ALASKA POWER AUTHORITY

SUSITNA HYDROELECTRIC PROJECT

TASK 7

ENVIRONMENTAL STUDIES

LAND USE ANALYSIS

NAVIGATIONAL USE

April 1982

by

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SUMMARY

This report contains information on past, present, and anticipated navigational use of the Susitna River drainage below Devil Canyon. Information collected can be utilized to conduct an assessment of the impacts of the proposed Susitna hydroelectric project on such navigation when the Alaska Department of Natural Resources (DNR) completes its hydrological investigation.

There is a history of navigational use of the Susitna which dates to 1834. Present areas of concentration of navigational use are on the Talkeetna River; Willow Creek; the Yentna River and its tributaries, the Skwentna and Kahiltna Rivers; the Deshka River (Kroto Creek); Alexander Creek; and areas on the Susitna near boat launches at Talkeetna, Sunshine, Kashwitna Landing, and Willow Creek. A variety of craft utilize the river for navigation, including rafts, canoes, airboats, and riverboats generally 14 to 27 feet in length with inboard and outboard motors having either prop or jet units. In addition, float planes are utilized in many areas throughout the Susitna drainage.

Presently, there is considerable navigational use on the Susitna and its tributaries. Population increases in the Railbelt area, coupled with settlement and development of 56 DNR land disposal areas (plus future disposal areas) in the drainage of the Susitna and its tributaries below Devil Canyon, will result in increased navigational use in the future.

The extent and nature of impacts of the Susitna hydroelectric project on navigational use will depend on the effects of reduced summer flows and stage in certain channels and sloughs on the Susitna. Potential impacts include effects on navigational use of the mainstem and, in addition, on uses in tributary streams dependent upon access via the Susitna.

1 - INTRODUCTION

1.1 Purpose

A preliminary assessment of the effects of post-project streamflows from the proposed Susitna hydroelectric project on downstream river navigation and access to state land disposal sites is being conducted under a cooperative agreement between the Alaska Power Authority and its contractors and the Alaska Department of Natural Resources (DNR). This report summarizes historic and present navigational uses below Devil Canyon, and has been prepared as background for the evaluation of project-induced changes in streamflow on navigation. This report was prepared by Terrestrial Environmental Specialists, Inc. (TES) for Acres American, Inc. under a modification to the scope of work of the Susitna Hydroelectric Project Phase I Environmental Studies (Task 7).

1.2 Background

The Susitna River has been designated "navigable" by the Bureau of Land Management, U.S. Department of Interior (BLM), from the mouth to approximately 7.5 miles upstream of Gold Creek (the eastern border of the Indian River Remote Parcel). Navigational use is known to occur to Portage Creek. There has been a high level of concern expressed by federal and state agency personnel concerning the effects of post-project streamflows on river stage due to operation of the proposed Susitna hydroelectric project, and the subsequent impacts on navigational use of the river for recreation, commerce, and land access. Such concerns have been documented via Susitna Hydro Steering Committee correspondence to the Alaska Power Authority during 1980. These concerns were again expressed in the reports on instream flow aspects (Dwight and Trihey 1981, Trihey 1981). In response to these concerns, Terrestrial Environmental Specialists, Inc. (TES) conducted a preliminary reconnaissance of issues related to navigational use of the

Susitna River in early 1981. Several of those expressing such concerns were contacted, including some who have experience using planes and boats on the river. TES also reviewed preliminary hydrological data on pre- and post-project flows, and obtained and reviewed documents describing historic and present navigational use of the river.

A definitive description of the effects of post-project streamflows and stage on navigational use and shoreline access could not be made based upon existing data. Much of the Susitna River and many of its principal tributaries have been used for navigation, float plane landing sites, and access to shoreline areas and major tributary streams. Additional data collection and investigation of these issues were therefore warranted.

In response to this need, a memorandum of understanding pertaining to cooperative investigations of the proposed Susitna hydroelectric project was signed by the Alaska Power Authority and the Alaska Department of Natural Resources in September 1981. A work plan was established, coordinated through E. Woody Trihey, to investigate the effects of the proposed Susitna hydroelectric project on navigational uses and access to state lands. The Alaska Department of Natural Resources, R&M Consultants, and TES are undertaking this work for Acres American, Inc. and the Alaska Power Authority.

1.3 Objectives

The objectives of the work plan are for DNR, R&M, and TES to: 1) identify past, present, and anticipated use of the Susitna River between Devil Canyon and Cook Inlet by boats and float planes and to provide a preliminary assessment of the effects of pre- and post-project flows on these uses, and 2) locate present and proposed state land disposal sites within the Susitna basin and determine the effects of pre- and post-project streamflows on access to these sites by boat or float plane.

This report summarizes baseline information on past and present boat and float plane use and state land disposal areas. An impact assessment can be performed when additional hydrological data become available.

1.4 Approach

Information was obtained on past, present, and anticipated navigational uses of the Susitna River below Devil Canyon, including estimated numbers of users, types of craft, seasonal utilization, and areas of concentration. The principal navigation routes in the lower river are identified. Because potential effects on the Susitna River mainstem may cause consequent impacts on its tributaries, such as affecting navigational access to them, TES also assembled information about boating activity in the principal tributaries to determine extent of use in those areas. Data were obtained primarily from existing documents and interviews. Much of the discussion of historical use is based upon the written record compiled by BLM to establish a case file on navigability. Other sources of information were also utilized as cited. In addition, TES observed the lower Susitna River and its tributaries to augment the baseline description of river access and use. The investigation addressed use of the river by float planes as well as boats. It does not include details on current winter use by dogsleds and snowmobiles since reliable information on these uses and post-project ice cover could not be compiled and evaluated within the time frame of this scope of work. Winter use is discussed in general terms.

TES also prepared maps of existing state land disposal sites and located future disposal areas from public information and in consultation with DNR's Southcentral District Office. This information will be reviewed by DNR's Water Management Section to determine which, if any, of these disposal sites are adjacent to river reaches for the navigational use investigation, and whether additional data should be obtained and analyzed.

2 - AGENCY CONCERNS

Agency concerns were initially documented in the draft and final reports pertaining to instream flow aspects of the proposed Susitna hydroelectric project (Dwight and Trihey 1981). For the most part, these involved concerns regarding access to the river and navigation on the river.

TES contacted those who had identified access or navigability on the river as concerns, as well as other state and federal agency personnel, to obtain additional information. Those contacted generally reiterated previous statements. The Alaska Department of Fish and Game's (ADF&G) and DNR's concerns included the effects of the project on navigation on the lower river and access to land disposal parcels (Harle pers. comm., Trent pers. comm.). A more general concern mentioned was for access for recreational purposes such as hunting and fishing, and also mining (Harle pers. comm.). It was reported that there appears to be more opportunity for employment in remote areas with lands becoming available, and access to these remote jobs could become an issue (Mielke pers. comm.). ADF&G stated that with increasing boat traffic on the Susitna and its tributaries, any project effects resulting in reduced flows and stage would affect more people (Trent pers. comm.).

Evidence of increased boating use was also reported by the operator at the Kashwitna Landing boat launch (also referred to as Susitna Landing), who stated that there has been a ten-fold increase in the number of boats launched in the past five years (Bloomfield pers. comm.). Boating activity has increased sufficiently for DNR's Division of Parks to consider installing additional launches on the lower river (Wiles pers. comm.).

3 - NAVIGATIONAL USE

3.1 Historic Navigational Use

From its delta region on Cook Inlet upriver to Devil Canyon, the Susitna River is considered a major transportation corridor between the coast and interior areas of southcentral Alaska. Native residents and explorers built their trails paralleling the lower Susitna. The Alaska Railroad, from a point near Willow and north to Gold Creek, parallels the course of the lower Susitna. The Susitna provides access for hunters, residents, and others to inland waterways in the drainage area. This section summarizes recorded historical use of the rivers and streams in the lower Susitna drainage; this information is tabulated in Appendix A.

The first recorded ascent of the Susitna River was in 1834 by the Russian explorer Vasili Malakoff. He was forced to drag, or "line", his boat up river. He was the first explorer to obtain geographic knowledge about the area. The next recorded incident took place in 1894 when J. M. Johnston and Edward Andrews ascended the Susitna with sleds (BLM 1981). One year later, one hundred prospecting parties entered the Susitna River. Two prospectors reached as far inland as Chulitna Fork. In 1896, William Dickey and his partner Allen Monks made the first well-documented trip up the Susitna using an open sea dory. Along the way they built two boats, both being 25 feet long, 18 inches wide and flared across the top to 40 inches (Cole 1979). On one occasion they moved up to Talkeetna trading station, then west up the Chulitna River. In the same year, Dickey, a prominent mining man in Alaska, ascended the Susitna on another prospecting trip. This time the journey reached the mouth of Portage Creek. Initials carved in the rock, including those of W. A. Dickey, are evident at this location. The inscription, however, bears the inexplicable date of 1897.

Gold was discovered in the Susitna River country in 1896. By the summer of 1897, one thousand prospectors had moved up the Susitna (BLM 1981). Captain Andrews and his party built a large dory and travelled

up the Susitna in 1896, but were forced to use dogsleds upon encountering ice. 1897 marked the first recorded trip to the Susitna's headwaters. Nine men made the trip using a large dory of whipsawed lumber in summer and sleds in winter. In the same year, a mining party travelled up the Yentna River.

W. G. Jack acted as guide to a U.S. Geological Survey (USGS) survey party which ascended the Susitna in 1898 by towing small boats upstream. "Jack concluded that the river could be navigated to the mouth of Indian River by a steamer drawing not more than 2 feet of water" (Cole 1979). Reports indicate a good deal of USGS travelling in 1898. G. H. Eldridge and Robert Muldrow ascended the Susitna from Cook Inlet to the mouth of Indian River. Six members of USGS canoed up the Susitna and its tributaries, the Yentna and Skwentna Rivers. One expedition moved overland from the Susitna up to the Tanana River. Sgt. Yanert of the U.S. Army and two others moved up to the Chulitna from near the mouth of Indian River, over to Broad Pass and the Nenana River. Also in 1898, O. G. Herning and his crew poled their way up the Susitna as far as Willow Creek.

In the fall of 1899 the ocean steamer Excelsior, piloted by Copper River Joe, moved up the Susitna to pick up equipment from a surveying party. About the same time an Alaska Commercial Company sloop moved upriver to Susitna Station. The Herron expedition moved from the head of the Yentna River to the mouth of the Tanana River. Lt. Herron (U.S. Army) and his party travelled a total of one thousand miles.

In 1902, prospectors in search of gold used the frozen rivers as highways and floated their boats in spring. At the same time, explorations for a proposed rail line were conducted along the Chulitna River. An ornithological trip led by Wilfred Osgood reached Bristol Bay via the Chulitna, Mulchatna, and Nushagak rivers in 1902.

Five prospectors discovered gold on the Susitna River in 1903 (BLM 1981). Robert Dunn, a geologist and explorer, followed the western tributaries of the Susitna to eventually reach the base of Mt. McKinley.

After an unsuccessful attempt to climb the mountain he rafted down the Chulitna using pike poles. Records also suggest Dunn and a companion reached the Kichatna River by boat. Also in 1903 Dr. Frederick Cook's party arrived at the base of Mt. McKinley using pack train and boats on the Susitna and Yentna Rivers. After the first failure to climb Mt. McKinley, the party descended the west fork of the Chulitna River using small, wooden two-man rafts.

Sometime during the early 1900's, two Englishwomen and two male companions took part in a hunting trip travelling up the Kuskokwim River to the divide between this drainage and the Susitna's. Kayaks were used for the rendezvous with the party's sailing schooner (the "Lily") which had been anchored at Cook Inlet.

Considerable prospecting was done in the general area of the Susitna River for the next several years. Alexander MacDonald did his prospecting in 1904 at Osborne Creek near the Deshka River (Kroto Creek). Documents indicate that two more prospectors, a Mr. Coffee and Mr. Miller, worked up the Susitna in 1905. The first recorded use of the Tokositna River by white man occurred in 1905. Miners working in the Home Lake area used the river. Dr. Cook made his second attempt at climbing McKinley in 1906, and he explored the rivers in the area in the process.

Two recorded trips occurred up the Susitna in 1907. Woolsey's two riverboats moved up the river as did a gas-powered scow owned by a Joe Anderson. Steamboats were operated on the Susitna the following year.

In 1908 J. E. Spurr and topographer W. S. Post entered the Kuskokwim Valley by canoeing up the Yentna and Skwentna Rivers. In 1910 Herschel C. Parker and Belmore Browne approached Mt. McKinley from the Susitna and Chulitna rivers.

Mining developed along the Talkeetna River in 1911. Two other events are recorded in the same year. The "Susitna", a river steamer, moved up the Susitna from Cook Inlet. S. R. Capps and a companion travelled by launch up the Yentna River. In 1912 supplies were sledded up the Susitna for the Parker-Browne expedition. Two years later in 1914, a soils survey crew left Susitna Station aboard a sternwheeler of the Alaska Engineering Commission. On board they carried an 18 foot rowboat which they used to descend the Susitna from a point three miles below Indian River. The Susitna was described as being navigable for light-draft, strong power boats as far as Indian River, 100 miles upriver from the mouth of the Susitna. It is not clear whether the same team or another survey crew ascended the Yentna by powerboat to a point 15 miles above McDougall near the confluence with the Skwentna River (BLM 1981).

During the late 1910's and early '20's, Alaska Engineering Commission forces used the Indian River for transporting supplies and men using tunnel (canvas covered) boats to points along the Alaska Railroad. In 1919 mushers crossed the Susitna near the mouth of the Indian River by using a ferryboat. During the early '20's, English sportsmen were led in an expedition guided by Andy Simons. They followed the course of the Susitna, Yentna, Skwentna, and Happy rivers.

No significant use of area waters is recorded for the next few years until 1930 when George Thompson and his brother drowned on the Yentna when their small boat capsized. They had spent the previous winter trapping upstream. In August of 1930, several men travelled by motorboat upriver from the mouth of the Yentna to McDougall (BLM 1981).

In 1947 the Army Corps of Engineers reported that the Chulitna River was navigable by small outboard motor-powered boats as far as Honolulu Creek (BLM 1980). In 1950, a Bureau of Reclamation survey of the upper Susitna used two aluminum boats, each weighing approximately 156 pounds, 14 feet long, with 56-inch beams and 20 inches deep with a

10 horsepower motor (Cole 1979). During the summer of 1955 a crew of eight, whose job was to chart the navigable watersheds in the Susitna drainage area, had hopes of using a 50-foot long boat with a decked-over bow and two large engines. Unfortunately, the boat was destroyed on rocks.

3.2 Recent Past and Present Navigational Use

This section summarizes more recent and present use of rivers and streams in the Susitna region, information for which specific dates and names are not always available. The following is a discussion of generally acknowledged use patterns.

(a) Susitna River

Prior to the completion of the Alaska Railroad in the 1920's, the Susitna River served primarily as a highway of commerce into the Susitna Valley. During the construction of the railroad, the Alaska Engineering Commission used gas-powered boats to transport men and materials to construction crews upriver to the area near Talkeetna. Boat traffic declined somewhat after the Railroad was finished, but today the Susitna is important as a means of providing access to its tributaries for recreationists and others traveling to upstream areas. Craft using the Susitna include rubber rafts, kayaks, canoes, shallow-draft riverboats and other small boats. The majority of boaters are private individual recreationists. A few charter operators transport people and supplies to various points in the drainage. Regardless of the purpose or intent of the use, craft used for either commercial or recreational navigation require similar hydrologic conditions (such as water depth). Therefore, the size of vessels that can navigate most portions of the Susitna River system is the same for both purposes.

Below Devil Canyon and upstream of Talkeetna, the Susitna is highly regarded for its wild and scenic river values, and it is used by

rafters and kayakers. The reach in Devil Canyon has world class whitewater status, and is regarded as one of the most difficult for kayaking. Standard craft are unable to navigate Devil Canyon.

Downstream of Devil Canyon to Cook Inlet there is considerable boating use on the Susitna River mainstem. The river is used for fishing, access and transportation to hunting areas, and access to land areas, both adjacent to the Susitna as well as its tributaries. Recreational and other uses are increasing. Dwight and Trihey (1981) reported a fifty percent increase in use of certain salmon streams in the Railbelt in the past three years.

One of the flying services contacted by TES reported that several points on the Susitna are used extensively by boaters or as landing sites for float planes. These include Alexander Slough near the mouth of the Susitna, and areas on the Susitna near the mouths of Alexander Creek, the Deshka River (Kroto Creek), Willow and Little Willow creeks, and the Kashwitna River (Rust pers. comm.). These areas are shown on the maps in Appendix B.

Considerable boating activity is known to take place on the Susitna near the four boat launches at Willow Creek, Kashwitna Landing, Sunshine (Parks Highway) Bridge, and Talkeetna. The launches provide boat access to the Susitna River itself and, via the Susitna, to its tributaries. TES made several site visits to the launches and spoke with many boaters. Most indicated that they used boats to fish in the Susitna or its tributaries during the summer and to gain access to hunting areas in the fall. Indications are that navigational use is increasing. The operator of the Kashwitna Landing launch, at the confluence of the Susitna and Kashwitna Rivers, reported that in 1976 there were 500 boats launched there, and based on the trend at mid-year, estimated that 5000 boats would launch at Kashwitna in 1981. On one Friday during king salmon season, 147 craft launched (Bloomfield pers. comm.).

TES also conducted an overflight of the Susitna and tributary streams to observe boating activity. The flight was conducted on Thursday, September 17, 1981, during moose season to enable observation of a high number of boaters. Each observation was located on a map along with the type of craft and other pertinent information. The maps in Appendix B and table in Appendix C summarize the data collection. Most of the craft observed were riverboats (flat-bottomed with square bow) with a jet-unit outboard motor. Boats with prop motors, airboats, rubber rafts, and canoes were also observed. TES observed 22 boats and one plane on the Susitna River mainstem below Talkeetna.

(b) Tributaries

The Chulitna River is one of the larger waterways in the Susitna drainage, although boat traffic is infrequent on the Chulitna. It does provide a winter route of travel between the Susitna and the Tanana River basins. Mining developments west of the river are served by winter trails from Talkeetna and the Alaska Railroad. Most activities along the Chulitna are related to hunting, fishing, trapping, and recreation.

The Talkeetna River is currently used quite heavily by conventional riverboats and jet boats during the summer. The river is used by area residents for trapping, subsistence, recreation, and mineral development purposes. The drainage areas of the Talkeetna River and the Sheep River (in the upper Talkeetna drainage) have a history of prospecting and mining. In addition, both have been used as access routes by backpackers, horsemen, and riverboaters. The Talkeetna River is navigable by outboard craft with 18 inch shafts to a point about 15 miles north of Talkeetna (BLM 1980). There are two commercial jetboat operators in Talkeetna. Although they will occasionally run up the Susitna to Portage Creek, Mahay's Riverboat Service reports that most of its business involves transportation on the Talkeetna and its tributaries, especially Clear (Chunilna) Creek

(Correra pers. comm.). Mahay's operates jet boats, including a 27-foot aluminum river boat with a 454 Chevy inboard jet unit. BLM reported that Clear Creek is heavily used during June through August by both private riverboats and commercial guides using jet boats upstream to a point about three miles above its confluence with the Talkeetna River (BLM 1980). Both the Talkeetna River and Clear Creek are capable of carrying riverboats greater than 6,000 pounds in weight.

The Yentna River drainage is heavily used for recreational boating, for fishing, and access to hunting areas. The Yentna and its principal tributaries also serve as means to interior land areas. The Skwentna River has been used by exploratory parties as an access route to the Kuskokwim basin. Recently Joe Delia, a commercial guide, has several times ascended the Skwentna to Emerald Creek in a boat carrying more than 1000 pounds. His boat, an 18 foot flat-bottomed riverboat with a jet unit, has been marginally successful above Emerald Creek (BLM 1980). Today the Skwentna up to Emerald Creek is used by commercial guides and recreational floaters, army units, government officials, miners, hunters, and trappers. Up to Emerald Creek the river is wide and deep enough to support boats capable of carrying one-half ton. The upper reaches of the Skwentna are used by kayaks, covered canoes and inflatable rafts. In the last four years the U.S. Army Alaska National Guard has floated 20-man rubber rafts of two ton capacity from Emerald Creek to the Village of Skwentna. The Hayes River is capable of carrying crafts greater than 1000 pounds to the point of its confluence with the Trimble River (BLM 1980). The Kahiltna River, another tributary of the Yentna, is also used by boaters.

The Kashwitna River has a history of use from the highway down to the Susitna River. It serves as a major means of access to the Susitna, through a privately operated boat launch near the mouth of the Kashwitna.

The Deshka River (Kroto Creek) experiences heavy use by sport fishermen during salmon runs. Some recreationists fly to nearby Neil and Amber Lakes, then float downstream using inflatable rafts. Once downstream the rafters are picked up at the creek's mouth. Amber Lake is a heavily used recreation cabin lake and a "put in" point for rafters going down the Deshka River. Rafters also put into Moose Creek and float to the mouth of the Deshka where they are picked up by plane or riverboat. One commercial operation transports recreationists to the Deshka from Kashwitna Landing via motorized raft, then flies them back to Anchorage after several days' fishing (Bloomfield pers. comm.). Both riverboats and airboats use the Deshka, with Neil Lake being a popular terminus for boaters coming upriver. However, it was reported that riverboats with jet units can travel five miles or more above Neil Lake (Trent pers. comm.).

Willow Creek is a popular put-in point for airboaters who travel down to the Susitna and then to other areas. Airboats are also commonly used on Alexander Creek.

During TES' aerial survey of boating use on the lower Susitna on September 17, 1981, 102 boats and eleven planes were observed on tributaries to the Susitna. Appendices B and C indicate locations of observations and types of crafts. Craft included canoes, rafts, airboats, and a variety of riverboats 14 to 24 feet in length with prop and jet units. Also observed were the remains of the Lois Ann, a 90-foot sternwheeler used to haul supplies to mining operations. It is located on the Yentna River at approximate river mile 34, near the mouth of Lake Creek. There is the possibility that a modern sternwheeler could commence operations on the Yentna and Skwentna Rivers. Construction has started on a 53-foot sternwheeler with an 18-inch draft (Anchorage Daily News, 1981). The boat would haul passengers and freight between Anchorage and Skwentna beginning in 1983.

3.3 Navigability Considerations

As discussed, a variety of craft are used for navigation on the Susitna and its tributaries. Most riverboats, by definition, are square-nosed flat-bottomed craft with shallow drafts. Equipped with standard outboard engines with props, they require approximately 18 inches of water to operate. When equipped with jet units, six inches of water is required; although once the boats are up and cruising, they draw only two inches. Airboats have drafts of only a few inches and, during operation, an inch or so is sufficient.

Semi-vee craft generally have drafts of 10 to 15 inches, while sitting, depending on load. During operation, they run on the top two inches of water, except for the motor. Those equipped with jet units require an additional inch or so of water, while those equipped with props require an additional 12 inches.

Inflatable rafts and canoes have drafts of one to one and one-half inches with light loads. With heavy loads they will have drafts of two to three inches. Large inflatable rafts driven by outboard motors have greater water requirements.

According to many pilots of light aircraft, a float plane can land on almost any reach of river or lake that is at least 1500 feet long and has wing tip clearance, with water that is at least 18 inches deep. As a general rule, any river reach or lake over 3000 feet long can be used by float planes to take off. Smaller areas can be used with clear approach and take-off paths, depending on velocity and turbulence of the water.

A Super Cub type aircraft with large wheels can operate on most beaches or sandbars over 100 feet long. Most aircraft operations along a river occur where there is a cabin or in good hunting and fishing areas.

The Susitna River has been determined by BLM to be navigable as far upstream as 7.5 miles above Gold Creek based upon (a) prior use by a boat for any purpose and (b) suitability as a highway of commerce since Alaska Statehood in 1959 (BLM 1981). Beyond this point no determination of navigability has been made by BLM. BLM will make a determination of navigability only in those areas involving state-selected lands. The U.S. Coast Guard considers the Susitna River between Gold Creek and the Tyone River to be non-navigable due to shifting sand and gravel bars and shifting channels (USCG pers. comm.). Navigational use is known to occur as far upstream as Portage Creek. Boating also occurs in the upper basin above Devil Canyon, but documentation of such navigation is not within the scope of this report.

3.4 Anticipated Navigational Use

Available information indicates that navigational use on the Susitna and its tributaries has increased substantially in recent years. As the state's population (and particularly the Railbelt's population) increases, more lands will be settled and developed in the Susitna drainage. TES assembled information concerning DNR land disposals adjacent to the Susitna River and its tributaries. Existing disposal areas are shown on the maps in Appendix B. A list of proposed disposal areas appears in Appendix D. DNR has offered disposals, including remote parcels, agricultural disposals, open-to-entry lands (OTE's), and subdivisions. The availability of lands will cause increased settlement of the drainage area and result in increased demand for access to live, hunt, and fish in these areas. The Susitna River and its tributaries will serve as a major means for such access until roads are eventually built, particularly during the navigation season from early May to October. Thus, future navigational use will increase in relation to population growth along with development and settlement of DNR land disposal areas.

Additional usage can be expected during fishing and hunting seasons. Also, hunting and fishing are increasing. As population levels rise, participation in these activities will entail increased use of stream reaches identified previously, both for fishing and for access to areas with sufficient game populations. This use will occur from May to November during salmon spawning periods, and in September during hunting season.

DNR Division of Parks is studying several areas in the lower Susitna as possible sites for improving existing launches, developing new launches, and providing new access to the Susitna River (Wiles pers. comm.). Such studies are being undertaken in anticipation of increased demand for boating on the Susitna. If improvements are ultimately made, they could further stimulate navigational use.

3.5 Winter Navigation

Winter navigation consists of use of the river ice by dogsleds and snowmachines when conditions permit. Use involves recreation, subsistence (e.g. trapping), and other activities in numerous locations on the Susitna River, including near Susitna Station, Willow, Kashwitna, Montana, and Talkeetna.

The Iditarod Trail, used annually for dogsled racing, crosses the Susitna River at Susitna Station and goes up the Yentna River. Residents in the Deshka River area typically make two or three trips a month between Willow and their residences on the west side of the Susitna (Delaney pers. comm.). Several dogsled teams are known to run out of Kashwitna (Susitna) Landing every weekend (Fredrickson, pers. comm.). In the Montana Creek area, there is an active dogsledding group that sponsors races almost every weekend. Races typically are 50, 100, 200, or 300 miles long. In these races, there is considerable travel on the Susitna River, usually for crossing in six main areas within 10 miles of Montana Creek (Fredrickson, pers. comm.). Residents of the

the Trapper Creek and Petersville area cross the river to Talkeetna for supplies. Use of snowmachines for this purpose has declined since completion of the Parks Highway in the early 70's.

4 - CONCLUSION

The purpose of this report was to document navigational use under pre-project conditions. The extent of impacts on navigational use will depend on the magnitude of reduced summer flows and stage in certain channels and sloughs on the Susitna. While it seems likely that navigational use on the mainstem would be most affected by construction (reservoir filling) and operation of the hydroelectric project, alterations to stream-bed morphology and stage at the mouths of tributary streams could affect a significant amount of boating activity in the tributaries where access to them is dependent upon a clear channel from the Susitna.

DNR's investigation is designed to estimate the extent of hydrologic alteration at key points on the Susitna. When these data are available, it should be possible to estimate the likelihood and extent of impacts on navigational use resulting from construction and operation of the Susitna hydroelectric project. A preliminary assessment of impacts, prepared by TES with input from DNR through Acres American, is presented in the Land Use Section of the Feasibility Report (Alaska Power Authority 1982).

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Water Management Section
Anchorage, Alaska

Mary Lou Harle, Water Management Officer
- Telephone conversation with Robert Anderson; February 20, 1981.

Division of Parks
Anchorage, Alaska

Jack Wiles, Chief
- Telephone conversation with Robert Anderson; March 4, 1981.
- Meeting with Robert Anderson and Alan Jubenville; September 21, 1981.
- Telephone conversation with Robert Anderson; September 22, 1981.

Division of Research and Development
Anchorage, Alaska

Al Carson, Deputy Director
- Telephone conversation with Robert Anderson; March 4, 1981.

Gary Stein, Historian
- Telephone conversation with Robert Anderson; December 12, 1981.

Alaska Department of Natural Resources
Southcentral District
Anchorage, Alaska

Romaine Clark, Land Disposal Officer
- Meeting with Robert Anderson; March 6, 1981.

Other Organizations and Individuals

Kashwitna Landing Boat Launch
Kashwitna Landing, Alaska

Ray Bloomfield, Operator
- Conversation with Vincent Lucid; June 25, 1981.
- Conversation with Robert Anderson; July 13, 1981.

Mahay's Riverboat Service
Talkeetna, Alaska

William Correra
- Conversation with Robert Anderson; August 15, 1981.
Steve Mahay, Operator
- Conversation with Vincent Lucid and Dana Schmidt; July 1, 1981.

Montana Creek Lodge
Montana, Alaska

Vivian Fredrickson, Owner
- Conversation with Robert Krogseng; January 15, 1982.

Rust's Flying Service
Anchorage, Alaska

Hank Rust, President
- Conversation with Robert Anderson; August 19, 1981.

Boater
Talkeetna River, Alaska

- Conversation with Robert Anderson; August 15, 1981.

Boater
Willow Creek, Alaska

- Conversation with Robert Anderson; August 15, 1981.

APPENDICES

(a)

APPENDIX A: HISTORICAL NAVIGATIONAL USE (PAGE 1 OF 7)

YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
1834	Vasili Malakoff	Susitna River mainstem		Exploration	Had to drag his boat upriver
1894	J.M. Johnston, Edward Andrews	Susitna River	Sleds	Exploration	
1895	One hundred (approx.) prospectors	Susitna River mainstem Chulitna fork		Prospecting	
1896	William Dickey, Allen Monks	Susitna River mainstem, Talkeetna Station, Chulitna River, Susitna River to Portage Creek	Open sea dory; Two boats:25', 18" wide, flared to 40"	Mining, prospecting	
1896	Capt. Andrews with party	Susitna River to Susitna Station	Large dory; then used dog sleds when they found ice	Prospecting	
1897	Approx. 1000 men	Susitna River mainstem		Prospecting	
1897	Nine men	Susitna headwaters	Large dory of whipsawed lumber in summer, sleds in winter	Prospecting	

a. Sources: BLM (1980, 1981), Cole (1979), Dwight and Trihey (1981).

YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
1897	Mining party	Yentna River		Mining	
1898	W.G. Jack, guide, and USGS survey party	Susitna River to mouth of Indian River	Towed small boats up-stream	Surveying	Jack thought river could be navigated to mouth of Indian River by a steamer drawing no more than two feet of water
1898	G.H. Eldridge, Robert Muldrow	Susitna River to mouth of Indian River		Exploration and surveying	
1898	Six USGS surveyors	Susitna River, some tributaries, Yentna and Skwentna Rivers	Canoes	Surveying	
1898	USGS Party	Susitna, then to Tanana River		Surveying	
1898	Sgt. Yanert, U.S. Army, and two others	Chulitna to near mouth of Indian Creek, then over Broad Pass to the Nenana River		Exploration	

YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
1898	O.G. Herning and crew	Susitna River to Willow Creek		Mining	Poled their way
Fall of 1899	Copper River Joe	Susitna River	Ocean steamer "Excelsior"	Picked up equipment from surveying party	
Fall of 1899	Alaska Commercial Company	Susitna River to Susitna Station	Sloop		
1899	Herron Expedition (Lt. Herron, U.S. Army)	Head of Yentna River to mouth of Tanana		Exploration	Traveled total of 1000 miles
1902	Prospectors	Various streams		Prospecting	Used frozen rivers in winter, floated boats in spring
1902	Survey parties	Chulitna River		Exploration and survey for proposed rail line	
1902	Wilfred Osgood and party	Reached Bristol Bay via Chulitna, Mulkatna and Nushagak Rivers		Ornithological trip	

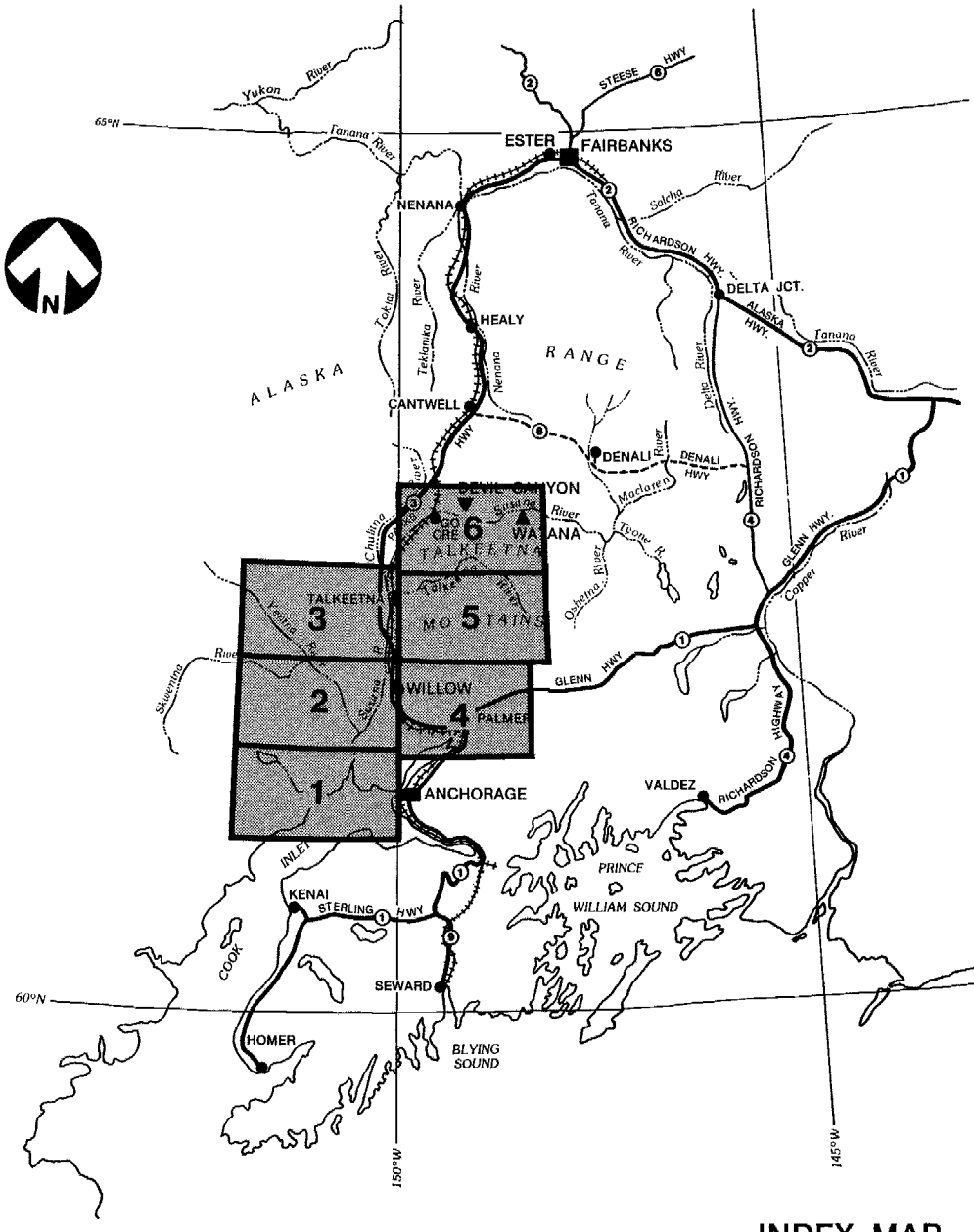
YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
1903	Five men	Klutina and St. Ann Rivers, Tyone Creek to upper Susitna		Prospecting	
1903	Robert Dunn	Western tributaries of Susitna to Mt. McKinley, then rafted down Chulitna		Expedition to climb Mt. McKinley	Rafted down Chulitna using pike poles
1903	Dunn and companion	Reached Kichatna River by boat		Expedition to climb Mt. McKinley	
1903	Dr. Frederick Cook's expedition	Ascended Susitna and Yentna Rivers to Mt. McKinley, descended west fork of Chulitna River	Used small, wooden two-man rafts	Expedition to climb Mt. McKinley	Used pack train & boats on Susitna & Yentna Rivers
early 1900's	Two Englishwomen and two male companions	Kayaks used to rendezvous with sailing schooner anchored at Cook Inlet		Hunting trip	Up the Kuskokwim River to the divide between it and Susitna
1904	Alexander MacDonald	At Osborne Creek near Deshka River (Kroto Creek)		Prospecting	

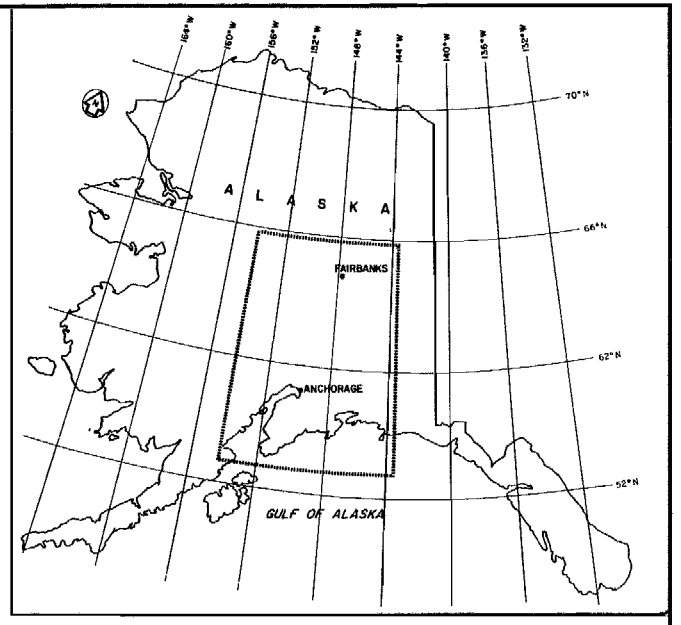
YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
1905	Mr. Coffee and Mr. Miller	Susitna		Prospecting	
1906	Dr. Frederick Cook	Rivers in area of Mt. McKinley		Second attempt to climb Mt. McKinley	Explored rivers in the region
1907	Woolsey	Susitna mainstem	Two riverboats		
1907	Joe Anderson	Susitna	Gas-powered scow		
1908	J.E. Spurr W.S. Post	Canoed up Yentna and Skwentna Rivers to Kuskokwim Valley	Canoes	Exploration	
1910	Fred Moffit	Supplied via west fork of Gulkana River, the Maclaren and Susitna		Geologic exploration	Geologist working at Valdez Creek
1910	Herschel C. Parker Belmore Browne	Susitna and Chulitna Rivers		Effort to reach Mt. McKinley	
1911		Up Susitna and Yentna from Cook Inlet to Susitna Station and Lake Creek	"Susitna" - a river steamer		

YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
1911	S.R. Capps and companion	Yentna River	Launch	Mining	
1912	Parker-Browne expedition	Susitna		Exploration	Supplies sledded upriver
1914	Soil survey crew	Susitna from Susitna Station	Sternwheeler	Geologic exploration	Same crew used 18-foot rowboat to descend Susitna from 3 miles below Indian River
1914	Survey crew	Ascended Yentna to confluence with Skwentna River	Powerboat	Surveying	
Late 1910's Early 1920's	Alaska Engineering Commission	Indian River	Tunnel boats	Transporting men and supplies along Alaska Railroad	
1919	Mushers	Crossed Susitna near mouth of Indian River	Ferryboat		

YEAR OR TIME PERIOD	WHO	LOCATION OF REPORTED NAVIGATIONAL USE	TYPE CRAFT	PURPOSE	ADDITIONAL INFORMATION
Early 1920's	English sportsmen	Susitna, Yentna, Skwentna and Happy Rivers		Hunting	Expedition guided by Andy Simon
1930	George Thompson and his brother	Yentna	Small boat	Trapping upstream	
August 1930	Mr. Beach and several others	Mouth of Yentna to McDougall	Motorboats		
1944	Cady and Hoare	Oskawalik River		USGS survey team	
1950	Bureau of Reclamation survey party	Upper Susitna	Two aluminum boats, each 156 pounds, 14 ft. long, 56-inch beams, 20 inches deep, 10 horse-power motor	Surveying	
Summer 1955	Crew of eight	Susitna drainage area	50 ft. long boat with decked-over bow, two large engines	Charting navigable watersheds	Boat was destroyed on rocks

APPENDIX B: MAPS OF NAVIGATIONAL USE AND DNR DISPOSAL AREAS





INDEX MAP

PREPARED BY TES / ACRES

LEGEND

- Craft observed Sept. 17, 1981 during TES aerial survey
- Planes observed Sept. 17, 1981
- Areas with concentrations of navigational use
- DNR Disposal; parcels identified by name

1:250,000 series

SUPER CUB LAKE

DINGLISHNA HILL

HOLSTEIN HEIGHTS

Chichantna River

Lower Beluga Lake

Mount Susitna

South Peak

Flat Horn

Alexander

Bell Island

Fish Creek

Susitna

Little Susitna

Middle Lake

Beaver Lake

Horseshoe Lake

Yohn Lake

My Lake

Carpenter Lake

Twin Island Lake

Lost Lake

Figure Eight Lake

Maguire

Big Island

Beluga

Stump Lake

Delta

Magot Pt

Susitna Flats

Mud

Bishop Creek

Bishop Lake

Carlson Lake

Felts Lake

Lewis River

Chuit River

Beluga River

Grants Slough

Seeley Lake

Threemile Creek

Long Ridge

Scott Mtn

Chuitlinchba Creek

Nikolai River

Middle River

Old Tyonek Creek

Tukallah Lake

Viapan Lake

Chilitbuna Lake

Third Lake

Ladd

MOQUAWKIE (TYONEK) INDIAN RESERVATION

Tyonek

Old Tyonek

Tobona

North Foreland Light

Granite Pt

Trading Bay

Iniskin Bay

Kustatan Slough

Winter Trail

Ivan River

Knik Arm

Pt Woronzof

Race Pt Light

North Pt

Fire Island

Pt Campbell

Campbell Lake

West Pt Light

Anchorage 5 Mi.

Matanuska-Susitna Borough

Greater Kenai Peninsula Borough

Anchorage Peninsula Borough

Turnagain Arm

Cook Inlet

Kenai Peninsula

Pt Possession

Diamond Lake

Moose Pt Shoal

Chickaloon Bay

Kenai National Moose Range

Fire Island Moose Range

R. 14 W. R. 13 W. R. 12 W. R. 11 W. R. 10 W. R 8 W. R 7 W. R 6 W. R 5 W. R 4 W.

T. 16 T. 15 T. 14 T. 13 T. 12 T 12 N T 11 N

30' 151° 30' 15' 61°

2 700 000 FEET (ZONE 5)

650000m.E. 6170000m.N. 1 200 000 FEET (ZONE 5)

NAVIGATIONAL USE AND LAND DISPOSAL AREAS - MAP 1

R. 14 W. | R. 13 W. | 30' R. 12 W. | R. 11 W. | R. 10 W. | 151° | R. 9 W. | R. 8 W. 400 000 FEET (ZONE 4) | R. 7 W. | 30' | R. 6 W. | R. 5 W. | R. 4 W.

62°

T. 22

T. 21

T. 20

45'

T. 19

T. 18

T. 17

30'

2 900 000 FEET (ZONE 4)

23 MI.

T. WASILLA

JOHNSON CREEK

SHELL LAKE N.

HEWITT LAKE REMOTE

SHELL HILLS SD.

SHELL HILLS REMOTE

SKWENTNA STATION SD.

ALDER VIEW SD.

LAKE CREEK-MCDOUGALL REMOTE

BIG 11 ESTATES

FRIDAY CREEK

CANYON CREEK LAKE

QUARTZ CREEK REMOTE

SKWENTNA FLATS SD.

KAHILTNA FLATS

KUTNA CREEK SD.

LOCKWOOD LAKE

YENTNA REMOTE

COAL CREEK REMOTE

HIGH MTN. SD.

ALEXANDER CREEK SD.

OTTER LAKES SD.

PUPPY HAVEN STATE RECREATION AREA

LE ROUX VIEW REMOTE

PAPOOSE TWINS

BIG LAKE OTE.

GOLD STREAK SD.

Beluga Mountain

Hayes River Pass

Dickason Mountain

Kashwitna

Willow

Susitna

Delta Islands

Caswell

Trapper Lake

Eightmile Lake

Twentymile River

Deep Creek

Clear Creek

Fox Creek

Bear Creek

Thursday Creek

Friday Creek

Alexander Lake

Rabbit Lake

Trail Lake

Sucker Lake

Whitsil Lake

Red Shirt Lake

Florence Lake

Long Lake

Crystal Lake

Rainbow Lake

Lucy Lake

Hook Lake

Nancy Lake

Jack Lake

Talachulitna Lake

Kitty Lake

Trinity Lakes

Movies Lake

Willow Creek

Kashwitna Lake

Lockwood Lake

Susitna Landing

Cabins

Airport

Gravel Pit

Tractor Trail

Railroad

Alaska Railroad

Parks Highway

Susitna River

Willow Creek

Kashwitna River

Little Willow Creek

Moose Creek

Kashwitna Knobs

196 Mile Creek

Rolly Creek

Wolverine Creek

Snag Creek

Ayr Creek

Ruth Creek

Lake Creek

Indian River

Skwentna River

Yentna River

Talachulitna River

Kahiltna River

Alexander Ridge

Susitna Ridge

LEGEND

- Craft observed Sept. 17, 1981 during TES aerial survey
- Planes observed Sept. 17, 1981
- Wreckage of 90-foot steamer "Lois Ann"
- Areas with concentrations of navigational use
- DNR Disposal; parcels identified by name

1:250,000 series

NAVIGATIONAL USE AND LAND DISPOSAL AREAS - MAP 2

LEGEND

- Craft observed Sept. 17, 1981 during TES aerial survey
- Planes observed Sept. 17, 1981
- Areas with concentrations of navigational use
- DNR Disposal; parcels identified by name

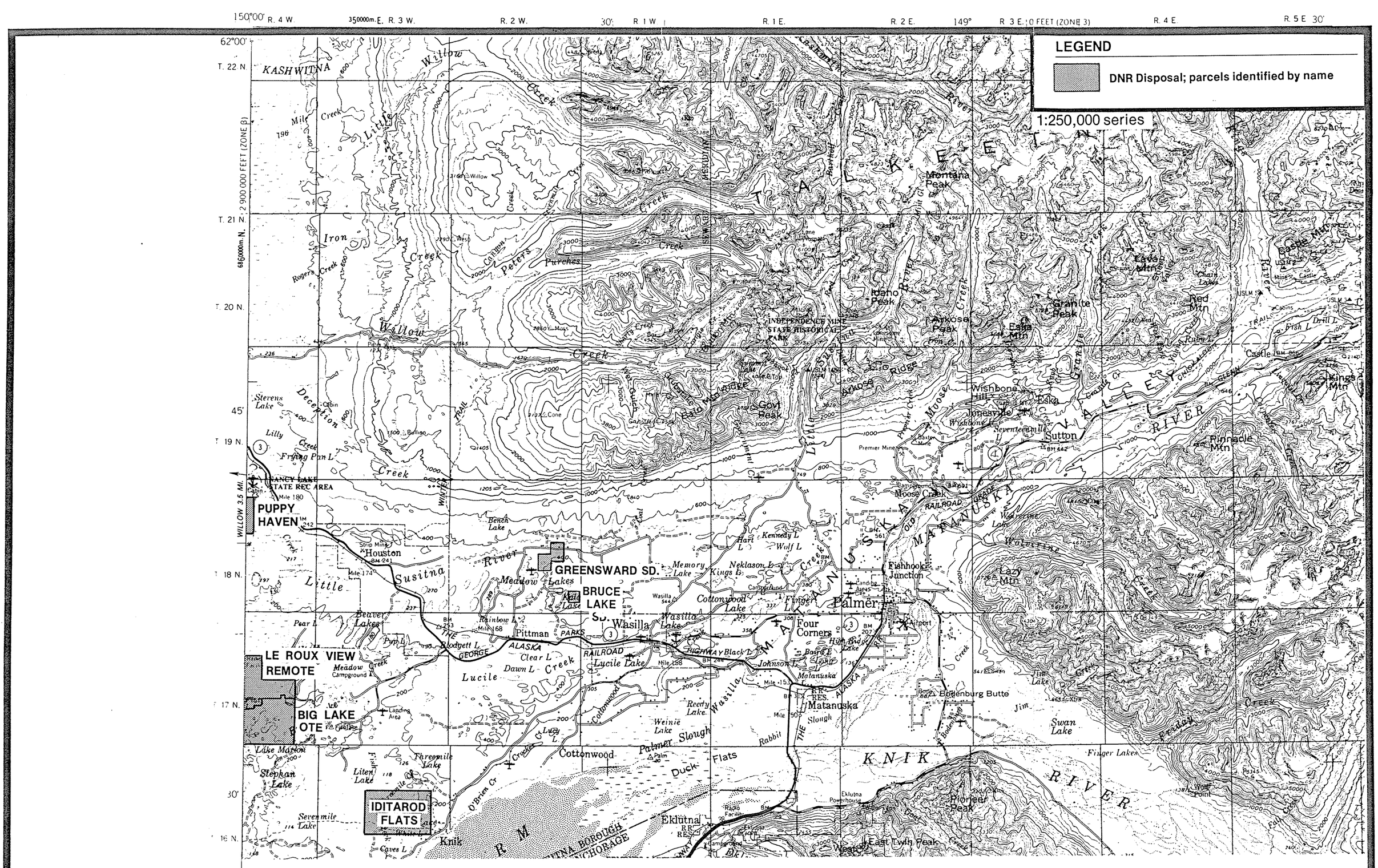
1:250,000 series

DENALI VIEW SD.
SWAN LAKE SD.
CHASE REMOTE
KENNY CREEK SD.
TRAPPER CREEK SD.
CHASE II SD., UNITS 1 & 2
GATE CREEK REMOTE
PETERS CREEK SD.
SCOTTY LAKE
TALKEETNA AG.
NINEMILE CREEK
YENLO HILLS
LAKE CREEK-MCDOUGALL REMOTE
AMBER LAKE
NAKOCHNA
NINEMILE CREEK II
DONKEY CREEK LAKE
KICHATNA
KAHILTNA
MONTANA CREEK
HEWITT LAKE REMOTE
SHELL LAKE NORTH
ALDER VIEW SD.
BIG 11 ESTATES

R. 14 W. R. 13 W. 30' R. 12 W. R. 11 W. R. 10 W. 151° R. 9 W. R. 8 W. 1 100 000 FEET (ZONE 5) 30' R. 7 W. R. 6 W. R. 5 W. 650000m.E. R. 4 W.

T. 23 T. 22 T. 21 T. 20 T. 19 T. 18 62° 680000m.N.

NAVIGATIONAL USE AND LAND DISPOSAL AREAS - MAP 3



NAVIGATIONAL USE AND LAND DISPOSAL AREAS - MAP 4

LEGEND

DNR Disposal; parcels identified by name

1:250,000 series

CHASE REMOTE

CHASE II SD., UNITS 3-5

TALKEETNA BLUFFS SD.

BALD MTN. REMOTE

BALD MTN. SD.

BARTLETT HILLS

MONTANA CREEK

Sovereign Mountain

Talkeetna Glacier

Chichalon Glacier

Talkeetna River

Susitna River

Kashwitna River

Kashwitna Lake

Caswell Lake

Sheep Creek

Rainbow Lake

Diane Lakes

Soetkene Lake

Bald Mountain

Middle Fork

South Fork

North Fork

Alaska Range

Talkeetna Mountains

27 N

26 N

25 N

24 N.

23 N

22 N

3 000 000 FEET (ZONE 4)

62°00'

150

R 4 W.

R. 3 W.

30'

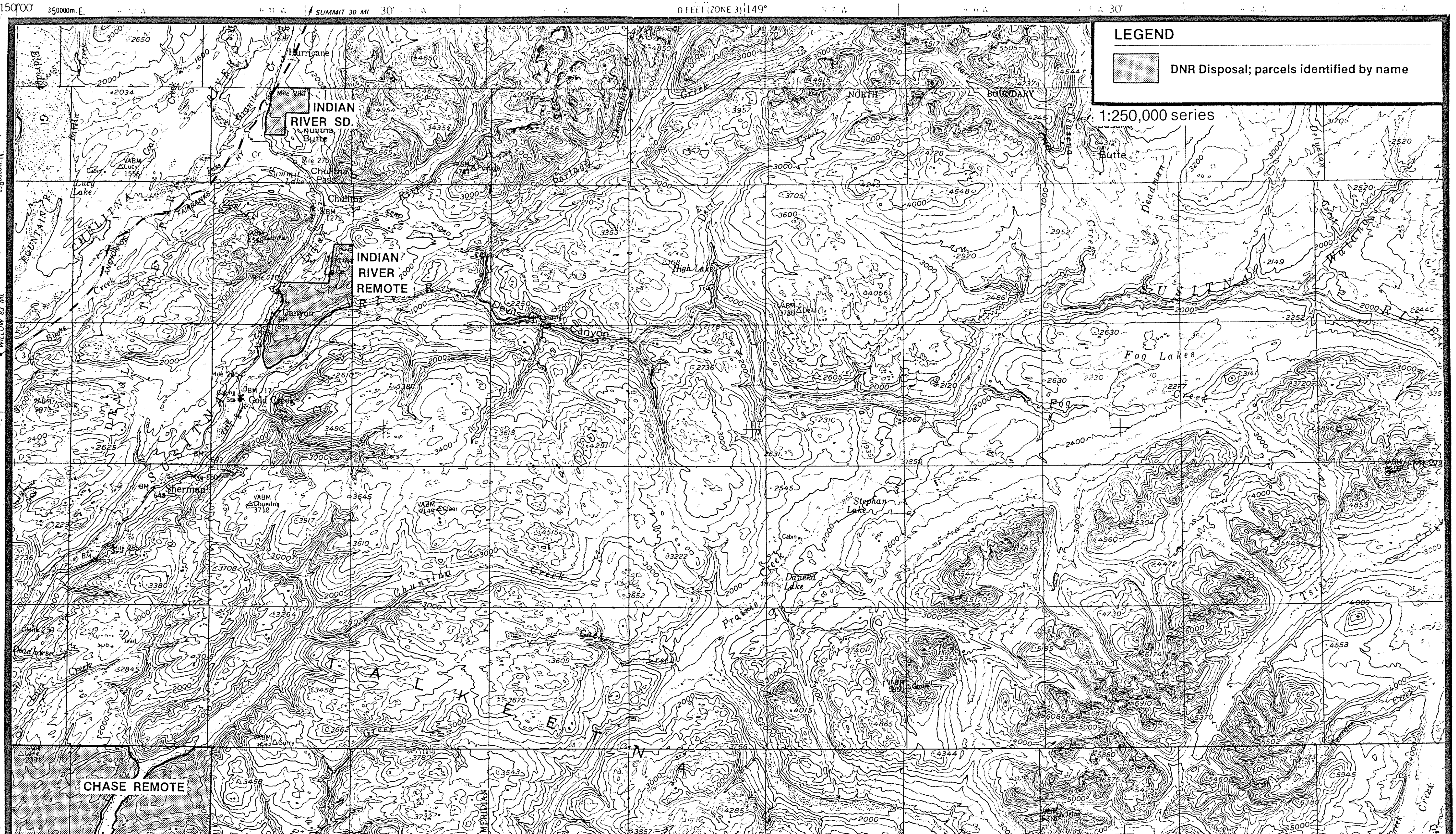
600 000 FEET (ZONE 4)

149°

R 3 E.

30'

NAVIGATIONAL USE AND LAND DISPOSAL AREAS - MAP 5



NAVIGATIONAL USE AND LAND DISPOSAL AREAS - MAP 6

(a)

APPENDIX C: TES AERIAL SURVEY OF NAVIGATIONAL USE (PAGE 1 OF 6)

LOCATION						
QUADRANGLE	TOWNSHIP, RANGE	SECTION	MILE	WATER BODY	CRAFT, PROPULSION	ADDITIONAL INFORMATION
Tyonek C-2	T-17N, R-7W	14	24	Susitna River	20' semi-vee, jet OB	
		12	1	Yentna River (Susitna confluence)	18' riverboat, jet	
		1	2	Yentna River	18' riverboat, unk.	
		2	3	Yentna River	20' riverboat, unk.	
	T-18N, R-7W	34	5	Yentna River	20' riverboat, jet; carrying 14' alum. semi-vee	Cabin on shore
		20	6	Yentna River	20' river boat	
		20	7	Yentna River	20' riverboat, jet; carrying 15' alum.	
	T-18N, R-8W	1	11	Yentna River	20' riverboat, jet with 115 hp OB	
	T-19N, R-8W	36	12.5	Yentna River	18' river raft	
		24	14	Yentna River	20' riverboat, twin OB jets	Tent camp on shore

a. Survey conducted from mouth of Susitna River at Cook Inlet to Talkeetna and to upper reaches of tributaries, including the Yentna, Deshka, Skwentna, Kashwitna, Kahiltna and Talachulitna rivers; on September 17, 1981, a weekday during hunting season for moose.

LOCATION						
QUADRANGLE	TOWNSHIP, RANGE	SECTION	MILE	WATER BODY	CRAFT, PROPULSION	ADDITIONAL INFORMATION
		23	18	Yentna River	65 hp. OB; square-end canoe	
Tyonek D-2	T-19N, R-8W	3	21	Yentna River	Canoe, paddling	
	T-20N, R-8W	27	23	Yentna River		Vacant camp
		28	24	Yentna River	18' riverboat jet	
		21	25	Yentna River	14' rubber raft, OB	Tent camp on shore
		16	26	Yentna River	Amphibian	
	T-21N, R-8W	34	2.5	Kahiltna River	Two 16' riverboats	Cabin on shore
		27-26	3.5	Kahiltna River	Plane; two river-boats; 18' with 75 hp jet	Cabin on shore
						Saw nothing upstream of this point on Kahiltna
Tyonek D-3	T-21N, R-8W	5	29.5	Yentna/Kahiltna confluence		Camp
	T-20 & 21N, R-9W		26.5	Twenty mile slough (Yentna River)		Observed no craft in slough
	T-21N, R-9W	23	33	Yentna River		Hamlet of McDougall-5 buildings. Lake Creek Lodge

LOCATION						
QUADRANGLE	TOWNSHIP, RANGE	SECTION	MILE	WATER BODY	CRAFT, PROPULSION	ADDITIONAL INFORMATION
Tyonek D-3	T-21N, R-9W	23	33	Yentna River		Observed truck on southwest side of Yentna
	T-21N, R-9W	15	33.5	Yentna River	15 boats and two planes	At McDougall, near confluence with Lake Creek
	T-21N, R-9W	22	34	Yentna River near confluence with Lake Creek	Inflatable raft, 18' riverboat	Remains of 90' steamer along shore; this was used to haul supplies to mining operations
		8	39	Yentna River	Two 18' riverboats, 14' skiff	Two cabins on shore
	T-22N, R-10W	35	43	Yentna River	18' riverboat, plane	
Talkeetna A-3	T-23N, R-11W	32	52	Yentna River	18' riverboat, OB jet, 18' riverboat 100 hp OB jet	
	T-23N, R-12W	22	58	Yentna River	Two 18' riverboats, jets	
		15	59	Yentna River		Cabin on unnamed trib.
		16	61	Yentna River	Plane	Plane landed on sand bar; tent camp
Talkeetna A-4	T-24N, R-12W	20	67	Yentna River tributary	Two 18' riverboats	Year-round camp on shore

LOCATION						
QUADRANGLE	TOWNSHIP, RANGE	SECTION	MILE	WATER BODY	CRAFT, PROPULSION	ADDITIONAL INFORMATION
Talkeetna A-4	T-25N, R-13W	28	86	Yentna River	16' riverboat, OB jet	
Talkeetna B-4	T-25N, R-13W	17	88	Yentna River	Plane; 24' river-boat	Camp on shore
	T-27N, R-14W	29	102	Yentna East Fork	Plane; 16' river-boat, jet	Camp on shore. Observed no craft farther upstream
Tyonek D-5	T-21N, R-12W	30	30		15' riverboat	Cabin on shore
Tyonek D-4	T-22N, R-10 & 11W	1,30	2	Skwentna River	Ten riverboats, props and jets, 2 planes	Skwentna settlement
	T-20N, R-12W	1,2,12	2	Talachulitna - Skwentna conf.	Plane; riverboat with OB jet	Tent camp and several cabins on shore
	T-22N, R-10W	20		Yentna-Skwentna confluence	Five riverboats 18-20', OB & IB jets	
Tyonek C-2	T-17N, R-6W	8	26	Susitna River above Yentna confluence	20' riverboat, jet	Tent camp on shore
	T-18N, R-6W	29	29	Susitna River	14' inflatable raft	
	T-18N, R-6W	21	30	Susitna River	Three 18-20' river-boats, jet	
Tyonek C-1	T-19N, R-6W	35	36	Susitna-Deshka (Kroto Cr.) confluence	Three riverboats near mouth	
	T-19N, R-6W	35		Deshka mouth	Two riverboats at mouth	Cabins on shore

LOCATION						
QUADRANGLE	TOWNSHIP, RANGE	SECTION	MILE	WATER BODY	CRAFT, PROPULSION	ADDITIONAL INFORMATION
Tyonek C-1	T-19N, R-6W	23	3	Deshka River	Four riverboats, airboat, canoe	Two cabins on shore
	T-19N, R-6W	15	4	Deshka River		Cabin and foundation on shore
	T-19N, R-6W	11	4.5	Deshka River	Six riverboats, 14-24'	Lodge, plane on shore
Tyonek D-2	T-21N, R-6W	16,33,23	15	Deshka River	Three riverboats, two jet boats	Three cabins on shore
Tyonek D-1	T-20N, R-5W	33,34	40.5	Willow Creek - Susitna confluence	Three riverboats, four airboats	
	T-21N, R-5W	13,24	48	Susitna River	Three riverboats	
	T-21N, R-4W	7	49	Kashwitna River	Six riverboats	Ten empty boat trailers on shore at Kashwitna Landing
Talkeetna A-1	T-24N, R-5W	23		Susitna River	Three riverboats	At ADF&G fishwheel
Tyonek C-2	T-17N, R-8W	19	11	Alexander Creek	Two airboats	
	T-17N, R-8W	30	10	Alexander Creek	Airboat	
	T-17N, R-8W	31	9	Alexander Creek	Airboat	

LOCATION						
QUADRANGLE	TOWNSHIP, RANGE	SECTION	MILE	WATER BODY	CRAFT, PROPULSION	ADDITIONAL INFORMATION
Tyonek B-2	T-16N, R-7W	30	4	Alexander Creek	Two airboats	Cabins on shore
	T-15N, R-7W	6		Alexander Creek, Susitna conf.	Two airboats, plane, canoe	

APPENDIX D: PROPOSED FUTURE DISPOSAL AREAS[a]

Possible Names of Future Disposals	Location	
Sunday Lakes Remote	T18N, R13W	SM[b]
Delta Islands	T19N, R5&6W	SM
Northwind Lake	T22N, R14W	SM
Red Creek	T23N, R13W	SM
Schneider Lake Remote	T24N, R8W	SM
Safari Lake	T27N, R7W	SM
Moose Creek	T25&26N, R6W	SM
High Mountain Rainbow	T26N, R1E	SM
Bald Mountain (addition)	T25N, R3W	SM
Indian River Subdivision (addition)	T33N, R2W	SM

Three areas north of Indian River Subdivision are possible future state land sale sites before 1984. All three are located west of, but adjacent to, the Parks Highway. They exist at:

T21&22S,R11W	FM[c]
T20S,R10W	FM
T19S,R9&10W	FM

a. Possible disposal areas beyond the Spring 1982 offerings.
b. Seward Meridian
c. Fairbanks Meridian