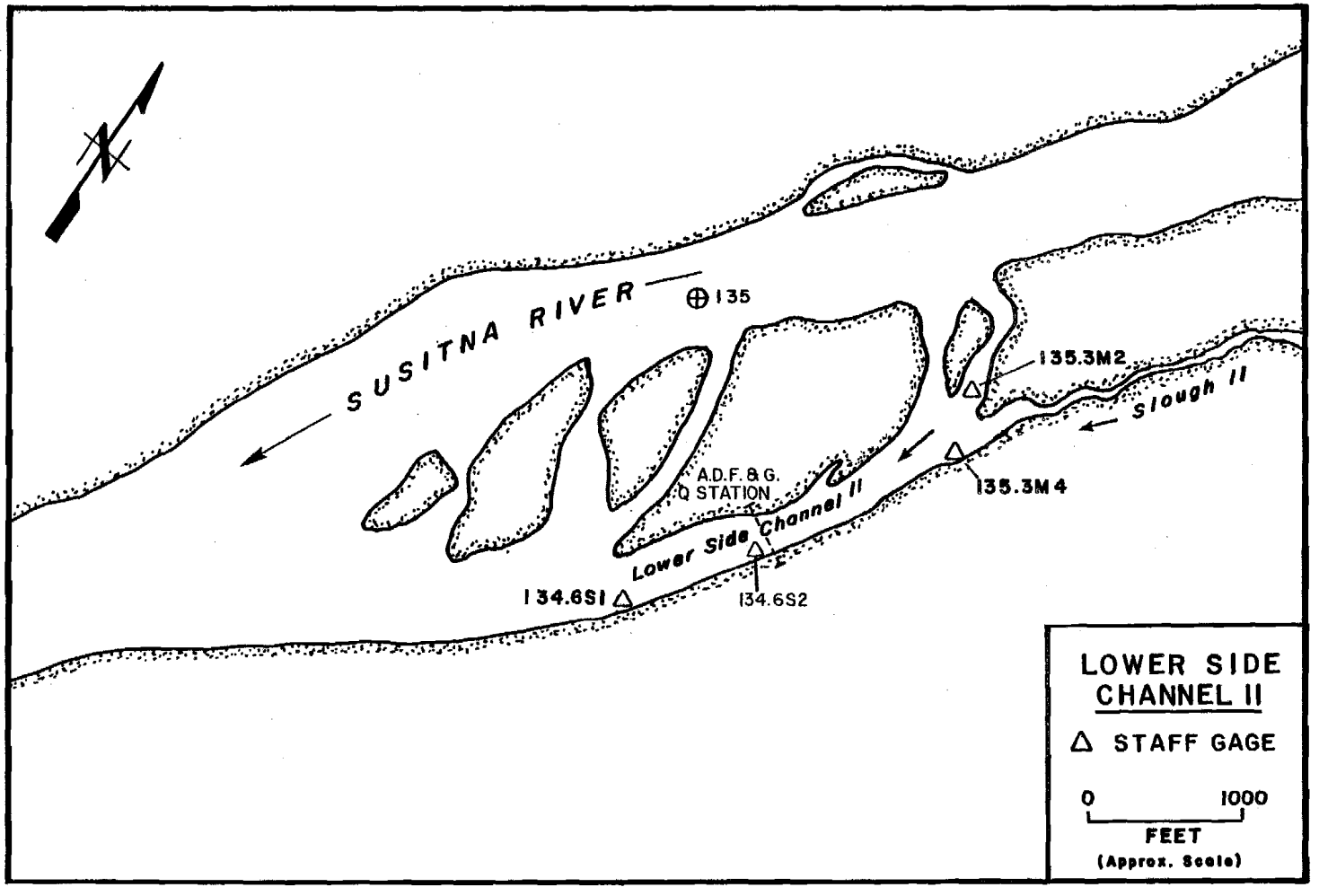

Figure 1-14. Site map of Lower Side Channel 11, which is located at the east bank of the Susitna River at river mile 134.6.

Table 1-6. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Lower Side Channel 11 at RM 134.6.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
134.6S1 (Mouth)	2.48	8,010 - 31,900
134.6S2 (Q Site)	2.50	8,010 - 31,900
135.3M4	4.48	7,950 - 31,900
135.3M2	3.43	5,020 - 36,000
Head staff gage not installed		

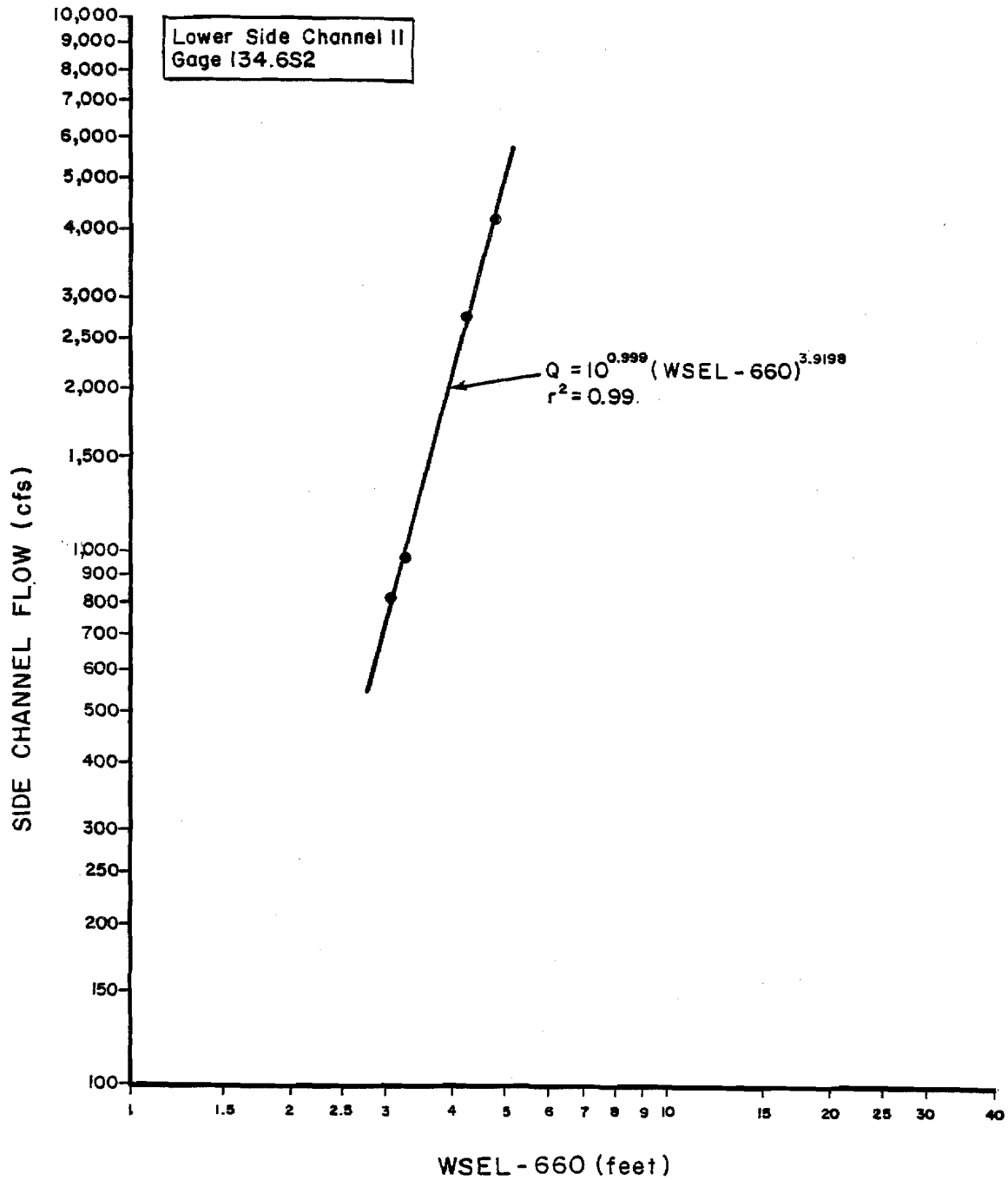

Figure 1-15. Stage versus flow rating curve for Lower Side Channel 11, staff gage 134.6S2.

ing mainstem discharge at Gold Creek (Figure 1-16). Both of these curves represent streamflow during breached conditions.

3.2.3.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side channel become governed by the mainstem at a discharge of 5,000 cfs at Gold Creek. This controlling breaching discharge is the same as the lowest observed breaching discharge for this side channel.

3.2.3.5 Backwater

An area of backwater was not observed to occur at the mouth of this side channel at any of the mainstem discharges observed during the 1983 open water field season.

3.2.4 Upper Side Channel 11 (RM 136.2)

3.2.4.1 Site Description

Upper Side Channel 11 (Figure 1-3) is located on the east bank of the Susitna River at river mile 136.2. It is approximately 0.4 miles in length and is separated from the mainstem by a large vegetated island. The head of Slough 11 joins this side channel just below the side channel head. Prior to breaching, flow in the side channel is provided by groundwater seepage. Subsequent to breaching, the majority of the flow in the side channel is provided by turbid water from the mainstem. An area of backwater occurs at the mouth of this side channel at moderate to high mainstem discharge.

During the 1983 open water field season, stage was monitored at five sites within this side channel. Streamflow was also measured at one of these sites (Figure 1-17).

3.2.4.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-7. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-43 - 1-A-45. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.2.4.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained within the free-flowing portion of the Upper Side Channel 11 study site (Appendix Table 1-A-8). From these measurements a simple stage/stream flow rating curve

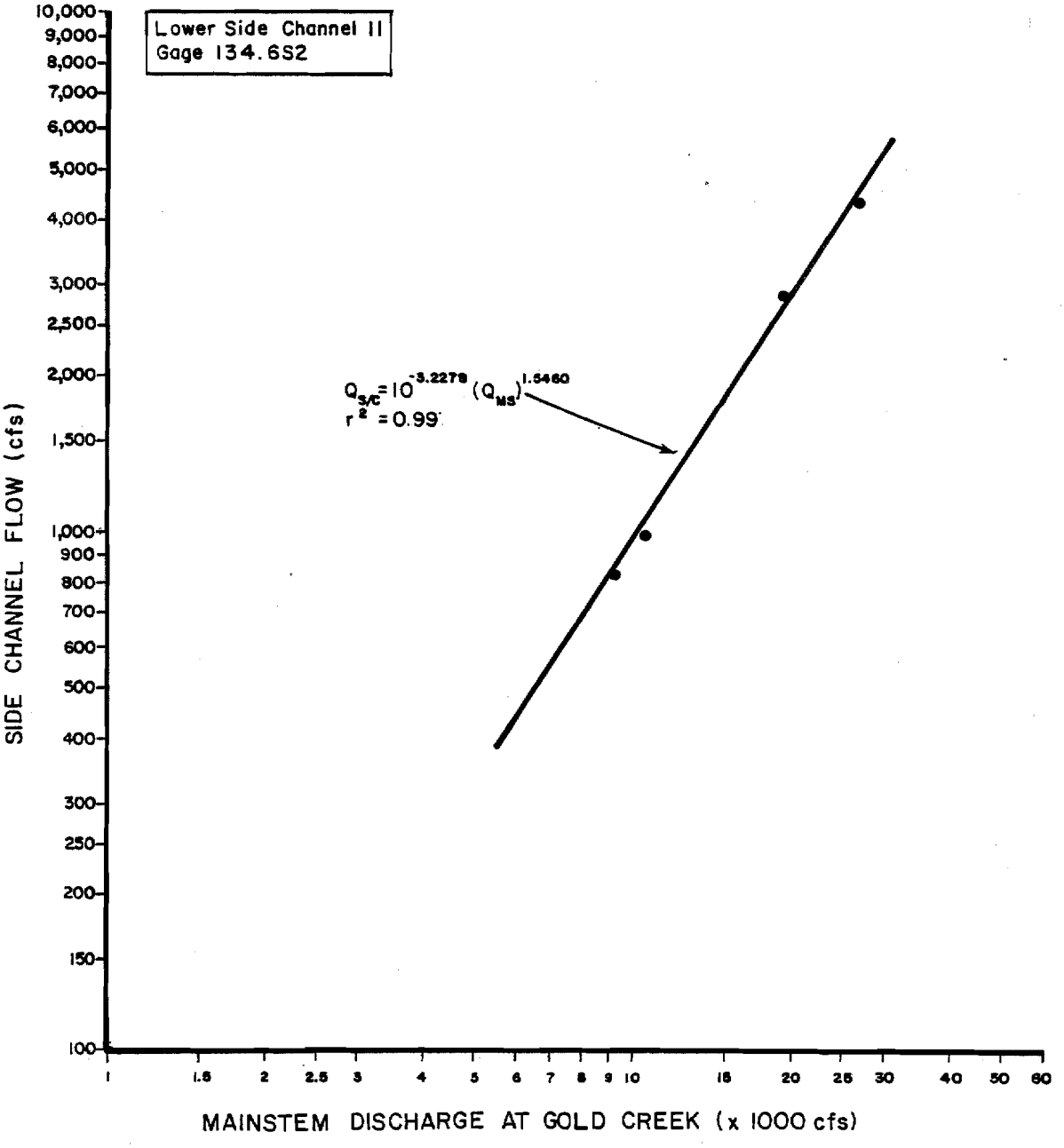

Figure 1-16. Side Channel flow versus mainstem discharge rating curve for Lower Side Channel 11, staff gage 134.6S2.

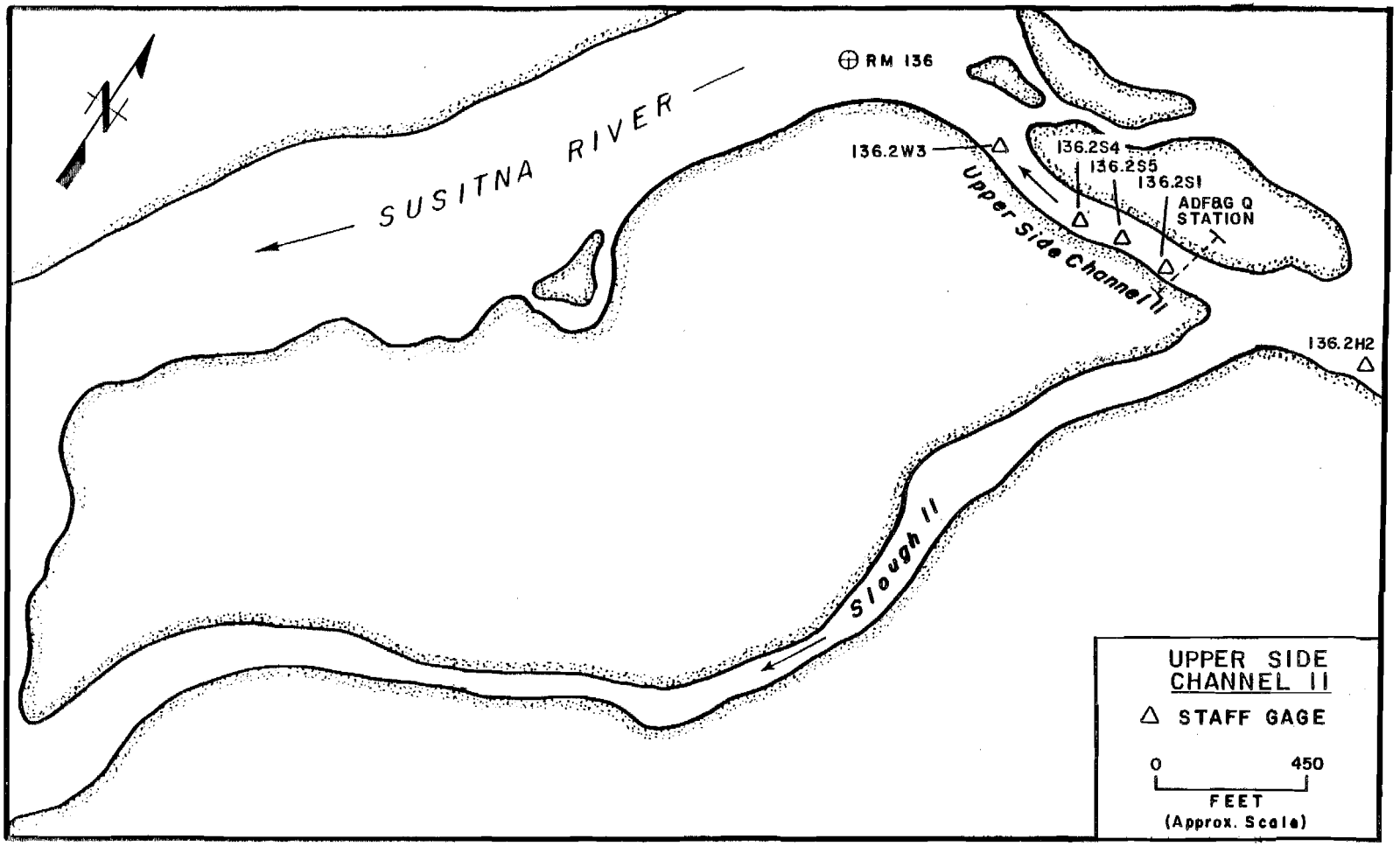

Figure 1-17. Site map of Upper Side Channel 11, which is located on the east bank of the Susitna River at river mile 136.2.

Table 1-7. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Upper Side Channel 11 at RM 136.2.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
136.2H2 (Head)	2.75	16,000 - 31,900
136.2S1 (Q-Site)	2.81	12,200 - 36,000
136.2S5	0.42	11,400 - 24,700
136.2S4	2.87	11,400 - 31,700
136.2W3 (Mouth)	2.72	11,400 - 31,700

was developed, (Figure 1-18). The stage/streamflow relationship occurring in this side channel was found to change during the upper range of streamflows with a point of inflection estimated to occur at a flow of 403 cfs. Only one flow measurement was obtained while the side channel was not breached. In addition, streamflow measured in Upper Side Channel 11 was plotted against corresponding mainstem discharge at Gold Creek (Figure 1-19).

3.2.4.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side channel become governed by the mainstem at the discharge of 16,000 cfs at Gold Creek. This controlling breaching discharge compares to the lowest observed breaching discharge of 13,000 cfs at Gold Creek for this side channel.

3.2.4.5 Backwater

An area of backwater was observed to occur at the mouth of the side channel during periods of moderate and high mainstem discharges. Based on available stage and channel geometry (see Chapter 2) data, an area of backwater was observed to occur at the mouth of this side channel to a point at least 400 ft. upstream at mainstem discharges as low as 11,400 cfs at Gold Creek.

3.2.5 Side Channel 21 (RM 141.2)

3.2.5.1 Site Description

Side Channel 21 (Figure 1-3) is located on the east bank of the Susitna River at river mile 141.2. It is approximately 0.9 miles in length and is separated from the mainstem by a series of well-vegetated islands and gravel bars. Prior to breaching of overflow Channel A5 (Figure 1-20), flow in the side channel is provided by flow from Slough 21 and local runoff and groundwater seepage. Subsequent to breaching, flow in the side channel is provided by overflow channels which provide turbid water from the mainstem. Backwater has been observed at the mouth of this side channel at high mainstem flows.

During the 1983 open water field season, stage was monitored at seven locations within this side channel study site. Streamflow was monitored at two of these stage monitoring stations (Figure 1-20).

3.2.5.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-8. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-50 - 1-A-52. Measurements of streamflow along with corre-

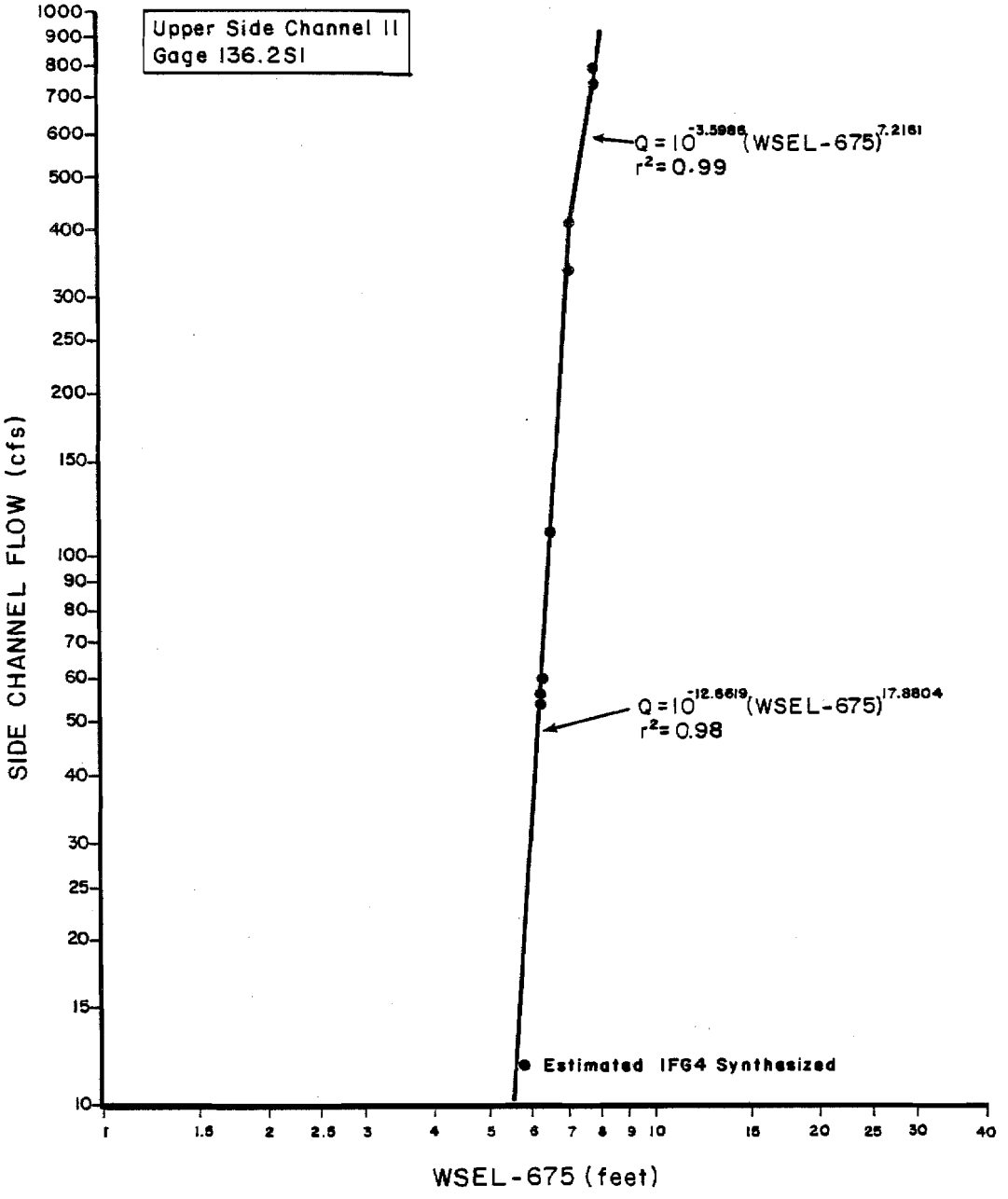

Figure 1-18. Stage versus flow rating curve for Upper Side Channel 11, staff gage 136.2S1.

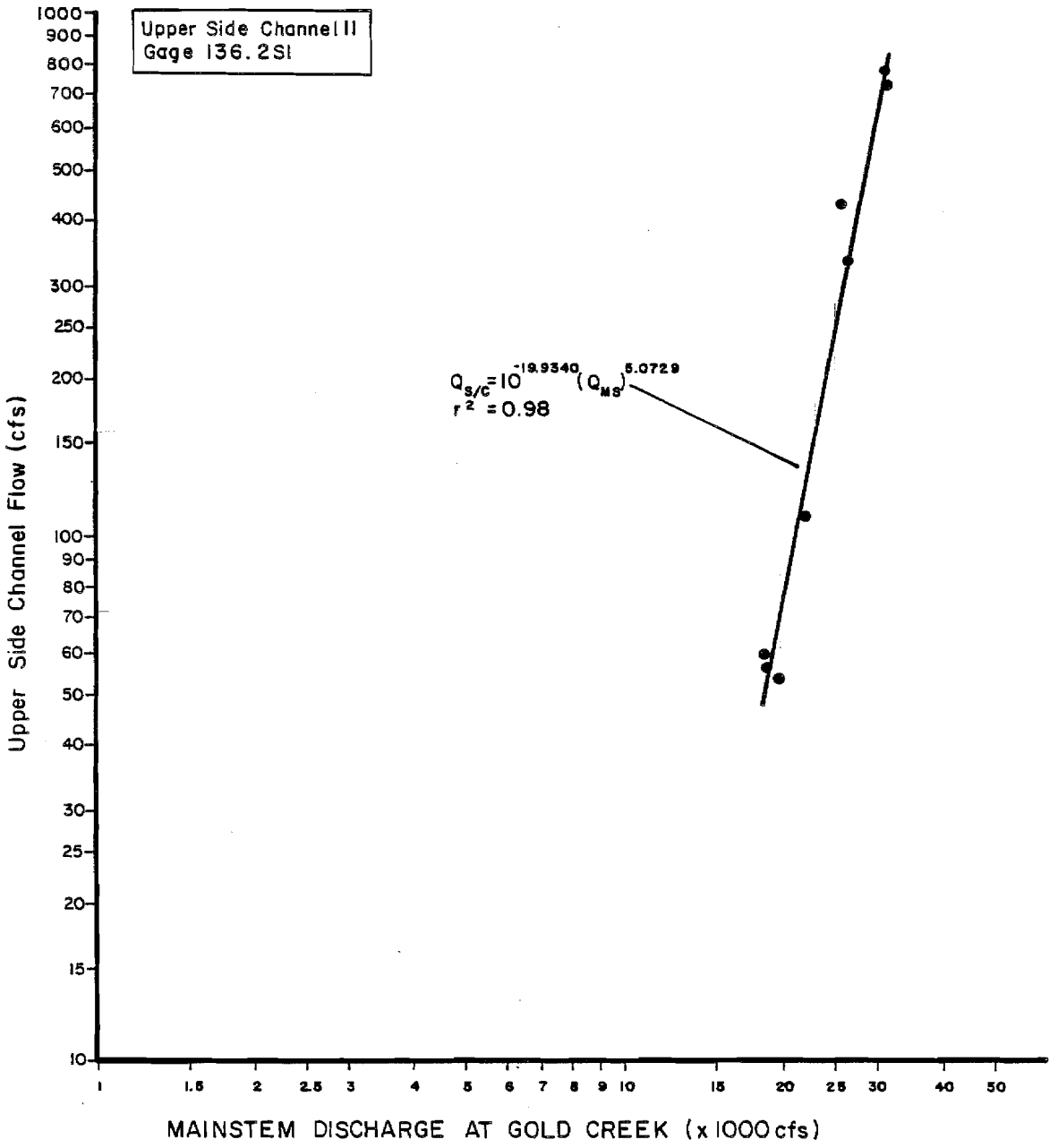

Figure 1-19. Side Channel flow versus mainstem discharge rating curve for Upper Side Channel 11, staff gage 136.2S1.

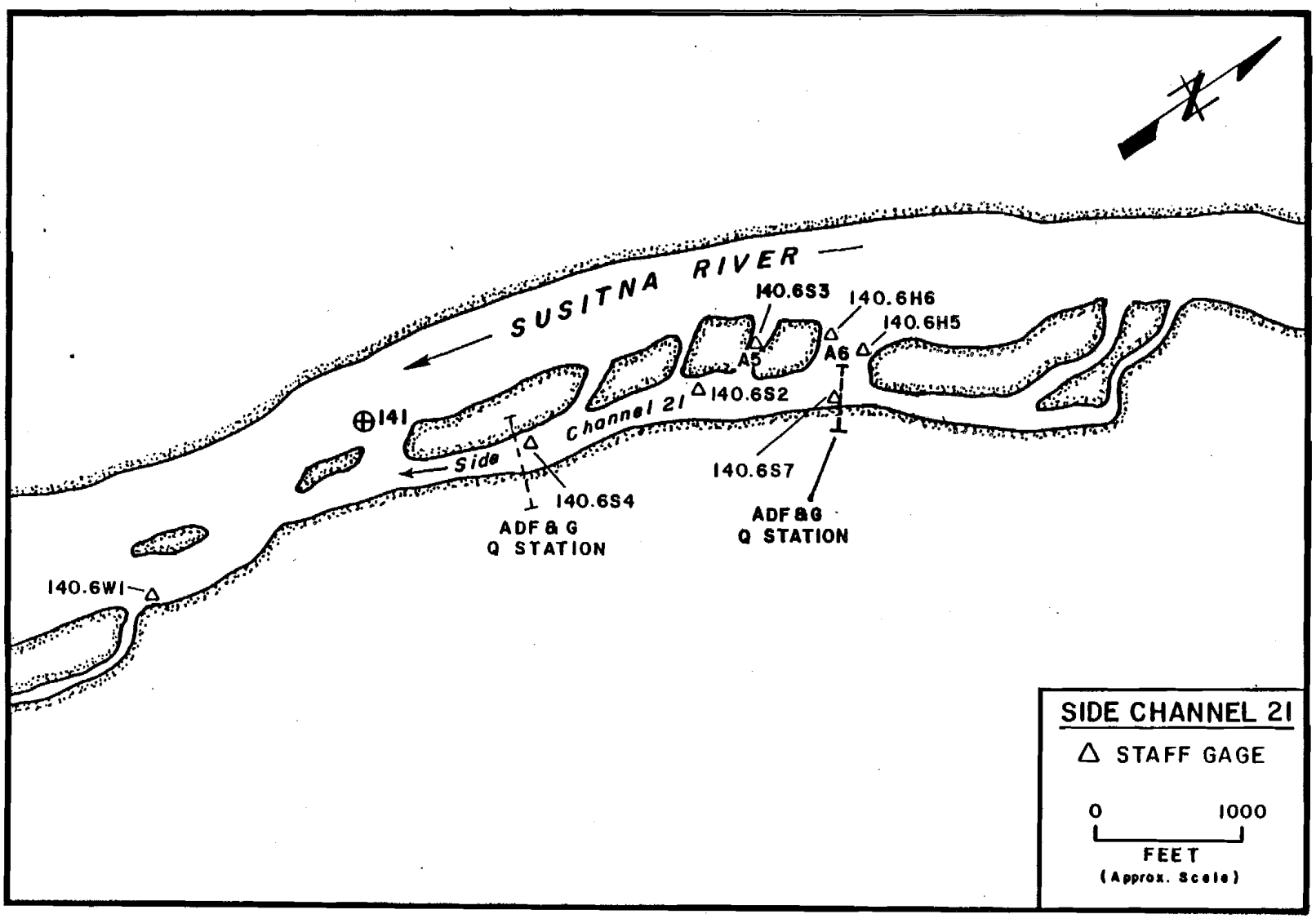

Figure 1-20. Site map of Side Channel 21 which is located on the east bank of the Susitna River at river mile 141.2.

Table 1-8. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Channel 21 at RM 141.2.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
140.6H5 (Upper A6)	1.12	21,600 - 33,000
140.6H6 (Lower A6)	0.74	26,000 - 33,000
140.6S3 (A5)	2.88	11,600 - 33,000
140.6S2	2.02	11,100 - 33,000
140.6S7 (Upper Q-Site)	1.45	11,000 - 29,900
140.6S4 (Lower Q-Site)	2.29	10,700 - 33,000
140.6W1 (Mouth)	3.31	7,230 - 33,000

sponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.2.5.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained at two locations within the free-flowing portion of Side Channel 21 (Figure 1-20, Appendix Table 1-A-8). From these measurements, simple stage/streamflow rating curves were constructed for each location (Figures 1-21 and 1-22). These rating curves represent streamflow conditions in the side channel during periods while the side channel was breached and unbreached. In addition, discharge data obtained at each location was plotted against corresponding mainstem discharge at Gold Creek (Figures 1-23 and 1-24). These curves represent only the streamflow conditions in the side channel while the side channel was breached.

3.2.5.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side channel downstream of overflows Channel A5 (Figure 1-20) become governed by the mainstem at a discharge of 12,000 cfs at Gold Creek. This discharge compared to the lowest observed breaching discharge of 9200 cfs for the A5 overflow channel. The hydraulic conditions present in Side Channel 21 upstream of overflow Channel A5 (Figure 1-20) become governed by the mainstem at a discharge of 24,000 cfs at Gold Creek. This discharge compared to the lowest observed breaching discharge of 18,000 for the A6 overflow Channel (Figure 1-20).

3.2.5.5 Backwater

An area of backwater was observed to occur at the mouth of this side channel during periods of moderate mainstem discharge. Based on available stage and channel geometry (see Chapter 2), Side Channel 21 has been observed to have an area of backwater occurring from the mouth upstream approximately 3,600 ft at a mainstem discharge of 16,000 cfs at Gold Creek.

3.3 Side Sloughs

Measurements of stage and discharge were obtained during the 1983 open water field season at selected locations within nine side slough study sites located in the Talkeetna to Devil Canyon reach of the Susitna River (Table 1-2, Figure 1-3). the stage versus mainstem discharge plots developed for side sloughs (Appendix Figure 1-A-24 - 1-A-25, 1-A-27 - 1-A-28, 1-A-32 - 1-A-36, 1-A-42, 1-A-45 - 1-A-46, 1-A-48 - 1-A-49) reflect the same hydraulic conditions determined for side channel habitats. The stage discharge relationships for side slough habitats are identified (as were the side channel habitats) as controlled, not controlled, backwater, no backwater, breached and not breached. Results of the side slough stage and discharge investigations are discussed below by site.

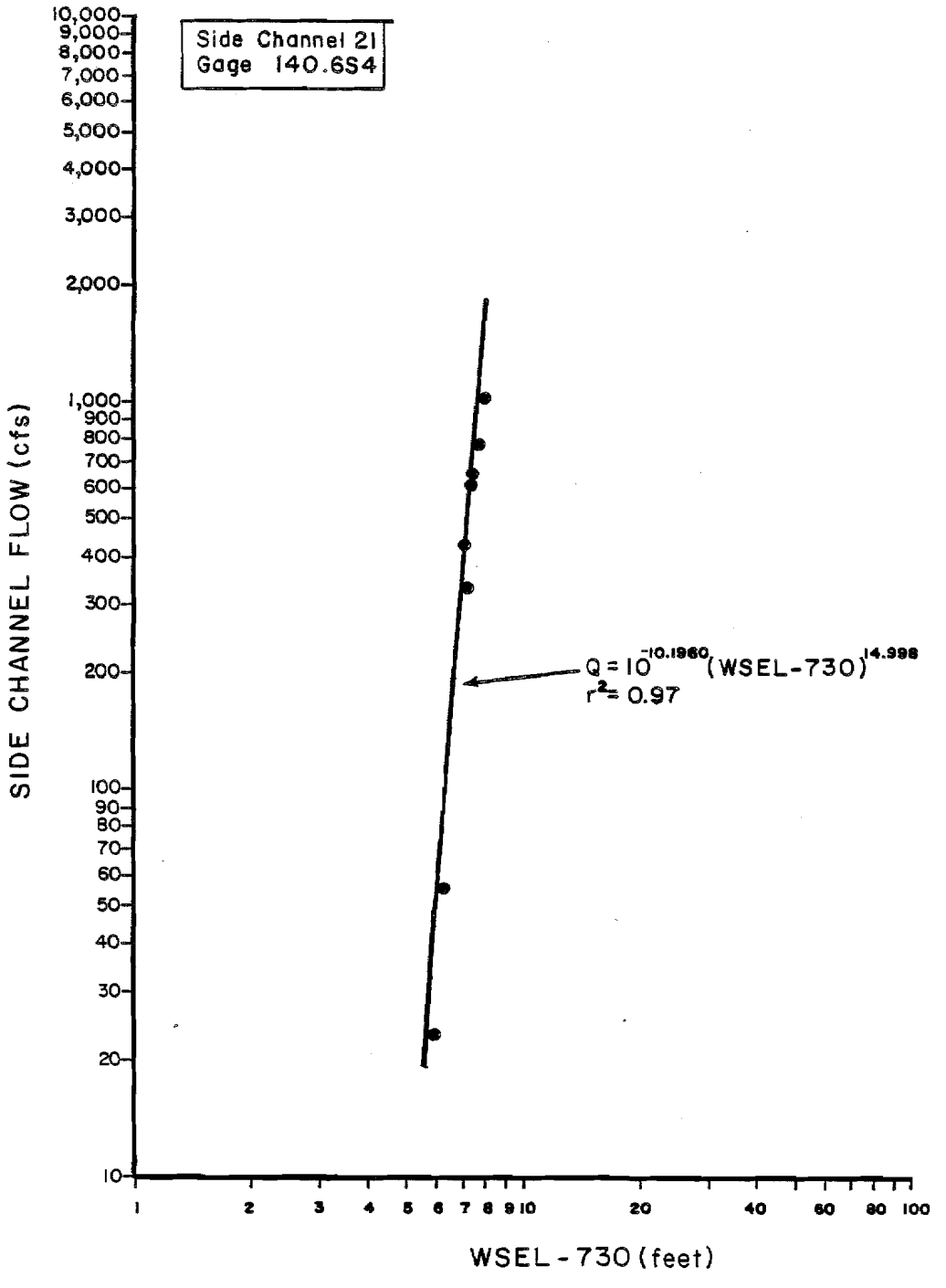

Figure 1-21. Stage versus flow rating curve for Side Channel 21, staff gage 140.6S4.

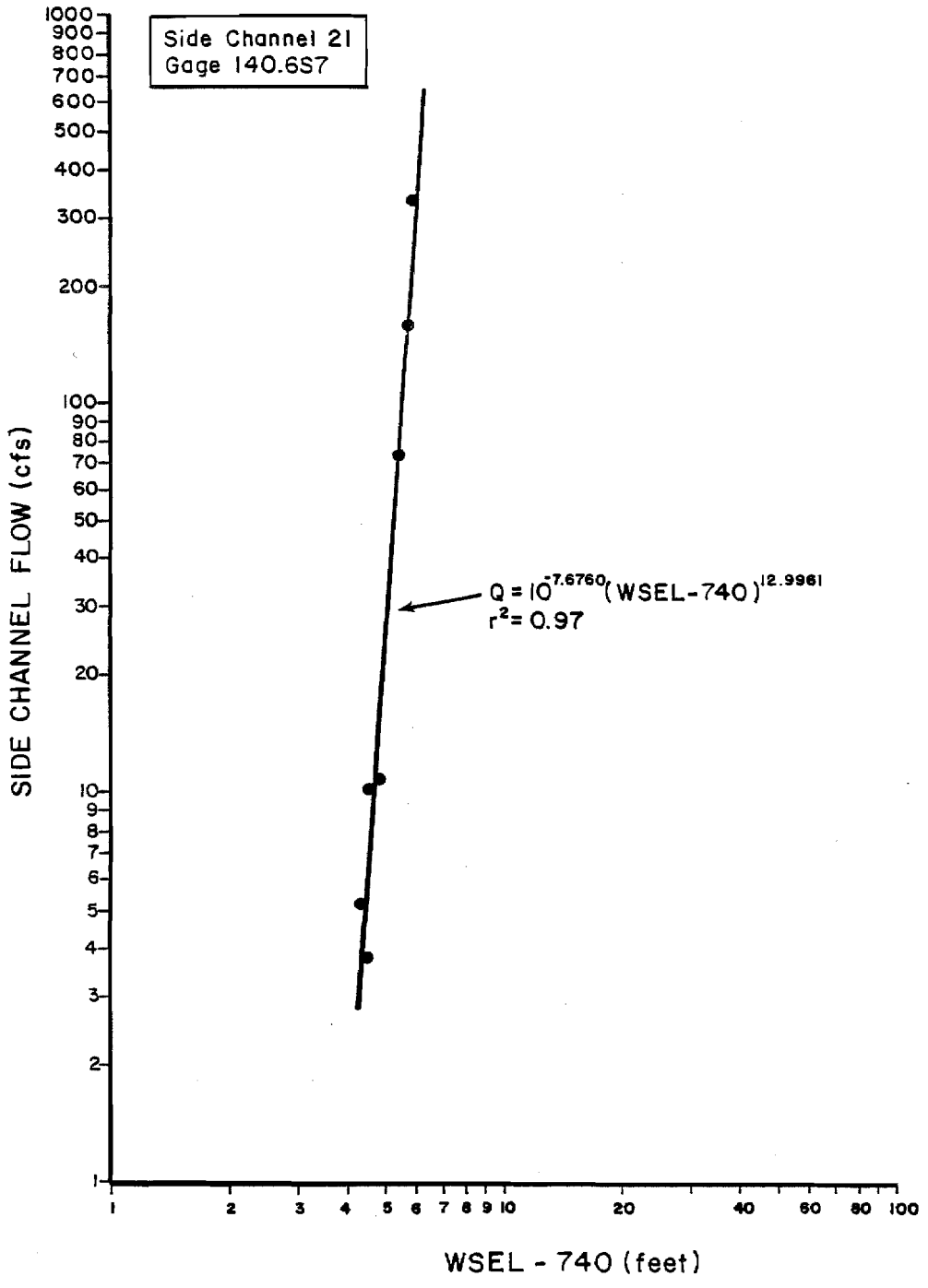

Figure 1-22. Stage versus flow rating curve for Side Channel 21, staff gage 140.6S7.

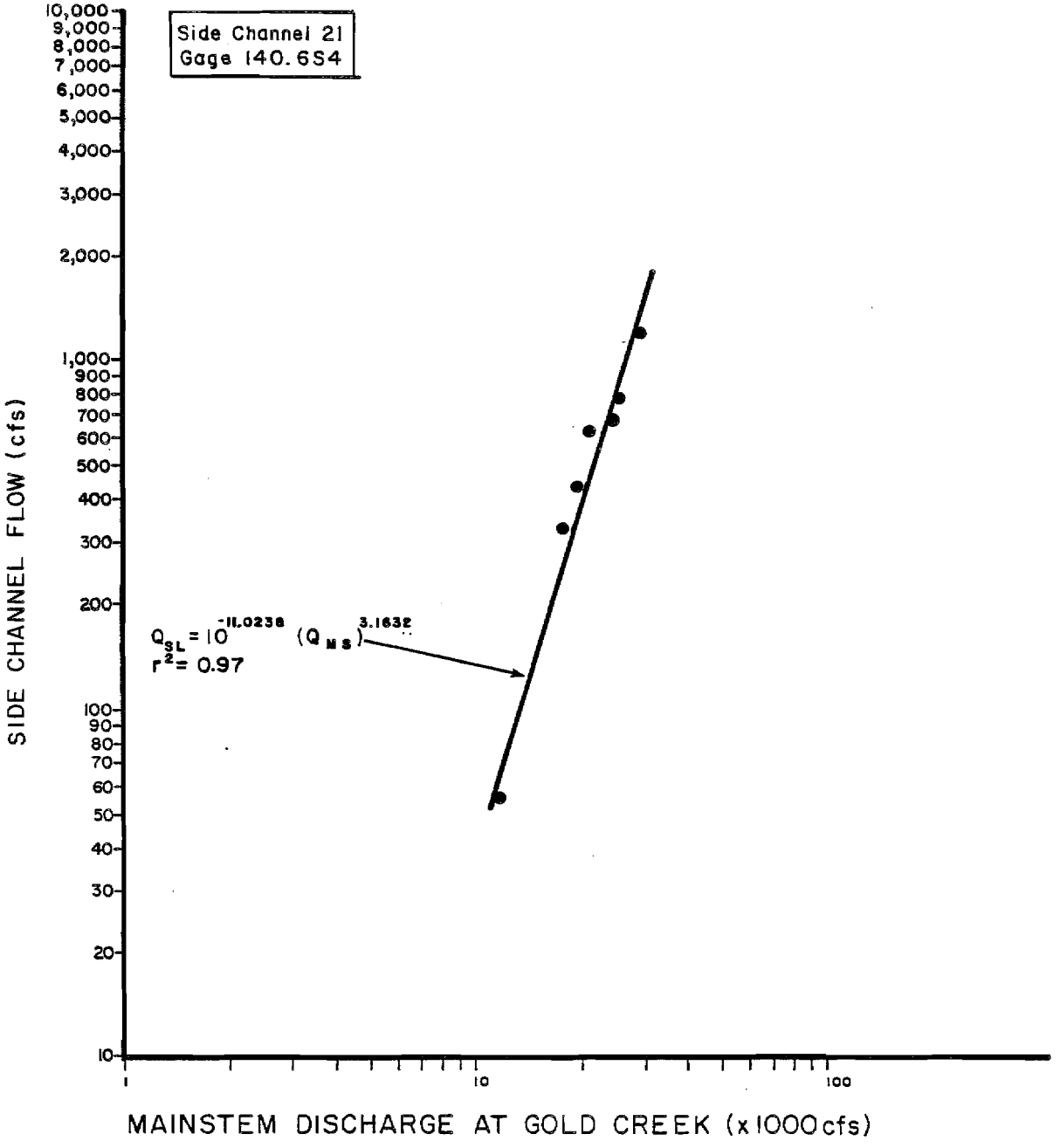

Figure 1-23. Side Channel flow versus mainstem discharge rating curve for Side Channel 21, staff gage 140.6S4.

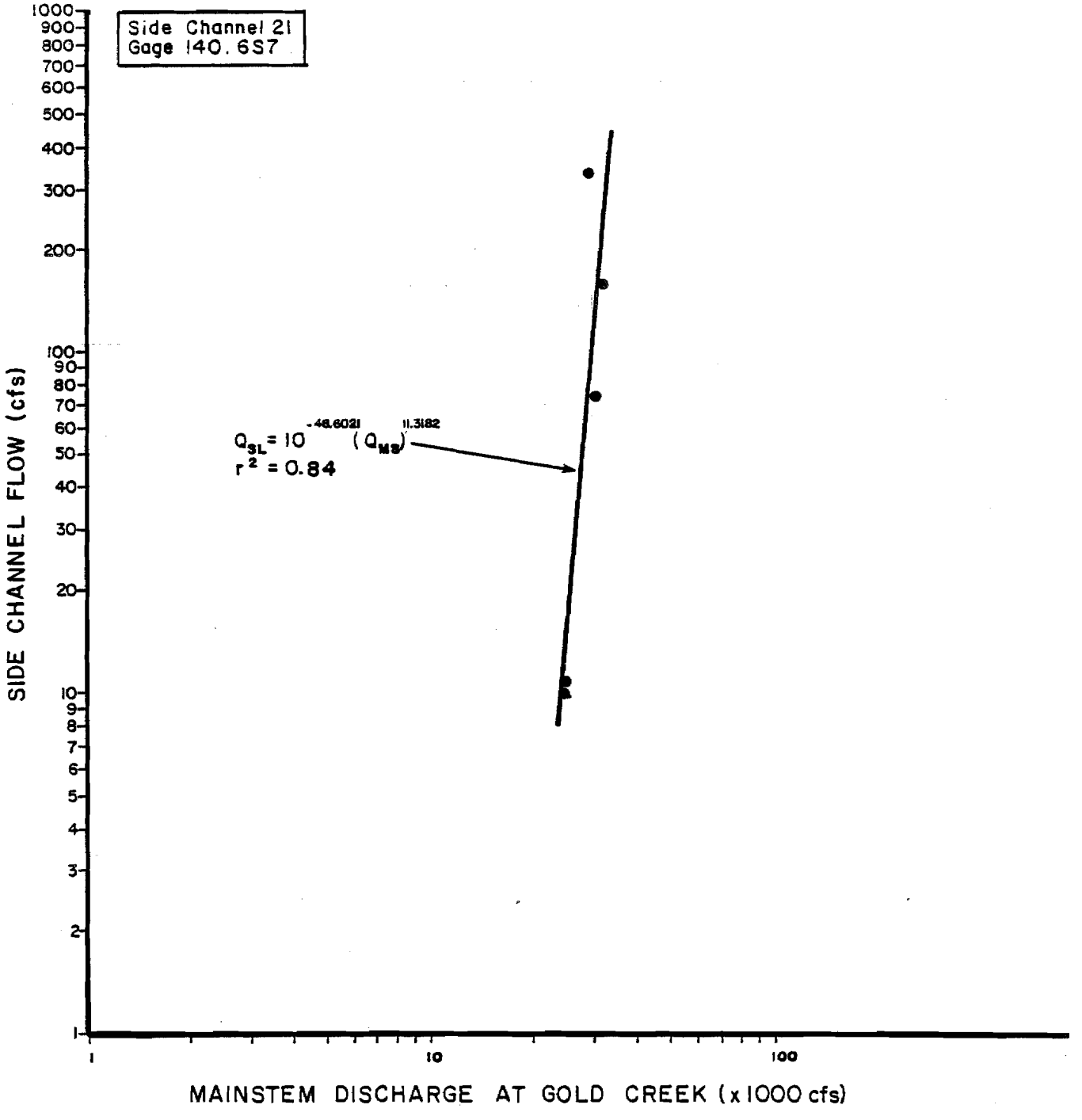

Figure 1-24. Side Channel flow versus mainstem discharge rating curve for Side Channel 21, staff gage 140.6S7.

3.3.1 Whiskers Side Slough (RM 101.2)

3.3.1.1 Site Description

Whiskers Side Slough (Figure 1-3) is located on the west bank of the Susitna River at river mile 101.2. It is approximately 0.6 miles in length and is separated from the mainstem by a well-vegetated island. Prior to breaching, flow in this side slough is provided by Whiskers Creek with additional smaller flow contributions provided by groundwater seepage. Subsequent to breaching, flow in the side slough is provided by both Whiskers Creek and turbid water from the mainstem. A substantial area of backwater occurs at the mouth of this side slough at low to high mainstem flows.

During the 1983 open water field season, stage was monitored at three sites within this side slough. Streamflow was also measured at one of these sites (Figure 1-25).

3.3.1.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-9. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each monitoring station within Whiskers Side Slough are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-24 - 1-A-25. Measurements of slough flow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.1.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained within the free-flowing portion of Whiskers Side Slough above its confluence with Whiskers Creek (Figure 1-25, Appendix Table 1-A-8). From these measurements a simple stage/streamflow rating curve was developed (Figure 1-26). This curve is representative of both breached and unbreached conditions. Insufficient flow data was obtained during the breached condition to relate the slough flow to that of mainstem discharge. The flow measurement of 2 cfs was obtained slightly downstream of the discharge station in a small riffle considered the hydraulic control for the Whiskers Side Slough discharge station.

3.3.1.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side slough become governed by the mainstem at a mainstem discharge of 23,000 cfs at Gold Creek. This discharge compares to the lowest observed breaching discharge of 22,000 cfs at Gold Creek for this side slough.

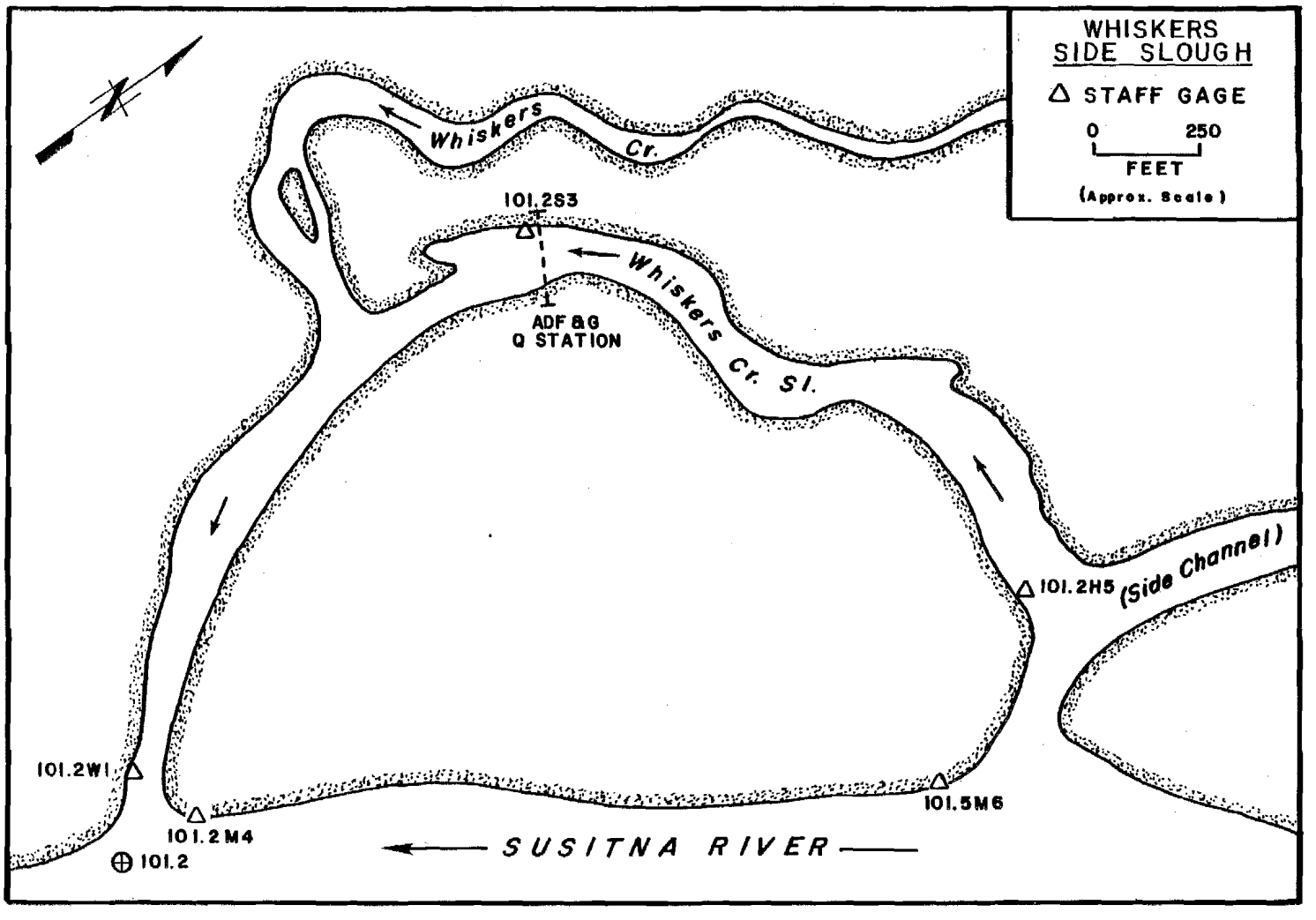

Figure 1-25. Site map of Whiskers Side Slough, which is located on the west bank of the Susitna River at river mile 101.2.

Table 1-9. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Whiskers Side Slough RM 133.6.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
101.2H5 (Head	1.12	12,200 - 18,600
101.2S3 (Q-Site)	2.03	8,440 - 37,000
101.2W1 (Mouth)	3.96	8,440 - 37,000

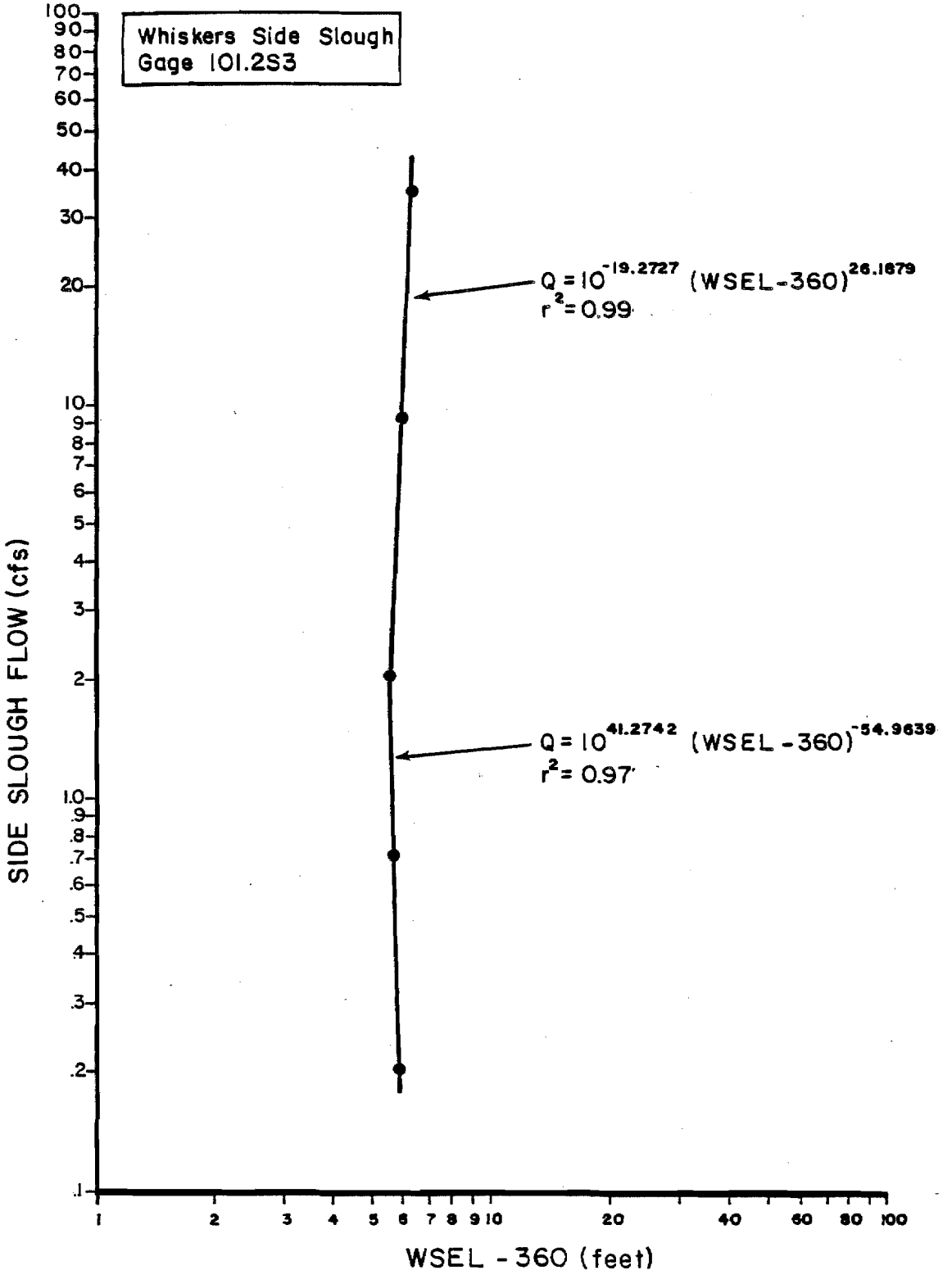

Figure 1-26. Stage versus flow rating curve for Whiskers Side Slough, staff gage 101.2S3.

3.3.1.5 Backwater

A substantial area of backwater occurs at the mouth of this slough during periods of low to high mainstem discharge. Based on available stage and channel geometry data (see Chapter 2), an area of backwater occurs at the mouth of this side slough at mainstem flows at Gold Creek as low as 8,440 cfs.

3.3.2 Side Slough 8 (RM 133.6)

3.3.2.1 Site Description

Side Slough 8, also known as Lane Creek Slough, is located on the east bank of the Susitna River at river mile 133.6, (Figure 1-3). It is approximately 0.4 miles in length and is separated from the mainstem by a well-vegetated bar. Prior to breaching, flow in this side slough is provided by local runoff and groundwater seepage. Subsequent to breaching, flow is provided in the slough from turbid water in the mainstem. An area of backwater occurs at the mouth of this side slough during periods of moderate to high mainstem flows.

During the 1983 open water field season, stage was monitored at three sites within this side slough. Streamflow was also measured at one of these sites (Figure 1-27).

3.3.2.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-10. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-27 - 1-A-28. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek at the time of measurement are presented in Appendix Table 1-A-8.

3.3.2.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained within the free-flowing portion of Side Slough 8 (Appendix Table 1-A-8). From these measurements, a simple stage/streamflow rating curve was constructed (Figure 1-28). In addition, streamflow data obtained at this site were plotted against corresponding mainstem discharge at Gold Creek (Figure 1-29). These plots represent streamflow conditions during both breached and unbreached, periods.

3.3.2.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side slough is governed by the mainstem at a mainstem

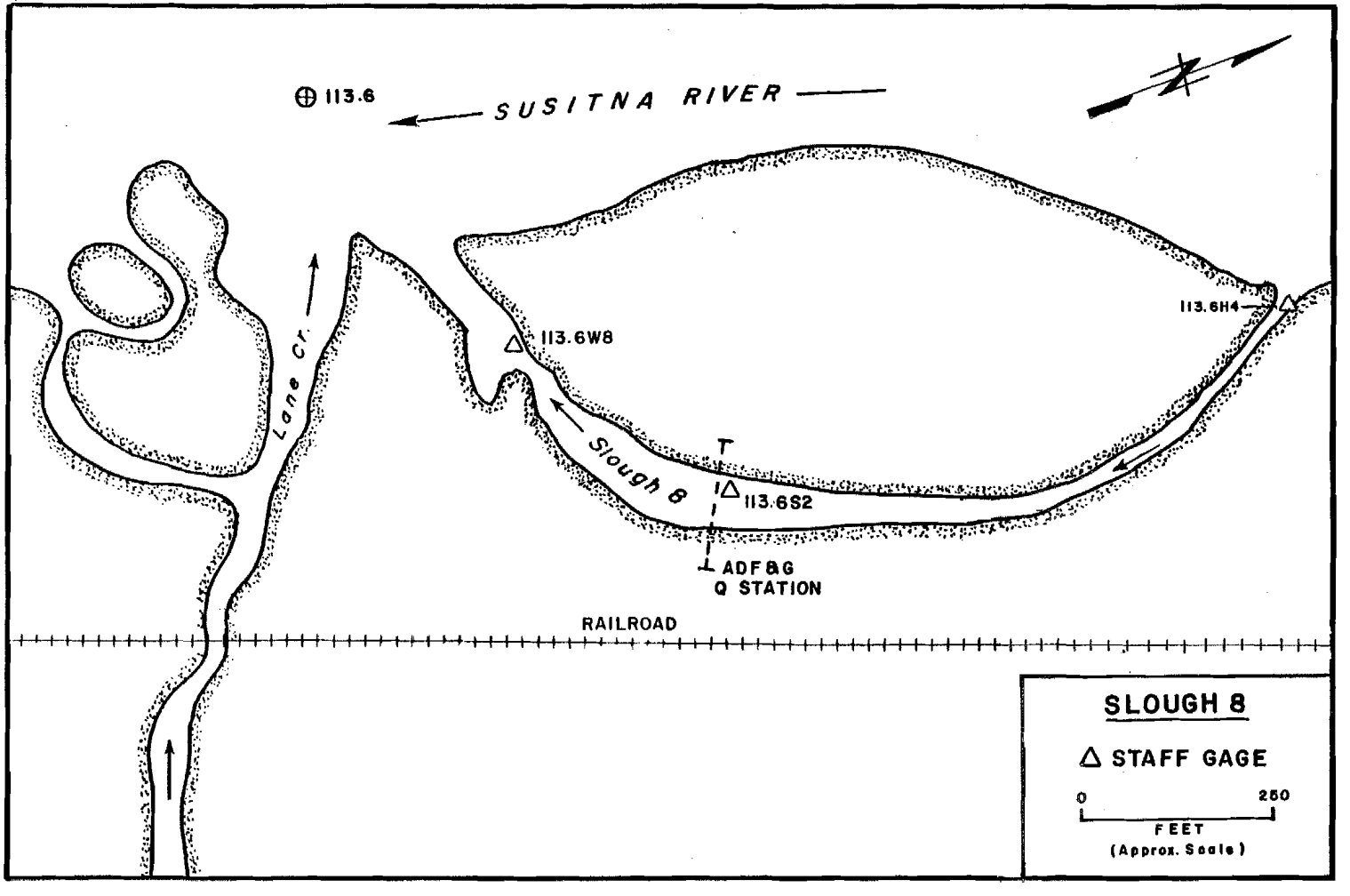

Figure 1-27. Site map of Side Slough 8, which is located on the east bank of the Susitna River at river mile 113.6.

Table 1-10. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 8 (Lane Creek Slough) at RM 133.6.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
113.6H4 (Head)	0.80	26,000 - 32,000
113.6S2 (Q-Site)	2.78	9,640 - 32,000
113.6W8 (Mouth)	3.99	9,640 - 31,900

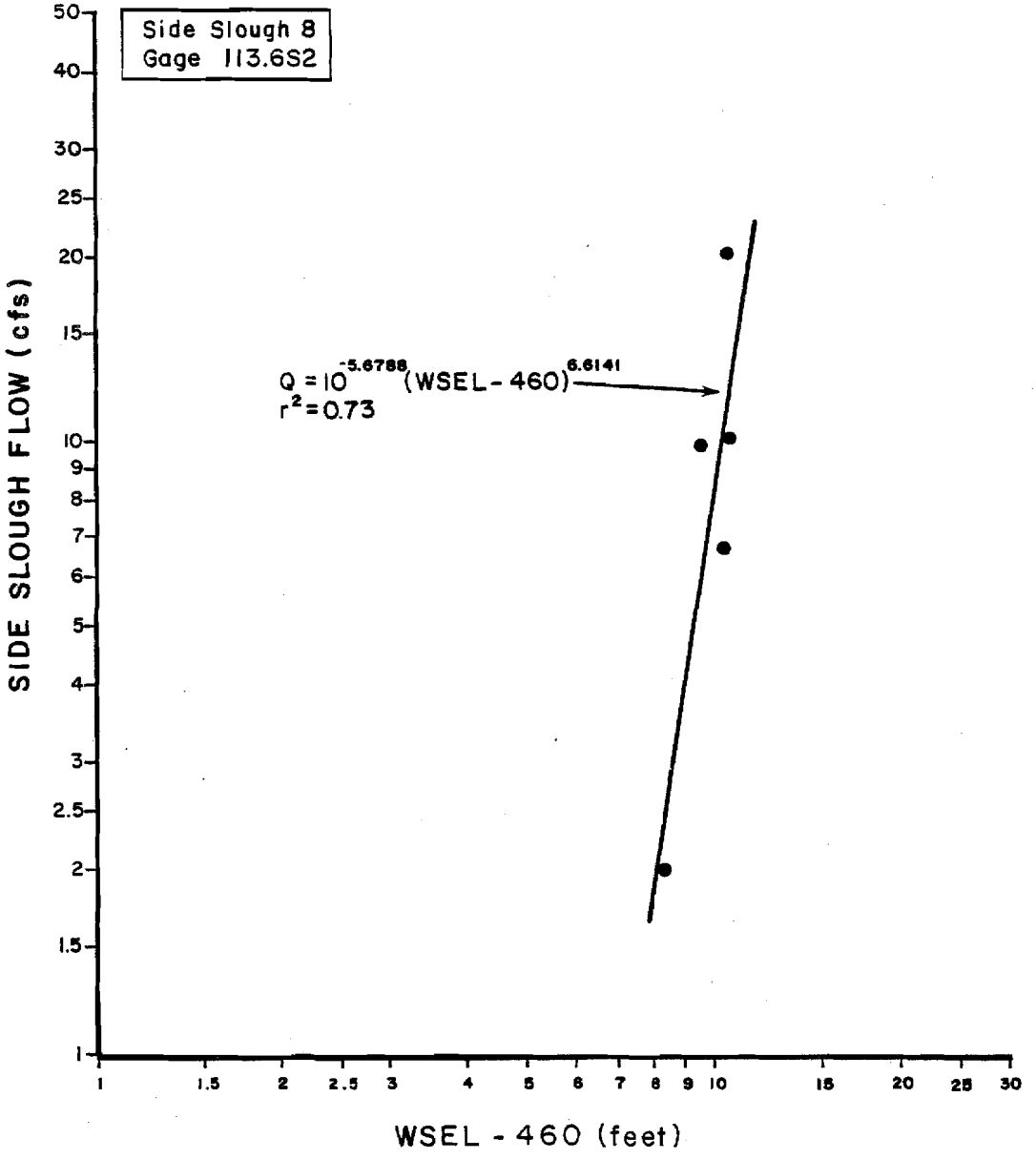

Figure 1-28. Stage versus flow rating curve for Slough 8, staff gage 113.6S2.

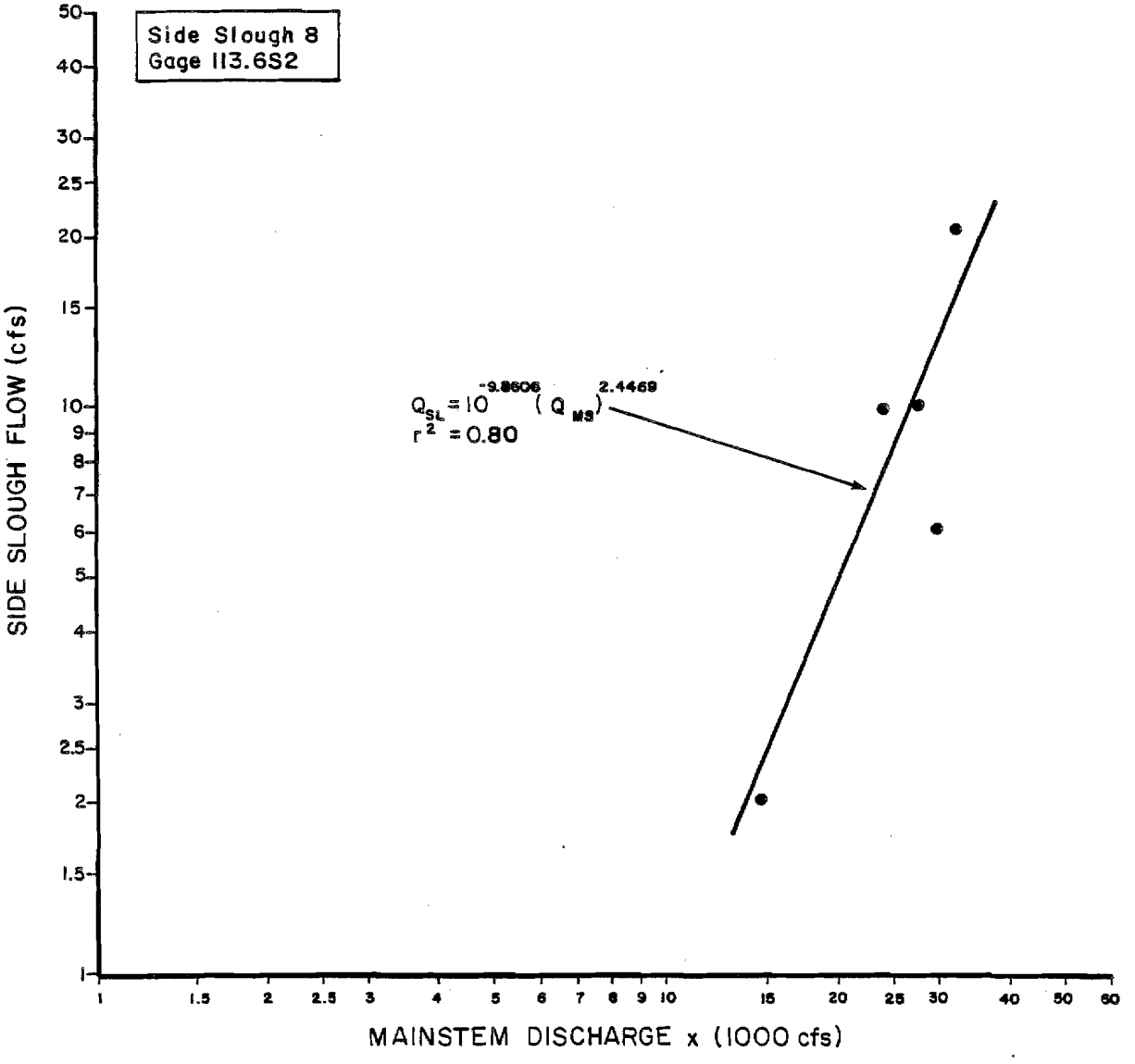

Figure 1-29. Slough flow versus mainstem discharge rating curve for Side Slough 8, staff gage 113.6S2.

discharge of 24,000 cfs at Gold Creek. This controlling discharge is the same as the lowest observed breaching discharge for this site.

3.3.2.5 Backwater

An area of backwater was observed to occur at the mouth of this slough during periods of moderately low to high mainstem discharge. Based on available stage and channel geometry (see Chapter 2) data, an area of backwater occurs at the mouth of this side slough at mainstem discharges at Gold Creek as low as 11,600 cfs.

3.3.3 Side Slough 8A (RM 125.3)

3.3.3.1 Site Description

Side Slough 8A (Figure 1-3) is located on the east bank of the Susitna River at river mile 125.3. It is approximately two miles in length and is separated from the mainstem by two relatively large vegetated islands. Approximately 0.5 miles upstream of the mouth, the channel divides into two forks, a NW fork and NE fork. Two beaver dams are present on the side slough with one occurring just downstream of the fork and one just upstream of the fork in the NE channel. Prior to breaching flow in the side slough is provided by local runoff and groundwater seepage. Subsequent to breaching flow is primarily turbid water from the mainstem. A substantial area of backwater occurs at the mouth of this side slough during periods of low to high mainstem flows.

During the 1983 open water field season, stage was monitored at nine sites within this side slough. Slough flow was also measured at three of these sites (Figure 1-30).

3.3.3.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-11. Measurements of water surface elevations along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-32 - 1-A-34. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.3.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained at three locations within the free-flowing portion of Side Slough 8A, (Appendix 1-A-8). From these measurements, simple stage/streamflow rating curves were developed (Figures 1-31 to 1-33). These curves represent streamflow during periods while the slough was both breached and not breached by mainstem water with the exception of the curve for the NE channel (Figure 1-33). The NE Channel was not observed breached during the 1983 open water season. Flow data obtained at each discharge station other

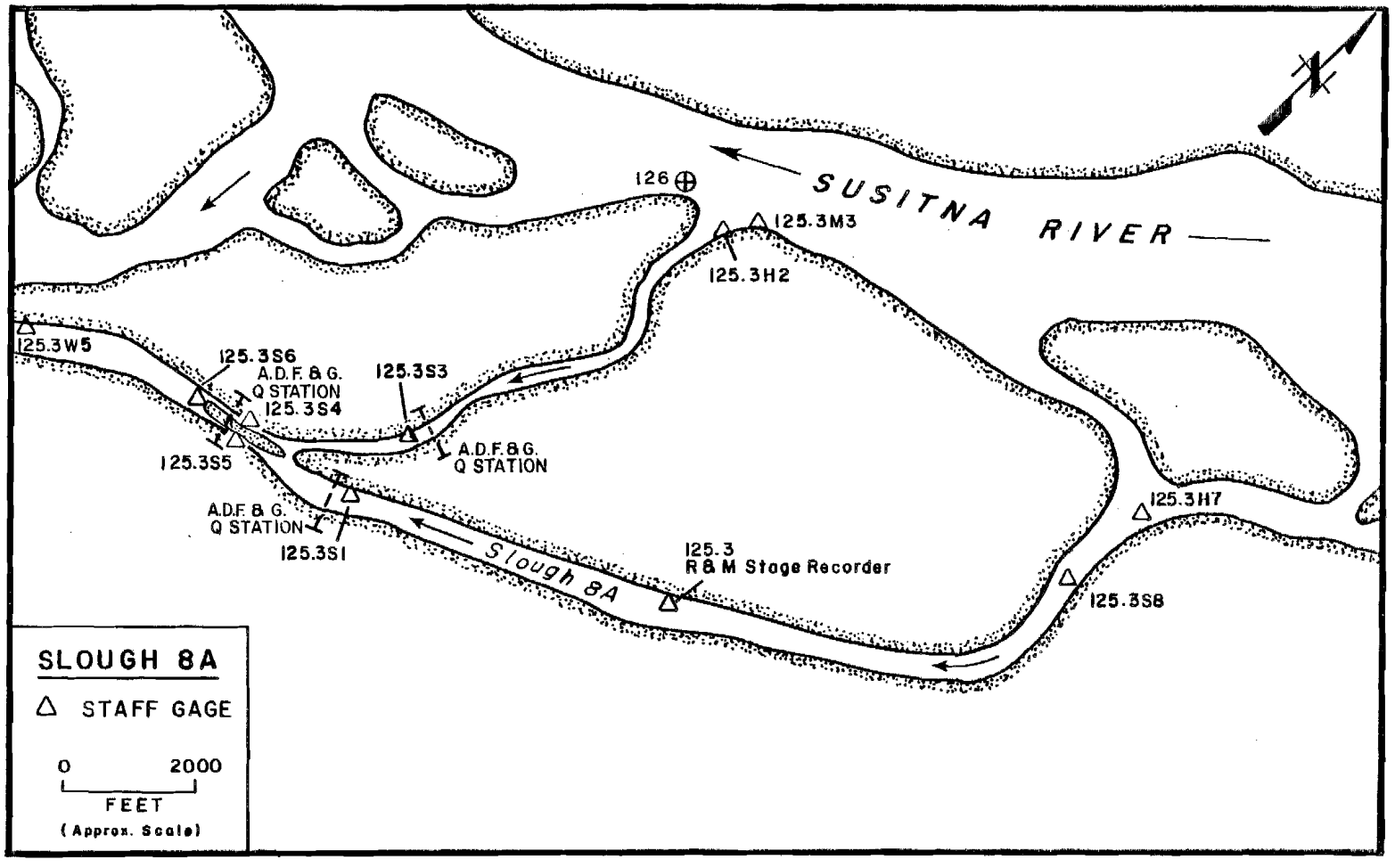

Figure 1-30. Site map of Side Slough 8A, which is located on the east bank of the Susitna River at river mile 125.3.

Table 1-11. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 8A at RM 125.3.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Discharge (cfs)
125.3H7 (NE Head)	Dewatered	5,000 - 31,000
125.3S8	0.55	20,600 - 31,000
125.3S1 (NE Channel Q-Site)	1.16	5,400 - 31,000
125.3H2 (NW Head)	0.50	27,400 - 32,000
125.3S3 (NW Q-Site)	0.80	10,600 - 31,000
125.3S5	0.45	7,230 - 31,000
125.3S4	0.65	7,230 - 31,000
125.3S6 (Backwater)	2.61	7,230 - 31,000
125.3W5 (Mouth)	3.42	7,230 - 36,000

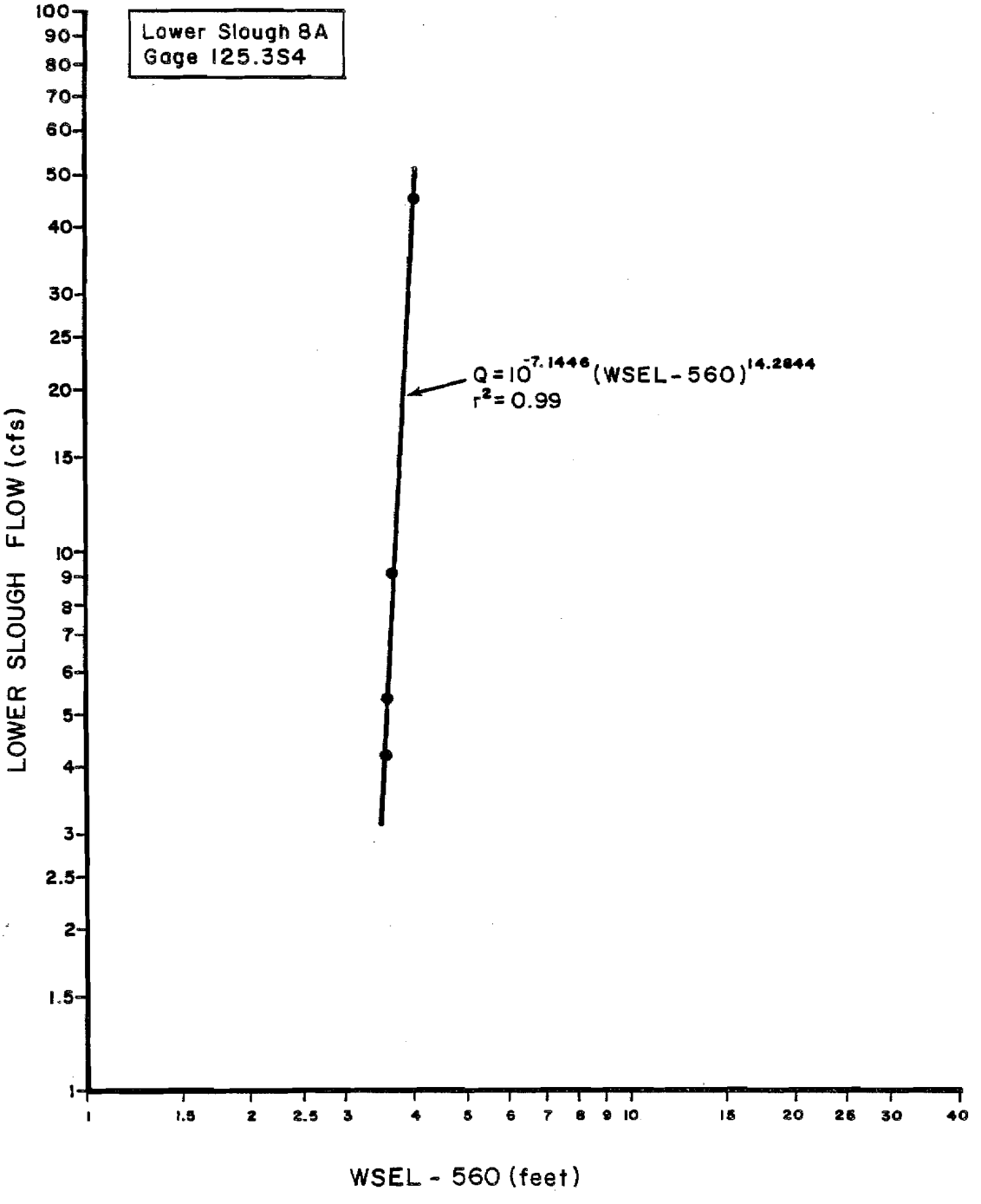

Figure 1-31. Stage versus flow rating curve for Side Slough 8A, staff gage 125.3S4.

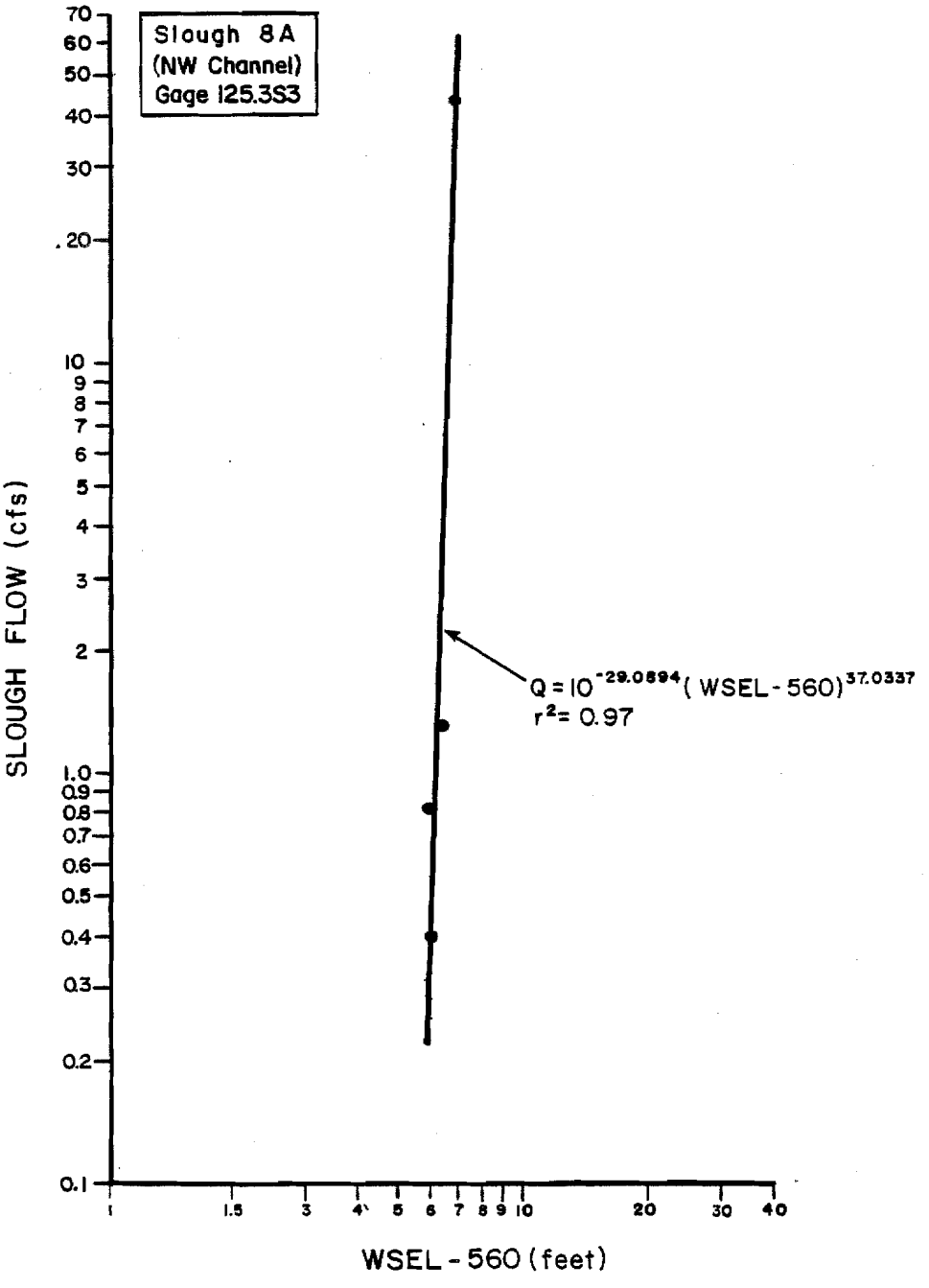

Figure 1-32. Stage versus flow rating curve for Side Slough 8A, staff gage 125.3S3.

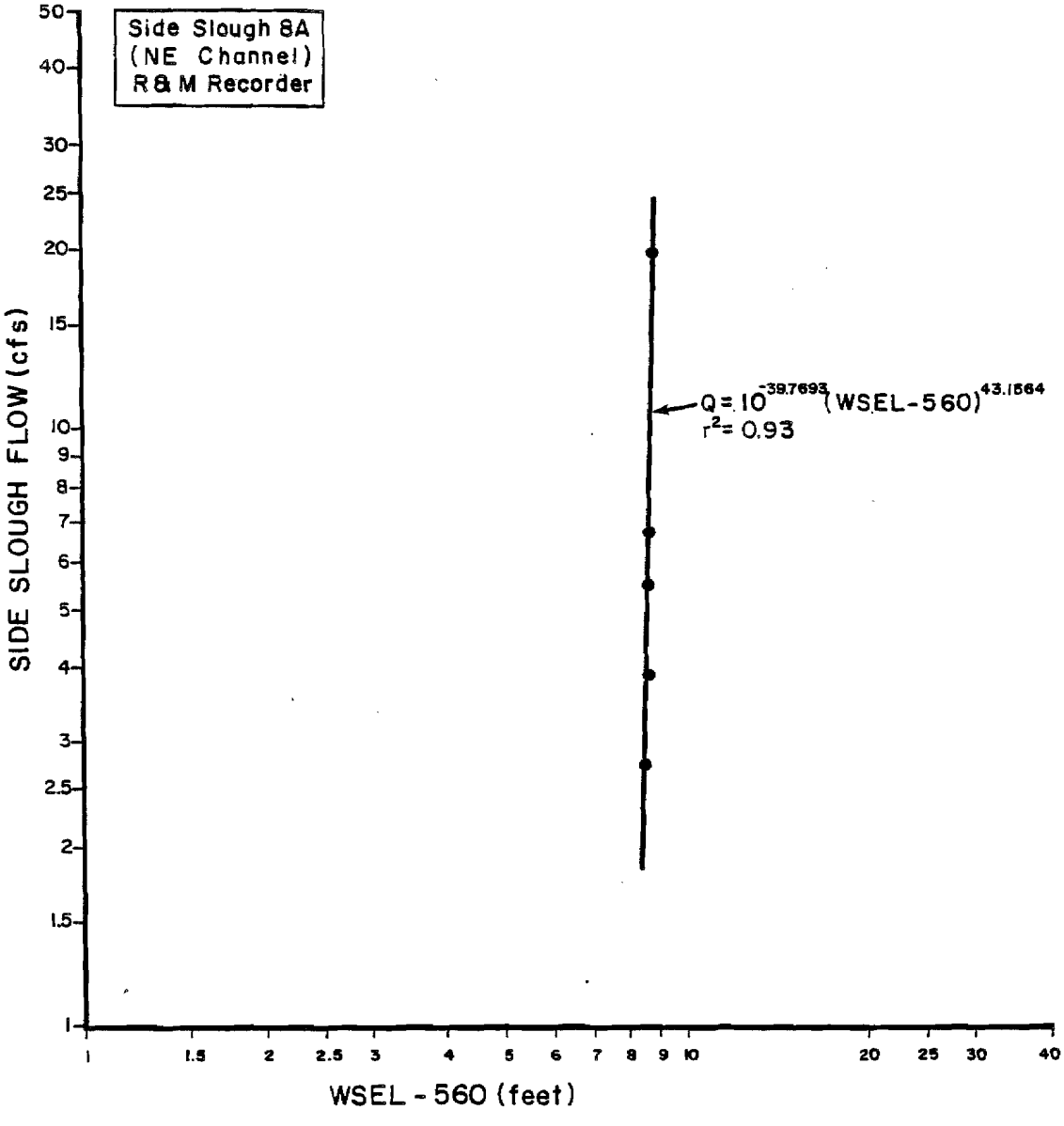

Figure 1-33. Stage versus flow rating curve for Side Slough 8A, staff gage at R&M recorder.

than the discharge station in the NE channel were also plotted against the corresponding mainstem discharge at Gold Creek (Figures 1-34 and 1-35). Due to an absence of breaching flows in the NE channel, this site was not plotted against mainstem discharge.

3.3.3.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present at the NW fork of this side slough become governed by the mainstem at a mainstem discharge of 27,000 cfs at Gold Creek. This controlling flow is the same as the lowest observed breaching discharge for this fork. Breaching of the NE Channel was not observed in 1983 but is estimated to occur at a mainstem discharge at Gold Creek of 33,000 cfs.

3.3.3.5 Backwater

An area of backwater was observed to occur at the mouth of this side slough during periods of low to high mainstem discharge. Based on available stage and channel geometry data (see Chapter 2), a substantial area of backwater occurs at the mouth of this side slough at mainstem discharges at Gold Creek as low as 7,230 cfs.

3.3.4 Side Slough 9 (RM 128.3)

3.3.4.1 Site Description

Side Slough 9 (Figure 1-3) is located on the east bank of the Susitna River at river mile 128.3. It is approximately 1.2 miles in length and is separated from the mainstem by a large vegetated island. Prior to breaching, flow in the slough is provided by two small tributaries and groundwater seepage. Subsequent to breaching, flow is primarily provided as turbid water from the mainstem. An area of backwater occurs at the mouth of this side slough at moderate to high mainstem discharges at Gold Creek.

During the 1983 open water field season, stage was monitored at three sites within this side slough. Streamflow was also measured at one of these sites (Figure 1-36).

3.3.4.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-12. Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-35 - 1-A-36. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

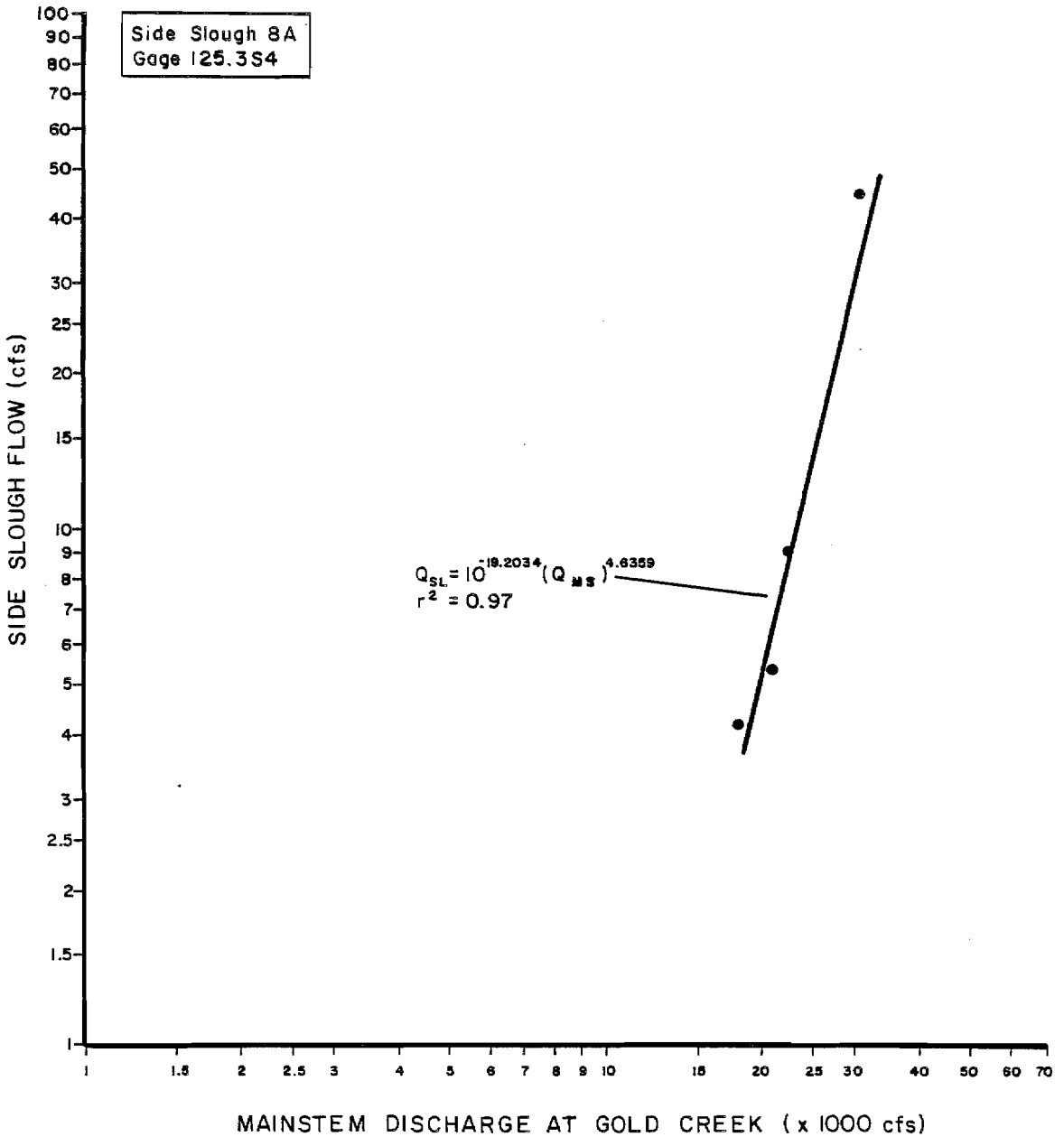

Figure 1-34. Slough flow versus mainstem discharge rating curve for Side Slough 8A, staff gage 125.3S4.

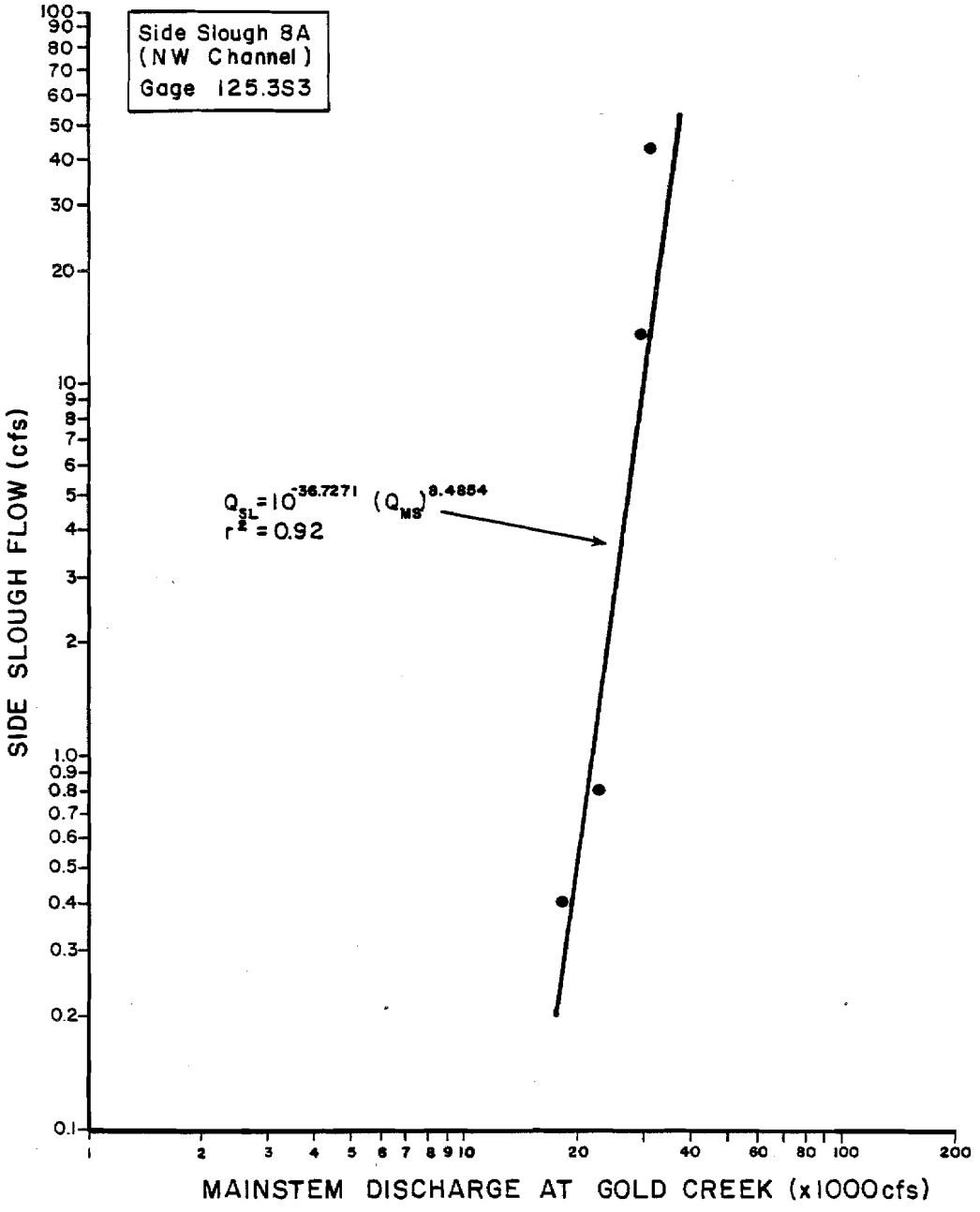

Figure 1-35. Slough flow versus mainstem discharge rating curve for Side Slough 8A, staff gage 125.3S3.

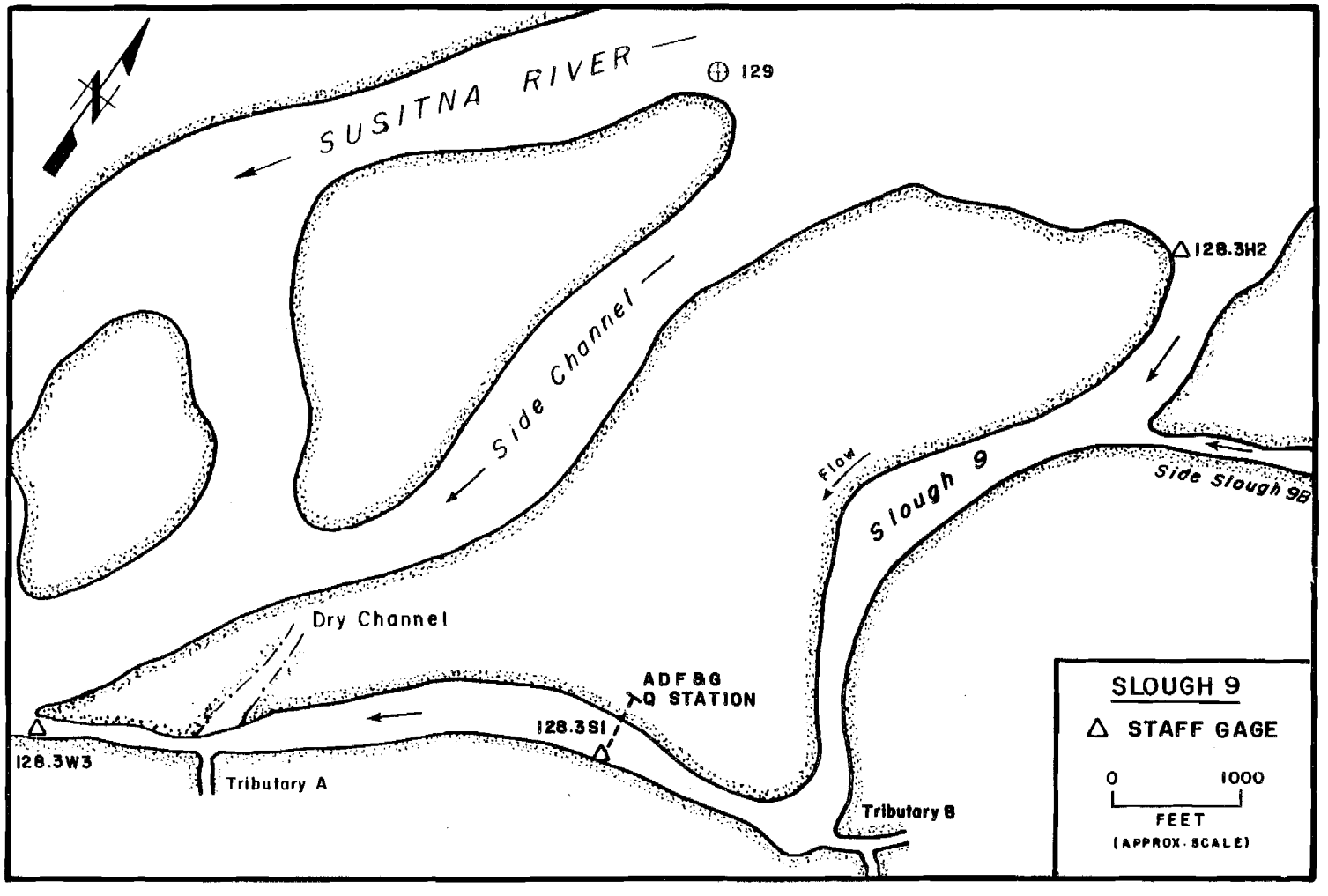

Figure 1-36. Site map of Side Slough 9 which is located on the east bank of the Susitna River at river mile 128.3.

Table 1-12. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 9 RM 128.3.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
128.3H2 (Head)	0.44	17,800 - 22,700
128.3S1 (Q-Site)	1.25	10,700 - 30,000
128.3W3 (Mouth)	4.40	8,760 - 36,000

3.3.4.3 Stage/Discharge Relationship

Measurements of stage and streamflow were obtained within the free-flowing portion of Side Slough 9 (Figure 1-36) by both ADF&G and R&M Consultants. The streamflow measurements obtained by R&M Consultants in 1982 and those obtained by ADF&G in 1982 and 1983 were plotted as a simple stage/streamflow rating curve (Figure 1-37). The stage measurements corresponding with the streamflow measurements obtained by R&M Consultants for 1982 have been found to be slightly higher than those stage measurements corresponding to the 1982 and 1983 ADF&G streamflow measurements. This variation has been attributed to a difference in location between the ADF&G and R&M Consultants stage monitoring stations. Two lines have been constructed depicting the stage/streamflow relationships determined by measurements obtained by R&M Consultants and the stage/streamflow relationship determined by ADF&G. The streamflow measurements obtained while the slough was breached during both 1982 and 1983 have been plotted with the corresponding mainstem discharge at Gold Creek (Figure 1-38).

3.3.4.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side slough become governed by the mainstem at a mainstem discharge of 19,000 cfs at Gold Creek. This controlling discharge compares to the lowest observed breaching discharge of 16,000 cfs at Gold Creek for this site.

3.3.4.5 Backwater

An area of backwater was observed to occur at the mouth of Side Slough 9 during periods of moderate to high mainstem discharges. Based on available stage and channel geometry (see Chapter 2) data, an area of backwater occurs at the mouth of this side slough at mainstem flows as low as 15,200 cfs.

3.3.5 Side Slough 11 (RM 135.7)

3.3.5.1 Site Description

Side Slough 11 (Figure 1-3) is located on the east bank of the Susitna River at river mile 135.7. It is approximately 0.9 miles in length and is separated from the mainstem by a large vegetated island. Prior to breaching flow in this side slough is provided by groundwater seepage. Subsequent to breaching flow is primarily turbid water from the mainstem. An area of backwater occurs at the mouth of this side slough during moderate and high mainstem discharges.

During the 1983 open water field season, stage was monitored at three sites within this side slough. Streamflow was also measured at one of these sites (Figure 1-39).

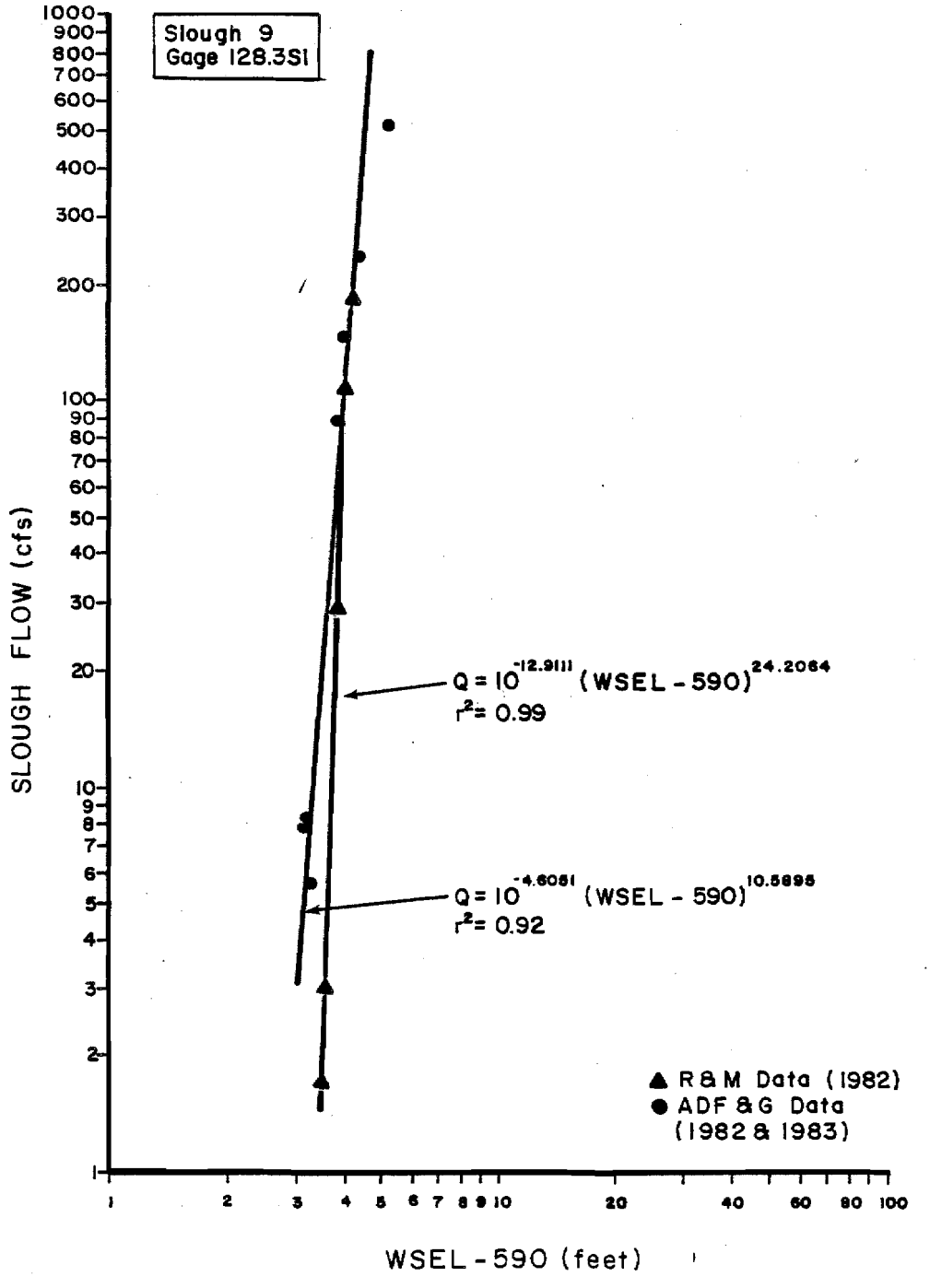

Figure 1-37. Stage versus flow rating curve for Side Slough 9, staff gage 128.3S1.

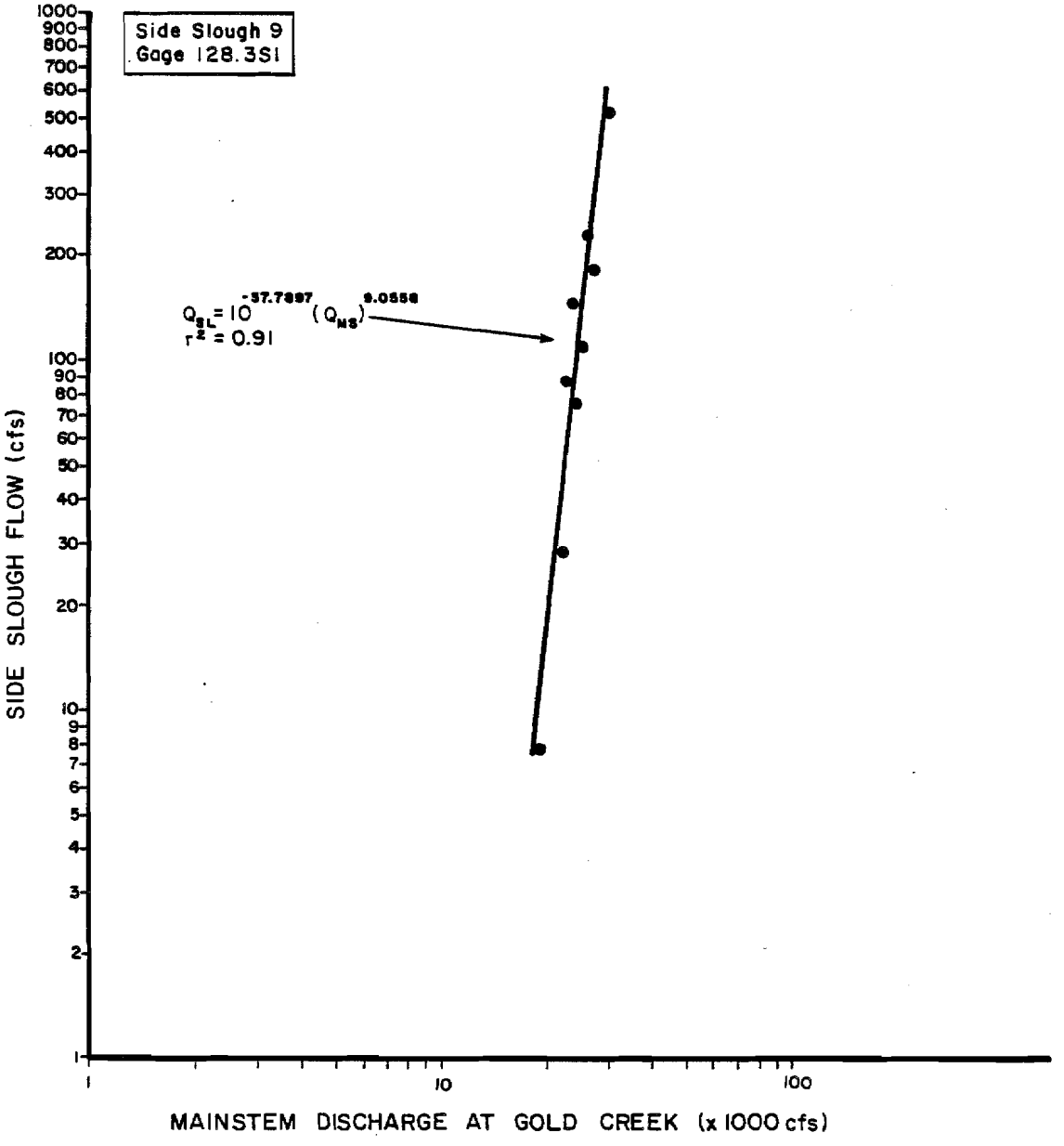

Figure 1-38. Slough flow versus mainstem discharge rating curve for Side Slough 9, staff gage 128.3S1.

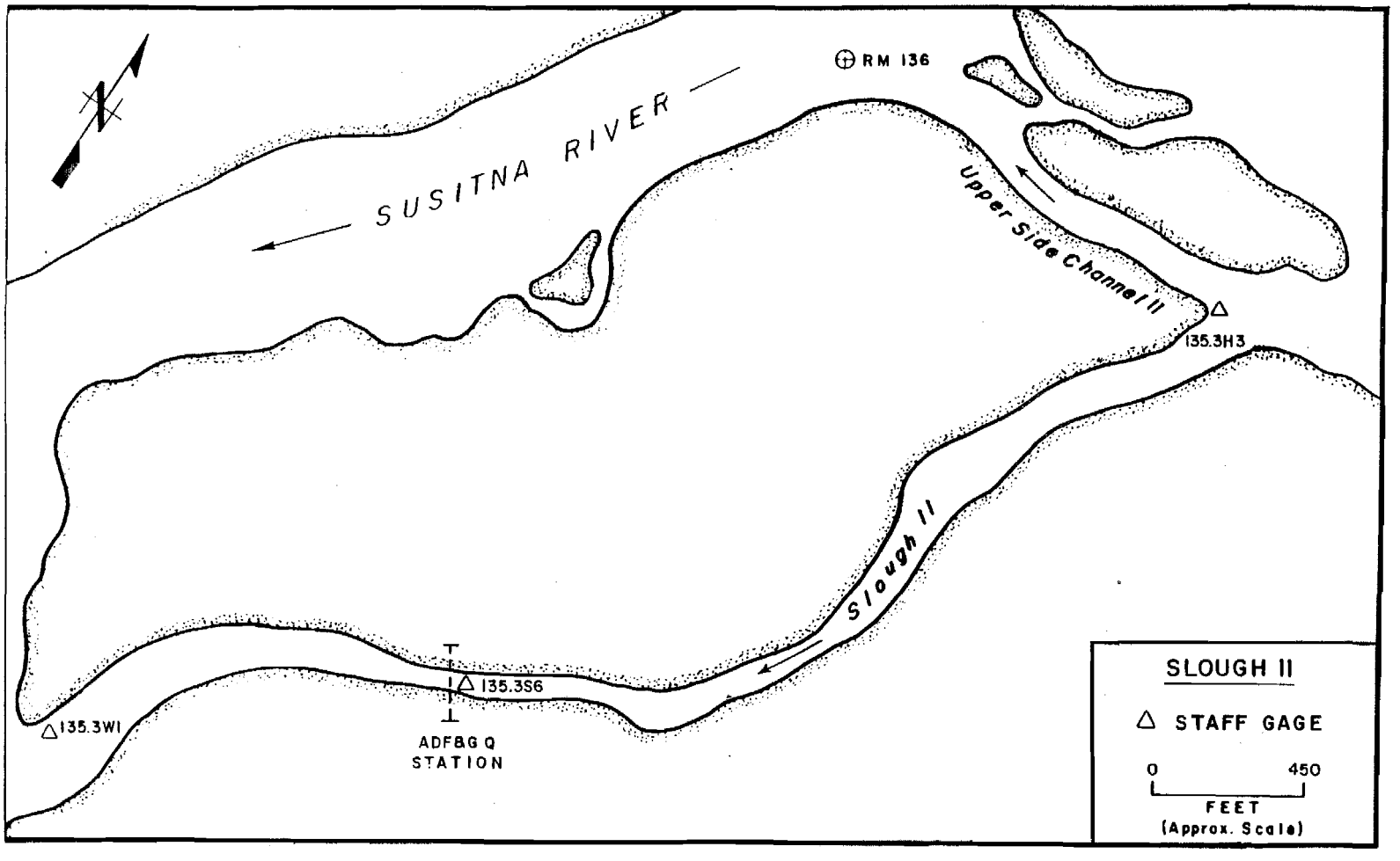

Figure 1-39. Site map of Side Slough 11, which is located on the east bank of the Susitna River at river mile 135.3.

3.3.5.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-13. Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station within Side Slough 11 are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-42. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.5.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Side Slough 11 (Figure 1-39, Appendix Table 1-A-8). From these measurements a simple stage/streamflow rating curve was constructed (Figure 1-40). This curve represents only streamflow conditions during unbreached conditions. This slough was not breached by mainstem water during 1982 or 1983 therefore, streamflow measurements were not plotted against corresponding mainstem discharge.

3.3.5.4 Mainstem Controlling and Breaching Discharges

Side Slough 11 has not been observed breached by mainstem discharge during 1982 or 1983. Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, Side Slough 11 is estimated to be breached when mainstem discharge at Gold Creek exceeds 42,000 cfs. The controlling discharge for Side Slough 11 is the same as that estimated to breach the slough.

3.3.5.5 Backwater

An area of backwater was observed to occur at the mouth of this slough during periods of moderate to high mainstem discharge. Based on available stage and channel geometry data (see Chapter 2), an area of backwater occurs at the mouth of this side slough at a mainstem discharge as low as 10,600 cfs. This backwater area is localized within the vicinity of the mouth of the slough.

3.3.6 Side Slough 16B (RM 137.8)

3.3.6.1 Site Description

Side Slough 16B is located on the west bank of the Susitna River at river mile 137.8 (Figure 1-3). It is approximately 0.4 miles in length and is separated from the mainstem by a large vegetated island. Prior to breaching, flow in this side slough is provided by groundwater seepage. Subsequent to breaching, flow in this side slough is primarily turbid water from the mainstem. An area of backwater has not been observed at the mouth of this side slough.

Table 1-13. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 11 RM 135.7.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
135.3H3 (Head)	Dewatered	less than 40,000
135.356 (Q-Site)	0.18	4,900 - 36,000
135.3W1 (Mouth)	4.00	7,230 - 31,900

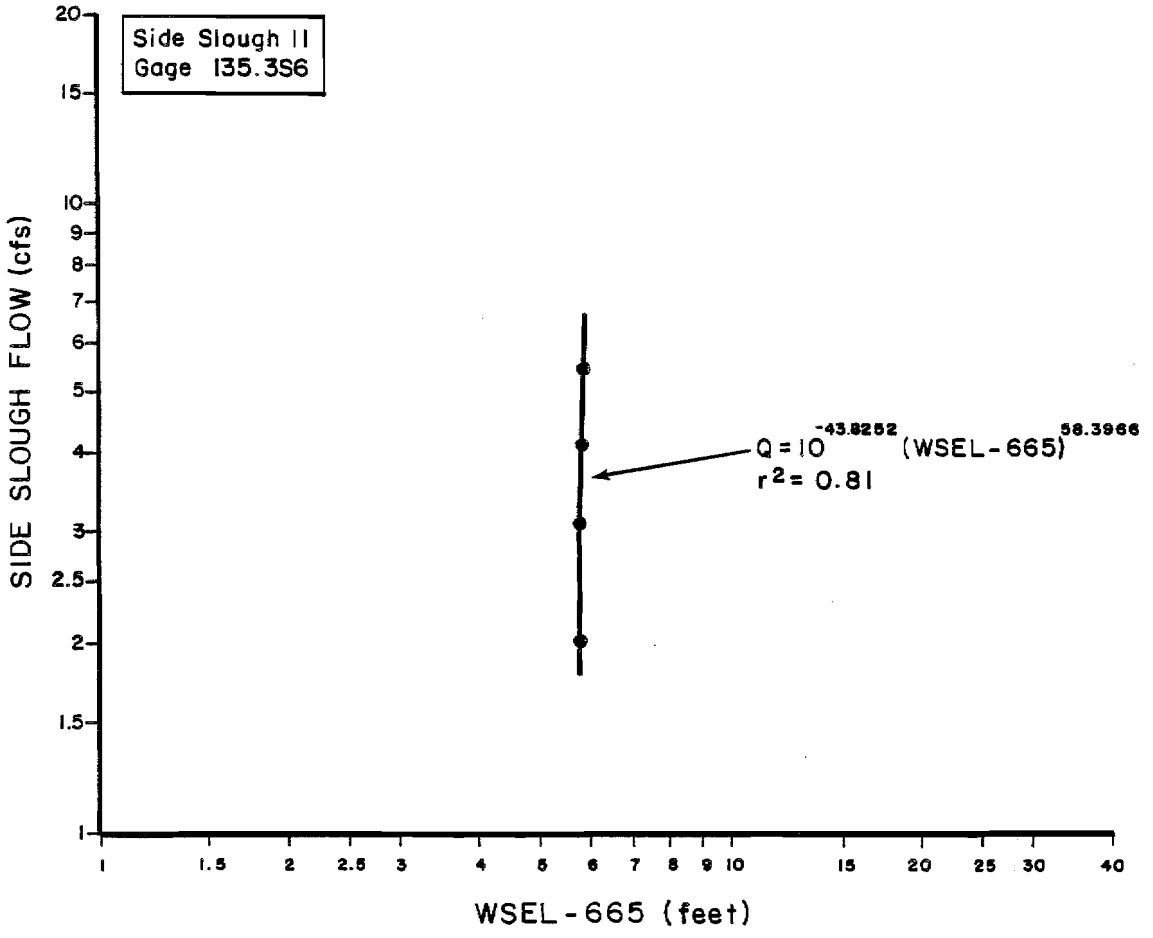

Figure 1-40. Stage versus flow rating curve for Side Slough 11, staff gage 135.3S6.

During the 1983 open water field season, stage was monitored at three sites within Side Slough 16B. Streamflow was also measured at one of the sites (Figure 1-41).

3.3.6.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-14. Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-45 - 1-A-46. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.6.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Side Channel 16B (Figure 1-41). From these measurements, a simple stage/streamflow rating curve was developed (Figure 1-42). This curve represents streamflow conditions during both breached and nonbreached conditions. In addition, the streamflow data obtained while the slough was breached was plotted against the corresponding mainstem discharge at Gold Creek (Figure 1-43).

3.3.6.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side slough become governed by the mainstem at a mainstem discharge of 23,000 cfs at Gold Creek. The lowest mainstem discharge at Gold Creek observed to breach Side Slough 16B was 20,000 cfs.

3.3.6.5 Backwater

Based on available stage and channel geometry data (see Chapter 2), an area of backwater has not been observed to occur at the mouth of Side Slough 16B.

3.3.7 Side Slough 20 (RM 140.2)

3.3.7.1 Site Description

Side Slough 20 is located on the east bank of the Susitna River at river mile 140.2 (Figure 1-3). It is approximately 0.5 miles in length and is separated from the mainstem by a vegetated island. Prior to breaching, flow in this side slough is provided by two small tributaries and groundwater seepage. Subsequent to breaching, flow in Side Slough 20 is primarily turbid water from the mainstem and clear water outflow from the larger of its' two tributaries (Waterfall Creek). An area of

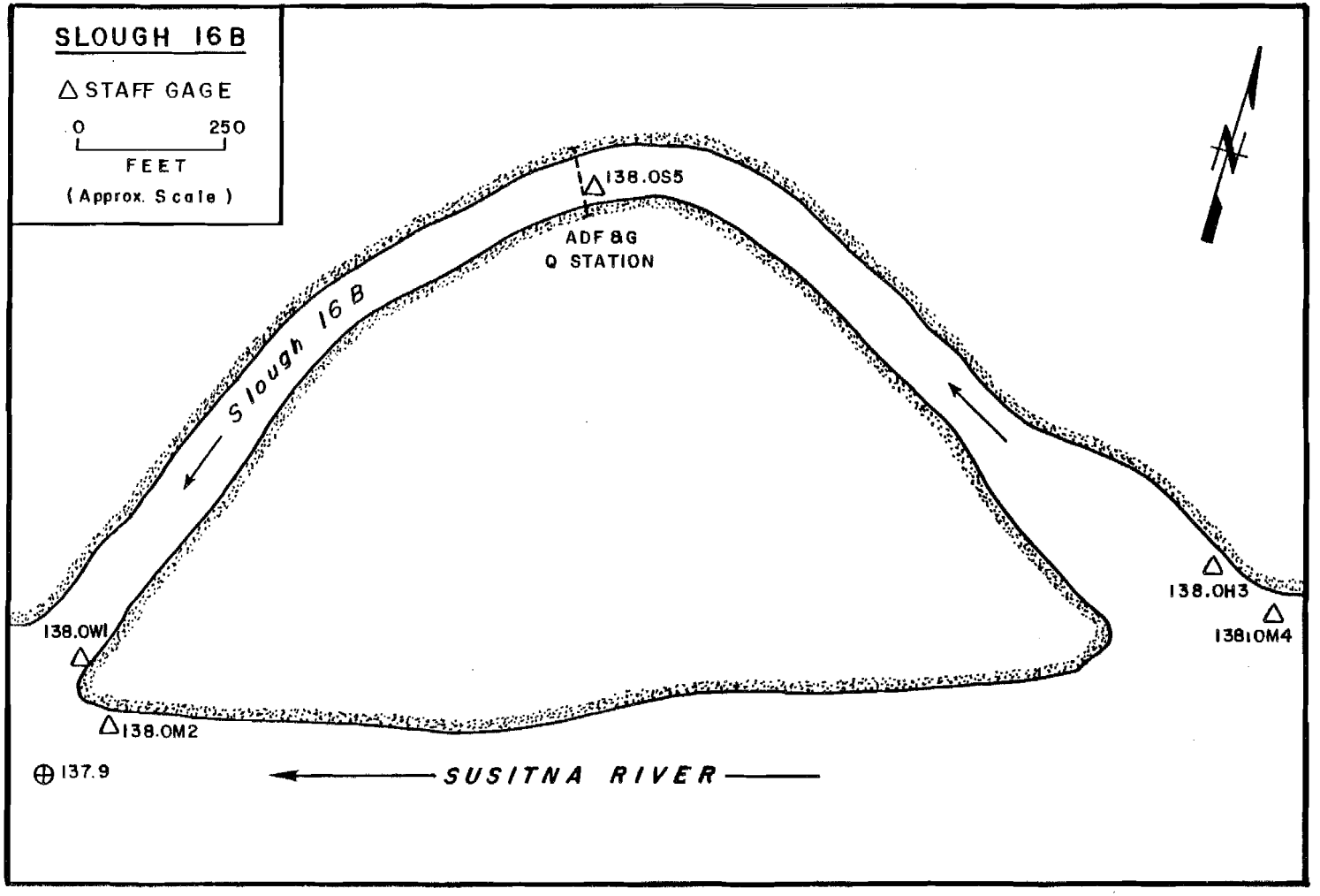

Figure 1-41. Site map of Side Slough 16B, which is located on the west bank of the Susitna River at river mile 137.8.

Table 1-14. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 16B at RM 137.8.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
138.0H3 (Head)	1.42	20,200 - 31,900
138.0S5 (Q-Site)	1.64	11,700 - 28,200
138.0W1 (Mouth)	2.88	12,200 - 31,900

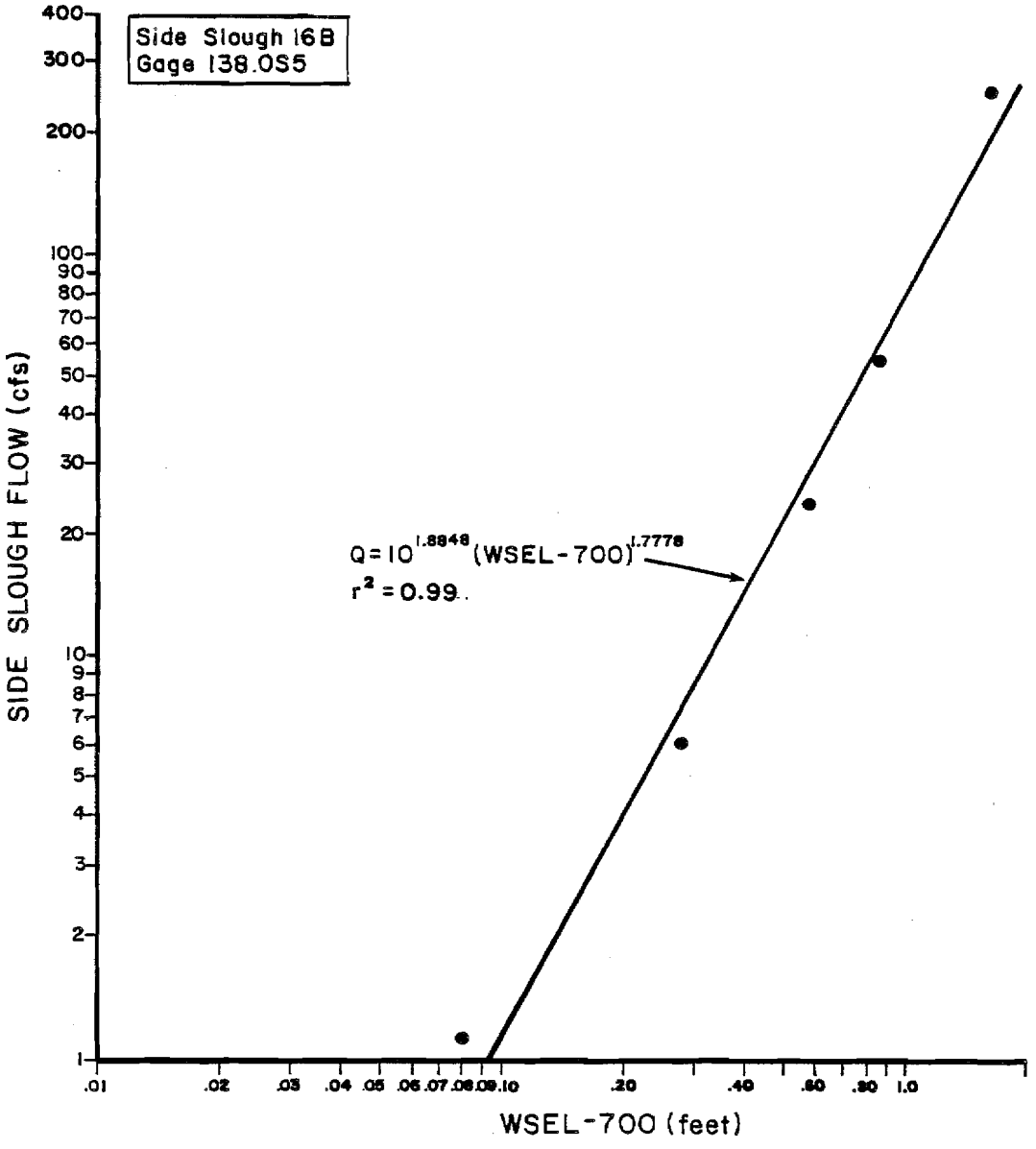

Figure 1-42. Stage versus flow rating curve for Side Slough 16B, staff gage 138.0S5.

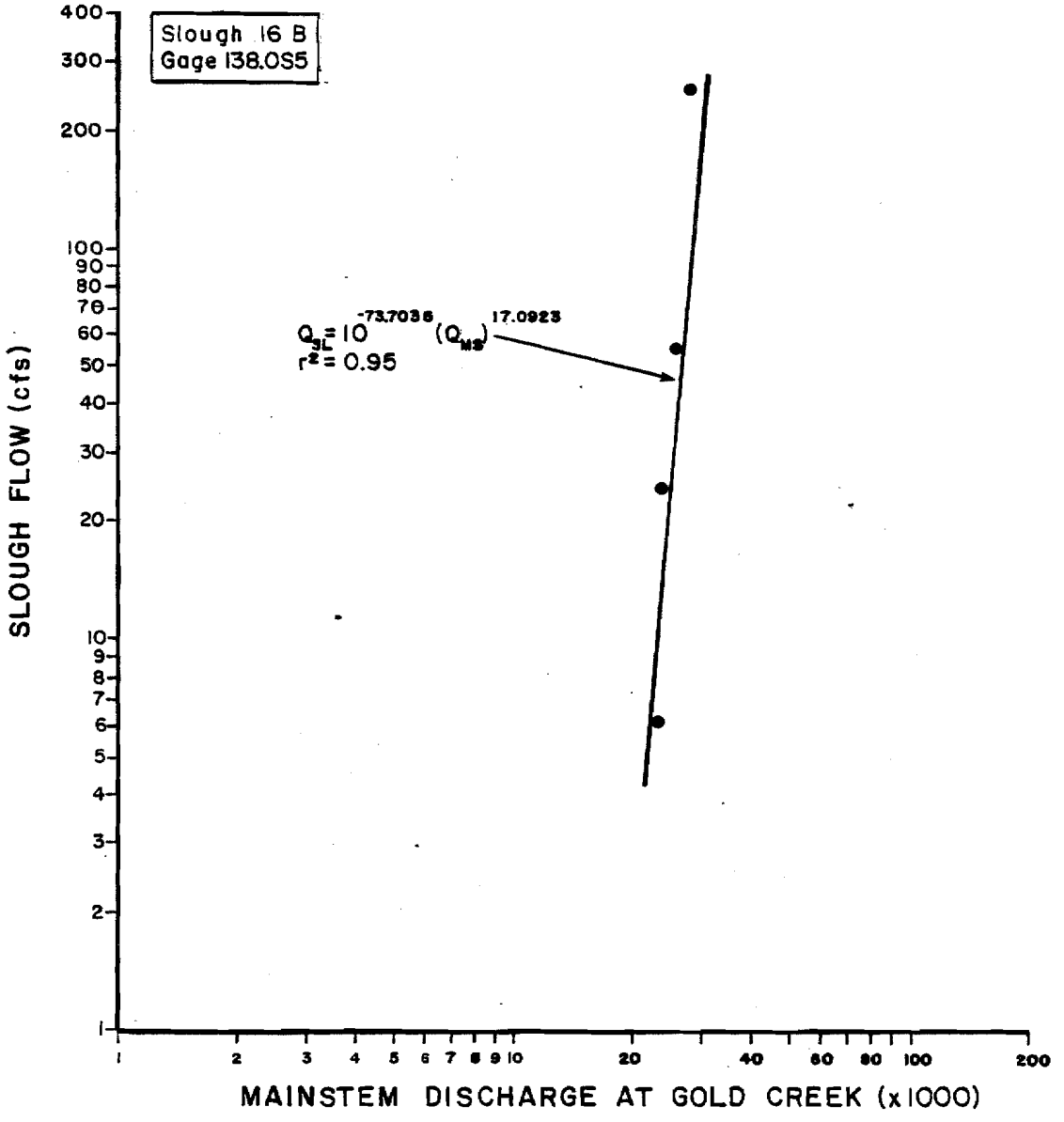

Figure 1-43. Slough flow versus mainstem discharge rating curve for Side Slough 16B, staff gage 138.0S5.

backwater occurs at the mouth of this side slough during periods of low to high mainstem flows.

During the 1983 open water field season, stage was monitored at three sites within Side Slough 20. Streamflow was also measured at one of these sites (Figure 1-44).

3.3.7.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-15. Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station within Side Slough 20 are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each monitoring site are presented in Appendix Figures 1-A-48 and 1-A-49. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.7.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Side Slough 20 (Appendix Table 1-A-8). From these measurements, a simple stage/streamflow rating curve was developed (Figure 1-45). This curve represents streamflows during both breached and unbreached conditions. In addition, the streamflow data obtained while the slough was breached were plotted against the corresponding mainstem discharge at Gold Creek (Figure 1-46).

3.3.7.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side slough become governed by the mainstem at a mainstem discharge of 23,000 cfs at Gold Creek. The lowest observed mainstem discharge at Gold Creek to breach Side Slough 20 is 22,000 cfs.

3.3.7.5 Backwater

An area of backwater was observed to occur at the mouth of this slough during periods of moderate to high mainstem discharge. Based on available stage and channel geometry data (see Chapter 2), an area of backwater occurs in the immediate vicinity of the mouth of this side slough at a mainstem discharge of 7,230 cfs at Gold Creek.

3.3.8 Side Slough 21 (RM 141.8)

3.3.8.1 Site Description

Side Slough 21 is located on the east bank of the Susitna River at river mile 141.8 (Figure 1-3). It is approximately 0.5 miles in length and is separated from the mainstem by a large vegetated island. Approximately half way up the side slough, the channel divides into two forks, a NW

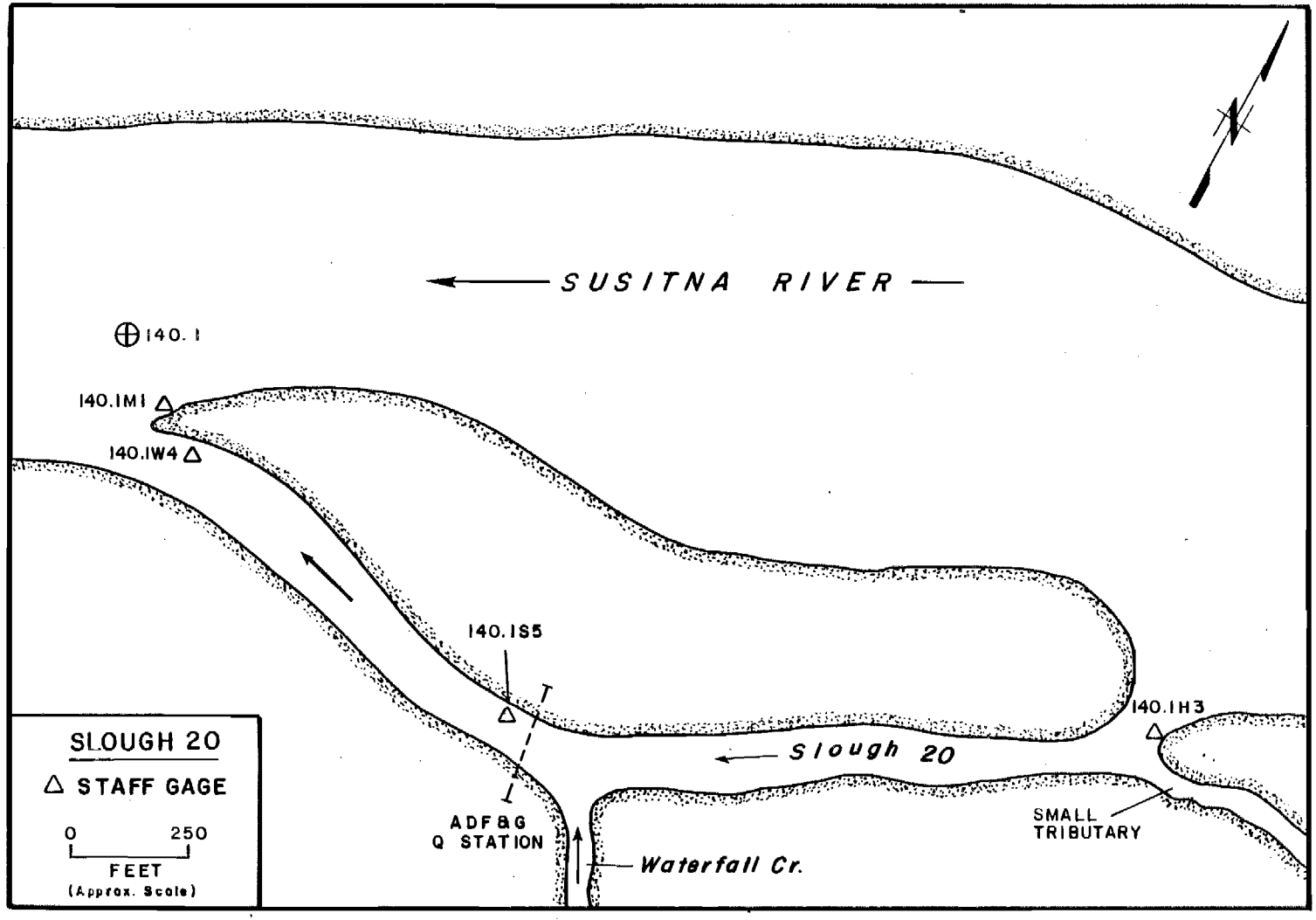

Figure 1-44. Site map for Side Slough 20, which is located on the east bank of the Susitna River at river mile 140.2.

Table 1-15. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 20 at RM 140.2.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
140.1H3 (Head)	0.99	21,500 - 32,500
140.1S5 (Q-Site)	1.43	8,480 - 32,500
140.1W4 (Mouth)	2.43	8,480 - 32,500

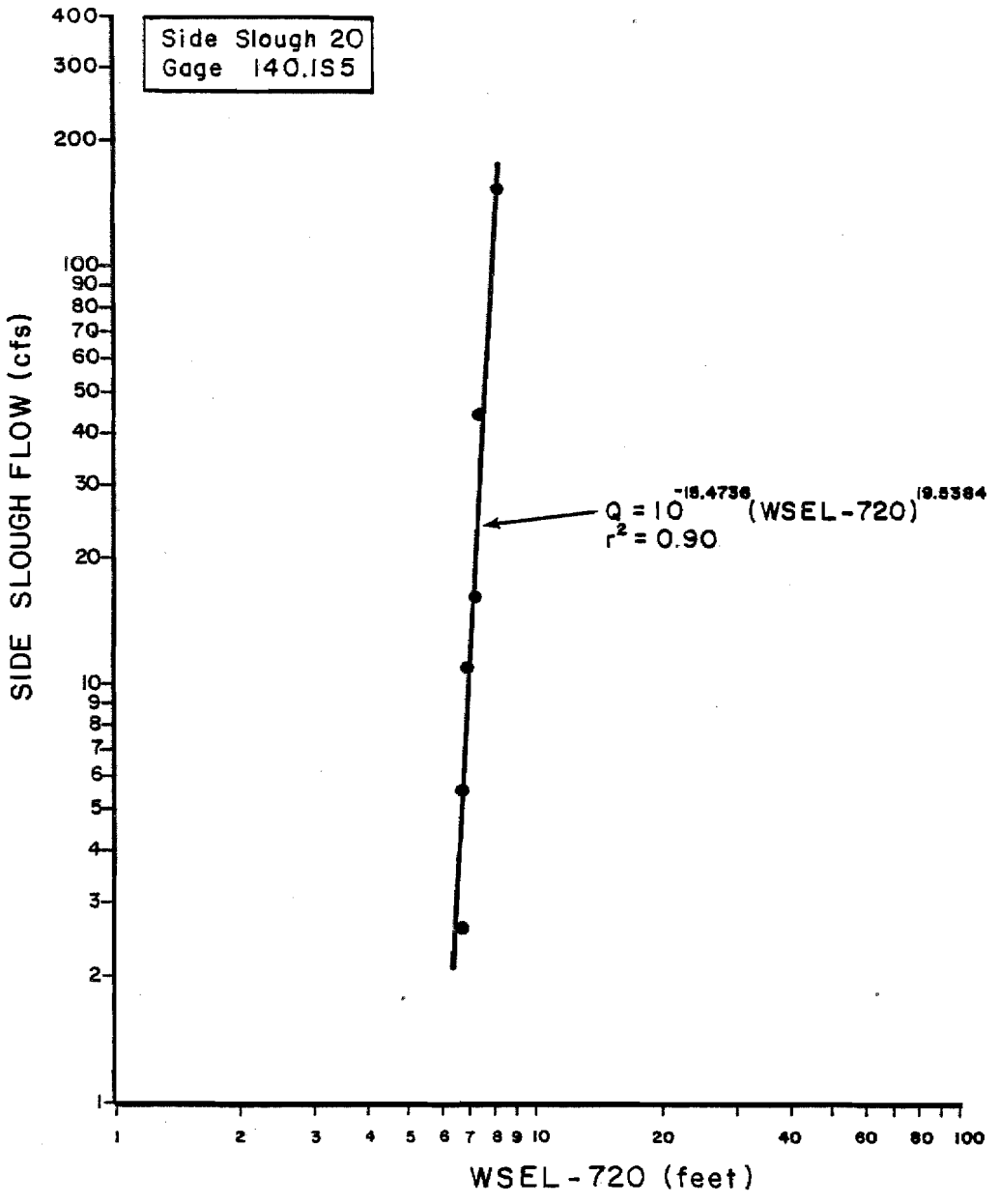

Figure 1-45. Stage versus flow rating curve for Side Slough 20, staff gage 140.1S5.

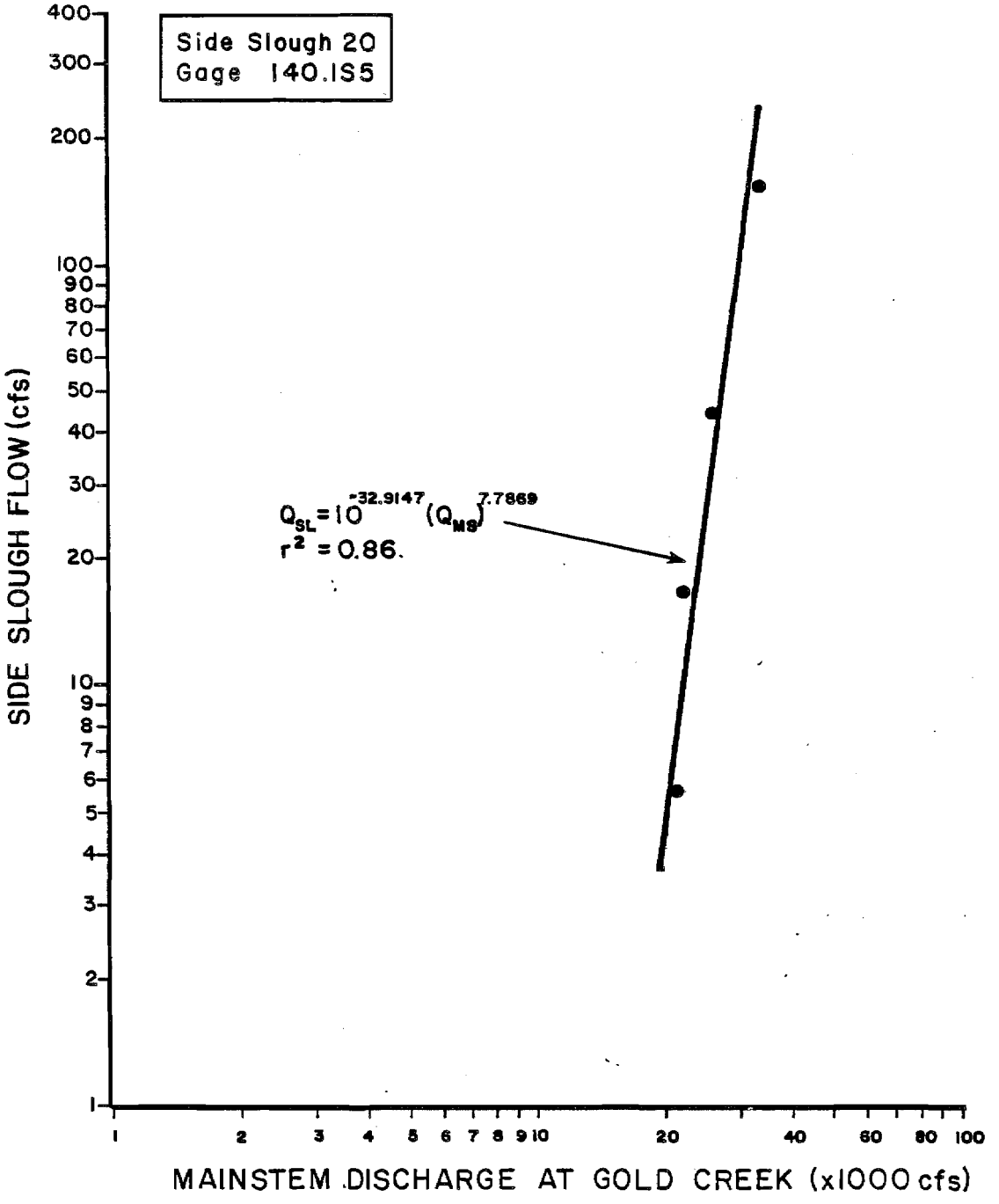

Figure 1-46. Slough flow versus mainstem discharge rating curve for Side Slough 20, staff gage 140.1S5.

and NE fork. Prior to breaching, the flow in this side slough is provided by groundwater seepage and local runoff. Subsequent to breaching, flow in the slough is provided by turbid water from the mainstem. An area of backwater does not occur at the mouth of this side slough.

During the 1983 open water field season, stage was monitored at four sites within this side slough. Streamflow was also monitored at one of these site (Figure 1-47).

3.3.8.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek at time of measurement for each stage monitoring station are presented in Table 1-16. Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-53 - 1-A-54. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.8.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow was obtained at one site within the free-flowing portion of Side Slough 21 (Appendix Table 1-A-8). From these measurements a simple stage/streamflow rating curve was developed (Figure 1-48). This curve represents streamflows during both breached and unbreached conditions In addition, the streamflow data obtained while this slough was breached was plotted against the corresponding mainstem discharge (Figure 1-49).

3.3.8.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in the NW and NE channels of this side slough become governed by the mainstem at mainstem discharges of 25,000 and 28,000 cfs at Gold Creek respectively. The lowest observed mainstem discharge to breach the NW and NE channels were 23,000 and 26,000 cfs at Gold Creek respectively. The breaching of the NW channel (25,000 cfs) governs the hydraulic conditions present in the portion of Side Slough 21 downstream of the fish in the slough.

3.3.8.5 Backwater

Based on available stage and channel geometry data (see chapter 2) and field observations no backwater was found to occur in Side Slough 21 at varying levels of mainstem discharge.

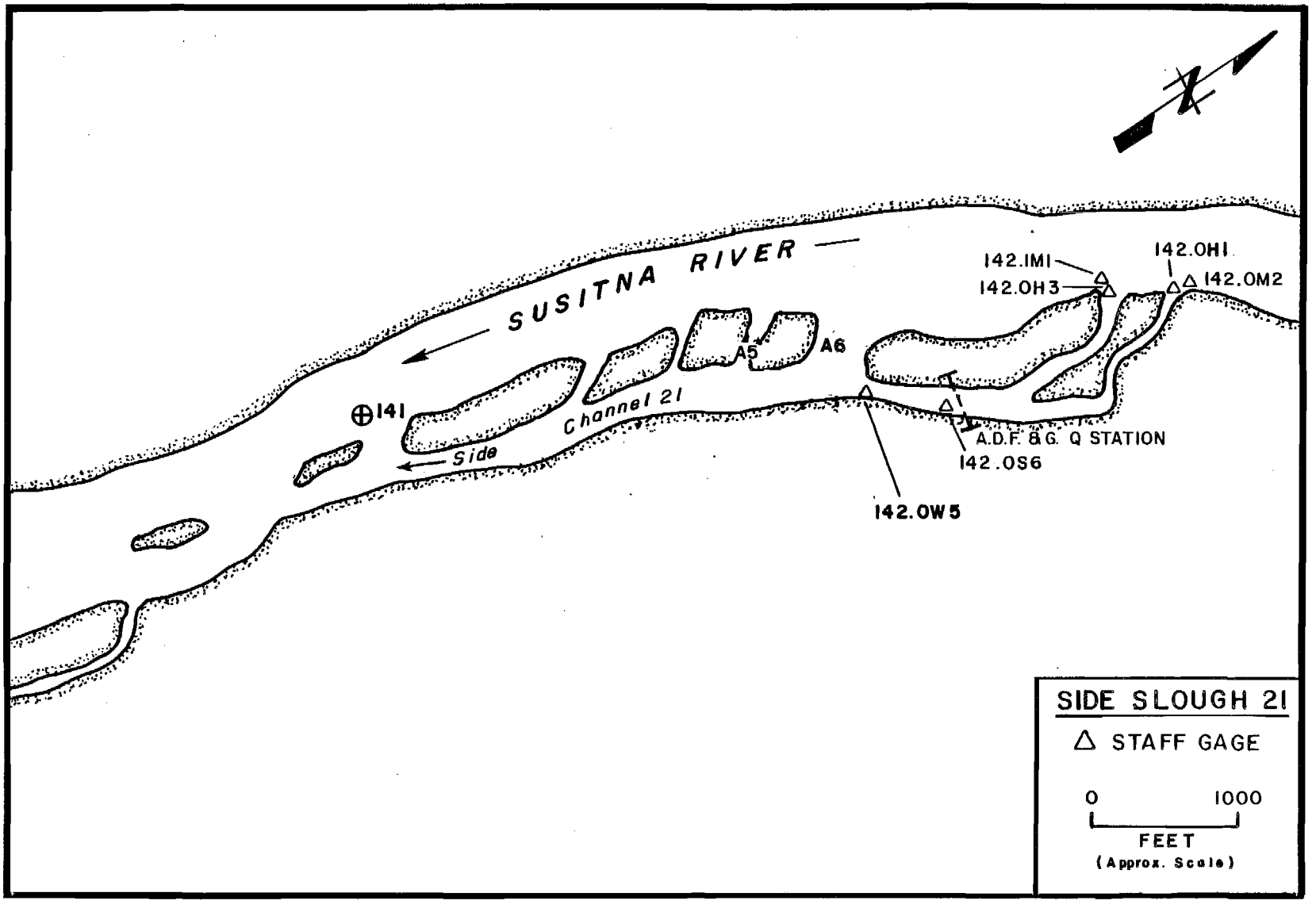

Figure 1-47. Site map for Side Slough 21, which is located on the east bank of the Susitna River at river mile 141.8.

Table 1-16. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 21 at RM 141.8.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
142.0H1 (NE Head)	0.65	28,200 - 33,000
142.0H3 (NW Head)	0.74	25,600 - 33,000
142.0S6 (Q-Site)	2.18	2,900 - 33,000
142.0W5 (Mouth)	2.06	7,230 - 33,000

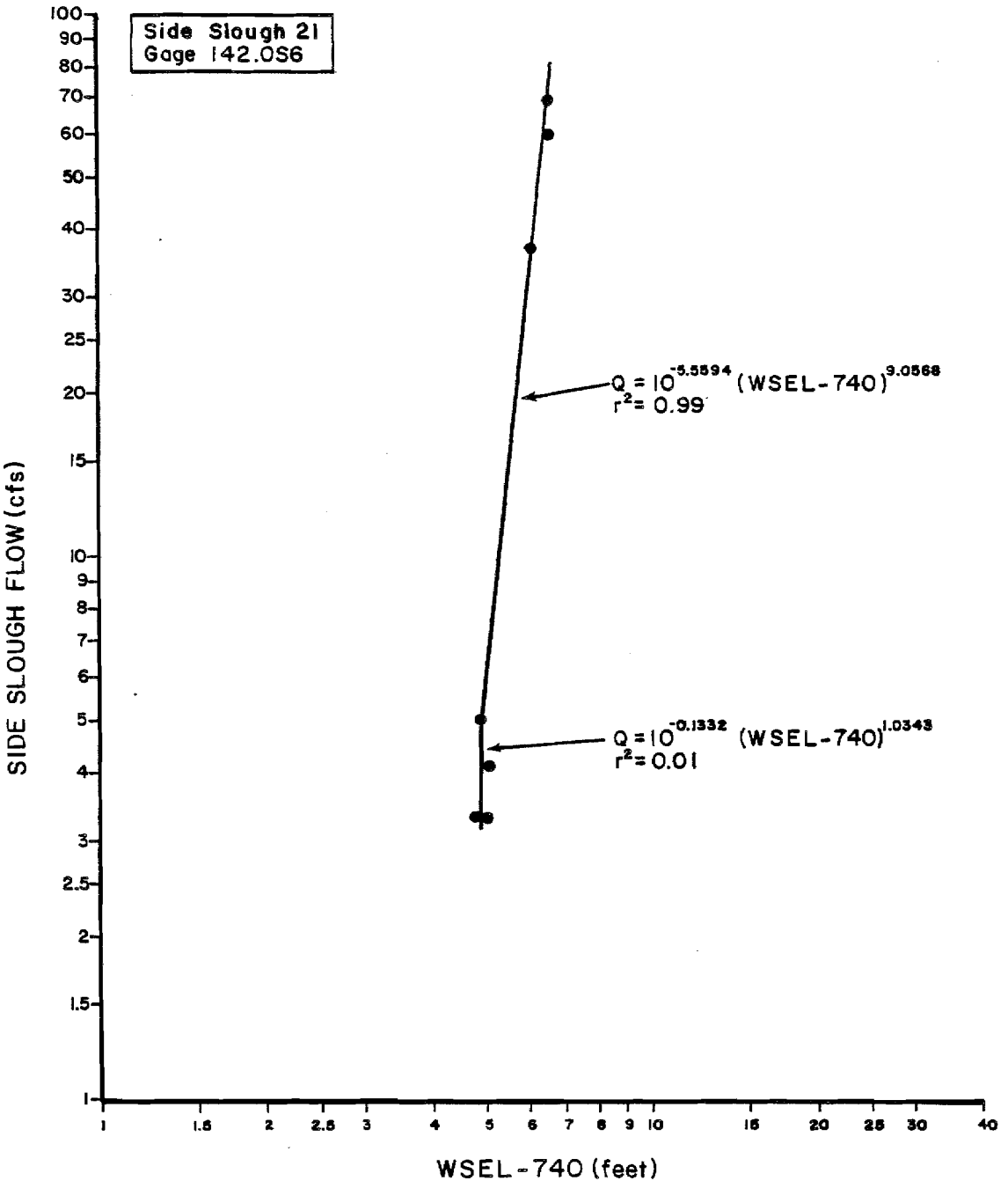

Figure 1-48. Stage versus flow rating curve for Side Slough 21, staff gage 142.0S6.

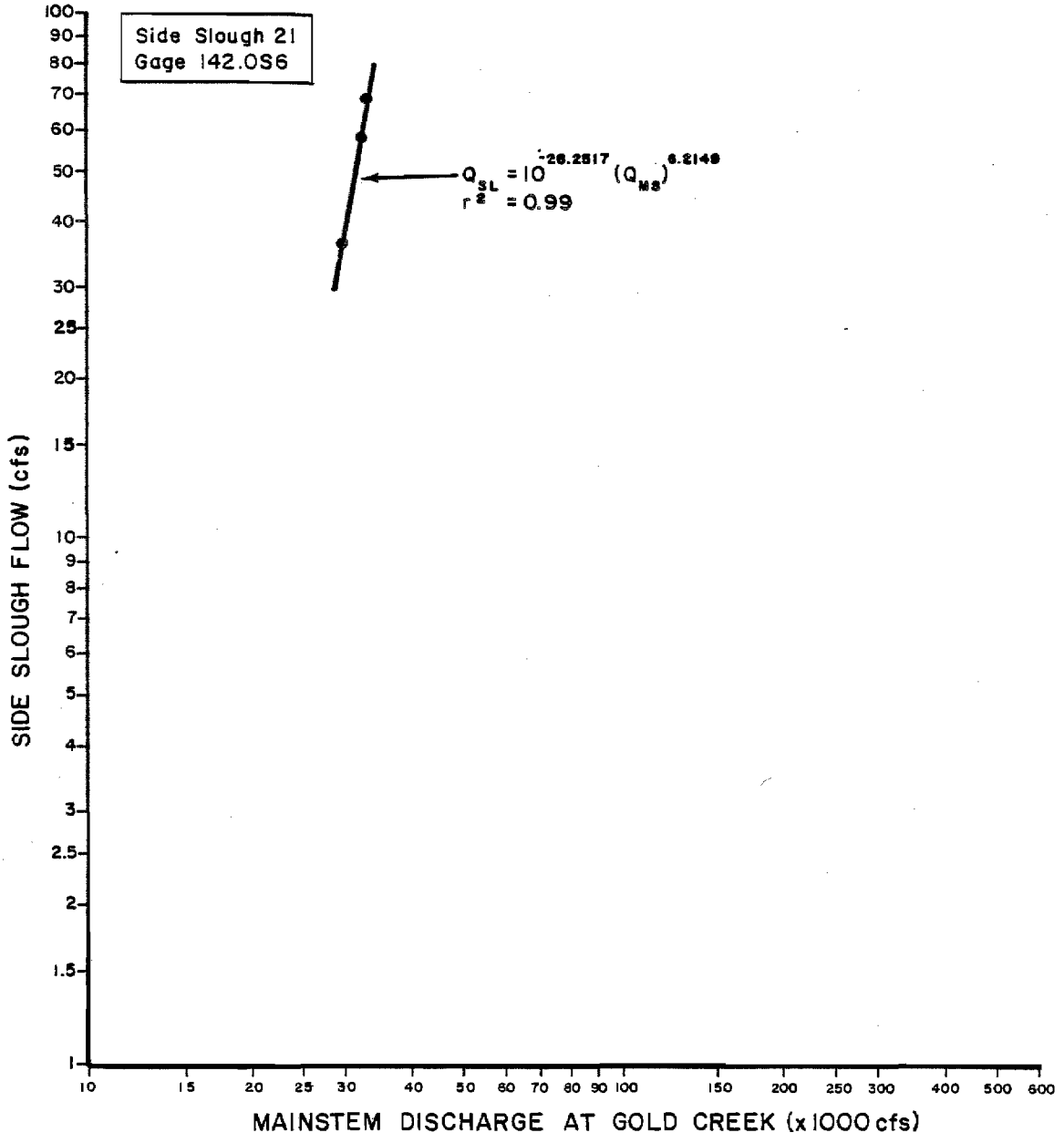

Figure 1-49. Slough flow versus mainstem discharge rating curve for Side Slough 21, staff gage 142.0S6.

3.3.9 Side Slough 22 (RM 144.2)

3.3.9.1 Site Description

Side Slough 22 is located on the north bank of the Susitna River at river mile 144.2 (Figure 1-3). It is approximately 0.5 miles in length and is separated from the mainstem by a narrow vegetated island. Prior to breaching, flow in this side slough is provided by a small tributary and groundwater seepage. Subsequent to breaching, flow is provided by turbid water from the mainstem. Very little backwater occurs at the mouth of this side slough.

During the 1983 open water field season, stage was monitored at four sites within this side slough. Streamflow was measured at one of these sites (Figure 1-50).

3.3.9.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-17. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-55 - 1-A-56. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.3.9.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Side Slough 22 (Appendix Table 1-A-8). From these measurements, a simple stage/streamflow rating curve was developed (Figure 1-51). This curve only represents streamflows during breached conditions. In addition, the streamflow data obtained at this site were plotted against the corresponding mainstem discharge at the time of measurement (Figure 1-52).

3.3.9.4 Mainstem Controlling and Breaching Discharges

Based on available streamflow and water surface elevation data and the professional opinion of the project engineer, the hydraulic conditions present in this side slough become governed by the mainstem at a mainstem discharge of 23,000 cfs at Gold Creek. The lowest observed mainstem discharge to breach Side Slough 22 was 20,000 cfs at Gold Creek.

3.3.9.5 Backwater

Based on available stage and channel geometry data (see Chapter 2) and field observations very little backwater occurs at the mouth of Side Slough 22.

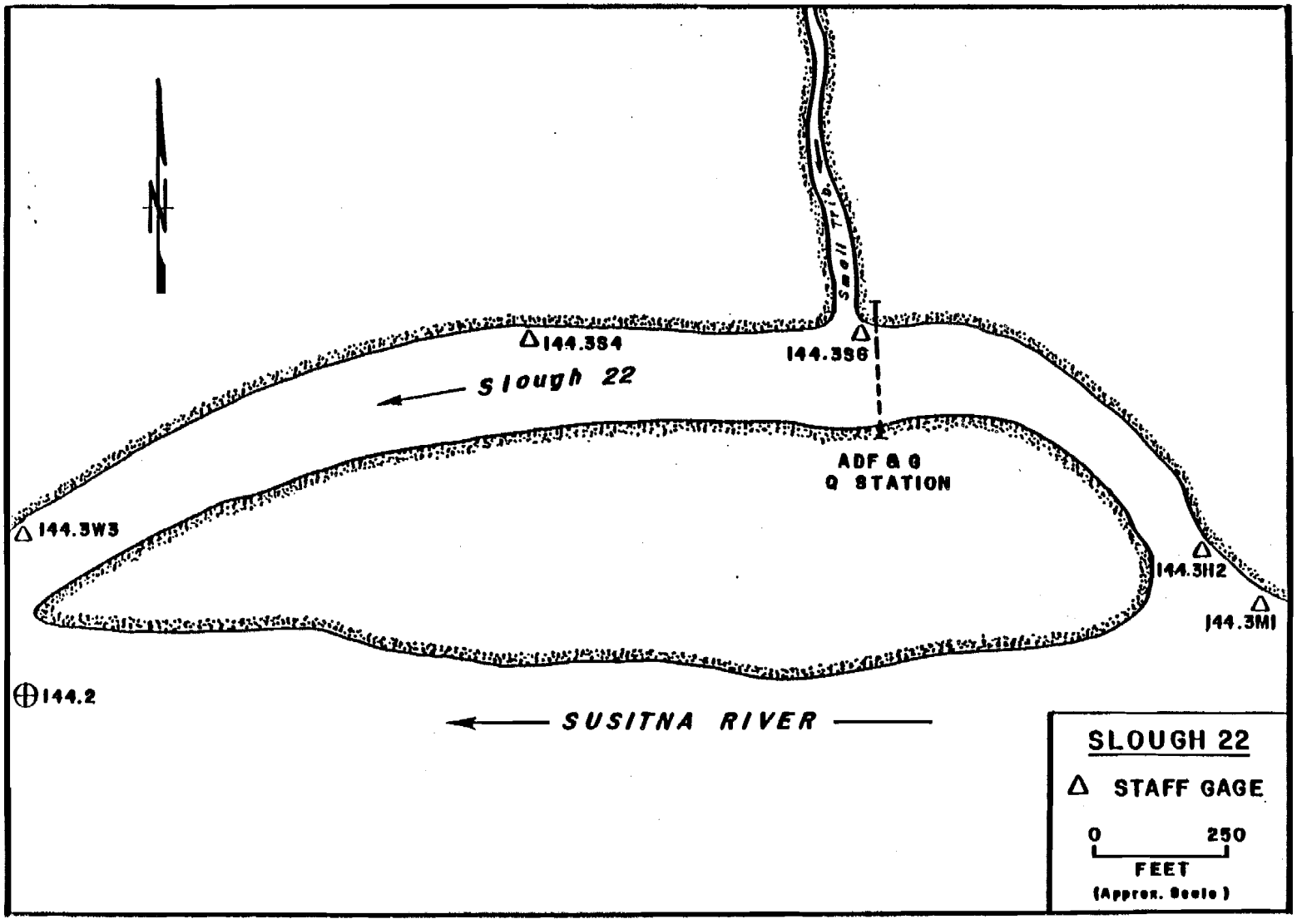

Figure 1-50. Site map for Side Slough 22, which is located on the north bank of the Susitna River at river mile 144.2.

Table 1-17. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Side Slough 22 at RM 144.2.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
144.3H2 (Head)	1.65	21,700 - 31,900
144.3S6 (Q-Site)	1.84	10,600 - 28,200
144.3S4	2.11	10,600 - 29,900
144.3W3	1.46	10,600 - 28,200

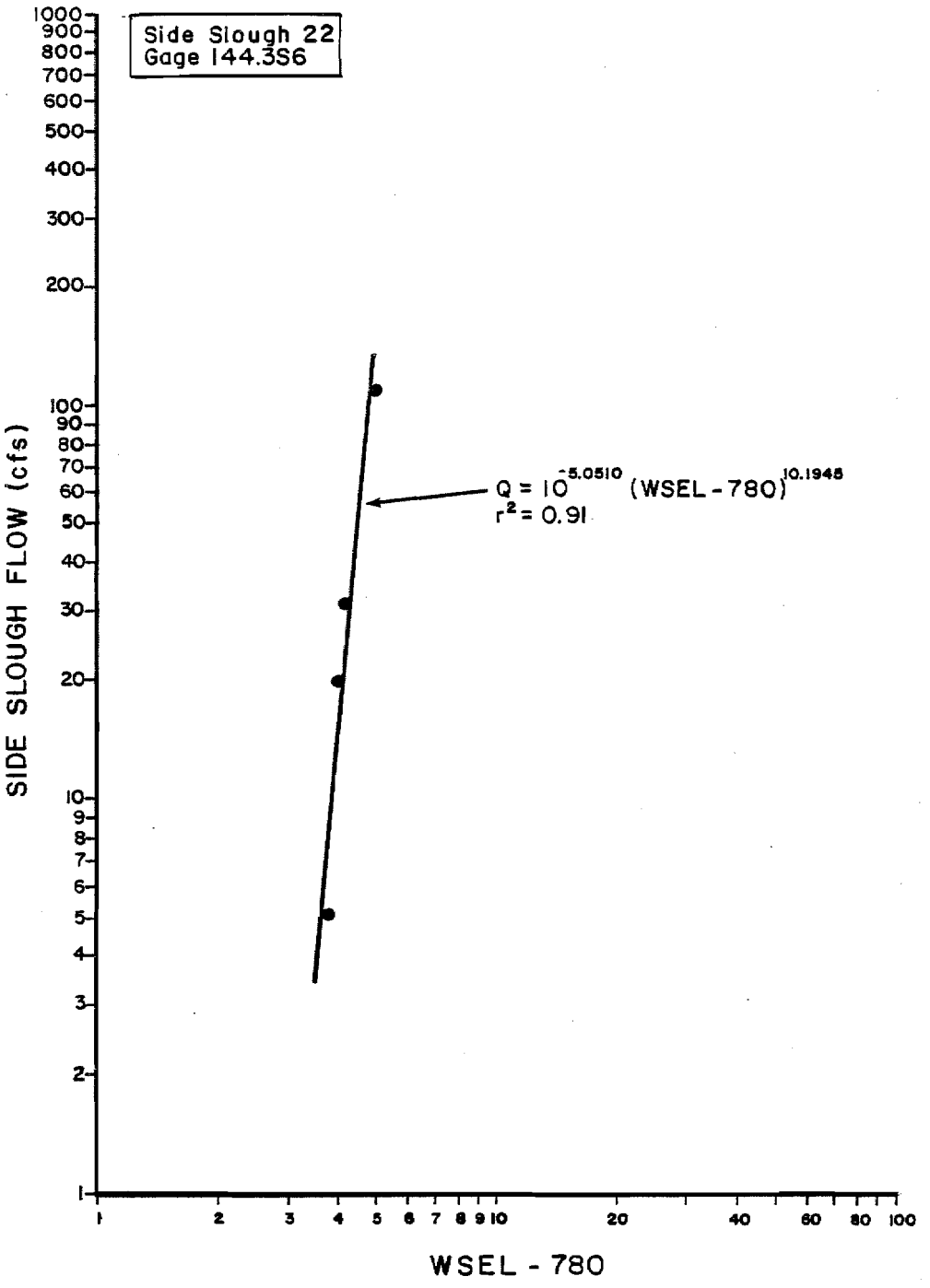

Figure 1-51. Stage versus flow rating curve for Side Slough 22, staff gage 144.3S6.

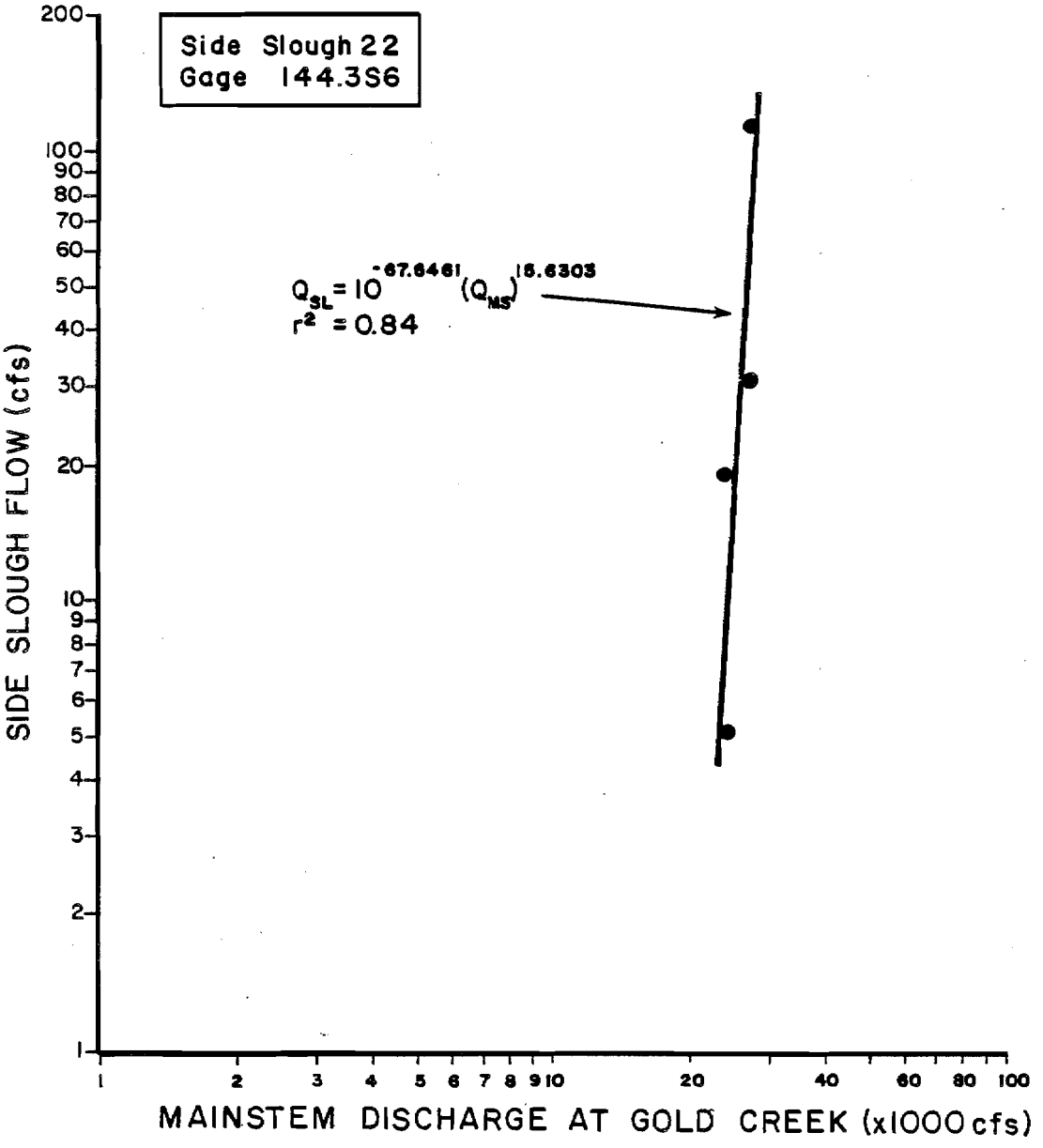

Figure 1-52. Slough flow versus mainstem discharge rating curve for Side Slough 22, staff gage 144.3S6.

3.4 Upland Sloughs

Measurements of stage and streamflow were obtained during the 1983 open water field season at selected sites within two upland sloughs located in the Talkeetna to Devil Canyon reach of the Susitna River. Results of these investigations are discussed below by site.

3.4.1 Upland Slough 6A (RM 112.3)

3.4.1.1 Site Description

Upland Slough 6A (Figure 1-3) is located on the west bank of the Susitna River at river mile 112.3. As in all upland sloughs, it has no connection with the mainstem other than at the slough mouth. The primary sources of flow for this slough originate from local runoff from pondage caused by a beaver dam. A substantial area of backwater occurs at the mouth of this upland slough during periods of low to high mainstem flows.

During the 1983 open water field season, stage was monitored at two locations within this upland slough. Streamflow was also measured at one of these site (Figure 1-53).

3.4.1.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each monitoring station are presented in Table 1-18. Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek at time of measurement for each monitoring site are presented in Appendix Figure 1-A-26.

Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.4.1.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site in Upland Slough 6A (Figure 1-53, Appendix Table 1-A-8). Because of the influence of backwater at this site, a stage/streamflow rating curve could not be constructed.

3.4.1.4 Backwater

A substantial area of backwater occurs at the mouth of this upland slough during periods of low to high mainstem discharges. Based on available stage and channel geometry data (see Chapter 2), an area of backwater occurs at the mouth of this upland slough at a mainstem discharge at Gold Creek as low as 7,230 cfs.

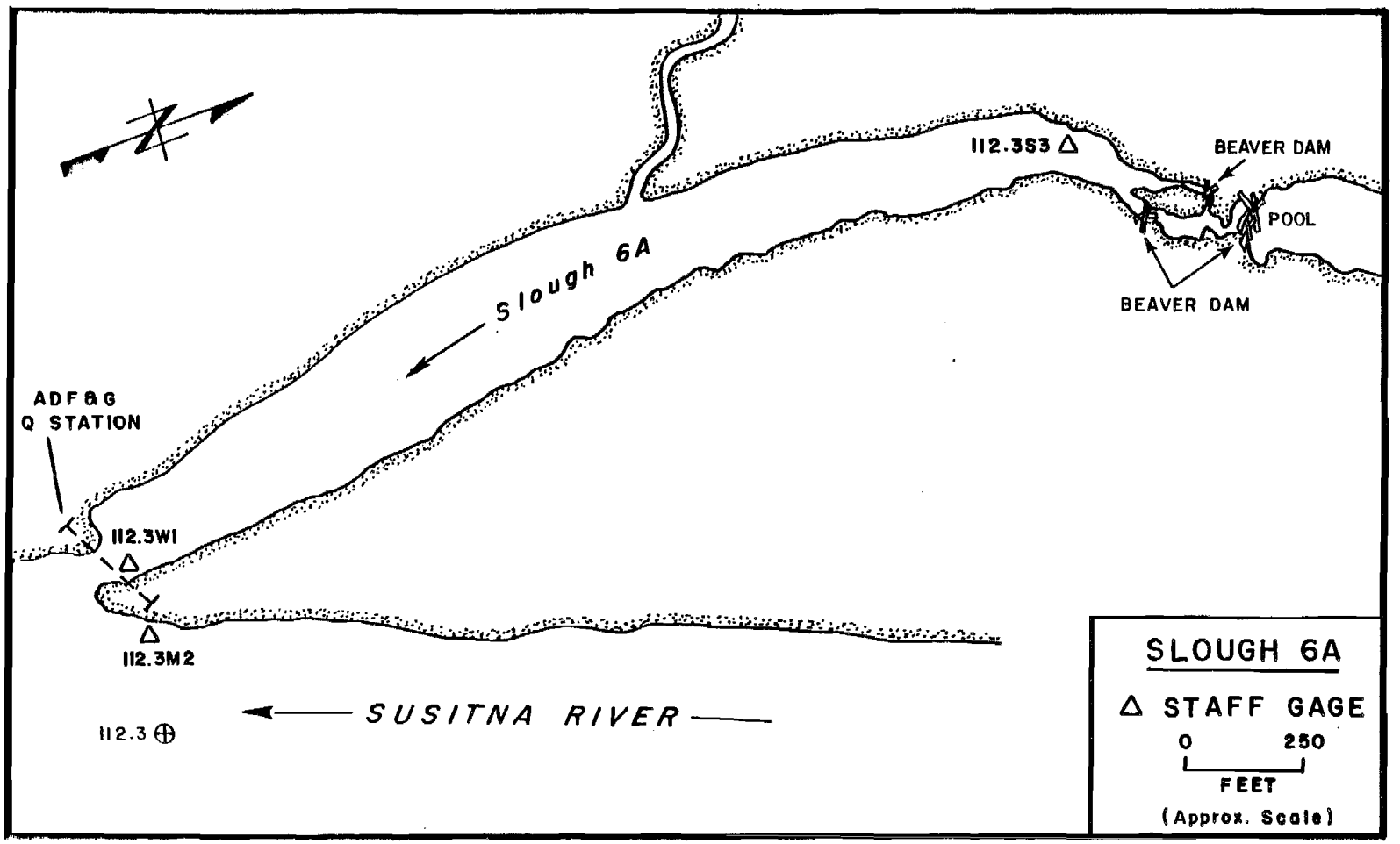

Figure 1-53. Site map of Upland Slough 6A, which is located on the west bank of the Susitna River at river mile 112.3.

Table 1-18. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Upland Slough 6A at RM 112.3.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
112.3W1	3.33	7,230 - 32,000
112.3S3	2.15	10,600 - 31,700

3.4.2 Upland Slough 19 (RM 140.0)

3.4.2.1 Site Description

Upland Slough 19 (Figure 1-3) is located on the east bank of the Susitna River at river mile 140.0. As in all upland sloughs, it has no connection with the mainstem other than at it's mouth. The primary sources of flow originate from ground water seepage. A substantial area of backwater occurs at the mouth of this slough during periods of low to high mainstem flows.

During the 1983 open water field season, stage was monitored at three locations within this upland slough. Streamflow was also measured at one of these sites (Figure 1-54).

3.4.2.2 General Results

Ranges of water surface elevation and corresponding ranges of mainstem discharge at Gold Creek for each stage monitoring station are presented in Table 1-19. Measurements of water surface elevation along with corresponding mainstem discharge at Gold Creek obtained at each stage monitoring station are presented in Appendix Table 1-A-7. Plots of water surface elevation versus corresponding mainstem discharge at Gold Creek for each stage monitoring station are presented in Appendix Figures 1-A-47 - 1-A-48. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.4.2.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site in Upland Slough 19 (Figure 1-54, Appendix Table 1-A-8). Because of the influence of backwater at this site, a stage/streamflow rating curve was not be constructed.

3.4.2.4 Backwater

A substantial area of backwater occurs at the mouth of this upland slough during periods of low to high mainstem flows. Based on available stage and channel geometry data (see Chapter 2), an area of backwater occurs at the mouth of Upland Slough 19 at a mainstem discharge at Gold Creek as low as 10,000 cfs.

3.5 Tributaries

Simultaneous measurements of stage and streamflow were obtained within selected tributaries within the Talkeetna to Devil Canyon reach of the Susitna River. These results are presented below by tributary site.

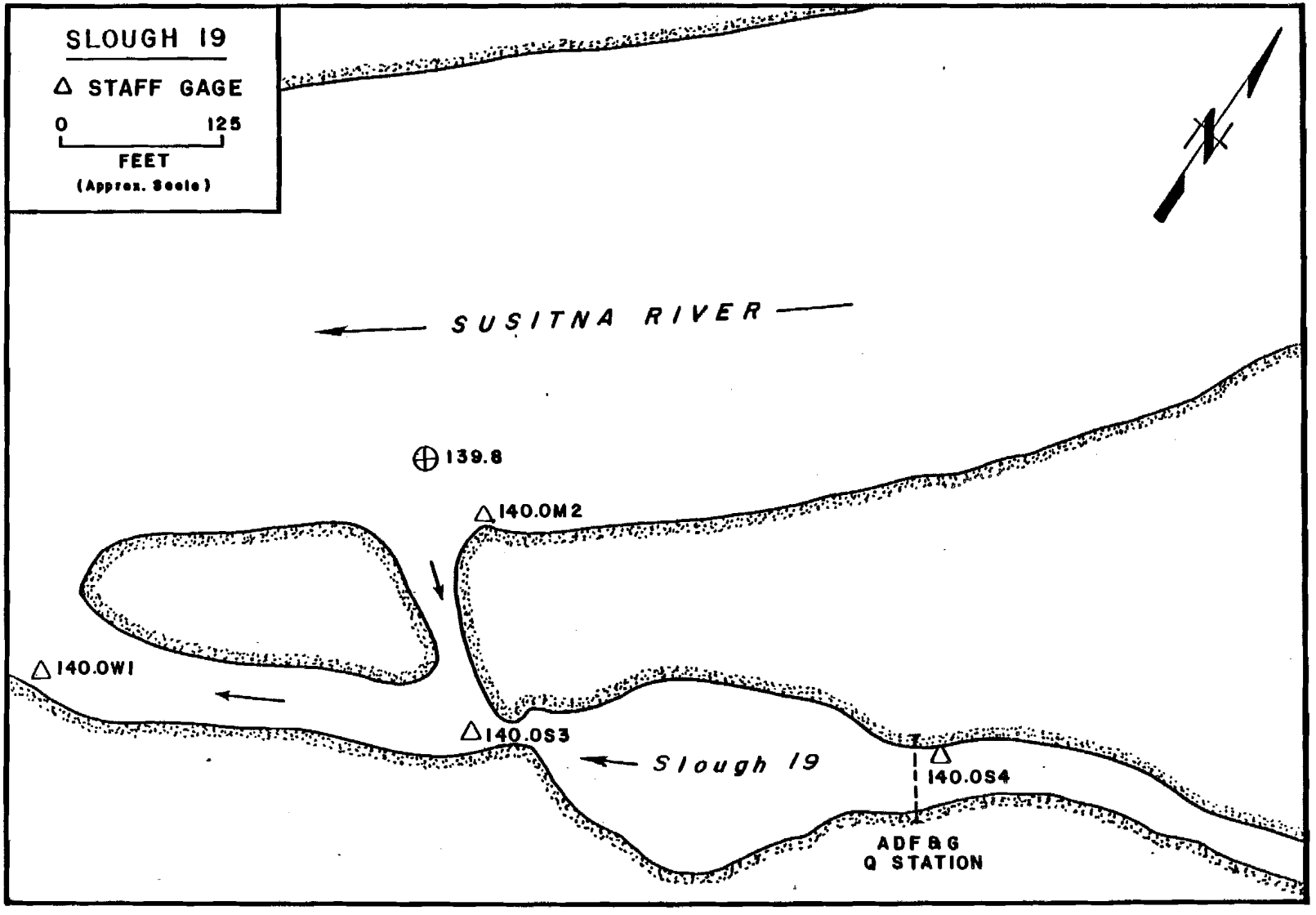

Figure 1-54. Site map of Upland Slough 19, which is located on the east bank of the Susitna River at river mile 140.0.

Table 1-19. Range of water surface elevation and corresponding mainstem discharge at Gold Creek (USGS 15292000) for each stage monitoring station within Upland Slough 19 at RM 140.0.

Gage Site	Range of Water Surface Elevation (ft)	Corresponding Mainstem Discharge (cfs)
140.0W1	3.74	7,230 - 33,000
140.0S3	3.17	10,700 - 30,000
140.0S4	2.21	10,700 - 29,900

3.5.1 Whiskers Creek (RM 101.4)

3.5.1.1 Site Description

Whiskers Creek (Figure 1-3) is located on the west bank of the Susitna River at river mile 101.4. It can be characterized as a relatively narrow, meandering stream containing many pools and riffles. It joins Whiskers Slough approximately 0.2 miles upstream of the slough's confluence with the mainstem Susitna River. During periods of high mainstem discharges, an area of backwater occurs in the mouth of the creek.

During the 1983 open water field season stage and streamflow were measured at one location within this creek (Figure 1-55).

3.5.1.2 General Results

Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at the monitoring station in Whiskers Creek are presented in Appendix Table 1-A-9. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek at the time of measurement are presented in Appendix Table 1-A-8.

3.5.1.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Whiskers Creek (Figure 1-55, Appendix Table 1-A-8). These measurements were used to construct a stage/streamflow rating curve (Figure 1-56).

3.5.2 Lane Creek (RM 113.6)

3.5.2.1 Site Description

Lane Creek (Figure 1-3) is located on the east bank of the Susitna River at river mile 113.6. It can be characterized as a relatively narrow, shallow, fast running, clear water stream containing many small pools and riffles.

During the 1983 open water field season, stage was monitored at two locations within Lane Creek. Streamflow was also measured at one of the locations (Figure 1-57).

3.5.2.2 General Results

Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at each monitoring site in Lane Creek are presented in Appendix Table 1-A-9. Measurements of streamflow along with corresponding measurements of water surface and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

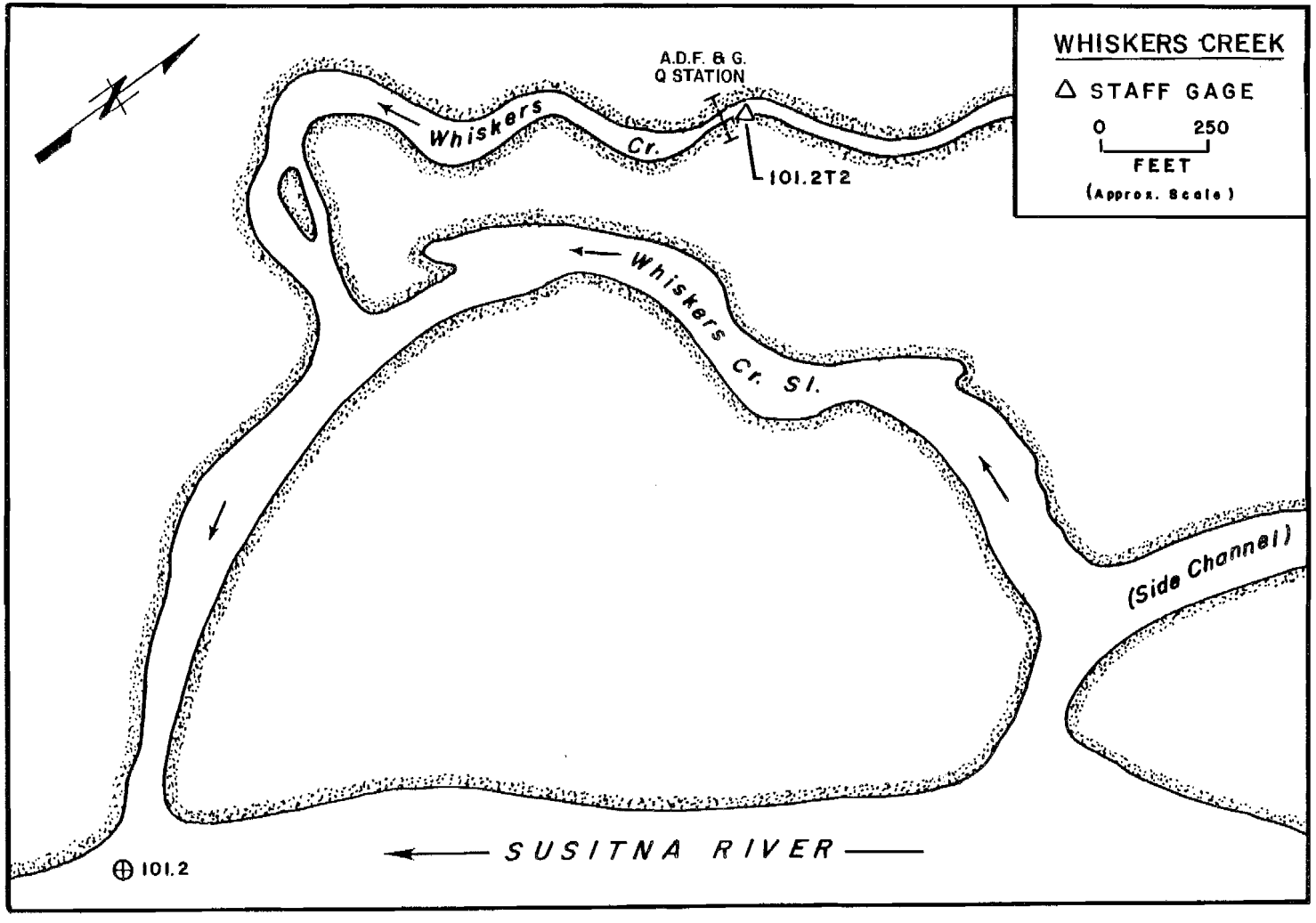

Figure 1-55. Site map of Whiskers Creek, which is located on the west bank of the Susitna River at river mile 101.4.

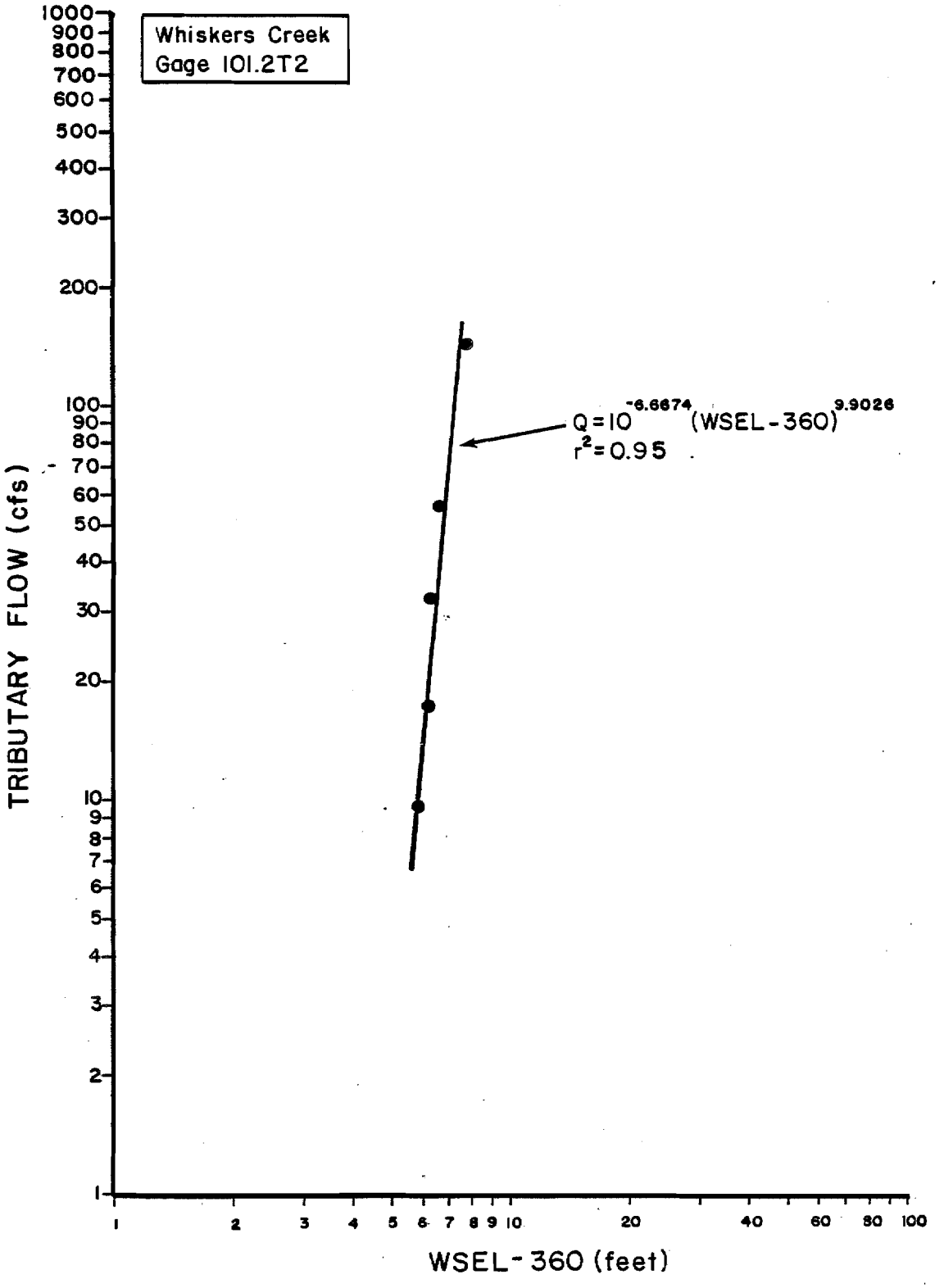

Figure 1-56. Stage versus flow rating curve for Whiskers Creek, staff gage 101.2T2.

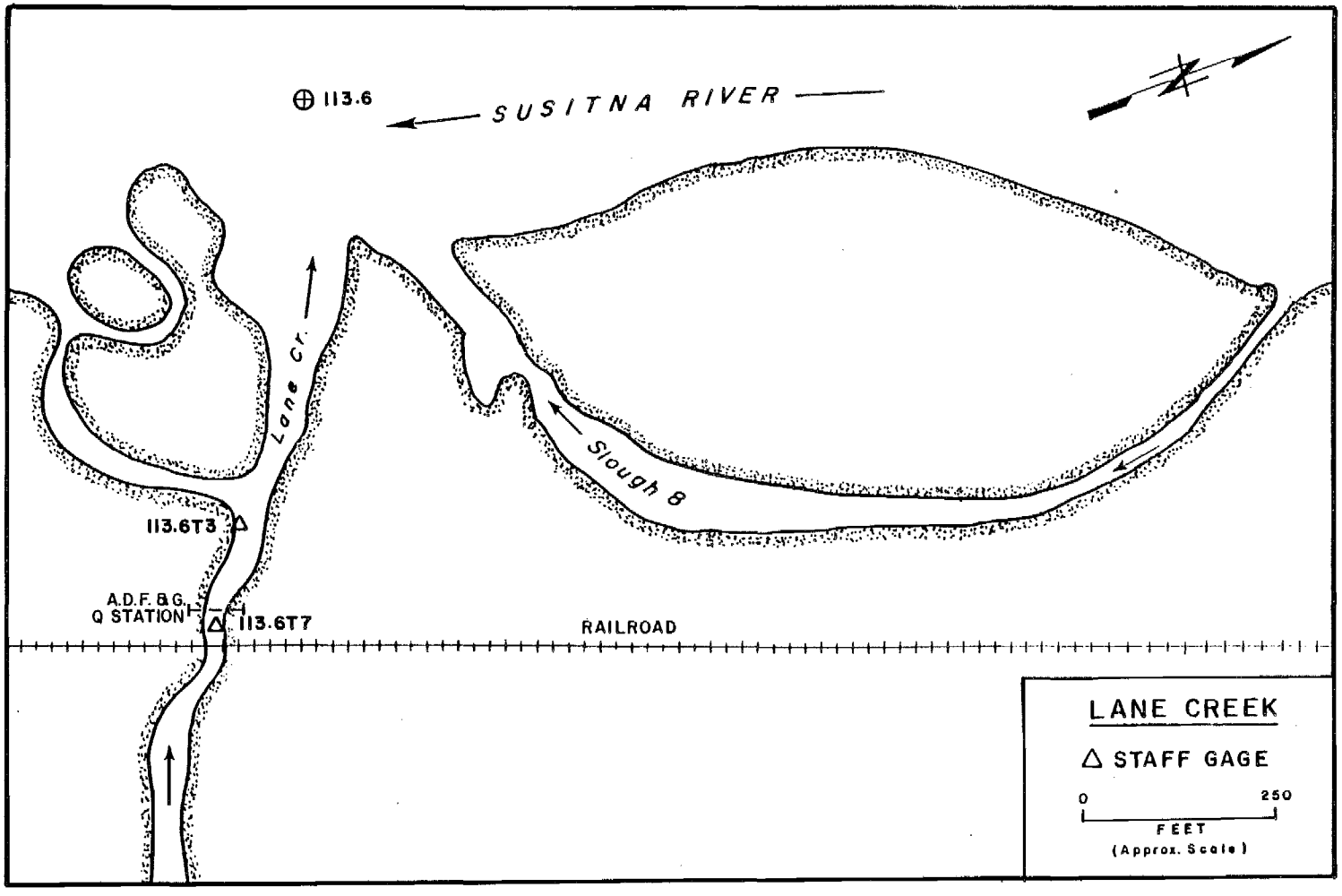

Figure 1-57. Site map of Lane Creek, which is located on the East Bank of the Susitna River at river mile 113.6.

3.5.2.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Lane Creek (Figure 1-57, Appendix Table 1-A-8). These measurements were used to construct a simple stage/streamflow rating curve (Figure 1-58).

3.5.3 Fourth of July Creek (RM 131.1)

3.5.3.1 Site Description

Fourth of July Creek (Figure 1-3) is located on the west bank of the Susitna River at river mile 131.1. It is a relatively steep gradient, narrow, shallow, fast-running clear water stream which overflows its bank during periods of high streamflow.

During the 1983 open water field season, stage and streamflow were monitored at one site within this creek (Figure 1-59).

3.5.3.2 General Results

Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek obtained at the monitoring station in Fourth of July Creek is presented in Appendix Table 1-A-9. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.5.3.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Fourth of July Creek (Figure 1-59, Appendix Table 1-A-8). These measurements were used to construct a simple stage/streamflow rating curve (Figure 1-60).

3.5.4 Waterfall Creek (RM 140.1)

3.5.4.1 Site Description

Waterfall Creek (Figure 1-3) is a tributary to Slough 20 located on the east bank of the Susitna River at river mile 140.1. It can be characterized as a relatively small, steep gradient stream that has many small pools and riffles.

During the 1983 open water field season, stage and streamflow were measured at one site within this creek (Figure 1-61).

3.5.4.2 General Results

Measurements of water surface elevation and corresponding measurements of mainstem discharge at Gold Creek are presented in Appendix Table 1-A-9. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

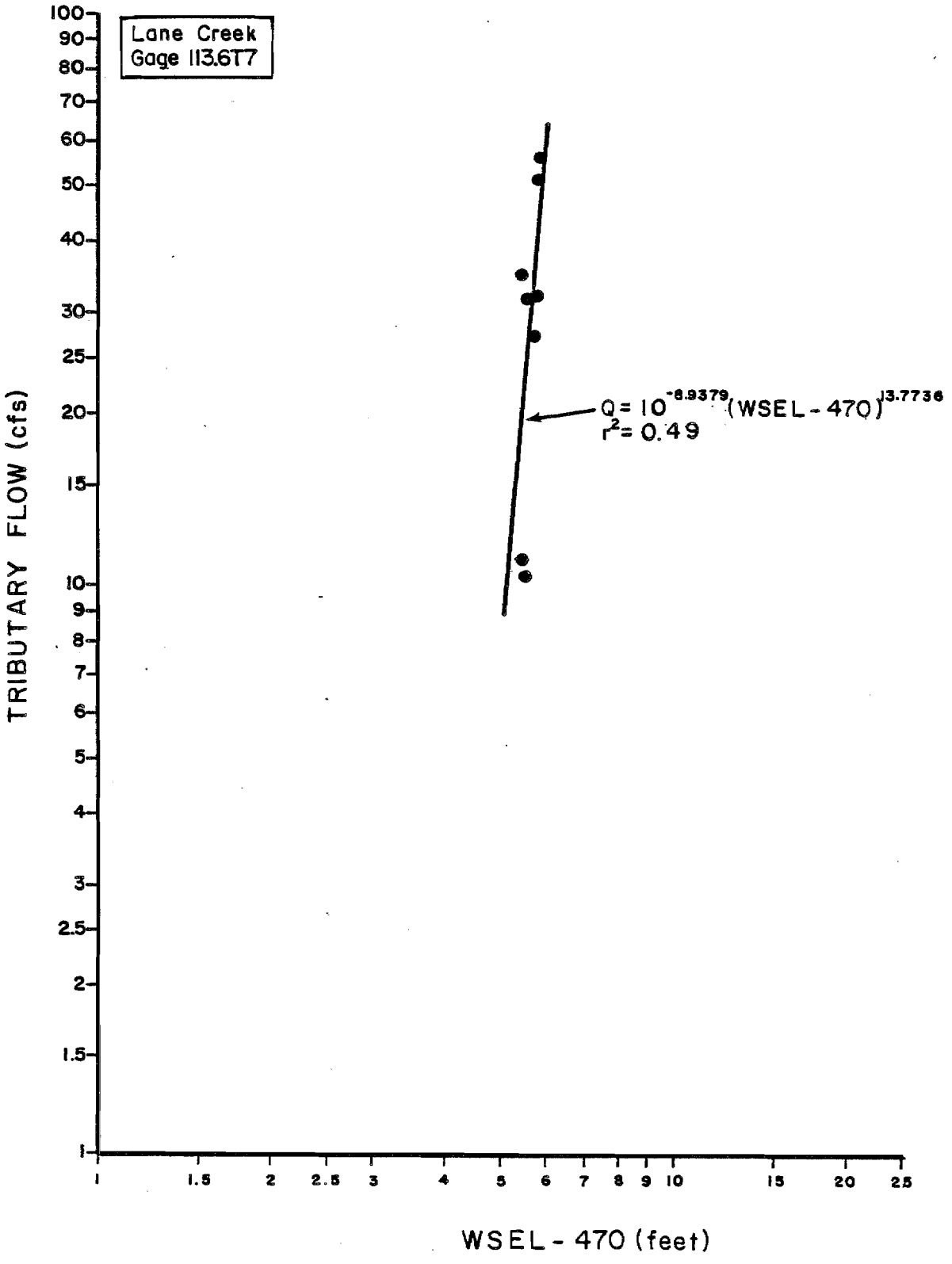

Figure 1-58. Stage versus flow rating curve for Lane Creek, staff gage 113.6T7.

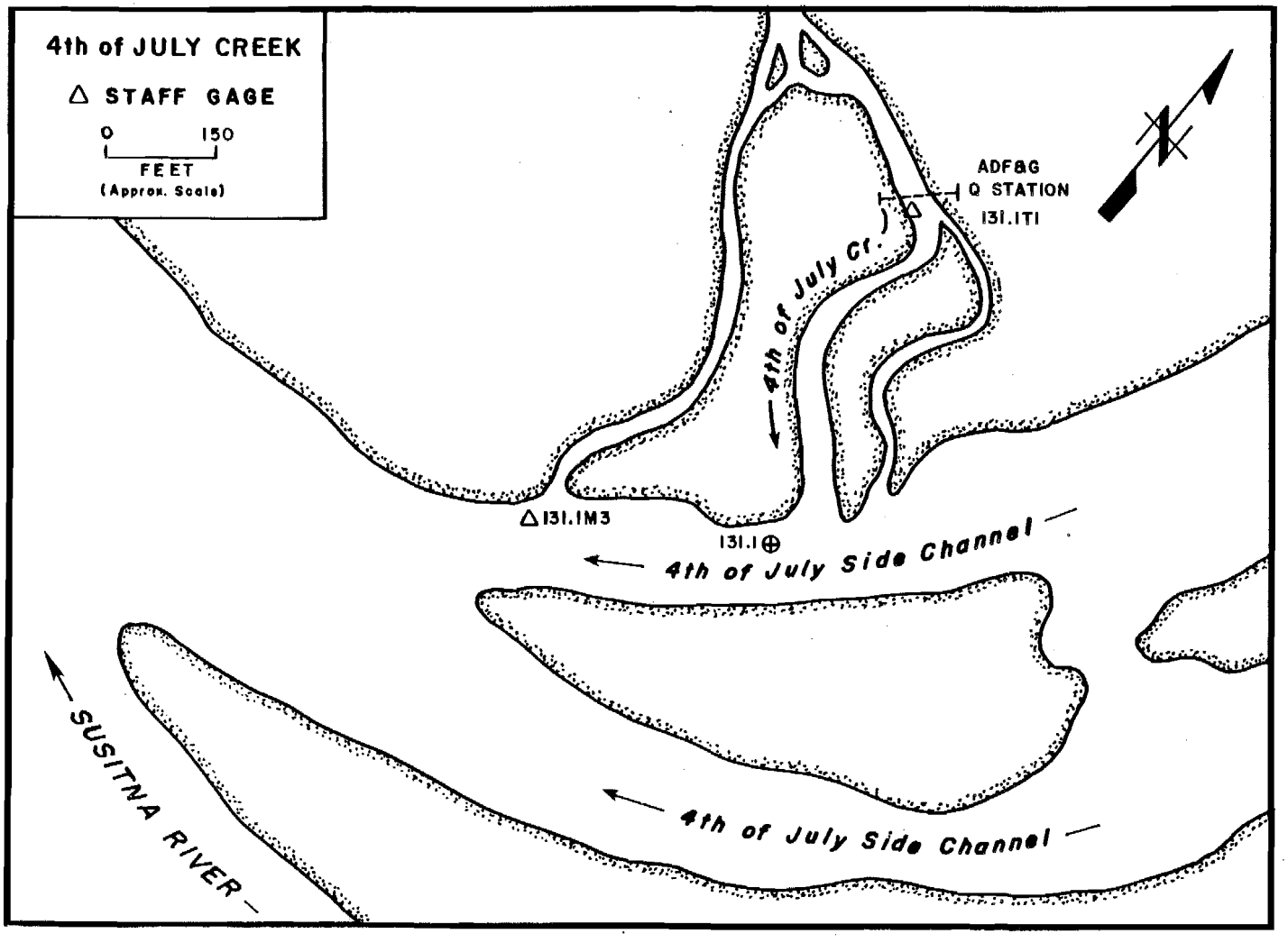

Figure 1-59. Site map of Fourth of July Creek, which is located on the west bank of the Susitna River at river mile 131.1.

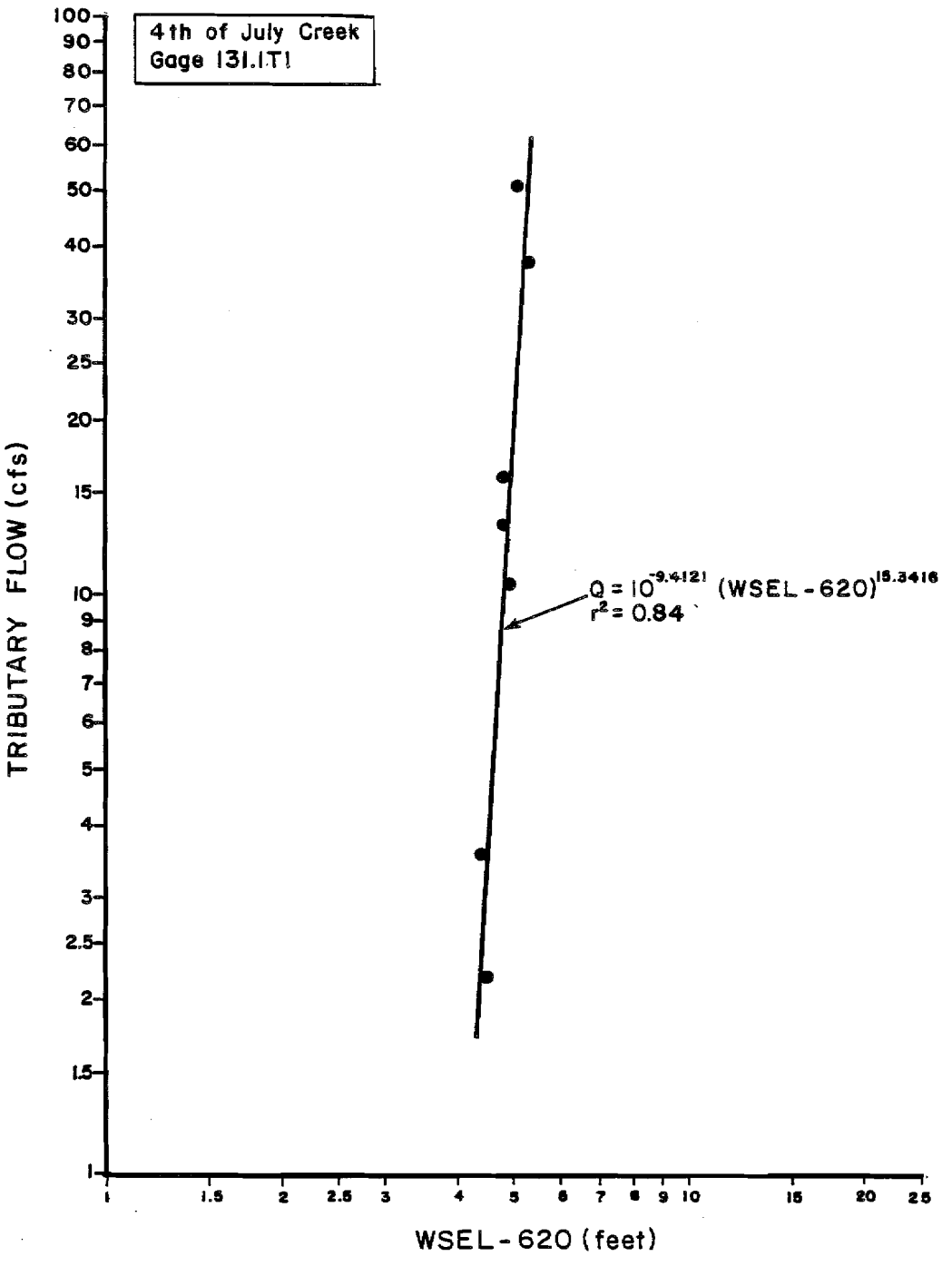

Figure 1-60. Stage versus flow rating curve for Fourth of July Creek staff gage 131.1T1.

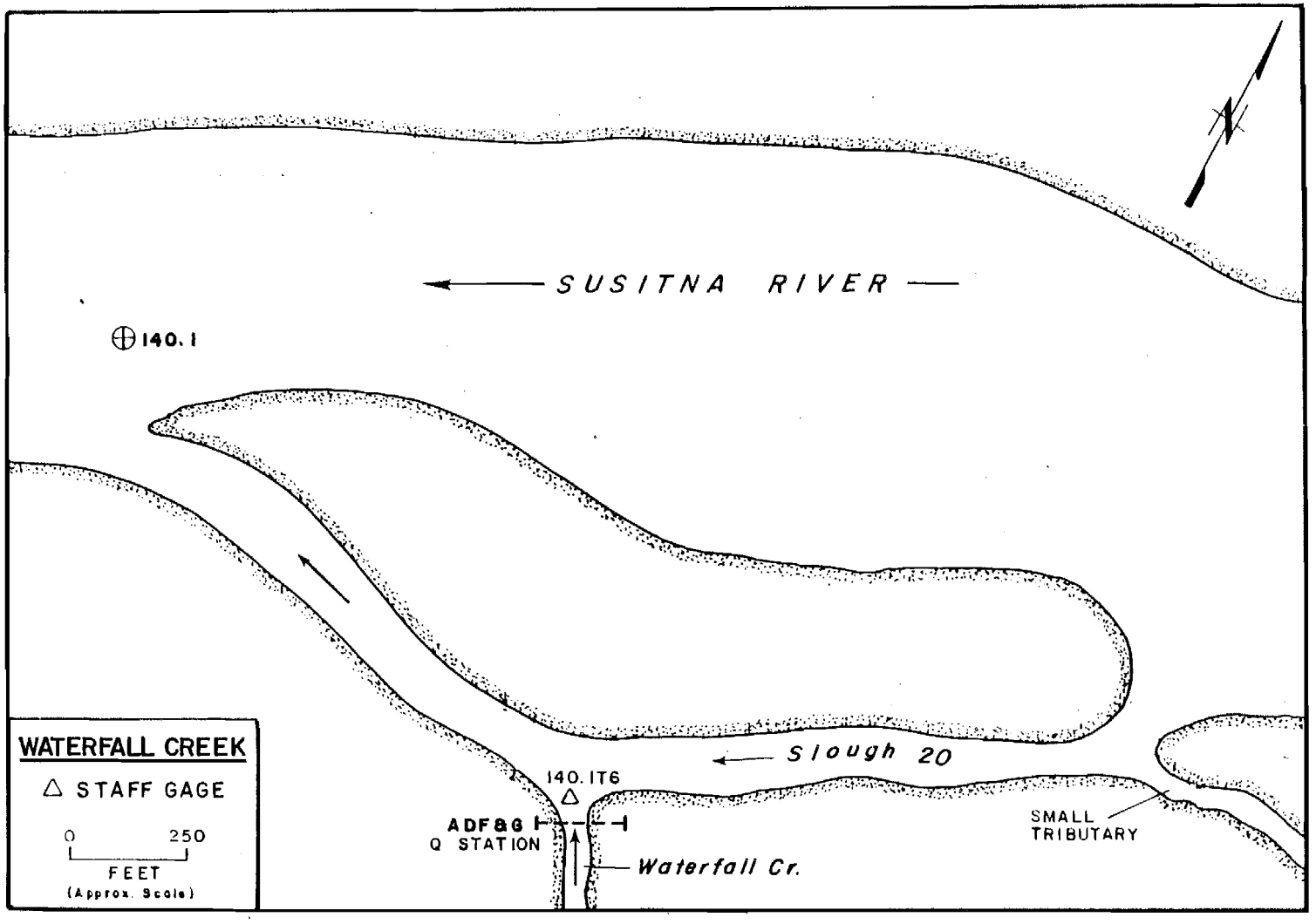

Figure 1-61. Site map of Waterfall Creek, which is located on the east bank of the Susitna River at river mile 140.1.

3.5.4.3 Stage/Discharge Relationship

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of Waterfall Creek. (Figure 1-61, Appendix Table 1-A-8). Insufficient data were obtained to construct a stage/streamflow rating curve.

3.5.5 Unnamed Tributary At Upper Slough 20 (RM 140.1)

3.5.5.1 Site Description

This unnamed stream (Figure 1-3) is a small tributary to Slough 20 which is located on the east bank of the Susitna River at river mile 140.1. It is a relatively narrow, meandering clear water stream and during periods of moderate to high streamflow in Slough 20, an area of backwater occurs at the mouth of this tributary.

During the 1983 open water field season, stage and streamflow were measured at one site within this tributary (Figure 1-62).

3.5.5.2 General Results

Measurements of water surface elevation and corresponding mainstem discharge at Gold Creek at the stage monitoring station are presented in Appendix Table 1-A-9. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8.

3.5.5.3 Stage/Discharge Relationships

Simultaneous measurements of stage and streamflow were obtained at one site within the free-flowing portion of this tributary (Figure 1-61, Appendix Table 1-A-8). These measurements were used to construct simple stage/streamflow rating curve (Figure 1-63).

3.5.6 Gold Creek (RM 136.8)

3.5.6.1 Site Description

Gold Creek (Figure 1-3) is a medium sized tributary that joins with the Susitna River on the east bank at river mile 136.8. It can be characterized as a relatively steep gradient, fast running, clear water stream having many pools and riffles.

During the 1983 open water field season, stage was monitored at two sites within Gold Creek (Figure 1-64). One of the sites was monitored with a staff gage and at the other site stage was monitored using a continuous depth recorder and associated pressure transducer. Streamflow was periodically measured at the latter stage monitoring station.

3.5.6.2 General Results

Measurements of stage (water surface elevation) obtained from staff gage

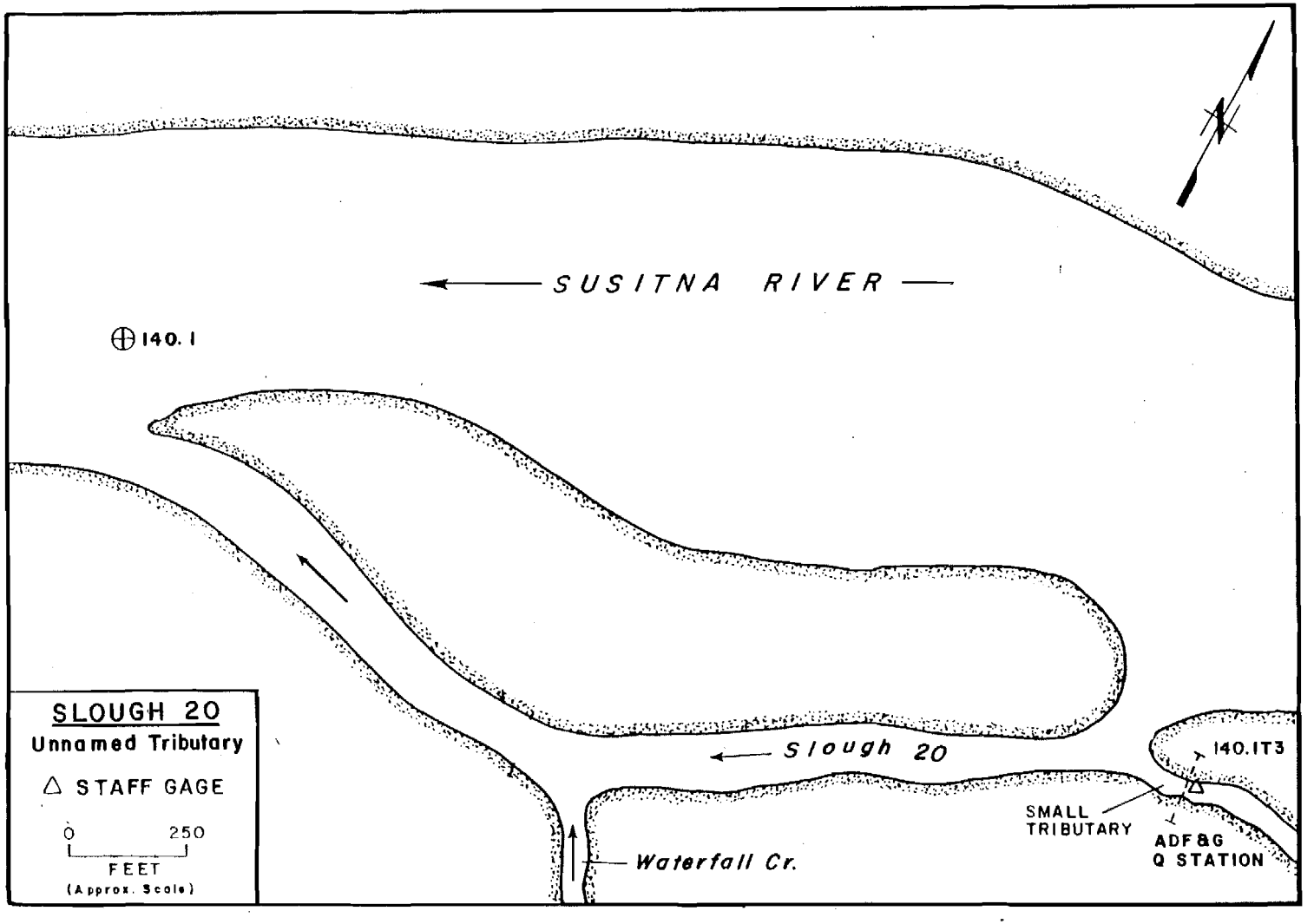

Figure 1-62. Site map of Slough 20 unnamed tributary, which is located on the east bank of the Susitna River at river mile 140.1.

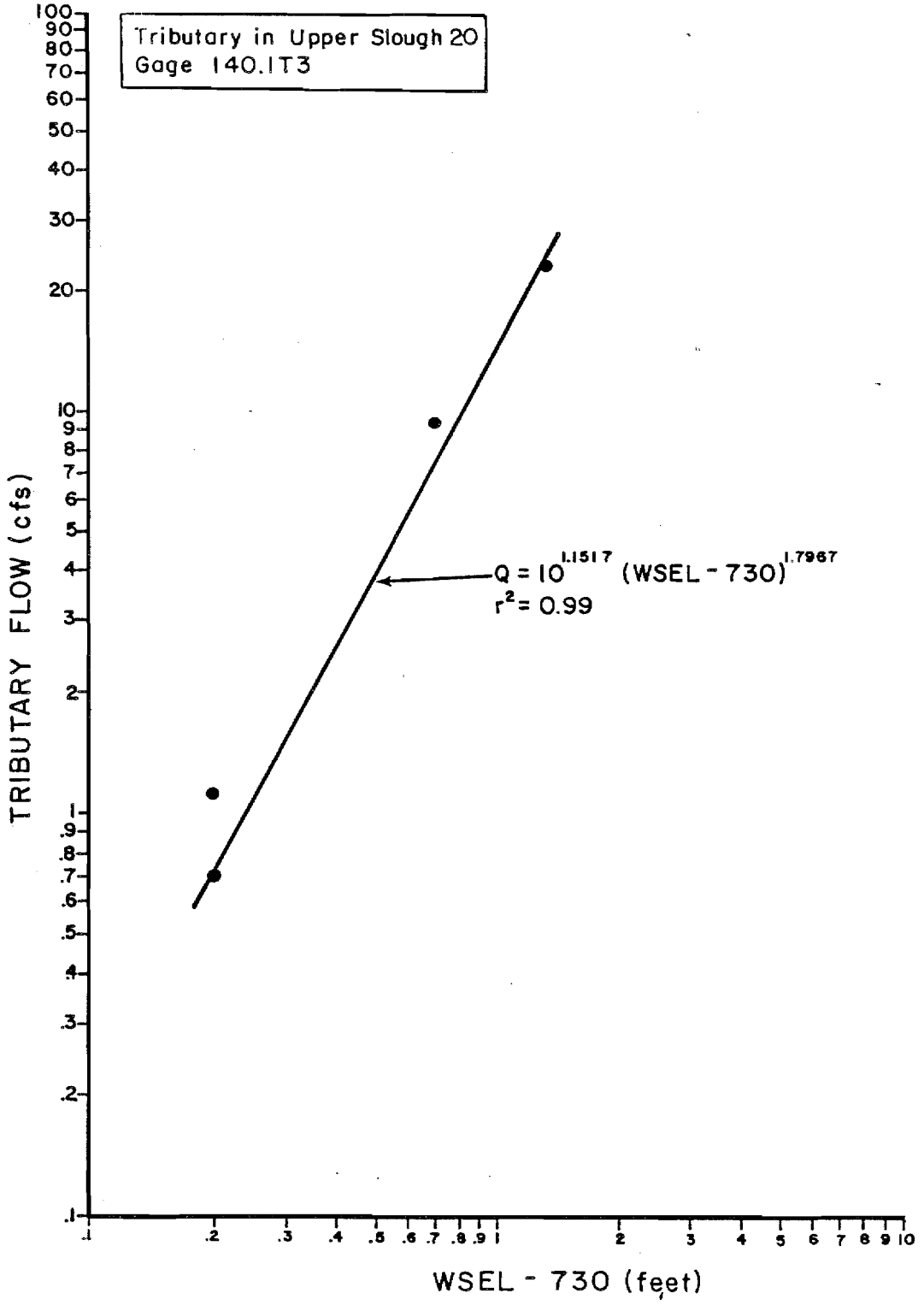

Figure 1-63. Stage versus flow rating curve for tributary in Upper Slough 20, staff gage 140.1T3.

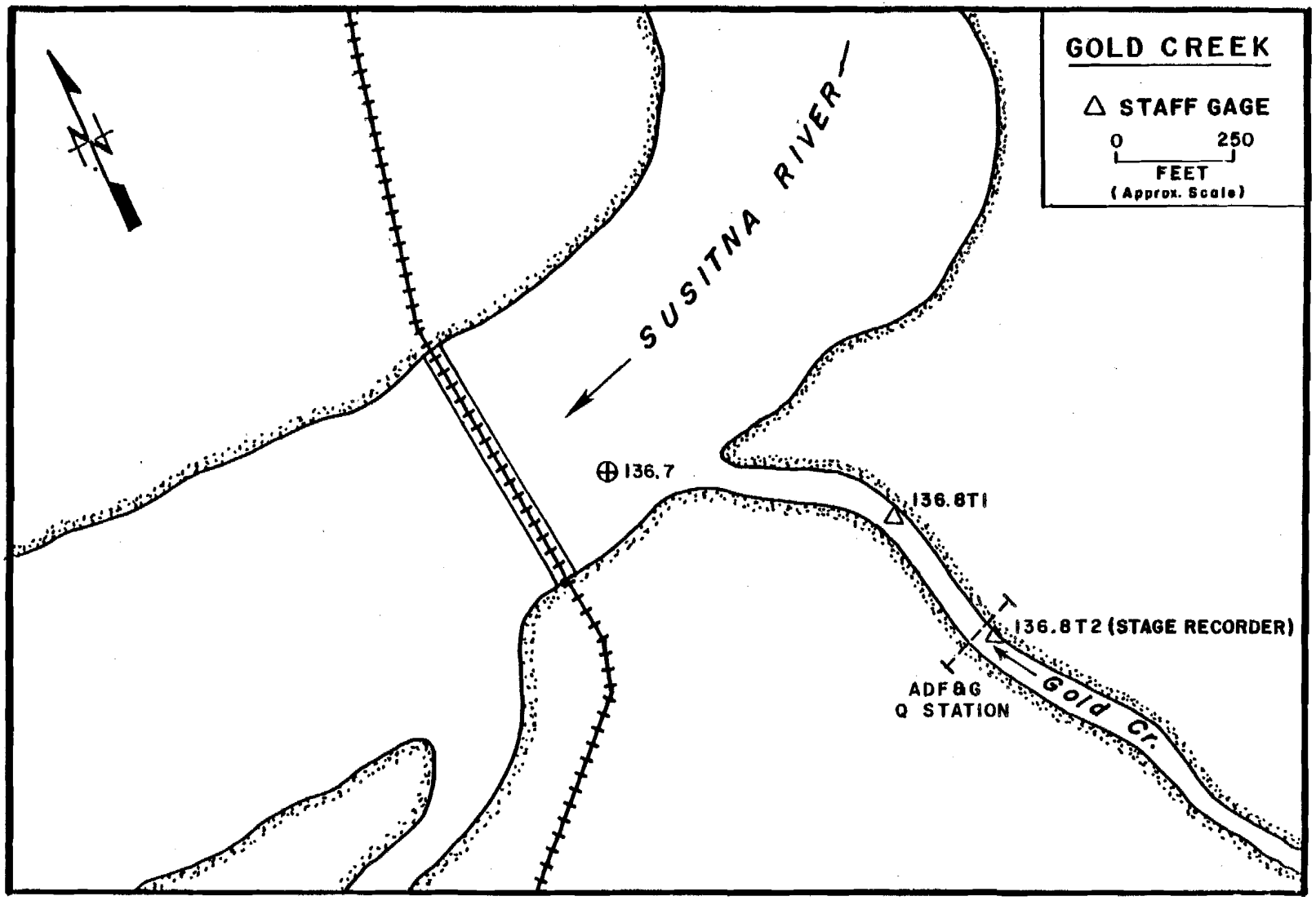

Figure 1-64. Site map of Gold Creek, which is located on the east bank of the Susitna River at river mile 136.7.

observations and corresponding mainstem discharge obtained at each stage monitoring station within Gold Creek are presented in Appendix Table 1-A-9. Measurements of streamflow and corresponding measurements of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8. Measurements of streamflow and the corresponding measurement of water depth obtained at the pressure transducer are presented in Table 1-20.

3.5.6.3 Stage/Discharge Relationship

Simultaneous measurements of water depth and streamflow were obtained at the site of the continuous stage recorder within Gold Creek. These measurements were used to construct a simple rating curve (Figure 1-65). The least squares regression equation for these depth of water and streamflow measurements was used to determine hourly streamflow data from the continuous water depth readings. Mean daily streamflow was then determined from these hourly streamflow records and are presented in Appendix Table 1-A-10.

3.5.7 Indian River (RM 138.6)

3.5.7.1 Site Description

Indian River (Figure 1-3) is a relatively large tributary which joins with the Susitna River on the west bank at river mile 138.6. It can be characterized as a relatively large, fast running, clear water, stream consisting of many pools and riffles.

During the 1983 open water field season, stage was monitored at one site within Indian River using both a continuous depth recorder and associated pressure transducer and staff gages. In addition, streamflow was periodically measured. (Figure 1-66).

3.5.7.2 General Results

Measurements of water surface elevation obtained from staff gage observations and corresponding mainstem discharge at Gold Creek obtained at the monitoring station within Indian River are presented in Appendix Table 1-A-9. Measurements of streamflow along with corresponding measurements of water surface elevation and mainstem discharge at Gold Creek at the time of measurement are presented in Appendix Table 1-A-8. Measurements of streamflow along with the corresponding measurement of water depth obtained at the pressure transducer are presented in Table 1-21.

3.5.7.3 Stage/Discharge Relationship

Simultaneous measurements of water depth and streamflow were obtained within Indian River at the site of the continuous stage recorder. These measurements were used to construct a simple rating curve (Figure 1-67). The least squares regression equation for these depth of water and streamflow measurements was used to calculated hourly streamflow data from the continuous water depth readings. Mean daily streamflow was then determined from the hourly streamflow record and is presented in

Table 1-20. Streamflow (cfs) and water depth measurements obtained at the Gold Creek tributary continuous stage recorder for 1983.

Date	Time	Water Depth (ft)	Streamflow (cfs)
830806	1600	0.77	34
830827	1700	0.87	51
830629	1500	0.87	56
830808	1800	1.53	154

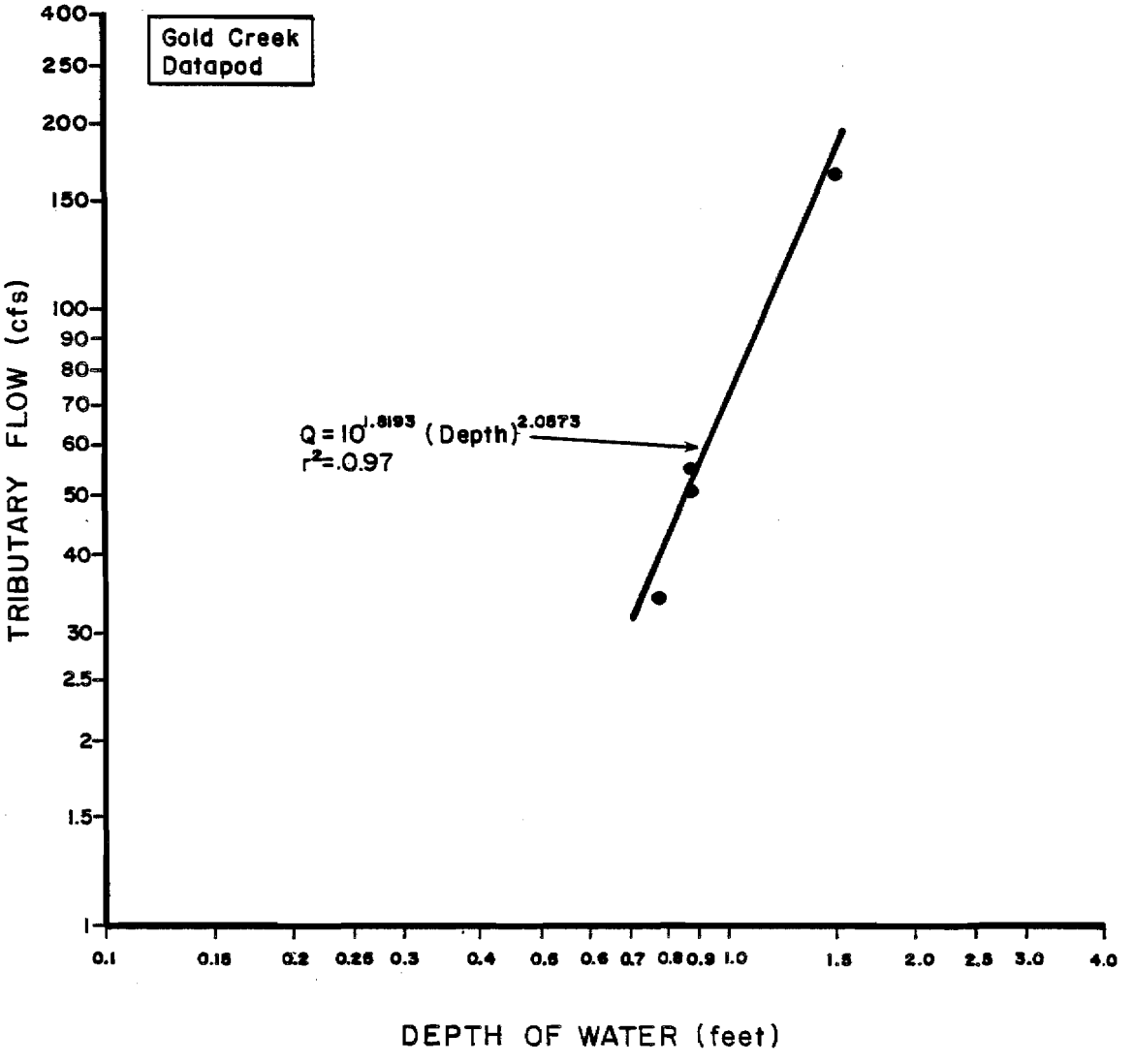

Figure 1-65. Depth of Water (feet) versus tributary flow rating curve for Gold Creek continuous stage recorder.

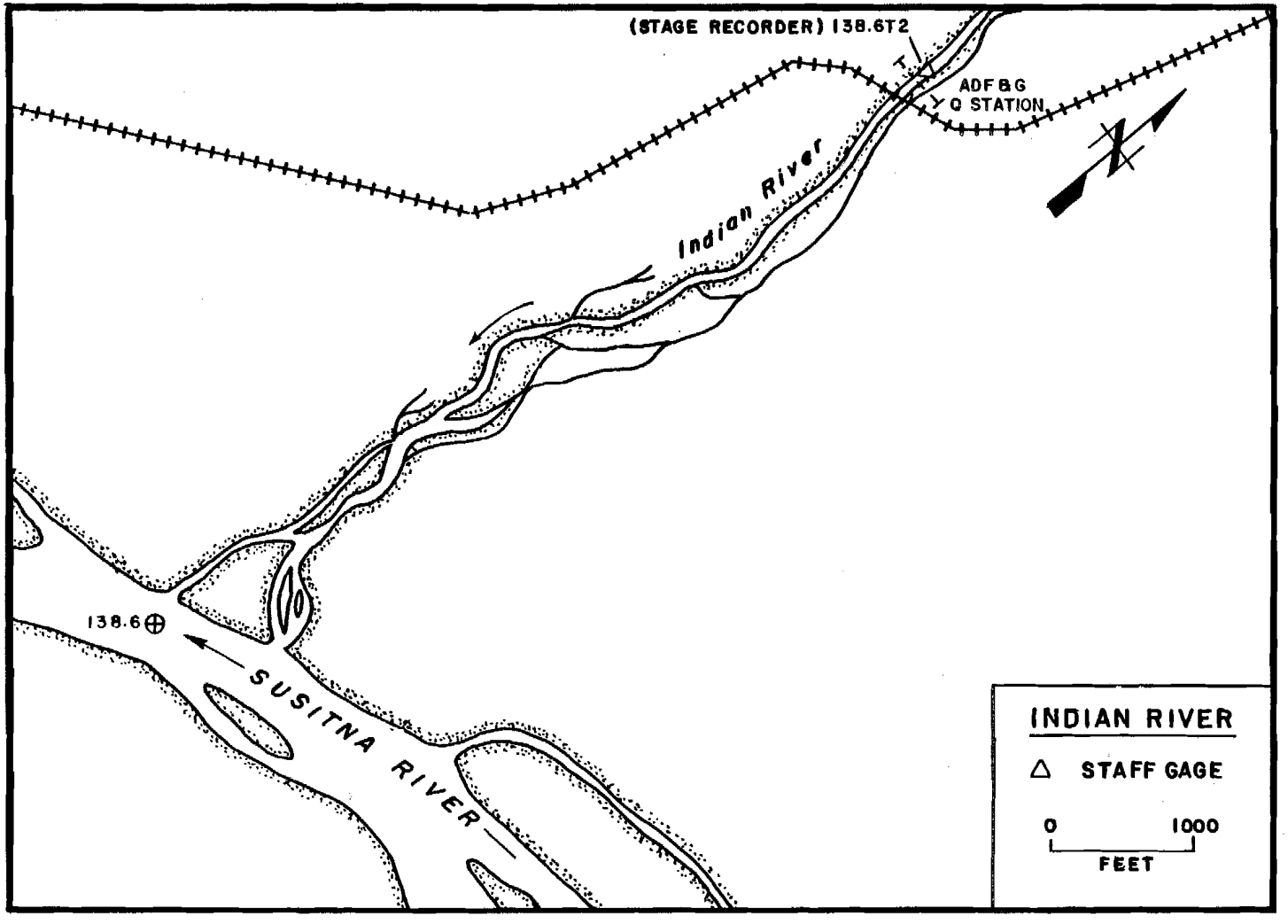

Figure 1-66. Site map of Indian River, which is located on the west bank of the Susitna River at river mile 138.6.

Table 1-21. Streamflow (cfs) and water depth measurements obtained at the Indian River tributary continuous stage recorder for 1983.

Date	Time	Water Depth (ft)	Streamflow (cfs)
830705	1200	1.50	459
830827	1200	1.50	338
830913	0900	1.40	242
830712	1600	1.30	173
830728	1830	1.20	98

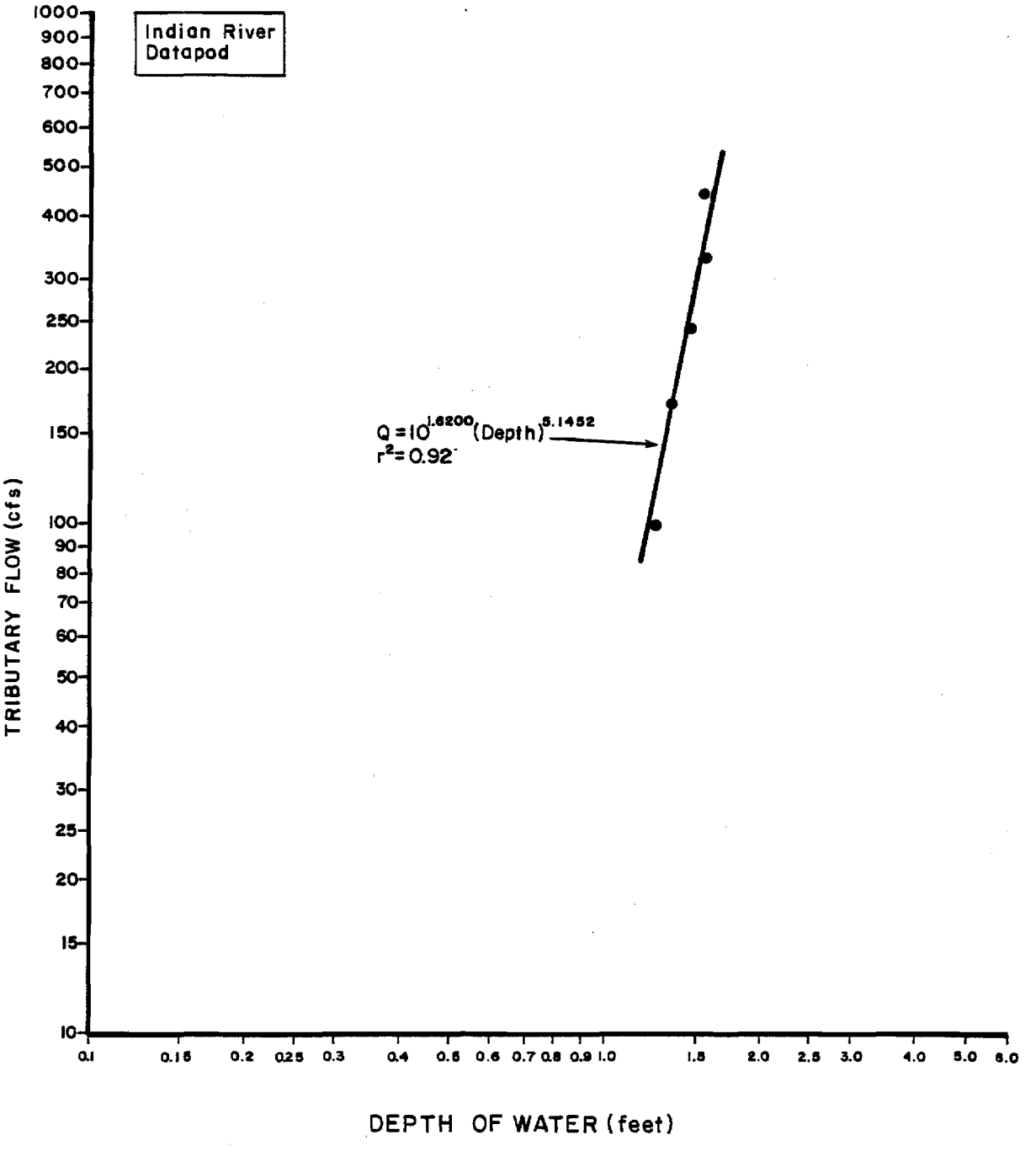

Figure 1-67. Depth of water (feet) versus tributary flow rating curve for Indian River, continuous stage recorder.

Appendix Table 1-A-11. A comparison of the measured streamflows to that estimated from the depth of water records indicate the streamflow record may be in error at higher streamflows (greater than 350 cfs). This has been attributed to streambed movement in the area of the monitoring station.

3.5.8 Portage Creek (RM 148.8)

3.5.8.1 Site Description

Portage Creek (Figure 1-3) is a relatively large, fast running, clear water stream that has many pools and riffles. It joins with the north bank of the Susitna River at river mile 148.8.

During the 1983 open water field season, stage was monitored at one site within Portage Creek using a continuous stage recorder and a staff gage. In addition, streamflow was periodically measured at this site (Figure 1-68).

3.5.8.2 General Results

Measurements of streamflow along with the corresponding measurement of water surface elevation and mainstem discharge at Gold Creek are presented in Appendix Table 1-A-8. Measurement of streamflow and corresponding measurement of water depth obtained at the pressure transducer are presented in Table 1-22.

3.5.8.3 Stage/Discharge Relationship

Simultaneous measurements of water depth and streamflow were obtained at the site of the continuous stage recorder within Portage Creek. These measurements were used to construct a simple rating curve (Figure 1-69). The least squares regression equation for these depth of water and streamflow measurements was used to calculate hourly streamflow in Portage Creek from the continuous water depth readings. Mean daily streamflow calculated from the hourly streamflow record are presented in Appendix Table 1-A-12.

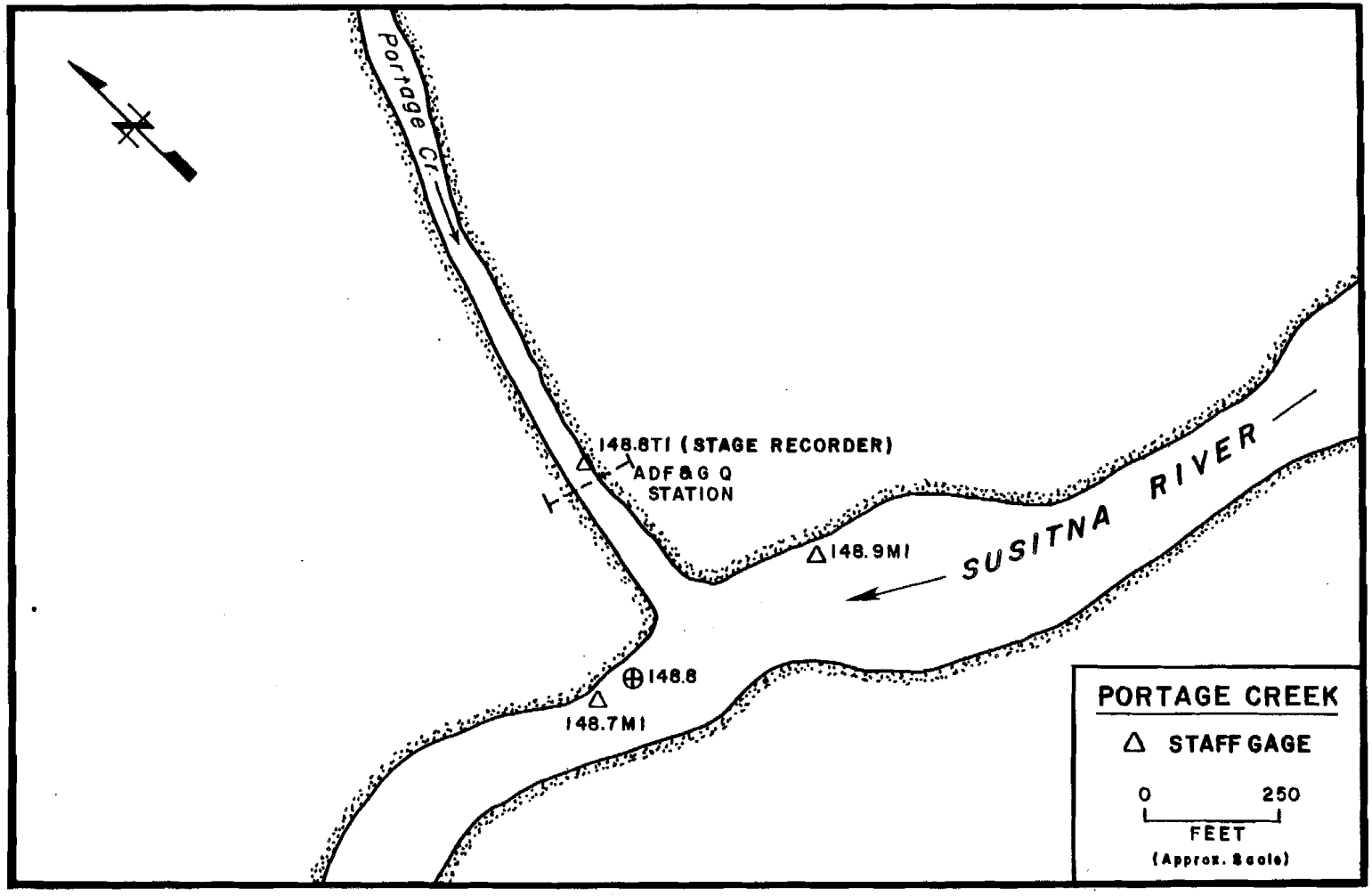

Figure 1-68. Site map of Portage Creek which is located on the west bank of the Susitna River at river mile 148.8.

Table 1-22. Streamflow (cfs) and water depth measurements obtained at the Portage Creek tributary continuous stage recorder for 1983.

Date	Time	Water Depth (ft)	Streamflow (cfs)
830702	1200	1.83	1055
830828	1200	1.70	789
830730	1100	0.87	267

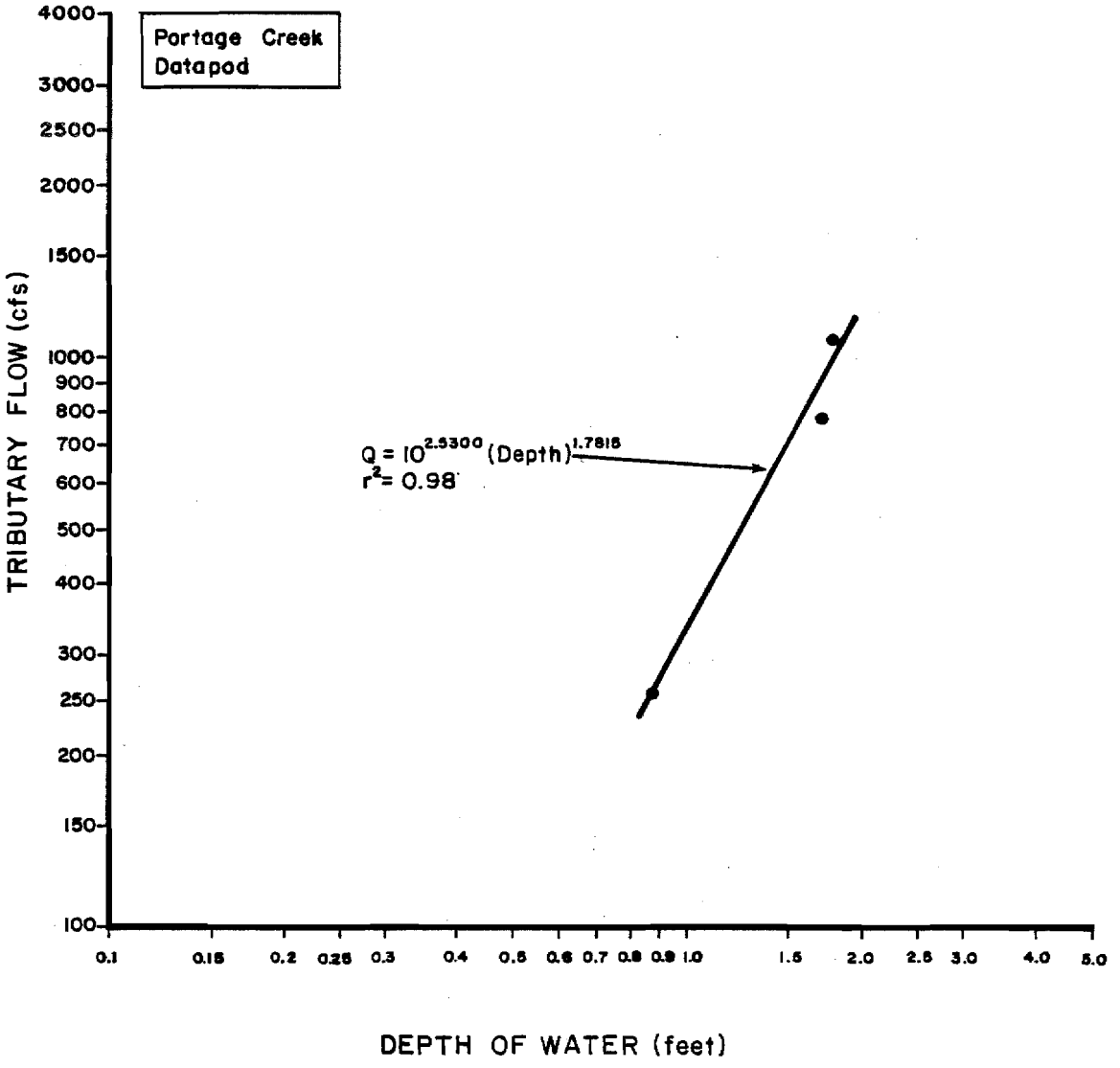

Figure 1-69. Depth of water (feet) versus tributary flow for Portage Creek, continuous stage recorder.

4.0 DISCUSSION

Stage and discharge data were collected during the 1983 open water field season to determine the influences that mainstem discharge has on the water surface elevation of the mainstem at selected locations and to evaluate the influences that mainstem discharge has on various hydraulic conditions present in peripheral habitats.

Streamflows recorded during both the 1982 and 1983 open water field seasons generally followed the historical 25 year streamflow record. In contrast, the streamflows experienced during the 1981 open water field season were higher than the historical 25 year streamflow record during the July to August period.

During the 1983 open water field season (May-October), mainstem discharge ranged from a low of 7,500 cfs on October 9 to a high of 36,000 cfs at Gold Creek on June 5. Generally, discharge increased during May, peaked in June, and decreased during September and October (Figure 1-5).

Based on 1982 (ADF&G, 1983) and 1983 data, the relationship between mainstem water surface elevation and mainstem discharge is relatively well defined for mainstem discharges at Gold Creek ranging from 7,500 to 35,000 cfs.

Mainstem discharge was found to influence various hydraulic conditions present within side channel, side slough, and upland slough habitats. Moderate to high levels of mainstem discharge caused backwater areas to form at the mouths of many of the side channels, side sloughs, and upland sloughs that were evaluated. The size and extent of these backwater areas increased as mainstem discharge increased.

Mainstem discharge was also found to influence, to varying degrees, the water surface elevation and streamflow conditions that occur within side channels and side sloughs, particularly when the head portions of these sites were breached by the mainstem. Prior to breaching (overtopping), the streamflow conditions present within these habitats are only indirectly related to mainstem discharge. Under these conditions, streamflows are small and water surface elevations remain relatively stable. Streamflow prior to breaching, is contributed by groundwater upwelling or seepage, surface water runoff, and tributary inflow.

With the occurrence of breaching of a side channel or side slough by progressively higher levels of mainstem discharge, a succession of events occurs within these habitats. The first event that occurs is the initial overtopping of the head portion of these habitats. The mainstem discharge at which this initial overtopping occurs is referred to as the "breaching discharge". This initial breaching may or may not significantly influence the hydraulic characteristics of a side channel or side slough due to the low quantity of flow entering the head portion and due to specific geomorphological features of a site. At some point, as progressively higher levels of mainstem discharge overtop the head portion of a side channel or side slough, the hydraulic characteristics of a site begin to become governed by mainstem discharge. The mainstem discharge at which this initially occurs is referred to as the

controlling breaching discharge. The period between the initial breaching discharge and the controlling breaching discharge is referred to as the "intermediate breaching discharge" condition. Depending upon the geomorphological character of the heads of side channels and side slough the controlling mainstem breaching discharge and the breaching discharge may be very close if not the same mainstem discharge.

In general, initial breaching discharges for side channels are lower than those for side sloughs. Initial mainstem breaching discharges for the side channels selected for study in the middle reach of the Susitna River vary from 5,000 to 20,000 cfs as measured at the USGS Gold Creek gaging station. These compare to mainstem breaching discharges for studied side sloughs in the middle reach of the Susitna River which vary from 16,000 to 42,000 cfs as measured at the USGS Gold Creek gaging station (Table 1-23).

These breaching discharges compare to controlling breaching discharges which range from 5,000 to 25,000 cfs and 19,000 to 42,000 cfs (Table 1-23) as measured at the USGS Gold Creek gaging station for side channels and side sloughs, respectively. The controlling breaching discharges are closer to the breaching discharges in side channels than in side sloughs. Side channels are generally of a lower elevation at their head portions than side sloughs and the head portion of a side channel is usually much broader allowing a larger quantity of water to flow over the head at the initial point of overtopping. This causes a more immediate influence of mainstem discharge on the hydraulic characteristics of a side channel. With the occurrence of controlling breaching discharges, both the water surface elevation and streamflow within side channel and side slough habitats increases dramatically.

The initial breaching and controlling breaching discharges presented in Table 1-23, are based on a combined interpretation of survey and water surface elevation data, aerial photography, field observations, and the professional judgement of our hydraulic engineering consultant. Table 1-23 represents our best estimate of breaching and controlling discharges for the studied sites. The discharge estimates are based on mean daily mainstem discharge as measured at the USGS Gold Creek gaging station rather than site specific mainstem discharge measurements. Because of this, an error of ± 15% may be associated with the estimates.

Simultaneous measurements of stage and streamflow obtained within the free-flowing portion of each side channel or side slough were plotted as simple rating curves. These curves describe the relationship between water surface elevation within each site to streamflow at the site. Because of the influence of mainstem discharge on the hydraulics at the gaging station, many of the plots depict both the breached and non-breached conditions.

Stage and streamflow measurements were also obtained in two upland sloughs located in the Talkeetna to Devil Canyon reach of the Susitna River. Because of the influence of backwater at these habitats, rating curves describing the relationship of site streamflow to water surface elevation could not be constructed.

Table 1-23. Initial breaching and controlling mainstem discharges for selected side channels and side sloughs in the Talkeetna to Devil Canyon reach of the Susitna River, 1983.

Site	RM	Initial[1] Breaching Discharge (cfs)	Controlling[2] Mainstem Discharge (cfs)
Side Channels			
Mainstem 2 Side Channel			
NW Channel	114.4	12,000	16,000
NE Channel	115.5	23,000	25,000
Side Channel 10	134.2	19,000	19,000
Lower Side Channel 11	135.0	5,000	5,000
Upper Side Channel 11	136.2	13,000	16,000
Side Channel 21			
Downstream of A5	140.6	9,200[3]	12,000
Upstream of A5	141.9	18,000[3]	24,000
Side Sloughs			
Whiskers Side Slough	101.2	22,000	23,000
Side Slough 8	113.6	24,000	24,000
Side Slough 8A			
NW Channel	126.2	27,000	27,000
NE Channel	126.7	33,000	33,000
Side Slough 9	128.3	16,000	19,000
Side Slough 11	136.4	42,000	42,000
Side Slough 16B	138.2	20,000	23,000
Side Slough 20[4]	140.6	22,000	23,000
Side Slough 21			
NW Channel	142.2	23,000	25,000[5]
NE Channel	142.3	26,000	- - -
Side Slough 22	144.7	20,000	23,000

[1] The initial breaching discharges presented in this table represent the lowest mainstem discharge occurring when the head portions of these side channel and slough habitats were observed to be breached.

[2] Controlling mainstem discharge values were determined by the project hydraulic engineer using available hydraulic data.

[3] Small overflow channel A6 (Figure 1-20) is initially breached contributing minimal flow to Side Channel 21.

[4] The northwest channel of Slough 21 initially governs the hydraulic characteristics for the main channel of the slough.

[5] Data not available to determine the controlling mainstem discharge for Slough 21 NE channel.

Significant areas of backwater occurred at the mouth of each of the upland sloughs during periods of low to high mainstem discharge. These backwater areas are characterized by increased water depth and reduction in water velocities.

Because upland sloughs are not hydraulically connected with the mainstem at their heads, the streamflow in these sites was not found to be directly related to mainstem discharge. The major contributors to streamflow in the upland sloughs included surface water runoff and groundwater upwelling.

Stage and streamflow measurements were obtained at eight tributaries located in the Talkeetna to Devil Canyon reach of the Susitna River. From these data, rating curves describing the relationship between tributary streamflow and water surface elevation were constructed.

Three of the tributaries studied contributed flow to side slough habitats (Whiskers Creek, Waterfall Creek and a small tributary near the head of Side Slough 20). Fourth of July Creek emptied into an adjoining side channel. The remaining tributaries evaluated emptied directly into the mainstem Susitna River. Tributary inflow was found to provide a significant contribution of flow to side slough habitats when the sloughs were not breached by mainstem discharge. Whiskers Creek was found to contribute as much as 90% of the flow to Whiskers Side Slough during unbreached periods. Similarly Waterfall Creek provided as much as 80% of the total discharge in Side Slough 20 under nonbreached hydraulic conditions.

All of the tributaries studied provided clear water plumes where they joined with sloughs, side channel or mainstem habitats. The extent of these clear water plumes were found to vary, depending on both the volume of flow of the tributary and the flow associated with the habitat into which they emptied.

Continuous measurements of streamflow were estimated for Gold Creek, Indian River, and Portage Creek for the months of May to October, 1983. The estimates were determined from continuous depth of water measurements and indicate the general magnitude and variability of stream flows for these tributaries. At Indian River, the streamflow record may be in error in the range of 20% for those flows exceeding 300 (cfs) due to streambed movement found to occur at the discharge station. Overall, the three tributaries exhibit similar trends with streamflow generally increasing during late May and early June, presumably due to snow melt, and decreasing in October. Peak flows occurred in August and September for each of these tributaries and are assumed to be the result of precipitation. Stream flow for Gold Creek, Indian River, and Portage Creek on August 9, 1983 (a period of high flow) was 200 (cfs) 2,647 (cfs) and 2,045 (cfs) (Appendix Tables 1-A-10 - 1-A-12), respectively. The total of these three tributaries provided approximately 16% of the mainstem discharge at Gold Creek (USGS 15292000) of 29,900 cfs occurring for the same day.

Stage and streamflow rating curves have been developed for each tributary studied in the Talkeetna to Devil Canyon reach of the Susitna River

with the exception of Waterfall Creek. From rating curves, continuous streamflow records have been estimated for Gold Creek, Indian River and Portage Creek. Although stage and discharge measurements have been obtained providing streamflow data for various fishery and hydrological studies, use of these rating curves should be limited to the 1983 open water season. Streambed movement which is common among several of these tributaries may alter the stage and streamflow relationship presently identified.

5.0 CONTRIBUTORS

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8.0 GLOSSARY

Backwater Area - A reach of stream with reduced or no velocity and a rise in stage resulting from a hydraulic or physical barrier. Backwater areas in habitats adjacent to the Susitna River usually are due to an increase in mainstem discharge and occur at the mouth of or within a side channel or slough.

Berm - The ledge or shelf at the head of a side slough or side channel that separates the side slough or side channel from the mainstem Susitna River or other side channels.

Breaching - The overtopping of the head of a side channel or side slough by the mainstem river.

Clearwater Plume - the extension of the clearwater of a tributary into the turbid mainstem at and below the confluence of the two. Due to the different densities of the mainstem and tributary waters, these two water bodies do not readily mix, causing a clearly defined clearwater extension of the tributary along the river bank at end below the actual confluence. The size of the plume is a function of tributary flow and mainstem discharge.

Controlling Discharge - The mainstem discharges at Gold Creek required to breach the upstream berm govern the hydraulic characteristics within a side slough or side channel.

Cross Section Profile - A survey of the vertical section of a channel bottom taken at right angles to a survey line resulting in a ground/streambed profile.

Datapod - A dual channel, electronic instrument capable of simultaneously measuring and recording from each channel on a continuous basis. Datapods have been used to monitor stage, temperature and dissolved gas concentrations.

Discharge - Discharge, or streamflow, is defined as the volume rate of flow of water passing a specific location at a specific period in time. Dimensions are usually expressed as cubic feet per second (cfs). For the purpose of this report "discharge" will refer specifically to mainstem flow and "streamflow" will refer to flow in side channels, sloughs and tributaries habitats.

DSM - A non-volatile, ultraviolet (UV) erasable, solid state data storage module capable of storing approximately 3 months of stage, temperature or dissolved gas concentration data.

Flow - The movement of a volume of water from place to place. See Discharge and Streamflow.

Gaging Station - A location which has been established for monitoring stage, flow and/or discharge.

Gradient - Rate of change in vertical elevation per unit horizontal distance.

Habitat - The surrounding environmental conditions to which a particular species and life stage of fish responds both behaviorally and physiologically.

Head - The upstream or point of origin of a lotic water body.

Initial Breaching Discharge - The mainstem discharge at Gold Creek which represents the initial point when mainstem water begins to enter the upstream head (berm) of a side slough or channel.

Intermediate Breaching Discharge - The range of mainstem discharges at Gold Creek representative of the conditions between the Initial and Controlling Discharges. This range occurs from immediately after mainstem surface water begins to overtop the upstream head (berm) of a side slough or side channel up to the point when the mainstem discharge begins to govern the hydraulic characteristics of the site.

Lower Reach (of the Susitna River) - The segment of the Susitna River between Cook Inlet and the Chulitna River confluence. (See also middle reach and upper reach).

Mainstem Habitat - Consists of those portions of the Susitna River that normally convey water throughout the year. Both single and multiple channel reaches are included in this habitat category. Groundwater and tributary inflow appear to be inconsequential contributors to the overall characteristics of mainstem habitat. Mainstem habitat is typically characterized by high water velocities and well armored streambeds. Substrates generally consist of boulder and cobble size materials with interstitial spaces filled with a grout-like mixture of small gravels and glacial sands. Suspended sediment concentrations and turbidity are high during summer due to the influence of glacial melt-water. Discharges recede in early fall and the mainstem clears appreciably in October. An ice cover forms on the river in late November or December.

Mean Daily Discharge - The computed mean mainstem discharge per 24 hour period for a USGS gaging station.

Middle Reach (of the Susitna River) - The segment of the Susitna River between the Chulitna River confluence and Devil Canyon. (See also lower reach and upper reach).

Monitoring Station - A station set up for the collection of a particular data base.

Mouth - The downstream confluence of a lotic water body with another water body.

Observed Data - Values derived through a visual estimate or evaluation.

Overflow Channel - Those channels which connect the mainstem river with side channel and side slough habitats and are located downstream of

the head portions of these habitats. Overflow channels periodically breach providing mainstem water into side channel and side slough habitats.

Overtopping - See breaching.

Peripheral Habitats - Aquatic habitats adjacent to the mainstem Susitna River habitat (e.g. side channel, side slough, upland slough, tributary mouth and/or tributary habitats).

Project Datum - The project elevations referenced to mean sea level.

Rating Curve - A curve representing a simple relation between two variables to be used to determine values of the dependent variable as a function of the independent variable. The rating curves developed using project measurements of stage and discharge consist of discharge rating curves and stage rating curves. The discharge rating curves are used to determine streamflow as a function of mainstem discharge and streamflow as a function of water surface elevation. The stage rating curves are used to determine stage referred to as water surface elevation as a function of mainstem discharge.

Side Channel Habitat - Consists of those portions of the Susitna River that normally convey water during the open water season but become appreciably dewatered during periods of low mainstem discharge. Side channel habitat may exist either in well defined overflow channels, or in poorly defined water courses flowing through partially submerged gravel bars and islands along the margins of the mainstem river. Side channel streambed elevations are typically lower than the mean monthly water surface elevations of the mainstem Susitna River observed during June, July, and August. Side channel habitats are characterized by shallower depths, lower velocities and smaller streambed materials than the adjacent habitat of the mainstem river.

Side Slough Habitat - Those channels located between the edge of the floodplain and the mainstem and side channels of the Susitna River. It is usually separated from the mainstem and/or side channels by well vegetated bars. An exposed alluvial berm often separates the head of the slough from mainstem discharge or side channel flows. The controlling streambed/bank elevations at the upstream end of the side sloughs are slightly less than the water surface elevations of the mean monthly discharges of the mainstem Susitna River observed for June, July, and August. At intermediate and low-discharge periods, the side sloughs convey clear water from small tributaries and/or upwelling groundwater. These clear water inflows are essential contributors to the existence of this habitat type. The water surface elevation of the Susitna River generally causes a backwater to extend well up into the slough from its lower end. Even though this substantial backwater exists, the sloughs function hydraulically very much like small stream systems and several hundred feet of the slough channel often conveys water independent of mainstem backwater effects. At high discharges the water surface elevations of the mainstem river is sufficient to

overtop the upper end of the slough. Surface water temperatures in the side sloughs during summer months are principally a function of air temperature, solar radiation, and the temperature of the local runoff.

Staff Gage - A non-recording staff, marked in graduations of hundredths of feet, used to monitor stage through observation.

Stage - The height of the water surface above an established datum plane. Stage can be converted to true water surface elevation if the observations are converted into project datum.

Streamflow - Same as discharge but refers specifically to side channel, slough and tributary flow whereas discharge denotes in the mainstem. See Discharge.

Suitability Criteria Curve - A preference curve, modified by additional information, e.g. observations, professional judgment, field and literature data, etc., to represent the suitability of habitat for a particular species and lifestage over the range of habitat components expected to be encountered. This is the curve used to calculate weighted usable area (also suitability index curve and weighted habitat criteria). The x and y axes are established in the same manner as the utilization curves.

Suitability Curve - See suitability criteria curve.

Suitability Index - The label for the y-axis indicating standardization to the 0 - 1 scale for a suitability curve. Can also be used to indicate a value determined from a suitability curve.

Synthetic Data - Estimated data sets based on professional judgment used in the hydraulic modeling calibration process to fill in data gaps.

Thalweg Profile - A longitudinal profile that describes the streambed elevation of the deepest portion of mainstem, tributary, slough or other riverine habitats.

Thermal Infrared Imagery - the process by which thermal images are obtained through the use of thermal infrared sensors (imagers); the tone of the image or picture is directly related to the infrared radiation emitted from the object imaged.

Tributary Habitat - Consists of the full complement of environmental conditions that occur in the tributaries. Their seasonal flow, sediment, and thermal regimes reflect the integration of the hydrology, geology, and climate of the tributary drainage. The physical attributes of tributary habitat are not dependent on mainstem conditions.

Tributary Mouth Habitat - Extends from the uppermost point in the tributary influenced by mainstem Susitna River or slough backwater effects to the downstream extent of the tributary plume which extends into the mainstem Susitna River or slough.

Turbid - The condition of water quality at a site when water clarity is decreased by inorganic and/or organic suspended materials.

um - a millionth of a meter.

Upland Slough Habitat - Differs from side slough habitat in that the upstream end of the slough does not interconnect with the surface waters of the mainstem Susitna River or its side channels even at high mainstem discharges. These sloughs are characterized by the presence of beaver dams and an accumulation of silt covering the substrate resulting from the absence of mainstem scouring discharges.

Upper Reach (of the Susitna River) - The segment of the Susitna River between Devil Canyon and the headwaters (See also lower reach and middle reach).

USGS Water Year - The USGS water year runs from October to September and the years designation is determined by the end of the period. The 1983 water year occurs from October 1 of 1982 to September 30 of 1983.

Water Surface Profile (WSP) Model - See IFG-2 Model.

WSEL - Abbreviation for water surface elevation.

9.0 APPENDIX 1-A

LIST OF APPENDIX TABLES

LIST OF APPENDIX FIGURES

LIST OF APPENDIX FIGURES (Cont.)

LIST OF APPENDIX FIGURES (Cont.)

LIST OF APPENDIX FIGURES (Cont.)

LIST OF APPENDIX FIGURES (Cont.)

LIST OF APPENDIX FIGURES (Cont.)

Appendix Table 1-A-1 Mainstem Susitna River mean daily discharges determined by the USGS at their gaging station at Cantwell (15291500) for WY83 (Oct. 1982 - Sept. 1983).

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5570	1800	1400	1300	1200	1200	1100	2000	19100	16800	17100	16000
2	5200	1800	1400	1300	1200	1200	1100	2100	16600	18200	17400	15000
3	5000	1800	1400	1300	1200	1200	1100	2400	22400	19100	17000	14600
4	4700	1800	1400	1300	1200	1200	1100	2600	24500	17500	16500	12400
5	4400	1800	1400	1300	1200	1200	1100	3000	19100	18800	16500	10900
6	4100	1700	1400	1300	1200	1200	1100	3400	16200	20100	18200	9760
7	4000	1700	1400	1300	1200	1200	1100	3800	15000	22900	18400	8910
8	4000	1700	1400	1300	1200	1200	1100	4300	13600	20800	16900	8370
9	4000	1700	1400	1300	1200	1200	1100	4500	12200	18200	22200	7920
10	4000	1700	1400	1300	1200	1200	1100	5400	11600	16400	22300	7700
11	3900	1600	1400	1300	1200	1200	1100	6200	12300	15200	18200	7610
12	3800	1600	1400	1300	1200	1200	1100	7400	12800	15200	16100	7260
13	3600	1600	1400	1300	1200	1200	1100	8400	12700	14900	16500	6790
14	3500	1600	1400	1300	1200	1200	1100	9200	12200	15200	18100	6570
15	3500	1600	1400	1300	1200	1200	1100	10000	12900	13400	17200	6620
16	3200	1500	1400	1300	1200	1100	1100	11000	14400	12300	16000	6450
17	3100	1500	1400	1300	1200	1100	1100	11200	16500	13200	14700	6830
18	3100	1500	1400	1300	1200	1100	1100	12000	15400	15000	14100	5610
19	3200	1500	1400	1300	1200	1100	1100	11600	15400	15300	12800	5450
20	3200	1500	1400	1300	1200	1100	1200	10500	17700	14000	12000	5700
21	2900	1500	1400	1300	1200	1100	1200	10500	17100	14800	13000	7750
22	2500	1500	1400	1300	1200	1100	1200	9630	17500	15000	15000	11800
23	2300	1500	1400	1300	1200	1100	1200	9720	18300	15700	14600	13000
24	2200	1500	1400	1300	1200	1100	1300	10300	18100	17600	17100	10500
25	2100	1500	1400	1300	1200	1100	1300	8960	17700	15800	19900	7700
26	2000	1500	1400	1300	1200	1100	1400	9720	18100	15000	23800	6700
27	2000	1500	1400	1300	1200	1100	1500	10500	18800	14700	21200	5780
28	1900	1500	1400	1300	1200	1100	1600	9040	19400	14200	17600	5400
29	1900	1500	1400	1300		1100	1700	10400	18700	14700	15600	5900
30	1900	1500	1400	1300		1100	1800	14900	17400	16000	14800	9500
31	1800		1400	1300		1100		19100		17100	16300	

Appendix Table 1-A-2 Mainstem Susitna River mean daily discharges determined by the USGS at their gaging station at Gold Creek (15292000) for WY83 (Oct. 1982 - Sept. 1983).

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12400	4800	3000	2900	1900	1900	1500	3600	33000	23100	23000	25400
2	11700	4700	2900	2800	1900	1900	1500	3900	29000	24900	22400	25400
3	11000	4600	2900	2800	1900	1900	1500	4200	35000	26200	21600	23600
4	10500	4500	2900	2700	1900	1900	1500	4500	36000	24800	20900	21000
5	9800	4400	2800	2700	1900	1800	1500	4900	30000	25100	21700	18200
6	8960	4300	2800	2600	1900	1800	1500	5400	26000	26300	23800	16000
7	8640	4300	2800	2500	1900	1800	1500	5800	23000	27200	25000	14800
8	8480	4200	2700	2500	1900	1800	1500	6400	22000	27900	26000	13700
9	8440	4100	2700	2400	1900	1800	1500	7200	19400	26300	29900	13200
10	8480	4000	2700	2400	1900	1800	1500	8000	18000	22200	31900	12700
11	8220	4000	2600	2400	1900	1700	1500	9000	19000	20000	27700	12200
12	7950	3900	2600	2300	2000	1700	1500	10000	20000	19700	24500	11600
13	8040	3800	2600	2300	2000	1700	1600	12000	19900	19100	25900	11100
14	7800	3800	2600	2200	2100	1700	1600	13000	19000	19800	27400	10700
15	7110	3700	2600	2200	2100	1700	1600	15000	19600	18600	26800	10600
16	6750	3600	2500	2200	2100	1700	1700	17000	21600	16400	24600	10500
17	6660	3600	2500	2100	2100	1700	1700	19000	23300	16500	22700	10000
18	6720	3500	2500	2100	2100	1700	1800	20000	22900	18900	21000	9400
19	6900	3500	2400	2100	2100	1700	1800	21000	23000	20600	19200	8920
20	6800	3400	2400	2000	2100	1700	1900	21000	25000	18600	17800	9320
21	6500	3400	2400	2000	2100	1600	2000	20000	24000	18100	18900	11000
22	6200	3300	2400	2000	2100	1600	2000	19000	23600	18600	21600	13600
23	6000	3300	2400	2000	2100	1600	2100	18000	25400	19200	22700	17500
24	5900	3200	2400	2000	2000	1600	2300	17000	24000	22700	24700	15200
25	5700	3200	2300	2000	2000	1600	3400	16000	23300	21900	27400	12000
26	5600	3100	2300	2000	2000	1500	3500	16000	23000	19400	31700	10600
27	5400	3100	2400	2000	2000	1500	2700	17000	22000	18500	31000	9640
28	5300	3100	2400	2000	2000	1500	2900	16000	21900	17700	26600	9080
29	5200	3000	2600	2000		1500	3100	17000	26800	17300	23300	9400
30	5100	3000	2800	2000		1500	3300	25000	24700	19100	22900	11600
31	4900		2900	2000		1500		32000		22800	24800	

Appendix Table 1-A-3 Mainstem Susitna River mean daily discharges determined by the USGS at their gaging station at Sunshine (15292780) for WY83 (Oct. 1982 - Sept. 1983).

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30600	7800	5600	6800	4600	4100	3100	8400	64000	64400	58300	60500
2	26400	7600	5600	6800	4600	4100	3100	9400	65300	65300	57700	65200
3	26600	7400	5600	6600	4600	4000	3100	11000	70100	67400	56300	59300
4	24800	7200	5500	6400	4500	4000	3100	12000	80800	64800	55400	50600
5	23000	7000	5500	6200	4500	3900	3200	13000	64800	65500	57400	42500
6	21400	7000	5500	6000	4500	3900	3200	15000	54200	70900	60200	36600
7	20600	6800	5500	5800	4500	3800	3200	17000	52700	72800	62000	35000
8	20000	6800	5500	5600	4500	3800	3200	20000	49100	67000	70900	33000
9	19400	6600	5500	5500	4500	3700	3200	22000	45400	70900	97700	32000
10	19100	6600	5500	5400	4600	3700	3200	25000	41900	63000	100000	30000
11	18400	6400	5500	5300	4700	3600	3300	28800	40800	57000	82700	28000
12	18000	6400	5500	5200	4800	3600	3300	32400	43200	54000	68800	27000
13	18800	6200	5500	5100	4900	3500	3400	35600	44700	54400	72700	25000
14	17700	6200	5500	5000	5000	3500	3400	36400	45200	54400	74000	24000
15	15800	6000	5500	5000	5000	3400	3500	37800	47100	51000	67200	23000
16	14600	6000	5500	4900	5100	3400	3600	40600	50100	47900	58000	22000
17	15200	6000	5500	4800	5100	3400	3700	42200	52900	46400	52400	21000
18	14700	6000	5500	4800	5000	3300	3900	42400	53300	48600	48900	21000
19	14600	6000	5500	4700	5000	3300	4000	43000	54800	50000	45700	20000
20	14400	6000	5500	4700	4900	3300	4200	41000	60400	49100	43000	20000
21	13200	5800	5500	4700	4800	3200	4400	40000	63000	47900	48400	22000
22	11600	5800	5500	4700	4700	3200	4600	38000	63600	48800	51100	25000
23	11200	5800	5500	4700	4600	3200	4800	37000	66400	50400	53200	27200
24	9920	5800	5400	4700	4500	3200	5000	35000	67000	55900	54100	25000
25	9200	5800	5400	4700	4400	3200	5400	34000	66200	52300	55300	20800
26	8920	5600	5400	4600	4300	3100	5800	34000	66400	46900	56000	18800
27	8840	5600	5400	4600	4200	3100	6200	34000	66000	44000	58800	18300
28	8400	5600	5600	4600	4200	3100	6800	37000	67700	43500	53000	18000
29	8200	5600	6400	4600		3100	7200	43000	68800	44600	47700	19000
30	8000	5600	6800	4600		3100	7800	50000	67000	48100	48600	31400
31	7800		6800	4600		3100		58000		54400	62500	

Appendix Table 1-A-4 Mainstem Yentna River mean daily discharges determined by the USGS at their gaging station near Susitna Station (15294345) for WY83 (OCT. 1982 - SEPT. 1983).

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25900	7000	4600	4100	3000	3400	2700	14000	65200	50700	41800	27200
2	23100	7000	4600	4200	3000	3400	2600	16000	62100	50900	42200	27500
3	21400	7000	4600	4200	3000	3400	2600	18000	58400	49800	43100	27000
4	20900	7000	4600	4100	3000	3400	2600	20000	58600	48300	43300	24100
5	19100	6500	4400	4000	3000	3400	2550	22000	51300	49100	46200	21600
6	17500	6500	4400	3900	3000	3400	2500	23000	44500	51300	52000	19300
7	15400	6500	4400	3800	3000	3400	2500	24000	44000	57800	59000	17400
8	15000	6500	4400	3700	3000	3400	2500	24000	43800	53700	75000	16400
9	14200	6000	4400	3500	3000	3200	2500	23000	42600	51300	100000	16000
10	13600	6000	4400	3400	3000	3200	2500	24700	41700	48900	112000	15400
11	12700	6000	4200	3300	3100	3200	2500	24900	38500	46800	91200	15000
12	12500	6000	4200	3200	3200	3200	2500	25400	37600	45900	63400	14800
13	12600	6000	4200	3200	3300	3200	2600	26400	37300	47700	56600	14600
14	11900	5500	4200	3200	3400	3200	2700	29700	37100	49400	59200	15900
15	11400	5500	4000	3200	3400	3000	2800	31000	37100	49000	49900	19000
16	11000	5500	4000	3200	3400	3000	2900	28700	38500	47000	40400	16900
17	10500	5500	4000	3200	3400	3000	3100	26700	39200	46000	35600	13300
18	10500	5500	4000	3100	3400	3000	3300	26400	42000	45000	34600	12300
19	10000	5000	4000	3000	3400	3000	3500	26800	45000	43000	33600	11500
20	9500	5000	4000	3020	3400	3000	3800	27100	50000	41000	32600	11300
21	9500	5000	3800	3000	3400	3000	4100	27500	51000	39000	35300	12500
22	9000	5000	3800	3000	3400	3000	4600	28200	52000	38000	44300	14000
23	8500	5000	3800	3000	3400	2900	5200	28100	55000	40000	42500	13800
24	8500	5000	3800	3000	3400	2900	5800	28000	57500	42000	36400	12300
25	8000	4800	3800	3000	3400	2900	6800	27300	56300	37000	31100	11000
26	8000	4800	3800	3000	3400	2800	7800	26500	57300	32800	27300	10600
27	8000	4800	3800	3000	3400	2800	9000	26500	60200	32000	25200	10100
28	7500	4800	3800	3000	3400	2800	10000	25000	55800	32600	24500	9640
29	7500	4600	3800	3000		2800	11000	26000	52600	35500	25400	9640
30	7500	4600	3800	3000		2700	13000	29600	51700	39200	26300	12000
31	7000		4000	3000		2700		48500		41800	27700	

Appendix Table 1-A-5 Mainsten Susitna River mean daily discharges determined by the USGS at their gaging station at Susitna Station (15294350) for WY83 (Oct. 1982 - Sept. 1983).

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	67000	19000	12000	10500	7600	8200	6600	15000	105000	116000	98400	91800
2	63000	19000	12000	10500	7600	8200	6600	18000	115000	116000	100000	90800
3	60000	18000	12000	10000	7600	8200	6600	21000	125000	117000	101000	93900
4	56000	18000	11000	10000	7600	8000	6520	24000	130000	115000	99800	84200
5	50800	18000	11000	9500	7600	7800	6500	29000	120000	114000	103000	75500
6	45700	18000	11000	9500	7600	7600	6500	34000	110000	118000	107000	67800
7	42200	17000	11000	9200	7600	7600	6500	42000	100000	128000	107000	61800
8	40500	17000	11000	9000	7800	7400	6500	50000	90000	126000	116000	58100
9	38700	16000	10000	8600	7800	7400	6500	55900	80000	118000	183000	55900
10	37000	16000	10000	8400	7800	7400	6500	62000	75000	113000	218000	53800
11	35200	16000	10000	8200	8000	7200	6400	68000	70000	108000	182000	51800
12	33800	16000	10000	8000	8200	7200	6400	72000	70000	104000	134000	50300
13	34400	15000	10000	8000	8400	7000	6400	75000	75000	104000	122000	49100
14	34300	15000	10000	8000	8600	7000	6400	75000	80000	106000	129000	49000
15	32000	15000	10000	8000	8800	7000	6400	80000	80000	105000	121000	52000
16	29000	15000	9600	7800	9000	7000	6600	80000	90000	101000	105000	51400
17	29100	15000	9600	7800	9200	7000	6800	82000	95000	99200	94200	46600
18	29200	15000	9200	7800	9400	7000	6800	85000	100000	100000	89000	43100
19	27500	14000	9200	7800	9400	6800	7000	85000	100000	98600	84900	40700
20	28000	14000	9000	7800	9400	6800	7200	80000	105000	96200	81500	40200
21	27000	14000	9000	7800	9200	6800	7400	75000	110000	94900	82800	43000
22	25000	14000	8800	7800	9200	6800	7800	70000	116000	95300	95200	47900
23	24000	14000	8800	7800	9000	6600	8000	66000	120000	93300	96400	51400
24	23000	13000	8800	7800	9000	6600	8500	64000	124000	96600	95600	51900
25	22000	13000	8800	7800	8800	6600	9000	62000	122000	94200	92500	45900
26	21000	13000	8800	7800	8600	6600	9500	64000	123000	88600	87600	40900
27	21000	13000	8800	7800	8600	6600	10500	66000	125000	83800	87600	39000
28	20000	12000	8800	7600	8400	6600	11500	70000	122000	82500	85800	37300
29	20000	12000	9000	7600		6600	12500	75000	120000	84500	81500	35000
30	19000	12000	9400	7600		6600	14000	85000	119000	88700	79800	46000
31	19000		10000	7600		6600		95000		94000	85800	

Appendix Table 1-A-6 Comparison of mainstem water surface elevations to mean daily mainstem discharge (cfs) obtained at the USGS gaging station at Gold Creek, (15292000).

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT WHISKERS SLOUGH MOUTH (101.2M4 AT R.M. 101.2)	831103	1525	362.57	4,500
	831027	1655	362.60	5,020
	821012	1633	362.73	7,950
	821009	1030	362.89	8,440
	821007	1415	362.96	8,640
	831011	1445	363.22	9,520
	830916	0940	363.29	10,500
	820822	1630	363.44	12,200
	830911	1010	363.55	12,200
	820823	1124	363.47	12,300
	831001	1505	363.83	13,200
	820909	1250	363.64	13,400
	820813	1420	363.70	13,600
	820927	1825	363.83	13,800
	820903	1545	363.97	14,600
	820831		364.07	16,000
	820807	1347	364.13	16,500
	820808	1950	364.22	16,600
	830529	1045	364.14	17,000
	830720	1835	364.40	18,600
	830722	1850	364.45	18,600
	830720	0900	364.49	18,600
	830822	1220	364.76	21,600
	830805	1635	364.82	21,700
	830619	1125	364.90	23,000
	830619	1830	364.99	23,000
	830617	1142	364.95	23,300
	830621	1730	365.24	24,000
	820920	1450	365.39	24,000
	830807	1450	365.25	25,000
	820715	1110	365.38	25,600
	830808	1920	365.63	26,000
	830703	1645	365.22	26,200
	830706	1405	365.27	26,300
	830828	1052	365.53	26,600

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT WHISKERS SLOUGH HEAD (101.5M6 AT R.M. 101.5)	831103	1520	365.11	4,500
	831027	1650	365.19	5,020
	831020	1645	365.71	7,230
	831011	1441	365.92	9,520
	830916	1020	366.03	10,500
	830911	0930	366.33	12,200
	831001	1530	366.60	13,200
	830716	1145	366.82	16,400
	830529	1045	366.85	17,000
	830720	1830	367.16	18,600
	830722	1825	367.23	18,600
	830822	1255	367.64	21,600
	830805	1630	367.72	21,700
	830619	1120	367.68	23,000
	830617	1735	367.86	23,300
	830807	1455	368.07	25,000
	830808	1900	368.36	26,000
	830703		368.02	26,200
	830706	1400	368.11	26,300
	830828	1055	368.24	26,600

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
TALKEETNA FISHWHEEL STATION (103.0F1 AT R.M. 103.0)	821012	1150	374.90	7,950
	821011	1325	374.97	8,220
	821009	1350	375.04	8,440
	821010	1310	375.06	8,480
	821008	1300	375.07	8,480
	821006	1305	375.26	8,960
	831011	1439	375.46	9,520
	831005	1100	375.73	10,300
	830916	1110	375.71	10,500
	830915	0947	375.74	10,600
	830921	1557	375.76	11,000
	831004	1005	376.18	11,400
	830912	0920	375.99	11,600
	820908	1535	375.99	11,900
	820822	1000	375.98	12,200
	820829	1000	376.00	12,200
	820821	1415	376.05	12,200
	830911	0910	376.13	12,200
	820823	1000	376.02	12,300
	820828	1725	376.10	12,400
	820929	1345	376.12	12,400
	820930	0830	376.09	12,500
	820820	1100	376.12	12,500
	820827	1715	376.24	12,900
	820928	1410	376.27	12,900
	831003	1140	376.45	13,000
	820912	1420	376.33	13,200
	831001	1900	376.51	13,200
	820909	1440	376.32	13,400
	830922	0910	376.04	13,600
	820814	1505	376.39	13,600
	820911	1530	376.39	13,600
	820905	2030	376.43	13,600
	820927	1610	376.47	13,800
	831002	0840	376.66	13,800
	820910	1440	376.60	14,400
	820812	2000	376.61	14,400
	820815	1300	376.58	14,800
	820925	1410	376.76	15,000
	820913	1520	376.72	15,200
	820816	0930	376.80	15,600
	830526	0830	376.83	16,000
	830525	1450	377.07	16,000
	830525	0830	377.21	16,000
	830716	1100	376.88	16,400

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
TALKEETNA FISHWHEEL STATION (103.0F1 AT R.M. 103.0) (continued)	830717	0900	376.78	16,500
	820707	1715	376.86	16,600
	830529	0830	376.91	17,000
	830527	0830	377.15	17,000
	830524	0800	377.22	17,000
	820924	1530	377.13	17,100
	830729	0925	376.96	17,300
	830923	0900	377.08	17,500
	830728	0920	377.08	17,700
	830820	0855	377.18	17,800
	830523	0803	377.24	18,000
	830610	0830	377.32	18,000
	830721	1000	377.05	18,100
	830727	0915	377.22	18,500
	830722	1015	377.21	18,600
	830720	0900	377.32	18,600
	830715	1000	377.37	18,600
	830718	0900	377.03	18,900
	830821	0915	377.23	18,900
	830611	0900	377.18	19,000
	830522	1000	377.33	19,000
	830614	0815	377.43	19,000
	830730	0840	377.12	19,100
	830713	1000	377.26	19,100
	830723	1030	377.18	19,200
	830819	0910	377.49	19,200
	830726	0910	377.42	19,400
	820923	1800	377.53	19,400
	830609	0800	377.66	19,400
	830615	0800	377.38	19,600
	830712	1000	377.33	19,700
	830714	1000	377.38	19,800
	830613	0815	377.50	19,900
	830521	1000	377.37	20,000
	830612	0830	377.39	20,000
	830711	1000	377.47	20,000
	820914	1510	377.75	20,200
	830719	0900	377.63	20,600
	830804	2010	377.69	20,900
	830520	1245	377.35	21,000
	830519	1000	377.64	21,000
	830818	1005	377.78	21,000
	830616	0900	377.61	21,600
	830822	0910	377.66	21,600
	830803	0930	377.74	21,600

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
TALKEETNA FISHWHEEL STATION (103.0F1 AT R.M. 103.0) (continued)	830805	0950	377.71	21,700
	820721	2400	377.92	21,900
	830725	0915	377.94	21,900
	830628	0800	378.51	21,900
	830608	0800	378.04	22,000
	830627	0800	378.19	22,000
	830710	1000	377.93	22,200
	820922	1255	378.20	22,300
	830802	0910	377.94	22,400
	820802	1425	378.21	22,500
	830724	1010	377.89	22,700
	830823	0835	377.93	22,700
	830731	1110	377.79	22,800
	830618	0900	378.18	22,900
	830619	0900	377.94	23,000
	830619	1140	377.99	23,000
	830801	0855	378.01	23,000
	830626	0800	378.05	23,000
	830607	0800	378.39	23,000
	830701	1200	377.95	23,100
	830617	0905	378.03	23,300
	830625	0830	378.25	23,300
	830622	0800	378.29	23,600
	820729	1630	378.31	23,600
	830806	0920	377.96	23,800
	830624	0825	378.35	24,000
	830621	0850	378.36	24,000
	820920	1610	378.51	24,000
	820921	1340	378.41	24,200
	830709	1000	378.29	24,300
	830812	0820	378.44	24,500
	830824	0815	378.00	24,700
	830630	0800	378.28	24,700
	830704	0900	378.22	24,800
	830702	1000	377.89	24,900
	820719	0715	378.42	24,900
	830530	0830	377.88	25,000
	830620	0900	378.14	25,000
	830807	0920	378.40	25,000
	830530	1535	378.41	25,000
	830530	1845	378.72	25,000
	830530	2310	378.86	25,000
	830705	1000	378.03	25,100
	830623	0820	378.34	25,400
	820718	2300	378.43	25,400

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
TALKEETNA FISHWHEEL STATION (103.0F1 AT R.M. 103.0) (continued)	820716	1300	378.42	25,600
	830813	0745	378.43	25,900
	830808	0905	378.35	26,000
	830606	0930	378.58	26,000
	830703	1000	378.35	26,200
	830706	1100	378.42	26,300
	820801	1645	378.76	26,400
	820730	1320	378.90	26,400
	830828	0925	378.82	26,600
	830629	0900	378.58	26,800
	820724	1345	378.87	26,800
	820918	1217	379.02	26,800
	820625	2200	378.99	27,000
	830707	0900	378.48	27,200
	820714	0745	378.81	27,300
	830825	0835	378.60	27,400
	830811	0850	379.25	27,700
	830708	1200	378.98	27,900
	820731	1100	379.24	28,400
	830602	0810	379.07	29,000
	820727	1535	379.24	29,100
	830809	0950	379.00	29,900
	830605	0900	379.68	30,000
	830827	0710	379.55	31,000
	830826	0815	379.11	31,700
	820726	1430	379.88	31,800
	830810	0910	379.75	31,900
	820725	1255	379.95	31,900
	830531	0815	379.15	32,000
	830531	1805	379.75	32,000
	820916	1445	380.01	32,500
	830601	0800	379.66	33,000
	830601	1800	379.90	33,000
	830603	0830	379.06	35,000
	830603	1150	379.31	35,000
	830603	2245	380.58	35,000
	830604	0815	380.45	36,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 9 (103.2M1 AT R.M. 103.2)	831020	1640	377.97	7,230
	831011	1434	378.51	9,520
	830917	0850	378.60	10,000
	830916	1112	378.76	10,500
	830915	1004	378.76	10,600
	830911	1500	379.18	12,200
	830923	0921	380.41	17,500
	830722	1240	380.64	18,600
	830805	1605	381.51	21,700
	830704	1110	381.70	24,800
	830807	1030	381.96	25,000
	830808	1030	381.92	26,000
	830808	1810	382.54	26,000
	830706	1245	382.02	26,300
	830828	1100	382.71	26,600
	830825	1033	382.30	27,400
	830827	0910	383.46	31,000
	830826	0920	383.00	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 10B (105.9Ml AT R.M. 105.9)	831103	1506	400.18	4,500
	831020	1630	400.92	7,230
	831011	1431	401.34	9,520
	830916	1205	401.28	10,500
	830915	1012	401.31	10,600
	830912	0930	401.49	11,600
	831003	1255	401.78	13,000
	830528	1845	402.19	16,000
	830529	1615	402.36	17,000
	830720	1820	402.39	18,600
	830612	1130	402.56	20,000
	830822	1515	402.89	21,600
	830805	1600	402.92	21,700
	830619	1110	402.98	23,000
	830808	1804	403.71	26,000
	830706	1240	403.40	26,300
	830828	1115	403.65	26,600
	830826	0930	404.09	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 10C (106.4M1 AT R.M. 106.4)	831020	1630	406.16	7,230
	831011	1430	406.53	9,520
	830916	1235	406.59	10,500
	830915	1014	406.64	10,600
	830912	0940	406.81	11,600
	831003	1310	407.15	13,000
	830528	1815	407.51	16,000
	830529	1650	407.58	17,000
	830529	1630	407.65	17,000
	830720	1820	407.74	18,600
	830612	1143	407.94	20,000
	830822	1525	408.21	21,600
	830805	1555	408.05	21,700
	830619	1105	408.22	23,000
	830808	1800	408.86	26,000
	830706	1230	408.55	26,300
	830828	1115	408.79	26,600
	830826	0935	409.09	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 11 (106.7M1 AT R.M. 106.7)	831103	1500	406.61	4,500
	831020	1625	407.63	7,230
	831011	1427	407.97	9,520
	830916	1310	408.07	10,500
	830915	1016	408.11	10,600
	830912	0945	408.31	11,600
	831003	1320	408.67	13,000
	830528	1720	409.09	16,000
	830529	1700	409.24	17,000
	830720	1815	409.45	18,600
	830612	1200	409.59	20,000
	830822	1550	409.91	21,600
	830805	1550	410.03	21,700
	830619	1100	410.00	23,000
	830808	1758	410.71	26,000
	830706	1230	410.41	26,300
	830828	1115	410.67	26,600
	830826	0940	410.96	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT SLOUGH 6A MOUTH	821006	1600	455.06	8,960
(112.3W1 AT R.M. 112.3)	820807	1205	456.43	16,500
	820722	1550	457.11	22,400
	820729	1445	457.29	23,600
	820921	1000	457.41	24,200
	820723	1100	457.27	24,900
	820917	1720	458.22	32,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 16 (112.4M2 AT R.M. 112.4)	830917	0945	455.64	10,000
	830916	1412	455.71	10,500
	830915	1042	455.71	10,600
	831004	1125	456.11	11,400
	830912	1140	455.92	11,600
	830922	1823	455.95	13,600
	830528	1254	456.60	16,000
	830528	1240	456.85	16,000
	830720	1750	457.02	18,600
	830722	1710	457.09	18,600
	830612	1300	457.19	20,000
	830822	1717	457.49	21,600
	830805	1518	457.42	21,700
	830619	0950	457.46	23,000
	830824	1630	457.73	24,700
	830807	1535	457.76	25,000
	830808	1733	457.98	26,000
	830706	1210	457.86	26,300
	830809	1500	458.25	29,900
	830826	1045	458.31	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 18 (113.0M1 AT R.M. 113.0)	831103	1436	459.27	4,500
	831027	1630	459.56	5,020
	831020	1620	460.43	7,230
	821012	1623	459.92	7,950
	821008	1500	460.14	8,480
	831011	1324	460.68	9,520
	821004	1325	460.65	10,500
	830916	1416	460.90	10,500
	830915	1050	460.93	10,600
	831004	1210	461.26	11,400
	830912	1230	461.16	11,600
	820909	1645	461.36	13,400
	830922	1820	461.63	13,600
	820903	1600	461.64	14,600
	820831		461.66	16,000
	820920	1518	462.89	24,000
	830824	1625	463.27	24,700
	830807	1820	463.27	25,000
	830808	1055	463.37	26,000
	830808	1728	463.66	26,000
	830825	1105	463.51	27,400
	830825	1845	464.07	27,400
	830825	1010	464.25	27,400
	830826	1535	464.33	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM BELOW LANE CREEK MOUTH (113.4M6 AT R.M. 113.4)	831103	1431	462.19	4,500
	831020	1620	463.64	7,230
	831011	1321	464.03	9,520
	830916	1418	464.32	10,500
	830915	1052	464.43	10,600
	831004	1220	464.68	11,400
	830912	1310	464.52	11,600
	830912	1145	464.54	11,600
	830922	1815	465.14	13,600
	830528	1045	465.48	16,000
	830716	1135	465.38	16,400
	830720	1635	465.83	18,600
	830615	1820	466.07	19,600
	830612	1320	466.03	20,000
	830616	1620	466.35	21,600
	830805	1500	466.37	21,700
	830619	1000	466.34	23,000
	830807	1540	466.87	25,000
	830808	1705	467.26	26,000
	830706	1200	466.89	26,300
	830825	1655	467.19	27,400
	830826	1545	468.12	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT LANE CREEK MOUTH (113.6M9 AT R.M. 113.6)	830716	1140	466.73	16,400
	830820	1307	467.09	17,800
	830710	1100	467.73	22,200
	830625	1030	467.72	23,300
	830622	1100	467.75	23,600
	830622	1242	467.75	23,600
	830807	1540	467.87	25,000
	830623	1030	467.92	25,400
	830808	1720	468.18	26,000
	830825	1730	468.13	27,400
	830814	1140	468.23	27,400
	830826	1545	468.87	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM ABOVE LANE CREEK MOUTH (113.7M5 AT R.M. 113.7)	831103	1425	464.53	4,500
	831020	1615	465.91	7,230
	831011	1319	466.26	9,520
	830916	1421	466.55	10,500
	830915	1056	466.65	10,600
	831004	1225	466.91	11,400
	830912	1505	466.84	11,600
	830912	1121	466.86	11,600
	830922	1817	467.61	13,600
	830528	0950	468.35	16,000
	830716	1230	468.06	16,400
	830720	1630	468.52	18,600
	830615	1730	468.71	19,600
	830612	1330	468.71	20,000
	830805	1455	469.23	21,700
	830710	1201	469.25	22,200
	830802	1130	469.24	22,400
	830619	1000	469.17	23,000
	830530	1750	470.61	25,000
	830808	1700	470.09	26,000
	830706	1200	469.68	26,300
	830825	1700	470.13	27,400
	830809	1920	470.51	29,900
	830826	1550	470.62	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM ABOVE MAINSTEM 2 MOUTH (114.4M1 AT R.M. 114.4)	831011	1316	475.02	9,520
	830916	1830	475.15	10,500
	830915	1100	475.17	10,600
	831004	1325	475.34	11,400
	830922	1800	475.65	13,600
	830720	1300	476.30	18,600
	830612	1540	476.47	20,000
	830805	1430	476.82	21,700
	830619	1010	476.83	23,000
	830806	1930	477.06	23,800
	830824	1440	477.21	24,700
	830808	1120	477.30	26,000
	830706	1150	477.36	26,300
	830825	1120	477.54	27,400
	830826	1800	478.53	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM A/B MAINSTEM 2 NW HEAD (115.5M4 AT R.M. 115.5)	831103	1415	479.84	4,500
	831020	1610	480.99	7,230
	831011	1312	481.39	9,520
	831005	1145	481.71	10,300
	830916	1755	481.62	10,500
	830915	1104	481.65	10,600
	830912	1705	481.88	11,600
	830922	1805	482.47	13,600
	830526	1630	482.92	16,000
	830721	1950	483.23	18,100
	830720	1250	483.30	18,600
	830611	1430	483.24	19,000
	830611	1345	483.49	19,000
	830805	1250	483.84	21,700
	830619	1015	483.91	23,000
	830806	1920	484.12	23,800
	830824	1355	484.24	24,700
	830530	1537	484.53	25,000
	830808	1118	484.39	26,000
	830706	1145	484.39	26,300
	830825	1130	484.57	27,400
	830826	1835	485.50	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM A/B MAINSTEM 2 NE HEAD (115.9M2 AT R.M. 115.9)	831103	1410	481.15	4,500
	831027	1620	481.67	5,020
	831020	1600	482.42	7,230
	831011	1307	483.07	9,520
	831005	1205	483.40	10,300
	830916	1710	483.31	10,500
	830915	1109	483.31	10,600
	830912	1710	483.59	11,600
	830922	1808	484.24	13,600
	830526	1515	484.58	16,000
	830721	1940	485.08	18,100
	830720	1200	485.20	18,600
	830611	1430	485.04	19,000
	830612	1345	485.32	20,000
	830805	1240	485.74	21,700
	830619	1020	485.78	23,000
	830806	1915	486.13	23,800
	830824	1340	486.19	24,700
	830530	1430	486.35	25,000
	830808	1116	486.43	26,000
	830706	1136	486.37	26,300
	830825	1130	486.62	27,400
	830827	1020	487.45	31,000
	830826	1840	487.62	31,700

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 24 (120.7M1 AT R.M. 120.7)	831103	1400	519.93	4,500
	831027	1605	520.17	5,020
	831020	1600	521.08	7,230
	821012	1617	520.88	7,950
	821008	1300	521.04	8,480
	831011	1253	521.48	9,520
	831005	1320	521.72	10,300
	821004	1139	521.60	10,500
	830916	1447	521.67	10,500
	830915	1625	521.73	10,600
	820907	1000	521.70	11,700
	820908	0930	521.72	11,900
	820829	1500	521.82	12,200
	820906	1800	521.82	12,200
	820930	1652	522.06	12,500
	831003	0954	521.79	13,000
	820830	1330	522.01	13,100
	820912	1030	522.06	13,200
	820909	1645	522.08	13,400
	820911	1030	522.12	13,600
	820910	0945	522.22	14,400
	820903	1350	522.35	14,600
	820913	1220	522.49	15,200
	830924	1650	522.59	15,200
	820831	1230	522.58	16,000
	820914	1600	523.18	20,200
	830619	1230	523.66	23,000
	820919	1226	524.05	24,100
	830824	1224	523.90	24,700
	830807	1250	524.00	25,000
	830828	1557	524.01	26,600
	830809	1010	524.46	29,900
	830827	1040	524.90	31,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 28 (124.4M1 AT R.M. 124.4)	831103	1355	550.82	4,500
	821008	1000	552.39	8,480
	831011	1248	552.58	9,520
	821004	1129	553.14	10,500
	830916	1420	553.20	10,500
	830915	1558	553.24	10,600
	830914	1815	553.28	10,700
	820930	1352	553.80	12,500
	831003	1453	553.90	13,000
	820909	1645	554.17	13,400
	820903	1233	554.47	14,600
	820902	1836	554.61	16,000
	830615	1700	555.63	19,600
	830804	1601	556.34	20,900
	830805	1150	556.14	21,700
	830823	1030	556.25	22,700
	830619	1148	556.26	23,000
	820919	1201	556.77	24,100
	830630	1215	556.52	24,700
	830706	1210	556.54	26,300
	830828	1548	556.88	26,600
	830825	1224	557.03	27,400
	830809	1035	557.38	29,900
	830827	1055	557.72	31,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL AT SLOUGH 8A MOUTH (125.3M4 AT R.M. 125.3)	830924	1150	562.54	15,200
	830721	1100	562.77	18,100
	830718	1200	562.93	18,900
	830804	1523	563.09	20,900
	830803	1505	563.21	21,600
	830607	1430	563.42	23,000
	830630	1220	563.33	24,700
	830623	1015	563.54	25,400
	830902	1630	563.55	25,400
	830606	1700	563.54	26,000
	830814	1345	563.71	27,400
	830809	1040	563.87	29,900
	830809	1730	564.13	29,900
	830605	1005	564.07	30,000
	830827	1115	564.09	31,000
	830604	1750	564.68	36,000
	830604	1000	564.78	36,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 29 (125.3M3 AT R.M. 126.1)	821012	1608	568.41	7,950
	831011	1238	569.18	9,520
	821004	1123	569.51	10,500
	821001	1100	570.02	12,400
	820909	1640	570.41	13,400
	820831		570.91	16,000
	830716	1930	571.45	16,400
	830721	1920	571.89	18,100
	830720	1115	572.00	18,600
	830615	1448	572.16	19,600
	830805	1130	572.54	21,700
	830823	1000	572.64	22,700
	830619	1142	572.61	23,000
	830625	1010	572.86	23,300
	820920	1131	572.18	24,000
	830630	1540	572.80	24,700
	830630	1220	573.23	24,700
	830623	0948	573.16	25,400
	830706	1159	573.11	26,300
	830828	1544	573.15	26,600
	830825	1234	573.35	27,400
	830809	1415	572.81	29,900
	830605	1015	573.88	30,000
	830827	1240	573.96	31,000
	830531	1308	574.12	32,000
	830603	1900	574.75	35,000
	830604	1800	574.60	36,000
	830604	1000	574.75	36,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM ABOVE SLOUGH 8A NE HEAD (125.3M6 AT R.M. 127.1)	830916	1411	579.98	10,500
	830914	1630	580.08	10,700
	830721	1915	581.44	18,100
	830720	1125	581.54	18,600
	830718	1015	581.95	18,900
	830615	1150	581.70	19,600
	830804	2033	581.78	20,900
	830805	1120	582.05	21,700
	830823	0930	582.06	22,700
	830619	1140	582.29	23,000
	830825	1341	582.77	27,400
	830827	1210	583.37	31,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 31 (128.7M1 AT R.M. 128.7)	831103	1330	594.34	4,500
	831027	1550	594.50	5,020
	831020	1545	595.54	7,230
	821012	1605	595.05	7,950
	831011	1222	595.92	9,520
	821004	1117	595.95	10,500
	830916	1407	596.13	10,500
	830914	1320	596.15	10,700
	821001	1259	596.39	12,400
	831003	1530	596.71	13,000
	820909	1640	596.92	13,400
	820903	1220	597.15	14,600
	820902	1619	597.29	16,000
	830614	1336	597.71	19,000
	830818	1540	597.94	21,000
	830805	1100	598.07	21,700
	830805	1400	598.15	21,700
	820919	1103	598.38	24,100
	830808	1845	598.72	26,000
	830828	1533	598.50	26,600
	830825	1446	598.66	27,400
	830810	0935	599.39	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 32 (129.7M1 AT R.M. 129.7)	831103	1330	606.05	4,500
	831027	1540	606.15	5,020
	831020	1540	606.53	7,230
	831011	1216	606.70	9,520
	830916	1402	606.81	10,500
	830914	1355	606.82	10,700
	831003	1533	607.11	13,000
	830720	1105	607.40	18,600
	830613	1644	607.54	19,900
	830818	1545	607.61	21,000
	830803	1240	607.57	21,600
	830805	1055	607.61	21,700
	830805	1438	607.61	21,700
	830619	1133	607.66	23,000
	830630	1150	607.76	24,700
	830630	1152	607.76	24,700
	830623	1400	607.90	25,400
	830808	1840	607.96	26,000
	830706	1109	607.81	26,300
	830828	1530	607.81	26,600
	830825	1450	607.91	27,400
	830809	1745	608.36	29,900
	830810	0940	608.38	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 33 (130.1M1 AT R.M. 130.1)	831103	1140	611.13	4,500
	831027	1515	611.28	5,020
	831020	1540	611.82	7,230
	831011	1213	612.14	9,520
	830916	1400	612.25	10,500
	830914	1430	612.26	10,700
	831003	1534	612.32	13,000
	830720	1100	613.16	18,600
	830614	1216	613.11	19,000
	830819	1131	613.49	19,200
	830818	1545	613.36	21,000
	830803	1230	613.43	21,600
	830805	1050	613.41	21,700
	830623	1400	613.76	25,400
	830808	1840	613.81	26,000
	830706	1056	613.63	26,300
	830828	1529	613.71	26,600
	830825	1451	613.75	27,400
	830809	1750	614.21	29,900
	830810	0940	614.22	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 34 (130.5M1 AT R.M. 130.5)	831103	1130	613.78	4,500
	831027	1505	614.09	5,020
	831020	1535	615.12	7,230
	831011	1207	615.32	9,520
	830916	1358	615.55	10,500
	830914	1510	615.53	10,700
	831003	1535	616.01	13,000
	830720	1055	616.97	18,600
	830614	1140	616.93	19,000
	830818	1550	617.27	21,000
	830803	0940	617.37	21,600
	830805	1050	617.33	21,700
	830619	1130	617.54	23,000
	830630	1157	617.54	24,700
	830623	1400	617.89	25,400
	830808	1835	617.94	26,000
	830706	1105	617.74	26,300
	830828	1527	617.77	26,600
	830825	1453	617.84	27,400
	830809	1800	618.09	29,900
	830810	0945	618.46	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 35	831103	1122	615.29	4,500
(130.9M1 AT R.M. 130.8)	831027	1500	615.62	5,020
	831020	1535	616.52	7,230
	821004	1107	617.14	10,500
	830916	1355	617.23	10,500
	821001	1406	617.58	12,400
	830910	1143	617.81	12,700
	831003	1534	617.87	13,000
	830909	1143	617.81	13,200
	820909	1630	618.05	13,400
	820903	1210	618.28	14,600
	820902	1518	618.47	16,000
	820831		618.55	16,000
	830613	1450	619.19	19,900
	830818	1550	619.37	21,000
	830803	1604	619.40	21,600
	830803	0945	619.48	21,600
	830805	1045	619.42	21,700
	830823	1102	619.56	22,700
	830619	1127	619.55	23,000
	820919	1040	619.86	24,100
	830623	1400	620.17	25,400
	830808	1723	620.27	26,000
	830808	1835	620.27	26,000
	830828	1525	620.00	26,600
	830825	1455	620.26	27,400
	820915	1047	620.66	28,200
	830809	1800	620.97	29,900
	830826	1121	620.97	31,700
	830810	0945	621.07	31,900
	820917	1016	621.08	32,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM B/L 4TH OF JULY CR (131.1M3 AT R.M. 131.1)	821012	1603	615.17	7,950
	831011	1158	615.53	9,520
	830912	1452	615.46	11,600
	820907	1750	615.64	11,700
	820822	1340	615.63	12,200
	830910	1058	615.59	12,700
	831003	1540	615.55	13,000
	820813	1235	615.69	13,600
	820818	1735	615.74	14,200
	820902	1705	616.01	16,000
	830613	1415	616.11	19,900
	830803	1700	616.38	21,600
	830803	1550	616.41	21,600
	830803	1115	616.53	21,600
	830822	1230	616.56	21,600
	830805	1430	616.52	21,700
	830823	1037	616.67	22,700
	830624	1644	617.23	24,000
	830709	1130	616.74	24,300
	830808	1653	617.73	26,000
	830828	1523	617.28	26,600
	830828	1602	617.31	26,600
	820915	1100	618.19	28,200
	830826	1115	618.55	31,700
	820917	1104	618.72	32,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 37	831103	1115	626.49	4,500
(131.8M1 AT R.M. 131.8)	831027	1450	626.80	5,020
	831020	1530	627.26	7,230
	831011	1155	627.47	9,520
	830916	1352	627.81	10,500
	830910	1221	628.31	12,700
	831003	1242	628.21	13,000
	830614	1033	629.33	19,000
	830803	1608	629.84	21,600
	830805	1426	629.00	21,700
	830823	1020	629.92	22,700
	830619	1122	629.90	23,000
	830808	1653	630.80	26,000
	830828	1521	630.36	26,600
	830825	1459	630.56	27,400
	830826	1125	631.00	31,700
	830810	1240	631.12	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT SIDE CHANNEL 10 MOUTH (133.8M6 AT R.M. 133.8)	831103	1110	649.62	4,500
	831027	1445	649.96	5,020
	831019	1258	650.47	8,010
	831011	1149	650.77	9,520
	830916	1346	650.86	10,500
	831003	1237	651.18	13,000
	830717	1724	651.53	16,500
	830729	1839	651.58	17,300
	830728	1410	651.63	17,700
	830727	1015	651.70	18,500
	830730	1112	651.78	19,100
	830726	1300	651.73	19,400
	830803	1638	651.92	21,600
	830805	1422	651.92	21,700
	830725	1020	651.98	21,900
	830710	1755	651.88	22,200
	830724	1020	652.03	22,700
	830823	1120	652.07	22,700
	830731	1122	652.06	22,800
	830618		651.96	22,900
	830619	1116	651.96	23,000
	830626	1400	652.33	23,000
	830625	1630	652.18	23,300
	830622	1805	652.18	23,600
	830806	1100	652.13	23,800
	830624	1026	652.18	24,000
	830623	1400	652.33	25,400
	830813	1225	652.43	25,900
	830808	1150	652.28	26,000
	830808	1649	652.43	26,000
	830828	1516	652.26	26,600
	830629	1520	652.31	26,800
	830825	1505	652.48	27,400
	830810	1345	653.08	31,900
	830810	0848	653.26	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 40 (134.3Ml AT R.M. 134.3)	831103	1105	654.75	4,500
	831027	1430	654.99	5,020
	821012	1601	655.44	7,950
	831019	1255	655.57	8,010
	831011	1146	655.80	9,520
	821004	1059	655.83	10,500
	830916	1344	655.90	10,500
	830911	1434	656.06	12,200
	821001	1631	655.99	12,400
	830910	1303	656.13	12,700
	830910	1713	656.15	12,700
	831003	1235	655.99	13,000
	830909	1624	656.17	13,200
	820909	1430	656.24	13,400
	820902	1452	656.47	16,000
	820831		656.49	16,000
	830729	1730	656.71	17,300
	830728	1410	656.84	17,700
	830727	1015	656.93	18,500
	830713	1605	656.84	19,100
	830730	1115	656.94	19,100
	830609	1132	656.91	19,400
	830613	1107	656.94	19,900
	820914	1815	657.12	20,200
	830803	1840	657.19	21,600
	830805	1420	657.33	21,700
	830725	1020	657.29	21,900
	830608	1736	657.26	22,000
	830608	1135	657.27	22,000
	830710	1755	657.21	22,200
	830823	1322	657.41	22,700
	830724	1528	657.47	22,700
	830731	1125	657.47	22,800
	830619	1115	657.41	23,000
	830607	1637	657.59	23,000
	830625	1630	657.69	23,300
	830622	1805	657.94	23,600
	830806	1100	657.57	23,800
	830624	1026	657.67	24,000
	820919	1006	657.60	24,100
	830709	1520	657.51	24,300
	830702	1655	657.66	24,900
	830813	1225	657.89	25,900
	830606	1045	657.74	26,000
	830808	1148	657.87	26,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 40	830808	1648	658.07	26,000
(134.3M1 AT R.M. 134.3)	830825	1508	658.04	27,400
(continued)	830708	1615	657.94	27,900
	820915	1119	658.37	28,200
	830605	1430	658.17	30,000
	830826	1728	658.74	31,700
	830810	1340	658.59	31,900
	830810	0844	658.69	31,900
	820917	1005	658.67	32,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT SLOUGH 16B MOUTH (138.0M2 AT R.M. 138.0)	831103	1036	693.24	4,500
	831027	1245	693.60	5,020
	831020	0935	694.50	7,230
	821012	1551	694.22	7,950
	831019	1151	694.64	8,010
	831007		694.77	8,760
	831011	1110	695.12	9,520
	830916	1145	695.51	10,500
	830914	1535	695.53	10,700
	821002	1425	695.62	11,700
	820822	1440	696.06	12,200
	831003	1212	696.33	13,000
	820909	1420	696.49	13,400
	820813	1105	696.53	13,600
	820902	1115	697.05	16,000
	820914	1656	698.04	20,200
	830822	0947	698.32	21,600
	830805	1354	697.30	21,700
	830619	0944	698.46	23,000
	820920	1340	698.69	24,000
	820919	1705	698.72	24,100
	820723	1000	698.74	24,900
	830808	1640	699.44	26,000
	830828	1506	699.06	26,600
	830825	0806	699.29	27,400
	820915	1259	699.93	28,200
	830809	1648	699.04	29,900
	820726	1230	700.00	31,800
	820725	1105	700.05	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT HEAD OF SLOUGH 16B (138.0M4 AT R.M. 138.3)	820909	1420	701.98	13,400
	820813	1020	702.02	13,600
	820831	1900	702.55	16,000
	830612	1743	703.09	20,000
	820914	1623	703.32	20,200
	830804	1600	703.25	20,900
	830822	0953	703.40	21,600
	830805	1330	703.46	21,700
	830619	1010	703.49	23,000
	830701	1600	703.44	23,100
	820920	1330	703.76	24,000
	820919	1540	703.73	24,100
	830808	1635	704.24	26,000
	830706	0950	703.93	26,300
	830828	1503	703.95	26,600
	820915	1249	704.72	28,200
	830809	1645	704.73	29,900
	830810	1618	704.69	31,900
	820725	1120	704.78	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 49 (138.3M1 AT R.M. 138.3)	831103	1031	698.47	4,500
	831027	1240	698.59	5,020
	831019	1149	699.80	8,010
	831011	1107	700.23	9,520
	830916	1147	700.65	10,500
	830914	1445	700.69	10,700
	831003	1200	701.35	13,000
	830822	0950	703.50	21,600
	830805	1332	703.57	21,700
	830701	1554	703.62	23,100
	830808	1637	704.82	26,000
	830706	0953	704.41	26,300
	830828	1504	704.42	26,600
	830809	1647	705.64	29,900
	830810	1616	705.52	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 50 (138.5M1 AT R.M. 138.5)	831027	1235	701.22	5,020
	821012	1550	701.95	7,950
	831019	1146	702.13	8,010
	831007		702.15	8,760
	831011	1103	702.48	9,520
	830916	1144	702.83	10,500
	830914	1411	702.93	10,700
	821002	1620	703.01	11,700
	820904	1415	703.97	14,400
	820902	1210	704.39	16,000
	820901	1906	704.88	17,900
	830612	1630	704.79	20,000
	820914	1515	705.22	20,200
	830822	0957	704.93	21,600
	830805	1329	705.11	21,700
	830619	1008	705.19	23,000
	820919	1531	705.57	24,100
	830808	1633	705.97	26,000
	830828	1502	705.65	26,600
	820918	1912	705.82	26,800
	830809	1643	706.57	29,900
	830810	1619	706.51	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 51	831103	1023	706.50	4,500
(138.9M1 AT R.M. 138.9)	831027	1230	706.52	5,020
	821012	1549	707.00	7,950
	831019	1140	707.04	8,010
	831007	1604	707.17	8,760
	831011	1100	707.29	9,520
	830916	1151	707.68	10,500
	830914	1419	707.72	10,700
	821003	1742	707.68	11,000
	821002		707.72	11,700
	831003	1130	708.17	13,000
	820909	1415	708.34	13,400
	820902	1205	708.73	16,000
	830612	1545	709.43	20,000
	820914	1512	709.47	20,200
	830805	1326	709.91	21,700
	830619	1006	709.99	23,000
	820919	1530	710.07	24,100
	830808	1631	710.76	26,000
	830828	1459	710.46	26,600
	830809	1643	711.52	29,900
	830810	1621	711.49	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT SLOUGH 19 MOUTH (140.0M2 AT R.M. 139.8)	831103	1016	718.64	4,500
	831027	1220	718.83	5,020
	821012	1548	719.13	7,950
	831019	1136	719.45	8,010
	831007	1600	719.46	8,760
	831011	1055	719.61	9,520
	830916	1154	720.08	10,500
	821003	1740	719.91	11,000
	820822	1400	720.33	12,200
	820820	0910	720.31	12,500
	820819	1020	720.43	13,300
	820819	1734	720.47	13,300
	820909	1330	720.59	13,400
	820905	1530	720.52	13,600
	820831	1825	721.00	16,000
	820807	1000	721.03	16,500
	820806	1505	721.08	16,800
	830529	1816	721.14	17,000
	820901	1747	721.23	17,900
	820708	1315	721.21	18,100
	830721	1835	721.26	18,100
	830612	1511	721.36	20,000
	820914	1502	721.45	20,200
	830804	1524	721.53	20,900
	830822	1004	721.60	21,600
	830616	1615	721.69	21,600
	830805	1323	721.69	21,700
	830823	1746	721.65	22,700
	830619	1003	721.71	23,000
	820711	1930	721.98	24,000
	820919	1525	721.75	24,100
	830630	1754	721.80	24,700
	830824	1315	721.94	24,700
	830808	1629	722.36	26,000
	830706	0945	722.08	26,300
	820801	1706	721.96	26,400
	830828	1455	722.01	26,600
	830629	1706	722.03	26,800
	820727	1310	722.44	29,100
	830809	1620	722.76	29,900
	820726	1245	722.61	31,800
	830810	1624	722.59	31,900
	820725	1140	722.67	31,900
	820916	1530	722.92	32,500

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 53 (140.1M1 AT R.M. 140.1)	831103	1010	720.86	4,500
	831027	1215	721.01	5,020
	831019	1129	721.87	8,010
	831011	1050	722.14	9,520
	830916	1155	722.52	10,500
	830913	1903	722.61	11,100
	831003	1106	723.11	13,000
	830716	1200	723.60	16,400
	830529	1426	723.77	17,000
	830721	1757	724.02	18,100
	830715	1130	724.09	18,600
	830612	1500	724.19	20,000
	830711	1155	724.20	20,000
	830804	1454	724.42	20,900
	830822	1007	724.46	21,600
	830616	1526	724.54	21,600
	830805	1320	724.58	21,700
	830724	1100	724.80	22,700
	830619	1001	724.57	23,000
	830701	1104	725.52	23,100
	830824	1250	725.07	24,700
	830702	1230	724.02	24,900
	830808	1627	725.30	26,000
	830706	0942	725.10	26,300
	830828	1455	725.15	26,600
	830828	1135	725.23	26,600
	830810	1704	725.88	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT SIDE CHANN. 21 MOUTH (140.6M1 AT R.M. 140.6)	831103	1006	729.35	4,500
	831027	1210	729.69	5,020
	821012	1546	729.99	7,950
	831019	1120	730.09	8,010
	831007	1551	730.04	8,760
	831011	1046	730.13	9,520
	830916	1157	730.47	10,500
	821003	1540	730.39	11,000
	830912	1024	730.60	11,600
	831003	1051	730.78	13,000
	830527	1315	731.05	17,000
	830712	1425	730.89	19,700
	830805	1310	731.73	21,700
	830824	1239	731.85	24,700
	830808	1625	732.17	26,000
	830828	1453	731.97	26,600
	830809	1219	732.35	29,900
	830810	1626	732.26	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 54 (140.8M1 AT R.M. 140.8)	831103	1000	731.15	4,500
	831027	1205	731.36	5,020
	831011	1042	732.42	9,520
	830916	1159	732.86	10,500
	821003	1527	733.08	11,000
	830912	1326	733.14	11,600
	831003	1047	733.37	13,000
	820831	1802	734.25	16,000
	830527	1430	734.42	17,000
	820901	1412	734.66	17,900
	830721	1615	734.62	18,100
	830712	1420	734.80	19,700
	820914	1400	734.90	20,200
	830804	1328	735.05	20,900
	830822	1011	735.06	21,600
	830805	1234	735.23	21,700
	830619	0958	735.24	23,000
	820919	1443	735.41	24,100
	830630	0927	735.38	24,700
	830824	1237	735.47	24,700
	830808	1622	735.80	26,000
	830706	0940	735.60	26,300
	830828	1451	735.52	26,600
	820918	1658	735.72	26,800
	830809	1221	735.63	29,900
	830810	1630	736.24	31,900
	830601	1742	736.30	33,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 55	831103	0956	738.93	4,500
(141.6M1 AT R.M. 141.6)	831027	1155	739.16	5,020
	831019	1117	740.34	8,010
	831011	1036	740.64	9,520
	830916	1200	740.94	10,500
	830913	1835	741.08	11,100
	831003	1047	741.56	13,000
	830527	1651	742.59	17,000
	830721	1611	742.89	18,100
	830612	1402	743.11	20,000
	830804	1315	743.53	20,900
	830822	1015	743.66	21,600
	830805	1233	743.70	21,700
	830619	0955	743.80	23,000
	830630	0931	744.17	24,700
	830824	1207	744.46	24,700
	830808	1620	744.68	26,000
	830706	0938	744.60	26,300
	830828	1449	744.50	26,600
	830809	1228	745.30	29,900
	830810	1632	745.45	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 56 (142.1M1 AT R.M. 142.1)	831103	0950	750.09	4,500
	831027	1100	750.35	5,020
	831019	1114	751.22	8,010
	821011	1600	751.06	8,220
	831011	1031	751.50	9,520
	830916	1205	751.89	10,500
	821003	1300	751.76	11,000
	830913	1802	752.03	11,100
	821002	0950	751.96	11,700
	821001	1110	752.07	12,400
	831003	1011	752.36	13,000
	820909	1330	752.56	13,400
	820927	1500	752.48	13,800
	820831		752.96	16,000
	830529	1258	753.17	17,000
	830721	1435	753.41	18,100
	830612	1030	753.59	20,000
	820914	1252	753.59	20,200
	830822	1022	753.83	21,600
	830803	1000	753.84	21,600
	830805	1231	753.94	21,700
	830619	0952	753.94	23,000
	820920	1230	754.06	24,000
	820919	1319	754.09	24,100
	830630	1157	754.13	24,700
	830824	1203	754.23	24,700
	830808	1615	754.53	26,000
	830706	0936	754.39	26,300
	830828	1445	754.39	26,600
	820918	1600	754.33	26,800
	820915	1602	754.94	28,200
	830809	1542	755.09	29,900
	830605	1700	754.59	30,000
	830605	1315	754.79	30,000
	830810	1636	754.88	31,900
	830601	1755	754.93	33,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
RIGHT BANK AT LRX 57 (142.0M2 AT R.M. 142.3)	831103	0945	751.02	4,500
	831020	0820	752.40	7,230
	831019	1110	752.54	8,010
	831007	1419	753.14	8,760
	831011	1027	753.22	9,520
	830913	1717	753.97	11,100
	830912	1915	754.15	11,600
	831003	0957	754.40	13,000
	820909	1330	754.43	13,400
	820813	0915	754.37	13,600
	820831		755.07	16,000
	820901	1257	755.47	17,900
	820708	1615	755.66	18,100
	830721	1430	755.68	18,100
	830518	0928	755.72	20,000
	830612	1040	755.81	20,000
	820914	1248	755.79	20,200
	830804	0940	756.16	20,900
	820709	1250	756.31	21,500
	830822	1024	756.45	21,600
	830805	1230	756.31	21,700
	820802	1450	756.24	22,500
	820720	1535	756.31	22,900
	830619	0950	756.34	23,000
	820920	1214	756.48	24,000
	820919	1317	756.45	24,100
	830630	1205	756.61	24,700
	830824	1202	756.76	24,700
	820728	1225	756.84	25,600
	830706	0928	756.94	26,300
	830828	1443	757.07	26,600
	820915	1604	757.56	28,200
	830809	1544	757.75	29,900
	820726	1300	757.53	31,800
	830810	1640	757.72	31,900
	820725	1500	758.06	31,900
	820916	1002	757.86	32,500
	830601	1800	757.59	33,000

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM AT SLOUGH 22 HEAD (144.3M1 AT R.M. 144.7)	831103	0938	783.92	4,500
	831027	1030	784.26	5,020
	831019	1103	784.99	8,010
	831007	1409	785.10	8,760
	831011	1021	785.27	9,520
	830916	1213	785.80	10,500
	820909	1330	786.60	13,400
	820813	0855	786.69	13,600
	820831	1115	787.07	16,000
	820807	1215	787.27	16,500
	820901	1240	787.52	17,900
	820708	1800	787.69	18,100
	820914	1129	787.78	20,200
	830805	1220	788.22	21,700
	820802	1720	788.06	22,500
	820720	1100	788.39	22,900
	820920	1125	788.40	24,000
	820919	1038	788.37	24,100
	830824	1006	788.66	24,700
	830702	1552	788.62	24,900
	820728	1135	788.82	25,600
	830606	0923	788.85	26,000
	830828	1438	788.83	26,600
	820918	1547	788.76	26,800
	820918	1400	788.85	26,800
	820623	1735	788.90	27,000
	820622	1615	789.48	31,000
	820726	1315	789.57	31,800
	830810	1649	789.72	31,900

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 61 (148.7M1 AT R.M. 148.7)	831103	0930	832.03	4,500
	831027	1015	832.36	5,020
	830916	1224	833.78	10,500
	830915	1504	833.81	10,600
	831003	0946	834.33	13,000
	820909	1325	834.25	13,400
	820904	1800	834.45	14,400
	820709		836.09	21,500
	820710	1600	836.20	23,000
	830828	1428	836.69	26,600
	820726	1500	837.00	31,800

Appendix Table 1-A-6 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LEFT BANK AT LRX 62	831103	0920	833.29	4,500
(148.9M1 AT R.M. 148.9)	831027	1000	833.60	5,020
	821012	1532		7,950
	831019	1052	834.54	8,010
	831011	1010	834.97	9,520
	830916	1226	835.44	10,500
	830915	1529	835.48	10,600
	831003	0943	836.08	13,000
	820909		836.45	13,400
	820909	1325	836.53	13,400
	820904	1800	836.68	14,400
	820709		838.39	21,500
	820919	1800	838.79	24,100
	830824	1109	838.98	24,700
	830828	1425	839.07	26,600

Appendix Table 1-A-7 Comparison of non-mainstem water surface elevations to mean daily mainstem discharge (cfs) obtained at the USGS gaging station at Gold Creek (15292000).

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
WHISKERS SLOUGH (MOUTH)	821009	1030	362.92	8,440
(101.2W1 AT R.M. 101.2)	830911	1020	363.48	12,200
	820823	1126	363.44	12,300
	820928	1715	363.64	12,900
	831001	1500	363.80	13,200
	820909	1500	363.67	13,400
	820927	1605	363.85	13,800
	820903	1550	363.97	14,600
	820816	1715	364.03	15,600
	830523	1130	364.36	18,000
	830720	0915	364.41	18,600
	830722	1850	364.43	18,600
	830804	1330	364.71	20,900
	820709	1715	364.77	21,500
	830822	1220	364.75	21,600
	830805	1635	364.83	21,700
	820617	1045	364.95	22,000
	830621	1730	365.24	24,000
	820920	1515	365.38	24,000
	830807	1400	365.31	25,000
	830808	1925	365.61	26,000
	830703	1645	365.21	26,200
	820726	1720	366.38	31,800
	820621	1300	366.75	37,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
WHISKERS SLOUGH (Q SITE) (101.2S3 AT R.M. 101.4)	821009	1145	365.58	8,440
	821006	1300	365.58	8,960
	820908	1540	365.61	11,900
	820822	1353	365.56	12,200
	830911	0945	365.70	12,200
	820928	1705	365.64	12,900
	831003	1520	365.82	13,000
	831001	1520	365.82	13,200
	820813	1355	365.61	13,600
	820927	1550	365.68	13,800
	820903	1550	365.65	14,600
	820816	1445	365.81	15,600
	830716	1130	365.70	16,400
	830720	0930	365.70	18,600
	830722	1840	365.72	18,600
	830804	1345	365.77	20,900
	830822	1255	365.75	21,600
	830618	1225	365.95	22,900
	830619	1230	365.78	23,000
	830617	1250	365.89	23,300
	820920	1530	366.20	24,000
	830621	1730	366.22	24,000
	830807	1345	366.25	25,000
	820715	1300	366.16	25,600
	830808	1940	366.60	26,000
	830703		366.18	26,200
	820622	0935	367.22	31,000
	820621	1300	367.61	37,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
WHISKERS SLOUGH (HEAD)	830911	0930	366.48	12,200
(101.2H5 AT R.M. 101.5)	831001	1520	366.48	13,200
	820904	1300	366.48	14,400
	820903	1550	366.48	14,600
	820816	1445	366.48	15,600
	830720	1100	366.48	18,600
	830722	1830	366.48	18,600
	830822	1300	367.77	21,600
	830617	1800	368.05	23,300
	820920	1830	368.09	24,000
	830807	1330	368.16	25,000
	820715	1415	368.18	25,600
	830808	1905	368.46	26,000
	830703		368.14	26,200
	820725	1040	368.89	31,900

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 6A (MOUTH)	831020	1500	455.00	7,230
(112.3WI AT R.M. 112.3)	821009	1600	455.13	8,440
	830915	1035	455.60	10,600
	831004	1110	455.92	11,400
	830912	1145	455.80	11,600
	830930	1330	456.09	11,600
	820822	1645	455.92	12,200
	820820	1725	456.02	12,500
	830908	1245	456.23	13,700
	820926	1405	456.41	14,000
	820910	1330	456.40	14,400
	820925	1740	456.53	15,000
	830528	1254	456.57	16,000
	830528	1140	456.59	16,000
	830716	1400	456.52	16,400
	820807	1200	456.58	16,500
	820808	1720	456.68	16,600
	830523	1130	456.87	18,000
	830722	1720	456.86	18,600
	830718	1230	456.80	18,900
	830612	1250	456.95	20,000
	820709	1850	457.20	21,500
	830616	1030	457.06	21,600
	830822	1655	457.22	21,600
	830805	1130	457.14	21,700
	830805	1510	457.20	21,700
	820729	1445	457.46	23,600
	820921	1000	457.63	24,200
	830824	1630	457.50	24,700
	830807	1530	457.52	25,000
	830808	1735	457.75	26,000
	830809	1500	458.02	29,900
	830826	1530	458.13	31,700
	820917	1717	458.33	32,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 6A (BACKWATER) (112.3S3 AT R.M. 112.5)	830915	1038	455.47	10,600
	831004	1105	455.78	11,400
	830912	1050	455.66	11,600
	830930	1330	455.93	11,600
	830722	1700	456.68	18,600
	830822	1700	457.08	21,600
	830805	1200	457.03	21,700
	830805	1520	457.07	21,700
	830824	1630	457.43	24,700
	830807	1530	457.36	25,000
	830808	1738	457.62	26,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8 (MOUTH)	830912	1530	466.70	11,600
(113.6W8 AT R.M. 113.6)	830910	1130	466.96	12,700
	830716	1145	467.60	16,400
	830616	1540	468.70	21,600
	830710	1203	468.76	22,200
	830802	1200	468.74	22,400
	830618	0945	468.96	22,900
	830807	1630	469.24	25,000
	830808	1705	469.66	26,000
	830825	1715	469.67	27,400
	830809	1925	470.46	29,900
	830826	1555	470.56	31,700
	830810	1040	470.69	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8 (Q SITE)	830927	1230	467.97	9,640
(113.6S2 AT R.M. 113.6)	821004	1235	468.24	10,500
	831004	1230	468.01	11,400
	830912	1600	467.94	11,600
	830910	1200	467.95	12,700
	820903	1456	468.28	14,600
	820925	1110	468.35	15,000
	830526	1110	468.05	16,000
	830528	1005	468.05	16,000
	830716	1150	467.97	16,400
	830716	1430	467.98	16,400
	830722	1730	468.15	18,600
	830615	1745	468.40	19,600
	830805	1450	468.70	21,700
	830710	1141	468.76	22,200
	830802	1200	468.77	22,400
	820722	1010	468.80	22,400
	830618	0945	468.98	22,900
	820920	1329	469.41	24,000
	820723	1010	469.15	24,900
	830807	1630	469.23	25,000
	830808	1711	469.66	26,000
	830825	1710	470.58	27,400
	830809	1816	470.36	29,900
	830826	1610	470.58	31,700
	830810	1105	470.65	31,900
	820917	1517	470.75	32,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8 (HEAD)	820903		472.53	14,600
(113.6H4 AT R.M. 113.6)	830716	1215	472.53	16,400
	830616	1830	472.53	21,600
	830802	1145	472.53	22,400
	820920	1310	472.53	24,400
	830808	1700	473.62	26,000
	830825	1735	473.60	27,400
	830809	1810	474.09	29,900
	830826	1550	474.24	31,700
	830810	1020	474.42	31,900
	820917	1830	474.30	32,000

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 (MOUTH)	831020	1410	473.59	7,230
(114.4W6 AT R.M. 114.4)	830928	1030	474.03	9,080
	831004	1320	474.76	11,400
	830922	1305	475.02	13,600
	830526	1800	475.68	16,000
	830720	1300	476.18	18,600
	830611	1915	476.12	19,000
	830613	1315	476.31	19,900
	830803	1230	476.69	21,600
	830805	1430	476.63	21,700
	830618	1730	476.89	22,900
	830806	1931	476.95	23,800
	830824	1450	477.06	24,700
	830704	1700	476.78	24,800
	830620	1530	477.37	25,000
	830530	1600	477.47	25,000
	830808	1121	477.17	26,000
	830706	1150	477.16	26,300
	830825	1120	477.38	27,400
	830826	1750	478.38	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 (LOWER BACKWATER)	830720	1305	476.17	18,600
(114.4S9 AT R.M. 114.5)	830612	1830	476.34	20,000
	830805	1430	476.71	21,700
	830806	1932	477.03	23,800
	830824	1500	477.16	24,700
	830704	1650	476.88	24,800
	830808	1122	477.26	26,000
	830706	1200	477.25	26,300
	830825	1115	477.49	27,400
	830826	1750	478.55	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 (UPPER BACKWATER) (114.4S7 AT R.M. 114.8)	830526	1830	475.77	16,000
	830720	1305	476.06	18,600
	830715	1330	476.39	18,600
	830611	1930	476.19	19,000
	830613	1155	476.35	19,900
	830612	1830	476.40	20,000
	830803	1245	476.81	21,600
	830805	1435	476.74	21,700
	830806	1933	477.04	23,800
	830824	1530	477.31	24,700
	830808	1134	477.38	26,000
	830825	1115	477.58	27,400
	830826	1755	478.70	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 NW CHANNEL (Q SITE) (114.4S5 AT R.M. 115.4)	830917	1025	478.84	10,000
	831004	1340	479.10	11,400
	830526	1650	480.01	16,000
	830721	2000	480.50	18,100
	830720	1430	480.61	18,600
	830722	1405	480.64	18,600
	830611	1520	480.56	19,000
	830611	1830	480.66	19,000
	830615	1220	480.82	19,600
	830805	1315	481.31	21,700
	830806	1150	481.51	23,800
	830806	1730	481.60	23,800
	830824	1410	481.59	24,700
	830530	1600	482.06	25,000
	830808	1440	481.89	26,000
	830825	1140	481.94	27,400
	830825	1300	481.97	27,400

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 NW CHANNEL (HEAD) (114.4H3 AT R.M. 114.4)	830922	1804	481.95	13,600
	830526	1530	482.42	16,000
	830721	1955	482.76	18,100
	830722	1445	482.86	18,600
	830720	1420	482.87	18,600
	830611	1820	482.61	19,000
	830611	1715	482.75	19,000
	830805	1300	483.02	21,700
	830806	1927	483.58	23,800
	830824	1400	483.68	24,700
	830704	1630	483.21	24,800
	830808	1119	483.82	26,000
	830706	1145	483.82	26,300
	830826	1815	484.61	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 NE CHANNEL (Q SITE) (114.4S8 AT R.M. 115.5)	830917	1040	480.41	10,000
	831004	1450	480.48	11,400
	830721	2000	480.44	18,100
	830720	1445	480.44	18,600
	830722	1420	480.44	18,600
	830805	1335	480.46	21,700
	830628		480.76	21,900
	830806	1900	480.57	23,800
	830824	1425	480.60	24,700
	830704		480.54	24,800
	830808	1530	481.28	26,000
	830825	1605	481.31	27,400
	830826	1925	482.88	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
MAINSTEM 2 NE CHANNEL (HEAD) (114.4H1 AT R.M. 115.5)	830526	1430	484.64	16,000
	830720	1245	484.64	18,600
	830619	1025	484.54	23,000
	830806	1915	484.72	23,800
	830824	1350	484.84	24,700
	830807	1445	485.00	25,000
	830530	1430	485.08	25,000
	830808	1115	485.05	26,000
	830703	1230	484.93	26,200
	830825	1135	485.23	27,400
	830827	1020	486.22	31,000
	830826	1845	486.35	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A (MOUTH-LEFT BANK) (125.3W5 AT R.M. 125.3)	831020	1240	561.34	7,230
	830915	1435	561.64	10,600
	830924	1155	562.47	15,200
	830721	1100	562.70	18,100
	830718	1200	562.86	18,900
	830719	1420	563.03	20,600
	830804	1523	563.03	20,900
	830803	1505	563.12	21,600
	830823	1055	563.21	22,700
	830607	1430	563.40	23,000
	830630	1220	563.36	24,700
	830902	1630	563.53	25,400
	830623	1000	563.54	25,400
	830606	1700	563.58	26,000
	830825	1218	563.63	27,400
	830814	1345	563.75	27,400
	830809	1040	563.98	29,900
	830809	1405	564.01	29,900
	830809	1730	564.12	29,900
	830605	1005	564.05	30,000
	830827	1115	564.12	31,000
	830604	1750	564.68	36,000
	830604	1000	564.76	36,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A (UPPER BACKWATER)	831020	1318	561.48	7,230
(125.386 AT R.M. 125.6)	830915	1440	561.65	10,600
	830909	1130	562.09	13,200
	830924	1214	562.42	15,200
	830924	1020	562.44	15,200
	830721	1120	562.69	18,100
	830718	1330	562.89	18,900
	830804	1523	563.04	20,900
	830803	1500	563.13	21,600
	830823	1100	563.19	22,700
	830902	1630	563.54	25,400
	830825	1205	563.64	27,400
	830814	1345	563.75	27,400
	830809	1045	563.84	29,900
	830809	1405	563.98	29,900
	830827	1110	564.09	31,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A LOWER Q SITE W.CHANN. (125.3S4 AT R.M. 125.7)	831020	1314	563.49	7,230
	830915	1450	563.49	10,600
	831003	1310	563.68	13,000
	830909	1130	563.52	13,200
	830924	1224	563.60	15,200
	830716	1900	563.53	16,400
	830721	1430	563.51	18,100
	830721	1515	563.51	18,100
	830718	1700	563.51	18,900
	830804	1320	563.57	20,900
	830725	1130	563.55	21,900
	830823	1400	563.66	22,700
	830902	1830	563.68	25,400
	830825	1158	563.71	27,400
	830809	1103	563.97	29,900
	830827	1427	564.14	31,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A LOWER Q SITE E.CHANN. (125.385 AT R.M. 125.7)	831020	1314	563.73	7,230
	830915	1450	563.64	10,600
	830909	1350	563.70	13,200
	830924	1234	563.71	15,200
	830804	1400	563.61	20,900
	830823	1500	563.65	22,700
	830902	1700	563.81	25,400
	830825	1159	563.73	27,400
	830809	1100	564.01	29,900
	830827	1450	564.18	31,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A NW CHANNEL (Q SITE) (125.3S3 AT R.M. 125.3)	830915	1515	566.01	10,600
	831003	1350	566.10	13,000
	830909	1230	566.03	13,200
	830924	1246	566.08	15,200
	830716	1800	566.11	16,400
	830721	1150	566.00	18,100
	830718	1920	566.00	18,900
	830804	1130	566.03	20,900
	830823	1340	566.05	22,700
	830809	1245	566.44	29,900
	830827	1320	566.81	31,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A NW CHANNEL (HEAD)	830823		573.11 1	22,700
(125.3H2 AT R.M. 126.2)	830902		573.11 1	25,400
	830825	1234	573.13	27,400
	830809	1415	573.33	29,900
	830827	1240	573.53	31,000
	830531	1308	573.63	32,000

1/Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A NE CHANNEL (Q SITE) (125.3S1 AT R.M. 125.8)	830506	1330	565.91	5,400
	830915	1505	567.22	10,600
	830909	1200	567.19	13,200
	830924	1315	567.29	15,200
	830716	1820	566.20	16,400
	830721	1250	566.33	18,100
	830615	1615	566.09	19,600
	830711	1130	566.15	20,000
	830804	1220	566.60	20,900
	830823	1210	566.97	22,700
	830630	1404	566.08	24,700
	830809	1130	566.91	29,900
	830827	1145	567.07	31,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A NE CHANNEL (125.3S8 AT R.M. 126.7)	830719	1300	574.26	20,600
	830825	1253	574.77	27,400
	830809	1430	574.71	29,900
	830827	1140	574.81	31,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 8A NE CHANNEL (HEAD)	830719	1315	577.06	20,600
(125.3H7 AT R.M. 126.9)	830825	1300	577.06	27,400
	830809	1435	577.06	29,900
	830827	1200	577.06	31,000

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 9 (MOUTH)	831007	1100	589.86	8,760
(128.3W3 AT R.M. 128.3)	831006	1500	589.86	9,800
	830914	1100	589.81	10,700
	830913	0700	589.86	11,100
	830912	1020	589.90	11,600
	830911	1100	589.97	12,200
	830910	1020	590.07	12,700
	830909	1045	590.18	13,200
	830922	0900	590.03	13,600
	830908	1800	590.33	13,700
	830924	1000	590.98	15,200
	830906	1600		16,000
	830717	1115	591.04	16,500
	830729	1638	591.32	17,300
	830923	0930	591.32	17,500
	830923	1700	591.32	17,500
	830728	1320	591.47	17,700
	830820	1120	591.31	17,800
	830820	1600	591.41	17,800
	830721	1830	591.47	18,100
	830905	1900	591.33	18,200
	830727	1000	591.64	18,500
	830720	2230	591.24	18,600
	830821	1000	591.53	18,900
	830821	1600	591.73	18,900
	830614	1530	591.65	19,000
	830730	1048	591.70	19,100
	830819	1700	591.60	19,200
	830819	1030	591.63	19,200
	830723	1830	591.81	19,200
	830726	1130	591.78	19,400
	830804	1000	592.10	20,900
	830818	1530	592.03	21,000
	830904	1200	592.03	21,000
	830822	0950	592.08	21,600
	830803	1930	592.13	21,600
	830803	0926	592.24	21,600
	830822		592.33	21,600
	830725	1553	592.13	21,900
	830725	1000	592.31	21,900
	830823	1800	592.33	22,700
	830823	1415	592.37	22,700
	830817	1000	592.41	22,700
	830731	1041	592.38	22,800
	830830	1300	592.41	22,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 9 (MOUTH)	830625	1000	592.67	23,300
(128.3W3 AT R.M. 128.3)	830625	1805	592.73	23,300
(continued)	830622	1824	592.83	23,600
	830806	1005	592.53	23,800
	830624	2200	592.73	24,000
	830709	1000	592.63	24,300
	830812	1200	592.71	24,500
	830816	1030	592.72	24,600
	830824	0900	592.53	24,700
	830630	1140	592.59	24,700
	830630	1142	592.59	24,700
	830824	2115	592.63	24,700
	830824	1130	592.65	24,700
	830831	1045	592.78	24,800
	830702	1630	592.73	24,900
	830807	1730	592.73	25,000
	830807	0930	592.83	25,000
	830902	1615	592.93	25,400
	830623	1748	593.02	25,400
	830902	1100	593.03	25,400
	830623	1345	593.12	25,400
	830813	1130	593.08	25,900
	830808	1030	592.93	26,000
	830808	1850	593.23	26,000
	830828	1536	593.48	26,600
	830815	1600	593.01	26,800
	830815	1200	593.13	26,800
	830825	0815	592.51	27,400
	830825	1630	593.20	27,400
	830814	1058	593.22	27,400
	830708	1600	593.22	27,900
	830809	1500	593.63	29,900
	830809	1630	593.73	29,900
	830809	1930	593.83	29,900
	830827	1315	593.07	31,000
	830826	0745	593.58	31,700
	830826	1830	593.83	31,700
	830810	1400	593.81	31,900
	830810	0915	593.90	31,900
	830604	1800	594.07	36,000
	830604	0923	594.21	36,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 9 (Q SITE)	830914	0955	593.27	10,700
(128.3S1 AT R.M. 128.9)	830912	1200	593.29	11,600
	831003	1515	593.50	13,000
	830922	1820	593.30	13,600
	830924	1550	593.33	15,200
	830716	2200	593.27	16,400
	830721	1800	593.36	18,100
	830730	0927	593.37	19,100
	830726	1730	593.44	19,400
	830609	1030	593.56	19,400
	830712	0715	593.43	19,700
	830711	1715	593.46	20,000
	830518	1334	593.81	20,000
	830725	1600	593.65	21,900
	830731	1444	593.93	22,800
	830607	1830	594.10	23,000
	830630	1030	594.00	24,700
	830824	1135	594.05	24,700
	830825	1215	594.36	27,400
	830605	2240	594.53	30,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 9 (HEAD)	830922	1900	603.70	13,600
(128.3H2 AT R.M. 129.3)	830924	1600	603.70	15,200
	830820	1130	604.27	17,800
	830721	1850	604.45	18,100
	830727	1500	604.51	18,500
	830719	1815	604.58	20,600
	830803	1805	604.71	21,600
	830823	1750	604.71	22,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10A	830913	1000	629.26	11,100
(132.1S1 AT R.M. 132.1)	830907	1115	629.83	14,800
	830803	1301	630.35	21,600
	830809	1015	631.33	29,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10 (MOUTH) (133.8W5 AT R.M. 133.8)	830911	1520	649.81	12,200
	830906	1600	650.71	16,000
	830717	1713	650.81	16,500
	830729	1840	651.01	17,300
	830923	1040	651.06	17,500
	830820	1200	651.00	17,800
	830720	1656	651.10	18,600
	830803	1623	651.63	21,600
	830710	1545	651.67	22,200
	830724	1045	651.89	22,700
	830731	1250	651.91	22,800
	830622	1805	652.26	23,600
	830806	1105	652.18	23,800
	830624	1025	652.17	24,000
	830624	1320	652.21	24,000
	830813	1200	652.41	25,900
	830808	1152	652.31	26,000
	830811	1255	652.51	27,700
	830809	0850	653.29	29,900
	830810	1000	653.31	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10	830911	1333	650.29	12,200
(133.8S7 AT R.M. 133.9)	830910	1318	650.30	12,700
	830909	1638	650.33	13,200
	830729	1839	650.89	17,300
	830823	1140	651.78	22,700
	830724	1600	651.86	22,700
	830731	1250	651.88	22,800
	830806	1105	651.97	23,800
	830810	1000	653.28	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10 (133.8S1 AT R.M. 133.9)	830911	1300	651.01	12,200
	830909	1633	651.06	13,200
	830713	1600	651.17	19,100
	830723	1030	651.24	19,200
	830609	1100	651.21	19,400
	830804	1300	651.60	20,900
	830710	1600	651.67	22,200
	830823	1154	651.83	22,700
	830724	1145	651.92	22,700
	830607	1625	652.03	23,000
	830829	1330	651.91	23,300
	830622	1805	652.25	23,600
	830624	1035	652.18	24,000
	830813	1220	652.53	25,900
	830605	1343	652.91	30,000
	830826	1145	653.54	31,700
	830810	1010	653.48	31,900
	830810	1110	653.53	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10 (133.8S2 AT R.M. 134.0)	830911	1230	651.94	12,200
	830910	1312	651.95	12,700
	830909	1631	651.96	13,200
	830713	1600	652.06	19,100
	830723	1200	652.17	19,200
	830609	1230	652.16	19,400
	830804	1300	652.43	20,900
	830710	1643	652.46	22,200
	830823	1208	652.69	22,700
	830607	1626	652.73	23,000
	830829	1325	652.61	23,300
	830829	1030	652.66	23,300
	830813	1220	653.06	25,900
	830605	1405	653.36	30,000
	830605	1407	653.36	30,000
	830826	1350	653.91	31,700
	830810	0921	653.86	31,900
	830810	1020	653.86	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10 (133.8S6 AT R.M. 134.1)	830910	1310	653.19	12,700
	830909	1618	653.19	13,200
	830823	1209	654.31	22,700
	830724	1340	654.35	22,700
	830829	1320	654.35	23,300
	830829	1115	654.41	23,300

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10 (Q SITE) (133.8S3 AT R.M. 134.2)	830911	1115	654.27	12,200
	830910	1100	654.29	12,700
	831003	1225	654.30	13,000
	830909	1622	654.29	13,200
	830717	1100	654.30	16,500
	830720	1630	654.43	18,600
	830713	1600	654.50	19,100
	830723	1200	654.74	19,200
	830609	1200	654.62	19,400
	830803	1745	655.15	21,600
	830803	1703	655.18	21,600
	830710	1719	655.21	22,200
	830823	1330	655.54	22,700
	830607	1645	655.73	23,000
	830808	1310	656.27	26,000
	830629	1610	656.09	26,800
	830605	1515	656.75	30,000
	830826	1713	657.97	31,700
	830810	1120	658.26	31,900
	830810	1233	658.26	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 10 (HEAD) (133.8H4 AT R.M. 134.2)	830717	1030	656.20	16,500
	830720	1700	656.20	18,600
	830730	1115	656.53	19,100
	830613	1045	656.56	19,900
	830803	1825	656.85	21,600
	830710	1755	656.91	22,200
	830823	1325	657.20	22,700
	830724	1526	657.25	22,700
	830731	1125	657.24	22,800
	830622	1805	657.53	23,600
	830623	1400	657.77	25,400
	830808	1329	657.78	26,000
	830809	0846	658.53	29,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LOWER SIDE CHANNEL 11 (134.6S1 AT R.M. 135.0)	831019	1254	661.47	8,010
	831011	1145	661.67	9,520
	830922		661.82	13,600
	830906	1610	661.82	16,000
	830729	1713	662.10	17,300
	830728	1340	662.27	17,700
	830820	1200	662.10	17,800
	830820	1205	662.12	17,800
	830730	1119	662.32	19,100
	830819	1045	662.32	19,200
	830723	1722	662.37	19,200
	830711	1400	662.27	20,000
	830804	1245	662.47	20,900
	830904	1237	662.52	21,000
	830818	1620	662.53	21,000
	830803	1740	662.52	21,600
	830822	1535	662.74	21,600
	830608	1205	662.57	22,000
	830823	1400	662.62	22,700
	830817	0945	662.82	22,700
	830731	1131	662.87	22,800
	830806	1030	662.82	23,800
	830806	1258	662.83	23,800
	830624	1324	663.10	24,000
	830812	1320	662.92	24,500
	830816	1000	663.11	24,600
	830831	1105	663.07	24,800
	830902	1156	663.27	25,400
	830808	1336	663.17	26,000
	830808	1430	663.22	26,000
	830828	0955	663.22	26,600
	830815	1230	663.32	26,800
	830825	1035	663.22	27,400
	830809	1811	663.95	29,900
	830827	1730	663.60	31,000
	830827	1340	663.77	31,000
	830826	0900	663.82	31,700
	830810	1259	663.95	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LOWER SIDE CHANNEL 11 (134.6S2 AT R.M. 135.2)	831019	1253	662.92	8,010
	831011	1145	663.42	9,520
	830915	0930	663.22	10,600
	830922		663.62	13,600
	830906	1610	663.67	16,000
	830729	1713	663.87	17,300
	830728	1915	663.80	17,700
	830820	1205	663.87	17,800
	830820	1200	663.95	17,800
	830730	1119	664.15	19,100
	830819	1045	664.07	19,200
	830723	1724	664.12	19,200
	830711	1400	664.15	20,000
	830804	1250	664.23	20,900
	830904	1238	664.22	21,000
	830818	1620	664.27	21,000
	830803	1740	664.27	21,600
	830822	1535	664.35	21,600
	830608	1203	664.29	22,000
	830823	1403	664.48	22,700
	830817	0945	664.55	22,700
	830731	1131	664.55	22,800
	830806	1030	664.57	23,800
	830806	1254	664.59	23,800
	830624	1324	664.77	24,000
	830812	1320	664.62	24,500
	830816	1000	664.72	24,600
	830831	1105	664.72	24,800
	830902	1157	664.90	25,400
	830813	1255	664.87	25,900
	830808	1336	664.82	26,000
	830828	0958	664.87	26,600
	830815	1235	664.92	26,800
	830825	1039	664.82	27,400
	830811	1700	664.72	27,700
	830809	1812	665.47	29,900
	830827	1730	665.22	31,000
	830827	1343	665.27	31,000
	830826	0900	665.42	31,700
	830810	1259	665.42	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL B/L SLOUGH 11 MOUTH (135.3M4 AT R.M. 135.3)	821012	1555	665.56	7,950
	821002	1040	666.68	11,700
	820906	1600	666.86	12,200
	820929	1830	666.81	12,400
	820830	1740	667.46	13,100
	820909	1420	667.36	13,400
	830906	1610	667.79	16,000
	820831		668.16	16,000
	830904	1238	668.69	21,000
	830822	1730	669.79	21,600
	830823	1414	669.95	22,700
	830812	1320	669.14	24,500
	830831	1105	669.24	24,800
	830902	1159	669.44	25,400
	830808	1338	669.45	26,000
	830808	1435	669.49	26,000
	830828	0958	669.44	26,600
	830825	1040	669.46	27,400
	830825	1514	669.54	27,400
	830825	0900	670.04	27,400
	830809	1815	670.09	29,900
	830827	1200	669.79	31,000
	830827	1345	669.89	31,000
	830826	0900	670.04	31,700
	830810	1259	670.04	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL A/B SLOUGH 11 MOUTH (135.3M2 AT R.M. 135.3)	831027	1430	667.27	5,020
	821012	1555	667.50	7,950
	830915	1807	667.78	10,600
	820907	1820	668.10	11,700
	820822	1535	667.92	12,200
	831003	1350	667.89	13,000
	820830	1735	668.62	13,100
	820909	1420	668.55	13,400
	830906	1610	668.55	16,000
	820831		668.80	16,000
	830729	1715	668.66	17,300
	830728	1340	668.79	17,700
	830820	1200	668.74	17,800
	830721	1150	668.76	18,100
	830727	1025	668.84	18,500
	830718	1025	668.91	18,900
	830730	1120	668.91	19,100
	830723	1735	668.91	19,200
	830819	1045	668.94	19,200
	830518	1318	668.91	20,000
	830804	1300	669.08	20,900
	830904	1238	669.06	21,000
	830818	1625	669.11	21,000
	830822	1535	669.16	21,600
	830725	1030	669.16	21,900
	830724	1030	669.21	22,700
	830817	0945	669.36	22,700
	830731	1131	669.29	22,800
	830618	1620	669.23	22,900
	830812	1320	669.36	24,500
	830816	1000	669.56	24,600
	830831	1110	669.46	24,800
	830902	1200	669.65	25,400
	830813	1300	669.70	25,900
	820624	1020	669.75	26,000
	830828	0958	669.66	26,600
	830629	1210	669.55	26,800
	830815	1235	669.76	26,800
	820714	1210	669.67	27,300
	830825	1042	669.76	27,400
	830825	1519	669.79	27,400
	830810	1307	670.21	31,900
	830810	0953	670.22	31,900
	830604	1430	670.70	36,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 11 (MOUTH)	831020	1210	666.29	7,230
(135.3W1 AT R.M. 135.3)	830915	1812	666.96	10,600
	831004	1353	667.07	11,400
	821002	1040	667.01	11,700
	820907	1825	667.15	11,700
	820906	1600	667.23	12,200
	820822	1540	667.32	12,200
	820830	1740	667.77	13,100
	820813	1115	667.81	13,600
	830922	1330	667.89	13,600
	820812	0935	667.91	14,400
	820811	1825	668.04	15,400
	830906	1630	668.28	16,000
	830728	1915	668.52	17,700
	830820	1205	668.60	17,800
	830718	1020	668.85	18,900
	830723	1730	668.91	19,200
	830518	1319	668.87	20,000
	830804	1253	669.05	20,900
	830804	1255	669.05	20,900
	830823	1616	669.24	22,700
	830618	1615	669.28	22,900
	830806	1131	669.37	23,800
	830806	1320	669.37	23,800
	820920	1026	669.41	24,000
	830816	1000	669.47	24,600
	820728	2030	669.37	25,600
	830813	1310	669.69	25,900
	820624	1020	669.72	26,000
	830828	1000	669.64	26,600
	830707	1120	669.75	27,200
	820714	1210	669.67	27,300
	830825	1045	669.72	27,400
	830825	1515	669.75	27,400
	830811	1100	669.82	27,700
	820918	1026	669.71	28,600
	830809	1100	669.92	29,900
	830827	1200	670.02	31,000
	830827	1730	670.02	31,000
	830827	1347	670.13	31,000
	820622	1045	670.16	31,000
	830826	0900	670.20	31,700
	830826	0905	670.20	31,700
	830826	1800	670.28	31,700
	830810	1309	670.22	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 11 (MOUTH)	830810	0837	670.29	31,900
(135.3W1 AT R.M. 135.3)	820621	1040	670.66	37,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 11 (Q SITE)	830505	1810	670.67	4,900
(135.3S6 AT R.M. 135.7)	830915	1751	670.67	10,600
	821003	1513	670.77	11,000
	831004	1340	670.67	11,400
	821002	1100	670.76	11,700
	820929	1800	670.75	12,400
	820830	1244	670.72	13,100
	830922	1205	670.66	13,600
	830524	1100	670.23	17,000
	830524	1420	670.73	17,000
	830721	1110	670.72	18,100
	830718	1040	670.72	18,900
	830609	1333	670.75	19,400
	830803	1330	670.73	21,600
	830823	1524	670.73	22,700
	830806	1155	670.73	23,800
	830806	1330	670.73	23,800
	830806	1500	670.73	23,800
	820920	1300	670.80	24,000
	820921	1130	670.80	24,200
	830828	1030	670.75	26,600
	830629	0950	670.76	26,800
	820918	1010	670.80	26,800
	830707	1145	670.76	27,200
	830604	1045	670.85	36,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 11 (HEAD)	831004	1300	684.00	11,400
(135.3H3 AT R.M. 136.4)	820830		684.00	13,100
	820813	1140	684.00	13,600
	820812	0935	684.00	14,400
	820811	1805	684.00	15,400
	820716	1255	684.00	25,600
	820918	1025	684.00	26,800

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
UPPER SIDE CHANNEL 11 (MOUTH)	831004	1258	676.84	11,400
(136.2W3 AT R.M. 136.2)	830911	1700	676.90	12,200
	830910	1730	677.01	12,700
	830711	1715	677.95	20,000
	830725	1257	678.31	21,900
	830829	1435	678.43	23,300
	830824	1605	678.31	24,700
	830826	1853	679.56	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
UPPER SIDE CHANNEL 11 (136.2S4 AT R.M. 136.2)	831004	1256	676.78	11,400
	830911	1655	676.91	12,200
	830910	1730	677.01	12,700
	830906	1720	677.41	16,000
	830829	1545	678.45	23,300
	830826	1851	679.65	31,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
UPPER SIDE CHANNEL 11 (136.2S5 AT R.M. 136.3)	831004	1247	677.68	11,400
	830911	1653	677.68	12,200
	830910	1800	677.69	12,700
	830906	1630	677.80	16,000
	830824	1605	678.10	24,700

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
UPPER SIDE CHANNEL 11 (Q SITE) (136.2S1 AT R.M. 136.5)	830911	1745	680.63	12,200
	830721	0945	681.34	18,100
	830727	1130	681.38	18,500
	830720	0940	681.34	18,600
	830821	1600	681.39	18,900
	830712	1115	681.40	19,700
	830725	1236	681.68	21,900
	830823		681.77	22,700
	830701	1150	681.74	23,100
	830806	1345	681.95	23,800
	830808	1450	682.24	26,000
	830808	1345	682.51	26,000
	830826	1835	682.93	31,700
	830810	1438	682.87	31,900
	830604	1300	683.44	36,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
UPPER SIDE CHANNEL 11 (HEAD)	831010		684.50	8,400
(136.2H2 AT R.M. 136.6)	830917		684.50	10,000
	830906	1700	685.20	16,000
	830729	1726	685.56	17,300
	830821	1600	685.91	18,900
	830730	1133	685.93	19,100
	830731	1030	686.56	22,800
	830806	1409	686.66	23,800
	830824	0934	686.62	24,700
	830808	1504	687.11	26,000
	830707	1100	687.18	27,200
	830826	1003	687.91	31,700
	830826	1856	687.95	31,700
	830810	1453	687.76	31,900

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 16B (MOUTH)	820822	1445	696.32	12,200
(138.0W1 AT R.M. 137.8)	820813	1035	696.34	13,600
	820902	1130	696.34	16,000
	830717	1210	696.36	16,500
	830820	1355	696.34	17,800
	830701	1200	697.27	23,100
	820919	1641	697.52	24,100
	820915	1352	699.06	28,200
	820725	1110	699.20	31,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 16B (Q SITE)	821002	1454	700.08	11,700
(138.0S5 AT R.M. 138.0)	820822	1500	700.05	12,200
	831003	1200	700.11	13,000
	820813	1040	700.07	13,600
	820814	1722	700.18	13,600
	820902	1140	700.10	16,000
	830717	1215	700.06	16,500
	830820	1315	700.10	17,800
	830701	1650	700.28	23,100
	820919	1617	700.58	24,100
	820801	1551	700.85	26,400
	820915	1412	701.69	28,200

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 16B (HEAD)	820813	1020	703.00	13,600
(138.0H3 AT R.M. 138.2)	820831	1900	703.00	16,000
	820914	1626	703.17	20,200
	830822	0954	703.23	21,600
	830701	1600	703.35	23,100
	820920	1310	703.55	24,000
	820919	1543	703.51	24,100
	820915	1252	704.50	28,200
	820725	1115	704.59	31,900

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 19 (ACCESS)	831020	0920	718.56	7,230
(140.0W1 AT R.M. 139.7)	830914	1045	718.72	10,700
	821002	1733	718.61	11,700
	820820	0925	718.76	12,500
	831003	1111	718.69	13,000
	820819	1050	718.73	13,300
	820905	1515	718.76	13,600
	820813	1015	718.85	13,600
	820925	1150	719.02	15,000
	820831	1832	719.43	16,000
	820807	1000	719.69	16,500
	820806	1510	719.83	16,800
	830529	1921	720.22	17,000
	820708	1300	720.16	18,100
	830721	1855	720.35	18,100
	830821	1430	720.13	18,900
	830615	1610	721.09	19,600
	820914	1507	720.60	20,200
	830804	1543	720.88	20,900
	830630	1650	721.11	24,700
	820801	1656	722.20	26,400
	830629	1625	721.37	26,800
	820623	0940	721.79	27,000
	820915	1550	721.97	28,200
	820727	1315	721.55	29,100
	830809	1606	722.08	29,900
	830605	1300	721.79	30,000
	820622	1110	721.28	31,000
	820726	1245	721.88	31,800
	820620	1910	722.18	33,000
	820620	1110	722.30	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 19 (BELOW MOUTH) (140.0S3 AT R.M. 139.5)	830914	1028	719.10	10,700
	831003	1109	719.14	13,000
	830529	1837	720.10	17,000
	830721	1843	720.32	18,100
	830804	1540	720.82	20,900
	830616	1605	721.02	21,600
	830823	1802	720.99	22,700
	830630	1655	721.11	24,700
	830824	1338	721.37	24,700
	830629	1630	721.44	26,800
	830809	1639	722.27	29,900
	830605	1300	721.94	30,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 19 (Q SITE)	830914	1110	720.04	10,700
(140.0S4 AT R.M. 139.9)	830529	1844	720.09	17,000
	830721	1833	720.29	18,100
	830804	1532	720.80	20,900
	830823	1806	720.97	22,700
	830630	1748	721.08	24,700
	830824	1323	721.34	24,700
	830629	1635	721.39	26,800
	830809	1632	722.25	29,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 20 (MOUTH)	821010	1700	724.23	8,480
(140.1W4 AT R.M. 140.1)	830913	1910	724.18	11,100
	820821	0935	724.16	12,200
	820822	1330	724.16	12,200
	820820	1850	724.20	12,500
	820819	1950	724.22	13,300
	830922	1445	724.27	13,600
	820813	0920	724.29	13,600
	820905	1550	724.33	13,600
	820831	1820	724.43	16,000
	830716	1200	724.32	16,400
	830529	1426	724.76	17,000
	820901	1500	724.57	17,900
	830610	1100	724.55	18,000
	830721	1758	724.60	18,100
	830715	1915	724.51	18,600
	830715	1130	724.61	18,600
	830711	1152	724.78	20,000
	820914	1420	724.82	20,200
	830804	1507	724.97	20,900
	830904	1340	724.88	21,000
	830616	1525	725.17	21,600
	830724	1100	725.28	22,700
	820711	1900	725.26	24,000
	820920	1255	725.40	24,000
	830824	1252	725.53	24,700
	830702	1430	725.43	24,900
	830901	1130	725.52	25,400
	830828	1135	725.71	26,600
	820918	1810	725.48	26,800
	820724	1100	725.69	26,800
	820623	0945	725.65	27,000
	820619		725.90	28,000
	820727	1125	726.04	29,100
	830809	1607	726.44	29,900
	820622	1115	726.30	31,000
	830810	1015	726.52	31,900
	820916	1345	726.59	32,500

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 20 (Q SITE)	821010	1730	726.89	8,480
(140.1S5 AT R.M. 140.2)	821003	1645	726.92	11,000
	830913	1915	726.75	11,100
	820820	1850	726.72	12,500
	831003	1100	727.00	13,000
	820813	0920	726.80	13,600
	830922	1500	726.81	13,600
	830716	1315	726.69	16,400
	820807	1130	726.85	16,500
	830529	1452	727.21	17,000
	820901	1715	726.89	17,900
	830721	1804	726.64	18,100
	820804	1200	726.90	18,500
	830715	1140	726.73	18,600
	830711	1159	726.70	20,000
	820914	1424	727.07	20,200
	830804	1511	726.69	20,900
	830616	1515	726.89	21,600
	820802	1210	727.07	22,500
	830701	1212	726.77	23,100
	830824	1258	726.93	24,700
	830828	1122	727.04	26,600
	820724	1130	727.19	26,800
	820623	0950	727.17	27,000
	820727	1125	727.50	29,100
	830809	1606	727.65	29,900
	820916	1415	728.15	32,500

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 20 (HEAD)	820820	1145	730.50	12,500
(140.1H3 AT R.M. 140.6)	820901	1715	730.50	17,900
	820914	1430	730.50	20,200
	820709	1225	730.96	21,500
	820802	1235	731.04	22,500
	830724	1030	731.10	22,700
	830701	1000	731.00	23,100
	820920	1240	731.08	24,000
	820711	1800	731.26	24,000
	820918	1712	731.39	26,800
	820623	1010	731.77	27,000
	820619		731.61	28,000
	820915	1539	731.76	28,200
	820727	1200	731.82	29,100
	830809	1208	731.65	29,900
	820916	1220	731.95	32,500

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 21 (MOUTH)	831020	0900	729.05	7,230
(140.6W1 AT R.M. 140.6)	830912	1238	729.32	11,600
	830527	1047	730.29	17,000
	830804	1425	730.81	20,900
	830616	1505	730.96	21,600
	830822	1909	730.99	21,600
	830630	1227	731.18	24,700
	830809	1202	731.90	29,900
	830601	1146	732.36	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 21 (UPPER Q SITE) (140.6S7 AT R.M. 141.7)	830921	1155	744.21	11,000
	830913	1345	744.24	11,100
	830912	1745	744.23	11,600
	830804	1200	744.49	20,900
	830630	1137	744.73	24,700
	830828	1158	745.00	26,600
	830825	0900	745.08	27,400
	830809		745.66	29,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 21 (LOWER Q SITE) (140.6S4 AT R.M. 141.1)	830914	1200	735.92	10,700
	830921	1600	735.93	11,000
	830913	1700	736.00	11,100
	830912	1524	736.11	12,200
	830911	1630	736.23	12,200
	830528	1544	736.77	16,000
	830721	1735	737.02	18,100
	830821	1430	737.04	18,900
	830713	1140	737.04	19,100
	830819	1130	737.06	19,200
	830804	1339	737.20	20,900
	830822	1707	737.29	21,600
	830725	1115	737.20	21,900
	830630	1430	737.36	24,700
	830824		737.53	24,700
	830807	1500	737.44	25,000
	830606	2230	737.41	26,000
	830606	1700	737.47	26,000
	830606	1330	737.48	26,000
	830809	1150	737.73	29,900
	830601	1737	738.21	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL 21 (MID CHANNEL)	830913	1410	742.73	11,100
(140.6S2 AT R.M. 141.6)	830527	1735	743.64	17,000
	830721	1615	743.61	18,100
	830819	1140	743.67	19,200
	830612	1330	743.91	20,000
	830804	1312	743.79	20,900
	830822	1534	743.88	21,600
	830630	1540	743.91	24,700
	830809	1557	744.57	29,900
	830601	1732	744.75	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SIDE CHANNEL (A5)	830912	1738	743.80	11,600
(140.653 AT R.M. 140.6)	830528	1202	744.47	16,000
	830803	1302	745.10	21,600
	830822	1516	745.34	21,600
	830630	0941	745.48	24,700
	830601	1320	746.68	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
CHANNEL A6 (UPPER)	830912		748.05	11,600
(140.6H5 AT R.M. 141.9)	830527		748.05	17,000
	830803	1250	748.40	21,600
	830822	1433	748.47	21,600
	830630	0953	748.64	24,700
	830809	1525	749.39	29,900
	830605	1710	749.02	30,000
	830605	1320	749.12	30,000
	830810	1029	749.52	31,900
	830601	1614	749.40	33,000

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
CHANNEL A6 (UPPER)	830912		748.05	11,600
(140.6H5 AT R.M. 141.9)	830527		748.05	17,000
	830803	1250	748.40	21,600
	830822	1433	748.47	21,600
	830630	0953	748.64	24,700
	830809	1525	749.39	29,900
	830605	1710	749.02	30,000
	830605	1320	749.12	30,000
	830810	1029	749.52	31,900
	830601	1614	749.40	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 21 (MOUTH)	831020	0843	744.72	7,230
(142.0W5 AT R.M. 141.8)	830913	1600	744.71	11,100
	830912	1755	744.70	11,600
	820821	1000	744.67	12,200
	830911	1500	744.71	12,200
	821001	1350	744.72	12,400
	820820	1700	744.68	12,500
	820813	0925	744.70	13,600
	820927	1645	744.75	13,800
	820831	1612	744.69	16,000
	820809	1335	744.72	17,000
	830721	1543	744.70	18,100
	830517	1238	744.72	19,000
	830819	1420	744.74	19,200
	830712	1433	744.73	19,700
	820914	1315	744.70	20,200
	830520	1115	744.76	21,000
	830822	1255	744.75	21,600
	830803	1013	744.76	21,600
	830608	1630	744.76	22,000
	820922	1111	744.82	22,300
	820802	1400	744.82	22,500
	820720	1850	744.76	22,900
	820920	1225	744.92	24,000
	820919	1225	744.89	24,100
	830630	1025	744.93	24,700
	830807	1030	745.12	25,000
	820728	1310	745.17	25,600
	830828	1200	745.26	26,600
	820918	1415	745.22	26,800
	820623	1040	745.34	27,000
	830811	1310	745.30	27,700
	830708	1045	745.58	27,900
	830809	1423	746.08	29,900
	830605	1630	745.52	30,000
	830605	1330	745.66	30,000
	820916	1134	746.59	32,500
	830601	1604	746.33	33,000
	830601	1310	746.73	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 21 (R&M CONSULTANTS)	830912	1758	741.45	11,600
(142.0S7 AT R.M. 141.9)	830819	1420	741.47	19,200
	830804	1117	741.43	20,900
	830822	1255	741.46	21,600
	830807	1400	742.40	25,000
	830828	1200	741.86	26,600
	830825	0837	741.93	27,400
	830811	1310	741.94	27,700
	830708	1045	742.21	27,900
	830809	1424	742.73	29,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 21 (Q SITE) (142.0S6 AT R.M. 142.0)	830428	1009	744.81	2,900
	830507	1210	744.86	5,800
	830507	1256	744.88	5,800
	830929	1009	744.81	9,400
	821003	1319	744.96	11,000
	830921	1215	745.00	11,000
	830913	1634	745.02	11,100
	830912	1758	745.02	11,600
	821002	1515	744.96	11,700
	820906	1240	744.89	12,200
	820820	1645	744.95	12,500
	831003	1030	745.02	13,000
	820927	1635	744.98	13,800
	820831	1512	744.91	16,000
	820809	1340	745.00	17,000
	830721	1525	744.99	18,100
	820914	1310	744.92	20,200
	830804	1113	745.00	20,900
	830822	1352	745.07	21,600
	820802	1400	744.99	22,500
	820720	1800	744.93	22,900
	820920	1216	745.04	24,000
	820919	1408	745.03	24,100
	830630	1115	745.03	24,700
	830831	1720	745.13	24,800
	820728	1305	745.13	25,600
	830828	1200	745.20	26,600
	820918	1531	745.14	26,800
	830825	0835	745.26	27,400
	830811	1310	745.43	27,700
	830708	1045	745.52	27,900
	820915	1830	746.05	28,200
	830809	1510	746.03	29,900
	820725	1710	746.99	31,900
	820916	1020	746.52	32,500
	830601	1346	746.64	33,000

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 21 (NW HEAD)	820831	1500	754.64	16,000
(142.0H3 AT R.M. 142.2)	820709	1300	754.64	21,500
	820802	1433	754.64	22,500
	820720	1635	754.64	22,900
	820711	1730	754.64	24,000
	820728	1235	754.72	25,600
	820918	1600	754.66	26,800
	820623	1055	754.81	27,000
	830809	1548	755.26	29,900
	830605	1700	754.89	30,000
	830605	1315	754.99	30,000
	820622	1230	755.17	31,000
	820725	1745	755.61	31,900
	820916	1004	755.30	32,500
	830601	1802	755.09	33,000
	820620		755.40	33,000

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 21 (NE HEAD)	820831	1335	755.61	16,000
(142.0Hi AT R.M. 142.3)	830518	1100	755.61	20,000
	820802	1449	755.61	22,500
	820920	1210	755.61	24,100
	820728	1235	755.61	25,600
	820915	1604	756.76	28,200
	830809	1544	757.56	29,900
	830605	1300	757.20	30,000
	820725	1500	757.22	31,900
	830810	1639	757.52	31,900
	820620		757.22	33,000
	830601	1755	757.41	33,000

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 22 (MOUTH)	830915	1250	780.38	10,600
(144.3W3 AT R.M. 144.2)	821003	1130	780.43	11,000
	820822	1200	780.41	12,200
	820813	0900	780.47	13,600
	820831	1155	780.61	16,000
	820914	1203	780.64	20,200
	820720	1435	780.73	22,900
	820920	1145	780.85	24,000
	820919	1223	780.85	24,100
	820728	1205	781.14	25,600
	820918	1525	781.12	26,800
	820623	1730	781.19	27,000
	820915	1735	781.84	28,200

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 22 (MID SLOUGH) (144.384 AT R.M. 144.5)	830915	1235	780.64	10,600
	830909	1015	780.66	13,200
	830716	1435	780.60	16,400
	830727	1100	780.59	18,500
	830701	1400	780.84	23,100
	830824	1100	781.25	24,700
	830702		781.22	24,900
	830828	1015	781.63	26,600
	830809	1420	782.47	29,900
	830809	1715	782.70	29,900

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 22 (Q SITE)	830915	1229	783.37	10,600
(144.386 AT R.M. 144.6)	820813	0900	783.36	13,600
	830716	1445	783.24	16,400
	830819	1220	783.53	19,200
	820914	1141	783.63	20,200
	820802	1710	783.52	22,500
	820720	1415	783.58	22,900
	820920	1130	783.89	24,000
	820919	1217	783.84	24,100
	830702	1632	784.04	24,900
	820728	1145	784.26	25,600
	820918	1424	784.30	26,800
	820915	1640	785.08	28,200

Appendix Table 1-A-7 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 22 (HEAD)	820813	0855	786.35 [1]	13,600
(144.3H2 AT R.M. 144.7)	820831	1130	786.35 [1]	16,000
	820708	1815	786.35 [1]	18,100
	830805	1220	788.20	21,700
	820802	1717	788.06	22,500
	820720	1100	788.35	22,900
	820920	1125	788.37	24,000
	820919	1102	788.34	24,100
	830824	1013	788.57	24,700
	820728	1140	788.78	25,600
	820918	1410	788.79	26,800
	820623	1735	788.88	27,000
	820915	1634	789.46	28,200
	820622	1615	789.43	31,000
	830810	1649	789.71	31,900

1/ Streambed elevation obtained from cross sectional profile.

Appendix Table 1-A-8 Comparison of water surface elevation (WSEL) and flow measurements at selected side channel, slough and tributary study sites in the Talkeetna to Devil Canyon reach to the mean daily Susitna River discharge recorded at Gold Creek, (USGS 15292000).

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
WHISKERS SIDE SLOUGH	820816	1445	365.81	.2	15,600
(GAGE 101.2S3 AT R.M. 101.4)	820903	1625	365.65	.7	14,600
	821009	1145	365.58	2.0	8,440
	830618	1100	365.95	9.1	22,900
	820920	1530	366.20	35.1	24,000
WHISKERS CREEK	830618	1145	366.06	9.8	22,900
(GAGE 101.2T2 AT R.M. 101.4)	820816	1700	366.37	16.9	15,600
	821009	1145	366.51	31.8	8,440
	820903	1550	366.87	54.7	14,600
	820920	1615	367.91	142.5	24,000
UPLAND SLOUGH 6A	820921	1040	457.49	.6	24,200
(GAGE 112.3W1 AT R.M. 112.3)	830722	1545	457.00	8.9	18,600
	830825	1120	458.13	45.9	27,400
LANE CREEK	830625	1455	475.53	10.8	23,300
(GAGE 113.6T7 AT R.M. 113.6)	830710	1050	475.46	11.0	22,200
	820817	1425	475.79	27.5	15,100
	830616	1130	475.77	32.1	21,600
	830825	1725	475.68	32.2	27,400
	820816		475.44	35.3	15,600
	820902		475.79	51.7	16,000
	820831		475.94	56.7	16,000

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
SIDE SLOUGH 8	820903	1456	468.28	2.0	14,600
(GAGE 113.6S2 AT R.M. 113.6)	830809	1815	470.41	6.7	29,900
	820920	1333	469.41	9.9	24,000
	830825	1620	470.58	10.0	27,400
	820917	1517	470.75	20.7	32,000
MAINSTEM 2 SIDE CHANNEL-NW CHANNEL	830611	1745	480.64	352.0	19,000
(GAGE 114.4S5 AT R.M. 115.3)	830806	1150	481.53	958.0	23,800
	830808	1215	481.92	1415.0	26,000
	830825	1315	481.96	1608.0	27,400
MAINSTEM 2 SIDE CHANNEL-NE CHANNEL	830721	2000	480.44	.2	18,100
(GAGE 114.4S8 AT R.M. 115.4)	830806	1820	480.57	.7	23,800
	830825	1515	481.30	15.8	27,400
	830808	1530	481.33	32.3	26,000
	830826	1935	482.88	429.0	31,700
SIDE SLOUGH 8A-NE CHANNEL	830721	1250	568.53	2.7	18,100
(GAGE R&M STAGE AT R.M. 125.9)	830630	1404	568.60	3.8	24,700
	830827	1145	568.75	5.4	31,000
	830823	1145	568.70	6.6	22,700
	830809	1130	568.91	19.5	29,900
SIDE SLOUGH 8A-NE CHANNEL	830721	1250	566.33	2.7	18,100
(GAGE 125.3S1 AT R.M. 125.9)	830630	1404	566.08	3.8	24,700
	830827	1145	567.07	5.4	31,000
	830823	1145	566.97	6.6	22,700
	830809	1130	566.91	19.5	29,900

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
SIDE SLOUGH 8A-NW CHANNEL	830721	1150	566.00	.4	18,100
(GAGE 125.3S3 AT R.M. 125.9)	830823	1300	566.05	.8	22,700
	830809	1245	566.46	13.4	29,900
	830827	1315	566.81	43.6	31,000
SIDE SLOUGH 8A (LOWER PORTION)	830721	1515	563.51	4.2	18,100
(GAGE 125.3S4 AT R.M. 125.9)	830804	1325	563.57	5.4	20,900
	830823	1400	563.66	9.0	22,700
	830827	1420	564.14	45.5	31,000
SIDE SLOUGH 9	820825		593.51	1.7	13,400
(GAGE 128.3S1 AT R.M. 129.2)	820909		593.56	3.0	13,400
	830721	1745	593.36	5.6	18,100
	830730	0930	593.37	7.8	19,100
	820904	1430	593.37	8.0	14,400
	820720		593.92	28.0	22,900
	830630	1030	594.00	77.4	24,700
	830607	1225	593.96	89.0	23,000
	820715		594.10	108.0	25,600
	820920	1520	594.15	148.0	24,000
	820623		594.27	182.0	27,000
	820918	1305	594.42	232.0	26,800
	830809	1547	595.25	501.5	29,900

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
4TH OF JULY CREEK	830803	1450	624.46	2.2	21,600
(GAGE 131.1T1 AT R.M. 131.1)	830803	1015	624.47	3.6	21,600
	830624	2030	624.94	10.5	24,000
	830709	1430	624.70	13.3	24,300
	830630	1750	624.80	16.4	24,700
	820803	1625	625.35	38.3	19,800
	830826	1025	625.15	51.5	31,700
SIDE CHANNEL 10	830911	1115	654.27	.2	12,200
(GAGE 133.8S3 AT R.M. 134.2)	830717	1030	654.30	.6	16,500
	830726	1530	654.72	8.0	19,400
	830803	1745	655.15	31.6	21,600
	830724	1620	655.57	80.0	22,700
	830629	1630	655.84	93.9	26,800
	830808	1235	656.30	266.6	26,000
	830810	1120	658.26	781.3	31,900
	830826	1605	657.97	803.0	31,700
SIDE CHANNEL 10	830911	1155	651.94	.3	12,200
(GAGE 133.8S2 AT R.M. 134.2)	830826	1350	653.91	776.0	31,700
	830810	0921	653.86	836.9	31,900
SIDE CHANNEL 10	830911	1300	651.01	.9	12,200
(GAGE 133.8S1 AT R.M. 134.2)	830826	1145	653.54	736.0	31,700
	830810	1110	653.53	756.8	31,900

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
LOWER SIDE CHANNEL 11	830929	1200	663.09	820.0	9,400
(GAGE 134.6S2 AT R.M. 134.6)	830915	0930	663.22	973.0	10,600
	830711	1400	664.15	2790.0	20,000
	830811	1700	664.72	4210.0	27,700
SIDE SLOUGH 11	830721	1020	670.72	2.0	18,100
(GAGE 135.3S6 AT R.M. 135.7)	820830	1244	670.72	3.1	13,100
	830629	1000	670.76	4.1	26,800
	820918	1010	670.80	5.5	26,800
UPPER SIDE CHANNEL 11	830911	1715	680.63	.1	12,200
(GAGE 136.2S1 AT R.M. 136.3)	- - -	- -	680.95	12.0	- - -
	830712	1145	681.35	54.0	19,700
	830720	0945	681.34	56.6	18,600
	830727	1130	681.38	59.6	18,500
	830608	1550	681.63	110.0	22,000
	830629	1255	682.13	335.0	26,800
	830808	1400	682.24	403.0	26,000
	830810	1346	682.87	735.6	31,900
	830826	1745	682.93	777.5	31,700
GOLD CREEK	830806	1605	696.09	34.1	23,800
(GAGE 136.8T1 AT R.M. 136.7)	830827	1705	696.18	51.1	31,000
	830629	1442	696.25	56.0	26,800
	830808	1809	696.86	153.6	26,000
SIDE SLOUGH 16B	820907		700.08	1.1	11,700
(GAGE 138.0S5 AT R.M. 138.0)	830701	1521	700.28	6.0	23,100
	820919	1617	700.58	24.0	24,100
	820801	1551	700.85	55.0	26,400
	820915	1412	701.69	257.0	28,200

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
INDIAN RIVER	830728	1830	847.03	97.9	17,700
(GAGE 138.6T2 AT R.M. 138.6)	830712	1600	847.18	173.0	19,700
	821007		4.75	178.0	8,640
	830913	0900	847.28	242.0	11,100
	820910		4.93	268.0	14,400
	830827	1215	847.49	338.0	31,000
	830705	1140	847.49	459.0	25,100
	820921		5.76	930.0	24,200
UPLAND SLOUGH 19	830721	1755	720.29	.2	18,100
(GAGE 140.0S4 AT R.M. 139.8)	820819	1730	718.79	.4	13,300
SIDE SLOUGH 20	820820	1120	726.76	2.6	12,500
(GAGE 140.1S5 AT R.M. 140.2)	830701	1230	726.77	5.7	23,100
	820901	1643	726.89	11.6	17,900
	820802	1220	727.07	16.5	22,500
	820918	1825	727.35	44.8	26,800
	820916	1415	728.15	158.8	32,500
WATERFALL CREEK	830701	1145	730.57	5.4	23,100
(GAGE 140.1T6 AT R.M. 140.3)	830616	1445	730.69	13.0	21,600
TRIBUTARY AT HEAD OF SLOUGH 20	820901	1540	730.20	.7	17,900
(GAGE 140.1T3 AT R.M. 140.6)	830701	1020	730.23	1.1	23,100
	820918	1217	730.74	9.3	26,800
	820916	1230	731.39	23.5	32,500

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
SIDE CHANNEL 21	830914	1325	736.08	23.0	10,700
(GAGE 140.6S4 AT R.M. 141.1)	830912	1540	736.11	56.1	11,600
	830721	1644	737.02	337.6	18,100
	830711	1440	737.06	431.0	20,000
	830822	1558	737.31	614.0	21,600
	830630	1430	737.36	655.2	24,700
	830606	1900	737.54	776.0	26,000
	830809	1007	737.73	1213.0	29,900
SIDE CHANNEL 21	830804	1200	744.49	3.8	20,900
(GAGE 140.6S7 AT R.M. 141.8)	820902	1710	744.30	5.0	16,000
	820919	1220	744.59	10.0	24,100
	830630	1130	744.73	10.9	24,700
	830605	1500	745.33	74.0	30,000
	820917	1540	745.80	157.0	32,000
	830809	1315	746.08	332.0	29,900
SIDE SLOUGH 21 (MAIN CHANNEL)	820831	1518	744.90	3.3	16,000
(GAGE 142.0S6 AT R.M. 141.9)	830721	1500	744.99	3.3	18,100
	830822	1307	745.07	4.1	21,600
	820802	1400	744.93	5.0	22,500
	830809	1430	746.03	36.9	29,900
	820916	1024	746.52	59.2	32,500
	830601	1346	746.57	70.0	33,000
SIDE SLOUGH 22	820919	1124	783.84	5.1	24,100
(GAGE 144.3S6 AT R.M. 144.6)	830702	1638	784.04	19.6	24,900
	820918	1425	784.28	31.2	26,800
	820915	1642	785.08	118.5	28,200

Appendix Table 1-A-8 (Continued)

	DATE	TIME	WSEL (ft)	MEASURED FLOW (cfs)	MAINSTEM DISCHARGE (cfs)
PORTAGE CREEK (GAGE 148.8T1 AT R.M. 148.9)	830730	1055	840.12	267.0	19,100
	820610		840.52	434.0	26,000
	830712	1300	840.44	477.0	19,700
	820904		840.94	620.0	14,400
	820805		840.98	666.0	17,400
	830828	1225	840.94	789.0	26,600
	830702	1214	841.33	1088.0	24,900
	820708		841.93	1190.0	18,100
	820915		842.17	2160.0	28,200

Appendix Table 1-A-9 Comparison of tributary water surface elevations to mean daily mainstem discharge (cfs) obtained at the USGS gaging station at Gold Creek (USGS 15292000).

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE
CREEK (Q SITE)	821009	1145	366.51	8,440
(101.2T2 AT R.M. 101.4)	821006	1300	366.59	8,960
	830911	0950	366.03	12,200
	820903	1550	366.87	14,600
	820920	1615	367.91	24,000
UPLAND SLOUGH 6A	820921	1040	457.49	.6 24,200
(GAGE 112.3W1 AT R.M. 112.3)	830722	1545	457.00	8.9 18,600
	830825	1120	458.13	45.9 27,400
LANE CREEK	830625	1455	475.53	10.8 23,300
(GAGE 113.6T7 AT R.M. 113.6)	830710	1050	475.46	11.0 22,200
	820817	1425	475.79	27.5 15,100
	830616	1130	475.77	32.1 21,600
	830825	1725	475.68	32.2 27,400
	820816		475.44	35.3 15,600
	820902		475.79	51.7 16,000
	820831		475.94	56.7 16,000

Appendix Table 1-A-9 Comparison of tributary water surface elevations to mean daily mainstem discharge (cfs) obtained at the USGS gaging station at Gold Creek (15292000).

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
WHISKERS CREEK (Q SITE)	821009	1145	366.51	8,440
(101.2T2 AT R.M. 101.4)	821006	1300	366.59	8,960
	830911	0950	366.03	12,200
	820822	1400	366.21	12,200
	820928	1715	366.84	12,900
	820909	1315	366.39	13,400
	820813	1405	366.48	14,600
	820903	1550	366.87	14,600
	820816	1700	366.37	15,600
	820808	1930	366.12	16,600
	830522	1500	366.50	19,000
	830618	1225	366.06	22,900
	820611		366.06	24,000
	820920	1615	367.91	24,000
	820715	1320	365.49	25,600
	820622	0930	367.07	31,000
	820725	1525	368.47	31,900
	820621	1300	367.40	37,000
LANE CREEK	821004	1228	472.03	10,500
(113.6T3 AT R.M. 113.6)	831004	1240	473.00	11,400
	830912	1615	472.57	11,600
	820909	1100	471.94	13,400
	820926	1335	472.11	14,000
	820910	1630	471.91	14,400
	820903	1450	472.23	14,600
	820925	1640	472.14	15,000
	830528	1010	473.09	16,000
	820808	1430	471.95	16,600
	830820	1435	472.95	17,800
	830721	1350	472.37	18,100
	830715	1345	472.40	18,600

Appendix Table 1-A-9 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
LANE CREEK (Continued)	830616	1115	472.75	21,600
	830710	1100	472.43	22,200
	830625	1500	472.55	23,300
	830622	1040	472.60	23,600
	830807	1605	472.39	25,000
	830808	1715	472.94	26,000
	820917	1645	472.58	32,000
LANE CREEK (Q SITE)	831004	1240	475.93	11,400
(113.6T7 AT R.M. 113.6)	830912	1615	475.57	11,600
	820817	1425	475.79	15,100
	820816		475.44	15,400
	820902		475.79	16,000
	820831		475.94	16,000
	830721	1350	475.28	18,100
	830715	1350	475.42	18,600
	830616	1130	475.77	21,600
	830710	1124	475.46	22,200
	830625	1500	475.53	23,300
	830807	1605	475.42	25,000
	830808	1715	475.87	26,000
	830825	1725	475.68	27,400
4TH OF JULY CREEK (Q SITE)	830912	1450	625.05	11,600
(131.1T1 AT R.M. 131.1)	820907	1745	625.29	11,700
	820908	1345	625.24	11,900
	820822	1315	624.99	12,200
	821001	1524	625.53	12,400
	830910	1108	625.15	12,700
	820813	1220	625.18	13,600
	820818	1805	625.18	14,200
	820903	1130	625.81	14,600

Appendix Table 1-A-9 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
4TH OF JULY CREEK (Q SITE) continued	820811	1015	625.33	15,400
	820902	1640	625.67	14,000
	820810	1835	625.38	16,700
	820924	1750	625.53	17,100
	830923	1025	625.28	17,500
	830703	1235	624.78	19,600
	820803	1625	625.35	19,800
	830804	1030	624.46	20,900
	830709	1450	624.70	21,500
	830803	1450	624.46	21,600
	830803	1015	624.47	21,600
	830823	1046	625.25	22,700
	820920	1030	626.28	24,000
	820919	1026	626.28	24,100
	830630	1750	624.80	24,700
	820728	1625	625.52	25,600
	830624	2030	624.94	26,000
	830730	1400	624.50	26,400
	830828	1557	625.08	26,600
	830811	1000	625.32	27,700
	830826	1024	625.16	11,700
	820917	1050	626.17	32,000
GOLD CREEK	830914	1709	696.16	10,700
(136.8T1 AT R.M. 136.8)	830516	1420	696.19	17,000
	830517	1415	696.24	19,000
	830617	1840	696.55	23,300
	830806	1542	696.09	23,800
	830808	1850	696.86	26,000
	830629	1442	696.25	26,800
	830827	1705	696.18	31,000

Appendix Table 1-A-9 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
GOLD CREEK (PRESSURE/TEMPERATURE)	830914	1717	694.43	10,700
(136.8T2 AT R.M. 136.8)	830517	1415	694.32	19,000
	830806	1542	694.39	23,800
	830808	1850	695.09	26,000
INDIAN RIVER (PRESSURE/TEMPERATURE)	830721	1255	747.10	18,100
(138.6T1 AT R.M. 138.6)	830517	0938	747.99	19,000
	830712	1600	747.18	19,700
	830617	0856	747.80	23,300
	830705	1140	747.51	25,100
INDIAN RIVER	831019	1200	847.29	8,010
(138.6T2 AT R.M. 138.6)	830913	0942	847.28	11,100
	830913	0946	847.30	11,100
	831003	1615	847.68	13,000
	830728		847.03	17,700
	830721	1255	847.10	18,100
	830712	1600	847.18	19,700
	830807	1315	847.22	25,000
	83	1140	847.49	25,100
	8308	1326	847.49	31,000
SLOUGH 20 (SMALL TRIBUTARY)	821003	1715	731.23	11,000
(140.1T3 AT R.M. 140.5)	820820	1145	730.16	12,500
	820813	1005	730.19	13,600
	830529	1612	730.38	17,000
	820901	1540	730.20	17,900
	830721	1817	730.17	18,100
	820804	1220	730.04	18,500
	820914	1447	730.52	20,200

Appendix Table 1-A-9 continued

LOCATION	DATE	TIME	WSEL (ft)	DISCHARGE (cfs)
SLOUGH 20 (SMALL TRIBUTARY) continued	830804	1441	730.20	20,900
	820802	1230	730.37	22,500
	830701	1020	730.23	23,100
	820918	1217	730.74	26,800
	820623	1015	730.61	27,000
	820619		730.77	28,000
	820727	1205	730.84	29,100
	830809	1211	730.86	29,900
	820622	1145	730.98	31,000
	820916	1230	731.39	32,500
WATERFALL CREEK (Q SITE) (140.1T6 AT R.M. 140.3)	830913	1916	730.56	11,100
	831003	1103	730.72	13,000
	830716	1315	730.48	16,400
	830529	1541	730.96	17,000
	830721	1802	730.44	18,100
	830715	1545	730.51	18,600
	830804	1514	730.47	20,900
	830616	1445	730.69	21,600
	830701	1145	730.57	23,100
	830824	1301	730.62	24,700
	830828	1120	730.55	26,600
	830809	1616	730.75	29,900

Appendix Table 1-A-10. Daily mean streamflow record for Gold Creek, Alaska, 1983. River Mile 136.7, Tributary River Mile 0.2

DATE	DISCHARGE[1] (cfs)
830516	---
830517	69
830518	76
830519	74
830520	81
830521	95
830522	110
830523	102
830524	102
830525	104
830526	113
830527	116
830528	118
830529	149
830530	172
830531	238

1 Discharge is estimated from the regression equation for the Gold Creek tributary streamflow/water depth rating curve.

Table 1-A-10 continued

DATE	DISCHARGE[1] (cfs)
830601	217
830602	193
830603	205
830604	163
830605	138
830606	156
830607	156
830608	137
830609	120
830610	118
830611	126
830612	120
830613	114
830614	115
830615	116
830616	116
830617	103
830618	105
830619	115
830620	102
830621	90
830622	90
830623	83
830624	73
830625	69
830626	65
830627	59
830628	59
830629	57
830630	54

1 Discharge is estimated from the regression equation for the Gold Creek tributary streamflow/water depth rating curve.

Table 1-A-10 continued

DATE	DISCHARGE[1] (cfs)
830701	53
830702	59
830703	51
830704	49
830705	47
830706	46
830707	43
830708	44
830709	40
830710	39
830711	36
830712	35
830713	39
830714	60
830715	50
830716	44
830717	42
830718	40
830719	36
830720	35
830721	33
830722	32
830723	36
830724	34
830725	32
830726	30
830727	29
830728	27
830729	26
830730	27
830731	30

1 Discharge is estimated from the regression equation for the Gold Creek tributary streamflow/water depth rating curve.

Table 1-A-10 continued

DATE	DISCHARGE[1] (cfs)
830801	27
830802	25
830803	24
830804	29
830805	40
830806	40
830807	37
830808	131
830809	200
830810	114
830811	83
830812	89
830813	114
830814	103
830815	84
830816	72
830817	65
830818	61
830819	56
830820	57
830821	79
830822	69
830823	64
830824	66
830825	60
830826	53
830827	52
830828	52
830829	50
830830	62
830831	84

1 Discharge is estimated from the regression equation for the Gold Creek tributary streamflow/water depth rating curve.

Table 1-A-10 continued

DATE	DISCHARGE[1] (cfs)
830901	79
830902	134
830903	88
830904	74
830905	68
830906	63
830907	60
830908	58
830909	54
830910	53
830911	49
830912	46
830913	45
830914	45
830915	46
830916	44
830917	42
830918	40
830919	38
830920	55
830921	60
830922	56
830923	52
830924	45
830925	44
830926	54
830927	63
830928	41
830929	52
830930	158

1 Discharge is estimated from the regression equation for the Gold Creek tributary streamflow/water depth rating curve.

Table 1-A-10 continued

DATE	DISCHARGE[1] (cfs)
831001	157
831002	114
831003	87
831004	76
831005	---

1 Discharge is estimated from the regression equation for the Gold Creek tributary streamflow/water depth rating curve.

Appendix Table 1-A-11. Daily mean streamflow record for Indian River, Alaska, 1983. River Mile 138.6, Tributary River Mile 1.0

DATE	DISCHARGE[1] (cfs)
830517	---
830518	1,545
830519	1,230
830520	1,092
830521	895
830522	865
830523	923
830524	931
830525	788
830526	662
830527	609
830528	508
830529	751
830530	1,809
830531	2,741

1 Discharge is estimated from the regression equation for the Indian River streamflow/water depth rating curve.

Table 1-A-11 continued

DATE	DISCHARGE[1] (cfs)
830601	2,019
830602	2,087
830603	3,137
830604	1,389
830605	804
830606	966
830607	1,122
830608	975
830609	894
830610	840
830611	812
830612	768
830613	732
830614	700
830615	880
830616	941
830617	812
830618	768
830619	1,026
830620	1,138
830621	989
830622	1,101
830623	945
830624	754
830625	723
830626	668
830627	599
830628	608
830629	467
830630	448

1 Discharge is estimated from the regression equation for the Indian River streamflow/water depth rating curve.

Table 1-A-11 continued

DATE	DISCHARGE[1] (cfs)
830701	443
830702	622
830703	406
830704	384
830705	384
830706	303
830707	236
830708	215
830709	189
830710	168
830711	156
830712	134
830713	158
830714	167
830715	142
830716	129
830717	127
830718	117
830719	105
830720	88
830721	84
830722	107
830723	124
830724	130
830725	105
830726	89
830727	89
830728	84
830729	73
830730	68
830731	85

[1] Discharge is estimated from the regression equation for the Indian River streamflow/water depth rating curve.

Table 1-A-11 continued

DATE	DISCHARGE[1] (cfs)
830801	80
830802	70
830803	63
830804	65
830805	122
830806	171
830807	147
830808	1,299
830809	2,647
830810	1,038
830811	556
830812	1,076
830813	2,389
830814	1,914
830815	1,180
830816	805
830817	596
830818	467
830819	368
830820	326
830821	588
830822	578
830823	685
830824	705
830825	562
830826	503
830827	433
830828	368
830829	341
830830	695
830831	2,185

1 Discharge is estimated from the regression equation for the Indian River streamflow/water depth rating curve.

Table 1-A-11 continued

DATE	DISCHARGE[1] (cfs)
830901	1,639
830902	3,015
830903	1,535
830904	1,026
830905	768
830906	604
830907	496
830908	436
830909	402
830910	361
830911	309
830912	268
830913	244
830914	239
830915	243
830916	211
830917	187
830918	178
830919	161
830920	278
830921	413
830922	365
830923	357
830924	253
830925	221
830926	201
830927	195
830928	208
830929	415
830930	2,308

1 Discharge is estimated from the regression equation for the Indian River streamflow/water depth rating curve.

Table 1-A-11 continued

DATE	DISCHARGE[1] (cfs)
831001	1,875
831002	1,468
831003	1,049
831004	909
831005	764
831006	717
831007	526
831008	429
831009	448
831010	568
831011	1,714
831012	1,573
831013	1,115
831014	759
831015	654
831016	546
831017	485
831018	434
831019	---

1 Discharge is estimated from the regression equation for the Indian River streamflow/water depth rating curve.

Appendix Table 1-A-12. Daily mean streamflow record for Portage Creek, Alaska, 1983. River Mile 148.8, Tributary River Mile 0.1

DATE	DISCHARGE[1] (cfs)
830514	---
830515	621
830516	721
830517	766
830518	794
830519	712
830520	695
830521	699
830522	679
830523	737
830524	700
830525	632
830526	622
830527	590
830528	581
830529	895
830530	1,587
830531	1,729

1 Discharge is estimated from the regression equation for the Portage Creek streamflow/water depth rating curve.

Appendix Table 1-A-12 continued

DATE	DISCHARGE[1] (cfs)
830601	1,395
830602	1,399
830603	1,902
830604	1,370
830605	855
830606	968
830607	1,052
830608	1,043
830609	902
830610	809
830611	851
830612	885
830613	904
830614	912
830615	999
830616	1,083
830617	1,013
830618	984
830619	1,167
830620	1,181
830621	1,113
830622	1,140
830623	1,109
830624	988
830625	947
830626	927
830627	952
830628	891
830629	772
830630	725

1 Discharge is estimated from the regression equation for the Portage Creek streamflow/water depth rating curve.

Table 1-A-12 continued

DATE	DISCHARGE[1] (cfs)
830701	712
830702	848
830703	662
830704	683
830705	771
830706	711
830707	---
830728	---
830729	257
830730	278
830731	392

1 Discharge is estimated from the regression equation for the Portage Creek streamflow/water depth rating curve.

Table 1-A-12 continued

DATE	DISCHARGE[1] (cfs)
830801	381
830802	315
830803	275
830804	283
830805	522
830806	689
830807	563
830808	1,382
830809	2,045
830810	1,471
830811	1,045
830812	1,087
830813	1,513
830814	1,553
830815	1,334
830816	1,134
830817	989
830818	867
830819	763
830820	737
830821	1,160
830822	1,094
830823	1,267
830824	1,286
830825	1,147
830826	1,131
830827	1,000
830828	857
830829	805
830830	1,671
830831	2,185

1 Discharge is estimated from the regression equation for the Portage Creek streamflow/water depth rating curve.

Table 1-A-12 continued

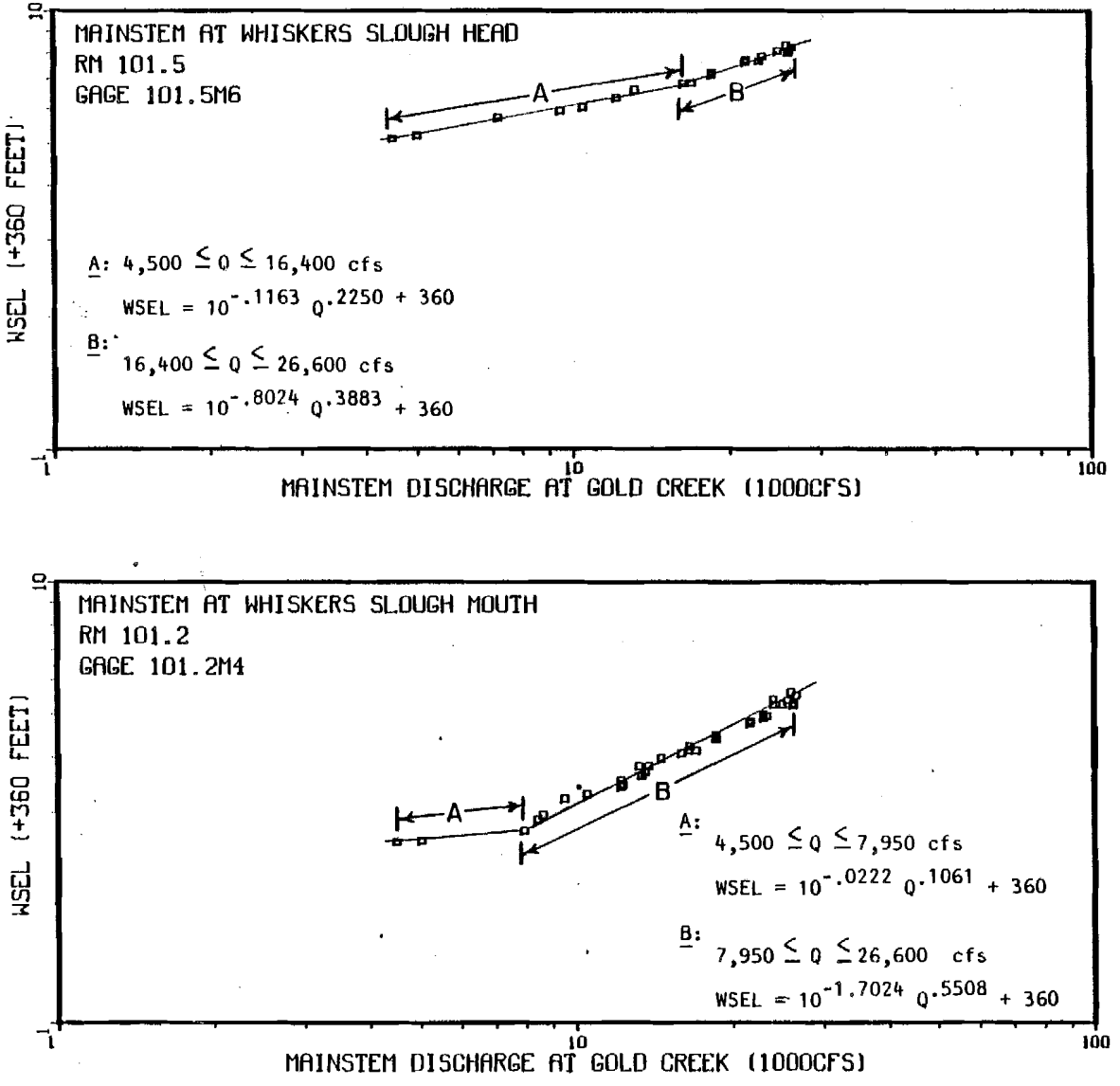
DATE	DISCHARGE[1] (cfs)
830901	1,952
830902	2,165
830903	1,706
830904	1,402
830905	1,189
830906	1,031
830907	903
830908	834
830909	765
830910	690
830911	618
830912	564
830913	521
830914	499
830915	475
830916	429
830917	394
830918	367
830919	344
830920	429
830921	525
830922	531
830923	541
830924	431
830925	396
830926	368
830927	348
830928	341
830929	418
830930	888

1 Discharge is estimated from the regression equation for the Portage Creek streamflow/water depth rating curve.

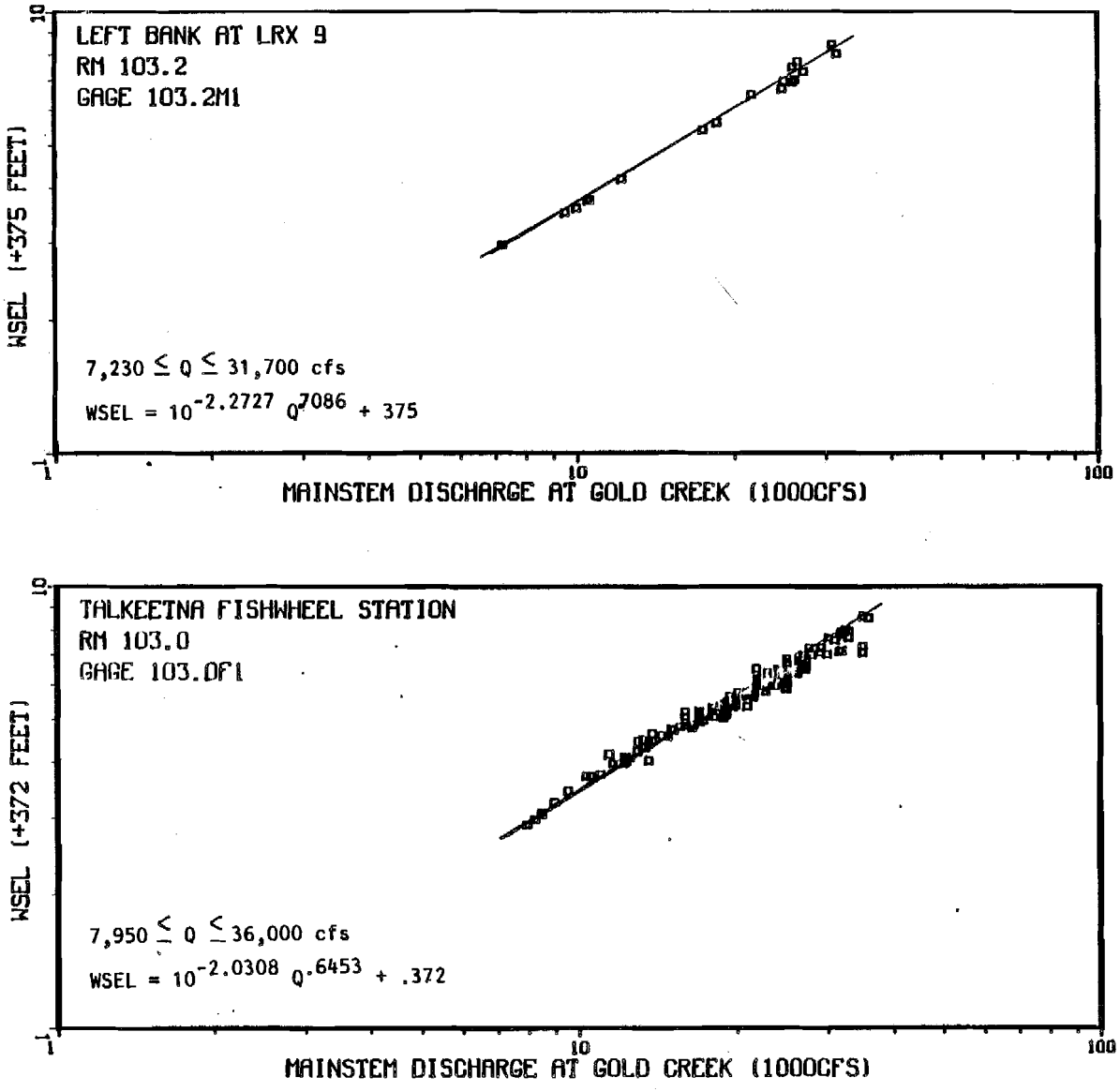
Table 1-A-12 continued

831001	875
831002	793
831003	699
831004	616
831005	570
831006	552
831007	473
831008	421
831009	444
831010	476
831011	768
831012	735
831013	612
831014	531
831015	490
831016	444
831017	424
831018	389
831019	---

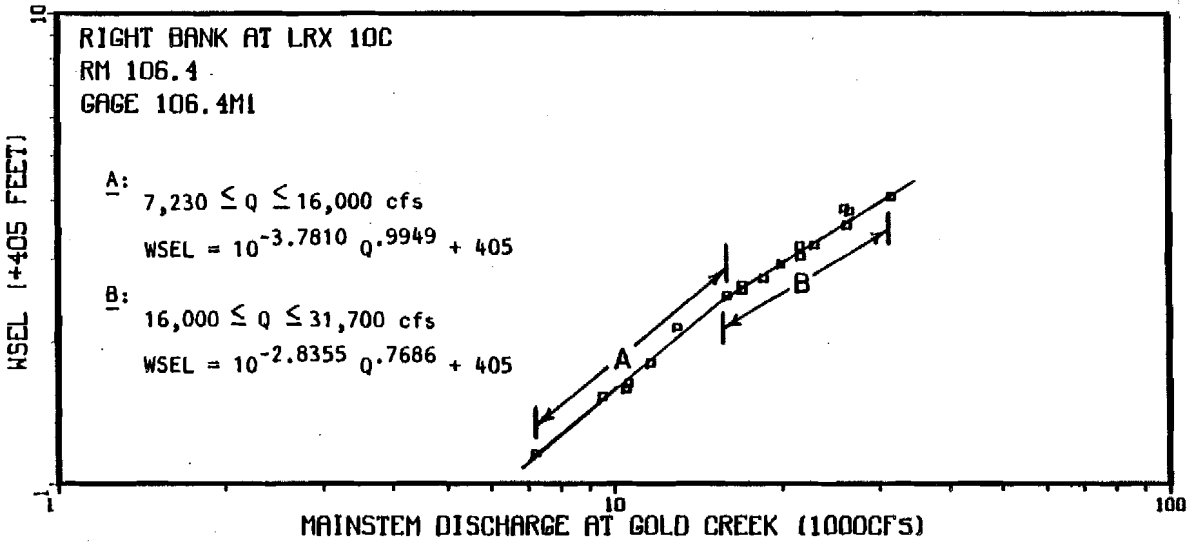
1 Discharge is estimated from the regression equation for the Portage Creek streamflow/water depth rating curve.

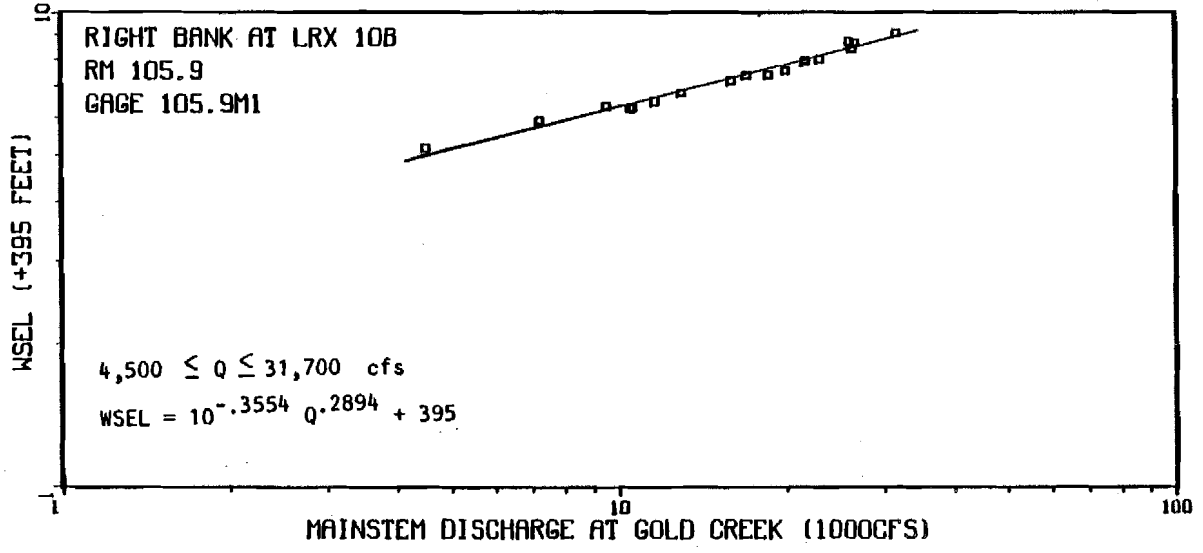


Appendix Figure 1-A 1. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at Whiskers Slough head and mouth.

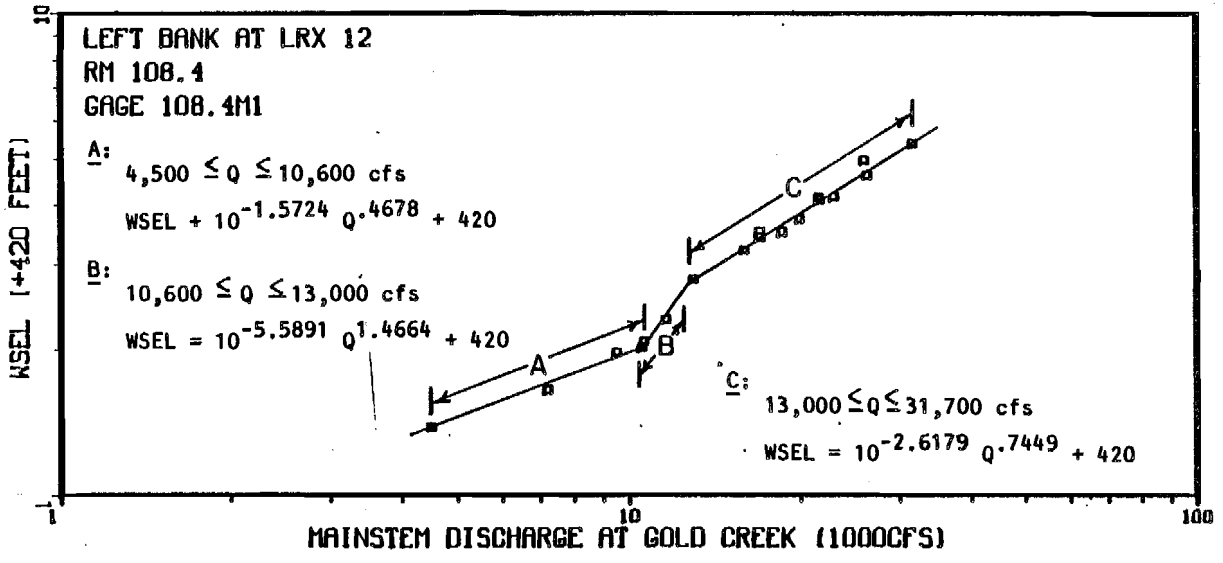


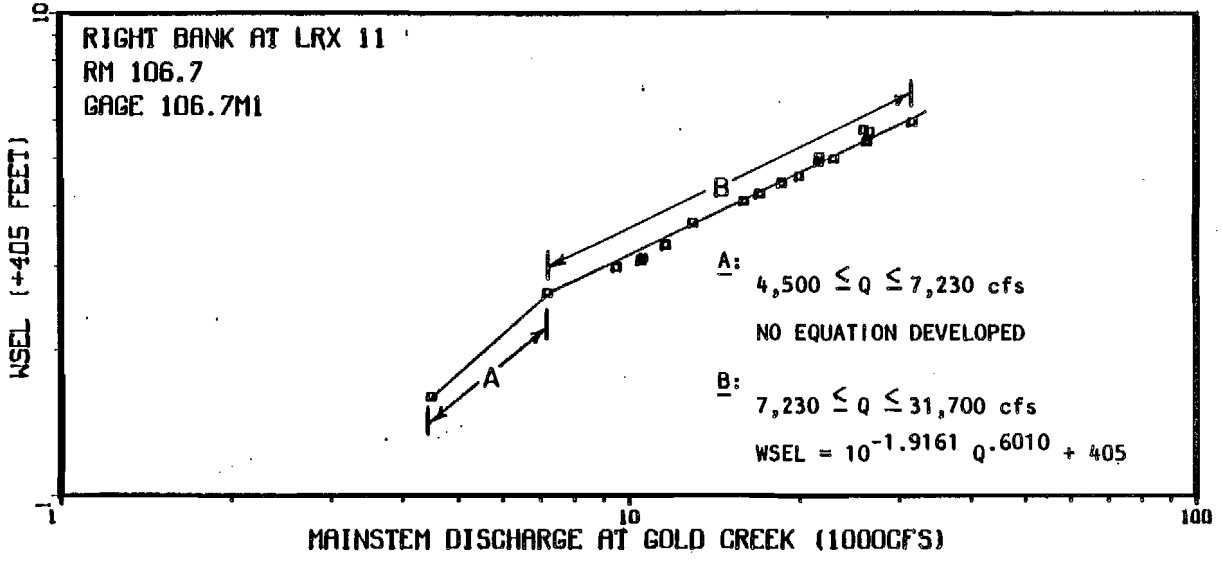
Appendix Figure 1-A-2. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at Talkeetna Fishwheel Station and left bank at LRX 9.



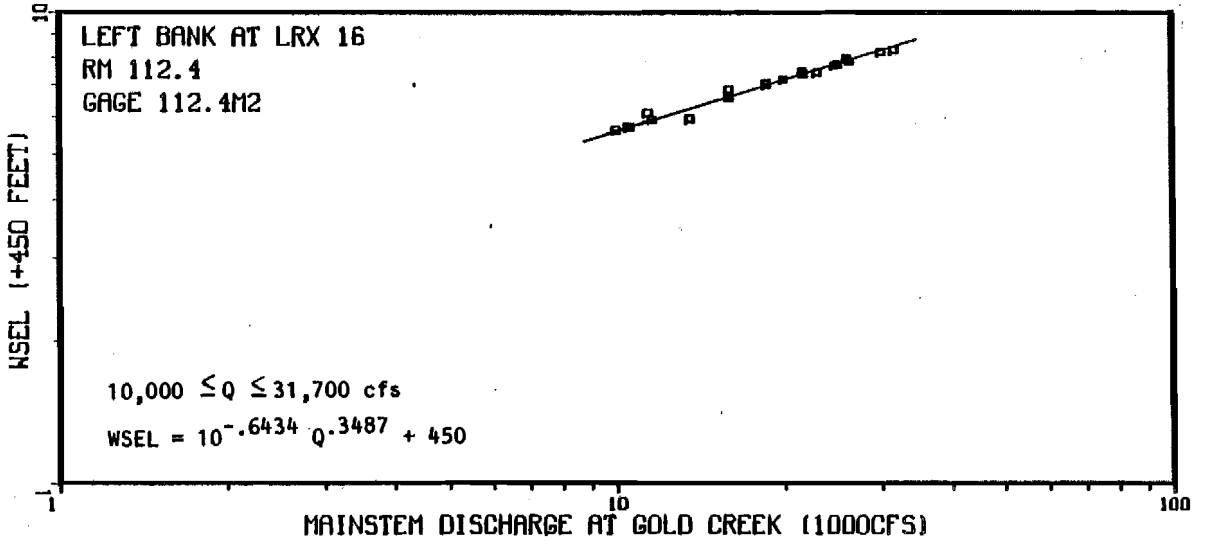


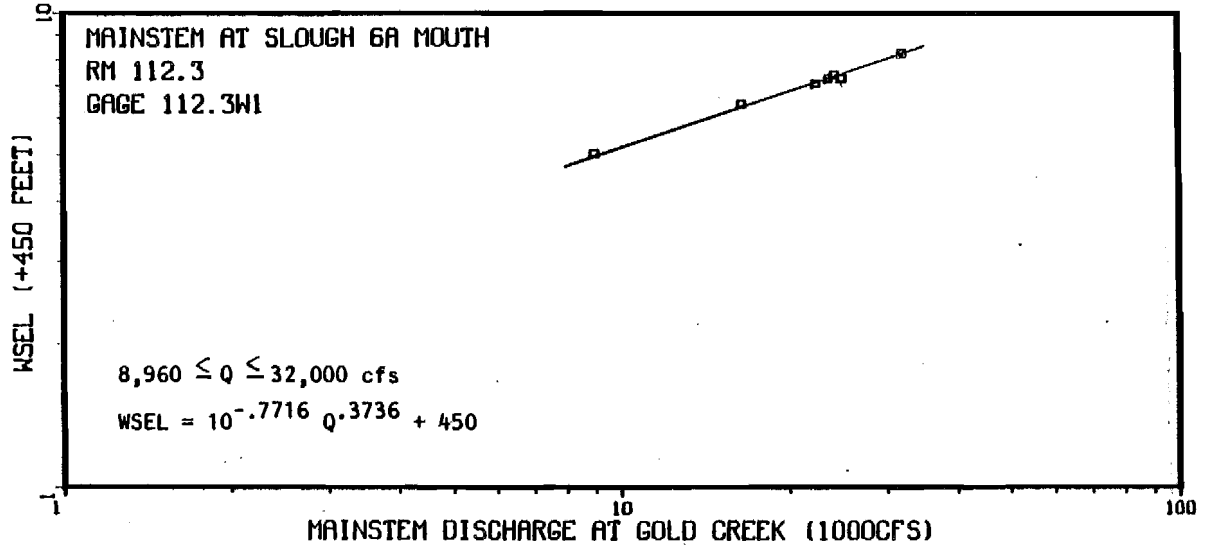
Appendix Figure 1-A-3. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at LRX 10B and right bank at LRX 10C.



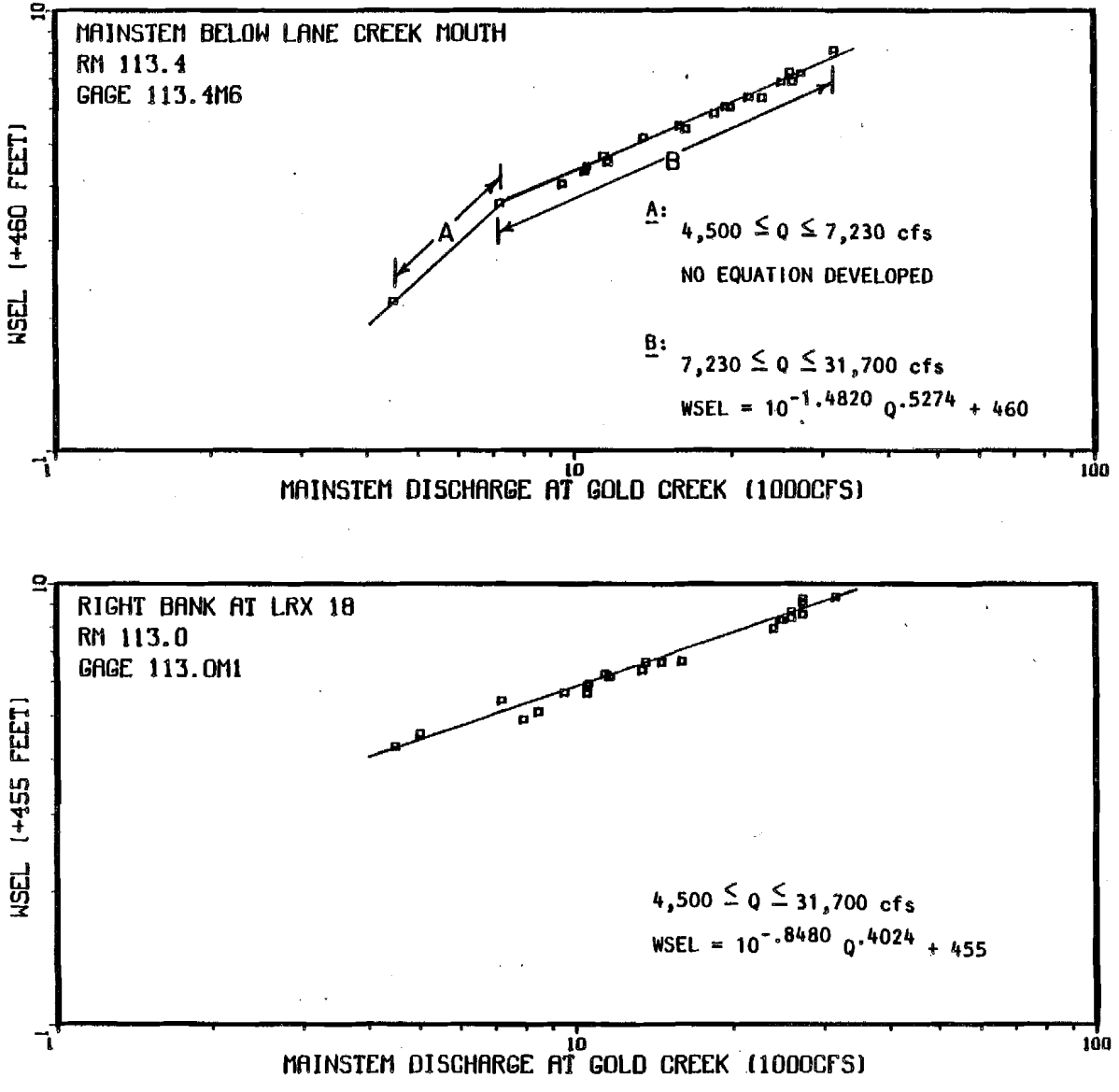


Appendix Figure 1-A-4. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at right bank at LRX 11 and left bank at LRX 12.

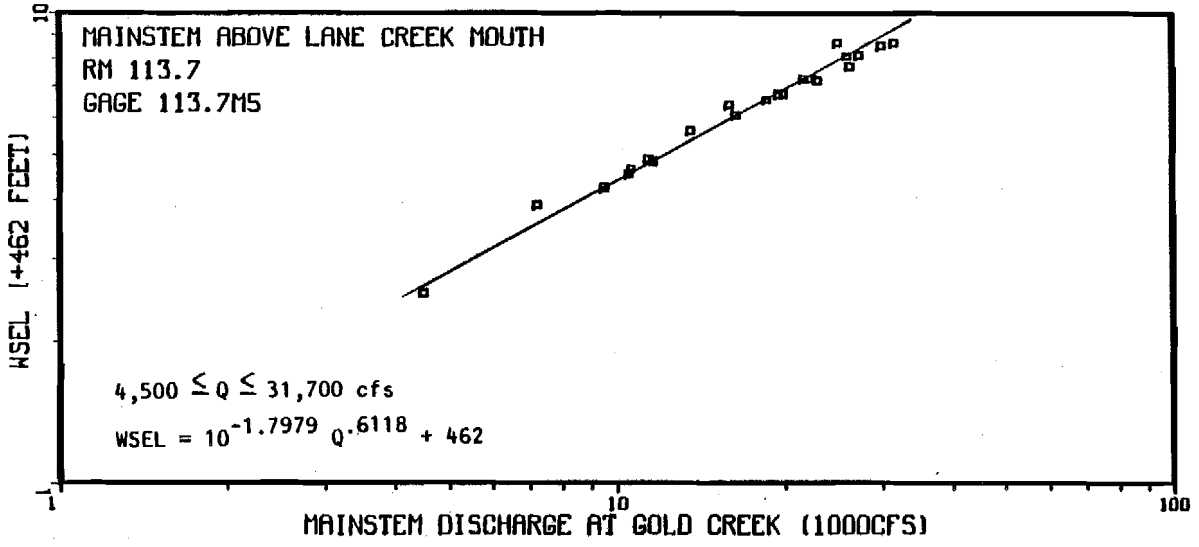


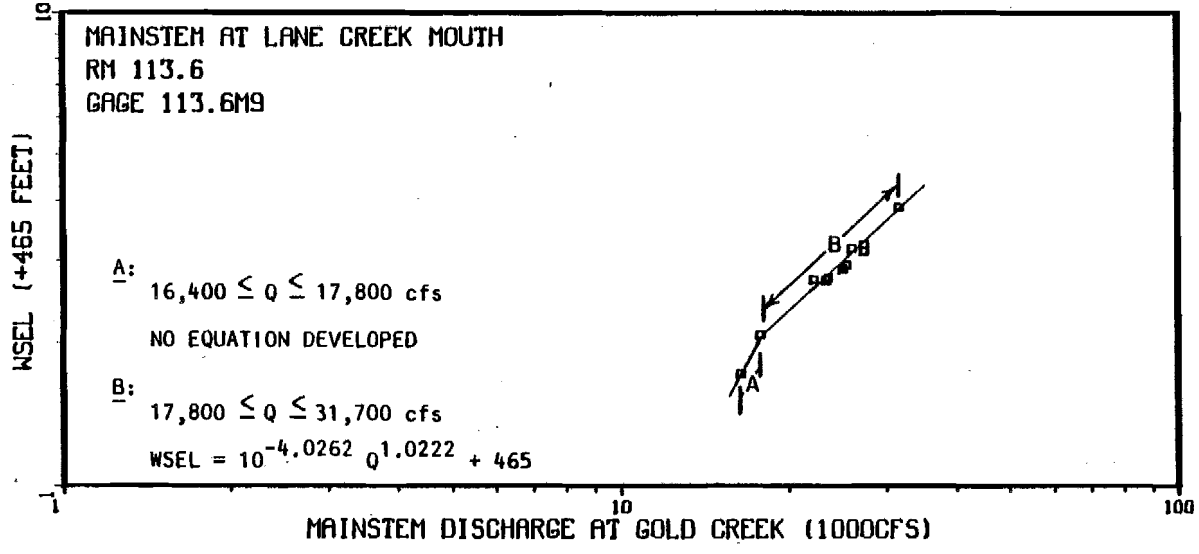


Appendix Figure 1-A-5. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at Upland Slough 6A Mouth and left bank at LRX 16.

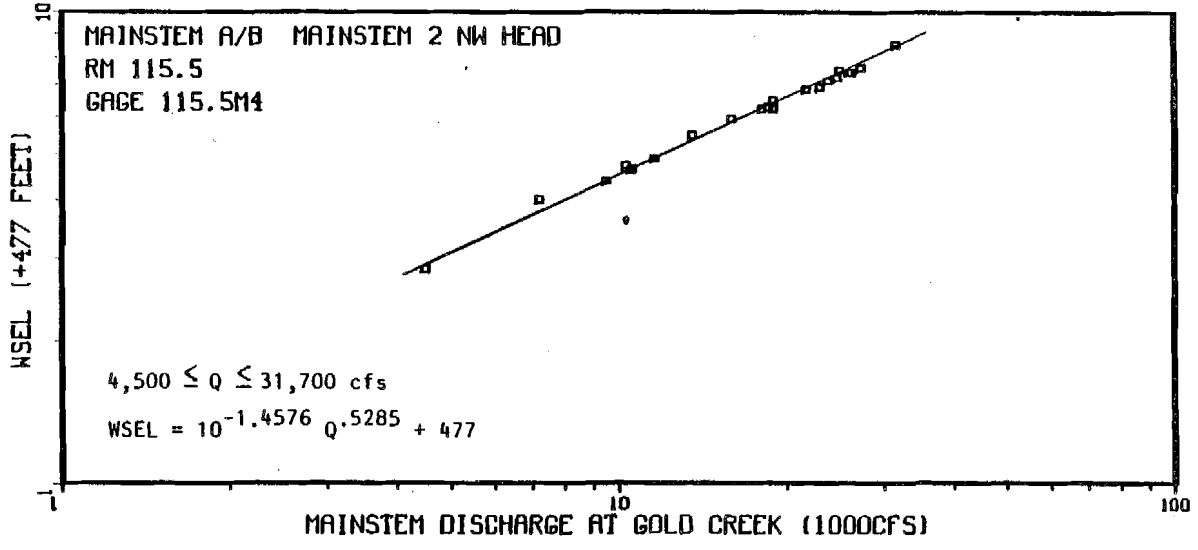


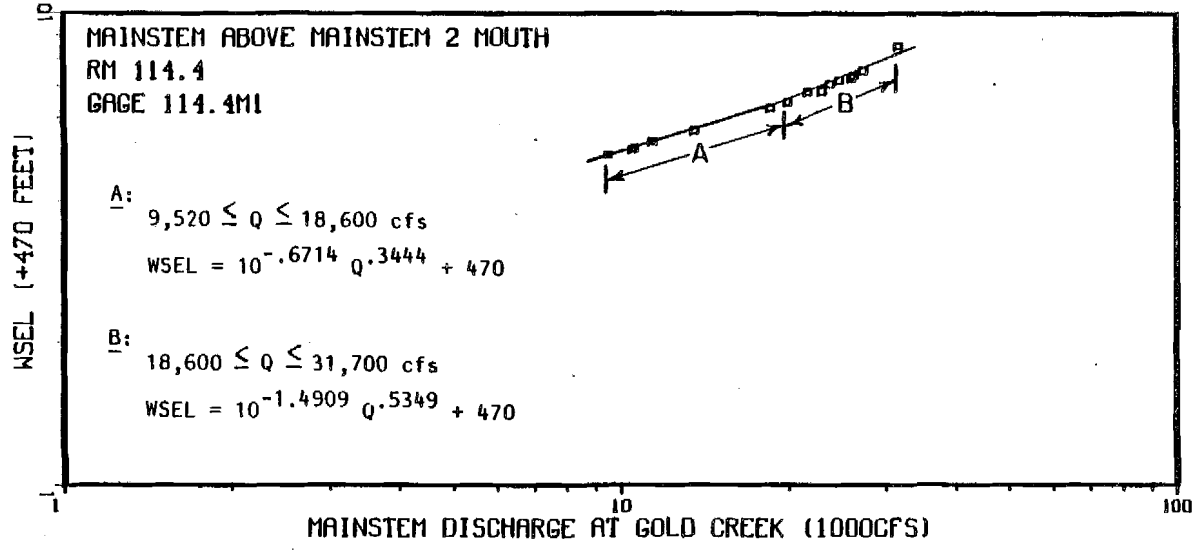
Appendix Figure 1-A-6. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at right bank at LRX 18 and mainstem below Lane Creek Mouth.



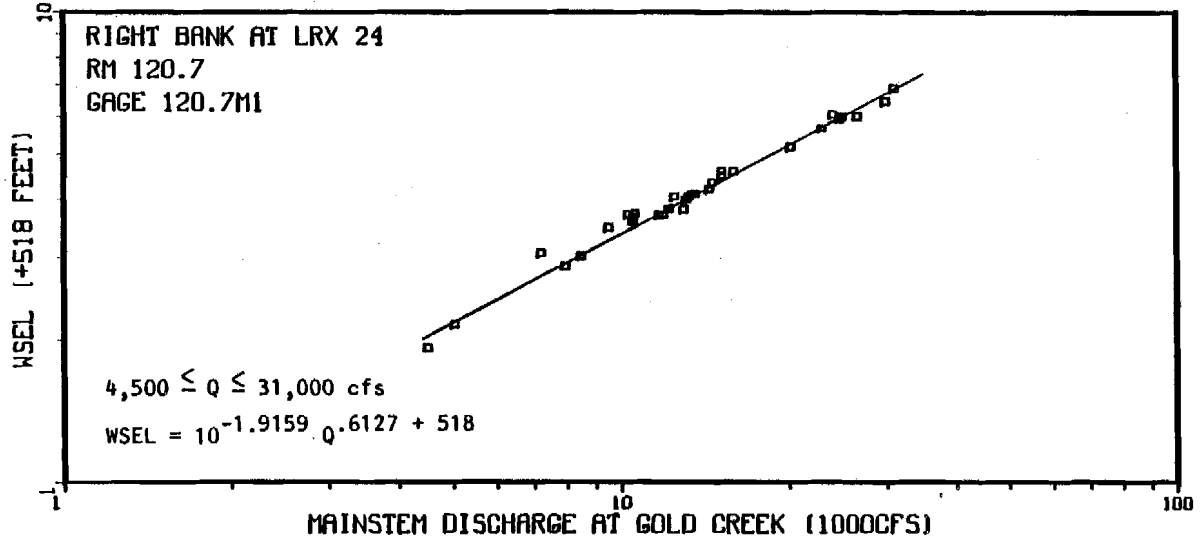


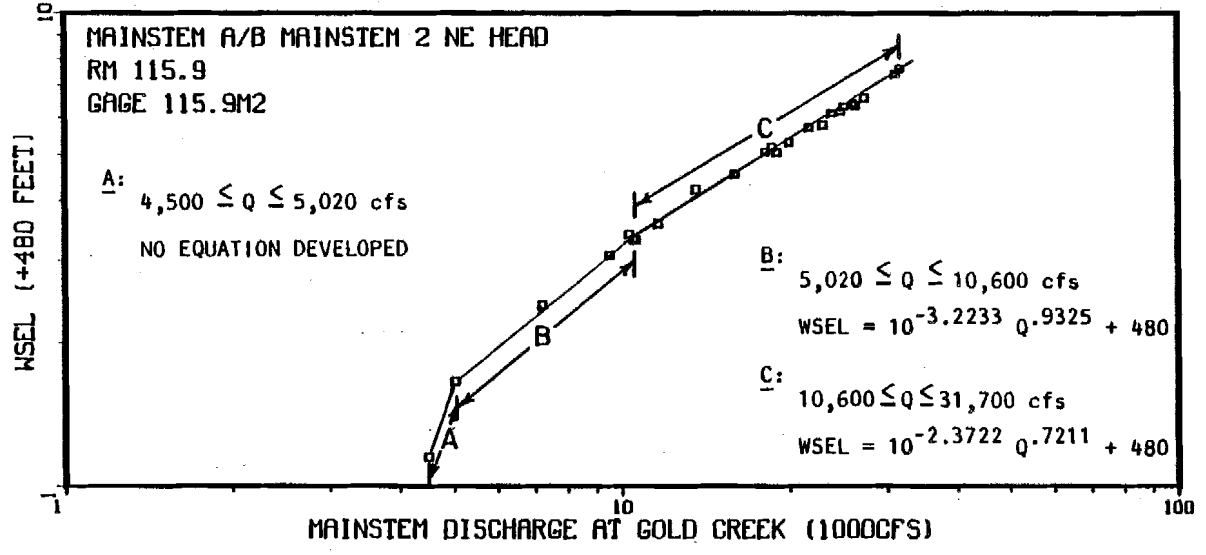
Appendix Figure 1-A-7. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at Lane Creek Mouth and abovd Lane Creek Mouth.



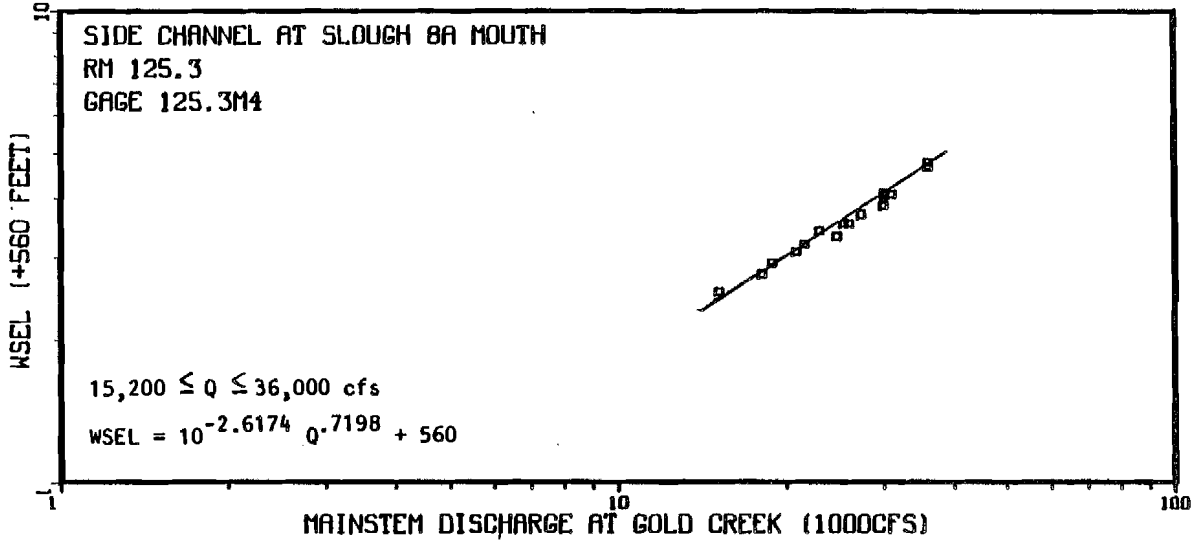


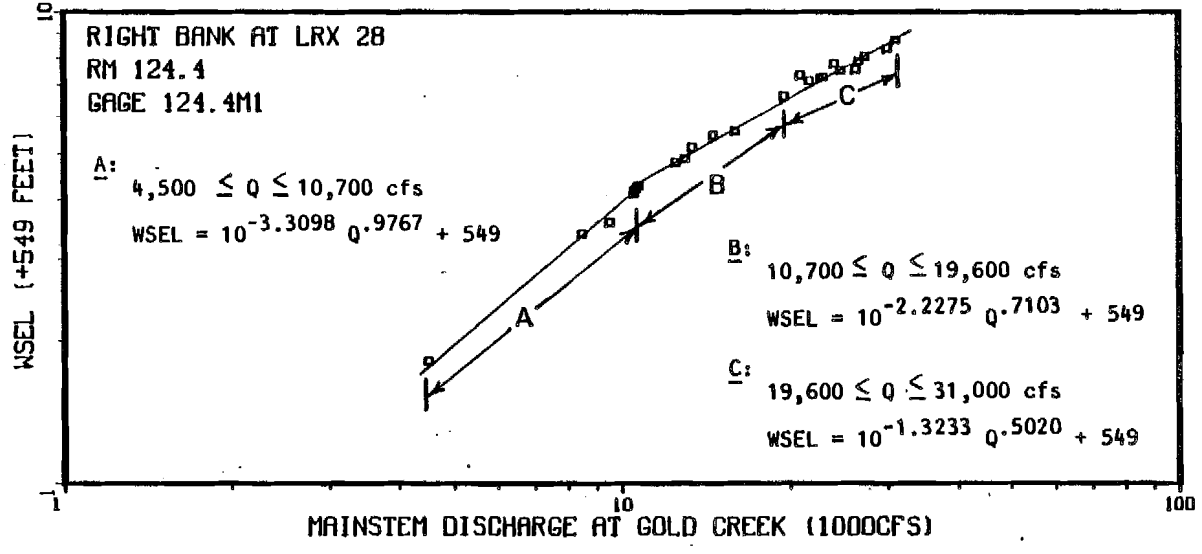
Appendix Figure 1-A-8. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation above Mainstem 2 Side Channel Mouth and above Mainstem 2 Side Channel NW head.



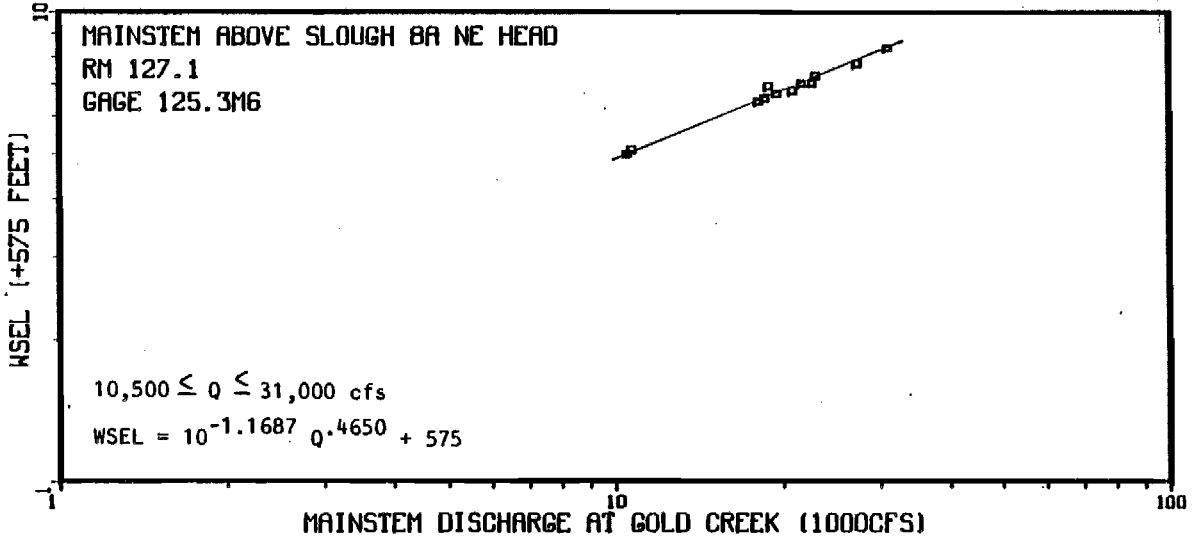


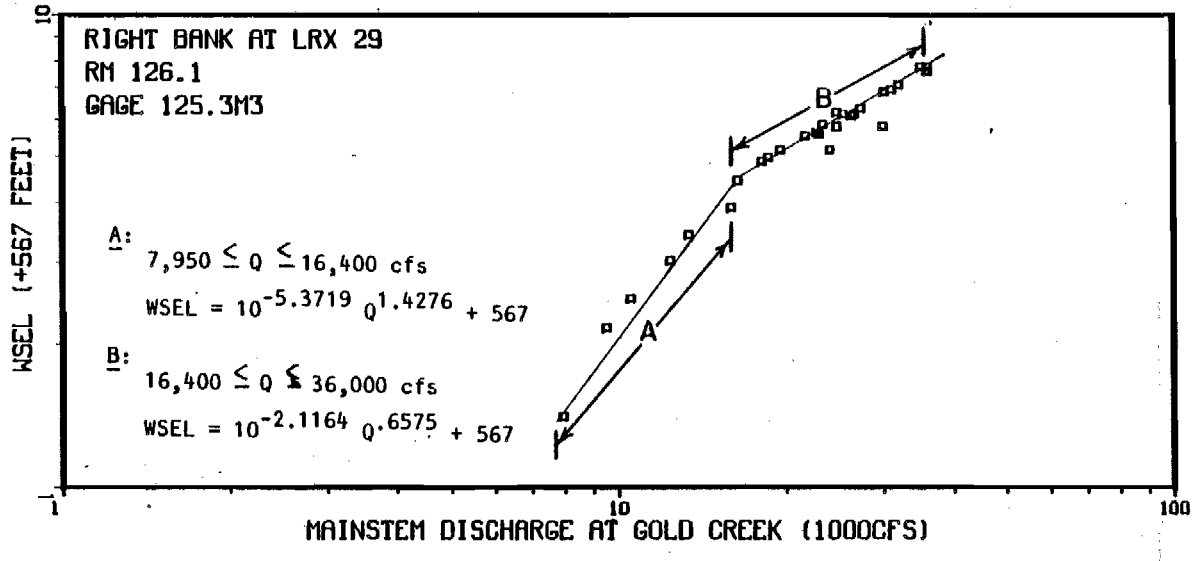
Appendix Figure 1-A-9. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation above Mainstem 2 Side Channel NE head and the right bank at LRX 24.



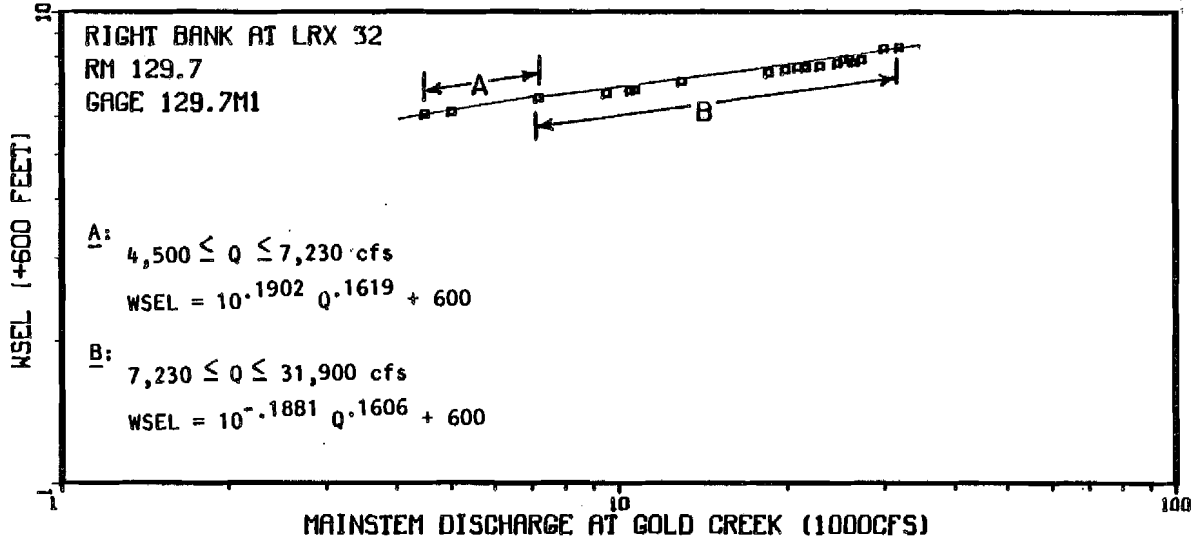


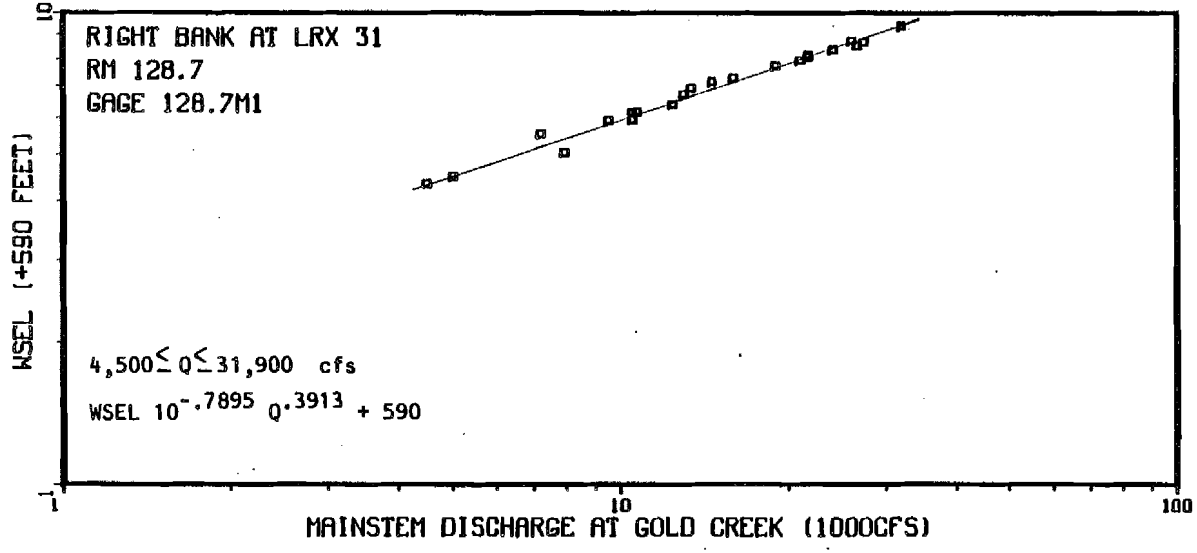
Appendix Figure 1-A-10. Mainstem (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 28 and at Side Slough 8A Mouth.



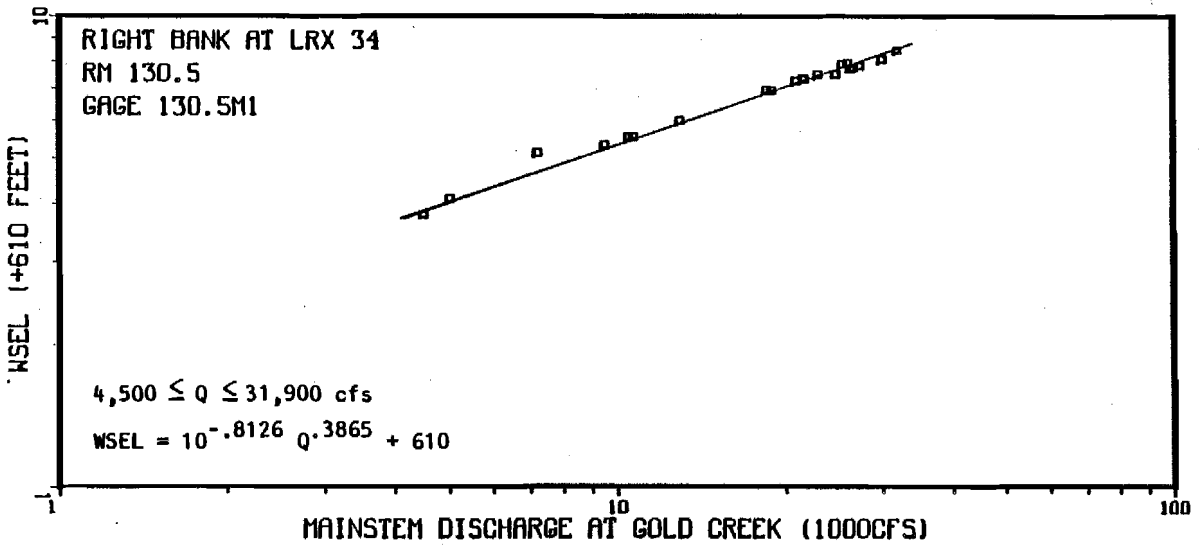


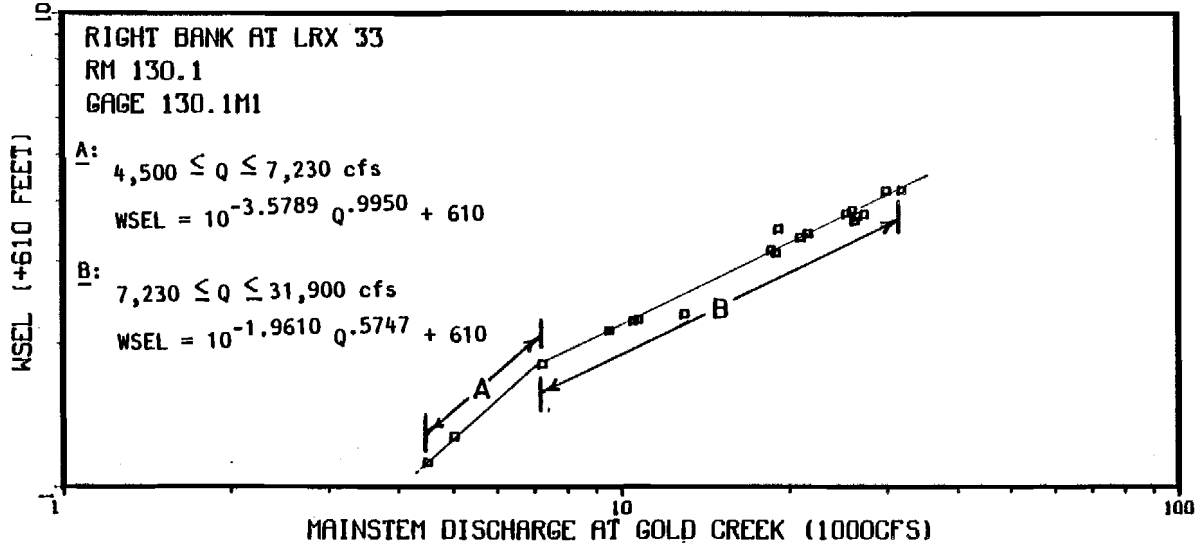
Appendix Figure 1-A-11. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 29 and above Slough 8A NE head.



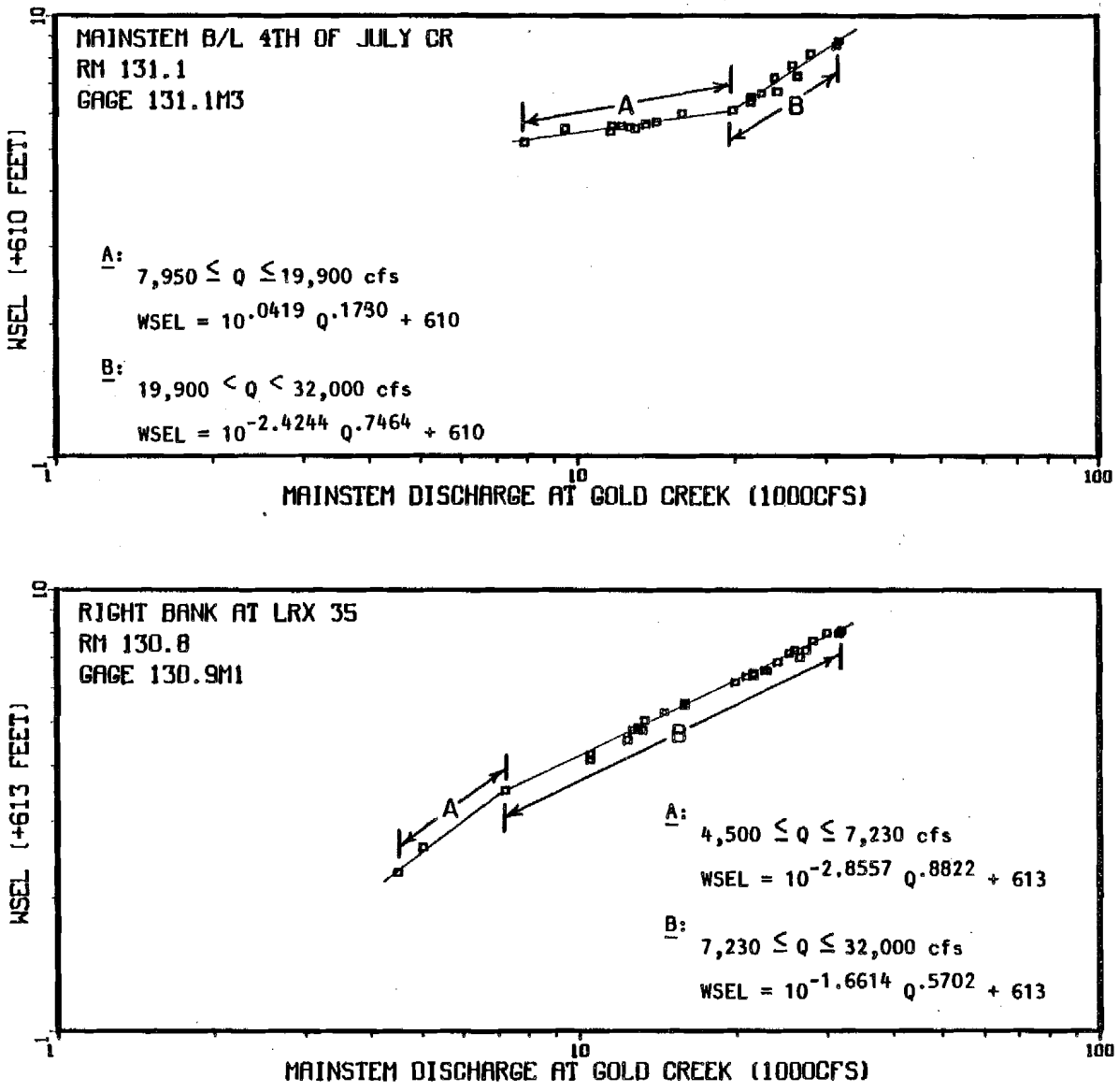


Appendix Figure 1-A-12. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 31 and LRX 32.

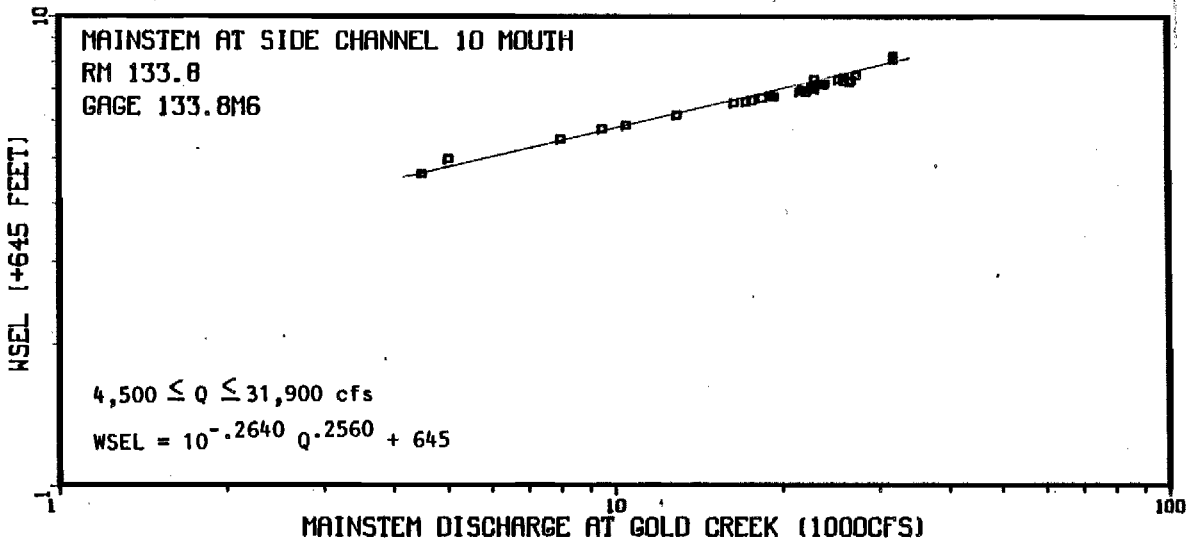


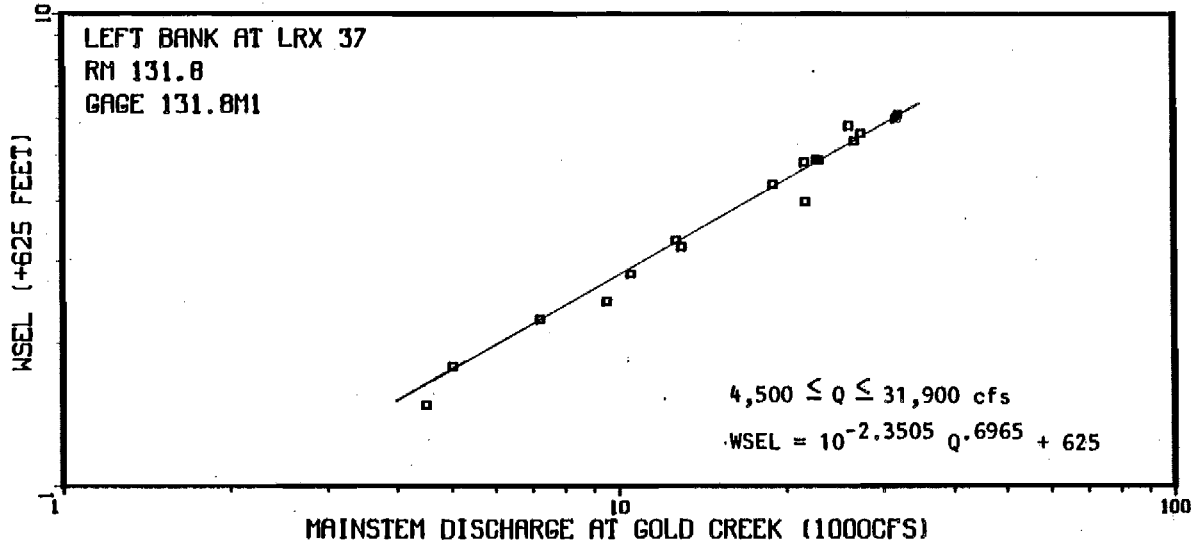


Appendix Figure 1-A-13. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 33 and at the right bank at LRX 34.

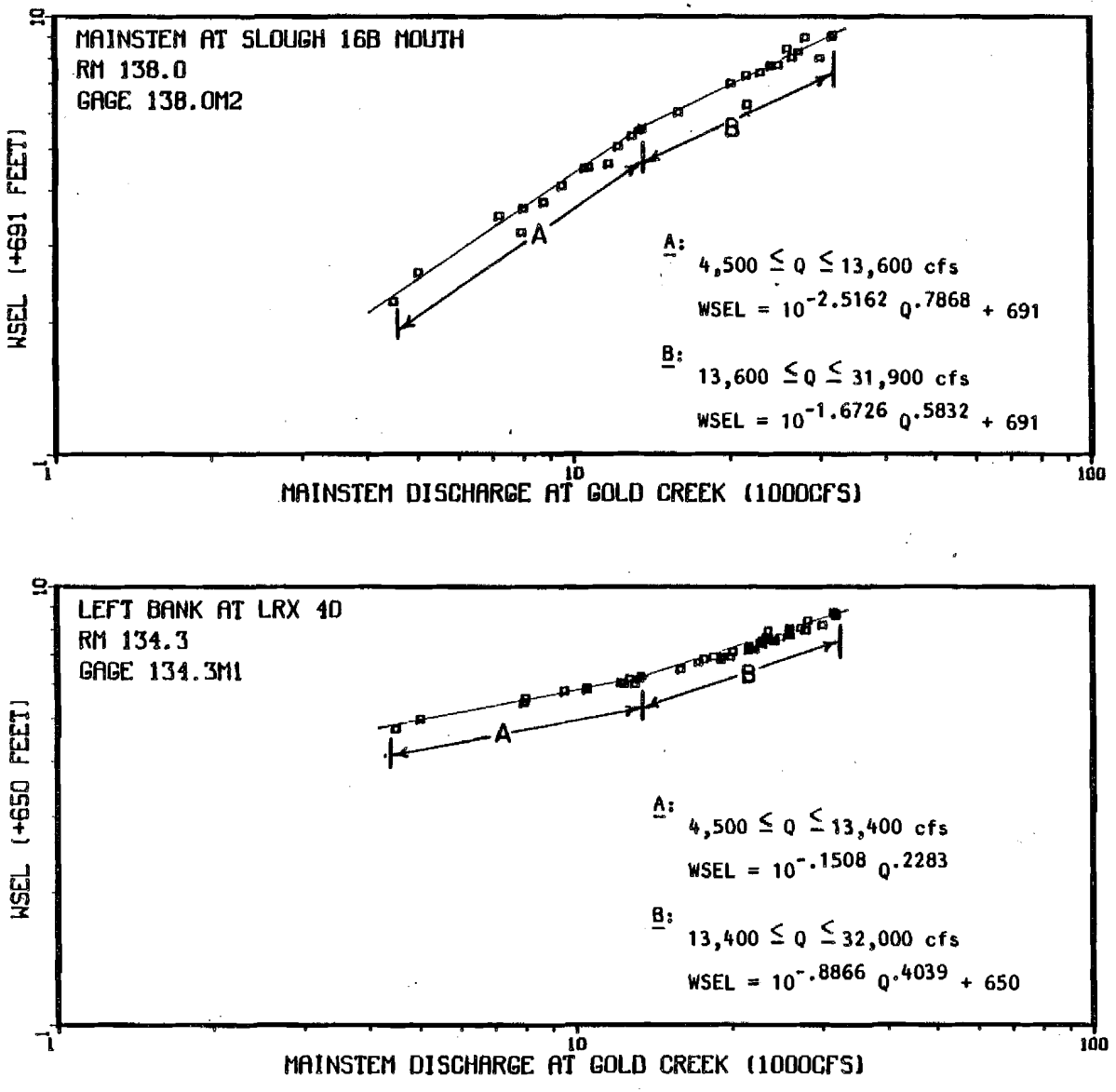


Appendix Figure 1-A-14. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 35 and below the mouth of Fourth of July Creek.

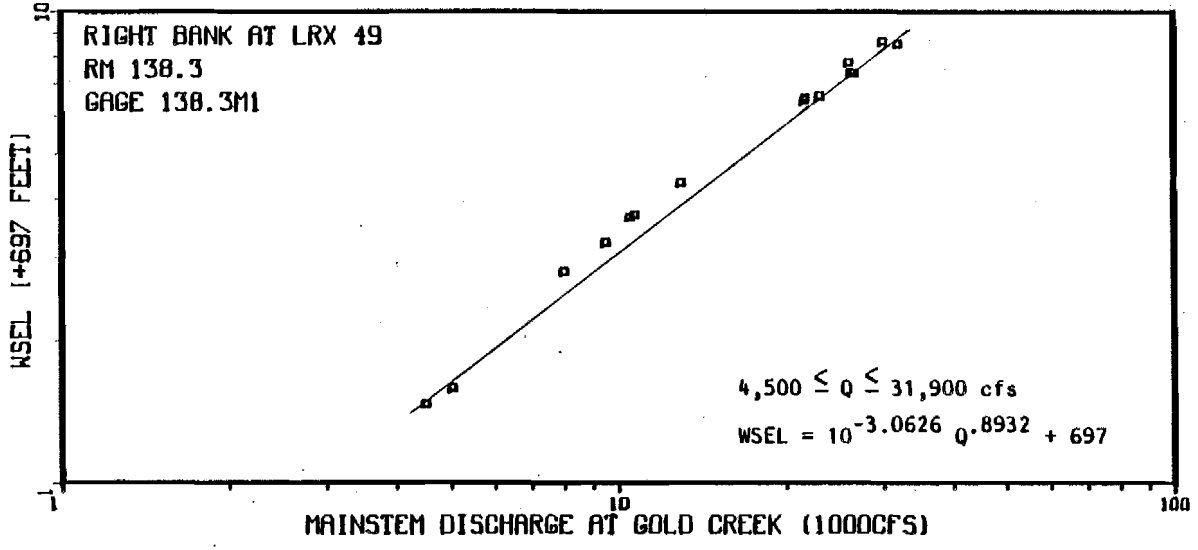


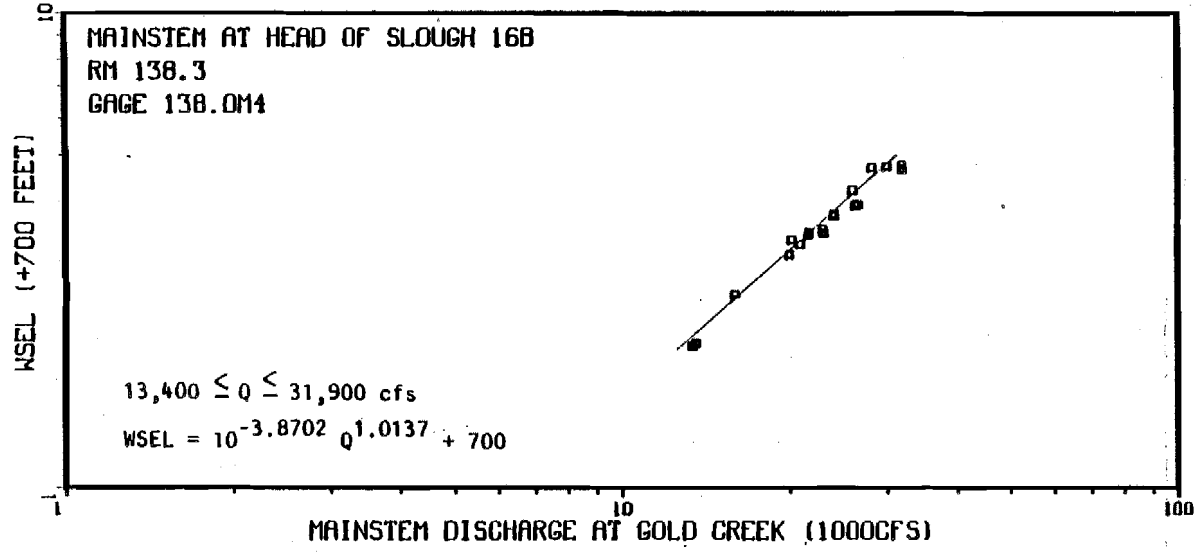


Appendix Figure 1-A-15. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the left bank at LRX 37 and at Side Channel 10 mouth.

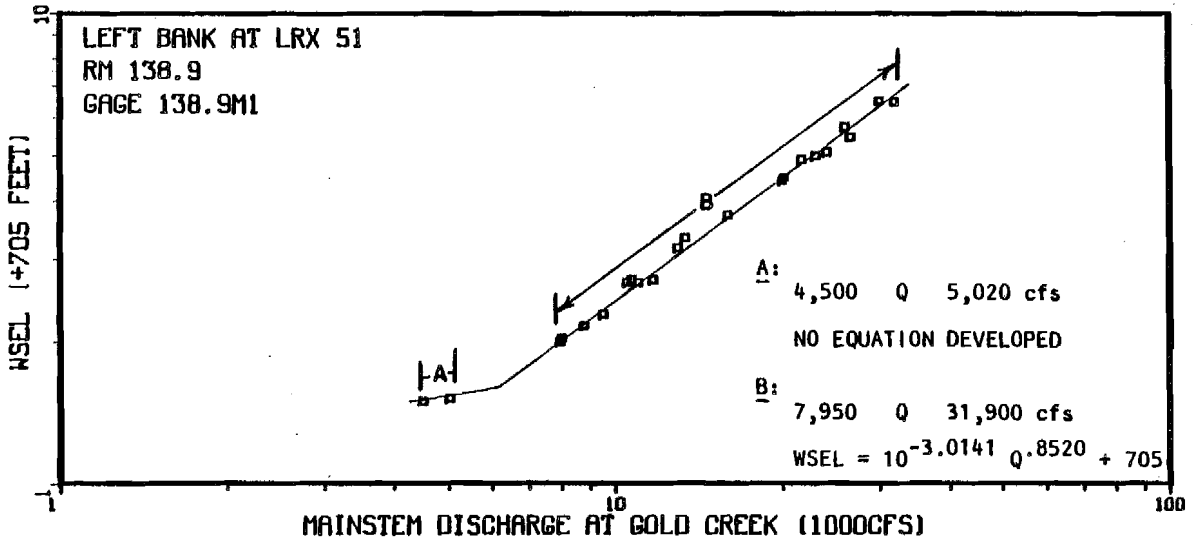


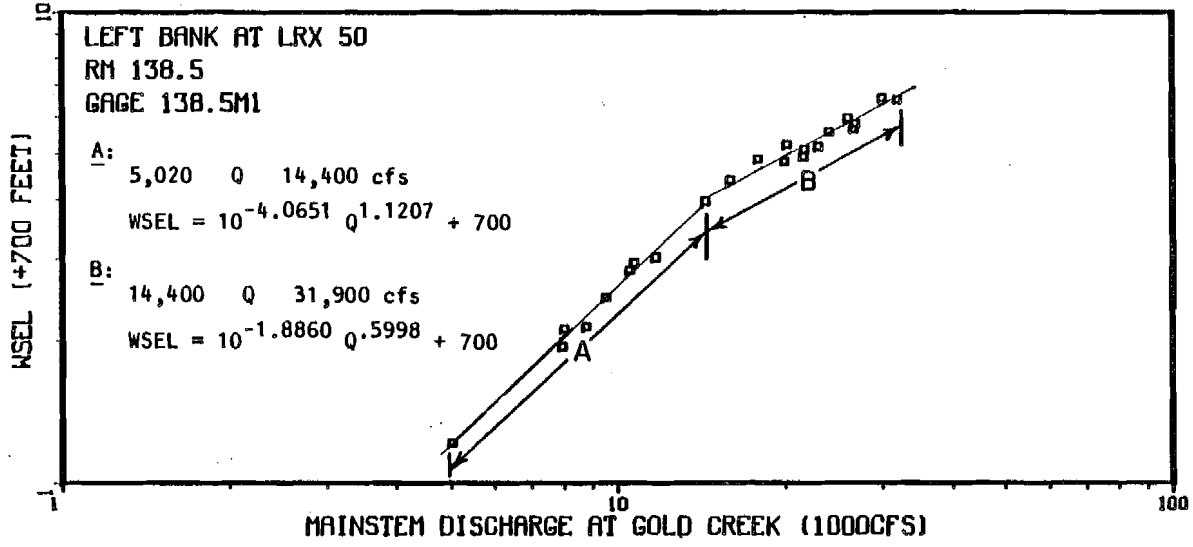
Appendix Figure 1-A-16. Mainstem discharge (Provisonal USGS 1983) versus mainstem water surface elevation at the left bank at LRX 40 and at Side Slough 16B mouth.



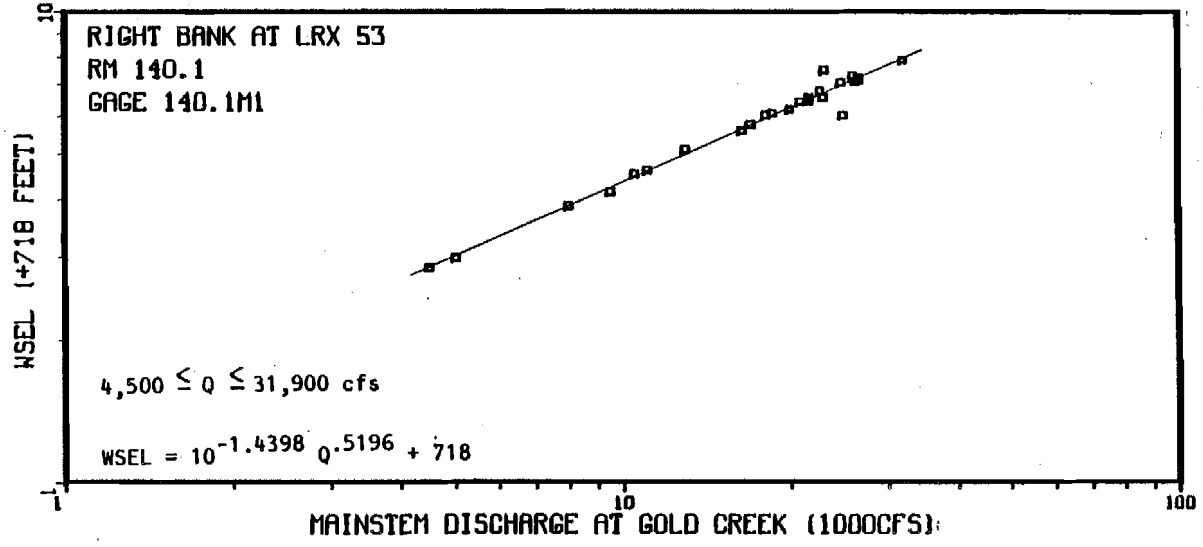


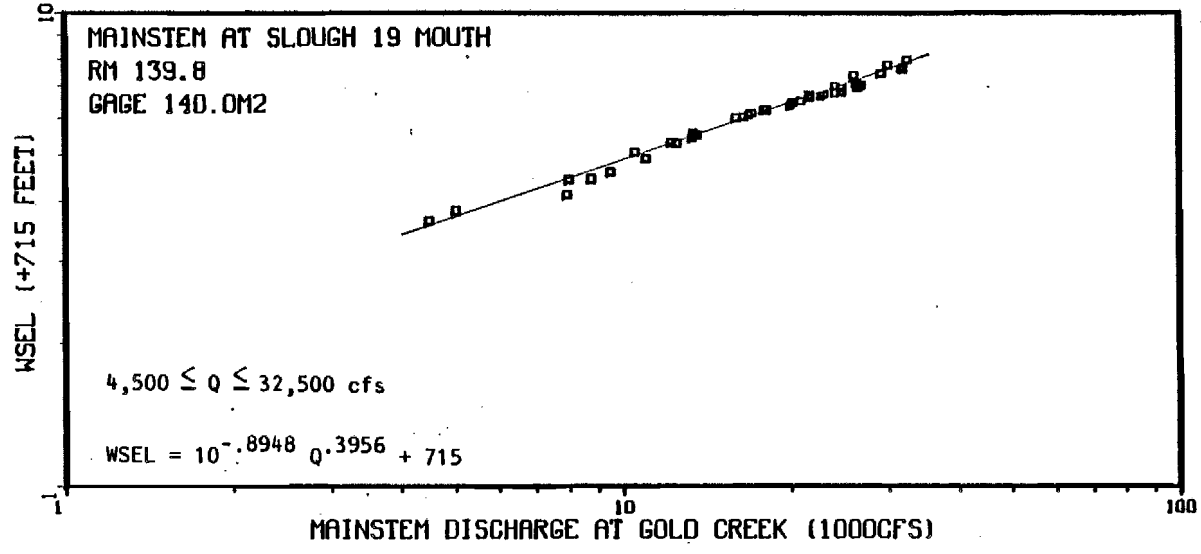
Appendix Figure 1-A-17. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the mainstem at the head of Side Slough 16B and the right bank at LRX 49.



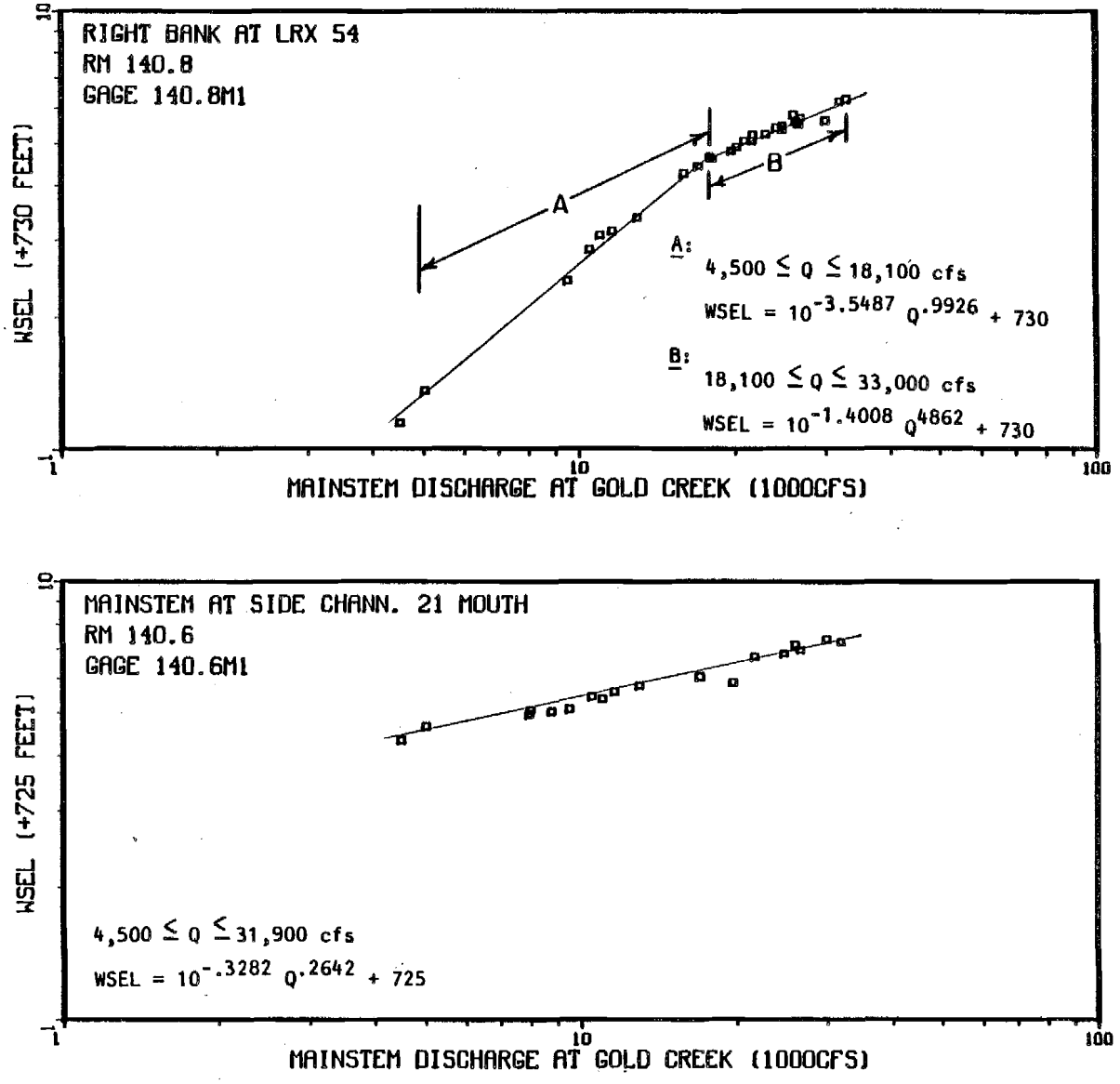


Appendix Figure 1-A-18. Mainstem discharge (Provisonal USGS 1983) versus mainstem water surface elevation at the left bank at LRX 50 and the left bank LRX 51.

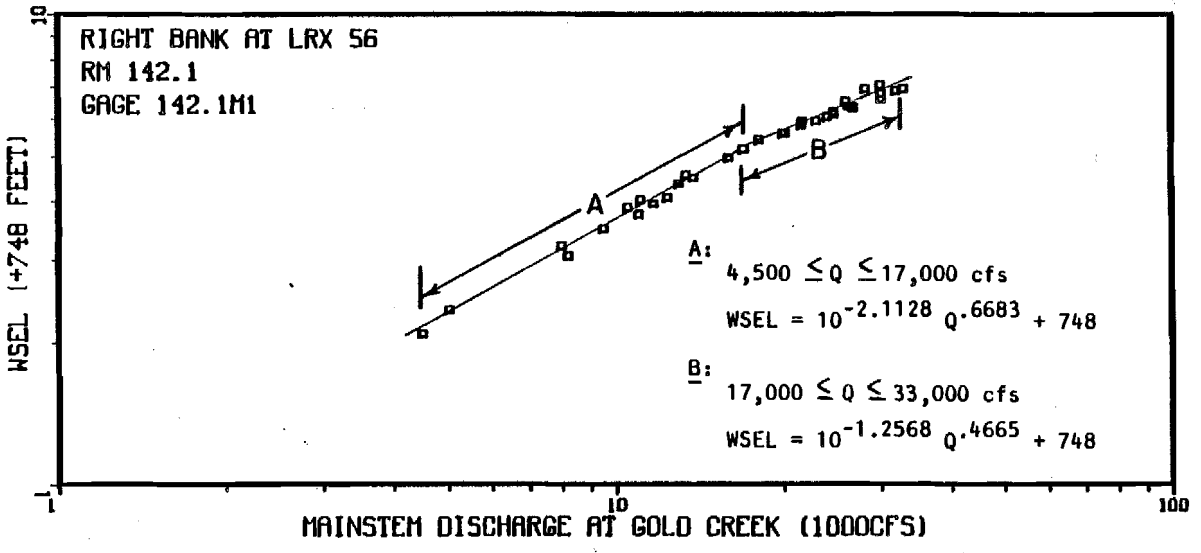


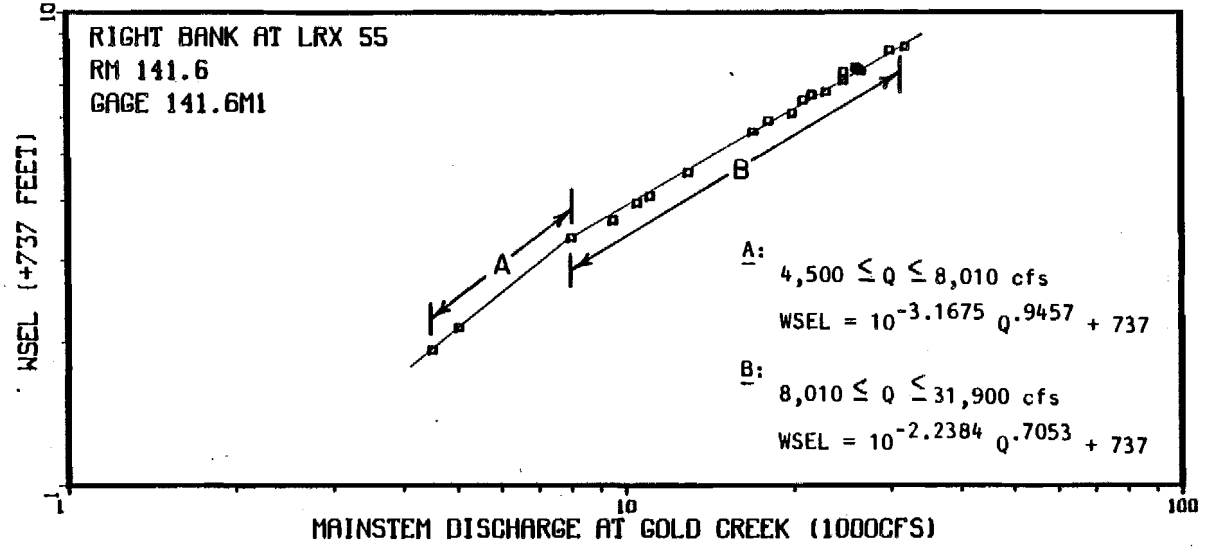


Appendix Figure 1-A-19. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at Upland Slough 19 mouth and the right bank at LRX 53.

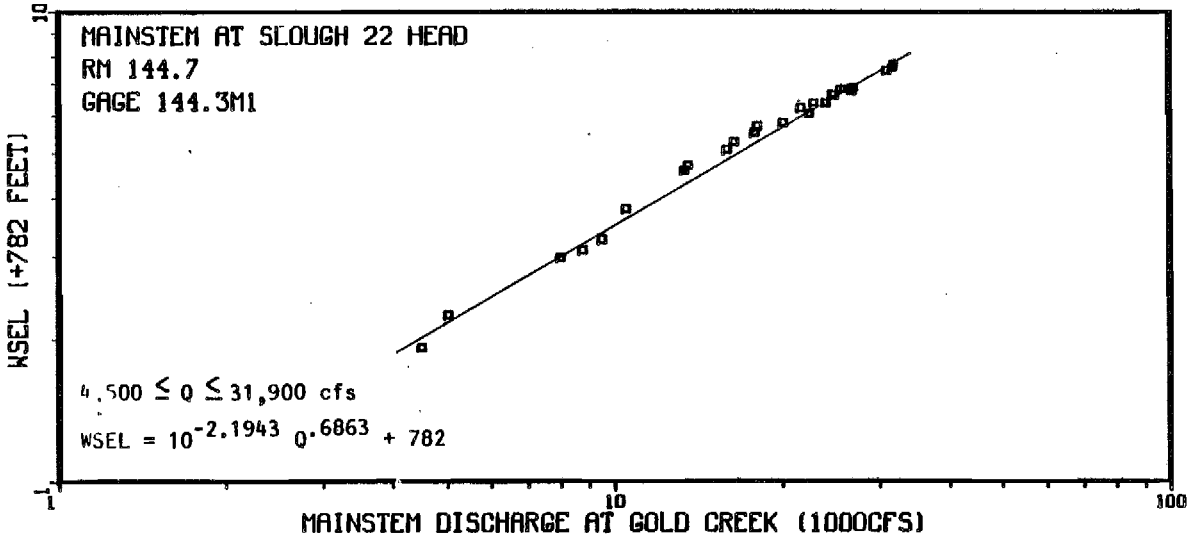


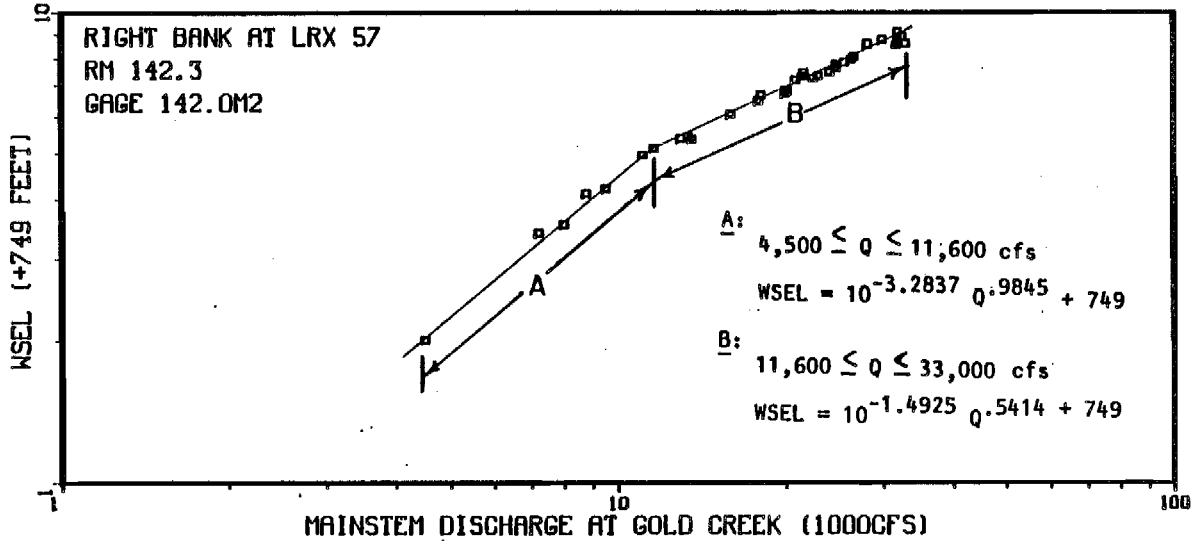
Appendix Figure 1-A-20. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at Side Channel 21 mouth and the right bank at LRX 54.



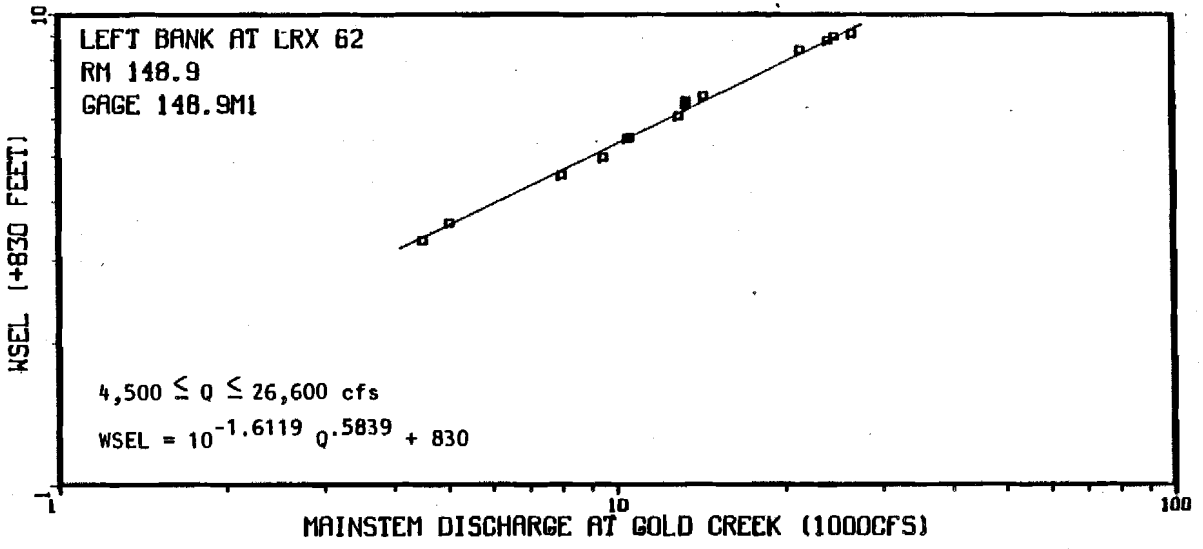


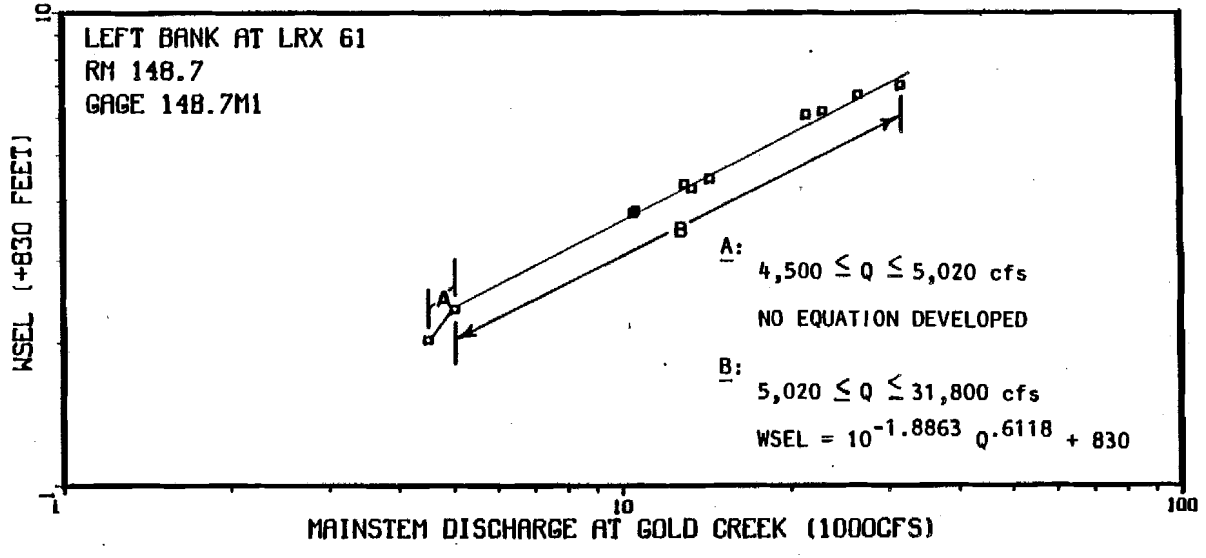
Appendix Figure 1-A-21. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 55 and the right bank at LRX 56.



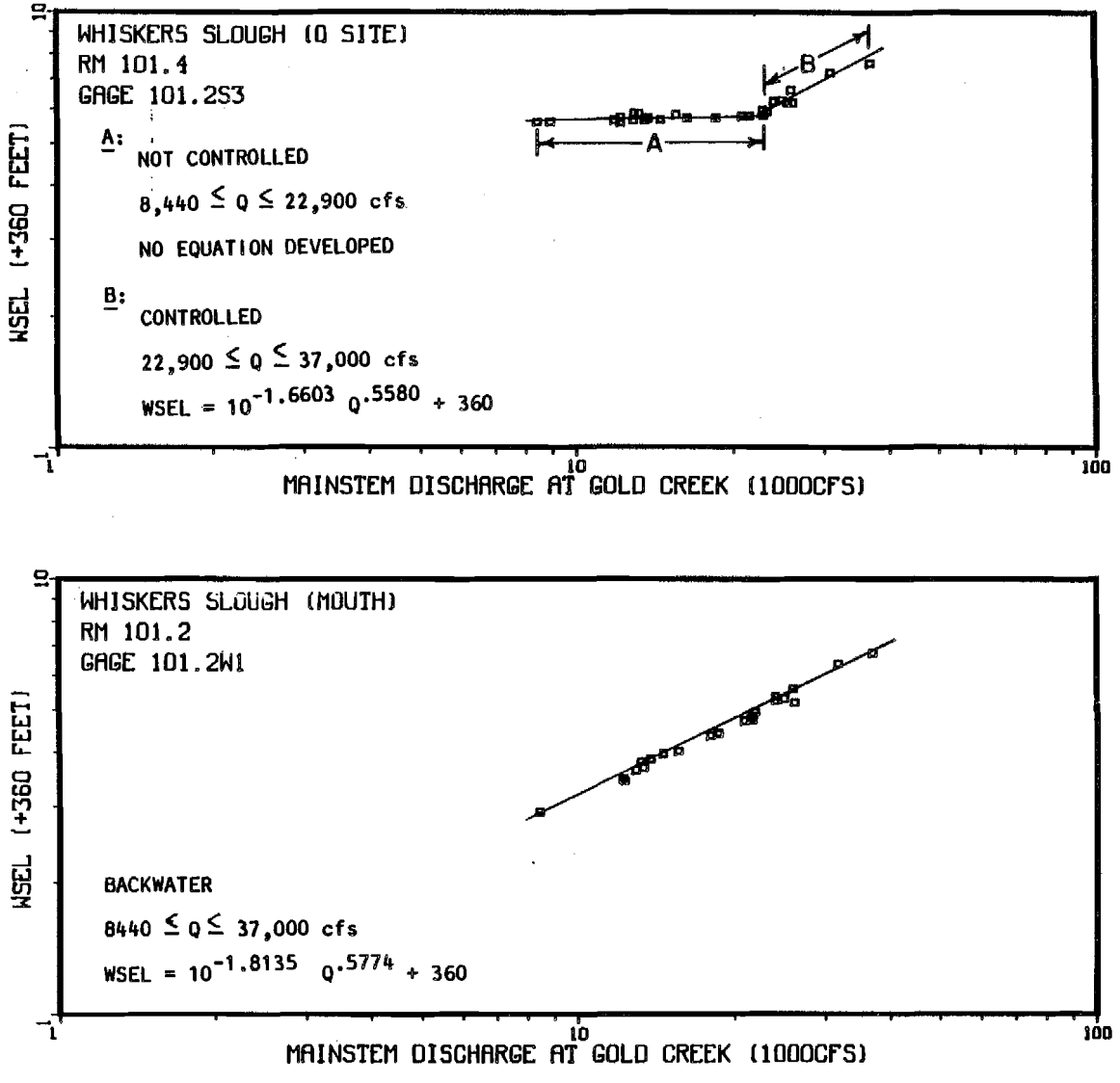


Appendix Figure 1-A-22. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the right bank at LRX 57 and at the mainstem at Side Slough 22 head.

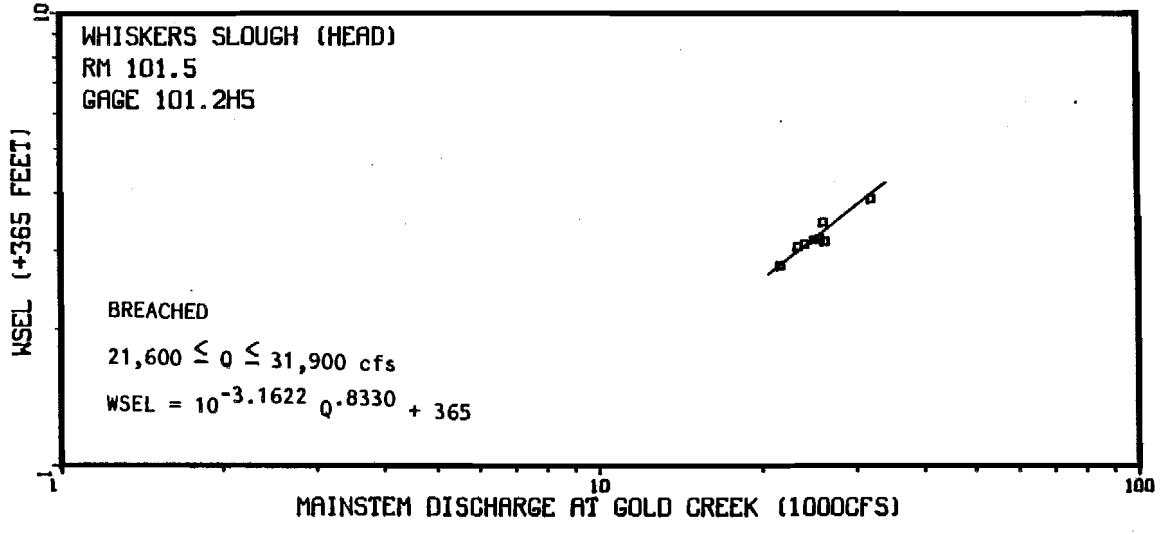




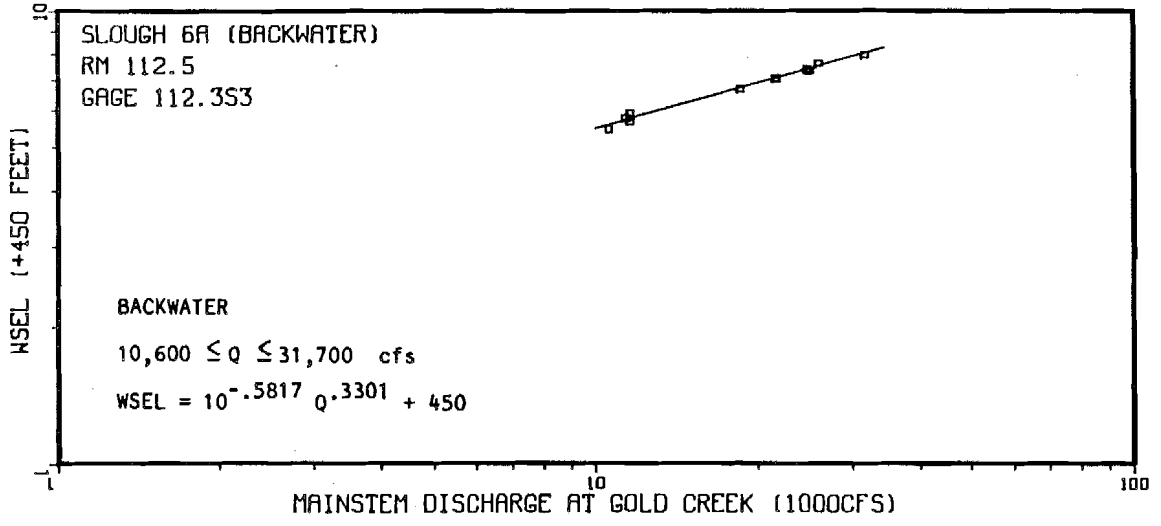
Appendix Figure 1-A-23. Mainstem discharge (Provisional USGS 1983) versus mainstem water surface elevation at the left bank at LRX 61 and theleft bank at LRX 62.

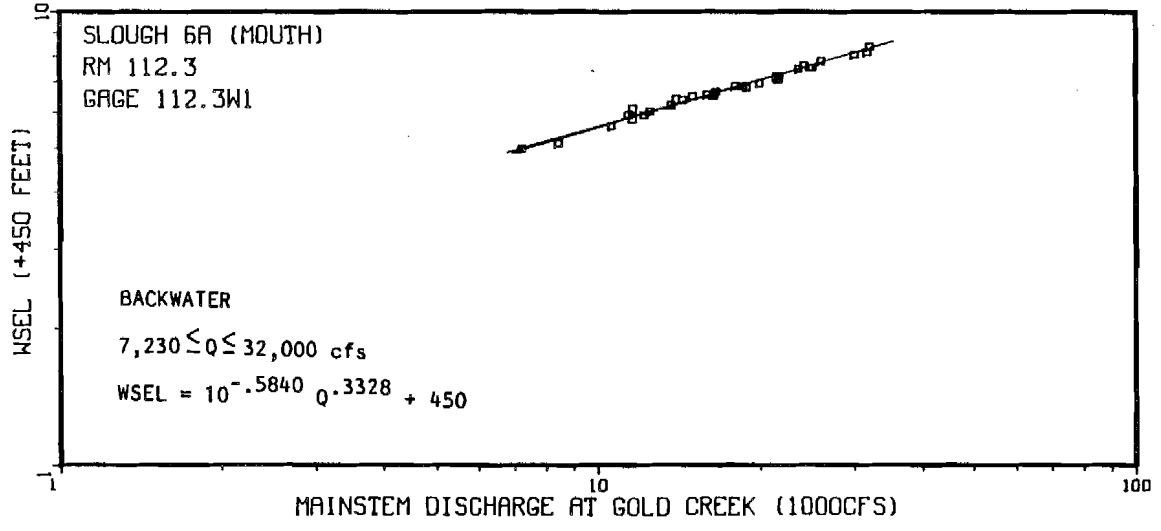


Appendix Figure 1-A-24 Non-mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Whiskers Slough Mouth and discharge site.

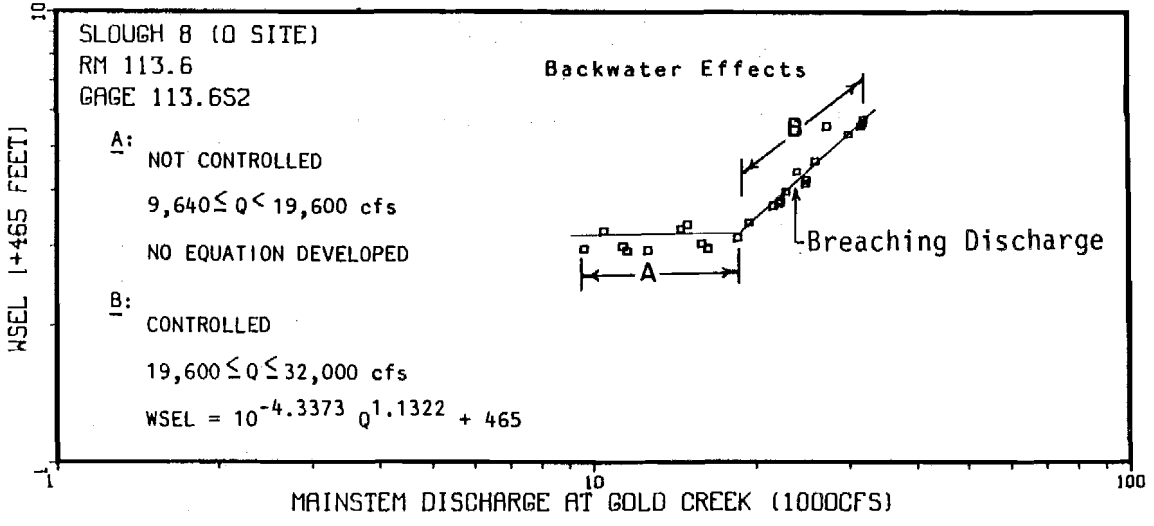


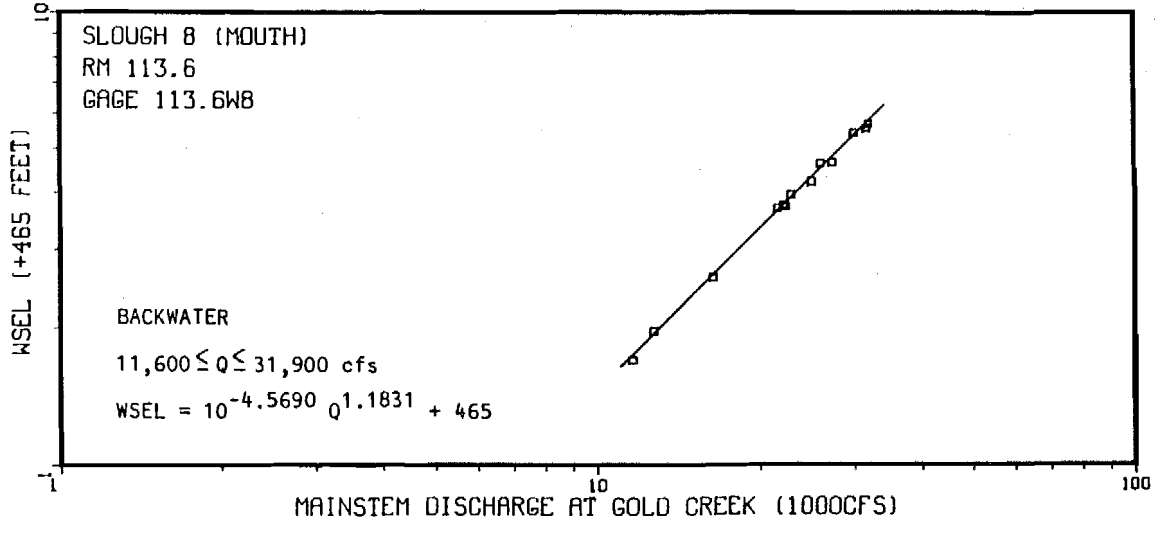
Appendix Figure 1-A-25 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Whiskers Slough head.



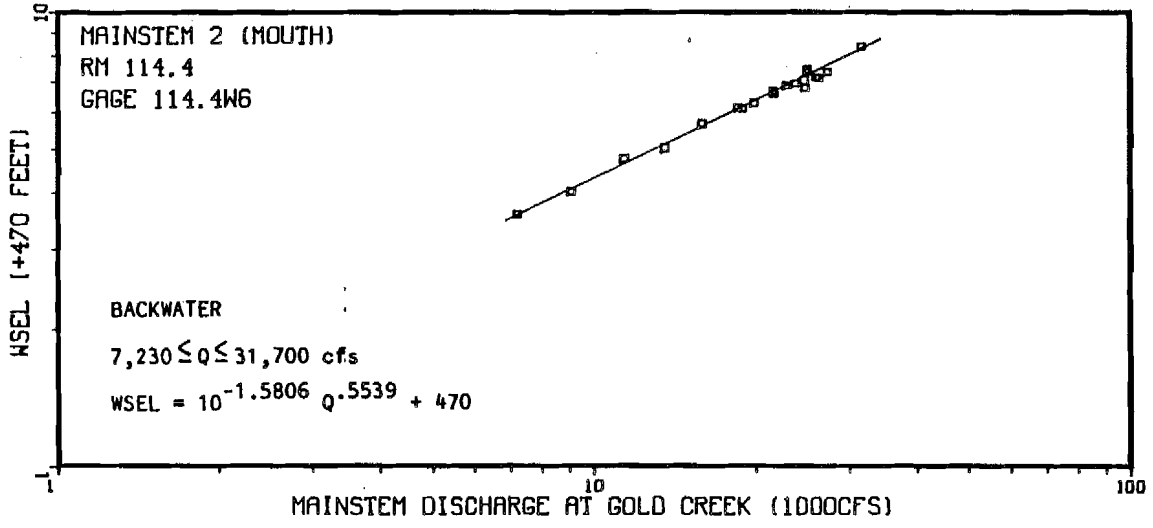


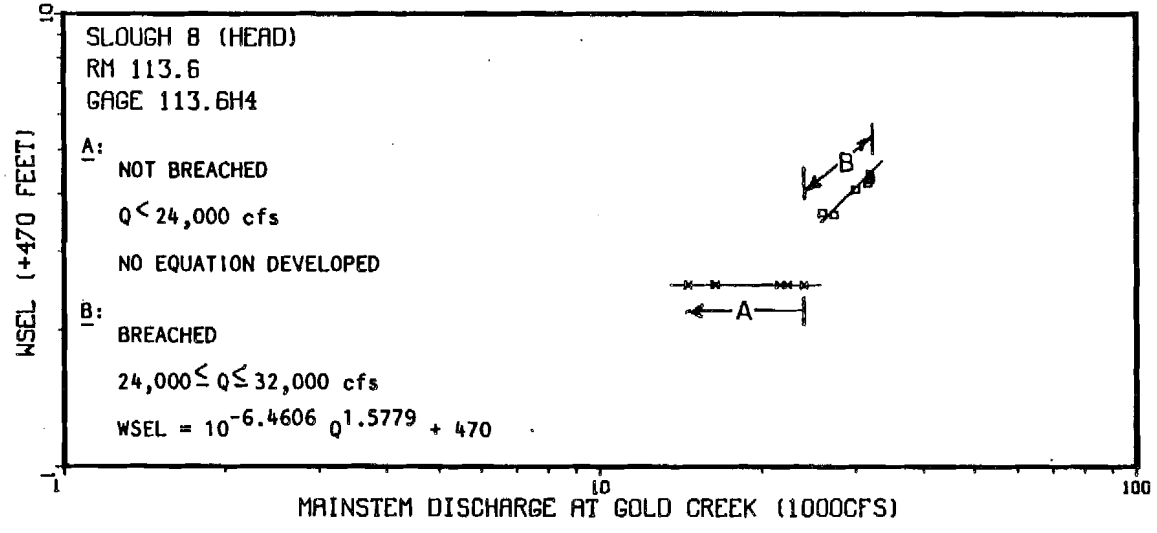
Appendix Figure 1-A-26. Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 6A mouth and backwater.



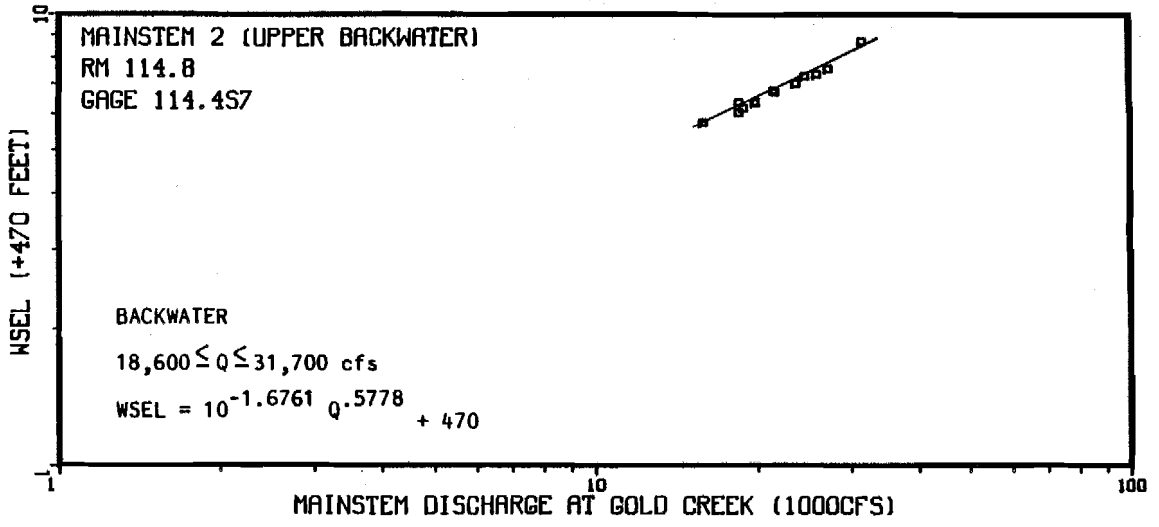


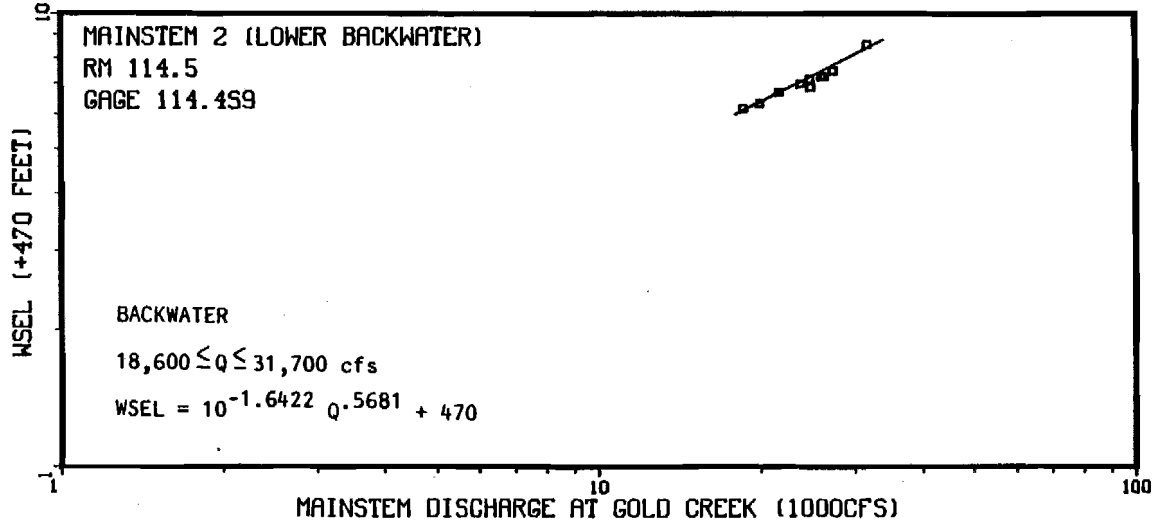
Appendix Figure 1-A-27. Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 8 mouth and discharge site.



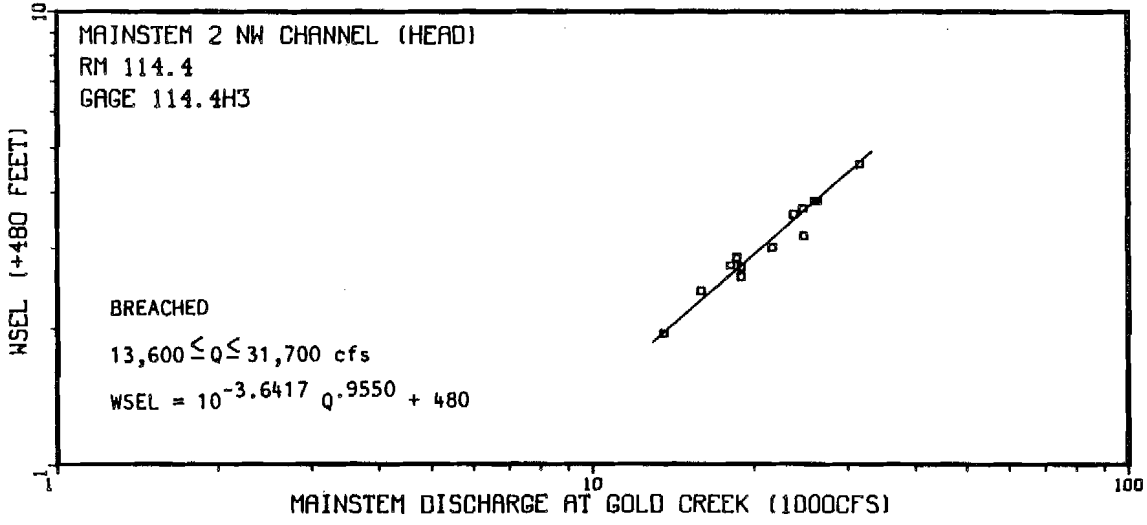


Appendix Figure 1-A-28. Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 8 head and Mainstem 2 mouth.





Appendix Figure 1-A-29 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Mainstem 2 lower backwater and upper backwater.



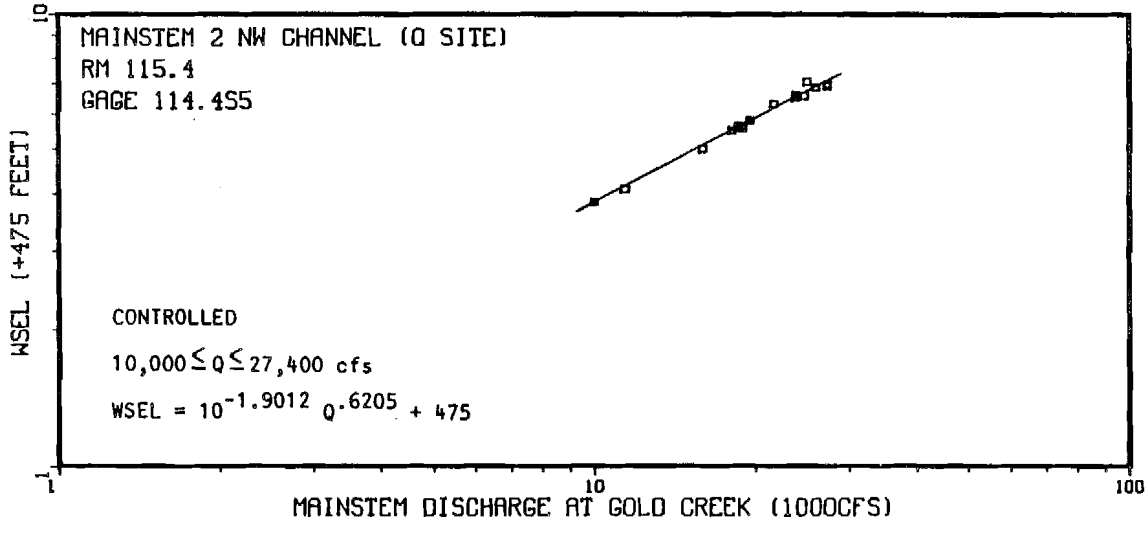
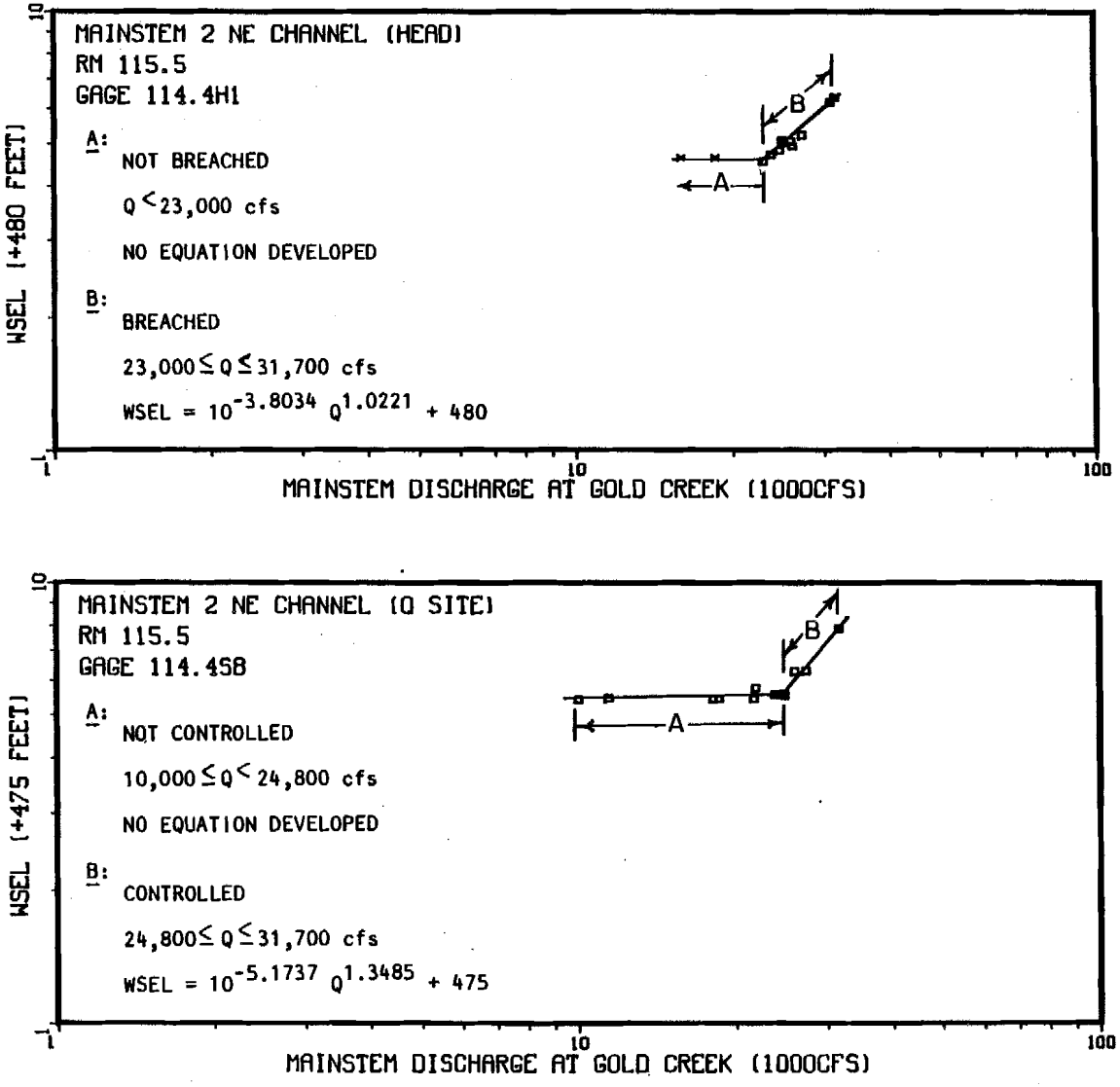
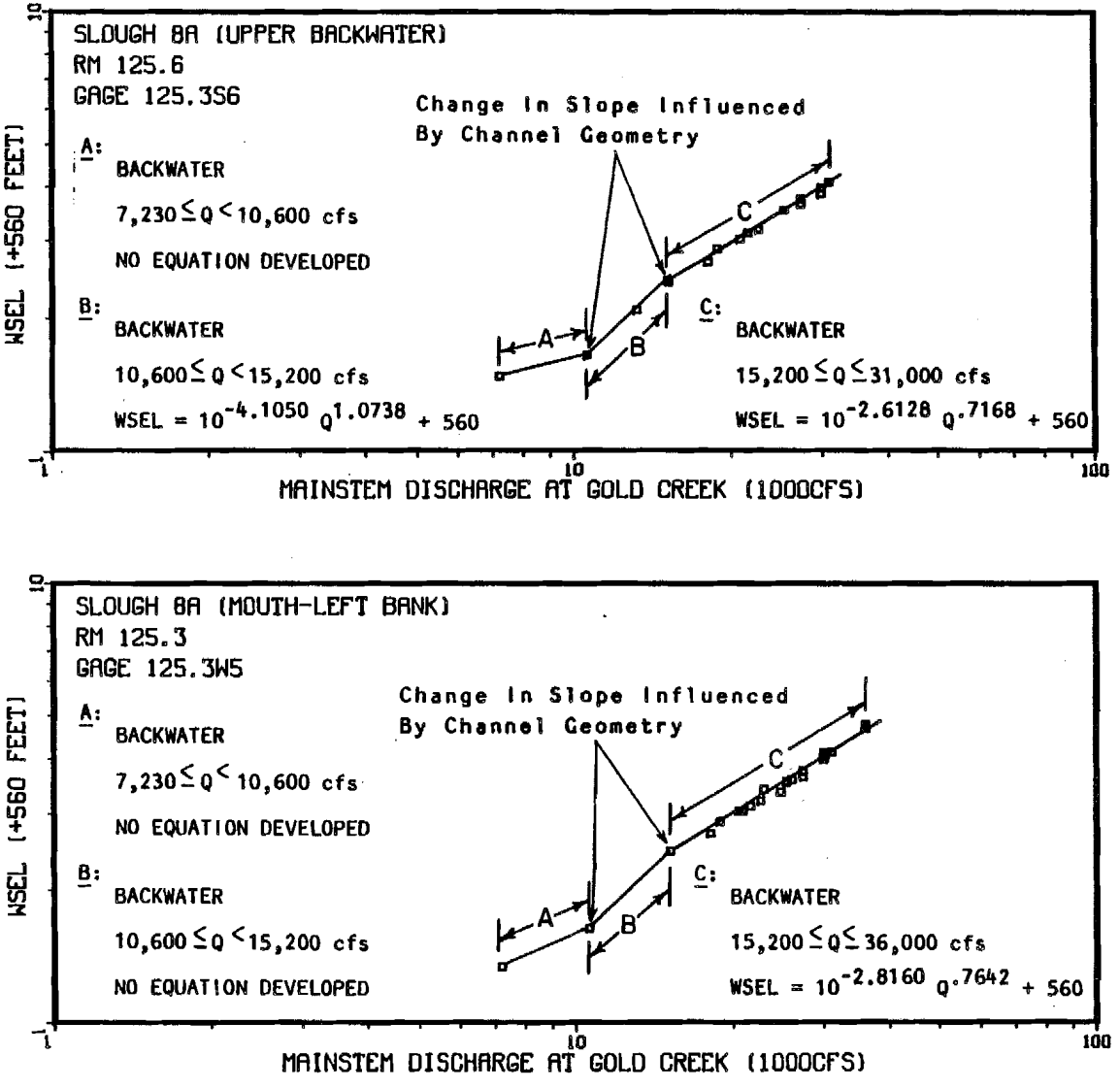


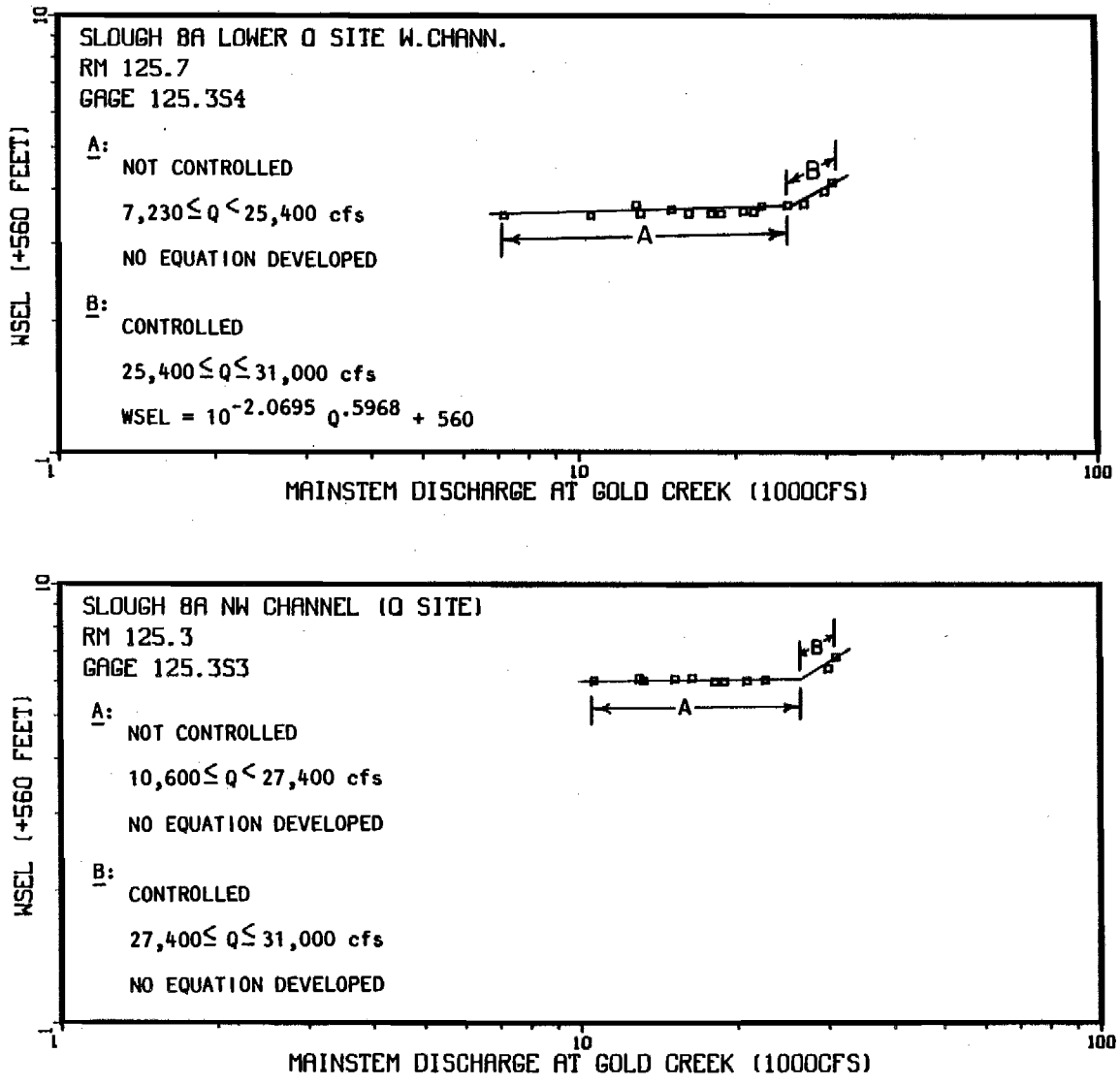
Figure 1-A-30. Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Mainstem 2 NW Channel discharge site and head.



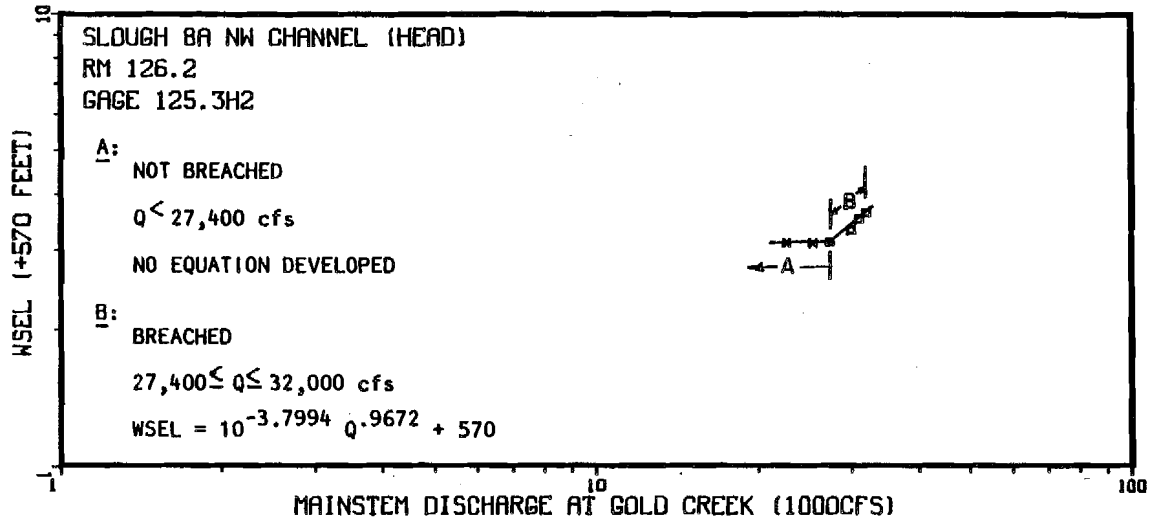
Appendix Figure 1-A-31 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Mainstem 2 NE Channel discharge site and head.

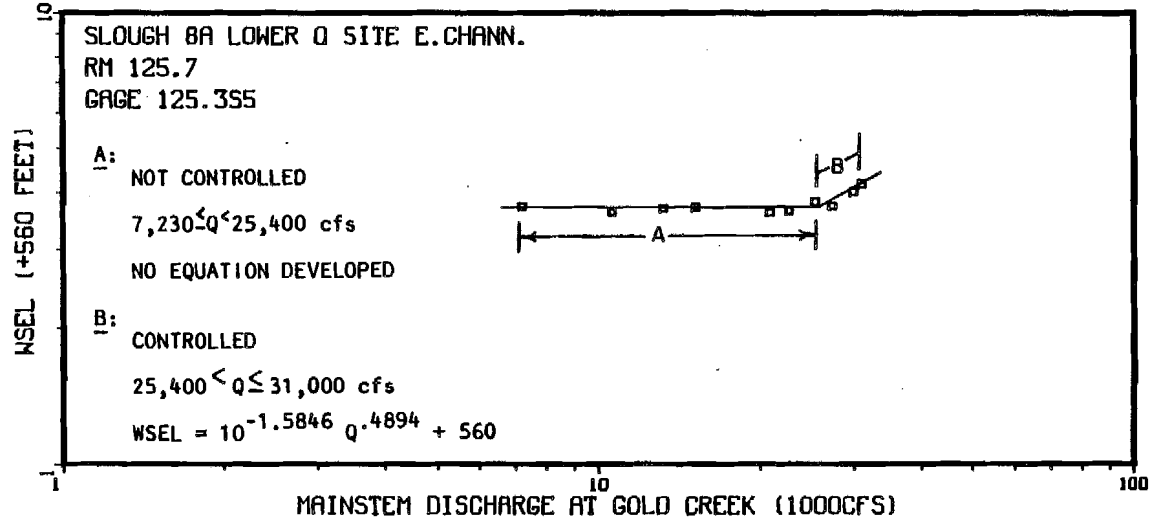


Appendix Figure 1-A-32 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 8A mouth and upper backwater.

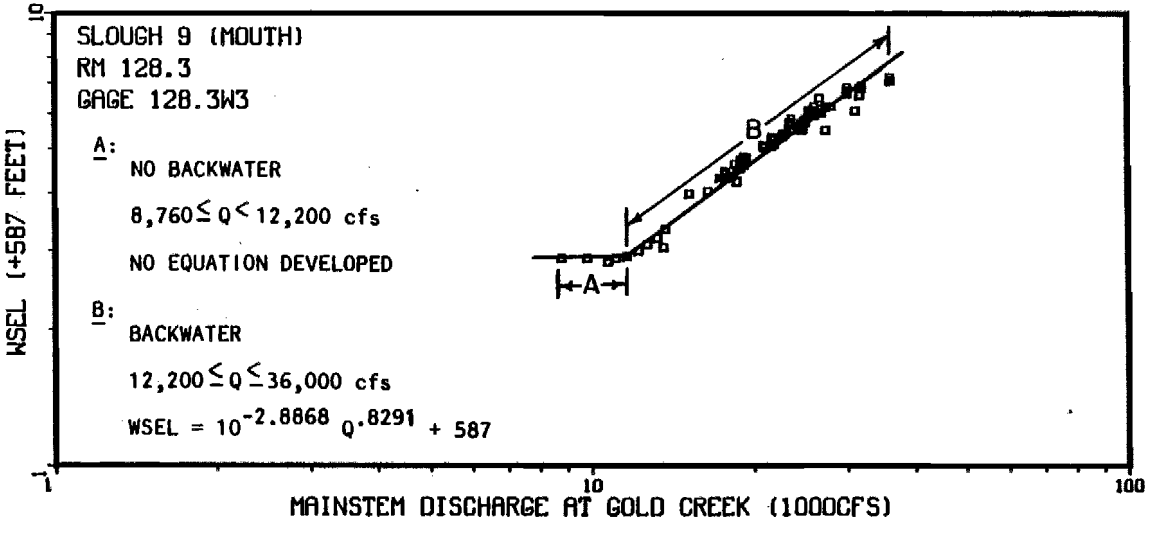


Appendix Figure 1-A-33 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 8A NW Channel discharge site and lower discharge site west channel.

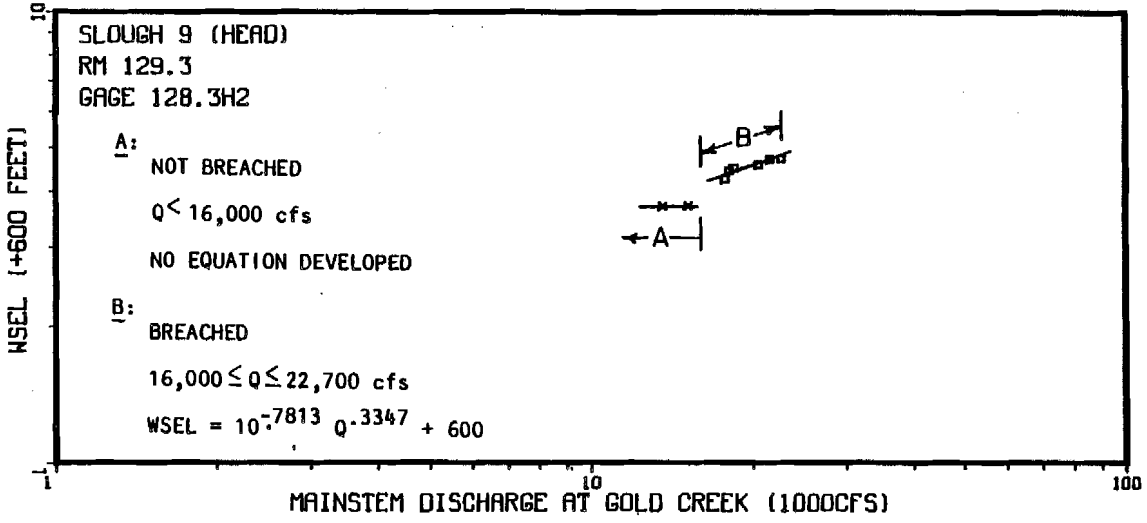


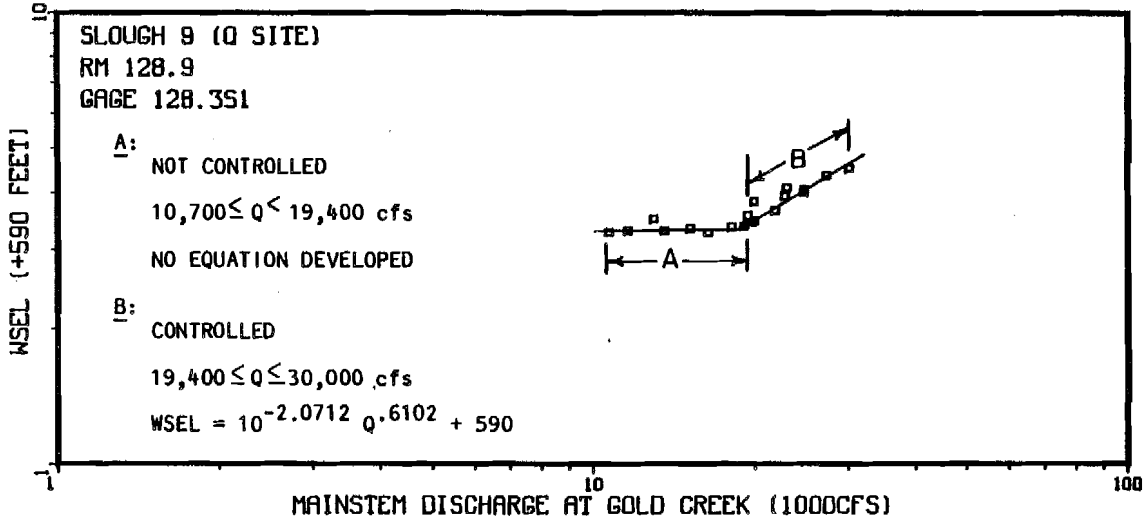


Appendix Figure 1-A-34 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 8A lower discharge site east channel and NW channel head.

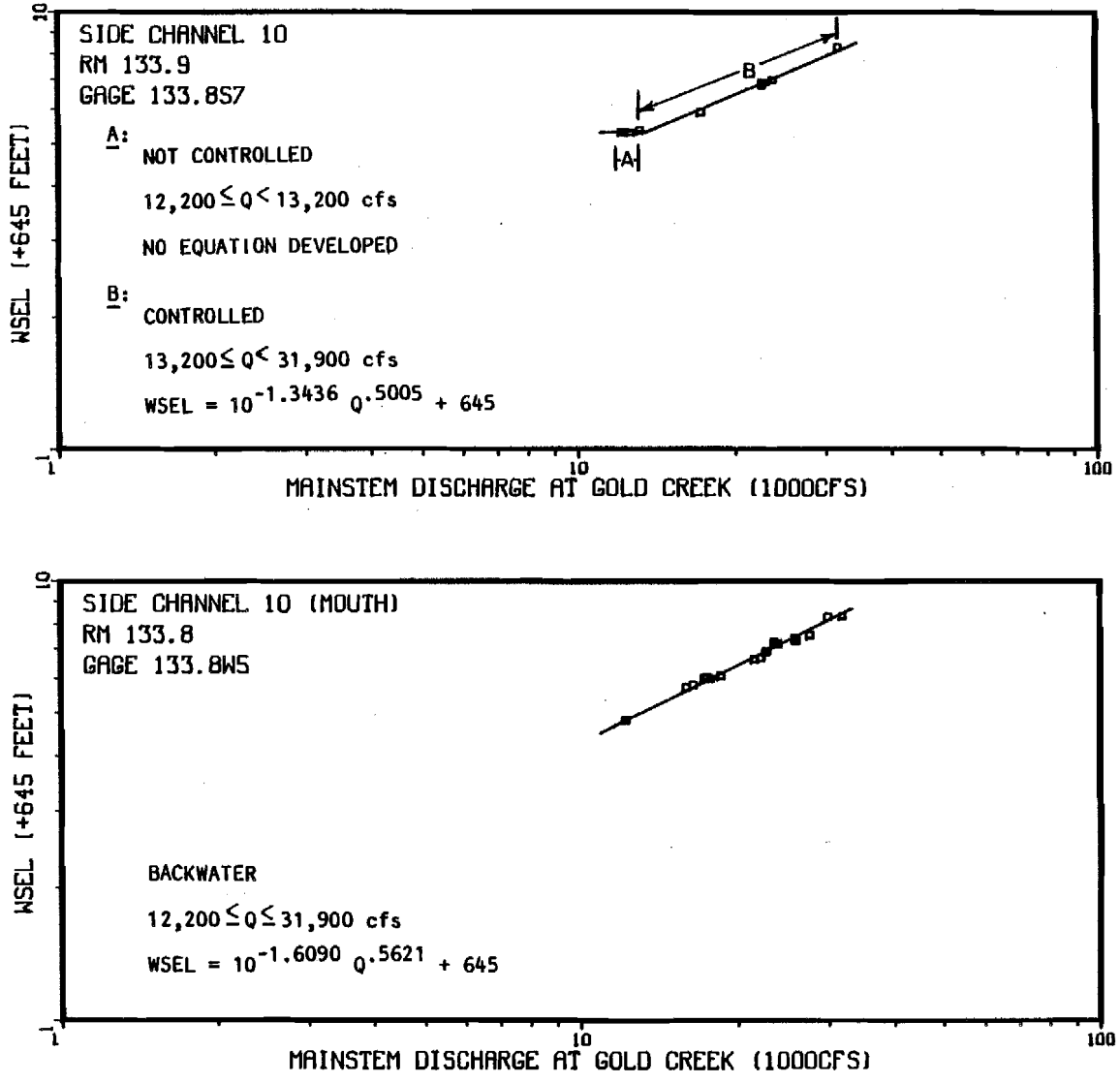


Appendix Figure 1-A-35 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 9 mouth.

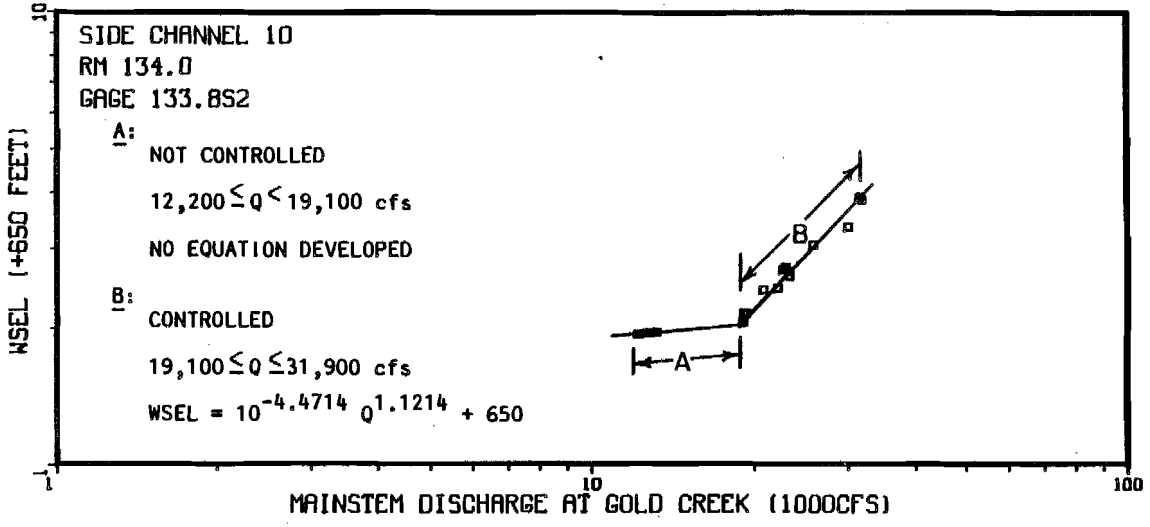


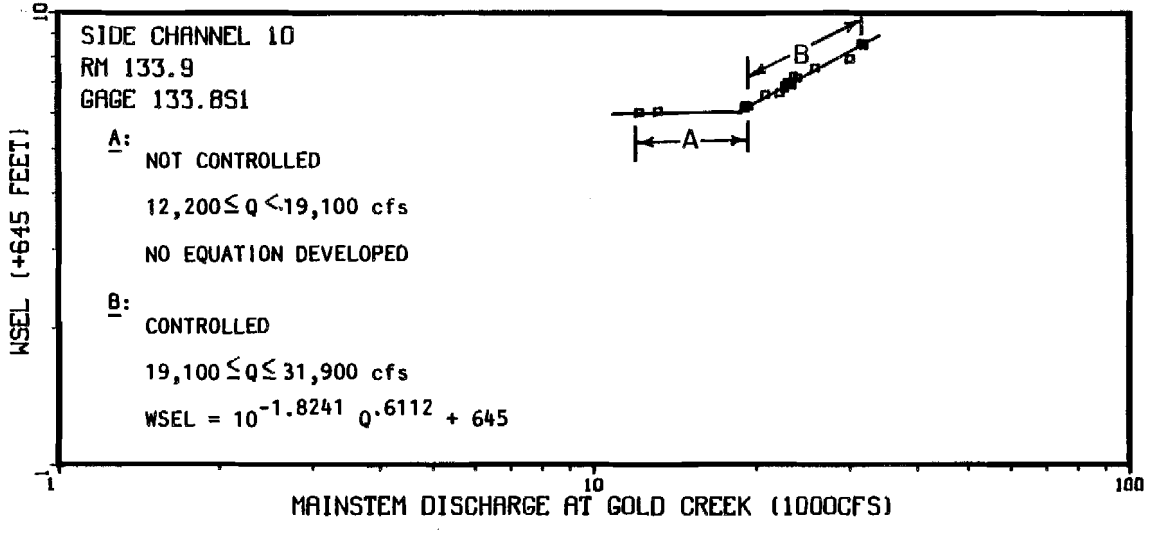


Appendix Figure 1-A-36 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 9 discharge site and head.

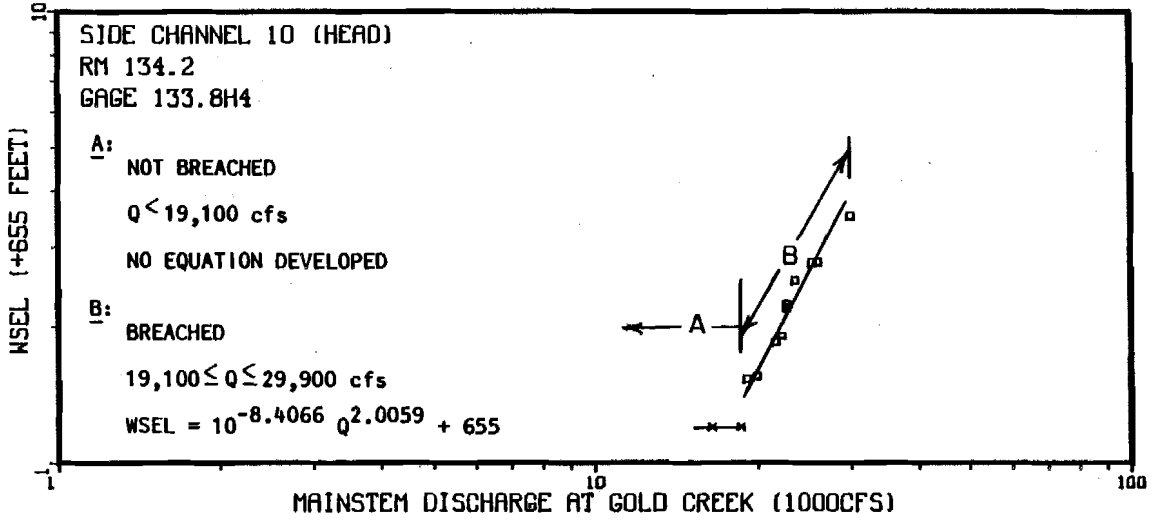


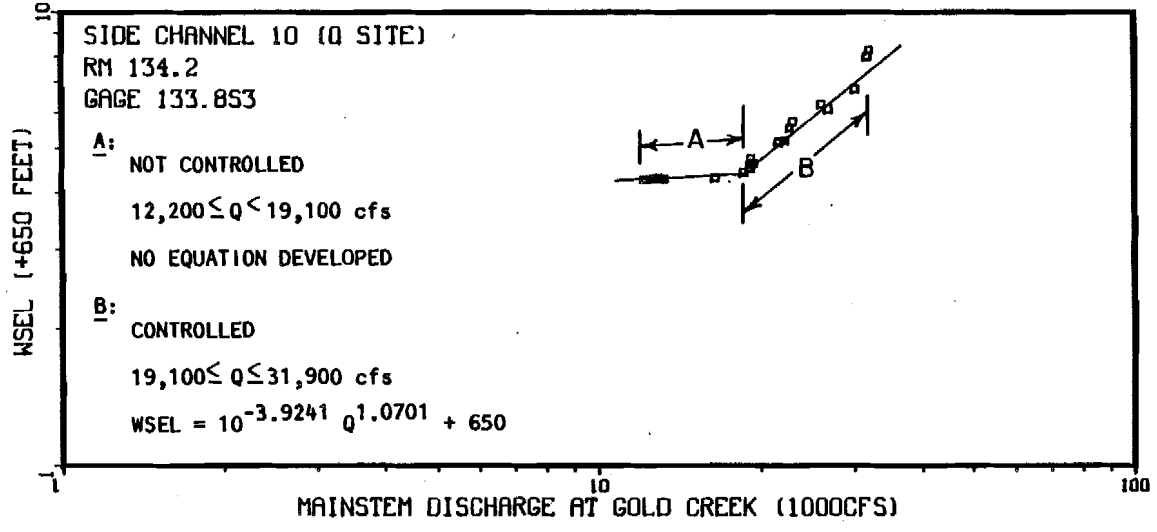
Appendix Figure 1-A-37 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channel 10 mouth and Side Channel 10 at staff gage 133.8S7.



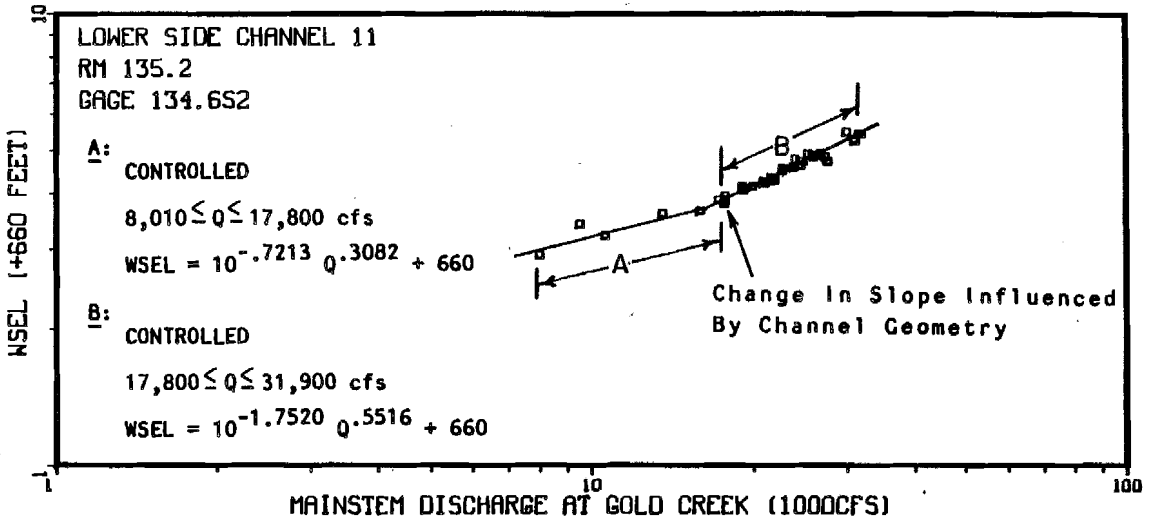


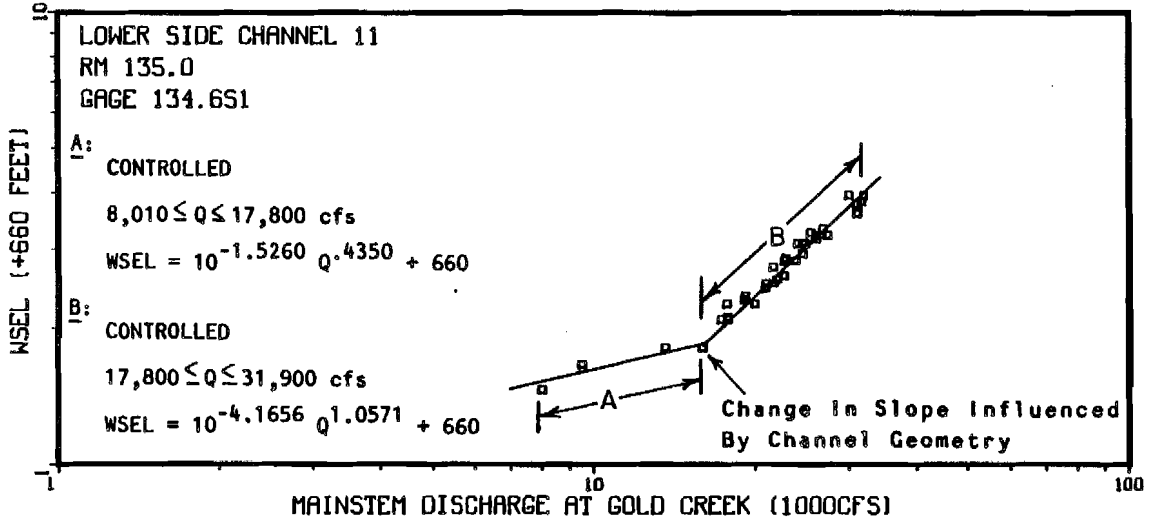
Appendix Figure 1-A-38 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channel 10 physical habitat modeling cross sections 1 and 2 (staff gages 133.8S1 and 133.8S2).



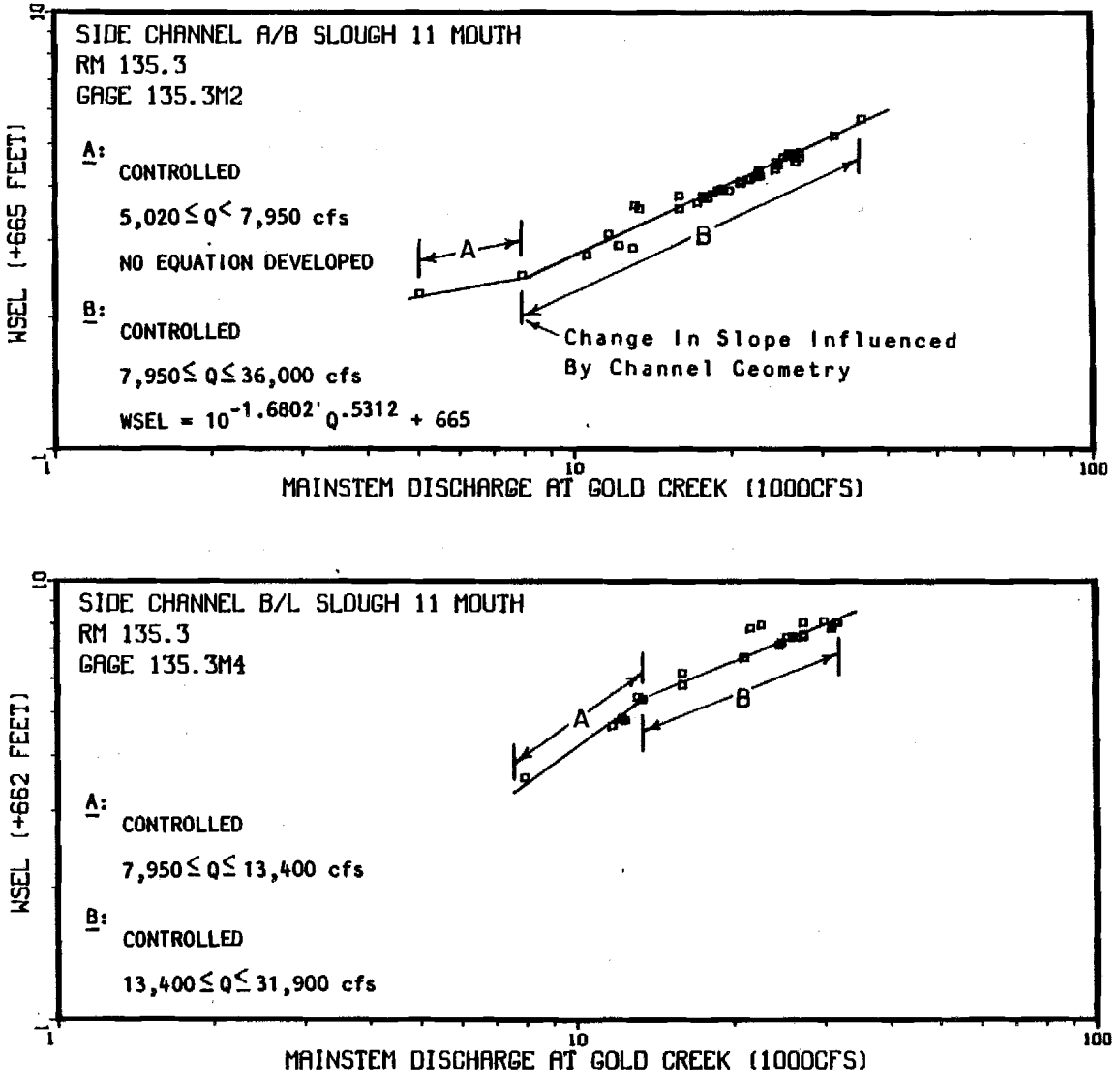


Appendix Figure 1-A-39 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channel 10 physical habitat modeling cross section 4 (discharge site) and head.

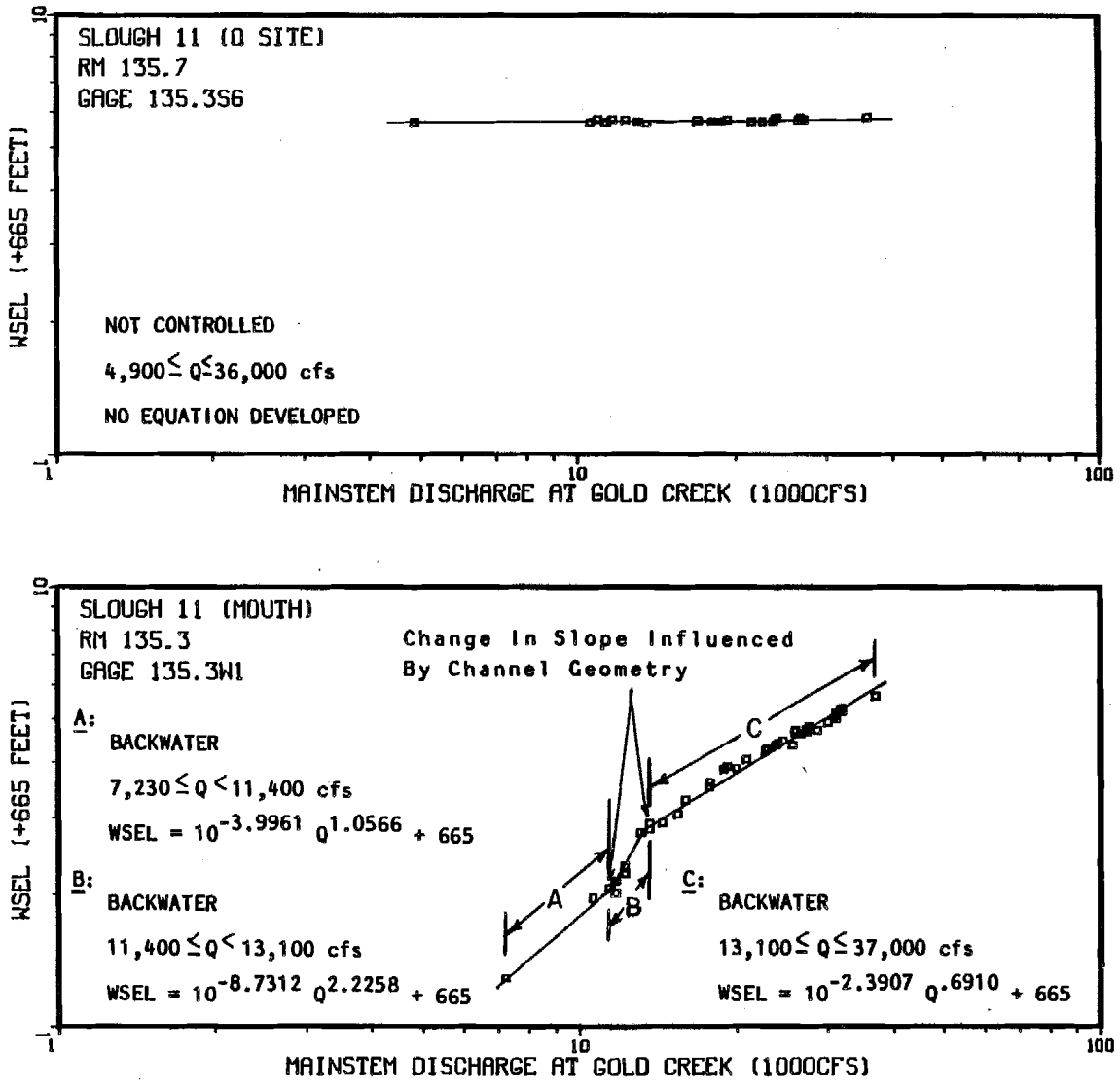




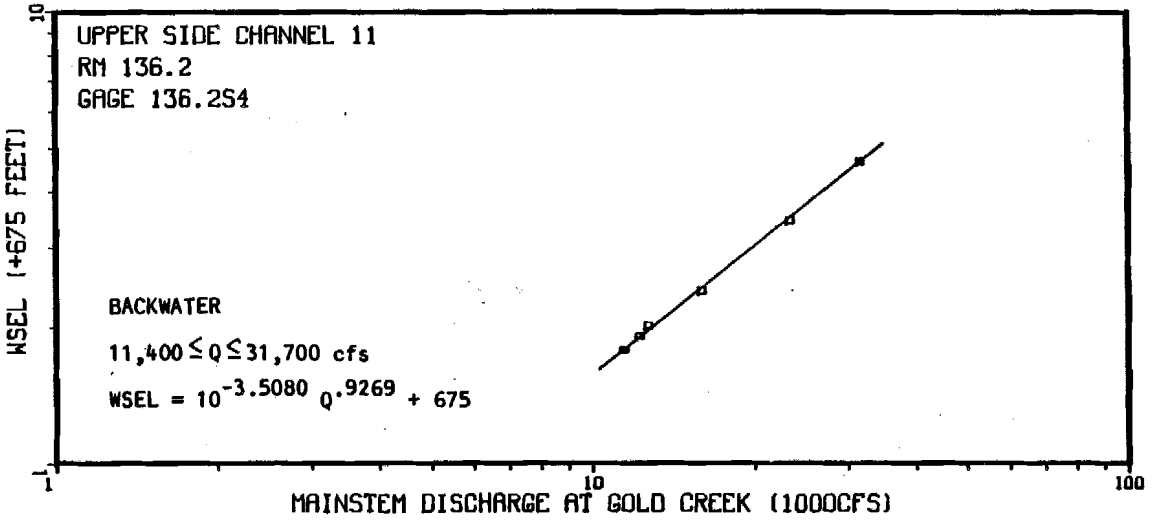
Appendix Figure 1-A-40. Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Lower Side Channel 11 physical habitat modeling cross-sections 1 and 3 (staff gages 134.6S1 and 134.6S2).

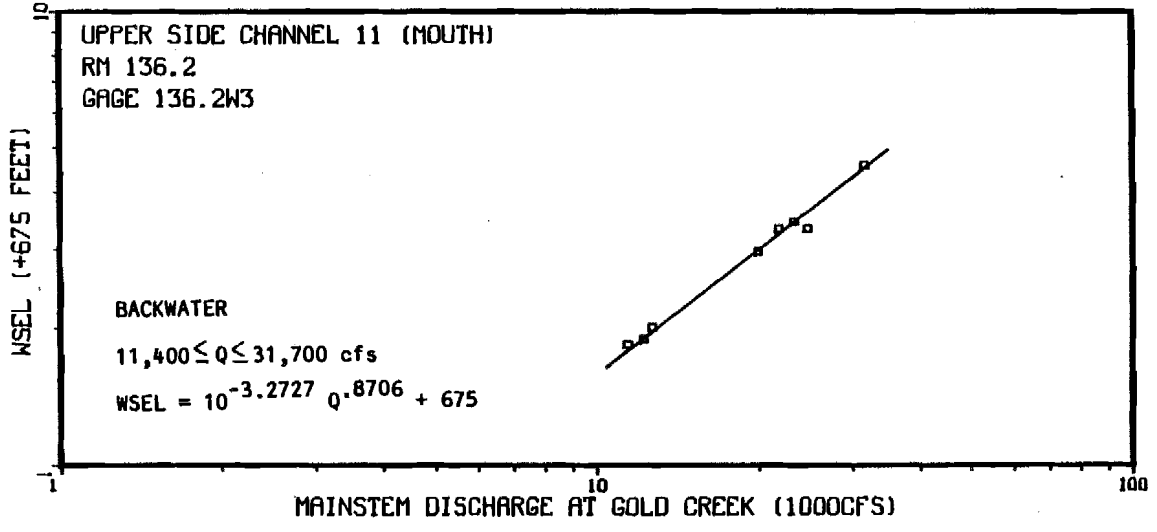


Appendix Figure 1-A-41 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channel below Slough 11 mouth and Side Channel above Slough 11 mouth.

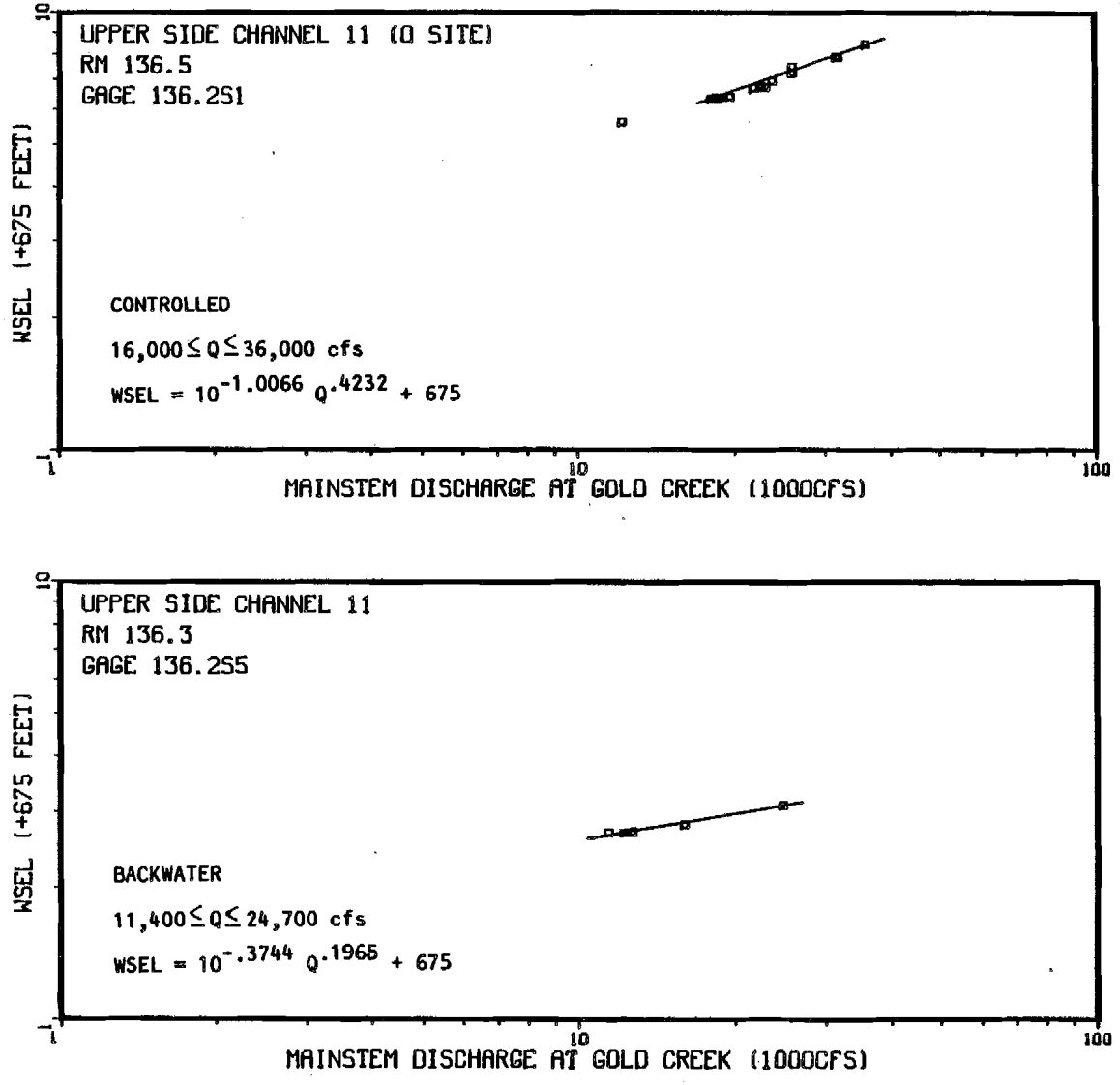


Appendix Figure 1-A-42 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 11 mouth and discharge site.

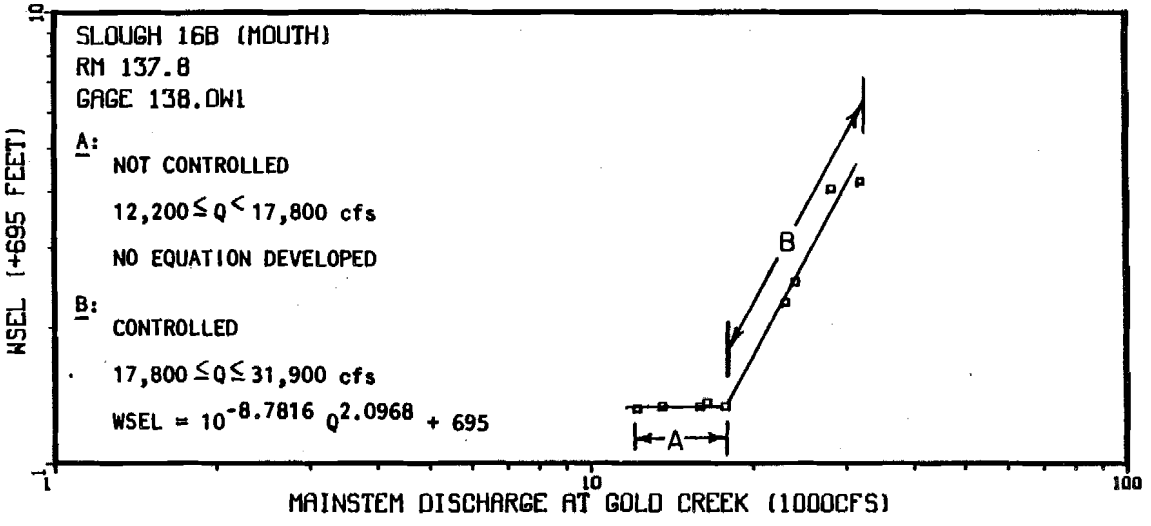


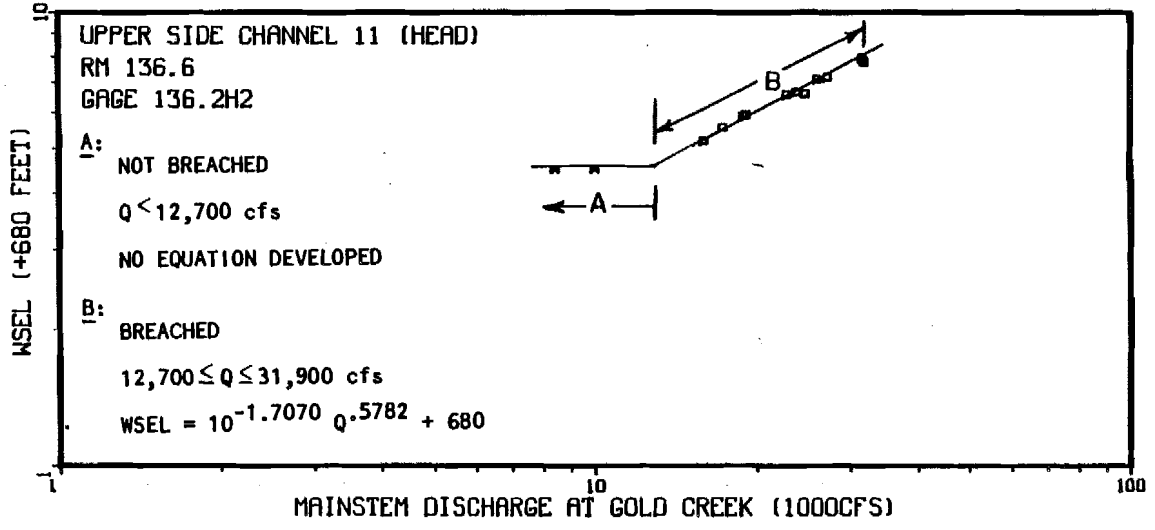


Appendix Figure 1-A-43 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Upper Side Channel 11 mouth and physical habitat modeling cross section 2 (136.2S4).

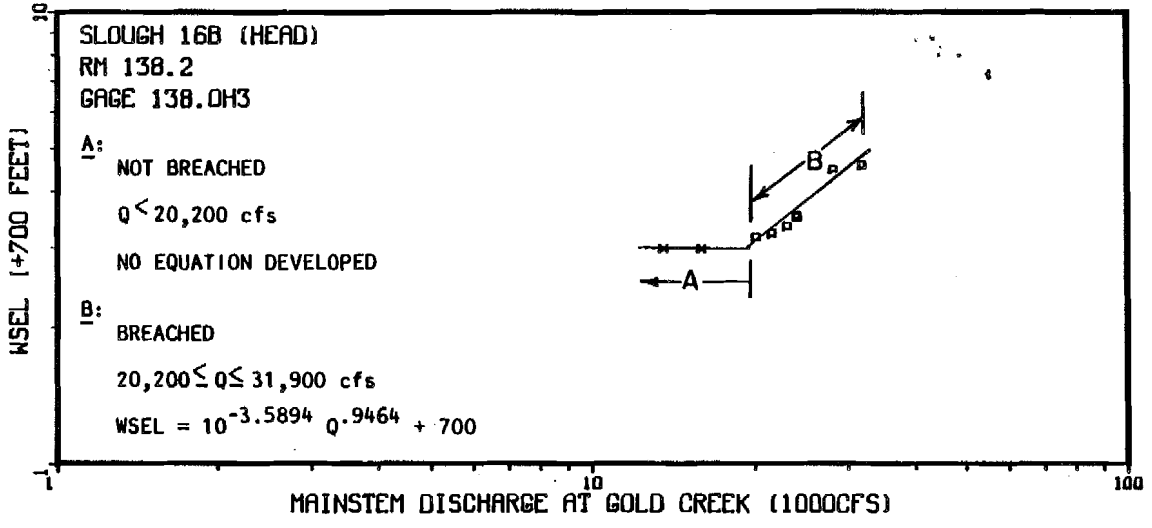


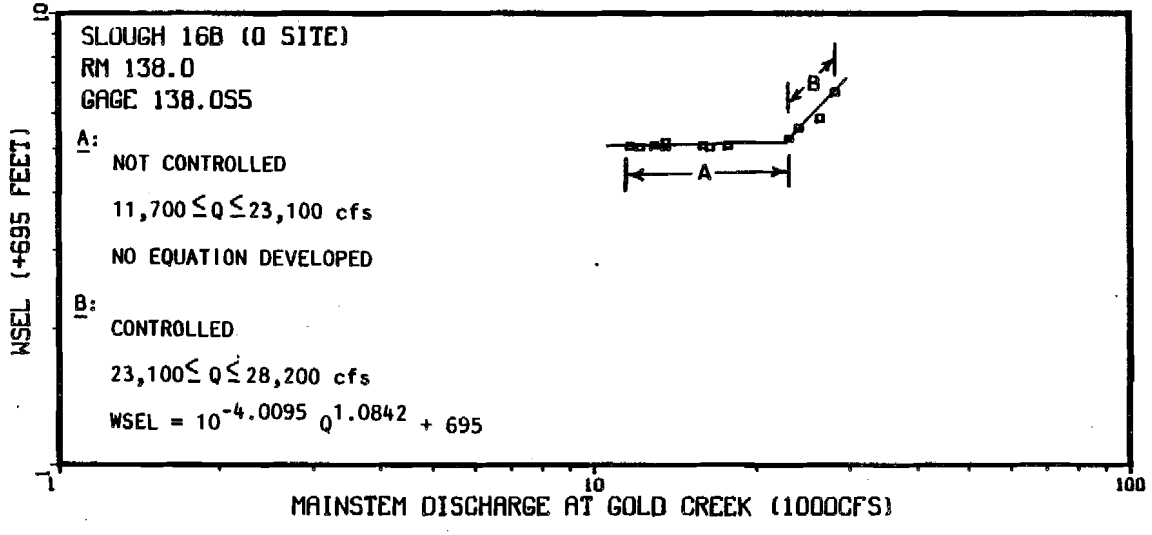
Appendix Figure 1-A-44 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Upper Side Channel 11 physical habitat modeling cross section 3 (136.2S5) and discharge site.



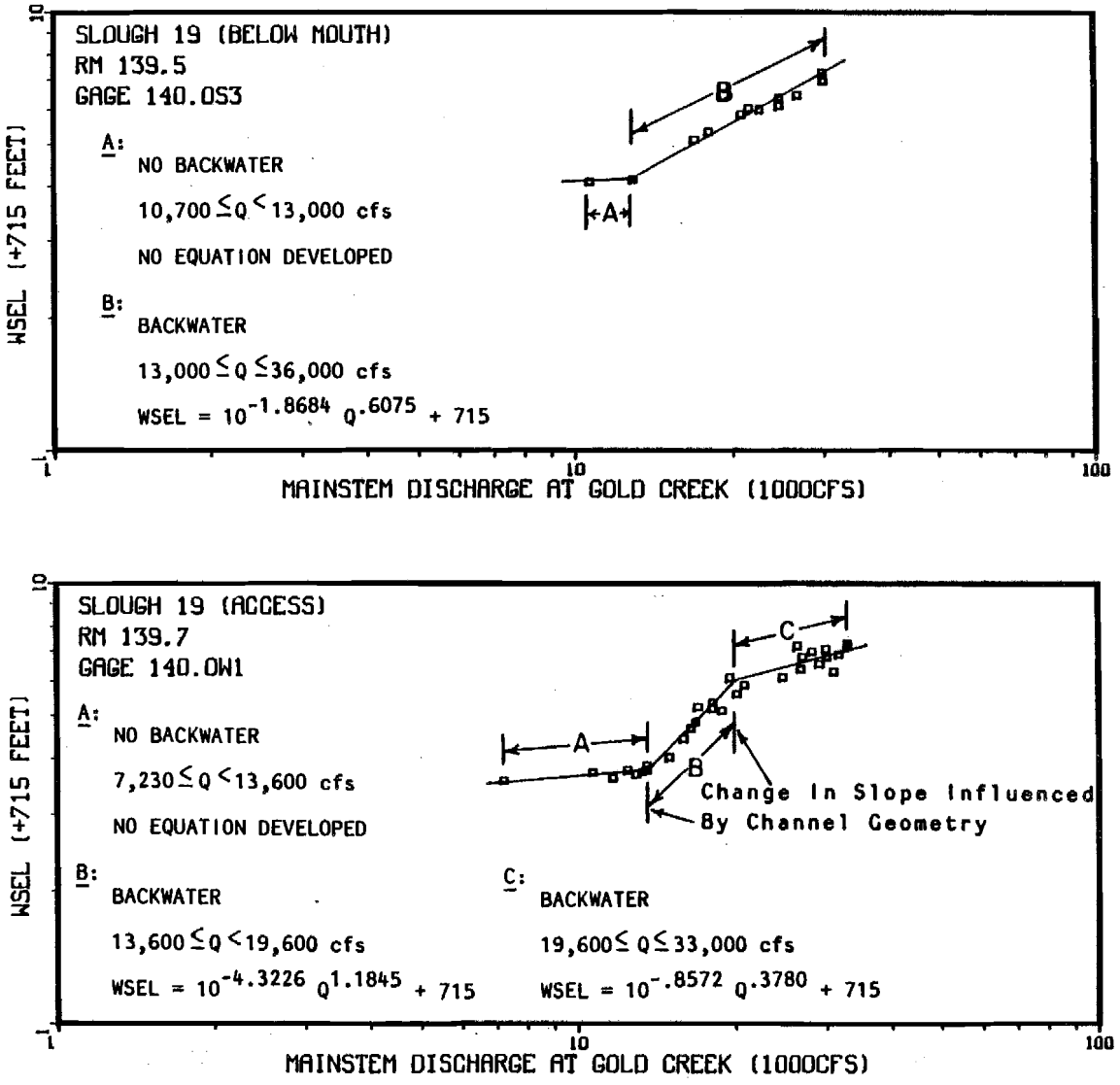


Appendix Figure 1-A-45 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Upper Side Channel 11 head and Slough 16B mouth.

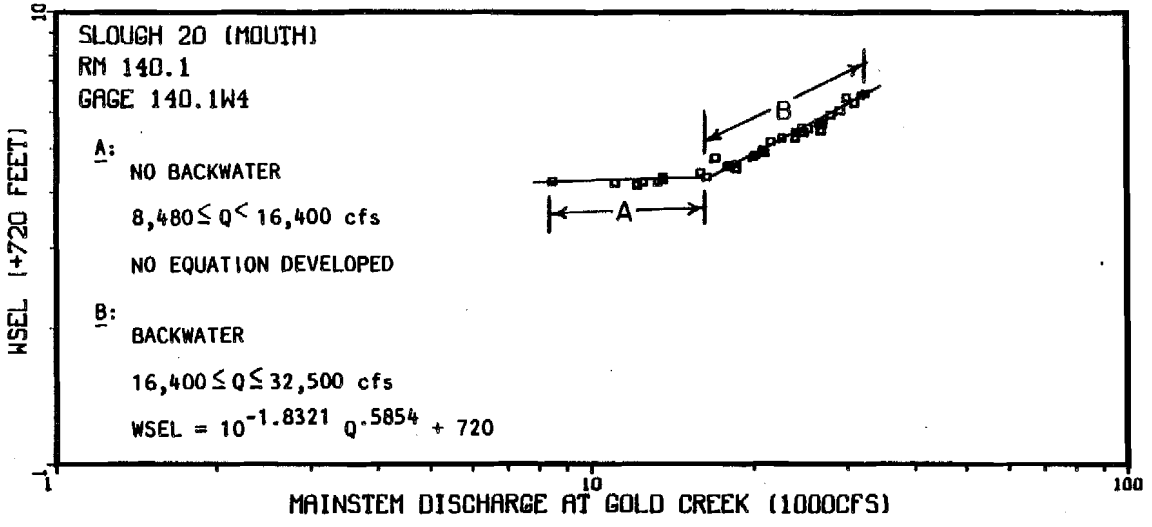


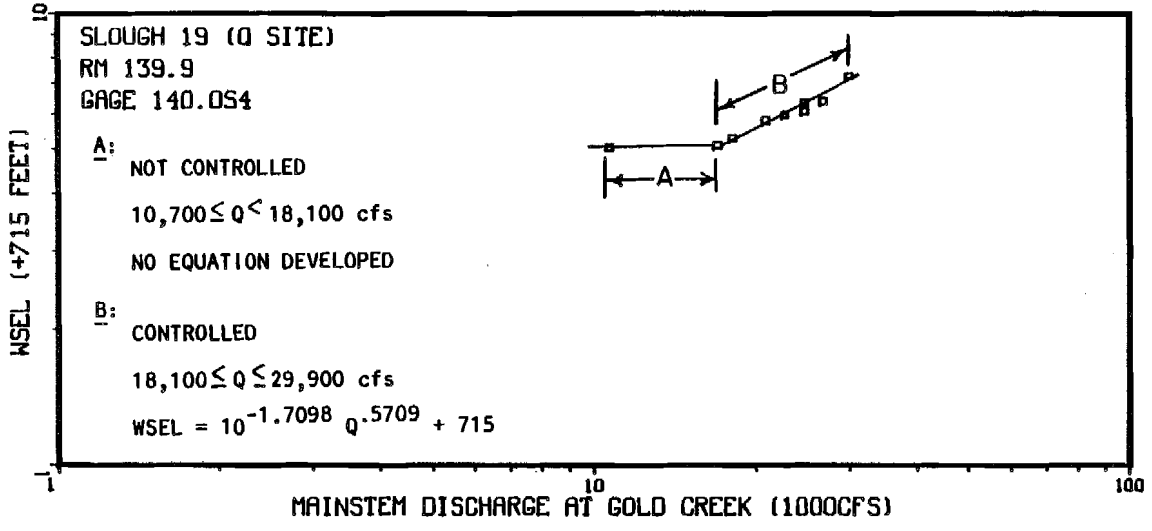


Appendix Figure 1-A-46 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 16B discharge site and head.

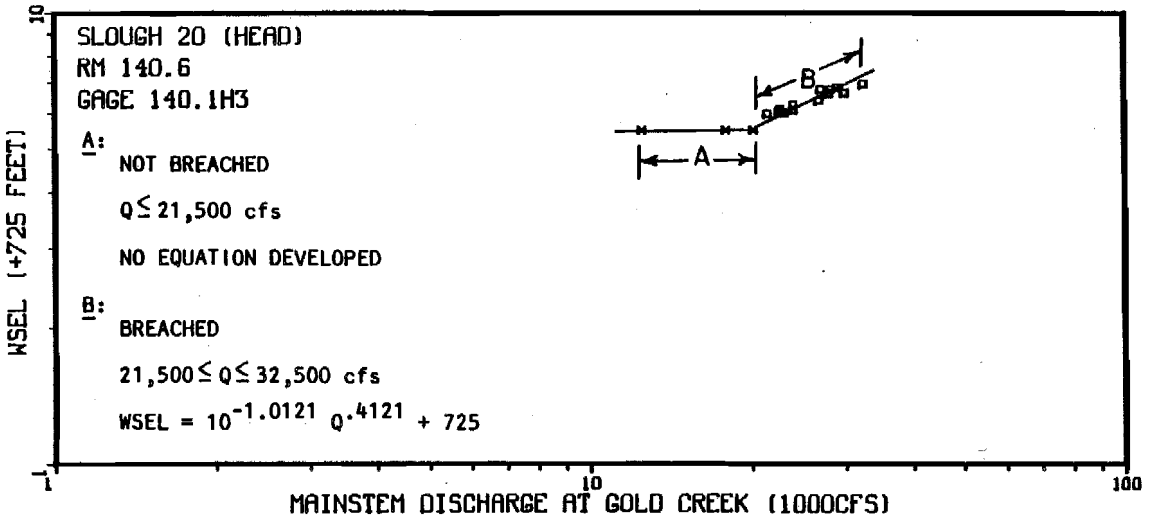


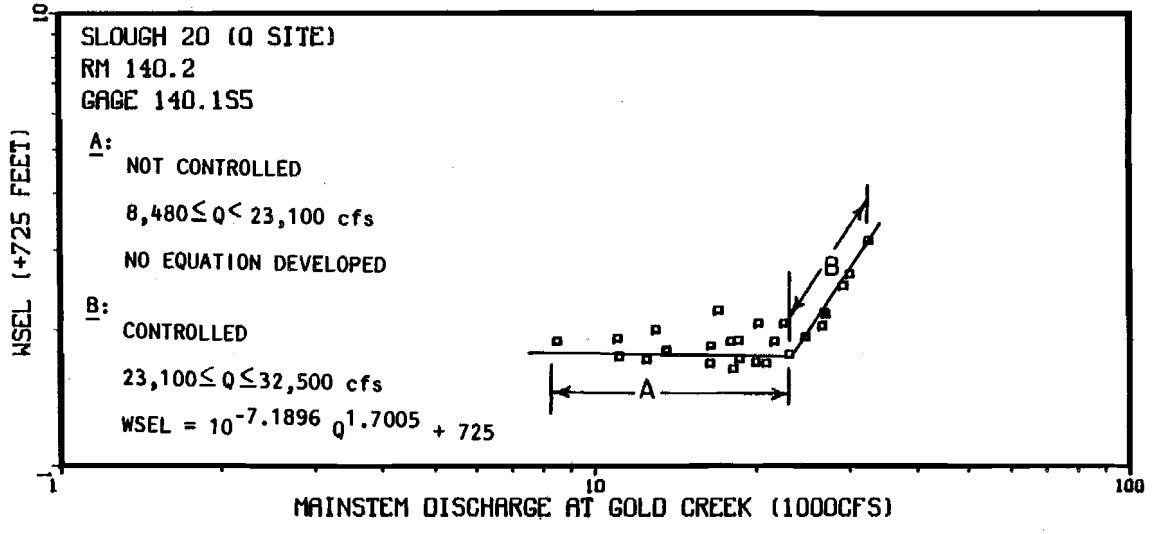
Appendix Figure 1-A-47 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 19 access and below mouth.



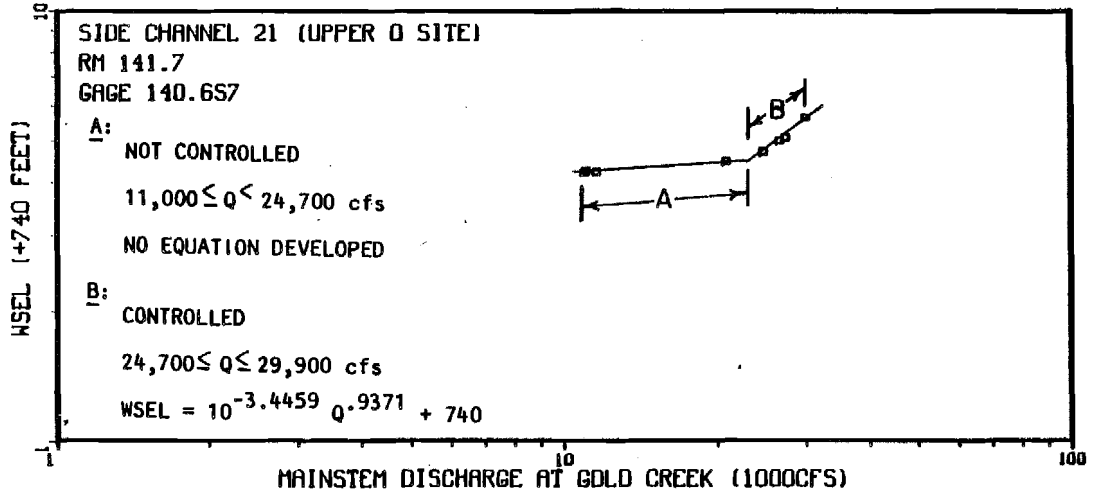


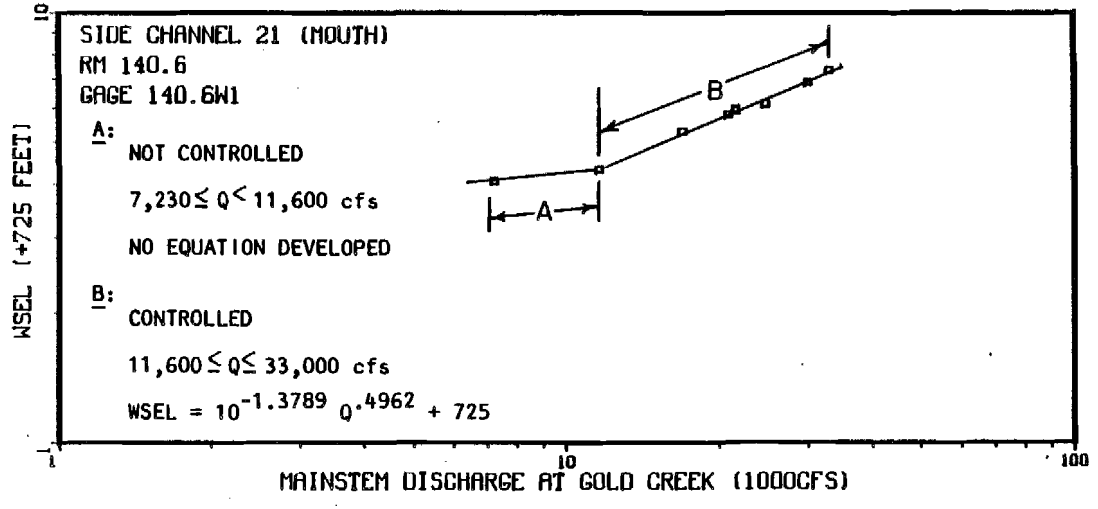
Appendix Figure 1-A-48 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 19 discharge site and Slough 20 mouth.



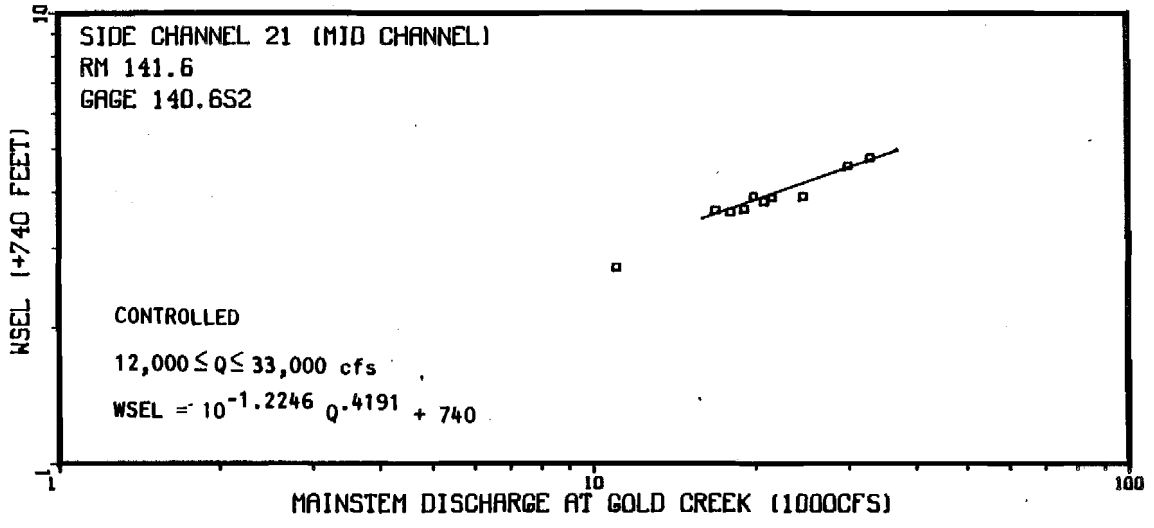


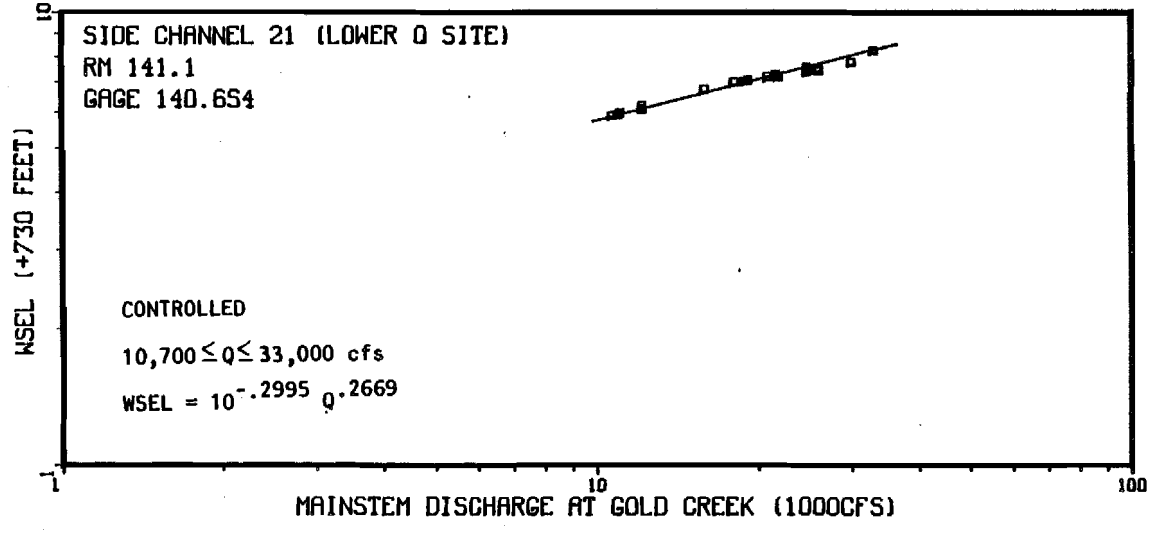
Appendix Figure 1-A-49 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 20 discharge site and head.



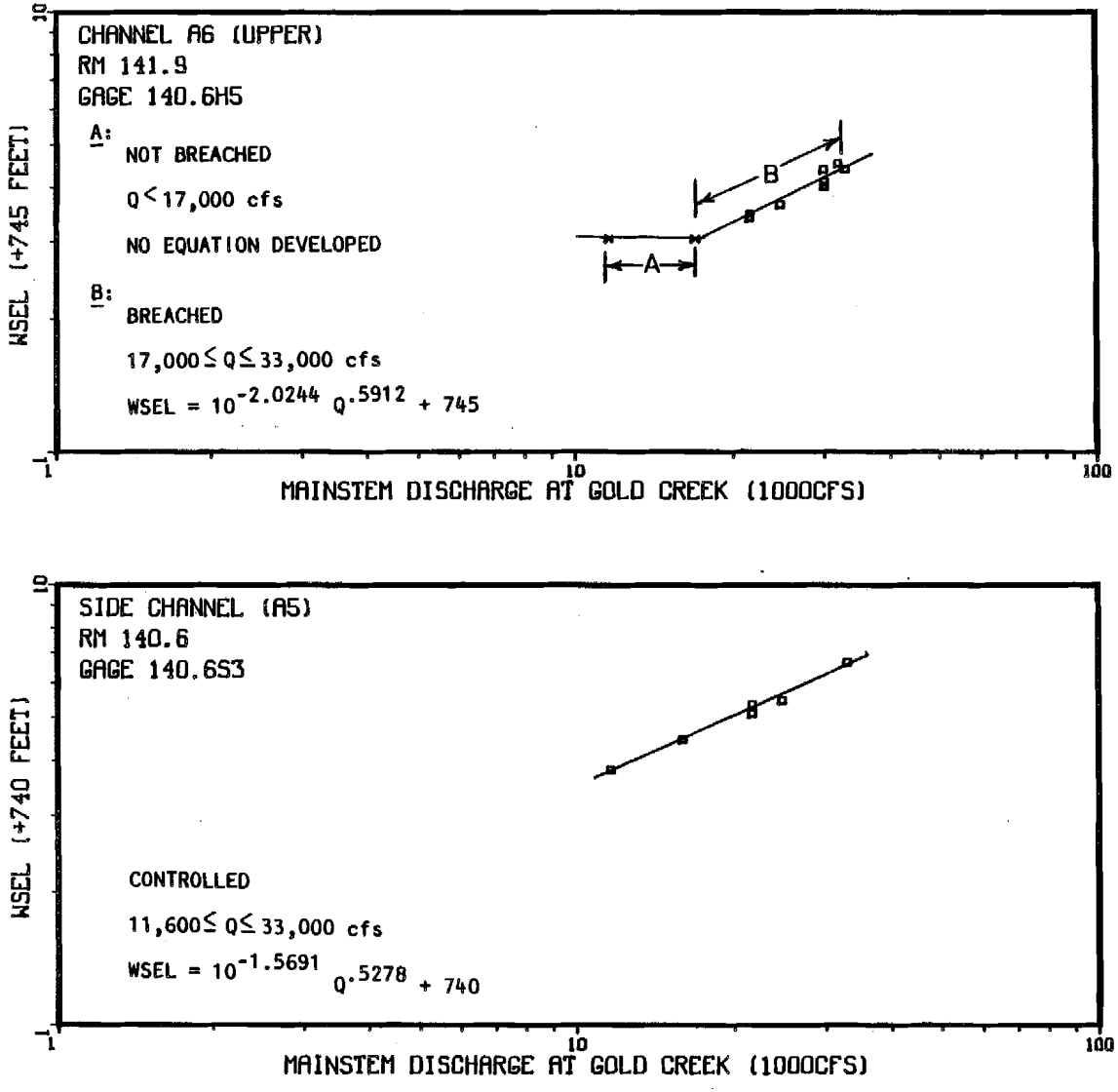


Appendix Figure 1-A-50 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channel 21 mouth and Upper discharge site.

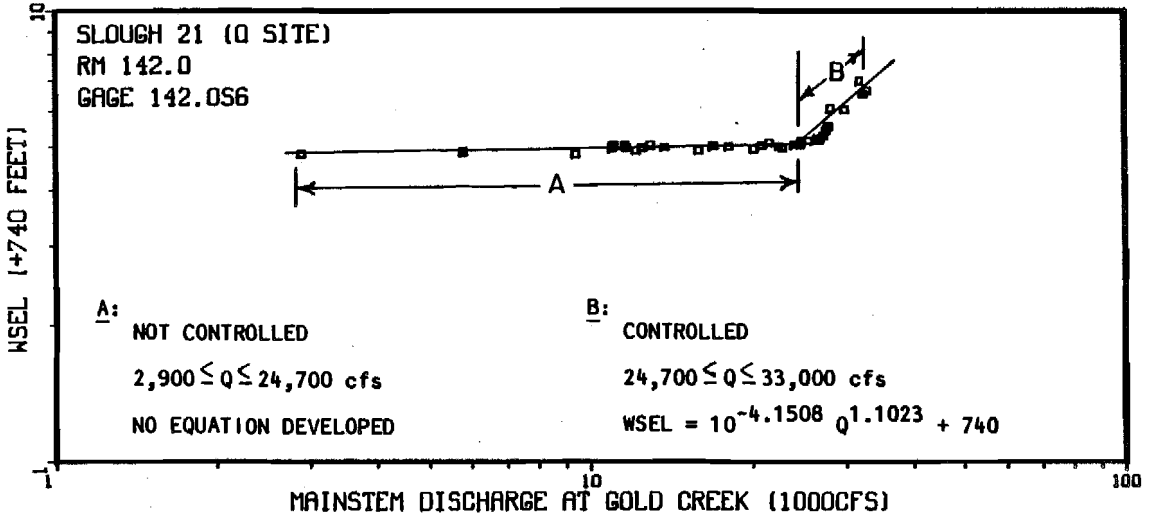


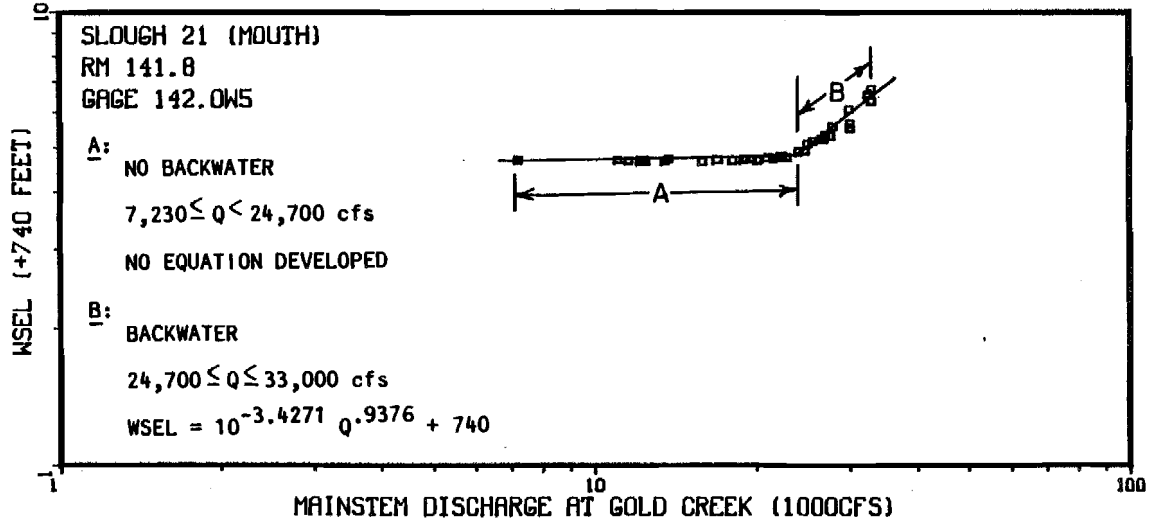


Appendix Figure 1-A-51 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channel 21 Lower discharge site and mid channel.

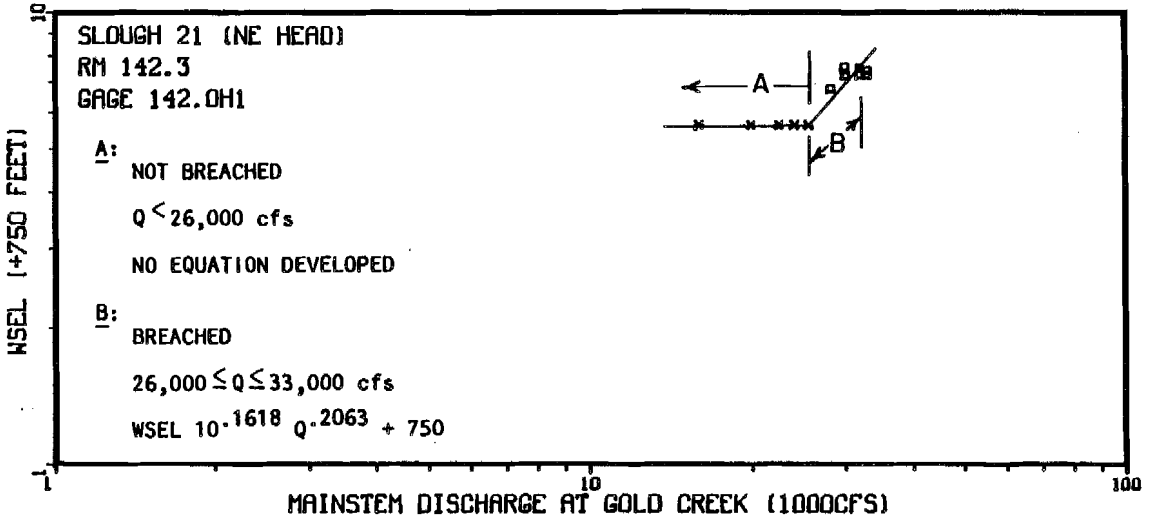


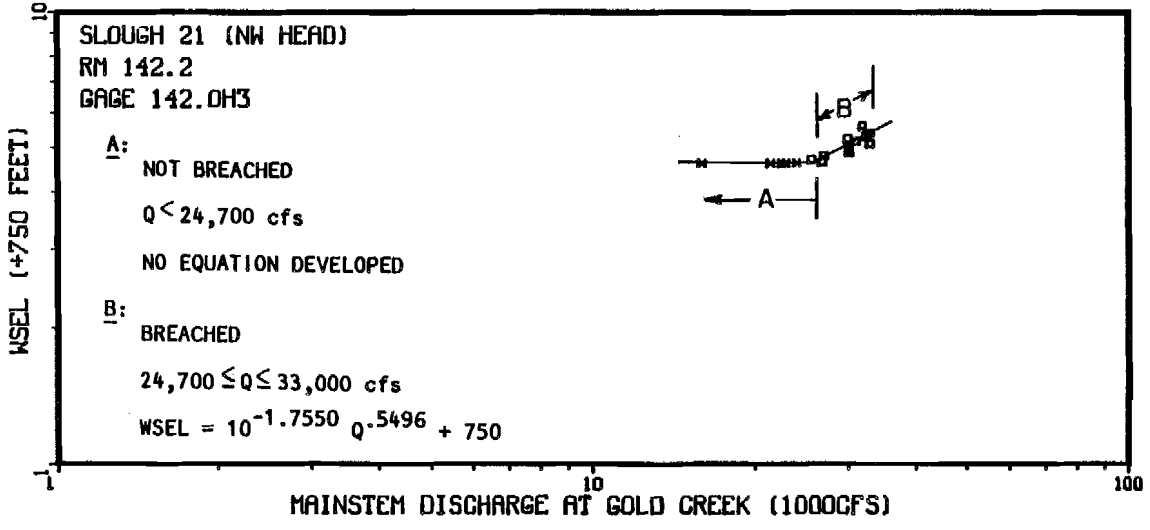
Appendix Figure 1-A-52 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Side Channels A5 and A6 Upper.



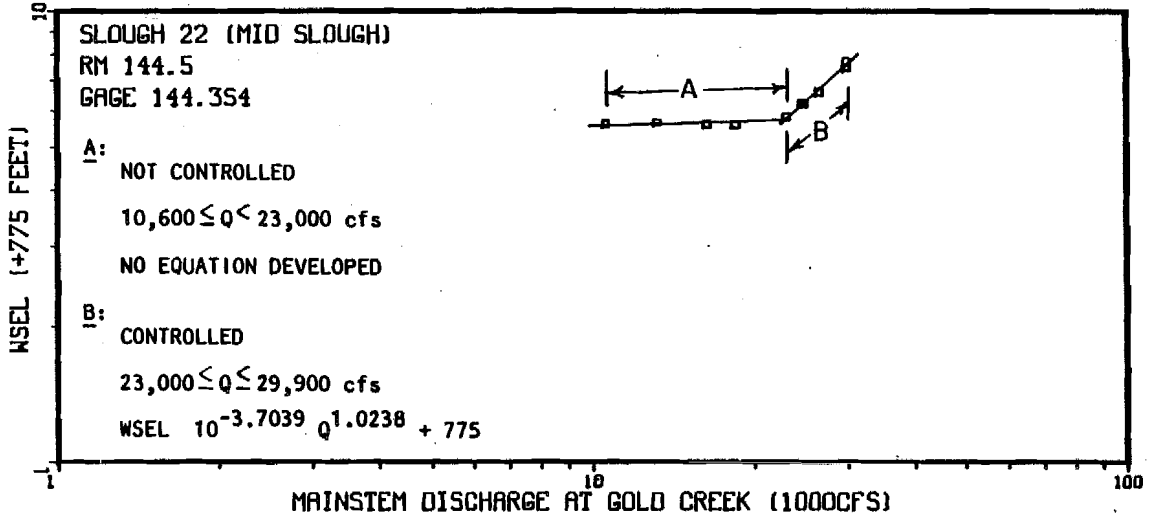


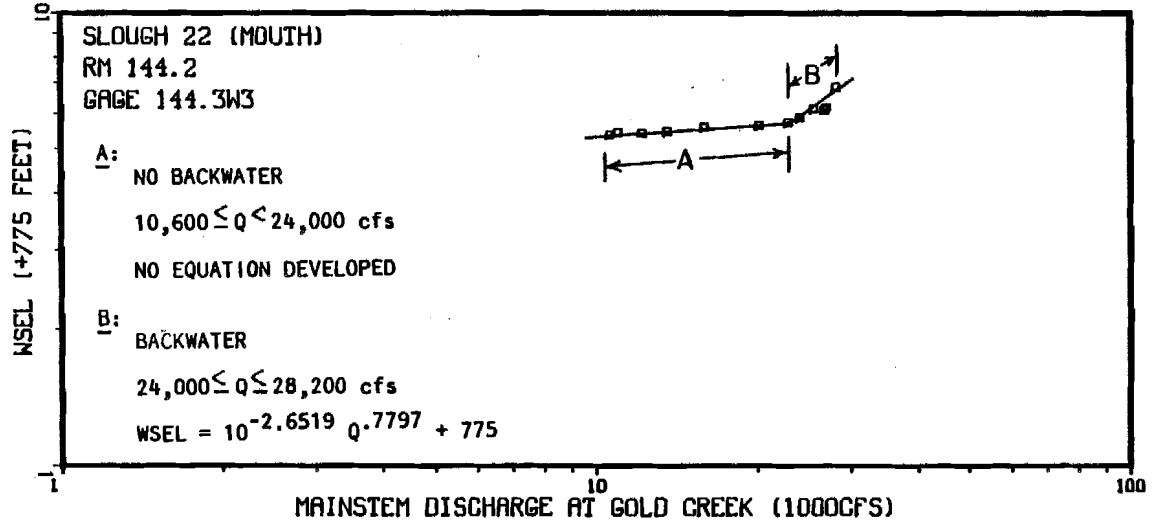
Appendix Figure 1-A-53 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 21 mouth and discharge site.



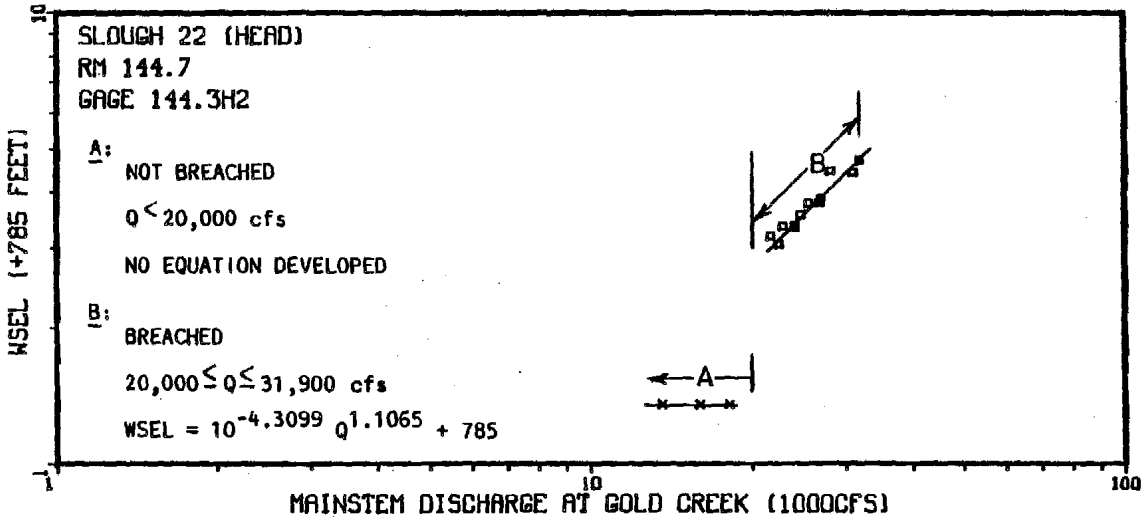


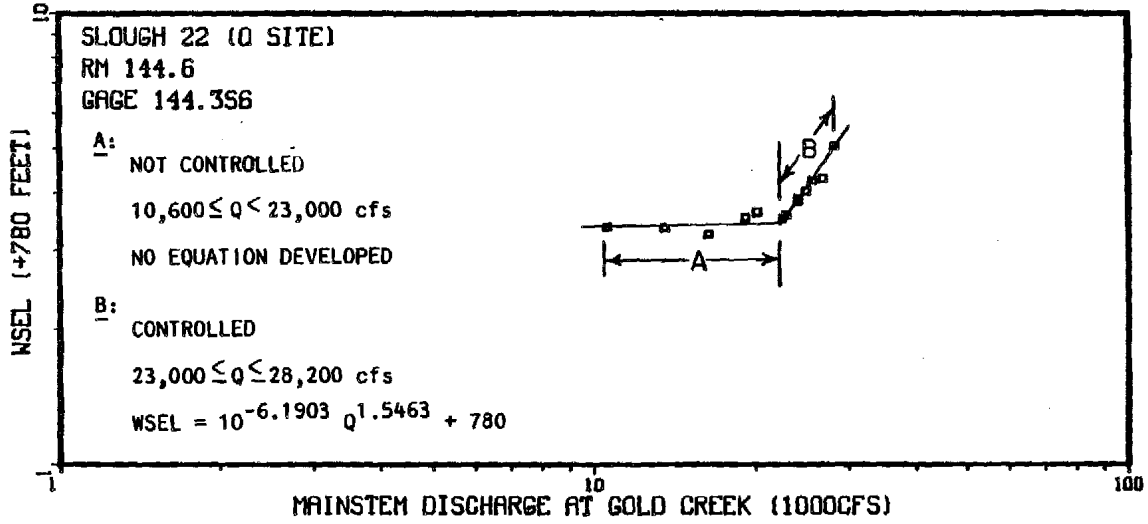
Appendix Figure 1-A-54 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 21 NW head and NE head.





Appendix Figure 1-A-55 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 22 mouth and mid slough.





Appensix Figure 1-A-56 Non-Mainstem discharge (Provisional USGS 1983) versus the water surface elevation at Slough 22 discharge site and head.