

Plan of Operations

Anarraaq and Aktigiruaq Exploration Program

Phase I – Exploration Access Road and Surface Pad Construction

Prepared for:

Alaska Department of Natural Resources
Alaska Department of Environmental Conservation
Northwest Arctic Borough

Teck

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ACRONYMS/ABBREVIATIONS

| | |
|---------|--|
| AAC | Alaska Administrative Code |
| ABA | Acid Base Accounting |
| ADEC | Alaska Department of Environmental Conservation |
| ADNR | Alaska Department of Natural Resources |
| ADF&G | Alaska Department of Fish and Game |
| AHRS | Alaska Heritage Resources Survey |
| ANFO | Ammonium Nitrate/Fuel Oil |
| APDES | Alaska Pollutant Discharge Elimination System |
| APE | Area of Potential Effect |
| ARD | Acid Rock Drainage |
| AS | Alaska Statute |
| ASBP | Alaska Statewide Bonding Pool |
| AWC | Anadromous Waters Catalog |
| BLM | Bureau of Land Management |
| BMP | Best Management Practice(s) |
| CFR | Code of Federal Regulations |
| CWA | Clean Water Act |
| DMTS | DeLong Mountain Transportation System |
| DA | Department of Army |
| DMLW | Division of Mining, Land and Water |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| MP | Milepost |
| MSGP | Multi-Sector General Permit |
| NAB | Northwest Arctic Borough |
| NLUR | Northern Land Use Research |
| NMFS | National Marine Fisheries Service |
| NRHP | National Registry of Historic Places |
| ODPCP | Oil Discharge Prevention Contingency Plan |
| OHA | Office of History and Archaeology |
| PAG | Potentially Acid Generating |
| Plan | Plan of Operations |
| PoO | Plan of Operations |
| Project | Anarraaq and Aktigirug Exploration Project |
| pXRF | portable x-ray diffraction instrument |
| SPCC | Spill Prevention, Control, and Countermeasure Plan |
| SOA | State of Alaska |
| SWPPP | Storm Water Pollution Prevention Plan |
| TAI | Teck American Incorporated |
| TDS | Total Dissolved Solids |
| TWUA | Temporary Water Use Authorization |

| | |
|--------|--------------------------------|
| US | United States |
| USACE | U.S. Army Corps of Engineers |
| U.S.C. | United States Code |
| USFWS | U.S. Fish and Wildlife Service |
| WOTUS | Waters of the United States |
| WHP | WHPacific, Inc. |

UNITS OF MEASURE

| | |
|-----------------|---------------|
| ft | foot/feet |
| km | kilometer |
| m ² | square meters |
| yd ³ | cubic yards |

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Executive Summary

This Plan of Operations (the Plan or PoO) is submitted to the Alaska Department of Natural Resources (ADNR) by Teck American Incorporated (TAI) in support of TAI's exploration efforts on the Anarraaq and Aktigiruaq prospects located approximately nine miles north of the Red Dog Mine and 89 miles north-northwest of Kotzebue. This exploration effort is being conducted on State of Alaska mining claims owned and operated by Teck American Incorporated. TAI is seeking formal approval of this Plan from ADNR.

Long-term program goals include identifying a sufficient resource, amenable to underground mining and conventional milling, that warrants advancing the exploration program on a schedule that could allow TAI to develop the prospects into a producing mine. At the present time there is insufficient data to determine whether these prospects can be developed in a manner that is both technically feasible and economic.

To preserve a technically reasonable timeline for this project, TAI is seeking ADNR authorization of the expanded exploration program in two phases. The two-phase approach allows TAI to preserve the construction schedule for the main access road, surface pads and secondary roads to access the pads, while continuing to advance the engineering and environmental management plans for site support facilities and the underground component of the overall exploration program.

This Plan describes Phase I of the program and seeks approval for certain surface civil construction activities only. Specifically, this current Phase I Plan is being submitted for approval to construct an exploration access road to the Anarraaq and Aktigiruaq exploration area, several surface pads, and secondary access roads to these pads and the development of two material sites on TAI owned and operated State mining claims. The pads will be the site of future surface facilities that are required to support a multi-year underground exploration program. Two segments of the access road and two additional material sites described in this Plan will be on NANA Regional Corporation, Inc. (NANA) lands. NANA will provide authorization for those road segments and material sites on their lands through a separate agreement with TAI.

For Phase II, TAI will submit a Plan of Operations Amendment in mid-2022, and several other permit applications that, once approved, will authorize construction of surface and underground facilities and other regulated activities associated with the underground exploration program. The future Phase II activities, including constructing surface facilities, underground development, and underground exploration activities, are briefly described in this Phase I Plan for transparency and context only.

TAI is seeking ADNR approval of this Phase I Plan of Operations that describes the following activities on state mining claims.

1. Constructing ~9.3 miles of access road connecting the Anarraaq and Aktigirug exploration area to the Red Dog Mine (5.6 miles on State land and 3.7 miles on NANA land).
2. Constructing ~3.1 miles of secondary roads on State Land to connect the exploration access road with the laydown and vent-raise pads.
3. Constructing surface pads that will be populated with the surface facilities (i.e., buildings, fuel and materials storage, etc.) that are required to support a future underground exploration program following Phase II permitting.
4. Reclamation and a reclamation cost estimate for the access road, secondary roads, and surface pads (i.e., all surface disturbance associated with activities described and approved in Phase I PoO).

The major physical components of the Phase I program described in this Plan are illustrated in Figure 1. Constructing the road and surface facility pads will take approximately 9 – 12 months to complete. TAI anticipates starting road construction in the first quarter of 2023, followed by construction of the surface facility pads as soon as the access road construction allows. However, this schedule is subject to change in response to project needs, weather, and availability of materials and equipment and other un-planned delays.

TAI has completed several surveys and studies to support engineering, planning, and permitting for this project including surface water-quality monitoring, wetlands mapping, cultural resource surveys, and aquatic life monitoring which help define the pre-disturbance natural environment along the proposed road and in the exploration area.

This Plan of Operations includes a reclamation plan and reclamation cost estimate sufficient to reclaim the surface disturbance and leave it in a stable configuration if the project does not advance beyond the Phase I exploration phase.

TAI will apply for a Title 9 permit from the Northwest Arctic Borough in mid-2022 for the activities described in this Plan. TAI received approval of its Construction Rock Handling Plan from the Alaska Department of Environmental Conservation (ADEC) in February 2019. That plan specified how TAI will manage potentially acid-generating rock it excavates in any of the new road cuts. Other required permits, including a U.S. Army Corps of Engineers Clean Water Act (CWA) Section 404 Permit, ADEC CWA Section 401 Certification, Alaska Department of Fish and Game (ADF&G) Title 16 Fish Habitat Permits, and ADNR Temporary Water Use Authorizations (TWUAs) will also be obtained prior to initiating any activities that need to be authorized with those permits.

1.0 INTRODUCTION

This Introduction includes brief descriptions of the location and access to the property and summarizes Teck American Incorporated's plans for the Anarraaq and Aktigirug Exploration Program.

1.1 Project Overview

Teck American Incorporated is proposing the activities in this Plan as the first phase in evaluating the economic and technical feasibility of mining lead-zinc resources identified near upper Ikalukrok Creek, known as the Anarraaq and Aktigirug prospects. Potentially, the evaluation of these prospects may lead to the definition of mineable resources that could provide feed to the Red Dog mill.

In Phase I, TAI proposes to develop the main access road, two material sites, surface pads, and secondary roads to access the pads. All the activities for which TAI is seeking ADNR approval will occur on State of Alaska mining claims under 100% ownership of TAI, except for two segments of the access road that will cross NANA land and two material sites on NANA land. TAI will receive separate authorization from NANA for all activities on NANA lands. The total surface disturbance for the activities described in this plan is 182 acres including 129 acres on State land and 53 acres on NANA land.

In the future, TAI will submit a Phase II PoO (as an amendment to this Phase I Plan) for approval to construct surface and underground support facilities using the roads and surface pads authorized in Phase I PoO Approval. Future surface facilities in the Phase II Plan will include a 4-season camp, fuel storage facility, a maintenance facility, core processing facility, offices, water treatment plants (mine drainage water, drinking water, and domestic wastewater), power generation facility and other support buildings and a stockpile area for transient waste rock. Underground activities will include developing approximately 80,000 ft. of underground exploration ramps and drifts and executing approximately 300,000 ft. of exploratory drilling over a multi-year period. We offer this description of Phase II activities for transparency and context.

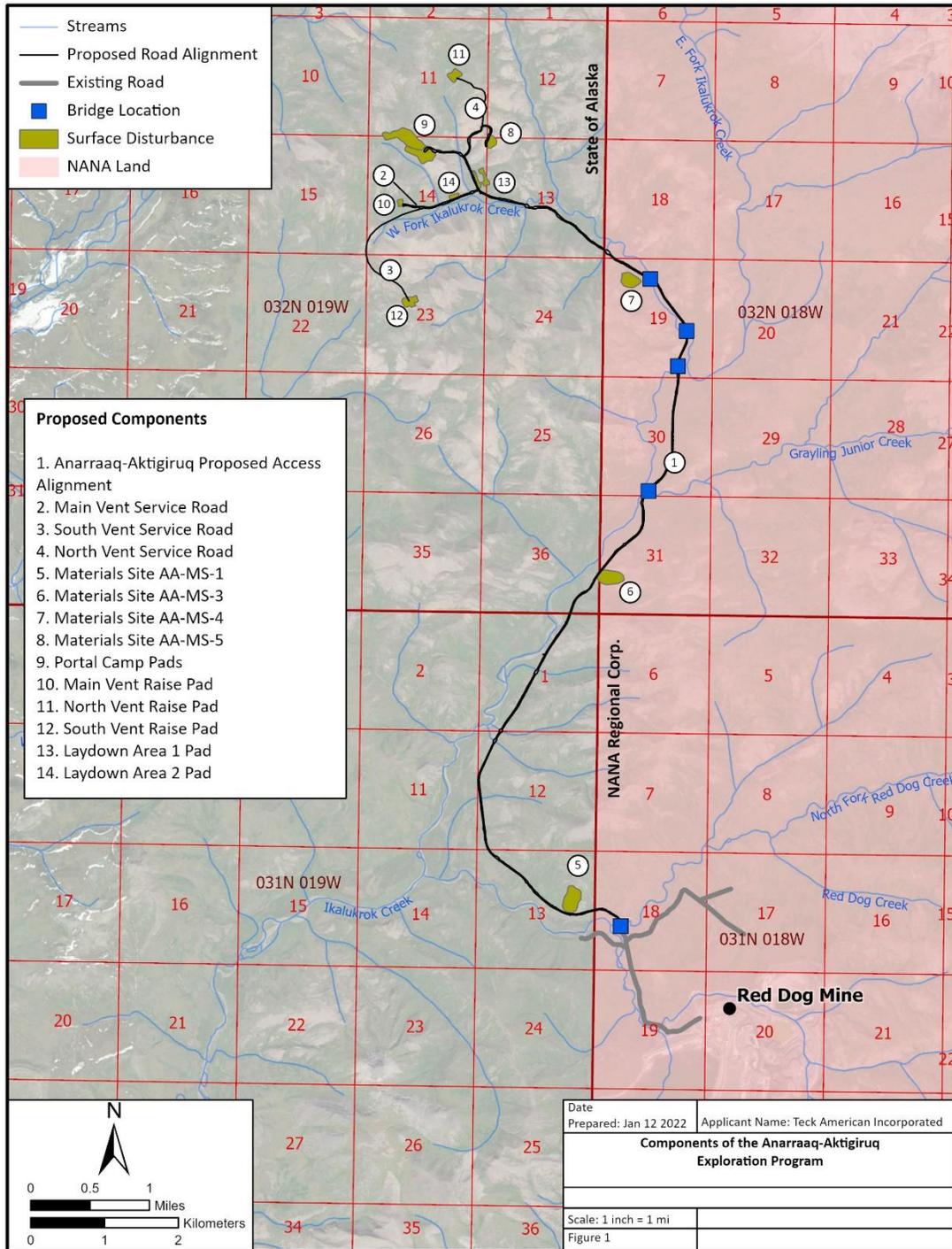
This two-phased permitting approach will allow TAI to complete the engineering and environmental studies it requires to generate final designs and plans for the surface facilities and underground program (Phase II), without delaying construction of the access road and surface pads (Phase I). Collectively this approach helps preserve a timeline that can be integrated into the Red Dog Mine Life-of-Mine planning.

1.2 Location, Access, and Property Description

The exploration property is situated in portions of four townships including Township 31-32 North, Range 18-19 West (T31N, R18W; T31N, R19W; T32N, R18W; and T32N, R19W), Kateel River Meridian (Figure 2). There is no existing overland access to the exploration area. TAI proposes

constructing a single lane exploration access road. The initial point of the road will be at the terminus of the existing fish-weir road at the Red Dog Mine, and extend for approximately 9.3 miles north, along Ikalukrok Creek and the West Fork Ikalukrok Creek, to the site of the future underground exploration camp and portal (Figure 1).

The access road route crosses State land where TAI owns State mining claims (Table 1, Figure 2), but also includes two segments that cross NANA land in T31 and 32N, R18W (Figure 2). NANA will provide written authority to construct the exploration access road segments on their land under a separate agreement between TAI and NANA.



Path: C:\s\FraZ\AK\AAEP\AAEP_20211208_2022PlanOfOperation\AAEP_20211208_2022PlanOfOperation.aprx

Figure 1. Components of the Anarraaq and Aktigiruaq Exploration Program Proposed in this Plan of Operations

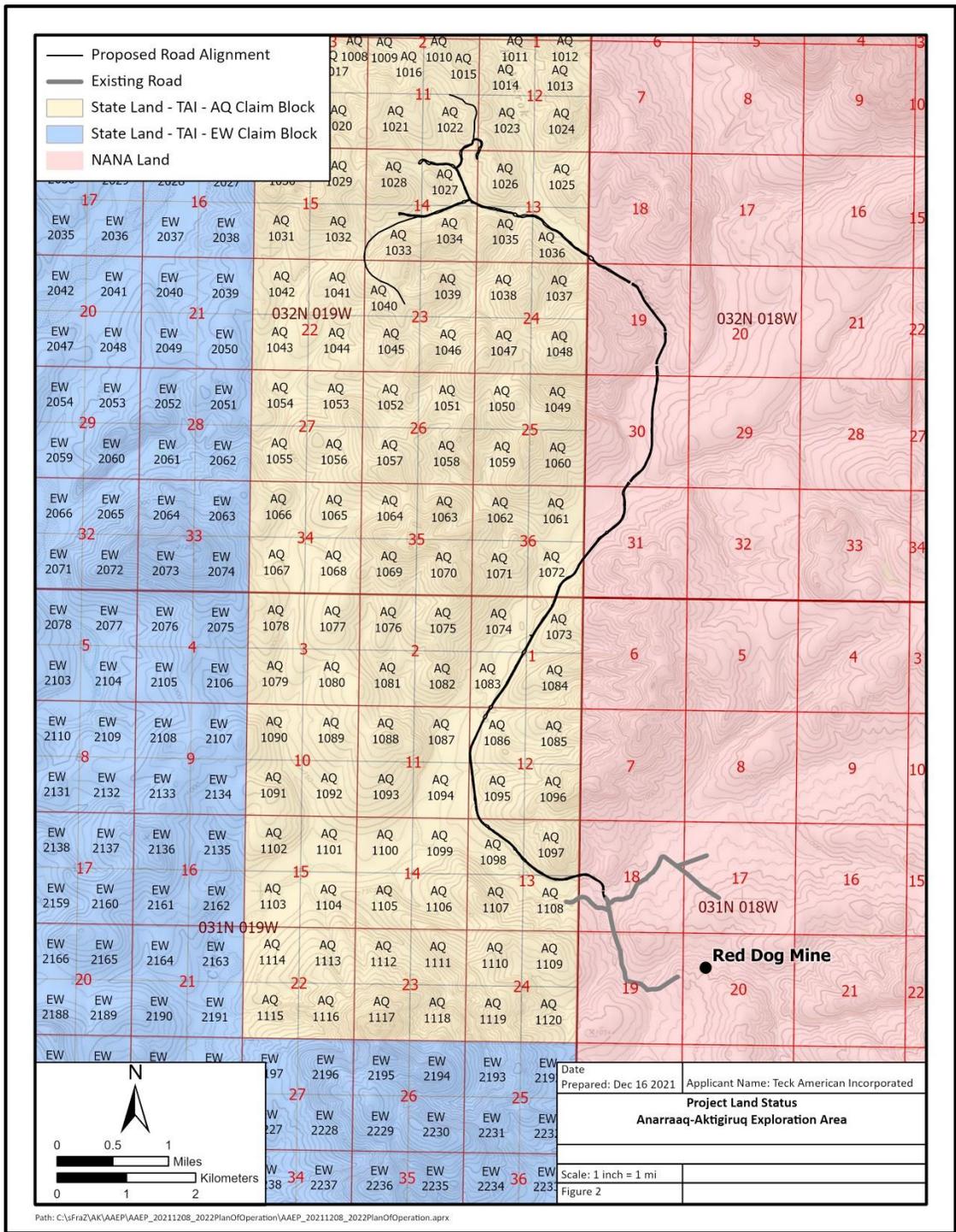


Figure 2. Project Land Status Map

Table 1. Mining Claims included in this Plan

| ADL No. | Claim Name | Location Date | Map Reference MTRS Quarter Section |
|----------------|-------------------|----------------------|---|
| 725339 | AQ 1021 | 07/Sep/2017 | Kateel River, 32N 19W, 11, SW |
| 725340 | AQ 1022 | 07/Sep/2017 | Kateel River, 32N 19W, 11, SE |
| 725341 | AQ 1023 | 07/Sep/2017 | Kateel River, 32N 19W, 12, SW |
| 725343 | AQ 1025 | 07/Sep/2017 | Kateel River, 32N 19W, 13, NE |
| 725344 | AQ 1026 | 07/Sep/2017 | Kateel River, 32N 19W, 13, NW |
| 725345 | AQ 1027 | 07/Sep/2017 | Kateel River, 32N 19W, 14, NE |
| 725346 | AQ 1028 | 07/Sep/2017 | Kateel River, 32N 19W, 14, NW |
| 725350 | AQ1032 | 07/Sep/2017 | Kateel River, 32N 19W, 15, SE |
| 725351 | AQ 1033 | 07/Sep/2017 | Kateel River, 32N 19W, 14, SW |
| 725352 | AQ 1034 | 07/Sep/2017 | Kateel River, 32N 19W, 14, SE |
| 725353 | AQ 1035 | 07/Sep/2017 | Kateel River, 32N 19W, 13, SW |
| 725354 | AQ 1036 | 07/Sep/2017 | Kateel River, 32N 19W, 13, SE |
| 725355 | AQ 1037 | 07/Sep/2017 | Kateel River, 32N 19W, 24, NE |
| 725358 | AQ 1040 | 07/Sep/2017 | Kateel River, 32N 19W, 23, NW |
| 725359 | AQ 1041 | 07/Sep/2017 | Kateel River, 32N 19W, 22, NE |
| 725390 | AQ 1072 | 07/Sep/2017 | Kateel River, 32N 19W, 36, SE |
| 725391 | AQ 1073 | 07/Sep/2017 | Kateel River, 31N 19W, 1, NE |
| 725392 | AQ 1074 | 07/Sep/2017 | Kateel River, 31N 19W, 1, NW |
| 725401 | AQ 1083 | 07/Sep/2017 | Kateel River, 31N 19W, 1, SW |
| 725402 | AQ 1084 | 07/Sep/2017 | Kateel River, 31N 19W, 1, SE |
| 725404 | AQ 1086 | 07/Sep/2017 | Kateel River, 31N 19W, 12, NW |
| 725405 | AQ 1087 | 07/Sep/2017 | Kateel River, 31N 19W, 11, NE |
| 725412 | AQ 1094 | 07/Sep/2017 | Kateel River, 31N 19W, 11, SE |
| 725413 | AQ 1095 | 07/Sep/2017 | Kateel River, 31N 19W, 12, SW |
| 725415 | AQ 1097 | 07/Sep/2017 | Kateel River, 31N 19W, 13, NE |
| 725416 | AQ 1098 | 07/Sep/2017 | Kateel River, 31N 19W, 13, NW |
| 725417 | AQ 1099 | 07/Sep/2017 | Kateel River, 31N 19W, 14, NE |
| 725425 | AQ 1107 | 07/Sep/2017 | Kateel River, 31N 19W, 13, SW |
| 725426 | AQ 1108 | 07/Sep/2017 | Kateel River, 31N 19W, 13, SE |

2.0 DESCRIPTION OF OPERATIONS

These are the principal activities included in this Plan of Operations:

- Constructing ~9.3 miles of exploration access road starting from the Fish Weir Road at the Red Dog Mine and extending along Ikalukrok Creek to the proposed portal pad site.
- Constructing ~3.1 miles of secondary roads to connect the proposed exploration access road to proposed surface pads described below.
- Constructing surface pads referred to in this Plan as the camp pad, portal pad, main vent-raise pad, north and south vent-raise pads and laydown pads 1 and 2.
- Developing two material sites (including blasting and crushing) on TAI owned and operated state mining claims to provide sufficient material for road and surface pad construction, and
- Reclamation, including a reclamation cost estimate for the reclamation of the access road, secondary roads, surface pads, and material sites on State mining claims and NANA land.

All personnel working on the Phase I construction program will be housed in facilities at the Red Dog Mine.

2.1 Construction Operations

2.1.1 CONSTRUCTION SCHEDULE

The Phase I Construction Schedule is outlined in Table 2 below. Construction activities are tentatively scheduled to begin in Q1 2023 and be completed by the end of 2023. This schedule may change subject to weather, equipment availability, timing and duration of spring freshet, permitting delays, or other unforeseen circumstances. Initially, construction activities will be focused on advancing the access road.

Construction will start at the north end of the existing fish-weir road at the Red Dog Mine and proceed to the north.

Ice bridges will be used to allow access road construction to advance in winter; bridge installation will lag somewhat behind the road construction until spring.

As soon as practical, construction of laydown pads 1 and 2, and portal and camp pads will proceed following initial access road construction. Secondary road construction will follow as required through 2023 to provide construction access for the vent-raise pads. The vent-raise pads may be completed after 2023 but in time to support development of the vent raises, later in the underground ramp development program (Phase II).

Table 2. Tentative Construction Schedule

| Tentative Construction Schedule - Anarraaq and Aktigiruaq Exploration Program - Phase 1 | | | | | | | | | | | | | | | | | |
|---|-------|---|---|-------|---|---|-------|---|---|-------|---|---|-------|---|---|-------|---|
| | Q1'23 | | | Q2'23 | | | Q3'23 | | | Q4'23 | | | Q1'24 | | | Q2'24 | |
| | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M |
| Exploration Access Road | ■ | | | ■ | | | | | | | | | | | | | |
| Portal Pad | | | | ■ | | | ■ | | | | | | | | | | |
| Camp Pad | | | | ■ | | | ■ | | | | | | | | | | |
| Laydown Pad 1 | | | | | | | ■ | | | | | | | | | | |
| Laydown Pad 2 | | | | | | | | | | ■ | | | | | | | |
| Main Vent-Raise Road and Pad | | | | | | | | | | ■ | | | | | | | |
| South Vent-Raise Road and Pad | | | | | | | | | | | | | ■ | | | | |
| North Vent-Raise Road and Pad | | | | | | | | | | | | | ■ | | | | |

2.1.2 EXPLORATION ACCESS ROAD AND SECONDARY ROAD CONSTRUCTION

Beginning with a bridge crossing on Red Dog Creek, the access road will be constructed for approximately 9.3 miles from the north end of the fish-weir road north of the Red Dog Mine tailings storage facility along Red Dog and Ikalukrok creeks to the proposed portal site (Figure 1). Following a short break in construction activities during spring freshet, construction will resume with a focus on completing roads and the surface facility pads.

Access road construction will start with snow removal. Geotextile will be placed where there is evidence of moisture-rich frozen soils that may be subject to thermal instability and settling. TAI anticipates that geotextile will be placed under approximately 50% of the road. Winter road construction allows clearing followed by placement of road fill, all under freezing conditions which minimizes thermal impacts/melting that would otherwise be associated with summer construction in ice-rich soils. Likely owing to frozen ground conditions, woody organics will be removed with a pass of the dozer and road fill will be placed on the frozen soil or geotextile. As a result, TAI does not anticipate stockpiling significant volumes of organics or topsoil. TAI plans to advance an ice road adjacent to, and simultaneous with construction of, the access road to provide two-way access and otherwise support construction activities. The ice road will consist of pre-packing existing snow coverage, adding any additional snow necessary to make a level driving surface, then adding water along the ice road alignment to stabilize the surface for driving. Water will be withdrawn from creeks within the area or the Bons Reservoir at the Red Dog Mine. In addition to the ice road alignment, temporary ice pads will be utilized near the five bridge construction sites as laydown yards for temporary storage of materials and equipment utilized in bridge construction.

The access road will utilize cut and fill methods as illustrated generally in Figure 3. Sufficient fill will be placed to build up the road surface to meet the road design specifications. In 2017 and 2018, TAI collected 26 samples from proposed road cuts along the road alignment (SRK, 2019). TAI anticipates excavating some potentially acid generating (PAG) material along road and pad

cuts and is authorized by ADEC to manage those materials in accordance with the approved Construction Rock Handling Plan as described in Section 2.3.

The access road will have a driving surface up to 30 ft.-wide with wider pullouts located periodically along the road, to allow passing. Total surface disturbance for the main access road will be approximately 79 acres. Of that total, 30 acres will occur on NANA land and 49 acres will occur on State land.

Road and pad construction will require approximately 989,000 yd³ of fill which will be obtained from cut sections of the road, material sites developed along the road, and the existing DD-2 material site at the Red Dog Mine. The locations of new material sites are illustrated in Figure 1 and discussed and illustrated in more detail in Section 2.1.3.

TAI will develop as many as four material sites; two on TAI owned and operated mining claims on State land and two on NANA land. TAI is seeking authorization to develop the material sites on State land as part of this PoO approval and TAI understands it will be required to purchase the material it extracts from State land regardless of whether the material is used for road construction on State or NANA land. TAI has included the reclamation costs for all four material sites in its reclamation cost estimate.

The engineering drawings for the access road, secondary roads and surface pads are included in Appendix A. Typical construction equipment that will be used for road construction is listed in Table 3.

Five steel span bridges will be installed as part of the road construction for water crossings, including the fish-bearing streams as illustrated in Figure 1. A typical bridge section is shown in Figure 4. Bridge crossings are planned for Red Dog Creek (1), Ikalukrok Creek (3), and Grayling Jr. Creek (1). Of these, the Red Dog Creek crossing, the first Ikalukrok Creek crossing, and the Grayling Jr. Creek crossing are in fish-bearing streams and require Title 16 Fish Habitat Permits from ADF&G. These permits were obtained in 2018 and remain in effect for the life of the structure (ADF&G, 2018a, b, and c).

The West Fork Ikalukrok Creek crossing, which is not a fish-bearing stream, will consist of four large-diameter culverts (two 8-ft. diameter primary culverts and two 7-ft. overflow culverts). A profile of the West Fork Ikalukrok crossing is shown in Figure 5. In addition, approximately 51 culverts will be installed for smaller drainage crossings and wet areas along the road for an approximate total of 55 culverts.

Approximately 3.1 miles of secondary roads will be constructed to connect the exploration access road to the surface pads as shown in Figure 6. These roads will have a driving surface up to 20 feet wide and will also utilize the same cut and fill methods employed on the access road. Ditches and other Best Management Practices (BMPs) will be deployed and maintained along all roads to control storm water runoff. The surface disturbance from the secondary roads will be approximately 22 acres.

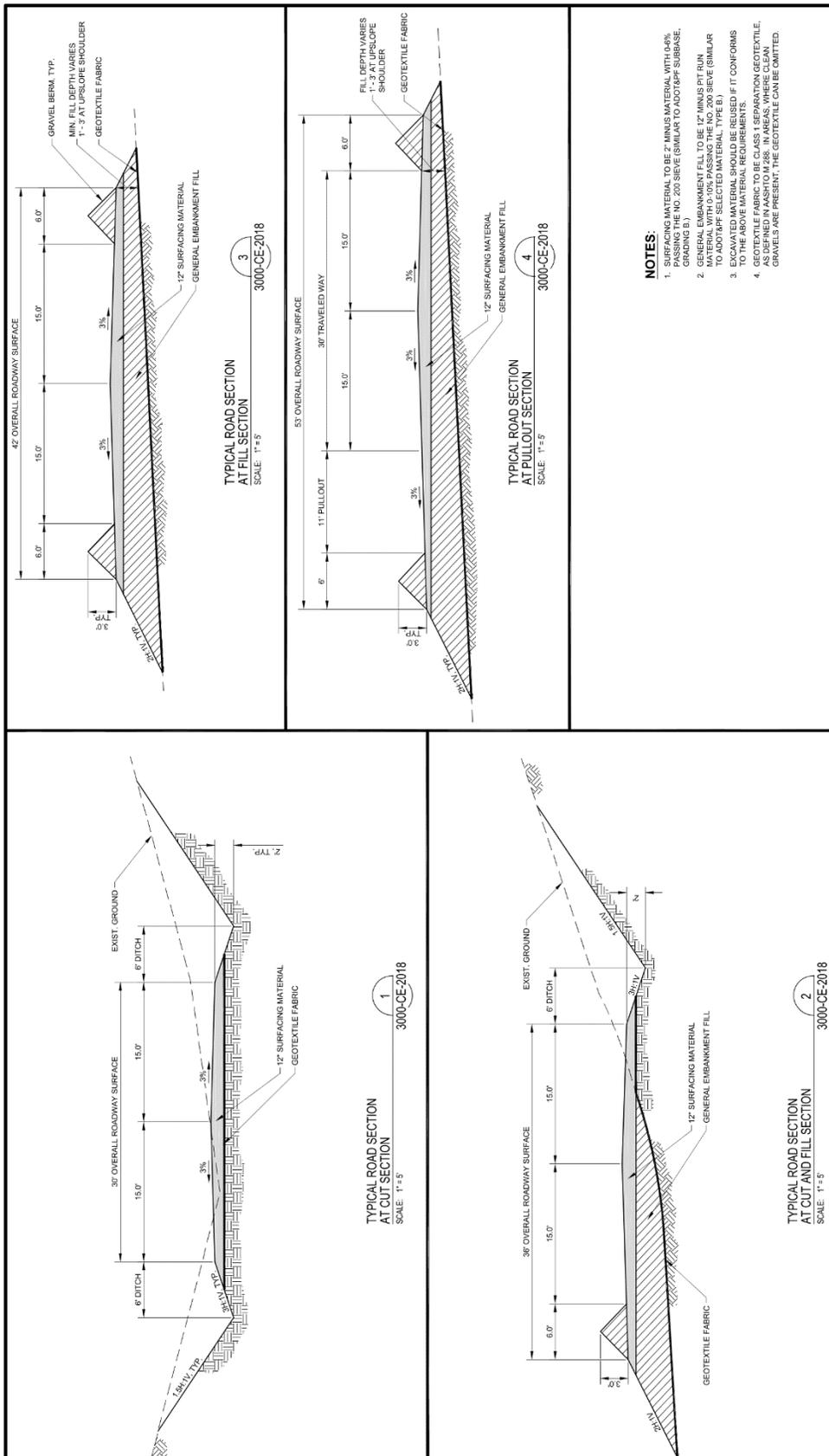


Figure 3. Access Road Typical Cut (top) and Fill (bottom) Sections

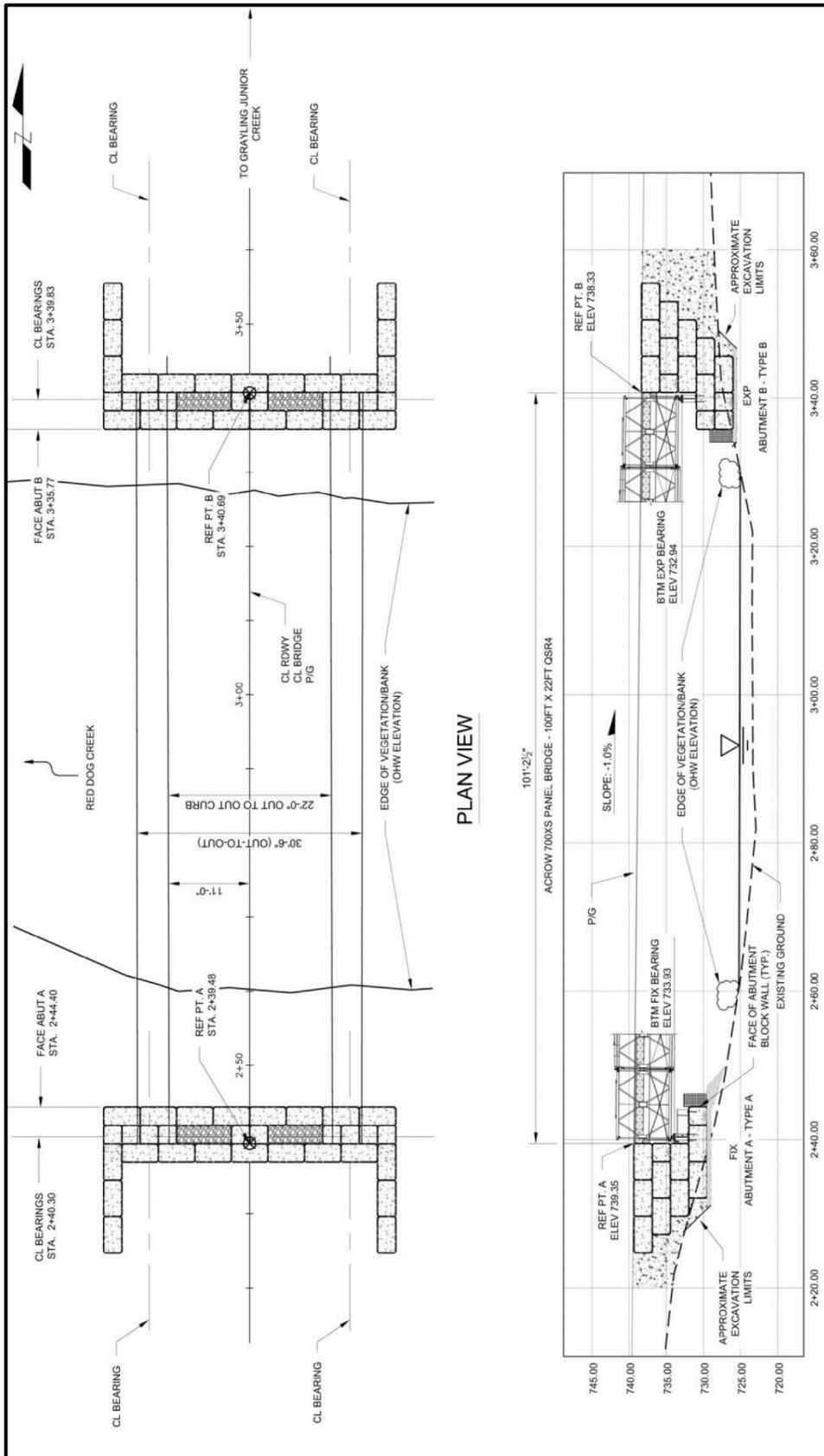


Figure 4. Typical Bridge Details

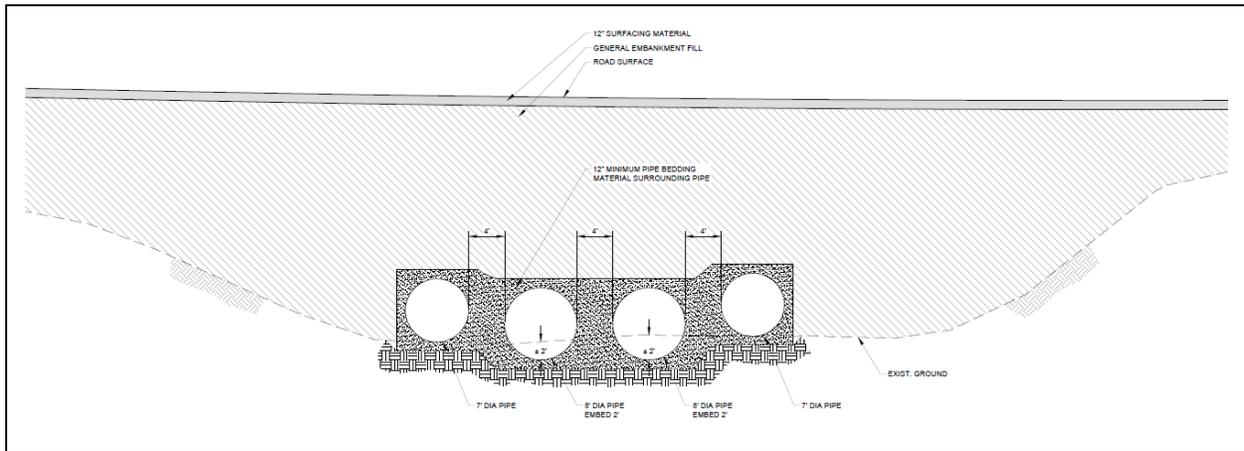


Figure 5. West Fork Ikalukrok Creek Culvert Crossing

Table 3. Typical Construction Equipment for Road and Pad Construction

| Description | Quantity, Model |
|--------------------|---------------------------|
| Haul trucks | 4, Cat 772/773 |
| Pay loader | 2, Cat 988H |
| Pay loader | 1, Cat 966 |
| Rock truck | 1, Cat 740 |
| Bull dozer | 1, Cat D10 |
| Excavator | 1, Cat 375 |
| Excavator | 1, Cat 385 |
| Water truck | 1, Cat Water Buffalo |
| Grader | 1, Cat 16H |
| Vibratory roller | 1, Cat |
| Drills/Compressors | 3, Ingersoll Rand CM-2000 |
| Manlift | 2 |
| Welding machines | 3, portable |
| Heaters | 4, portable diesel-fired |
| Light plants | 14, portable |
| Pickup trucks | 12 |
| Service truck | 3 |
| Tire truck | 1 |
| Boom truck | 1 |
| Flatbed truck | 1 |
| Powder truck | 1 |
| Tractor trailer | 1 |
| Fuel truck | 1 |

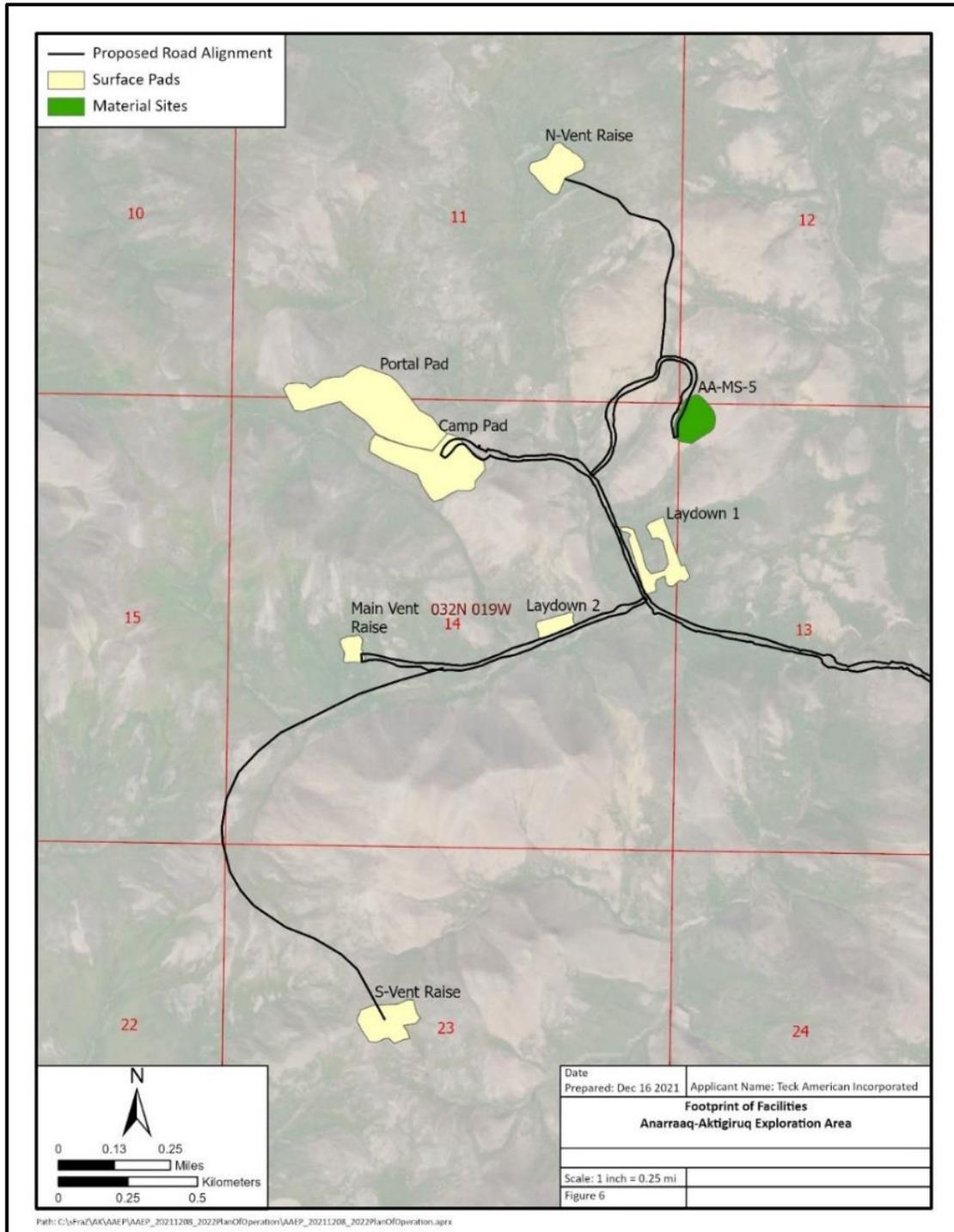


Figure 6. Anarraaq and Aktigiruk Exploration Area including Northern Portion of Proposed Exploration Access Road, Secondary Roads, Surface Pads, and Material Sites.

2.1.3 MATERIAL SITE DEVELOPMENT

TAI has identified four potential material sites for extraction of road and pad construction material. These are depicted in Figure 1. Material sites AA-MS-1 and AA-MS-5 are located on State land where TAI also holds valid State mining claims. AA-MS-3 and AA-MS-4 are on NANA land. The State of Alaska will administer the material sites/sales on State owned land under Alaska Statute (AS) 38.05.565 which allows ADNR to sell or dispose of materials under certain circumstances (special purposes) without the area being designated as a material site. TAI anticipates that formal approval of the material sites and the unit cost for materials will be incorporated in the PoO Approval document. TAI will receive authorization to develop material sites on NANA land directly from NANA.

The material sites are all on uplands and the material consists of variably-weathered shale, chert, quartzite, limestone, and/or limey sandstone. Material will be blasted, excavated, and some will be passed through a stationary grizzly before being hauled for use in road and pad construction. Some material will also be processed through a crusher. Additional material will be obtained from the DD-2 material site at the Red Dog Mine and paid for under an existing material sale contract with the State. Final development plans for these sites are pending the outcome of a geotechnical evaluation program scheduled for summer 2022. If this work results in any significant changes to the size, location or access to the material sites TAI may request an amendment to the PoO Approval to accommodate these changes prior to year-end 2022.

In 2017 and 2018, TAI collected surface outcrop grab samples from the general area of the material sites and facility pads and submitted them for Acid Base Accounting (ABA) geochemical analyses. The data indicate the material is non-acid generating (“non-PAG”) to uncertain (Figure 7). “Uncertain” means the material falls within a range that it could produce acid depending on some additional screening. That screening is described in the Construction Rock Handling Plan discussed in Section 2.3. Table 4 also summarizes the samples collected for ABA analyses from proposed material sites and road cuts in the project area.

TAI will produce run-of-mine material by blasting at each material site. Run-of-mine material will generally be -12 inch size and used as general embankment fill for road construction. AA-MS-4 is more siliceous, and the plan is to crush this material and use it to top the general embankment fill to generate a firm and durable driving surface.

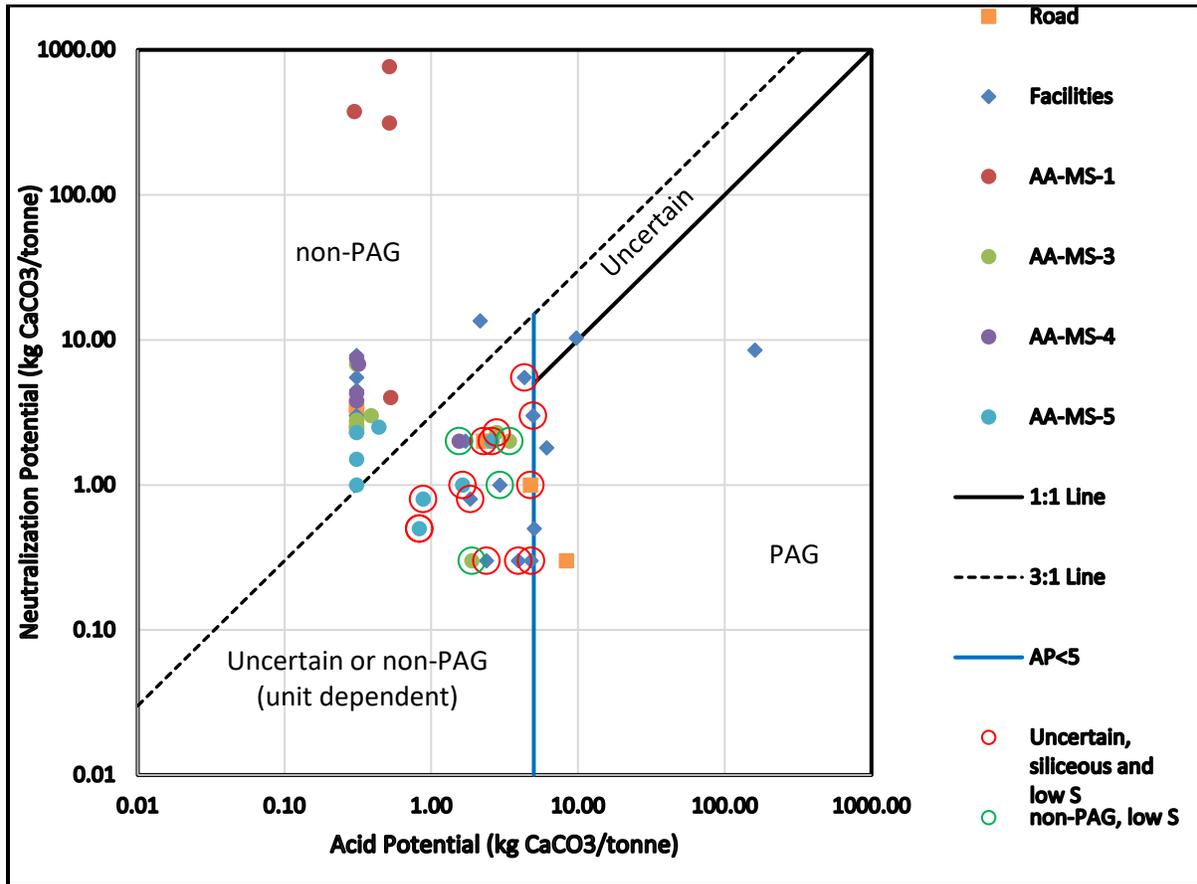


Figure 7. ARD Potential of Surface Rock Samples Classified by Surface Location
 Some minor adjustments may be made to the locations of the proposed material sites, based on additional information – including 2022 geotechnical drilling, prior to the start of construction. Potentially, TAI may need to identify alternative sites prior to or during construction. All alternative sites will be approved by ADNR or NANA and appropriate authorizations will be obtained prior to any surface disturbance at the new sites.

Pursuant to 11 AAC 96.010 (a)(1)(A) an activity involving the use of explosives and explosive devices, except firearms, requires a permit or other written authorization from ADNR. TAI will use drill and blast techniques to develop the material sites to provide construction material for the roads and surface pads. TAI is hereby formally requesting authorization to carry out blasting activities as described in this Plan, through the approval of this Plan of Operations. Packaged ammonium nitrate/fuel oil (ANFO) bulk explosive will be used as a blasting agent for developing the material sites. The ANFO will be stored at the Red Dog Mine.

Table 4. ARD Classification of Surface Rock Sample

| Sample ID | Easting WGS 84 Zone 3N (m) | Northing WGS 84 Zone 3N (m) | Stratigraphic Unit | Lithology | Units | Neutralization Potential | Acid Potential | NP/AP | TIC/AP | ARD Classification |
|-----------|-------------------------------------|--------------------------------------|-------------------------|------------------------|---------------|-----------------------------|-------------------------|---------|---------|----------------------------------|
| | | | | | | kg CaCO ₃ /t | kg CaCO ₃ /t | | | |
| 2768209 | | 7562440 | Okpi kruak | Sandstone | Outcrop | 3.8 | 0.31 | 12.16 | 3.64 | non-PAG |
| 2768235 | 587730 | 7562445 | Okpi kruak | Sandstone | Subcrop | 2 | 1.55 | 1.29 | 0.29 | non-PAG - low S |
| 205253 | 587846 | 7562495 | Okpi kruak | Sandstone | Subcrop | 6.8 | 0.32 | 21.59 | 10.82 | non-PAG |
| 205254 | 587939 | 7562444 | Okpi kruak | Sandstone | Subcrop | 7.5 | 0.31 | 24.00 | 8.73 | non-PAG |
| 205255 | 587772 | 7562445 | Okpi kruak | Sandstone | Subcrop | 4.3 | 0.31 | 13.76 | 2.18 | non-PAG - low S |
| 205244 | 585585 | 7565073 | Okpi kruak | Sandstone | Float | 9.5 | 0.31 | 30.40 | 14.55 | non-PAG |
| 205211 | 584244 | 7562390 | Okpi kruak | Mudstone | Outcrop | 0.50 | 0.31 | 1.60 | 1.45 | non-PAG - low S |
| 205245 | 585466 | 7565171 | Okpi kruak | Mudstone | Float | 3.80 | 0.31 | 12.16 | 2.18 | non-PAG - low S |
| 205250 | 587112 | 7563098 | Okpi kruak | Shale/Mudstone | Subcrop | 3.30 | 0.31 | 10.56 | 2.18 | non-PAG - low S |
| 8801 | 584609 | 7561917 | Ipewik | Shale | Drill Core | 19 | 0.31 | 60.80 | 122.91 | non-PAG |
| 205206 | 584761 | 7562042 | Ipewik | Mudstone | Outcrop | 4 | 0.31 | 12.80 | 3.64 | non-PAG |
| 205201 | 584972 | 7562065 | Middle Otuk | Chert | Subcrop | 6.30 | 1.23 | 5.12 | 5.92 | non-PAG |
| 205202 | 584907 | 7562090 | Middle Otuk | Chert | Outcrop | 12.50 | 0.31 | 40.00 | 33.45 | non-PAG |
| 205203 | 584734 | 7562004 | Middle Otuk | Chert | Outcrop | 8.00 | 0.31 | 25.60 | 26.18 | non-PAG |
| 205204 | 584790 | 7561953 | Middle Otuk | Chert | Outcrop | 1.30 | 3.37 | 0.39 | 0.81 | Uncertain - low S, but siliceous |
| 205207 | 584604 | 7562102 | Middle Otuk | Chert | Outcrop | 12.00 | 0.31 | 38.40 | 23.27 | non-PAG |
| 205208 | 584643 | 7562249 | Middle Otuk | Chert | Subcrop/Float | 12.30 | 0.31 | 39.18 | 36.20 | non-PAG |
| 205215 | 584758 | 7563357 | Middle Otuk | Chert | Float | 2.00 | 1.71 | 1.17 | 1.33 | Uncertain - low S, but siliceous |
| 205216 | 584880 | 7563273 | Middle Otuk | Chert | Float | 1.00 | 4.74 | 0.21 | 0.53 | Uncertain - low S, but siliceous |
| 205234 | 584932 | 7564085 | Middle Otuk | Chert | Subcrop | 7.80 | 0.31 | 24.96 | 16.73 | non-PAG |
| 205235 | 584798 | 7564261 | Middle Otuk | Chert | Subcrop/Float | 0.30 | 2.38 | 0.13 | 0.48 | Uncertain - low S, but siliceous |
| 205236 | 584541 | 7564220 | Middle Otuk | Chert | Float | 3.00 | 4.93 | 0.61 | 0.92 | Uncertain - low S, but siliceous |
| 205238 | 584624 | 7564322 | Middle Otuk | Chert | Subcrop | 5.50 | 4.32 | 1.27 | 1.58 | Uncertain - low S, but siliceous |
| 205239 | 584805 | 7564372 | Middle Otuk | Chert | Outcrop | 40.50 | 0.96 | 42.10 | 5.43 | non-PAG |
| 8800 | 584503 | 7564171 | Lower Otuk | Shale | Drill Core | 8.5 | 161.09 | 0.05 | 0.08 | PAG |
| 205219 | 585392 | 7563509 | Upper Siksi kpuak | Chert | Float | 0.3 | 3.93 | 0.08 | 0.12 | Uncertain - low S, but siliceous |
| 205223 | 585864 | 7564231 | Upper Siksi kpuak | Silicified shale/Chert | Subcrop | 0.5 | 0.83 | 0.60 | 0.82 | Uncertain - low S, but siliceous |
| 205224 | 585777 | 7564168 | Upper Siksi kpuak | Silicified Shale | Subcrop/Float | 2.5 | 0.44 | 5.71 | 1.04 | Uncertain - low S, but siliceous |
| 205225 | 585868 | 7564179 | Upper Siksi kpuak | Chert | Float | 1 | 0.31 | 3.20 | 4.36 | non-PAG |
| 205227 | 585982 | 7564262 | Upper Siksi kpuak | Silicified shale/Chert | Outcrop | 1 | 1.64 | 0.61 | 0.69 | Uncertain - low S, but siliceous |
| 205228 | 585849 | 7564211 | Upper Siksi kpuak | Chert | Outcrop | 2 | 2.59 | 0.77 | 0.18 | Uncertain - low S, but siliceous |
| 205229 | 585842 | 7564230 | Upper Siksi kpuak | Chert | Float | 0.8 | 0.88 | 0.91 | 0.77 | Uncertain - low S, but siliceous |
| 205231 | 585721 | 7564081 | Upper Siksi kpuak | Silicified shale | Subcrop | 1.5 | 0.31 | 4.80 | 2.91 | Uncertain - low S, but siliceous |
| 205233 | 585047 | 7564012 | Upper Siksi kpuak | Silicified shale | Outcrop | 0.8 | 1.85 | 0.43 | 0.49 | Uncertain - low S, but siliceous |
| 205240 | 585633 | 7564263 | Upper Siksi kpuak | Chert | Subcrop/Float | 2 | 2.28 | 0.88 | 0.60 | Uncertain - low S, but siliceous |
| 205241 | 585687 | 7564551 | Upper Siksi kpuak | Chert | Outcrop | 1.5 | 3.13 | 0.48 | 0.36 | Uncertain - low S, but siliceous |
| 205242 | 585677 | 7564731 | Upper Siksi kpuak | Chert | Outcrop | 0 | 1.97 | 0.05 | 0.23 | Uncertain - low S, but siliceous |
| 205243 | 585769 | 7564876 | Upper Siksi kpuak | Chert | Subcrop | 1.3 | 0.63 | 2.07 | 1.81 | Uncertain - low S, but siliceous |
| 205246 | 586140 | 7564762 | Upper Siksi kpuak | Chert | Subcrop | 3.3 | 0.31 | 10.56 | 4.36 | non-PAG |
| 205248 | 586331 | 7564622 | Upper Siksi kpuak | Chert | Outcrop | 5 | 0.31 | 16.00 | 11.64 | non-PAG |
| 205249 | 586721 | 7563436 | Upper Siksi kpuak | Chert | Outcrop | 2.5 | 0.31 | 8.00 | 8.00 | non-PAG |
| 8799 | 584503 | 7564171 | Upper Siksi kpuak | Chert | Drill Core | 13.5 | 2.16 | 6.24 | 7.88 | non-PAG |
| 205256 | 587903 | 7558343 | Upper Siksi kpuak | Chert | Outcrop | 6.8 | 0.31 | 21.76 | 18.91 | non-PAG |
| 2768210 | 587993 | 7562687 | Middle Siksi kpuak | Shale | Outcrop | 0.3 | 2.13 | 0.14 | 0.96 | non-PAG - low S |
| 2768211 | 585363 | 7564079 | Middle Siksi kpuak | Shale | Outcrop | 3.5 | 0.31 | 11.20 | 1.45 | non-PAG - low S |
| 2768212 | 585924 | 7563993 | Middle Siksi kpuak | Shale | Outcrop | 4.5 | 0.31 | 14.40 | 1.45 | non-PAG - low S |
| 205217 | 585342 | 7563356 | Middle Siksi kpuak | Shale | Outcrop | 1 | 2.94 | 0.34 | 0.23 | non-PAG - low S |
| 205222 | 585782 | 7563895 | Middle Siksi kpuak | Shale | Outcrop | 5.5 | 0.31 | 17.60 | 2.91 | non-PAG - low S |
| 205226 | 585869 | 7564234 | Middle Siksi kpuak | Shale | Float | 2.3 | 0.31 | 7.36 | 2.18 | non-PAG - low S |
| 205230 | 585688 | 7564014 | Middle Siksi kpuak | Shale | Subcrop | 1 | 0.31 | 3.20 | 2.18 | non-PAG - low S |
| 205232 | 585090 | 7564002 | Middle Siksi kpuak | Shale | Outcrop | 3 | 0.31 | 9.60 | 3.64 | non-PAG |
| 205247 | 586107 | 7564736 | Middle Siksi kpuak | Shale | Subcrop | 2.3 | 0.31 | 7.36 | 2.18 | non-PAG - low S |
| 8802 | 585310 | 7563565 | Middle Siksi kpuak | Shale | Drill Core | 5.3 | 0.31 | 16.96 | 18.91 | non-PAG |
| 205257 | 587869 | 7558356 | Middle Siksi kpuak | Shale | Outcrop | 2.8 | 0.31 | 8.96 | 2.91 | non-PAG - low S |
| 205258 | 587727 | 7558415 | Middle Siksi kpuak | Shale | Float | 2.5 | 0.31 | 8.00 | 2.18 | non-PAG - low S |
| 205259 | 587627 | 7558473 | Middle Siksi kpuak | Shale | Outcrop | 2.5 | 0.31 | 8.00 | 2.18 | non-PAG - low S |
| 2768203 | 587223 | 7557488 | Lower Siksi kpuak | Siliceous shale | Subcrop | 6.3 | 3.69 | 1.71 | 0.74 | Uncertain - low S, but siliceous |
| 2768204 | 587358 | 7557466 | Lower Siksi kpuak | Siliceous shale | Subcrop | 2.8 | 2.00 | 1.40 | 0.57 | Uncertain - low S, but siliceous |
| 2768205 | 587358 | 7557444 | Lower Siksi kpuak | Siliceous shale | Talus | 3.5 | 2.82 | 1.24 | 0.16 | Uncertain - low S, but siliceous |
| 2768206 | 587772 | 7558497 | Lower Siksi kpuak | Siliceous shale | Subcrop | 2.3 | 2.79 | 0.83 | 0.41 | Uncertain - low S, but siliceous |
| 2768208 | 587979 | 7558521 | Lower Siksi kpuak | Shale | Outcrop | 0.3 | 1.89 | 0.16 | 0.36 | non-PAG - low S |
| 2768207 | 587808 | 7558533 | Lower Siksi kpuak | Chert | Outcrop | 2 | 3.41 | 0.59 | 0.20 | low S - non-PAG |
| 2768230 | 584595 | 7563413 | Lower Siksi kpuak | Shale | Drill Core | 10.3 | 9.75 | 1.06 | 1.89 | Uncertain |
| 205214 | 584290 | 7563173 | Lower Siksi kpuak | Chert | Outcrop | 7.5 | 4.61 | 1.63 | 2.46 | Uncertain - low S, but siliceous |
| 205260 | 587751 | 7558544 | Lower Siksi kpuak | Chert | Outcrop | 3 | 0.39 | 7.69 | 9.90 | non-PAG |
| 205205 | 584750 | 7561978 | Ikal ukrok | Chert | Subcrop | 0.30 | 5.35 | 0.06 | 0.17 | PAG |
| 205210 | 584304 | 7562339 | Ikal ukrok | Chert | Subcrop | 2.80 | 2.60 | 1.08 | 0.96 | Uncertain - low S, but siliceous |
| 205212 | 584202 | 7562770 | Ikal ukrok | Chert | Subcrop/Float | 1.30 | 6.64 | 0.02 | 0.17 | PAG |
| 205213 | 584318 | 7562957 | Ikal ukrok | Chert | Subcrop | 1.50 | 4.03 | 0.02 | 0.23 | Uncertain - low S, but siliceous |
| 205220 | 585825 | 7563778 | Ikal ukrok | Chert | Float | 1.80 | 6.12 | 0.29 | 0.15 | PAG |
| 205221 | 585869 | 7563665 | Ikal ukrok | Chert | Float | 0.30 | 4.80 | 0.06 | 0.28 | Uncertain - low S, but siliceous |
| 205237 | 584515 | 7564396 | Ikal ukrok | Chert | Outcrop | 0.50 | 5.03 | 0.10 | 0.18 | PAG |
| 205252 | 587598 | 7562709 | Ikal ukrok | Chert | Float | 0.30 | 8.36 | 0.04 | 0.08 | PAG |
| 2768213 | 584380 | 7563391 | Ikal ukrok | Siliceous shale | Outcrop | 3.3 | 3.42 | 0.97 | 0.20 | Uncertain - low S, but siliceous |
| 205209 | 584404 | 7562289 | Ikal ukrok | Shale | Subcrop | 1 | 4.55 | 0.22 | 0.20 | non-PAG - low S |
| 205251 | 587384 | 7562895 | Ikal ukrok | Shale | Float | 2.5 | 6.63 | 0.02 | 0.10 | PAG |
| 205218 | 585482 | 7563438 | Ikal ukrok | Silicified Shale | Outcrop | 0.5 | 12.12 | 0.01 | 0.06 | PAG |
| 2768201 | 587479 | 7554214 | Undifferentiated Kogruk | Chert | Outcrop | 4 | 0.53 | 7.61 | 32.00 | non-PAG |
| 205261 | 587446 | 7553962 | Undifferentiated Kogruk | Chert | Outcrop | 375 | 0.30 | 1241.91 | 1158.37 | non-PAG |
| 205262 | 587449 | 7554077 | Undifferentiated Kogruk | Limestone | Outcrop | 313 | 0.52 | 599.89 | 562.78 | non-PAG |
| 2768202 | 587471 | 7554168 | Undifferentiated Kogruk | Limestone | Outcrop | 764 | 0.52 | 1478.97 | 1405.23 | non-PAG |

Based on current road and pad designs, TAI anticipates requiring approximately 989,000 yd³ of fill to construct the road, berms, and pads and most of this material will be extracted from the material sites. Up to approximately 166,000 yd³ of material will be excavated from the cut sections of the road. However, some of that will be unusable as fill elsewhere if it is determined to be PAG material when it is excavated and will be managed in accordance with the Construction Rock Handling Plan as discussed in Section 2.3. The material sites are briefly described below:

AA-MS-1

This site will be located on State land at approximately milepost (MP) 0.5 on the proposed access road. The material has been mapped as limestone of the Kogruk Formation. The entire AA-MS-1 Area was classified as non-PAG material based on mapped Kogruk Formation and the non-PAG low sulfur classification of five ABA samples collected from within the material source area. AA-MS-1 could be developed into a large material site owing to the high quality of the material. Initially, TAI estimates disturbing approximately 4.0 acres to extract 250,000 yd³ of material but the site may ultimately be as large as 16 acres or more. The site is illustrated in Figure 8.

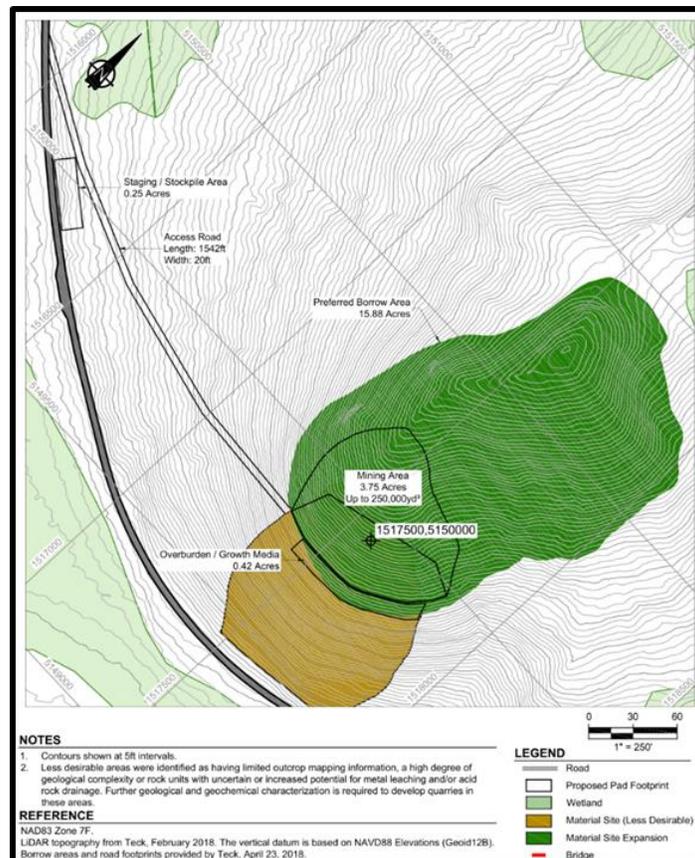


Figure 8. Material Site AA-MS-1

AA-MS-2

Based on the 2017 and 2018 ABA data and the geologic complexity, this site has been eliminated from development plans due to the poor suitability of the material.

AA-MS-3

This site will be located on NANA land at approximately MP 4.2 on the proposed access road. The material has been mapped as Lower Siksikpuq Formation consisting of shale and chert. The north half of the AA-MS-3 area was classified as having an uncertain ARD potential. Of the three ABA samples collected within, or adjacent to this section of AA-MS-3, one had an uncertain

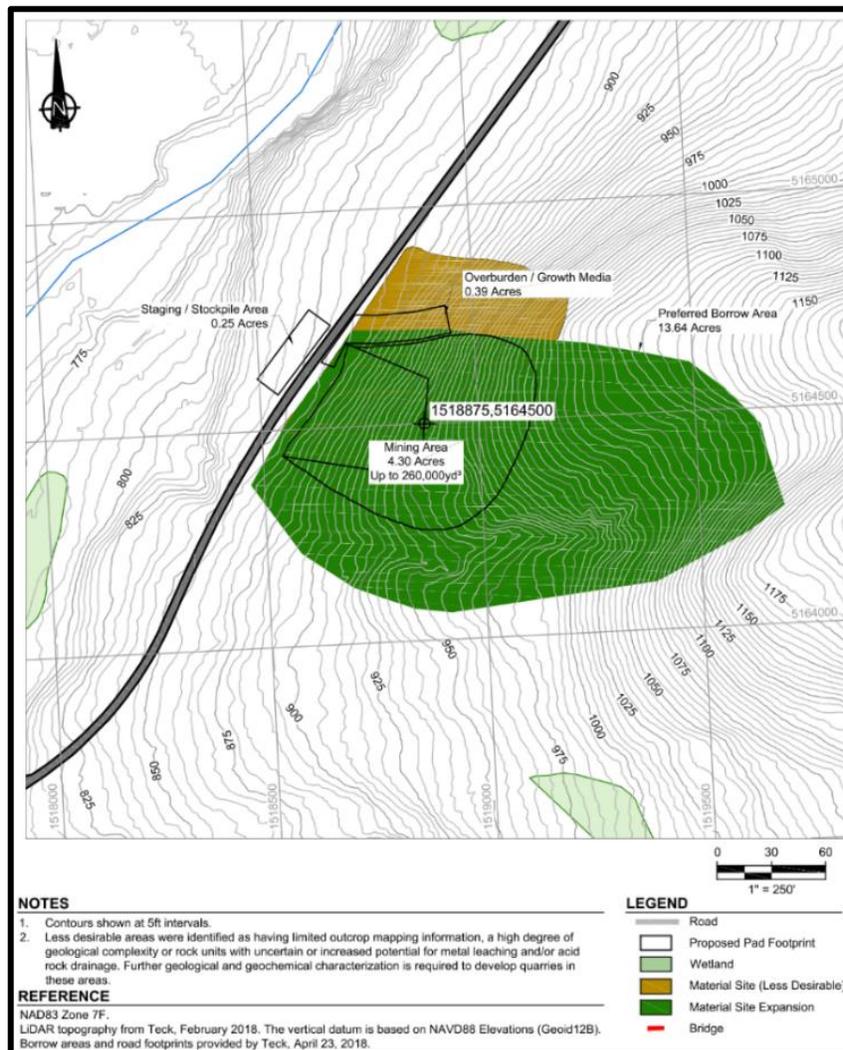


Figure 9. Material Site AA-MS-3

classification and two had a non-PAG classification. The southern half of the AA-MS-3 was classified as non-PAG or an area of geological uncertainty due to the lack of outcrops. Two non-

PAG samples were collected from within the material source area boundary and two samples with a non-PAG classification were collected southeast of the material source area. This material site straddles an unnamed stream drainage which may restrict full development of the site. Initially, TAI plans to disturb approximately 4.3 acres at this site to excavate approximately 260,000 yd³ of material but the site may potentially be expanded to a disturbance of approximately 13 acres. The site is illustrated in Figure 9.

AA-MS-4

This site will be located on NANA land at MP 7.2 on the proposed access road. The material has been mapped as sandstone/quartzite from the Okpikruak Formation and the ARD potential ranges from non-PAG to uncertain. The five ABA samples collected within the material source area boundary are considered non-PAG. However, there remains some geological uncertainty in the northern portion due to the lack of outcrops. Initially, TAI plans to disturb approximately 5.5 acres at this site to excavate approximately 280,000 yd³ of material but potentially the site may be expanded to approximately 10 acres. The site is illustrated in Figure 10.

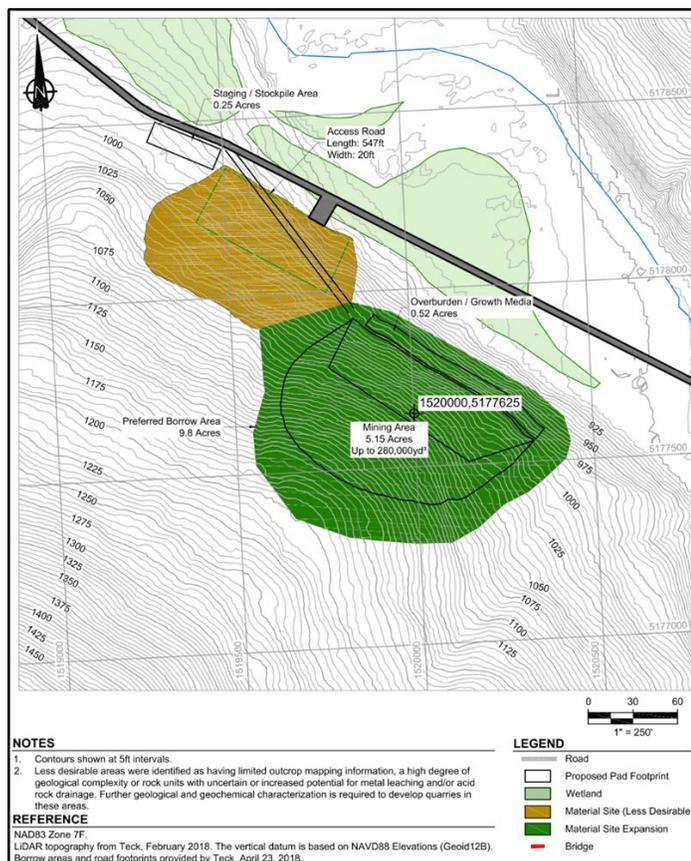


Figure 10. Material Site AA-MS-4

AA-MS-5

This site will be located on State land on a secondary road developed for access to this site. Material from the site has been characterized as chert from the Upper Siksikpuk and shale from the Middle Siksikpuk, which are typically classified as non-PAG to uncertain. However, because outcrop is absent over most of source area at AA-MS-5, there is a degree of geologic uncertainty for this site. Six ABA samples were collected within this material source, three were non-PAG and three were classified as uncertain. Two small portions of AA-MS-5 were classified as non-PAG, and one portion was classified as uncertain. Initially, TAI plans to disturb approximately 3.2 acres at this site to excavate approximately 125,000 yd³ of material but the site may potentially be expanded in size and disturb approximately 4.5 acres. The site is illustrated in Figure 11.

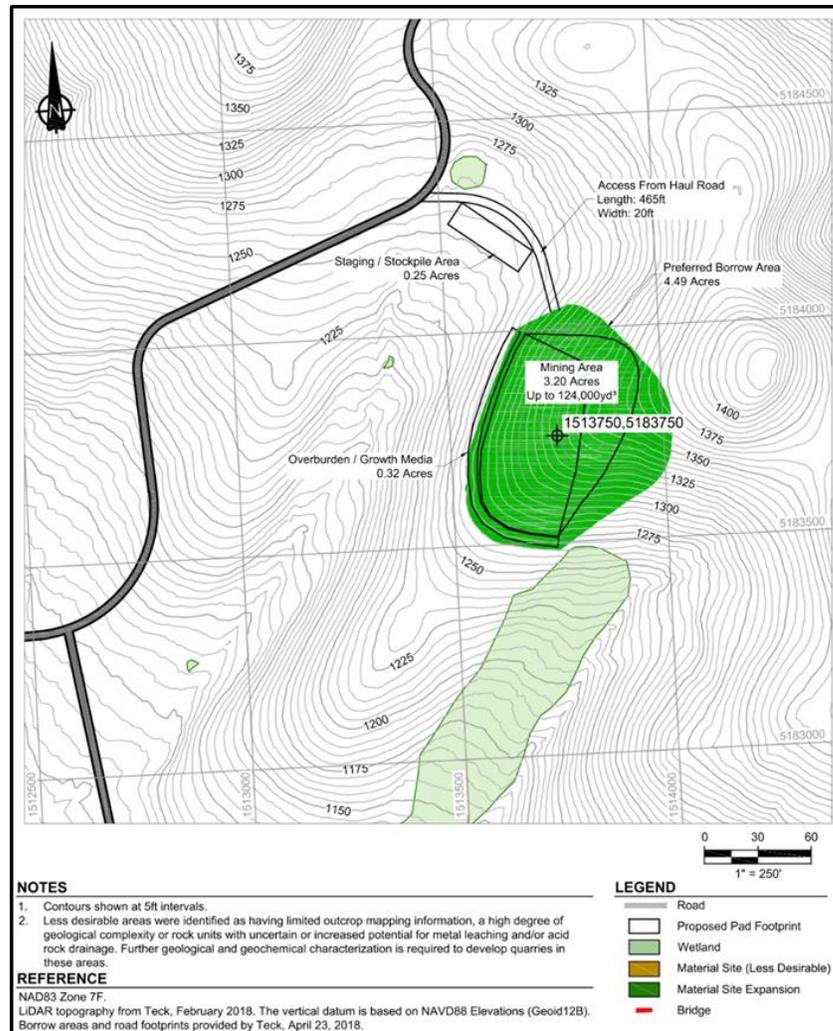


Figure 11. Material Site AA-MS-5

2.1.4 SURFACE PAD CONSTRUCTION

The general arrangement of the surface pads is illustrated in Figure 6 and includes the portal pad, camp pad, laydown pads 1 and 2, and main, north, and south vent-raise pads. The pads are all connected to the exploration access road by secondary roads.

The portal pad, camp pad, vent-raise pads, and laydown pads will consist of at least 3 feet of general embankment fill from the material sites, capped with material suitable to create a driving surface. These pads will be constructed on uplands, where settling and thermal instability is not a concern. As with the access road, any salvageable topsoil will be segregated and stockpiled adjacent to the pads during construction for later use in reclamation, but little salvageable soil is anticipated in these sub-alpine uplands.

The camp pad and portal pad, both illustrated on Figure 12, are contiguous and will have combined dimensions of 600 ft. by 2,000 ft., occupying an area of approximately 32 acres. In the future, pending approval of the Phase II PoO amendment, the camp, portal, power generating facility, equipment maintenance facility, fuel storage facility, water treatment plants, core logging, and other facilities will be constructed on these pads.

Laydown pads 1 and 2 are intended for future storage of drill core, drilling and mining equipment and other supplies, some of which will be stored in stacked Conex containers. These are illustrated in Appendix A. Laydown pad 1 will have a horseshoe shape and approximate dimension of 850 ft. by 550 ft. comprising an area of approximately 5.7 acres. Laydown pad 2 will have approximate dimensions of 200 ft. by 500 ft. comprising approximately 2.0 acres.

The main vent-raise pad will be the location of the main vent raise where it breaches the surface. The main vent-raise pad is approximately 1.7 acres in size. The north and south vent-raise pads will be where those vent-raises breach the surface. The north vent-raise pad is approximately 9.0 acres in size and the south vent-raise pad is approximately 6.0 acres in size. Vent-raise pads are illustrated in Appendix A. Although the vent-raise pads will be approved and constructed as part of this Plan, the construction of the vent-raises will be permitted in Phase II as part of the underground exploration program, through the future amendment to this Plan.

2.2 TEMPORARY WATER USE

TAI and/or its construction contractors will be relying on water application to suppress dust during construction of the access road and surface pads and initially, to construct an ice/snow road and ice road stream crossings at the start of road construction activities. Small volumes of water will also be required for concrete work at the bridge abutments. Water will be sourced from one or more streams along the access road, or Bons Reservoir. In addition to continued use of existing authorizations, TAI is applying for a Temporary Water Use Authorization (TWUA) from ADNR to withdraw water from Bons Reservoir, Red Dog Creek, Ikalukrok Creek, and two tributaries to Ikalukrok Creek along the proposed access road.



Figure 12. Conceptual Layout of Portal and Camp Pads

2.3 CONSTRUCTION ROCK MANAGEMENT

In the process of constructing the access road and pads, and developing the material sites, TAI anticipates having to identify, segregate, and manage potentially acid generating (PAG) rock. PAG is widespread in the region owing to the intrinsic characteristics of bedrock. The following discussion describes what Best Management Practices (BMPs) will be applied that will allow TAI to proceed with construction activities while managing any PAG and being protective of the environment.

The BMPs described below are summarized from the Anarraaq and Aktigirug Exploration Program Revised Construction Rock Handling Plan (TAI, 2022). The plan was initially approved by ADEC in February 2019 and TAI submitted an amendment to the plan in January 2022 reflecting minor modifications to the access road alignment but preserving the construction rock characterization and segregation procedures. TAI anticipates approval of the amended plan in advance of initiating road construction in 2023.

TAI has identified the geological units at material sites, along cut segments of the proposed roads and at the pads where bedrock will be blasted and removed to achieve the design grade. Those cut segments have been compared with TAI's regional geologic map and the locations of geochemical samples collected in 2017 and 2018 to identify cuts that have the potential to produce PAG rock when they are excavated.

TAI will implement the Construction Rock Handling Plan with the objective of managing excavated rock during construction from all areas where bedrock is excavated. The following BMPs are from the TAI Construction Rock Handling Plan:

- A trained geologist will visually examine the bedrock cut material and decide whether the material is suitable for construction (i.e., non-PAG) based on the following:
 - Once “bedrock” is exposed in the excavation the geologist will examine it and confirm it corresponds to the recognized geologic units in the maps provided in the construction rock handling plan (typically should agree with map). If the geologist determines the bedrock is not part of the geologic unit assigned to it on the ARD Classification map (unit uncertainty), or the unit assigned has uncertainty in the ARD classification (geochemical uncertainty), then the ARD classification will continue with the steps described below.
 - The geologist will examine hand samples from the bedrock cut and visually estimate the sulfide types (i.e., pyrite, galena, sphalerite, pyrrhotite) and abundance (%) of each.
 - The geologist will use the portable x-ray diffraction (pXRF) instrument to test for Sulfur as Fe-sulfide and Acid Potential (AP) from at least five fresh bedrock surfaces within the excavation within a 25m² area. The pXRF will be pre-programmed for the rock types present and the calculation process for Fe-sulfide and AP is automated.

- The geologist will use dilute (10%) HCl to perform fizz tests on the same bedrock surfaces for the presence of carbonate and describe the effervescence as weak or strong.
 - The geologist will use this information and criteria provided in the construction rock handling plan to assign the rock as either PAG or non-PAG.
- Road cut material designated as PAG will be segregated, removed from the cut and hauled to a temporary storage area prior to final disposal. TAI is considering permanent disposal sites at AA-MS-1 and or at the Red Dog Mine, but in either case the final disposal will be approved by ADEC.
 - For PAG encountered on pads, the material may be removed or may be used as internal fill in the same pad if placed more than 100 ft. inside the designed edge of the pad and covered with at least 3 feet of clean fill as part of the pad construction.
 - PAG identified at material sites will be disturbed as little as practicable and left in these material sites.
 - Road cut material designated as non-PAG material is suitable for use for all aspects of road and pad construction.

2.4 Storm Water Management

During the road and surface pad construction, storm water will be managed in accordance with ADEC Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activities (2020 MSGP, APDES General permit number AKR060000, authorization number. AKR06AF84). Storm water management will be part of the road construction contractor's contractual obligation with TAI. In advance of construction, the contractor will review and revise as necessary the existing Storm Water Pollution Prevention Plan (SWPPP) submitted to ADEC by TAI as part of the Notice of Intent (NOI) for coverage under the MSGP (revised and re-submitted June 2020 for the 2020 MSGP).

The road construction contractor will be responsible for all aspects of storm water management during the construction period. Storm water BMPs required for road construction that may include settling basins, velocity dissipaters, silt fences, wattles, etc., will be constructed, installed, and maintained by the road contractor. After construction, TAI will assume management of the BMPs and overall management of storm water.

2.5 Fuel Management

Fuel for the access road construction activities will be sourced from bulk storage at the Red Dog Mine. Spill prevention and response for fuel storage and handling at the Mine is described in the Red Dog Mine Spill Prevention, Control, and Countermeasure (SPCC) Plan, authorized by the Environmental Protection Agency (EPA), and the Oil Discharge Prevention and Contingency Plan (ODPCP), authorized by ADEC.

Fuel storage and handling for road construction will be managed in accordance with an SPCC Plan prepared by TAI. During road construction, fuel sourced from Red Dog Mine bulk storage will be hauled in fuel truck(s) directly to the equipment in the field for refueling. Once the access road construction progresses, a temporary fuel storage tank will be placed at a practical location along the access road and the fuel haul truck will refuel construction equipment along the road from there. The TAI construction SPCC Plan will be appropriately certified and implemented prior to fuel storage in regulated quantities at the road construction or Red Dog Mine staging areas.

2.6 Minimization of Fish and Wildlife Impacts

Regulation 11 AAC 86.800(b)(9) requires that a Plan of Operations describe the actions to be taken to avoid or minimize detrimental effects on fish and wildlife and their habitats.

TAI has taken several steps to minimize these impacts. Teck Alaska has engaged ADF&G for more than 20 years in the Red Dog Mine area, including Ikalukrok Creek, to study the distribution and health of aquatic systems including anadromous and resident fish, aquatic invertebrates, and periphyton. These data are briefly discussed in Section 3.0 of this Plan. To avoid or minimize detrimental effects on fish and fish habitat, TAI will install five steel span bridges where the exploration access road crosses large streams, including the first three crossings (Red Dog Creek, Grayling Jr. Creek, and the first Ikalukrok Creek crossing) where the streams are known to support Arctic Grayling and Arctic Char. One large stream crossing in an area without fish present, the West Fork Ikalukrok Creek crossing near the exploration facilities area, will be constructed using fill and large diameter culverts.

Bridge construction will take place during winter months and the bridge abutment construction will be above ordinary high-water levels and without modifying the natural stream channels. The use of the bridges, rather than culverts, on crossings in fish-bearing streams will minimize effects to the natural stream channels and allow fish passage for the duration of the program. ADF&G reviewed the bridge designs of the bridges across fish bearing streams as part of the Title 16 permitting process.

TAI has collaborated with the Red Dog Mine environmental staff to develop procedures for exploration access road users to minimize impacts to caribou from vehicular traffic on the road. The draft caribou road procedures are included in Appendix D. The Red Dog Mine has developed a similar plan for use along the DeLong Mountain Transportation System (DMTS) road to the port, which includes temporary road closures or halted traffic to accommodate caribou movements. That Red Dog Mine plan served as the basis for the exploration access road caribou procedures.

TAI also recognizes it has certain obligations to avoid disturbance and taking of Bald Eagles, Golden Eagles, and migratory birds under the various acts that protect these species.

TAI will make note of any Golden Eagle activity in the area during construction activities and take all practical steps to reduce disturbance of the birds. TAI will contact the U.S. Fish and Wildlife Service (USFWS) if an active Golden Eagle nest site is identified in the project area.

TAI assumes migratory birds may nest in the project area. TAI's winter road construction schedule will eliminate the risk of impacting the nests of migratory birds in the project area during the months when snow covers the ground. TAI has scheduled the access road and pad construction activities during the winter months to the greatest practical extent. Disturbed ground is less desirable to ground-nesting birds which otherwise rely on the tundra cover to disguise and construct their nests. If the actual schedule of activities indicates disturbance of native ground will be necessary during the typical nesting periods for the migratory birds, TAI will place "bird tape" to discourage birds from nesting in areas designated for disturbance during the nesting season.

In 2018, as part of the initial permitting process for the Clean Water Act Section 404 permit, the USACE consulted with the USFWS about compliance with the Endangered Species Act (ESA). The USFWS provided informal consultation under the ESA that there are no threatened or endangered species in the project area and USFWS did not expect project-related activities to adversely impact listed species (USFWS, 2018). TAI understands no mitigation measures are required to comply with the ESA in the project area at this time.

2.7 Request to Restrict Public Access

TAI is requesting herein that the Director of ADNR Division of Mining, Land and Water allow TAI to restrict public access to the roads and surface pads of this program for public safety per 11 AAC 86.800(b)(12) which requires an applicant to include such a request for any site the operator (applicant) wants the Division to close to public access to protect public safety or to prevent unreasonable interference with the rights of the operator. Heavy equipment operations, diesel air emissions, and the storage and use of explosives on the surface warrant such a restriction. The risk to public safety from our operations will start with the initiation of construction activities and continue for the life of this program including Phase II when TAI constructs surface facilities and proceeds with underground exploration. The Director has the authority to allow this public access restriction under 11 AAC 86.145(a)(1).

3.0 ENVIRONMENTAL BASELINE STUDIES

3.1 Surface Water Quality

For nearly twenty years, Red Dog Mine staff have been collecting surface water quality samples from 22 sites in the Wulik River and Ikalukrok Creek drainages as shown on Figure 13 and 14. Data are available from all 22 sites since 2014 and from select sites (i.e., Cub Creek and others) since as early as 2000. Several Stations are in drainages coincident with the proposed exploration surface facilities, the upper portion of the access road and all the secondary roads as shown on Figure 14. The data help to define the baseline environmental conditions in these drainages prior to any disturbance associated with the program.

TAI offers the following characterization of the surface water quality Anarraaq – Aktigirug area. Samples were generally taken on a monthly or bi-monthly basis from May to October each year for those years shown in parenthesis below:

- Station #205 - West Fork Ikalukrok 205 (2000 to 2002; 2015 to 2017)
- Station #206 - Ikalukrok 206 (2000 to 2002; 2015 to 2021)
- Station #207 - Ikalukrok (2000 to 2017)
- Station #208 - East Fork Ikalukrok (2000 to 2002; 2015 to 2019)
- Station #230 – Ikalukrok (2018 to 2021)
- Station #231 – West Fork Ikalukrok (2018 to 2021)
- Station #232 – Marissa Creek (2018)
- Station #233 – Warf Creek (2018 and 2021)
- Madison Creek (2014 to 2019)
- Cub Creek (2000 to 2002; 2015 to 2017)

An assessment of the following parameters was performed for the most recent five years of data, or data available if the monitoring period was less than five years, from these stations:

- Total Dissolved Solids (TDS)
- pH
- Total and dissolved aluminum (Al), arsenic (As), cadmium (Cd), copper (Cu), iron (Fe), lead (Pb), selenium (Se), and zinc (Zn)

Water quality sample results for these parameters were compared to the following water quality criteria:

- Alaska Department of Environmental Conservation Water Quality Standards 18 AAC 70 (effective March 5, 2020); and
- Alaska Water Quality Criteria for Toxic and Other Deleterious Organic and Inorganic Substances for Freshwater Aquatic Life (December 12, 2008).

The Alaska water quality aquatic life criteria for several metals are based on hardness, including cadmium, copper, lead, and zinc. For this assessment, the 15th percentile hardness from the data available for each station was used to calculate the applicable aquatic life water quality criteria; some sampling events did not provide a hardness value.

The water quality characteristics of the six stations are summarized below with respect to the most stringent Alaska water quality criteria:

TDS

TDS values were the Alaska water quality criteria in most cases apart from two exceedances at Ikalukrok 207 and one at Cub Creek. A particularly anomalous value of 19,100 mg/L was reported in the February 2001 sample from Ikalukrok 207, concurrent with elevated levels of cadmium, copper, iron, lead, and zinc.

pH

Values of pH were consistently low at four monitoring stations: West Fork Ikalukrok, Ikalukrok 207, Madison Creek, and Cub Creek. Over 90% of the samples were below the minimum pH criteria of 6.5 at Madison Creek and Cub Creek. At Cub Creek, pH values between 2.5 and 4 were consistently measured from the start of sampling indicating the acidic nature of most of the samples.

Aluminum and Zinc

Baseline aluminum and zinc values were high at all six monitoring stations with >90% of samples exceeding criteria at three locations (West Fork Ikalukrok 205, Cub Creek and Ikalukrok 207) for aluminum and >89% of samples exceeding criteria at four locations (Madison Creek, West Fork Ikalukrok 205, Cub Creek, and Ikalukrok 207) for zinc, respectively. East Fork Ikalukrok 208 had the least number of exceedances in aluminum and zinc, with only 8.5% of values greater than the aluminum criteria and 20.3% greater than the zinc criteria.

Selenium and Arsenic

Few exceedances were detected for selenium and no samples exceeded the criteria for arsenic. Selenium exceedances were isolated to the suspect anomalous event in February 2001 at Ikalukrok 207 and Cub Creek, where 1.3% of samples exceeded the selenium criteria.

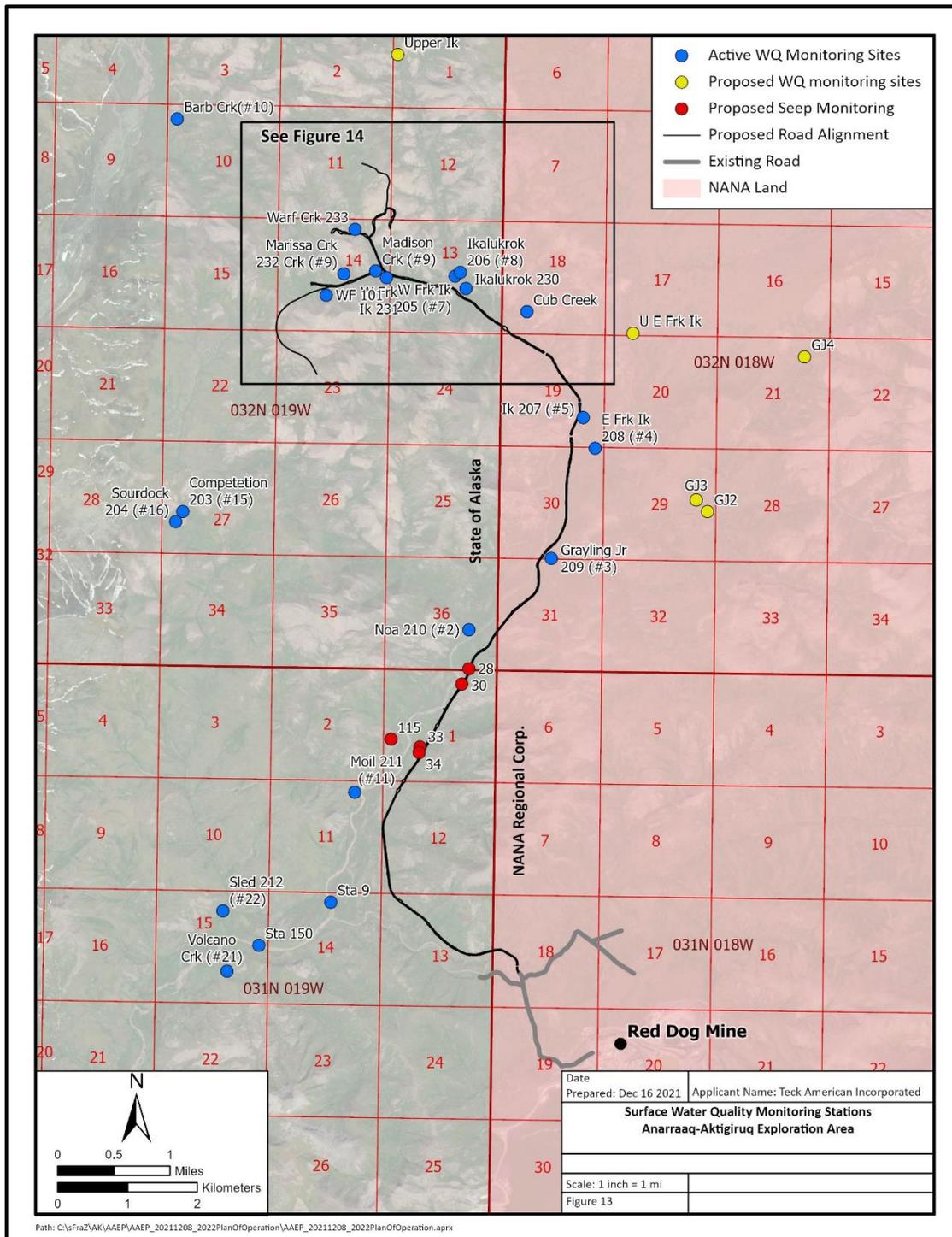


Figure 13. Surface Water Quality Monitoring Stations for the Anarraaq and Aktigiruaq Exploration Project

Cadmium, Copper, Lead, and Iron

Elevated levels of cadmium were consistently detected at Cub Creek and Ikalukrok 207 with isolated exceedances recorded at West Fork Ikalukrok 205 and Ikalukrok 206. Consistent copper exceedances were also detected at Cub Creek, Ikalukrok 207 and West Fork Ikalukrok 205 with 89.2%, 61.3% and 72.0% of values exceeding criteria, respectively. Isolated exceedances for copper were detected at Ikalukrok 206 and East Fork Ikalukrok 208. Lead values were constantly high at Cub Creek with 94.9% of values exceeding the criteria. Several lead exceedances were also measured at Madison Creek and Ikalukrok 207, with 2.4% and 3.6% exceeding criteria, respectively. Elevated iron concentrations were detected at four monitoring stations with more than 90% of samples exceeding criteria at Cub Creek.

In summary, the Cub Creek monitoring station consistently exceeded the criterion for most measured parameters, except for TDS, arsenic, and selenium. ADF&G speculate that Cub Creek, which often has a rusty color, may provide a chemical barrier to fish passage and limits the presence of fish in Ikalukrok Creek above the confluence with the East Fork Ikalukrok Creek (Al Ott, ADF&G, 2018).

Ikalukrok 207 (located downstream of Cub Creek) also had notable exceedances in the same parameters, but with a lower incidence rate than Cub Creek. Aluminum and zinc were consistently high at all monitoring stations. pH remained below the lower-level criteria of 6.5 in most samples taken from all monitoring stations, excluding Ikalukrok 206 and East Fork Ikalukrok, Ikalukrok 207 and isolated exceedances at Ikalukrok 206 and East Fork Ikalukrok 208.

Due to the lack of industrial presence in the area, the exceedances of the Alaskan water quality criteria are interpreted to be naturally occurring. Background TDS concentrations in surface water quality samples from many sample sites collected by Red Dog Mine as part of their monitoring requirements show a marked increase in TDS beginning in 2018. This has affected the Red Dog Mine's ability to rely on Red Dog and Ikalukrok creeks for their assimilative capacity for TDS during the seasonal discharge seasons. Red Dog Mine personnel have noticed an increase in conspicuous seeps in the region and tentatively attribute both to climate change and specifically to the warming of permafrost and the release of TDS from shallow groundwater. Red Dog Mine is supporting several studies to characterize changes in permafrost and their relationship to water quality in the region.

TAI will continue to collect water quality samples throughout the Ikalukrok Creek basin and in the Anarraaq and Aktigiruaq area for the foreseeable future. The data will provide a useful baseline to continue to track natural changes in water quality and a basis for comparison in the future after the exploration program is initiated.

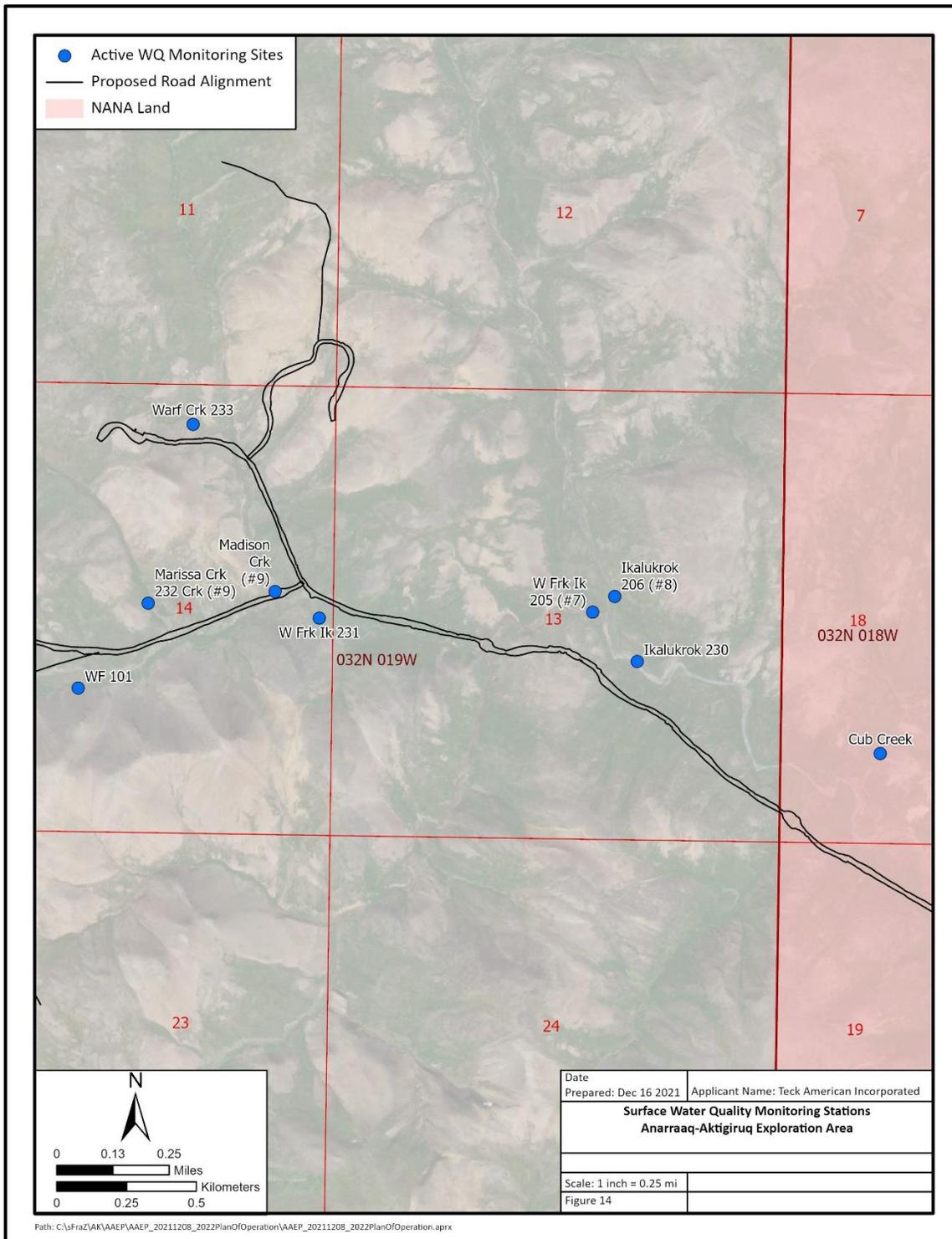


Figure 14. Surface Water Quality Monitoring Stations for the Anarraaq and Aktigiruiq Project in the Vicinity of Planned Infrastructure.

3.2 Aquatic Biomonitoring

The Alaska Department of Fish and Game (ADF&G) has been performing aquatic studies in the greater Red Dog Mine area since 1991, including sites on Ikalukrok Creek and additional sites added in 2020 and will expand that work further in 2022. That work has been focused on three fish species including Dolly Varden, Arctic Grayling, and Chum Salmon and also included monitoring of aquatic invertebrates and periphyton. The work has included identification of wintering, spawning and rearing habitats, fish tissue sampling (for metals), and fish counts. In addition, some aquatic study work was performed as part of the baseline environmental effort in 1980 and 1983, prior to constructing the Red Dog Mine. All the public ADF&G reports detailing the aquatics survey work are available on the Habitat Technical Reports e-Library website - [ADF&G Publications](#).

In 2021, ADF&G began publishing baseline biomonitoring reports on their baseline biomonitoring for the Anarraaq and Aktigiruaq Prospects separate from the Red Dog Mine biomonitoring reports. Information from the 2020 Anarraaq and Aktigiruaq biomonitoring season can be found in See Technical Report 21-05 http://www.adfg.alaska.gov/static/home/library/pdfs/habitat/21_05.pdf for that information from the 2020 biomonitoring season. As previously mentioned in the discussion of surface water quality (Section 3.1), aquatic biomonitoring data suggest notable changes in water quality changes in the Anarraaq and Aktigiruaq area including lowering pH, and a decrease in chlorophyll-a concentrations, and increasing TDS levels beginning in about 2018. These changes are concurrent with the increased levels of TDS described above.

The Catalog of Waters Important for the Spawning, Rearing or Migration of Anadromous Fishes (Anadromous Waters Catalog or AWC) which indicates that Dolly Varden rear in Ikalukrok Creek as far upstream as the confluence with the East Fork Ikalukrok Creek, as illustrated on Figure 15. ADF&G has not observed fish in Ikalukrok Creek above the confluence with East Fork Ikalukrok Creek, possibly due to the poor water quality suggested by the high iron concentrations visible in the rusty water that flows into the Ikalukrok Creek from Cub Creek (Al Ott, personal communication, 2018). In addition, Arctic Grayling has been documented in Ikalukrok Creek up to and including Grayling Jr. Creek. The presence of Arctic Grayling has not been established in Ikalukrok Creek above the confluence with Grayling Jr. Creek (Audra Brase, ADF&G, personal communication, 2018). All fish distribution data based on the biomonitoring work performed by ADF&G to date in the Anarraaq and Aktigiruaq area has been incorporated into the [Anadromous Waters Catalog](#).

3.3 Wetlands Surveys

TAI contracted WHPacific, Inc. (WHP) (now Kuna Engineering, LLC) to complete wetlands mapping along the potential exploration access road corridors in 2015, 2017, 2018, and 2019. This information is compiled in a comprehensive report (Kuna, 2019). The exploration access road will occupy a small fraction of the survey area and will permanently impact only approximately 19.6 acres of wetlands and 2,412 linear feet of WOTUS.

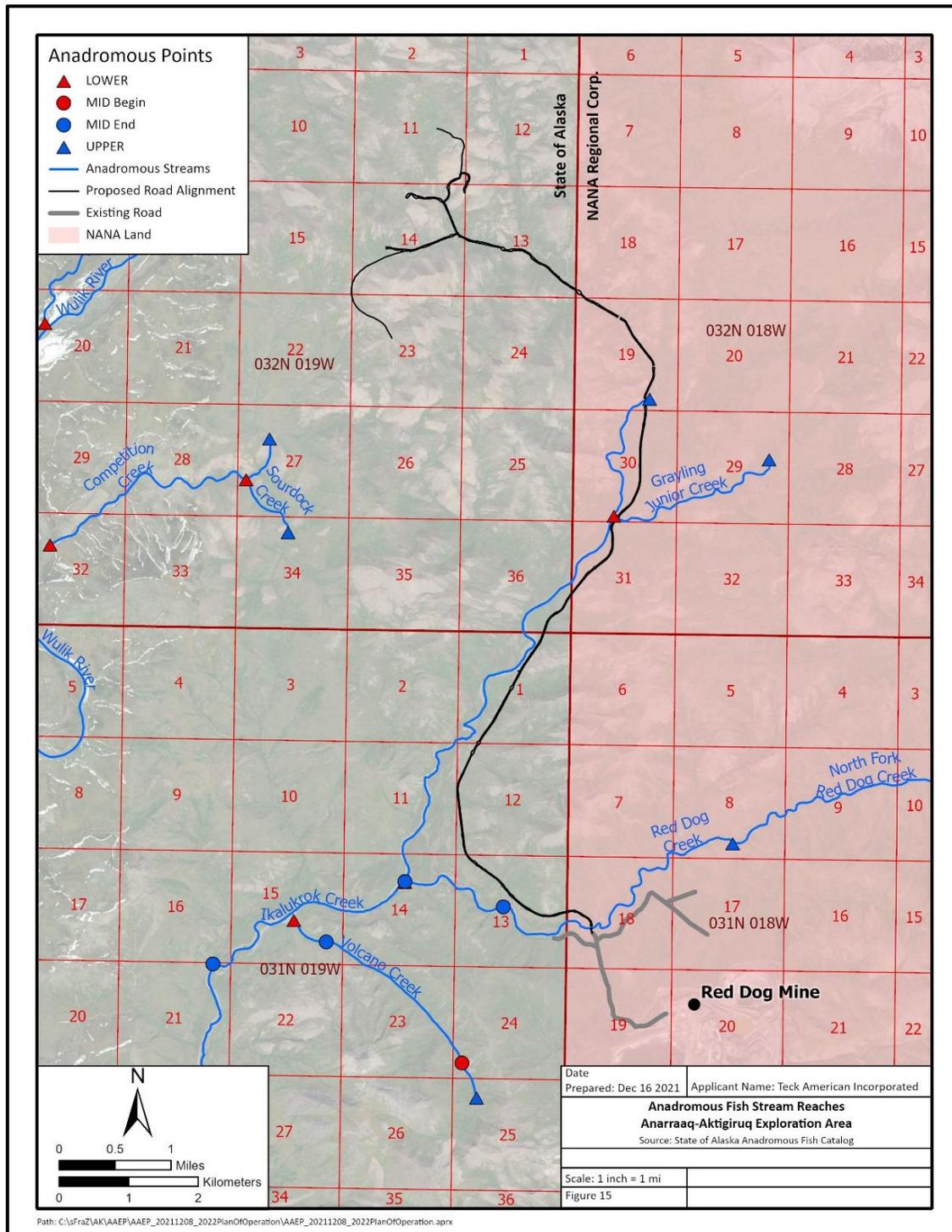


Figure 15. Anadromous Fish Stream Reaches in Red Dog Mine and Anarraaq-Aktigiruk Area

All streams within the Anarraaq and Aktigirug Exploration Area flow to the Wulik River and into the Chukchi Sea and are therefore considered either perennial or relatively permanent tributaries of navigable water for regulatory purposes. Kuna (2019) concluded that wetlands abutting or adjacent to jurisdictional waterways would fall under federal jurisdiction. TAI used the Kuna wetlands mapping data to support the CWA Section 404 permit application to place fill in Waters of the U.S. (WOTUS) necessary to construct the road. TAI took steps to avoid and minimize impacts to wetlands through; 1) de-selecting a western road corridor option, largely due to the predominance of wetlands along that route, 2) using span bridges on larger stream crossings, and 3) siting proposed surface facilities on uplands. Approximately 19.6 acres of wetlands and 2,412 linear feet of WOTUS will be impacted by the main access and secondary roads. The surface pads will have no impact on wetlands or linear impacts to WOTUS. TAI submitted the 404 permit application to the USACE in February 2022 and is still under review at the time that this Plan of Operations was written. TAI also submitted the Request for 401 Certification at the same time as the 404 permit application and anticipates receiving both before the end of 2022.

3.4 CULTURAL RESOURCES (ARCHAEOLOGICAL) SURVEYS

In 2017, TAI contracted with WHPacific, Inc. (now Kuna Engineering, LLC) to conduct a cultural resources survey of the proposed Anarraaq and Aktigirug exploration access road corridor and areas of possible disturbance associated with the proposed surface facilities. The cultural resource survey included background research and pedestrian (field) surveys for cultural resources. No historic structures are present in the Anarraaq and Aktigirug area; therefore, no historic-period-buildings survey was conducted.

As detailed in the 2017 WHP Report, the pedestrian survey resulted in the identification of three prehistoric sites within the project area (DEL-551, DEL-552, and DEL-554), two prehistoric isolated finds (DEL-555 and DEL-557), and one historic isolated find (DEL-556) (Figure 16). Prehistoric site DEL-271, identified prior to the pedestrian survey, was revisited, and expanded. Site boundaries were delineated by the visible horizontal extent of surface artifacts. DEL-271 was recommended as eligible for listing on the National Register of Historic Places (NRHP). The remaining four sites (DEL-551, DEL-552, DEL-553, and DEL-554) were listed in the WHP report (2017) as unevaluated for the NRHP as additional information was required for evaluation. WHP recommended all sites and isolates be avoided by surface disturbing activities. The road alignment was selected to avoid these sites.

An additional site, DEL-378, is located near the start of the proposed access road, but that site was flooded by the construction of the fish weir below the Red Dog Mine tailings facility. The impact to this site was previously evaluated by the USACE as part of POA-1984-0084- Mod X issued to TAI on March 11, 1997.

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**Contact Project
Manager or Applicant
for More Information**

Additional archaeological survey work was conducted in 2018 and 2019 by Walking Dog Archaeology to expand the investigation area and obtain information to support NRHP eligibility determinations (Walking Dog Archaeology, 2018 and 2019). In addition, S. R. Braund and Associates and Walking Dog Archaeology prepared a historic district evaluation (S. R. Braund and Associates and Walking Dog Archaeology, 2020) that provides a comprehensive evaluation of the cultural sites in the Area of Potential Effect (APE) and concluded the sites did not constitute a historic district. All archeological reports have been submitted to the Alaska Department of Natural Resources Office of History and Archaeology (OHA) and to the USACE as part of the CWA Section 404 permit process. These reports are accessible to qualified persons through the Alaska Heritage Resources Survey (AHRs).

The location of the access road and other proposed surface disturbances have been designed to avoid these sites, which are generally shown on Figure 16. Summaries of the sites and isolated finds, excerpted from the S. R. Braund and Associates and Walking Dog Archaeology (2020) historic district evaluation report, are included below.

Site DEL-271

Summary: DEL 271 was discovered in 1987 by BLM archaeologists who reported a lithic scatter consisting of a flake core and projectile point base with affinities to the Denbigh or Norton Tradition. No information regarding subsurface testing or collection of artifacts was included on the submitted AHRs card, and no formal report or other documentation appears to exist. WHPacific revisited the site in 2017 and failed to relocate the reported projectile point base but did note a concentration of pressure flakes was located against a bedrock outcrop below the recorded location of the site and identified a large (9 centimeter [cm] x 7cm) high-angled scraper made of black metasedimentary material and associated lithic debitage at the reported location of the site. No mention of the reported flake core is provided. No subsurface testing was conducted during the 2017 revisit (WHP, 2017).

Walking Dog Archaeology (2018b) conducted subsurface testing at the site in 2018 to collect sufficient data to determine whether DEL-271 is eligible for inclusion onto the NRHP. While there, they relocated the scraper described in the 2017 report, and identified a gray-blue chert flake core fragment, possibly the same reported in 1987. The 2018 revisit also reported a flake cluster near a bedrock outcrop which appears to be the same location as the 2017 revisit. This shatter may have been the result of naturally occurring frost-action and mass-wasting and may not have been cultural. Thirteen subsurface tests were excavated along the landform that contains DEL-271, all of which were negative for cultural material. The available data appears to indicate DEL-271 is a surface archaeological site

that consists of at least two non-diagnostic lithic tools and a concentration of lithic debitage.

Evaluation: After the 2018 revisit, Walking Dog Archaeology (2018b) recommended DEL-271 be determined not eligible for listing in the National Register of Historic Places because it was recommended as not significant under any of the NRHP criteria.

Integrity: Walking Dog Archaeology (2018b) recommended DEL-271 as not eligible for inclusion onto the NRHP; consequently, Walking Dog Archaeology did not conduct an analysis of the aspects of integrity.

Site DEL-378

Description: Northern Land Use Research archaeologists initially identified this site in 2001 during a cultural resource reconnaissance survey for an exploratory drill site and proposed access road west of Red Dog Mine. DEL-378 consists of a single non-diagnostic retouched flake tool and one piece of black chert shatter (Potter and Bowers, 2001). Two test pits were excavated in the vicinity of the piece of black chert shatter, both of which were negative for additional cultural materials. There is no indication the site has been revisited since its initial identification in 2001.

Evaluation: Based on findings from the 2001 fieldwork, NLUR prepared an evaluation and determination of eligibility for DEL-378. NLUR recommended the site as not eligible for inclusion onto the NRHP because it was recommended as not significant under any of the NRHP criteria (Potter and Bowers, 2001).

Integrity: NLUR recommended DEL-378 as not eligible for inclusion onto the NRHP; consequently, NLUR did not conduct an analysis of the aspects of integrity (Potter and Bowers, 2001).

Site DEL-551

Description: Initially identified by WHPacific archaeologists in 2017 during cultural resource investigations exploration road, DEL-551 consists of a moderate to low density concentration of lithic artifacts located on the surface of a deflated gravel bench overlooking Ikalukrok Creek (WHP, 2017). The site assemblage is made up of four nondiagnostic tools made of gray chert and 33 pieces of debitage made of gray and white chert and brown chert. Nondiagnostic tool types reported from the site include a utilized cobble, a multidirectional flake core, a retouched bifacial thinning flake with characteristics of a “spokeshave”, and a utilized core reduction flake. The debitage at the site is primarily made up of bifacial and core reduction debris and flake fragments.

Walking Dog Archaeology revisited the site in 2019 to gather additional information to assist in evaluating whether the site was eligible for inclusion onto the NRHP (Walking Dog Archaeology, 2019). Work at the site in 2019 included systematic pedestrian survey and excavation of eleven 25cm x 25cm subsurface shovel tests along a rough grid across the previously reported site boundary. Surface survey and subsurface shovel testing did not identify any new cultural material at the site.

Evaluation: WHPacific initially recommended DEL-551 as eligible for NRHP listing under Criterion D (potential to yield information to address important questions regarding the prehistory or history of the region) (WHP, 2017). However, based on the results of the Walking Dog Archaeology 2019 investigation, Walking Dog Archaeology (2019) recommended the site is not eligible under Criterion D because it lacks culturally and/or temporally diagnostic artifacts and does not possess a subsurface component. In addition, DEL-551 was recommended as not eligible for NRHP listing because it was recommended as not significant under any of the other NRHP criteria (e.g., A, B, C).

Integrity: Walking Dog Archaeology (2019) recommended DEL-551 as not eligible for inclusion onto the NRHP; consequently, Walking Dog Archaeology did not conduct an analysis of the aspects of integrity.

This site is included here for completeness but is located more than 500 ft. from the proposed road route and outside the Area of Potential Effect for the project

Site DEL-552

Description: Initially identified by WHPacific archaeologists in 2017 during cultural resource investigations for the exploration road, DEL-552 consists of a low-density concentration of lithic artifacts located on the surface of a deflated gravel bench overlooking the confluence of an unnamed stream and Ikalukrok Creek (WHP, 2017). The site assemblage was reported to consist of four nondiagnostic pieces of lithic debitage all made of light gray chert including two bifacial and two core reduction flakes. No subsurface testing was conducted at the site in 2017.

Walking Dog Archaeology conducted a 2019 revisit to DEL-552 to gather additional information to assist in evaluating whether the site was eligible for inclusion onto the NRHP (Walking Dog Archaeology, 2019). Work at the site in 2019 included systematic pedestrian survey and excavation of six 25cm x 25cm subsurface shovel tests. The pedestrian survey of the site identified approximately 40 additional nondiagnostic flakes and a flake core concentrated in two separate loci spaced roughly 12 meters (m) apart. One

of the six subsurface shovel tests at the site was positive for additional cultural material, which consisted of a flake found just beneath the surface vegetation.

Evaluation: The 2017 survey report noted that DEL-552 was not evaluated for a determination of eligibility for NRHP listing at that time due to a lack of available information. The results of the 2019 archaeological testing led to a recommendation the site is likely eligible for inclusion onto the NRHP under Criterion D as it has the potential to yield important information about the prehistory or history of the region, as it has at least two separate activity areas and may represent a multi-component site. Walking Dog Archaeology recommended the site as not eligible under the remaining NRHP criteria.

Integrity: Walking Dog Archaeology (2019) recommended this site as eligible for inclusion onto the NRHP under Criterion D and found that it retained its integrity in the aspects of setting, feeling, and association. Although not specifically addressed in the 2019 report, it is also likely that DEL-552 retains the aspect of location.

Site DEL 554

Description: Initially identified by WHPacific archaeologists in 2017 during cultural resource investigations for the exploration road, DEL-554 consists of a low-density concentration of lithic artifacts located on the surface of a deflated gravel bench overlooking Ikalukrok Creek (WHP, 2017). The site assemblage consists of nine nondiagnostic pieces of lithic debitage from a dark metasediment core including seven flake fragments, a core reduction flake, and an incomplete core reduction flake. No subsurface testing was conducted at the site in 2017.

Walking Dog Archaeology conducted a 2019 revisit to DEL-554 to gather additional information to assist in evaluating whether the site was eligible for inclusion onto the NRHP (Walking Dog Archaeology, 2019). Work at the site in 2019 included systematic pedestrian survey and excavation of six 25cm x 25cm subsurface shovel tests within the reported site boundary. Surface survey and subsurface testing did not identify any new cultural material at the site.

Evaluation: The 2017 survey report noted that DEL-554 was not evaluated for a determination of eligibility for NRHP listing at that time due to a lack of available information. The results of the 2019 survey testing led to a recommendation the site is not eligible for inclusion onto the NRHP as it was not considered significant under any of the NRHP criteria.

Integrity: Walking Dog Archaeology (2019) recommended DEL-554 as not eligible for inclusion onto the NRHP; consequently, Walking Dog Archaeology did not conduct an analysis of the aspects of integrity.

Site DEL-555

Description: Initially identified by WHPacific archaeologists in 2017 during cultural resource investigations for the exploration road, DEL-555 consists of a single lithic artifact located on the surface of a deflated gravel bench overlooking Ikalukrok Creek. The artifact is described as a core flake made of black chert. No subsurface testing was conducted at the site in 2017.

Walking Dog Archaeology conducted a 2019 revisit to DEL-555 to gather additional information to assist in evaluating the eligibility of the site for inclusion onto the NRHP (Walking Dog Archaeology, 2019). Work at the site in 2019 included systematic pedestrian survey and excavation of four 25cm x 25cm shovel tests near the reported site location. The previously identified core flake was not relocated during the 2019 revisit to the reported site location, nor were any new cultural materials identified on the surface or from subsurface testing at the site.

Evaluation: The 2017 survey report noted that DEL-555 was not evaluated for a determination of eligibility for NRHP listing at that time due to a lack of available information. Walking Dog Archaeology (2019), based on the 2017 survey information and the results of the 2019 testing recommended the site as not eligible for inclusion onto the NRHP as it was not considered significant under any of the NRHP criteria.

Integrity: Walking Dog Archaeology (2019) recommended DEL-555 as not eligible for inclusion onto the NRHP; consequently, Walking Dog Archaeology did not conduct an analysis of the aspects of integrity.

Site DEL-556

Description: Initially identified by WHPacific archaeologists in 2017 during cultural resource investigations for the exploration road, DEL-556 consists of two historic period reindeer bells located on the surface of a deflated relic gravel bench overlooking Ikalukrok Creek (Brownell et al., 2017). The artifacts are described as handmade metal reindeer bells; one with a clapper/metal thong and the other with a leather thong. No subsurface testing was conducted at the site in 2017.

Walking Dog Archaeology conducted a 2019 revisit to DEL-556 to gather additional information to evaluate whether the site was eligible for inclusion onto the NRHP (Walking Dog Archaeology, 2019). Work at the site in 2019 included systematic pedestrian survey and excavation of four 25cm x 25cm subsurface shovel tests near the reported site area. Pedestrian survey was

unable to relocate the previously reported reindeer bells, and subsurface testing did not identify any new cultural material at the site.

Evaluation: The 2017 survey report noted that DEL-556 was not evaluated for a determination of eligibility for NRHP listing at that time due to a lack of available information. Based on the 2017 survey information and the results of the 2019 testing, Walking Dog Archaeology (2019) recommended the site is not eligible for inclusion onto the NRHP listing because it did not appear to be significant under any of the NRHP criteria.

Integrity: Walking Dog Archaeology (2019) recommended DEL-556 as not eligible for inclusion onto the NRHP; consequently, an analysis of the aspects of integrity was not conducted.

Site DEL-557

Description: Initially identified by WHPacific archaeologist in 2017 during cultural resource investigations for the exploration road, DEL-557 consists of an isolated lithic artifact located on the surface of a deflated relic gravel bench of Ikalukrok Creek (WHP, 2017). The artifact is described as a flake fragment made of black chert. No subsurface shovel tests were excavated at the site in 2017.

Walking Dog Archaeology conducted a 2019 revisit to DEL-557 to gather additional information to assist in evaluating whether the site was eligible for inclusion onto the NRHP (Walking Dog Archaeology, 2019). Work at the site in 2019 included systematic pedestrian survey and excavation of five 25cm x 25cm subsurface shovel tests within the reported site boundary. Pedestrian survey and subsurface testing did not identify any new cultural material at the site.

Evaluation: The 2017 survey report noted that DEL-557 was not evaluated for a determination of eligibility for NRHP listing at that time due to a lack of available information. The results of the 2019 testing led to a recommendation the site was not eligible for inclusion onto the NRHP because it was recommended as not significant under any of the NRHP criteria.

Integrity: Walking Dog Archaeology (2019) recommended DEL-557 as not eligible for inclusion onto the NRHP; consequently, an analysis of the aspects of integrity was not conducted.

4.0 REGULATORY REQUIREMENTS

4.1 State of Alaska Regulations

4.1.1 REGULATIONS FOR SURFACE USE OF MINING CLAIMS

The following is a discussion of the regulations that apply to allowable surface uses of the State mining claims and the approvals necessary for them that apply to this Plan of Operations.

According to 11 AAC 86.145(a)

- (1) A (mining claim) locator does not have exclusive use of the surface of the location. A locator may use the surface of the location only to the extent necessary for the prospecting for, extraction of, or basic processing of mineral deposits. A locator may not restrict public access to or other uses of the surface unless approved in writing by the director. The director may allow the locator to restrict public access or other surface uses of the location only to protect public safety or prevent unreasonable interference with the rights of the locator.
- (2) The building, placing, or use of surface structures or other surface improvements, including airstrips and roads, within the boundaries of a mining property must be approved by the director in writing through a plan of operations, land use permit, or other written authorization. The director will only approve surface structures or other surface improvements that are necessary to carry out authorized operations. Factors to be used by the director in approving the surface structures, other surface improvements, or uses include access to the property, remoteness of location, security of the operations, planned level of operations, existing authorized surface uses, and the current level of activity.

TAI is requesting the Director (of the ADNR Division of Mining, Land and Water) allow TAI to restrict public access to the roads and surface facilities of this program for their safety per 11 AAC 86.800(b)(12). Heavy equipment operations, diesel air emissions and use of explosives on the surface warrant such a restriction. The Director is given the authority to allow this access restriction under 11 AAC 86.145(a)(1).

Regulation 11 AAC 86.145(a)(2) is the legal underpinning for this Plan of Operations. This Plan is being submitted to meet the requirements of this regulation by obtaining the approval of the director, in writing, for all the surface improvements we propose constructing on TAI State mining claims.

According to 11 AAC 96.010(a)(1)(A), an activity involving the use of explosives and explosive devices, except firearms, requires a permit or other written authorization. TAI anticipates using explosive to quarry road construction material from at least four material sites and may require explosive for some of the road cut construction. TAI is applying for written authorization for use of explosive for these purposes through the approval of this Plan of Operations.

4.1.2 MATERIAL SALES STATUTES

ADNR advised TAI that it will authorize development of the material sites on state land for this project under statute AS 38.05.565 (Brent Martellaro ADNR-Mining Section email 11/4/21). The statute allows ADNR to dispose of materials from sources or sites to a holder of a permit, land lease, or right-of-way issued by the department. TAI will be required to pay for the materials, likely at the same yardage rate Teck Alaska, Inc. currently pays for materials it extracts from MS-DD2 at the Red Dog Mine. ADNR (Brent Martellaro ADNR-Mining Section emails of 11/9/21) has confirmed TAI can use the materials from the material sites on both State and NANA land for road construction purposes.

4.1.3 TEMPORARY WATER USE REGULATIONS

Pursuant to 11 AAC 93.035 (a)-(b) and 11 AAC 93.220, a Temporary Water Use Authorization must be received from ADNR prior to:

- (1) the consumptive use of more than 5,000 gallons of water from a single source in a single day; or
- (2) the regular daily or recurring consumptive use of more than 500 gallons per day (gpd) from a single source for more than 10 days per calendar year; or
- (3) the non-consumptive use of more than 30,000 gallons per day (0.05 cubic feet per second) from a single source; or
- (4) any water use that may adversely affect the water rights of other appropriators or the public interest.

TAI and/or its construction contractors will be relying on the application of water for ice road construction and dust suppression during construction of the access road and surface pads. Water will be sourced from one or more streams or ponds along the road alignment. As soon as those sources are identified, TAI will apply for authorizations for temporary water use from ADNR in addition to our currently active TWUAs. The volume of water that may be withdrawn will be specified in TWUA application(s) rather than here in the PoO.

4.1.4 PLAN OF OPERATIONS REGULATIONS

According to 11 AAC 86.800, an approved Plan of Operations can take the place of a land use permit or a miscellaneous land use permit that would be required under Title 11 for unleased lands. The lands described in this PoO are unleased State lands held through valid State mining claims, or private (NANA) land. Per 11 AAC 86.800(f) - For the operator's convenience, the proposed Plan of Operations may include information needed to apply for approvals from other departments or local and federal agencies under other applicable laws and regulations, such as effects of the operation on air and water quality, disposal of toxic wastes, effects on navigation, and effects on anadromous fish habitat. In accordance with 11 AAC 86.800(b), the plan must show how the operator proposes to comply with performance standards, stipulations, or conditions applicable to the prospecting permit or lease. The proposed plan of operations must address the areas to be mined, location and design of settling ponds, tailings disposal, overburden

storage, permanent or temporary diversions of water, access routes, reclamation plans, and other actions necessary to conduct the operation. The plan must include statements and maps or drawings setting out the following, as applicable:

- (1) the sequence, schedule, and duration of the proposed operations;
- (2) size and purpose of the operations;
- (3) number of pieces of equipment and people working on the program;
- (4) amount of material to be handled, processed, or removed, and how the material will be processed;
- (5) method of tailings disposal;
- (6) area of timber to be cleared, amount to be used, and clearing methods;
- (7) overland access routes to be used, and whether new roads, landing strips, or other new transportation facilities will be needed;
- (8) reclamation that will be carried out, including a timetable for each step in the reclamation, an estimate of the cost, and a description of the measures to ensure that all debris is disposed of in a sound manner;
- (9) the actions to be taken to avoid or minimize detrimental effects on fish and wildlife and their habitats;
- (10) amount and source of water to be used;
- (11) location and size of camp facilities;
- (12) any site the operator wants the division to close to public access to protect public safety or to prevent unreasonable interference with the rights of the operator;
- (13) how the operator's plans for compliance with other applicable laws and regulations, including size and location of required facilities or improvements, will affect resources under the jurisdiction of the department; and
- (14) any additional information required by the director to assist in evaluating the proposed plan of operations.

All of the above information, applicable to the proposed project, is addressed in this Plan. As this Plan does not propose any mining, and because there is no timber in the program area, TAI submits that 11 AAC 86.800(b)(4), (5), and (6) are not applicable and are not addressed in this Plan. In addition, authorization for withdrawal of water is authorized under Temporary Water Use Authorizations from ADNR-Water Resources Section, as such specific details for the volume and source of water are not provided in this Plan.

4.1.5 RECLAMATION PLAN AND RECLAMATION BONDING STATUTES AND REGULATIONS

In addition to the requirement in 11 AAC 86.800(b)(8) that a Plan of Operations must include information (statements, maps, and drawings) describing the reclamation that will be carried out, including a timetable for each step in the reclamation, an estimate of the cost, and a description of the measures to ensure that the all debris is disposed of in a sounds manner, ADNR also regulates project reclamation planning and the requirement for financial assurances (Reclamation Bonding) under AS 27.19 and 11 AAC 97. Specifically, 11 AAC 97.200 sets certain performance

standards for reclamation that require a site to be reclaimed to a stable condition relative to erosion (after one year) and to naturally revegetate after five years, as well as requiring segregation of native topsoil for reclamation and other requirements. 11 AAC 97.210 addresses the removal of buildings, debris, and structures on state land, including the option of leaving buildings and structures if the surface owner or land manager approves it. 11 AAC 97.220 requires openings of all shafts, adits, tunnels, and air vents to underground mine workings shall be stabilized and properly sealed to protect the public, wildlife, and the environment. 11 AAC 97.240 requires a miner shall reclaim a mined area that has potential to generate acid rock drainage (acid mine drainage) in a manner that prevents the generation of acid rock drainage or prevents the offsite discharge of acid rock drainage. Additional requirements for the Reclamation Plan are prescribed in 11 AAC 97.300-350.

Reclamation bonding is regulated under 11 AAC 97.400 and requires that miners either:

- (1) participate in the statewide bonding pool under 11 AAC 97.425;
- (2) post a performance bond with the commissioner to ensure complete compliance with AS 27.19, this chapter, and the approved reclamation plan, consisting of either
 - (A) a corporate surety bond under 11 AAC 97.405; or
 - (B) a personal bond accompanied by a letter of credit, by a certificate of deposit, or by a deposit of cash or gold, under 11 AAC 97.410;
- (3) post a bond or financial guarantee with another government agency to satisfy that agency's reclamation related bond requirements if, in a cooperative management agreement with that agency, the commissioner has determined that the agency's bond requirements are at least as effective as those of AS 27.19 and that requiring another bond would be unnecessary; or
- (4) post a general performance bond that
 - (A) is written in favor of an agency of the State of Alaska;
 - (B) requires reclamation to standards no less effective than those of AS 27.19 and this chapter;
 - (C) is in an amount no less than \$750 per acre of mined area or area to be mined;
 - (D) remains in effect until the mined area is reclaimed to standards no less effective than those of AS 27.19 and this chapter; and
 - (E) requires that, if the bond is liquidated, proceeds in the amount of \$750 per acre of mined area will be paid or reserved exclusively for the purpose of reclamation until all mined areas are reclaimed to standards no less effective than those of AS 27.19 and this chapter.

Another option for meeting financial assurance obligations for reclamation is the State mine reclamation trust fund established under AS 37.14.800. This is a State-managed trust fund companies can contribute to as a means of later withdrawing funds to meet their reclamation obligations. Currently no active mines participate in the trust fund.

This Plan of Operations includes a Reclamation Plan which meets the regulatory requirements for a Reclamation Plan described here. The Reclamation Plan is described in more detail in Section 5.0 and included in its entirety in Appendix B.

4.1.6 STORM WATER REGULATIONS

Storm water is regulated by ADEC under the Alaska Pollutant Discharge Elimination Program (APDES) Program, delegated to the State by the EPA. Storm water management for the program will be managed under the terms of a Multi-Sector General Permit (MSGP #AK060000) for storm water discharges associated with industrial activity. Storm water discharges associated with industrial activities are defined by 40 CFR 122.26(b) (14) (i-ix and xi). To ensure protection of water quality and human health, the permit establishes control measures and Best Management Practices (BMPs) that must be used to control the types and amounts of pollutants that can be discharged from certain industrial activities. This general permit is intended to regulate storm water (rain, snow, and snowmelt) runoff which may come in contact with industrial activities and/or materials which may cause contamination.

To obtain authorization to operate under the MSGP, the permittee must develop a Storm Water Pollution Prevention Plan (SWPPP), submit the SWPPP to ADEC with a Notice of Intent (NOI) to operate under the MSGP and pay the authorization fee in accordance with 18 AAC 72.

TAI is requiring its road construction contractor to be responsible for maintaining the SWPPP, constructing and maintaining storm water BMPs and otherwise managing storm water during construction activities during Phase I of this program. TAI submitted the road construction SWPPP with the NOI and authorization fee to ADEC on December 14, 2018. TAI updated the SWPPP with the requirements of the 2020 MSGP and submitted a new NOI on June 25, 2020. ADEC issued MSGP number AKR06AF84 on September 17, 2020. The TAI contractor will review and revise the SWPPP as required prior to the start of road construction activities.

4.1.7 FISH PASSAGE STATUTES AND REGULATIONS

The Anadromous Fish Act (AS 16.05.871 - .901) requires an individual or government agency provide prior notification and obtain permit approval from ADF&G before altering or affecting “the natural flow or bed” of a specified waterbody, or fish stream. All activities within or across a specified anadromous waterbody including construction; road crossings; gravel removal; mining; water withdrawals; the use of vehicles or equipment in the waterway; stream realignment or diversion; bank stabilization; blasting; and the placement, excavation, deposition, or removal of any material require approval from the ADF&G Habitat Section.

The location of specified anadromous waterbodies is contained in the Catalog of Waters Important for the Spawning Rearing or Migration of Anadromous Fishes (or Anadromous Waters Catalog or AWC) is updated annually and adopted into regulation (5 AAC 95.011) after public review; it is the legal record of known anadromous fish streams in the State of Alaska.

The AWC indicates that the Ikalukrok Creek is rearing habitat for Dolly Varden up to the confluence with the East Fork Ikalukrok Creek.

The Fishway Act (or Fish Passage Act AS 16.05.841), requires an individual or government agency notify and obtain authorization from the ADF&G Habitat Section for activities within or across a stream used by fish if it is determined such uses or activities could represent an impediment to the efficient passage of resident or anadromous fish.

In addition to the presence of Dolly Varden in Ikalukrok Creek, other data from ADF&G (Al Ott, 2018) have established the presence of Arctic Grayling in Ikalukrok Creek and some of its tributaries including Grayling Junior Creek. While Arctic Grayling is not an anadromous fish, compliance with the Fishway Act protects the movement of this species within these drainages.

TAI applied for and obtained Title 16 Fish Habitat Permits in 2018 from ADF&G for crossings over fish habitat streams and will comply with both the Anadromous Fish Act and the Fishway Act as required at stream crossings. These permits include FH18-III-235, 236, and 237 for Red Dog Creek, Ikalukrok Creek, and Grayling Jr. Creek, respectively.

4.1.8 OIL DISCHARGE PREVENTION REGULATIONS

Oil discharge prevention and response planning may be required for this program under 18 AAC 75. The trigger for an Oil Discharge Prevention Contingency Plan (ODPCP) is 5,000 barrels (210,000 US gallons) of crude oil or 10,000 barrels (420,000 US gallons) of refined product. This would be triggered if the ADEC determined that the construction program was part of a facility subject to 18 AAC 75.400 (i.e., part of the Red Dog Mine).

TAI will collaborate with ADEC in the determination of whether the Anarraaq and Aktigirug Exploration Program is considered part of the regulated mine facility for the purposes of triggering addition to the Mine's ODPCP.

4.1.9 SOLID WASTE REGULATIONS

Waste rock is managed under ADEC solid waste management regulations 18 AAC 60. Due to the intrinsic characteristics of the bedrock in the region, TAI anticipates excavating potentially acid-generating materials along the main access road and the portal and camp pads. Potentially acid-generating rock generated during the construction of the roads and surface pads proposed in this Plan is being regulated under 18 AAC 60.005(e) which states:

If a person treats a waste and demonstrates to the department's satisfaction that the potential for a release of hazardous constituents is eliminated by the treatment and the treated waste will not present a threat to the public health, safety, or welfare or to the environment, the department will allow the treated waste to be managed as an inert waste under 18 AAC 60.460 or an exempt waste under (c) of this section. The operator of the treatment works must

- (1) secure the approval of the department before handling the waste as inert or exempt under this subsection; and

- (2) keep records demonstrating that all waste managed under this subsection was treated in the manner on which the approval was based.

TAI submitted the Construction Rock Handling Plan (TAI, 2018) to ADEC in 2018 and obtained plan approval on February 1, 2019 (ADEC, 2019) to treat the PAG construction rock as an exempt inert waste. A minor amendment to that plan is under review by ADEC that addresses a minor realignment of the main access road. Additional information about TAI's Construction Rock Handling Plan and the BMPs that TAI will implement to ensure the safe management of PAG material and protection of the environment during construction in in Section 2.3.

4.2 Federal Government Regulations

4.2.1 FILL TO WATERS OF THE U.S.

Section 404 of the Clean Water Act (CWA) established a program to regulate the discharge of dredged and fill material into waters of the United States (WOTUS), including jurisdictional wetlands. Under this regulatory program, no discharge of dredged or fill material may be permitted if a practicable alternative exists that is less damaging to the aquatic environment or the WOTUS would be significantly degraded. Proposed activities are regulated through a Department of the Army (DA) permit review process by the U.S. Army Corps of Engineers (USACE) that evaluates applications under a public interest review, as well as the environmental criteria set forth in the CWA Section 404(b)(1) Guidelines. DA Permit requires that, to the extent practicable, TAI has taken steps to avoid and minimize impacts to wetlands. Compensatory mitigation may be required for unavoidable impacts. An individual DA permit is required for projects with potentially significant adverse impacts to WOTUS, but discharges that will have only minimal adverse effects may be authorized under a general permit. Other agencies with DA permit review and/or decision roles include the Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS). In addition, the CWA grants States and tribal governments the authority to review and approve, condition, or deny proposed projects, actions, and activities directly affecting waters of the United State; therefore, the State of Alaska also has a role through the CWA Section 401 water quality certification process. The USACE cannot issue a 404 permit until ADEC decides on water quality certification or waives the right to review the request.

TAI is applying for an individual CWA Section 404 permit for the impacts to WOTUS stemming from the exploration access road and surface pad construction. TAI has applied to ADEC for CWA Section 401 water quality certification of the 404 permit.

4.2.2 OIL POLLUTION PREVENTION REGULATIONS

The EPA's oil pollution prevention regulations are contained in 40 CFR 112, the Spill Prevention, Control, and Countermeasure (SPCC) rule, authorized under Section 311 of the CWA. Facilities that store 1,320 gallons or more of oil-based products in containers with volumes of 55-gallons or

more, are subject to the SPCC Rule. The planned construction operation will require oil-based storage more than 1,320 gallons; therefore, a SPCC Plan is required. If the total capacity of SPCC-regulated oil containers at the facility reaches 10,000 gallons, the SPCC Plan must be reviewed and certified by a professional engineer.

TAI will develop an SPCC Plan specific to the construction activities and will amend the plan as needed during the construction effort to reflect actual operating conditions.

4.2.3 MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The migratory bird species protected by the Act are listed in 50 CFR 10.13. TAI adherence to the Migratory Bird Treaty Act is discussed in Section 2.6

4.2.4 BALD AND GOLDEN EAGLE PROTECTION ACT

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

"Disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death, or nest abandonment.

Neither Bald nor Golden Eagles have been formally identified in the program area. The area is within the range of the Golden Eagle. TAI's compliance with the Bald and Golden Eagle Protection Act is described in Section 2.6.

4.2.5 ENDANGERED SPECIES ACT

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the U.S. Fish and Wildlife

Service (USFWS) and the Commerce Department's National Marine Fisheries Service (NMFS). The Service has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife, such as whales, and anadromous fish, such as salmon.

Under the ESA, species may be listed as either endangered or threatened. "Endangered" means a species is in danger of extinction throughout all or a significant portion of its range. "Threatened" means a species is likely to become endangered within the foreseeable future. All species of plants and animals, except pest insects, are eligible for listing as endangered or threatened. For the purposes of the ESA, Congress defined species to include subspecies, varieties, and, for vertebrates, distinct population segments.

The USACE consulted with the USFWS to check for the presence of ESA-species in the project area as part of the Section 404 Permit Action. The USFWS confirmed there are no threatened or endangered species in the project area (USFWS, 2018).

4.3 Local Regulations

4.3.1 NORTHWEST ARCTIC BOROUGH

The Northwest Arctic Borough (NAB) is a permitting agency at the borough level. The borough exercises land use planning and related zoning powers under the terms of state law and the borough home rule charter. This is codified under Title 9 and available for reference on the web at <http://codepublishing.com/ak/nwarcticborough.html>. Title 9 addresses zoning and land use and provides the NAB with the authority to guide, control, regulate and/or preclude future development of land within the borough in accordance with the land use policies stated in Title 9 and the NAB Comprehensive Plan.

Title 9 Permit applications are due before initiating any land use activity. The Anarraaq and Aktigirug Exploration Program is situated within the NAB Resource Development District, and under NAB code, the exploration activities require a Master Plan permit. TAI will apply for a Title 9 Conditional Use Permit for the activities described in this Plan in mid-2022.

5.0 RECLAMATION AND RECLAMATION BONDING

Teck American Incorporated is obligated to reclaim impacts that result from its exploration activities. A description of the reclamation plan is required under 11 AAC 86.800 as part of the Plan of Operation. TAI has developed this reclamation plan described below and included in its entirety in Appendix B.

5.1 Reclamation Plan

The Reclamation Plan for the Anarraaq and Aktigiruaq Exploration Program includes the following major components:

- Reclamation of the Anarraaq and Aktigiruaq exploration access and secondary roads,
- Reclamation of the material sites on State and NANA land along the access road, and
- Reclamation of the surface pads.

Road reclamation will include removal of all bridges and culverts, ripping or scarifying the road surface to encourage moisture and seed retention, and reseeding the road with an approved seed mixture to stabilize the surface and encourage recruitment of native vegetation. Boulders or signage will be placed along highwalls around the material sites for public safety. Water bars and crowns will be constructed on the road surface as required during reclamation to discourage erosion, redirect runoff and discourage ponding. The surface pads and material sites will be dressed, as necessary, to discourage ponding by directing runoff without encouraging erosion. The surfaces will be ripped or scarified to discourage erosion and encourage moisture and seed retention. The scarified surface will be reseeded with an approved seed mixture (see Tables 4 and 5 in the Reclamation Plan) for stabilization while native revegetation recruitment occurs over the longer term. The eventual goal is to have stable native vegetation through natural recruitment of native species from the surrounding undisturbed lands. In the arctic environment with its short growing season and immature soils, it is expected to take several years before there is measurable natural plant recruitment.

It is noted that owing to the arctic environment, the native organic soil horizon (i.e., “organic mat”) and native vegetation is sparse; therefore, it is generally impractical to segregate and stockpile the organic matter during winter road construction. It will be stockpiled wherever practical. As a result, the Reclamation Plan does not include stockpiling the organic layer or other growth media during construction, or the transportation and application of growth media to the scarified road surface during reclamation.

Reclamation sequencing would start with the surface pads at the ends of secondary roads. Following reseeding of the surface pads, road reclamation would start at the north end and surface dressing and reseeding would take place in segments as culverts and bridges are removed and

the entire reclamation effort “retreats” towards the last bridge across Red Dog Creek at the southern terminus of the access road. Removal of the bridge across Red Dog Creek and reseeded the ground surface where the bridge abutments were, will be the final reclamation activities.

Once the road is closed and reclaimed, TAI will submit a Notice of Termination signifying the end of the operations under the MSGP for storm water. TAI has included costs in the reclamation cost estimate for seasonal aerial inspections along the reclaimed road for locations that might not have stabilized and appear to be contributing to storm water quality exceedances. TAI has also included labor costs for periodically addressing these spots for a period of five years following reclamation of the road. Mitigation measures for storm water issues after road closure and reclamation will be limited to what can be accomplished with hand tools or helicopter-portable equipment.

5.2 Financial Assurance

TAI has developed a cost estimate for the activities described above and in the Reclamation Plan in Appendix B. The total cost estimate for reclamation, and post reclamation monitoring for a five-year period, is \$5,430,597 including Indirect Costs consistent with ADNR guidance on reclamation cost estimation. TAI intends to post a financial assurance in a form acceptable to the State regulatory agencies prior to initiating work under this Plan of Operations.

6.0 REFERENCES

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WHPacific, Inc., 2017, Proposed Aktigiruaq Exploration Access Road Cultural Resources Survey, Northwest Arctic Borough, Alaska, WHPacific Consultants Report, November 2017, 37 p.

Appendix A – Engineering Drawings for Road and Surface Pads

Appendix B – Reclamation Plan

Appendix C – Mining Claim Table

Appendix D – Access Road Caribou Procedures