ACCUMULATE ENERGY
P.O. Box 112212 Anchorage, Alaska 99511-2212

29 September 2017

Melissa Head (melissa.head@alaska.gov)
Alaska Department of Natural Resources, Division of Mining, Land & Water
Northern Region Office
3700 Airport Way
Fairbanks, AK 99709-4699

RE: Application for Land Use Permit for ICEWINE Project Exploration Wells: Bravo #1 & Charlie #1
North Slope, Alaska
Accumulate Energy Alaska, Inc.

Dear Ms. Head:

Accumulate Energy Alaska, Inc. (AEA) is proposing to drill two exploration oil wells (Bravo #1 and Charlie #1) in support of the ICEWINE Project during winter 2018. The proposed wells will be drilled from ice pads about 24 and 27 miles west of the Franklin Bluffs Pad, and will be accessed via a tundra winter (ice) road (TWR) starting at MP386.5 Dalton Highway.

In support of these activities, AEA hereby submits a Land Use Permit application package in conformance with application instructions and pursuant to *AS 38.05.850* for State review and approval

Also enclosed is a check for $100 for the ADNR/DML&W Land Use Permit (LUP) application fee.

Thank you for your consideration in this matter. We look forward to working with the ADNR/DML&W.

If you have any questions and require additional information, please contact me.

Respectfully,

Erik Opstad
Alaska Operations General Manager
Accumulate Energy Alaska, Inc.
907.244.5210
erik.opstad@gmail.com

Attachments

ADNR/DML&W Land Use Permit (LUP) Application Package

- Land Use Permit Application
- Land Use Permit Application Supplemental Questionnaire for: Use of Uplands and Non Marine Waters
- Land Use Permit Application Supplemental Questionnaire for: Off Road Travel
- Attachments
  - Attachment 1 - Project Location: TWR Alignment and Ice Pad GPS Waypoint Coordinates
  - Attachment 2 – Figures and Maps
  - Attachment 3 - Supplemental Project Report: Project Overview, Field Reconnaissance and TWR Routing
- Check made out to State of Alaska

STATE OF ALASKA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF MINING, LAND AND WATER

LAND USE PERMIT APPLICATION
AS 38.05.850

Applicants must complete all sections of this application. In addition, applicants proposing:

- the use of the uplands and non marine waters must also complete the Supplemental Questionnaire for Use of Uplands and Non Marine Waters accompanying this application;
- off-road travel must also complete the Supplemental Questionnaire for Off-Road Travel accompanying this application; and/or
- the use of tide and submerged lands must also complete the Supplemental Questionnaire for Use of Marine Waters accompanying this application.

Other items that must accompany the completed application are:

- **a (non-refundable)** $100 application filing fee;
- a 1:250,000 or 1:63,360 scale USGS map showing the location of the proposed activity;
- additional items identified and required in any supplemental questionnaire(s) to this application; and
- additional pages if more space is necessary to answer the questions completely.

Completed Land Use Permit Applications should be mailed to one of the following offices:

Public Information Center
550 W. 7th Ave, Suite 1260
Anchorage, AK 99501
(907) 269-8400

Public Information Center
3700 Airport Way
Fairbanks, AK 99709
(907) 451-2705

MLW Information Office
P.O. Box 111020
Juneau, AK 99811-1020
(907) 465-3400

LAS # 32023

Applicant Information:

CID: 57587

Erik Opstad
Applicant Name — Date of Birth

Accumulate Energy Alaska, Inc. — Erik Opstad — EIN
Doing Business As — Contact Person

P.O. Box 112212 Anchorage, AK 99511-2212 — erik.opstad@gmail.com
Mailing Address with City, State and Zip — Email Address

( ) Home Phone | (907) 244 5210 Work Phone | (907) 244 5210 Cell Phone | (907) 345 5821 FAX

If you are applying for a corporation, give the following information:

Name, address and place of incorporation: Accumulate Energy Alaska, Inc. 5353 Memorial Drive, Suite 1069 Houston TX, 77007 Note- AEA is an ADNR/DOG "Businesses Qualified for the Current Calendar Year"

Is the corporation qualified to do business in Alaska? **Yes** [X] **No** [ ]. **If yes**, provide name, address and phone number of resident agent: Erik Opstad P.O. Box 112212 Anchorage, AK 99511-2212 (907) 244 5210

Type of User, Select one:

[ ] Private non-commercial (personal use)
[ ] Commercial Recreation or Tourism
[ ] Public Non-profit including Federal, State, Municipal Government Agency
[X] Other commercial or industrial

Duration of Project:
The proposed activity will require the use of state land for: **(Check one)**

[ ] a single term of less than one year. **Beginning month:** _____ **Ending month:** _____

[X] a multi year term for up to 5 years. **Beginning year:** 2017 **Ending year:** 2022

If multi year and seasonal, circle months of use in each year. **Jan., Feb., Mar., Apr., May, Jun., Jul., Aug., Sept., Oct., Nov., Dec.**

Project Location

Latitude/Longitude or UTM: **See GPS Waypoint Coordinates in Attachment 1**

Section: **Varies*** Township: **004N - 006N** , Range: **009E - 013E** , Meridian: **Umiat**

(The spaces below are to be used if the boundaries of the proposed project cross section lines.)

***See attached Figures 3 and 4 for MTRS Designation (Attachment 2)**

Section:_____, Township:_____, Range:_____, Meridian: _____

Section:_____, Township:_____, Range:_____, Meridian: _____

Proposed project will require the use of up to **465** acres. (Add additional sheets as necessary)

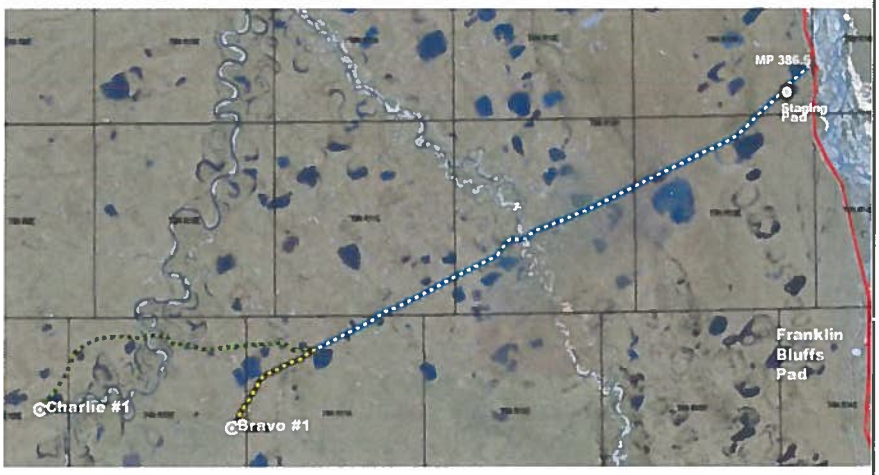
Project Description - Describe in detail your intended use of state land. (State land also includes all tide and submerged lands beneath coastal waters and all shorelands beneath other navigable water bodies of the state.) Discuss development and activities. (Attach additional pages as necessary.)

Accumulate Energy Alaska, Inc. (AEA) is proposing to drill two exploration oil wells (Bravo #1 and Charlie #1) in support of the ICEWINE Project during winter 2018. The proposed wells will be drilled from ice pads about 24 and 27 miles west of the Franklin Bluffs Pad, and will be accessed via a tundra winter (ice) road (TWR) starting at MP386.5 Dalton Highway.

Starting in November 2017, winter operations will include pre-packing and constructing the Main TWR and two TWR Spurs (Bravo TWR Spur and Charlie TWR Spur) to access the Bravo #1 and Charlie #1 drill sites where two ice pads will be built to support drilling operations. Project road activities include the following:

1. Constructing the 18.75-mile long Main TWR starting at MP386.5 Dalton Highway, with a 500- by 500-foot ice staging pad within 1 mile of the start of the Main TWR
2. Constructing the 3.75-mile long Bravo TWR Spur to the Bravo #1 pad location & constructing the 500- by 500-foot Bravo #1 ice pad
3. Constructing a 17.75-mile long Charlie TWR Spur and constructing the 500-by 500-foot Charlie #1 ice pad.

All TWRs will be built to accommodate drill rig moves, and pads large enough to safely carry out drilling and support operations. All TWRS and ice pads will be constructed and maintained using the generally accepted practices for the North Slope, subject to ADNR opening criteria for winter tundra travel in the lower NS Foothills. Additionally, TWRs crossings at established subsistence and winter trails will be constructed to provide a smooth transition to ensure trail users have safe passage. Upon completion of use, TWR stream crossings will be slotted, breached, or weakened to facilitate breakup and minimize potential impacts to stream banks. Any snow or ice used as fill for ramps will be removed from banks in a manner that does not disturb the natural streambank.



Should a portion of the permitted area be closed to the general public? **Yes [X]** **No [ ]**. **If yes**, explain which portion and provide justification for exclusive use:

AEA proposes to close public access to the TWRs and ice pads to protect the public from health and safety hazards that could from drilling and support operations on State-owned land. This is especially true for access to the TWRs from the Dalton Highway. Closure would include an area within 100 feet of the TWRs and ice pads.

Site Description - Briefly describe the current condition of the proposed site of use, noting any trash, garbage, debris or signs of possible site contamination (If significant, we recommend you provide pictures to establish initial conditions):

The proposed TWR alignments and ice pad locations shown in Appendix A reflect the results of fieldwork conducted by AEA in mid-August where a field team mapped routes and locations that avoided higher, drier tundra covered by shrubs, forbs and tussock vegetation. Field notes from the same route inspections found trash and debris, including intact insulfoam panels, blown by the wind strewn up to 7 miles from the Main TWR start along the Main TWR alignment. Additionally, the Main TWR also encountered traditional winter trails between the Toolik & Kuparurk Rivers that contain tundra damage. These are generally linear depressions running filled with ponded water.

Are there improvements or materials on the site now? Yes [ ] No [**X**] If yes, briefly describe the improvements, their approximate value, and who owns them (We recommend you provide pictures of improvements):

Site Description continued - Describe the natural vegetation --- ground cover, trees, shrubs --- and any proposed changes. Describe the location of any estuarine, riparian, or wetlands and any noticeable animal use of area.

The natural vegetation in the Project area is Arctic tundra characterized by cold air with low moisture holding capacity, combined with minimal precipitation. This flat area is covered with small thaw lakes and ponds, beaded streams, polygonal patterned ground and pingos underlain by permafrost up to 2,000 feet in depth.

The dominant vegetation type across the foothills area and much of the coastal plain grows in a thin soil layer and consists of tussock tundra, with willows in the small drainages and wet sedge and grasses tundra in old drained lakes. Tussocks are formed of cotton grass and other sedges and forbs, with scattered dwarf shrub. The flat areas of the coastal plain are considered wetlands despite limited precipiation.

Manin TWR route at MP6 looking W-SW

Site Access - Describe how you plan to access the site, and your mode of transportation.

Site access will be by TWRs using conventional wheeled and tracked vehicles. AEA also will request access by tracked vehicles approved by the ADNR/DML&W for summer tundra travel. These will be used to pre-pack TWR routes and ice pad prior to official opening of winter tundra travel to drive frost down and preserve early snow. Finally, as a possible option, two locations for a 5,000-foot long ice airstrip have been identifed: Lake A28 (U004N/010E, Sec. 12 & 13 and U004N/011E, Sec. 7. The ice airstrip will transport materials and change out crews and will designed/constructed with appropriate lighting and control systems proscribed by the FAA.

If your access is by aircraft, specify the type and size of aircraft: Aircraft transporting up to 30 passengers (Beechcraft 3000 or similar)

To access the site, the aircraft is equipped with **floats [X] wheels [ ] skis [ ]**.

Number of people

1. Indicate the number of employees and supervisors who will be working on the site. **Up to 75**
2. Indicate the number of customers who will be using the site per year or season. **0**
3. Indicate the number of days the site will be used per year or season. **255**

Environmental Risk / Hazardous Substances - In the course of your proposed activity will you generate, use, store, transport, dispose of, or otherwise come in contact with toxic and/or hazardous materials, and/or hydrocarbons? **Yes[X] No[ ]. If yes,** please describe:

The types and volumes of fuel or other hazardous substances present or proposed: Diesel fuel (476 bbls - 13,600 gallons), Drill fluids (100 bbls - 4,200 gallons), Crude oil (476 bbls - 19,998 gallons), Returned downhole fluids (3,000 bbls - 126,000 gallons), Ethylene glycol - used and new (10 bbls - 420 gallons) and Used oil (20 bbls - 840 gallons).

The specific storage location(s): 6 HH) LJ X UHV DQG IR U V WRUDJH ORFDWLRQ DW HDFK SDG

The spill plan and prevention methods:

Fuel storage, handling, transfers, spill response and spill reporting will be conducted in accordance with AEA's Oil Discharge Prevention and Contingency Plan (ODPCP) approved by the ADEC as Plan No. 15-CP-5241. The plan includes immediate response actions, reporting requirements, communication trees, receiving environments, spill cleanup mobilization response times, well control information and spill prevention guidance. Information related to immediate response actions, receiving environments, spill cleanup mobilization response times and well control also can be found in the ODPCP.

All bulk hazardous fluid and fuel transfers will be conducted in accordance with the fluid transfer guidelines described in AEA's Fluid Transfer Procedures and Checklist (Appendix A in ODPCP 15-CP-5241). Trained spill technicians & oil handlers, operating under the Fluid Transfer Procedures, will attend all fuel & fluid transfer operations at all times. During fuel and fluid transfer operations, equipment storage or maintenance activities, the site will be protected from leaking or dripping fuel and hazardous substances using drip pans or other surface liners designed to catch and hold fluids under the equipment or by creating a specialized area using an impermeable liner or other suitable containment mechanism.

Appropriate spill response equipment (required by and described in detail in ODPCP 15-CP-5241) also will be staged on location for controlling and cleaning up any accidental discharges. AEA also has an approved Spill Prevention Control and Countermeasure (SPCC) Plan for tanks to be operated at Bravo #1 and Charlie #1. Contractors also will provide SPCC plans specific for their operations in support of the drilling and testing operations.

Environmental Risk/Hazardous Substances (continued) - If you plan to use either above or below ground storage containers (like tanks, drums, or other containers) for hazardous material storage, answer the following questions for each container:

Where will the container be located? Containers will be spotted within secondary containment areas (SCAs) on ice pads. See Figures 7 & 8 for more details.

What will be stored in the container? Diesel fuel, drill fluids, crude oil, returned downhole fluids, ethylene glycol - used & new, and used oil

What will be the container's size in gallons? AEA anticipates that 13,600 gallons of fuel will be stored at each drill site in two double-walled aboveground storage tanks (ASTs). Storage of 13,600 gallons is based on tank volume (both ASTs will not exceed 9,999 gallons) and an 80% fill level limit per fuel transfer procedures. An onsite tanker truck will fuel ancillary equipment such as heaters, light plants, and heavy equipment. Crude oil and returned drill fluids also will be stored in double-walled ASTs with volumes less than 9,999 gallons also filled to 80%. Drilling fluids, POLs, ethylene glycol and used will be stored in 5-gallon pails, 55-gallon drums or a variety of different sized (250-400 gal) isocontainers that are regulated by the USDOT and/or EPA.

Give a description of any secondary containment structure, including volume in gallons, the type of lining material, & configuration: See Figures 7 & 8 for SCA structure dimensions, configurations and proposed locations.

Fuel and hazardous substance storage will comply with State and federal oil pollution prevention and contingency requirements found in 18 AAC 75, 40 CFR 112, and NSBMC § 19.50 and § 19.70. ASTs used to store flammable and combustible liquids also are regulated by the EPA and will comply with the International Fire Code (IFC) and 13 AAC 50.025.

All ASTs (fuel, crude oil, returned downhole fluids) will be spotted within lined secondary containment areas (SCAs) providing 110% of the largest AST volume plus seasonal precipitation. The SCAs will be comprised of a bermed liner system comprised of the following (from the bottom up):

- Geofabric (Propex Geotex 801 or similar)
- Hdrocarbon-resistant, minimum 30-mil geomembrane liner (Cooley L1023 DEP or similar)
- Geofabric

The ASTs will then be staged on rig matsor plywood . Drums &isocontainers will be grouped together on drum dock skids within similar containment, or within self-contained rig modules with steel floors.

Will the container be tested for leaks? **Yes[X] No[ ]** ASTs are inspected and tested for leaks on proscribed schedules found in API 651. Drums and isocontainers are tested before use during fabrication.

Will the container be equipped with leak detection devices? **Yes[X] No[ ]. If no**, describe: ASTs will have interstitial leak detection tubes; drums and isocontainers are monitored constantly for leaks during operations, along with underlying SCAs. With 24-hour operations on the rig this provides a practical and reliable method of leak detection.

Do you have any reason to suspect, or do you know if the site may have been previously contaminated? **Yes[ ] No[X]. If yes,** please explain:

Date Stamp: 28 September 2017

AEA Alaska Operations General Manager

Signature of Applicant or Authorized Representative Title

AS 38.05.035(a) authorizes the director to decide what information is needed to process an application for the sale or use of state land and resources. This information is made part of the state public record and becomes public information under AS 09.25.110 and 09.25.120 (unless the information qualifies for confidentiality under AS 38.05.035(a)(9) and confidentiality is requested.) Public information is open to inspection by you or any member of the public. A person who is the subject of the information may challenge its accuracy or completeness under AS 44.99.310, by giving a written description of the challenged information, the changes needed to correct it, and a name and address where the person can be reached. False statements made in an application for a benefit is punishable under AS 11.56.210.

Land Use Permit Application Supplemental Questionnaire for:
Use of Uplands and Non Marine Waters

To be completed to provide more detailed information about projects or activities requiring the use of state owned uplands and non marine waters. All site development details identified in this section must be represented graphically in the scaled drawings on Page 4 of the supplement.

Temporary Structures – **1)** Describe all temporary improvements (including buildings, tent platforms, out-buildings, docks, floats, and floating facilities), including their dimensions and building materials. **2)** Label improvements to be maintained on a year round basis as year round. **Note:** Seasonal improvements must be completely dismantled and removed or stored on or before the end of authorized terms of use.

Please see Figures 7 & 8 in Attachment 2

Distance structures including pit privies will be located from the ordinary highwater mark of the nearest freshwater body (lake, stream, river, etc), or the mean high water mark of a saltwater body: _____

Harvest of Non-Timber Related Forest Products – Please list the type and quantity of each non-timber related forest product (berries, ferns, willow, mushrooms, birch bark, etc.) to be harvested for commercial use:

NOT APPLICABLE

Contact the DNR Division of Forestry to obtain authorizations for the harvest of small trees.

Motorized Equipment - List mechanized/motorized equipment to be used, including type, size, purpose, & number of each

The number and types of vehicles and equipment scheduled for use in construction and maintenance of the ice road, & drilling support operations include the following:

- Model 2000 Tucker Snow-Cats on tundra track w/ portable ice auger drills (2) - DML&W approved for summer tundra travel
- Caterpillar motor grader (1)
- Caterpillar 966 loaders or similar (4)
- Snow blowers and ice trimmers – Cat 966 loader mounted (2)
- Caterpillar D-6 dozers or similar (1)
- Caterpillar TL1255 12,000# Telehandler w/ forks
- Tractor/Maxi-Haul (30cy) dump trailers and/or Cat hard tail end dumps (8)
- 28 Passenger Shuttle Bus (1)
- Crew Cab 4WD Drive Pickup Truck- Diesel (6)
- Crew Cab Welding Truck (1)
- Tractor/325-bbl vacuum trucks (3)
- 15 cy Super suckers (3)
- 130-bbl Conventional water tanker trucks and 200-bbl water buffaloes (3)
- Mechanic field service trucks (1)
- 5000-gal fuel tanker trucks (1)
- Heater 700,000 BTU ES700 (5)
- Light Towers Allmand Pro Nite-Lite 2 or similar (6)
- Tractor/trailer wireline unit (1)
- Tractor/trailer e-line unit (1)
- Tractor/trailer and roll-off winch trucks (4)

Storage and Parking - If you plan to store items or park boats, vehicles and/or heavy equipment on the site, describe complete the following:

Describe and give dimensions of long term and short term parking and or storage areas. See Figures 7 & 8 in Attachment 2

Is parking or storage planned to take place on filled tidelands. **Yes[ ] No[X]**

Does storage involve structures or materials floating in a waterbody? **Yes[ ] No[X]** If yes,describe._____

WASTE (continued)

4. Domestic wastewater. Disposal is discussed above.

SOLID WASTE: Non-hazardous solid waste will be stored on site in Municipal Solid Waste (MSW) and Construction & Demolition (C&D) dumpsters that will be hauled to and disposed in the NSB SA10 landfill. MSW and C&D dumpsters will be managed to avoid potential wildlife interactions by covering. Metal will be collected and sent offsite for recycling. Oily waste will be managed & stored on-site until transport to an approved disposal facility. Used oil will be transported in drums for offsite recycling and/or disposal at an approved facility.

HAZARDOUS and UNIVERSAL WASTES: RCRA-hazardous wastes expected to be generated during construction, drilling and production operations include very small quantities of Characteristic Hazardous and Universal Wastes (as defined by 40 CFR 261.3) These will be managed on-site in Satellite Accumulation Areas (SAAs), manifested and then transported to approved disposal or recycling facilities at the completion of the field operations.

Animal Use

Will there be any use of animals (horses, llamas, dogs, etc.)? **Yes[ ] No[x]**

Will there be commercial use of the animals (horseback rides, packing, dog sled rides, etc.)? **Yes[ ] No[x]** If yes, please explain:

Dismantle, Removal, Restoration Plan – Provide a plan for dismantling and removing temporary structures. Include method and timeline for total site restoration:

Upon completion of drilling and evaluation operations, the wells will either be plugged and abandoned (P&A) or suspended in accordance with AOGCC regulations. Equipment and structures will be removed from the Project area at the end of the season.

Ice pads and TWRs will be scraped to remove dark-colored drips missed by the ACC spill technician and the resulting snow will be thawed with resulting oily water disposed of at a permitted disposal facility. Upon completion of use, TWR stream crossings will be slotted, breached, or weakened to facilitate breakup and minimize potential impacts to stream banks. Any snow or ice used as fill for ramps will be removed from banks in a manner that does not disturb the natural stream bank.

Trash and debris will be removed and transported for disposal at a permitted disposal facility. AEA will conduct an inspection and "stick picking" operation via helicopter in Summer 2018 to ensure that NSB and State cleanup requirements have been met.

Although activities will be conducted from TWRs and ice pads, impacts to vegetation and habitat may occur. Therefore, AEA will inspect the Project area following snowmelt in 2018 during "stickpicking" to confirm that tundra damage did not occur. If tundra damage is discovered, AEA will consult with the State and the NSB to determine the appropriate methods for restoration, and incorporate them into a Tundra Damage Rehabilitation/Remediation Plan that meets requirements found in NSBMC § 19.30, 19.500 and § 19.60, ADL 393058 and 393043 lease conditions, and specific State requirements. The Plan will address the area, type, and extent of damage and will be developed in accordance with the Alaska Coastal Revegetation & Erosion Control Guide (developed by the State of Alaska Plant Materials Center), the Streambank Revegetation and Protection Guide (developed by the Alaska Department of Fish and Game), and other relevant guidance documents. Agency personnel will be invited to verify that rehabilitation operations are complete and that any issues identified are addressed.

SHORT TERM (PORTABLE) COMMERCIAL RECREATION CAMPS: Identify commercial recreation activity/activities for which short term (portable) camps **will be** established to accommodate employees and clients, and provide a general description of the location(s) (e.g. guide use area, game management sub-unit, river, stream, lake, etc.) where the recreational activity/activities and short term (portable) camp use will occur.

0 **Big Game Guiding: (List up to 3 Guide Use Areas.)**

0 **Sportfishing (List river corridors, lakes, etc.)**

0 **Boating/Rafting/Kayaking: (List river corridors, lakes, etc.)**

0 **Other Recreation: (Type and general geographic description.)**

- Identify any State of Alaska Refuge, Sanctuary and/or Critical Habitat Area where short term (portable) camps will be used. NONE

Will activities include "day use" of state land managed under the Haines State Forest Management Plan? Yes ___ No x

Storage and Parking (continued)

Number of disassembled tent frames 0 Number of tent platforms 0

List and describe items that are large and difficult to transport. Include dimensions: Large items requiring tractor/trailer & roll-off truck support to be located on ice pads in support of TWR and drilling support operations include the following:

- 30' X 40' Portable Insulated Steel Building
- Mobile Office Trailer 48' X 12'
- Smoke Shack 8' X 20'
- Break Shack 8' X 20'
- 40' Steel Connex - Bare
- 40' Insulated Steel Connex - Heat & Power

Will barrel(s) or an equivalent type of storage container be used? **Yes[X] No[ ]** If using something other than barrels for storage containers, describe the alternative container. 1 cy plywood mud boxes, 150- to 450-gallon isocontainers

Describe any measures you plan to take to minimize drips or spills from leaking vehicles or equipment. Measures to minimize drips or spills from leaking vehicles or equipment are described in detail along with training in AEA's Oil Discharge Prevention and Contingency Plan approved by the ADEC as 15-CP-5241 (ODPCP 5241).

During fuel and fluid transfer operations, equipment storage or maintenance activities, the site will be protected from leaking or dripping fuel and hazardous substances using drip pans or other surface liners designed to catch and hold fluids under the equipment or by creating a specialized area using an impermeable liner or other suitable containment mechanism. Appropriate spill response equipment, as required in ODPCP 15-CP-5241, will be staged on location & managed/maintained by an on-site spill technician. Trained spill technicians & fuel contractor personnel (oil handlers), operating under Fluid Transfer Procedures, will conduct all fuel & fluid transfer operations. A copy of ODPCP 15-CP-5241 will be kept on site for guidance in controlling and cleaning up any accidental discharges of fuels, lubricants, or produced fluids.

Water / Wastewater

Water Supply – Describe the water supply and proposed use.

During operations, up to 5,000 gallons per day (gpd) potable water will be required for domestic use. Potable water will be transported to the camp and rig pads by water truck. For other fresh water uses, AEA has submitted temporary water use authorizations (TWUAs) from ADNR/DML&W for withdrawal of ice chips and water from 37 area lakes. This water use will total about 98 million gallons (Mgal) as follows: 89 Mgal for TWR and ice pad construction and maintenance (fresh water and ice chips combined), 5 Mgal for drilling operations and 4 Mgal for stimulating and testing each well. Water pumped from lakes will be transported by low ground pressure vehicles or rolling stock once winter tundra travel is approved by ADNR. Rolling stock will only use trails that have been improved with a firm ice surface or packed snow to support the weight and pressure of the vehicles. Snowmelt and other run-off from Project facilities will be managed through implementation of AEA Best Management Practices (BMPs) and a Storm Water Pollution Prevention Plan (SWPPP) pursuant to the Alaska Pollutant Discharge Elimination System (APDES) general permit for north slope activities (NS GP AKG32000).

Wastewater – Describe the wastewater type and quantity and proposed method of wastewater disposal: (for the marine environment, also describe the proposed gray and black water systems or out fall pipeline.

Camp and support operations are expected to generate less than 3,000 gallons per day of domestic wastewater (both gray and black water). Domestic wastewater will be temporarily stored in camp wastewater treatment plant (WWTP) sewage tank modules before being hauled to the NSB-SA-10 wastewater treatment plant for disposal. Domestic wastewater will not be treated on site.

Waste – Describe the types of waste that will be generated on-site, including solid waste, the source of the waste, and the method of waste disposal, i.e. pit privy, or self-contained system, or outfall line; indicate distance from the nearest waterbody.

PLEASE SEE ATTACHED SUPPLEMENTAL PAGE

SUPPLEMENTAL PAGE - UPLANDS

Waste – Describe the types of waste that will be generated on-site, including solid waste, the source of the waste, and the method of waste disposal, i.e. pit privy, or self-contained system, or outfall line; indicate distance from the nearest waterbody.

All waste management activities will be conducted in general accordance with the AEA ICEWINE Project Waste Management Plan (WMP) and in conformance with AEA HSE Management Policies. Additionally, the latest versions of the Alaska Safety Handbook (ASH), the North Slope Environmental Field Handbook (NSEFH) and the Alaska Waste Disposal & Reuse ("Redbook") Guide are adopted as guidance, reference and standard operating procedures and workplace "best" safety, environmental and waste management practices for AEA operations. ALL WASTES WILL BE MANAGED AND TRACKED BY USING NORTH SLOPE MANIFEST PROCEDURES.

RCRA-EXEMPT WASTES. Four waste streams exempt from regulation as Resource Conservation and Recovery Act (RCRA) hazardous wastes ("RCRA-exempt wastes") per 40 CFR 261.4 and 261.7 will be generated during operations. These include:

E&P fluids and solids from drilling and testing operations. Up to 4,000 barrels (bbls) of drilling wastes and another 4,000 bbls of test fluids will be generated during drilling, and then temporarily stored onsite (if necessary), hauled and disposed by injection in either offsite Class I or Class II UIC disposal wells. Non-oily E&P solid drill cuttings may also be hauled the NSB SA 10 landfill for beneficially reused as sanitary cover if acceptance criteria are met. Finally, on-site disposal through annular injection may be conducted, as approved by the AOGCC.

Residue and rinsate found in "RCRA empty" containers. Residue and tank rinsate found in RCRA-empty tanks and vessels will be manifested, hauled and disposed by injection in offsite Class I or II disposal injection wells as they are generated at tank wash bays after drilling and testing operations.

Household (camp) hazardous wastes such as cleaning supplies. RCRA-exempt household hazardous wastes will be combined with domestic wastewater & temporarily stored in the camp sewage tank modules before being hauled to the NSBSA- 10 WWTP for disposal.

Domestic wastewater from camps and envirovacs. Up to 4,000 barrels (bbls) of drilling wastes and another 4,000 bbls of test fluids will be generated during drilling, and then temporarily stored onsite, hauled and disposed by injection in either offsite Class I or Class II UIC disposal wells.

SOLID WASTE. Non-hazardous solid waste will be stored on site in Municipal Solid Waste (MSW) and Construction & Demolition (C&D) dumpsters that will be hauled to and disposed in the NSB SA10 landfill. MSW and C&D dumpsters will be managed to avoid potential wildlife interactions by covering. Metal will be collected and sent offsite for recycling. Oily waste will be managed & stored on-site until transport to an approved disposal facility. Used oil will packaged in drums for transport & be recycled or disposed at an approved facility.

HAZARDOUS and UNIVERSAL WASTES: RCRA-hazardous wastes expected to be generated during construction, drilling and production operations include very small quantities of Characteristic Hazardous and Universal Wastes (as defined by 40 CFR 261.3) will be managed on-site in Satellite Accumulation Areas (SAAs), manifested and then transported to approved disposal or recycling facilities at the completion of the field operations.

Land Use Permit Application Supplemental Questionnaire for:
Off Road Travel

Answer the following questions if your proposed activity includes off-road travel.

Terrain Factor. Circle the following terrain type(s) that best describes your route of travel:

- Wetlands
- Open, non-tundra or wetland areas.
- Rivers or other water bodies.
- Wooded areas with trees of 6" or greater diameter (at breast height).
- Tundra areas.

Vehicles and Weight. List the number and kinds of vehicles to be used for motorized travel, the weight of each vehicle and the weight of each trailer or sled (including loaded weight) to be carried by that vehicle:

Equipment	Gross Weight	Units	Function
Model 2000 Tucker Terra Snow-Cat (smooth tracks)	7 tons	2	Pre-pack tundra winter snow (ice) roads TWR & pads
Caterpillar Motor Grader	21 tons	1	Pad/TWR Const.
966C Front-end Loader	18 tons	2	Pad/TWR Const. & Drill Ops Support
966C-Mounted Snow Blower and Ice Trimmer	20 tons	2	Pad/TWR Const. & Maint.
Cat D6D LGP Bulldozer	19 tons	1	Pad/TWR Const. & Maint.
Caterpillar TL1255 Telehandler (zoom boom)	17.7 tons	1	Drill Ops Support
Maxi-Haul dump trailers or Cat 730 End Dumps	28 tons (ice) to 60 tons (solids)	8	Pad/Road Const. & Drill Ops Support
28 Passenger Shuttle Bus	5 tons	1	Pad/Road Const. & Drill Ops Support
Crew Cab 4WD Drive Pickup Truck- Diesel	3 tons	6	Pad/Road Const. & Drill Ops Support
Tractor/325-bbl Vac Trailer	45 tons (loaded)	3	Drill Ops Support
15 cy Super Sucker	28 tons (loaded)	3	Drill Ops Support
200-bbl Water Buffalo (water trucks)	48 tons (loaded)	3	Pad/Road Const. & Drill Ops Support
Mechanic Field Service Trucks	12 tons	1	All Project Activities
5,000-gal Fuel Tanker Truck	26 tons (loaded)	1	All Project Activities
Tractor/trailer wireline unit	28 tons	1	Drill Ops Support
Tractor/trailer wireline unit	28 tons	1	Drill Ops Support
Tractor/trailer and Roll-off Winch Tractor	30 tons	4	Mob/Demob.

Mileage.

- State the average total miles traveled in one round trip: **30**
- State the number of trips proposed: **1,792 (= 30 pre-pack + 200 TWR const. + 122 mob/demob Arctic Fox #1 + 1,440 drill ops support. All trips on TWR except for 30 pre-pack by Tucker Sno Cat)**

Season Factor. Proposed date(s) of travel will be: **From: 1 Nov (start pre-pack) To: 14 May (end winter tundra travel)**

Stream and Water Body Crossings. - Note who you contacted in the ADF&G, Division of Habitat:

Date: **13 Sep 2017** Person: **Jack Winters - submitted Title 16 Fish Habitat Permit Package**

Fuel and Hazardous Substance Factor. The volume of fuel and hazardous substances to be used is the total volume (in gallons) to be carried on one vehicle and any trailers or sleds that vehicle is towing.

- Maximum volume of fuel (in gallons) that is being transported by one vehicle and any trailers or sleds it is towing: **14,560** gallons. **(280-bbl max highway load in 325-bbl vac truck)**
- Hazardous substances other than fuel:

  Substance **Crude oil, use oil, ethylene glycol, drill fluids, returned downhole fluids**
- Do you have an Oil Discharge Prevention and Contingency Plan approved by the Alaska Department of Environmental Conservation? **Yes[X] No[ ]** ODPCP Plan No. 15-CP-5241
- Do you have either a trained spill response team or a contract with a spill response company? **Yes[X] No[ ]**

Attachment 1

Project Location:

TWR Alignment and Ice Pad GPS Waypoint Coordinates

As-staked Main Tundra Winter Access Road (TWR) Centerline

Waypoint ID	GPS Coordinates (WGS84) lat°	lon°	Description
Start	69.84621	148.761487	MP 0 (at MP386.5 Dalton Highway)
121	69.84148	148.777351	MP .5
122	69.83911	148.785609	MP .75
123	69.83439	148.801182	MP 1.25
124	69.83202	148.809282	MP 1.5
125	69.82972	148.816918	MP 1.75
173	69.82726	148.825266	MP 2
174	69.82499	148.832947	MP 2.25
175	69.82266	148.840679	MP 2.5
176	69.82029	148.848806	MP 2.75
224	69.81796	148.856531	MP 3
225	69.81557	148.864469	MP 3.25
226	69.81366	148.873550	MP 3.5
260	69.81224	148.883233	MP3.75
230	69.81071	148.893271	MP 4
231	69.80933	148.902325	MP 4.25
232	69.80791	148.911945	MP 4.5
233	69.80648	148.921503	MP 4.75
234	69.80513	148.930804	MP 5
235	69.80363	148.940315	MP 5.25
236	69.80219	148.950029	MP 5.5
237	69.80076	148.959541	MP 5.75
238	69.79930	148.969017	MP 6
239	69.79801	148.977126	MP 6.25
240	69.79636	148.988442	MP 6.5
241	69.79493	148.997946	MP 6.75
242	69.79349	149.007271	MP 7
247	69.79201	149.016891	MP 7.25
248	69.79060	149.026701	MP 7.5
249	69.78917	149.035947	MP 7.75
250	69.78769	149.045598	MP 8
251	69.78626	149.055062	MP 8.25
252	69.78466	149.064806	MP 8.5
253	69.78308	149.075560	MP 8.75
257	69.78203	149.084070	MP 9
254	69.78067	149.093981	MP 9.25
255	69.77944	149.103842	MP 9.5
256	69.77844	149.113751	MP 9.75
129	69.77713	149.123939	MP 10
126	69.77614	149.131693	MP 10.25
127	69.77504	149.141489	MP 10.5
128	69.77351	149.150572	MP 10.75
133	69.77166	149.156705	MP 11
130	69.77059	149.170095	MP 11.25
131	69.77063	149.181881	MP 11.5

As-staked Main Tundra Winter Ice Road (TWR) Centerline

Waypoint	GPS Coordinates (WGS84)		
ID	lat°	lon°	Description
132	69.76955	149.186661	MP 11.75
134	69.76668	149.193016	MP 12
135	69.76370	149.199669	MP 12.25
136	69.76236	149.208555	MP 12.5
137	69.76109	149.216539	MP 12.75
138	69.75916	149.227909	MP 13
139	69.75778	149.236548	MP 13.25
258	69.75603	149.247197	MP.13.5
140	69.75460	149.256383	MP 13.75
141	69.75312	149.264974	MP 14
142	69.75149	149.275267	MP 14.25
259	69.74981	149.285088	MP14.5
143	69.74841	149.294094	MP 14.75
144	69.74703	149.302760	MP 15
145	69.74529	149.312859	MP 15.25
146	69.74390	149.321696	MP 15.5
147	69.74263	149.329496	MP 15.75
154	69.74084	149.341153	MP 16
151	69.73957	149.351297	MP 16.25
152	69.73797	149.360950	MP 16.5
153	69.73610	149.369304	MP 16.75
155	69.73451	149.379216	MP 17
156	69.73299	149.388987	MP 17.25
157	69.73164	149.396928	MP 17.5
158	69.72996	149.407167	MP 17.75
159	69.72843	149.416982	MP 18
160	69.72690	149.426005	MP 18.25
161	69.72539	149.434933	MP 18.5
162	69.72379	149.444838	MP 18.75
163	69.83665	148.793507	MP 19
181	69.72548	149.510601	MP 20.5

As-staked Bravo TWR Spur Centerline

Waypoint ID	GPS Coordinates (WGS84) lat°	lon°	Description
164	69.72222	149.453953	MP 19 B
165	69.72062	149.463763	MP 19.25 B
167	69.71852	149.472072	MP 19.5 B
171	69.71760	149.482762	MP 19.75 B
177	69.71619	149.491024	MP 20 B
179	69.71445	149.501452	MP 20.25 B
182	69.71305	149.509758	MP 20.5 B
183	69.71182	149.517608	MP 20.75 B
185	69.70944	149.527406	MP 21 B
186	69.70639	149.533329	MP 21.25B
187	69.70348	149.538694	MP 21.5 B
188	69.70021	149.544815	MP 21.75 B
189	69.69737	149.550274	MP 22 B
191	69.69424	149.556013	MP 22.25 B
193	69.69145	149.561309	MP 22.5 B

As-staked Charlie TWR Spur Centerline

Waypoint ID	GPS Coordinates (WGS84) lat°	lon°	Description
166	69.72268	149.461220	MP 19.25 C
169	69.72251	149.471386	MP 19.5 C
172	69.72268	149.482300	MP 19.75 C
178	69.72468	149.491553	MP 20 C
180	69.72564	149.500342	MP 20.25 C
184	69.72525	149.520382	MP 20.75 C
190	69.72490	149.532625	MP 22 C
192	69.72476	149.541598	MP 22.25 C
194	69.72440	149.551861	MP 22.5 C
195	69.72417	149.561690	MP 22.75 C
196	69.72383	149.573154	MP 23 C
197	69.72357	149.583228	MP 23.25 C
198	69.72322	149.594035	MP 23.5 C
199	69.72309	149.603755	MP 23.75 C
200	69.72381	149.615725	MP 24 C
201	69.72505	149.623625	MP 24.25 C
202	69.72564	149.636411	MP 24.5 C
203	69.72490	149.643003	MP 24.75 C
204	69.72663	149.652662	MP 25 C
205	69.72931	149.657630	MP 25.25 C
206	69.72912	149.667546	MP 25.5 C
207	69.72950	149.678704	MP 25.75 C
208	69.72826	149.689086	MP 26 C
209	69.72848	149.698312	MP 26.25 C
210	69.72864	149.709176	MP 26.5 C

As-staked Charlie TWR Spur Centerline

Waypoint	GPS Coordinates (WGS84)		
ID	lat°	lon°	Description
211	69.72893	149.719680	MP 26.75 C
212	69.72893	149.730794	MP 27 C
213	69.72874	149.740237	MP 27.25 C
214	69.72840	149.750339	MP 27.5 C
215	69.72699	149.760371	MP 27.75 C
216	69.72528	149.769914	MP 28 C
217	69.72344	149.778192	MP 28.25 C
218	69.72088	149.785728	MP 28.5 C
219	69.71751	149.789895	MP 28.75 C
220	69.71362	149.794271	MP 29 C
221	69.71101	149.799040	MP 29.25 C
222	69.70799	149.804837	MP 29.5 C
223	69.70503	149.810987	MP 29.75 C
227	69.70251	149.817826	MP 30 C
228	69.70015	149.824841	MP 30.25 C
229	69.69794	149.832060	MP 30.5 C

As-staked Wellbore Locations

Waypoint	GPS Coordinates (WGS84)		
ID	lat°	lon°	Description
112	69.68820	149.567000	Bravo #1
113	69.69693	149.831800	Charlie #1

As-staked Stream Crossings Centerline

Waypoint	GPS Coordinates (WGS84)			
ID	lat°	lon°	Description	Depth
243	69.79346	149.006180	MP 7 Creek Crossing Pt 1	1.9'
244	69.79346	149.006200	MP 7 Creek Crossing Pt 2	1.9'
245	69.79348	149.006240	MP 7 Creek Crossing Pt 3	1.5'
246	69.79349	149.006260	MP 7 Creek Crossing Pt 4	1.3'
261	69.77122	149.158220	Toolik River Xing Pt 1	1.6'
262	69.77114	149.158330	Toolik River Xing Pt 2	1.2'
263	69.77097	149.158550	Toolik River Xing Pt 3	2.7'
264	69.77087	149.158660	Toolik River Xing Pt 4	3.0'
265	69.77082	149.158710	Toolik River Xing Pt 5	2.2'
266	69.77079	149.158740	Toolik River Xing Pt 6	1.6'
267	69.77077	149.158770	Toolik River Xing Pt 7	1.1'
148	69.73944	149.354900	MP 16.25 Creek Xing Pt 1	2.1'
149	69.73945	149.354870	MP 16.25 Creek Xing Pt 2	1.4'
150	69.73946	149.354860	MP 16.25 Creek Xing Pt 3	1.9'
170	69.72271	149.475485	MP 19.5 Charlie Creek Xing	1.5'
168	69.71855	149.471940	MP 19.5 Bravo Creek Xing	1.5'

As-staked Stream Crossings Centerline

Waypoint ID	GPS Coordinates (WGS84) lat°	lon°	Description	Depth
114	69.72967	149.681240	Kuparuk River Xing Pt 1	<1'
115	69.72957	149.683840	Kuparuk River Xing Pt 2	2.3'
116	69.72954	149.685606	Kuparuk River Xing Pt 3	1.0'
117	69.72932	149.686176	Kuparuk River Xing Pt 4	1.3'
118	69.72896	149.686868	Kuparuk River Xing Pt 5	5.1'
119	69.72882	149.687041	Kuparuk River Xing Pt 6	5.4'

Water Sources & Water Source Access

Waypoint ID	GPS Coordinates (WGS84) lat°	lon°	Description
1	69.84366	148.780784	A1
68	69.83413	148.758748	A3 Lake Access
95	69.83361	148.759106	A4 Lake Access
96	69.83371	148.759739	A4 Lake Entrance
94	69.83326	148.762594	A4
69	69.83074	148.770708	A3 Lake Entrance
67	69.82917	148.772581	A3
2	69.84188	148.775906	A1 Access
3	69.84252	148.776810	A1 Lake Entrance
34	69.83492	148.785279	A2
36	69.83613	148.789583	A2 Lake Entrance
35	69.83715	148.791639	A2 Access
97	69.81074	148.848898	A5
99	69.81274	148.869908	A5 Lake Entrance
98	69.81397	148.871515	A5 Lake Access
100	69.78664	148.947561	A6
102	69.79626	148.952587	A6 Lake Entrance
101	69.80099	148.957213	A6 Lake Access
103	69.79620	148.968285	A7
105	69.79716	148.977655	A7 Lake Entrance
104	69.79777	148.978488	A7 Lake Access
106	69.78224	149.030994	A8
108	69.78627	149.041591	A8 Lake Entrance
107	69.78767	149.043668	A8 Lake Access
109	69.76762	149.057299	A9
111	69.77048	149.066276	A9 Lake Entrance
4	69.78919	149.075858	A10
110	69.78243	149.081335	A9 Lake Access
5	69.78227	149.082741	A10 Lake Access
6	69.78396	149.084518	A10 Lake Entrance

Waypoint	GPS Coordinates (WGS84)		
ID	lat°	lon°	Description
7	69.77657	149.110074	A11
9	69.77782	149.111853	A11 Lake Entrance
8	69.77848	149.112460	A11 Lake Access
10	69.77353	149.117833	A12
12	69.77482	149.119327	A12 Lake Entrance
11	69.77754	149.122281	A12 lake Access
13	69.76811	149.181105	A13
16	69.76115	149.183809	A14
15	69.76963	149.184093	A13 Lake Entrance
14	69.77018	149.184878	A13 Lake Access
18	69.76279	149.195157	A14 Lake Entrance
17	69.76475	149.197514	A14 Lake Access
19	69.75364	149.208318	A15
21	69.75585	149.211954	A15 Lake Entrance
20	69.76058	149.219333	A15 Lake Access
22	69.74685	149.252335	A16
24	69.74918	149.256524	A16 Lake Entrance
23	69.75312	149.264349	A16 Lake Access
26	69.74864	149.293252	A17 Lake Access
27	69.75091	149.295401	A17 Lake Entrance
25	69.75283	149.297288	A17
33	69.73748	149.335019	A191
32	69.73794	149.335620	A19 Lake Entrance
31	69.74106	149.339317	A19 Lake Access
28	69.73787	149.346923	A18
30	69.73848	149.347612	A18 Lake Entrance
29	69.73965	149.348754	A18 Lake Access
37	69.73476	149.361107	A20
39	69.73647	149.362020	A20 Lake Entrance
38	69.73739	149.362230	A20 Lake Access
41	69.73142	149.395399	A21 Lake Entrance
40	69.73187	149.396054	A21 Lake Access
42	69.73093	149.396100	A211
44	69.73164	149.398001	A22 Lake Access
45	69.73331	149.399354	A22 Lake Entrance
43	69.73456	149.400595	A22
48	69.72284	149.438299	A23 Lake Entrance
47	69.72466	149.439751	A23 Lake Acces
46	69.71937	149.441384	A23
50	69.72274	149.467024	A24 Lake Access
51	69.72306	149.467195	A24 Lake Entrance
49	69.72447	149.469496	A24
53	69.72498	149.492637	A25 Lake Access

Waypoint	GPS Coordinates (WGS84)		
ID	lat°	lon°	Description
54	69.72442	149.492783	A25 Lake Entrance
52	69.72350	149.496505	A25
55	69.72153	149.521261	A26
57	69.72386	149.521970	A26 Lake Entrance
56	69.72515	149.523128	A26 Lake Access
62	69.71052	149.525840	A28 Lake Access
63	69.71115	149.528020	A28 Lake Entrance
61	69.71527	149.541311	A28
59	69.70158	149.542369	A27 Lake Access
60	69.70180	149.543022	A27 Lake Entrance
58	69.70259	149.544686	A27
66	69.72274	149.591273	A29 lake Entrance
65	69.72322	149.591337	A29 Lake Access
64	69.72162	149.594657	A29
74	69.72512	149.624116	A31 Lake Access
75	69.72505	149.624286	A31 Lake Entrance
73	69.72399	149.626297	A31
77	69.72938	149.656837	A32 Lake Access
78	69.72898	149.658081	A32 Lake Entrance
76	69.72829	149.660991	A32
81	69.72777	149.703393	A33 Lake Entrance
80	69.72876	149.703584	A33 Lake Access
79	69.72446	149.706789	A33
70	69.72867	149.745213	A30 Lake Access
71	69.72222	149.748589	A30 Lake Entrance
72	69.71585	149.751592	A302
82	69.72076	149.776997	A34
84	69.72271	149.779869	A34 Lake Entrance
83	69.72294	149.780291	A34 Lake Access
92	69.70925	149.802553	A37 Lake Access
85	69.70188	149.810576	A35
87	69.70346	149.814465	A35 Lake Entrance
86	69.70373	149.814884	A35 Lake Access
93	69.71223	149.819192	A37 Lake Entrance
91	69.71257	149.825290	A37
88	69.69828	149.831745	A36 Lake Access
89	69.70125	149.850368	A36 Lake Entrance
90	69.70164	149.865811	A36

Attachment 2

Project Location: Figures

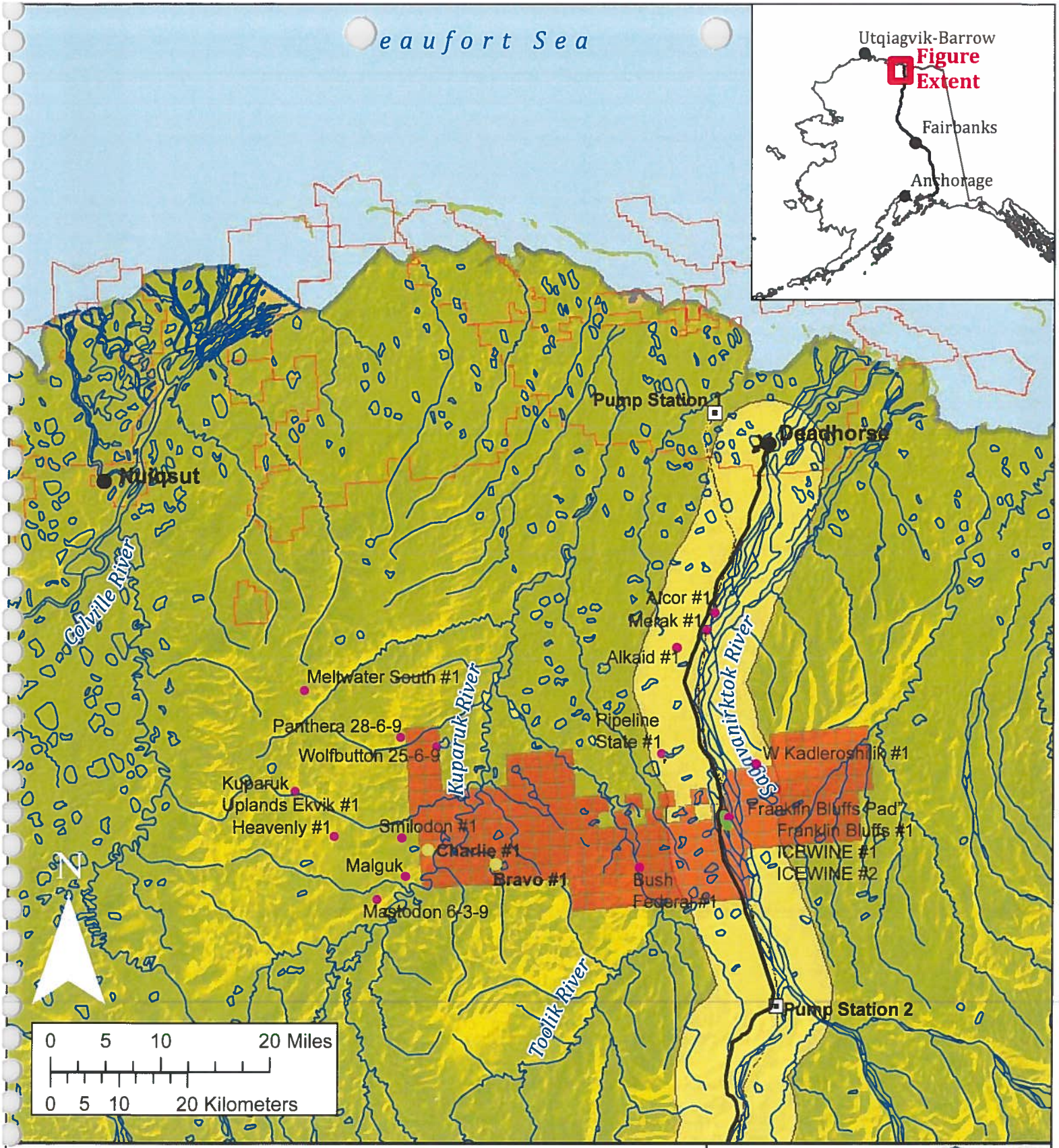
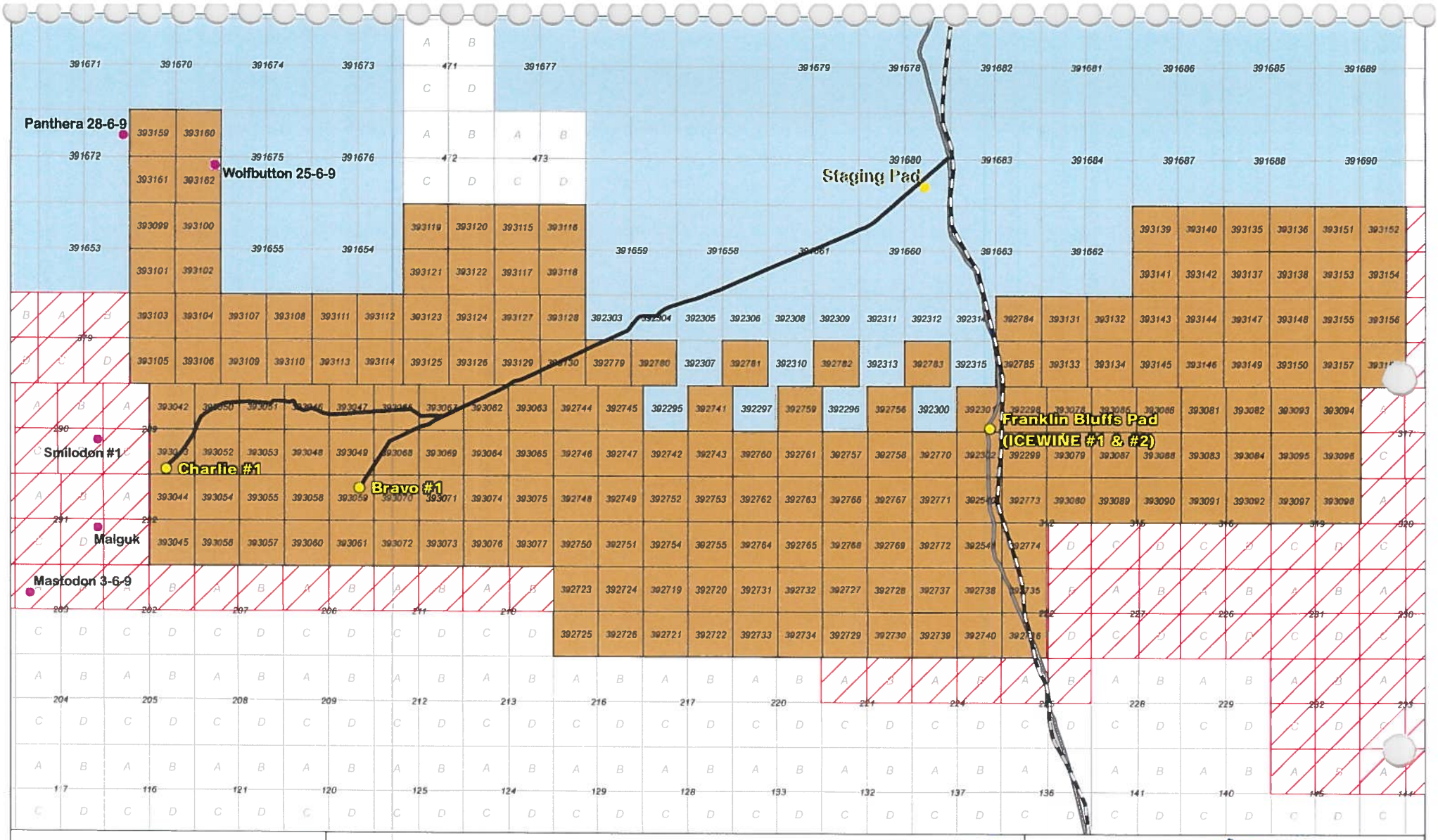
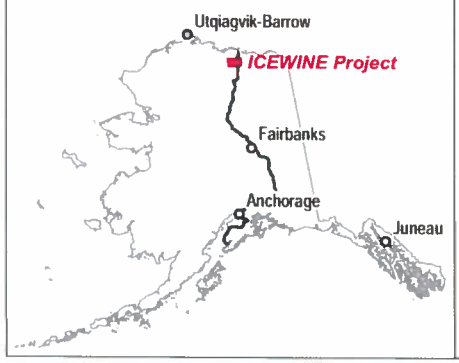


Figure 1

ICEWINE Exploration Wells
Bravo #1 & Charlie #1

Project Overview





LEGEND

- ICEWINE Project Wells
- Regional Wells
- Proposed Ice Road
- Trans-Alaska Pipeline System
- Dalton Highway ("Haul Road")
- AEA ADL Leases
- Great Bear ADL Leases
- NS O&G Lease Sale Tracts
- Pending Leases

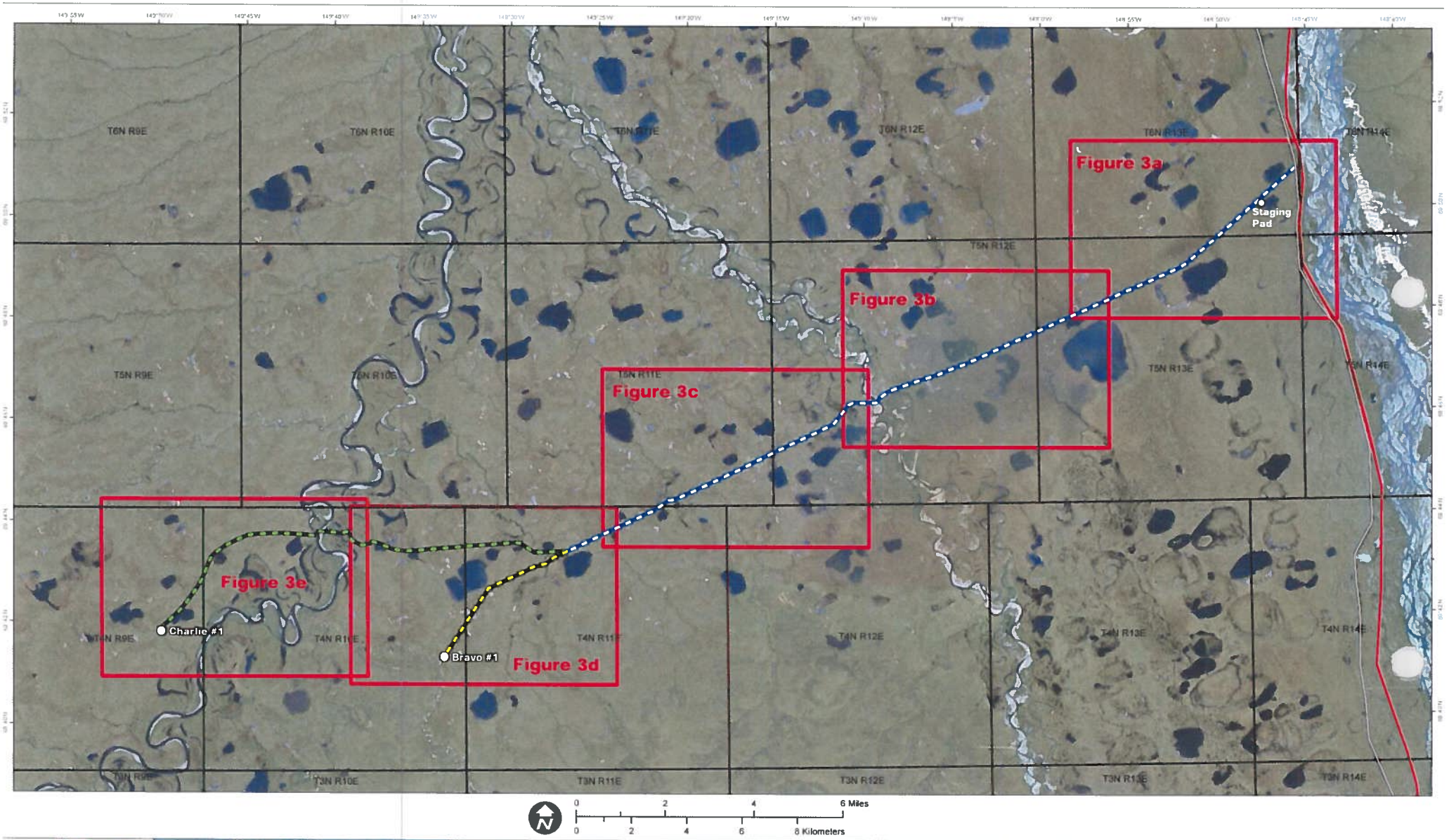
ACCUMULATE ENERGY

Figure 2

ICEWINE PROJECT EXPLORATION WELLS

Bravo #1 & Charlie #1

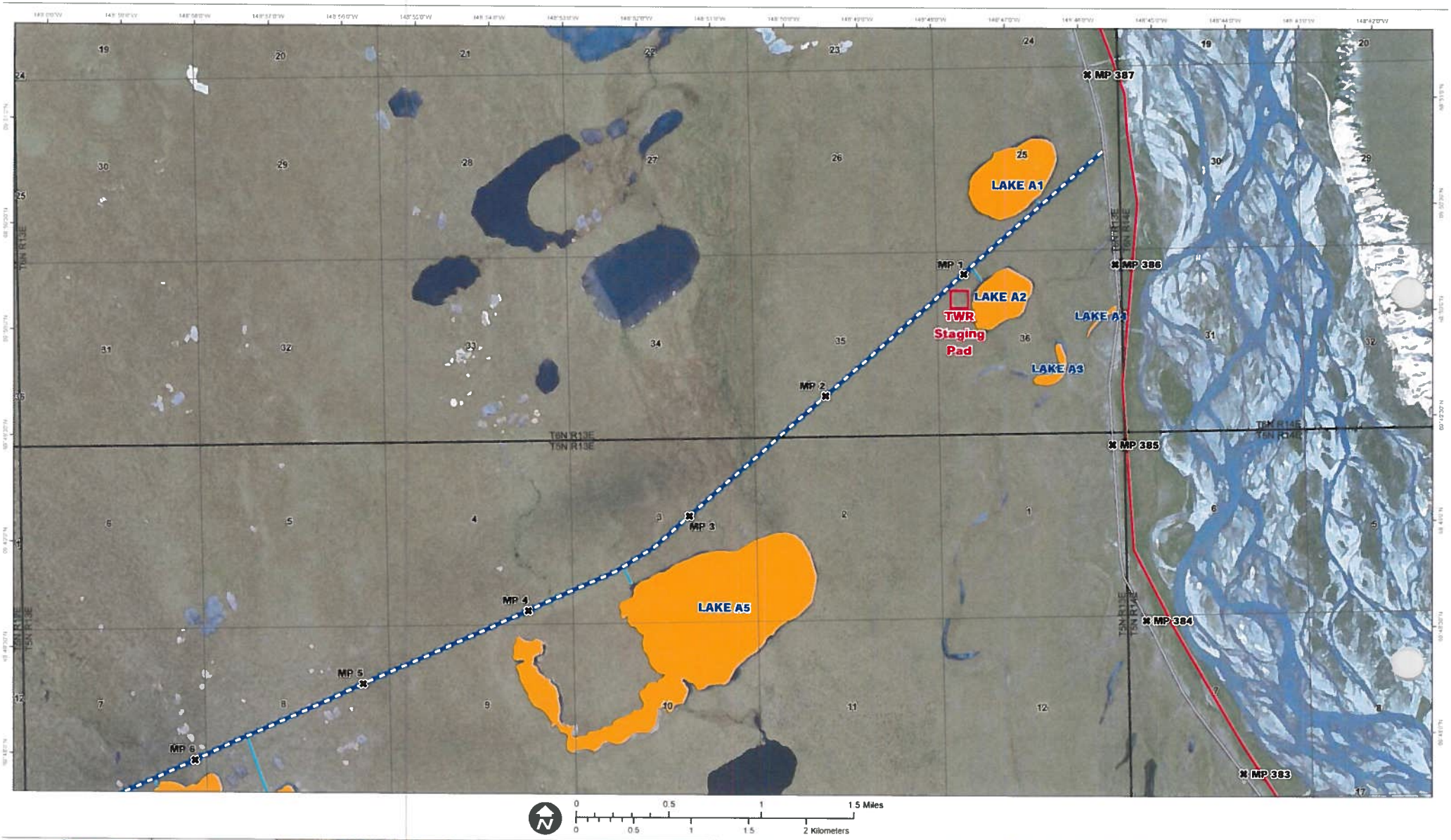
AEA ADL Oil & Gas Leases Area Map



Proposed Main TWR
Proposed Bravo TWR
Proposed Charlie TWR
Drill Site
Dalton Highway (Haul Road)
Trans-Alaska Pipeline

Figure 3
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWRs Index Map - Aerial MTRS



ACCUMULATE ENERGY

Map Location

ALASKA

Sheet Index

1 2 3 4 5

- Proposed Main TWR
- Proposed Bravo TWR Spur
- Proposed Charlie TWR Spur
- Water Source Access Road
- Proposed Water Source
- TWR Staging Pad
- Dalton Highway (Haul Road)
- Trans-Alaska Pipeline

Figure 3a

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings - Aerial MTRS

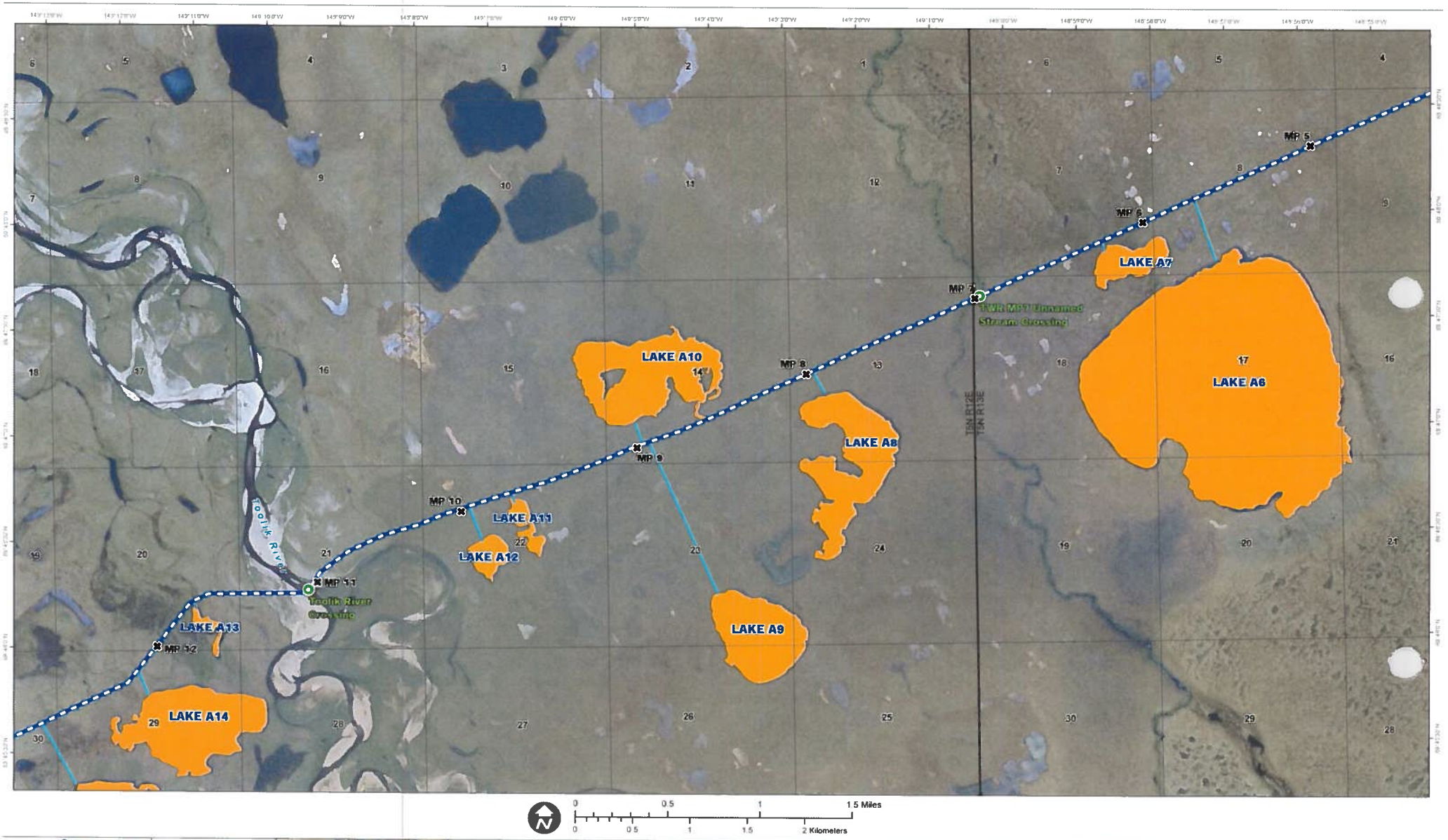


Figure 3b

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings - Aerial MTRS

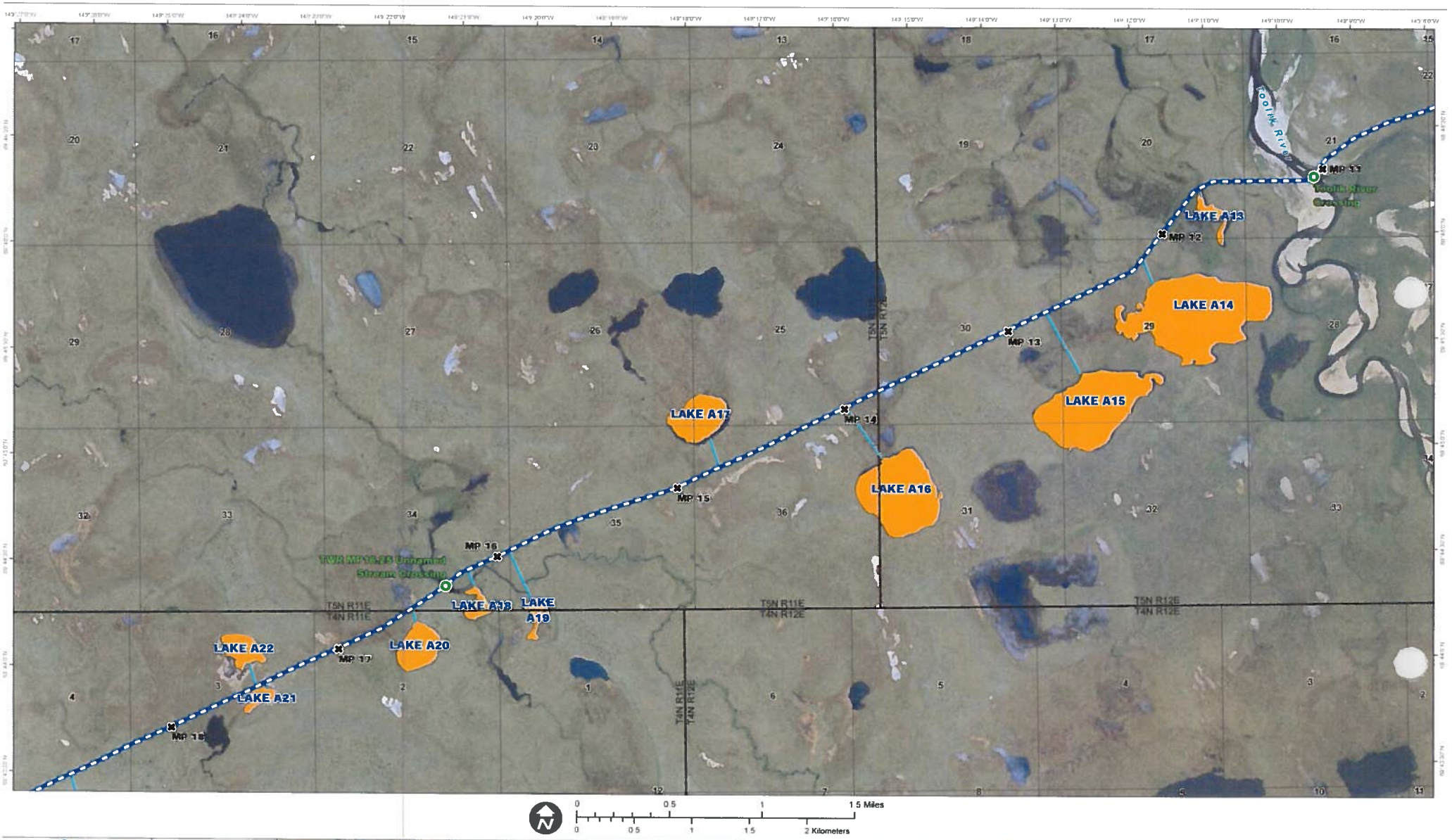


Figure 3c

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings - Aerial MTRS

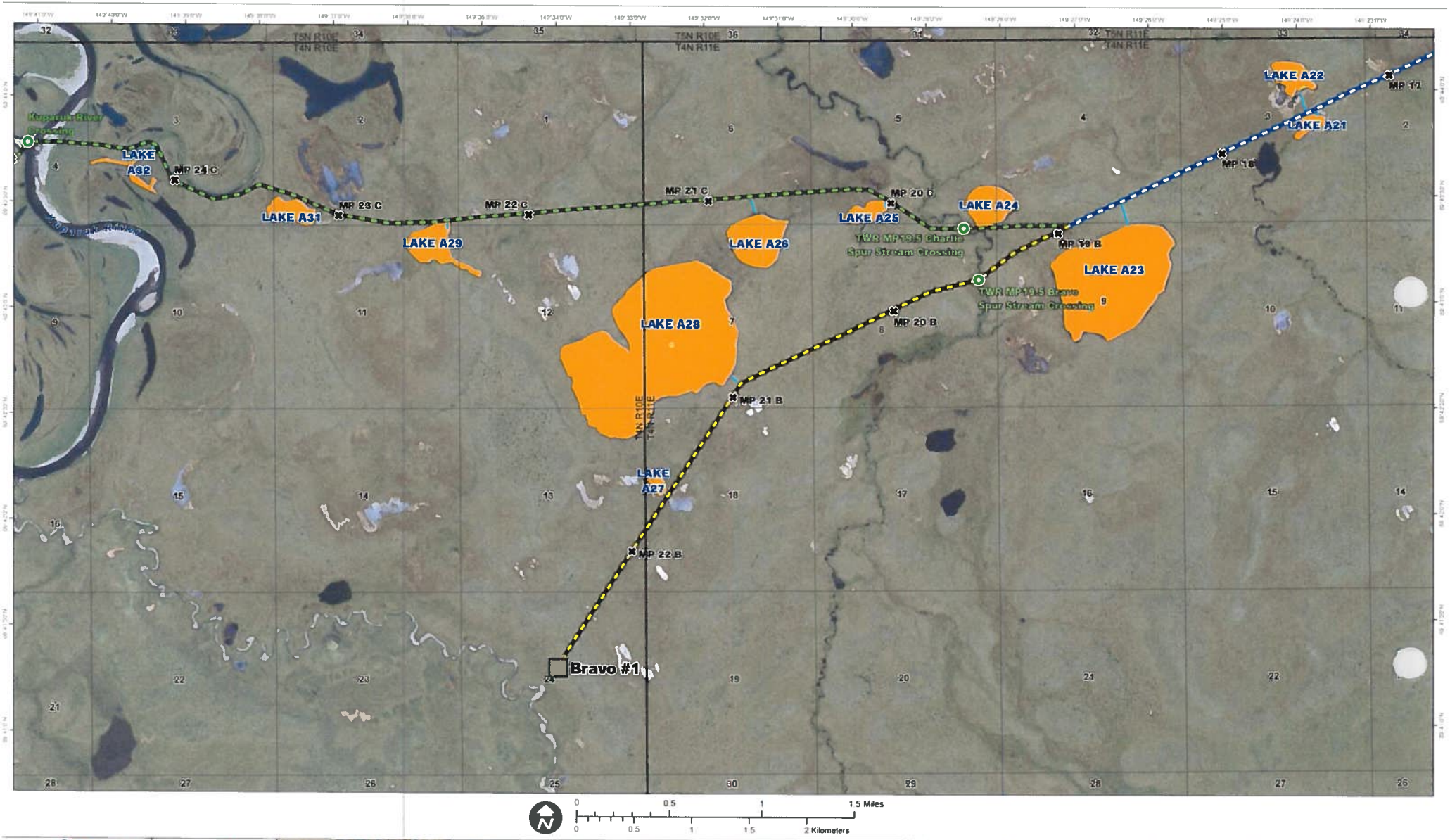
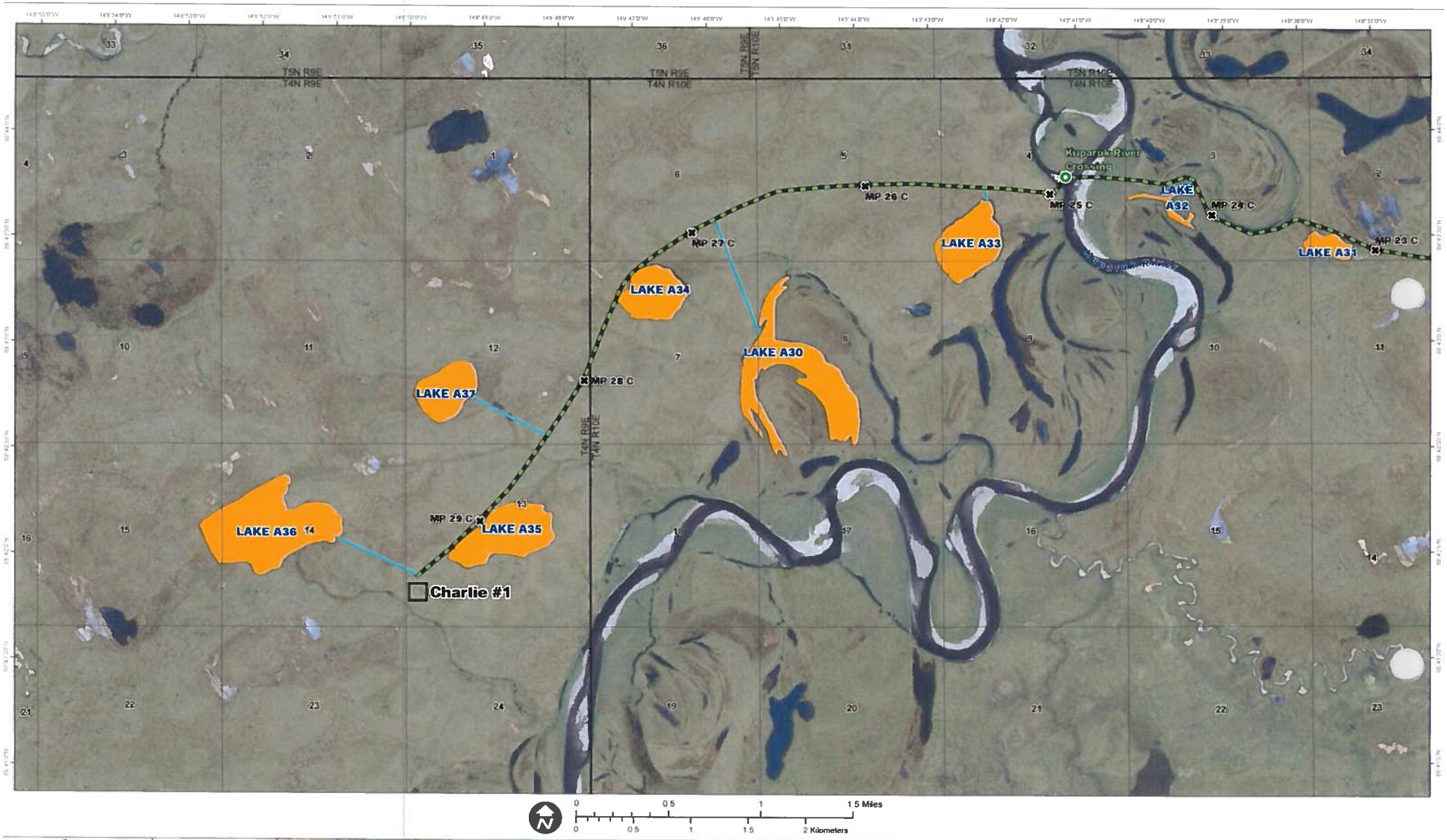


Figure 3d

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings - Aerial MTRS

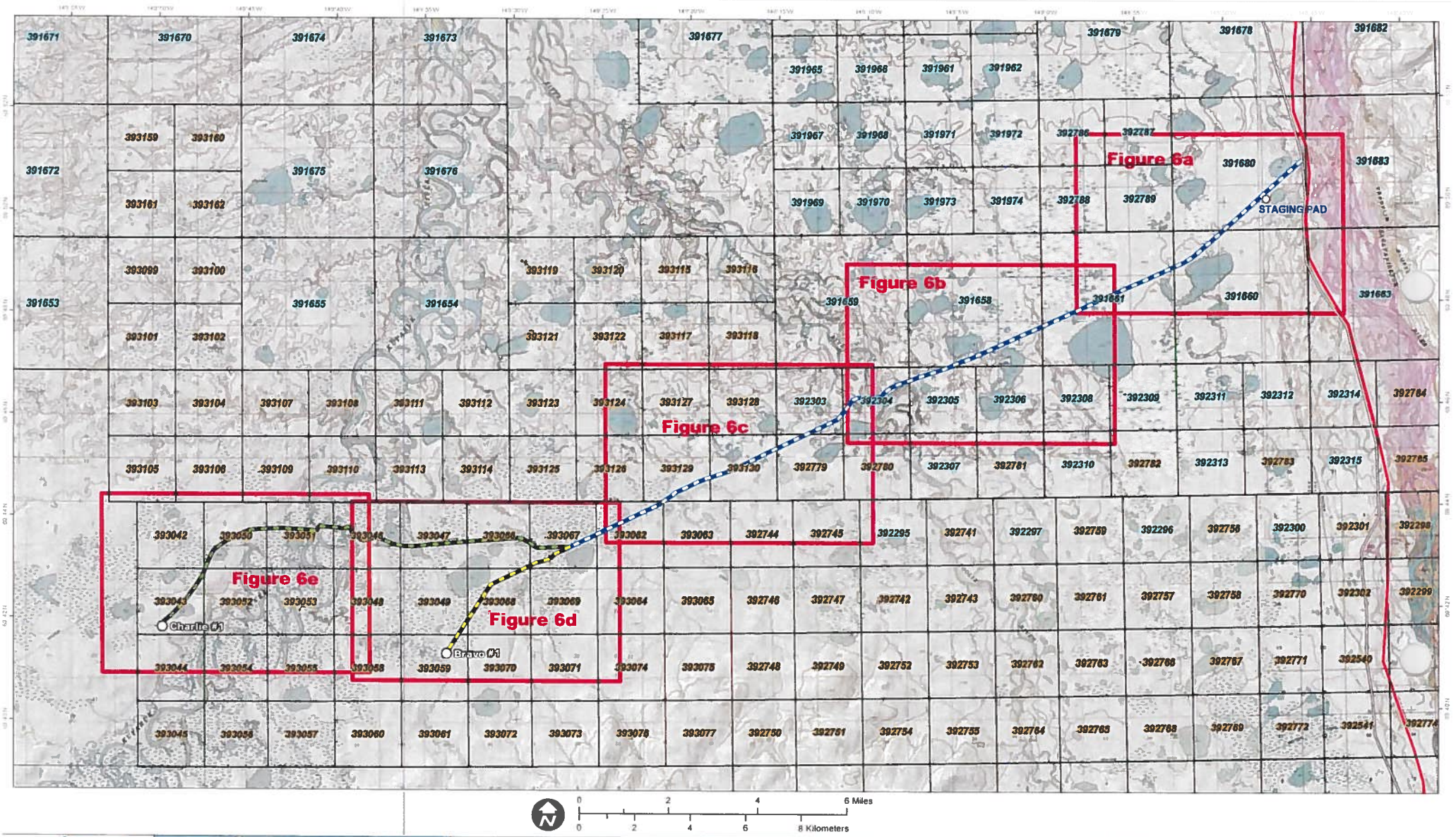


ACCUMULATE ENERGY

Figure 3e

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings - Aerial MTRS



ACCUMULATE ENERGY

Figure 6
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWRs Index Map - Topo ADLs

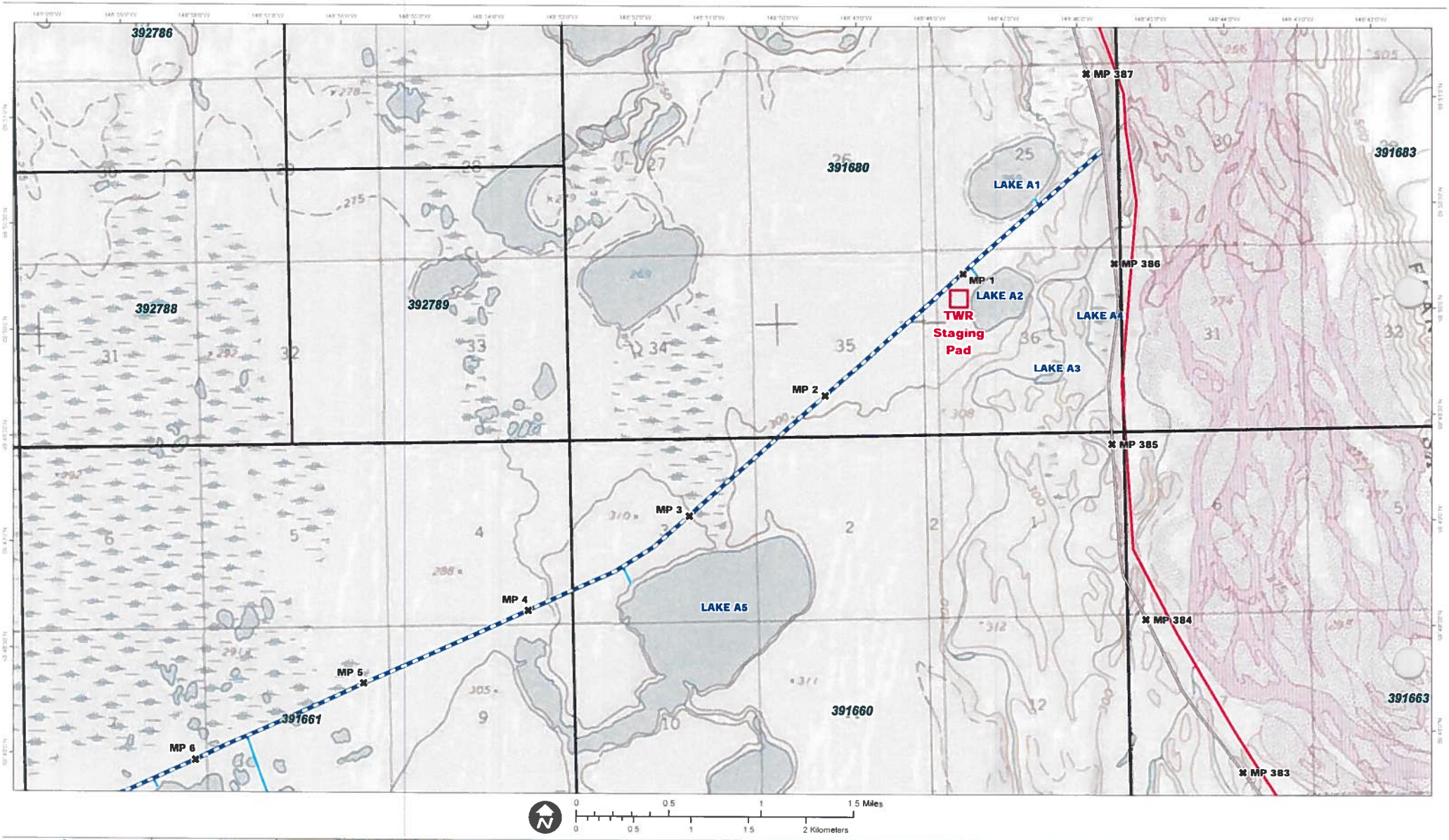
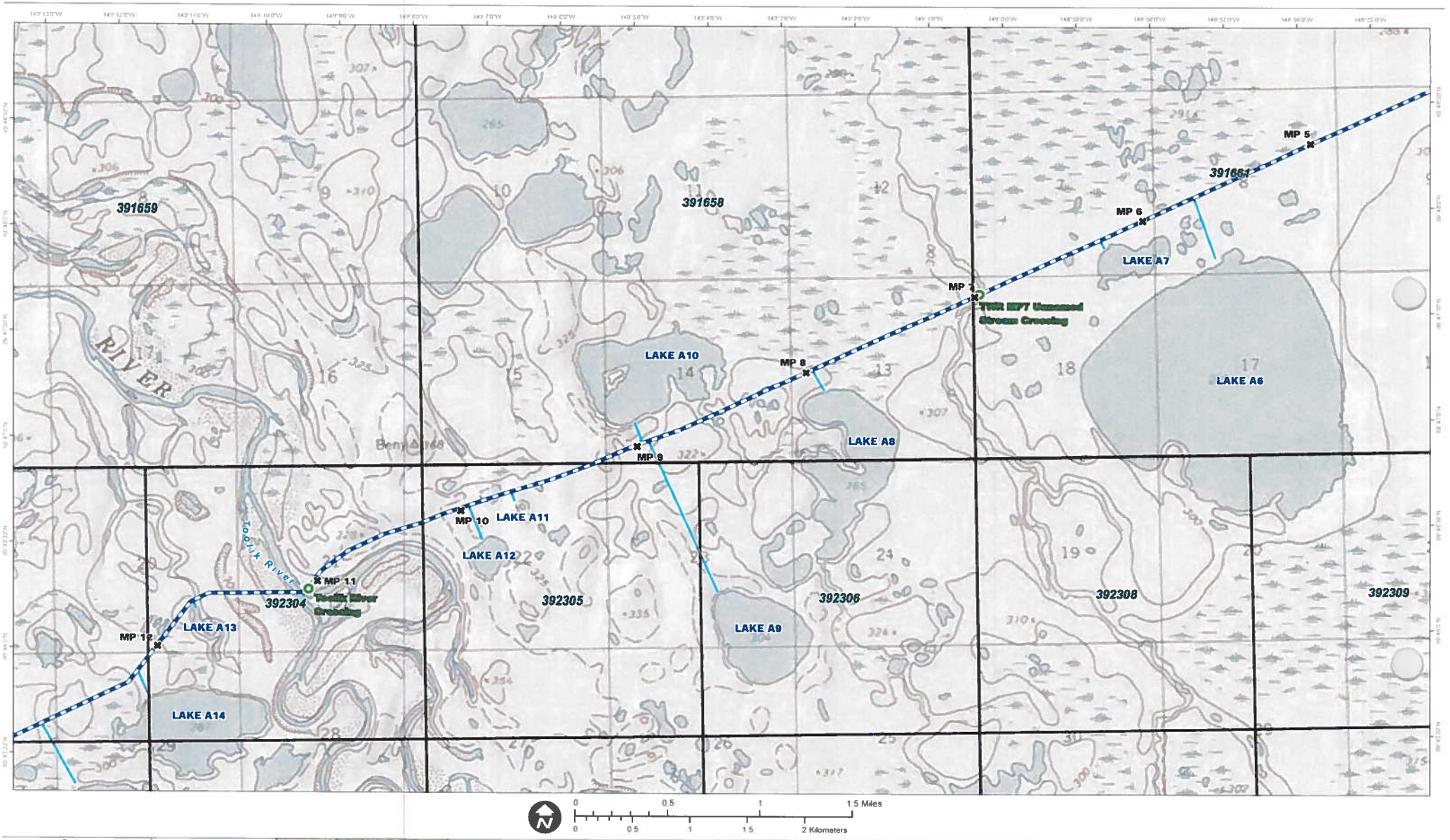


Figure 6a

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings

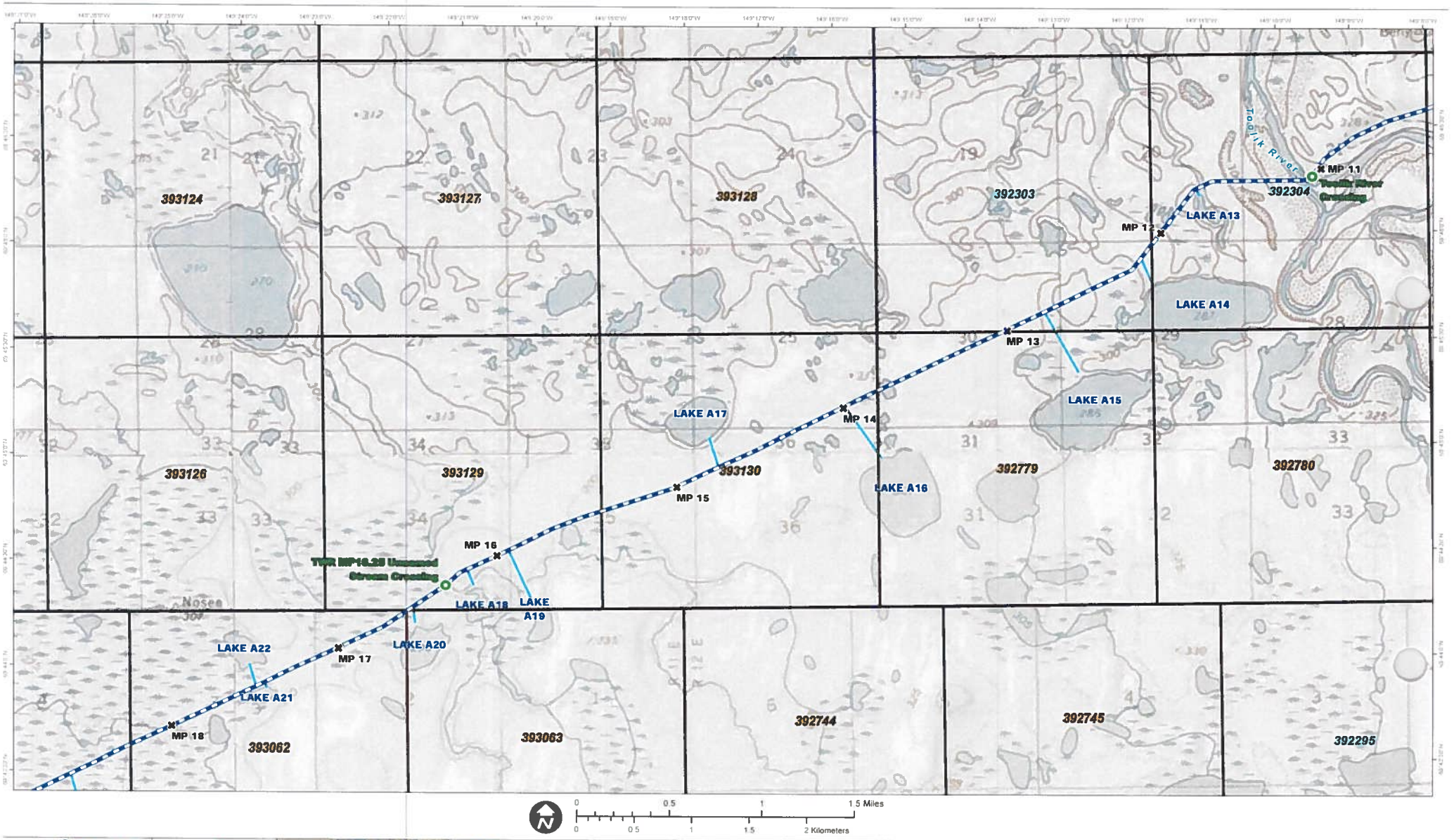


ACCUMULATE ENERGY

Figure 6b

ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings



ACCUMULATE ENERGY

Map Location

Sheet Index

Proposed Main TWR
Proposed Bravo TWR Spur
Proposed Charlie TWR Spur
Dalton Highway (Haul Road)
Trans-Alaska Pipeline
Water Source Access Road
Proposed Stream Crossing
393129 AEA ADL O&G Lease
392305 Great Bear ADL O&G Lease

Figure 6c
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1
Proposed TWR with Water Sources and Stream Crossings

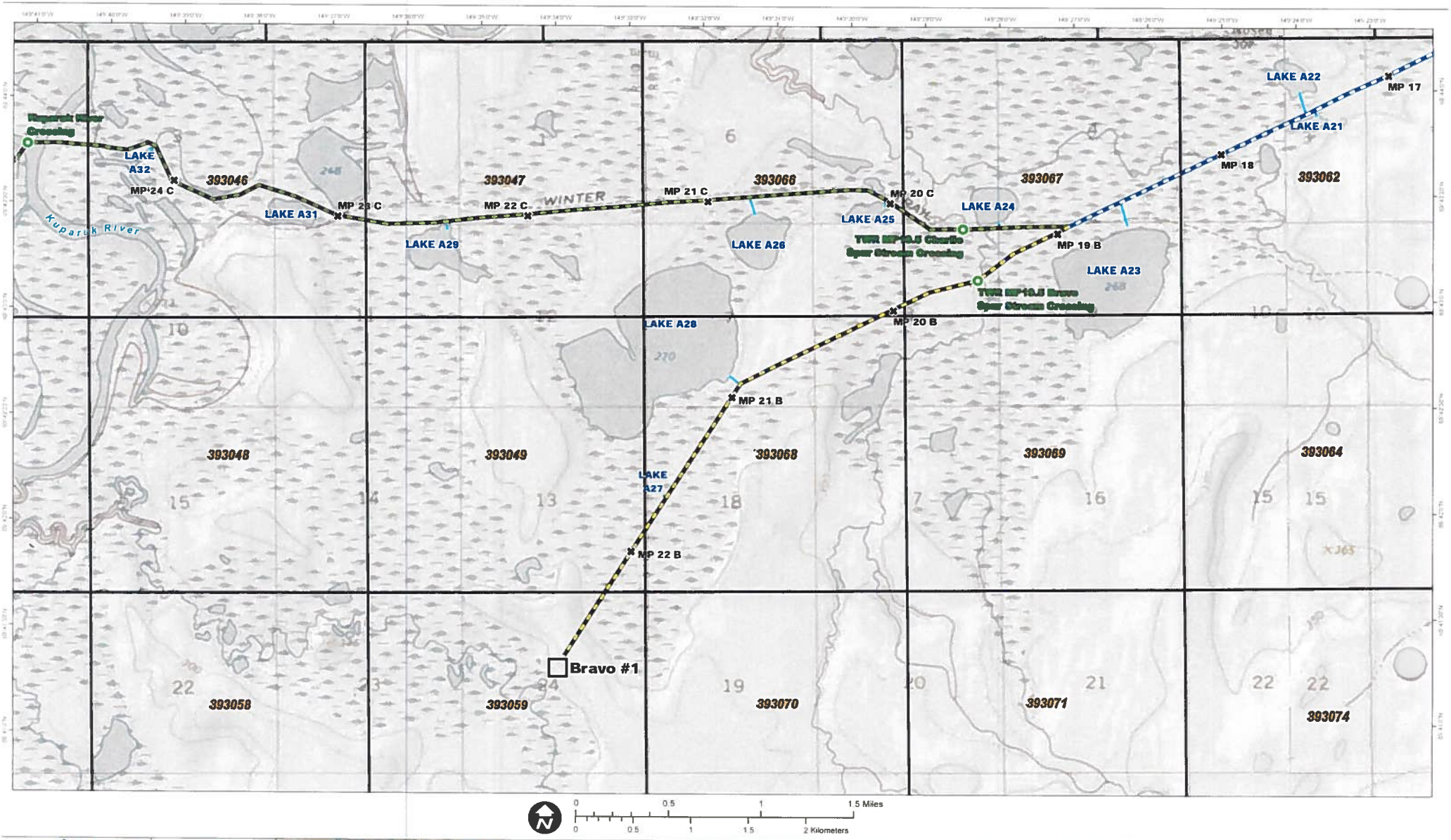
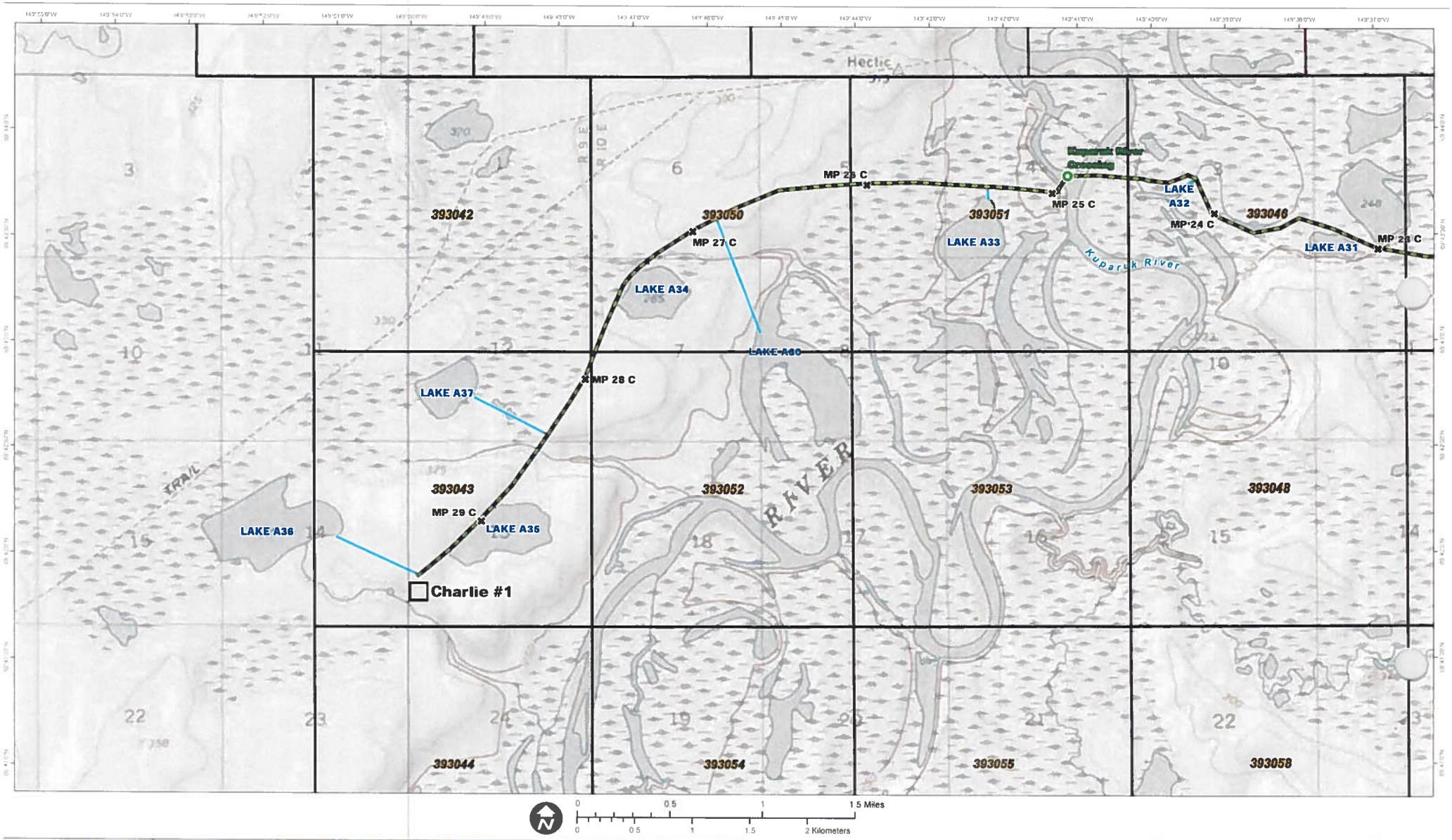


Figure 6d
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1
Proposed TWR with Water Sources and Stream Crossings



ACCUMULATE ENERGY

Map Location

ALASKA

Sheet Index

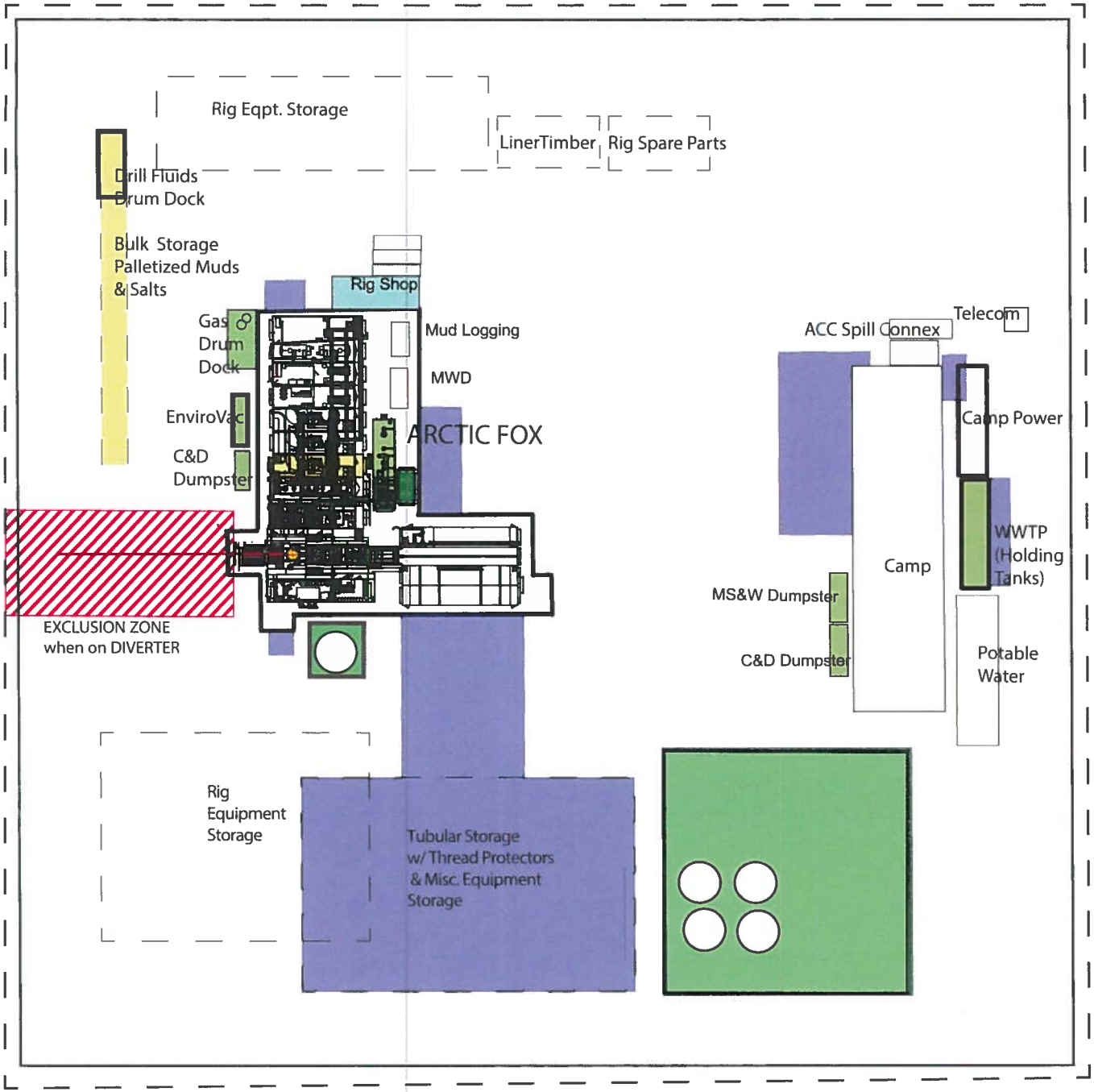
1 2 3 4 5

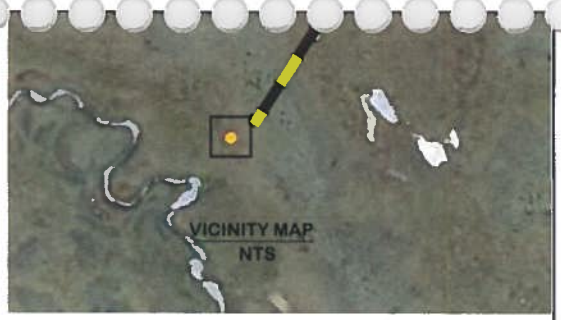
Proposed Main TWR
Proposed Bravo TWR Spur
Proposed Charlie TWR Spur
Dalton Highway (Haul Road)
Trans-Alaska Pipeline
Water Source Access Road
Proposed Stream Crossing
393129 AEA ADL O&G Lease
392305 Great Bear ADL O&G Lease
Drill Site

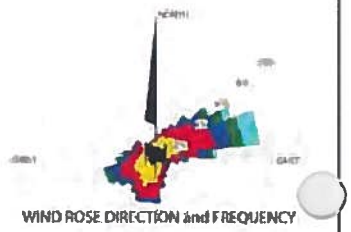
Figure 6e

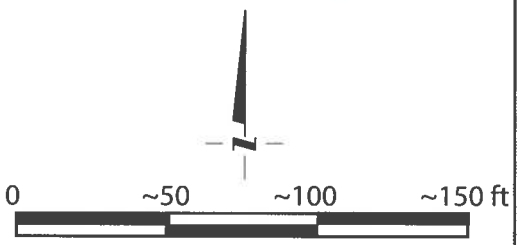
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1

Proposed TWR with Water Sources and Stream Crossings





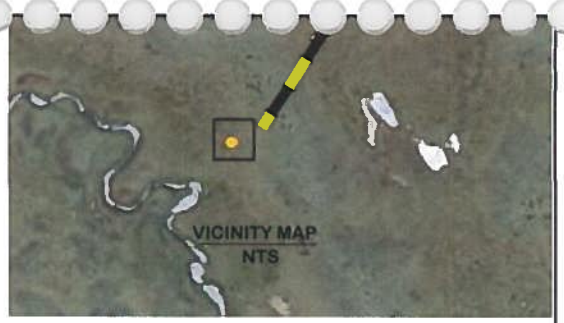


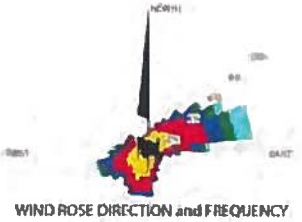


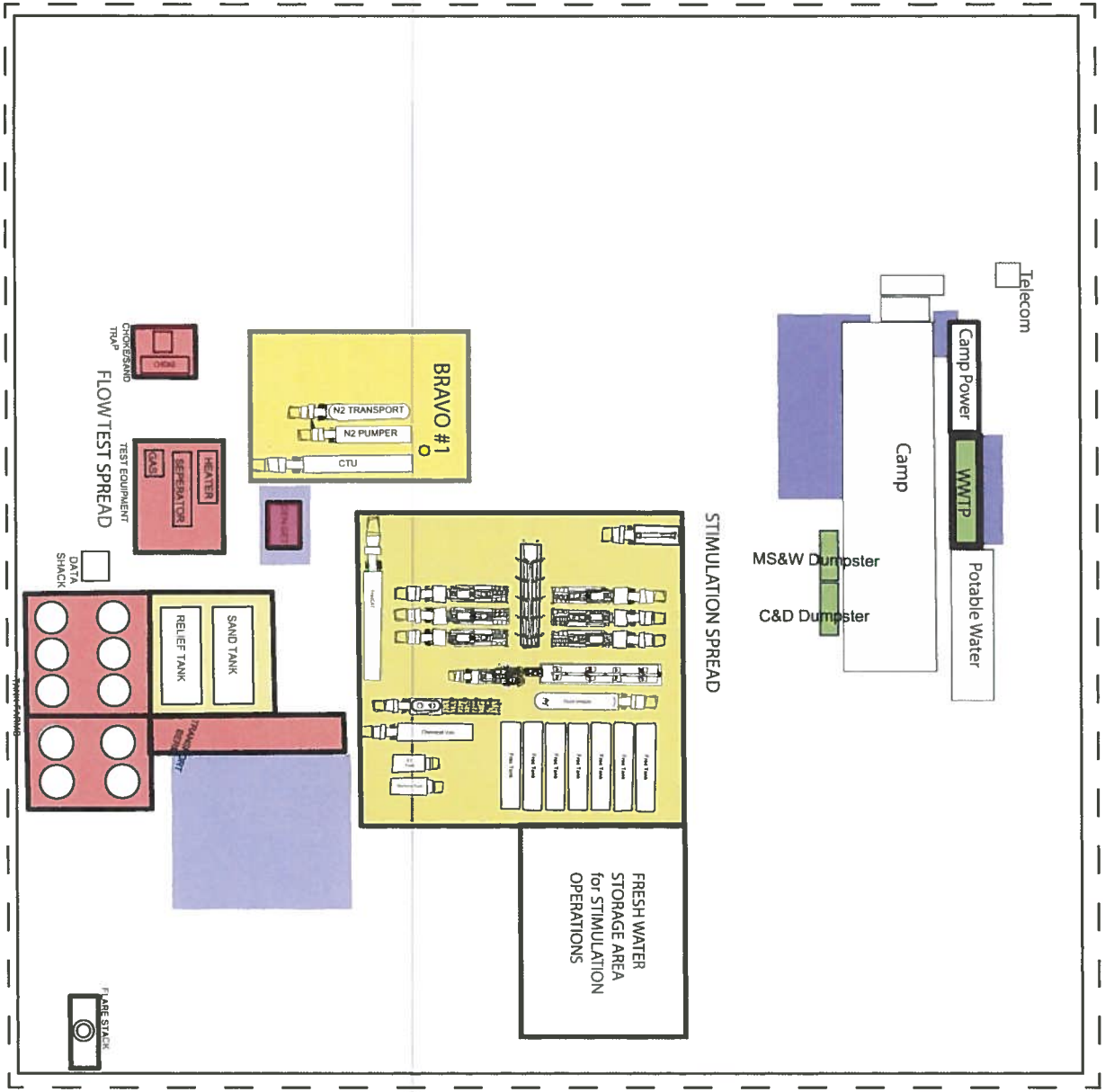
Legend

- Processing & Storage Area
- Equipment Maintenance Area
- Waste Treatment & Storage
- Staging, Parking and Lay Down Areas
- Lined SCA
- Aboveground Storage Tank (Double Walled)

Figure 7
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1
PROPOSED
SITE LAYOUT DURING DRILLING







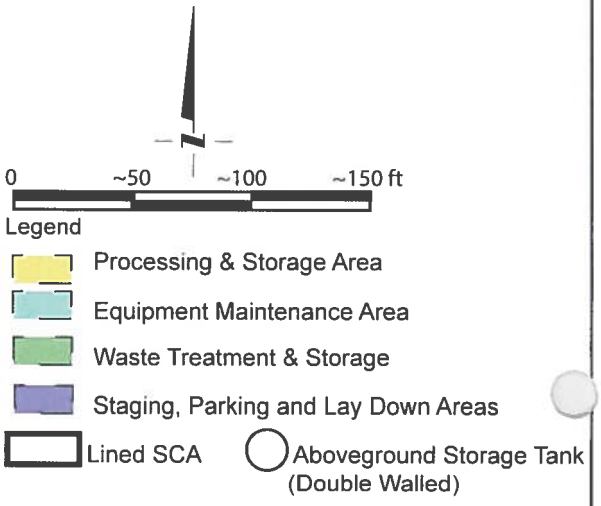


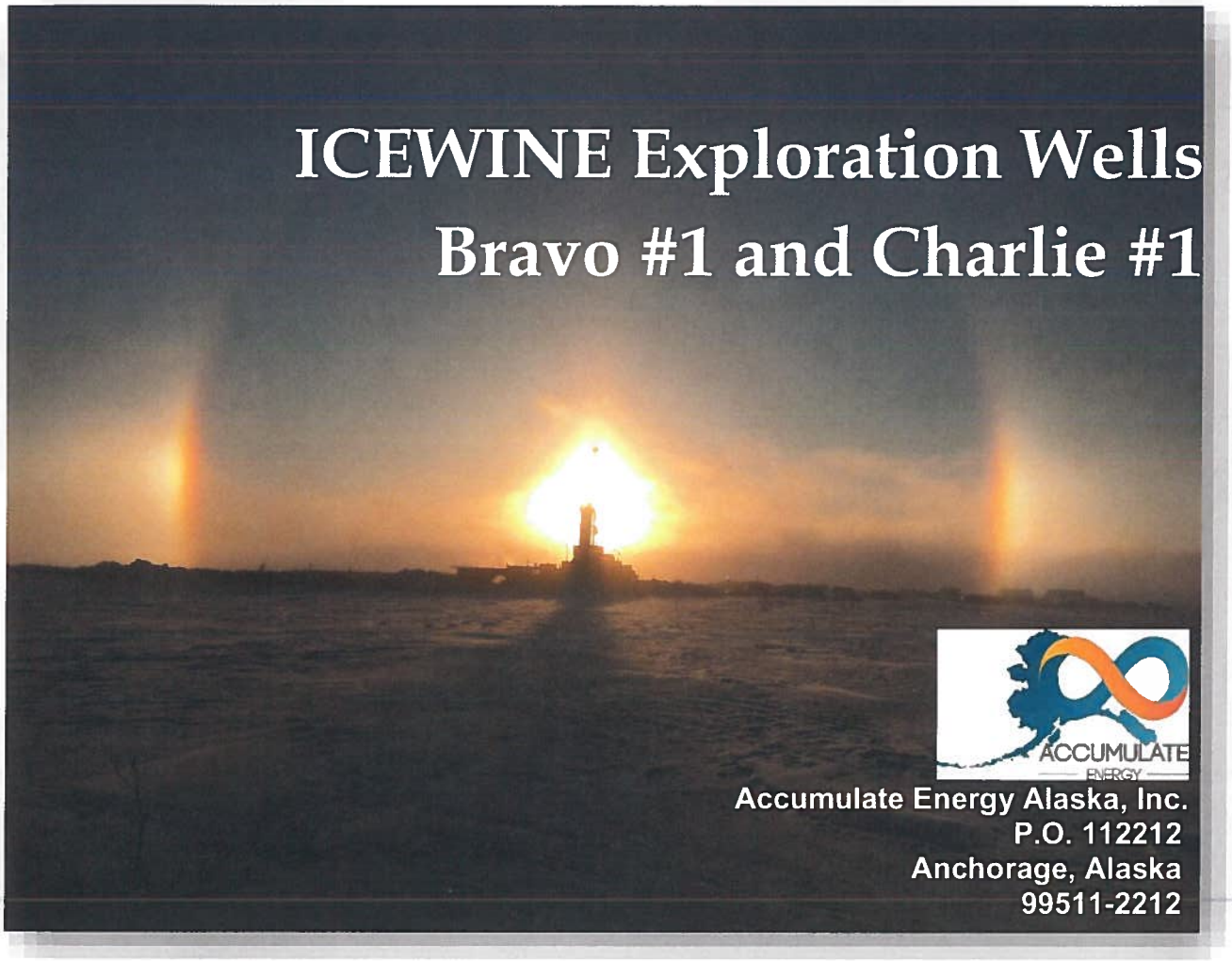
Figure 8
ICEWINE Project Exploration Wells
Bravo #1 and Charlie #1
PROPOSED SITE LAYOUT DURING TESTING

Attachment 3

Supplemental Project Report:

Project Overview, Field Reconnaissance and TWR Routing

Project Overview, Field Reconnaissance and TWR Routing



Accumulate Energy Alaska, Inc.
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September 2017

Table of Contents

Project Overview

Accumulate Energy Alaska, Inc. (AEA) is proposing to drill two exploration oil wells (Bravo #1 and Charlie #1) as part of a multi-year program beginning in winter 2017/2018. The proposed wells will be drilled from ice pads about 27 miles west of the Franklin Bluffs Pad, and will be accessed via a tundra winter (ice) road (TWR) starting at MP386.5 Dalton Highway. AEA planned winter operations include construction and maintenance of 32 miles of ice roads (Main TWR. Bravo TWR Spur and Charlie TWR Spur) and three ice pads (two drill pads and one staging pad), and drilling & then testing the Bravo #1 and Charlie #1 exploration wells. AEA also may include an include an ice airstrip.

Primary drilling objectives include testing and evaluating the SeeBee Formation for oil. This same target was found in surrounding exploration wells, and is currently on production in the nearby Kuparuk River Unit (KRU) Meltwater Oil Pool located about to 20 miles the north. The Meltwater Oil Pool is the closest oil production and development.

AEA planned winter operations include construction and maintenance of 34 miles of ice road (Main TWR, Bravo TWR Spur and Charlie TWR Spur) and three ice pads (two drill pads and one staging pad), and drilling & then testing the Bravo #1 and Charlie #1 exploration wells. AEA also may include an ice airstrip. All facilities will be temporary, and will be designed and constructed to meet federal, State and North Slope Borough (NSB) regulatory requirements, industry standards and arctic oil field best practices. Additionally, the NSB Oil and Gas Technical Report (NSB 2104) was consulted.

Well Sites

Both Bravo #1 and Charlie #1 exploration wells will be drilled to depths of about 11,000 feet true vertical depth (TVD) to test stacked conventional objectives within the SeeBee Formation. AEA will use the Arctic Fox #1 (or similar mobile land drilling rig). Wells will be designed and permitted in accordance with the Alaska Oil and Gas Conservation Commission (AOGCC) regulations. The wells may be tested and hydraulically stimulated/flow tested, and may include laterals, sidetracks, or additional penetrations from the same exploration pad. Operations also may include wireline logging and related seismic surveys, such as vertical seismic profiles (VSPs). AEA has developed and will maintain a well control plan for its drilling program that includes primary and secondary blowout prevention systems, a well capping program, and a relief well plan designed for successful operation in arctic conditions. All operations will be from ice pads.

Buildings and Utilities

General well site and pad layouts as shown in Figures 7 and 8 in Attachment 2 to the ADNR Land Use Permit application. Temporary facilities used to support the winter exploration program at each wellsite include a satellite office camp, storage and laydown areas, communication tower and connexes, and maintenance shops. There also will be 60-bed camp at Bravo #1. The camp will include offices, restroom, foodservice and recreation areas. AEA plans to spot the camp at the Bravo #1 ice pad for the duration of the Exploration Program; however, the camp may be moved between pads. The satellite office camp will be moved with the drill rig between pads. A construction staging pad is planned to be constructed at the start of the Main TWR, about 1 mile west of MP386.5 Dalton Highway as shown in Figures 3c, 4c, 5c, 6c in Attachment 2. Appendix A. This location is west of Dalton Highway right of way (ROW), within the Dalton Highway Transportation Corridor. The staging ice pad (500 feet by 500 feet) also will be roughly 5.7 acres in plan and may have a self-contained 30-bed TWR construction camp as well as laydown areas and maintenance shops.

Rig operations will be self-contained, powered by generators. Smaller dual generator sets will provide power to camps, offices, and other facilities. Satellite phone service and internet will be available at each field camp. Operational radio communications will utilize fixed base stations and truck-mounted radio equipment, with small communication towers placed at each pad. Potable water will be hauled to the site and domestic wastewater hauled from the site (see Water and Wastewater below).

Water and Wastewater

During operations, up to 5,000 gallons per day (gpd) potable water will be required for domestic use. Potable water will be transported to the camp and rig pads by water truck. For other fresh water uses (drilling operations and TWR construction), AEA will withdraw water and trim ice chips from 37 area lakes, issued under temporary water use authorizations (TWUAs) from ADNR/DML&W. Water use will total about 98 million gallons (Mgal) as follows: 89 Mgal for TWR and ice pad construction and maintenance (fresh water and ice chips combined), 5 Mgal for drilling operations and 4 Mgal for stimulating and testing each well. Snow will be removed from portions of the lakes prior to water withdrawal to help provide access for water trucks and ice trimmers. Water pumped from lakes will be transported by low ground pressure vehicles or rolling stock once winter tundra travel is approved by ADNR. Rolling stock will only use trails that have been improved with a firm ice surface or packed snow to support the weight and pressure of the vehicles. Snowmelt and other run-off from Project facilities will be managed through implementation of AEA Best Management Practices (BMPs) and a

Storm Water Pollution Prevention Plan (SWPPP) pursuant to the Alaska Pollutant Discharge Elimination System (APDES) general permit for north slope activities (NS GP AKG32000).

Camp and support operations are expected to generate less than 3,000 gallons per day of domestic wastewater (both gray and black water). Domestic wastewater will be temporarily stored in camp wastewater treatment plant (WWTP) sewage tank modules before being hauled to the NSB-SA-10 wastewater treatment plant for disposal. Domestic wastewater will not be treated on site.

Fuel and Hazardous Substances: Management, Storage and Spill Response

Ultra-low sulfur diesel (USLD) fuel, trucked to the camp and rig pads by commercial carrier, will be used in drilling, completion and well testing activities. The USLD will contain trace red dye to help make spills easily visible to help in spill response and cleanup.

AEA anticipates that approximately 8,000 gallons of fuel will be stored at each drill site in double-walled aboveground storage tanks (ASTs) staged within secondary containment areas (SCAs) providing 110% containment. No individual fuel storage tank will exceed 9,999 gallons. The tanker truck also will fuel ancillary equipment such as heaters, light plants, and heavy equipment.

No individual AST will exceed 9,999 gallons with capacity storage limited to 80%, and all ASTs will be w/in 110% SCAs...

Up to 8,000 gallons of water-based drill fluids plus other exploration and production (E&P) supplies and products also will be stored on-site during drilling operations in ASTs within lined SCAs providing 110% containment. Again, ASTs will not exceed 9,999 gallons.

Fuel and hazardous substance storage will comply with State and federal oil pollution prevention and contingency requirements found in 18 AAC 75, 40 CFR 112 and NSBMC § 19.50 and § 19.70. ASTs used to store flammable and combustible liquids are regulated by and will comply with the International Fire Code (IFC) and 13 AAC 50.025.

Contingency Plans and Spill Prevention

AEA's existing, ADEC-approved spill plan: ODPCP 15-CP-5204, covers drilling, fuel storage, construction, facility operations, spill response equipment to be staged at the facility; and spill prevention and response considerations specific to this Project. Spills of fuels, hydrocarbons, or chemicals on ice pads will be cleaned up immediately and thoroughly to prevent damage to the underlying tundra when the ice pad melts.

AEA will design and develop the Project to avoid and minimize the possibility of spills. Spill prevention measures include a maintenance and inspection program as well as an employee spill prevention training program. Additionally, fuel transportation and transfers will be performed by two trained operators.

Vinyl liners, with foam dikes and a capacity of 25 gallons, will be placed under all valves or connections to fuel and chemical tanks when located outside of secondary containment. Duck ponds will be placed under pickup trucks, loaders, and all other moving equipment. AEA also conducts internal training on spill prevention measures. These, in combination with compliance with State, federal, and local regulations, reduce the likelihood of a spill occurring.

Solid Waste

All wastes will be managed and tracked by using Red Book guidelines and NS manifest procedures...

All waste management activities will be conducted in general accordance with the AEA ICEWINE Project Waste Management Plan (WMP) and in conformance with AEA HSE Management Policies. Additionally, the latest versions of the Alaska Safety Handbook (ASH), the North Slope Environmental Field Handbook (NSEFH) and the Alaska Waste Disposal & Reuse ("Redbook") Guide are adopted as guidance, reference and standard operating procedures and workplace "best" safety, environmental and waste management practices for AEA operations. ALL WASTES WILL BE MANAGED AND TRACKED BY USING NORTH SLOPE MANIFEST PROCEDURES.

RCRA-EXEMPT WASTES. Four waste streams exempt from regulation as Resource Conservation and Recovery Act (RCRA) hazardous wastes ("RCRA-exempt wastes") per 40 CFR 261.4 and 261.7 will be generated during operations. These include:

1. E&P fluids and solids from drilling and testing operations. Up to 4,000 barrels (bbls) of drilling wastes and another 4,000 bbls of test fluids will be generated during drilling, and then temporarily stored onsite (if necessary), hauled and disposed by injection in either offsite Class I or Class II UIC disposal wells. Non-oily E&P solid drill cuttings may also be hauled the NSB SA 10 landfill for beneficially reused as sanitary cover if acceptance criteria are met. Finally, on-site disposal through annular injection may be conducted, as approved by the AOGCC.

2. Residue and rinsate found in "RCRA empty" containers. Residue and tank rinsate found in RCRA-empty tanks and vessels will be manifested, hauled and disposed by injection in offsite Class I or II disposal injection wells as they are generated at tank wash bays after drilling and testing operations.
3. Household (camp) hazardous wastes such as cleaning supplies. RCRA-exempt household hazardous wastes will be combined with domestic wastewater & temporarily stored in the camp sewage tank modules before being hauled to the NSBSA- 10 WWTP for disposal.
4. Domestic wastewater from camps and envirovacs. Up to 4,000 barrels (bbls) of drilling wastes and another 4,000 bbls of test fluids will be generated during drilling, and then temporarily stored onsite, hauled and disposed by injection in either offsite Class I or Class II UIC disposal wells.

SOLID WASTE. Non-hazardous solid waste will be stored on site in Municipal Solid Waste (MSW) and Construction & Demolition (C&D) dumpsters that will be hauled to and disposed in the NSB SA10 landfill. MSW and C&D dumpsters will be managed to avoid potential wildlife interactions by covering. Metal will be collected and sent offsite for recycling. Oily waste will be managed & stored on-site until transport to an approved disposal facility. Used oil will packaged in drums for transport & be recycled or disposed at an approved facility.

HAZARDOUS and UNIVERSAL WASTES: RCRA-hazardous wastes expected to be generated during construction, drilling and production operations include very small quantities of Characteristic Hazardous and Universal Wastes (as defined by 40 CFR 261.3) will be managed on-site in Satellite Accumulation Areas (SAAs), manifested and then transported to approved disposal or recycling facilities at the completion of the field operations.

Roads, Pads and Airstrips

Figures showing the features required to support drilling and testing (e.g., TWRs and ice pads) for this winter exploration program are in Attachment 2 to the ADNR LUP application.

Starting in November 2017, winter operations will include pre-packing and constructing the Main TWR and two TWR Spurs (Bravo TWR Spur and Charlie TWR Spur) to access the Bravo #1 and Charlie #1 drill sites where two ice pads will be built to support drilling operations. Project road activities include the following: 1) constructing the 18.75-mile long Main TWR starting at MP386.5 Dalton Highway; 2) constructing a 500- by 500-foot ice staging pad within 1 mile of the start of the Main TWR; 3) constructing the 3.75-mile long Bravo TWR Spur to the Bravo #1 pad location and then constructing the 500- by 500-foot Bravo #1 ice pad; and, 4) constructing a 17.75-mile long Charlie TWR Spur and then constructing the 500-by 500-foot Charlie #1 ice pad. All TWRs will be built to accommodate drill rig moves, and pads large enough to safely carry out drilling and support operations. All TWRS and ice pads will be constructed and maintained using the generally accepted practices for the North Slope, subject to ADNR opening criteria for winter tundra travel in the lower NS Foothills. Pre-packing of the trail will be requested prior to the official tundra opening to drive frost down and preserve early snow. Additionally, TWRs crossings at established subsistence and winter trails will be constructed to provide a smooth transition to ensure trail users have safe passage.

Two locations for an optional ice airstrip have been identified:

1. Option 1 – (Preferred) ice airstrip constructed on Lake A28 within U004N010E, Sec. 12-13 and U004N/011E, Sec. 7
2. Option 2 (Alternative) - ice airstrip constructed on Lake A23 within U004N011E, Sec. 7. Although two airstrip locations have been identified, only one may be selected and constructed. The ice airstrip will facilitate transportation of materials and personnel crew changes. The ice airstrip will be approximately 300 feet by up to 5,000 feet and will be planned/permitted/constructed with appropriate lighting and control systems. to accommodate up to 30- passenger aircraft.

Rehabilitation Plan

Upon completion of drilling and evaluation operations, the wells will either be plugged and abandoned (P&A) or suspended in accordance with AOGCC regulations. Equipment and structures will be removed from the Project area at the end of the season. Ice pads and roads will be scraped to remove dark-colored drips missed by the ACC spill technician and the resulting snow will be thawed with resulting oily water disposed of at a permitted disposal facility. Trash and debris will be removed and transported for disposal at a permitted disposal facility. AEA will conduct an inspection and "stick picking" operation via helicopter in Summer 2018 to ensure that NSB and State cleanup requirements have been met.

Upon completion of use, TWR stream crossings will be slotted, breached, or weakened to facilitate breakup and minimize potential impacts to stream banks. Any snow or ice used as fill for ramps will be removed from banks in a manner that does not disturb the natural stream bank.

Although activities will be conducted from TWRs and ice pads, impacts to vegetation and habitat may occur. Therefore, AEA will inspect the Project area following snowmelt in 2018 during "stickpicking" to confirm that tundra damage did not occur. If tundra damage is discovered, AEA will consult with the State and the NSB to determine the appropriate methods for restoration, and incorporate them into a Tundra Damage Rehabilitation/Remediation Plan that meets requirements found in NSBMC § 19.30, 19.500 and § 19.60, ADL 393058 and 393043 lease conditions, and specific State requirements. The Plan will address the area, type, and extent of damage and will be developed in accordance with the Alaska Coastal Revegetation & Erosion Control Guide (developed by the State of Alaska Plant Materials Center), the Streambank Revegetation and Protection Guide (developed by the Alaska Department of Fish and Game), and other relevant guidance documents. Agency personnel will be invited to verify that rehabilitation operations are complete and that any issues identified are addressed.

If tundra damage is discovered, AEA will consult with the State and the NSB to determine the appropriate methods for restoration, and incorporate them into a Tundra Damage Rehabilitation/Remediation Plan ...

Minimize Adverse Effect

Historic & Archeological Sites

AEA has completed a consultation, survey and fieldwork to inventory prehistoric, historic, and archeological sites ("resources") on and around the proposed ice pads and TWR alignments. This was done by Reanier & Associates, Inc. (Reanier) in June 2017. As part of the survey, TLUI data was obtained by Reanier from the NSB Inupiat Heritage and Language Center (NSB IHLC) and reviewed, along with data from Alaska Heritage Resource Survey and National Register of Historic Places. This data and a field report will be submitted for review by the NSB Planning and Land Management Department, Cultural Resources Office and the ADNR/OHA State Historic Preservation Office ("SHPO").

The data and field report both indicate there are no archaeological, historic or cultural resources within 0.4 miles of the Main TWR alignment, Bravo TWR Spur and Charlie TWR Spur alignments, or staging and drill ice pad locations.

Additionally, AEA has created a series of 500-foot buffers ("environmentally sensitive zones") around sites identified by Reanier during the study, where traffic will be excluded. Combined with drilling operations limited to winter when the ground is frozen and covered snow, these zones will help provide adequate protection for the historic and archaeological resources. Finally, it is AEA's intention that historic, cultural or archaeological resources (or suspected resources) that are discovered during Project activities are not to be disturbed under any circumstance. This will include providing training to all field personnel on what to do as part of required Project orientation.

If archaeological sites are discovered during Project activities, the following steps will be taken.

1. Project personnel discovering historical or archaeological (or suspected) resources during operations will not disturb materials in place at the site of discovery and mark the area with flagging tape
2. Project personnel will stop all activities and then inform their job supervisor whom will contact AEA's onsite representative;
3. AEA will then report these properties to SHPO and NSB ILHC for identification and assessment, and 4) AEA will use identification and assessment consultations to guide further planned activities in the site area.

Fish & Wildlife Habitat

Pad and roads constructed of ice will only be used in winter months during the open winter tundra travel season. Streams will be crossed in shallow waters that normally freeze to bottom or will be bridged using temporary bridges founded on ice ramps and abutments. Willow habitats were identified/located during fieldwork in August 2017 and the TWR alignments staked to avoid them during TWR and ice pad construction. In summary, all AEA activities will be conducted to minimize impacts on fish and wildlife. This includes mitigation measures outlined in the ADL lease stipulations and adherence to State of Alaska and NSB land management regulations and permit requirements.

During staking of alignments and pads in August, AEA also focused on avoiding areas (especially S-SW facing stream embankments, pingos and drained lakes) that appeared to be prime bear den habitat, keeping in mind required buffer zones. A wildlife avoidance & interaction plan and a bear avoidance interaction plan (for both grizzly and polar bear) has been prepared & will be included in the site orientation for all Project personnel.

Field Reconnaissance and TWR Routing

Proposed ice pad locations and TWR alignments were inspected in mid-August during field work and then staked based on terrain considerations and to avoid archeological & historical Critical Site locations. Alignments and ice pads also were staked to avoid damaging willows which are important food sources for local wildlife, and to avoid higher, drier tundra covered by shrubs, forbs and tussock vegetation where possible.

The project will start with the pre-packing of the TWR alignments to capture early snowfall and to drive frost down by reducing the insulating factor of powder snow. TWR construction will begin once soil temperature are -5°C at a 1-foot depth and 9 inches of snow is covering tundra. To help determine this occurrence, three thermistor stations were installed along with snow level sensors at Main TWR MPs 1, 14 and 19. The thermistors will measure ground temperatures within the active zone and the sensors will measure snow depth covering the tundra.

TWR and Ice Pad Objectives

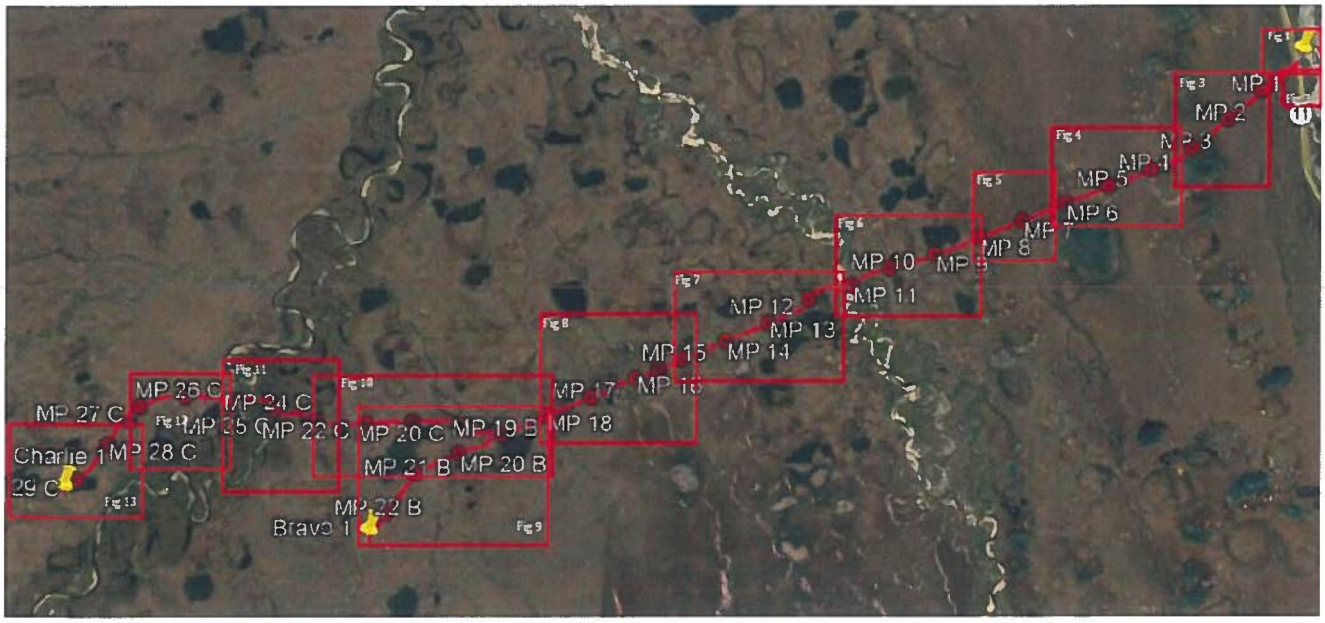
AEA developed the following objectives as a guide for constructing and operating TWRs and ice pads.

1. Use summer approved tundra vehicles for pre- packing.
2. Construct the TWRs and ice pads only after the soil reaches a temperature of -5°C at 1-foot depth and 9 inches of snow cover has accumulated on alignment route. If snow cover does not achieve 9 inches, then ice chips will be used in front of the road build.
3. Avoid sensitive tundra by performing extensive summer reconnaissance to pick route and ice pad locations. Where sensitive tundra cannot be avoided, be sure adequate snow cover or ice chips are in place to support tussock and willow structure during construction.
4. Cross rivers and streams where willow counts are at their least. Use plastic fence to enhance snow accumulation, if needed, at the stream crossings during pre-packing to help cover the willows.
5. Build TWR alignment as straight as possible and avoid sharp corners. Accident data indicates most incidents occur on corners. Long sweeping corners will be installed where change in direction is needed.
6. Ensure ice ramps at river crossings do not exceed a 5% grade approach to meet safety criteria for rig transport.
7. Add a minimum of 6 inches of ice to tundra to ensure tundra protection and weight stability for equipment.
8. Construct TWRs crossings at established subsistence trails to provide a smooth transition for safe passage.

Site Reconnaissance Methods

AEA conducted the site reconnaissance for AEA in four phases.

Phase 1 "1,000-foot View." During Phase 1 in May 2017, AEA reviewed Google Earth® imagery to map out preliminary TWR routes and locate lakes for possible uses as water-sources. Preliminary mapping was done by evaluating the entire route by and areas where sensitive tundra appeared to be present. Each sensitive area and river/ stream crossing was assigned a GPS waypoint number and latitude/longitude coordinates (using WGS84 datum) for identification during site visits by Reanier (TLUI and SHPO fieldwork) in June 2017 and by AEA in August 2017.



Phase 1 TRW alignments from Dalton Hwy 386.5 entrance to Bravo #1 and Charlie #1.

Phase 2 "100-foot View." AEA inspected the routes by Robinson R-44 helicopter in August 2007 to locate suitable drill sites, map TWR routes to the drill sites, and locate river and stream crossings. Again, all results were assigned GPS waypoints.

Phase 3 Ground Reconnaissance. Next, AEA inspected drill site locations, river/stream crossings and TWR alignments by using the Robinson R-44 to land in quarter mile increments and confirm conditions. This information was used to adjust the TWR alignments based on sensitive tundra, stream and river depths, willow density and topography.

Phase 4 Water Reconnaissance. As noted, all TWR routes were planned based on proximity to lakes for use as water and ice chip sources. Therefore, AEA collected depth measurements at 37 lakes in August 2017 by using a Garmin Striker 4™ geo-referenced fathometer at waypoints along transects across each lake from a float equipped Robinson R-44™ helicopter. AEA provided waypoint depth measurements and locations to Brailey Hydrologic, LLC (Brailey). Using these data, Brailey prepared a 3-dimensional model of each lake basin and generated bathymetric maps and volume estimates from the models. Volume estimates for each lake are summarized in Table 1 at the end of this Project Overview, along with proposed water withdrawals based on interpretation of ADNR and ADF&G guidance. The same information also is presented in Attachment x to the Form 100 -Development Permit Application per application instructions.

Results of Field Reconnaissance along TWR Alignments (Segments 1 to 13)

Segment 1: MP 386.5 Dalton Highway will be the access point to the Main TWR alignment (see figures in Attachment 2). A ten-foot elevation difference will require a 5-degree ramp with a 60-foot wide access with a minimum of 20 feet of ramp built to the west at same elevation as the Dalton Highway.

Main Map Figure 1: MP 386.5 of Dalton Highway/ Haul Road was chosen for best high-ridge departure above the elevation of the historical Sag River Channel

Aerial shot looking at MP 386.5 southwest between Lakes A1 (right) and A2 (left).

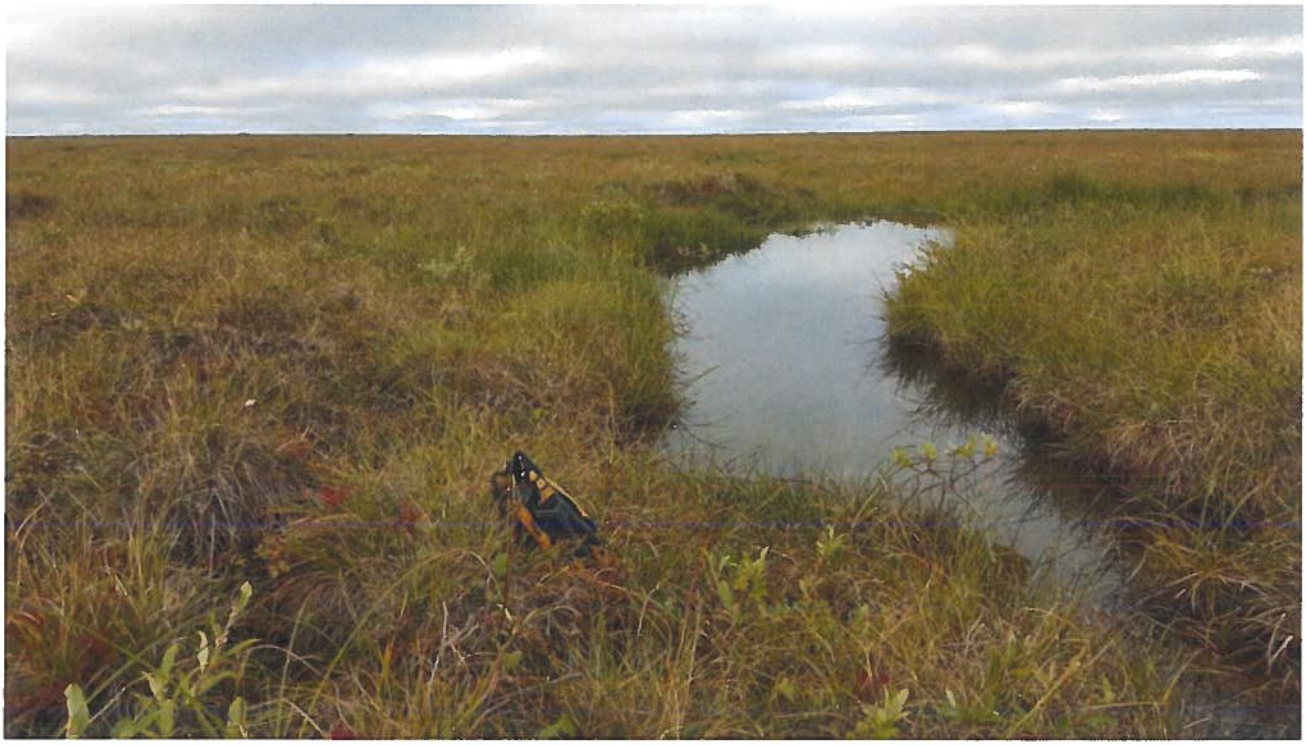
Lakes A1 (foreground) and A2 spilt the TWR at MP .5- 1.0.

Segment 2: MP 1 AEA TWR is the location of the first Beaded Stream Data Logger Thermistor Unit. The online data will be used to estimate cooling trend of ground and snow depth. The topography of the area is flat for the first 0.75 miles followed by low-centered polygonal tundra filled with water. This tundra type is found throughout all alignments and will freeze back, thus requiring less ice chips as fill.

Main Map Figure 2: Lake A2 can be accessed via Sag River dead-arm by building a trail quickly over nearly all ice. The alignment then can be built from A2 back to Ramp at MP 386.5.

MP 1 Beaded Stream Data Logger looking northwest towards Franklin Bluffs. There are two ground sensors collecting data. The north sensor lead is the control "off-road" sensor. The south sensor lead will be the "on-road" sensor that will be used to track the pre-packed portion of the trail.

Aerial of Lake A5 looking north.



Polygonal trough filled with water just beyond MP 1 looking southwest.

Main Map Figure 3: MP 1- 3.5 with topography change at MP 2.6 and the first sweeping corner at MP 3.25.

Segment 3: MP 1 to MP 3.5 topography is consistent. There is a slight elevation change at MP 2.6. The first sweeping corner in the alignment will need to take place at MP 3.25 as the TWR continues in a more westerly route towards Lake A5. Lake A5 will be the next major source of water and ice chips.

Main Map Figure 4: MP 3.5 to MP 6.25

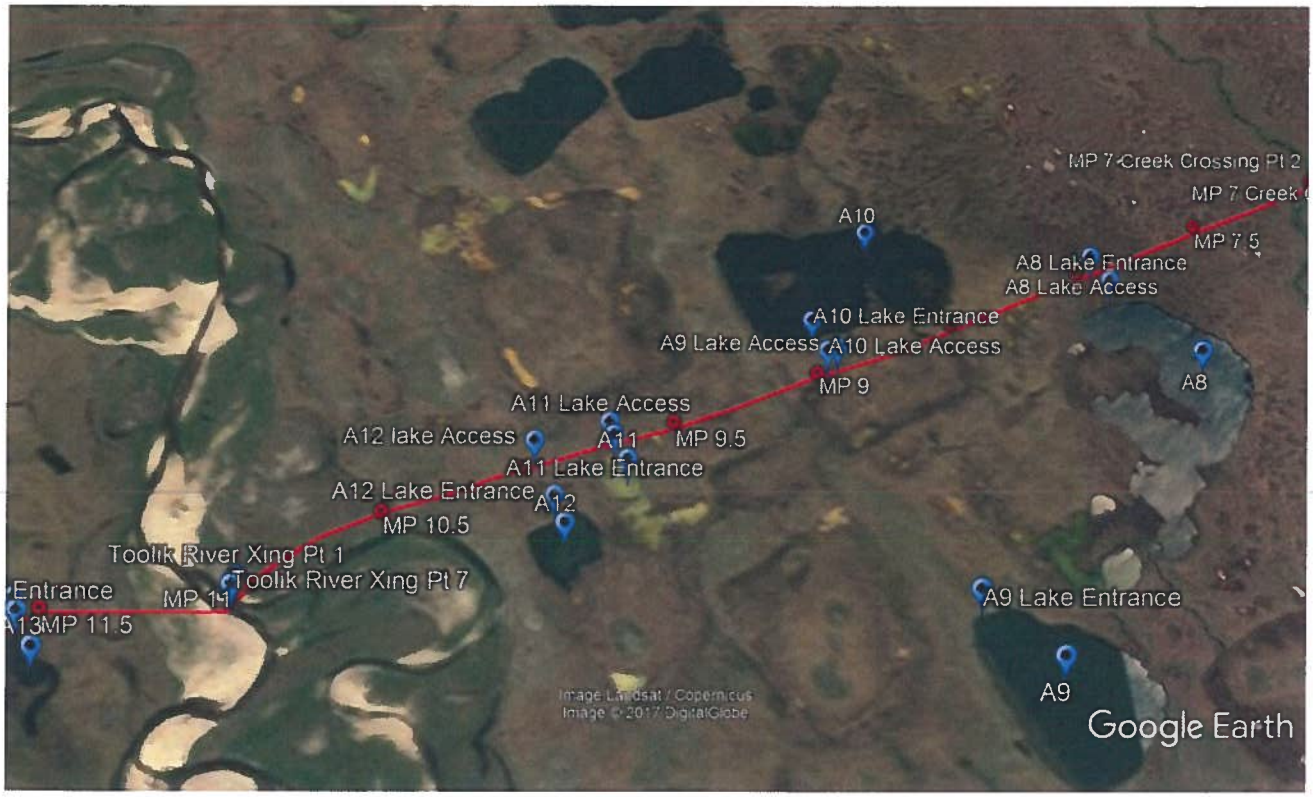
Segment 4: MP 3.5 to MP 6.25 topography changes away from polygonal troughs to a more consistent tussock and arctic sedge grass. Lake A5 is a great water source for this section of the TWR. Both the east and west ends of the lake should have grounded ice for a chip source early in season. The alignment continues a southwest trajectory and touches the edge of Lake A7 water source.

Main Map Figure 5: MP 6.25 to MP 8.0 Google Earth view including MP 7 creek crossing.

Segment 5: MP 6.25 to MP 8.0 is very similar topography compared to the previous three miles. Lakes A6 and A7 are available for water and chip sources. There is a creek crossing at MP 7.

This crossing has 1' to 2' willows on each side bank. The depth of the creek varies from 1.3' to 1.9' deep. The creek does have deeper pools on each side of the crossing, so care should be taken to delineate the correct area to mark crossing.

MP 7 creek crossing



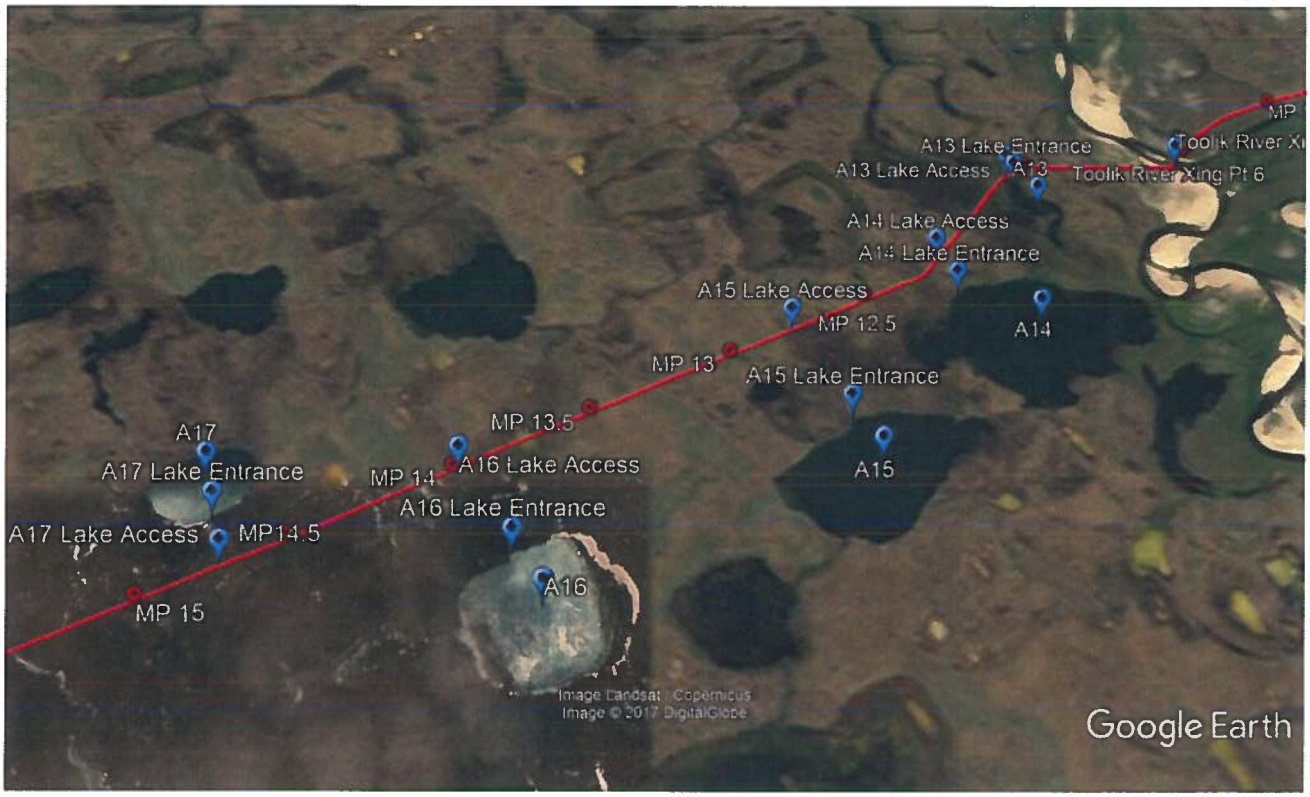
Main Map Figure 6: MP 8.0 to MP 11.5 with lakes A8, A9, A10, A11, A 12 and the Toolik River Crossing all shown on map.

Segment 6: MP 8.0 to MP 11.5 takes the route to the Toolik River crossing. One old trail has been noted and recorded for previous tundra damage around MP 8. See picture below. Lakes A8, A9, A10, A11 and A12 are all available for water and ice chip source.

MP 8 existing tundra damage

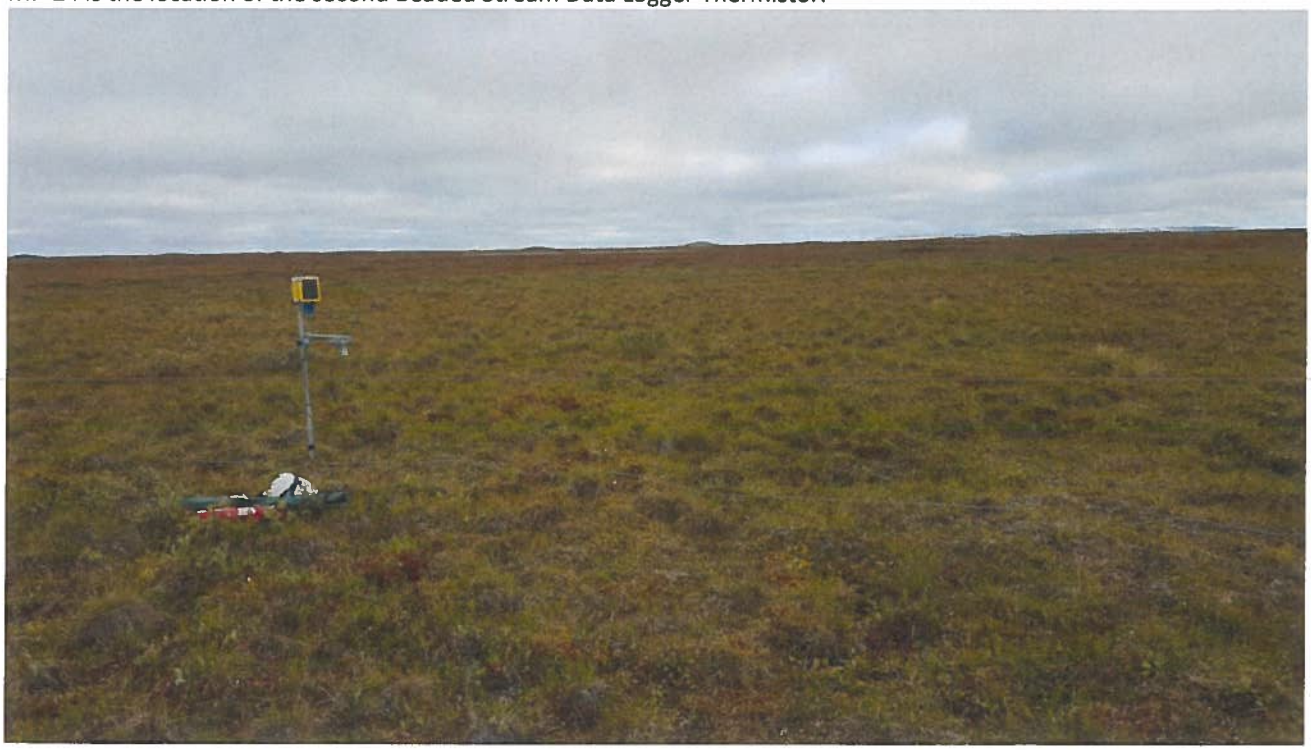
Toolik River Crossing looking west with lakes A13 and A 14 in the foreground.

The Toolik River was sounded in several locations and the most-shallow area and least amount of willows in area was chosen for the alignment. Water depths ranges are from 1'- 3' at the crossing location.

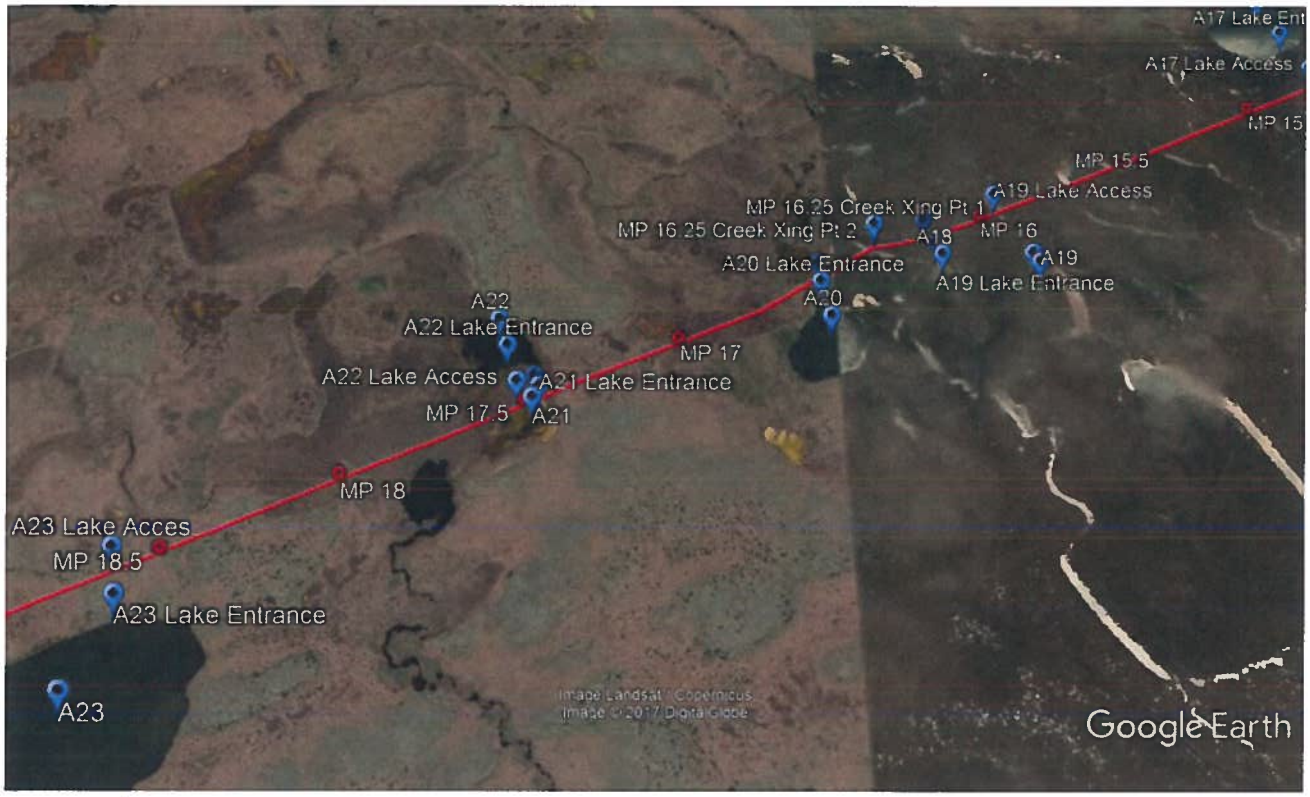


Main Map Figure 7: MP 11.5 to MP 15 with lakes A13, A14, A14, A15, A16 and A17 shown on map.

Segment 7: MP 11.5 to MP 15 alignment makes a northerly turn around Lake A13 and then turns back to the south west to Lake A14. The alignment should stay south of 3 small pingo ridges between MP 12 and MP 15. All 3 ridges are visible from marked coordinates. There is adequate amounts of water and ice chip source available in this section of road and should be considered as an additional source for product beyond MP 15 to MP 18, as lake volumes decrease in that area. MP 14 is the location of the second Beaded Stream Data Logger Thermistor.

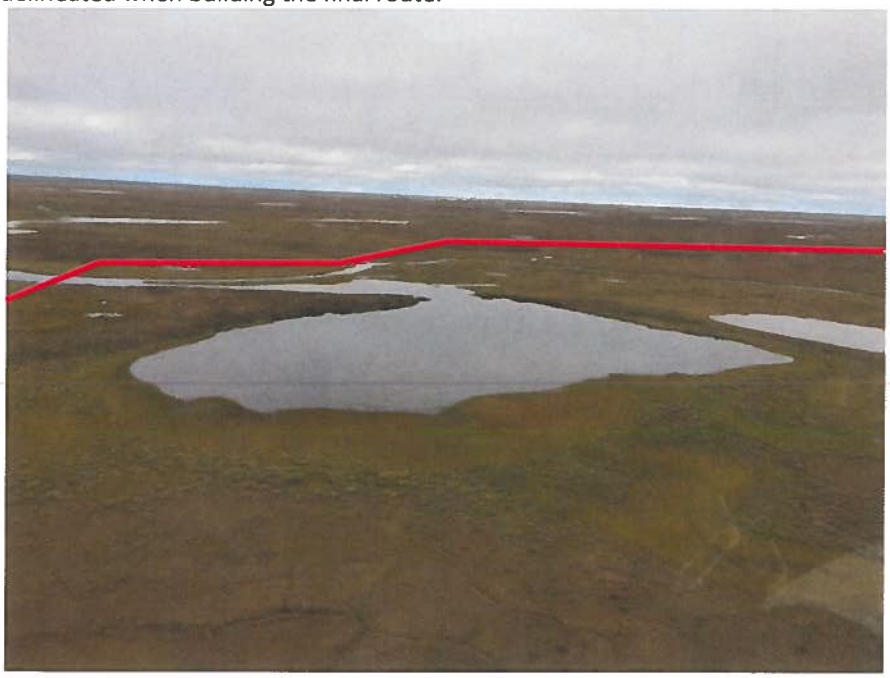


MP 14 Beaded Stream Data Logger with 2 ground temperature sensors and snow depth sounder looking northeast.

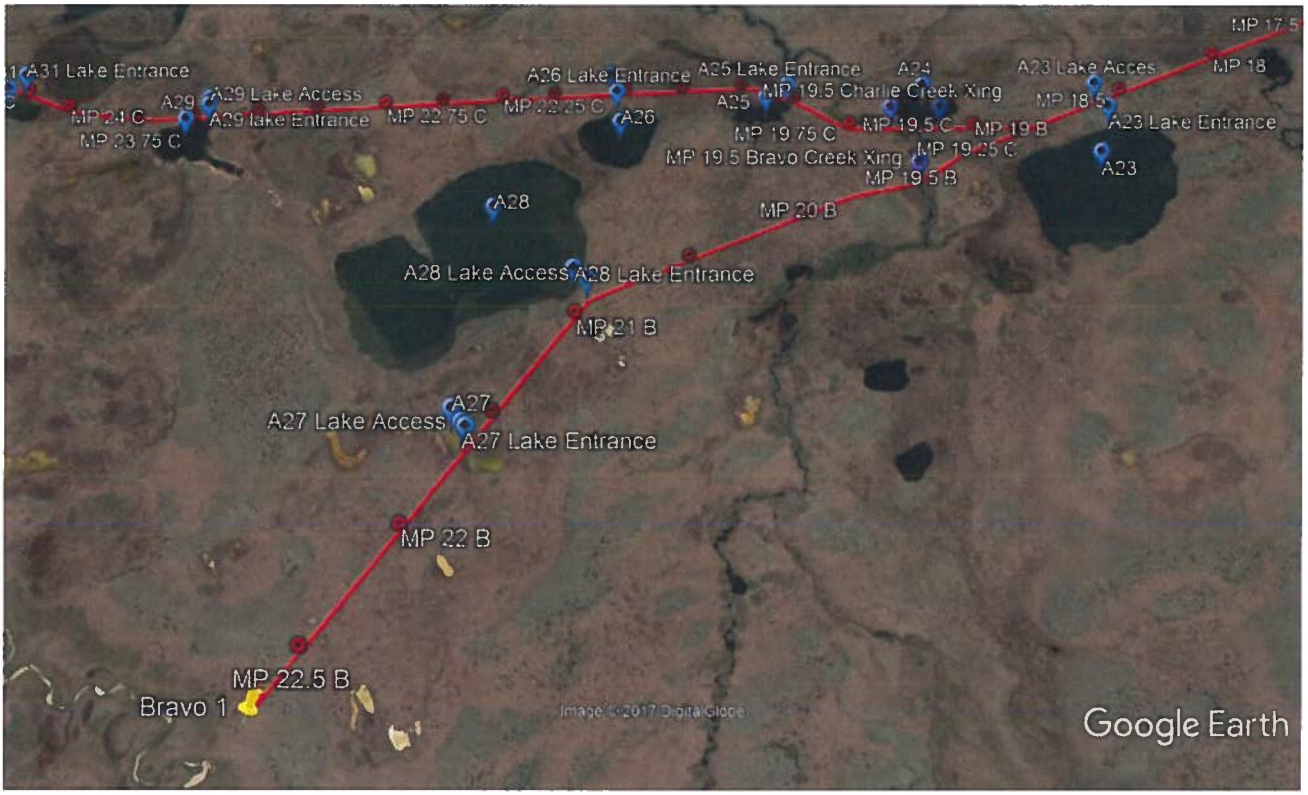


Main Map Figure 8: MP 15 to MP 18.5 with lakes A18, A19, A20, A21, A22 and A23.

Segment 8: MP 15 to MP 18.5 is where the least amount of water is available and several topographical changes take place. From MP 16 to the creek crossing at MP 16.25, there is a distinct route along the north of the creek that must be used until the mapped crossing. Otherwise the creek would need to be crossed twice. The mapped creek crossing has depths from 1' to 2.1'. This creek does have depths of at least 6' on either side of this 50' crossing, so the area should be delineated when building the final route.

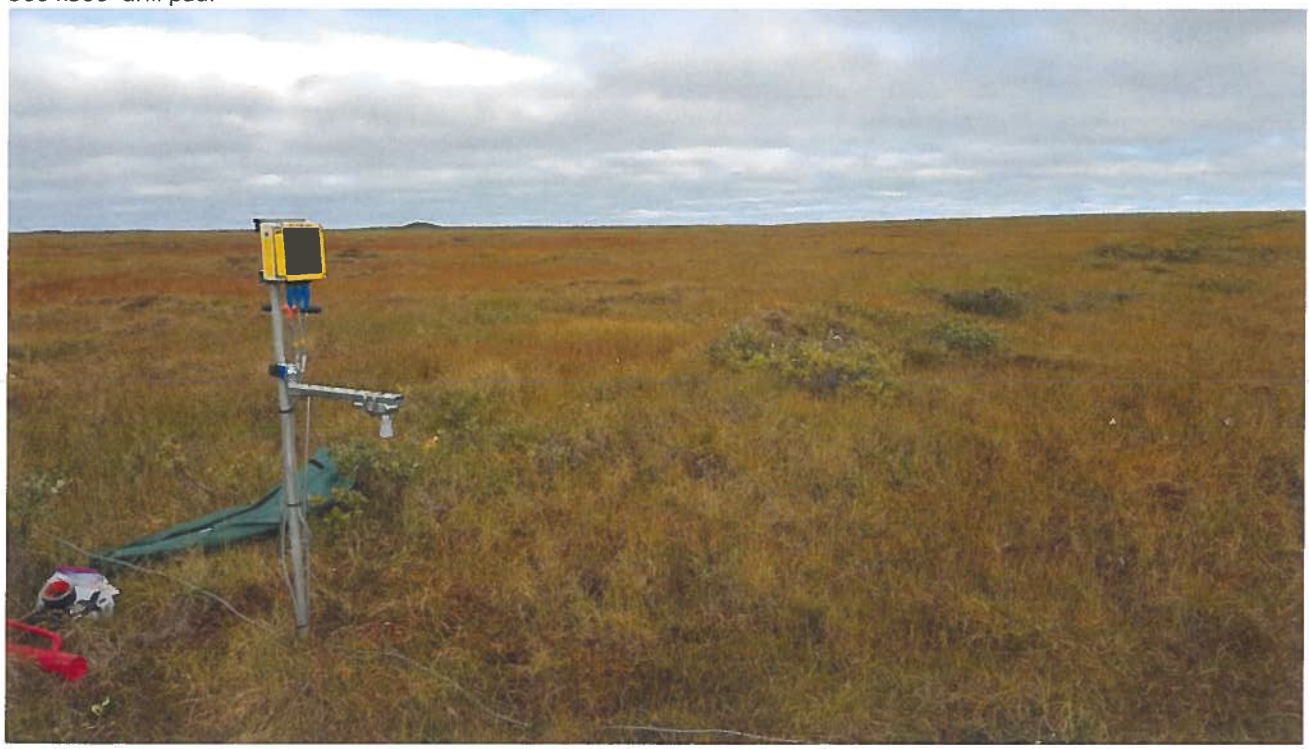


MP 16.25 creek crossing at Lake A18. Use GPS coordinates to delineate crossing. As traveling west, stay to north of creek until creek crossing due to tundra type and elevated ridges on each side of creek area.



Main Map Figure 9: MP 18 to MP 22.5 Bravo 1 route with Lake A23, A27 and A28 with creek crossing at MP 19.25.

Segment 9: MP 18.5 to MP 22.5 B makes a creek crossing at MP 19.5 and continues southwest to Lake A28. The third Beaded Stream Data Logger is installed at MP 19. The alignment makes a sweeping turn more south-southwest to the Bravo 1 drill site. The alignment splits Lake A27 and then to an elevated ridge. This ridge has several deep polygonal troughs that can be avoided to the east of the marked route. The Bravo 1 drill site is flat and will be a good location for a 500'x500' drill pad.



MP 19 third Bead Stream Data Logger Thermistor with two temperature ground sensors and snow depth sounder looking east.

MP 19.25 Bravo route Creek Crossing, 1.5' at the deepest spot on crossing.

Bravo 1 well location staked.

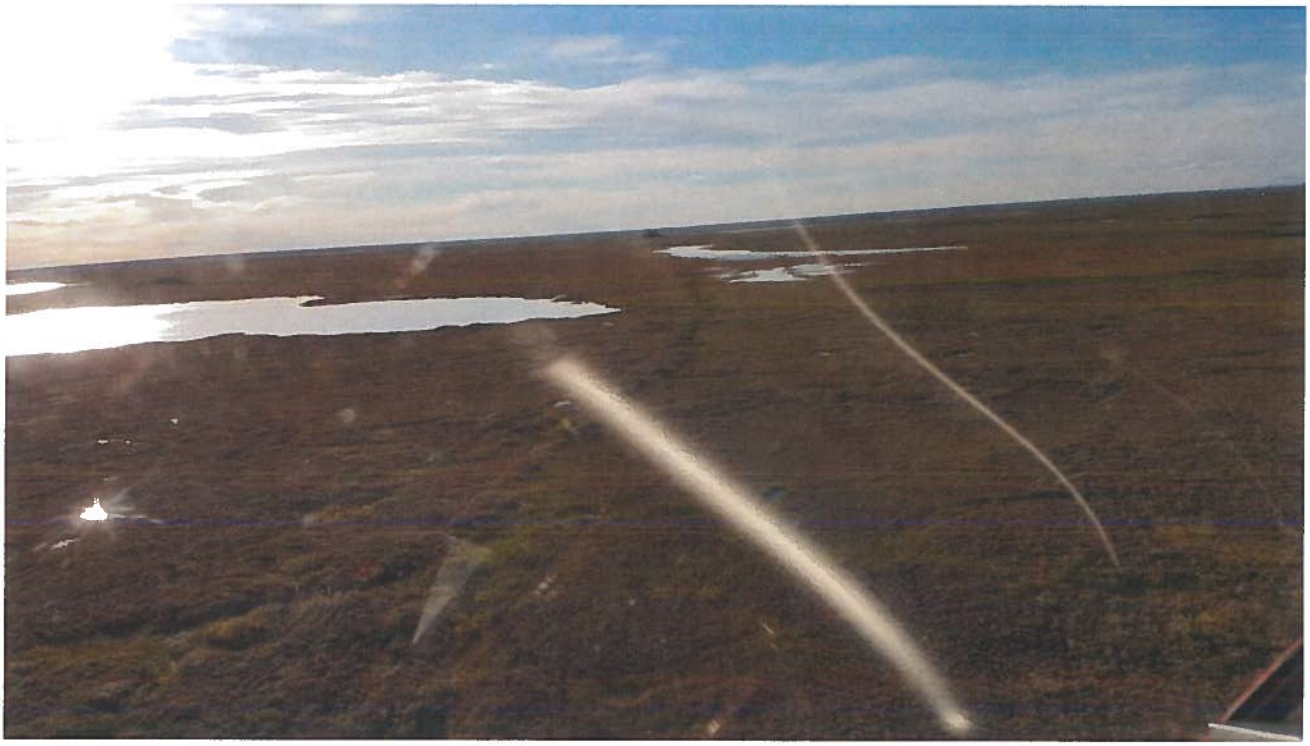
Elevations at the Bravo 1 pad change from the northerly ridge to the stream at the south of the drill site. Area around staked well should be analyzed to set pad in such so the least amount of fill is needed.

Main Map Figure 10: MP 19 to MP 22 C going south of Lake A24, crossing 19.5 Mile Creek C, going next to Lake A25 and then directly west past Lake A26 towards the Kuparuk River via the old winter trail.

Segment 10: MP 19 to MP 22 C (Charlie 1 route) takes off to the west and splits 19 Mile Creek and Lake A24 on an old established winter trail towards the Kuparuk River. The topography is flat and there are four water and chip source lakes in the immediate area.

Lake A24 with 19.5 Mile Creek below. A traditional winter trail splits the lake and the creek in the left of the picture.

The route to Charlie 1 originally had been mapped to depart from the Bravo 1 drill pad directly west across the Kuparuk River. During recon, several obstacles including a 4' willow forest, several river dead-arms and a 40' bluff made that approach not possible. The old winter trail was inspected and made the best choice for access.



Looking west past Lake A20 and showing the markings of the old historical trail.

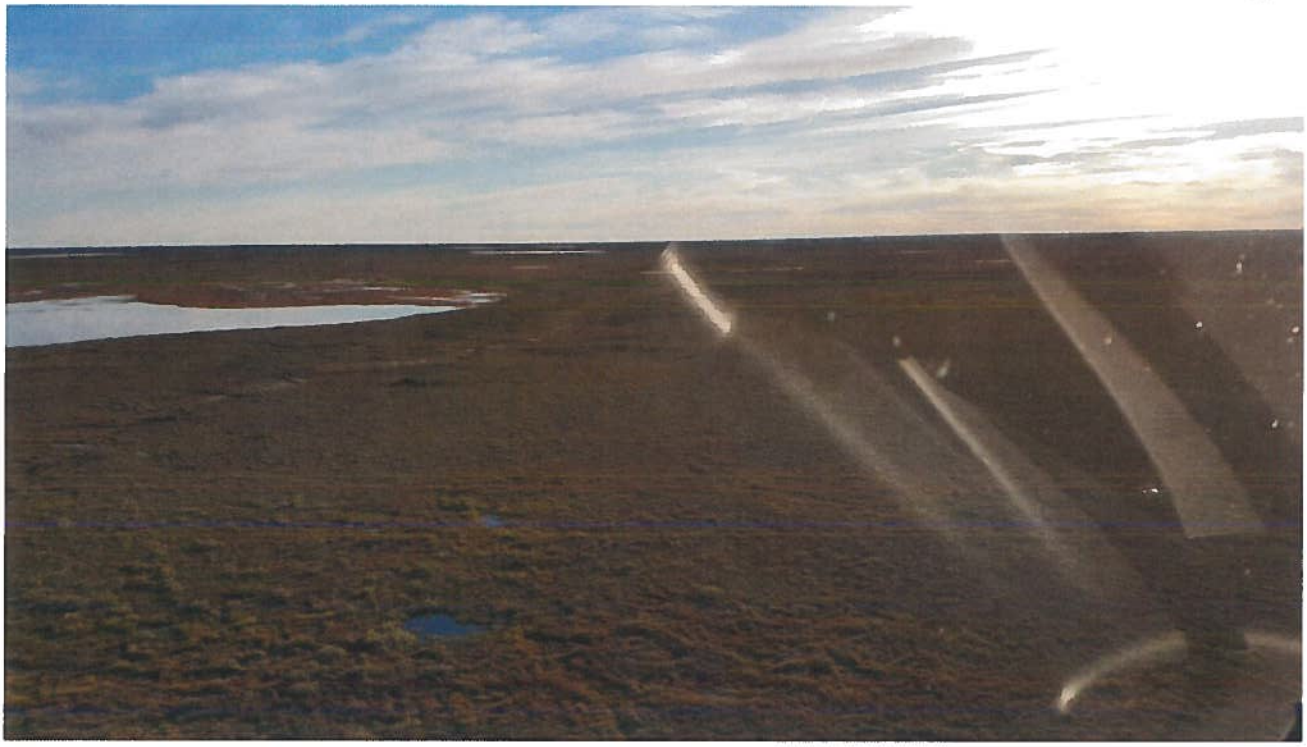
Main Map Figure 11: MP 22 to MP 25 continues along the traditional trail.

Segment 11: MP 22 to MP 25 takes the route across the Kuparuk River. The route has several turns which are necessary to go around dead-arms of the Kuparuk. Large sweeping turns are recommended through this area for safety during operations. The river crossing was sounded in several areas and the best location to the cross at where the river forms a "Y". The south-western bank of the Kuparuk is elevated 10'-12' with a 7' deep channel about 30' wide. To the north of this channel, an elevated gravel bar splits the river. The eastern channel varies in depth from 2'-3' and should dry up by freeze up.

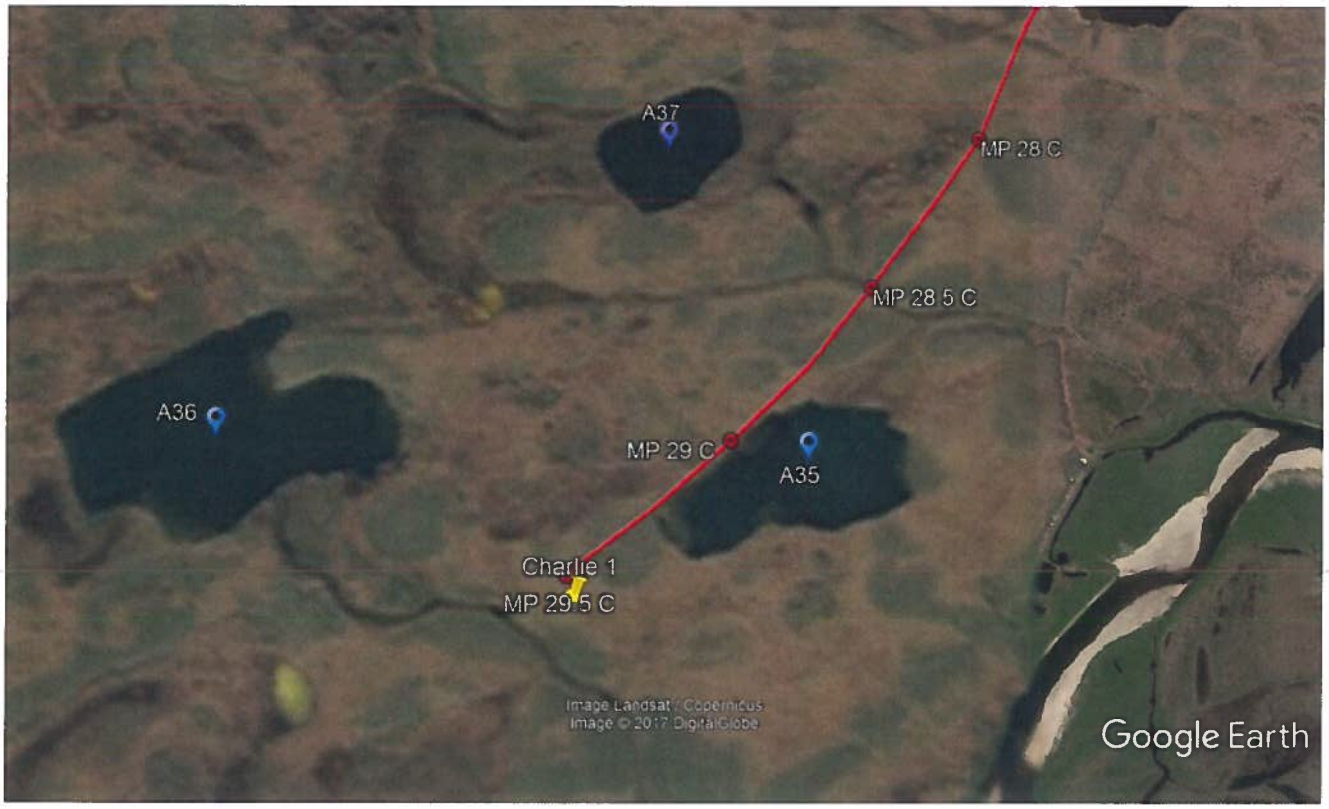
Kuparuk River Crossing looking west. Note elevated gravel bar in center of channel to be used to build ramp to elevated bank.

Main Map Figure 12: MP 25 C to MP 28 C rises out of the Kuparuk River valley to the west traveling by Lake A33 and A34.

Segment 12: MP 25 C to MP 28 C rises out of the Kuparuk River Valley passing by Lake A33 and A34. Lake A30 has also been permitted for water use, but is off the alignment by 1 mile and is difficult to access. This water source would only be accessed should we need maintenance water late in the exploration season.



MP 25 C looking southwest and showing Lake A33 and A34 in the foreground.



Main Map Figure 13: MP 28 C to Charlie #1

Segment 13: MP 28 C to Charlie 1. The route was chosen based on the presence of low-centered polygonal troughs from Lake A34 to A35, and level ground in the area of the proposed Charlie #1 drill site. This will required less ice chips as fill.

Charlie #1 was moved south to a more level location where less ice chips would be needed for fill.

Water Reconnaissance

37 lakes were inspected along the TWRs for water quality, water quantity and proximity to the alignment route. AEA has applied for Temporary Water Use Authorizations (TWUA's) for lakes listed below.

Table 1: Water Sources Summary

Water Source Lake	Requested (MMgal)	Max Depth (ft)	Distance from TWR Routes (ft)
A1	2.6	5.9	200
A2	9.2	7	475
A3	2.4	7.2	1200
A4	3.1	7	0
A5	12.5	5.9	600
A6	14.6	5.6	600
A7	0.5	10	200
A8	16.4	6.4	700
A9	28.8	10.5	4700
A10	6	7	550
A11	1.3	2.8	100
A12	5.4	5	1000
A13	1.6	6.7	0
A14	1.3	6.2	650
A15	4.9	6.7	1900
A16	1	7	1750
A17	4.7	8.2	800
A18	2	6.4	400
A19	0.7	4.5	1000
A20	4.6	6.5	300

A21	1	4.7	0
A22	5.3	5.3	525
A23	12.8	7.5	575
A24	6.9	4.9	0
A25	3.5	7	0
A26	9.1	5.8	535
A27	1.6	6	0
A28	12.8	5.9	350
A29	1.3	8.5	0
A30	6.6	13.4	2500
A31	4.9	7.1	0
A32	2.1	11.3	0
A33	2	6.6	325
A34	1.2	7.4	0
A35	1.2	10.2	0
A36	4.6	7	2500
A37	10.2	4.8	2400

The contractor awarded the AEA TWR will have the option to move the route 500' north or south of the GPS marked route should it make the route closer to the water source. If moved, the agency stipulations of river/creek crossings, willow destruction and sensitive tundra avoidance must still be met.