APPENDIX D

ESSENTIAL FISH HABITAT ASSESSMENT

Page

Essential Fish Habitat Assessment

Noatak Airport Relocation
Noatak, Alaska

February 2019

State Project Number: Z614780000

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1.0 INTRODUCTION AND BACKGROUND

The Alaska Department of Transportation and Public Facilities (DOT&PF), in cooperation with the Federal Aviation Administration (FAA), proposes to relocate the Noatak Airport (Figures 1-3). The existing airport is threatened by Noatak River erosion, which would necessitate permanent runway closure. Consequently, there is insufficient land to address other existing airport deficiencies. Time critical airport relocation ensures continued safe and reliable air transportation for Noatak.

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that federal action agencies consult with the National Marine Fisheries Service (NMFS) when taking action that may impact the quality and/or quantity of Essential Fish Habitat (EFH).

The proposed project would mine gravel bars within the Noatak River to provide material for construction. The River Material Source (East) is the existing community source, and the River Material Source (South) is located approximately two miles downstream from the village (Figure 2). Material source development would involve excavation of gravels and sand (HDL 2006). Material source operations could occur at any time of year, and bridges or culverts would be required to cross braids of the Noatak River and access the active source. Adequate setbacks, as determined through permitting, would be maintained to avoid breeching the river channels.

The Noatak River is listed in the Anadromous Waters Catalog (AWC) by the Alaska Department of Fish and Game (ADF&G) as Stream No. 331-00-10290. It is listed as important for the presence of Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), chum salmon (*O. keta*), pink salmon (*O. gorbuscha*), and sockeye salmon (*O. nerka*). Non-EFH species listed as present include: Dolly Varden (*Salvelinus malma*), sheefish (*Stenodus nelma*), and whitefish, which are also listed for rearing (ADF&G 2018a).

A winter snow road (Route 3 on Figure 2) will be permitted for contractor use from the Delong Mountain Transportation System (DMTS) to bring equipment and materials to the project. This would include crossing Kiyak Creek (ADF&G Stream No. 331-00-10290-2141-3003), listed as important for chum salmon spawning (ADF&G 2018a).

Kuchoruk Creek (not listed or surveyed by ADF&G) would require a new bridge to access the proposed airport from Noatak. ADF&G has indicated chum salmon are likely present (ADF&G 2006).

As the Noatak River and Kiyak Creek are listed in the AWC for providing Pacific salmon habitat, it is considered EFH for salmon under the Federal Management Plan for Pacific Salmon in the Economic Exclusion Zone (EEZ) off the Coast of Alaska (NMFS 2005; ADF&G 2018a).

2.0 PROPOSED ACTION

The Proposed Action (Figures 1-3) would consist of:

Airport

- Construct runway, taxiway, apron, lighting, a Snow Removal Equipment Building (SREB), and FAA Navigational Aids.
  - The runway and taxiway would be built to FAA standards for a category B-II airport capable of handling passenger and cargo aircraft and accommodate ground maneuvering larger aircraft such as DC-6 and C-130 that serve the airport unscheduled.
  - The apron area would be constructed for temporary loading of passengers and/or cargo as well as itinerant parking and access to lease lots.
  - Construct a building and pad capable of housing snow removal equipment and lighting/navigational controls.
  - Construct pads and install new and relocated navigational aids, and other airport related equipment and shelters.
- Decommission existing airport, Distance Measuring Equipment (DME), and Non-Directional Beacon (NDB).

Access Road

- Construct an airport access road between Noatak and the relocated airport, with a bridge crossing Kuchoruk Creek.
- The access road would be approximately 2 miles long and 24-ft. wide, with side slopes that include other safety features (e.g. signage) where required, and culverts would be installed to maintain drainage patterns.
- A two-lane bridge would cross Kuchoruk Creek and be designed to accommodate high water and aufeis. Abutments would be placed on either side of the creek within the floodplain. Work may be required below ordinary high water (OHW) of the creek, however no in-water work is anticipated.

Material Sources

- Develop local material sources and access.
- Local gravels within the Noatak River drainage would be used for construction; excavation may occur below the water table.
- A pioneer material access road would accommodate safe summertime access and prevent damage to underlying soil hydrology.

Mobilization
- Transport material and equipment utilizing a combination of air, water, and overland access.
- Construct gravel pads for staging areas.

Utilities
- Extend above ground utility lines to the relocated airport.
- Mitigate loss of existing fuel transfer system by constructing pads to be available for fuel transfer and temporary storage due to decommissioning the existing airport.

Right of Way
- Acquire land for the relocated airport and access road through various temporary and permanent interests from federal, state, and private entities.
- Dispose of existing airport property in accordance with Federal and State regulations.

Connected Action
- A new community provided fuel transfer station and delivery system would be required.
- Contamination on existing airport lease lots would be required to be remediated by responsible leases.

Airport Layout Plan
- FAA conditional approval of the Noatak Airport Layout Plan.

Proposed Action elements potentially affecting the EFH include: development of material source(s) within the Noatak River, hauling of materials off the river bar within areas below ordinary high water, and crossing Kiyak Creek. The selected contractor determines the methods and means used to develop the material source(s). For purposes of this evaluation, the following assumptions are made:

- Temporary bridge(s), fill, or temporary culvert(s) may be required to cross Noatak River braids or divert water. Culverts would be sized and maintained for stream flows and fish passage.
- A temporary ice bridge(s) would be placed across Kiyak Creek.

- Adequate setbacks, as determined through permitting, would be maintained to avoid breeching the river channels.
- If required by the ADF&G Fish Habitat Permit, a fish escapement channel would be excavated to prevent the trapping of fish in the excavation area.

3.0 ESSENTIAL FISH HABITAT

The 1996 Sustainable Fisheries Act reauthorized the Magnuson-Stevens Act (MSA; 16 USC.1801, et seq.), introducing new requirements for the description and identification of EFH in fishery management plans. EFH is defined as waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (50 C.F.R. Part 600). Further, EFH is designated based on best available scientific information and the levels defined by the MSA (NMFS 2005):

- Level 1 information corresponds to distribution;
- Level 2 information corresponds to density or relative abundance;
- Level 3 information corresponds to growth, reproduction, or survival rates; and
- Level 4 information corresponds to production rates.

The Proposed Action falls within the Salmon Fisheries in the EEZ off the Coast of Alaska (Salmon Fisheries Management Plans [FMP]). The Salmon FMP designated all waters offshore Alaska as EFH for all five species of Pacific salmon. In addition, the FMP designates all waters identified in the ADF&G Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes (ADF&G 2018a) as important for Pacific salmon, as EFH. All EFH for Pacific salmon within the Proposed Action is based on Level 1 distribution information. Construction and operation of the material sources and ice road/winter haul route would occur within designated EFH for Pacific salmon.

Table 1 describes the waterbodies with EFH and the species and life-stage supported within the segments contained within the Proposed Action. General site photographs of the Noatak River are provided below (Table 2).

Table 1 Essential Fish Habitat Water Bodies in the Proposed Action

Anadromous Catalog No.	Salmon				
	Chinook	Chum	Coho	Pink	Sockeye
Kiyak Creek 331-00-10290-2141-3003	-	Spawning	-	-	-
Noatak River 331-00-10290	Present				

Table 2 Site Photographs of the Noatak River

2017 Overview of Noatak River at Proposed River Material Source (South) (Red Arrows)

2017 Standing on the Proposed River Material Source (South)

3.1 *Noatak River*

The Noatak River is one of the largest remote mountain ringed river basins in America. It drains over 400 miles; from headwaters in the Schwatka Mountains of the Brooks Range, to Kotzebue Sound in the Chukchi Sea. With the upper 330 miles designated as 'Wild,' the Noatak River is one of the longest designated wild rivers in America. The Wild designation does not extend below the Kelly River confluence (30 miles upstream of Noatak and Proposed Action area).

The Noatak River supports the presence of Chinook salmon, coho salmon, chum salmon, pink salmon, sockeye salmon, Dolly Varden, and sheefish; and presence and rearing of whitefish (ADF&G 2018a). It is a shallow gravel bedded river, with many active multi-braded channels and oxbows. The Noatak River has a moderate gradient over 400 miles (NPS 2018). In the Proposed Action area, the streambed consists of gravel, cobbles, and boulders, with very few fine sediments in the streambed. Riparian habitat is dominated by black spruce permafrost tundra; with deep cut banks on active corners, and deciduous trees and shrubs limited to historic gravel bars.

Pacific salmon (e.g. Chinook, coho, chum, pink, and sockeye) spawn in the late summer and fall, after which adults undergo apoptosis and die. Adults only return to freshwater and spawn once. Young would remain in freshwater for 1-5 years, and migrate to the saltwater to feed and mature into adults. Chum salmon are the primary commercial and subsistence fishery for the area (Eggers and Clark 2006). Near Noatak, chum salmon spawning prefers secondary channels, away from the mainstem Noatak River (Merritt and Raymond 1983). Shallow active channels provide abundant habitat for spawning, rearing juvenile fish, and no apparent barriers to fish migration. Subsistence fisheries in the Noatak took ~7,818 chum salmon in 2012, which composed over 90% of the subsistence salmon harvest (Menard 2016). In 2007, it is estimated that 24,724 lbs of chum salmon were harvested in Noatak, out of 26,686 lbs of all salmon species (ADF&G 2018b).

Dolly Varden migrate upstream into Noatak River tributaries to spawn (Scanlon 2004). Young remain in freshwater for 2-5 years, before joining adults, who spend summers in saltwater feeding (Scanlon 2004). Dolly Varden overwinter in deep freshwater mainstem areas (Scanlon 2004). Limited radio tracking studies found that they congregate where tributary streams flow into the mainstem Noatak River (Scanlon 2004; Schwanke and Johnson 2016). These are likely locations with permanent oxygen, stable temperature regimes, and ice free subsurface conditions during the winter. Individuals generally return to natal streams to spawn, but may overwinter in other locations; some have been tracked up the Wulik River, an ocean journey of at least 80 miles (Scanlon 2004). In 2007, it was estimated that 32,000 lbs of 'trout' were harvested in Noatak, which likely consists of Dolly Varden (ADF&G 2018b).

Sheefish migrate upstream to spawn, preferring shallow water habitat for broadcast spawning (ADF&G 2008; 2018c; Alt 1972). They then migrate back to lower sections of large rivers, river deltas, and estuaries, where they feed and overwinter (ADF&G 2008, 2018c; Alt 1972). Young rear in eddies, lakes, and estuaries. Adults feed in river deltas and estuaries, and overwinter in brackish waters (ADF&G 2008, 2018c; Alt 1972). Sheefish spawning locations have not been mapped on the Noatak River. In 2007, it was estimated that 1,105 lbs of sheefish where harvested in Noatak (ADF&G 2018b).

Whitefish are a general term for a series of *Prosopium sp.* and *Coregonus sp.* which are important subsistence fish in Alaska (ADF&G 1994). They inhabit most freshwater river and lake habitats. There is limited information on their biology in the region. In 2007, it was estimated that 14,234 lbs of whitefish were harvested in Noatak (ADF&G 2018b).

3.2 *Kiyak Creek*

Little information is available for Kiyak Creek. It is listed as providing chum salmon spawning habitat. Chum salmon life characteristics would be the same as those described for the Noatak River (above).

4.0 ANALYSIS OF EFFECTS TO ESSENTIAL FISH HABITAT

4.1 *Material Source Development*

Construction of material sources within floodplains could have a variety of effects on EFH and EFH species (Limpinsel et al. 2017). Material extraction sources studied in Alaska's Arctic and Subarctic floodplains have shown a variety of adverse and some beneficial effects on fish and fish habitat (Joyce et al. 1980; Ott et al. 2014). Direct effects could include creating turbidity, change of habitat, and alteration of channel morphology (Limpinsel et al. 2017). Fish entrapment potential was also documented at some sources where extraction sources left depressions in floodplains that were later flooded at high water and then became isolated as water dropped. Project planning and mitigation measures can reduce the potential for construction related impacts, through avoidance of active channels, implementation of best management practices (BMPs) to reduce turbidity, and reclamation practices that avoid fish entrapment.

Development of Noatak River material sources could affect EFH and EFH species as described above. A variety of mitigation measures would be implemented to mitigate impacts to EFH and EFH species. Adequate setbacks would be maintained to avoid breeching the river channels and creating areas that may entrap fish. These may also limit the amount of sediment laden stormwater from exiting the source. If required by the ADF&G Fish Habitat permit, a connection channel would be constructed to provide an exit to fish should they enter the excavation area after reclamation is complete.

Access to material sources from the bank would require crossing braids of the Noatak River. This may be accomplished by constructing temporary culverts, bridges, and/or winter ice bridges. Culverts would be sized and maintained for stream flows and fish passage.

4.2 *Ice Bridges for Winter Snow Road*

The primary potential effects of a winter snow road between DMTS and the project area would include ice bridge construction and associated water withdrawal (Limpinsel et al. 2017). Up to five temporary ice bridges are anticipated. Water withdrawal activities can affect fish in multiple ways. Fish could be entrained or entrapped within the pumping system itself or become impinged on the intake structure at the point of withdrawal (Limpinsel et al. 2017). Water quality could be degraded through accidental spills, changes in thermal regimes, and increases in turbidity. Excessive withdrawal, up to dewatering, of locations from any given source could also have negative impacts to EFH.

Winter water withdrawal also has specific impacts (Limpinsel et al. 2017). Excessive water removal can cause overwintering habitats to freeze to the bottom, or remove sufficient volumes to create anoxic environments, suffocating individuals. Changing thermally stable upwellings could affect spawning beds and fish eggs within the gravel as well as impede fish passage to and between important overwintering habitats.

Water availability for development of ice bridges during winter would be limited, and the most likely source would be nearby ponded features or the mainstem Noatak River. Screened intake and volume withdrawal criteria would be used to ensure potential affects to fish and EFH are mitigated. Volume limitations and use of ADF&G compliant screened intakes would reduce the potential for adverse effects.

Other potential effects of ice bridges on fish and fish habitat are primarily associated with two major factors— freeze-down of fish overwintering areas and impedance of breakup flows during spring. Ice bridge crossings of flowing waters may cause freeze down into the substrates that can stop subsurface flow, forcing it above the ice. This creates concerns for both overwintering habitat and the potential for creation of ice dams during spring break up that may block flows and restrict passage. Ice dams during spring break up would be prevented by identifying potential blockages from ice infrastructure and removing the potential blockage prior to break up.

State of Alaska Temporary Water Use Permits and ADF&G Fish Habitat permits would be obtained to minimize the impact from ice bridges to fishery resources.

4.3 *Fuel Spills*

There is potential for accidental release of fuel used in heavy equipment associated with material extraction. Fuel operations would be conducted under a Spill Prevention, Control, Countermeasure (SPCC) plan to prevent impacts to surface water quality. These plans specify that refueling of heavy equipment takes place a minimum distance from flowing waters.

5.0 AVOIDANCE AND MINIMIZATION

The following measures are identified to avoid, minimize or mitigate potential effects to fishes and fish habitats.

General:

- Compliance with the Alaska Pollutant Discharge Elimination System (APDES), Construction General Permit (CGP), and implementation of the required Stormwater Pollution Prevention Plan (SWPPP) and BMPs during construction, would reduce the potential for sediment laden storm water runoff during construction. Stabilization of side slopes with vegetation or non-erodible material would also be implemented as part of CGP compliance to further reduce the potential for sedimentation of nearby streams.
- Construction of all crossing structures would adhere to appropriate BMPs for in-stream work to minimize potential effects to fishes and fish habitats from sediment mobilization and transport, and accidental contaminant spills.

Material Source Development:

- Impacts to Noatak River braids would be minimized through temporary bridge(s) or temporary culvert(s). Culverts would be sized and maintained for stream flows and fish passage.
- Adequate setbacks, as determined through permitting, would be maintained to avoid breeching the river channels.

Ice Bridges for Winter Snow Road:

- Ice dams during spring break up would be prevented by identifying potential blockages from ice infrastructure, and removing the potential blockage prior to break up.

Fueling:

- Fuel operations would be conducted under a SPCC plan to prevent impacts to surface water quality.

6.0 CONSERVATION RECOMMENDATIONS

The Proposed Action contains features designed to reduce the potential for effects on EFH species. Conservation measures include:

Material Source Development:

- If required by the ADF&G Fish Habitat Permit, a fish escapement channel would be excavated to prevent the trapping of fish in the excavation area.

Winter Snow Road:

- Water withdrawal volume limitations and use of ADF&G compliant screened intakes would reduce the potential for adverse effects.
- Screened intake and volume withdrawal criteria would be used to ensure potential affects to fish and EFH are mitigated.
- Ice dams during spring break up would be prevented by identifying potential blockages from ice infrastructure and removing the potential blockage prior to break up.

Fueling:

- SPCC plans would recommend fueling equipment take place a minimum distance from flowing waters.

7.0 CONCLUSIONS

Development of the Noatak Airport Relocation Project may have short- and long-term adverse effects on EFH. However, as described throughout this evaluation and summarized below for each component of the Proposed Action, and in conjunction with proposed conservation recommendations and BMPs, the Proposed Action is Unlikely to Adversely Affect/Adverse Effects Minimal.

7.1 *Material Sources*

Development of the material sources could have long-term adverse effects on EFH and EFH species without implementation of mitigation measures.

7.2 *Determination*

May Adversely Affect/Adverse Effects Minor to Moderate: The material sources are located within EFH and could have adverse effects on EFH. The point bar at this location is dynamic, with seasonal flooding, and surrounded by the active channel of a meandering river. The source would be sized and placed adequately distant from the active channel to reduce the potential for river capture. Access to this source would be designed to minimize adverse impacts to side channels. Despite the potential adverse effects, population level effects to salmon would not be expected as this section of the Noatak River is not listed as supporting rearing or spawning habitat.

7.3 *Ice Bridges for Winter Snow Road*

Construction and operation of the winter snow road could have short-term construction related effects to EFH.

7.4 *Determination*

No Adverse Effects: The primary potential to adversely affect EFH would be from winter water withdrawal from the waterways to support ice road construction. Screened intakes and winter withdrawal volume limitations as required for State of Alaska permits authorizing the withdrawal would minimize the potential for adverse effects to EFH and EFH species. No population level effects would be anticipated for any EFH species.

8.0 REFERENCES

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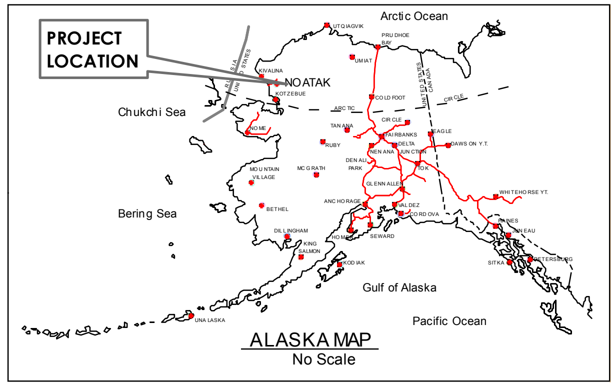
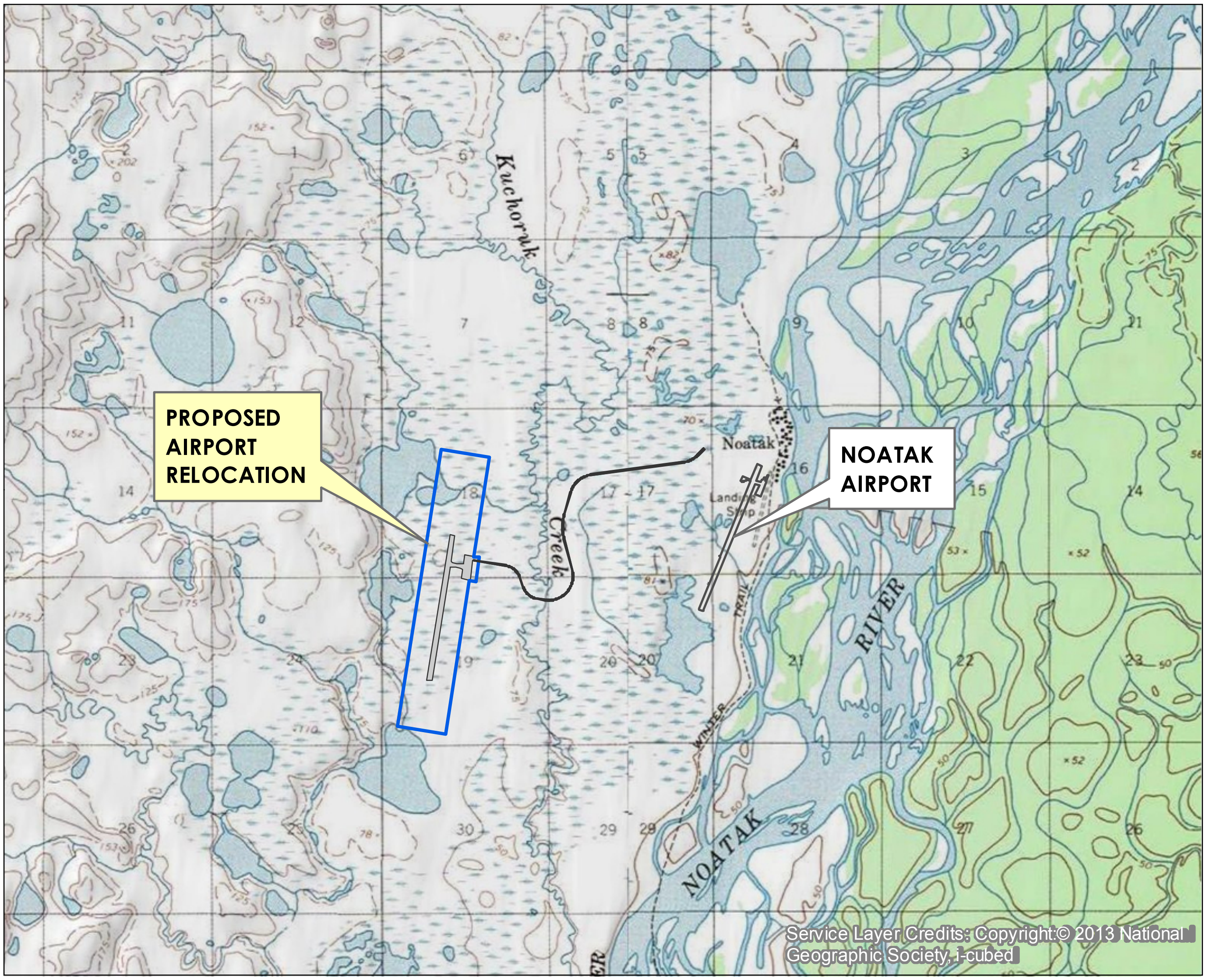
9.0 FIGURES





Project Origin: City of Noatak
Kotzebue Recording District,
T25, R19W, Sections 5,8,16-21, 29-32
T26, R19W, Sections 5-7, 18-20, 29, 32
T27, R19W, Sections 4, 5, 9, 16, 20, 21, 29, 32
T28, R19W, Sections 5-7, 17-21, 28, 33
T29, R19W, Sections 7, 17, 18, 20, 21, 27, 28, 33, 34
Kateel River Meridian

0 0.5 1 2 Miles
1:63,360 (at original document size of 8.5x11)

STATE OF ALASKA
Department of Transportation and Public Facilities
2301 Peger Road Fairbanks, AK 99709

NOATAK AIRPORT RELOCATION
NOATAK, ALASKA

Location & Vicinity Map

DATE: February, 2019	FIGURE **1**

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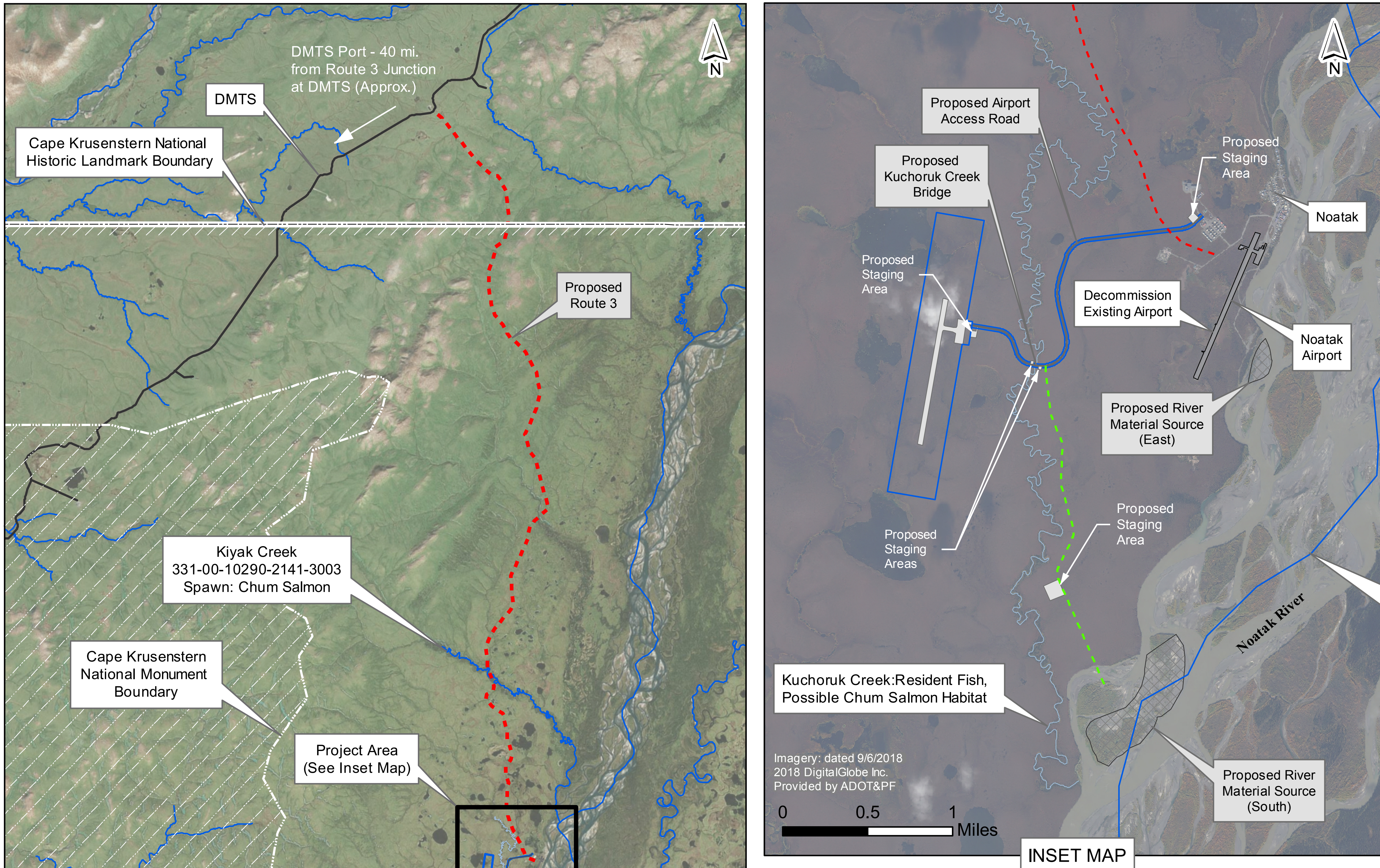

LEGEND

- Proposed Airport Property
- Proposed Runway & Apron
- Proposed Airport Access Road and Above Ground Electric Line
- Proposed Winter Snow Road (Route 3)
- Proposed Pioneer Road
- DeLong Mountain Transportation System (DMTS)
- Kuchoruk Creek
- ADF&G Anadromous Stream

Noatak River
AWC 331-00-10290-2141,
Present: Chinook, Chum, Coho, Pink, Sockeye Salmon
Non-EFH Species: Dolly Varden, Sheefish, Whitefish

STATE OF ALASKA
Department of Transportation and Public Facilities
2301 Peger Road Fairbanks, AK 99709

NOATAK AIRPORT RELOCATION
NOATAK, ALASKA

Fish Habitat

DATE: February, 2019 | FIGURE **11**

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LEGEND

- Proposed Pioneer Road
- Proposed Material Source
- Proposed Staging Area
- Kuchoruk Creek
- ADF&G Anadromous Stream

STATE OF ALASKA
Department of Transportation and Public Facilities
2301 Peger Road Fairbanks, AK 99709

NOATAK AIRPORT RELOCATION
NOATAK, ALASKA
Proposed River Material Source (South)

DATE: February, 2019

FIGURE **3**

U:\2047059000\GIS\mxd\EFH\2047059000_EFH_Fig-03_Mat_Site.mxd Revised: 2019-02-12 By: cpannone

HATTENBURG DILLEY & LINNELL
Engineering Consultants

November 8, 2006

Ryan Anderson, P.E.
Alaska Department of Transportation and Public Facilities
2301 Peger Road
Fairbanks, Alaska 99709

Re: Preliminary Hydrological Report for Noatak, Northern Regions Geotechnical Investigations 2005, AKSAS 62601

Dear Mr. Anderson,

Hattenburg Dilley & Linnell (HDL) is pleased to present the results of our preliminary hydrologic study for Noatak. HDL coordinated with Ken Karle, P.E., of Hydraulic Mapping and Modeling (HMM) to produce this report. The purpose of our preliminary study was to conduct a visual assessment of a potential borrow source island on the Noatak River about two miles downstream from the village of Noatak (Figure 1). ADOT&PF is planning construction of a new airport in Noatak, located approximately 1.5 miles east of the existing airport. The airport will include a new runway approximately 5,000 feet long by 100 feet wide in a 5,600-foot by 150-foot safety area; a 300-foot by 400-foot apron; a taxiway; and a 1.5-mile long access road. It is estimated that about 1,000,000 cubic yards (CY) of material would be required for the construction of this new airport.

Our scope of work for this phase of the project consisted of analysis of aerial orthophotos, topography, and geotechnical data, a site visit to conduct a hydrological reconnaissance, and a preliminary assessment of the potential causes and effects of mining within the Noatak River. This letter presents the results of the work as well as recommendations for future hydrologic and hydraulic work, particularly in support of the ADOT&PF's material source permitting efforts.

1.0 Data and Literature Analysis

HDL and HMM received mapping, photos, topography, and geotechnical data from ADOT&PF. We also conducted a field reconnaissance via boat, on foot, and by helicopter, and interviewed several locals about their experience with the river morphology over time. These items and activities, and other literature were analyzed to determine the appropriateness of the island in the Noatak River for gravel mining, the tendency of materials to replenish over time, and the potential effects of mining on the erosion of the river banks. The following should be considered in evaluating the mining of the island.

Scott Hattenburg, PE
Lorie Dilley, PE/CPG
Dennis Linnell, PE
David Lundin, PE

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1.1 Stream channel type. Based on field observations and aerial photography, the Noatak River near the village of Noatak appears to have a high width-to-depth ratio. Removal of sediment from stream channels with naturally high width to depth ratios is less risky than from low width to depth ratio streams. Braided river channels are better candidates for sediment removal than other river channel types (Dunne et al. 1981). Because braided river systems are dynamic and channel shifting is relatively frequent and rapid, channel shifting due to sediment extraction may have less of an impact (Follman 1980). However, it is important to note that not all braided streams are necessarily aggrading, or depositing material (Simpson and Smith 2001).

The Noatak River transitions from a single channel meandering river to a braided configuration 30 to 40 miles upstream, at its confluence with the Kelly River and the Kugururok River. These two rivers flow south out of the Brooks Range and may be a source of increased bedload transport. The Noatak River at Noatak appears to have the potential to replenish the extracted material.

1.2 Large streams are better candidates for sediment removal than small streams. Large stream systems are preferable to small stream systems because they have comparatively more sediment, larger channels, and wider floodplains, and the proportionally smaller disturbance in large systems will reduce the overall impact of sediment removal (Follman 1980). On a smaller stream, the location of the extraction site is more critical because of the limited availability of exposed sediment deposits and the relatively narrower floodplain. The Noatak is a relatively large river, therefore extraction of material will have comparatively less impacts than in a small river.

1.3 Bars on the Noatak River appear to replenish annually. Residents report that an existing gravel removal site, located on a point bar adjacent to the village site, actively replenishes with gravel following the spring breakup high flow period. This site has been active for several years, and appears to be a consistent source of gravel, albeit on a smaller scale than that proposed for this project.

The island proposed for mining has a large point bar with poorly graded gravels. There is little overburden and vegetation, indicating that this point bar is an active depositional feature, and material may be depositing annually (Figure 2). Refer to the appended photo log for more photos of the island bar.

1.4 Permafrost at shallow depths affects bank erosion rates. Thermal and mechanical erosion results from heat transfer to frozen material followed by river transport of the thawed sediments (Walker and Arnborg, 1966). No permafrost was encountered in ADOT&PF's geotechnical investigation on the island, and it was not encountered there in our field reconnaissance. Significant permafrost was evident on the west mainland cut banks from the Noatak River. In this reach, active erosion from permafrost was present (Figure 3). The exposure of the massive ice at the cut bank and resulting erosion will likely continue whether or not the river geometry continues to direct the energy toward the cut bank.

1.5 The quantity of usable material is adequate. Mining of the material on the island would occur in winter when water levels are relatively low. The geotechnical investigation, conducted in March and April 2006, indicated that the water table is typically 8 to 11 feet below natural grade at this time of year. Mining 8 to 10 feet of material from appropriate areas of the island will yield the 1,000,000 CY required for this project plus enough for a comfortable margin of error. Figure 4 indicates three mining areas on the island. Mining should occur preferentially in Area 1, with utilization of materials in Area 2 reserved for use when Area 1 does not produce adequate quantities of quality materials.

1.6 The cumulative effects of changes in sediment supply should be considered at the watershed scale. Reservoir construction, stream channel straightening, levee construction, bank protection works, and flow regulation can all substantively change the sediment load, morphology and habitat qualities of streams. The effects may occur shortly after project completion or be delayed and/or prolonged for decades. In general, sediment removal from streams is imprudent downstream from reservoirs or where channels are confined between levees or bank protection works, because these changes reduce coarse sediment supply (Cluer, 2004). Other than a small gravel removal site upstream, there are no other human activities in the Noatak watershed that would reduce sediment supply.

Commercial gravel/sediment removal generally poses low risk in channel locations where: (1) degraded habitat can be improved by sediment removal, (2) the interactions between aquatic species of interest and negative effects due to sediment removal are known (and are rare or non-existent), and where (3) risks of habitat loss caused by long-term geomorphic adjustments are low (Cluer, 2004). ADOT&PF will work with the Alaska Department of Fish and Game (ADF&G) to determine if the island bar area is critical habitat for any species of concern. Various methods have been developed to help minimize harmful effects of gravel removal for commercial purposes and are discussed below.

Managing extraction volumes within a sediment budget, and retaining minimal geomorphic form (to define a low flow migration channel, or head of bar to reduce headcutting), is used in California for commercial gravel/sediment regulation. Though reliable sediment budgets for the Noatak River may be difficult to develop, recommended techniques that both retain minimal form and provide a buffer should reduce harmful effects and encourage replenishment through deposition.

Further, it is recommended that the methods of gravel removal be designed to enhance topographic complexity within the channel, and to encourage natural restoration of self-sustaining geomorphic features and associated aquatic and riparian habitats. The rate and volume of sediment removal should not exceed that needed to promote the properly functioning habitats appropriate for the stream. It is also recommended that the duration of removal operations be finite.

2.0 Recommendations

The Noatak River appears to be a good candidate for gravel removal. It is clear, however, that the village of Noatak and the surrounding reach is in an active floodplain, and banks in the vicinity are actively eroding.

Historical photos and anecdotal evidence suggest that the island and channel morphology is likely to change to some degree annually. Local residents predict that the river will soon cut the island in half from north to south along a slough that has recently formed. An indication of the thalweg location and depth in both the main channel and the sloughs would provide some hints as to the morphologic tendencies. The local residents interviewed could not estimate the channel depth. Without further and complex hydraulic river modeling, it is difficult to predict the island morphology at a time in the future when gravel extraction activities would occur.

The gravel excavation plan should address the following considerations:

- <u>Northern point of island.</u> Protect upper vegetated section of the bar from any excavation activities. The protective armor layer should not be disrupted and existing vegetation should be allowed to naturally grow and establish.
- <u>Lateral buffer.</u> The undisturbed set-back area between the low flow channel that separates the island from the right bank and the Area 1 mining area should be no less than 20 percent of the active channel width. The protective armor layer should not be disrupted and vegetation should be planted or allowed to naturally establish. Additionally, the western third of the island is also designate as a lateral buffer, and should be left unexcavated and undisturbed, except for road access and other staging

activities.

- Grading and shaping. The plan should include a requirement for grading and shaping of the site post-extraction to ensure that there are no potholes, pits, or small pools left at the extraction site that may cause fish entrapment. Additionally, the bar should be sloped to maintain a positive flow back toward the main channel to prevent stranding.
- Excavation depth. The depth should vary so that there is always positive flow back into the main channel where water remains throughout the year. Maximum excavation depth should be less than the thalweg depth of the main channel to minimize potential for main channel movement.
- Excavated head slope. No steeper than 10:1 (horizontal to vertical). This is the slope transition between the protected head of bar and the bottom of the excavation area. This parameter is established to reduce the risk of channel movement.
- Excavated side slopes. No steeper than 10:1 (horizontal to vertical). This is the transition between the lateral buffer area and the bottom of the excavation area.
- Phased excavation. Excavation should begin in Area 1. Upon reaching suggested depths and quantities in Area 1, excavation should continue in Area 2.

With these considerations in mind, HDL estimated the total available volume of material that could be mined from the island. This volume includes all surface material inside the areas marked 1 and 2 on Figure 4 excavated to an elevation of 45 feet, which is at or up to 2 feet above the groundwater surface level observed in April 2006 in the geotechnical report. The total potential volume of mined material is approximately 1,400,000 CY. Areas 1 and 2 alone could produce well over the estimated 1,000,000 CY required for the airport project, and should be used preferentially over the unmarked western third of the island, to minimize exacerbation of the active erosion on the west mainland cut bank. Figures 5 and 6 represent a plan and cross-section of the mining plan.

Gravel will be excavated down to the existing water table. In winter, the water table may vary plus or minus several feet from the 45 foot elevation noted above for the estimation of available material volume. As such, variation in the water table at the time of excavation will affect the volume of available material.

It is unlikely that mining activity as shown in Areas 1 and 2 will affect erosion rates in the village of Noatak. The Noatak River has many gravel bar islands of varying size and several channels that appear to move and deposit gravel regularly, and Noatak is two miles upstream of the gravel island. It is likely that gravel materials will redeposit on the island after mining activities are through, although the size and form of the island may change.

3.0 Follow-On Tasks

Value can be added to this assessment if the mining contractor can be assured that enough material will still be available when mining occurs. It is also important to estimate the morphologic effects of mining on the bank erosion rates, and the tendency of the river to replenish material on the island bar. In order to better assess the channel morphology changes over time and predict the island morphology, we recommend 1) acquiring large scale historical aerial photos of the Noatak River upstream and downstream of Noatak to track the river changes over time, and 2) measuring river cross sections for at three locations along the reach (shown in Figure 4 as A-A' through C-C') to locate the thalweg and determine river bottom elevations.

4.0 Schedule

We would propose that the channel cross section information be gathered during an ice-free condition. Historical photos can be acquired and analyzed concurrently, with further recommendations for gravel mining operations submitted to ADOT&PF shortly thereafter.

If you have any questions or wish to discuss the findings or recommendations please do not hesitate to contact us.

Sincerely,
HATTENBURG DILLEY & LINNELL, LLC

Laurie Hulse, P.E.
Civil Engineer

HYDRAULIC MAPPING AND MODELING

Kenneth Karle, P.E.
Hydraulic Engineer

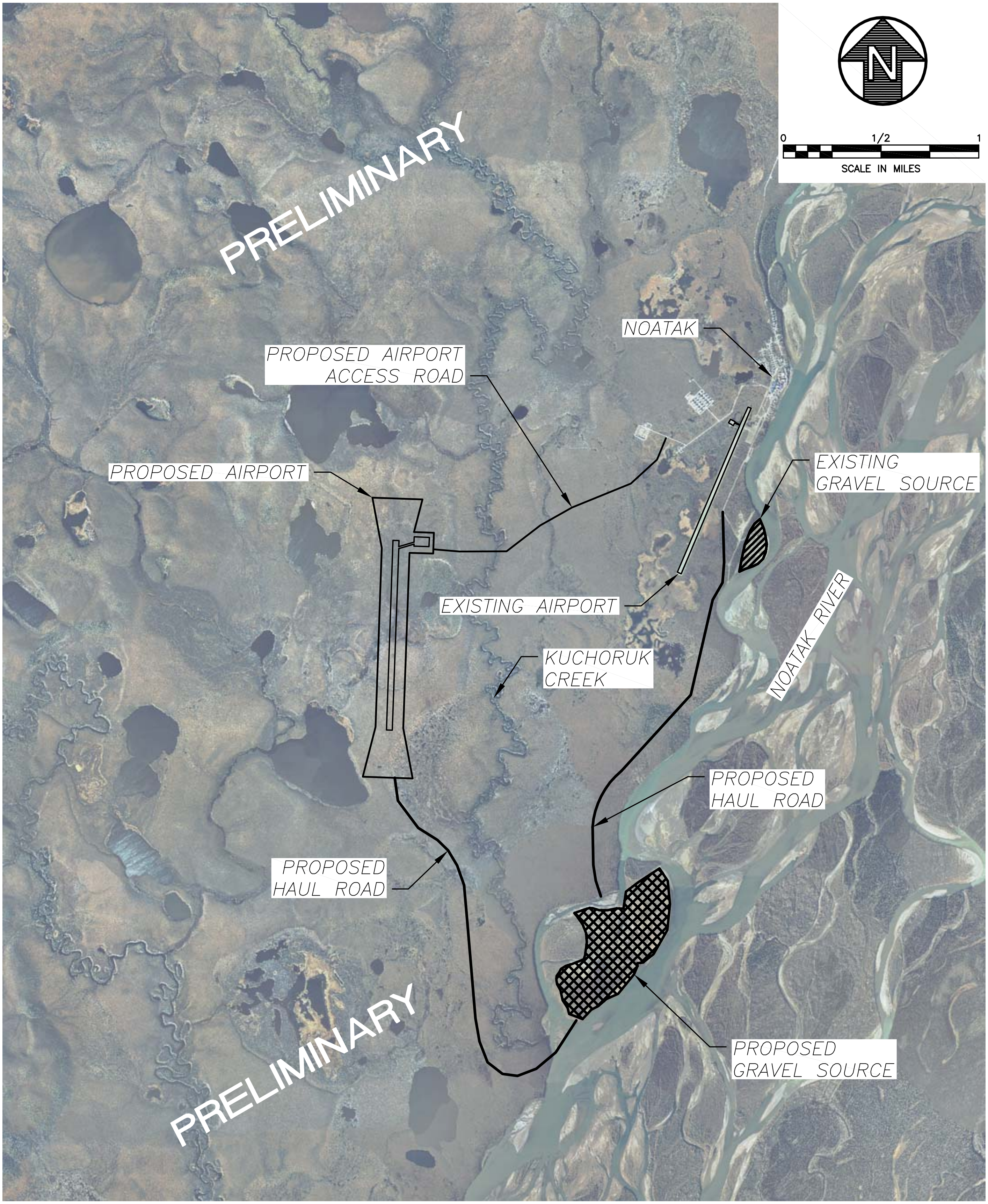
Attached:	Figure 1	Vicinity Map
	Figure 2	Poorly Graded Gravel Material on Island

Figure 3	Thermal and Mechanical Riverbank Erosion
Figure 4	Gravel Borrow Area Preliminary Mining Plan
Figure 5	Gravel Mining Plan Cross Sections
Figure 6	Gravel Mining Plan Cross Section Profiles

References

Trip Report Summaries

Photo Log



HATTENBURG DILLEY & LINNELL
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- PLANNING

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NOATAK AIRPORT RELOCATION
GRAVEL BORROW AREA
PRELIMINARY MINING PLAN
NOATAK, ALASKA

DATE:	11-08-06	DRAWN BY:	MHN	SHEET:	FIGURE 1
SCALE:	SHOWN	CHECKED BY:	LMH	JOB NO.:	05-113

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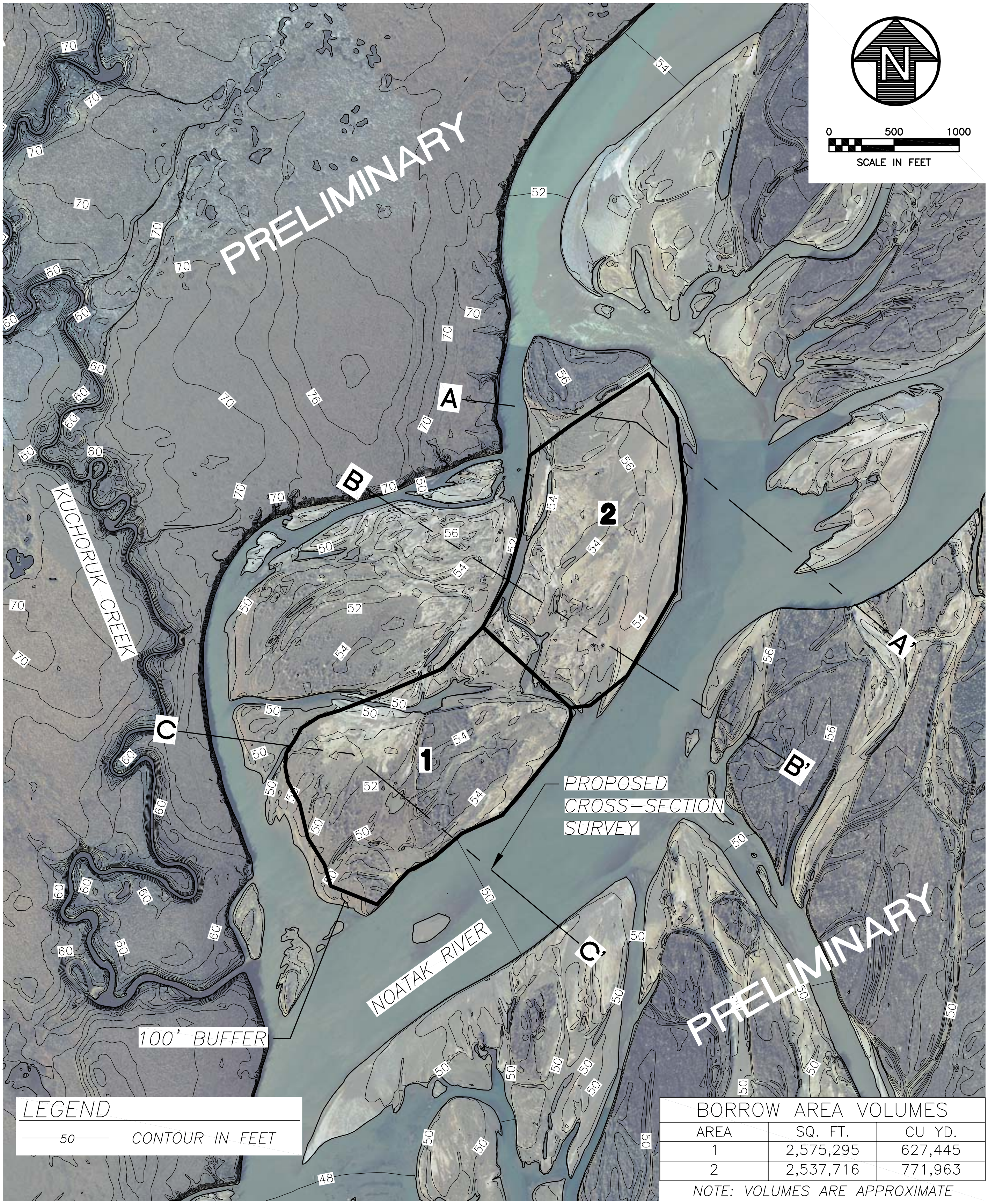
XREF: 05113_00_DESIGN

Figure 2. Poorly graded gravel material on island

Figure 3. Thermal and mechanical riverbank erosion



BORROW AREA VOLUMES

AREA	SQ. FT.	CU YD.
1	2,575,295	627,445
2	2,537,716	771,963

NOTE: VOLUMES ARE APPROXIMATE

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PRELIMINARY MINING PLAN
NOATAK, ALASKA

DATE:	11-08-06	DRAWN BY:	MHN	SHEET:	FIGURE 4
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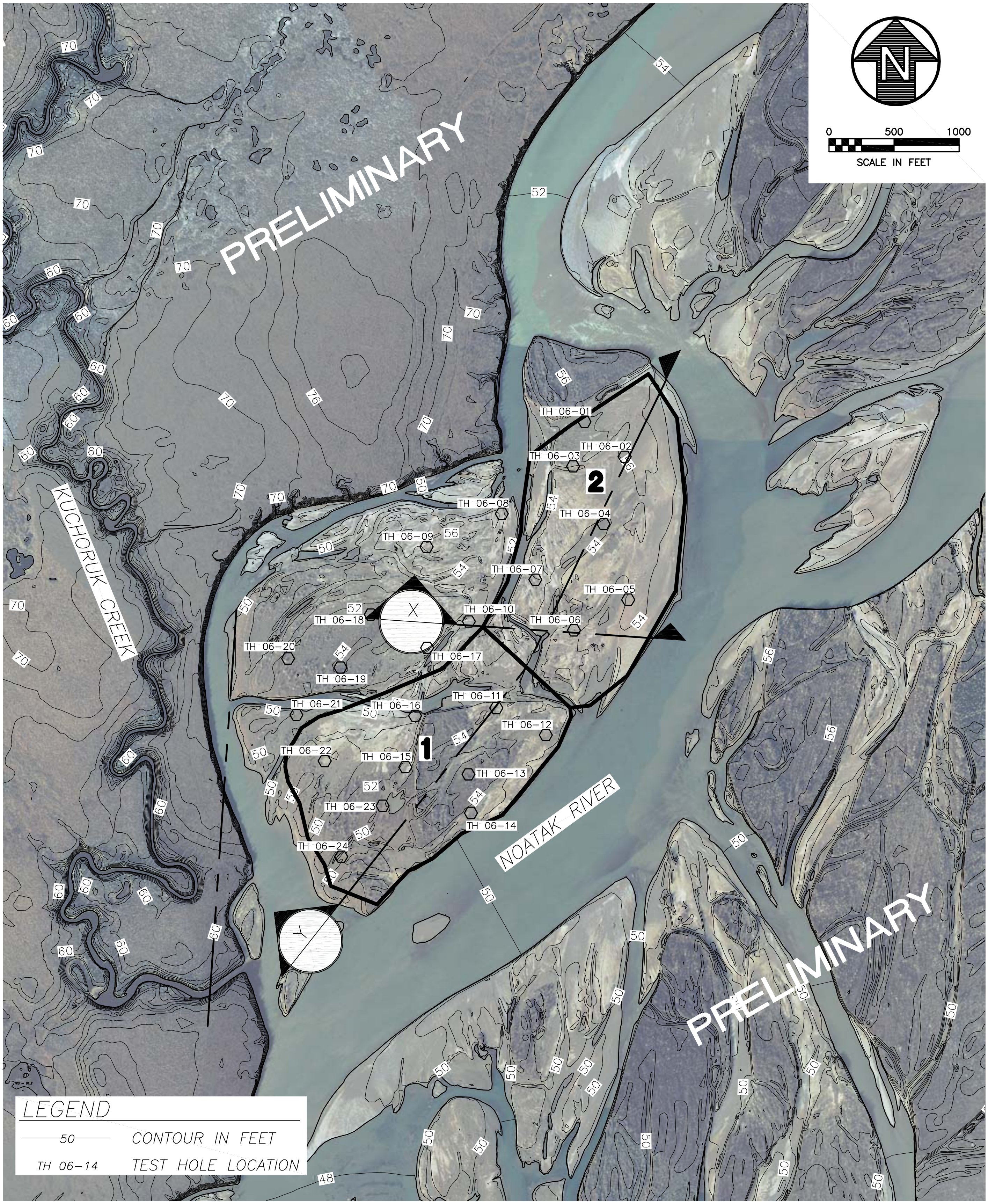

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NOATAK AIRPORT RELOCATION
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PRELIMINARY MINING PLAN
NOATAK, ALASKA

DATE: 11-08-06	DRAWN BY: MHN	SHEET: FIGURE 5
SCALE: SHOWN	CHECKED BY: LMH	JOB NO.: 05-113

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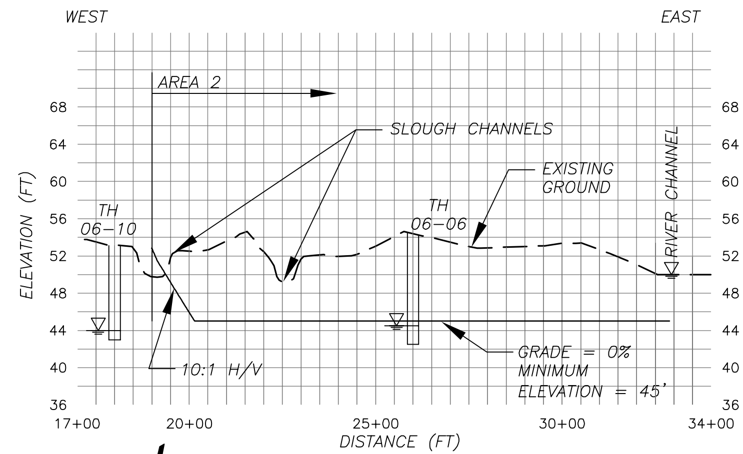


X EAST WEST SECTION

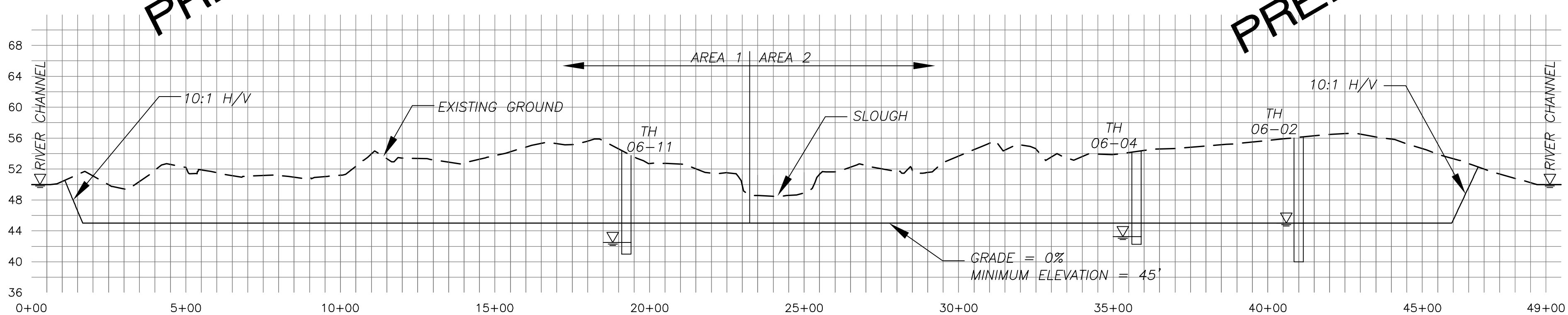
SCALE: HORIZ. 1:500 VERT. 1:20

NOTES:

1. TEST HOLE LOGS (TH) LOCATIONS ARE APPROXIMATE.
2. GROUND WATER ELEVATIONS IN TEST HOLES ARE FROM APRIL 2006. GROUND WATER ELEVATIONS WILL VARY WITH SEASON AND YEAR.
3. RIVER WATER ELEVATIONS ARE FROM SEPTEMBER 28, 2005. RIVER WATER ELEVATIONS WILL VARY WITH SEASON AND YEAR.
4. RIVER WATER AND GROUND SURFACE ELEVATIONS ARE VALID AT THE TIME OF DATA COLLECTION ONLY. A SURVEY IS REQUIRED AT THE TIME OF MINING TO DETERMINE ACTUAL MINING LIMITS AND QUANTITIES.

PRELIMINARY

PRELIMINARY



Y NORTH SOUTH SECTION

SCALE: HORIZ. 1:500 VERT 1:20

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GRAVEL BORROW AREA
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NOATAK, ALASKA

DATE:	11-08-06	DRAWN BY:	MHN	SHEET:	FIGURE 6
SCALE:	NOTED	CHECKED BY:	SLH	JOB NO.:	05-113

References

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Trip Report Summary

August 17, 1006
Noatak, Alaska

Laurie Hulse, P.E., of Hattenburg Dilley & Linnell, LLC (HDL) and Ken Karle, P.E., of Hydraulic Mapping and Modeling (HMM) accompanied ADOT&PF staff to Noatak on August 17, 2006.

I met Ken Karle at the Anchorage Airport at 4:30 am. The 6am flight arrived in Kotzebue and we met Ryan Anderson, Jesse Reinikainen, and Patty Miller at the charter flight office. After a delay due to fog, Patty, Ken, and I arrived in Noatak at 12:30pm. Ryan and Jesse arrived shortly after with the helicopter. Julie Rowland met us at Noatak.

Patty, Ken and I met IRA officials at their office and secured a boat ride with Jim downriver to the potential gravel source island at about 1:30pm. We walked around on both the east and west sides of the island, observing hydrologic and hydraulic conditions. We observed the permafrost melt in the channel cut bank upstream of the island.

Back in Noatak, we met up with Ryan and Jesse, and attended the public meeting that Ryan organized at 3pm. The meeting was well-attended and provided an overview of the airport relocation project.

After the meeting, Ken, Jesse and I took a helicopter ride to view the gravel source island from the air. We also looked over the Kuchoruk Creek crossing that is planned for the new airport access.

After the 30-minute helicopter ride, the charter back to Kotzebue was waiting. Ken, Patty, Ryan and I flew back to Kotzebue. Jesse and Julie remained behind in Noatak.

We caught the 8:30pm flight from Kotzebue back to Anchorage, arriving at about 11pm.

Scott Hattenburg, PE
Lorie Dilley, PE/CPG
Dennis Linnell, PE
David Lundin, PE

3335 Arctic Boulevard Suite 100 • Anchorage Alaska 99503 • Phone: 907.564.2120 • Fax: 907.564.2122
808 South Bailey Street Suite 102 • Palmer Alaska 99645 • Phone: 907.746.5230 • Fax: 907.746.5231

HYDRAULIC MAPPING AND MODELING
Kenneth F. Karle, P.E.
PO Box 181, Denali Park, AK 99755

FIELD TRIP REPORT

Subject: August 2006 Field Trip Report to Noatak, Alaska

Project Name: Noatak Airport Relocation: Preliminary Hydrology Analysis

Location: Noatak River and Noatak Village

Date: August 17, 2006

1.0 INTRODUCTION

Laurie Hulse (HDL), Ken Karle (Hydraulic Mapping and Modeling), Ryan Anderson (ADOT&PF) and Jesse Reininkainen (ADOT&PF) traveled to Noatak to conduct a visual assessment of a potential borrow source island on the Noatak River about two miles downstream from the village of Noatak. We traveled to and from the community on a combination of air carriers including Alaska Airlines, Hageland Aviation, and Bering Air, arriving and departing on August 17, 2006. In Noatak, we also met with Patti Miller and Julie Rowland (ADOT&PF).

2.0 FIELD VISIT AND LOCAL INTERVIEWS – NOATAK, ALASKA

After arrival at Noatak, Laurie Hulse and Ken Karle spent several hours discussing the hydrology of the Noatak River with several NANA Regional Corporation staff. We discussed general conditions on the river, including annual breakup, inundation of point bars, lateral changes of the main channel water flow, and duration of inundation.

One of the local residents provided Patti Miller and us with a trip down the river by boat to see the proposed project location. We interviewed Jim about his observations on the river morphology. He pointed out numerous locations where severe bank erosion is ongoing along the right bank (see Figure 1), which is 10-15 feet in height. However, he noted that such conditions are not unusual, and that most erosion occurs in the spring during and following the high discharge rates after breakup.

We landed on the island in several places, including near the lower end in the low-water slough (Figure 2), and near the upper middle section along the main channel (Figures 3 and 4). The island appeared to be between 1 and 3 feet above the current water level. Jim noted that the island is inundated every spring during the high runoff period, even up into the vegetated levels. Jim noted a channel that is developing through the middle of the island, and noted, as did other local residents, that he expects the channel to fully develop and divide the island into 2 sections by next summer. Jim was unable to estimate the depth of the main channel. We noted a steep actively eroding bank at the head of the island, which is heavily vegetated with willow and alder (Figures 5, 9, 10).

We also passed a point bar just downstream from the village that is currently used as a material source (Figures 6 and 8). Jim noted that the point bar replenishes every year with new sediment deposition. As such, most residents we talked to express the opinion that scalping gravel on river bars should have no effect on river morphology, and that most gravel mined will be replenished by annual sediment deposition.

One resident noted that his father, born in the early 1900s, told him that the river has dropped in depth over the past 50 years; walking across the river is almost possible now during low flow conditions. The resident also noted, as did others, that the main channel has moved significantly to the west, closer to the village and airstrip, in the past 40 years.

Upon our return to the village, we discussed the river morphology with other long-time residents, who echoed earlier comments about channel changes and annual deposition of sediment on river bars.

In mid-afternoon, we participated in a well attended a community meeting hosted by Ryan Anderson and Jesse Reininkainen (AKDOT&PF). Ryan and Jesse used a PowerPoint presentation to explain the status of the airport relocation project to local residents. We answered questions from local residents about the need for hydrology studies to help with determining the best location for a gravel source for the project.

Following the meeting, Laurie Hulse and Ken Karle viewed the island and adjacent areas in a helicopter arranged by ADOT&PF. At an elevation of several hundred feet above ground level, we were able to observe the braided nature of the Noatak River, and the extremely wide floodplain. We were also able to note that the main channel is severely impinging on the head of the project island at a severe angle (Figure 10).

We also flew over Kuchoruk Creek, which flows from north to south about one mile west from the village of Noatak Creek (Figure 12). In order to access the new airport location, a bridge will be required to cross Kuchoruk Creek. The creek appears to have a high sinuosity and a low width-to-depth ratio. Such systems generally maintain a high resistance to plan form adjustment, and are generally very stable unless disturbed. Downstream of the potential bridge location, we observed a few meander cutoffs that had occurred; other than those, Kuchoruk Creek appeared to be very stable. A wide riparian vegetative buffer is found along both banks through the entire reach, also indicating channel stability.

3.0 PHOTOS

Figure 1 – Left bank of Noatak River downstream from village, with visible ice lenses and active erosion.

Figure 2 – At lower end of island, looking across low water channel to the left bank, approximately 12-15 feet high.

Figure 3 - At mid-section of island, looking downstream along main channel.

Figure 4 – At mid-section of island, looking downstream. Gravel bank is 2-3 feet above water surface elevation.

Figure 5 – Head of island, with heavily vegetated area.

Figure 6 – Point bar currently used as material source, with annual deposition.

Figure 7 – Cement bag revetment to protect main bank at Village of Noatak.

Figure 8 – Aerial photo of point bar currently used as material source.

Figure 9 – Looking downriver at island. Note heavy vegetation at top of island, and new channel forming through mid-island.

Figure 10 – Looking upriver at island. Note severe deflection of main channel at head of island.

Figure 11- Looking from west to east at island. River flows from left to right.

Figure 12- Kuchoruk Creek, at new bridge crossing location. Note existing footbridge.

4.0 END OF TRIP

Following the helicopter trip, we returned later that evening via charter to Kotzebue with Ryan Anderson and Patti Miller, and subsequently returned to Anchorage via commercial carrier.

HDL Noatak Hydrologic Feasibility Study Photo Log

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File Name:island from SW.jpg
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File Name:island from west.jpg
Capture Date:2006/08/16 20:11:59

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HDL Noatak Hydrologic Feasibility Study Photo Log

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HDL Noatak Hydrologic Feasibility Study Photo Log

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Capture Date:2006/08/16 16:20:04

File Name:thermal erosion 1.jpg
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File Name:thermal erosion 2.jpg
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HDL Noatak Hydrologic Feasibility Study Photo Log

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HDL Noatak Hydrologic Feasibility Study Photo Log

Back Next

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Capture Date:2006/08/16 16:14:13

File Name:island vegetated upstream point.jpg
Capture Date:2006/08/16 20:12:40

File Name:island vegetation 2.jpg
Capture Date:2006/08/16 16:17:00

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HDL Noatak Hydrologic Feasibility Study Photo Log

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Capture Date:2006/08/16 16:29:36


File Name:island material 3.jpg
Capture Date:2006/08/16 16:33:28


File Name:island material and vegetation.jpg
Capture Date:2006/08/16 16:29:14

Back Next

HDL Noatak Hydrologic Feasibility Study Photo Log

Back

File Name:west side of island.jpg
Capture Date:2006/08/16 17:05:42

Back

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668
March 25, 2019

Keith Gordon, Environmental Protection Specialist
U.S. Department of Transportation
Federal Aviation Administration
222 W. 7th Ave, Box #14
Anchorage, Alaska 99513-7587

Re: Z614780000 Noatak Airport Relocation, Northwest Arctic Borough

Dear Mr. Gordon:

The Alaska Department of Transportation and Public Facilities (ADOT&PF) and the Federal Aviation Administration (FAA) propose community safety improvements in Noatak, Alaska by relocating and constructing an airport, access road, utilities, and material source; and decommissioning the existing airport. The existing airport is threatened by Noatak River erosion, which necessitates permanent runway closure. Additionally, there is insufficient land available to address other existing airport deficiencies. The Endangered Species Act (ESA) and Magnuson-Stevens Fishery Conservation and Management Act (MSA) require federal agencies to consult with the National Marine Fisheries Service (NMFS) on any action that significantly affect endangered marine mammals or may adversely affect Essential Fish Habitat (EFH) [50 CFR 600.920 (a)(1)].

NMFS received a Draft EFH Assessment and other project documents from ADOT&PF on February 7, 2019. On February 15, ADOT&PF met with NMFS EFH and ESA leads to discuss its scope, timeline, and impacts. On February 22, NMFS received notice of FAA's approval of those documents for our consultation. Specifically, based on the information provided by ADOT&PF and FAA in the February 2019 Draft EFH Assessment, and items discussed at our meeting, we offer the following comments pursuant to the MSA.

Proposed Action

The proposed project would mine gravel bars within the Noatak River to provide material for construction. Two material sources are proposed: the East River Material Source, which is the existing community source, and the South River Material Source, located approximately two miles downstream of the village. Material source operations could occur at any time of year, and bridges or culverts would be required to cross braids of the Noatak River and access the active source. A winter snow road will be permitted for contractor use from the Delong Mountain Transportation System to bring equipment and materials to the project area. This includes crossing Kiyak Creek, an anadromous stream. A new bridge would also be constructed over Kuchoruk Creek in order to access the proposed airport from Noatak.

Essential Fish Habitat and EFH Assessment

The Fishery Management Plan for Salmon Fisheries in the Exclusive Economic Zone off Alaska (Salmon FMP) identifies EFH for all five species (*Oncorhynchus* spp.) of Pacific salmon in the project area. The Alaska Department of Fish and Game (ADF&G) anadromous waters catalog (AWC) identifies presence of all five salmon species in the Noatak River, and chum salmon (*O. keta*) spawning in Kiyak Creek. Kuchoruk Creek is not currently designated as anadromous, however ADF&G has indicated only chum salmon may be present.

In its EFH Assessment, ADOT&PF and FAA considered impacts on EFH fishery resources from the proposed action, including those from developing material sources within the Noatak River, hauling of materials from the river bar within areas below ordinary high water, and crossing Kiyak Creek in winter. The EFH Assessment is considered complete and provides the mandatory contents described in 50 CFR 600.920 (e)(3).

Adverse Effects of the Proposed Action

NMFS appreciates ADOT&PF and FAA referencing our recent publication, *Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska*, during the development of their EFH Assessment for this project. ADOT&PF and FAA have determined that the proposed action may have minimal adverse effects on EFH. NMFS agrees with this determination. Potential adverse effects to EFH from the proposed action may include:

- Alteration of habitat and increased turbidity resulting from material source extraction.
- Potential for fish entrapment if material sites leave depressions that become isolated pools when water levels decrease.
- Potential for fish entrapment from water withdrawal during winter snow road construction.
- Degradation of water quality through accidental spills and increased turbidity.
- Potential blockages to fish passage due to ice dams.
- Reduction of available overwintering habitat.

EFH Conservation Recommendations

ADOT&PF and FAA have included measures to mitigate impacts to EFH, including adherence to best management practices (BMPs) and relevant State of Alaska and other federal permitting requirements. We acknowledge the following conservation measures put forth in the EFH Assessment:

- Construction of all crossing structures will adhere to appropriate BMPs for in-stream work to minimize potential effects to fishes and fish habitats from sediment mobilization and transport, and accidental contaminant spills.
- Impacts to Noatak River braided streams will be minimized through temporary bridges or culverts. Culverts would be sized and maintained for stream flows and fish passage.
- Adequate setbacks, as determined through permitting, will be maintained to avoid breeching the river channels.
- Ice dams during spring break up will be prevented by identifying potential blockages from ice infrastructure, and removing the potential blockage prior to break up.
- Fuel operations will be conducted under a Spill Prevention, Control, and Countermeasure plan to prevent impacts to surface water quality.
- If required by the ADF&G Fish Habitat Permit, a fish escapement channel will be excavated to prevent the trapping of fish in the material source extraction area.
- Water withdrawal volume limitations and use of ADF&G compliant screened intakes will reduce the potential for adverse effects.

- Screened intake and volume withdrawal criteria will be used to ensure potential effects to fish and EFH are mitigated.
- Ice dams during spring break up will be prevented by identifying potential blockages from ice infrastructure and removing the potential blockage prior to break up.

After review of the EFH Assessment and the conservation and mitigation measures already in place, NMFS offers the following EFH Conservation Recommendations, pursuant to Section 305(b)(4)(A) of the MSA:

- If possible and when practicable, materials from the existing airport should be used for construction of the new infrastructure.
- Minimize the areal extent and depth of extraction to the extent practicable.

Section 305(b)(4)(B) of the MSA requires federal agencies to provide NMFS with a written response to these EFH Conservation Recommendations within 30 days. Should a response be inconsistent with our recommendations, ADOT&PF and FAA must provide reasoning to NMFS for not implementing them. Further, if ADOT&PF and FAA will not make a decision within 30 days of receiving EFH Conservation Recommendations, they should provide NMFS with a letter within 30 days to that effect, and indicate when a full response will be provided.

ADOT&PF and FAA are consulting with NMFS on the effects of this project on species listed under the ESA. Please continue your communication with Bonnie Easley-Appleyard at bonnie.easley-appleyard@noaa.gov or (907) 271-5172 on ESA matters. Should the proposed action, its effects on EFH, or mitigation measures change significantly, NMFS wishes to be informed of any such changes in order to reassess our determination. If you have any questions regarding EFH resources on this project, please contact Samantha Simpson at samantha.simpson@noaa.gov or (907) 271-1301.

Sincerely,

Robert D Mecum

for James W. Balsiger, Ph.D.
Administrator, Alaska Region

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