

FLOOD PLAIN INFORMATION

*Rcd 4/30/85
M.S. Boro. af.*

TALKEETNA RIVER - SUSITNA RIVER - CHULITNA RIVER

TALKEETNA , ALASKA



PREPARED FOR THE MATANUSKA-SUSITNA BOROUGH BY THE DEPT. OF THE ARMY,
ALASKA DISTRICT, CORPS OF ENGINEERS, ANCHORAGE, ALASKA.

JUNE 1972

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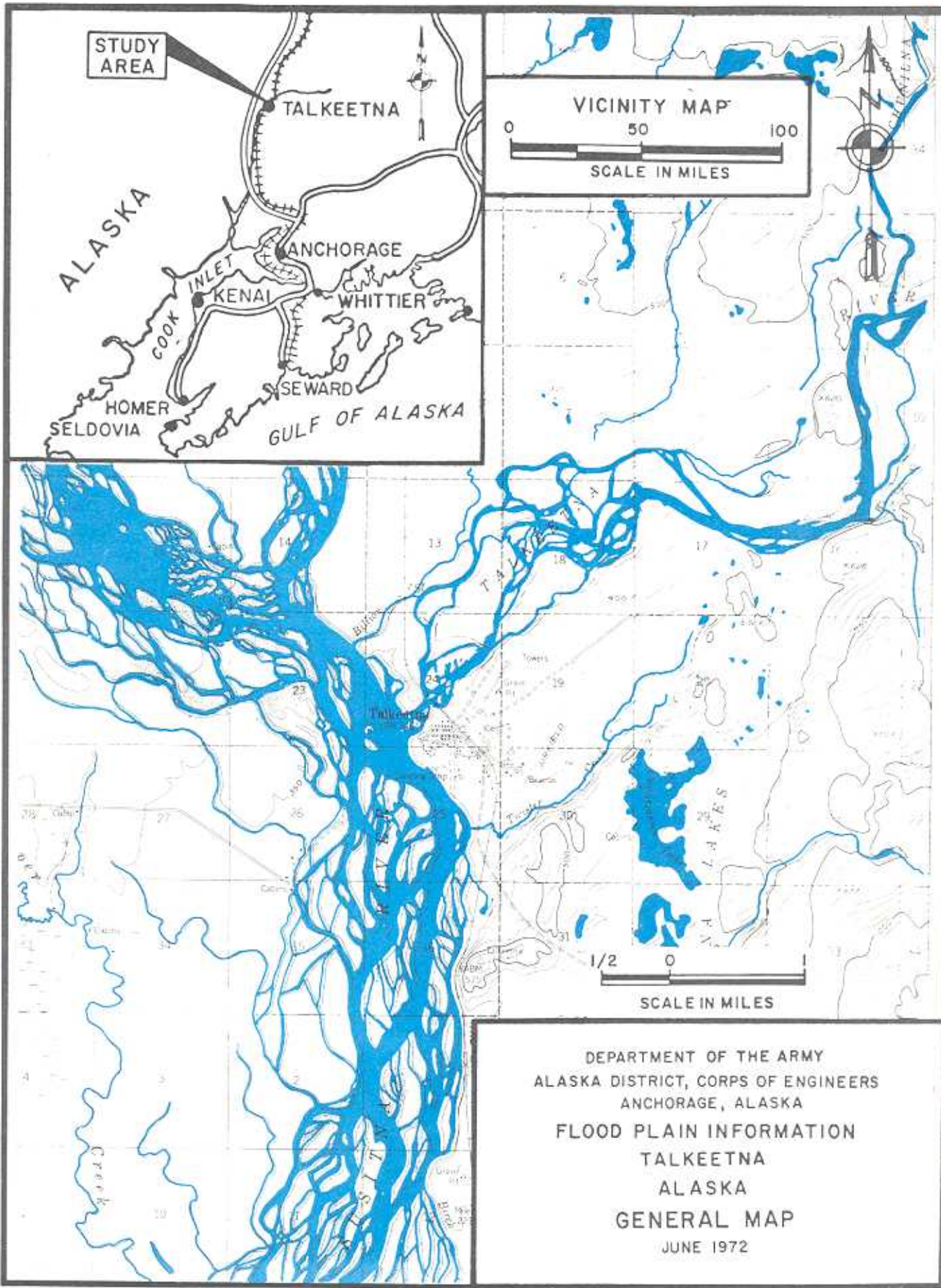
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STUDY AREA

TALKEETNA

ALASKA

ANCHORAGE

INLET

KENAI

WHITTIER

COOK

SEWARD

HOMER
SELDOVIA

GULF OF ALASKA

VICINITY MAP

0 50 100

SCALE IN MILES

SCALE IN MILES

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, CORPS OF ENGINEERS
ANCHORAGE, ALASKA
FLOOD PLAIN INFORMATION
TALKEETNA
ALASKA
GENERAL MAP
JUNE 1972

PREFACE

The portion of Talkeetna covered by this report is subject to flooding from the Talkeetna, Susitna and Chulitna Rivers. The properties along these streams are primarily residential and commercial, and were severely damaged by the flood of 1942. The open spaces in the flood plain which may come under pressure for future development are extensive. Although large floods have occurred in the past, studies indicate that even larger floods are possible.

This report has been prepared because a knowledge of flood potential and flood hazards is important in land use planning and for management decisions concerning flood plain utilization. It includes a history of flooding in Talkeetna and identifies those areas that are subject to possible future floods. Special emphasis is given to these floods through maps, photographs, profiles, and cross sections. The report does not provide solutions to flood problems; however, it does furnish a suitable basis for the adoption of land use controls to guide flood plain development and thereby prevent intensification of loss and damage. It will also aid in the identification of other flood damage reduction techniques such as works to modify flooding and adjustments, including flood proofing, which might be embodied in an overall Flood Plain Management (FPM) program. Other FPM program studies--those of environmental attributes and the current and future land use role of the flood plain as part of its surroundings--would also profit from this information.

At the request of the Matanuska-Susitna Borough, and endorsement of the State of Alaska, Department of Natural Resources, this report was prepared by the Alaska District, Corps of Engineers, under continuing authority provided in Section 206 of the 1960 Flood Control Act, as amended.

Assistance and cooperation of the Alaska Railroad, Federal Aviation Agency, Alaska Department of Highways, National Weather Service, Matanuska-Susitna Borough, and private citizens, in supplying useful data and photographs for the preparation of this report are appreciated.

Additional copies of this report can be obtained from the Matanuska-Susitna Borough. The Alaska District, Corps of Engineers, upon request, will provide technical assistance to planning agencies in the interpretation and use of the data presented as well as planning guidance and further assistance, including the development of additional technical information.

BACKGROUND INFORMATION

Settlement

Talkeetna, which is an Indian name meaning river of plenty, was established early in the Twentieth Century just below the confluence of the Susitna, Talkeetna and Chulitna Rivers. The village served as a supply and trade center for miners operating in the foothills of the Alaska Range and Talkeetna Mountains. Reportedly, Talkeetna was originally the site of a Tanaina Indian Village although there are presently only two Indian families living in Talkeetna.

Talkeetna was the terminus of river boat traffic from Cook Inlet up the Susitna River. It developed as a major camp and distribution center when the railroad was built. The railroad station was established in 1915 and a Post Office in 1916.

During World War II many of the gold mines were shut down as a result of war time wage and cost controls. After the war, mining remained unprofitable, as it is today, and most of the mines remained closed. However, lenient homestead regulations brought many veterans into the area taking up some of the population loss from unemployed miners.

Population figures for the unincorporated village of Talkeetna are as follows: 1920-70; 1930-89; 1939-136; 1950-106; 1960-76; and 1970-182.

The Stream and Its Valley

The Talkeetna River and the Chulitna River are major tributaries of the Susitna River. Talkeetna River, with a total drainage area of 2015 square miles, has its origin at Talkeetna Glacier in the Talkeetna Mountains. From this rugged terrain

the river flows northwest 40 miles and then southwest 40 miles to its junction with the Susitna River at the village of Talkeetna.

The areas above Talkeetna, drained by the three rivers, range from 350 to over 6,000 feet in elevation and all have portions of their higher elevations glacier covered. Drainage areas contributing to runoff at locations in or near the study areas are shown in Table I.

TABLE I
DRAINAGE AREAS

Location	River Length Miles	Drainage Area sq. mi.
Talkeetna River at Mouth	80	2,015
Chulitna River at Mouth	80	2,630
Susitna River at Talkeetna	200	11,035
Susitna River Above Mouth Of Chulitna River	200	6,390

The climate of the area is characterized by moderately warm summers and cold winters with temperature extremes ranging from plus 91 degrees F. to 48 degrees below zero. Annual precipitation averages 28.8 inches and annual snowfall 114 inches. Rainfall is generally the heaviest in July, August and September with monthly precipitation amounts about equal for the rest of the year.

Developments in the Flood Plain

The flood plain of the Talkeetna River at the village of Talkeetna is wide and developed only on the south side at the mouth of the river. The only bridge in the study area is the

Alaska Railroad Bridge which crosses just upstream from the mouth of the Talkeetna River.

The flood plain within the village of Talkeetna is occupied by residential and commercial developments. The railroad, highway, streets and utility lines, in addition to homes and businesses, would be subject to flooding. This flood plain is only partially developed and future development is likely, especially with the increase in tourist traffic because of the opening of the new Anchorage-Fairbanks highway.



ALASKA RAILROAD BRIDGE, LOOKING UPSTREAM FROM NORTH BANK OF TALKKEENA RIVER
FIGURE 1

FLOOD SITUATION

Sources of Data and Records

The U. S. Geological Survey has maintained stream gages at the following locations upstream from Talkeetna for the period indicated:

<u>Location</u>	<u>Period of Record</u>
Susitna River at Gold Creek	August 1949 to present
Chulitna River near Talkeetna	February 1958 to present
Talkeetna River above Talkeetna	June 1964 to present

The gage location on the Talkeetna River is shown on the general map. The others are not within the area covered by this map.

To supplement the records of the gaging stations and those of snow surveys, newspaper files, historical documents and records were searched for information concerning past floods. These records have helped to develop a knowledge of floods which have occurred on these rivers and have also shown that the floods on the three rivers do not peak concurrently.

Maps prepared for this report were based on the U. S. Geological Survey quadrangle sheet Talkeetna B-1. River cross sections and structural data on the bridge and culverts were obtained by field surveys performed by Alaska District, Corps of Engineers, personnel.

Flood Season and Flood Characteristics

Major floods have occurred in the study area during the spring, summer and fall seasons with the greatest recorded flood occurring in September 1942. Floodflow stages can rise

from normal flow to extreme flood peaks in a relatively short period of time with high velocities in the main channels of the rivers.

The flood of September 1942 resulted from a combination of 48 hours of heavy rains and melting snows which had recently fallen in the mountains. In addition to floods caused by runoff, Talkeetna is susceptible to floods caused by sudden releases of water that have been impounded by ice jams.

Factors Affecting Flooding and Their Impact

Obstructions to Floodflows - Natural obstructions to floodflows include trees, brush and other vegetation growing along the stream banks in flood plain areas. Man-made encroachments on or over the rivers, such as the railroad bridge, can also create more extensive flooding than would otherwise occur.

During floods, trees, brush and other vegetation growing in flood plains impede floodflows, thus creating backwater and increased flood heights. Trees and other debris may be washed away and carried downstream to collect on the bridge or other obstructions. As floodflows increase, masses of debris could break loose and a wall of water and debris would surge downstream until another obstruction is encountered. Debris could collect against the bridge until the load exceeds its structural capacity and the bridge is destroyed.

In general, obstructions restrict floodflows and result in overbank flows and unpredictable areas of flooding, possible

destruction of bridges and culverts and an increased velocity of flow immediately downstream. It is impossible to predict the degree or location of the accumulation of debris; therefore, for the purposes of this report, it was necessary to assume that there would be no accumulation of debris at the bridge or any clogging of culvert openings in the development of the flood profiles.

Flood Damage Reduction Measures - In 1951 the Corps of Engineers completed an emergency bank protection project at Talkeetna, Alaska, under Section 14 of the 1946 Flood Control Act. The project, located on the left bank of the Talkeetna River below the Alaska Railroad Bridge, consists of a brush and timber fascine 1,000 feet long which was constructed to arrest erosion. Subsequent to construction of the emergency work, a flood control project was authorized which called for a stone revetment approximately 1,500 feet long downstream from the railroad bridge. In 1960 this authorized project was placed in an inactive category as the emergency timber fascine constructed in 1951 was performing satisfactorily. Recently, the river has cut a small channel through the fascine structure and the village is again threatened by erosion. A restudy by the Corps of Engineers of the authorized project to determine feasibility, justification and local cooperation requirements under existing conditions in the area will probably be undertaken in Fiscal Year 1973.

In an effort to control erosion and protect its bridge, the Alaska Railroad, in 1949, made a channel change immediately upstream from the bridge. This realignment cut off a

meander of the river and allowed the river to flow at right angles to the bridge. Figures 2 and 3 illustrate the before and after conditions.

There are no existing Borough zoning ordinances, building codes, or other regulatory measures specifically for the reduction of flood damage. The village of Talkeetna is not incorporated and therefore does not have any zoning powers. This study has been requested so that it may be used as a basis for the development of Flood Plain Management planning measures by the Matanuska-Susitna Borough.

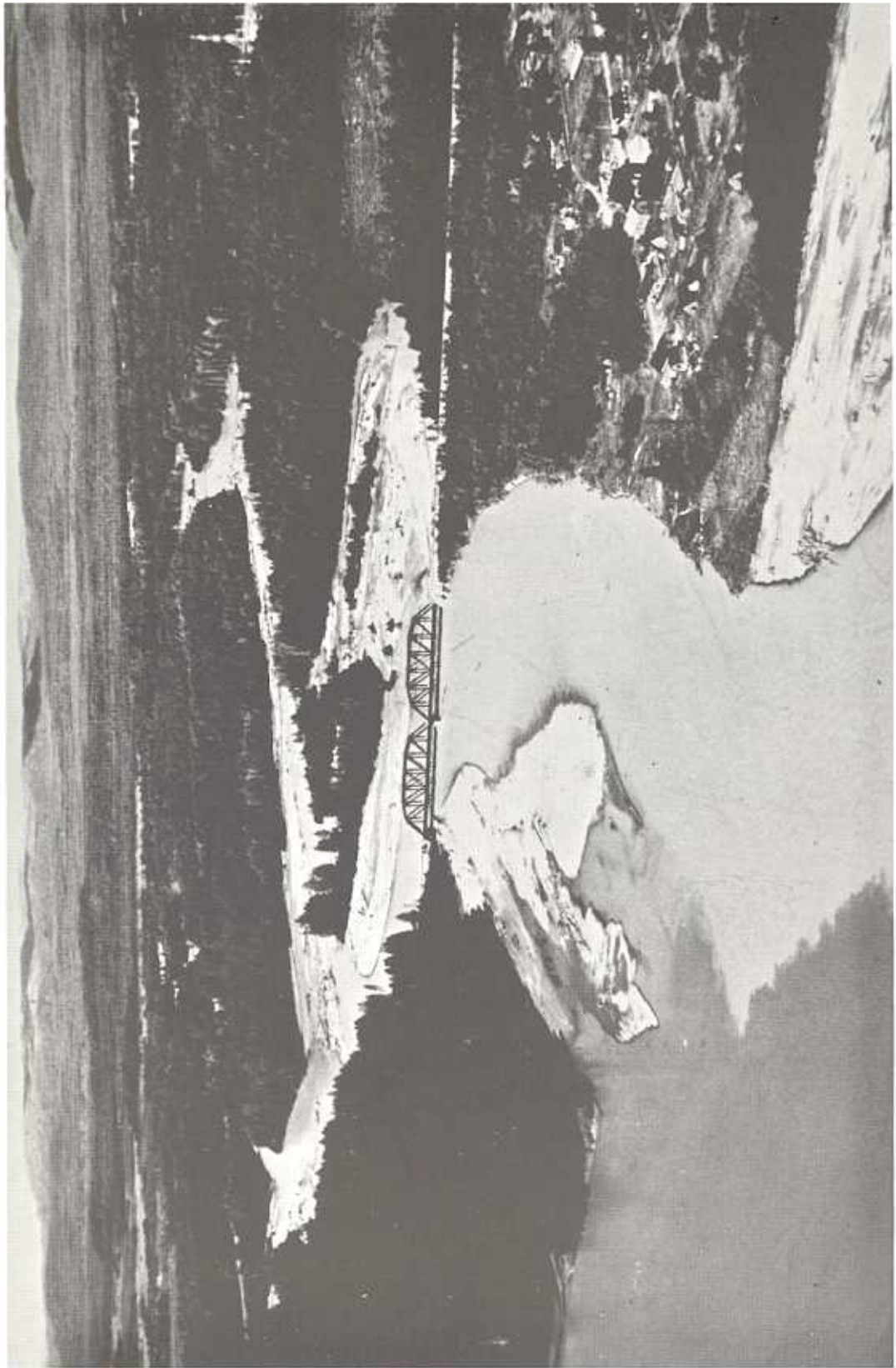
Other Factors and Their Impact - The majority of the inundated area at Talkeetna has been along the banks of the Talkeetna River near its confluence with the Susitna River. This is due largely to the compounded backwater influence of the Susitna at high stages. When high runoff from the tributaries has occurred during these periods of high stages on the Susitna, it has aggravated the flooding by increasing the height and duration of the river's backwater effects. Flooding and threats of flooding promote action by local officials in flood warning and flood fighting activities. Due to the size and nature of the village, there is no significant problem with floatable materials being stored in the flood plain which might cause additional damage.

Flood Warning and Forecasting - The National Weather Service, Alaska River Forecast Center (RFC) located in

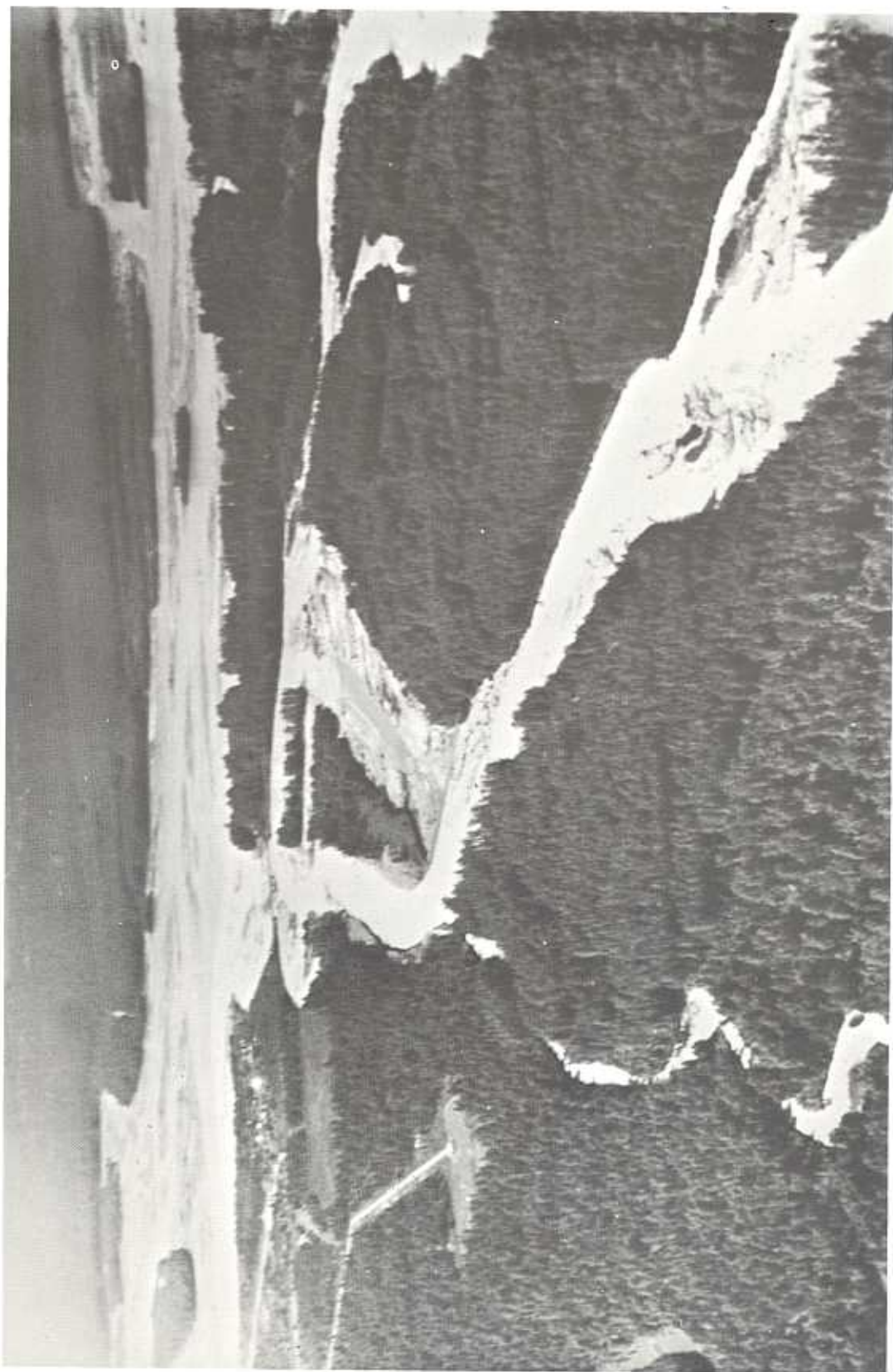
Anchorage, issues flood warnings for the Talkeetna area to radio and television stations and the local media for further dissemination to residents of the area. In addition, the Center maintains records of daily river stages on the Susitna River at Gold Creek, at the Alaska Railroad Bridge and at the Highway Bridge at Sunshine. The National Weather Service also issues regular weather forecasts and hazardous weather warnings for the area.

Flood Fighting and Emergency Evacuation Plans- Although there are no formal flood fighting or emergency evacuation plans for the Talkeetna area, provisions for alerting area residents in time of emergency are accomplished by the Alaska Disaster Office through the Matanuska-Susitna Borough. This office maintains communication with the National Weather Service at its control center, establishing a "flood watch" during the early stages of flood threat. Residents along the river are warned by radio and telephone of approaching flood conditions and advised to evacuate the area. Subsequent flood fighting, evacuation and rescue activities are coordinated on a Borough-wide basis with Borough officials.

Material Storage On The Flood Plain-As previously stated, due to the size and nature of the community, there are no significant quantities of floatable materials stored in the flood plain at Talkeetna. If they were present they could be carried away by flood flows, causing serious damage to any structures downstream.



AERIAL VIEW OF TALKOOTNA RIVER, LOOKING UPSTREAM, SHOWING
NATURAL CONDITIONS OF THE RIVER IN AUGUST, 1949
FIGURE 2



AERIAL VIEW OF TALKLEETNA RIVER, AUGUST 1950, SHOWING THE CHANNEL CHANGE
CONSTRUCTED BY THE ALASKA RAILROAD
FIGURE 3



VIEW OF FASCINE FROM UPSTREAM END AS IT APPEARED IN MAY, 1951
FIGURE 4



FASCINE AS IT APPEARS TODAY
FIGURE 5

PAST FLOODS

Summary of Historical Floods

Very little information is available concerning historical floods at Talkeetna. Records indicate that an ice jam occurred on the Susitna River at Gold Creek in 1919, but they did not indicate whether or not Talkeetna was flooded. Floods have also occurred in September 1942 and August of 1971. The 1942 flood is the highest of record and is the only one that caused any significant damage. The 1971 flood had a peak which lasted only a few hours and only flooded the lower, abandoned, parts of the village.

Flood Records

Information on historical floods in the Talkeetna area was obtained from the stream gaging stations maintained by the U. S. Geological Survey at a number of locations within the Susitna Watershed near Talkeetna. Additional information on past floods was obtained from interviews with residents along the Talkeetna River, newspaper files and historical documents.

Flood Descriptions

The following are descriptions of the flood of record that occurred at Talkeetna, Alaska in September 1942:

WORST FLOODS FORCE RESIDENTS TO FLEE

Talkeetna Under Water Use Rowboats

Nagley Store, Trading Post, DeVault Road- House Are Damaged

Returning travelers who knew Talkeetna "Before and after" today are recounting the ravages of Monday's flood when the Talkeetna, Chulitna and Big Susitna rivers rose far above their confining banks and partially inundated Talkeetna village.

The river rise was estimated by several as more than six feet, one cabin on the Talkeetna river was torn away and floated downstream to crack up against a mass of debris, the DeVault Roadhouse and the Talkeetna Trading Post were flooded, the old pier and boathouses on the Talkeetna are gone, and the township itself is covered with mud and glacier silt.

Stacks of stove wood, cut during the summer for use this winter, were drifted away, according to those returning to Anchorage.

Women and children, sent hurriedly to Sunshine Tuesday out of danger's way, have been returned to their homes, it was said.

Real danger, one Anchorage man reports, was seen Monday night when the flood waters reached within eight inches of the dike. It was at that time, he said today, that the entire town was threatened for had the dike not held against the great rush of water Talkeetna would have been wiped out.

Travelers told too of the swollen creeks, some of which widened to half a mile from their normal few yards.

Work crews, for which every available able-bodied man was recruited, are still working against odds to repair damaged structures.

Say River Rose Six Feet To Flood Homes and Stores

In one of the worst floods in memory of sourdough residents, rowboats are being used as a means of transportation in Talkeetna, women and children have been evacuated to safety, and the Big Susitna, the Chulitna rampaging over their banks.

The three great rivers, swollen by 48 hours of heavy rains and new snows running from the mountains after warm winds, flooded their banks Monday and sent a rush of water into homes, stores and streets of the township.

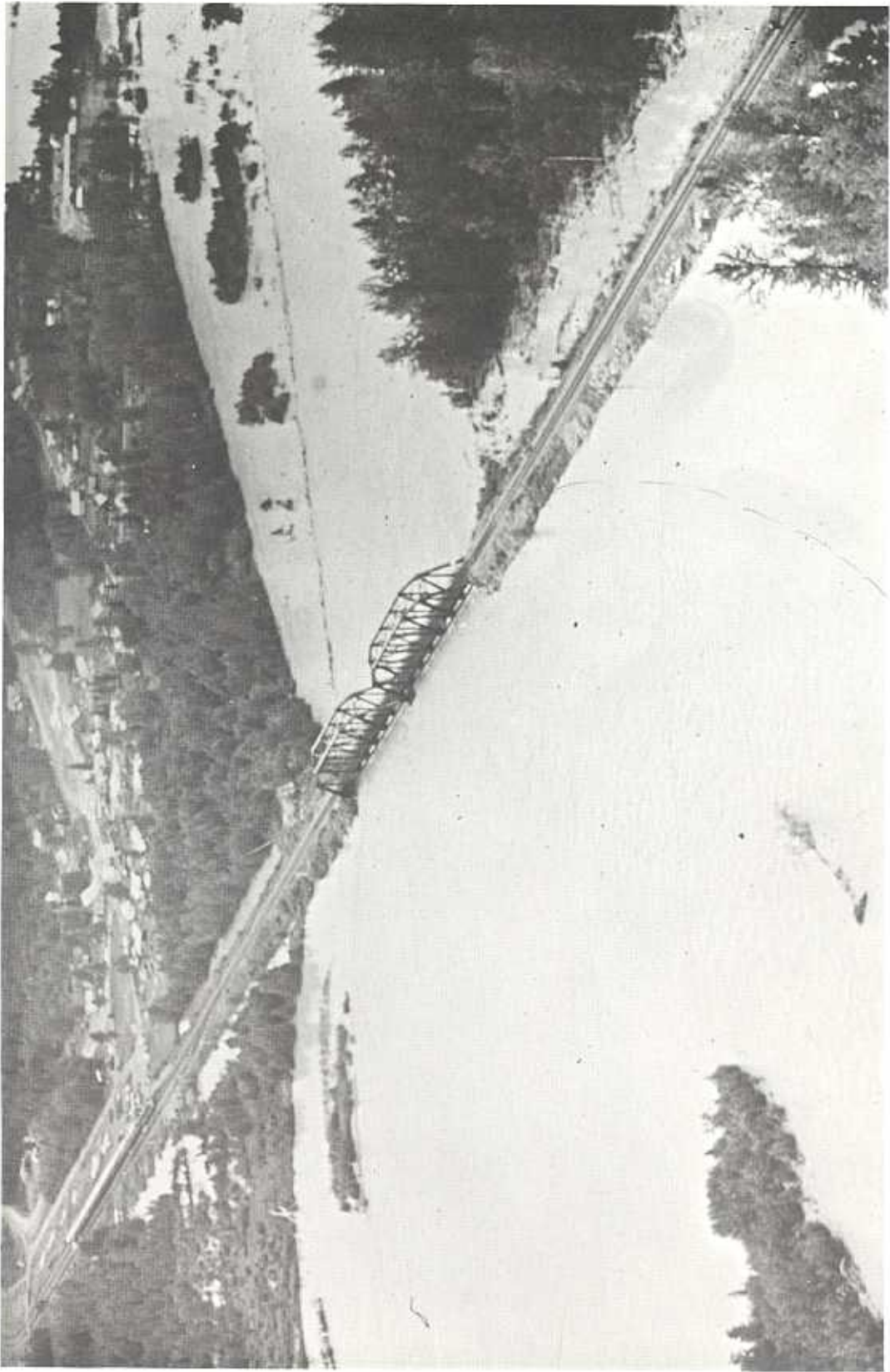
While details of the damage were not immediately available, an indication is given by the report that between two and three feet of water stood in the H.W. Nagley store which occupies one of the highest spots in Talkeetna and which, during the height of the flood, was isolated as an island.

The Talkeetna Trading Post, operated by Belle McDonald near the banks of the Big Susitna, the DeVault Roadhouse, just across the road, and the Fairview Inn were probably the most seriously damaged, according to unofficial reports.

Work crews were rushed to Talkeetna to repair damaged structures weakened by flood waters and Col. O.F. Ohlson was there today supervising the work.

As flood water rose to an alarming height Monday, women and children were crowded on speeders and run to Sunshine and housed in the section house. It is believed between 20 and 30 were sent to temporary quarters to avoid mishap in the flood area and to provide warm and dry housing for the women and children. No accidents have been reported in meager details brought to Anchorage. It is believed that stores and trading posts had not as yet stocked their complete winter supplies but that damage by water to merchandise will amount to a considerable loss.

(a) Simulated from microfilm copy



AERIAL VIEW OF THE AUGUST 1971 FLOOD AT TALKETTNA
FIGURE 6

FUTURE FLOODS

Floods of the same or larger magnitude as those that have occurred in the past will occur in the future. Larger floods have been experienced in the past on streams with similar geographical and physiographical characteristics as those found in the study area. Similar combinations of rainfall and runoff which caused these floods could occur in the Talkeetna area. Therefore, to determine the flooding potential of the study area, it was necessary to consider storms and floods that have occurred in regions of like topography, watershed cover and physical characteristics. Discussion of the future floods in this report is limited to those that have been designated as the Intermediate Regional Flood and the Standard Project Flood. The Standard Project Flood represents a reasonable upper limit of expected flooding in the study area. The Intermediate Regional Flood may reasonably be expected to occur more frequently although it will not be as severe as the infrequent Standard Project Flood.

Intermediate Regional Flood

The Intermediate Regional Flood (IRF) is defined as one that will occur once in 100 years on the average, although it could occur in any year. The peak flow of this flood was developed from statistical analysis of streamflow and precipitation records and basin runoff characteristics for the stream under study. In determining the Intermediate Regional Flood for the Talkeetna and Susitna Rivers, statistical studies were made using the records of flood data from the U. S. Geological Survey gaging stations throughout the vicinity of Talkeetna,

Alaska. Peak flows thus developed for the Intermediate Regional Floods at selected locations in the study area are shown in Table 2.

Standard Project Flood

The Standard Project Flood is defined as a major flood that can be expected to occur from a severe combination of meteorological and hydrological conditions that is considered reasonably characteristic of the geographical area in which the study area is located, excluding extremely rare combinations. The Corps of Engineers, in cooperation with the NOAA Weather Service, has made comprehensive studies and investigations based on the past records of experienced storms and floods and has developed generalized procedures for estimating the flood potential of streams. Peak discharges for the Standard Project Flood at Talkeetna are shown in Table 2. Discharge hydrographs for the Talkeetna SPF and the Susitna River SPF at Talkeetna are shown on Plates 9 and 10, respectively.

TABLE 2
PEAK FLOWS FOR INTERMEDIATE REGIONAL
AND STANDARD PROJECT FLOODS

Location	Drainage Area sq. mi.	Intermediate Regional Flood Discharge cfs	Standard Project Flood Discharge cfs
Susitna River at Talkeetna	11,035	268,000	315,000
Talkeetna River at mouth	2,015	97,000	121,000

TABLE 3
FLOOD ELEVATIONS
Talkeetna River at Alaska Railroad Bridge

Flood	Elevation (a)
Standard Project	354.4
Intermediate Regional	351.8
August 1971	346.9

(a) Feet, mean sea level

Frequency

A frequency curve of peak flows was constructed on the basis of available information and computed flows of floods up to the magnitude of the Standard Project Flood. The frequency curve thus derived, which is available upon request, reflects the judgment of the engineers who have studied the area and are familiar with the region; however, it must be regarded as approximate and should be used with caution in connection with any planning of flood plain use. Floods larger than the Standard Project Flood are possible but the combination of factors necessary to produce such large floods would be extremely rare.

Hazards of Large Floods

The extent of damage caused by any flood depends on the topography of the area flooded, depth and duration of flooding, velocity of flow, rate of rise, and developments in the flood plain. An Intermediate Regional or Standard Project Flood on the Talkeetna and Susitna Rivers or on the Talkeetna River, itself, will result in inundation of residential and commercial areas in the village of Talkeetna. The same flood situation on the Susitna River alone would result in only the lower end of

the village, adjacent to the Susitna, being flooded. Deep floodwater, flowing at high velocity and carrying floating debris, will create conditions hazardous to persons and vehicles attempting to cross flooded areas. In general, floodwater 3 or more feet deep and flowing at a velocity of 3 or more feet per second could easily sweep an adult person off his feet, thus creating definite danger of injury or drowning.

Flooded Areas and Flood Damages - The areas in the village of Talkeetna that are subject to flooding by the Intermediate Regional and Standard Project Floods are shown on Plates 2 and 3. The actual limits of these overflow areas may vary somewhat from those shown on the maps because the 50 foot contour interval and scale of the maps do not permit precise plotting of the flooded area boundaries. As may be seen from these plates, floodflows from the Susitna and Talkeetna Rivers cover essentially all of the village. The highest stages of flooding throughout the study area occur when the floodwaters from the Talkeetna meet with the high stages of the Susitna River. Areas that will be flooded by the Intermediate Regional or Standard Project Floods include commercial and residential sections along with the associated roads and private utilities. Considerable damage to these facilities would occur during an Intermediate Regional Flood. The majority of homes in Talkeetna would be damaged by this flood. Heavily laden floodwaters would deposit their silt load throughout the village due to the lower velocities of overbank flow in this area. Utilities and transportation facilities would be damaged in addition to an interruption of communications. Most of the water wells are not completely sealed, therefore the flooding and subsequent

pollution of the wells would create a serious health hazard. Both airfields would be damaged and their use limited. Evacuation of people from the village would not be a major problem though, due to the fact that highway access to Talkeetna would not be affected. Floodwaters will flow over the highway and railroad just south of Talkeetna, closing access into the community and disrupting rail traffic between Anchorage and Fairbanks.

Damage would be even more severe during a Standard Project Flood due to the wider extent and greater depths of flooding, higher velocity flow and longer duration of flooding. Plates 4, 5 and 6 show water surface profiles of the IRF and SPF. Depth of flow in the channel can be estimated from these illustrations. Typical cross sections of the flood plain at selected locations, together with the water surface elevation and extent of the IRF and SPF, are shown on plates 7 and 8.

Obstructions - During floods, debris collecting on the bridge and culverts could decrease their carrying capacity and cause greater water depths (backwater effect) upstream of these structures. Since the occurrence and amount of debris are indeterminate factors, only the physical characteristic of the structure were considered in preparing profiles of the Intermediate Regional and Standard Project Floods. Similarly, the maps of flooded areas show the backwater effect of the bridge but do not reflect the increased water surface elevation that could be caused by debris collecting against the structure. The bridge is high enough not to be inundated by floodflows.

However, even without considering an accumulation of debris on the structure, it still causes a substantial backwater effect. This backwater causes a considerable portion of the area east of the Alaska Railroad to be inundated by water during major floods which approach the IRF in magnitude. With the exception of The Federal Aviation Administration (FAA) facilities, there is, at present, a minimum of development in this area. Damage to the FAA facilities would be relatively minor considering the first floor elevations of these structures. Water will flow over the railroad embankment and down into the village. The floodwaters will also flow over the railroad and highway just south of the village. Depths and quantity of flow cannot be accurately determined, although both are anticipated to be minor. Overall depths of flooding east of the railroad line will range up to 6 feet with the deepest area adjacent to the railroad embankment south of the FAA airfield.

Velocities of Flow - Water velocities during floods depend largely on the size and shape of the cross sections, conditions of the stream and the bed slope, all of which vary on different rivers and at different locations on the same river. During the Intermediate Regional and Standard Project Floods, average velocities of main channel flow would range from 5 to 7 feet per second on the Talkeetna River except at the railroad bridge where they would range from 14 to 17 feet per second. Water flowing above 8 feet per second is capable of causing severe erosion to streambanks and transporting large objects. Overbank flow in the Talkeetna area would average 1 to 2.5 feet per

second. At these velocities, deposits of silt and other debris can be expected.

Rates of Rise and Duration of Flooding - Floods on the Talkeetna and Susitna Rivers generally have a gradual rise until the ground becomes saturated, then they experience a constant, rapid rise of one to three days duration until the peak is reached. Generally, the duration of the extremely high flows does not exceed one or two days and then the flood waters drop quickly. For the Intermediate Regional and Standard Project Floods, Table 4 gives the maximum rates of rise, height of rise (from critical stage level to maximum floodflow level), time of rise (time period corresponding to height of rise), and duration of critical stage (period of time flooding is above critical stage level).

TABLE 4
RATES OF RISE AND DURATION
(Talkeetna River at Alaska Railroad Bridge)

FLOOD	Maximum Rate of Rise ft/hr	Height of Rise ft	Time of Rise hrs	Duration of Critical Stage hrs
Intermediate Regional Flood	.7	8.3	19	60
Standard Project Flood	.8	10.9	26	82

Photographs, Future Flood Heights - The levels that the Intermediate Regional and Standard Project Floods are expected to reach at various locations in the village of Talkeetna are indicated on the following photographs.



FUTURE FLOOD HEIGHTS AT THE ROADHOUSE ON THE MAIN STREET OF TALKEETNA
FIGURE 7



FUTURE FLOOD HEIGHTS AT THE TALKEETNA MOTEL AND RESTAURANT
FIGURE 8

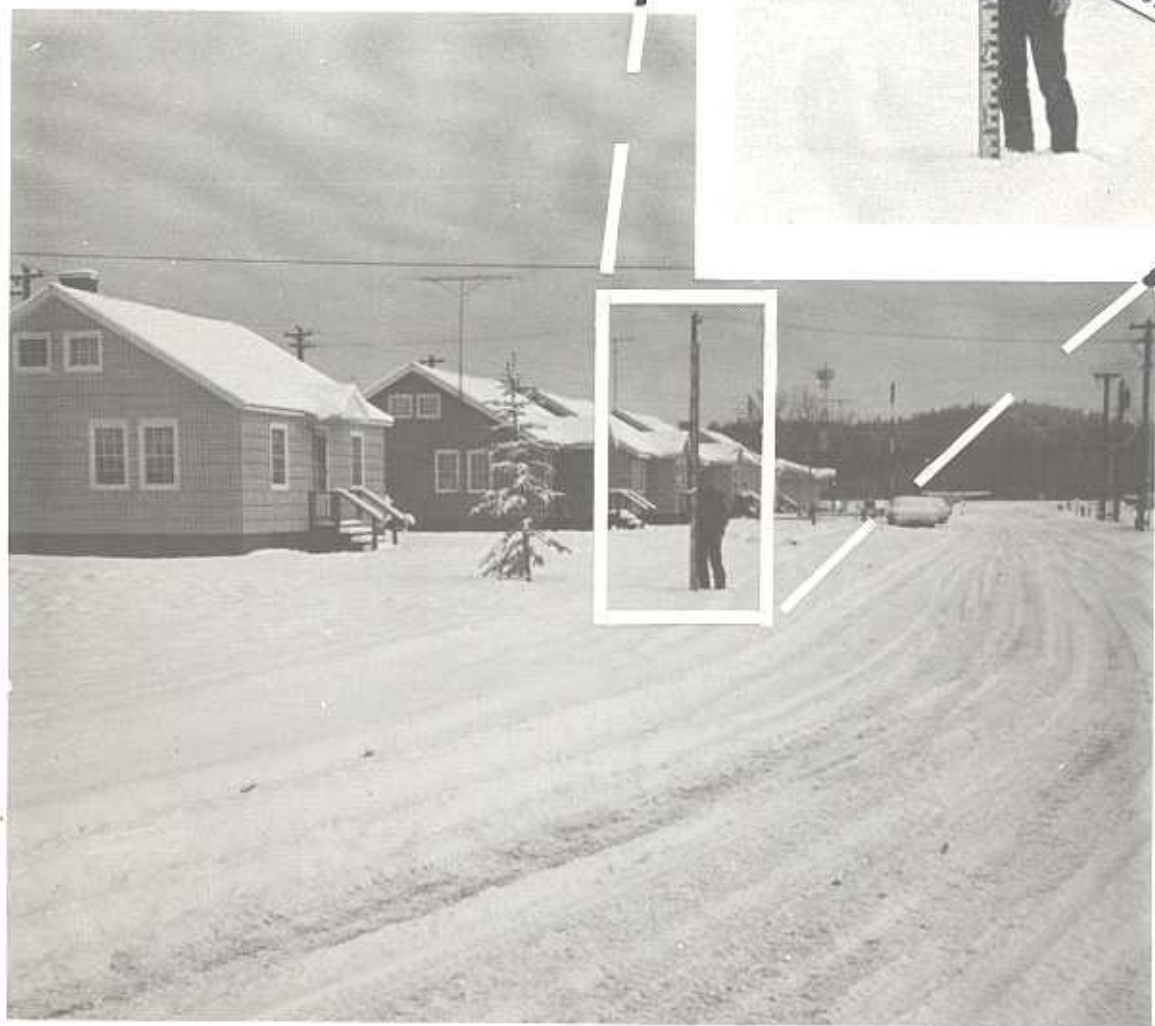


FUTURE FLOOD HEIGHTS AT THE TALKEETNA FSS.
FIGURE 9



FUTURE FLOOD HEIGHTS AT THE B & K TRADING CO. - MAIN STREET, TALKEETNA.
U. S. POST OFFICE TO THE RIGHT
FIGURE 10

FIGURE 11 - FUTURE FLOOD HEIGHTS AT
THE FAA HOUSING SITE



GLOSSARY

Backwater. The resulting high water surface in a given stream due to a downstream obstruction or high stages in an intersecting stream.

Flood. An overflow of lands not normally covered by water that are used or usable by man. Floods have two essential characteristics: The inundation of land is temporary; and the land is adjacent to and inundated by overflow from a river, stream, ocean, lake, or other body of standing water.

Normally a "flood" is considered as any temporary rise in streamflow or stage, but not the ponding of surface water, that results in significant adverse effects in the vicinity. Adverse effects may include damages from overflow of land areas, temporary backwater effects in sewers and local drainage channels, creation of unsanitary conditions or other unfavorable situations by deposition of materials in stream channels during flood recessions, rise of ground water coincident with increased streamflow, and other problems.

Flood Crest. The maximum stage or elevation reached by the waters of a flood at a given location.

Flood Peak. The maximum instantaneous discharge of a flood at a given location. It usually occurs at or near the time of the flood crest.

Flood Plain. The areas adjoining a river, stream, water-course, ocean, lake, or other body of standing water that have been or may be covered by floodwater.

Flood Profile. A graph showing the relationship of water surface elevation to location, the latter generally expressed as distance above mouth for a stream of water flowing in an open channel. It is generally drawn to show surface elevation for the crest of a specific flood, but may be prepared for conditions at a given time or stage.

Flood Stage. The stage or elevation at which overflow of the natural banks of a stream or body of water begins in the reach or area in which the elevation is measured.

Head Loss. The effect of obstructions such as narrow bridge openings or buildings that limit the area through which water must flow, raising the surface of the water upstream from the obstruction.

Hydrograph. A graph showing flow values against time at a given point, usually measured in cubic feet per second. The area under the curve indicates total volume of flow.

Intermediate Regional Flood. A flood having an average frequency of occurrence in the order of once in 100 years although the flood may occur in any year. It is based on statistical analyses of streamflow records available for the watershed and analyses of rainfall and runoff characteristics in the general region of the watershed.

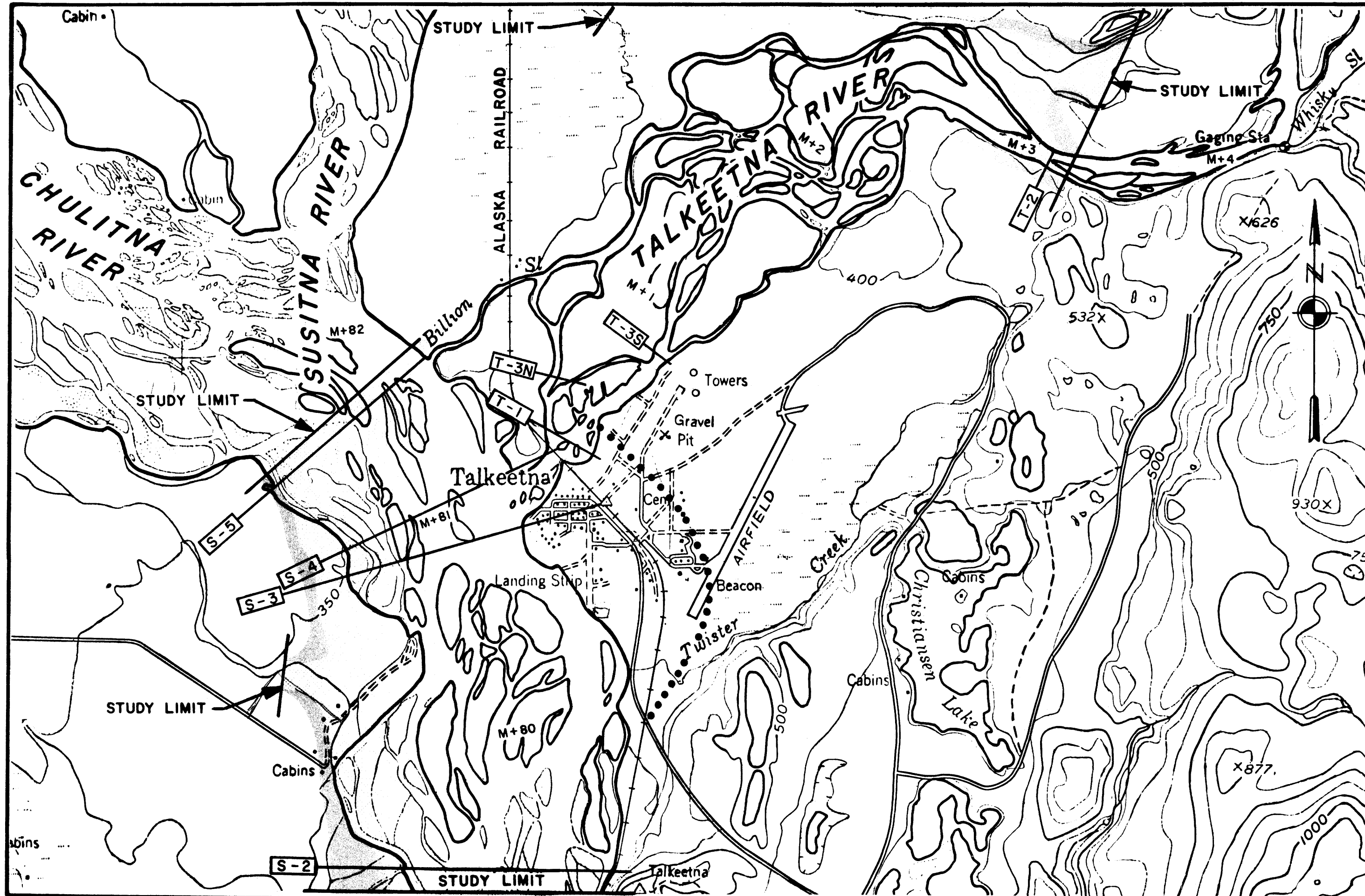
Left Bank. The bank on the left side of a river, stream or watercourse, looking downstream.

Right Bank. The bank on the right side of a river, stream, or watercourse, looking downstream.

Standard Project Flood. The flood that may be expected from the most severe combination of meteorological and

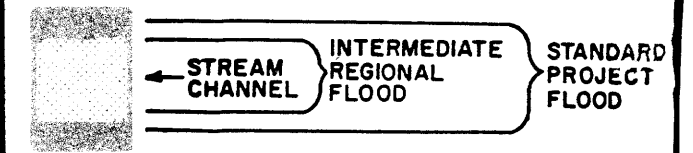
hydrological conditions that are considered reasonably characteristic of the geographical area in which the drainage basin is located, excluding extremely rare combinations. Peak discharges for these floods are generally about 40-60 percent of the Probable Maximum Floods for the same basins. As used by the Corps of Engineers, Standard Project Floods are intended as practicable expressions of the degree of protection that should be sought in the design of flood control works, the failure of which might be disastrous.

Underclearance Elevation. The lowest point of a bridge or other structure over or across a river, stream, or watercourse that limits the opening through which water flows. This is referred to as "low steel" in some regions.



LEGEND

OVERFLOW LIMITS



M+4 MILES ABOVE MOUTH

T-3 CROSS SECTION

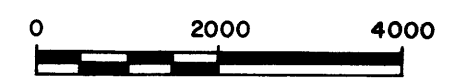
250 GROUND ELEVATION IN FEET SEA LEVEL DATUM

••••• LOCATION OF SUPPLEMENTAL PROFILE

NOTES

1. MAP BASED ON U.S.G.S. QUADRANGLE SHEET TALKEETNA B-1. MINOR ADDITIONS AND ADJUSTMENTS MADE BY CORPS OF ENGINEERS.
2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.
4. MINIMUM CONTOUR INTERVAL IS 50 FT.

SCALE IN FEET



1" = 2100'

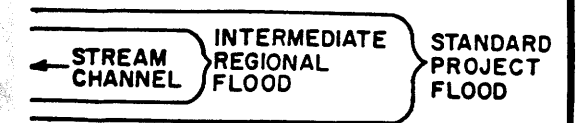
**FLOODED AREA MAP
FLOOD PLAIN INFORMATION
TALKEETNA, ALASKA**

PREPARED BY THE
DEPARTMENT OF THE ARMY
ALASKA DISTRICT, CORPS OF ENGINEERS
ANCHORAGE, ALASKA

JUNE 1972

LEGEND

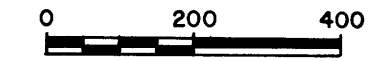
OVERFLOW LIMITS



NOTES

- 1. MAP BASED ON B.L.M. AERIAL PHOTOGRAPHS FLOWN AT 1500' IN 1971.
- 2. LIMITS OF OVERFLOW SHOWN MAY VARY FROM ACTUAL LOCATION ON GROUND AS EXPLAINED IN THE REPORT.
- 3. AREAS OUTSIDE THE FLOOD PLAIN MAY BE SUBJECT TO FLOODING FROM LOCAL RUNOFF.

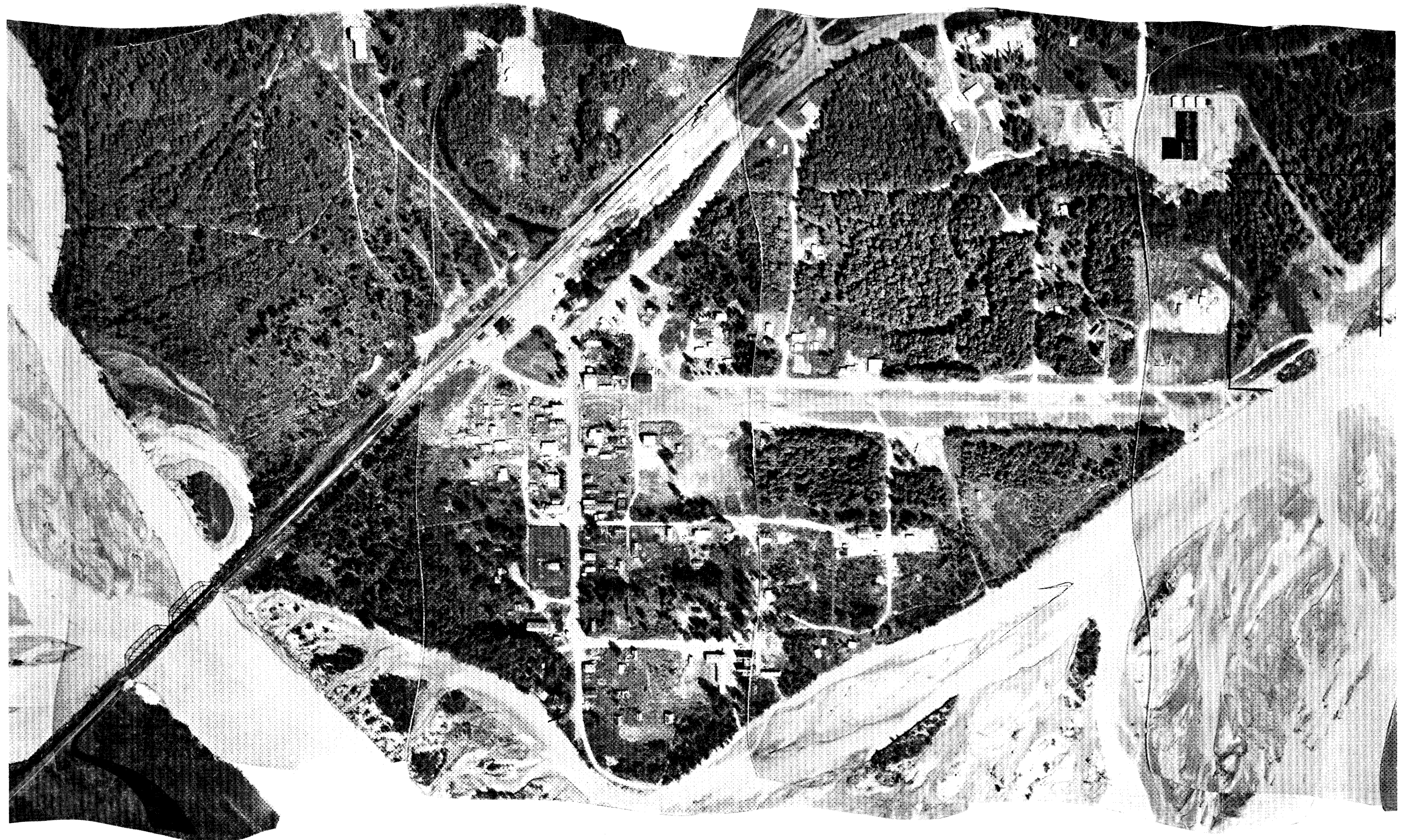
APPROXIMATE SCALE IN FEET

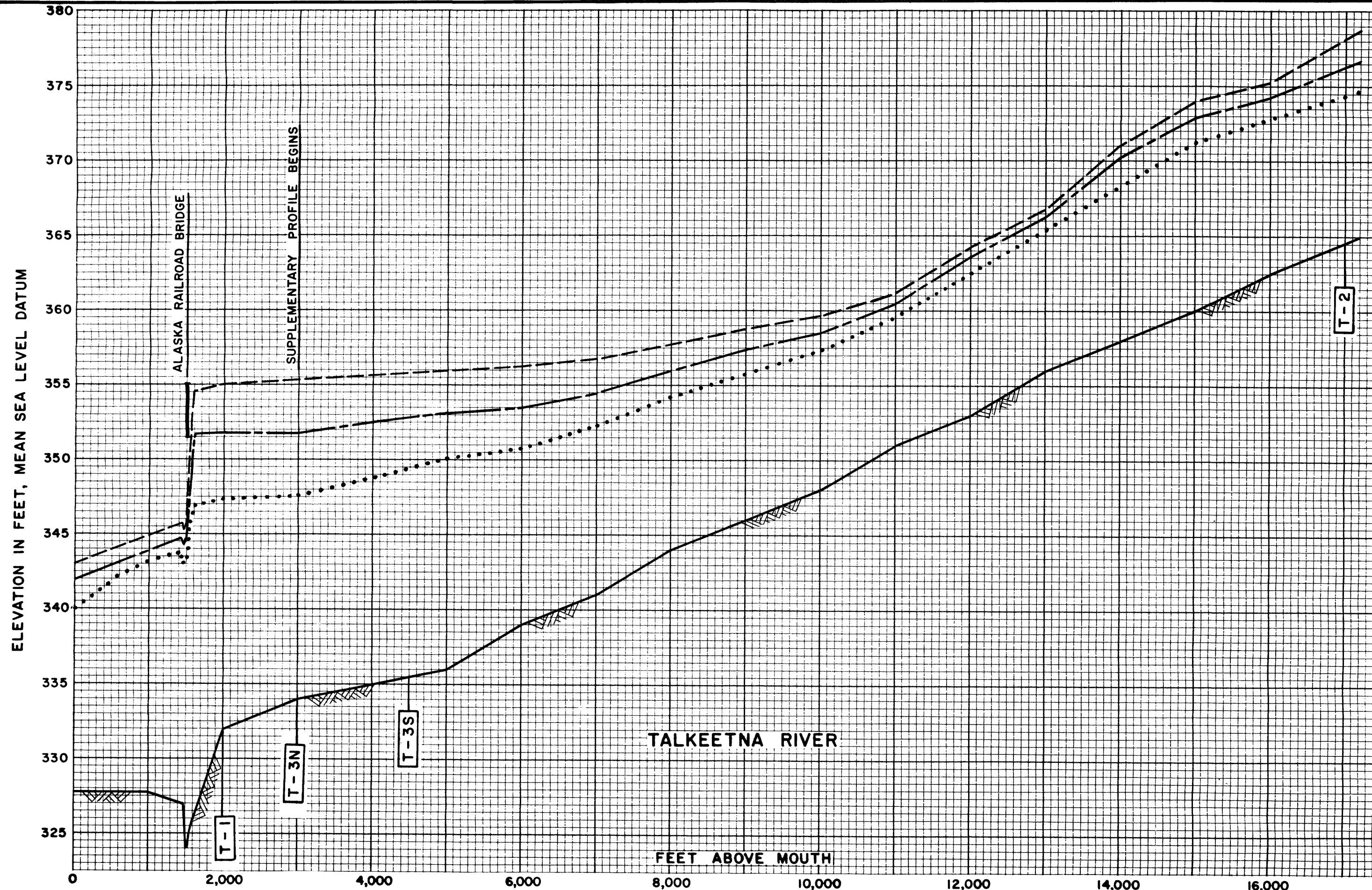


**FLOODED AREA MAP
FLOOD PLAIN INFORMATION
TALKEETNA, ALASKA**

PREPARED BY THE
DEPARTMENT OF THE ARMY
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ANCHORAGE, ALASKA

JUNE 1972

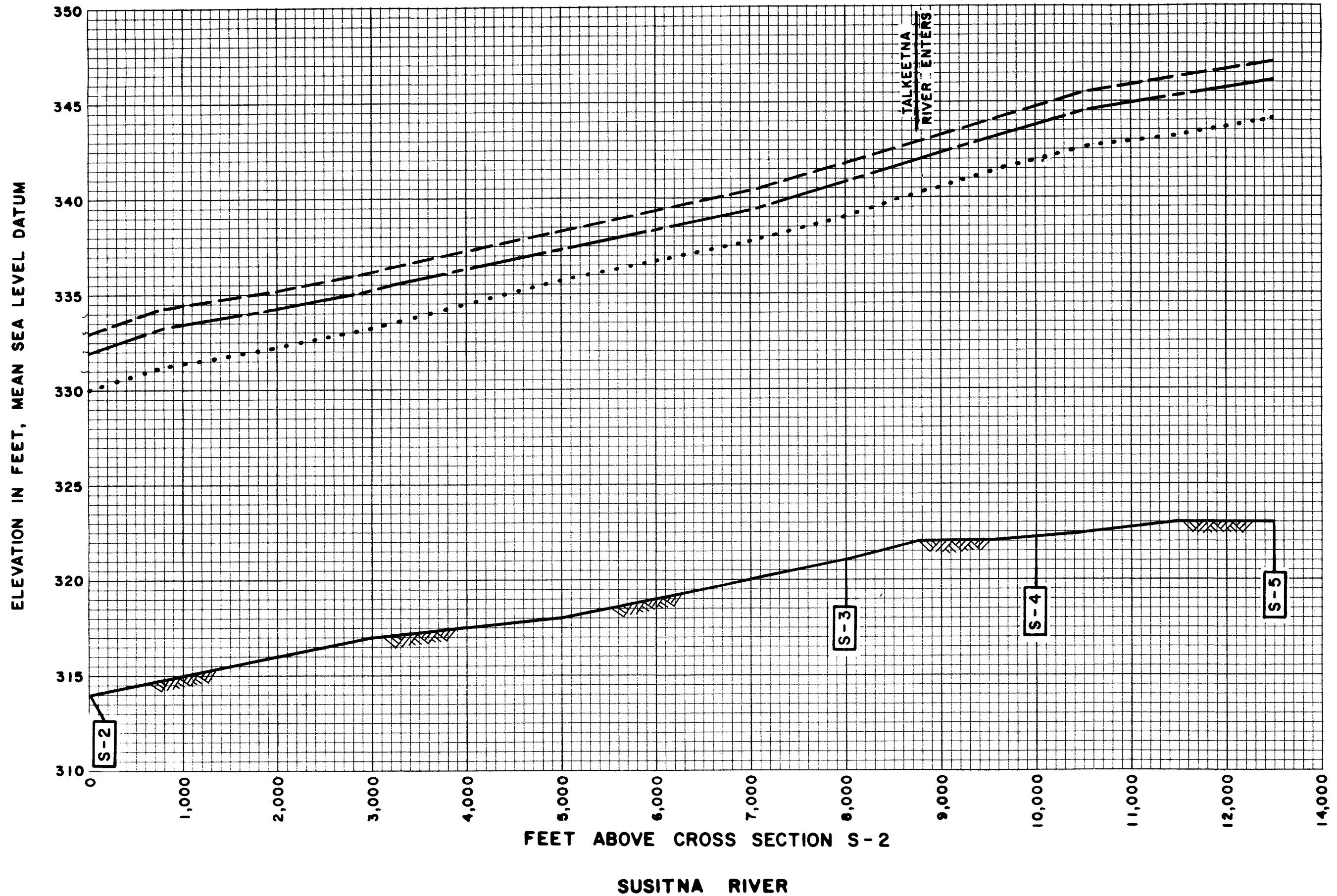




- LEGEND**
- STANDARD PROJECT FLOOD
 - - - INTERMEDIATE REGIONAL FLOOD
 - ... AUGUST 1971 FLOOD
 - ▨ STREAM BED
 - ☐ S-2 CROSS SECTION

DEPARTMENT OF THE ARMY
 ALASKA DISTRICT, CORPS OF ENGINEERS
 ANCHORAGE, ALASKA

FLOOD PLAIN INFORMATION
 TALKEETNA, ALASKA
 HIGH WATER PROFILES
 TALKEETNA RIVER
 JUNE 1972



- LEGEND**
- STANDARD PROJECT FLOOD
 - - - INTERMEDIATE REGIONAL FLOOD
 - ... AUGUST 1971 FLOOD
 - ▨ STREAM BED
 - ☐ S-2 CROSS SECTION

DEPARTMENT OF THE ARMY
 ALASKA DISTRICT, CORPS OF ENGINEERS
 ANCHORAGE, ALASKA

FLOOD PLAIN INFORMATION
 TALKEETNA, ALASKA

HIGH WATER PROFILES
 SUSITNA RIVER
 JUNE 1972

360

355

350

345

340

335

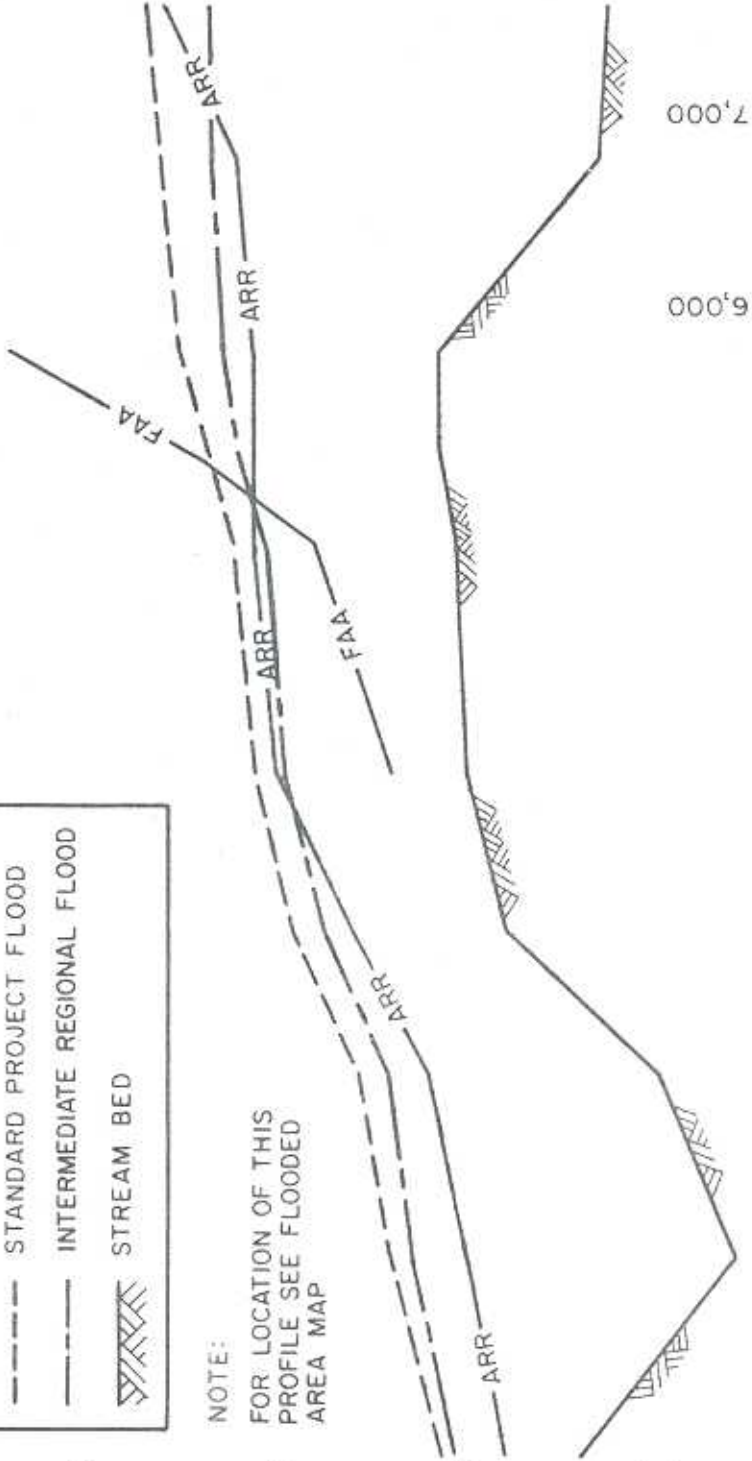
LEGEND

- STANDARD PROJECT FLOOD
- - - INTERMEDIATE REGIONAL FLOOD
- ▲▲▲ STREAM BED

ELEVATION IN FEET (MSL)

NOTE:

FOR LOCATION OF THIS
PROFILE SEE FLOODED
AREA MAP



8,000

7,000

6,000

5,000

4,000

3,000

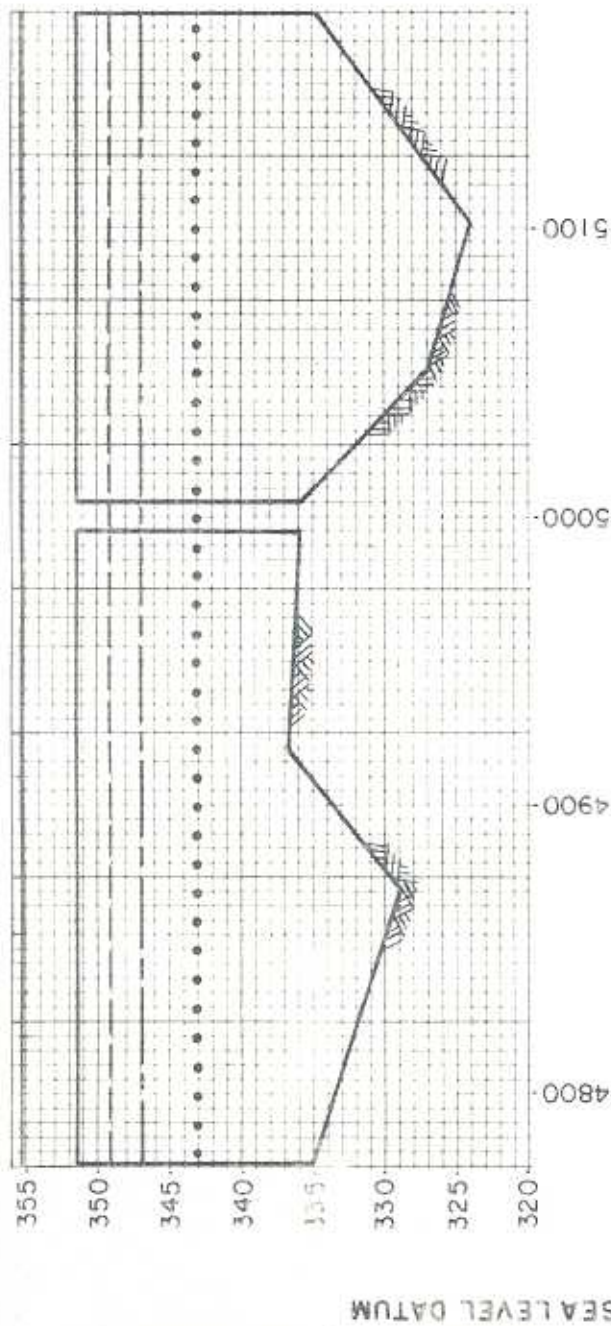
2,000

1,000

DISTANCE IN FEET

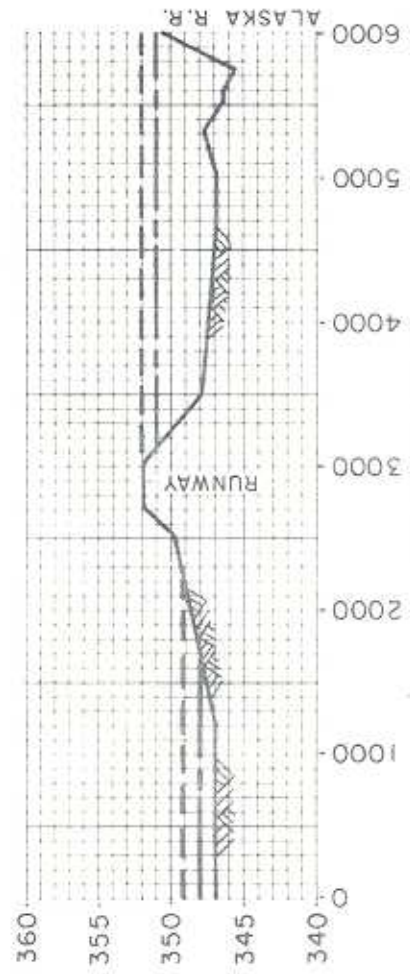
DEPARTMENT OF THE ARMY
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ANCHORAGE, ALASKA

FLOOD PLAIN INFORMATION
TALKEETNA, ALASKA
SUPPLEMENTAL HIGH WATER PROFILE
TALKEETNA RIVER OVERFLOW



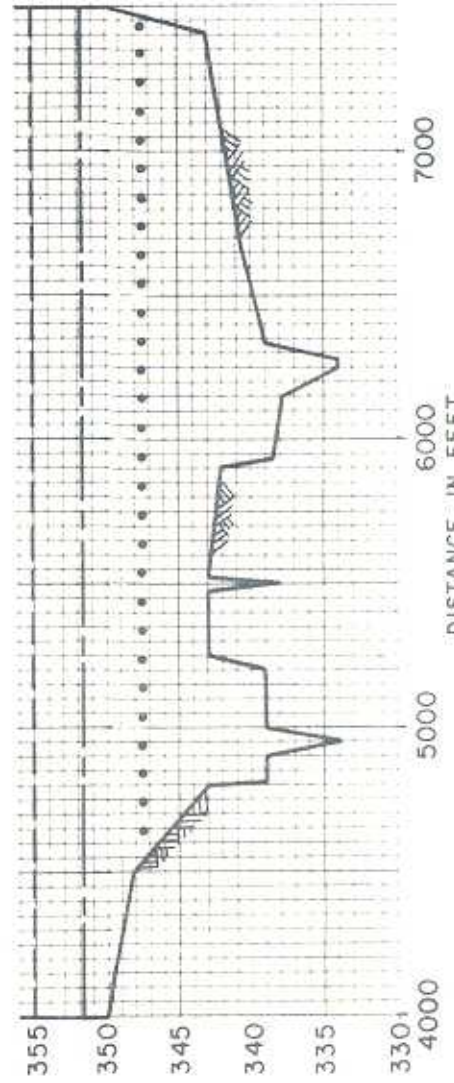
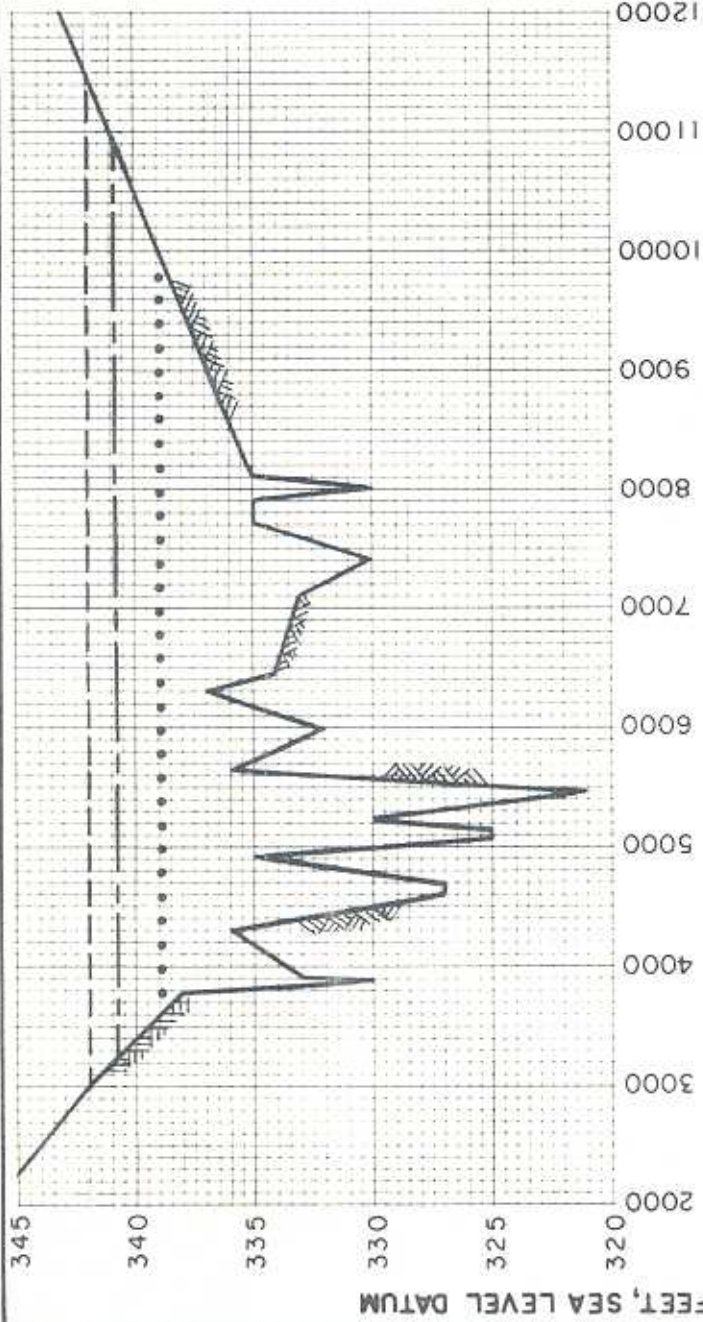
NOTE:

Sections taken looking downstream.
Additional sections not shown but available at District Office.



EAST OF ALASKA R.R. BETWEEN TALKEETNA RIVER & F.A.A.

DEPARTMENT OF THE ARMY
ALASKA DISTRICT, CORPS OF ENGINEERS
ANCHORAGE, ALASKA
FLOOD PLAIN INFORMATION
TALKEETNA, ALASKA
SELECTED CROSS SECTIONS
TALKEETNA RIVER
JUN. 1972



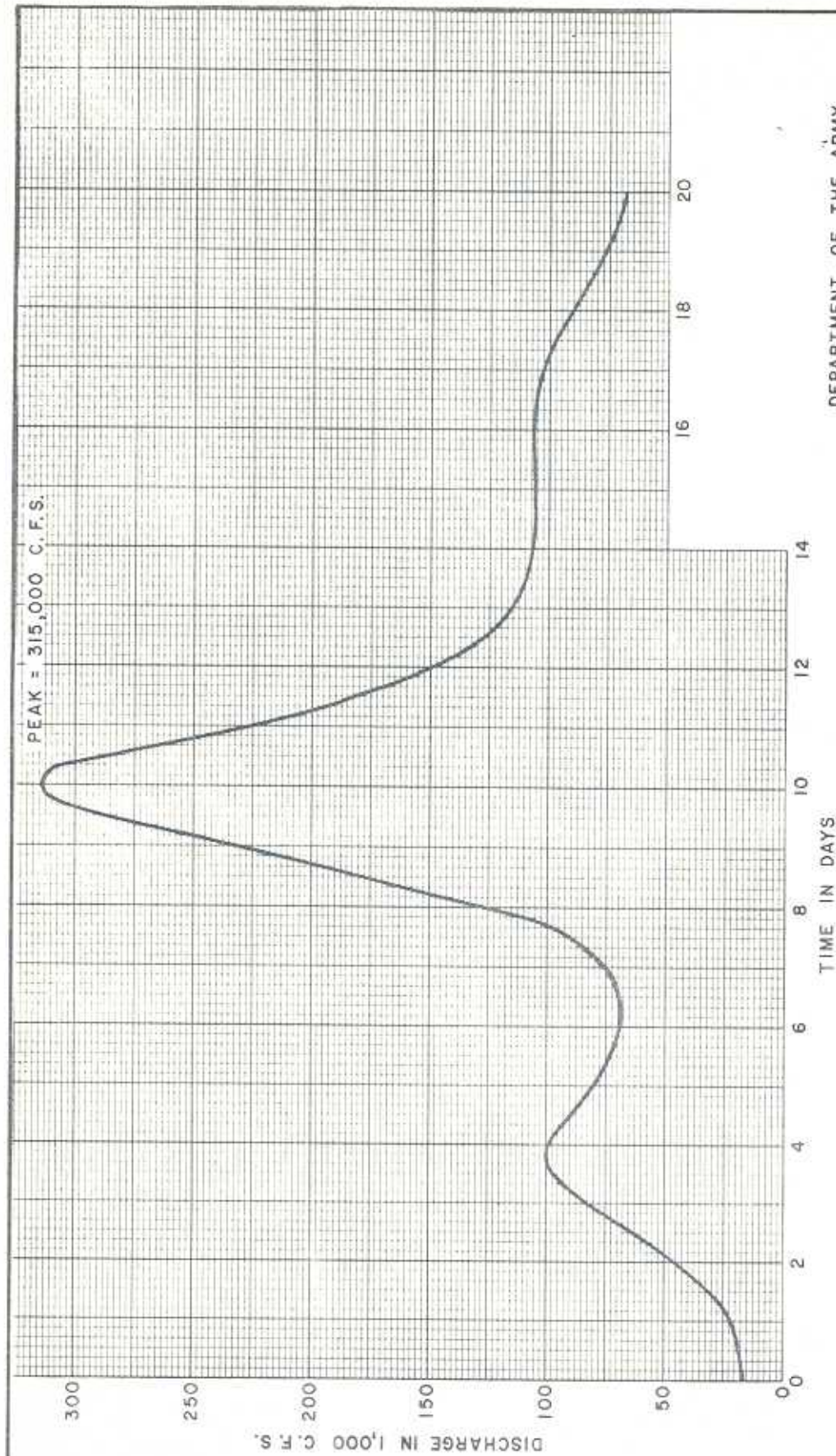
LEGEND

- Standard Project Flood
- - - Intermediate Regional Flood
- August 1971 Flood

NOTE:

Sections taken looking downstream.
 Additional sections not shown but available at District Office.

DEPARTMENT OF THE ARMY
 ALASKA DISTRICT, CORPS OF ENGINEERS
 ANCHORAGE, ALASKA
FLOOD PLAIN INFORMATION
 TALKEETNA, ALASKA
 SELECTED CROSS SECTIONS
 TALKEETNA & SUSITNA RIVERS
 JUNE 1972



DEPARTMENT OF THE ARMY
 ALASKA DISTRICT, CORPS OF ENGINEERS
 ANCHORAGE, ALASKA

FLOOD PLAIN INFORMATION
 TALKEETNA, ALASKA
 SUSITNA RIVER AT TALKEETNA
 STANDARD PROJECT FLOOD
 HYDROGRAPH

JUNE 1972

