



STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES
NORTHERN REGION



KOTZEBUE TO CAPE BLOSSOM ROAD
RECONNAISSANCE STUDY

STATE PROJECT NO. 76884

FEBRUARY 2011

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ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
ADNR	Alaska Department of Natural Resources
ANCSA	Alaska Native Claims Settlement Act
BIA	Bureau of Indian Affairs
DCCED	Alaska Department of Commerce, Community and Economic Development
DOT&PF	Alaska Department of Transportation and Public Facilities
KEA	Kotzebue Electric Association
KIC	Kikiktagruk Inupiat Corporation
NANA	Northwest Arctic Native Association
NWAB	Northwest Arctic Borough
NWI	National Wetlands Inventory
ROW	Right-of-Way
USACE	U.S. Army Corps of Engineers
VORTAC	Very High Frequency Omni-Directional Radio Range Tactical Air Navigation Aid



EXECUTIVE SUMMARY

The purpose of this reconnaissance study is to evaluate preliminary road alignment options beginning in Kotzebue and terminating at Cape Blossom. These options are evaluated based on topography (alignment, grade); soils conditions; erosion and sediment control; hydrology including spring break up; availability of construction materials; maintenance; snow and icing problems; right of way and utility considerations; development and potential development areas for the community; wetlands; cultural and historic resources; fish and wildlife issues; subsistence; community input; and of course, cost.

To date, Alaska Department of Transportation and Public Facilities (DOT&PF) has evaluated several preliminary alternatives including the alternatives evaluated in the 1981 report: "Kotzebue to Chicago Creek Highway Project." Other options include variations to the preliminary alignments presented in that report, connections to the community near the windmill farm, as well as to Ted Steven's Way. The lack of suitable material in the Baldwin Peninsula drives costs of the alternatives. Three options for construction methods have been evaluated for this report: Construct the road completely from barged in gravel; construct the road from local gravel; construct the road embankment from local fine grained material dredged from the proposed Cape Blossom port site. This report also evaluates the requirements for a staged project, in order to capitalize on funding opportunities as they become available.

Many studies have been performed historically for this project. In an effort not to reproduce work that has already been completed, a resource library has been developed and included as Appendix A. The reports listed in the resource library are available electronically from DOT&PF. Field work for this study was limited to what was needed in order to develop cost estimates and additional alignment options.

A staged project most efficiently capitalizes on existing funding opportunities. In general terms, to construct a road to Cape Blossom would cost approximately \$3.2 million per mile for a two lane road, and approximately \$2.4 million per mile for a single lane road. These costs assume developing borrow sources along the route and using fine grained soil to construct the embankment, allowing the road to settle and consolidate over time. Additional costs are to be expected to cross the single large drainage encountered at Sadie Creek.

The next step in the Kotzebue to Cape Blossom Road Project is to begin the Preliminary Design and Environmental Process, and to further evaluate the alignments identified in this report. This report has not identified a preferred alternative. The information in this report may be used to analyze the alternatives and identify a preferred alternative. Additional data collection such as imagery collection, survey, and geotechnical studies have been identified as essential elements of the preliminary design/environmental stage.



INTRODUCTION

The Kotzebue to Cape Blossom Road Reconnaissance Study is a Federal Highways Administration funded project administered through the DOT&PF, Northern Region. This study was developed by utilizing historic reports and verifying assumptions within the reports with data collection activities. The purpose of this study is to address the feasibility of a road connecting the community of Kotzebue to a City planned port at Cape Blossom. All historic reports, as well as data and reports generated as part of this project, are listed in Appendix A and are available by request from DOT&PF.

The Kotzebue to Cape Blossom Road was first studied in the early 1980's by Michael Baker Jr., Inc. for the State of Alaska in an effort to gain access to coal resources at Chicago Creek Alaska (Reference Resource Library, Appendix A). This study included identification of several alignments from Kotzebue to Coal Creek heading Southeast through the Baldwin Peninsula for approximately 150 miles. The Michael Baker study includes a collection and analysis of existing data, aerial reconnaissance of the general route alternatives, alignment maps, and an onsite investigation. In addition to these alignments, an alternate alignment is presented in a supplemental Michael Baker Jr., Inc. report that specifically addresses access to Cape Blossom. This supplemental report describes the physical characteristics of



FIGURE 1 - LOCATION MAP OF BALDWIN PENINSULA

the alignment routes, soils conditions, vegetation, land status as of September 1, 1981, and environmental features. This report also included a cost estimate and haul analysis for construction materials. A plan and profile index map is included as available information.

The Chicago Creek study was followed in 1983 by the “Feasibility Analysis: Kotzebue Deep Water Port/Airport Analysis” prepared for the City of Kotzebue. The objective of this report was to determine the overall feasibility of developing a deep water port and transshipment port at Kotzebue and to ascertain the feasibility of locating an airport near the deep water port. This report identifies the alternative alignment of the Chicago Creek Road as the basis for access to the deep water port in the feasibility study. The feasibility analysis also addresses the physical environment, wind and climate studies, bathymetry of the region, biological setting, soils, permafrost, oceanography, sea ice, and hydrology. This analysis evaluated additional deep water port sites at Kotzebue and Isthmus, and states that the Cape Blossom site is the most advantageous because deep water (35 foot depth) is only 6,400 feet from shore, and the site is relatively close to Kotzebue (approximately 15 miles). In comparison, to get to a 35 foot water depth at Kotzebue would require dredging to 13 miles from the shore. Cape Blossom was selected as the “the best location to develop a deep water port”.

Other reports have been completed evaluating the feasibility of a port at Cape Blossom by the Corp of Engineers since the 1980’s reports, but are not as comprehensive or as broad in scope. These reports are listed in Appendix A and have similar conclusions as the reports identified previously. The most recent studies were developed in 2004 by the Corp of Engineer’s and focus on port developments, and not road developments. An airport relocation feasibility study was developed in 2007 by DOT&PF addressing airport relocation issues, many of which apply to the Cape Blossom Road Reconnaissance Study. These studies are referenced throughout this report.

After evaluating historic studies related to this project, DOT&PF identified data gaps for further data acquisition. These data gaps included identifying current community needs, design criteria, material site considerations and subsurface conditions, topography characterization, coastal engineering considerations, and hydrology. DOT&PF collected additional data to help fill these data gaps.

This reconnaissance study focuses on preliminary alignments to construct a road from Kotzebue to Cape Blossom, as well as the associated impacts and considerations. Construction costs are addressed, considering local vs. barged in materials, project staging, and project timeframes. Project permitting and environmental considerations are also included.



PRELIMINARY PURPOSE AND NEED

The purpose of the Kotzebue to Cape Blossom Road is to provide access between Kotzebue and a port site at Cape Blossom. Kotzebue serves as a transportation and economic center for Northwest Alaska. Nearly all regional supplies arrive in Kotzebue by ocean shipments between June and September. There are no roads or railroads to Kotzebue. A port site with deeper water is needed to more economically deliver fuel and commodities to the community and in turn, the region. Currently, all loads are lightered to Kotzebue from larger vessels that are restricted to waters 15 miles offshore, due to shallow water depths. This method of delivery results in increased costs for the region for goods and energy needs. Additionally, land availability at the current port is limited, and storage problems exist. A new port site at Cape Blossom would allow larger vessels to dock and provide room for expansion.

Another need for the Cape Blossom Road is to provide access for the community to development areas, recreation and subsistence areas, and private landholdings. The community has expansion plans to extend into the higher elevation areas to the east and south of Kotzebue. The City of Kotzebue Comprehensive Plan (December 2000), the city's community planning document, explains the need for housing developments, along with the expansion of the sewer and water utilities, airport expansion/relocation, and the development of a small boat harbor. Also, Sadie Creek has been identified in public meetings as a potential recreational and subsistence area that would receive greater use if access was available. A road to Cape Blossom would also allow access to private landholdings along the western coast of the Baldwin Peninsula, where current access is limited to four wheelers, snow machines, or boats.

In 2010, the Northwest Arctic Borough, the City of Kotzebue, and the Native Village of Kotzebue identified the Kotzebue to Cape Blossom Road as their highest priority transportation project.



FIGURE 2 - VIEW OF THE CITY OF KOTZEBUE



EXISTING CONDITIONS AND DATA AVAILABILITY

Existing conditions can best be summarized by referencing existing reports that have addressed the conditions of the region over time, mainly the 1981 “Kotzebue to Chicago Creek Highway Project” prepared by Michael Baker Jr., Inc. for the State of Alaska. Other reports documenting existing conditions include “Feasibility Analysis, Kotzebue Deep Water Port/Airport” prepared by Tetra Tech and Wright Forssen Associates, and reports developed by PDC, Inc. as part of the Kotzebue Airport Relocation Feasibility Study prepared in January 2008. In general these reports have covered conditions for the entire Baldwin Peninsula by evaluating road/airport/port options.

LOCAL/REGIONAL SETTING

Kotzebue is located at approximately 66.9° North and 162.6° West (Section 3, Township 17N, Range 18W, Kateel River Meridian) on the Baldwin Peninsula in the Kotzebue Sound, on a 3-mile-long spit. A total of 27.0 square miles of land and 1.7 square miles of water are within its city limits. The mouth of the Kobuk, Noatak and Selawik Rivers are near Kotzebue.

Kotzebue is the largest of the eleven communities in the NWAB. NANA (the area’s regional native corporation) and the NWAB share the same boundaries. Kotzebue Airport serves as the regional air transportation hub for the 10 other communities in the NWAB (Ambler, Buckland, Deering, Kiana, Kivalina, Kobuk, Noatak, Noorvik, Selawik, and Shungnak) and to some extent for the Red Dog Mine, 90 miles north of Kotzebue, as well as for the village of Point Hope further up the coast in the North Slope Borough (*Northwest Arctic Transportation Plan, 2004, DOT&PF*). NANA generates revenues to provide jobs and social services such as healthcare and education for the native Alaskans in its region.

In 2007, the state demographer estimated Kotzebue’s population at 3,135, almost 44 percent of the total estimated Borough population of 7,133 (Alaska Department of Commerce, Community and Economic Development).

TABLE 1 - NORTHWEST ARCTIC BOROUGH POPULATION (DCCED 2007)

Northwest Arctic Borough Population	Percentage of the Borough Population	
Ambler	278	3.9 %
Buckland	457	6.4 %
Deering	133	1.9 %
Kiana	391	5.5 %
Kivalina	398	5.6 %
Kobuk	119	1.7 %
Kotzebue	3,135	44.0 %
Noatak	489	6.9 %
Noorvik	636	8.9 %
Selawik	828	11.6 %
Shungnak	269	3.8 %
Total Population	7,133	



HISTORY

Kotzebue has been occupied by Inupiat Eskimos for at least 10,000 years. The Inupiat name for Kotzebue is Qikiqtaġruk (ki-kik-tug-rook), which means "the place that is almost island". "Qikiqtaġruk" was the hub of ancient arctic trading routes long before European contact, due to its coastal location near a number of rivers. The German Lt. Otto Von Kotzebue "discovered" Kotzebue Sound in 1818 for Russia. The community was named after the Kotzebue Sound in 1899 when a post office was established. Since the turn of the century, expansion of economic activities and services in the area has enabled Kotzebue to develop relatively rapidly. The City was formed in 1958. An Air Force Base and White Alice Communications System were later constructed.

FACILITIES

Water is supplied by the 100-acre-foot Devil's Lake Reservoir, located two miles from the city. VORTAC Lake had previously supplied water to the city as well, but is now deemed inoperable. Water from Devil's Lake is treated and stored in two 1.5-million-gallon tanks, which is approximately 10 days worth of water for the City of Kotzebue. Water is heated with a waste heat recovery system at the electric plant, and distributed in circulating mains. Piped sewage is treated in a 32-acre zero discharge facultative lagoon west of the airport. Significant improvements are needed to this 30-year-old facility. Around 80% of homes are fully plumbed, and 521 homes are served by the City system. The 30-year-old PVC water and sewer mains are currently undergoing replacement. A new transfer station and Class 2 permitted landfill with balefill has recently been completed. Recycling and hazardous waste disposal have been improved. Kotzebue uses ten 50 kilowatt wind turbines to supplement electricity.

TRANSPORTATION

Air is the primary means of transportation year-round. The state-owned Ralph Wien Memorial Airport supports daily jet service to Anchorage and several air taxis to the region's villages. It has a 5,900 foot long by 150 foot wide main paved runway and 3,800 foot long by 100 foot wide crosswind gravel runway. A seaplane base is also operated by the state.

The shipping season lasts 100 days, from early July to early October, when the Kotzebue Sound is ice-free. Due to river sediments deposited by the Noatak River 4 miles above Kotzebue, the harbor is shallow. Deep draft vessels must anchor 15 miles out, and cargo is lightered to shore and warehoused. Shallow draft barges are employed for these lightering operations, as well as for local material transportation. There are 26 miles of local gravel roads, used by cars, trucks and motorcycles during the summer. Several of the main roads within Kotzebue are paved. Snow machines are used in the winter months extensively for travel to outlying villages.

CLIMATE

Climate data is important in developing design criteria for road embankments and drainage structures, as well as for analyzing maintenance needs for a proposed road. Current and historical data is available at the University of Alaska in Fairbanks through their website



(<http://climate.gi.alaska.edu/Climate/Location/West/Kotzebue.html>). For this reconnaissance study, a preliminary evaluation of the data was performed to establish road embankment heights and to make assumptions for drainage structures. The next phase of this project would evaluate this data in more detail.



FIGURE 3 - KOTZEBUE IN THE WINTER

A thermal analysis program was used to make preliminary evaluations of subsurface thaw consolidation. This information is necessary to determine an appropriate embankment height. The goal is to design an embankment with minimum thaw of the subsurface – to ensure stability. Thaw depths were calculated using parameters found in the MUT1D (Multi User-Friendly Thermal Model in 1 Dimension) and BERG2 (Micro-Computer Estimation of Freeze and Thaw Depths and Thaw Consolidation). The following parameters were used to develop a thermal model for the Cape Blossom Road:

TABLE 2 - KOTZEBUE CLIMATE DATA

Mean Annual Surface Temperature	28.4 °F
Sine Wave Amplitude	44.6 °F
Thaw Season Surface n-Factor	1.9 – 0.9
Freeze Season Surface n-Factor	0.9
Air Thawing Index (F-days)	2400 °F-days
Air Freezing Index (F-days)	6500 °F-days
Mean Annual Air Temp (F-deg)	20.76 °F
Amplitude of Air Temp Sine Wave	36.5 °F
Moisture Content	10% - 45%



Initial calculations determined subsurface thaw to be at depths of 5.0 – 7.0 ft. Numerous models were analyzed, with specifications of 8 ft to 12 ft embankments and moisture contents of 10% to 45%. An embankment height of 8 ft satisfies the minimum criteria for subsurface thaw consolidation and has a lower up-front project cost. Historically, it has been noted that in Arctic conditions with variable moisture contents and significant amounts of permafrost and ice lenses, a more conservative approach of installing a 10 ft embankment reduces the maintenance costs over the lifetime of the road.

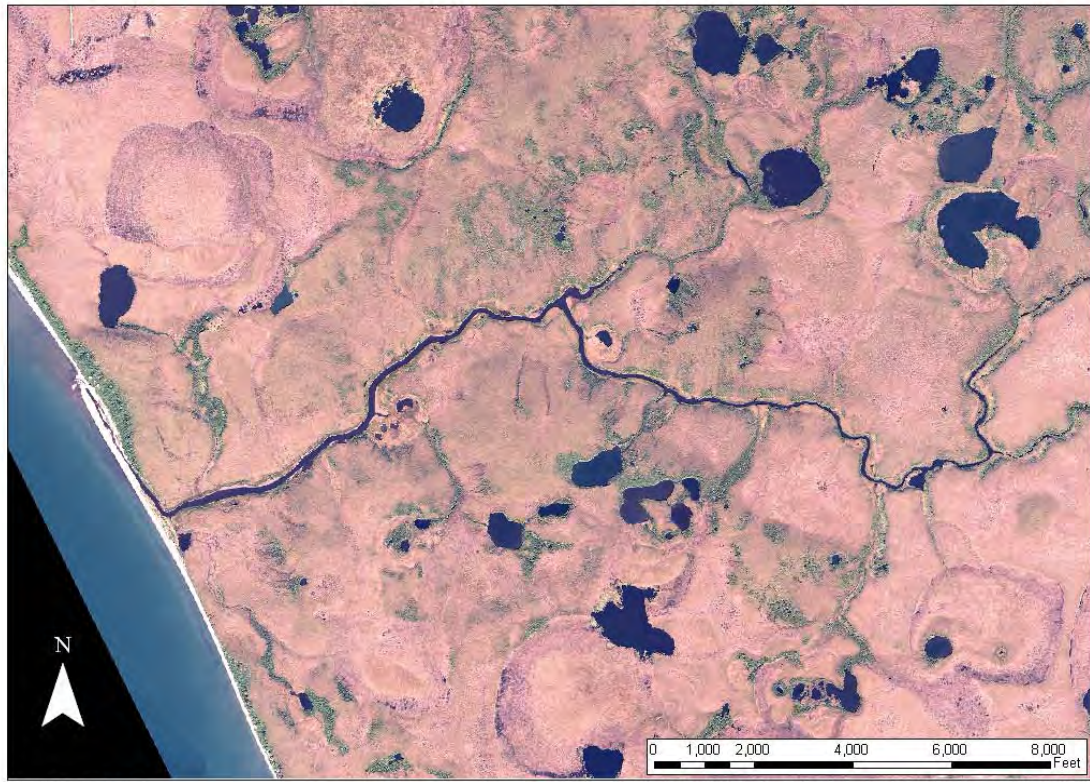
Precipitation was evaluated for use in developing drainage structure estimates and in evaluating Stormwater Pollution Prevention Plan needs. According to the University of Alaska, the mean precipitation for Kotzebue is 10.05 inches. The annual extreme precipitation amount is 14.76 inches (in 1990). The highest one day maximum precipitation for the area is 1.64 inches (in 1978).

Snowfall, in combination with wind, is evaluated to determine potential snow drifting effects a road may cause. The mean annual snowfall is 49.4 inches with a mean annual snow depth of 12 inches. The highest total annual snowfall for Kotzebue is 88 inches (in 1965), with a one day maximum of 19 inches in 1938. The wind in Kotzebue has been studied in the past at the Kotzebue Airport. A wind record was evaluated from 1945 to 1987 to establish wind trends in Kotzebue. The wind study indicates winds occur up to 18 mph from any directions, but stronger winds above 18mph come primarily from the Northeast and South. Wind data collection devices at the airport confirm that the predominant winds are from the North Northeast, and the South Southwest.

SADIE CREEK DRAINAGE

The Sadie Creek Drainage Area is estimated to be 35 square miles. Discharge for selected storm events was calculated in accordance with the procedures outlined by Curran, J.H., Meyer, D.F., and Tasker, G.D., (2003) for the Sadie Creek area. Table 3 summarizes calculated surface water discharges for various return periods. In the regression equation, **A** is the drainage basin area in square miles.





Sadie Creek

QuickBird Satellite Imagery - August 19, 2008

FIGURE 4 - SATELLITE IMAGE OF SADIE CREEK

TABLE 3 - SADIE CREEK ESTIMATED DISCHARGE FOR SELECTED RETURN PERIODS

Flood Event	Regression Equation	Discharge <i>Cubic Feet Per Second</i>	Average Standard Error of Prediction <i>Log Units</i>	Average Standard Error of Prediction <i>Percent</i>	Average Equivalent Years of Record
Q ₂	28.07 A ^{0.8916}	668.242	0.212	52	1.3
Q ₅	47.51 A ^{0.8691}	1044.082	0.204	50	1.5
Q ₁₀	61.00 A ^{0.8588}	1292.336	0.203	49	1.9
Q ₂₅	78.33 A ^{0.8486}	1600.384	0.205	50	2.5
Q ₅₀	91.29 A ^{0.8424}	1824.509	0.208	51	3.0
Q ₁₀₀	104.2 A ^{0.8370}	2042.926	0.211	52	3.3
Q ₂₀₀	117.1 A ^{0.8322}	2256.994	0.216	53	3.6
Q ₅₀₀	134.2 A ^{0.8266}	2535.591	0.223	55	3.9



Design storm rainfall totals are presented in the following chart.

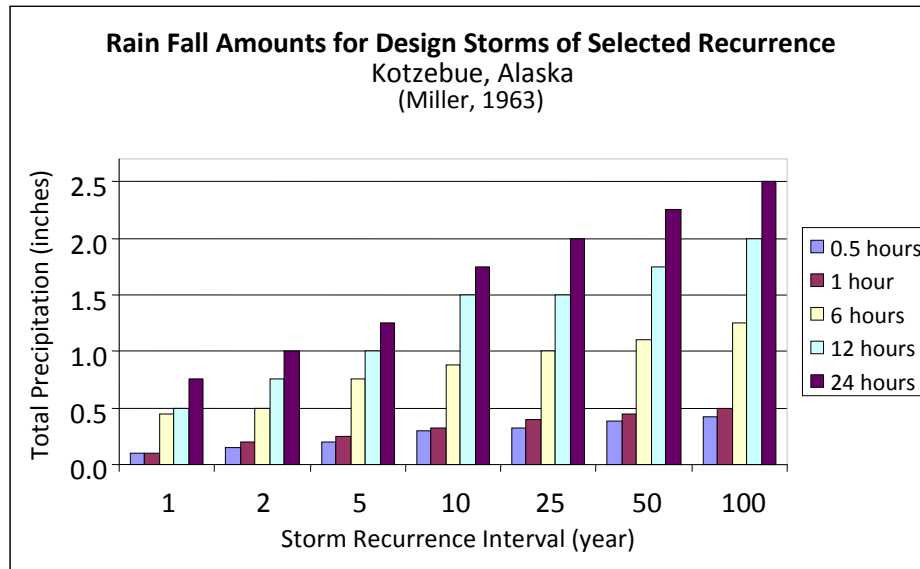


FIGURE 5 - RAIN FALL AMOUNTS FOR DESIGN STORMS OF SELECTED RECURRENCE

SOILS, GEOLOGY AND MATERIAL SOURCES

OVERVIEW

The following information was collected by R&M Consultants, Inc. for the *Kotzebue Airport Relocation Feasibility Study, October 2007*.

The Baldwin Peninsula is a narrow land feature, of about 150 to 175 square-miles, bounded on the west by Kotzebue Sound, off the Chukchi Sea, and on the east by Hotham Inlet. The peninsula is interpreted to be a terminal moraine, created at the end of a pre-Wisconsin glacial advance (e.g. Hamilton, 1994; and Huston et al., 1990). Currently, the peninsula is unglaciated and situated in the Kobuk-Selawik Lowlands physiographic division, characterized by rolling, lake-dotted lowlands with gently sloping hills to about 350 feet in elevation, surrounded by coastal, wave-cut bluffs and a narrow beach (Wahrhaftig, 1965). Surface drainage from the peninsula generally flows to the west, into Kotzebue Sound, following June Creek, Sadie Creek, Riley Creek and two or more other unnamed courses east of Cape Blossom. The peninsula's vegetation is generally moist to wet tundra (AEIDC, 1975).

The Upper Baldwin Peninsula is underlain by continuous permafrost (Brown et al., 1997) likely extending to depths of at least several hundred feet. The permafrost is considered shallow and contains significant volumes of ground ice, regardless of elevation or topography. The basis of this interpretation is the prevalent thermokarst terrain (e.g. thermokarst lakes, thaw sinks, thermo-erosional niches, beaded streams, thaw bulbs, and ice-wedge casts), and the massive ground ice forms visible in many of the coastal bluffs and indicated by polygon-patterned ground. The shallow permafrost also appears to be moderately warm (i.e., above about 28 to 30°F).



The surficial geology of the Upper Baldwin Peninsula is comprised of variable marine, estuarine, glaciomarine and glacial sediments, (e.g. Hamilton, 1994; and Krause, 1985), over Mid- to Late Tertiary sandstone, conglomerate and shale, early Tertiary volcanic rock, and Pre-Tertiary metamorphic rock (e.g. Decker et al., 1988; and Kirschner, 1994). There are no bedrock outcrops on the peninsula, and the depth of unconsolidated surficial deposits is unknown. A test well drilled at Kotzebue in the early 1950s to a depth of 326 feet did not encounter bedrock (Williams, 1970).

The surficial soil deposits can be grouped into six general units:

- **Estuary deposits** - consisting of the fine-grain silt and clays that eroded from the coastal bluffs, or were discharged from the Kobuk and Noatak Rivers. Around Kotzebue, such deposits are described as loose to medium dense, silt and organic silt.
- **Beach deposits** - sand and fine, rounded to subrounded gravel accumulated around portions of the Upper Peninsula. Likely comprised of materials eroded from the glacial till and glaciofluvial units exposed in the coastal bluffs, and then transported by long shore currents (notable spits have formed around the Upper Peninsula at Kotzebue, Pipe Spit and Nimiuk Point). These coarse-grained deposits, where present, are typically narrow and thin; although similar coarse-grained materials have been reported more than one-half mile offshore of Sadie Creek and Cape Blossom.



FIGURE 6 - MASSIVE ICE FORMS SEEN ALONG THE COASTLINE OF THE BALDWIN PENINSULA



- **Lagoon deposits** - generally consisting of soft organic-rich silts and fine sands, situated between the beach and coastal bluff (e.g. along east side of the Kotzebue Airport).
- **Upland silt** - away from the coast, this unit mantles the Upper Peninsula, consisting of very fine-grained, non- to moderately plastic silt, including eolian, colluvium and lake (lacustrine) deposits. Locally, this unit is up to greater than 90 feet thick and likely interspersed with amorphous and coarse organic matter (including buried layers of peat and wood from old forests). These types of soils are typically ice-rich, and very unstable and susceptible to rapid erosion when unfrozen.
- **Glaciofluvial deposits** – this course-grained unit has been observed as sporadic (discontinuous) thin sections in the coastal bluff around the peninsula, sandwiched between the upland silt and glacial till units. From limited observation, this unit also appears to contain some cobble and boulder sized materials.
- **Glacial till** - a heterogeneous mix of non to moderately plastic fine-grained glacial and reworked marine deposits. The Upper Baldwin Peninsula is cored by a glacial till. Based on very limited information, the top of the glacial till near Kotzebue may be above sea-level, but may occur deeper, below sea-level, near Sadie Creek and along the coast on either side of Cape Blossom.

EXISTING MATERIAL SOURCES

There are currently several existing material sources that have been used on the Baldwin Peninsula for past projects. Isaac Lake near the airport has been successfully used to extract gravel in the past, but recent operations have indicated that the usable gravel from the lake is becoming very limited. Nimiuk Point is a source of material that has been used for many construction projects in the past, most recently, the Kotzebue East Side Obstruction Removal Project which was completed in 2007. Nimiuk point is located on the east side of the Baldwin Peninsula, approximately 18 miles SE of Kotzebue (a distance of 25 miles by barge). The East Side Obstruction Removal Project required 310,000 tons of borrow material meeting Standard Airport Specifications. The material from Nimiuk Point was hauled using shallow draft barges due to the shallow water near Kotzebue. Beach material has also been used in the past for construction projects, but is limited in quantity and quality, and is not considered a reliable source for large capital works projects.





FIGURE 7 - MATERIAL SITE AT NIMIUK POINT

POTENTIAL MATERIAL SOURCES

Based on conceptual estimates 400,000 to 750,000 cubic yards of borrow material may be required for the construction of Cape Blossom Road. There are two general areas of interest on the Upper Baldwin Peninsula which may contain coarse-grained material suitable for forming new embankments and possible aggregate for pavements, including beach (and offshore) deposits near Cape Blossom, and the buried glaciofluvial deposits in the northeastern portion of the peninsula. Recent exploration offshore at Cape Blossom indicate near shore sediments are silts and sands, with very minor gravel. These soils are abundant, but poorly suited for embankment construction. Beach gravels are high-quality, meeting specification for crushed aggregate, but low fines content as well as small grainsize and restricted distribution reduce their attractiveness as a material source.

While no substantial exploration has been completed in the northeastern Baldwin Peninsula, this area may have the greatest potential for containing significant quantities of suitable borrow and aggregate on the Baldwin Peninsula. Recent test holes encountered significant thicknesses of gravel at depths of 20 to 60 feet below ground surface. Additional exploration is planned to further define these gravels. The few available samples from surface and test holes indicate this material is well-graded to poorly-graded gravel. Its suitability for aggregate products is uncertain due to variable Degradation values.



There are other known, or previously considered (by others) sites around the Kotzebue Sound region, which could be developed to provide borrow, aggregate and/or rock materials. Table 4 summarizes seven potential areas which may be found, subject to field exploration, to contain significant volumes of materials suitable for this project. The recent R&M report describing current conditions is provided in Appendix E.

TABLE 4 - POTENTIAL MATERIAL SOURCE AREAS, KOTZEBUE SOUND REGION

<i>Areas of Interest</i>	<i>Type of Materials Likely Present</i>	<i>Potential to Produce Significant Quantities</i>
Baldwin Peninsula		
1 Cape Blossom Beach	Sand, gravel and silt	Poor
2 Northeast Coast	Sand, gravel and silt	Poor (to High?)
Other Kotzebue Sound Areas		
3 Lower Noatak River	Sand, gravel and bedrock	High
4 Deering-Candle	Bedrock	High
5 Candle-Buckland	Bedrock	Moderate to High
6 Noorvik-Kiana	Sand, gravel and bedrock	High
7 Lower Baldwin Peninsula	Sand and gravel	Poor to Moderate

LAND STATUS

In October 2006, McClintock Land Associates, Inc. prepared the Kotzebue Airport Relocation Feasibility Study, Land Status Report for the DOT&PF. This report identified existing land interest, ownership of adjacent property, rights-of-way, and other land settlement agreements in the project area. The Land Status Report inventoried all ANCSA conveyance documents, U.S. Surveys, BLM and State Master Title Plats, recorded plats and subdivisions, agreements, leases, rights-of-way, 17(b) easements, and Native Allotment certifications for land actions within the project area. This information was used in the drafting of the preliminary alignments. A Land Status Report for the Baldwin Peninsula (prepared for the Airport Study) is located in Appendix D. A map describing land status is also shown in Appendix D. Additional information on Land Status is also described in the Environmental Overview section later in the report.

In general, acquiring the right-of-way (ROW) for a road to Cape Blossom would involve native corporation lands. There are two Native Corporations that hold the interest in the lands needed for a ROW to a deep water port at Cape Blossom. The Kikiktagruk Inupiat Corporation (KIC) holds the surface estate to both patented and interim conveyed lands that could potentially be impacted by this project. The NANA Regional Corporation holds the subsurface estate to both patented and interim conveyed lands that could be impacted by the project. NANA also holds the surface and subsurface estate to certain patented lands on the peninsula that could be impacted by the project.



The native allotments in the area can generally be avoided, and do not impact road alignments. Native Allotments may be impacted in the vicinity of the deep water port, but until more details are developed on the feasibility of the deep water port site, the exact location is undetermined. There is both corporation land and native allotments in the vicinity of the deep water port. The Land Status Map, as well as the Land Status Report in Appendix D describes the allotments.

There are two 17(b) Easements (25 foot trail easements) that could be impacted by a road to Cape Blossom: the Trail to Buckland (EIN 12, D1) and the Trail to Noorvik (EIN 8, D1, and D9). The uses allowed on these 25 foot trail easements are travel by foot, dogsled, animals, snowmobiles, two and three wheeled vehicles, and small all terrain vehicles (less than 3000lbs GVW). The season of use is limited to winter. If an all season road is constructed to Cape Blossom, considerations of the road impacts should be included in the environmental process and engineering of the road. Trail crossings and road access will need to be considered. 17(b) Easements are shown on the land status map in Appendix D.

The Kotzebue Electric Association (KEA) has a lease from KIC for a windmill farm (tract 1) that is approximately 3 miles from Kotzebue (Map 5 in Appendix B shows the lease boundaries). An existing road runs from Kotzebue’s Ted Steven’s Way via Hillside Road through the windmill farm, and this existing road would make for an economical starting point for a road to Cape Blossom, if this option is evaluated only based on road length. The ROW of the existing road should be evaluated in the next phase of this project to determine ROW width and if the ROW will be sufficient for the project.

ROW REQUIREMENTS

For the purposes of future development and planning a road to Cape Blossom, this study assumes a 300 foot wide ROW would be acquired to facilitate the commercial activities that are anticipated as a result of the road. Additional ROW will also be required at the Deep Water Port. But until more work is done developing the deep water port concept, the ROW cannot be estimated at this time. Below is a table listing the road ROW acreages for the most direct routes to Cape Blossom.

TABLE 5 - RIGHT OF WAY ACREAGE REQUIREMENTS FOR MOST DIRECT ROUTES

		Route ‘A’ Segments ACFIJ	Route ‘B’ Segments BCFIJ	Route ‘D’ Segments DHIJ	Route ‘E’ Segments EJ
<i>Road Length</i>	Miles	11.2	10.5	12.7	20.3
<i>Right Of Way Needed</i>	Acres	312.7	381.8	461.8	738.2



ENVIRONMENTAL OVERVIEW

The Kotzebue to Cape Blossom road is intended to provide access to a proposed deep water port at Cape Blossom. Having a deep water port near Kotzebue, the regional hub, would promote economic growth and reduce the costs for fuel and commodities in the NWAB. In addition, the proposed road would provide safer and more efficient access to recreational and subsistence use areas, ANCSA 14(c) campsites and Native allotments, as well as facilitate future opportunities for development and community expansion for residents of Kotzebue.

Although the proposed project would provide benefits for the region's residents, it is understood that it must be constructed and maintained in a manner protective of public health and cultural interests. This environmental overview provides an aid to identifying studies that may be required during the environmental process, and encourages public involvement in the eventual selection of a preferred road route.

The Baldwin Peninsula was recently studied during the Kotzebue Airport Relocation Feasibility investigation performed in 2006 and 2007 by PDC, Inc. for the DOT&PF (Airport Study). The Airport Study conducted and summarized preliminary research on selected environmental impact categories, including: Air Quality, Coastal Resources, Compatible Land Use, Construction Impacts, Section 4f; Farmlands; Fish and Wildlife; Threatened and Endangered Species; Floodplains; Hazardous Materials; Historical, Architectural, Archaeological and Cultural Resources; Light Emissions and Visual Impacts; Natural Resources and Energy Supply; Noise; Water Quality; Wetlands; and Wild and Scenic Rivers.

AIR QUALITY

The Airport Study identifies Kotzebue as not currently being located in an air quality Non-Attainment Area as defined by 18 AAC 50.030, and as described in 40 C.F.R. 81. Kotzebue had been found to exceed federal 24-hour PM_{10} ambient air quality standards during monitoring which took place between 2002 and 2004. This monitoring program is described in a report authored by Sierra Research, Inc. entitled "*Alaska Rural Dust Control Alternatives.*" Five PM_{10} monitoring stations were set up for this study. Four of five referenced monitoring stations were set up at a busy, unpaved roadway, and the fifth was set away from the roadway, but still within the community.

How PM_{10} air quality standards would be affected by a road to Cape Blossom is uncertain. At this time there are no residences or commercial developments along the proposed road alignment options. Airborne particulates caused by temporary construction activities and affecting ambient air quality would be mitigated by watering. Eventually, the completed road could potentially be maintained by the City of Kotzebue, and long term dust issues would need to be addressed in a maintenance agreement with the city.



COASTAL RESOURCES

The proposed road project lies within the NWAB Coastal Zone District Boundary. The DOT&PF will design the proposed road to be compatible with subsistence use areas, and to allow for the free passage and movement of fish and wildlife with due consideration of historic, migratory patterns. It is recognized that the southern portion of Kotzebue Lagoon supports concentrations of waterfowl during the spring and fall migrations, and that the area under consideration for the proposed deep water port is recognized to seasonally support nesting waterfowl. These two areas are listed as “Sensitive Use Areas”, as defined in the Borough Comprehensive Plan, AS 46.40.030. Coastal resource issues will be addressed by coordination with the NWAB as outlined in the NWAB Coastal Management Plan, and with ADNR, ADF&G and USFWS during the environmental process. Local and Traditional Knowledge will also be incorporated into evaluations of these areas to fully capture any potential impact concerns.

COMPATIBLE LAND USE

The Airport Study identifies the following, potential land use conflicts that could apply to a road to Cape Blossom, and that will need to be resolved as part of the environmental process for a road project:

- Subsistence activities;
- ANCSA 17(b) trail easements, Native Allotments, and ANCSA 14(c) campsites;
- nesting and habitat areas for migratory birds and other wildlife;
- current and future landfill operation and development;
- windmill farm operation;
- cemeteries;
- community potable water sources;
- community expansion and development; and,
- existing and future airport development and operation.

SUBSISTENCE ACTIVITIES

Subsistence gathering, hunting and fishing occur throughout the Baldwin Peninsula. Specific, important areas will be addressed in a future environmental document, but it may be assumed that subsistence activities may occur anywhere in proximity to a new road to Cape Blossom. Such a road would certainly facilitate easier access to existing gathering, hunting and fishing areas, and consequently may encourage their greater overall use.

The NWAB Planning Commission would likely consider the proposed road to Cape Blossom as “Related to Community Service”. This land use area designation is required before any permits are issued for the development of a transportation corridor as required by the Borough Management Plan (Title 9, Article VIII, Section 9.28.220). The Borough’s Planning Commission has also indicated that the proposed port area would be re-zoned as a “Resource Development District” to facilitate its development. Land use



issues associated with the project will be addressed by, and coordinated with, the Borough Planning Commission during the environmental process. Additionally, the proposed road will be designed and constructed to be compliant with the NWAB Coastal Management Plan.

ANCSA 17(B) TRAIL EASEMENTS

ANCSA 17(b) trail easements will likely be intersected by a road to Cape Blossom. The DOT&PF will design the proposed road to incorporate crossings where trail intersections occur.

Proposed road routes to the east of Kotzebue Lagoon would cross two 17(b) trail easements, EIN 8 (the trail to Buckland) and EIN 12 (the trail to Noorvik). Both EIN 8 and EIN 12 are designated twenty-five foot wide easements. Twenty-five foot easements restrict allowable uses to travel by foot, dogsled, animals, snowmobiles, two and three wheeled vehicles, and small all-terrain vehicles (less than 3000 lbs. gross vehicle weight). In addition, use is limited to the winter season.

An alternative road route to the south, along the coastline, could possibly encounter 17(b) trail easements EIN 15 and EIN 53. These two easements are designated as sixty feet in width. A sixty foot wide trail easement broadens the range of travel modes allowed to include, in addition to modes listed for twenty-five foot easements, larger all-terrain vehicles (greater than 3,000 lbs. gross vehicle weight), tracked vehicles, four-wheel-drive vehicles, automobiles and trucks. Additionally, there are no seasonal restrictions on use.

NATIVE ALLOTMENTS

Native Allotments occur throughout the Baldwin Peninsula but are concentrated primarily along coastal areas. All potential road alignment options can avoid Native Allotments excepting, possibly, those parcels located directly at the proposed Cape Blossom Deep Water Port site. While there is one potential alignment that may avoid all allotments near one port site option, not enough data yet exists on potential port locations to consider that routing a viable option. Until sufficient bathymetric and other port site data is acquired, the probability of avoiding Native Allotments near any future, proposed facility remains unknown.

SOLID WASTE LANDFILL

The City of Kotzebue operates a solid waste landfill located approximately 3 miles south of the city. The City recognizes the need to plan for a new landfill for future use, though an alternative location has not been selected at this time. The future landfill site is not anticipated to be affected by the road alignment options, however the City Manager's site selection process would benefit from the proposed road. Expanding the available road system to Cape Blossom will allow consideration of additional, prospective landfill sites that are currently inaccessible.

WINDMILL FARM

An electrical power generating windmill farm is located approximately 4 miles south of the City of Kotzebue. The windmill farm is operated by the Kotzebue Electric Association (KEA) on land leased from KIC. The windmill farm consists of ten, 50-kilowatt wind turbines and their associated, on-site infrastructure, which are operated to supplement the electrical needs of Kotzebue.



An existing road leads from the City of Kotzebue to the windmill farm. The terminus of this existing road is proposed as the starting point of the shortest road alignment option considered for this project (Map 5 in Appendix B). KEA has expressed concerns that increased vehicular traffic on this road may compromise public safety and security at the windmill farm. The DOT&PF will need to address KEA's concerns regarding this proposed road option.

It is possible that perimeter fencing around the windmill farm would be sufficient to alleviate KEA's concerns. It may also bear out that extending the windmill farm road will allow travelers an opportunity to continue on to more remote recreational and subsistence areas, such as Sadie Creek, thereby relieving vehicle and pedestrian congestion, and their associated risks, at its current terminus.



FIGURE 8 - KEA WINDMILL FARM

CEMETERIES

Two cemeteries are located in Kotzebue; one in town, and a second on the hillside to the east of Kotzebue Lagoon. The proposed routes to Cape Blossom are sufficiently distant from the cemeteries that no impacts are anticipated. As part of any future, environmental documentation process, additional studies will be conducted to ensure these cemeteries are not negatively impacted. One positive impact of a new road to Cape Blossom would be that the City of Kotzebue Planning Commission, which has recognized a need for a new cemetery, will be able to consider additional, prospective cemetery sites along the route.



MUNICIPAL WATER SOURCES

The City of Kotzebue currently obtains potable drinking water from a surface water source at Devil's Lake. VORTAC Lake previously supplied water for the city, but the pump at that location is currently inoperable. Water has been pumped from these two lakes into pipelines connecting to a treatment plant, where the product is filtered, disinfected, and transferred to storage tanks for distribution throughout the community.

The DOT&PF will design, construct, and maintain the new road to be protective of the watershed areas of Devil's Lake and VORTAC Lake. The proposed routes are sufficiently distant from both source lakes that no impacts to their respective watersheds are anticipated. Additionally, the City of Kotzebue is in the process of securing funds to complete municipal groundwater wells. The proposed road is not anticipated to affect groundwater recharge areas or groundwater aquifers. However, additional studies may be required during the environmental process to fully confirm that a road to Cape Blossom does not compromise the safety or integrity of community potable water sources.

COMMUNITY DEVELOPMENT

New expansion and community developments for the City of Kotzebue are greatly hindered by the lack of suitable building lots remaining within the city's core area. Limitations on economic growth due to constraints on available housing and commercial areas are addressed in the *City of Kotzebue Comprehensive Plan; Adopted December 07, 2000*.

The City of Kotzebue has developed community expansion plans focusing on areas to its southwest and southeast. These plans are incorporated in the *City of Kotzebue Comprehensive Plan*. A road to Cape Blossom may influence future city expansion plans and, in community meetings, future expansion of the city was discussed as a component of the need for this project. The community would like to expand its current residential and commercial property to areas located at higher elevations due to uncertainties of reported climate change, and potential for associated sea level increases. A road to Cape Blossom may provide feasible access to valuable residential and commercial-use expansion areas.

A master plan is currently being developed to address a potential airport relocation project. Criteria for determining a suitable airport site may be affected by potential road alignments, particularly if road alignment locations interfere with the airport relocation options. The existing airport location should also be considered during route selection due to the currently restricted road access through airport property. Due to safety and security concerns, access to a Cape Blossom road from the community will require the use of Ted Steven's Way and the BIA road, avoiding the integration of existing roads through airport property.

ANCSA 14(c) CAMPSITES

ANCSA 14(c) campsites are present throughout the coastal areas near Kotzebue. Project road alignment options are not anticipated to impact these campsites directly, however, easier access to some campsites may be an indirect effect of any selected road option leading to Cape Blossom.



CONSTRUCTION IMPACTS

Typical construction impacts for a road would be short term. Water and Air Quality impacts would be addressed in the Erosion and Sediment Control Plan developed during the design process. The one major drainage in the area, Sadie Creek, would require special consideration to ensure minimal water quality impacts at this location. Another short term construction impact is noise. Since the road alignment options are well south of the community, noise is anticipated to have minimal impact on existing receptors.

SECTION 4F

As described in the Airport Study, no publicly owned parks, recreation areas, wildlife refuges, or any publically or privately owned historical sites, are known to be in the vicinity of potential Cape Blossom road alignment options.

HISTORIC AND ARCHAEOLOGICAL

During the Airport Study, a report was prepared by Northern Land Use Research, Inc. that evaluated the greater Baldwin Peninsula. Due to confidentiality of archaeological site location information, that report is not included in the appendices of this document. The Baldwin Peninsula does contain known, and has potential for discovery of unknown cultural resources. Preliminary design work and environmental investigations will be conducted in a manner that ensures potential project impacts to cultural resources are identified and mitigated.

WATER QUALITY

Construction of a road to Cape Blossom has the potential to cause sediment laden runoff to enter waterways. In order to prevent this, any Contractor constructing the project will be required to develop an Erosion Sediment Control Plan that addresses both non-point sources of storm water runoff and potential runoff pollutants such as fuel and hazardous materials staged at storage areas. Addressing storm water runoff should begin during preliminary design work and environmental investigations, with an emphasis on Sadie Creek Crossing and the coastal areas near Cape Blossom. During construction, the Contractor will be required to hold an approved Storm Water Pollution Prevention Plan that addresses water quality issues for the project.

WETLANDS

The Airport Study evaluated wetlands within the Baldwin Peninsula by using aerial photography, National Wetlands Inventory Maps, and performing a reconnaissance over-flight of the area. The resulting report is included in Appendix C. The majority of the Baldwin Peninsula is considered wetlands. Construction of a road to Cape Blossom would require a U.S. Army Corps of Engineers permit in order to place fill, or excavate, in wetlands. High value wetlands are anticipated to be present in the vicinity of Sadie Creek and Cape Blossom. The report also anticipates high value wetlands will be



present further southeast of Cape Blossom. An order-of-magnitude estimate of wetlands fill required for this project is included as Table 6. A 30% contingency factor was applied in calculating these project footprints due to the unknowns in topography, and lack of survey data at this point in the study.

TABLE 6 - WETLANDS FILL ACREAGE REQUIREMENTS FOR MOST DIRECT ROUTES

		Route 'A' Segments ACFIJ	Route 'B' Segments BCFIJ	Route 'D' Segments DHIJ	Route 'E' Segments EJ
<i>Road Length</i>	Miles	11.2	10.5	12.7	20.3
<i>Approx. Wetlands Fill Footprint Two Lane Road</i>	Acres	104	126	152	243
<i>Approx. Wetlands Fill Footprint Single Lane Road</i>	Acres	87	107	123	205

FISH AND WILDLIFE

The Airport Study describes preliminary estimates of fish and wildlife resources on the Baldwin Peninsula. No anadromous fish streams are reported as cataloged for the project area according to the Alaska Department of Fish and Game’s “Atlas to the Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes” publication. Terrestrial wildlife species that the project area was reported to support include caribou, moose, brown bear, and small mammals such as Arctic ground squirrels, snowshoe hares, red fox, river otters, lemmings and voles. Year round bird species noted as frequenting the project area include the Common raven and ptarmigan. Migratory birds seasonally inhabiting the project area include numerous species of waterfowl (geese, ducks, mergansers and swans), shorebirds and neo-tropical songbirds. Sadie Creek has been identified as supporting populations of breeding water birds including loons, waterfowl,, and seabirds such as various gulls and Arctic Terns. Breeding Tundra Swans have been documented in the lakes within the project area.

While no federally-listed Threatened or Endangered wildlife species are likely to inhabit, or be directly impacted by, the project, there has recently been a sweeping designation of Critical Habitat throughout the project area for federally-listed, Threatened polar bears. This Critical Habitat designation will require conscientious consultations with, and possibly project permitting by, the U.S. Fish and Wildlife Service. More detailed discussions on potential project fish and wildlife issues and a recent Technical Memorandum on polar bear Critical Habitat produced for another project near Kotzebue, can be found in Appendix C.



ENVIRONMENTAL IMPACT CATEGORIES NOT ADDRESSED IN DETAIL

Farmlands, Noise, Environmental Justice, Floodplains, and Natural Resources impacts have not been addressed in this report, though will be fully addressed during the formal environmental process for the project.

ANTICIPATED PERMITS

The following is a list of anticipated permits and permitting agencies for this project:

- **U.S. Army Corp of Engineers Section 404 Permit – Wetlands Fill**
Construction of the road will fill and/or excavate wetlands, and will require this permit.
- **State of Alaska, Department of Natural Resources, Division of Coastal Management - Coastal Project Questionnaire and Consistency Determination**
The Kotzebue to Cape Blossom Road Project is within the NWAB Coastal Management Zone as defined by the Alaska Department of Natural Resources, and will require this application and action.
- **Northwest Arctic Borough Title 9 – Zoning and Land Use**
All projects within the Northwest Arctic Borough require this application.
- **U.S. Fish and Wildlife Service Section 10 (ESA) Incidental Take Permit**
Required for activities where a federally-listed species (i.e., polar bears) may be adversely affected by construction activities such as damage to, or losses of, designated Critical Habitat.



ROAD DESIGN

DESIGN CRITERIA

Using AASHTO's Guidelines for Geometric Design of Very Low-Volume Local Roads ($ADT \leq 400$), the road to Cape Blossom would be classified as a rural industrial/commercial access road. The design traffic volume would be 100 vehicles per day or less, with a design speed of 30 mph. A road grade of 6% or less is recommended for roads with low-speed vehicle operation. The dimensions used for a two-lane or single-lane are shown in the table below.

TABLE 7 – ROAD DIMENSIONS

Roadway Surface	Unpaved
Roadway Width (Including Shoulders)	24'
Bridge Width	27'
Minimum Embankment Height	8'
Road Side Slopes	3:1
24" Culverts	5 per mile
Separation Geotextile	84'

The typical section for this project would consist of a minimum of 8' embankment at centerline. Although this amount of fill will not necessarily eliminate road settlement issues related to subsurface thawing, it will allow the subsurface to remain reasonably frozen, and maintenance levels would be acceptable for a gravel road constructed in this region. The typical section for a two lane road would be 24' wide, and the typical section in areas found to have significant snow drifting problems, a 4:1 side slope is recommended. A minimum of 3:1 slopes are recommended for the road for embankment stability and driver safety.

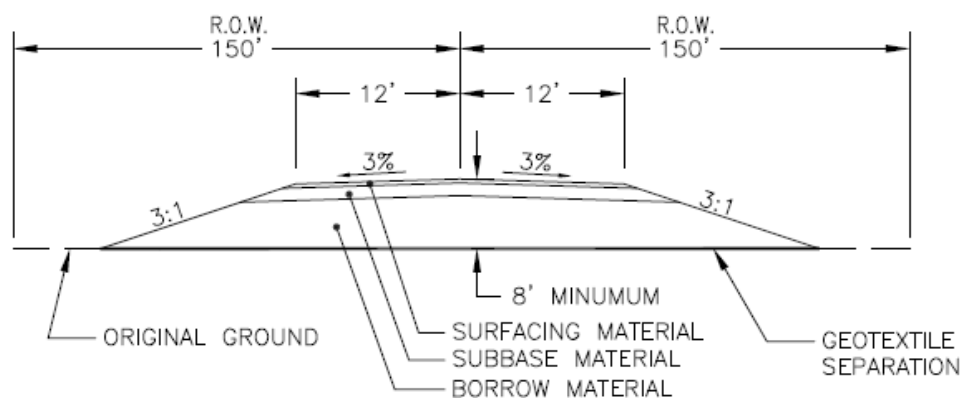


Figure 9 - Recommended Typical Section



Due to the uncertainty of finding a suitable borrow site for gravel fill material, use of dredged ocean bottom material has been explored. This is fine grained silty material and is generally not suitable for roadway embankment however a few successful projects have used a silt embankment. In order to construct a road with this material, the material would be placed and compacted and then allowed to settle for multiple years before final construction of the roadway surface. The advantage to using dredged material is its relative low cost compared to barging in gravel material if no local gravel source is available, however the construction process will extend the time before a usable roadway is finished.



FIGURE 10 - CONSTRUCTION OF A SILT EMBANKMENT AT ALAKANUK AIRPORT (SEPT. 2008)

A road to Cape Blossom is anticipated to be designed for vehicle traffic to and from Cape Blossom for both commercial and recreational uses. Large hauling vehicles to haul cargo and fuel would utilize the road potentially year round, if bulk fuel storage was available at Cape Blossom. Recreational travel would potentially occur year round as well, to access private landholdings along the coastline. Current vehicles in Kotzebue include cars, pick-up trucks, fuel hauling vehicles, and maintenance vehicles. Future design work would include identifying a vehicle inventory for the community, and specific vehicles that may be used for transporting cargo and supplies to Kotzebue from a Deep Water Port at Cape Blossom.





Figure 11 - Typical Industrial Haul Road, Northwest Alaska

PRELIMINARY ALIGNMENTS OPTIONS

In order to develop preliminary alignments of the Kotzebue to Cape Blossom road, the 1981 Kotzebue to Chicago Creek Reconnaissance Study was revisited. The alignments proposed in the 1981 report were overlaid on top of a USGS topographic map (see Map 1, Appendix B). The results showed portions of the alignments interfering with recent development in Kotzebue, passing through native allotments, and did not address any hydrology issues. The 1981 alternate alignments were adjusted with the aid of the 2006 land status map from McClintock Land Associates, mosaic orthographic imagery from September 2004 to August 2006, and USGS 5-meter elevation data. Other considerations were also addressed in the revised preliminary alignments, such as: the starting point for the routes, utilizing the existing road to the windmill farm; crossing Sadie Creek; and the option to take a longer more elevated route. The adjusted preliminary alignments are mapped in black on the USGS topographic map along with the native allotments (see Map 2, Appendix B).

The preliminary routes are broken into segments to allow for a cost analysis of the different alternatives (see Map 3, Appendix B). Segment 'A' shows the existing 2.3 mile road from the New Hillside Road to the windmill farm and is not included in construction costs. Segment 'B' would construct a new 1.9 mile road beginning from New Hillside Road and ending at the windmill farm. Segment 'D' and 'E' begin at Ted Steven's Way and follow the higher elevations of the Baldwin Peninsula. The beginning segments of all the preliminary alignments are shown on Map 4, Appendix B. Map 5 in Appendix B shows how Segments 'A', 'B', and 'C' interact with the existing road through the windmill farm.



A close-up of Sadie Creek is shown on Map 6 in Appendix B. A drainage structure will be required to pass a road over Sadie Creek. Two options are examined in the preliminary alignments. Segment 'F' passes over a single wide section of the creek, while Segment 'H' passes over two narrower sections of the creek. Distances of the most direct routes starting from Routes 'A', 'B', 'D', and 'E' are shown in the table below.

TABLE 8 - LENGTH OF MOST DIRECT ROUTES

	<i>Miles</i>
Route 'A' – ACFIJ	11.2
Route 'B' – BCFIJ	10.5
Route 'D' – DHIJ	12.7
Route 'E' – EJ	20.3

DRAINAGE STRUCTURES

Drainage structures such as culverts will be required throughout a proposed road to Cape Blossom to ensure continuous drainage across the road, and to equalize drainage areas where needed.

Based on a reconnaissance field visit, the crossing of Sadie Creek will require a bridge. Depending on the route selected, either one or two bridges would be needed. A crossing on segment "F" would require a single 420 foot bridge. A crossing on segment "H" would cross two branches of Sadie Creek and would require one 100 foot bridge and one 220 foot bridge. These lengths are initial estimates based on limited information and will require further field study to refine. A reconnaissance report further detailing bridge requirements is attached as Appendix E.

No fish studies have been performed for Sadie Creek or other drainages, although local conversations indicate that fish do occur in lower portions of Sadie Creek.

ICE ROADS

An alternative option to constructing a conventional embankment fill road would be to construct seasonal ice roads from the deep water port at Cape Blossom to haul materials and supplies to Kotzebue. The grades of all of the alignments could accommodate an ice road, although special considerations would have to be made for drainage crossings, especially Sadie Creek. The advantage to an ice road is that there is less immediate cost to construct than a fill embankment. The cost of constructing ice roads year after year, and the maintenance of the ice roads would add up over time, and more studies would be needed to evaluate these costs. The Community would also not have all season access to the deep water port, which would require a large storage facility for the barging season, until an ice road could be built to ship the supplies to Kotzebue. The disadvantages of an ice road are the short season that is available for ice road construction and use, the continued cost of ice road maintenance and to construct ice roads each year; specialized equipment and training required to construct ice roads, and the increased cost of operating equipment in the wintertime, versus a summer all season operation.



Ice roads are regularly used by the oil and gas industry on the North Slope and Foothills regions of Alaska as well as by the Canadian Northwest Territories Department of Transportation. Ice roads are also occasionally constructed for conducting a winter haul of material as part of DOT&PF construction projects. Due to the variation in geographic location, climate and design loads of past ice roads, the cost for construction vary greatly and would be hard to predict without further study. Construction costs and the length of time the ice road could be available to traffic would also vary from year to year depending on seasonal temperatures.

In order to pursue the ice road options, additional studies would be required to evaluate potential water sources for ice road construction, including bathymetric and ice surveys and fish studies. Permitting Agencies would include the Department of Natural Resources, Army Corp of Engineers, the Department of Coastal Ocean Management, and the Department of Fish and Game. Other agencies may be required depending on the alignment and water source used.

CONSTRUCTION THROUGH INNOVATIVE READINESS TRAINING

It is possible that a road to Cape Blossom could be constructed through the U.S. Military's Innovative Readiness Training (IRT) program. This is a program managed by the Office of the Assistant Secretary of Defense, Reserve Affairs through which state or local agencies can request military support for various activities including construction projects. In order for a project to be considered under this program, it must a) consist to activities which support the assigned military unit's readiness training requirements, b) not endorse or favor any non-governmental entity, and c) have obtained certification of non-competition with other available public or private sector service organizations. Further coordination with the Office of the Assistant Secretary of Defense would be required to determine how construction under the IRT program would affect design and scheduling of the project.



COST ESTIMATES

There are two major variables in the cost of this project: 1) the typical section selected and 2) the availability of a local material source. A variation in the roadway embankment height or side slope will have a direct effect on the volume of material required and thus a proportional impact on the overall cost. Initial estimates based on past projects show that if a local material source is available, construction costs would be less than half of those if material must be barged in.

Estimated costs in this report are for construction only and do not include construction engineering or State overhead costs.

COST VARIATION DUE TO CHANGES IN TYPICAL SECTION

There are three variables associated with the typical section which greatly affect cost.

Roadway Width. A roadway width of 24 feet has been selected as the minimum desirable for this type of road. Increasing the width would provide an additional safety factor but is not required based on the very low traffic volumes anticipated. A narrower road could be constructed as a single lane road with turnouts in order to allow passing. A 16 foot road with turnouts would cost 80% to 90% that of the 24 foot road.

Embankment Side Slope. The recommended side slope for this road is 3:1. This slope is considered traversable and would not present additional hazard to drivers. An alternative to save money would be to steepen the slope to 2:1. This would reduce the material required by between 15% and 20% depending on embankment height.

Embankment Height. The selected embankment height must be high enough to minimize snow drifting and thaw of permafrost under the embankment but must be balanced with the added cost for higher embankment. The minimum embankment height that was considered is 6 feet. This is high enough to minimize potential snow drifting and would provide some thermal protection for the permafrost. However similar roads on the North Slope have required significant annual maintenance to repair settlement due to thaw action. An embankment height of 8 feet satisfies the minimum criteria for subsurface thaw consolidation. Historically, it has been noted that in Arctic conditions with variable moisture contents and significant amounts of permafrost and ice lenses, a more conservative approach of installing a 10 foot embankment reduces the maintenance costs over the lifetime of the road. For this road the recommended embankment height is 8 feet.



The table 9 shows how changing side slope and embankment height affects the amount of fill material required.

TABLE 9 – CUBIC YARDS OF MATERIAL PER MILE

Side Slope	Embankment Height		
	6'	8'	10'
3:1	49,000	75,000	105,500
2:1	42,000	62,500	86,000

COST VARIATION DUE MATERIAL SOURCES AVAILABLE

Due to the limited borrow material on the Baldwin Peninsula, the cost of the road will be highly dependent on where the material comes from. Three possible methods for construction have been identified 1) identify and use a local borrow material site, 2) barge borrow material in from elsewhere in the region and 3) dredge sea bottom material from the Cape Blossom port site. Based on past cost estimates, it will likely cost over twice as much to barge material rather than use a local source.

For these three material sources, estimated costs for construction are shown in Table 10. Costs shown include the cost of embankment, geotextile separation, culverts and bridges plus \$5 million for in mobilization, surveying and other costs.

TABLE 10 – ESTIMATED COSTS BASED ON MATERIAL SOURCE (8' EMBANKMENT, 3:1 SIDE SLOPES)

	Route "A" Segments ACFIJ	Route "B" Segments BCFIJ	Route "D" Segments DHIJ	Route "E" Segments EJ
Total Length (miles)	11.2	10.5	12.7	20.3
Local Borrow Material	\$ 48,300,000	\$ 50,600,000	\$ 57,600,000	\$ 81,900,000
Barged Borrow Material	\$ 130,600,000	\$ 141,800,000	\$ 168,100,000	\$ 258,600,000
Dredged Borrow Material	\$ 44,400,000	\$ 46,000,000	\$ 51,600,000	\$ 71,000,000

These costs are for the recommended typical section. One option which would save on construction costs would be to build using an 8 foot embankment with 2:1 side slopes as described under the discussion on typical sections. Table 11 is identical to Table 10 but using the smaller typical section.

TABLE 11 – ESTIMATED COSTS BASED ON MATERIAL SOURCE (6' EMBANKMENT, 2:1 SIDE SLOPES)

	Route "A" Segments ACFIJ	Route "B" Segments BCFIJ	Route "D" Segments DHIJ	Route "E" Segments EJ
Total Length (miles)	11.2	10.5	12.7	20.3
Local Borrow Material	\$ 35,300,000	\$ 36,300,000	\$ 40,200,000	\$ 54,000,000
Barged Borrow Material	\$ 80,300,000	\$ 86,200,000	\$ 100,800,000	\$ 150,900,000
Dredged Borrow Material	\$ 34,300,000	\$ 35,000,000	\$ 38,200,000	\$ 49,700,000



PROJECT PHASING

This construction of this road has the potential to be constructed in phases based on when funding becomes available. In addition to funding, the breakdown of phases would depend on local material availability, logical termini and project time frames. Based on the recommended route 'A', there are two easily identifiable logical termini: Sadie Creek and the end of the existing road to the KEA windmill farm.

PHASED OPTION 1: CONSTRUCT TO SADIE CREEK

An option for a phased project would be to construct up to Sadie Creek. This option would be 4.6 miles long and include improving the existing road in segment 'A' as well as construction of segments 'C' and 'F' up to Sadie Creek. Table 12 shows the estimate costs for this option using the recommended typical section as well as a minimized typical section. Costs shown include the cost of embankment, geotextile separation, culverts plus \$1.5 million for in mobilization, surveying and other costs.

TABLE 12 – ESTIMATED COSTS FOR CONSTRUCTION TO SADIE CREEK

	8' embankment 3:1 side slopes	6' embankment 2:1 side slopes
Local Borrow Material	\$ 17,300,000	\$ 13,300,000
Barged Borrow Material	\$ 41,900,000	\$ 26,800,000
Dredged Borrow Material	\$ 17,500,000	\$ 14,400,000

PHASED OPTION 2: IMPROVE EXISTING ROAD

An option for a phased project would be to improve existing 2.7 miles of road from Ted Steven Way out to where it ends at the KEA Windmill Farm. This option would be less expensive than constructing to Sadie Creek and would provide a logical termi for the road. Costs shown include the cost of embankment, geotextile separation, culverts and \$1.5 million for in mobilization.

TABLE 13 – ESTIMATED COSTS FOR CONSTRUCTION TO WINDMILL FARM

	8' embankment 3:1 side slopes	6' embankment 2:1 side slopes
Local Borrow Material	\$ 6,400,000	\$ 5,100,000
Barged Borrow Material	\$ 14,200,000	\$ 9,300,000
Dredged Borrow Material	\$ 5,800,000	\$ 4,800,000



COST FOR INNOVATIVE READINESS TRAINING CONSTRUCTION

If this project is constructed under the military’s IRT program, the cost of construction would be reduced because labor costs could be excluded. Table 14 shows estimated costs for construction as an IRT program. This estimate includes material costs only and assumes a local borrow source is available with only surface course being barged in. A royalty of \$5 per ton of local borrow is assumed.

TABLE 14 – ESTIMATED COSTS FOR IRT CONSTRUCTION

	Route “A” Segments ACFIJ	Route “B” Segments BCFIJ	Route “D” Segments DHIJ	Route “E” Segments EJ	To Sadie Creek
8’ embankment 3:1 side slopes	\$ 21,200,000	\$ 21,600,000	\$ 23,400,000	\$ 30,200,000	\$ 5,300,000
6’ embankment 2:1 side slopes	\$ 16,900,000	\$ 16,896,624	\$ 17,700,000	\$ 21,100,000	\$ 4,000,000



RECOMMENDED STUDIES FOR DESIGN

SPRING BREAK-UP STUDIES

Limited data exists for Sadie Creek and spring break-up, as well as several smaller drainages in the region. Spring break-up data will be needed for developing bridge and drainage structure designs. A hydrology study would be useful for any future environmental and design work for a future project. The estimated cost for a hydrology study for this project is \$300,000.

GEOTECHNICAL STUDIES

Further reconnaissance explorations at specific material source sites are needed, including: aerial-photography interpretation; topographic and bathymetric mapping; test borings supplemented with geophysical surveys to characterize the foundation and material conditions (e.g., soils, ground ice and temperature), and laboratory testing to characterize the general soil index and physical properties.



FIGURE 12 - DOT&PF'S B24 DRILL TRANSPORTED BY SNOWMACHINE

GIS DATABASE DEVELOPMENT

Development of a comprehensive GIS database for the Baldwin Peninsula including engineering and environmental data for the project, as well as archiving imagery and photography, land status and survey information of the area would be useful for a future environmental document and design project. The estimated cost for the development of a GIS Database is \$60,000.



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APPENDIX A

REFERENCE RESOURCE LIBRARY



**Kotzebue to Cape Blossom Road
Project No. 76884**

Resource Library Index

<u>Subject Area</u>	<u>Resource Type</u>	<u>Title</u>	<u>Author</u>	<u>Year</u>	<u>Description</u>
Climate	Report	Kotzebue Wind Data Analysis - 2006	PDC for DOT&PF	2006	Wind Study for the Kotzebue Airport relocation feasibility study
Coastal	Report	1973 Section 103 Reconnaissance Study	USACE	1973	Shoreline protection reconnaissance report for the community.
Coastal	Report	1973 Federal - State Planning Commission	Federal - State Planning Commission	1973	Investigated proposals for sheet pile bulkheads serving vessels of 8' and 20' drafts. Construction costs were found prohibitive.
Coastal	Report	1973 Alaska Division of Waters and Harbors	Alaska Division of Waters and Harbors	1973	Engineering Report considering Local Harbor Improvements
Coastal	Report	1977 KPFF Engineering and Planning	KPFF	1977	Engineering Feasibility Study considering creation of Industrial Park and port facility, including onshore construction and dredging of dock areas.
Coastal	Report	1977/1978 Shoreline Erosion Control Demonstration Project	USACE	1978	Report outlining demonstration project using groins and revetments for erosion protection.
Coastal	Report	1979/1980 Flood Insurance Study	USACE	1980	Flood insurance study report investigating severity of flood hazards in Kotzebue with mapping for use in FEMA's flood insurance program
Coastal	Report	1981 Section 107 Reconnaissance Study	USACE	1981	A reconnaissance report outlining reasons navigation improvements for medium draft ocean going barges are not economically favorable. Recommends city request NOAA help in search of Deep water channel.
Coastal	Report	1998 Section 905(b) Analysis for Navigation Improvements	USACE	1998	Report identifies several alternatives to aid navigation of medium draft ocean going barges that are physically feasible. Although none are economically feasible. Alternatives include: Move facilities to Cape Blossom, Dredging a 15 mile channel to Kotzebue, Constructing a fuel offloading facility 15 miles offshore with an undersea pipeline, and building a causeway from Kotzebue to deeper water.

Coastal	Report	Cape Blossom Navigation Improvements, January 2004	USACE	2004	Study examining fuel purchase and transportation cost savings associated with the construction of a tank farm at Cape Blossom, and the preliminary feasibility of such a project.
Coastal	Report	Section 905(b) (WRD 86) Analysis Navigation Improvements, Kotzebue, Alaska	USACE	2002?	
Coastal	Report	NOAA Annual Surveys	NOAA	Yearly	NOAA annually surveys and marks the natural channel from Kotzebue through Kotzebue Sound to water deep enough for Ocean going barges. Shallow draft barges that lighter fuel and general cargo from the oceangoing barges use the channel.
Engineering Reconnaissance	Report	Western Access Road Reconnaissance Study	Western District DOT&PF	2073	Referenced in Chicago Creek Study - not yet in library
Engineering Reconnaissance	Report	Kotzebue to Chicago Creek Highway Project Volumes 1-3	Alaska DOT&PF	1981	Reconnaissance Study including Engineering Report, Photo Mosaics, and supplemental report
Environmental	Report	Kotzebue Airport Relocation Feasibility Study Cultural Resource Analysis	NLUR for DOT&PF	2006	Cultural Resource Study for the Baldwin Peninsula
Environmental	Report	Kotzebue Airport Relocation Study Wetlands 2007	PDC for DOT&PF	2007	Preliminary Wetlands study of the Baldwin Peninsula
Environmental	Report	Kotzebue Airport Relocation Study Fish and Wildlife 2007	PDC for DOT&PF	2007	Preliminary Fish and Wildlife Study on the Baldwin Peninsula
Feasibility	Report	Feasibility Study: Kotzebue Deepwater Port/ Airport	Tetra Tech and Wright Forssen Associates	1983	Feasibility Study Addressing issues of Cape Blossom and Airport Relocations
Feasibility	Report	Preliminary Feasibility Study of a Coal Mine at Chicago Creek	ADGGS	1986	Prelim Feasibility discusses Coal use for Kotzebue and Barge issues
Feasibility	Report	Kotzebue Airport Relocation Feasibility Study Draft	PDC for DOT&PF	2007	Feasibility Study addressing the need for a relocated airport.
Geology	Report	Engineering Geology of Northwest Alaska	ADGGS	1986	Maps with Report of geological hazards of the Baldwin Peninsula
Geotechnical	Report	Kotzebue Airport Subsurface Soils investigation 1963	DOT&PF	1963	Drilling Investigation at Airport
Geotechnical	Report	Kotzebue Airport Borrow Study for Phase V Construction	Tryck, Nyme, and Hayes for DOT&PF	1968	Earthwork study for an Airport Expansion project in 1968
Geotechnical	Report	Kotzebue Airport Runway Insulation over Permafrost	DOT&PF	1969	Thermal Analysis of the Kotzebue Runway
Geotechnical	Report	Engineering Geology and Soils Report - Kotzebue Materials Investigation - March 1978	DOT&PF	1978	Geotechnical Report for Airport Apron and Taxiway project.
Geotechnical	Report	Kotzebue Apron Paving Project 1983	DOT&PF	1983	Geotechnical Investigation for 1983 Paving project, including materials study
Geotechnical	Report	Kotzebue Aggregate Exploration Dredge Sites 1984	Lon Nelson GEODE Exploration	1984	Geotech investigation of several material sources in the region including Cape Blossom.

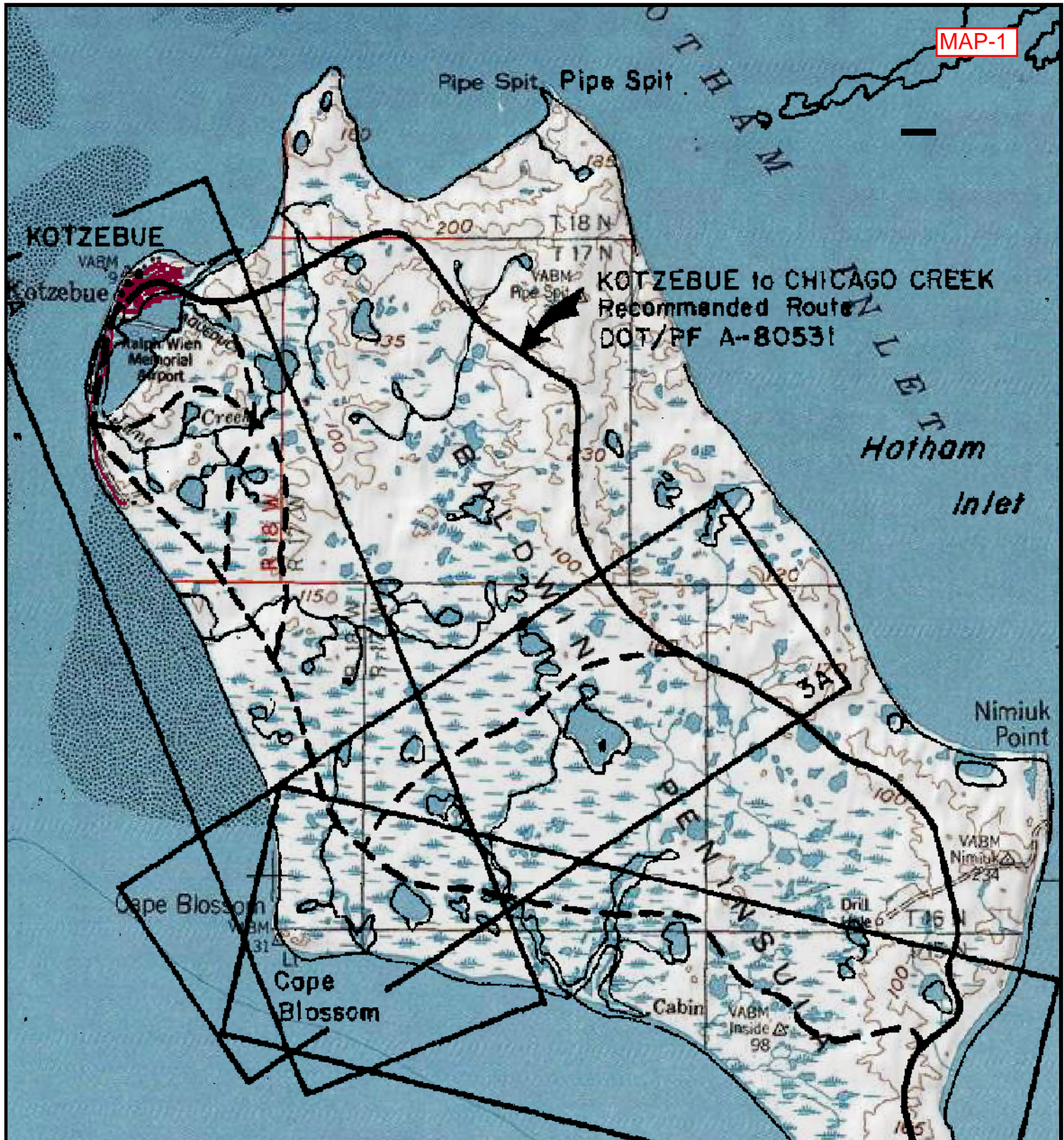
Geotechnical	Report	Kotzebue Airport subsurface exploration and foundation recommendations	DOT&PF	1985	Geotech investigation and recommendations for Airport Improvement project in 1985
Geotechnical	Report	Radiometric Dating of the Seward and Baldwin Peninsulas	US Geological Survey	1985	Geological study of rock ages in the vicinity of cape Blossom and south
Geotechnical	Report	Engineering Geology and Soils Report - Kotzebue Airport Apron Expansion - March 1990	DOT&PF	1990	Geotechnical Report for 1990 Kotz Runway Resurfacing Project
Geotechnical	Report	Kotzebue Airport E-W Runway resurfacing supplemental report 1	DOT&PF	1993	Airport Drilling Investigation
Geotechnical	Report	Overview of Environmental and Hydrogeological Conditions at Kotzebue Alaska	US Geological Survey	1995	Broad look at Environmental and Hydrological conditions in the Kotzebue region
Geotechnical	Report	Ralph Wien Memorial Airport, Proposed Apron Rehabilitation and Expansion, Kotzebue, Alaska	Alaska DOT&PF	2000	Geotech report for a airport apron rehabilitation and expansion project.
Geotechnical	Report	Kotzebue Fifth Avenue Paving project, 2000	DOT&PF	2000	Geotechnical Report evaluating Pavement materials and conditions for fifth avenue project.
Geotechnical	Report	Kotzebue Airport Apron Rehabilitation and Expansion October 2000	Shannon and Wilson for DOT&PF	2000	Geotechnical Report evaluating subsurface conditions for Apron Project
Geotechnical	Report	Kotzebue Airport Potential Borrow Site Investigation;	Shannon and Wilson for DOT&PF	2001	Geotech Report evaluating potential material sources near the airport
Geotechnical	Report	Kotzebue ARFF & SREB Subsoil and foundation Report	Phukan for DOT&PF	2001	Geotech Report evaluating subsurface and foundations for ARFF/SREV in Kotzebue
Geotechnical	Memo	Glacier Creek Material Source Memo	DOT&PF	2003	Memo and Map identifying material sites in the Kotzebue region.
Geotechnical	Report	Kotzebue Airport Eastside Obstruction Removal and Safety Area Expansion	R&M for DOT&PF	2004	Geotech Report for Airport Eastside Obstruction Removal
Geotechnical	Report	Shore Avenue Lake Street to Crowley Dock 2997	DOT&PF	2007	geotech investigation for Kotzebue Shore Avenue project
Geotechnical	Report	Kotzebue Airport Relcoation Feasibility Study Geotechnical Report	R&M for DOT&PF	2007	Geotech Report addressing material sites in the region.
Geotechnical	Report	Final Report: Use of Geofiber and synthetic fluid for stabilizing marginal soils	UAF	2007	Report evaluating geofiber and synthetic fluid technologies for poor foundation soils
Geotechnical	Report	Kotzebue to Cape Blossom Road	DOT&PF	2009	Reconnaissance level Geotech Report for Kotzebue to Cape Blossom Road
Hydrology	Report	Kotzebue Eastside Obstruction Removal and Safety Area Expansion Hydrology Report	R&M for DOT&PF	2004	Hydrology Report for the Kotz Eastside Obstruction Removal Project
Land Status	Maps	17(b) Easement Maps	DNR	2005	Various 17b Easement Maps in the Kotzebue Area
Land Status	Report	Kotzebue Airport Relocation Feasibility Study Land Status Report	McKlintock for DOT&PF	2006	Land Status Report discussing Land Status on Baldwin Peninsula
Land Status	Inventory	Land Use Inventory	McKlintock for DOT&PF	2006	Inventory of ANCSA 14(c), ANCSA 17(b) Easements, BLM MTP's, Federal Townsites, IC's and Patents, Leases, Native Allotments, Plats, State MTP's, US Surveys

Land Status	AutoCad Maps	Land Status Mapping in CADD of the Baldwin Peninsula	McKlintock for DOT&PF	2007	AutoCad Maps of Land Status for the Baldwin Peninsula
Local Knowledge	Article	The Long Range Effects on Locally Important Marine Resources of the Proposed deepwater Port in Kotzebue	Alaska Tsunami Papers	2003	Local article on marine resources and potential effects of a deepwater port.
Survey	Bathymetry	Cape Blossom Coastal Bathymetry	USKH	2009	Bathymetric data for 2 mile by 2 mile area along the shore south of Cape Blossom
Survey	Survey	Terrestrial Routes Survey Data	U.S. Marine Corps	2010	Survey data for 1000' wide corridor along Routes "A" and "B"
Survey	Bathymetry	Kotzebue Sound Coastal Bathymetry	USKH	2010	Bathymetric data for 1 mile by 6.5 mile area along the shore south of Kotzebue
Survey	Bathymetry	Kotzebue Sound Coastal Bathymetry	R&M	2010	Bathymetric data for 0.3 mile by 1 mile area along the shore northwest of Kotzebue
Transportation Study	Report	Fort Hamlin to Kotzebue Sound Reconnaissance	US Geological Survey	1902	Historic report evaluating routes from Fort Yukon to Kotzebue
Transportation Study	Report	Western and Arctic Alaska Transportation Study	Louis Berger and Associates/Philleo Engineering	1980	Nome to Kotzebue Road - Referenced in Chicago Creek Study
Transportation Study	Report	Kotzebue Transportation Needs: Cape Blossom Road, Deep Water Port, Airport Relocation	Unknown	2003	Includes Correspondence from City and NANA regarding project, also with Summaries and Port Schematics

APPENDIX B

PRELIMINARY ALIGNMENTS



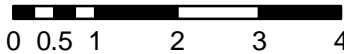


**KOTZEBUE to CHICAGO CREEK
Recommended Route
DOT/PF A-8053!**

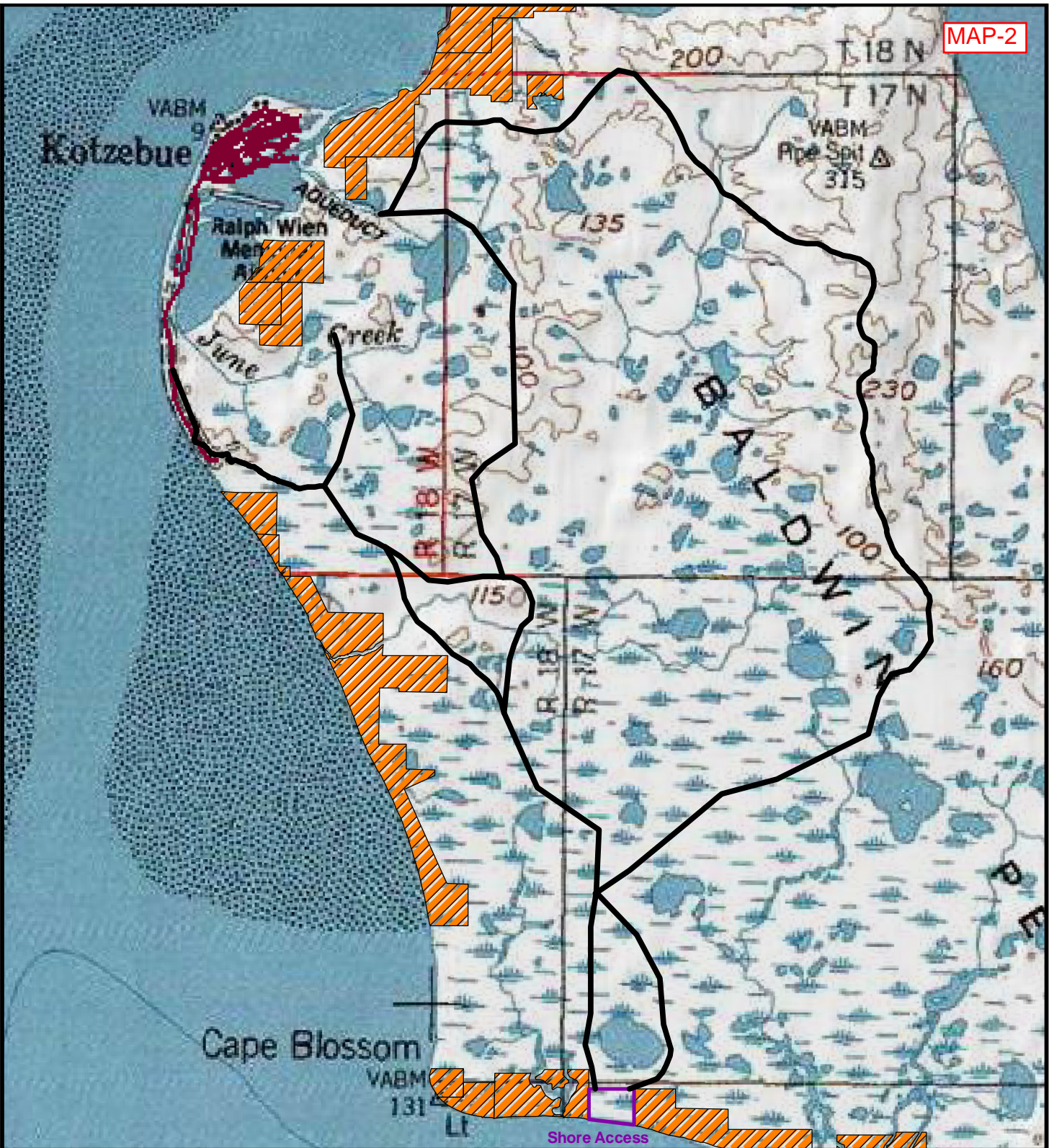
Within the March 1982 Reconnaissance Study for the Kotzebue to Chicago Creek Highway Project, a map was provided of alternate alignments to Cape Blossom (submitted to AKDOT&PF by Michael Baker, Jr., INC. Engineers & Surveyors). The map is shown here overlying a USGS topographic map of the Baldwin Peninsula. This map was revisited and compared to an updated land status map. This was the initial starting point for drafting possible routes from Kotzebue to Cape Blossom.

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March 1982 - Kotzebue to Chicago Creek Reconnaissance Study:
Cape Blossom Alternate Alignments

SCALE:  Miles

PREPARED BY: Casey Adamson
DATE: January 8, 2008

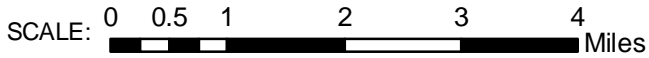


Preliminary routes from Kotzebue to Cape Blossom are shown in black. Native allotments are referenced to the land status report from McClintock Land Associates, Inc., October 2006.

-  ROUTES
-  SHORE ACCESS
-  NATIVE ALLOTMENT

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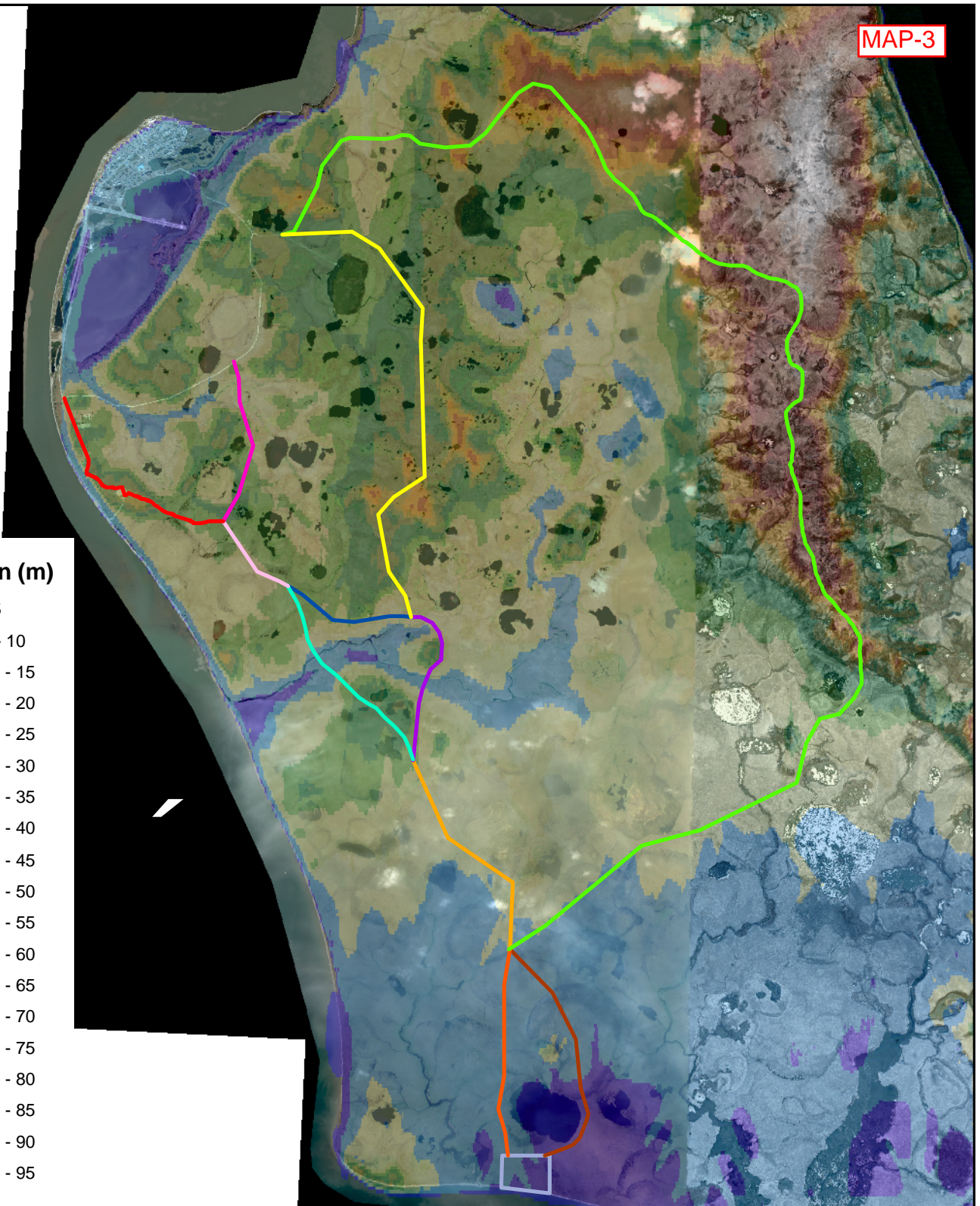
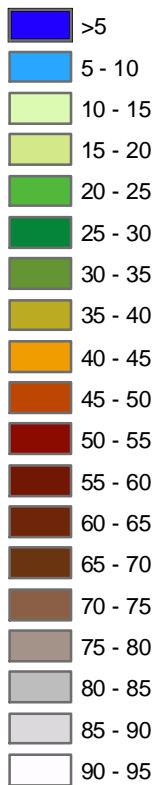
KOTZEBUE TO CAPE BLOSSOM
 PRELIMINARY ALIGNMENTS



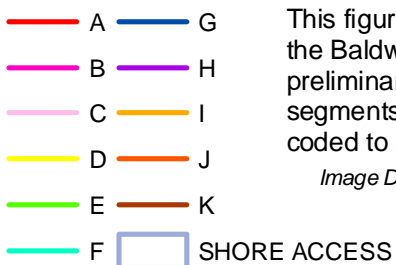
PREPARED BY:
 Casey Adamson

DATE: January 30, 2008

Elevation (m)



Road Segments



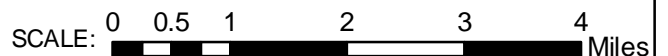
This figure shows a mosaic image of the Baldwin Peninsula with the preliminary routes broken into segments. The topography is color coded to show the elevation changes.

Image Dates: September 29, 2004 to August 7, 2006

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 NORTHERN REGION DESIGN GROUP
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KOTZEBUE TO CAPE BLOSSOM
 PRELIMINARY ALIGNMENTS



PREPARED BY:
 Casey Adamson

DATE: January 30, 2008



Road Segments

- A
- B
- C
- D
- E

This figure shows the beginning segments of the possible routes from Kotzebue to Cape Blossom. Here segment 'A' would not be part of the road construction, instead its purpose is to show the route needed to be driven to reach segment 'C' if 'C' is chosen to be the starting segment.

Image Date: August 7, 2006

STATE OF ALASKA

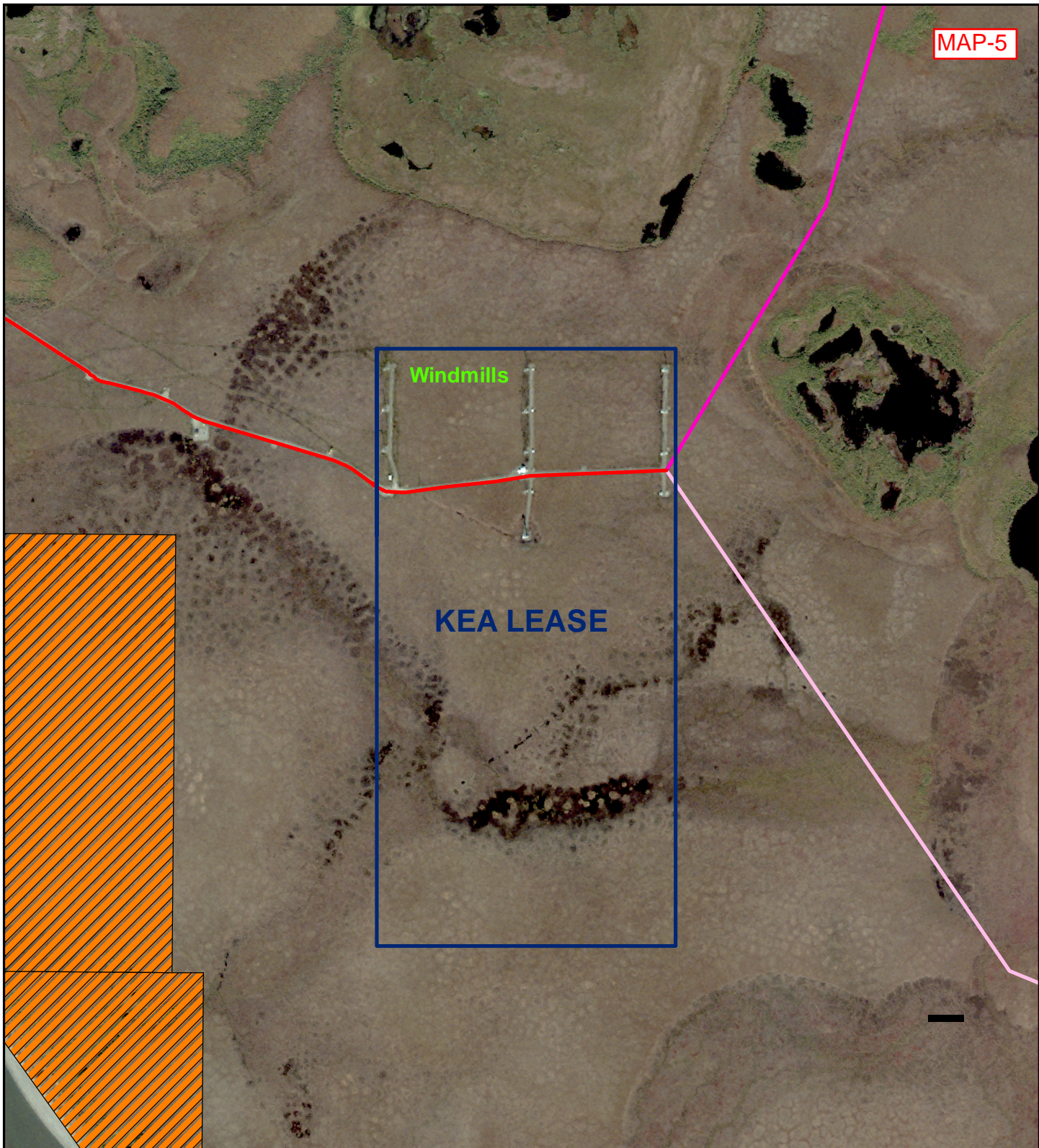
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KOTZEBUE TO CAPE BLOSSOM
 PRELIMINARY ALIGNMENTS

SCALE: 0 0.25 0.5 1 Miles

PREPARED BY:
 Casey Adamson

DATE: January 30, 2008



Road Segments

- A
- B
- C

NATIVE ALLOTMENT

This figure shows land status information and how segment 'A' uses the existing road through the windmill farm. The end of segment 'A' is the end of the existing road.

Image Date: August 7, 2006

STATE OF ALASKA

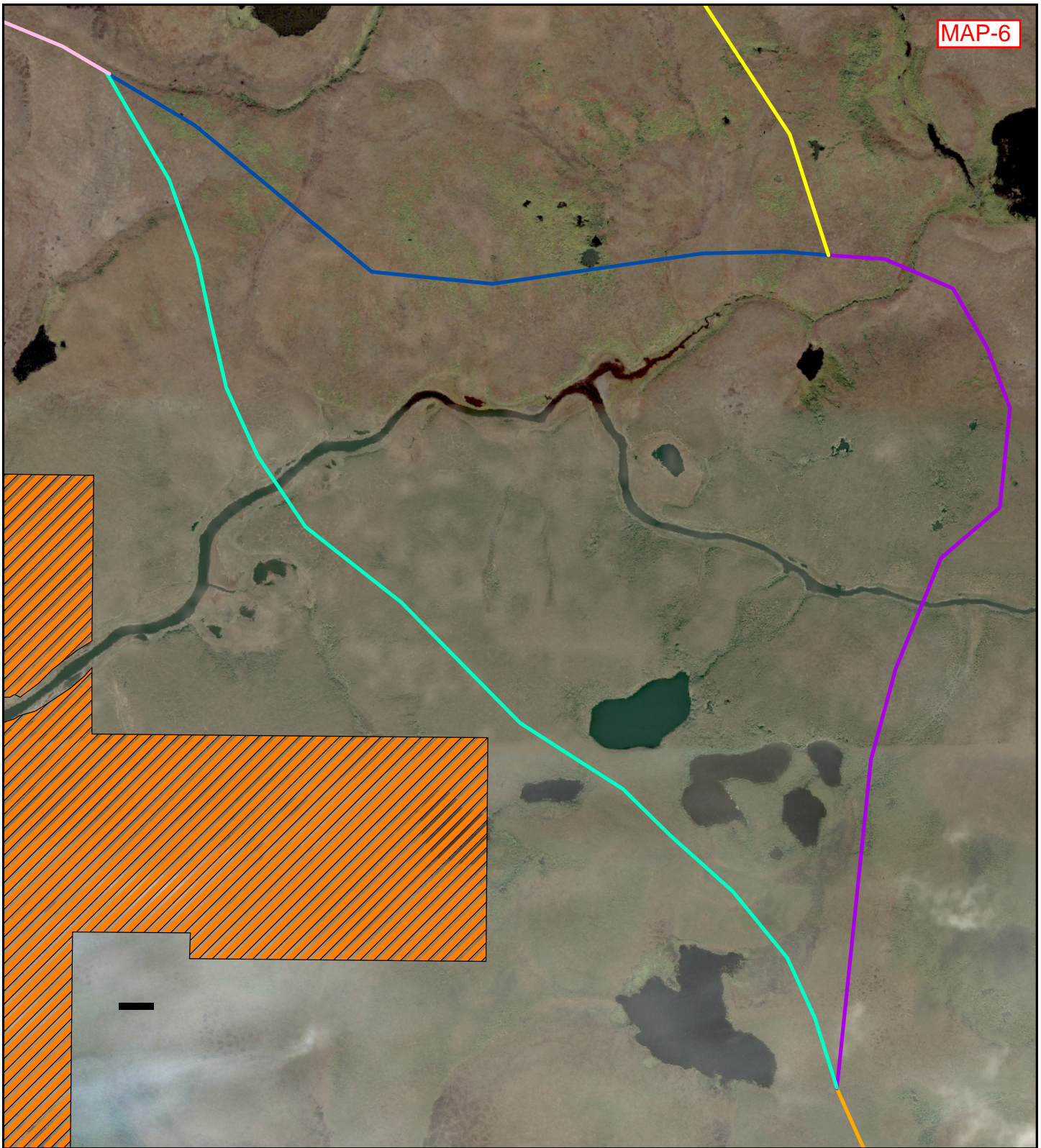
Department of Transportation and Public Facilities
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KOTZEBUE TO CAPE BLOSSOM
PRELIMINARY ALIGNMENTS

SCALE: 0 250 500 1,000 1,500 2,000 Feet

PREPARED BY:
Casey Adamson

DATE: January 11, 2008



Road Segments

- C — G
- D — H
- F — I
- NATIVE ALLOTMENT

This figure shows an image of the preliminary routes crossing Sadie Creek. Segment 'F' crosses at a single wide section of the creek, while segment 'H' crosses at two narrow sections of the creek.
Image Date: August 7, 2006

STATE OF ALASKA

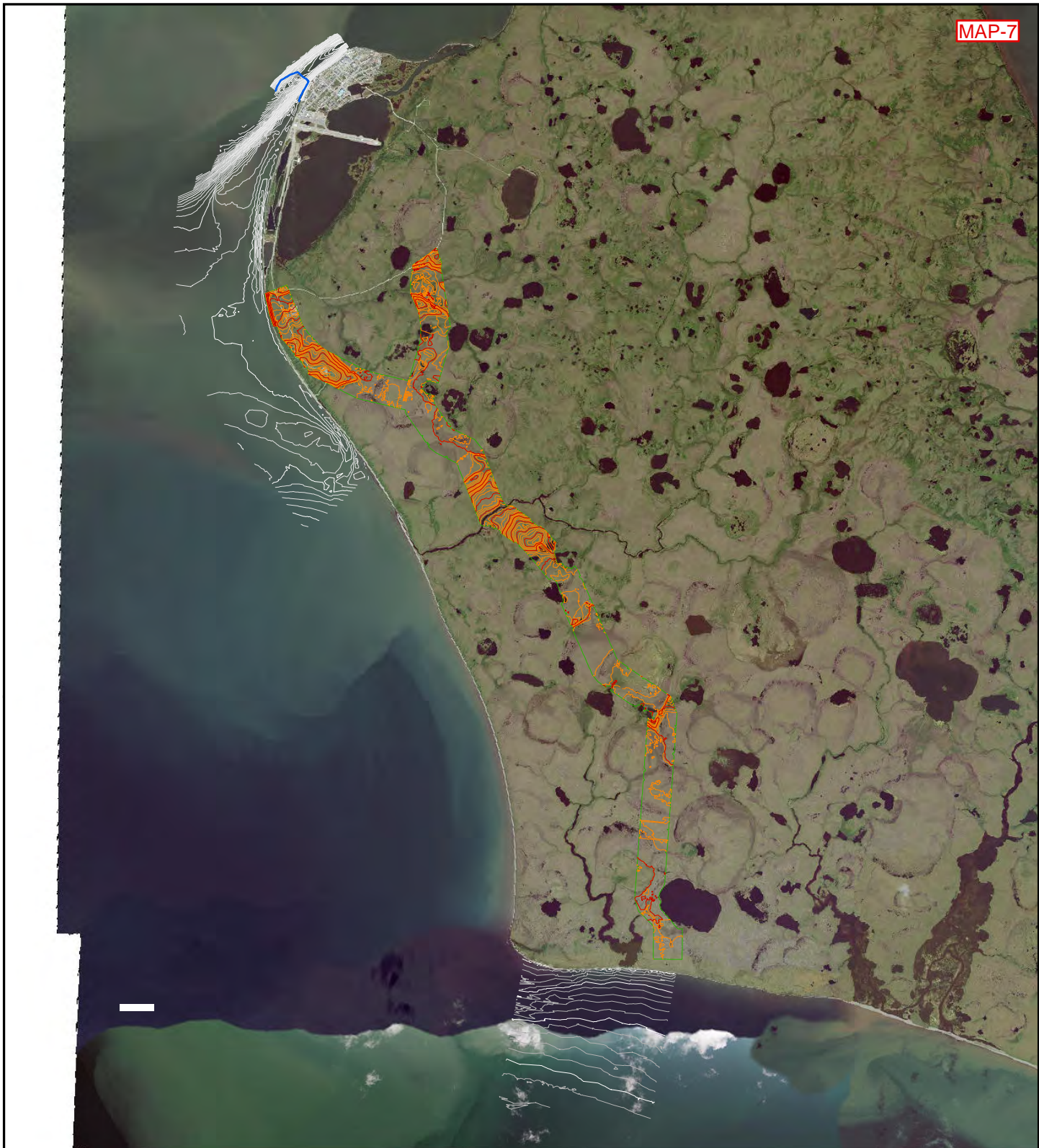
Department of Transportation and Public Facilities
 NORTHERN REGION DESIGN GROUP
 2301 Peger Rd. Fairbanks, AK 99709

KOTZEBUE TO CAPE BLOSSOM
 PRELIMINARY ALIGNMENTS

SCALE: 0 750 1,500 3,000 Feet

PREPARED BY:
 Casey Adamson

DATE: January 11, 2008



This figure shows survey data acquired in the Kotzebue area. The contours between Kotzebue and Cape Blossom were acquired in summer 2010 by the United States Marine Corps (5' contour interval - orange; 20' contour interval - brown). The bathymetry contours to the northwest of Kotzebue acquired in 2000, and the contour interval is 2'. The bathymetry contours to the west and south of Kotzebue were acquired July 9 - 15, 2010, and the contour interval is 1'. The bathymetry at Cape Blossom was acquired in September 24 - 26, 2009, and the contour interval is 2'.

Image Date: August 4, 2010

STATE OF ALASKA

Department of Transportation and Public Facilities
 NORTHERN REGION DESIGN GROUP
 2301 Peger Rd. Fairbanks, AK 99709

**KOTZEBUE TO CAPE BLOSSOM
 PRELIMINARY ALIGNMENTS**

SCALE: 0 0.5 1 2 3 4 Miles

PREPARED BY:
 Scott Maybrier

DATE: February 17, 2011

APPENDIX C

ENVIRONMENTAL REPORTS



WETLANDS ASSESSMENT

This wetlands assessment is based on an overflight survey of the three airport relocation alternatives conducted on 28 August 2006; no ground survey was conducted. Thus, wetland descriptions are based on oblique aerial photographs taken during the overflight and previous knowledge of wetland communities in the region. Vegetation (Hanson 1951, 1953; NOAA 2002), wetland (B & B Environmental 1996), U.S. Fish and Wildlife National Wetlands Inventory (NWI) maps (Appendix A), and soil surveys (Rieger et al. 1979) also were reviewed to assist in the evaluation.

A preliminary evaluation of the relative functional value of the wetland habitats found in each alternative also was conducted (Table 1), based on functional information compiled for comparable habitats in the region (ABR, in preparation, B & B Environmental 1996, Shannon and Wilson and ABR 1995). Because the entire project area is underlain by permafrost, functional values associated with groundwater discharge and recharge are low, although estuarine marshes and mudflats and coastal wetland complexes do help buffer the effects of storm surges. The primary functions of wetlands are to provide feeding, nesting, and staging habitats for migratory birds and large mammals such as moose, caribou, and brown (grizzly) bears. Wetlands important to wildlife also score high in terms of subsistence and recreational support, as these areas are popular traditional hunting areas and may attract visitors for wildlife viewing. Wildlife use of the three alternatives is described in the Fish and Wildlife Summary.

ALTERNATIVE AREA 1

The dominant wetland communities in this area are Moist Sedge Tundra (including Tussock Tundra) and Moist Sedge-Shrub Tundra (Photos 1–3), although Wet Sedge Meadow Tundra (Photo 4), Low Willow Shrub Tundra (Photos 4–5), and Fresh Sedge Marsh (Photo 6) also occur along the margins of lakes and ponds and watercourses. Plant species associated with the Moist Sedge and Sedge-Shrub communities include cottongrass tussock (*Eriophorum angustifolium*), Bigelow sedge (*Carex bigelowii*), diamondleaf willow (*Salix pulchra*), and Richardson willow (*S. richardsonii*). A variety of ericaceous shrubs also are commonly present, including blueberry and cranberry (*Vaccinium* spp.) and Labrador tea (*Ledum decumbens*). Low Willow Shrub Tundra is dominated by diamondleaf, Richardson, and Alaska bog willow (*S. fuscescens*). Other

associated species may include bluejoint (*Calamagrostis canadensis*), fescue grass (*Festuca altaica*), and forbs such as arctic dock (*Rumex arcticus*) and roseroot (*Sedum rosea*). Although several large lakes occur in the study area (e.g., Devil's Lake), well-developed emergent wetlands or complexes of ponds, marshes, and wet meadows are generally lacking. The soils are typically ice-rich silts with a moderately thick, surface organic horizon. Depth to permafrost is generally shallow, although probably somewhat deeper along streams and pond and lake margins. Some segregation ice (ice wedges) are likely to be present, although patterned ground features are not widespread. Much of the coastal margin of this portion of the Baldwin Peninsula is composed of steep bluffs (Photo 7), thus, salt marshes and other coastal wetlands valuable to waterbirds also are limited. The highest value wetlands, in terms of habitat use, are located in the vicinity of the current airport, which includes estuarine habitats (Figure 1).

Most of the area was classified as Waters of the US (surface waters and wetlands) on the NWI maps (Appendix Figures A1 and A2), but uplands do occur as small inclusions along the margins of drained lake basins, on ridges associated with hilly terrain northeast of Kotzebue, and along the coastal margins of the peninsula (Photo 7). They are probably dominated by low and tall (depending on degree of wind exposure) shrubs such as willow and alder (*Alnus* sp.), and dwarf ericaceous shrubs such as mountain avens sp. (*Dryas*), white arctic mountain heather (*Cassiope tetragona*), and crowberry (*Empetrum nigrum*).

ALTERNATIVE AREA 2

Alternative Area 2 includes Sadie Creek and encompasses the middle portion of the Baldwin Peninsula. This area is similar in habitat composition to Area 1 (e.g., Photo 8), although the Sadie Creek area includes a well-developed wetland complex associated with the creek, several old lake basins (Photos 9&10), and tidally influenced marshes. This area was identified as having the greatest proportion of high-value wetlands (Figure 1). Alternative Area 2 also includes a higher density of waterbodies than Alternative Area 1 (Photo 11), which likely support wetland fringes of Wet Sedge Meadow Tundra, Low Willow Shrub Tundra, and Fresh Sedge Marsh. Plant species associated with these wetland complexes include willow, water sedge, loose-flowered alpine sedge (*Carex rariflora*), round-fruited sedge (*C. rotundata*), and tall cottongrass (*Eriophorum angustifolium*). Floating mats of *Sphagnum* moss also are likely to be associated

with the drained lake basin complexes. Similar to Alternative Area 1, the coastal zone was mostly bordered by steep bluffs, with the exception of the area surrounding Sadie Creek.

Uplands include an even smaller proportion of the study area than Area 1 and are almost exclusively associated with the coastal zone (bluffs) (Appendix A).

ALTERNATIVE AREA 3

For Alternative Area 3 (which includes Cape Blossom [Figure 12]), the most notable wetland areas are two estuarine marsh and mud flat complexes associated with drainages intersecting the coast approximately 1.5 miles and 4.5 miles east of Cape Blossom (Photo 13). Wet Sedge Meadow Tundra and Fresh Sedge Marsh also likely occur upstream, beyond the zone of coastal influence. Plant species commonly associated with salt marshes in the region include lyngbye sedge (*Carex lyngbyaei*), hoppner sedge (*C. subspathacea*), alkali sedge (*Puccinellia* spp.), and low chickweed (*Stellaria humifusa*). The remainder of Alternative Area 3 shares many of the same wetland types as the other alternatives, although the area is wetter overall. Large expanses of Wet and Moist Sedge Tundra were evident during the field survey (Photo 14). The steeply faced coastal bluffs of the two other alternatives also occur along the coastline of Area 3.

Similar to Area 2, uplands are restricted to the bluffs along the coastal margin (Appendix Figures A3 and A4).

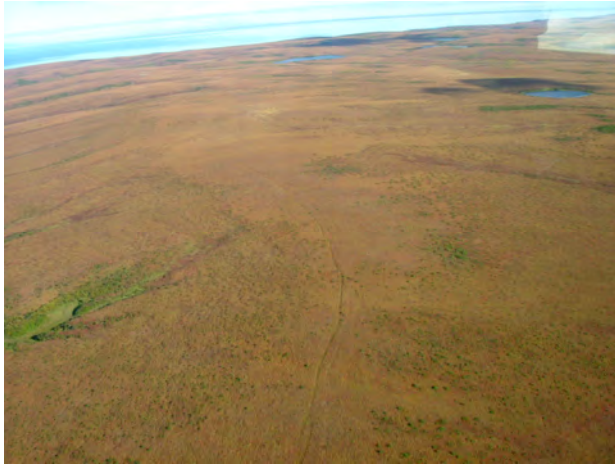


Photo 1. View west, Moist Sedge Tundra, Area 1.

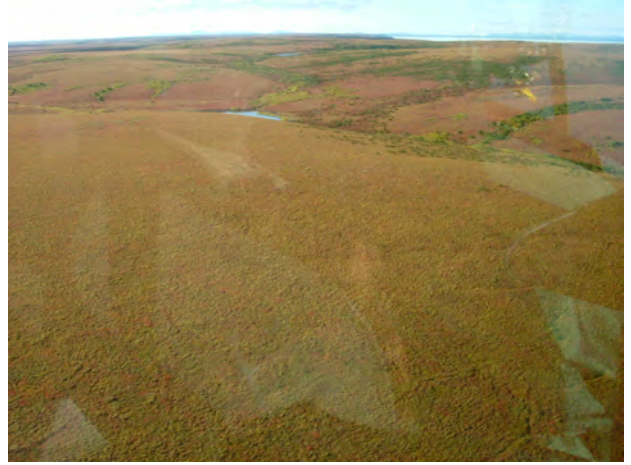


Photo 2. View southwest, Moist Sedge Tundra, Area 1.

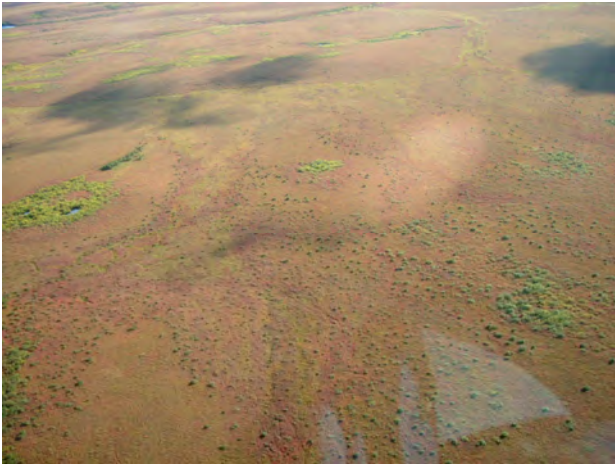


Photo 3. View north, Moist Sedge-Shrub Tundra, Area 1.

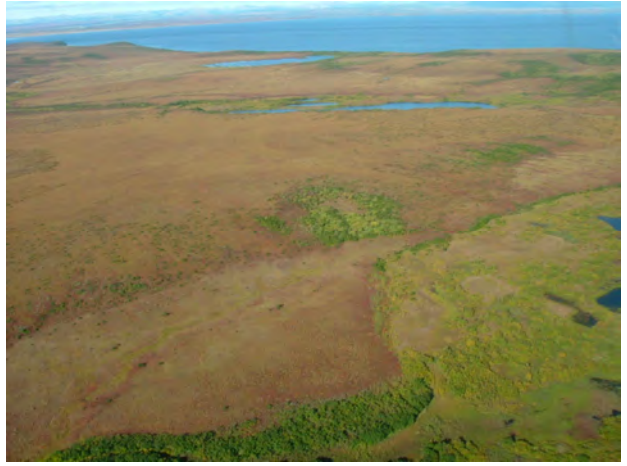


Photo 4. View east, Low Willow Shrub and Wet Sedge Meadow Tundra, Area 1.



Photo 5. View north, Low Willow Shrub, Area 1.



Photo 6. View south, Fresh Sedge Marsh, Area 1.



Photo 7. View southeast, coastal bluff (north end of peninsula), Area 1.



Photo 8. View north, Low Willow Shrub and Wet Sedge Meadow Tundra, Area 2.



Photo 9. View west, Sadie Creek, Area 2.



Photo 10. View south of wetland complex near mouth of Sadie Creek, Area 2.



Photo 11. View southwest, Area 2.



Photo 12. View southeast, Cape Blossom, Area 3.



Photo 13. View northeast of salt and brackish water marshes, Area 3.

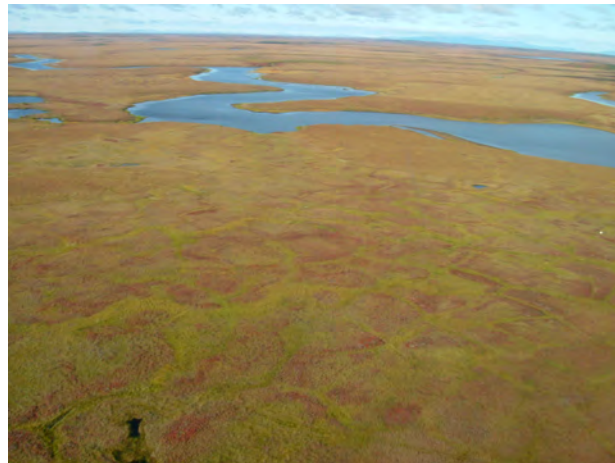


Photo 14. View north of Wet Sedge and Moist Sedge Meadow Tundra, Area 3.

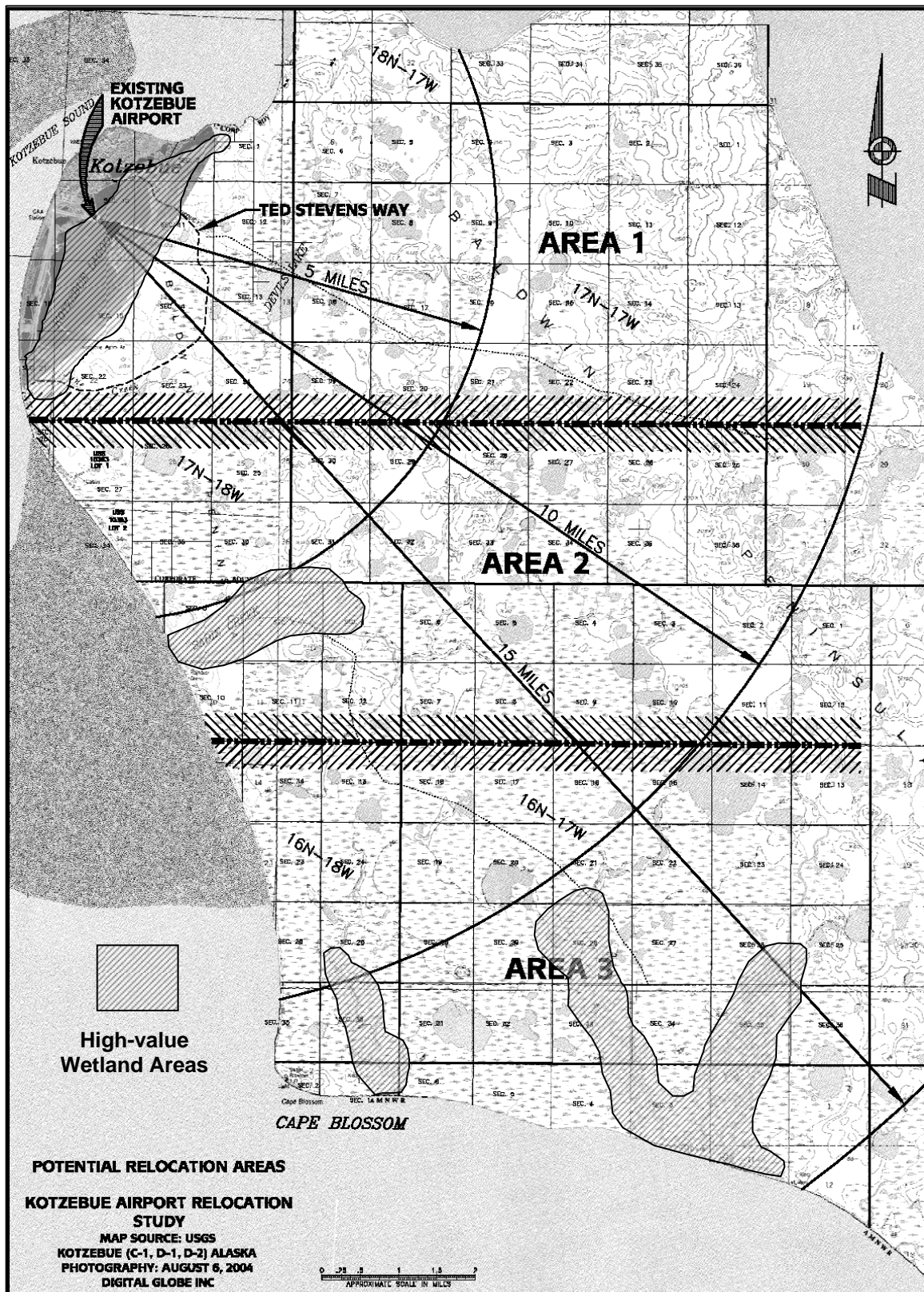


Figure 1. Location of wetlands with high wildlife habitat value among the three airport location alternatives.

Table 1. Relative ranking of functions and values of wetlands among the three airport relocation alternatives, Kotzebue, Alaska, 2006.

Functions and Values	Alternative 1	Alternative 2	Alternative 3
Groundwater Discharge	Low	Low	Low
Groundwater Recharge	Low	Low	Low
Erosion Control and Flow Regulation	Low	Moderate	Moderate
Sediment/Toxicant Retention	Low–Moderate	Low–Moderate	Low–Moderate
Nutrient Retention	Moderate	Moderate	Moderate
Production Export	Low	Low	Moderate
Aquatic Habitat	Low	Low	Moderate
Wildlife Habitat	Moderate	Moderate	Moderate
Regional Ecological Diversity	Low	Low	Moderate
Subsistence/ Recreation Use	High	Moderate	Moderate

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**APPENDIX A. U. S. FISH AND WILDLIFE SERVICE NATIONAL WETLANDS INVENTORY (NWI)
MAPS, KOTZEBUE AIRPORT RELOCATION AREAS**

Fish and Wildlife Resources

Fish

No anadromous fish streams are present in the project area according to the Alaska Department of Fish and Game *Atlas to the Catalog of Waters Important to the Spawning, Rearing or Migration of Anadromous Fishes* (www.sf.adfg.state.ak.us/SARR/FishDistrib/anadcat.cfm).

Wildlife Resources

The project area supports a diversity of terrestrial wildlife species typical of wet and moist tundra habitats found in western Alaska. Terrestrial mammal species in the project area include those important to local residents for hunting and other subsistence activities (trapping): caribou *Rangifer tarandus* (and feral reindeer), moose *Alces alces*, brown (grizzly) bears *Ursus arctos*, and small mammals, such as arctic ground squirrels *Spermophilus parryii*, tundra (arctic) and snowshoe hares (*Lepus othus* and *L. americanus*), red foxes *Vulpes vulpes* (occasionally arctic foxes *Alopex lagopus*), river otters *Lutra canadensis*, and microtines (lemmings and voles).

The Baldwin Peninsula lies within the range of the Western Arctic Caribou Herd and is primarily used as a migratory area during spring and fall, when large numbers (tens of thousands) of animals may cross the Baldwin Peninsula (Dau 2005; J. Dau, ADF&G, pers. comm.). Caribou are generally not resident in the project area, however. Caribou are an important subsistence and sport hunting resource to Kotzebue residents. Moose are not very abundant in the project area but a few moose were observed during the reconnaissance survey in August 2006 near Kotzebue. Moose use the riparian willow thickets in the project area and overall numbers on the Baldwin Peninsula are in the range of 25–30 animals (J. Dau, ADF&G, pers. comm.). Although some moose are hunted on the peninsula, most moose harvested in Game Management Unit 23 (which encompasses the project area) are taken in the mainland drainages rather than in the project area (Dau 2004). A small herd of muskoxen *Ovibos moschatus* also use the project area, but are not hunted by local residents. These animals are apparently attracted to airport runways and have been hazed from the Kotzebue runway in the past (J. Dau, ADF&G, pers. comm.).

Grizzly bears are present in the project area during summer and travel the coastal beaches in search of marine mammal carcasses, but also likely access tundra areas when berries are plentiful. Grizzly bears are not normally seen during winter and spring in the project area, but Jim Dau, ADF&G regional biologist, reported that one grizzly bear den was found one year approximately 12 miles east-southeast of Kotzebue at the base of a small bluff.

Trapping of small mammals (primarily red foxes, but also some river otters) by local residents does occur in the project area, primarily as a recreational activity. The Baldwin Peninsula also supports a population of tundra (arctic) hares, which are a relatively rare small mammal species and have a restricted range in western coastal Alaska (J. Dau, ADF&G, pers. comm.).

The Baldwin Peninsula and Kotzebue area support a high diversity of both terrestrial and marine birds that use the rich coastal and tundra habitats in the area. Other than a few resident species (common raven *Corvus corax*, ptarmigan (*Lagopus* spp.), a few passerines), most birds use the project area only during the summer months (late April–early October) when suitable habitats and food are available to support breeding activities. The tundra breeding-bird community is dominated by waterbirds, particularly the waterfowl (geese, ducks, swans) and shorebirds species that are the primary nesting species in the wetlands, ponds, and lakes in the project area. The wetland habitats around Sadie Creek in Alternative Area 2 have been identified as supporting populations of breeding waterbirds, including loons (Yellow-billed, Pacific, and Red-throated loons [*Gavia adamsii*, *G. pacifica*, *G. stellata*]), waterfowl (geese, Greater Scaup *Aythya marila*, Northern Pintail *Anas acuta*, Tundra Swan *Cygnus columbianus*) and other waterbirds (Red-breasted Merganser *Mergus serrator*, Arctic Terns *Sterna paradisaea*) (NOAA 2002; M. Spindler, USFWS, pers. comm.). A small breeding colony of Aleutian Terns *Sterna aleutica* is located near the Kotzebue airport in Alternative Area 1 (NOAA 2002). Breeding Tundra Swans also can be found at the larger lakes in the project area (USFWS, unpubl. data). Shorebird populations in the area are not well studied but are likely similar to those of the nearby Seward Peninsula (Kessel 1999). The grassy meadows and wetlands complexes found in Alternative Areas 2 and 3 in the Sadie Creek to Cape Blossom region have been identified by local residents as important hunting areas and are used by local residents for hunting geese and ducks, as well as egging during early summer (J. Dau, ADF&G, pers. comm.).

Threatened and Endangered Species

No terrestrial species of birds or mammals listed as threatened or endangered under the Federal Endangered Species Act (1973, as amended) are likely to occur in the project area (S. Conn, USFWS, pers. comm.). Two species of threatened seabirds, the Steller's Eider (*Polysticta stelleri*) and Spectacled Eider (*Somateria fischeri*) nest on the Yukon-Kuskokwim Delta to the south of Kotzebue, but they are not known to commonly migrate through the Kotzebue area or use the Baldwin Peninsula (USFWS 1996, 2002).

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Personal Communications:

Conn, Sarah. U.S. Fish and Wildlife Service, Fairbanks Field Office, Threatened and Endangered Species. Sept. 2006.

Dau, Jim. Alaska Department of Fish & Game, Kotzebue, AK. Oct. 2006.

Spindler, Michael. U.S. Fish and Wildlife Service, Kanuti NWR (former manager of the Selawik NWR), Oct. 2006.

The Consultation Process

The Federal Aviation Administration (FAA) is required by Section 7 of the Endangered Species Act (ESA) to consult with the USFWS because the proposed project is within the designated boundaries of polar bear critical habitat and/or may impact the bear and/or adversely modify its habitat. Actions that adversely modify critical habitat are 1) those that would reduce the availability or accessibility of polar bear prey species, 2) those that would directly impact primary constituent elements required for polar bear survival and recovery, or 3) those that would render critical habitat areas unsuitable for use by polar bears. Consultations with the USFWS may be either informal or formal. Informal consultation is designed to identify and resolve potential concerns at an early stage in the planning process. The process may conclude informally when the USFWS concurs in writing that the proposed Federal action is “not likely to adversely affect” the polar bear or its critical habitat. However, if the USFWS determines through informal consultation that adverse impacts are likely to occur, then formal consultation is initiated.

Formal consultation is concluded when the USFWS issues a biological opinion on whether the proposed project will likely jeopardize the continued existence of the polar bear or adversely modify its critical habitat. When the USFWS issues a jeopardy opinion, the USFWS will also provide reasonable and prudent alternatives to the project, if any are identifiable. “Reasonable and prudent alternatives” are defined as alternatives that 1) can be implemented in a manner consistent with intended purpose of the project, 2) can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, 3) are economically and technologically feasible, and 4) would avoid jeopardizing the continued existence of the listed species or destroying or adversely modifying critical habitat. Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. The formal consultation process generally takes 135 days. DOT&PF and FAA may choose to develop their own alternative based on what they perceive as the best available scientific and commercial data. However, this alternative may be challenged in court.

Kotzebue RSA Expansion Project

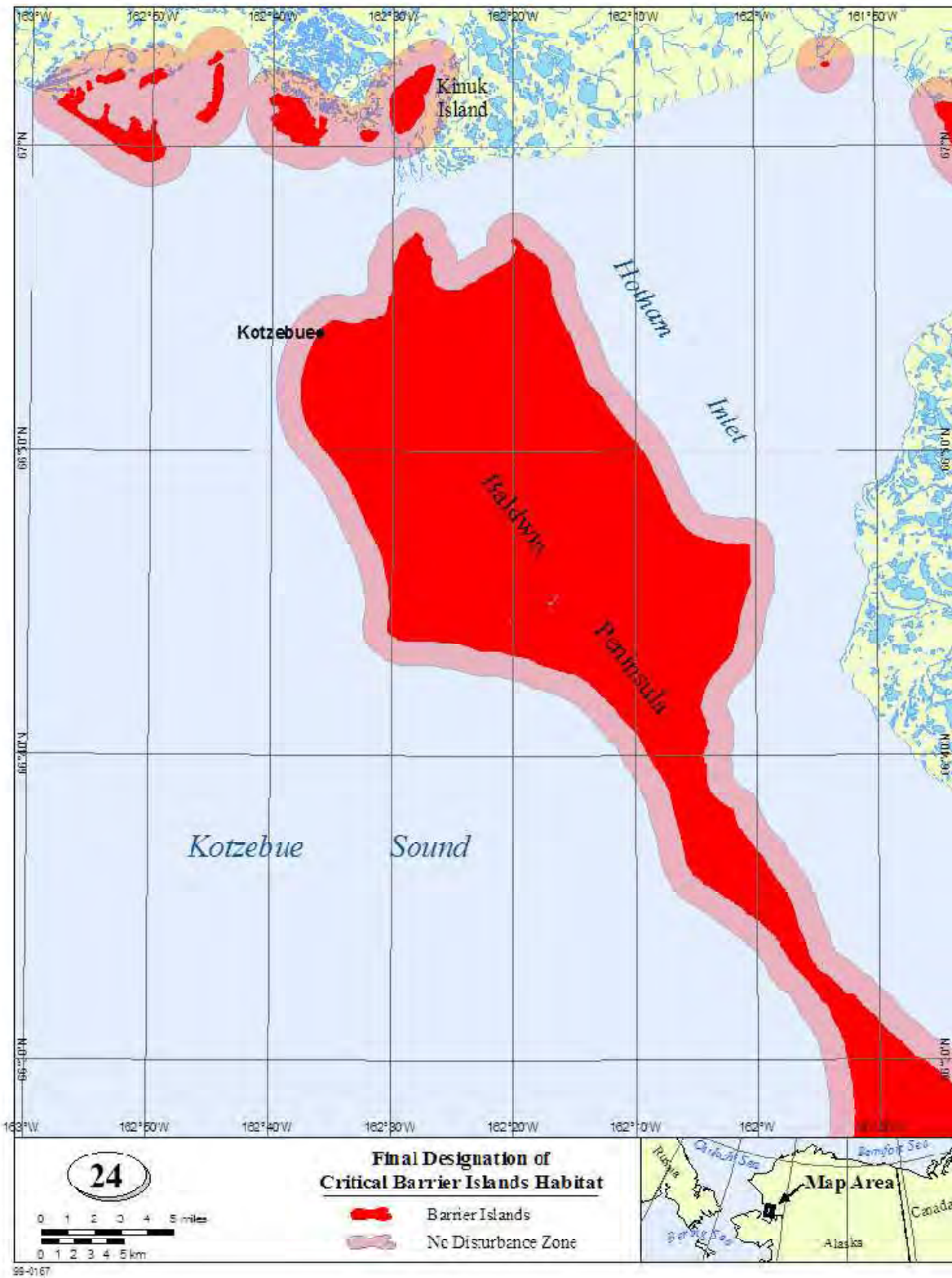
Kotzebue RSA project would expand the developed area of the airport to both the east and west of the main runway. One leading alternative would likely require erosion protection to be placed on the shoreline north of the main runway. These areas are within designated critical habitat and no-disturbance zones, however are not used as denning or feeding habitat for polar bears, and their proximity to populated areas make them unlikely candidates for successful breeding and feeding grounds. According to the airport wildlife hazard management plan, large mammals present little hazard at the airport and therefore no permits or plans are in place to haze or take such species that could present a concern to human or facility safety.

DOT&PF conducted informal consultations with resource agencies in October, 2009 at the start of the RSA project. USFWS did not express concern regarding polar bear habitat, however the marine mammal section was not explicitly consulted. The National Marine Fisheries Service marine mammal section stated that they did not have any concerns with the City of Kotzebue marine area. In addition, communications with local residents and the airport manager suggest that polar bears have not been seen locally in decades.

Recommendations

USKH recommends that the DOT&PF initiate informal consultation with USFWS as soon as possible. We recommend the alternatives from the agency scoping letters be presented, followed by a discussion of how our current proposed western extension is greatly reduced in length. Based on our research and the coordination completed to date, it is likely the USFWS will determine the project to have “no adverse effect” to polar bear or its critical habitat. Should informal consultation result in the USFWS determining that a western expansion of the main runway would likely result in impacts to the polar bears’ critical habitat, DOT&PF and FAA may need to consider an eastern only expansion as the preferred alternative. If a formal consultation moves forward for the western expansion, we anticipate that USFWS possesses enough information regarding the area to make a determination of impacts and discuss mitigation without a project specific biological assessment, which would conclude the formal consultation process faster than the average timeframe.

Figure 1



APPENDIX D

LAND STATUS REPORT



Note: The *Kotzebue Airport Relocation Feasibility Study: Land Status Report* prepared by McClintock Land Associates, Inc is a stand-alone report. A portion of the report is included here. Please see the full report for associated exhibits and reference materials.



KOTZEBUE AIRPORT RELOCATION FEASIBILITY STUDY LAND STATUS REPORT

Prepared by:

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Eagle River, Alaska 99577

Prepared for:

PDC, Inc.
1028 Aurora Drive
Fairbanks, Alaska 99709

October 3, 2006

State of Alaska Department of Transportation and Public Facilities
AKSAS PROJECT NO: 61317

INTRODUCTION

The Alaska Department of Transportation and Public Facilities (ADOT&PF) funded a project to examine the feasibility of relocating the Kotzebue Airport, known as Ralph Wien Memorial Airport. Kotzebue Airport is a regional hub in northwestern Alaska that serves 11 area communities with an expanding need for air transportation for the supplies, fuel, and passengers. The objective of this study is to examine Cape Blossom and other potential relocation sites to determine the costs, benefits and potential impacts of the relocation.

This project will provide a basis for an update to the Kotzebue Airport Master Plan and provide guidelines for future airport development that will address aviation demand in a financially feasible manner, while at the same time resolving the aviation, safety, capacity, environmental, and socioeconomic issues existing with this regional airport and the Kotzebue community.

This report will identify existing land interest, ownership of adjacent property, rights-of-way, and other land settlement agreements in the project area. Documented present and future land use and any existing conflicts on and adjacent to the potential relocation sites are also provided.

A land use inventory summarized on an excel spreadsheet includes all ANCSA conveyance documents, U.S. Surveys, BLM and State Master Title Plats, recorded plats and subdivisions, agreements, leases, rights-of-way, 17(b) easements, and Native Allotment certifications for land actions within the project area. All documents are provided in PDF format and hard copy. Information on planned and proposed land uses, potential conflicts on and adjacent to the three areas identified for the potential airport relocation sites is summarized, but is supplemental to information provided by the community through meetings and questionnaires. General airport documents including leases, deeds, property plans, and easements are included and supplement those already gathered by DOT's contractor. All land status information is based on the most current federal, state and officially recorded documents.

An assessment of land use compatibility issues affecting the optimal airport location (as it relates to documented land status) and potential actions is provided. The inventory, land status summary and land status map are intended to assist in the Airport Site Selection.

COMMUNITY PROFILE

Kotzebue is located on a 3-mile long sand spit at the end of the Baldwin Peninsula in Kotzebue Sound, 26 miles above the Arctic Circle. The community lies at approximately 66.898280° North Latitude and 162.59585° West Longitude. (Section 3, Township 17 N., R. 18 W, Kateel River Meridian.) The community is bordered by Kotzebue Sound to the west and Hotham Inlet (locally referred to as “Kobuk Lake”) to the east. Hotham Inlet meets Kotzebue Sound that is part of the Chukchi Sea. The general area encompasses 27.0 square miles of land.

Kotzebue serves as a regional center for villages in the Northwest Arctic Borough and one in the North Slope Borough. Kotzebue Sound was named after Russian explorer Otto von Kotzebue who 'discovered' it in 1818. The site was the hub of ancient arctic trading routes for local Natives as well as Russian Natives across the Bering Straits for hundreds of years. A post office was established in 1899.

The local name for the site is Kikiktagruk and is believed to have been occupied by Iñupiat Eskimos for at least 9,000 years. It may be one of the oldest settlements in both North and South America. Kotzebue had a 2005 population of 3,205 and has an annual growth rate of 3.99%. Approximately 70-75% of the population is Native Alaskan (Iñupiat Eskimo). The community is highly dependent upon a traditional subsistence lifestyle as a supplement to their income.

**LAND STATUS OF PROPERTIES WITHIN THE PROPOSED AIRPORT
BOUNDARIES FOR THE PROPOSED KOTZEBUE AIRPORT**

The mapping limits for the Kotzebue Airport Photogrammetry and Mapping Project covers an area within:

Township 14 North, Range 16 West, Kateel River Meridian
Township 15 North, Range 16 West, Kateel River Meridian
Township 15 North, Range 17 West, Kateel River Meridian
Township 15 North, Range 18 West, Kateel River Meridian
Township 16 North, Range 16 West, Kateel River Meridian
Township 16 North, Range 17 West, Kateel River Meridian
Township 16 North, Range 18 West, Kateel River Meridian
Township 17 North, Range 16 West, Kateel River Meridian
Township 17 North, Range 17 West, Kateel River Meridian
Township 17 North, Range 18 West, Kateel River Meridian
Township 18 North, Range 17 West, Kateel River Meridian
Township 18 North, Range 18 West, Kateel River Meridian

The land status is described below and is depicted on the enclosed map.

EXISTING LAND OWNERSHIP AND AGENCY JURISDICTION

Land Ownership

The primary landowners within the project area are Kikiktagruk Inupiat Corporation (KIC), NANA Regional Corporation (NANA) and Native Allottees. KIC is the Native Village Corporation for the village of Kotzebue which incorporated and organized in 1973 in accordance with Section 8 of the Alaska Native Claims Settlement Act (ANCSA), as amended, Public Law 92-203, 85 Stat. 688, 43 U.S.C. 1601 et. seq., and the laws of the State of Alaska. KIC is headquartered in Kotzebue, Alaska and has 1,953 shareholders.

Agency Jurisdiction

The Northwest Arctic Borough (NAB) was formed in June 1986 and is a home rule borough and is the local political subdivision of the State of Alaska. The Borough encompasses approximately 36,000 square miles and is the second largest borough in Alaska. Kotzebue is the largest village in the Borough. As a home rule borough with planning and zoning authority, the NAB is responsible for issuing permits for most projects in or affecting lands within the Borough. Title 9 of the NAB Code provides the authority for the NAB to guide, control, regulate and prohibit future development of land within the Borough in accordance with its land use policies and the NAB Comprehensive Plan. The Borough also uses the Title 9 permit review process to implement the policies and standards of the Coastal Zone Management Program (CZM.) According to the Borough Planning Director, the proposed area is in a Subsistence Conservation Zone, however, there are exceptions made for development.

The Bureau of Land Management has interim jurisdiction of lands that have been selected but not conveyed to KIC and NANA.

The Bureau of Indian Affairs (BIA) has trust responsibilities over Native Allotments held in restricted title. The Kotzebue IRA Council has undertaken the trust functions for Native Allotments around Kotzebue under a Public Law 93-638 Contract with the BIA. The Realty program provides information, counseling, and other assistance to Alaska Natives concerning pending Native Allotment claims, forest management, general land management, property rights, probate matter, and wills.

KIKIKTAGRUK INUPIAT CORPORATION

KIC has an original land entitlement of 161,280 acres pursuant to the terms of ANCSA §12(a) from the United States Government. KIC also received an additional selection entitlement of 1,020 acres of land under ANCSA 12(b). The 12(b) entitlement is often referred to as the “second-round selection” of land that is allocated from NANA Regional Corporation (NANA) out of its 12(b) pool of 208,392 acres of land. These lands have been selected, but are not yet conveyed.

KIC’s total ANCSA entitlement is 162,300 acres of surface estate. KIC also over-selected land within its ANCSA withdrawal area and those lands are called 12(c) selections.

KIC has received the majority of its ANCSA entitlement of surface land through both Interim Conveyance and Patent from the Bureau of Land Management. Under the terms of ANCSA, the KIC is entitled to the surface estate, while NANA receives rights to the subsurface estate.

The title that KIC receives is subject to specific exceptions and reservations to the United States from the lands granted, including the subsurface estate, ANCSA 17(b) easements, valid existing rights, requirements, third party interests created by the U.S. Government pursuant to ANCSA Section 14(g), and requirements of ANCSA 14(c).

NANA received 1,050,667 acres of land and related subsurface rights, according to the most recent NANA estimates. Villages in the NANA region are entitled to select over 1.4 million acres of land. NANA also selected land under ANCSA 14(h)(8), that are referred to as “in lieu selections.” NANA receives the surface and subsurface estate of these lands. ANCSA 12(c) is land over-selected by KIC to which NANA will receive the subsurface.

KIC ANCSA Land Ownership

KIC received title to the surface estate of certain real property located within the following lands around Kotzebue from the Bureau of Land Management (BLM). These conveyances are specific to the project area:

Interim Conveyance 004

The surface estate of Interim Conveyance 004 was issued to Kikiktagruk Inupiat Corporation and recorded in Book 5, Pages 574-583 on July 12, 1977.

Interim Conveyance 024

The surface estate of Interim Conveyance 024 was issued to Kikiktagruk Inupiat Corporation and recorded on December 29, 1975.

Interim Conveyance 062

The surface estate of Interim Conveyance 062 was issued to Kikiktagruk Inupiat Corporation and recorded on July 6, 1977.

Interim Conveyance 544

Surface estate of Interim Conveyance 544 was issued to Kikiktagruk Inupiat Corporation on September 2, 1982.

Interim Conveyance 759

The surface estate of Interim Conveyance 759 was issued to Kikiktagruk Inupiat Corporation and recorded on December 5, 1983.

Interim Conveyance 1364

Surface estate of Interim Conveyance 1364 was issued to Kikiktagruk Inupiat Corporation on September 15, 1988.

Interim Conveyance 1404

Surface estate of Interim Conveyance 1404 was issued to Kikiktagruk Inupiat Corporation on December 14, 1987.

Interim Conveyance 1359

The surface estate of Interim Conveyance 1359 was issued to Kikiktagruk Inupiat Corporation on September 21, 1987.

Interim Conveyance 1556 & Corrected Interim Conveyance 1892

The surface estate of Interim Conveyance 544 was issued to Kikiktagruk Inupiat Corporation and recorded on September 2, 1982 in Book 23, Pages 894 - 906. Corrected Interim Conveyance 1893 was issued on June 27, 2005 and recorded as 2005-000283-0 on July 5, 2005 to identify Native Allotments to be excluded.

Interim Conveyance 1627

The surface estate of Interim Conveyance 1627 was issued to Kikiktagruk Inupiat Corporation on August 1, 1995.

Interim Conveyance 1849

The surface estate of Interim Conveyance 1849 was issued to Kikiktagruk Inupiat Corporation on October 25, 2002 and recorded as 2002-000662-0 on November 22, 2002.

Corrected Interim Conveyance 1895

Surface estate of Interim Conveyance 1895 was issued to Kikiktagruk Inupiat Corporation on June 27, 2005 and recorded as 2005-000300-0 on July 6, 2005. This Interim Conveyance corrected I.C. 580 dated December 28, 1982 recorded in Book 24 beginning at page 663, Kotzebue Recording District.

Patent 50-82-0133

Patent for Surface estate was issued to KIC on September 22, 1982 and recorded in Book 23, Pages 914-918.

Patent 50-83-0025

Patent for Surface estate was issued to KIC on December 28, 1982.

Patent 50-83-0063

Patent for Surface estate was issued to KIC on February 8, 1983.

Patent 50-87-0130

Patent for Surface estate was issued to KIC on December 23, 1986.

Patent 50-88-0033

Surface estate of Patent was issued to KIC on December 21, 1987.

NANA REGIONAL CORPORATION, INC.

Interim Conveyance 545 & Corrected Interim Conveyance 1892

Corrected IC was issued to NANA Regional Corporation, Inc. for the subsurface estate and recorded as 2005-000295-0 on July 5, 2005.

Interim Conveyance 1893

Corrected IC of the subsurface estate was issued to NANA Regional Corporation, Inc. and recorded as 2005-000283-0 on July 5, 2005.

Corrected Interim Conveyance 1894

Corrective Interim Conveyance 1894 was issued for the subsurface estate to NANA Regional Corporation, Inc. on June 27, 2005 and recorded as 2002-000662-0.

Patent 50-82-0134

Patent 50-82-0134 for the subsurface estate was issued to NANA on September 2, 1982.

Patent 50-2003-0290

The surface and subsurface estate of Patent 50-2003-0290 was issued to NANA on June 4, 2003.

KIKIKTAGRUK INUPIAK CORPORATION ANCSA 14(c) OBLIGATION

ANCSA §14(c)

Under ANCSA §14(c), KIC is required to reconvey the surface estate of certain lands to individuals, organizations, municipal governments and airport operators. Section 14(c)(1) refers to land occupied as of December 18, 1971 as a primary place of residence, primary place of business, reindeer husbandry headquarters site, or subsistence campsite. ANCSA §14(c)(2) refers to non-profit organizations. ANCSA §14(c)(3) provides for conveyances to municipal governments for community expansion and §14(c)(4) refers to airports.

ANCSA §14(c)(1) & (2)

There are numerous 14(c)(1) subsistence campsites located throughout the mapping area. Concentrations of subsistence campsites are located on KIC land at the Noatak River, on Shesolik Spit, and the Little Noatak River. KIC has adjudicated all of these claims, mapped them, and staked them in the field. There are some claims whose boundaries are in conflict and the KIC Lands Department is still attempting to resolve them. The 14(c) claims are not yet surveyed by BLM, but are shown on the project map as adjudicated and staked.

ANCSA 14(c) claims are concentrated primarily in the core township, Township17 North, Range 18 West, Kateel River Meridian.

ANCSA §14(c)(3)

Pursuant to the terms of ANCSA §14(c)(3), all ANCSA village corporations are required to reconvey land to municipalities or to the State in Trust to meet present and foreseeable community use and expansion.

The provision states:

“the Village Corporation shall then convey to any Municipal Corporation in the Native village or to the State in trust for any Municipal Corporation established in the Native village in the future, title to the remaining surface estate of the improved land on which the Native village is located and as much additional land as is necessary for community expansion, and appropriate rights-of-way for public use, and other foreseeable community needs: Provided, That the amount of lands to be transferred to the Municipal Corporation or in trust shall be no less than 1,280 acres unless the Village Corporation and the Municipal Corporation or the State in trust can agree in writing on an amount which is less than one thousand two hundred and eighty acres; Provided further, That any net revenues derived from the sale of surface resources harvested or extracted from lands reconveyed pursuant to this subsection shall be paid to the Village Corporation by the Municipal Corporation or the State in trust: Provided, however, That the word "sale", as used in the preceding sentence, shall not include the utilization of surface resources for governmental purposes by the Municipal Corporation or the State in trust, nor shall it include the issuance of free use permits or other authorization for such purpose.”

ANCSA §14(C)(3) Agreement

KIC and the City of Kotzebue signed an agreement on May 17, 1996 in complete satisfaction of KIC’s ANCSA §14(c)(3) obligation. By this agreement, KIC agreed to convey land to the City to meet present and foreseeable public needs. KIC has prepared a draft ANCSA 14(c) Map of Boundaries (MOB), but it has not been submitted to the Bureau of Land Management. The 14(c)(3) agreement identifies the following land to be conveyed to the City of Kotzebue:

- A new landfill site consisting of 45 acres.
- Kotzebue Wastewater Treatment site consisting of 29.14 acres.
- Sewage lagoon parcel consisting of 13.25 acres.
- A watershed consisting of 350 acres.
- A waterline utility easement consisting of 6.26 acres.
- A waterline utility easement consisting of 8.52 acres.
- A water utility line consisting of 2.85 acres.
- Vortac Lake road right-of-way consisting of 10.90 acres.
- Cemetery road right-of-way consisting of 1.52 acres.
- A recreation parcel consisting of 5.00 acres.
- The watershed/utility corridor consisting of 650 acres.

ANCSA §14(c)(4)

ANCSA §14(c)(4) is the provision providing for the reconveyance of airports that existed as of December 18, 1971. KIC implemented this provision for portions of the Kotzebue airport. The provision states:

“the Village Corporation shall convey to the Federal Government, State, or to the appropriate Municipal Corporation, title to the surface estate for airport site, airway beacons, and other navigational aids as such existed on December 18, 1971, together with such additional acreage and/or easements as are necessary to provide related governmental services and to insure safe approaches to airport runways as such airport sites, runways, and other facilities existed as of December 18, 1971.”

ANCSA §14(c) Map of Boundaries and Survey

Bureau of Land Management (BLM) regulations in 43 CFR 2650.5-4, ANCSA require Corporations to prepare and submit Maps of Boundaries depicting lands qualified as ANCSA §14(c) reconveyances to BLM. The KIC ANCSA 14(c) Map of Boundaries is the official map that depicts the location of all 14(c) land to be surveyed by BLM. Part of the submittal process requires that all conflicts on 14(c) land be resolved prior to submittal. The day that BLM stamps the MOB is the date of filing and the day that BLM starts the one-year (1) ANILCA Section 902(b) Statute of Limitations time clock. The one-year Statute of Limitations must toll before BLM can issue final approval of the Map of Boundaries.

BLM can survey the land before the one-year Statute of Limitations tolls providing the Corporation submits a waiver letter agreeing to bear the cost of any additional surveys resulting from successful MOB challenges or appeals.

When all conflicts are resolved KIC will submit the final Map of Boundaries. All 14(c) interests have been identified in Kotzebue and are so depicted on the map.

LAND OWNERSHIP OF THE KOTZEBUE AIRPORT

Introduction

Ralph Wien Memorial Airport is situated on the northwest shore of Baldwin Peninsula and is intimately linked to the livelihood of the community. Alaska's vast expanse and unique geography, in addition to weather challenges, makes air transportation vital to the social and economic well-being of area residents.

Kotzebue is the regional hub and business center for the Northwest Arctic Borough. The community serves 11 area villages that generate considerable activity in and out of Kotzebue. The Ralph Wien Memorial Airport serves as the entry point to these smaller villages and is located less than a half-mile from the Kotzebue community center. While the current location provides convenient access, the location constrains future community expansion to the south. Kotzebue lacks a developed surface transportation system and marine access is seasonal in nature.

Currently, commuter and air taxi operators carrying both passengers and cargo, serve Kotzebue and its outlying villages from Ralph Wien Memorial Airport. Air carrier jet aircraft share the facility with small general aviation aircraft.

KOTZEBUE AIRPORT LAND STATUS ACTIONS

The following information summarizes major land status actions regarding the current Kotzebue airport in a chronological sequence beginning in 1950. The Ralph Wien Memorial Airport was constructed in 1950 and was known as the Civil Aeronautics Authority Strip.¹ The State of Alaska prepared a property plan for the Kotzebue VORTAC Site A-1 on May 31, 1963. On June 24, 1963, the State filed application F-031367 for a right-of-way from BLM. On July 15, 1963, Airport Lease F-031466 was segregated from the public domain. BLM made a decision to create a

¹ Cape Blossom Road Deep Water Port Airport Relocation ; 2001

right-of-way (44 LD 513) to three adjoining sites and two connecting access roads required for the VORTAC facility on February 10, 1964. This decision was declared null and void within a Native Allotment in Section 22, T. 17 N., R. 18 W., K.R.M. and the right-of-way was no longer needed.

On February 11, 1964 FAA requested segregation of certain lands from the public domain for an access road and protection of the facilities to be constructed. A 20-year lease was requested by FAA. BLM decided at FAA's request to retain Parcel 1, containing the VOR facility for an area 300 feet by 1,500 feet in size on March 19, 1964. Public Land Order 3830 segregated the VORTAC facility on the same date.

Patent No. 1236260 was issued from BLM to the State of Alaska Department of Transportation (State) for Tracts 2, 3, 5, 6, 7, and 8 of USS 2645 on May 12, 1964. As a result of the States application for the Airport Lease, Tract A, FAA cancelled their request for Tract A.

PLO 3830 withdrew land for use by the Federal Aviation Administration (FAA) for the maintenance of their air navigational facility on September 17, 1965 and it later became subject to an ANCSA §3(e) determination under ANCSA. BLM granted a 20 year Public Airport Lease to the State on November 1, 1965 and it was renewed on December 20, 1979 for Tract V, Parcel A. Tract V was later deeded from KIC to the State under the provision of ANCSA §14(c)(4).

On August 25, 1982, KIC granted a perpetual Permit, Avigation and Hazard Easement and Right-of-Way to the State for 336.4 acres of land described as Tract V, Parcel A, VORTAC facility. This grant was made pursuant to an agreement (Modified Quitclaim Deed) made by KIC on the same day to grant this land to the State under §14(c)(4). There was language in the permit that the permit would affect existing use by the City of Kotzebue water project.

The watershed in the A&H Easement area was later promised for reconveyance to the City of Kotzebue under ANCSA §14(c)(3). This deed also contained a reverter clause that in the event the lands cease to be used for airport purposes, the title would revert to KIC.

General Airport Inventory

The Kotzebue Airport is located adjacent to and south of the City of Kotzebue, on an irregular-shaped parcel of 1,805 acres, of which 80 to 85% is water. Commercial aviation operations, the majority of general aviation tie-downs, and the associated paved apron area and taxiways are located in the northwest section of the Airport property. The Airport is owned and maintained by the State of Alaska, Department of Transportation and Public Facilities.

The mainland geology is comprised of ice rich, thaw unstable silts. Little development on the mainland has occurred due to poor soil conditions, combined with isolation from City facilities by the lagoon. However, the new road around the lagoon has provided improved access and some development is beginning to occur. The airport constrains development to the south on the spit, which has more favorable soil conditions for development.

Existing airport facilities include:

- Airfield
- Airspace and navigational aids
- Terminal area facilities and aircraft storage
- Ground access and vehicle parking
- Utilities
- Other support facilities

The primary runway 8-26 is over 5,900 feet in length and was paved in 1970. More than half of the runway length is constructed on fill in the lagoon to the east of Kotzebue Spit.

The cross wind runway has a gravel surface length of Runway 17-35 is 4,350 feet. The usable length was reduced to 3,800 feet to provide adequate safety area beyond each runway threshold, per FAA standards for runway safety area. Currently, there is an aircraft parking area along the west side of Runway 17-35 within the runway obstacle-free area.

Access

There are 26 miles of local gravel roads, used by cars, trucks and motorcycles during the summer. Snowmachines are preferred in winter for local transportation. Existing surface access to the Terminal Area from Kotzebue is by Third and Fifth Avenues. Third Avenue was paved in 1996, becoming the first paved road in Kotzebue. Access roads serve the existing terminal area buildings and air taxi operators.

The only road leading south from town passes through the Airport within the safety area of Runway 8. The road is used to access summer fish camps, the sanitary landfill, an Air Force radar site, and properties along the coast to the south. There is a gate controlling access to the airport operating area via this road, although it is not always used.

In 1997 the Bureau of Indian Affairs (BIA) funded the construction a new 3.7 mile, \$6 million road east of Kotzebue Lagoon to divert traffic around the airport runway and to serve the community as the link to the new solid waste facility. This road connects to Ted Stevens Way in the north and to the road through the airport to the south.

Land Use

The incorporated limits of Kotzebue encompass 26.5 square miles, of which less than one square mile is located on the spit north of the airport. Most of the higher land on the spit is developed, with remaining areas in lowlands subject to flooding. Nearly all new development in Kotzebue requires that fill be placed to make the lots suitable for building. Development within Kotzebue blends residential housing with commercial use. The City's planning commission is developing a land use plan to maximize use of remaining land on the spit.

The majority of land within the City limits is on the mainland east of the lagoon. This area is known locally as "The Hillside" where there is already one privately owned subdivision, with access roads and lots for sale. There have been several discussions concerning additional subdivisions in this area. A bridge connects the spit to the mainland, with a road approximately three miles long; access is provided to the City's main water source at Devil's Lake. This watershed and watershed corridors, the cemetery site, and recreational site in this area will eventually be conveyed to the City of Kotzebue by KIC, under the provisions of ANCSA 14(c)(3).

Floatplane Facilities

The Kotzebue Lagoon to the east of the runway serves as an unofficial floatplane landing area. Isaac Lake, to the south west of Runway 17-35, was previously used by floatplanes. KIC dredged this area and extracted gravel for prospective airport construction needs.

**STATE OF ALASKA DEPARTMENT OF
TRANSPORTATION & PUBLIC FACILITIES**

General information is provided on the Kotzebue airport, and supplements detailed airport information available through DOT&PF contractor, PDC Engineers, Inc.

General Airport Property

T. 17 N., R. 18 W., Kateel River Meridian

- Survey 2645, Tracts 5 and 8;
- Survey 2645, Tracts 5 and 8;
- Survey 2645, Tract 8;
- Survey 2645, Tracts 3 and 8;
- Survey 2645, Tracts 2, 3, 6 and 8;
- Survey 2645, Tracts 5 and 8;
- Survey 2645, Tracts 6, 7 and 8;
- Survey 2645, Tract 8 and U.S. Survey 3554

Access to Airport

Bison Street, Caribou Way and Ted Stevens Way from Third Avenue to Devils Lake were upgraded a distance of two miles. The upgrading included grade raising, widening, drainage and surfacing, as well as minor erosion protection in the tidal area near town. Bicycle and pedestrian traffic between town and the new BIA Hillside Road was also accommodated. The road serves as the sole road access to the City's water supply, cemetery and VORTAC site. It also provides access to recreation and subsistence gathering sites.

The Hillside Road connects Ted Stevens Way to the City's landfill, wind generation site, and to Cape Blossom, another popular recreation and subsistence gathering areas.

At the present time, public access to the landfill, wind generators and the Cape Blossom area is via a road that crosses a restricted area, an aviation and hazard easement of the Kotzebue Airport property. FAA and the Alaska Department of Transportation would like to terminate public access through the west end of Runway 08-26 for safety concerns. Continuing access across this restricted area represents a hazard to aviators and the public. The upgrade of Ted Stevens Way has created a viable alternative public access route to the Cape Blossom area.

Former Airport Lease/Avigation and Hazard Easement

KIC issued a Modified Quitclaim Deed (MQCD) to the State DOT/PF under ANCSA §14(c)(4) for Tract V, the former lease² for the clear zone for the Kotzebue Airport before it received title to this area. On August 25, 1982 KIC granted a perpetual Permit, Avigation and Hazard Easement and Right-of-Way to the State of Alaska Department of Transportation and Public Facilities to 336.4 acres of land described as Tract V, Parcel A, within Section 11, T. 17 N., R. 18 W, K.R.M. The FAA reserved the right of reasonable use and enjoyment of the lands described, to the extent that such use and enjoyment shall never interfere with the exercising of the easement and rights therein granted. There is a reversionary clause attached to this easement.

Because KIC had received title from the federal government in 1982 before it received Interim Conveyance, this MQCD clarified that KIC selected and will receive

² Airport lease F-031466 located within Secs. 11, 12, and 13, T. 17 N., R. 18 W., Kateel River Meridian, issued to the State of Alaska, Department of Transportation and Public Facilities, under the provisions of the act of May 24, 1928 (49 U.S.C. 211-214). This former lease was identified as a valid existing right in IC 544.

this tract as part of its ANCSA land entitlement. The State constructed and maintained the Kotzebue Airport as a public airport, and KIC agreed to segregate and convey Tract V, Parcel A-1 for the VORTAC site. This grant included a statement, "FURTHER, this PERMIT shall not affect existing use by the City of Kotzebue water project."

Since there were legal description problems, the Federal Aviation Administration commissioned a survey in 2000 to determine the exact location of the Kotzebue VORTAC site in relation to the existing restricted Native allotments in the area, particularly where the 2,000-foot radius from the VOR conflicts with the Allotments.

The survey verified that Parcel A-1, Tract V that KIC conveyed to the State of Alaska under 14(c)(4) did not contain the VORTAC site. The site may not be eligible for conveyance under 14(c)(4) as it does not meet the requirements of ANCSA law in its present location. The survey corrected the legal description for the 3(e) parcel to be retained by FAA.

During the effort to construct the Ted Stevens Way, the City of Kotzebue needed site control for a 100 foot road right-of-way. BLM reserved a 60-foot road under an ANCSA 17(b) easement. KIC owned the underlying interest of the 17(b) easement and had to use two legal descriptions to transfer the 100-foot road to the City of Kotzebue, one for the 60 foot 17(b) easement and another for an additional 40 feet. Since the VORTAC site has a 2,000-foot restrictive easement, KIC requested a waiver from FAA to grant the additional 40 feet needed for the road right-of-way for that portion of the road inside the excess 3(e) site.

EIN 75 C4, an easement reserved under ANCSA 17(b) restricts the use of lands within a 2,000-foot radius of the VOR antenna.

FEDERAL AVIATION ADMINISTRATION

Vortac Site

On January 14, 1977, FAA submitted an application for a 100-foot wide Right-of-Way (F-23302) in Kotzebue for the construction of an access road to the VORTAC facility. NANA and KIC issued letters of non-objection to FAA for the construction of a road (F-23302) on January 31, 1977.

On August 16, 1979, the PHS Department Health, Education and Welfare sent a letter to BLM requesting that an easement be reserved on lands that would soon be transferred to KIC and that BLM retain land under a 3(e) determination. The requests were made so that the City of Kotzebue could have access to its municipal potable water facilities for the purpose of use and maintenance. The VORTAC structures have been in use since 1970 and the Devil's Lake structure has been used since 1975. The structures requested for BLM retention include a 1,050 foot long compacted silt dam located in the FAA withdrawal, a 30x24 foot water heating plant located within 200 feet south of the dam, and the VORTAC reservoir. On December 20, 1979 BLM approved the grant of a Right-of-way Grant for 1,667.88 x 100 feet and serialized the reservation as F-23302.

The land status of the road beyond the Bridge was complicated by various Airport related withdrawals made over the years starting in 1964. The VORTAC site (PLO 3830) was withdrawn on September 17, 1965. Other infrastructure related to the construction of the VORTAC, including the road right-of-way, waterline easement and power line easement were reserved for the benefit of FAA. The VORTAC road also serviced the community of Kotzebue by providing access to the water reservoir. In addition to the VORTAC site, other land rights included a Native Allotment, a permit to the State of Alaska for an Avigation and Hazard Easement, existing and future ANCSA 17(b) easements, a 2,000-foot buffer around the VORTAC antenna and the watershed KIC intends to deed to the City of Kotzebue.

VORTAC Road

On January 14, 1977, FAA submitted an application for a 100-foot wide Right-of-Way (F-23302) in Kotzebue for the construction of an access road to their VORTAC facility. On January 31, 1977, NANA and KIC issued letters of non-objection for the construction of the road (F-23302) to FAA. BLM approved the right-of-way grant for 1,667.88 x 100 feet for F-23302 on December 20, 1979. When KIC received Interim Conveyance No. 544 on September 2, 1982, the conveyance was subject to the reservation of right-of-way F-23302 for an access road granted to FAA. A letter from Robert D. Arnold to KIC on June 21, 1982, stated, "EIN 66 C5 Delete this existing trail easement as access to the VORTAC station will be provided for by an agreement between FAA and KIC Access via granted right-of-way F-23302 50' FAA is also available."

As grantee, FAA was entitled to all the rights, privileges and benefits granted by the terms of the grant during the term of the grant, until it expired, was relinquished or was modified by the mutual consent of KIC and the FAA. This right-of-way called VORTAC Access Road Project was located within Section 11, T. 17 N., R. 18 W., KRM and reserved a total of 1667.88 feet long x 100 feet wide for a total of 3.83 acres and shown on drawing ALD-OTZ-040.002X. The easement was not reserved on the subject 3(e) lands because the right-of-way was reserved for the FAA, and the FAA had control of the subject lands at the time. It is apparent that FAA's original intent was to reserve a 100-foot access road. BLM granted a twenty-year term right-of-way with an expiration date of December 20, 1999.

The Kikiktagruk Inupiat Corporation received Interim Conveyance #544 on September 2, 1982. The IC reserved right-of-way F-23302 under ANCSA Section 14(g). Such interest applies to lessees, contractees, permittees, and grantees of rights-of-way and easements that originated before ANCSA. The corporation was required to honor the provisions of the right-of-way, permit or lease for its duration.

Upon receipt of IC #544 in 1982, administrative agency BLM waived jurisdiction of this road to KIC. The right-of-way expired on December 20, 1999. This road was included in the agreement for KIC to reconvey it to the City of Kotzebue under 14(c)(3).

2,000-Foot VORTAC Easement

On June 14, 1983, the FAA submitted site use plans and justification to BLM for 139.85 acres used in connection with the operation of the navigation facility. The FAA stated that use of the land began in 1968 when it constructed the VORTAC facilities. No action took place between December 18, 1971 and December 18, 1974 to reduce the needed area. FAA indicated the need for absolute control of the lands within the 1,000-foot radius of the VOR antenna and heavy restriction on the use of land between the 1,000 and 2,000-foot radius. FAA stated they also require the continued use of the access road. A request was made by FAA to include a special stipulation in the lease stating that the land be subject to a 44 L.S. 513 Right-of-Way serialized as F-031891.

PLO 3830, ANCSA §3(e) Site

KIC owns a portion of land in the former Public Land Order (PLO) 3830. This PLO was withdrawn on September 17, 1965 by the FAA for the maintenance of the air navigational facility across the lagoon near Kotzebue. This federal installation later became subject to an ANCSA §3(e) determination and was serialized as F-65065. A §3(e) determination was made in 1985 by BLM to release all of the land in the former PLO except an area 300 feet by 1,500 feet in size and described as Parcel 1, Tract B, which was to be retained by the Federal government.

BLM failed to convey the released land to KIC because there was an error in the legal description in the original §3(e) determination. BLM described Tract B, Parcel 1 in the wrong place, causing this parcel to be in conflict with the Louis A. Beltz Native Allotment. Mr. Beltz's use and occupancy (of land mistakenly described by BLM) of June 1, 1950 predated all other uses in this area. There was also a legal

description error in the conveyance of Tract V, Parcel A-1 for the VORTAC site. The VORTAC antenna was not located in this parcel.

KIC received expedited conveyance from BLM for the excess ANCSA 3(e) land through which the Ted Stevens Way Road crossed. KIC received interim conveyance to this land with IC #1849 on October 25, 2002.

RIGHTS-OF-WAY

A right-of-way, F-033395, located within Sec. 11, T. 17 N., R. 18 W., K.R.M. was granted for a power line to Kotzebue Electric Association, Inc., under the provisions of the act of February 15, 1901 (43 U.S.C. 959), as amended;

A 100 foot right-of-way, F-23302, located within Sec. 11, T. 17 N., R. 18 W., K.R.M. was granted for an access road to the U.S. Department of Transportation, Federal Aviation Administration, under the provisions of Public Law 94-579 (October 21, 1976) Title V (43 U.S.C. 1761-1771).

KIC granted a right-of-way to the City of Kotzebue on January 14, 2003 for the Ted Stevens Way extension. It was recorded as 2003-000025-0, Kotzebue Recording District on January 16, 2003.

KIC granted a 3.7 mile right-of-way to the Kotzebue IRA Council for the Hillside Road project adjoining the easterly right-of-way of the Air Force Road (EIN 53 C5) located in Section 21, T. 17 N., R. 18 W., K.R.M. This right-of-way grant included conditions and a reverter clause.

Kikiktagruk Inupiat Corporation granted an easement for an electric line to Kotzebue Electric Association in Sections 16, 21 and 28 of T. 17 N., R. 18 W., K.R.M. on March 27, 1984.

PERMITS AND LEASES

The KIC Lands Department issues gravel permits to KIC shareholders and other permittees that need gravel for projects in the City of Kotzebue. KIC has two active gravel permits and will probably receive gravel permits at Numiuk Point and Arctic Circle in the near future.

Kikiktagruk Inupiat Corporation granted a lease agreement for a windmill site to Kotzebue Electric Association in Section 25 and 35 of T. 17 N., R. 18 W.. K.R.M. on July 7, 2003.

UNITED STATES BUREAU OF LAND MANAGEMENT

ANCSA §17(b) Easements

Section 17(b) of the Alaska Native Claims Settlement Act (ANCSA), 43 U.S.C. 1616(b), authorizes the reservation of public easements on lands conveyed to Native Regional and Village Corporations. Such easements are referenced by Easement Identification Number (EIN) on the easement map.

All easements are subject to applicable Federal, State, or Municipal Corporation regulations. Department Manual 601 DM 4 (September 11, 1984) establishes procedures for the administration of easements that are under the jurisdiction of the Department of the Interior. It provides that the Department of the Interior agency whose land is accessed by the easement shall administer an easement reserved pursuant to Section 17(b) of ANCSA. Any uses which are not specifically listed are prohibited.

There are several ANCSA 17(b) Easements located within the study areas that are reserved through lands granted by the United States to KIC. Easements reserved near the present airport or near town are not listed but are shown on the map:

EIN 75 C4:

An easement restricting use of the lands within a 2,000 foot radius of the VOR antenna located in Secs. 11, 12, and 14, T. 17 N., R. 18 w., Kateel River Meridian. The uses allowed include the uses associated with the construction, reconstruction, operation, and maintenance of a VOR site, the right to clear and keep the lands clear from any obstruction infringing upon or penetrating the airspace, and the right to prohibit use on and remove from the lands beneath the airspace any source which would create interference for users of the VOR radio signal.

EIN 76 C4:

An easement twenty (20) feet in width for the City of Kotzebue's existing waterline from the west boundary of Tract B Parcel 2, in Sec. 11, T. 17 N., R. 18 w., Kateel River Meridian., southeasterly to the south boundary of Tract B Parcel 2 in Sec. 11, T. 17 N., R. 18 w., Kateel River Meridian. The uses allowed are those activities associated with the construction, operation, and maintenance of the waterline facility.

EIN 77 C4:

An easement twenty (20) feet in width for an existing powerline from the west boundary of Tract B Parcel 2 in Sec. 11, T. 17 N., R. 18 w., Kateel River Meridian, southeasterly to the south boundary of Tract B in Sec. 11, T. 17 N., R. 18 w., Kateel River Meridian. The uses allowed are those activities associated with the construction, operation and maintenance of the powerline facility.

EIN 8a C5:

An easement sixty (60) feet in width for an existing road from the west boundary of Tract B Parcel 2, in Sec. 11, T. 17 N., R. 18 W., Kateel River Meridian, southeasterly through Tract B Parcel 2 to the southern boundary of Tract B Parcel 2. The uses allowed are those listed above for a sixty (60) foot wide road easement.”

EIN 8 D1, D9:

An easement for an existing access trail twenty-five (25) feet in width from the edge of State patented submerged lands near Kotzebue within Tract 5, U.S. Survey No. 2645 within Secs. 2 and 11, T. 17 N., R. 11 W., Kateel River Meridian. The uses allowed are those listed above for a twenty-five foot wide trail easement.³ The season of use will be limited to winter.

EIN 12 D1:

An easement twenty-five (25) feet in width for an existing access trail from the west section line of Section. 18, T. 16 N., R. 17 W., Kateel River Meridian, southeasterly to public land. The uses allowed are those listed above for a twenty-five foot wide trail easement. The season of use will be limited to winter.

EIN 15 C5:

An easement sixty (60) feet in width for an existing road from the south boundary of patent No. 1236172, in Section 16, T. 17 N., R. 18 W., Kateel River Meridian, southerly to public land in T. 16 N., R. 18 W., Kateel River Meridian. The uses allowed are those listed for a sixty (60) foot wide road easement.

EIN 53 C5:

A transportation and communications easement sixty-five (65) feet in width for an existing road and two (2) buried communications cables, from the southern edge of patented State land in Sec. 16, T. 17 N., R. 18 W., Kateel River Meridian, southerly to the north boundary of the U.S. Air Force withdrawal. The uses allowed are those listed for a sixty (60) foot wide road easement and those use associated with the construction, operation and maintenance of the communication cable facilities.

³ 25-Foot Trail – The uses allowed on a twenty-five (25) foot wide trail easement are: travel by foot, dogsled, animals, snowmobiles, two- and three-wheeled vehicles, and small all-terrain vehicles (less than 3,000 lbs. Gross Vehicle Weight (GVW)).

NATIVE ALLOTMENT ACT

Pursuant to the Native Allotment Act of May 17, 1906, any Alaskan Native of full or mixed blood who was either head of a family or 21 years old could apply for no more than 160 acres of non-mineral land from the Department of Interior Bureau of Land Management. Native Allotees receive title in the form of a Certificate, which is a legal document that conveys beneficial possession of land and contains a patent number protected against alienation and taxation by the U.S. Government. The Kotzebue IRA is the main service provider for Native Allotment administration. Several allotments near Kotzebue have been taken out of restricted status.

Restricted Deeds

“Restricted” deeds are protected against taxation and alienation, and cannot be conveyed or encumbered without approval by the Secretary of the Interior (BIA).

Restricted lands mean that:

- The property is tax-exempt from all taxes.
- Income from the land cannot be taxed. (If the land is rented, leased or sold, the money cannot be taxed, just the interest, and it does not need to be reported to the IRS.)
- The land cannot be seized, taken away, trespassed upon, or be subject to liens. The land receives protection by the Federal Government from unauthorized seizure by the State, Federal and City governments for anything (not even the IRS). No one can trespass on the land, and no can place liens against the land.
- Restricted landowners can obtain free real estate services and counseling. (638 Services Providers or the BIA)
- The Bureau of Indian Affairs must approve all transactions (sales, leases, rights-of-way, rents, gift deeds, mortgages, etc.)

Unrestricted Deeds

“Unrestricted” deeds mean that the land is removed from a protected status in a manner approved by the Secretary of the Interior (BIA). The land is taxable, alienable and no longer under the BIA’s jurisdiction.

Unauthorized Use.⁴

Prior to approval of the allotment application, the agency having jurisdiction of the land retains unauthorized use abatement responsibility. In the case of BLM lands, at least, BIA assumes this responsibility after the application is approved. Prior to approval, either agency may initiate unauthorized use investigation with BIA providing its findings to the district office for appropriate action.

Prior to approval, removal of resources or construction of improvements by a third party constitutes unauthorized use. An allotment applicant may, before approval, utilize resources for his/her personal use, but not for most commercial purposes except in the case of subsistence resources under State fish and game laws. After approval, the Allottee and BIA assume jurisdiction over all resources not reserved to the United States.

Alienation of Interest

Certain activities on allotments are considered an alienation of interest. If cultural resources, for example, may be adversely affected by proposed development, the BIA must observe the requirements of Section 106 of the National Historic Preservation Act before approving a change in an allotment’s restricted status.

⁴ NATIVE ALLOTMENTS, BLM ALASKA HANDBOOK

Revocable Use Permits

P. L. 93-638 Service Providers must comply with several regulatory authorities in granting leases or permit on trust lands. 25 U.S.C. Sec. 415. deals with “Leases of restricted lands” and 25 CFR 162.3 provides procedures for Leasing/Permitting, Grazing, Probate and Funds Held in Trust.

25 U.S.C. 169 and 25 USC 415 provides procedures for the granting of leases and permits on restricted land. This authority is cited in the beginning of the Revocable Use Permit (RUP) that grants permission to State of Alaska-Department of Transportation/Public Facilities to gain access on restricted land for the purposes of conducting topographic surveys, Geotechnical work, soils inspection, and wetlands delineation. The compensation amount is negotiated between the 638 Service Provider and the Allottees.

The regulations were revised on January 22, 2001 in the areas of probate, funds held in trust for Indian tribes and individual Indians, leasing/permitting, and grazing. These revisions are meant to further fulfill the Secretary's fiduciary responsibility to federally recognized tribes and individual Indians. Revisions to leasing/permitting regulations implement the Indian Agricultural Resource Management Act and address appropriate procedures for entering into leases and permits on Indian lands and, more importantly, aid in properly determining and accounting for the value of such leases to individual land owners and tribal entities. The effective date for the implementation date of the regulations is March 23, 2001. Included below are portions of the regulations and a web site to view the regulation.

169.3 Consent of landowners to grants of right-of-way.

(a) No right-of-way shall be granted over and across any tribal land, nor shall any permission to survey be issued with respect to any such lands, without the prior written consent of the tribe.

§169.4 Permission to survey

Anyone desiring to obtain permission to survey for a right-of-way across individually owned, tribal or Government owned land must file a written application therefore with the Secretary. Upon receipt of an application made in compliance with the regulations of this part 169, the Secretary may grant the applicant written permission to survey.

Native Allotments within the subject area include:

Area 1

T. 17 N., R. 17 W., KRM

50-96-0070
50-96-0028
50-89-0224

T. 17 N., R. 18 W., KRM

50-85-0400
50-85-0121
50-97-0162
50-84-0474
50-2005-0361
50-84-0339
50-84-0771
50-86-0267

T. 18 N., R 17 W. and 18 W., KRM

50-96-0079
50-95-0341
50-96-0219
50-96-0085
50-84-0497
50-89-0177
50-89-0535
50-95-0644
50-95-0028
50-84-0406
50-95-0569

50-89-0224
50-96-0070
50-95-0556

Area 2

16N 18W KRM

50-91-0367
50-95-0508
50-96-0080
50-95-0620
50-95-0640

T. 17 N., R. 16 W., KRM

50-86-0263, Lots 1 and 2, U.S.S. 6764
50-96-0220, U.S.S 10858

T. 17 N., R. 18 W., KRM

50-91-0055
50-86-0065
50-96-0366

Area 3

T.15 N., R.16 W. KRM

50-95-0408, Lots 1 and 2, U.S.S. 10792
Portion of 50-2005-0005, Lots 2 and 3,

T. 15 N., R. 17 W., KRM

50-95-0298
50-95-0299, Lot 2, USS 10800
50-86-0224
50-95-0297, Lots 1 and 2, U.S.S. 10846
50-95-0338, Lots 3 and 4, U.S.S. 10846
50-2004-0329, U.S.S. 10847
50-2005-0005, Lot 1 and portions of Lot 2 and 3, U.S.S. 10847

T. 15 N., R. 18 W., KRM

Portion of NA Application F18853, Parcel A, USS 10850
Portion of 50-2005-0409, Lot 2, U.S.S. 10801
Portion of 50-96-0363, Lot 1, U.S.S. 10801
Portion of 50-2005-0522, Lots 3 and 4, U.S.S 10801
Portion of 50-95-0298

T. 16 N., R. 16 W., KRM

50-95-0334, U.S.S. 10852, Lot 1 and U.S.S. 10851, Lot 1
50-95-0403, U.S.S. 10852, Lot 2
50-95-0404, U.S.S. 10852, Lot 3
50-98-0238, U.S.S. 10853, Lot 2
50-95-0259, U.S.S. 10851, Lot 2

T. 16 N., R. 18 W., KRM

50-95-0556
50-96-0195
50-95-0607
50-96-0649
50-97-0202
50-97-0556
50-96-0195
50-95-0607
50-96-0649
50-97-0202
Portion of NA Application F18853, Parcel A, USS 10850
Portion of 50-2005-0409, Lot 2, U.S.S. 10801
Portion of 50-2005-0522, Lots 3 and 4, U.S.S 10801

DEVELOPMENT PLANS AND PLANNED USES

AREA 1

ANILCA §1407 Shareholder Homesite Program

§1407. §21 of the Alaska Native Claims Settlement Act is amended by adding a new subsection at the end thereof, as follows:

"(j) A real property interest distributed prior to December 18, 1991, by a Village Corporation to a shareholder of such Corporation pursuant to a program to provide homesites to its shareholders, shall be deemed conveyed and received pursuant to this Act: Provided, That the land received is restricted by covenant for a period not less than ten years to single-family (including traditional extended family customs) residential occupancy, and by such other covenants and retained interests as the Village Corporation deems appropriate: Provided further, That the land conveyed does not exceed one and one-half acres: Provided further, That the shareholder receiving the homesite, if the shareholder subdivides the land received, shall pay all Federal, State, and local taxes which would have been incurred but for this subsection, together with simple interest at six percent per annum calculated from the date of receipt of the land to be paid to the appropriate taxing authority."

KIC plans to implement a shareholder homesite program near the community on unencumbered land located off of Ted Stevens's Road. The homesite distribution allowed under ANILCA §1407 will accommodate 1,953 shareholders. Under the homesite program the parcels must be no more than 1½ acres in size.

The development will require the survey, platting and approval for multiple subdivisions, road access, and may require approximately 3,000 acres of unencumbered KIC land. This development will impact a large amount of land near Kotzebue and further congest the current airport property area. Planning for the shareholder homesite subdivision is expected to take a minimum of two years. Many Alaska Native Corporations have initiated plans for Shareholder Homesite Programs only to discover that the costs and land requirements are too great to be feasible.

AREA 1-3

Port Development and Road to Cape Blossom

The City of Kotzebue investigated the feasibility of a deep water port in 1977 and in 1983. The study was concentrated in several sites up to twenty-four miles from Kotzebue. The first port project study conducted by KPFF Architecture Engineering Planning proposed the creation of a mooring facility for ocean going barges at three sites: Cape Blossom, Isthmus Point and the present site in front of town were studied. Cape Blossom is located twelve miles from Kotzebue and is owned by KIC, NANA, and several Native Allottees. Development of the port would require that a road be constructed from Kotzebue to Cape Blossom where maintenance and storage buildings could also be constructed. Electricity lines, water and sewer systems would also need to be developed for infrastructure support.

In February 2006, the Federal Lands Highway Program, Safe, Accountable, Flexible, Efficient Transportation Equity Act: *A Legacy for Users* (SAFETEA-LU) was enacted; the Office of Federal Lands identified approximately 115 related projects nationwide including the road to Cape Blossom. The list of FLH-related earmarks is subject to change based on further analysis and investigation.

Inter-village tie power lines have been identified as a means to address the high cost of energy in the region; it would be prudent for future power development to be coordinated with any airport development.

POTENTIAL CONFLICTS

AREA 1

Potential conflicts are identified below, although this list is not exhaustive:

- Subsistent picking of wild plants/berries
- Nesting areas of migratory birds/Animal habitats
- Hunting
- Kotzebue Water Source
- Cemetery
- Current and future Landfill
- Watershed and corridors
- Private Subdivisions – Residential Lots
- Native Allotments
- ANCSA 14(c)(1) Subsistence Campsites
- ANCSA 17(b) 25 Foot Noorvik Winter Trail Easement (EIN 8, D12, D9)
- ANCSA 17(b) 2,000 Foot Vortac Easement
- Recreational areas
- Windmill farm
- Access Road to beach for gravel extraction
- Beach Recreation⁵

AREA 2

- Subsistent picking of wild plants/berries
- Nesting areas of migratory birds/Animal habitats
- Caribou migration
- Hunting
- Increased noise may impact sea mammals and other wildlife
- Native Allotments
- ANCSA 14(c)(1) Subsistence Campsites
- Watershed
- Nimiuk Point Subdivision Development
- ANCSA 17(b) 25 Foot Winter Trail Easement (EIN 12, D1)

⁵ Local people use the beach in the areas adjacent to the airport and south along the coast for recreational purposes. The construction of the Lagoon Road has reduced the need for access across the airport safety zone area.

AREA 3

- Subsistent picking of wild plants/berries
- Nesting areas of migratory birds/Animal habitats
- Kotzebue people frequent beaches in the area after storms finding ancient mastodon and mammoth ivory
- Caribou migration
- Hunting
- Old village sites in the area – may have archeological restrictions
- ANCSA 17(b) 25 Foot Winter Trail Easement (EIN 12, D1)

Summary

The documentation of land status of the existing airport and detailed mapping of the land status is important to assist in the site selection. The land status map cumulates the documented conveyances and land actions of a large, growing community. The information in this report will supplement the local information provided on the community level.

APPENDIX E

BRIDGE HYDRAULICS RECONNAISSANCE REPORT



RECONNAISSANCE REPORT Bridge Hydraulics

Introduction

On September 24, 2009, I accompanied Northern Region Design staff on a reconnaissance field trip to evaluate bridge site options over Sadie Creek. The reconnaissance team spent several hours inspecting creek crossing locations via helicopter. This report presents photographs of the bridge sites being considered for the project, my anticipated bridge length requirements, and rough cost estimates for planning purposes.

Data Gaps

Little hydrologic and hydraulic information is available for Sadie Creek. I have offered conservative bridge lengths to address the current uncertainties at the site. Cost savings may be realized if shorter bridge spans can be used. The following lists key variables are needed to make that determination.

- Peakflow data or estimates;
- High ice elevation, thickness, and aufeis accumulations (if any);
- General spring snowmelt and breakup patterns;
- High water elevation, including floods over ice
- Velocities during floods;
- Spring snowpack data, and historical trends;
- Meteorologic data for Kotzebue Sound and the Baldwin Peninsula; and
- Arctic hydrologic and geomorphic processes

We will need a thorough understanding the role of permafrost within the Sadie Creek basin. The Baldwin Peninsula features numerous thermokarst lakes, many of which are presently dry lake beds. These landscape features suggest a dynamic subsurface flow regime and a gradually changing surface topography as underlying ice layers thaw.

Bridge Considerations

Figure 1 (attached) provides an aerial view of the creek crossing locations being considered at the time of the site visit. Photographs were taken of the stream crossing locations from both the upstream and downstream directions (Figures 2-11). Note the persistent snow (or ice) along the banks of the Sadie Creek in Figure 1. These snow patches may serve as indicators of winter ice surface widths and the lateral limits of spring floods.

We have yet to determine the lateral extent of the Sadie Creek floodplain and the potential impact(s) of a bridge-related encroachment. At this stage, it is reasonable to assume that the active channel and a portion of the overbank areas should be spanned. Preliminary bridge span requirements for planning purposes can be inferred from channel and overbank features, along with distance measuring tools in Google Earth. Table 1 below lists conservative bridge length estimates for stream crossing options. Note that the easterly option (Crossing #2) would likely

require two bridges. Additional analysis will allow us to evaluate the feasibility of shorter span lengths or the use of culverts. For this reconnaissance report, I assume that beam type bridges (precast concrete or steel) with relatively short spans and pier heights are appropriate for the Sadie Creek crossing alternatives. The maximum span length available for standard decked bulb-tee girders is 150 ft. I also assume that the shipment and transport of this girder type would be feasible to the creek crossing sites, as Kotzebue is on the water port location.

Based upon recent bridge project bid tab data, the following cost estimating factors may be used for planning purposes. These cost factors are based upon bridge deck area in square feet (SF), and include all bridge-related construction and labor items (primarily the Section 500 pay items) and temporary work structures needed to access in-water work areas.

1. Short spans (<140-ft) and pier heights (<40-ft) use \$500/SF
2. Moderate spans (130-ft to 150-ft) and pier heights (40-ft to 80-ft) use \$750/SF
3. Long spans (>150-ft) and tall piers (>80-ft) use \$1000/SF

The structures that best represent these classifications or “types” are described below, with photographed examples provided as attachments to this report. I anticipate that the Sadie Creek crossings could be accommodated with a “Type 1” structure, using relatively short spans and pier heights. Descriptions of the larger structure types are provided below for comparative purposes.

- “Type 1”. Standard decked bulb-tee girder superstructure on *driven pile* foundations, similar to the Bridge No. 649 Chistochina River on the Tok Cutoff highway. This structure would be acceptable for low to moderate ice loads only.
- “Type 2”. Standard decked bulb-tee girder superstructure on *drilled shaft* foundations, similar to the Bridge No. 1386 South Channel replacement bridge in Unalaska. This structure would be acceptable for low to moderate ice loads only.
- “Type 3”. Steel girder superstructure with a precast or cast-in-place deck, similar to Bridge No. 671 Kenai River at Soldotna or Bridge No. 539 Knik River along the Old Glenn Highway. A substantial pier may be required to resist moderate to severe ice loads, possibly with ice-breaking provisions. Examples include Bridge No. 271 Yukon River and Bridge No. 205 Copper River at Chitina. Above the “high ice” elevation, the pier segments may be of reduced size.

TABLE 1. Preliminary bridge cost estimates for planning purposes only. These cost estimates are based upon a bridge deck width of 27 ft*.

River	Bridge “type” and unit cost per sq. ft.	Prelim. Length (ft)	Estimated Cost (\$)
Sadie Creek #1	Type 1, \$500/SF	420	6 mil
Sadie Creek #2a	Type 1, \$500/SF	220	3 mil
Sadie Creek #2b	Type 1, \$500/SF	100	1.5 mil

*DOT&PF Northern Region is planning for a 24 ft wide typical section per AASHTO low volume road standards. The proposed bridge would accommodate this roadway section with 1.5 ft wide bridge rails on each side.

ATTACHMENT 1

Sadie Creek Crossing Alternatives #1 & #2, Cape Blossom Access



FIGURE 1. An aerial view of Sadie Creek and the stream crossing locations being considered. The straight line distance between Crossings #1 & #2a is about 1.21 miles. (Photo from Google Earth)

Sadie Creek Crossing #1

The red line on the figures illustrates the approximate spatial scale of the proposed bridge. Note that the bridge would be elevated and that our bridge concept would include sloping spill-through abutments.



FIGURE 2. An upstream view of the Crossing #1 location over Sadie Creek.



FIGURE 3. Another upstream view of Sadie Creek from the Crossing #1 site. This low-angle perspective shows the shallow topography of the area.



FIGURE 4. A downstream view of the Crossing #1 site over Sadie Creek.



FIGURE 5. Another downstream view of the Crossing #1 site over Sadie Creek, this one from a lower angle.

Sadie Creek Crossing #2a

The red line on the figures illustrates the approximate spatial scale of the proposed bridge. Note that the bridge would be elevated and that our bridge concept would include sloping spill-through abutments.



FIGURE 6. An upstream view of the Crossing #2a site over Sadie Creek. For planning and preliminary cost estimating purposes, we anticipate this bridge would be 220 ft long.



FIGURE 7. Another upstream view of the Crossing #2a site over Sadie Creek.



FIGURE 8. A downstream view of the Crossing #2a location over Sadie Creek.

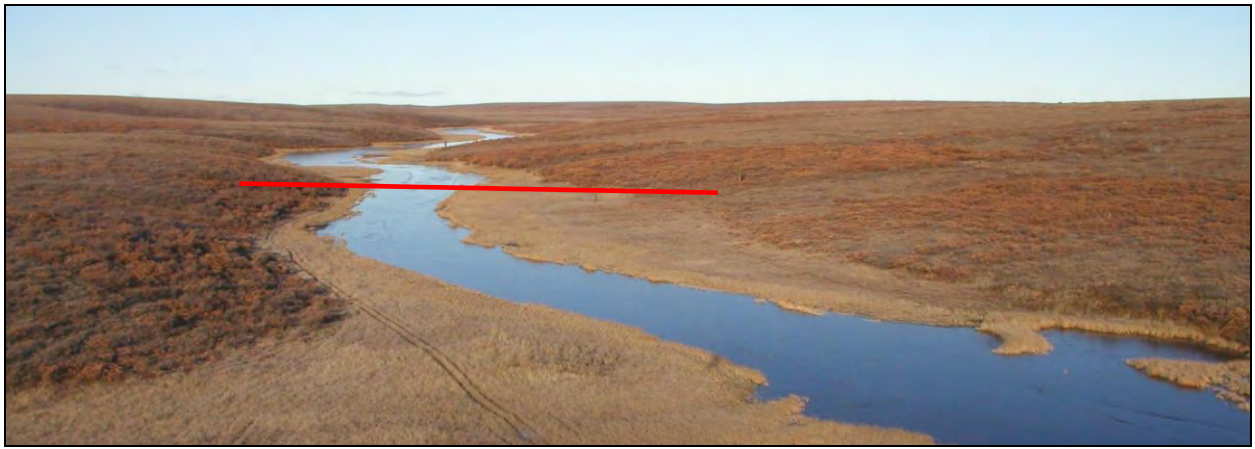


FIGURE 9. Another downstream view of the Crossing #2a location over Sadie Creek, this one from a lower angle.

Sadie Creek Crossing #2b

The red line on the figure illustrates the approximate spatial scale of the proposed bridge.

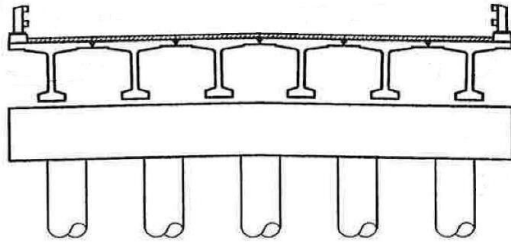


FIGURE 10. An upstream view of the Crossing #2b site over Sadie Creek. The flow direction is to the bottom left of the photograph.

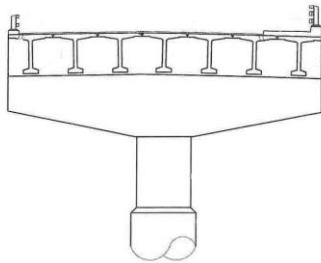
ATTACHMENT 2

Pier Type Examples

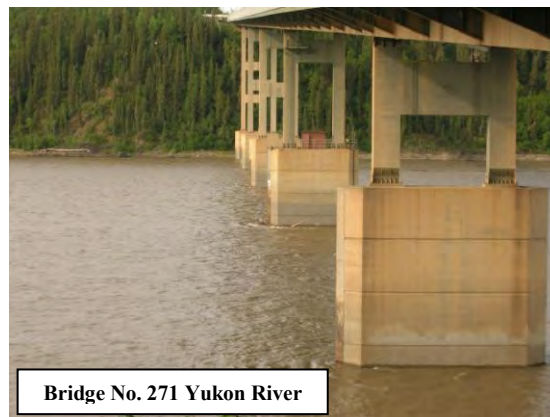
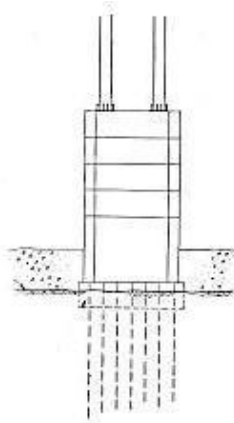
“Type 1” Example. Standard decked bulb-tee girder superstructure on *driven pile* foundations, acceptable for low to moderate ice loads only.

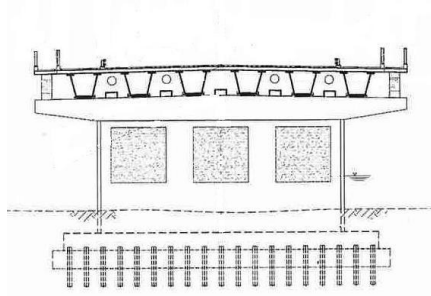


“Type 2” Example. Standard decked bulb-tee girder superstructure on *drilled shaft* foundations, acceptable for low to moderate ice loads only.

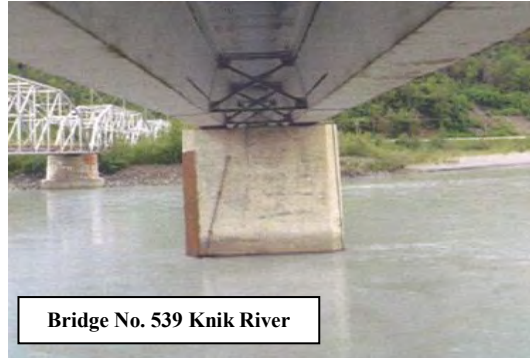
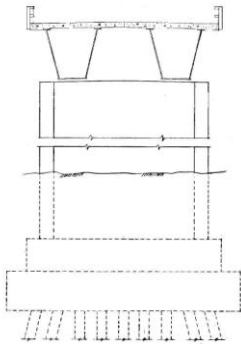


“Type 3” Examples. Steel girder superstructure with a precast or cast-in-place deck. A substantial pier may be required to resist moderate to severe ice loads, possibly with ice-breaking provisions. Above the “high ice” elevation, the pier segments may be of reduced size.

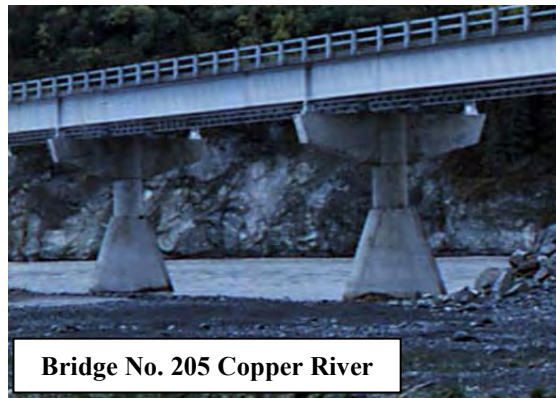
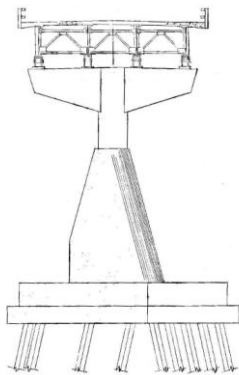




Bridge No. 671 Kenai River (Soldotna)



Bridge No. 539 Knik River



Bridge No. 205 Copper River

APPENDIX F

LOCAL GOVERNMENT RESOLUTIONS





P.O. Box 46
Kotzebue, Alaska 99752

City Hall
442-3401

Police Dept.
442-3351

Fire Dept.
442-3404

Public Works
442-3401

**CITY OF KOTZEBUE
RESOLUTION NO. 02-19**

A RESOLUTION OF THE CITY COUNCIL OF KOTZEBUE, ALASKA SUPPORTING THE INCLUSION OF THE BLOSSOM HILL ROAD CORRIDOR AND PORT SITE IN THE ALASKA DEPARTMENT OF TRANSPORTATION'S NORTHWEST ARCTIC TRANSPORTATION PLAN.

WHEREAS, the Alaska Department of Transportation and Public Facilities "ADOT/PF" is currently developing a Northwest Arctic Transportation Plan ("NATP");

WHEREAS, the NATP will approach transportation needs for Northwest Alaska from two perspectives - - community needs and resource development needs;

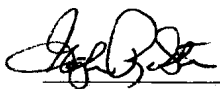
WHEREAS, the Blossom Hill site is the best opportunity for the State of Alaska to develop a deep water port to support the needs of Kotzebue and the needs of the villages in the region; and

WHEREAS, the high cost to transportation in the Kotzebue area is a hardship on the people of the region and hinders economic development.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Kotzebue would request that the Blossom Hill Project, road corridor and port site, be included within the community transportation portion of the NATP currently being developed by ADOT/PF.


PASSED AND APPROVED by a duly constituted quorum of the City Council for the City of Kotzebue on the 1st day of November, 2001.

CITY OF KOTZEBUE:


for EUGENE S. SMITH
Eugene S. Smith, Mayor

(Seal)

ATTEST:


Nancy Mercer
Nancy Mercer, City Clerk

Resolution No. 03-23

A RESOLUTION OF THE KIKIKTAGRUK INUPIAT CORPORATION OF KOTZEBUE, ALASKA SUPPORTING THE INCLUSION OF THE CAPE BLOSSOM HILL ROAD CORRIDOR AND PORT SITE IN THE ALASKA DEPARTMENT OF TRANSPORTATION'S NORTHWEST ARCTIC TRANSPORTATION PLAN.

WHEREAS, the Alaska Department of Transportation and Public Facilities "ADOT/PF" is currently developing a Northwest Arctic Transportation Plan ("NATP")

WHEREAS, the NATP will approach transportation needs for Northwest Alaska from two perspectives – community needs and resource development needs.

WHEREAS, the Cape Blossom Hill site is the best opportunity for the State of Alaska to develop a deep water port to support the needs of Kotzebue and the needs of the villages in the region, and

WHEREAS, the high cost to transportation in the Kotzebue area is a hardship on the people of the region and hinders economic development.

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Kikiktagruk Inupiat Corporation request that the Cape Blossom Hill Project, road corridor and port site, be included within the community transportation portion of the NATP currently being developed by ADOT/PF.

PASSED AND APPROVED by a duly constituted meeting of which a quorum of the Board of Directors of the Kikiktagruk Inupiat Corporation was present on the 24th March, 2003.

KIKIKTAGRUK INUPIAT CORPORATION:


Sandy Shroyer-Beaver, Chairperson


Charlie R. Gregg, Secretary

**NORTHWEST ARCTIC BOROUGH
RESOLUTION 03-05**

**A RESOLUTION OF THE NORTHWEST ARCTIC BOROUGH
ASSEMBLY SUPPORTING THE INCLUSION OF THE CAPE
BLOSSOM HILL ROAD CORRIDOR AND PORT SITE IN THE
ALASKA DEPARTMENT OF TRANSPORTATION'S
NORTHWEST AREA TRANSPORTATION PLAN.**

WHEREAS, the Alaska Department of Transportation and Public Facilities (ADOT/PF) is currently developing a Northwest Area Transportation Plan ("NATP");

WHEREAS, the NATP will approach transportation needs for the Northwest Arctic Borough from two perspectives – community needs and resource Development needs;

WHEREAS, the Cape Blossom area site is the best opportunity for the State of Alaska to develop a deep water port to support the needs of Kotzebue and the rest of the Northwest Arctic Borough villages; and

WHEREAS, without a deep water port the Northwest Arctic Borough must lighter all fuels and heavy freight 12 miles from shore, thereby, escalating fuel and freight costs that does economically affect all residents of the Northwest Arctic Borough; and

WHEREAS, the present Kotzebue airport, due to its present location within the township of Kotzebue and since the events of 9/11, cannot be provided adequate security without providing undue hardship on the residents of Kotzebue.

NOW, THEREFORE BE IT RESOLVED: that the Assembly of the Northwest Arctic Borough by this resolution hereby requests that the Cape Blossom area airport, road corridor and deep water port project be included within the community transportation portion of the NATP.

Passed and adopted this 8th day of April 8, 2003.




Walter G. Sampson, President

Passed and approved this 8th day of April 8, 2003



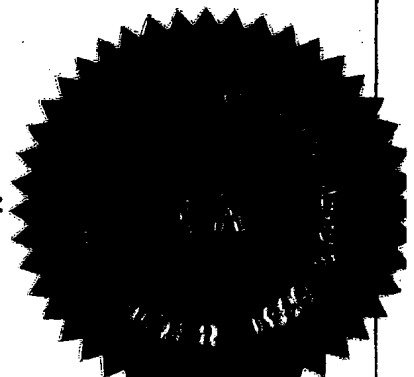
Roswell L. Schaeffer, Sr., Mayor

Signed and attested to this 8th day of April 8, 2003.



Helena Hildreth
Borough Clerk

ATTEST:



RESOLUTION OF THE BOARD OF DIRECTORS
OF
NANA REGIONAL CORPORATION, INC.

Resolution 2003-03

A Resolution supporting the inclusion of the Cape Blossom Hill Road Corridor and Port Site in the Alaska Department of Transportation's Northwest Arctic Transportation plan.

WHEREAS, the Alaska Department of Transportation and Public Facilities (ADOT/PF) is in process of developing a Northwest Arctic Transportation Plan (NATP); and

WHEREAS, the NATP represents input from communities and shareholders within the NANA Region Boundaries; and

WHEREAS, the employment needs in addition to costs related to transporting goods and supplies to the NANA Region have been historically high; and

WHEREAS, the development of the Cape Blossom Hill road corridor and Port Site provides an opportunity for NANA Region shareholders to be gainfully employed during construction of the project and to ultimately enjoy the lower cost of goods, supplies and fuel.

BE IT THEREFORE RESOLVED, that the NANA Regional Corporation Board of Directors strongly support and request that the Cape Blossom Hill Road Corridor and Port Site Project be included in the Northwest Arctic Transportation Plan.

ADOPTED on this 17th day of April 2003, at a duly called meeting held in Kotzebue, Alaska, by a vote of 20 for 0 against and 0 abstaining.

Donald G. Sheldon
Donald G. Sheldon, Chairman

Dood Lincoln
Dood Lincoln, Secretary

**NORTHWEST ARCTIC BOROUGH AND CITY OF KOTZEBUE
JOINT PLANNING COMMISSIONS
RESOLUTION JPC-10-01**

**A RESOLUTION OF THE NORTHWEST ARCTIC
BOROUGH AND CITY OF KOTZEBUE JOINT
PLANNING COMMISSIONS SUPPORTING THE CAPE
BLOSSOM ROAD AND PORT DEVELOPMENT**

WHEREAS: The Northwest Arctic Borough (NAB) Planning Commission was established under title 8 of borough code for the purposes of administering measures adopted by the assembly for implementation of the borough comprehensive plan and coastal management program; and

WHEREAS, The City of Kotzebue (City) Planning Commission was established for the purposes of administering local planning, platting and land-use measures; and

WHEREAS, The Cape Blossom Road and Port Project is a high priority development for the community of Kotzebue and Northwest Arctic Borough/NANA Region to facilitate economic transportation of goods, fuel, equipment and materials to/from the region; and

WHEREAS, The project will have significant economic, community development, social and cultural benefits and is consistent with the NAB and City Comprehensive Plans; and

WHEREAS, The following organizations have passed resolutions supporting the project – (a) Northwest Arctic Borough Assembly resolution 03-05, (b) City of Kotzebue resolution 02-19, (c) NANA Regional Corporation board of directors resolution 2003-03, (d) Kikiktagruk Inupiat Corporation resolution 03-23.

NOW THEREFORE BE IT RESOLVED, The Northwest Arctic Borough and City of Kotzebue Joint Planning Commissions confirm support for the Cape Blossom road and

port development, and encourage state, federal and private agencies to fully fund the design and construction to realize the significant benefits to the community and region.

PASSED AND ADOPTED THIS 3rd DAY OF FEBURARY, 2010.



Raven Sheldon, Borough Planning Commission Chair



Charles M. Huss, City Planning Commission Chair

**SIGNED AND ATTESTED TO THIS 3rd DAY OF
FEBURARY, 2010.**



Helena Hildreth, Borough Clerk

NORTHWEST ARCTIC BOROUGH

P.O. Box 1110

Kotzebue, Alaska 99752

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February 20, 2009

Ryan F. Anderson, P.E.
DOT&PF Project Manager
2301 Peger Road
Fairbanks, AK 99709-5316

RE: State Project No. 76884

Dear Mr. Anderson:

Taikuu for the opportunity to review and comment on the Kotzebue to Cape Blossom Road – Reconnaissance Study (dated January 2008). After reviewing the project information, this letter contains comments on behalf of the Northwest Arctic Borough regarding the project.

1. The purpose and need statement of the study (page 9) needs to include additional factors that the road will provide the community and region including the following:

Economic Benefits:

- Improve the barge freight system via the new road connecting to the deep water port at Cape Blossom.
 - Key to reducing the cost of fuel by eliminating current lighter age – it is estimated that it would be a third (1/3) less. This is particularly important to the future as the price of fuel has skyrocketed and dependence of the community for heating in an arctic climate, utility/electrical generation and ground transportation.
 - The new access will also reduce the cost of barged goods including seasonally delivered groceries, vehicles, boats, construction equipment, and gravel materials.
- Facilitate natural resource development
 - Provide access to potential natural gas deposits for community power and heating needs (land owned by KIC and NANA)
 - Provide access to potential geo-thermal bulbs for renewable and clean power

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- Future road access and extension to Kiana connecting to the Baird Mountain deposit and/or the claims located around the Omar, Blindspot, Deadfall, Powdermilk, Peak and Frost prospects which are known to have lead, zinc and high grade copper. This potential mine is located outside of Kiana and currently under exploration by Nova Gold.
- The NWAB encourages enhanced infrastructure in the area to support the current and future economic development of natural resources, particularly mining and tourism.

The Red Dog Mine is the world's largest zinc mine and operates within the borough. Cost effective and accessible freight service is important to support corporate exploration and operations which involve the area. This includes the Lik, Ambler Mining District, Deering and Candle areas that are currently in the mine exploration stages and an enhanced transportation system is key to promote large investment by companies for natural resource development with economic impacts for jobs. The NWAB is supportive of improving transportation infrastructure to enhance the efficient mobilization of equipment, supplies and products to/from markets.

- Facilitate village electrical utility intertie system development
 - During the July 2008 Energy Summit in Kotzebue, village interties were discussed as methods to reduce electrical energy costs. This could include the development of wind, geo-thermal, natural gas and/or hydro projects and distributing the power to the communities of Kotzebue, Selawik, Noorvik and Kiana.
- Fisheries support and potential development
 - The port would allow fish processors to harbor in the Kotzebue area and facilitate new fisheries development in cooperation with the community.
- Tourism development
 - The borough is supportive of the tourism industry that needs a safe and reliable port to promote future growth by the cruise industry.
- Job creation
 - Create new jobs in the construction and maintenance of the road infrastructure.
 - Expand jobs in the transportation sector with trucking and taxi services.

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Social Benefits:

- Kotzebue community expansion
 - The City of Kotzebue has limited growth opportunities at the current site and the road will provide an opportunity to create new housing subdivisions outside of flood plains. At the same time, it will also allow for new commercial buildings and industrial use areas.
 - Prospective sites along the road route for the City of Kotzebue to establish a new community cemetery.
- Kotzebue airport relocation relationship
 - The new road will support the relocation of the Kotzebue airport. The current airport is inadequate for the future needs of Kotzebue and the region. It is a long-term project; however, the new road will provide the needed access to additional sites sufficient to construct a new airport.

The airport is the only commercial passenger service and main freight services year round for this region. Freight, including food, medical supplies and US mail, is a vital component as it provides store bought goods for all communities such as fresh produce, basic essential food items and large ticket items such as snow machines and outboard motors which are essential to subsistence hunting in this region.

As the relocation will accommodate current and future needs for the next 20 years, the borough encourages the Cape Blossom Road project as a transportation enhancement that will aid in relocation of the airport to sustain the quality of life and promote economic growth.
- Gravel access for community development
 - The new road will provide the potential to improve access to gravel sources. Gravel access is a key factor to community infrastructure maintenance and development. This is an important factor cost factor in future projects including airports, landfills, community streets, and housing pads/subdivisions.
- Facilitate development of safe harbor for large vessel transportation and a new US Coast Guard station
 - With global climate change, the arctic waters are being investigated for a “Bering Gate” routing over the Polar cap. As part of that development,

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the borough is concerned with safe harbors for large vessels to reduce the chance of search and rescue efforts, as well as provide re-fueling infrastructure and opportunities for global shipping of goods/products.

- Assist in monitoring ship movements via the AIS system – the organization has indicated they would like to install equipment in the Kotzebue area.
- The US Coast Guard has also expressed an interest in establishing a station at Cape Blossom for monitoring the arctic waters.
- The new port may also provide the US Department of Defense a submarine harbor to aid in improving national defense.
- Navigation improvements
 - The beacons and other navigational aids will improve the safety of local boaters by individuals in the summer, and snow-machine travelers in the winter. The area is used as a transportation route and this will improve the search and rescue response – note, two young men died this last week (February 19, 2009) in Kotzebue due blizzard conditions and being lost just 10 miles of out of Kotzebue.
 - Radar systems improvements with federal agencies.

Cultural Benefits:

- Subsistence access
 - A new road will support local resident access to existing and new subsistence resources which are important for sustaining culture as well as economic impacts.
- Supporting people where they want to live to address out-migration
 - As the costs continue to rise in rural Alaska, new methods and strategies need to be designed so that life-long Alaskans can be supported where they choose to live. The new road will make the community more affordable to reside and support current and future populations. This will help preserve the unique humanities and culture of the community.

2. The purpose and need statement of the study (page 9) should also reflect that this project is a long-standing community priority with strong support from the borough and Native Village of Kotzebue, including the commitment of cash local match to the State of Alaska DOT P&F.

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3. The existing conditions and data available section (page 10) needs to include population growth information. As background, the NWAB is experiencing population growth and the borough planning department estimates population growth for the next 20 years to be in the 2-5% annual growth rate borough-wide, mainly from natural growth with young families and longer life spans among adults. This is an important feasibility factor as freight demands are projected to increase with a larger population.
4. Corrections on page 11, first paragraph: Inupiat have occupied the area for at least 10,000 years (versus the stated 600); and the correct Inupiaq spelling of Kotzebue is Qikiqtaġruk.
5. The design traffic volume is probably under-stated on page 27 under the road design. Based upon the comprehensive uses of the potential road identified in comment #1, the number of vehicles could increase to 500 vehicles per day or more depending upon the future completion of the various community projects – airport relocation, US Coast Guard station, inter-connecting road to Kiana, and housing sub-division development.

We look forward to the final study and opportunities for additional involvement. If you have any questions, please feel free to contact me at 442-2500 or via e-mail at tokleasik@nwabor.org. Quyaana.

Sincerely



Ukallaysaaq Tom R. Okleasik
Planning Director

Cc: Mayor Siikauraq Whiting
Alagialq Grant Hildreth, NWAB Planning Department, Deputy Director
Inuuraaq Charlie Gregg, NWAB Planning Department, Land Specialist
Agniin Jade Hill, NWAB Economic Development Director
John Erlich, City of Kotzebue – Planning Department
Abraham Synder, NANA Lands Department
Ernie Norton, KIC
Linda Joule, Native Village of Kotzebue

Native Village of Kotzebue

Kotzebue IRA

RESOLUTION 2009-115

A RESOLUTION OF THE NATIVE VILLAGE OF KOTZEBUE IN SUPPORT OF THE UNITED STATES COAST GUARD ESTABLISHING A STATION AT OR NEAR CAPE BLOSSOM, WITHIN THE NORTHWEST ARCTIC BOROUGH, AT THE SOUTH BORDER OF THE CITY OF KOTZEBUE

Knowledge of Language

Knowledge of Family Tree

Sharing

Humility

Respect for Others

Love for Children

Cooperation

Hard Work

Respect for Elders

Respect for Nature

Avoid Conflict

Family Roles

Humor

Spirituality

Domestic Skills

Hunter Success

Responsibility to Tribe

WHEREAS, The Native Village of Kotzebue is an Indian Tribe pursuant to provisions of the Federal Indian Reorganization Act of 1934 as amended in 1936 and is the governing Body of the Native Village of Kotzebue which has federal, state and local contracts and grants to provide programs and services to its members; and,

WHEREAS, the United States Coast Guard is considering establishing a new station of operations to be located in or near the City of Barrow, the City of Kotzebue, or the City of Nome; and,

WHEREAS, the geographic location near Kotzebue is ideal for the development of a marine safe harbor for ships traveling in the waters off Northwest and Northwestern Alaska; and,

WHEREAS, the location near Kotzebue would be conveniently situated between the City of Barrow and the City of Nome; and,

WHEREAS, the Kotzebue community has previously supported a United States Air Force Distant Early Warning (DEW) facility located five miles south of the community where a minimally attended radar facility still exists; and,

WHEREAS, the City of Kotzebue, Northwest Arctic Borough and Alaska Department of Transportation have developed preliminary plans to construct a new airport in the vicinity of Cape Blossom in order to comply with Transportation Security Administration (TSA) regulations, and such airport could serve the aviation needs of the Coast Guard; and,

WHEREAS, the possibility of future oil and gas development in the Chukchi Sea and Beaufort Sea may require the Coast Guard to position itself to prepare for potential maritime disasters and to assist in oil spill prevention and recovery in the Arctic Waters; and,

WHEREAS, the documented loss of sea ice brings the probability of new international shipping activities as well as potential new commercial fisheries in the Arctic Waters which will require Coast Guard surveillance; and,


WHEREAS, the 2008 State of Alaska Department of Administration's Alaska Geographic Differential Study conducted by the McDowell Group documents that Kotzebue's Geographic Cost of Living Differential is 61% higher than Anchorage, so the Native Village of Kotzebue and its members, as well as the region's other residents, would all benefit from a lower cost of living as a result of the development of a deep water port which would produce economic benefits including lower cost commodities, new jobs, and Coast Guard recruitment opportunities and careers for our young adults;

NOW THEREFORE BE IT RESOLVED, that the Native Village of Kotzebue joins the Northwest Arctic Borough, the City of Kotzebue, Kikitagruk Inupiat Corporation and NANA Regional Corporation in supporting the development of a United States Coast Guard Station at or near Cape Blossom.

CERTIFICATION

This resolution is adopted at a special/regular meeting of the Native Village of Kotzebue, Kotzebue IRA Council held on October 13, 2009 by a vote of 6 for and 0 against, and 2 not voting.


Margaret Hansen, Chairperson


Wilbur Karmun, Jr., Secretary

